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Lower Manhattan Transportation Strategies

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Metropolitan Transportation Authority



NEW YORK STATE
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Introduction



The destructive effects of September 11, 2001, have necessitated the restoration and catalyzed the renewal of Lower Manhattan's transportation system. As Lower Manhattan rebuilds, it is critical not only to restore the transportation functionality lost due to the disaster, but also to anticipate and accommodate the range of changes that September 11th has triggered. These changes include the creation of a glorious and fitting September 11th memorial, the transformation of the World Trade Center site, and the broader revitalization of Lower Manhattan.

Key to the recovery and future success of Lower Manhattan is accessibility. Downtown must provide swift, convenient and comfortable transportation for commuters from within the city, workers from throughout the region, and travelers from other parts of the world. This document sets forth transportation strategies that will help Lower Manhattan accomplish these goals. Chief among these strategies are: creating a world-class airport and regional access system linking Lower Manhattan to all three of the area's major airports and Long Island; and revitalizing downtown's damaged and aging transportation network, including its two transportation hubs and outmoded infrastructure. This document offers a description and timeline for these and other transportation projects. Together, these projects will enable Lower Manhattan to grow into an even stronger center of international commerce and rise to its role as a major visitor destination.

Introduction

Prior to September 11, 2001, more than 85% of workers arriving daily in Lower Manhattan traveled by public transportation, making New York's downtown the most transit-dependent central business district in the United States. Unfortunately, investment in Lower Manhattan's 19th and 20th century infrastructure has not kept pace with its 21st century needs. Due in part to the inadequacies of its increasingly overburdened and outmoded transportation infrastructure, Lower Manhattan's position in the region, nation, and the world has been slipping. In one of the most prosperous economic periods in New York City history — the years between 1991 and 2000 — the share of office employment in Lower Manhattan as a percentage of total employment south of 59th Street fell from 39% to 33%, while Midtown's share increased from 42% to 45%.¹

The events of September 11th have exacerbated this trend. The attacks led to the temporary displacement of approximately 138,000 downtown jobs.² To date, 60,000 jobs — beyond the 16,000 drop already experienced in the 1990's — have not returned to Lower Manhattan and many have relocated to other nearby areas, including Midtown, Jersey City, and Stamford, leaving the current employee population of Lower Manhattan at approximately 325,000.³ The decision of employers to relocate their businesses outside of Lower Manhattan has been due in significant part to September 11th's disastrous impact on downtown's infrastructure and the severe worsening of its transportation problems — including the temporary paralysis of the downtown 1/9 line, the closure of important city streets, and the destruction of the World Trade Center PATH terminal with the resultant loss of PATH service.

In the aftermath of September 11th, Governor George E. Pataki has enumerated a set of priority projects to restore Lower Manhattan's transportation infrastructure and lay the foundation for the area's future growth. Mayor Michael R. Bloomberg has articulated New York City's *Vision for Lower Manhattan*, offering a broad set of strategies for revitalizing Lower Manhattan through transportation upgrades and innovative land-use improvements. Taken together, the Governor's and Mayor's strategies lay the groundwork for the revitalization of Lower Manhattan.

The Search for Solutions

While looking to the future, the rebuilding of the World Trade Center and the revitalization of Lower Manhattan have also occasioned a fresh look at the half-century of studies that have proposed solutions to Lower Manhattan's long-standing infrastructure problems. Generations of transportation experts and advocates have devoted thousands of pages to the topic. The reports range from a series of studies issued by the Downtown Lower Manhattan Association (DLMA),

a group chaired by David Rockefeller from the 1950's through the mid-1970's, to the *Master Links* regional transportation strategy articulated by Governor Pataki in the 1990's. Almost every large-scale study of development issues in New York City and the greater metropolitan region has cited Lower Manhattan's transportation issues as important to address.

These fifty years of studies⁴ have drawn the same conclusion: for Lower Manhattan to remain a world-class, international business center, it must provide for more efficient movement of people – particularly from their homes to work. Woven through the long literature regarding Lower Manhattan's transportation system are several remarkably consistent themes that can assist in the development of post September 11th strategies. The continuing importance of these themes has been verified by numerous recent studies.⁵ These themes include:

- The Lower Manhattan subway system must be rationalized and improved, particularly by restructuring the labyrinthine connections among the many lines and creating/increasing key strands of service.
- Innovative solutions are required to improve automobile, truck, bus, and pedestrian movement on the streets of Lower Manhattan.
- Direct access to the region's airports is vital to the growth of Lower Manhattan as a global business center.⁶
- Commuters from Long Island, New Jersey, and the northern suburbs of New York and Connecticut, must be provided with faster and more convenient transportation to Lower Manhattan.

Many recommendations introduced in the past have been pursued and implemented, including the expansion of the PATH system, changes in pedestrian and vehicular circulation, and planning for the Second Avenue Subway. However, many key projects remain unrealized. As an important example, convenient airport and Long Island access remains a much-needed but elusive goal.

Restoring Jobs and Catalyzing Economic Development

Numerous constituencies agree that transportation improvements form the backbone of the revitalization of Lower Manhattan's economy. Members of the LMDC Financial Services and Professional Firms Advisory Councils, comprised of prominent business leaders who advise the LMDC on the concerns of



A February 2002 LMDC Advisory Council meeting.

Access to a Business Center - Canary Wharf, London



A growing commercial business district has developed at Canary Wharf in London over the last two decades, transforming the area from an abandoned dock to a thriving cluster of global financial service institutions. Similar to Lower Manhattan, the weakness of the transportation infrastructure was one of the main obstacles to the growth of the commercial tenant base. The construction on the Jubilee subway line, which connects Canary Wharf to Central London's West End in 15 minutes, proved to be a turning point in the development of the area.

Much like parts of the Lower Manhattan shore, Canary Wharf was a cargo warehouse at the center of the Docklands district up until the mid-1960s. Sea-cargo business at the docks declined precipitously in the early 1970s as new technology and containerization reduced the competitiveness of the London Docklands.

The London Docklands Development Corporation was created in 1981 to revitalize the Docklands area. The central area, representing about 10% of the total, was designated an Enterprise Zone, offering tax incentives to both investors and developers. The first major commercial buildings were completed in 1991, but were not immediately successful. One reason for the failure of the development was the inadequacy of the existing public transportation infrastructure coupled with the down turn in the global economy. Until the construction of the Jubilee Line, Canary Wharf's public transportation system was limited to the Docklands Light Rail, a newly constructed transit system that had limited connections with other London transit systems. To address the Docklands' problems, construction of the Jubilee line commenced in 1993.

When construction began in 1993, the total employment in Canary Wharf was 7,000 people. By the beginning of 2000, one year after completion of the Jubilee subway line, the number of jobs had grown almost 300% to 27,000 and by January 2003 it totaled 55,000. Key financial and professional service firms relocated to Canary Wharf, with the pace of new tenants accelerating in the late 1990s.^[1]

While the financial market boom of the late 1990s played a key role in the absorption of commercial space in Canary Wharf, it is widely acknowledged that the development would not have succeeded at the pace observed without the transportation enhancement provided by the Jubilee line. A total of 9 million square feet of commercial space has been completed since 1991 and another 5.5 million square feet is under construction, of which 95% is pre-leased.

^[1] Key tenants include State Street Bank (1991), Morgan Stanley (1991), Credit Suisse First Boston (1994), Skadden, Arps, Slate, Meagher & Flom (1996), Burlington Resources (1997), Readers Digest (1997), Bank of Montreal (1998), HSBC (1998), Bank of New York (1998), KPMG (2000), Clifford Chance (2000), McGraw-Hill (2000), Northern Trust Bank (2000), Lehman Brothers (2000), and Barclays (2001).

their industries, have consistently cited transportation as an essential driver in their businesses' location decisions. In their *Key Principles in Rebuilding Lower Manhattan*, the Alliance for Downtown New York, Association for a Better New York, New York City Partnership, and Real Estate Board of New York cite transportation and infrastructure as the first priority.⁷ Similarly, surveys by the Downtown Alliance and Wall Street Rising found that transportation is the single most important improvement for firms and workers in Lower Manhattan.⁸

CBD	Square Footage*	Number of Employees*	Available Transportation*	Change in Office Jobs During the 1990's
Midtown Manhattan	282,900,000	970,000	3 commuter rails, PATH, 19 subway lines, ferries, bus, Amtrak, airport access	49,000
Lower Manhattan	107,800,000	388,000	0 commuter rail, PATH, 18 subway lines, ferries, bus	-16,000

* Pre-September 11 numbers; square footage numbers obtained from Cushman & Wakefield.

Midtown Manhattan provides a valuable example of how enhancements to local, regional, and international transportation can spur economic development. Between the 1980s and today, several transportation improvements have occurred in Midtown that are the result of long-term transportation planning. Enhancements to key subway stations, such as Times Square-42nd Street, have improved navigation and convenience for thousands of daily subway riders. New Jersey Transit's Midtown Direct service to Midtown's Penn Station created a one-seat ride between New Jersey and Midtown Manhattan for additional New Jersey Transit customers. During the same time period, the MTA increased its fleet of Metro-North and LIRR trains, enabling a higher frequency of service to Midtown from several of the surrounding suburban regions. More recently, the Port Authority has completed an airport link from Midtown to Newark Liberty International Airport, while construction to connect Midtown to JFK is under-way.

If Lower Manhattan were to follow Midtown's example, it would be of mutual advantage. A 1997 study by Empire State Development Corporation found that improved transportation for Lower Manhattan would create 14,000 new downtown jobs, increase average Class A commercial rents in Lower Manhattan by as much as 12%, and boost economic activity across all of Manhattan by as much as \$930 million⁹ – benefiting not only Downtown, but also Midtown.

The Future of Lower Manhattan — Connectivity for the City, Region, and World

The development of a September 11th memorial and a rebuilt World Trade Center will require substantial upgrades to the area's rail, bus, ferry, and street systems. The Statue of Liberty already receives 3.5 million visitors per year departing from Lower Manhattan, while the original observation deck for the World Trade Center site received approximately 2 million visitors per year.

Access to An International Airport - The Rail Link for Hong Kong's Chek Lap Kok Airport

Air-rail links are becoming a central amenity for leading global airports. Currently, the gold standard of a successful airport access system is the Hong Kong Airport Railway, which provides direct service to the airport and has stimulated significant economic development in the areas near the rail stations.



The Hong Kong International Airport at Chek Lap Kok airport was opened in 1996, and is largely built on filled land. The Hong Kong Government made the strategic decision that more than 50% of all passenger trips to the airport should be made by rail. Direct rail access to the airport opened in 1998 and was built by the Mass Transit Railway Corporation ("MTRC"), an autonomous body wholly owned by the government of Hong Kong.⁽¹⁾ The Hong Kong Airport Railway is comprised of two types of rail access services. First, a dedicated high-speed rail service, the Airport Express Line ("AEL"), provides efficient and convenient access to the downtown business districts of Kowloon and Central Hong Kong. Second, there is a regular rail rapid transit line (the Lantau line) that is a part of the citywide metro network and connects to other lines and transfer points. It is expected that 250,000 passengers will use the rail access system to the new airport per day.

The Airport Express Line was designed to create the feeling that arriving at an AEL station is tantamount to arriving at Chek Lap Kok. Attractive features of the stations include high quality finishes, use of natural lighting, flight information displays, advance baggage check-in, and food service. The travel time to the airport from Central Hong Kong is 23 minutes, and passengers experience a business class environment.

The construction of the Airport Express Line spurred significant development of apartments, hotels and commercial buildings on the property surrounding the stations. Much of this development occurred on formerly vacant land or landfill, which became valuable due to its linkage to the Airport Express Line. The MTRC purchased from the government ownership of sites above station depots and associated transport interchanges. The MTRC then developed the sites as joint ventures with private developers and its share of the profits was used to partially finance the railway. Property development on AEL-linked sites includes 24.8 million square feet of residential development, 6.6 million square feet of commercial space, 3.6 million square feet of retail space and 3.1 million square feet of hotel space and serviced apartments.⁽²⁾

⁽¹⁾ The MTRC was privatized in June 2000 and is listed on the Hong Kong Stock Exchange.

⁽²⁾ Alistair J. Budge Reid, *Japan Railway and Transport Review* 19: 40.

The September 11th memorial has the potential to receive 5 million visitors per year or more. Upgrades of Lower Manhattan's existing facilities will not only significantly improve visitor experiences, but will also substantially raise the quality of life for this area's residents and workers. These advances are key to retaining and growing Lower Manhattan's commercial base.

Beyond the boundaries of Lower Manhattan, population growth across the region demands key transportation system improvements to maintain access to Lower Manhattan for critical labor pools. These projections lead to the conclusion that practical, achievable improvements should be made within the area's rail and ferry systems to serve Long Island, the northern New York suburbs/Connecticut, and New Jersey more effectively.

The global reach of business demands that top firms have ready access to clients and partners around the world. Consequently, airport access is a central focus of this document. Convenient airport access is a critical driver of Lower Manhattan's future growth and the key to maintaining its prominence in international business. Benefiting all of Manhattan, the airport access options presented in this publication represent the borough's best chance for centralized, coordinated connections to all three airports in the region.

Going forward, it is imperative that Lower Manhattan transform itself into an even stronger international commercial center. This transformation can be achieved through transportation improvements — both in the reconstruction of facilities lost on September 11th and in the implementation of local, regional, and international connections. By achieving a new level of global reach, Lower Manhattan can secure its position as a global business leader.

Paramount Goals: Serving the Memorial and Catalyzing the Economy

Providing a gateway to the planned September 11th memorial and revitalizing the downtown economy are the paramount goals for the improvement of the Lower Manhattan transportation system. The transportation infrastructure that is built today will be used by millions of visitors to the World Trade Center memorial for years to come. It is essential that design and construction proceed in a way that is both sensitive to the magnitude of the events that took place on the site and capable of handling large numbers of visitors.

Transportation improvements also must act as a catalyst for economic development, spurring commercial growth and enhancing neighborhood life in Lower Manhattan. The new transportation infrastructure should more effectively link Lower Manhattan to the region and the world. Improvements to the quality of the transportation network will enhance passengers' travel experience, attract a larger pool of residents and workers to the area, and provide a foundation upon which to rebuild the downtown economy. The potential to locate in close proximity to the new transit complex, for example, will attract commercial tenants to new office buildings, as well as drive the conversion or revitalization of underutilized buildings in the area. Enhanced airport and regional access will serve as an asset for existing Lower Manhattan firms and help to attract new ones.

Within this overall goals framework, the following set of objectives has been drawn from analyses of the existing transportation network and input from an extensive public dialogue. These objectives have guided the identification and development of the ideas within this document.

- **Create a Grand Point of Arrival**

Although Lower Manhattan contains some of the most extensive transit infrastructure in the world, it is largely concealed from sight and often confusing to navigate. For example, while the Fulton Street subway station complex serves nearly as many commuters as Grand Central Terminal, its entrances are tucked away in building lobbies and its interior space is cramped and convoluted. An easily navigable central station providing connections among numerous transit services — including the twelve Lower Manhattan subway lines, PATH, and the World Financial Center ferry terminal — can serve as a grand point of arrival and signature location for people arriving in Lower Manhattan. The presence of an iconic and efficient transportation complex will reaffirm Lower Manhattan's preeminence as a center for global business and an attractive place to live, work and visit.

- **Improve Access to the Region's Airports**

Access to the region's airports is crucial to Lower Manhattan's continued viability as the financial capital of the world and as the country's third largest central business district. New York's economy is increasingly dependent on financial and professional service firms that have intensive national and global travel requirements. While Lower Manhattan is located in proximity to the three major New York airports, it currently lacks efficient airport access. Traveling to JFK, LaGuardia, and Newark from Lower Manhattan is presently time-consuming and unpredictable. A 21st century central business district requires routes to the area's airports that are efficient and reliable. Transportation invest-

ments must make business trips across the nation and globe more convenient in order to maintain the competitiveness of the industry-leading firms of Lower Manhattan.

• **Improve Access To the Region's High Growth Areas**

Lower Manhattan must become more accessible to the region's growing labor pools. Currently, Lower Manhattan benefits from strong links to some portions of the commuter market, e.g., communities in New Jersey. However, its connection to the fast-growing counties of Long Island should be significantly improved. Transportation investments should aim to improve the everyday commute of workers from Long Island and other parts of the region in order to make Lower Manhattan a desirable place in which to locate major companies.

• **Promote New Commercial and Retail Development**

The volume of people passing through the new transit complex every day will provide lucrative opportunities for retailers and restaurants and will stimulate new business to locate in proximity to the station. Indeed, the new permanent PATH terminal itself will include shops, restaurants, and markets, restoring the retail activity that existed within the original World Trade Center concourse. Building upon the traffic and streetscape improvements that will make downtown streets more attractive and navigable, these new retail facilities will serve workers, residents, and visitors whose presence at various times of day will help make Lower Manhattan a 24-hour community.

• **Improve Efficiency, Connectivity, and the Passenger Experience**

Increasing the efficiency of the existing transit system is an extremely cost-effective way to increase capacity while at the same time enhancing the overall passenger experience. Improving connections among rail lines, increasing linkages between different modes of transit, and modernizing station facilities can yield valuable benefits in reducing the time it takes to make transfers and to travel in and out of subway stations. Similar improvements to the passenger environment have shown positive results in the past: the MTA's first major capital program for the entire subway system in the 1980's included massive renovations and upgrades to passenger facilities. The program successfully improved the passenger perception of the subways and, as a result, ridership increased. Since 1996, subway and bus ridership has increased by 27% and 50% percent, respectively.

• **Ease Surface Congestion**

Commercial and residential districts depend upon streets and sidewalks as primary means of movement. Surface congestion slows the movement of both people and goods, diminishing economic activity and hindering residential life. For the anticipated growth in Lower Manhattan, including the surge in visitors, a strategy must be formulated for dealing with loading and unloading of freight, dropping off and picking up passengers, bus parking, and other vehicular traffic issues. Alleviating sidewalk congestion and improving the overall pedestrian experience are also critical needs for improving quality of life for residents. The new streets established as part of the redevelopment of the World Trade Center site will play an important role in the strategy to rationalize the street network and create a lively, attractive new streetscape for a revitalized downtown.

• **Promote Active Pedestrian Life on the Streets**

If Lower Manhattan is to be active seven days a week, 24 hours a day, it must be welcoming to pedestrians on its streets at all hours. Residents, workers, and visitors are all drawn to street activity, and want to live, work, and visit places that are vital and energetic. All transportation improvements should be geared toward enlivening the streets that surround them, and the streets themselves should be improved to encourage pedestrians to walk, shop, and spend more time in Lower Manhattan.

Funding Priorities for Lower Manhattan

In keeping with the goals and objectives outlined above, Governor George E. Pataki has articulated a set of priority projects to revitalize Lower Manhattan. These projects were determined after consultation with the Transportation Working Group comprised of representatives of the State of New York, the City of New York, the Metropolitan Transportation Authority (MTA), the Port Authority of New York and New Jersey (PANYNJ), the New York State Department of Transportation (NYSDOT) and the Lower Manhattan Development Corporation (LMDC). These projects include a number of key transportation investments: a Lower Manhattan Transit Hub that incorporates the World Trade Center Transportation Complex (including the permanent World Trade Center PATH Terminal, pedestrian connections and related infrastructure) and the Fulton Street Transit Center; the South Ferry Subway Terminal; access to regional airports; bus facilities and WTC site sub-grade infrastructure; and improvements to West Street.

The federal government has earmarked \$4.55 billion of the \$20.6 billion of federal funds allocated for recovering from the September 11th attacks for transportation investment. On February 6, 2003, the Governor submitted to the Federal Emergency Management Agency and the Federal Transit Administration the funding requests for three priority projects — the World Trade Center Transportation Hub, Fulton Street Transit Center and South Ferry — estimates for which total \$2.55 to \$2.85 billion. Descriptions of the proposed projects are included in the chapters that follow.

Cost estimates are based upon the responsible agencies' current estimates. Because many projects are in the preliminary stages of development, the cost estimates are likely to be refined as projects move forward. In recognition of the fact that the scope of each of these projects, as well as the cost estimates, may change over time, the Transportation Working Group will continue meeting to review project status and propose changes to scopes and costs.

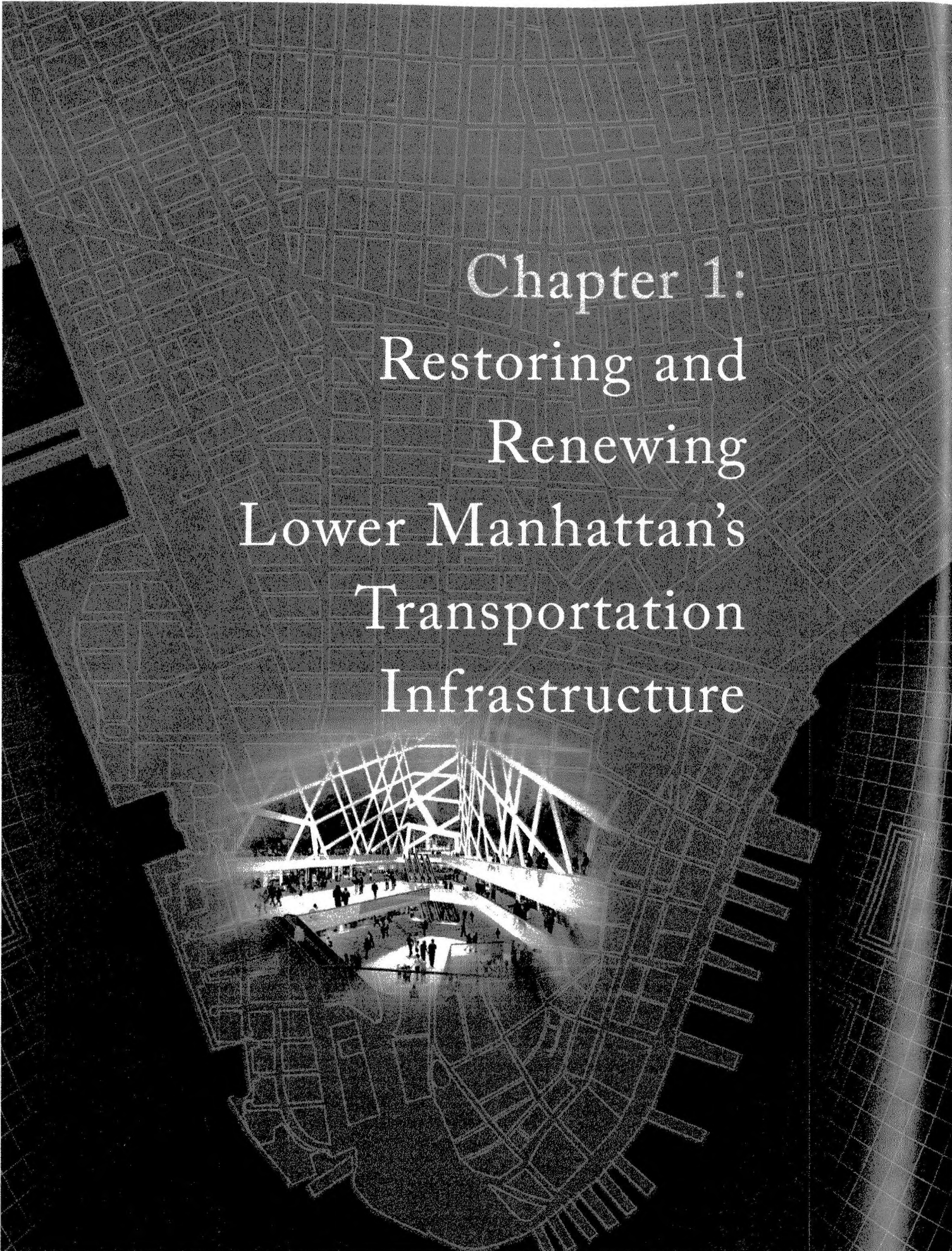
Going forward, the allocation of the remaining \$1.7 to \$2.0 billion of the \$4.55 billion in FEMA and FTA funding must now be determined. In addition to the three listed projects, there are a number of additional projects that the State, City and the transportation agencies consider important for the revitalization of Lower Manhattan and that should be accomplished. Preliminary cost estimates for the set of transportation projects which are under consideration are listed on the accompanying table. The remaining \$1.7 to \$2.0 billion will not be sufficient to finance all of these projects. Additional funding will be required.

FUNDING PLAN AND PROJECT STATUS		
High priority for remaining \$1.7 to \$2.0 billion of FEMA/FTA funds and other funding to be identified		
	Cost Estimate	Development Status
JFK Airport/Long Island Access	\$2.0 to \$5.3 billion	Inter-agency alternatives analysis study beginning as an initial step towards design and construction.
West Street	\$400 to \$900 million	Alternatives analysis and preliminary engineering under way.
Tour Bus Facility and WTC Sub-Grade Infrastructure	\$500 million	Bus facility site alternatives analysis under way.
Commuter Ferries	\$150 to \$200 million	Funding in place for some sites. New expansion study in preparation.
Street Configuration and Circulation	\$100 million	City identification of streets conducted. Some street reconstruction under way, more slated.
Funding anticipated from sources outside FEMA/FTA Funds, including agencies' capital programs		
Newark Airport Access	\$525 million	PANYNJ feasibility study in progress.
LaGuardia Airport Ferry	\$3 to \$6 million	PANYNJ to issue Request for Expression of Interest (RFEOI) later this year.
Linking Metro-North to 4/5 at Grand Central Station	\$50 to \$75 million	MTA in final stages of analysis.
Downtown Heliport/Airport Access	Less than \$1 million (significant investment not required)	Mainly requires organizational & regulatory approvals

In coming months, the Lower Manhattan Development Corporation, in conjunction with the State, the City and its partner agencies, will continue to study the possible impact of transportation investment alternatives on the future of Lower Manhattan and also explore potential sources of funds.

Potential sources include the following:

- LMDC Community Development Block Grant funds,
- Insurance proceeds related to the destruction of the transportation complex at the World Trade Center site,
- The capital programs of the transportation agencies,
- Transportation user fees, and
- Other federal funding sources.



Chapter 1: Restoring and Renewing Lower Manhattan's Transportation Infrastructure

The September 11th attacks destroyed critical portions of the Lower Manhattan transportation system, compounding existing deficiencies and jeopardizing the area's sustainability as a central business district. By rebuilding the transportation network — restoring service, eliminating deficiencies, and anticipating future needs — Lower Manhattan can lay the foundation for its revitalization.

Investments in Lower Manhattan's transportation infrastructure should be aimed at accommodating the rapid pace of 21st Century commerce and ensuring that our downtown remains well positioned among its international rivals. In addition to being the financial capital of the world, Lower Manhattan is home to the fastest growing residential area in New York City, with thousands of new housing units constructed in the last decade. Downtown is the center of New York City's government, the location of several educational institutions, and the site of many new and established cultural institutions. Lower Manhattan's prominence in a number of contexts draws a variety of people from a variety of places, making transportation central to its growth and vitality.

Although Lower Manhattan contains many significant transportation assets, most date back to the pre-World War I era. The events of September 11th struck a devastating blow to this already outmoded system. Going forward, millions of visitors are expected to visit the World Trade Center memorial that is currently in development — straining the capacity of the system still further. It is time to restore downtown's aging and damaged transit infrastructure, and, in the process, assist Lower Manhattan in achieving advanced technological standards. Clean and efficient rail stations, real-time passenger information systems, modern bus facilities, improved vehicular circulation, and enhanced above- and below-ground pedestrian connections are vital to the accomplishment of this objective.

Rail Station and Service Improvements

Subway

Lower Manhattan boasts the densest concentration of subway service in America, with 18 lines and 19 stations¹ serving an approximate area of 1.25 square miles below Canal Street.² These lines are heavily used. In fact, Lower Manhattan has by far the highest percentage of transit ridership in the nation. For the almost 220,000 Lower Manhattan workers who live in the city, the subway is the overwhelmingly preferred transit option, with 57% of workers from Manhattan, 77% from Brooklyn, 70% from Queens, and 70% from the Bronx relying on the subway for their commute. With such extensive subway usage, improvements to Lower Manhattan's rail facilities and service should be a high priority.

Nearly all of Lower Manhattan's transportation infrastructure was built in the early part of the 20th century. The last of the major subway projects in Lower Manhattan was the completion of the IND subway tunnels in the early 1930's. The manner in which the transit network developed — over the course of a century and as a set of competing private systems — has resulted in a number of deficiencies:



An illustrative example of the confusing passageways at the Fulton Street - Broadway Nassau Subway Station.

- **Poor Transit Connections:** Transferring between subway lines is awkward and disorienting. The connections between subways and other modes, including the PATH train, ferries and buses, are inefficient.
- **Inadequate Station Conditions:** Many of Lower Manhattan's subway stations have short and narrow platforms, crowded pinch-points that constrict passenger movement, and inadequate stairwells for distributing passengers along the length of platforms.

Many of these problems are manifested at the Fulton Street-Broadway Nassau station, which serves nine subway lines and 62,000 riders during weekday peak periods. Connections between the lines are confusing and circuitous, while the station's pedestrian passages are narrow and crowded and its entries are inadequate. An August 2001 study conducted by the Straphangers Campaign of over 4,200 riders at 15 different stations found that riders were especially dissatisfied with conditions at the Fulton Street station. Seventy-one percent of riders reported dissatisfaction at the crowding in the station — one of the worst ratings of the fifteen stations polled. Riders also complained that the Fulton complex was one of the worst in terms of station information and station security. Overall, passengers gave the station worse ratings than two-thirds of the other stations polled.³

Another station that suffers from an antiquated design is the single-track South Ferry station, constructed in 1918. Serving the 1/9 lines the station connects with the Staten Island Ferry Terminal and serves more than 15,000 riders per day. The inefficient operation at South Ferry restricts the number of riders who can board the trains, slows down the loading and unloading process, and limits the capacity of the entire 1/9 line.

World Trade Center PATH Service

The destruction of the World Trade Center PATH terminal on September 11th has put Lower Manhattan at a great disadvantage. The PATH terminal and tracks that lay below the World Trade Center were completely destroyed and the tunnels under the Hudson River connecting the PATH system in New Jersey to the World Trade Center site were flooded, damaging the tracks, signals, and other components. Accommodating PATH service, as well as three NYCT subway lines, and local and commuter buses along perimeter streets, more than 100,000 PATH and subway riders traveled through the World Trade Center concourse each morning — part of an estimated 150,000 total daily users entering the complex. Despite its ability to handle large crowds, its layout was inefficient, circuitous, and made direct connections confusing for workers and visitors alike.

Restoring and enhancing PATH service is crucial. PATH provides the primary transit link to Lower Manhattan from New Jersey, serving local markets in Hudson and Essex counties and providing a key linkage for New Jersey Transit rail commuters on routes that terminate at its major hubs at Newark Penn Station and Hoboken Terminal. In recent years, Jersey City and



The PATH train at the World Trade Center site prior to September 11th.

Hoboken waterfront areas have experienced growth in both residential and office development. Much of that development is within walking distance of PATH stations and has therefore increased the numbers of commuters traveling to and from Lower Manhattan, adding bi-directional ridership pressure to the PATH lines serving Lower Manhattan. PATH's Newark-WTC service was operating near capacity in the AM peak before September 11th. More than 67,000 passengers used PATH's WTC Terminal for travel to and from Lower Manhattan each weekday. The Port Authority introduced ferry service between Hoboken Terminal and the World Financial Center in 1989 to ease rush-hour pressure on the Hoboken-WTC PATH service.

Construction of a temporary WTC PATH station, rehabilitation of the trans-Hudson tunnels, and incorporating terminal station capability, and ten-car platform lengths at the Exchange Place Station are projects which are under way and on schedule for completion by the end of 2003. The temporary WTC PATH facility will be a stand-alone open-air station providing an entrance/exit on Church Street for up to 50,000 daily PATH riders.



The Port Authority is creating new crossover tracks at Exchange Place in Jersey City to enable PATH service restoration at that station by June 2003.

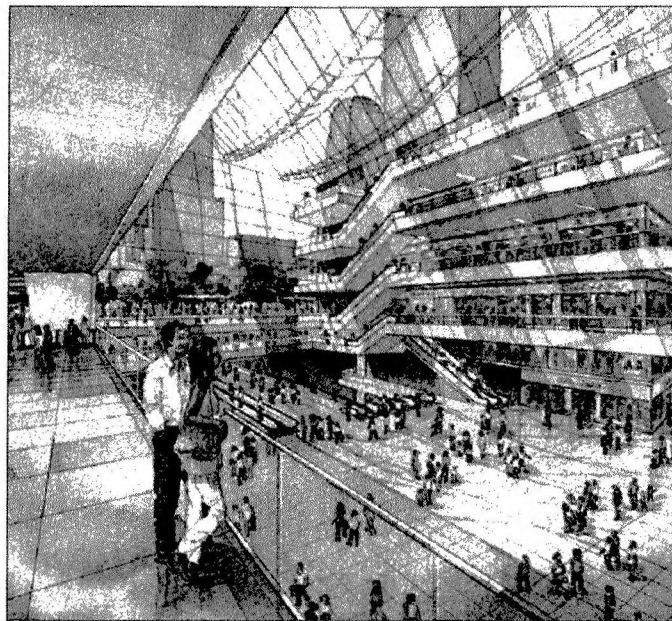
Lower Manhattan Transit Complex

The Lower Manhattan Transit Complex consists of two components: (1) the World Trade Center PATH Terminal and (2) the Fulton Street Transit Center, located at Fulton Street and Broadway. They will be connected by an east-west concourse, extending under Church Street and Broadway.

A GRAND POINT OF ARRIVAL FOR LOWER MANHATTAN

Providing efficient and reliable PATH and subway service will be a key driver in the continuing development of Lower Manhattan.

Located in proximity to each other, the Fulton Transit Center and the World Trade Center PATH Terminal will be striking physical manifestations of Lower Manhattan's position as a global destination. Whether arriving from London, Long Island or New



Conceptual image of the PATH Terminal's interior.

Jersey, a train traveler's first impression of Lower Manhattan will be the hub located at the World Trade Center site and at Fulton Street. The structure will be a significant architectural icon for Lower Manhattan and serve as a civic space for exhibitions, performances, and important events. The presence of a world-class transportation center will affirm Lower Manhattan's prominence as a global leader in business and define its role as a top Class A office market.

World Trade Center PATH Terminal

A new WTC PATH Terminal is required to fully restore and enhance PATH services that existed prior to September 11th, and to support the economic redevelopment of Lower Manhattan. It is projected that, upon full buildout, over 150,000 people will use the terminal on a daily basis — including PATH and subway riders, and other visitors. The Port Authority of New York and New Jersey is designing the new PATH Terminal to act as a gateway to Lower Manhattan — providing access north to the City Hall area and Tribeca, south to the Financial District, east to the Fulton St. Transit Center, and west to Battery Park City and the World Financial Center.

PATH will continue to be a vital and growing link between Lower Manhattan and New Jersey, as well as New York's Rockland and Orange counties. The region's west-of-Hudson counties are the largest source of Lower Manhattan workers apart from the five boroughs, and are forecast to grow in population more rapidly overall than the boroughs. PATH facilities will be expanded in the new terminal, including lengthening platforms (from 8-cars to 10-cars) and adding a platform, to enhance efficiency and passenger experience, and to accommodate future growth. The new terminal will provide a larger mezzanine level and feature a new regional fare collection system that will incorporate "SmartCard" technology to facilitate travel between transit systems.

Besides improved transit service, the new terminal will also provide more options for connecting with various transit modes, surrounding streets, the memorial, and nearby buildings. Below-grade circulation elements can extend in both north-south and east-west directions, featuring wide corridors and moving walkways to ease pedestrian travel across the roughly 1,000-foot wide WTC site (e.g., between Church Street and West Street or between Liberty Street and Vesey Street). Above-ground circulation will be greatly enhanced as well, with clearly configured pedestrian routes, more lively street-level retail, and shaded parks and open space. Information and wayfinding systems will assist travelers in reaching their destinations.

Studio Daniel Libeskind's Memory Foundations design for the World Trade Center site further fleshes out this transportation infrastructure. The Libeskind design locates the WTC PATH Terminal building between Fulton and Dey streets. The terminal opens onto the Wedge of Light, a large piazza onto which multiple important structures will front, including St. Paul's Chapel, the Millennium Hotel, a new Hotel and Conference Center, and a major new commercial office building. The Wedge of Light piazza is bisected by Fulton Street, a major east-west artery, and connects the new terminal building to both Church and Greenwich Streets. The PATH Terminal becomes a major presence within the new World Trade Center site and arises as a magnificent new structure for downtown.

Given its positioning, the Terminal has the potential for major street entrances along Church Street, Liberty Street, Vesey Street, and possibly others, as well as connections to the Fulton Transit Center (to the east) and the World Financial Center (to the west). The western connection underneath West Street will also provide access to the expanded WFC ferry terminal.

Lower Manhattan Transit Complex

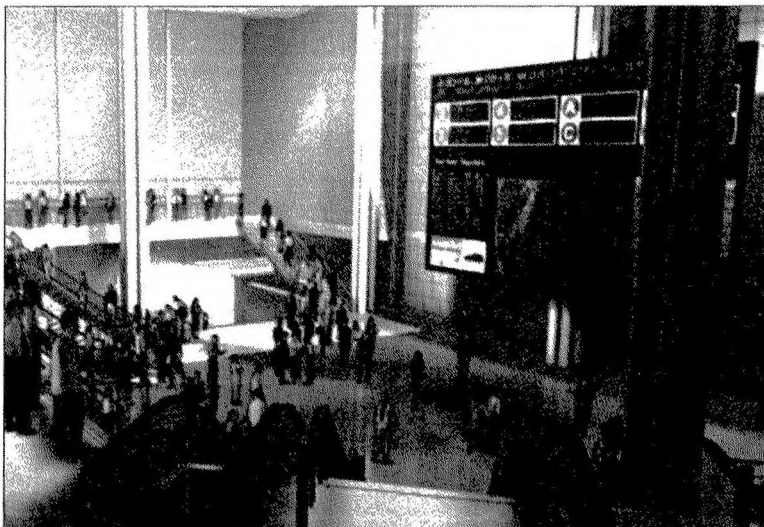
The project will incorporate appropriate security infrastructure and systems, as well as sustainable design components such as building management systems to provide for energy conservation. The WTC PATH terminal design also will allow for the future growth and integration of potential Lower Manhattan transportation enhancements such as airport rail access or commuter rail extensions.

Fulton Street Transit Center

The Fulton Street station complex will be completely rebuilt, reorganizing the existing maze of ramps, stairs and platforms into a more rational configuration in which transfers among the 2, 3, 4, 5, A, C, J, M, and Z subway lines will be simple and easy. It will also create a new, highly visible entry pavilion at the corner of Broadway and Fulton Street, made possible by the acquisition of properties along the Broadway frontage. Rebuilding this corner will make it possible to untangle the corridors, add new and larger station entrances, and create new above- and below-ground links to the 1/9, N/R, and E subway platforms, as well as a new PATH terminal.

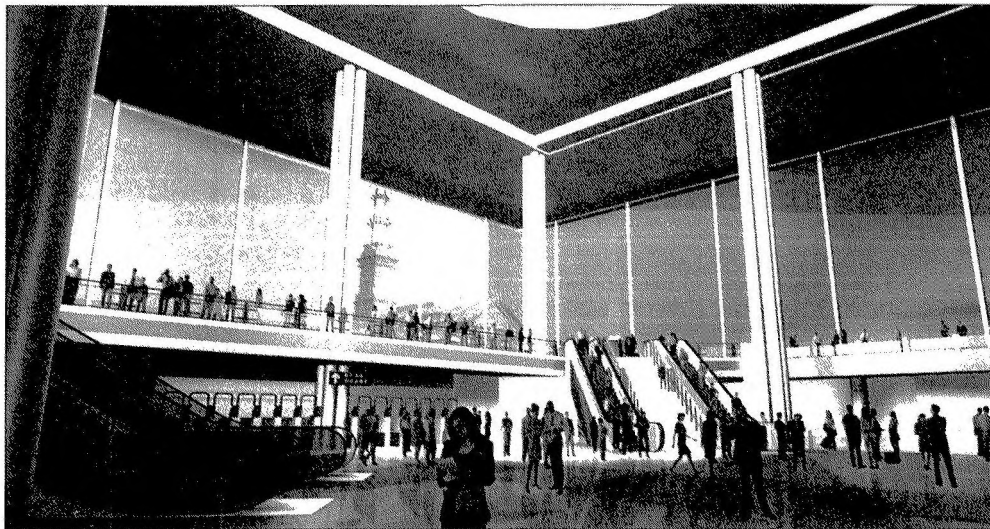
The new design will help remedy the station's currently labyrinthian condition, as explained in the previous section, and reduce the time it currently takes passengers to navigate the station. Untangling the corridors and adding new station entrances will provide improved connections among the different lines and facilitate easier passenger movement. Elements such as waiting areas that are clean, bright and safe; clear signage; convenient retail that relates to the surrounding street life; and wide circulation areas will ensure

that the Fulton Street Transit Center is a vast improvement over existing facilities. Concerns that passengers currently have expressed around the congestion and lack of information in the station will be addressed through these improvements.



An example of what the MTA's Fulton Street Transit Center's wayfinding information display might look like.

The Fulton Street Transit Center will be a major presence on the revitalized Fulton Street. The LMDC, in conjunction with the Department of City Planning, recently hired two consulting teams — Robert A.M. Stern Architects and Gensler Architecture, Planning, and Design — which are exploring new retailing and design ideas for the Fulton Corridor. The goal of the study is for Fulton Street to become the major east-west artery of Lower Manhattan by transforming the street's character into a unique retail, arts, culture, and entertainment destination. As advocated in Mayor Bloomberg's *Vision for Lower Manhattan*, the transformation of the Fulton Street-Broadway Nassau station into an attractive and efficient transit hub, will significantly aid in spurring the revitalization of the Fulton Corridor — and the surrounding areas — into a lively, mixed-use neighborhood that links the Hudson and East Rivers.



This conceptual rendering by the MTA illustrates how the new Fulton Street Transit Center will be a vast improvement over current crowded conditions.

Lower Manhattan Transit Complex

PROJECT DESCRIPTION:

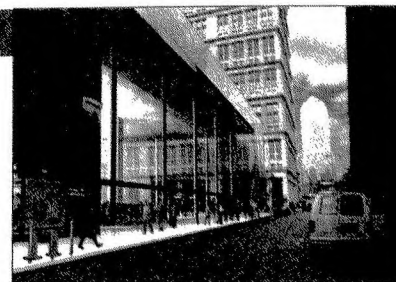
The Lower Manhattan Transit complex will consist of a new PATH Terminal on the WTC site, a new Fulton Street Transit Center, and pedestrian connections linking these facilities with each other and the World Financial Center and WFC ferry terminal.

The new PATH terminal will provide expanded and modernized facilities including additional and lengthened platforms, "SmartCard" fare collection equipment, and appropriate security. The terminal will also facilitate pedestrian circulation (e.g., to Church Street, and across West Street, Vesey Street, and Liberty Street; as well as on the WTC site itself) to interconnect the various mass transit lines, streets, and future memorial and commercial development.

Agencies:

The Port Authority of New York and New Jersey

Metropolitan Transportation Authority



MTA rendering of the Fulton Street Transit Center concept.

Current Conditions:

The PATH Terminal at the World Trade Center was destroyed in the September 11th attacks. The permanent terminal will replace the temporary WTC PATH Terminal that is currently under construction and scheduled to be in operation by late 2003.

Estimated Schedule and Cost:

WTC PATH Terminal	Fulton Street Transit Center
Phased completion over 3 to 6 years	3 to 4 years
\$1.7 to 2.0 billion	\$750 million

(See note below.)



Studio Daniel Libeskind's rendering of the WTC PATH Terminal interior.

Note: The Port Authority is requesting \$1.4 to \$1.7 billion in funding from FEMA/FTA — an amount that reflects an allocation of potential Port Authority insurance recoveries.

Issues and Impacts:

► Value to Lower Manhattan:

- The new WTC PATH Terminal will re-establish and enhance the level of service for Lower Manhattan PATH customers, while serving as a major point of arrival for commuters and visitors to Lower Manhattan.
- The re-configured Fulton Street Transit Center will improve access to and between, the subway lines that it serves and provide a direct link to the PATH, World Trade Center and World Financial Center.

WTC PATH Terminal

- Lengthened 10-car platforms to maximize capacity.
- Additional platform for more efficient loading and unloading.
- New direct-fixation tracks to improve ride quality.
- Direct connections provided to NYCT subways, including 1/9, N/R, and A, C, E lines, as well as the 4, 5, J, M, and Z lines at the Fulton Street complex.
- Direct connection to the World Financial Center.
- Major street presence as a large civic building on the Libeskind Wedge of Light, a piazza that will serve as an important new public space.
- Multiple street-level access points and a main terminal entry building.
- Numerous vertical circulation elements and moving walkways to ease pedestrian circulation.
- Climate-controlled terminal with restroom facilities.
- Sustainable design components for energy conservation.
- Appropriate systems for security and communications systems, and provisions for ADA accessibility.

Fulton Street Transit Center

- Creates attractive and efficient connections between subway, PATH, World Trade Center and World Financial Center.
- Creates an efficient transportation center east of Broadway, where the majority of downtown employees work.
- Improves access between the WTC area and locations east of Church Street including the subway stations.
- Improves orientation and clarity for the customer.

Current Status:

Currently in planning stage. Environmental review underway. Design work to begin in mid-2003.

South Ferry Station

South Ferry Station

The South Ferry terminal subway station on the 1/9 subway line will be completely redesigned to accommodate the full length of a typical 10-car subway train, rather than the 5-car platform that exists today. As one of the oldest stations in the system, its platforms are so short that only five of the ten cars on the subway can be used for passenger loading and unloading. Consequently, riders unfamiliar with the station may find themselves walking through five cars of the subway just to exit the train.

These changes will speed the movement of trains in and out of the station and reduce travel times between Penn Station and South Ferry. Currently, all trains on the 1/9 line make an extended stop at the Rector Street station to allow South Ferry-bound passengers to move to the first five cars where they need to be to unload. Furthermore, the extremely tight radius of the station requires retractable platforms and limits the speed with which trains can pass through the station.

New connections to the Staten Island Ferry and the N/R station at Whitehall Street will also be made possible. Overall, the upgraded facility will ease the commute of Staten Island residents headed for Wall Street, the World Financial Center, the new World Trade Center, and other destinations in Manhattan.

One important consideration in the renovation of the South Ferry Station is the impact of locating the project within Historic Battery Park. The MTA is developing an alternative design that will accomplish the goals of the project while positioning the new terminal completely outside of the park. Under this configuration, the station will still be in proximity to both the Staten Island ferry and the Whitehall Street N/R station.



The curved, outmoded South Ferry Platform.

PROJECT DESCRIPTION

Upgrading the existing 5-car loop station on the 1/9 line to 21st-century standards, with a full length (10-car), two-track, island platform for 1/9 trains. The improvements will provide a pedestrian connection to the Whitehall Street N/R station and the Staten Island Ferry.

Agency:

Metropolitan Transportation Authority

Current Conditions:

The current station is configured as a loop, and the platform only accommodates 5 of the 10-car subway trains. As a result, the passengers in the rear five cars must walk to the first five cars in order to exit the train. The loop configuration also hinders efficiency throughout the entire 1/9 line. Currently, there is a connection to the Staten Island ferry, but no direct passenger connections to other subway lines.

Estimated Schedule and Cost

3 to 4 years

\$400 million

Issues and Impact:

► Value to Lower Manhattan:

- The service improvement will increase capacity throughout all of the 1/9 line, reducing travel time for commuters traveling to Lower Manhattan from Penn Station.

► Overall Impact:

- Accommodates loading of full-length 10-car trains.
- Additional entrance created.
- Improves reliability, on-time performance, and travel time for Manhattan's West Side subway service.
- Provides a new free connection between the 1/9 line at South Ferry and the N/R line at Whitehall St.
- Given that Staten Island is the fastest growing of the five boroughs -- and that its population growth rate will be among the top half of counties in the region over the next 25 years -- improvements to South Ferry station will help to accommodate increased Staten Island ferry ridership.
- Provides ADA (American Disabilities Act) accessibility

Current Status:

Currently in planning stage



Surface Transportation Improvements

Lower Manhattan is the historic core of New York City, characterized by narrow, winding lanes laid down by Dutch settlers in the seventeenth century. Today those lanes are lined by buildings of every era and style, forming canyons amidst towering skyscrapers. The network of streets in Lower Manhattan results in significant congestion, compromises in safety, and inefficient surface transportation.

Although Lower Manhattan enjoys many distinctive features, including historic monuments, great architecture, water on three sides, and a strong commercial and residential base, it lacks several critical elements that could transform it into a cohesive downtown. With narrow and crowded streets, limited open space, and old transportation stations, Lower Manhattan's public realm is in need of improvement. LMDC is focusing on significant public realm changes that can be made throughout Lower Manhattan that will make this historic part of New York a more attractive place to live, work, and visit. Whether the problem is the narrow streets of Chinatown or the width of West Street, planning for Lower Manhattan needs to address problems related to surface transportation.



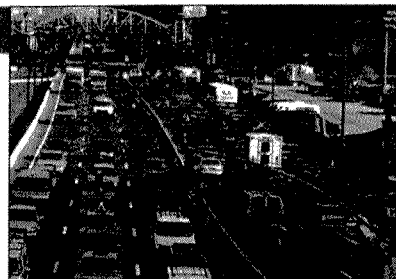
An example of how high bus volumes create both circulation and parking problems.

The Department of City Planning's 1993 *Plan for Lower Manhattan* noted that "overcrowding, traffic jams, and a jostling for space," end up "pitting pedestrians against vehicles, and trucks and buses against taxis and private cars."⁴ These problems are endemic to the Financial District and the Civic Center, as well as to Chinatown. As early as 1975, the City Planning Commission noted that "a rational and convenient pedestrian circulation network... as well as improvements in the street network...and [West Street]" were necessary upgrades.⁵ Street closings since September 11th, such as those of Park Row and Broad Street, have exacerbated the challenges of street management.

Lower Manhattan is one of the only central business districts nationally that does not contain a bus facility. Bus congestion was identified as a problem as early as the 1966 *Plan for Lower Manhattan*, which considered the lack of a bus facility a major disadvantage relative to Midtown. The creation of the World Trade Center site memorial and the development of the rest of the site will likely increase the number of buses visiting the Lower Manhattan district. This volume increase will pose a growing problem both in terms of circulation and parking.

West Street

West Street, also known as Route 9A, is a multi-lane, 260-foot wide highway serving both regional and local traffic in Lower Manhattan. Its traffic conditions and width — more than twice as wide as a typical Manhattan avenue — make it a barrier for pedestrians by cutting off Battery Park City, the World Financial Center, and the Hudson River waterfront from the rest of Lower Manhattan. Significantly, West Street acts as a divide between the World Trade Center site, the emerging residential community south of Liberty Street, and the existing Battery Park City community. Residents complain about the safety hazards of crossing West Street, and retailers in the World Financial Center suffer from their lack of accessibility.



Current West Street conditions.

Since September 11th, there has been extensive discussion of the best ways in which to accommodate the large traffic volumes that flow along West Street, while also improving the pedestrian experience and making the areas adjacent to West Street more amenable to residential and commercial development. The portion that runs along the length of the World Trade Center site is of special concern since it must provide an appropriately dignified and aesthetically graceful setting for the future World Trade Center memorial. Numerous design concepts have been considered that attempt to address the dual goals of meeting the needs of the Memorial Garden within the bathtub of the World Trade Center site — an integral component of Studio Daniel Libeskind's site design — and eliminating West Street as a barrier between Lower Manhattan neighborhoods.

Improving the Pedestrian Experience: The Promenade

The New York State Department of Transportation, working with the LMDC and the Port Authority, has developed a design for West Street that consists of a tree-lined pedestrian promenade from the World Trade Center site to Historic Battery Park. This design will accomplish the goals of creating better east-west pedestrian connections, improving the pedestrian environment, easing surface congestion, and accommodating the need to create a quiet, respectful site for the memorial. This plan will transform a congested highway into a grand landscaped boulevard — one that will rival such exemplary urban spaces as Barcelona's Passeig de Gracia, Berlin's Unter den Linden, or Paris's Champs Elysees.



The new West Street Promenade looking south.

Rebuilding West Street as a tree-lined promenade will allow it to link the World Trade Center site physically and visually to the southern tip of Manhattan, Ellis Island, and the Statue of Liberty. The promenade will incorporate elements such as:

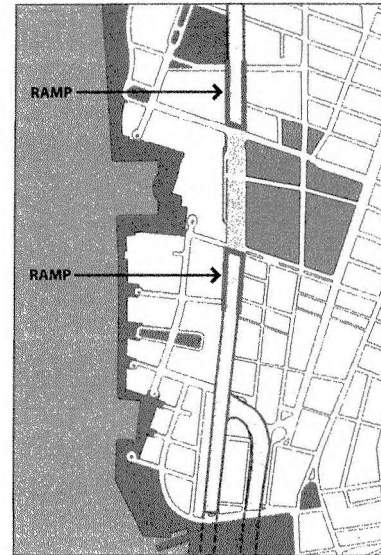
- a wider sidewalk along the east edge of the highway, which will improve pedestrian circulation, provide a buffer from traffic, and provide a more attractive edge to the neighborhood east of the highway and south of Liberty Street,
- realignment of portions of the roadway to allow for the creation of new public open space and green spaces,
- increased landscaping of the open space that will preserve or incorporate the community gardens and green spaces that already exist within the right-of-way,
- decorative pavements, plantings, lighting, street furniture and other streetscape enhancements and pedestrian amenities,
- crosswalks modified to improve pedestrian connectivity and safety, both across and along the highway,
- the introduction of pedestrian bridges, and
- the final link of the Hudson River bikeway, which will run continuously all the way from 59th Street to Battery Park.

West Street

Reducing Traffic Congestion

There are several options for reconfiguring West Street into the type of promenade envisioned. The construction of a simple at-grade promenade is one option. Under this option, the length of West Street (from the Battery to the World Trade Center site) would be landscaped. The design and construction of this option would take three years and cost approximately \$400 million.

However, the most effective way* to reduce surface traffic substantially at the WTC site is to build a short bypass tunnel that will create a depressed and covered roadway between Liberty and Vesey Streets -- the length of the four city blocks that are adjacent to the site. This approach creates two levels: the lower level bypass will contain two express lanes in each direction, while a road with two lanes in each direction plus turning lanes will be created at the surface to accommodate local vehicular traffic. The State Department of Transportation estimates that approximately 75% of the traffic along West Street will utilize the tunnel portion and 25% will utilize the surface road. This scenario will result in a much less congested roadway at the WTC site where pedestrians will be crossing, creating a more pleasant environment for residents and workers. In addition, the short tunnel approach will provide opportunities for enhanced landscaping adjacent to the memorial due to the decrease in the number of surface lanes between Liberty and Vesey Street. It also has the advantage of reducing noise from traffic along the length of the World Trade Center site.



Schematic diagram of the West Street short bypass tunnel option.

Further analysis of the two options is required; however, there is a strong preference for the short bypass, given its advantages. It is estimated that the design and construction of the tree-lined promenade and the short bypass would cost \$900 million. Portions of the promenade would be created within two years, and the entire project would be completed within five years.

*Note: Completely tunneling West Street from the World Trade Center site to Battery Park would not sufficiently reduce congestion. It is estimated that 65% of vehicles, most bound for local destinations, would be required to remain above ground.

Short-term Improvement

To ease the passage across West Street and improve access to the World Financial Center and Battery Park City in the immediate term, State DOT, the Port Authority, and LMDC will work with the City and other partners to improve existing West Street pedestrian bridges and construct an additional overpass (e.g. at Vesey Street).



West Street Promenade looking north.

Managing Buses on the Streets of Lower Manhattan

A comprehensive strategy must be developed in order to serve tourists, commuters, and other visitors who increasingly use bus transit to access Lower Manhattan. Buses play an important role in carrying commuters and visitors to Lower Manhattan. Commuter bus volumes are expected to continue to grow in the coming years. Furthermore, even with concerted efforts to promote alternatives, planning estimates show that up to 25 percent of visitors to the World Trade Center memorial will arrive by bus — adding to the existing bus crowding in the area.

Recognizing the conflicting role that commuter and tour buses play in Lower Manhattan by enabling access to the area on the one hand and creating unnecessary street and sidewalk congestion on the other, the Port Authority and LMDC planning teams reached out to partner transportation agencies to conduct a bus study that assessed the future bus demand in Lower Manhattan. These teams developed strategies with the potential to improve service while reducing buses' adverse impact on local traffic and neighborhoods. The effort was aimed at reaching an interagency consensus on the main elements of a commuter- and tour-bus management plan that would coordinate with ongoing Lower Manhattan planning.

Chinatown is another popular destination for both tour and commuter buses but its narrow streets are ill-suited for such uses. LMDC's recently commissioned Chinatown Traffic Study will yield strategies for better managing charter and tour-bus operations serving attractions in that area, and their relationship to routing and operational recommendations for the rest of Lower Manhattan will be considered as that study nears completion.

Tour and Charter Buses

In the summer months, hundreds of tour buses carry visitors to Lower Manhattan's existing attractions each day. The largest tour bus destination is Battery Park, where ferries depart for the Statue of Liberty. Many of these buses utilize the northern curb of the park for staging and storage while passengers visit the historic Statue. The grouping of buses in this specific location is highly disruptive for traffic going to Battery Park City and entering the Brooklyn-Battery Tunnel. Buses also park under the elevated FDR Drive, which poses an impediment to pedestrians wishing to access the East River waterfront and generally detracts from the area around the South Street Seaport. In addition, sightseeing tour buses that can run continuous

tours as frequently as every fifteen minutes during the peak season add another significant layer of congestion.

In addition to gathering data on existing tour and charter bus activity in Lower Manhattan, the bus study examined projections prepared for the Port Authority of potential volumes of visitors to the WTC memorial, as well as estimates of the share likely to use tour or charter buses. Even with excellent subway and PATH service directly at the site, it is forecasted that 15 to 25 percent of all visitors to the memorial will arrive by charter and tour buses. This quantity of buses is so significant that, were the buses to drop off their passengers around the periphery of the World Trade Center site and park on the adjacent surface streets while waiting to pick them up at the end of their visit, the memorial and the site might be ringed by buses at times of peak demand. Since such a situation would seriously detract from the dignity and character of the memorial and would hinder pedestrian and vehicular access to and from the remainder of the site, the Port Authority has identified the need for a secure facility (location to be determined) for the storage of tour and charter buses. This facility would be expected to accommodate between 75 and 150 buses. A bus management plan will be required to ensure the smooth operation of the facility.

Commuter Buses

Commuter buses each day bring over 31,000 passengers to Lower Manhattan. During morning rush hour, over 450 buses travel through the streets of Lower Manhattan. Buses from Staten Island account for 43% of the volume, followed by Brooklyn buses which account for 25%. Eight percent arrive from Ocean, Monmouth, and Middlesex counties in New Jersey. The PA and LMDC bus study concluded that gradual growth in commuter bus volumes is likely. The buses utilize Broadway for southbound travel and Church and West Streets for northbound travel. Bus staging is haphazard, random and disruptive to general traffic flow and pedestrian safety. Certain express buses park on the street all day between the morning and evening commutes. With narrow streets, limited loading zones, no terminal and minimal space for storage or queuing, Lower Manhattan's streets and pedestrian zones are easily congested by these services. Indeed, 52% of residents of Lower Manhattan's Community Board 1 cite traffic congestion and pollution as a high priority problem.

The interagency bus study specifically examined two concepts for improved commuter-bus management. The first was an enhanced on-street operations scenario. This approach would involve further development of priority-lane and curbside treatments, especially on Church Street, including sheltered waiting areas for passengers, information kiosks, and other amenities. This concept preserves the local drop-off and pick-up service that makes commuter buses attractive,

Bus Facilities and Infrastructure

but requires allocating more of Lower Manhattan's limited street and curbside capacity to buses during peak commuting hours, thus potentially impacting other vehicular operations.

A number of strategies are being considered to address the concerns regarding buses making stops through Lower Manhattan. MTA New York City Transit is evaluating options for developing an Advanced Traveler Information System (ATIS), which would allow information on the status of bus service, including bus arrival times, to be provided at each bus stop. Extensively used on European bus systems, ATIS is now being implemented in the United States, including the "Metro Rapid" bus system in Los Angeles, and a demonstration project on the 22-Fillmore bus line in San Francisco.



Queuing passengers crowding Lower Manhattan sidewalks as they wait at their bus stop.

Opportunities may also exist to enhance the "street furniture" and aesthetic appeal at bus stops. In the same way that MTA's Fulton Street Transit Center will provide a gateway to subway service for the Lower Manhattan area, newly designed bus stops and waiting areas could potentially provide a gateway for surface transit services. Portland's Tri-Met bus system for example, which has outfitted downtown bus stops with distinctive bus stop pavilions providing sheltered waiting areas and comprehensive route information, suggests an approach which could benefit Lower Manhattan.

A second concept examined in the bus study focused on development of off-street, full service commuter bus terminal operations in Lower Manhattan, a perennial proposal that attracted renewed attention after the September 11th attacks. The consultant team determined that two facilities would be needed — one to intercept Brooklyn and Staten Island buses using the Brooklyn Battery Tunnel, and another for Holland tunnel buses. These facilities would include berths for loading/unloading, ticketing and waiting areas for passengers, as well as bus storage. Passengers would exit and board buses at the terminals in lieu of on-street service for most routes. This approach would take buses off much of the local street network, but require most passengers to walk further (unless the terminal concept incorporated shuttle bus services).

Though the consultant team concluded both options were viable, the interagency group agreed that the enhanced on-street operations concept offered a better level of service to passengers and supported more efficient bus operations, especially if buses were to be given priority treatment

such as dedicated bus lanes. The group targeted several aspects of the concept for further development, including adequacy of curbside frontage on key routes, potential two-way operation on lower Church Street, and details of enhanced curbside treatment and intermodal transfers at Battery Place and on Church Street and Route 9A where these roadways cross the east-west concourses of the proposed Lower Manhattan Transit Complex.

One problem the group identified for further attention is the deficit in available storage capacity even for existing levels of bus activity. Most commuter and tour buses serving Lower Manhattan are stored outside the area at present. Some park on the periphery of Lower Manhattan in locations likely to be unavailable as redevelopment plans proceed. Operational inefficiencies and site availability complicate efforts to identify additional bus storage sites north of Lower Manhattan or in Brooklyn or Hudson County.



Commuter buses, sightseeing buses and delivery vehicles contributing to congestion on State Street near Historic Battery Park.

Bus Facilities and Infrastructure

World Trade Center Site Stabilization, Reinforcement and Restoration

Ensuring Structural Stability

The damage resulting from the destruction of the World Trade Center site requires significant stabilization to ensure the continued structural integrity of the foundation. In addition, restoration of key below-grade infrastructure — both for transportation and other purposes — is required to prepare the site for future development. Site preparation work includes permanent reinforcement of the slurry wall that surrounds the World Trade Center site, demolition of remaining damaged structures and required excavation.

Creation of New Transportation Infrastructure for Vehicular Access

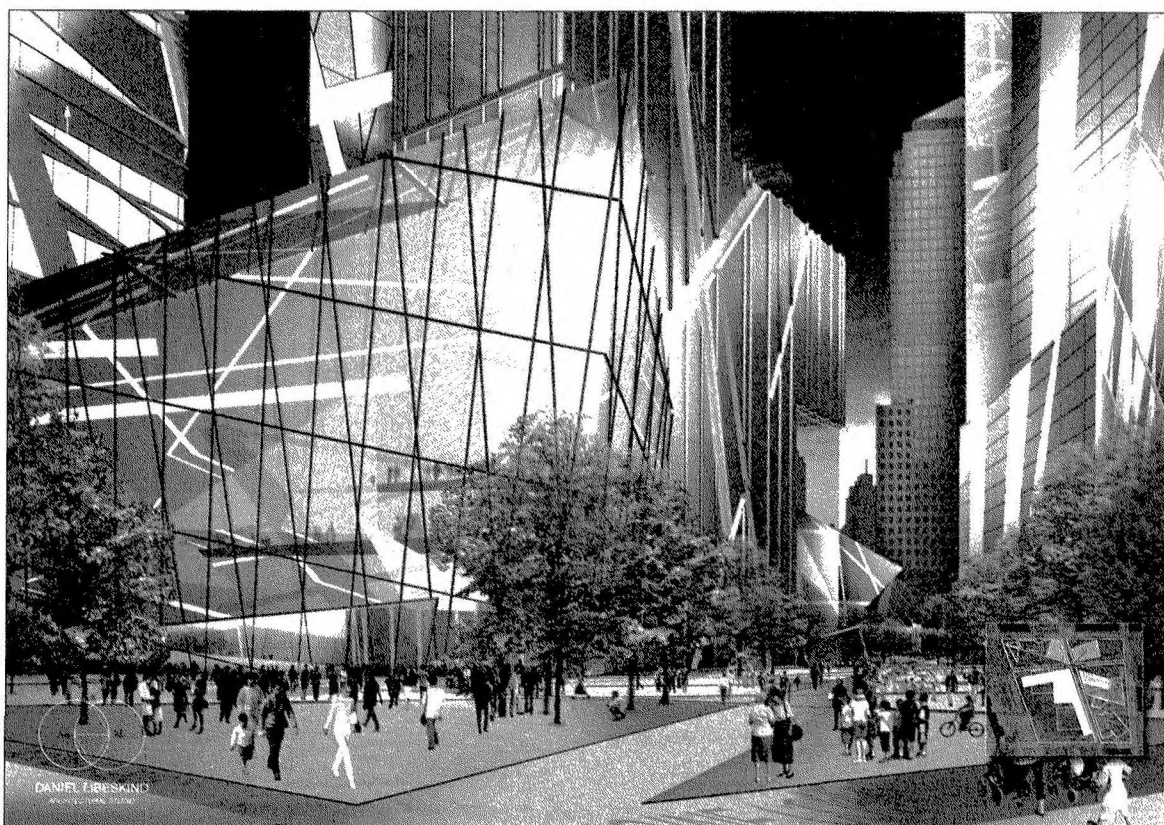
Reconfiguration of the roadways and ramps that were available at the former WTC complex is necessary to support efficient traffic flow and to meet new security and site-access requirements, including below-grade access for deliveries. Additional underpinning of the 1/9 subway lines is required to allow connections between the east and west sides of the site for construction of the PATH terminal.

Site Preparation for the Memorial and Future Development

The construction of the World Trade Center memorial is a priority consideration in how infrastructure work will proceed. Construction of the infrastructure improvements will be performed in conjunction with implementation of the memorial and with Studio Daniel Libeskind's overall plan for WTC redevelopment.

Restoring Fulton and Greenwich at the WTC site is a crucial component of Studio Daniel Libeskind's site plan. (The configuration of streets at the new World Trade Center is discussed later in this chapter.) Restoration of surface streets on the site, which will require the rebuilding of underlying structural support elements, are important steps that will improve pedestrian and vehicular circulation, and reduce traffic congestion at the site and its environs.

The Port Authority, in conjunction with LMDC, is performing planning studies on the various WTC site infrastructure components described and expects to advance into preliminary engineering in mid-2003.



View looking west down Fulton Street. Rendering by Studio Daniel Libeskind.

Streets

The street network is the circulation system of New York City. At most times of the day streets provide a common public realm for travel, social interaction, and simply getting around. It is important that, as Lower Manhattan rebuilds, its street layout is analyzed and the optimum configuration determined. Several components can help guide this effort: the restoration of Fulton and Greenwich Streets, the "loop and the spine"(discussed below), improvements to West Street and Water Street, the City's proposed Street Management Program, and more effective traffic management in Chinatown.

Restoring and Unlocking the Street Grid

A major element of World Trade Center site planning is the restoration of Fulton and Greenwich Streets. The creation of the World Trade Center superblock interrupted a number of Lower Manhattan streets. One of the goals for the future WTC site is to restore streets that will improve the currently inconvenient and confusing network. The relatively narrow downtown streets do not lend themselves to supporting two-way traffic and one goal in restoring streets is to address this problem. A potential solution is to "pair" streets to provide more adequate routes for north-south and east-west travel.

Greenwich Street and Church Street

Reconnecting Greenwich Street through the World Trade Center site is critical in fulfilling the goal of connecting Tribeca with the nascent residential neighborhood south of Liberty Street and ensuring that the redeveloped WTC site will not be a barrier to north-south links. The restored Greenwich Street has the potential to be a vehicular street, a pedestrian path, or both. Studio Daniel Libeskind's design envisions connecting a new Greenwich Street with West Broadway, which currently ends at the WTC site, to create a seamless link with Tribeca. Church Street, one block east, could complement the new Greenwich-West Broadway route to create a system for local north-south trips.



Restoring and pairing critical north-south streets.



View looking north up Greenwich Street. Rendering by Studio Daniel Libeskind.

Under Libeskind's plan, Greenwich Street between Vesey and Liberty will be lined by retail establishments. At the intersection of Greenwich and Fulton Streets, there will be a major new crossroads, with cultural facilities, a hotel and conference center, an office building and the new PATH Terminal. The intersection of Greenwich and Fulton will be a significant downtown destination.

Church Street will also become a more lively street with the presence of both commercial office and retail uses along a clearly defined street edge. Two significant points along Church Street will be the entrance to the Cortlandt Street Galleria, a glass-enclosed, climate-controlled passageway through which pedestrians will be able to walk to Greenwich, and the Wedge of Light piazza at Fulton Street, described on the following pages.

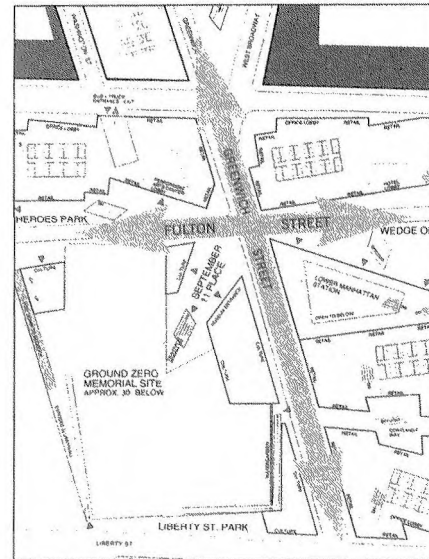


The interior of the Cortlandt Street Galleria. Rendering by Studio Daniel Libeskind.

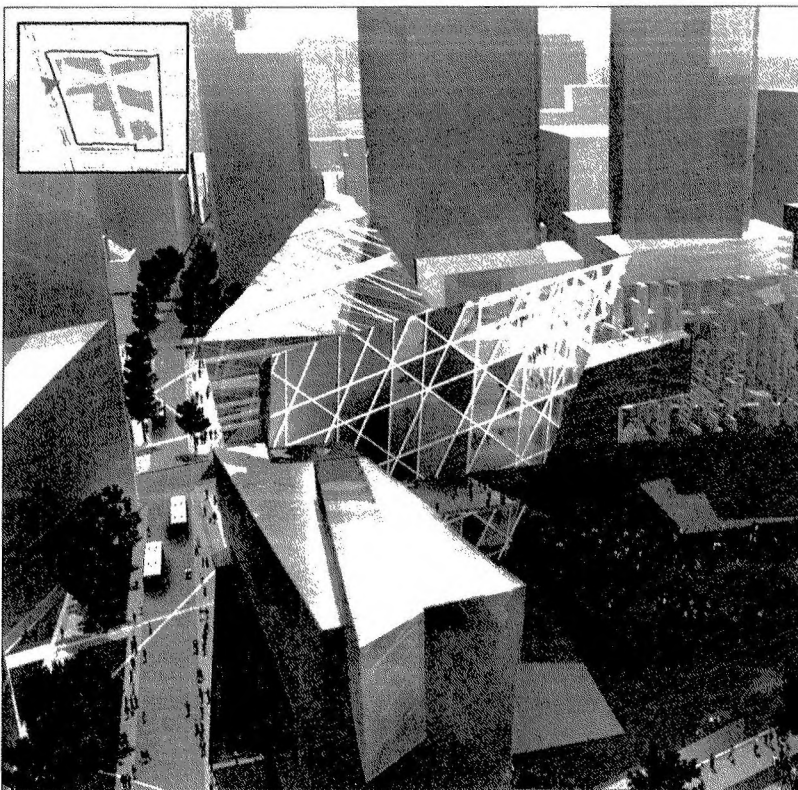
Fulton Street

The new Fulton Street will become the major east-west artery through Lower Manhattan, from river to river, with a lively mix of residential, retail, commercial and institutional uses, along with a series of new public spaces. Every transit line passing through Lower Manhattan has a stop on Fulton Street, and it has major anchors at its east end (South Street Seaport), west end (World Financial Center) and center (Fulton Transit Center and Broadway).

The site plan by Studio Daniel Libeskind angles Fulton Street to be on axis with the Winter Garden, creating a significant view corridor. Fulton Street connects two major new public spaces on the WTC site: the Wedge of Light piazza between Church and Greenwich streets, and the Park of Heroes between Greenwich and West streets. Traveling west from Broadway, pedestrians have an entirely new experience of public space unlike any other in Lower Manhattan. First, they pass through the new Wedge of Light piazza. The Wedge of Light is one of the center pieces of Daniel



Restoring Fulton and Greenwich Streets are vital to restoring Lower Manhattan neighborhood connectivity.



View looking east down the new continuous Fulton Street. Rendering by Studio Daniel Libeskind.

Libeskind's plan. Once a year, on September 11th, between the time the first plane struck the first tower, and the time the second tower fell, no shadows will fall in the Wedge of Light. The piazza is enlivened by two hotels, a conference center, shops, restaurants and the new WTC PATH Terminal. The Wedge of Light piazza funnels pedestrians to the intersection of Fulton and Greenwich streets, where September 11 Place forms a new destination for visitors to the Memorial Garden, the 9/11 Interpretative Museum,

and a new performing arts center. Fulton Street continues onto the Park of Heroes, a landscaped open space lined by new cultural buildings and the 1,776 foot-tall tower. The Park of Heroes will connect onto an enlarged series of open spaces along the redesigned West Street.



The Wedge of Light Plaza on Fulton Street. Rendering by Studio Daniel Libeskind.

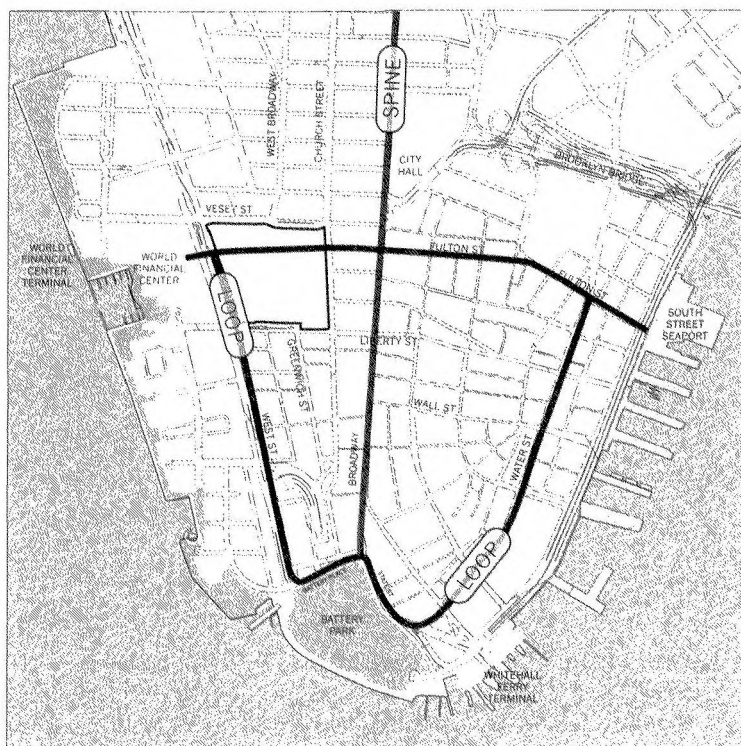
By re-instituting Fulton Street as a major cross-town connection, it can link transit lines with exits on Fulton and ferry service on the Hudson and East Rivers. Reaching the new World Financial Center Ferry Terminal will require pairing Fulton with Vesey Street, which extends to the Hudson. By coupling these two streets, a functioning east-west route can be established. There are various concepts being considered for traffic on Fulton: traffic may be restricted to public transportation, or a portion could be open to pedestrians only. If Fulton Street is closed to private automobiles, it could work as a two-way route for public buses and taxis, functioning much like the existing pairing of 49th and 50th Streets for transit in midtown. If not closed to traffic, it could also be coupled with Liberty Street in a continuous east-west loop.

The future of transportation on Fulton Street is dependent on decisions made regarding the Fulton Transit Center and the redevelopment of the retail corridor. LMDC and the Department of City Planning are currently undertaking a study to develop a revitalization strategy for strengthening and diversifying retail outlets and arts/entertainment venues throughout the Fulton Corridor. This strategy will likely include streetscape enhancements to enliven the area, and will certainly affect pedestrian and traffic flow in the area.

The Loop and the Spine

"The Loop and the Spine" provide a broad vision for uniting disparate areas of Lower Manhattan.

Illustrated in the map below, the loop encircles downtown, running down West Street, around Battery Park, up Water Street, and along a new Fulton Street that spans from river to river. The loop ensures easy pedestrian and vehicular circulation, links a network of important public spaces, and helps provide orientation within the complex street network. Bisecting this loop is Broadway, the canyon of heroes, that serves as the main street of Lower Manhattan.



The Loop and the Spine concept.

• *West Street Promenade*

Per the description earlier in this chapter, West Street will be redesigned as a grand promenade with a short bypass tunnel, forming a dignified and powerful connection from the World Trade Center memorial through Lower Manhattan and to the Statue of Liberty and Ellis Island. As part of the loop, West Street will be reconfigured to provide better connections between Battery Park City and the rest of Lower Manhattan. Finally, it will be landscaped with trees to remember the victims of September 11th and provide new public spaces that enhance the pedestrian experience.

• *Battery Place/State Street*

The southern portion of the loop is comprised of Battery Place and State Street for vehicular traffic, and Historic Battery Park for pedestrians. Planned renovations to Battery Park will greatly enhance the perimeter pathway, linking the east and west sides of downtown with a beautiful, tree-lined alley.

• *Water Street*

Water Street is home to the largest concentration of office buildings downtown other than the World Trade Center site. Redesignated as a tree-lined boulevard, it will create a focal point on the east side and help make Water Street a signature address like Park Avenue. This segment of the loop will also serve to better connect the financial district with the adjacent East River waterfront.

• *Fulton Street*

Another function of Fulton Street is that it will connect West Street with Water Street, completing the loop and providing Lower Manhattan with an east-west main street. A redeveloped Fulton Street will transform downtown dramatically. Anchored by the World Financial Center Ferry Terminal at the Hudson River on the west and the South Street Seaport and a ferry stop on the East River on the east, Fulton Street will become the only major east-west retail corridor in Lower Manhattan. With a new MTA transit center at Broadway, a new PATH terminal, and potential new rail services, Fulton Street is also the daily arrival and departure place for tens of thousands of workers, residents and visitors. Fulton Street could be vehicular or pedestrian as it runs through the WTC site, and include east-west, transit service such as a shuttle bus. East of Broadway, it is the central street for a growing residential neighborhood center along the Fulton and John Street corridor.

• *Broadway Spine*

The Canyon of Heroes has a storied history as the place where American celebrates its accomplishments and acknowledges achievement. As the principal north-south axis, it is the only relatively wide street that can be easily located. Yet lower Broadway today is not as great a street as it has the potential to be. The ongoing streetscape enhancements being conducted by the Downtown Alliance, combined with a revitalized transit center at Fulton and Broadway, can transform Broadway into a more highly functional and aesthetically powerful roadway for Lower Manhattan.

New York City Department of Transportation's Street Management Program

At over 200 acres, streets and sidewalks comprise the largest category of public space in Lower Manhattan. As such, the street network is subject to the highest demands from the most diverse group of users. These users include pedestrians, private vehicles, buses, trucks making deliveries, taxis and for-hire vehicles, tourists, bicyclists, emergency response vehicles, sanitation vehicles, utility maintenance and construction, vendors, and many more. At critical periods during the day, the conflicting demands of so many users overwhelm the capacity of the street network and the street fails, not just for a given user group, but for all user groups. The New York City Department of Transportation (NYCDOT) has developed a Street Management Program which aims to allocate street, curb, and sidewalk capacity fairly and efficiently among competing user groups.

The crux of a Street Management Program is identifying priority uses of given streets at different times of day and restricting other uses to maximize efficiency for the priority uses, implemented in a manner consistent with physical improvements to the street and other changes in Lower Manhattan (e.g., at the World Trade Center site, along West Street, along Fulton Street, or at the East River waterfront).

Identifying priority uses depends upon stated overall goals for the Lower Manhattan street network. These goals include: promoting the livability of Lower Manhattan, encouraging business development, accommodating heavy pedestrian volumes, providing access to the streets for those vehicles that need it, reducing congestion on the streets, and supporting traffic management and emergency response during crisis situations.

There is precedent for restricting access to streets based on priority needs. Many streets in the Financial District, including Fulton Street, Nassau Street, John Street and others, are already closed to vehicular traffic during the day to give priority to pedestrians at lunchtime. In September of 2002, NYCDOT implemented the Church Street Busway, which restricts private vehicular access to Greenwich Street, Trinity Place and Church Street during the morning and afternoon rush hour periods, giving priority to buses on the most heavily used bus corridor in Lower Manhattan. In Midtown, NYCDOT had success with its Thru Streets program, restricting turning movements and truck deliveries on pairs of streets to facilitate faster crosstown travel times.

As plans for Lower Manhattan begin to take form and as neighborhoods change, so too will the demands placed on the street network change. A key component of Street Management is continuous data collection to determine how the street network is being used, who uses it when and where it fails. New technologies will allow for the collection of real-time data that can be used to

make a variety of adjustments throughout the day to meet the changing needs of the users on the street. Small Variable Message Signs could be used to change parking regulations during the day; retractable bollards could be used to open and close different streets throughout the day; signal timings could be adjusted to accommodate heavier pedestrian or vehicular volumes, depending on which is given priority. An effective Street Management Program is a dynamic operation that will allow the City to tailor its street network to the unique needs of the surrounding neighborhoods.

Lower Manhattan Bus Loop

To improve circulation within Lower Manhattan for workers, visitors and residents, a shuttle bus route should be established around the Lower Manhattan loop (described above). Such a route would link the different neighborhoods and attractions of Lower Manhattan, reinforcing the sense that Lower Manhattan is a cohesive community. It would be a free, "step-on, step-off" shuttle bus service, that could loop down West Street, across the Battery, up Water Street, and back across Fulton to the World Trade Center Site.

According to the Lower Manhattan Bus Loop Implementation study completed by the Department of City Planning in 1994, there is a large market for such a service. The most popular visitor attractions of Lower Manhattan (the World Trade Center site, the Statue of Liberty & Ellis Island Ferry and South Street Seaport) are each located more than a 10 minute walk from each other, and there are a large number of commuters whose final destinations are not a convenient walk from the transportation node where they arrive. In addition, residents would benefit from being able to travel more easily between neighborhoods, shopping areas and workplaces.

The Downtown Alliance is in the process of establishing a free "step-on, step-off" shuttle bus service that is scheduled to begin operation soon. The shuttle service will connect the eastern and western sides of Lower Manhattan, from Battery Park City to the South Street Seaport. These "Downtown Connection" handicapped accessible, zero-emission electric powered buses will run from 10:00 a.m. to 8:00 p.m. seven days a week. They will travel in both directions on a U-shaped route along North and South End Avenues in Battery Park City, onto Battery Place and finally onto State and Water Streets until they reach Beekman Street. The buses will run 10 minute headways and each will seat approximately 30 people. This effort will lay the foundation for future shuttle bus service in Lower Manhattan.

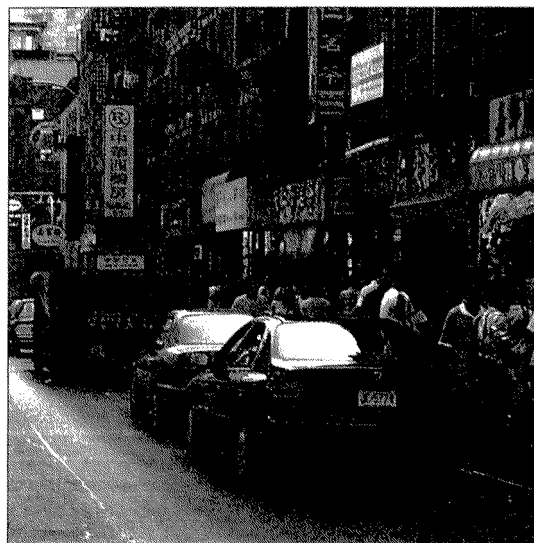
Improving Chinatown Traffic

Critical to improving the quality of life in Chinatown is to identify ways of alleviating the pervasive traffic congestion in the neighborhood. Potential means of reducing congestion include the creation of new bus loading areas for the growing commuter bus business, alternative loading and carting measures to reduce street litter, and providing increased parking to reduce double-parking and "circling" for spaces.

Currently, there are two complementary efforts studying ways to ameliorate the poor traffic conditions in Chinatown. One is the Chinatown Transportation and Traffic Improvements Study which is being conducted jointly by LMDC and the New York City Department of Transportation in coordination with multiple City and State agencies. The study will examine problems such as truck parking on sidewalks, garbage storing and carting practices, and the rise of independent, intra-city bus services which congest the neighborhood's narrow streets.

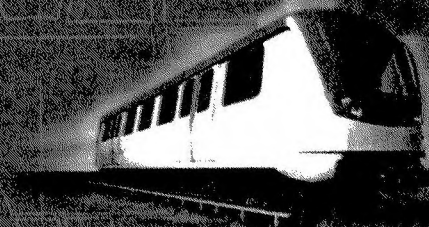
The other is the Canal Area Transportation Study (CATS). CATS is a multi-agency effort coordinated by the New York Metropolitan Transportation Council with extensive community participation. The effort recognizes the dual pressures on the Canal Street corridor resulting from significant through traffic passing between the Holland Tunnel and Manhattan Bridge, and local vehicular activity generated by residential, business, and visitor trips throughout the area. CATS Phase One, nearing completion, focuses on near-term measures to ease congestion, improve traffic flow, and enhance pedestrian safety. A second phase will address longer-term options to improve the corridor and to distribute through trips more effectively on the available roadway network.

The coordination of pedestrian and vehicular improvements in the Canal Street corridor and in the area around the Brooklyn Bridge is critical, and can lead to comprehensive traffic solutions that benefit residents, business owners, and visitors to Chinatown.



An example of the congested street conditions in Chinatown.

Chapter 2: Airport and Long Island Commuter Access



Improved access to the region's airports and Long Island is critical to the continued competitiveness of New York City and the long-term economic vitality of Lower Manhattan. For centuries, New York has been a leader in international commerce, and as the global economy continues to develop, Lower Manhattan's transportation infrastructure must keep pace. Airports are now key components in the global economy both for trading goods and for professional services transactions. Governor Pataki's 1996 *Master Links* strategy and Mayor Bloomberg's *Vision* have previously identified airport access as New York City's highest transportation priority and the most important initiative in preserving the city's role as the premiere commercial center in the global economy. Equally important investments to access John F. Kennedy International Airport can be leveraged to provide access for Long Island, one of the area's fastest growing regions and a critical labor pool. Analysis shows that improved Long Island commuter access has the potential to double the working age population living within a 60-minute commuting distance from Lower Manhattan within 20-25 years.¹

Air transport is playing an increasingly critical role in facilitating international business. By enabling the global movement not only of products, but also of people, air transport brings "business managers together, enabling them to build the links, communications and personal relationships necessary to achieve ... a [high] level of international business activity."² Indeed, businesses and hotels that generate and/or attract air travelers have a strong interest in continuous improvements in airport access. They will tend to locate in places where access to the airports is most convenient. Therefore, cities that are able to make easy, reliable connections between airports and centers of business have major competitive advantages over those cities that are unable to make such connections.

To maintain New York's position as a world leader, the trip to and from airports must be made friendlier, faster, and more efficient. The key is to create such an attractive new system to the airports that it will successfully entice an abundance of new users. The geographic location and transit capacity of Lower Manhattan offers an opportunity to create these types of connections to all three major airports in the region and, in particular, a quick, reliable, direct connection to JFK International Airport, the region's primary international gateway.

KEY GOALS FOR AIRPORT AND LONG ISLAND COMMUTER ACCESS

An effective airport and Long Island access system should provide:

- ▶ Travel times that are superior to automobiles and taxis or current mass transit service
- ▶ Reliable, regular, and inexpensive service
- ▶ A high level of comfort and convenience
 - Available, comfortable seats
 - A trip with minimal or no transfers
 - Clear wayfinding and signage with readily available information

For Airport Access

- Capacity to check baggage and/or room for storing luggage on vehicles
- Separation from commuter crowding, especially during weekday rush hours
- Preferably a direct, one-seat ride to the airport

For Long Island Access

- Convenient station location near places of work
- Connections to LIRR service and other transit lines

Table 2.1

International Airport/Rail Link Precedents ³									
City/Airport	Destination	Baggage Check-In	Mode of Travel	Frequency Peak/Off-Peak		One-Seat Ride ²	Direct to Airport Terminal?	Travel Time ¹	Cost [#]
Amsterdam/Schiphol	Amsterdam Central Station	No	Train	6 min	10 min	Yes	Yes	19 min	\$3.10 second class \$5.00 first class
London/Heathrow	Paddington Station	Yes	Heathrow Express	15 min	15 min	Yes	Yes	15 min	\$20.50 standard \$33.00 first class
London/Gatwick	Victoria Station	No	Non-Stop Train	15 min	30 min	Yes	Yes	30 min	\$17.00 express class \$28.00 first class
Paris/Charles de Gaulle	Gare du Nord	No	Regional Express Rail (RER)	15 min	15 min	Yes	Yes	35 min	\$8.00 standard
Tokyo/Haneda	Hamamatsu Station	No	Tokyo Monorail	5 min	5 min	Yes	Yes	22 min	Up to \$4.00
Hong Kong/Chek Lap Kok	Central Hong Kong Rail Station	Yes	Dedicated Direct Rail	10 min	10 min	Yes	Yes	23 min	\$13.00
Frankfurt/Frankfurt International	Frankfurt Central Station in Downtown Frankfurt	No	S-Bahn (Regional Commuter Rail)	5-10 min	15 min	Yes	Yes	11-13 min	\$3.50
Frankfurt/Frankfurt International	Frankfurt Central Station in Downtown Frankfurt	No	ICE (InterCity Express)	30 min	30 min	Yes	Yes	11 min	\$12.00
Chicago/O'Hare International	Downtown Chicago	No	Subway	8 min	10 min	Yes	Yes	45 min	\$1.50
Washington, D.C./Reagan National Airport	Downtown Washington D.C.	No	Subway	6-8 min	10-12 min	Yes	Yes	20 min	\$3.25
Atlanta/Hartsfield International	Five Points Station in Downtown Atlanta	No	Rapid Transit	8 min	8 min	Yes	Yes	16 min	\$1.75

¹ Travel time is calculated from the Airport to the designated destination in the "Destination" column.

[#] All foreign costs were calculated based on available exchange rate information.

As shown in Table 2.1, London, Tokyo, Hong Kong, and Chicago are just a few of the cities that already provide one-seat rides from central business districts to international airports. Such services are often paired with direct commuter rail. Both London and Hong Kong already have facilities for baggage check-in at the central city.

In contrast to our global counterparts, current access to the airports from Lower Manhattan is inconvenient, time-consuming, unreliable, and often expensive. Travel to the JFK terminals from Lower Manhattan by public transportation currently requires 70 to 80 minutes and at least one change in mode of transportation.⁴ When the AirTrain JFK begins service, travel time via mass transit will still average 61 to 65 minutes. On the other hand, a trip to the airport by automobile, taxi, or bus is unpredictable and can take well over an hour, being subject to some of the most crowded traffic conditions in the New York metropolitan region.

Within the mass transit system, air traveler amenities are poor. Most downtown subway stations contain no escalators or elevators, and turnstiles and stairs are difficult for passengers with luggage to negotiate. Subways and buses are crowded throughout the day and also do not provide luggage storage. For these and a number of other reasons, only 5.5%⁵ of Lower Manhattan air passengers travel to the airport by mass transit. By comparison, 41% of passengers traveling to London's Heathrow Airport and 59% of passengers traveling to Hong Kong International Airport make their trip via mass transit. A major goal for Lower Manhattan should be to significantly increase the number of air travelers traveling to the airports by mass transit. The most logical way to accomplish this goal is to adopt a system that provides convenience while at the same time allows the most number of people to access the airports.



Lower Manhattan has the potential to become the airport access hub for the New York metropolitan region.

Going forward, Lower Manhattan is in a position to match or surpass these other central business districts by offering airport access not only to one, but to three national and international airports. The distance from Lower Manhattan to Newark Liberty International Airport, LaGuardia Airport, and JFK is relatively short, and recent investments have provided improved airport connections. These include the AirTrain Newark, which is already in service to the Newark Airport rail station and from which Amtrak and New Jersey Transit provide regional rail connections to midtown Manhattan and Newark Penn Station (PATH will re-connect Lower Manhattan to Newark Penn Station when World Trade Center service re-opens later this year). By year's end, another project, the AirTrain JFK, will bring air passengers either to the newly refurbished Jamaica Station, accessible by the LIRR and the J, Z, and E subway lines, or to Howard Beach Station accessible to the A subway line.

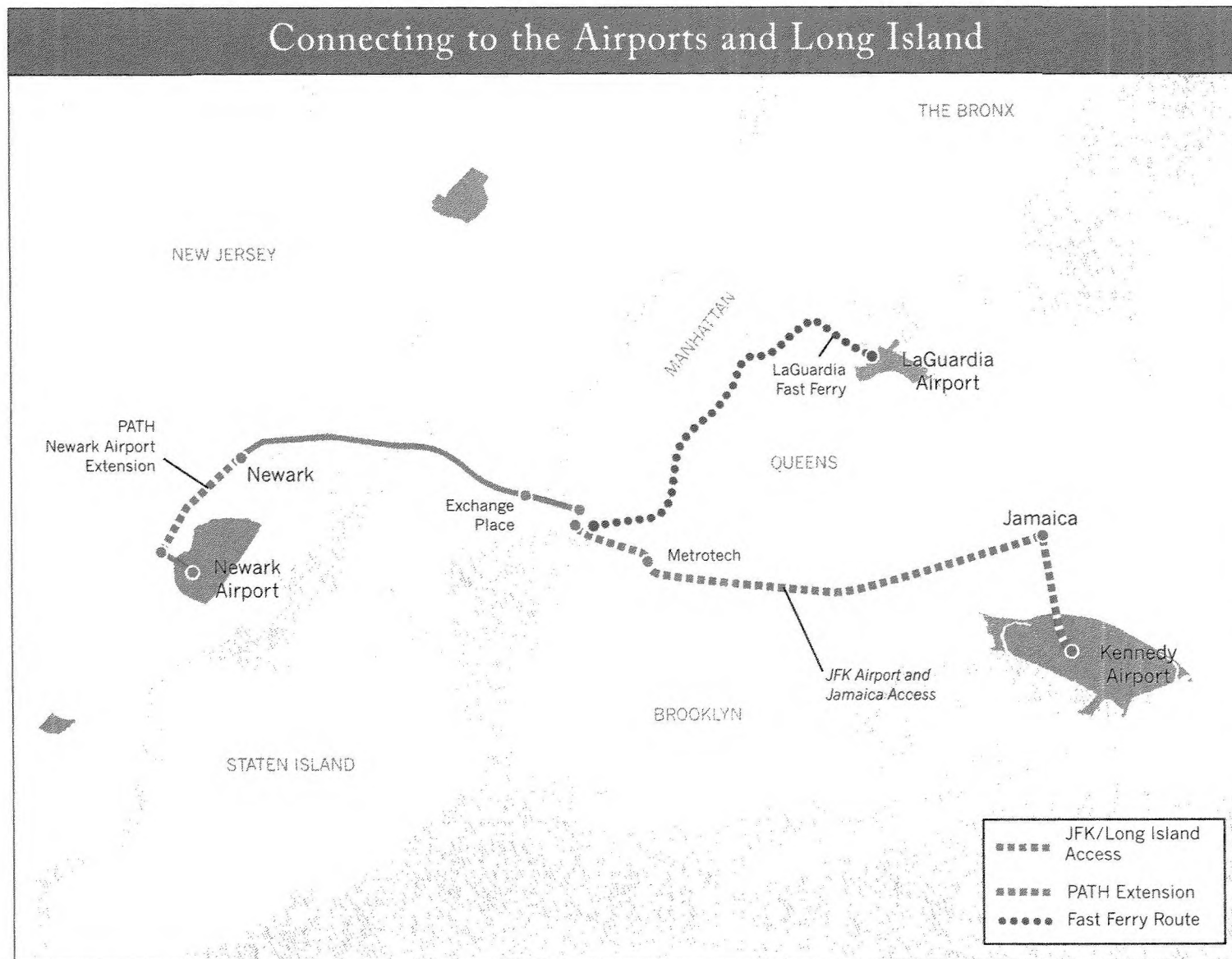
These measures are a first step forward for the region in providing more convenient and efficient airport access. As previously noted, current travel times for Lower Manhattan passengers are long, convenience is limited, and passenger experience is poor. However, building upon existing and planned systems, new investment can make Lower Manhattan the major airport center for the region, with service to all three major airports from a grand arrival and departure facility in the heart of downtown. The infrastructure investments required for airport access would also provide improved commuter access, thus addressing two of the region's most pressing transportation needs at once. The following chart outlines some of the options proposed to achieve these goals.

Airport Access and Commuter Alternatives⁶

Newark Liberty Airport to Lower Manhattan				
Existing	Time to Airport (min)	One seat-ride to Airport?		
AirTrain to NJ Transit and transfer to PATH at Newark	50	N		
Enhancement Options	Time to Airport (min)	One seat-ride to Airport?	Cost to Implement	Time to Implement (yrs)
PATH Extension to Newark International Airport Rail Station	38	N	\$525 million	7-8

JFK International Airport and Jamaica Station to Lower Manhattan				
Existing (via AirTrain JFK opening late 2003)	Time to Airport (min)	One seat-ride to Airport?		
LIRR from Jamaica to Atlantic & subway	64	N		
LIRR from Jamaica to Penn & subway	65	N		
A Train via Howard Beach	61	N		
Preliminary Models for Enhancement	Time to Airport (min)	One seat-ride to Airport?	Cost to Implement	Time to Implement (yrs)
Super Shuttle	38	N	\$2.0 to 2.3 billion	5
JFK Direct	23	Y	\$4.7 to 5.3 billion	10 (5 for initial phase)

LaGuardia Airport to Lower Manhattan				
Existing	Time from Airport (min)	One seat-ride from Airport?		
M60 Bus to Lexington Avenue Subway	68	N		
Enhancement Options	Time to Airport (min)	One seat-ride to Airport?	Cost to Implement	Time to Implement (yrs)
Fast Ferry to New LaGuardia Ferry Landing	37	N	\$3 to 6 million	1



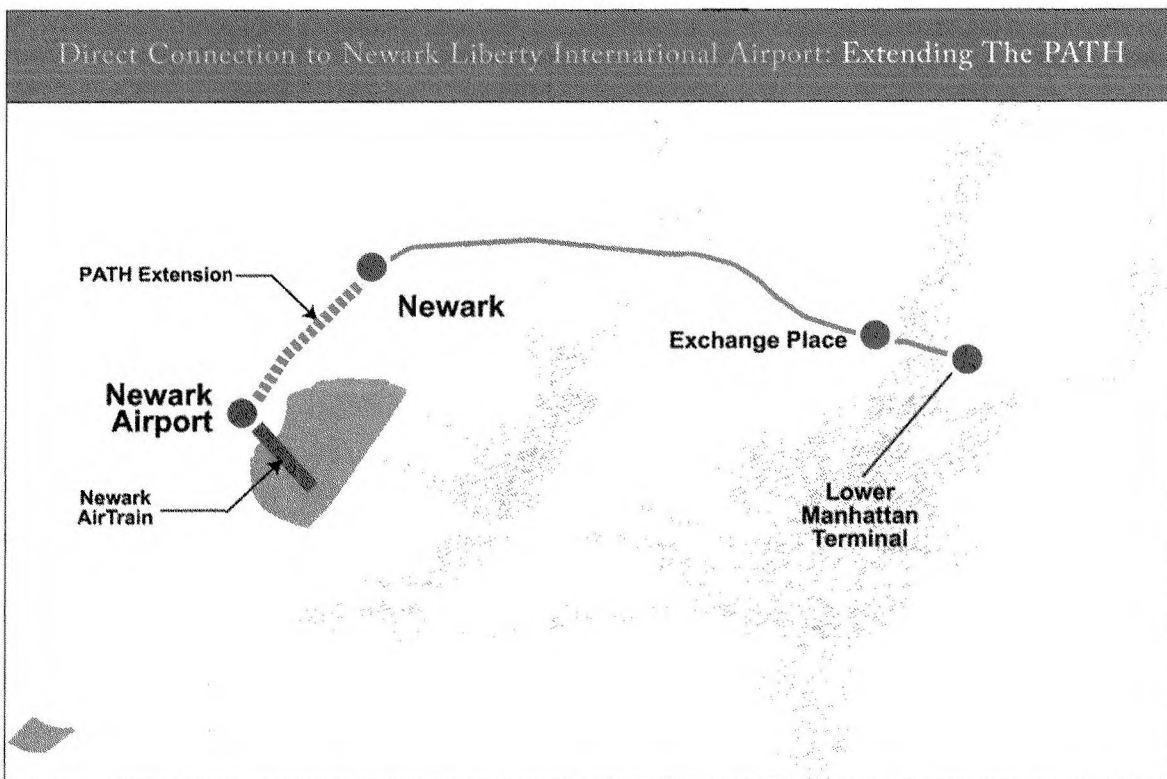
Lower Manhattan has the potential for fast and reliable access to all three area airports and Long Island.

Newark Liberty International Airport

Once PATH service is restored to Lower Manhattan, customers traveling to Newark Liberty International Airport will be able to take PATH to Newark Penn Station, proceed to a NJ Transit train for a one-stop trip to the Newark Liberty International Airport Rail Link station, and board the AirTrain to reach the airport terminals. However, under this scenario, the trip will require two transfers en route.

Travel to Newark Liberty International Airport from Lower Manhattan can be greatly improved by making a relatively modest investment. By extending PATH service from Newark Penn Station approximately 2.5 miles to the Newark Liberty International Airport station, travelers from the airport will be able to ride the AirTrain Newark from the airline terminals to the Airport's Rail Link Station, connecting with PATH directly into Lower Manhattan. This two-seat trip will be equivalent to the current service available for rail passengers from Penn Station in midtown. Mayor Bloomberg's *Vision* presents a direct version of this airport access option, in addition to the JFK Direct option discussed below.

The construction of this extension is achievable in a relatively short period of time. The Newark Liberty Airport rail station was built with room for an extra platform and track space to accom-



By extending the existing PATH service by 2.5 miles, Lower Manhattan will have an efficient connection to AirTrain Newark.

moderate a future transit connection. The station can be adapted to provide a connection with the extended PATH service by constructing an overpass or underpass structure to allow the extended PATH tracks to cross the Amtrak main line tracks. At the rail station, escalators and elevators from a new PATH platform will ascend directly into the AirTrain station concourse. In the Lower Manhattan Transit Complex, a passenger processing facility, including airline ticketing, check in, waiting, and flight and train information, could be created to allow air travelers the maximum level of convenience and comfort.

The extension of PATH to the Newark Liberty International Airport station will cost an estimated \$525 million and will take 7 to 8 years to complete, including design, engineering, permitting, and construction.⁷ The service will provide passengers an approximately 38-minute ride to Lower Manhattan from the Newark Liberty Airport rail station, requiring one transfer from AirTrain Newark to PATH. This improvement will save 12 minutes of travel time over existing train service. The Port Authority will work with partner agencies to secure funds for this project from outside of the \$4.55 billion FEMA/FTA allocation.

LaGuardia Airport

LaGuardia traditionally has been New York's hub for domestic business air travel. The current trip from Lower Manhattan by subway and bus takes in excess of an hour and requires a transfer. The greatest potential for improving Lower Manhattan access to LaGuardia Airport in the near term exists with ferry service, which would take advantage of LaGuardia's location on the upper East River and the availability of ferry terminals in Lower Manhattan.

A new airport ferry service⁸ would operate on a route from Lower Manhattan (Pier 11 and/or World Financial Center) and the Marine Air Terminal at LaGuardia, along with other potential stops, linking with a shuttle bus that provides access to the airline terminals at the airport. A new ferry landing and airport terminal connections, such as a shuttle bus service, would be required at the Marine Air Terminal. Such a service could be combined with the new East River/Lower Manhattan ferry operations, and possibly be extended to other locations on Long Island Sound, such as Rye, New York, or Stamford, Connecticut, as described in Chapter 3.

The Port Authority's regional ferry program has allocated \$12 million in capital funds to establish passenger ferry service to the New York airports. With air passenger volumes still below pre-September 11th levels, timing for implementation of airport ferry services in the near term depends on renewed growth in air passenger volumes and interest by private ferry operators. The



High speed ferry access would connect Lower Manhattan with LaGuardia Airport.

Port Authority and other partners see potential opportunities to initiate new ferry routes that draw on airport and commuter markets with enough combined ridership to sustain economically viable service.

In cooperation with partner agencies, the Port Authority will issue a Request for Expressions of Interest later this year to identify operator interest in LaGuardia Airport ferry routes.

In addition, the Port Authority is pursuing the initiation of another ferry service — to JFK International Airport. (See p. 70 for description of this possible service.)

John F. Kennedy International Airport and Long Island

Dramatically improving access to John F. Kennedy International Airport, New York City's primary international arrivals facility, is of the highest priority. By providing international air access that is convenient and reliable, Lower Manhattan (and, indeed, Manhattan as a whole) will gain a considerable asset — one that is fast becoming a standard among top business centers around the world. Equally important, the investments required to improve JFK access to Lower Manhattan will simultaneously improve commuter rail access for Long Island. It is therefore possible to stimulate Lower Manhattan's revitalization — and the region's growth — on two fronts through a single set of system improvements.

Promising, preliminary models for establishing such a combined JFK and Long Island service have emerged — the Super Shuttle and the JFK Direct. The Super Shuttle approach would offer a direct ride to Jamaica Station with a convenient transfer to the JFK Airport AirTrain. By largely using existing infrastructure and alignments, the Super Shuttle offers a lower cost and shorter implementation time than JFK Direct. The JFK Direct would create a one-seat ride directly to Jamaica and JFK Airport, utilizing a new tunnel beneath the East River and modern system technologies. JFK Direct offers a substantial savings in travel time to the airport. (These two approaches are described in greater detail below.) In addition to these models, a number of variants and alternatives merit further exploration.

To study the range of possibilities exemplified by the Super Shuttle and the JFK Direct, the LMDC, Port Authority, MTA, and New York City Economic Development Corporation (EDC) have partnered to initiate the JFK Airport Access and Long Island Commuter Service Alternatives Analysis Study, described more fully later in this section. The goal of this study will be to identify a high quality and buildable JFK and Long Island service that is prepared to enter into formal environmental review and construction.

The following text describes areas of inquiry for the study — beginning with the two preliminary models — and concludes with a more detailed description of the study itself.

The Super Shuttle Model

The Super Shuttle approach would utilize existing subway routes and LIRR tracks to create a direct trip from Lower Manhattan to Jamaica Station in Queens. This service would travel from Lower Manhattan on the A,C subway track and LIRR Atlantic Branch track to Jamaica Station. From there, riders would transfer to the soon-to-be operational AirTrain to JFK Airport or to LIRR commuter trains to Long Island. Because this option would pri-

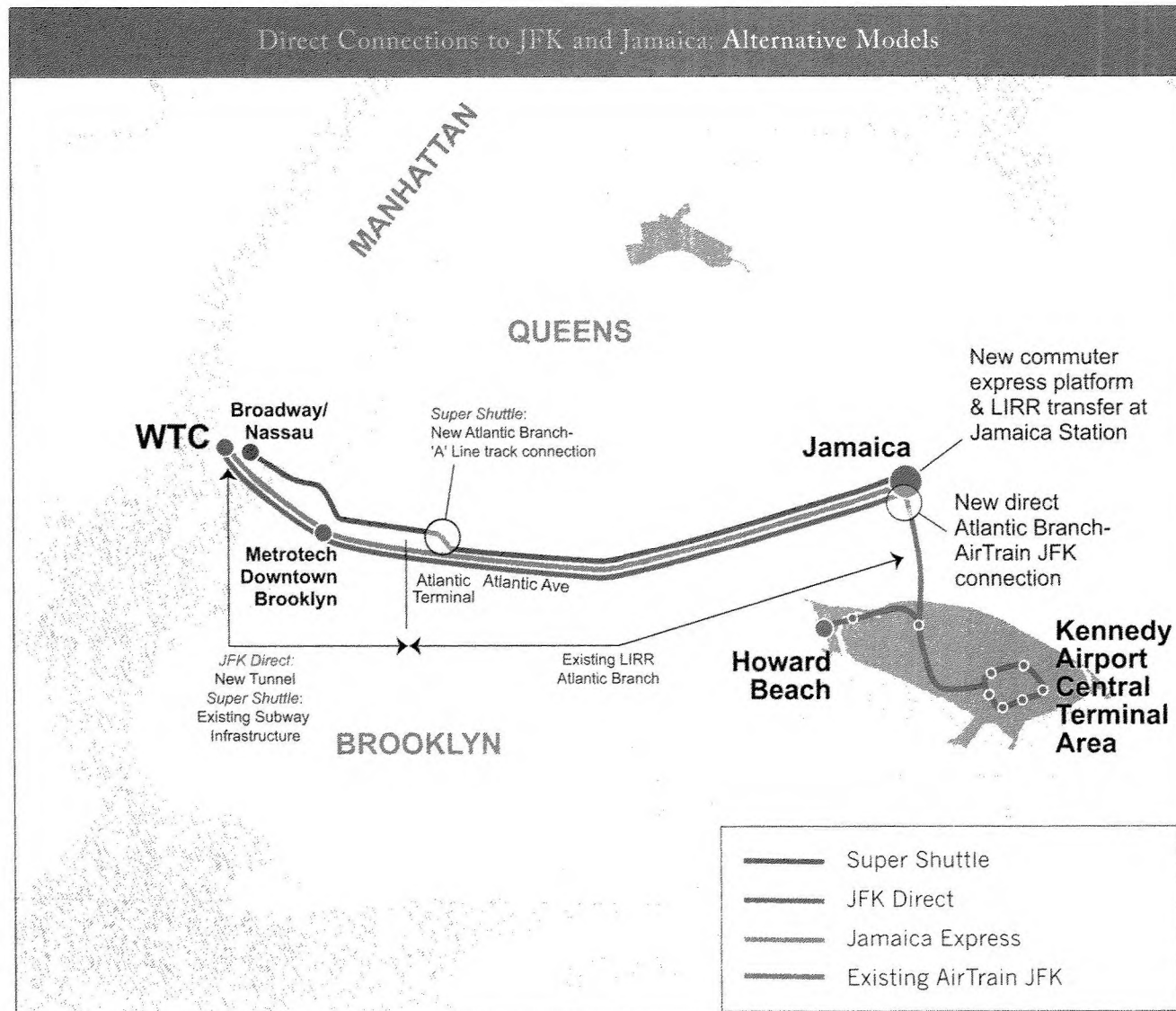
marily operate using existing structures and systems, it could be implemented relatively quickly and at a lower cost than alternatives that rely more heavily on new construction. The limited new construction that would be required includes a short tunnel to bypass Atlantic/Flatbush Avenue Terminal in Brooklyn and another short tunnel to connect the C and F lines west of the Hoyt-Schermerhorn Station in Brooklyn. As currently conceived, no new construction would be required in Manhattan.

Airport riders would take the Super Shuttle to the AirTrain at Jamaica Station, which would bring them directly to the JFK terminals. The trip would take a total of 38 minutes, a savings of approximately 23-27 minutes compared to existing service.⁹ This one-transfer option would be equivalent to Midtown service from Penn Station to either Newark Liberty or JFK, though the potential for premium subway cars used by the Super Shuttle would provide a higher level of traveler comfort.

Long Island commuters would transfer at Jamaica Station from LIRR trains to the Super Shuttle to Lower Manhattan. At present, a commute from Long Island requires as many as two transfers, or three "seats." The commuters' new one transfer, two-seat ride to Lower Manhattan would take 28 minutes, saving approximately 5-10 minutes compared to existing service.¹⁰ With Super Shuttle, Long Island commuters would eliminate the transfer to a crowded subway car at Atlantic Terminal or Penn Station, instead boarding an empty Super Shuttle at Jamaica for a ride directly into Lower Manhattan.

Operationally, because the Super Shuttle would share tracks and a tunnel with the A train service, delays on either line would have the potential to affect both services. In addition, since the A/C line's East River tunnel is operating at maximum capacity, the introduction of the Super Shuttle would require the C line to be diverted onto the F train tracks/tunnel from Jay Street in Brooklyn to West 4th Street in Manhattan in order to create track capacity for the Super Shuttle. This option may therefore reduce overall system capacity for Lower Manhattan. The specific effect of this change must be analyzed.

The Super Shuttle is estimated to cost between \$2 billion and \$2.3 billion dollars and to take 5 years to build.¹¹ By taking advantage of existing subway tunnels with available capacity, this option significantly limits the cost and time of implementation. The Super Shuttle approach would provide a straightforward, quickly implementable new transit service that benefits both JFK air passengers and Long Island commuters.



There are several options that connect Lower Manhattan to JFK Airport and Jamaica.

The JFK Direct Model

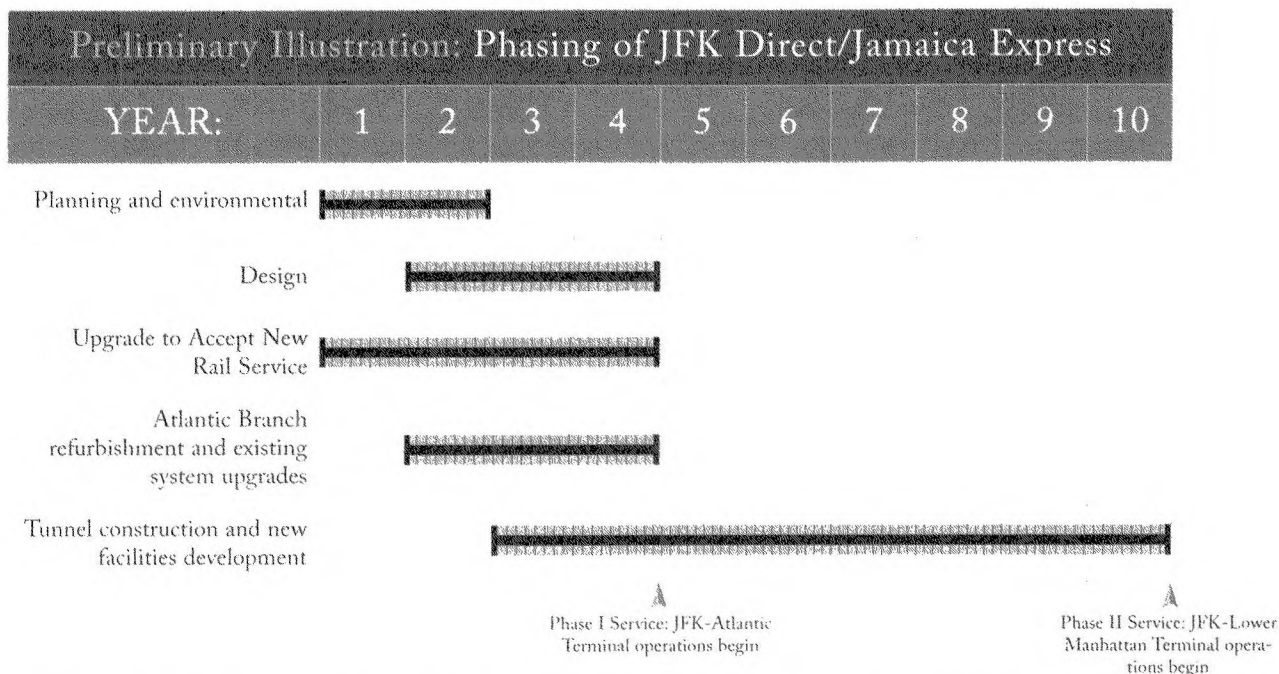
The JFK Direct would extend the AirTrain JFK from its planned terminal at Jamaica directly into Lower Manhattan, with a stop in Downtown Brooklyn. A companion service to the JFK Direct, the Jamaica Express, would also run from Lower Manhattan to Jamaica for Long Island customers, replacing current LIRR Atlantic Branch service. Presented as an option in Mayor Bloomberg's Vision, this system would require the construction of new tunnels and infrastructure from Lower Manhattan to Downtown Brooklyn, including a new East River tunnel, and minor modifications to the LIRR Atlantic Branch tracks.

The AirTrain JFK, scheduled to enter service later this year, will provide a significant improvement over existing transit connections to the airport, which currently require passengers to walk across multiple platforms, pay multiple fares, wait for connecting services, and travel a long, circuitous route. The JFK Direct would build upon the improvements provided by AirTrain JFK by providing a one-seat service to and from the JFK Airport terminals, eliminating the transfer via AirTrain at Jamaica or Howard Beach. With a one-seat ride competitive with car services and other premium modes of travel to the airport, the JFK Direct offers Lower Manhattan an amenity that is the emerging international standard for central business districts. As illustrated in the earlier chart, London, Tokyo, Paris, and Hong Kong already provide direct, one-seat rail access to their central business districts from their major airports.

Travel on the JFK Direct from Lower Manhattan to JFK could take as little as 23 minutes, saving 38-42 minutes over current service.¹² Like the JFK AirTrain, the JFK Direct would be specifically configured for airport travelers, with luggage storage, wide doors, and other specialized features.

Travel on the Jamaica Express from Lower Manhattan to Jamaica could take as little as 15 minutes, saving 18-22 minutes over current service.¹³ Jamaica Express trains would consist of more cars than JFK Direct and would provide bench seating and other commuter rail amenities to serve Long Island riders.

Construction phasing could permit a portion of the JFK Direct to begin operation from JFK to Atlantic Terminal before the entire system is completed. Concurrent with tunnel construction, the LIRR Atlantic Branch could be fitted with AirTrain propulsion and control technology from Jamaica to Atlantic Terminal and a platform for transfers to LIRR trains could be built at Jamaica. These upgraded tracks and platforms could provide interim service to Atlantic/Flatbush Avenue Terminal for both JFK Direct and Jamaica Express trains. Upon completion of the new



tunnels and stations, the JFK Direct and Jamaica Express would extend service to Lower Manhattan, bypassing Atlantic Terminal and making one stop in Downtown Brooklyn.¹⁴

In Lower Manhattan, pending resolution of security issues, a baggage check-in and a dedicated platform could be provided for the JFK Direct, while ticketing and waiting facilities could be provided for the Jamaica Express. Separate fare systems for the two services could be implemented easily and passenger comfort could be maximized. Airport travelers would not need to squeeze onto rush-hour commuter trains and commuters would not be inconvenienced by luggage-laden railcars on major travel days.

The JFK Direct and Jamaica Express would cost \$4.7-5.3 billion. It would take 5 years to construct the first phase of this project to Atlantic Terminal, as described above. The entire system would be completed in 10 years.¹⁵ Further development of the proposal is needed to address construction feasibility, the relationship to the currently programmed AirTrain JFK service to Jamaica, and other institutional and operational issues. Nonetheless, the JFK Direct model demonstrates the potential for accomplishing a fast, reliable, one-seat ride to JFK Airport utilizing an existing technology.

JFK Airport Access and Long Island Commuter Service: Subjects for Study

The inter-agency Alternatives Analysis for JFK Airport and Long Island service will evaluate a range of options, including the models described above, over a year-long period. The study will place a particular emphasis on constructability and operational feasibility; it will document existing baseline conditions and services, examine the cost of each alternative, and explore environmental, organizational, and community impacts. Rigorous demand analyses based on ridership forecasts and population growth data will be conducted. Alternatives will be identified that will provide a significant improvement compared to existing service in categories such as travel time, frequency, number of transfers, and passenger utilization. Ultimately, a single preferred alternative will be chosen for implementation. Short-term solutions may also be identified for implementation while the development and construction of the long-term approach progresses.

The chosen approach may take the form of one of the two models, may incorporate altogether different elements, or may combine the components and benefits of both concepts. One example of the latter possibility is as follows: a hybrid vehicle, capable of operating within both the subway and AirTrain systems, could be designed to maximize usage of existing infrastructure, as the Super Shuttle does, while also providing a convenient one-seat ride from Lower Manhattan to the airport, as the JFK Direct does. Such an idea will be explored thoroughly as part of the study.

Another area that merits investigation is the creation of a new East River tunnel. A key component of the JFK Direct model, a new tunnel could offer significant benefits for a Super Shuttle-type system by providing a means to avoid the capacity issues of existing tunnels. In addition, further research is warranted to explore connectivity with existing subway services. A new system could be configured to maximize connections to other services or even to physically connect to and extend an existing transit line. It is possible that a system for one-seat JFK Airport and Long Island access that incorporates hybrid vehicle technology, utilizes a new tunnel, and provides connectivity with other services would be priced at a level between the Super Shuttle and JFK Direct models.

The above are only a subset of the issues that will be reviewed within the study. At the conclusion of the analysis, the alternative identified as the preference of the agencies will represent the most favorable balance of feasibility, functionality, and operability, considering the pros and cons of each option. Throughout the study, data will be generated and preliminary analysis conducted for use in an Environmental Impact Statement (EIS) that will commence upon the selection of the preferred alternative. Concurrently, funding will be secured for the project. With the EIS complete, the preferred alternative for JFK and Long Island service will begin construction.

Short-term Improvement: Ferry Service to JFK

The Port Authority is undertaking efforts to develop a passenger ferry service linking Lower Manhattan and Midtown to the airport as a short-term access improvement complementing the AirTrain JFK links to the LIRR and the subway system. From Lower Manhattan, ferry service could provide a reliable 40-50 minute service to the airport. The Port Authority anticipates initiating the service by late 2005.

Downtown Manhattan Heliport

In addition to the above-described rail service, a much smaller scale, relatively inexpensive, supplemental airport service for business executives and other travelers could be created in the form of regularly-scheduled Lower Manhattan helicopter service from the Downtown Manhattan Heliport (DMH) at Pier 6.

New York has a long history of helicopter services, including services to and from the area's three airports. However, no scheduled services are operating at this time. The last scheduled airport service from Manhattan ended two decades ago; only high price range chartered services are currently available. Lower Manhattan is therefore positioned to offer a unique amenity by providing a premium business district-to-airport service on a scheduled (not merely chartered) basis.

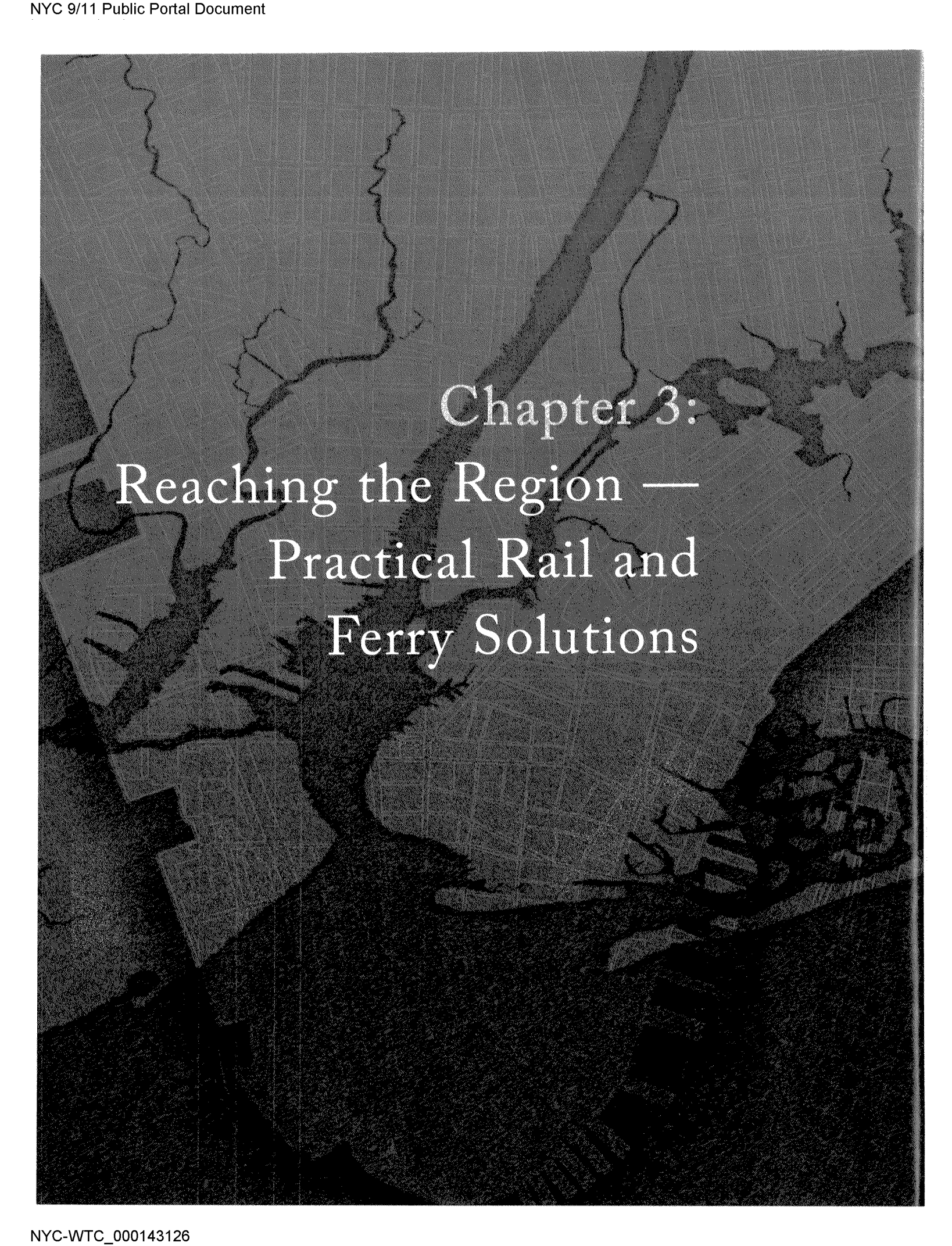
To enable the provision of regularly scheduled helicopter operations in New York City, a system of regulations would be required to manage service operations between the downtown Pier 6 heliport and the area's major airports. This system would need to set guidelines for passenger security, equipment maintenance, ticketing, baggage handling, flight scheduling, and other service parameters. Provisions would be needed to help reduce noise impacts to the greatest practical extent. In addition, the Federal Aviation Administration (FAA) would need to review and refine the area's helicopter flight path system to ensure that new service would not interfere with airplane traffic and would allow for both visual and instrument flights. With comprehensive operating regulations in place, helicopter service providers would have greater certainty in developing and implementing regularly scheduled flights.

Very little capital investment would be required to initiate this service. The landing and terminal facilities at the DMH and the helicopter facilities at the area's three airports are in good condition. The barriers to regularly-scheduled helicopter service to the airports are organizational rather than infrastructural.

However, as safety and security concerns would be paramount for a helicopter service, a number of basic requirements would need to be satisfied. These include the following:

- Establishment of landing protocol at the airports with a designated terminal gate and security systems for the helicopter passengers that are approved by the Transportation Security Administration
- Approval of the new services by the FAA and US Department of Transportation
- Provisions for the storage of jet fuel and for refueling at the DMH, which require New York City Fire Department approval

Assuming these requirements are met and operational guidelines are developed, regular helicopter service between Lower Manhattan and the three area airports could be implemented relatively quickly. Though this service would by no means supplant rail access or approach its capacity, a number of potential operators are available and a Lower Manhattan heliport already exists. Currently, a charter helicopter service from the Downtown Manhattan Heliport to the airport can cost approximately \$1,000 per flight.¹⁶ Regular service could conceivably achieve economies of scale to reduce that cost to below \$100 per passenger. Such a service could be made more attractive with a feeder van or shuttle bus in Lower Manhattan and a similar service at the airports for passenger distribution to terminals. Further exploration and pursuit of this idea is warranted.

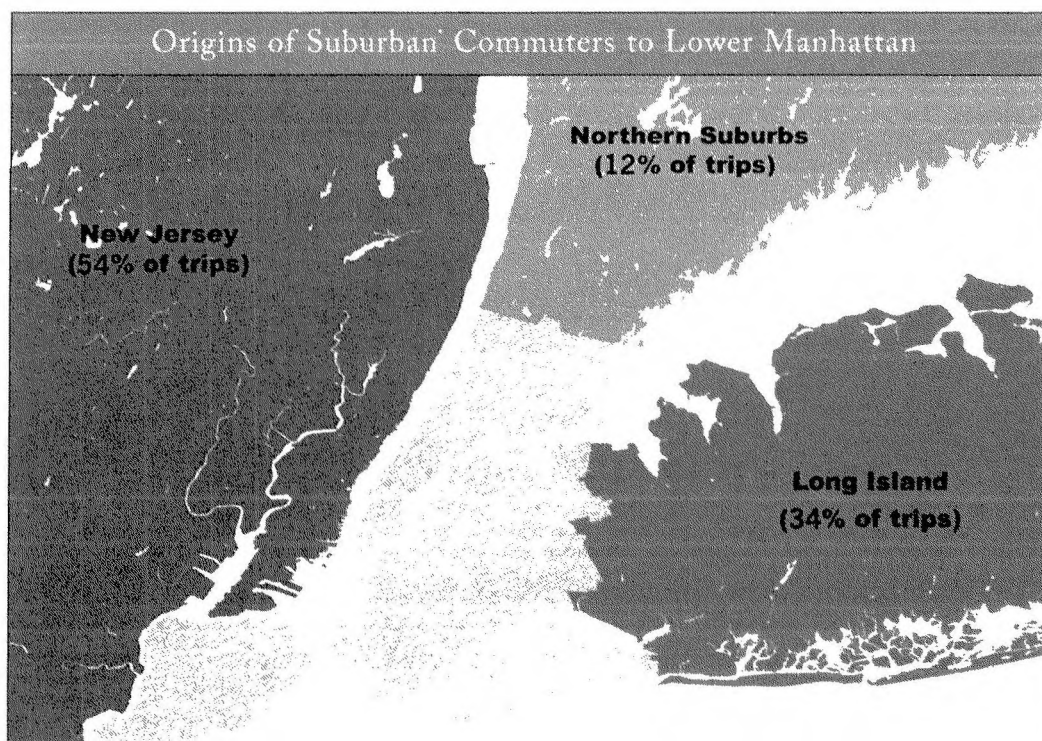


Chapter 3: Reaching the Region — Practical Rail and Ferry Solutions

It is important for Lower Manhattan to improve its access to the population growth centers of the metropolitan area – so as to expand its labor pool and sustain its vitality. To achieve such enhanced regional connectivity, it is important to balance major capital improvements with less expensive interventions that can have a substantial cumulative effect. Adopting this realistic perspective, the following chapter outlines small- and moderate-scale initiatives that will enhance transit service between Lower Manhattan and locations throughout the region.

In coming years, the New York metropolitan region's population is expected to grow at a pace that is faster than the city's. Long Island and New Jersey, in particular, are expected to generate the highest population increases in the area. According to the New York Metropolitan Transportation Council, Suffolk County on Long Island will experience the greatest gain of any county in the region between the years 2000 and 2025, while Ocean, Middlesex, and Monmouth Counties in New Jersey are projected to have the second, third and fourth highest rates of growth. Fairfield County in Connecticut follows closely behind them.

The map below illustrates the origins of Lower Manhattan suburban commuters traveling during the 6 to 10 a.m. on weekdays. The majority of these commuters originate from New Jersey communities, many of which are well-served by transit systems. The Long Island suburbs comprise fully 34% of these trips while the northern New York and Connecticut suburbs make up only 12%. Given both its rate of growth and its percentage of labor force contribution, Long Island is a logical focus for enhanced commuter service.



* Tri-state area, non-New York City commuters.
Source: Parsons Brinckerhoff.

ACCESSING THE REGION: NORTHERN SUBURBS

Subway & Commuter Rail Expansion and Improvements

Methods of improving rail access to Lower Manhattan for commuters from northern New York and Connecticut have been in discussion for decades. While Metro-North Railroad provides excellent service from Westchester, Connecticut, and other northern suburbs to Grand Central Terminal, the connecting trip to Lower Manhattan adds time and increases unpredictability. In the evening, a five-minute delay in uptown subway service can result in missing the connection to a Metro-North train and become a half hour-long delay for regional commuters heading home.

The directness and speed of the Lexington Avenue Express (the 4 and 5 lines) will continue to be highly important for Lower Manhattan. However, the level of crowding at rush hour — both on-board the trains as well as on the platform — is a drawback for commuters destined for Lower Manhattan. Passengers sometimes must wait on densely crowded platforms for one or more fully loaded trains to pass by before there is room to board. Once inside the subway car, they are often unable to secure a seat as trains come into the station near or at capacity.

Several steps must be taken in order to remedy the challenges of the Metro-North/Lexington Avenue commute:

Lower-Level Lexington Line Connection at Grand Central Terminal

According to the MTA, approximately 1.3 million passengers use the Lexington Avenue subway on a daily basis, making it the busiest subway line in the entire United States. Of the approximately 13,000 Metro-North morning peak period riders who transfer at Grand Central Terminal to the southbound Lexington Avenue subway, about two-thirds, or over 8,000, are destined for Lower Manhattan south of Houston Street. During a typical morning rush hour, it can take upwards of seven minutes for a Metro-North commuter to walk from the commuter train platform to the downtown platform of the Lexington Avenue subway. Much of this time can be spent in queues at narrow stairs, escalator banks and turnstiles. These factors nearly double the length of time it should take to get downtown.

Tangible improvement of the crowding and queuing conditions along pedestrian routes within Grand Central Terminal can be achieved in the immediate term by building the lower level Lexington Connection, a new pedestrian link within Grand Central Terminal for Metro-North customers going to and from the subway. Addressing the peak crowding conditions within the subway station at Grand Central and on the subway trains themselves requires a more comprehensive and longer-term solution — namely, the construction of a new subway line — the Second Avenue Subway — to relieve conditions on the crowded Lexington Avenue line. (See more on the Second Avenue Subway below.)

Lower-Level Lexington Line Connection at Grand Central Terminal

The Lower Level Lexington Connection will provide a new pedestrian route linking the lower platform levels of the Metro-North terminal with the mezzanine of the Lexington Avenue subway station. The existing routes, particularly the escalators, become overcrowded at rush hour and queues build up. The new connection adds a third route, which will be much more direct for those Metro-North passengers arriving at the lower level. These riders could save upwards of five minutes on their trip downtown. Diverting a share of the Metro-North traffic to the new connection also will make the existing routes less crowded and will shorten walk times through the terminal for all Metro-North customers heading downtown.

A passageway leading southward from the end of the lower level Metro-North platforms at Grand Central will be constructed to provide direct access to the underside of the Lexington Avenue Line platforms and tie into one of the existing vertical pedestrian connections between the Lexington Line and the #7 Flushing Line, providing a new direct route to both subway lines. Additional vertical movement capacity will be provided to and from the subway platforms, and options exist for providing escalator connections at the Metro-North end of the passageway to both the upper and lower concourses of Grand Central Terminal, as well as to the proposed new terminal for the Long Island Rail Road at Grand Central.

The Lower Level Lexington connection is estimated to cost in the range of \$50 to \$75 million and can be completed within 3-4 years, depending upon the complexity and scope of improvements undertaken, which will be determined once engineering studies by NYC Transit have been completed.



The new Lower Level Lexington Line pedestrian connection will save commuters up to 5 minutes in their trip to Lower Manhattan.

Lexington Avenue Subway Throughput Improvements

The MTA, as a result of its study of Lower Manhattan access options and in the course of its continual program to modernize and upgrade the subway system, will be developing ways to maximize service on the existing Lexington Avenue Line. Among the ideas that are on the table for incrementally increasing the throughput capacity and reliability of the service are:

- Stationing conductors on the platforms of heavily-used stations to expedite the boarding and discharging of passengers,
- Modernizing and upgrading certain elements of the signal system and devices such as the "gap-fillers" at 14th Street which today cause short delays to every train on the line,
- Accelerating the deployment on the Lexington Avenue Express of new R143 cars, whose doors and vestibules are designed to discharge and board passengers slightly more quickly than the older cars, and
- Stationing medical assist personnel at key stations to enable them to treat passengers who become ill on the platform, thereby keeping the trains moving.

Real-time Passenger Information Systems

When the current MTA capital project is completed, which includes the creation of a centralized control facility for the Lexington Avenue and Seventh Avenue Lines, a wealth of real-time information on the status and performance of the system will be available for dissemination to passengers. A goal for the future of the subways is to provide better information to riders for use in making decisions about how to get to their destination. The portion of the Lexington Avenue subway between Grand Central and Lower Manhattan should be used as an early prototype for developing and implementing new information systems that would post the arrival times and destinations of the next several trains, inform passengers of delays or problems on the line before they enter the system, and possibly offer suggestions as to alternate routes. Understanding which lines are experiencing delays will allow riders to make better choices in getting to their destination. Information displays could be placed within both the Metro-North and subway areas of the Grand Central complex, and at the Lower Manhattan stations of the Lexington Avenue Line. Specifically, a major passenger information center could be created within the high-ceilinged space of the new Fulton Transit Center, which adjoins the uptown Lexington Avenue Line platform. The information displays also could show real-time information about the commuter railroads. Capital costs would be modest relative to those associated with major construction projects and elements of these systems could begin to come on-line within a 2-3 year period.

Second Avenue Subway

Improvements to the Lexington Avenue subway are important in improving the commute to Lower Manhattan, yet these changes are inadequate to truly address the severe capacity burdens

on this service. The Lexington Avenue line serves all residents east of Central Park, whereas, the residents west of Central Park have multiple subway options. South of 59th Street in Manhattan, the residential population is overwhelmingly located on the east side and, for many, the Lexington Avenue line is the only subway within walking distance from their homes. The construction of the Second Avenue Subway will relieve crowding on board Lexington Avenue trains and provide needed service to the East Side. The Second Avenue line was identified by the MTA in its *Lower Manhattan Access Alternatives* study as the best solution for improving travel between Metro-North at Midtown and Lower Manhattan — precisely because it will attract some East Side passengers from the Lexington Avenue line. The Second Avenue Subway is slated for funding by the MTA, independent of Lower Manhattan transportation funds.

While the long-range goal is for new subway construction and a less crowded Lexington Avenue line, substantial benefits can be realized in the near-term as a result of the above-described initiatives — improving the pedestrian connections at Grand Central, building the Fulton Transit Center, equipping commuters with real-time information on the status of subway line and commuter railroad operations, and implementing operational improvements to maximize the capacity and reliability of the line. These short-term initiatives will combine to make the subway trip between Grand Central and Lower Manhattan much more convenient and appealing).

ACCESSING THE REGION: NEW JERSEY

Restoring PATH Service and Facilitating Access from New Jersey

Access to Lower Manhattan from New Jersey is accomplished in large measure by the PATH system. PATH, which served 67,000 riders a day to Lower Manhattan before September 11th, provides easy connections in Hoboken to New Jersey Transit trains serving many of the more populated communities.

When PATH service is restored in late 2003, Lower Manhattan will again have direct connections to suburban areas in New Jersey. The Port Authority and New Jersey Transit have been implementing a strategy to provide service for the long-term growth forecast for New Jersey. Most important in accommodating future growth is the project to increase capacity on PATH trains from eight to ten cars. As of June 29, 2003, the Exchange Place PATH Station will operate as a terminal station with expanded ferry service to Lower Manhattan until WTC PATH service is restored in late 2003. Finally, improvements to the rail network that facilitate connections to Lower Manhattan PATH service — such as expansion of NJ Transit rail service to Hoboken, introduction of the Hudson-Bergen Light Rail Service, and the Secaucus Transfer — will continue to provide more options for Lower Manhattan-bound commuters.

ACCESSING THE REGION: LONG ISLAND

Long Island Rail Road and AirTrain

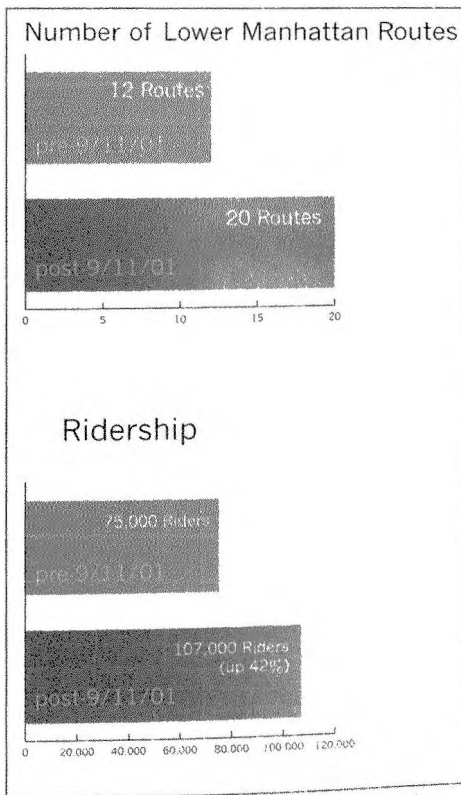
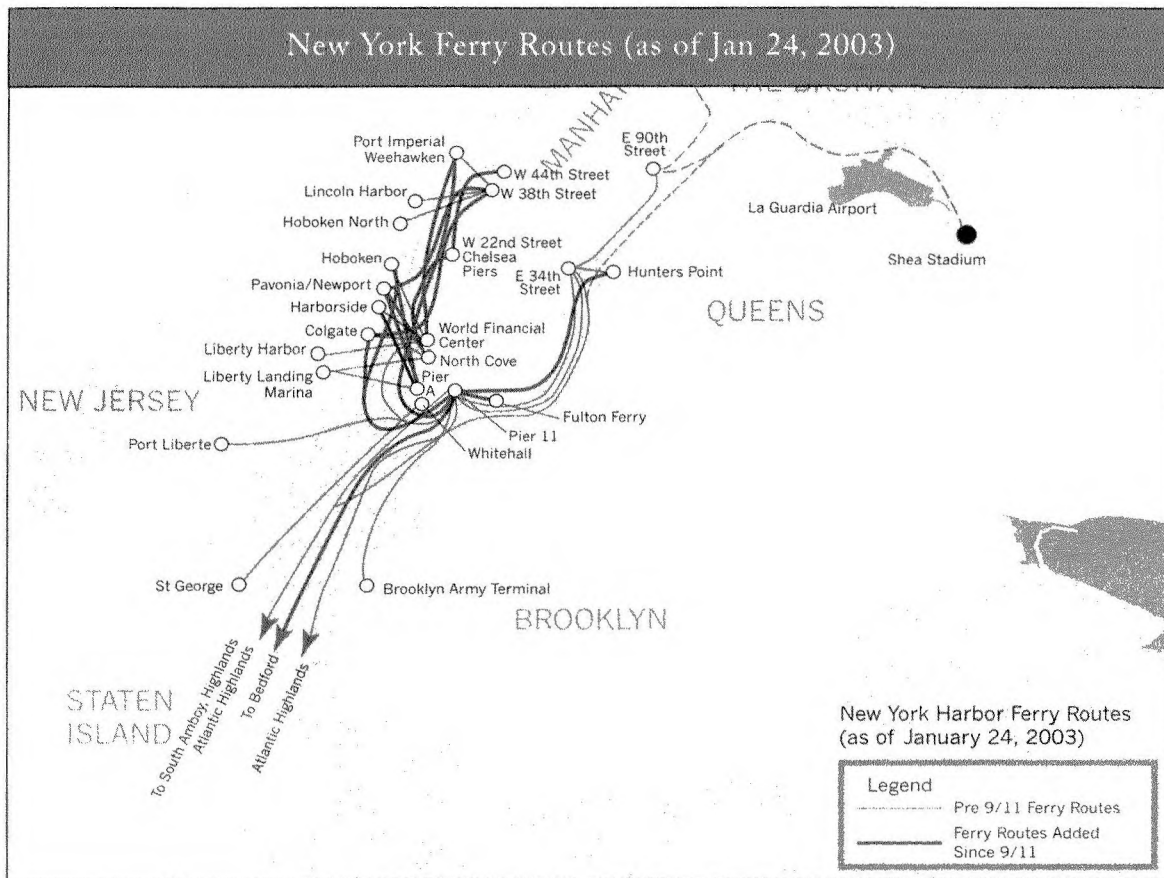
Long Island is served by one of the most extensive networks of commuter rail in the world. The Long Island Rail Road system includes 124 stations serving 290,000 people each weekday. To reach Lower Manhattan, however, Long Island commuters are faced with a set of equally inconvenient options. The first is through Atlantic Terminal in Brooklyn to a Lower Manhattan bound subway. Some commuters have direct service from Long Island to Atlantic Terminal, though a significant number do not. Those riders must switch at Jamaica for Atlantic Terminal-bound LIRR trains, and switch again for the subway to downtown. The subway connection at Atlantic Terminal is difficult to navigate, and the subway ride to Lower Manhattan is crowded during rush hours.

The other alternative is to take LIRR directly to Penn Station in Midtown and switch for a downtown subway line. This is a less direct route but does not require a second transfer. On the other hand, it contributes to crowding at Penn Station, which is already the most heavily used train station in the country.

New transportation infrastructure that would improve access to Lower Manhattan from Long Island would significantly bolster Lower Manhattan's competitiveness as a business center. See Chapter 2 for a description of potential Long Island service enhancements (coupled with JFK Airport access).

ACCESSING THE REGION: FERRY SERVICE

Over the past year and a half, ferries have proven invaluable in accommodating the needs of commuters from New Jersey who previously relied on PATH service. Ferries' role in the recovery from September 11th augmented their already important role in the Lower Manhattan transportation network. Enhancing and expanding ferry service is a key means of linking Lower Manhattan to the region. They are a sensible and viable option for a number of reasons: ferries require minimal capital investment relative to other forms of mass transit, new service can be implemented relatively quickly, and they are particularly suited to Lower Manhattan, where the shoreline is within convenient walking distance of a significant portion of the business district. Already, the private ferry fleet operating in New York Harbor is the largest in the United States, with Lower Manhattan being the prime destination. While the majority of ferry routes serve the

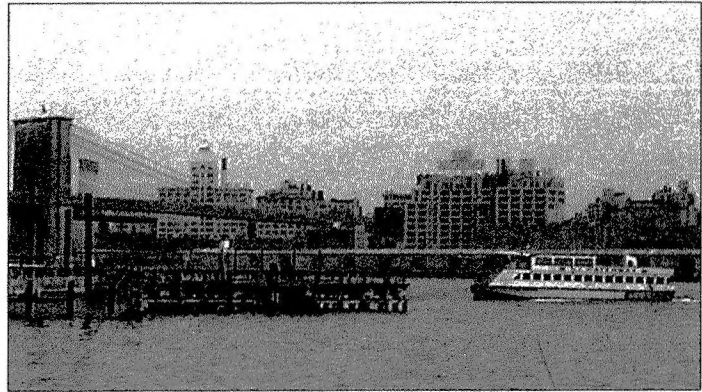


New Jersey market, locations in the northern suburbs and the outer boroughs are being explored and strategic investment should occur in cases where ferries can provide a shorter, more comfortable commute.

Creating A Regional Ferry Strategy to Benefit Lower Manhattan — Next Steps

Identifying precisely how to expand ferry service to Lower Manhattan from throughout the region will require a focused, formal study. Ferry service falls under the jurisdiction of multiple transportation agencies and is privately operated. Therefore, a coordinated effort needs to be undertaken to analyze possibilities and craft a strategy to maximize the benefit ferries can provide Lower Manhattan. The goal of the study will be to:

- Recommend locations for long-haul, high speed service originating in Westchester, Fairfield and Rockland counties, southern New Jersey, Staten Island and other locations.
- Identify ferry lines that were instituted after September 11th that are priorities for preservation.



Pier 11 on the east side of Lower Manhattan.

- Identify potential catchment points, e.g. at major vehicular river crossings (tunnel or bridge), where commuters would transfer to a Lower Manhattan-bound ferry.
- Assess the ferry infrastructure (terminals, slips, other facilities, and vehicle fleets) in Lower Manhattan and potential regional destinations and recommend areas of investment.

A review of existing Lower Manhattan ferry service, on-going improvement projects, as well as potential projects suitable for further study, are discussed below.

Post-September 11th Ferry Services

In the aftermath of September 11th, ferry ridership surged due to cessation of the Lower Manhattan PATH service and some subway services near the World Trade Center site, and the restrictions placed on access to the area by automobiles and commuter buses. Spearheaded by the Mayor's Office and the Port Authority, and funded by FEMA, eight new routes were implemented to accommodate commuters whose previous means of commuting had been disrupted.

By spring 2002, these routes had an average weekday ridership of nearly 107,000 passengers, a 42 percent increase over their pre-September 11th levels. Pier 11, near the foot of Wall Street, experienced the largest increase (nearly 300 percent), with the New Jersey Transit Hoboken Terminal operation contributing the greatest share of this increase. Ridership on the longer-haul Monmouth County runs also showed marked increases.

Continuing Growth in Lower Manhattan Ferry Service

The Port Authority, New York City Economic Development Corporation (EDC), and City Department of Transportation coordinate and monitor ferry operations in the city and region, working with a growing number of public partners in New Jersey and in New York's northern suburbs. These agencies have been accelerating efforts to advance various long-term service enhancements to expand the role of ferries in Lower Manhattan's transportation network.

Five main components should be considered to ensure the continued improvement and growth of Lower Manhattan ferry service. Four will be described in brief and the fifth, ferry service for the northern suburbs, will be explored more thoroughly:

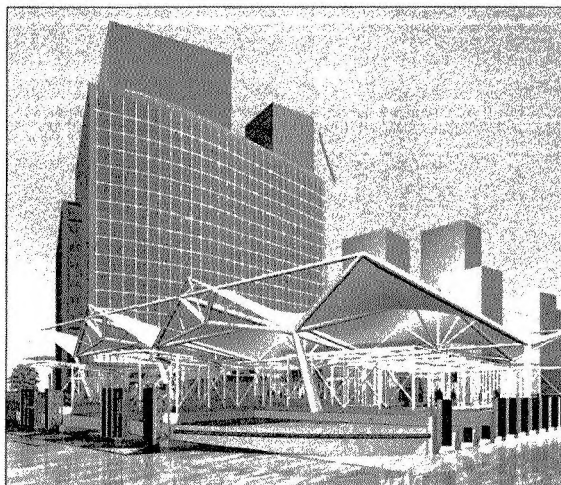
(1) Identifying existing FEMA-subsidized lines that are important to sustain.

For certain commuters, ferries provide the best possible means of traveling to work. An example is the service to Pier 11 from New Jersey that was implemented after September 11th. For some New Jersey commuters who work in the "Water Street Corridor" on the east side of Lower Manhattan, taking a ferry to Pier 11 is more convenient than was their previous commute via PATH to the World Trade Center. Many of the ferry lines established after September 11th currently receive operating subsidies from the Federal Emergency Management Agency. These subsidies will most likely diminish and eventually cease when PATH is fully restored. Without such support, some routes will discontinue for lack of ridership and revenue. Others may be sustainable based on their ongoing convenience and utility to a significant number of commuters.

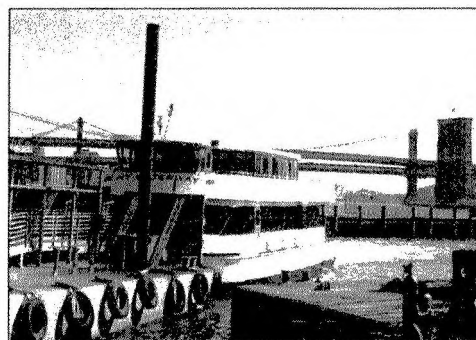
Careful analysis of ferry customer trends — on both Pier 11 routes and others established after September 11th — should be conducted once WTC PATH service resumes to determine whether further public agency intervention is appropriate.

(2) New ferry terminals and landings

Plans are in place to upgrade certain facilities that serve ferries in Lower Manhattan — to increase vessel berthing and passenger handling capacity and provide a comfortable, attractive environment. An advantage of ferries is that they have the potential to provide a level and quality of service that equals or exceeds what the rail transit system offers. The locations in Lower Manhattan where ferry infrastructure investment is planned or possible include:



A Port Authority rendering of the proposed World Financial Center ferry terminal.



Ferry service to the east side of Lower Manhattan grew substantially after September 11th.

·*World Financial Center:* The Port Authority is building a new, glass enclosed, five-slip (four end loading and one side loading), floating ferry terminal at the World Financial Center. This new terminal will replace the existing two-slip Port Authority facility by the end of 2005. This project, planned before September 11th, incorporates a modular design that could be duplicated (in varying sizes) at coastline locations elsewhere.

·*Lower East River/Wall Street Area:* The existing terminal facility at Pier 11 has seen a huge increase in demand since September 11th, but its mostly outdoor environment offers relatively limited amenities for passengers. Pier 11 has recently been improved, but its popularity as a destination suggests that more investment is needed on the lower East River. Enhancing the landside infrastructure along Lower Manhattan's eastern waterfront, whether at Pier 11 or a nearby location, would be a logical investment to improve the quality of ferry service downtown.

·*The East River ferry network:* New York City's EDC is instituting an East River service with terminals at East 90th, East 75th, East 67th, East 34th, East 23rd Streets, and Slip 5 of the Battery Maritime Building. The primary operations at these locations are envisioned as commuter services between Lower Manhattan and the Upper East Side with the ferry operations potentially extended to and from LaGuardia Airport (see below and Chapter 2). Service at these terminals will be operational in July 2004.

·*Whitehall Ferry Terminal:* Reconstruction of the Whitehall Ferry Terminal to improve operations for the Staten Island ferry is currently underway with its completion scheduled for summer 2004.

·*Potential new terminal:* Bay Ridge, Brooklyn Presently, ferry service from Brooklyn departs from points in Bay Ridge and the Brooklyn Bridge waterfront area. These locations have limited ridership due to the fact that they only serve the residential areas adjacent to the terminals. By locating the terminals more strategically, a greater number of commuters could benefit. In the case of Bay Ridge, utilizing the 65th street yard as a ferry stop, the market can be expanded to include commuters driving the Belt Parkway/Gowanus Expressway route to Manhattan. The 65th Street location can be expanded to include a weather protected parking structure with direct highway links to the Belt Parkway and Gowanus Expressway. This structure would provide a protected access to the ferries and allow customers to exit the highway system before reaching bottleneck locations. This ferry service would be direct to the Lower Manhattan terminals and a convenient way to reduce driving time. (Further study required.)

(3) Providing ferry service between Lower Manhattan and the Marine Air Terminal at LaGuardia Airport.

This service could be operated in conjunction with other planned East River services, or as a single purpose service between Lower Manhattan and the airport. Such an operation would be an improved version of the Delta Water Shuttle that provided service between Pier 11 and the Marine Air Terminal prior to September 11th. The details of this potential service are explored in Chapter 2.

(4) Establishing high speed ferries to New Jersey and Staten Island

In 1996, the Port Authority studied the possibility of new, high-speed ferry services to Lower Manhattan from various waterfront sites in Middlesex County, New Jersey, and on the southeastern shore of Staten Island. As a result, private providers have initiated ferry services from Belford, Highlands/Atlantic Highlands, and Highlands (Monmouth County, New Jersey), respectively, to Pier 11 in Lower Manhattan and other landings in Manhattan. The success of these long distance, high speed services can serve as a model for the implementation of additional lines.

The Port Authority is working with local officials on Staten Island to explore the possibility of initiating similar high-speed ferry service to Lower Manhattan from Midland Beach. Service at this mid-island location could provide an attractive commuting alternative.

(5) Establishing high speed ferries to Northern New York and Connecticut

Ferry service, which has grown by leaps and bounds between Lower Manhattan and New Jersey, has been slow to expand to the north. A convenient and comfortable one-seat ride from the northern suburbs is possible via high-speed ferry and is a commuting option that should be seriously explored. Already, a coalition of planning organizations is developing a Long Island Sound Waterborne Transportation Plan, including potential ferry links to Manhattan. Several specific initiatives, discussed below, are in development along the Hudson River.

Northern suburban service would yield substantial benefits. It would:

- Provide greater connectivity between northern suburban areas and Lower Manhattan, thereby enhancing the attractiveness of the downtown area as a place to work and to do business.
- Offer transportation options for Lower Manhattan commuters who use the Metro-North Railroad, replacing the need for a rail transfer with service directly from suburban ferry terminal locations to Lower Manhattan, and providing an alternative mode in the event of railroad service disruptions.
- Reduce the volume of travel by automobile between Lower Manhattan and northern suburban communities.

Based on a review of past studies and considerations of ridership potential, costs, and feasibility, a representative set of eight ferry terminal locations in Westchester, Rockland, and Fairfield Counties has been identified (see chart). The operational parameters of such service assume use of the latest high-speed passenger ferry vessel technology currently in operation in the New York area (most likely a 300 - 400 passenger water-jet propelled catamaran with a cruising or long distance service speed of 40 knots, or 46 miles per hour), and an overall travel experience that is similar to an airline business class service. The specific sites considered are proximate to Metro-North stations or have waterfront locations that provide reasonable geographic coverage of important northern suburban travel markets. The ferry study will consider these locations and others as possibilities for service expansion.

High Speed Express Ferry to the Northern Suburbs: Possibilities for Expanded Service			
Town	Time to Lower Manhattan by Railroad & Subway	Potential Time by High Speed Express Ferry	Comments
<i>Westchester County</i>			
Yonkers (Note: The City of Yonkers is negotiating arrangements for the financial support needed to initiate planned commuter service to West Midtown and Lower Manhattan.)	56 Minutes (Fulton Street)	28 min. (WFC)	The ferry terminal would be located at the Yonkers City Pier, about 800 feet from the MTA/Metro-North Railroad (MNR) Hudson Line station. A new esplanade connects the train station and the City Pier. The general ferry landing location is an area of extensive new waterfront development including a 600-car parking garage near the train station. A limited number of Amtrak Empire Service trains also serve Yonkers.
Rye	1 hr. 2 min. (Wall Street)	34 min. (Pier 11)	Rye Playland is a centrally located place for ferry service to the City with parking areas and a large pier for docking vessels. Despite many years of effort by the City of New York, the Port Authority and private operators, no ferry service has yet been initiated from this location.
Ossining	1 hr. 6 min. (Fulton Street)	47 min. (WFC)	The Ossining rail station, located about 100 yards from the landing, serves the MNR. There is a high-speed ferry service between Haverstraw in Rockland County and Ossining with six trips in the AM peak period and nine trips in the PM peak timed to connect with MNR trains at Ossining.
Tarrytown	1 hr. 0 min. (Fulton Street)	39 min. (WFC)	Tarrytown is approximately 25 miles north of Grand Central Terminal (GCT) on the MNR Hudson Line. Tarrytown has been considered for ferry service in the past.
<i>Connecticut</i>			
Norwalk	1 hr. 21 min. (Wall Street)	54 min. (Pier 11)	Norwalk Harbor is a naturally protected inlet with a potential connection to the South Norwalk MNR station. The market at this location includes Bridgeport, Fairfield, Southport and Westport as well as inland towns of Fairfield County.
Stamford	1 hr. 8 min. (Wall Street)	46 min. (Pier 11)	Potentially all of the Fairfield County municipalities could contribute riders to a ferry service originating at Stamford. The harbor lies within a naturally sheltered area and has been considered a potential ferry location in prior studies. There is good roadway access and ample parking at this proposed ferry terminal location.
<i>Rockland County (Service area of the NJ Transit Pascack Valley Line)</i>			
Nyack	1 hr. 20 min. (Fulton Street)	38 min. (WFC)	Nyack as a potential ferry service location was the subject of a joint feasibility study by the New York Thruway Authority and the Port Authority in the mid-1990s that explored ferry service between Rockland County and Manhattan as a possible measure to mitigate traffic congestion on the Tappan Zee Bridge. Various routes were studied, including possible stops at Tarrytown and Yonkers to enhance the financial viability of the service. (The study involved an investigation of other locations in Rockland County including Haverstraw.)
Haverstraw	95 min. (Fulton Street)	49 min. (WFC)	The probable originating location is Haverstraw Village, the location of the current terminal for the Haverstraw-Ossining Ferry shuttle. The village has requested federal funds to initiate service to Manhattan via Yonkers.

Note: Information compiled by Parsons Brinckerhoff from transportation agencies and other sources.

ENDNOTES

Introduction

- 1 Information provided by New York City Economic Development Corporation.
- 2 TenantWise estimate of jobs displaced in Lower Manhattan immediately following September 11th attacks.
- 3 Information provided by Urbanomics.
- 4 See Downtown Lower Manhattan Association *First Report* (1958), *Second Report* (1963), *Third Report* (1969); City of New York *Lower Manhattan Plan* (1966, 1993); City of New York *Lower Manhattan Future Access Analysis 1980-1990* (1973); City Planning Commission *Lower Manhattan Waterfront* (1975); Mayor's Office of Lower Manhattan Development *Water Street Access and Development* (1976). The three DLMA reports presciently identified transportation connections in general, and commuter rail and airport access in particular, as a key catalyst for growth in a post-industrial Lower Manhattan. Building upon these landmark reports, the City of New York and its agencies developed its *Lower Manhattan Plan* in 1966 - and again in 1993 - along with other studies in subsequent years that further enumerated key transportation projects to spur development. These projects included South Ferry station renovation, the Second Avenue subway, West Street improvements, and expanded ferry service.
- 5 See Hamilton Rabinovitz and Alschuler (HR&A), *Lower Manhattan Transportation Access Economics Benefit Study*, prepared for the Empire State Development Corporation, the Economic Development Corporation and the Downtown Alliance (1996); as well as other sources that provide support with evidence from other metropolitan areas, including APTA *Rail Transit and Property Values* (Washington, DC, 2002); Weinstein and Clower *The Initial Impacts of the DART LRT System* (Dallas, 1999); Sedway Group *Regional Impact Study Commissioned by Bay Area Rapid Transit District* (San Francisco, 1999).
- 6 Even this point was presciently articulated as early as the 1950s. See Rockefeller's discussion of "a proposal for airport connections" in Downtown Lower Manhattan Association *Lower Manhattan Recommended Land Use, Redevelopment Areas, and Traffic Improvements, First Report* (1958).
- 7 Alliance for Downtown New York, Association for a Better New York, New York City Partnership, and Real Estate Board of New York, *Key Principles in Rebuilding Lower Manhattan* (2002).
- 8 Alliance for Downtown New York, *Transportation Priorities for Lower Manhattan* (2003); Wall Street Rising, *Retail Needs Survey* (2002)
- 9 Hamilton, Rabinovitz & Alschuler, *Lower Manhattan Transportation Access Economic Benefits Study*, 7.

Chapter 1

- 1 Data provided by MTA.
- 2 TransCAD regional transportation data base of Census Tracts provided by MTA.
- 3 NYPIRG Straphangers Campaign *Annual Survey of Major Subway Stations* (2001). Interviews were conducted with 4,206 riders at 15 stations between May to August 2001.
- 4 Mayor's Office of Lower Manhattan Development, *Water Street Access and Development* (New York: City of New York, 1976), xii.

Chapter 2

- 1 Data provided by the City of New York.
- 2 DRI/WEFA, *The National Economic Impact of Aviation*, July 2002, p. 5.
- 3 Figures compiled by Parsons Brinckerhoff Quade & Douglas, Inc.
- 4 Travel times calculated by Parsons Brinckerhoff Quade & Douglas, Inc.
- 5 Metropolitan Transportation Authority, *Lower Manhattan Access Study*, p. 2.54.
- 6 Figures compiled by Parsons Brinckerhoff Quade & Douglas, Inc.
- 7 Cost and time estimates compiled by Parsons Brinckerhoff Quade & Douglas, Inc.
- 8 The Delta Water Shuttle operated hourly from Manhattan to LaGuardia, but service was suspended in early 2001.
- 9 Travel times calculated by Parsons Brinckerhoff Quade & Douglas, Inc.
- 10 Travel times calculated by Parsons Brinckerhoff Quade & Douglas, Inc.
- 11 For each model in the JFK/Long Island access section, a single methodology for estimating costs has been consistently applied in order to allow for comparisons between models. Cost of financing is not included in these estimates. By including financing cost and utilizing different methods to calculate contingency, phasing, and other factors, a higher cost estimate for each model may be obtained. In addition, to accurately account for inflation in estimating final cost, price estimates have been adjusted based upon the length of construction. The Super Shuttle model has been adjusted based on a 5-year construction term.
- 12 Travel times calculated by Parsons Brinckerhoff Quade & Douglas, Inc.
- 13 Travel times calculated by Parsons Brinckerhoff Quade & Douglas, Inc.
- 14 There is a possible second branch of the AirTrain extension to and from JFK that merits further exploration: extending the existing AirTrain at Howard Beach. This branch could extend onto an unused portion of the viaduct currently traversed by the A train in southeast Queens and eventually connect to the Atlantic Branch via a rebuilt tunnel entrance that exists but has been sealed. This second JFK Direct scenario would provide airport customers with another fast option to JFK Airport – 22 minutes from Lower Manhattan to the JFK Terminals – and would make Jamaica Express operations more flexible.
- 15 The Mayor's *Vision* prices this option at \$3.7 billion. With escalation to account for inflation, based on phased implementation over a 10-year construction term, this figure increases to \$4.7 billion. For important information about cost calculations for the JFK/Long Island access options, please see footnote 11.
- 16 One carrier's fee is \$775 to \$1,250 per flight.

CREDITS

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