PATH’s Recovery From September 11th

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ABSTRACT

The PATH Commuter Rail System is a key component of the transportation infrastructure of the New York Metropolitan Area. It carries thousands of commuters between New Jersey and New York. One of its two terminus points in New York City (Lower Manhattan) was eliminated by the events of September 11th, 2001. In an effort to re-establish this service, the Port Authority of New York and New Jersey has embarked on an extremely “fast track” program to construct a new PATH terminal at the site of the former World Trade Center, restore the tunnels connecting this terminal with New Jersey, and improve the first station in New Jersey, Exchange Place, to operate as an interim terminal and handle the size trains needed to provide the level of service required by this key rail artery.

The plan is to restore service to Exchange Place by June 2003 and to Lower Manhattan by the following December. To accomplish this a construction contract was awarded well before design could be completed. A series of work orders, including several early procurement items, have been issued to progress construction while the design is still being developed.

The initial service at the World Trade Center Site will be to a temporary “bare bones” facility. Alternatives are being evaluated concerning the nature and location of a permanent terminal as well as a concourse connecting the neighboring World Financial Center with the terminal and points East, including a possible Metropolitan Transportation Authority (MTA) transit center.
In addition, the Port Authority is cooperating with the Lower Manhattan Development Corporation (LMDC), the New York City Department of Design and Construction (DDC), other agencies and the public concerning overall transportation for Lower Manhattan, and a most importantly, a fitting memorial to those who lost their lives on September 11th.
INTRODUCTION--EVENTS OF 9/11 AND THE IMPACT ON PATH

The World Trade Center
When the World Trade Center was destroyed, 28.7 million square feet of office space was temporarily damaged or destroyed. This was 30% of the total Lower Manhattan market. The loss was equivalent to all the commercial office space in either Atlanta or Miami. Thirty-one tenants occupying 100,000 sq. ft. or more were displaced by the disaster. The impact on the neighboring communities was incalculable.

The area below the towers contained a shopping center, eateries and a major transit hub. From this location passengers were provided access to several New York City Subways as well as to the key rail system connecting Lower Manhattan with New Jersey—the Port Authority Trans-Hudson System or PATH.

The PATH Terminal, as well as the Mezzanine and Concourse levels were destroyed. The World Trade Center Terminal that handled 67,000 passengers per day ceased operation. Thankfully, the portions of the PATH system approaching and within the World Trade Center were evacuated without any loss of life. This was possible because Port Authority Police quickly notified the PATH trainmaster as soon as events began to unfold. Instructions were given to
immediately evacuate passengers arriving on the platforms. Next, trains arriving at the platforms were told not to stop, and continue through the terminal and return to New Jersey. All other trains bound for the Trade Center were held in New Jersey or routed to the uptown branch. Finally, one train which offloaded passengers at Exchange Place, was sent to the Trade Center to evacuate remaining PATH employees and one homeless person who did not want to leave the terminal.
All that remained is part of the original platform and an escalator bank that connected the mezzanine and the concourse levels. The platform will be demolished to make way for a new structure. The escalator bank structure is still usable and will become part of a new temporary facility. The track alignment will also be reused, although new tracks, power, signals and communications will have to be installed.

What we have today is an open space that will take many years to fill. May 30th marked the formal end to the recovery effort. June 1st marked the official commencement of the restoration work to restore PATH commuter service to the site. Months earlier, work in the downtown tunnels under the Hudson River, and at the Exchange Place Station in Jersey City had already begun. In addition, early procurement of equipment for the WTC site Temporary Terminal was well underway.
Overview of PATH Service

The PATH system was derived from the now-defunct Hudson and Manhattan Railroad (H&M), which predated the Interborough Rapid Transit Subway of New York City. Work on the tunnels under the Hudson River began in 1874, stalled after an accident and resumed in 1890. The tunnels were finally completed in 1895. They were constructed of cast iron rings with bolt fasteners. On July 19, 1909, H&M began operations between the new Hudson Terminal (later replaced by the World Trade Center) in Manhattan and the Pennsylvania RR Station (later renamed the Exchange Place Station) in Jersey City. H&M fell into bankruptcy in the 1950s and was acquired by the Port Authority in 1962 as part of the PA’s authorization to plan, design and construct the World Trade Center. PATH has 7.4 miles of its route in tunnels, while 6.4 miles are at grade. The PATH System, prior to September 11th, had four terminus points: Newark and Hoboken in New Jersey; 33rd Street and the World Trade Center in New York. There were a total of thirteen stations.

After September 11, 2001 the World Trade Center Terminal was destroyed, the tunnels between the WTC and Exchange Place were flooded, and Exchange Place Station had to be closed.
Exchange Place was designed as a through station and had no provision for allowing trains to enter from one tunnel and return using another—it was not a “terminal”.

The closing of Exchange Place eliminated service to the Jersey City riverfront area (referred to as the “Gold Coast” of New Jersey) including connection to ferry service to New York City.

Post September 11, 2001 PATH Route Network

With the loss of downtown service, many commuters who worked in Lower Manhattan had to use PATH’s midtown service and connect with New York City transit lines that serviced downtown. Others changed to ferry service. As a result, overall PATH ridership dropped by about 25% from 260,000 to 195,000 passengers per day. Consequently, station utilization has dramatically changed. For example, activity at Christopher Street, the first station in New York City coming from New Jersey on the uptown line, has increased by 175% during peak hours. Ridership to 9th Street, the next stop, has increased by 717% to over 28,000 passengers per day—up from 4,000! Station crowding is commonplace during rush hour.
THE DOWNTOWN RESTORATION PROGRAM

On December 13th 2001, the Port Authority of New York and New Jersey authorized the Downtown Restoration Program to restore service to Exchange Place and the World Trade Center Site, and alleviate overcrowding on existing PATH routes. The Program consists of three projects: the construction of a new (temporary) terminal at the World Trade Center site; the restoration of the tunnels connecting the site and New Jersey; and improvements at Exchange Place to enable this station to temporarily operate as a terminal.

The plan is to restore service to Exchange Place by June 2003, to allow better access to the area and provide a link with ferry service to New York City. This will alleviate the negative economic impact that the loss of service had on the local business community and property owners. In parallel with this work, the tunnels under the Hudson River would be restored and
the temporary terminal at the World Trade Center site would be constructed. These two latter projects are scheduled for completion by the end of 2003. The overall cost is authorized at $544 million. A net cost, fixed fee construction contract, estimated at $300 million, was awarded to a tri-venture of Yonkers Contracting Co., Inc./Tully Construction Co./A.J. Pegno Construction Corporation on February 1st, 2002. With this award, we created a partnership among our contractors, PATH, consultants and Port Authority staff. We were able to immediately release work orders for long lead procurement packages and for the initial removal work. The following is a breakdown of the authorization:

<table>
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<th>Project</th>
<th>Board Authorization</th>
<th>Estimated Construction Cost</th>
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<tr>
<td>Exchange Place Capacity Improvements</td>
<td>$160 Million</td>
<td>$ 70 Million</td>
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<tr>
<td>Rehabilitation of Tunnels E &amp; F</td>
<td>$160 Million</td>
<td>$ 90 Million</td>
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<tr>
<td>Temporary PATH Station (WTC)</td>
<td>$224 Million</td>
<td>$140 Million</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$544 Million</strong></td>
<td><strong>$300 Million</strong></td>
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Here are some details about the Program.

**Exchange Place**

The Exchange Place Station is located in Jersey City at the Hudson River, approximately 80 feet below ground in rock. The two tube tunnels coming from lower Manhattan begin to spread apart from one another, so that the station is almost 150 feet wide. There are two tracks whose platforms are connected to one another through relatively long pedestrian tunnels. After the terrorist attacks on New York, Exchange Place itself was undamaged but was operationally infeasible to utilize because of the lack of a track layout configuration that enabled the trains to change direction. Three elevators, extremely large and fast for the time of construction (early
1900’s), connected the station with the street and the Pennsylvania Railroad Station.

Reconstruction after the Port Authority takeover resulted in a new street entrance with escalators as well as an 88 foot long elevator.

After the attacks, the tunnels under the Hudson River were flooded from broken water and sewer lines, inoperable sump pumps to discharge normal tunnel seepage, and the vast amounts of water used to put out the fires and mitigate the smoke. Concrete plugs the diameter of the tunnel and approximately 17 feet long were installed on the NJ side of the tunnels as an emergency protective measure to prevent flooding of entire system (flood waters had reached the power rail at Exchange Place). In February 2002 the plugs were removed and the improvements began.

The work involves shifting the existing turnouts, used for the junction of the Hoboken and Newark routes, to the west. These turnouts will be replaced with larger radius switches and augmented with new crossover track, to allow trains to operate at a faster speed and maintain required headways. In addition the new crossovers would be provided to allow the trains to “turn back”, entering and leaving the terminal on either track. This work requires that rock be removed in designated areas and new switches be installed. In addition, the eastbound platform would be extended to accommodate ten cars—up from seven. The westbound platform would also handle ten car trains—up from eight. The longer trains are being provided to accommodate the high
peak hour volumes anticipated for the future. The work is being done now to save cost and time, and avoid operational disruption later.

The scope and general sequence of the permanent improvements include:

- Demolition and removal of track, duckbanks, cables, conduits, and equipment.
- Temporary relocation of necessary PATH operating utilities.
- Mining and tunneling operations for creating relocated turnouts and new crossovers.
- Station improvements (platforms, etc.) for future expansion to 10-car train.
- Construction of new platform-level emergency access to existing surface egress routes.
- Installation of track, turnouts and signals.
- Permanent relocation of all PATH operating utilities.
- Station restoration.
Early action items required for this project were identified and quantified early in the design to ensure project acceleration.

Additionally, the location for storage of advanced delivery materials was provided adjacent to the PATH yard in Jersey City.

Early Procurement items for this project included:

- Special trackwork
- Running Rail and Power Third Rail
- Switch machines
- Load Break Switch
- Traction power cables and hardware
- Microprocessor-based signal relay equipment and cables
- Communication (fiber optic) cables
- Pumps for tunnel drainage
The existing ballasted track system will be removed in its entirety, down to the concrete tunnel invert. A new track system will be furnished and installed that will consist of new welded 100 lb. RE rail, ballast and ties. The existing 75 lb. contact rail, support insulators & brackets and coverboard assembly will be removed in its entirety. A new contact rail assembly will be furnished and installed, that will consist of 150 lb NMC rail, new support brackets/insulators and new wood coverboard assembly.

Turnouts to include:

- One No. 12 turnout
- One No. 4
- Four No. 4½
- One No. 5
- One No. 6

**Tunnels E and F**

When the World Trade Center was destroyed, the tunnels connecting Exchange Place and New York became flooded and remained in that condition for approximately 40 days. The seismic activity that resulted in the collapse, as well as the flooding, resulted in displaced and severely contaminated track ballast, corroded electrical components including switch and signal equipment as well as concrete damage. Systems that had to be restored included all the track,
track support structure, duct banks, cables (including high voltage, traction power, communications and signal), lighting, drainage, fire protection, in-tunnel communications, and railroad signals. Structurally, the cast iron rings were sound having sustained little damage.

As at Exchange Place, the existing ballasted track system was removed in its entirety, down to the concrete tunnel invert. There is approximately 11,000 feet of track, 5600 feet in each tunnel that had to be removed and replaced. A new track system will be furnished and installed that will consist of new welded 115 lb. RE rail, insulated direct fixation fasteners, epoxy coated concrete inserts, and 5000 psi reinforced concrete trackbed. The existing 75 lb. contact umbrella rail, support insulators, brackets and coverboard assembly was removed in its entirety. A new contact rail assembly will be furnished and installed, that will consist of new 84C composite third rail, new support brackets, insulators and new coverboard assembly.

Early Procurement items for this project included:

- Running rail, 84c composite third rail and direct fixation fasteners.
- Traction power cables and hardware.
- Microprocessor based signal relay equipment and cables.
- Pumps for tunnel drainage.
- 27 KV and 15KV power cables.
In addition, the damaged tunnel concrete liner, cracked tunnel cast iron liner rings, and any severely corroded and leaking ringbolts will be repaired. The existing duck banks in both tubes from Exchange Place to the WTC projections were completely demolished and removed.

Since most of the existing cables were completely bounded up by efflorescence within the ducts, the demolition and removal of duct banks and cable occurred simultaneously. Cable splices containing asbestos in each manhole were removed, and the ductbank, with required ducts, will be restored.

Distribution power and lighting will be replaced through tunnels E & F from existing terminations at the Exchange Place substation to terminations at the World Trade Center Projections. The existing tunnel lighting system will be removed and replaced with a new tunnel lighting system. The work covered includes the demolition and installation of 27 kV, 15 kV and low voltage power, distribution and lighting systems. The work required for the restoration of the 27 kV distribution system includes:

- Removal of 3-27 kV circuits, SF-2, SF-4 and SF-6, from the existing cable terminations at Exchange Place to the projections at WTC tunnels E & F. The existing 27 kV cables are 3C-1/0 with circuit SF-2 run in the ductbank through tunnel F and circuits SF-4 and
SF-6 run through the ductbank in tunnel E. Total length of cable demolition is approximately 18,000 cable feet.

- Installation of 3 new 27 kV circuits from Exchange Place to the WTC projections. The new cable will be 3C-2/0 with circuit SF-2 run in the ductbank through tunnel F and circuits SF-4 and SF-6 run through the ductbank in tunnel E. Approximately 18,000 cable feet and 36 high voltage cable splices will be required.

The work required for the installation of a new 15 kV distribution system includes the installation of 2 new 15 kV circuits for vent fan operation. The new cable will be 3C-4/0 with one circuit run in the ductbank through tunnel F and one circuit run through the ductbank in tunnel E. Approximately 12,000 cable feet and 24 high voltage cable splices will be required.

The work required for the restoration of low voltage circuits for lighting and convenience receptacles includes:

- Demolition of approximately 450 existing 6-foot high output fluorescent lighting fixtures and lamps.
- Demolition of approximately 24 existing branch circuit distribution panels with corresponding circuit breakers.
- Demolition of approximately 24,000 cable feet of 3C – number 4 distribution cable.
- Installation of 450 8-foot, high output fluorescent or induction lighting fixtures and lamps.
- Installation of approximately 24 new branch circuit distribution panels with corresponding circuit breakers.
- Installation of 30 convenience receptacles and corresponding branch circuit wiring.
- Installation of approximately 24,000 cable feet of 3C – number 4 distribution cable.

The work required for the restoration of DC traction power includes:

- Demolition of 13 DC track circuit breakers and hand operated disconnect switches with respective control wiring and corresponding 500 MCM cable taps to the third rail power sections.
- Demolition of approximately 30,000 feet of 2 kV insulated 2000 MCM DC positive and negative distribution cables.
- Installation of 13 DC track circuit breakers and hand operated disconnect switches with respective control wiring.
- Installation of approximately 54,000 feet of 2 kV insulated 2000 MCM DC positive and negative distribution cables.
- Installation of approximately 120 – 2 kV splices.
- Installation of approximately 5 – negative return wayside bus arrangements tapped from the negative cables to the running rails.

The existing radiax cable will be maintained during construction until the new radiax is installed.

New cables will be installed including (in each tube):

- 25-pair copper
- 100 pair copper
- 144-strand single mode fiber radiax
This project will also include the replacement of the radiating coaxial cable in the two tunnels for the PATH VHF radio system, and to add capability for the inclusion of the PATH Police 800 MHz trunked system, the 800MHz ICALL and ITAC mutual-aid channels, and the Channel A 450 MHz channel.
Until its destruction, the PATH World Trade Center Terminal replaced what was called Hudson Terminal.

In 1909 the H&M erected over the station Hudson Terminal, the world’s then largest office complex that consisted of two skyscrapers. Underneath the two towers was the station itself, Hudson Terminal, with entrances from Cortlandt, Dey and Fulton Streets. Two of the entrances were via ramps and shallower than usual stairs to speed the flow of passengers between the street and the concourse. Like the WTC complex, the space under the two buildings was taken up by the passenger concourse. The concourse offered ticket offices for the Class I railroads as well as a multitude of stores and services, from barbers, to florists, to restaurants, to newsstand.

The platforms at Hudson Terminal were designed to separate passengers boarding and alighting from the same train. This crowd control was particularly necessary, with over 30 million passengers using the station in the 12 months ending on March 31, 1914; these passengers had been brought in and out of the station on the 858 trains operating workdays (then, Monday through Saturday). The Port Authority demolished Hudson Terminal and erected on its site the World Trade Center, whose kernel consisted of two 110 story office towers: ironically the highest buildings in the world at the time of their erection. Throughout the construction of the World Trade Center, PATH service remained in full operation. Transfer of operation from the Hudson Terminal track layout to the WTC Terminal track occurred over a single weekend.
Below the WTC, the original Hudson Terminal station with its five-tracked loop was replaced with a new five-tracked loop with less severe curves. At the time of its opening, WTC was said to be the first fully air-conditioned subway station in the world. The World Trade Center carried on Hudson Terminal’s plan of a concourse with stores and services above the train platforms but on a much grander scale. Here PATH tracks were approximately 80 feet below the street and on the lowest level of a multilevel subway interchange, with the IND, BMT and IRT subway lines lying above them. The next level above the PATH tracks was the entry level with fare card machines and station personnel. From here a bank of nine 65-foot long escalators rose up to the shopping concourse, as large as many suburban malls, that lay under the World Trade Center complex. The station was the single busiest one of the PATH system with up to 70,000 passengers a day.

This project will develop a new temporary terminal at the World Trade Center site.
The terminal will be built at the same location as the destroyed facility to expedite alignment and configuration design and mitigate the need for property acquisition. No additional property will be required in order to re-establish PATH service. The temporary terminal will be comprised of a track and platform configuration similar to the former World Trade Center terminal. The terminal will have a mezzanine above the platforms, with stairs and elevators connecting the two levels.

From the mezzanine, passengers will follow the previous circulation route to escalators, elevators, and stairs, which provide access up to street level on the west side of Church Street. The fare control area will be located at the mezzanine level. The temporary PATH terminal will feature screened enclosures to provide protection from both inclement weather and the anticipated construction at the surrounding site. The terminal will be fully ADA
compliant with elevator access between levels.

The structures will consist of four levels—platform, mezzanine, IRT 1/9 lines underpass and grade levels. PATH Station Platforms within bathtub shall be constructed at the same location as the existing station platform utilizing existing column grid and foundations wherever possible in order to minimize additional excavation and foundation work. The length of the platforms available to customers will be modified to accommodate 8 cars. Certain areas were designed as long term improvements—not precluding the future use of the part of the temporary terminal as part of the permanent facility.

The existing IRT underpass and a public escalator/stair tower will connect the mezzanine with the entry structure. PATH and Port Authority Police operational spaces will be provided as required. All public spaces and track zones will be open, but weather-protected. Only specific public spaces will have full HVAC requirements. A new permanent electrical substation for traction power and the terminal is also included. No public toilets or concessions are included in the program.

Station Structure:

- All roofs will be designed as protective construction shields.
- Platforms shall consist of composite metal deck with thick concrete slab at top, supported by a structural steel framing structure. The total slab thickness will vary to provide 1/8”/ft slope towards the edges for drainage. Platform concrete finish will be a wood float finish.
• The mezzanine floor shall also be constructed of composite metal deck with concrete slab at top supported by beams. Total concrete slab thickness will vary to provide a slope and floor drains shall be provided accordingly. Mezzanine slab finish shall also be a wood float finish.

• The structural framing shall be non-composite and designed for additional loading to allow use of precast slab with 1” to 3” topping in lieu of metal deck with concrete construction.

• The columns will be designed to accommodate future construction of floor levels as existed pre-September 11th up to and including the plaza level.

• The weight of 2” metal deck with concrete slab thickness will vary from 42 psf to 66 psf and the weight of precast slab with 1” to 3” topping will vary from 69 psf to 94 psf.

• The protective shield shall be constructed of metal roof deck supported by steel beams, girders and columns. The beams and girders shall be sloped for drainage. The deck above passenger/occupied areas shall be waterproofed using a roofing membrane.

Church Street Access Structures:

• The existing reinforced concrete IRT underpass structure will be re-used with modifications to the escalator pits.

• The Church Street Access structure pedestrian/handicap access shall be addressed by the provision of an elevator from the underpass to street level.

• The existing undamaged structural slab at the Church Street level will be used and restored as needed. The structural system for new access structure will be similar to
station structure described above and existing foundations and columns shall also be
utilized wherever possible.

Substation:

- The substation shall be an elevated, separate structure, located south of the Tower 2
  footprint. The substation equipment will be located above track level, approximately at
  the Mezzanine level of the station.
- The substation columns and footings will be designed to support future construction of
  floor levels up to street level. This over-build scenario is to help prevent the necessity of
  introducing future columns through the substation space for street restoration. Columns
  will protrude above roof level to allow for future splicing/extension of these elements.
  Similarly, only if future work on the lower level requires that columns are removed, the
  floor girders will have cantilever stubs to allow for future extension, enabling the
  structure to be supported by the bathtub foundation wall.

Early Procurement

Early Action items required to ensure project acceleration included:

- Elevators.
- Escalators.
- Microprocessor based signal relay equipment and cables.
- Substation Equipment.
- 27 KV and 15KV power cables.
FUTURE WTC SITE DEVELOPMENT

In June, the Port Authority, in conjunction with the Lower Manhattan Development Corporation (LMDC), selected a team led by Beyer Blinder Belle Architects & Planners LLP, in association with Parsons Brinckerhoff, to provide consulting services regarding an integrated urban design and transportation planning study for the WTC site, adjacent areas, and related transportation. The planning effort will end in December with a recommendation for future development. The process of refining this recommendation involves several meetings with all stakeholders and significant public input each step of the way.

The recommendation will include the location of the Permanent PATH Terminal, the configuration of the concourse connecting the Terminal with Battery Park City, the World Financial Center, various subway lines and a possible MTA transit center in the Broadway/Nassau/Fulton Street area. Other key issues include:

- Memorial/Open Space – how large should the parcel of land be for the memorial?
• Subgrade – what uses are appropriate; bus terminal, truck dock for the site, support spaces for the memorial, retail.

• Above grade Development – what uses are appropriate; offices, retail, cultural

• Intermodal connections and traffic flow projections would be analyzed – subways, ferries, PATH, buses, etc.

• West Street depression alternatives – vehicular access to the WTC subgrade for transportation and servicing (truck dock) must be maintained.

The Permanent PATH Terminal will be located at one of two locations—under Church Street near where #4 & #5 World Trade Center once stood and at the location of the Temporary Terminal. Either location will conform to the following criteria:

• 10-Car Platform Configuration

• Integrate Fare Control with “SmartCard”

• Permanent Intermodal Connection with NYC Subways

• Transportation concourse to Link with Proposed MTA Transit Center

• Create East-West Pedestrian Link at Underground Level

The connection with the various subway lines is a key feature of the Permanent Terminal and its Concourse. All of the lines run North and South with no lateral connection.

The land occupied by the World
Financial Center and Battery Park City was created from earth removed from the original World Trade Center site. No transit lines pass near this location. The concourse will provide an underground passage from the West across the WTC site to link with all downtown subways—1/9, N/R, E, A/C, J/M/Z, 2/3 and the 4/5. This concourse is envisioned to be about 50’ in width, have moving sidewalks and retail along its length--similar to concourses at major airports, with natural light introduced wherever possible.

The Permanent Terminal and the concourse will take 4 to 5 years to complete. Construction could start as early as the 3rd quarter of 2003, with project completion sometime in 2007.

The Church Street Alternative
One possible location for the Permanent Terminal is adjacent to Church Street. This location would provide a “green field” construction environment as it is separated from the temporary station and all other early construction. However building a terminal here might preclude other types of development that might be better suited to this location or require coordination with future site development.
The World Trade Center Site Alternative

The other location for the Permanent Terminal is where the Temporary Terminal is being built. This location has cost and schedule advantages but would require more complex staging to minimize operational impacts on PATH service, and more coordination with the design of the Temporary Terminal.
CONCLUSION

*The World Trade Center Site*

Construction at the WTC site began in June 2002. Old track has been removed, stabilization of walls was completed and foundations for the temporary terminal are being constructed. PATH service to Lower Manhattan utilizing the temporary terminal is scheduled to begin by the end of 2003.
There are many other plans being considered for Lower Manhattan. Most are transportation related, as this is a critical impact of the attacks and one that must be resolved. When the Trade Center was destroyed, so was the principal transportation hub in Lower Manhattan. In place of train service, ferries now carry significant numbers of commuters—so the ferry infrastructure needs improvement. Bus service to the area has been increased further crowding what are already overcrowded, narrow streets—a bus terminal and bus staging areas are being considered. Truck and automobile traffic from the Brooklyn Battery and Holland Tunnels clogs West Street—depressing portions of West Street for through traffic is being investigated. Finally, train access to Lower Manhattan is limited to PATH and subways, and all systems are crowded, especially during rush hour. Long Island Railroad, Metro North, and New Jersey Transit expansions are being considered.

PATH is the first step. In little over a year we plan to have service restored to Lower Manhattan. This is a major effort and one being performed by a very dedicated team. We are all proud to be part of this important Program.
## REFERENCES

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