

WORLD TRADE CENTER SITE
Bounded by Vesey, Church, Liberty Streets, & Route 9A
New York
New York County
New York

HABS NY-6369
NY-6369

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NY-6369

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN BUILDINGS SURVEY
National Park Service
U.S. Department of the Interior
1849 C Street NW
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(page 1)

Location: Bounded by Vesey Street on the north, Church Street on the east, Liberty Street on the south, and Route 9A (West Street) on the west, in lower Manhattan, New York City, New York.

Present Owner: Port Authority of New York and New Jersey (PANYNJ)

Present Use: PANYNJ's temporary World Trade Center PATH station is situated on a portion of the site.

Significance: The World Trade Center (WTC) Site is significant as the location of the September 11, 2001 attacks on the two 110-story towers of the WTC, attacks which constitute "historic events that have made a significant contribution to the broad patterns of our history." In connection with the events of September 11, the WTC site is exceptionally significant in the history of the United States as the location of events that immediately and profoundly influenced the lives of millions of American citizens and for its role in symbolizing and commemorating those events for survivors, families of victims, New Yorkers, Americans, and visitors from all over the world. The flying of two large commercial jetliners into the WTC's Twin Towers were the acts that precipitated numerous events of great magnitude, among them the deaths of an unprecedented number of individuals in a single location as a result of foreign attacks on American soil, and also actions, still unfolding, taken by the United States both at home and abroad in response to the attacks themselves and to the issues of global terrorism of which they were a part. The ultimate historical importance of the various events and actions resulting from the attacks has yet to be fully determined since they are still underway, and additional actions are likely to be initiated in the foreseeable future. However, there exists more than sufficient information at this time to document the exceptional importance of the attacks on the WTC to the history of the United States in the 21st century.

The attacks of the Twin Towers on September 11, 2001, caused the death of what is currently estimated to have been nearly 2,800 people, and when taken together with the attack on the Pentagon and the crash of hijacked Flight 93 in Shanksville, Pennsylvania, the death toll rises to more than 3,000 people. An immediate result of the attacks was a profound transformation in both local and national security. Shortly

after the attacks, the Federal Aviation Administration grounded all flights then within the United States airspace and turned back all flights then coming into the country - something that it had never done before and that continued for several days after September 11. The United States Office of Homeland Security (which later became the Department of Homeland Security) was established on October 8, 2001. In early October 2001, the United States and other members of the international community attacked and then invaded Afghanistan, where the governing Taliban regime harbored terrorist leaders and training camps. The comprehensive Federal response to the events of September 11, 2001, also included Congressional enactment of major legislation such as the Aviation and Transportation Security Act, the National Construction Safety Team Act, the Air Transportation Safety and System Stabilization Act, the United States Patriot Act, and the Terrorism Risk Insurance Act of 2002, as well as far-reaching changes in foreign policy.

The significance of the WTC Site is enhanced by the fact that the collapses of the Twin Towers were captured on film, witnessed on television by millions of people as they occurred, and have been replayed countless times all over the world. As such, the images have been indelibly burned into our collective memory, and the WTC Site is a compelling reminder of the tragic event of that terrible day.

In addition to its direct association with the events of September 11, 2001 the WTC Site has already acquired significance as the primary place for commemorating the events that transpired there. Almost from the day of the attacks, crowds of people from all over the world, representing diverse cultures, nationalities, and classes, have journeyed to the WTC Site to pay their respects to the victims and bear witness to the significance of the events. It has been the location of countless memorials, ceremonial events, and private pilgrimages by the families of the victims, residents of New York, and citizens of the nation, and the world. On each of the two subsequent anniversaries of the attacks, the name of each of the victims was read aloud at the WTC Site, thus publicly proclaiming the collective grief of a nation.

Project Information:

The WTC Site was recorded for the Historic American Buildings Survey under the terms of a Memorandum of Agreement for the Permanent World Trade Center PATH Terminal executed among the Federal Transit Administration, New York State Historic Preservation Office, Advisory Council on Historic Preservation, and Port Authority of New York and New Jersey in April 2005. The recordation was carried on by Port Authority of New York and New Jersey, primarily utilizing, as stipulated in the agreement, information previously prepared for the *Coordinated Determination of National Register*

Eligibility - World Trade Center Site, jointly issued by LMDC, FTA, and FHWA in March 2004, and for the project's Environmental Impact Statement. The WTC Site was photographed for HABS between June 2004 and March 2005 by John Bartelstone of PANYNJ and Bruce A Harms of The Louis Berger Group, Inc., East Orange, New Jersey.

PART I. PHYSICAL CONTEXT

- A. The WTC Site is located on the west side of Lower Manhattan in the Tribeca neighborhood. The approximately 16-acre site is bounded by Vesey Street on the north, Liberty Street on the south, Route 9A (West Street) on the west and Church Street on the east. The IRT No. 1/9 subway divides the WTC Site into a western and an eastern section. Reinforced concrete walls approximately 3 feet thick and 70 feet high set the 11-acre western portion (commonly known as "the bathtub") from the 5-acre eastern portion, which is bordered by Church Street.

PART II. HISTORICAL CONTEXT¹

A. European Contact, 17th Century

Prior to European contact in the early 17th century, Native Americans speaking a Munsee dialect of the Eastern Algonquin language inhabited Manhattan Island. Native Americans referred to the island of Manhattan as *minna-atn*, which meant "Island of Hills." The first contact between Native Americans and Europeans occurred when Dutch trading expeditions began visiting the Hudson River several years before the founding of New Amsterdam at the southern tip of Manhattan in 1626. As early as 1609, Robert Juet, who accompanied Henry Hudson on his voyage, recorded contact with the native population and provided a description of the people and their trading practices in his journal. Dutch colonization in Manhattan began in earnest in 1625 when an expedition of farmers from the Dutch West India Company arrived at the southern tip of Manhattan with the purpose of building a fort and laying out nine Company farms.

B. Dutch Settlement, 18th Century

Wall Street was once the northern line of land fortification for the Dutch settlement. Pearl Street, to the east of the WTC Site, marked the eastern edge of the island and the Hudson River waterfront followed the approximately location of Greenwich Street today. Settlers constructed piers from the emergent shipping trade along high bluffs of the East River. By the end of the 18th century, the island's shoreline had been extended with new land created on fill. The city's waterfront, particularly around the southern portion of the island, formed an important trade and business area. As the Dutch converted farmland into a commercial district, they arranged blocks into an irregular pattern that gave the area its characteristically narrow, winding system of streets. Residential areas were located inland and to the north, removed from commercial and industrial zones. The WTC Site is located in what is presently known as Tribeca, a neighborhood in Lower Manhattan generally bounded by Canal Street to the north, Broadway to the east, Barclay Street to the south, and the Hudson River to the west.² Tribeca became a primarily residential neighborhood in the early 1800s, notable including an enclave of stately brick residences surrounding St. John's Park on Hudson Street.³

¹ Adapted from AKRF, Inc., *Coordinated Determination of National Register Eligibility - World Trade Center Site, New York City, New York*, March 31, 2004.

² In the mid-1970s, real estate developers deemed the area Tribeca as shorthand for "triangle below Canal."

³ These houses were later razed for the construction of a freight depot, and the site now houses St. John's Rotary and the exit of the Holland Tunnel.

C. Lower Manhattan and the WTC Site, 19th and Early 20th Centuries

In 1813, Bear Market (later Washington Market), a fruit and produce market, opened at the western end of the neighborhood and became Manhattan's primary food suppliers. The market eventually occupied a full block along Washington Street between Fulton, Vesey, and West Streets, now part of the WTC Site. The neighborhood retained a primarily residential character until the 1840s, when intensified shipping and commerce in Lower Manhattan attracted business and led to the area's transformation into a major point of transfer. By the 1860s, the area was firmly transformed into a commercial district. The western half of Tribeca's contemporary boundaries became New York's wholesale food center, including Washington Market. In 1872, dairy merchants seeking to standardize the wholesale business founded the New York Mercantile Exchange (originally the Butter and Cheese Exchange of New York). Booming business necessitated the construction of a new building for the Exchange at the corner of Hudson and Harrison Streets in 1882; the Exchange occupied this location until its move first to a larger space in the WTC in 1977 and later to Battery Park City. In the 1880s, merchants built additional warehouses to house mercantile exchanges dealing in butter, cheese, and eggs. The eastern portion of Tribeca became a central transfer point for textiles and dry goods by the middle of the 19th century, with new stores, factories, and storage facilities built to service these activities.

The development of Lower Manhattan as a shipping and mercantile district continued through the late 19th century. At the same time, banks, investment companies, and brokerage firms built corporate offices in Lower Manhattan to be near the trading activity of the New York Stock Exchange and other financial and trading institutions, establishing New York City's Financial District. In 1883, the Brooklyn Bridge linked the boroughs of Brooklyn and Manhattan and opened commuting options for a growing Brooklyn population that previously could reach Manhattan only by ferry. In addition, the bridge opened up trade routes to Brooklyn, Queens, and Long Island. At the turn of the century, prototypical skyscrapers began to appear on the Lower Manhattan skyline. In 1898, 15 Park Row became the world's tallest office tower. Additional tall buildings appeared in the area during the first half of the 20th century, most notable the Equitable Building, the Woolworth Building, 70 Pine Street, and 40 Wall Street.

During the first half of the 20th century, Tribeca, including the Washington Market, remained a vital commercial district. However, in the 1950s and 1960s, the area was again transformed. Shifts in market and economic trends resulted in the moving away and/or closure of wholesale business, leaving the neighborhood's many warehouses empty. In the 1960s, the city established the Washington Street Urban Renewal Area to transform Tribeca and adjacent neighborhoods from failing wholesale and industrial uses to new residential and office uses, with schools to serve the new community. Artists were the first to take advantage of the spacious and well-lit buildings, and many factories and warehouses were converted to residential lofts and living/work space. Today Tribeca is a fashionable residential district that includes art galleries, upscale shops, and restaurants.

PART III. SITE HISTORY

A. The Hudson and Manhattan (H&M) Railroad Terminal

The H&M Railroad connected the New Jersey waterfront with Manhattan, facilitating connections between the fledgling New York City subway system and New Jersey streetcars.⁴ The H&M Railroad constructed the Hudson Terminal, the predecessor to the WTC PATH station, in 1908-1909. Architects Charles Clinton and William H. Russell designed two 19-story Renaissance Revival towers, called the Hudson Terminal Buildings, to house both transportation and commercial uses, making the Hudson Terminal the first major train station to combine office space with railways.⁵ The Terminal featured a system of ramps, rather than stairs, between levels in order to facilitate pedestrian traffic to the platforms.⁶

Two single-track cast-iron tubes called the Hudson Tubes ran under the Hudson River from New Jersey, separating as they entered Manhattan. Engineers utilized an innovative technique pioneered in London, the Greathead Shield, to construct the tubes. Invented by South African-born engineer James Henry Greathead in 1870, the shield was composed of an iron cylinder with a square door at the front to access the excavation. As sections of bedrock were cleared, hydraulic rams moved the shield forward, and workers bolted the cast-iron tunnel material into a cylindrical shape (or tube).⁷

With construction of the Holland Tunnel in 1927, the George Washington Bridge in 1931, and the Lincoln Tunnel in 1937, New Jersey commuters transitioned to bus and car travel, and H&M ridership plummeted. In 1961, the H&M filed for bankruptcy, and in 1962 PANYNJ of New York acquired the tracks for its new subsidiary, PATH. The H&M Terminal remained in use until 1971, when the PATH ATC terminal opened.⁸

B. The World Trade Center⁹

Before September 11, 2001, six buildings occupied the WTC Site. The 110-story Twin Towers (1 and 2 WTC), each of which stood over 1,350 feet tall, were the two tallest buildings in the world when completed and opened for occupancy in December 1970 and April 1972, respectively.¹⁰ The Site also included nine-story buildings at Four and Five World Trade Center (4 and 5 WTC); the eight-story United States Customs House (6 WTC); and a 22-story hotel (3 WTC), all of which surrounded the Austin J. Tobin Plaza (the Plaza). The Concourse, a retail mall and transportation hub providing pedestrian connections to the PATH trains to New Jersey and to subway lines operated by

⁴ Columbia University website, <http://www.columbia.edu/~brennan/abandoned/hudterm.html>

⁵ Robert A.M. Stern, Gregory Gilmartin and John Massengale, *New York 1900* (New York: Rizzoli International Publications, Inc., 1983: 45. Quoted in Andrea Burke, AKRF, Inc. to Jerrold Dinkels, PANYNJ, Memorandum, re: Field Inspection of the Former H&M Terminal. August 19, 2003.

⁶ Columbia University website, <http://www.columbia.edu/~brennan/abandoned/hudterm.html>

⁷ http://www.ltmuseum.co.uk/learning/online_resources/ecobus_omnibus/pg/1851c.htm#34c

⁸ Burke, p. 2

⁹ Adapted from AKRF, Inc., *Coordinated Determination of Eligibility*

¹⁰ 1 WTC measured slightly taller than the 2 WTC owing to a 351.5-foot roof mast supporting television and FM radio antennae for major public and private broadcasters in New York City located on its roof.

Metropolitan Transit Authority/New York City Transit (MTA/NYCT), stood directly below the Plaza. Six below-grade floors in the bathtub and three below-grade levels on the east side of the WTC Site provided parking for approximately 2,000 cars, housing for a freight system, and significant infrastructure and utilities that supported the operation of the WTC's buildings and transportation facilities, including PATH. The six below-grade floor slabs also provided critical lateral stability for the 70-foot-high concrete slurry walls of the bathtub. This subgrade area in the bathtub contained various central plant and services and a grid of columns (measuring 30x30 feet in most areas) to support these subgrade slabs and buildings.

1. Planning

Conceived by the Downtown-Lower Manhattan Development Association in the early 1960s, the WTC complex represented major urban renewal planning. The Downtown-Lower Manhattan Development Association originally conceived of the WTC early in the decade. Chase Manhattan Bank Chairman, David Rockefeller, founder of the association, with his brother, New York governor Nelson Rockefeller, pushed hard for the project, insisting it would benefit the city. The States of New York and New Jersey authorized the Port Authority of New York and New Jersey (PANYNJ), to acquire the H&M Railroad (now known as PATH) in 1962. That same year, PANYNJ began plans to build the WTC, selecting architect Minoru Yamasaki to design the project, architects Emery Roth & Sons to handle production work, and, at the request of Yamasaki, the firm of Skilling, Helle, Christiansen and Robertson to serve as engineers. PANYNJ envisioned a project with a total of 10 million square feet of office space. To achieve this, Yamasaki considered more than a hundred different building configurations before finally settling on the concept of twin towers flanked by three lower-rise structures.

PANYNJ cleared a 12-block area for the WTC complex, closing five city streets, demolishing existing buildings, and extensively excavating the site. The area west of the No. 1/9 IRT subway line where the bathtub that became the base for the Twin Towers required particularly deep excavation. Yamasaki's design allowed construction of the complex, including the Twin Towers, around the Hudson Tubes of the H&M Railroad without any interruption of train service. Subsequently, PANYNJ constructed a new PATH Terminal and tracks at a lower level in the bathtub, replacing the Hudson Terminal on Church Street.

2. Construction

Historically, Lower Manhattan's skyline boasted the most technologically advanced buildings of the time. As advancing skyscraper technology allowed taller buildings to be built, many pioneering buildings were erected in Lower Manhattan, several of which were intended to be - and were - the tallest buildings in the world, such as the Woolworth Building. These modern skyscrapers were often constructed alongside older, smaller buildings. By the mid-20th century, the Lower Manhattan skyline was a mix of historical and modern, low- and high-rise structures, demonstrating the evolution of building technology as well as New

York City's changing streetscapes. Although many skyscrapers were located in the immediate vicinity, the new WTC introduced structures of a much larger scale. When completed, the Twin Towers were the most prominent features of the new WTC and Lower Manhattan's skyline

Site constraints required the introduction of innovative building techniques for the foundations, elevators, and structural system of the WTC buildings. First, much of the ground on which the WTC would be located lay on landfill, which had extended the west side of Lower Manhattan into the Hudson River in the 18th century. Nearly half of the WTC was located where the Hudson River once flowed. Over a million cubic yards of fill would need to be excavated to set the WTC on bedrock, and at issue was how to keep the waters of the Hudson River out.

John M. Kyle, Jr., chief engineer for PANYNJ, proposed the use of the slurry trench method. With this method, excavating machines dug out a 3-foot-wide trench down to bedrock, roughly 70 feet below street level. These trenches were dug in 22-foot-wide sections. As fill was removed from each section, a slurry of water and bentonite (an expansive clay) was pumped in. The clay naturally plugged any holes in the sides of the dirt walls. A giant reinforcing steel cage was then lowered into the trench with attachment points for reinforcing tiebacks that were later anchored to bedrock outside the wall. Then concrete was poured into the trench, which forced out the temporary slurry as it rose from the bottom up. These 3-foot-thick wall sections enclosed a rectangular area that became known almost immediately as the bathtub, although they were meant to keep water out, not in. Once the walls were complete, earth from within the bathtub was removed, and was used as fill on which Battery Park City was later built. When infrastructure inside the bathtub was complete, the tiebacks were severed.

Another innovation associated with the Twin Towers was the introduction of express and local elevators. Ironically, while the invention of elevators made skyscrapers possible, developers prior to the WTC commonly believed elevators to be the limiting factor in how high skyscrapers could reach. Prevailing wisdom held that the higher the building, the more people occupying the building and, therefore, the greater the number of elevators necessary to transport them. Elevators require a significant amount of floor space, thus leaving less square footage available to lease. This dilemma hindered the development of skyscrapers as an architectural form and, as a result, skyscrapers seldom climbed above 80 stories. In order to maximize leasable floor space and provide enough elevators to support all the office workers, Yamasaki divided the Twin Towers into three vertical transportation zones. Local elevators for each of these zones were stacked vertically in the core of the building. Large express elevators traveled up to "skylobbies" on the 44th and 78th floors. At these floors, passengers exited the elevators on the side opposite from where they had entered and crossed the lobby to board local elevators. Each tower also had two express elevators that went all the way to the top from the lowest subgrade level. By separating express and local

elevators, the skylobby system maximized efficiency of transport and economy of space.

Yamasaki's design resulted in the innovative tube-style construction for the Twin Towers, in which structural steel columns were located along perimeter walls, the central core of elevator shafts, the stairwells, and the bathrooms.¹¹ The exterior walls thus carried the vertical loads as well as resisted all lateral forces. These vertical load-bearing columns were closely spaced and served as frames for narrow floor-to-ceiling windows. This construction method was made possible with high-strength steels that were not previously available.

3. 1993 Terrorist Attack

At 12:18 PM on February 26, 1993, a terrorist set off a truck bomb in the public parking garage underneath the WTC killing six individuals, and causing extensive damage to subgrade infrastructure and the hotel (3 WTC). Following the bombing, PANYNJ eliminated public parking and implemented a capital upgrade program for security improvements, including operational security measures. In 1995, PANYNJ erected a public "World Trade Center Memorial" on the plaza level of the WTC above the blast site and established a private memorial area in a subgrade level.

4. September 11, 2001

By 2000, the WTC was more the 95 percent occupied and was a major economic force in Lower Manhattan. Located at the heart of the nation's third-largest business district, the WTC complex employed over 42,000 workers, contained approximately 12 million square feet of commercial office space within the Twin Towers and for adjacent office buildings, and boasted hotel and conference facilities, open space, and one of the most successful enclosed specialty retail centers in the country. The Twin Towers became symbols of commercial vitality, representing the strength of the Financial District and New York City as a world leader in trade and finance, as well as important symbols of the nation's global economic power. The sheer height and scale of the towers was a bold architectural statement, and the Twin Towers were among the country's most widely recognized architectural symbols.

On September 11, 2001, terrorists hijacked three commercial jetliners (two of which departed from Logan International Airport, and one of which departed from Washington Dulles International Airport) and used them to destroy the WTC and damage the Pentagon, respectively. Terrorists hijacked an additional commercial jetliner from Newark Liberty International Airport, which subsequently crashed in Pennsylvania. At 8:46 AM, American Airlines Flight 11 carrying 92 people struck 1 WTC (North Tower) between floors 94 and 98, with impact roughly centered on

¹¹ The perimeter columns of the Twin Towers extended vertically into the concrete floor of the bathtub, although in certain areas the perimeter column loads were transferred to span over bottom-level infrastructure, including the PATH tracks. Therefore, not all of the perimeter columns in the concrete floor of the bathtub were aligned with the actual façade perimeters of the Twin Towers that were visible at grade.

the building's north face. National and international media coverage of the attacks began almost immediately. At 9:03 AM, United Airlines Flight 175 carrying 65 people struck 2 WTC (South Tower) between floors 78 and 84 toward the east side of the building's south face. As the planes flew into the towers, each banked steeply, causing damage across multiple floors. As the aircraft plowed through the buildings, fireballs erupted, and jet fuel spread across the impact floors and down interior shaftways, igniting more fires.

At 9:59 AM, 56 minutes after the first plane struck, the South Tower collapsed. The North Tower stood until 10:29 AM when it, too, collapsed. The collapse of the towers caused destruction of or extensive damage to all of the other buildings on the WTC Site, as well as several adjacent buildings. Portions of the South Tower fell on the hotel (3 WTC) at the corner of Liberty Street and Route 9A; on the building at the corner of Liberty and Church Streets (4 WTC); on the Plaza; and on the surrounding streets, including the building and plaza at 130 Liberty Street. When the North Tower collapsed, portions fell on 5 WTC, on 6 WTC, on the Plaza, and on the surrounding streets and structures west of Route 9A and north of Vesey Street. The attack rendered all mass-transit stations and facilities at the WTC complex inoperable, and service shut down on several lines until new connections could be established. In the aftermath of the attacks, human remains, building materials, and burning debris covered the entire WTC Site.

North of the WTC Site, damage to 7 WTC resulted in its collapse later that day. South of the WTC Site, the Church of Saint Nicholas was destroyed; 130 Liberty Street was severely damaged, and its two-level plaza along Liberty Street was destroyed. Other buildings surrounding the WTC Site, including the Hilton Hotel, Century 21 Department Store, and the Federal Office Building/U.S. Post Office on Church Street, Fiterman Hall on Barclay Street, 90 West Street, the Barclay-Vesey (Verizon) Building on Route 9!, and the Winter Garden, the World Financial Center, and Gateway Plaza in Battery Park City were also severely damaged. Debris covered an even larger area, extending north to Chambers Street, east to Nassau/Broad Streets, south to the Battery, and west to the Hudson River waterfront.

While an estimated 15,000 people were evacuated from the WTC Site, approximately 2,749 people in and around the WTC died, including WTC workers, commuters, area residents, visitors, everyone on the hijacked airliners, and rescue personnel. This number includes 343 New York City firefighters, 23 New York City police officers, 37 members of PANYNJ Police Department, 92 passengers on American Airlines Flight 11, and 65 passengers on United Airlines Flight 175.

5. The Recovery Effort

Shortly after the attacks on the WTC, the Federal Aviation Administration (FAA) grounded all flights in the United States. The PANYNJ Police Department and other PANYNJ employees, the New York City Police Department (NYPD), the

Fire Department of New York (FDNY), other emergency response personnel, and concerned citizens rushed to respond to these attacks. President George W. Bush declared Lower Manhattan a national disaster area, and the United States Congress approved \$21 billion in aid for repair, restoration, and recovery efforts. Congress allocated these funds via the Federal Emergency Management Agency (FEMA), the Federal Transit Administration (FTA) and the Department of Housing and Urban Development (HUD), to be separately administered by each of the agencies and local project sponsors. FEMA dispatched approximately 1,600 workers to Lower Manhattan to assist in the recovery effort. Thousands of volunteers flooded into the area to assist as well.

In the weeks following the attacks, FEMA declared much of Lower Manhattan south of Houston Street a restricted area for security and recovery purposes. Safety installations, emergency vehicles, recovery equipment, and rescue and recovery facilities appropriated large streets and parks, including Route 9A, Battery Park, and the Hudson River Park below Houston Street, for extended periods. The attacks and recovery effort temporarily displaced many of the businesses and residents in the surrounding area.

Rescue and recovery operations, begun immediately after the attacks under the direction of FEMA and the New York City Department of Design and Construction, transformed the WTC Site as it existed as of noon on September 11. Recovery workers operated around the clock, initially focusing on human rescue operations. Emergency personnel rescued only 18 people from the ruins of the WTC, fifteen of whom were firefighters and police officers trapped during rescue efforts. Two injured police officers were discovered in the underground retail concourse; the remaining 16 victims were located among the ruins of the South Tower. Fourteen of them - 12 firefighters, one police officer, and one civilian office worker - were found largely unscathed in an intact stairwell section between the second and fourth floors, sandwiched between collapses. Two PANYNJ employees were rescued from the rubble of the North Tower. Approximately 27 hours after the collapse, one of PANYNJ's workers became the last person to emerge alive from the ruins. As of January 2004, the New York City Office of the Chief Medical Examiner confirmed the deaths of 2,749 individuals. By the end of 2004, recovery efforts unearthed 20,000 human remains, some of which remained unidentified. The Office of the Chief Medical Examiner preserved unidentified human remains. No remains were identified for more than 1,200 victims.

The City of New York maintained primary responsibility for the recovery efforts and coordinated its efforts with other private and governmental entities until June 30, 2002, when recovery efforts concluded, and the Department of Design and Construction returned the WTC Site to PANYNJ control.¹² Approximately 1.8

¹² Recovery contracts let by the DDC stipulated that most of the structural steel from the WTC be removed and distributed for recycling. Major pieces of steel from the towers and 7 WTC were taken to the National Institute of

million tons of damaged structures and materials were removed through the fall, winter, and spring of 2001-2002. Damaged portions of the lower facades of the Twin Towers that remained intact in the aftermath were cut and removed to allow recovery of human remains. On the east side of the WTC Site, the standing portions of 4 WTC and 5 WTC were demolished and removed. The recovery process exposed the 70-foot deep bathtub within the western portion of the WTC Site. The bathtub had contained the bases of the Twin Towers, the hotel (3 WTC), U.S Customs House (6 WTC), the PATH Terminal and supporting facilities, as well as the parking garage where the explosives were detonated in the 1993 terrorist attack on the WTC.

To stabilize and conserve what remained of the WTC Site, as well as to protect the health and safety of the rescue workers, necessary infrastructure repairs were undertaken concurrently with the recovery efforts, including the temporary stabilization of the slurry wall with over a thousand steel cable tiebacks, and flood-proofing portions of the WTC Site - primarily along the south, east, and west portions of the WTC bathtub. Structural slabs in the northern portion of the bathtub (beneath 6 WTC) remained in place for interim stabilization of the northern slurry wall. MTA/NYCT completed reconstruction of the No. 1/9 subway tunnel in September 2002, and service resumed on that subway line to Lower Manhattan. The Cortlandt Street station within the WTC Site remained closed.

6. Rebuilding Lower Manhattan

In November 2001, the New York State Urban Development Corporation, doing business as Empire State Development Corporation (ESDC), established the Lower Manhattan Development Corporation (LMDC) to oversee the revitalization and rebuilding of Lower Manhattan. Eight of the 16-member Board of Directors of LMDC were nominated by the Governor of the State of New York, and eight were nominated by the Mayor of the City of New York. HUD grants made possible under a \$2.783 billion appropriation from the United States Congress funded LMDC's activities.

As recovery workers removed debris from areas near the WTC and verified the near-term stability of standing structures, residents were allowed to return to the surrounding area. By the beginning of 2002, FEMA pushed the restricted area back west of Broadway and south of Barclay Street, and a public viewing platform was constructed on Fulton Street, just east of Church Street. The

Standards and Technology in Gaithersburg, Maryland for analysis. In addition, selected building remnants (structural steel, building materials, and buildings components, including portions of the structural tridents at the lobby level of the North Tower) and artifacts (including crushed emergency and private vehicles, tracks from the PATH and No. 1/9 lines, and bicycle rack) were salvaged for possible memorial and museum use and stored by PANYNJ in Hangar 17 at John F. Kennedy International Airport. In October 2002, the PANYNJ Board formally acted to approve a program and funding to protect, catalog, and store these artifacts. Other artifacts were salvaged by the New York State Museum and are stored at their facility in Albany. The New York State Museum also gave salvaged artifacts to other museums and institutions in New York and New Jersey.

platform remained in place until Church Street reopened, and a wide sidewalk/viewing area on the west side of the street (on the eastern edge of the WTC Site) was created. While Liberty, Vesey, and Barclay Streets surrounding the WTC Site remain closed to vehicular traffic, pedestrian paths have been created across Vesey and Liberty Streets from Church Street to Route 9A. Route 9A reopened on March 29, 2002, after construction of an interim roadway allowing the re-opening of the Brooklyn-Battery Tunnel.

In order to restore service to a major regional transit hub at the conclusion of the recovery operations, PANYNJ began construction of a temporary WTC PATH station July 2002. The station opened for service in November 2003. The temporary station substantially replicated the configuration that existed on the morning of September 11, 2001, except that the tracks and platforms were not fully enclosed, and were built to an eight-car length instead of the original 10-car length. The station is not heated or air-conditioned, has fewer pedestrian and transit connections, and its only entrance is located on Church Street, near Vesey Street.

On March 11, 2002, LMDC, PANYNJ, and the City of New York established an Interim Memorial in Battery Park. The damaged *Sphere*, a bronze sculpture that stood in the center of the WTC Plaza, served as the centerpiece of the memorial and was made available through a donation by the AXA Art Insurance Corporation. Governor Pataki and Mayor Bloomberg dedicated the *Tribute in Light*, two banks of 44 spotlights that projected light almost 1 mile into the night sky near the location of the Twin Towers on March 11 as well. *Tribute in Light*, the result of collaboration between civic organizations and artists from a broad range of disciplines, was visible from up to 25 miles around Lower Manhattan. The lighting of the *Tribute in Light* was one of many ceremonies held across the United States that day; it illuminated the sky for 32 consecutive nights.

In the months following the attacks, the Federal government established several programs to assist individuals affected by the events of September 11. The Victim Compensation Fund provided monetary compensation to families and dependents of victims in lieu of pursuing civil court case for damages. The Small Business Administration offered low-interest loans to eligible individuals to repair or replace damaged property and personal belongings not covered by insurance. FEMA's Disaster Housing Program made funds available to individuals whose homes were uninhabitable, while FEMA and New York State also provided cash grants to those who did not qualify for the Small Business Administration loans. The Department of Labor provided funds for the extension of unemployment assistance. Financial assistance provided by individuals and nonprofit organizations, such as the American Red Cross, September 11th Fund, Twin Towers Fund, and New York State World Trade Center Relief Fund also sustained recovery efforts.

After regaining control of the WTC Site in 2002, PANYNJ continued stabilization measures, including slurry-wall repairs, structural shoring, de-watering systems, and structural monitoring. PANYNJ also constructed perimeter walkways and a perimeter fence with information panels describing the history of the WTC Site and the area for thousands of daily visitors to the WTC Site. In August 2002, Congress appropriated \$4.55 billion in Federal funding to FEMA and the FTA for transportation projects in Lower Manhattan.

PART IV. SITE DESCRIPTION¹³

A. Location and Existing Conditions (General)

The WTC Site is located on the west side of Lower Manhattan, in the Tribeca neighborhood. The approximately 16-acre site is bounded by Vesey Street on the north, Liberty Street on the south, Route 9A/West Street on the west, and Church Street on the east. The IRT No. 1/9 subway bifurcates the WTC Site into a western portion and an eastern portion. The 11-acre western portion is delineated by reinforced concrete walls approximately 3 feet thick and 70 feet high. Within these walls, the ground was excavated to bedrock for construction of a portion of the WTC and the below-ground PATH Terminal. Early on, this foundation structure was nicknamed "the bathtub" because the concrete walls sealed the basement of this part of the WTC against water seepage from the nearby Hudson River. With removal of the ruined structures and debris following the attacks, the bathtub was exposed to nearly full view for the first time since its construction. Slurry walls constructed around the bathtub are visible in this portion of the WTC Site except where a portion of the substructure of 6 WTC has been left in place to support those walls. The eastern portion of the WTC Site, which was not so deeply excavated, has a typical basement structure. Along Church Street, the eastern portion is at grade with three below-grade levels.

B. WTC Site, Western Portion (Bathtub)

After removal of approximately 1.8 million tons of material, only remnants of the parking garage below 6 WTC remained within the bathtub, extending partially along Route 9A and Vesey Street. The most visible remnants of the WTC are the slurry walls surrounding the bathtub.

1. West Wall (constructed pre-September 11)

This wall stood beneath the roadbed of Route 9A and adjacent to the North Tower (1 WTC), the hotel (3 WTC) and 6 WTC. The north end of the wall is partially obscured by remnants of the below-grade structure of 6 WTC. Damage to the wall from September 11 and water damage incurred after September 11 is visible. Concrete used to repair the damage and increase the height of the wall to prevent further flooding from the Hudson River is evident as well. Sections of reinforcement remain exposed.

¹³ In addition to remnants of the WTC complex, elements constructed or installed in association with the recovery and stabilization efforts following September 11, as well as elements associated with the temporary PATH station, are included to provide a complete picture of the WTC Site today. This section has been adapted from the *Coordinated Determination of Eligibility* (2004).

Visible features include:

- a. Vehicular entrance ramps (constructed pre-September 11)
Two pairs of rectangular openings in the west wall served as vehicular access for the WTC parking garage from ramps formerly in the median of Route 9A (currently situated beneath the northbound lanes of the temporary roadway). The entrance ramps are located approximately 42 feet above the bathtub floor at the former B2 basement level. The northern pair is located just south of the surviving sections of the former parking structure beneath 6 WTC. The southern pair flanks the southern set of cooling water pipes. For the 1993 WTC attack, terrorists used one of the southern ramps to drive the vehicle with explosives into the garage.
- b. Cooling water pipes (constructed pre-September 11)
Openings for two pairs of cooling water intake and outflow pipes are located in the west wall. The 60-inch pipes installed with the original construction ran under West Street between the WTC Site and a subterranean Hudson River Water Pump House facility in Battery Park City. Sixty-six-inch pipes installed in the 1990s ran underneath subgrade entrance ramps under West Street/Route 9A and entered the WTC Site beneath the North Tower (1 WTC).
- c. Tiebacks (installed post-September 11/temporary)
Recovery workers installed nearly 1,000 temporary tiebacks to hold the wall in place during removal of debris and damaged below-grade structures. The tiebacks extend as far as 40 feet, and some are anchored to bedrock around the bathtub area. All of the tiebacks have protective caps.
- d. Southern projection (constructed pre-September 11)
This is the largest visible opening in the west wall and is located near the southern end of the wall. The structure was used for emergency PATH-tunnel egress and ventilation, as part of the venting system for the garage, housing emergency diesel generators, and was connected to ventilation structures located in the median of Route 9A. There is a similar projection behind the remnants of the 6 WTC substructure (northern projection).
- e. PATH Tunnel access (constructed pre-September 11)
The restored tracks, covered and partially walled, emerge from the southern projection at the bottom of the bathtub. The second PATH tunnel is in the northern projection and therefore largely obscured by remnants of the former parking structure beneath 6 WTC.
- f. Egress stairs (constructed post-September 11/temporary)
Steel emergency egress stairs for the PATH Tunnels E and F emerge into the bathtub from the middle of the west wall, and link with emergency walkway access from each tunnel to grade level along Route 9A.

2. South Wall (constructed pre-September 11)

The south wall was located under the middle of Liberty Street, adjacent to the South Tower (2 WTC). As on the west wall, damage to the wall, new concrete repairs and the vertical extension of the wall to prevent flooding are apparent. Significant features include:

- a. PATH tracks (constructed post-September 11)
The PATH tracks run adjacent to the base of the south wall in the same location as they did prior to September 11, 2001.
- b. PATH substation (constructed post-September 11)
The new blank-walled structure above the PATH tracks provides traction power for train operations.
- c. Recovery and construction ramp (constructed post-September 11/temporary)
Installed in March 2002, the ramp provided temporary pedestrian and vehicular access from street level to the floor of the bathtub during the recovery effort. It also serves as emergency egress routes for the temporary WTC PATH station.
- d. Tiebacks (constructed post-September 11/temporary)
Recovery workers installed tiebacks to hold the wall in place when the debris and damaged below-grade structures were removed.

3. East Wall (constructed pre-September 11)

This wall is visible above the temporary PATH tracks and on either side of the temporary WTC PATH station. September 11 damage, along with new concrete in repaired sections of the wall, is apparent.

Significant feature include:

- a. Hudson Tubes (constructed pre-September 11)
Two cast-iron ring tubes are located in the east wall; only the south tube is visible.
- b. Vehicular access ramp (constructed pre-September 11)
The ramp is located just west of the east wall and formerly led into the below-grade service areas of the WTC complex. Inside the WTC Site, at approximately Fulton Street, the ramp runs through one of the original Hudson Tubes. Outside the WTC Site, the ramp connected to Barclay Street under 7 WTC, where trucks entered and exited the complex.
- c. WTC PATH Station (constructed post-September 11/temporary)
The temporary WTC PATH Station stands adjacent to the eastern wall of the bathtub at the same location and elevation as the pre-September 11 facility. PATH trains enter and exit the station on the platform level. The

turnstiles are located at the mezzanine level, also within the bathtub. Overlooking the bathtub, translucent screens along the west wall of the mezzanine allow light into the mezzanine level but do not obscure most views of the WTC Site. Printed panels located along the walls feature quotes of famous New Yorkers. Four temporary emergency exit staircases lead from the mezzanine to the floor of the bathtub.

4. North Wall (constructed pre-September 11)

This wall is largely obscured by the remnants of the substructure of 6 WTC.

Significant features include:

- a. 6 WTC (constructed pre-September 11)
Remnants of the grade-level slab, and egress staircase, and six below-grade floor of 6 WTC (Levels B1-B6) remain at the north end of the bathtub. Smoke scars from September 11 are visible at levels B1-B5, which served as below-grade parking, and were temporarily stabilized and shored as part of the site recovery.
- b. Tiebacks (constructed post-September 11/temporary)
Recovery workers installed tiebacks to hold the wall in place where slabs were demolished. A few tiebacks near the truck access ramp have cables that have not been cut back and capped.
- c. Vehicular Access Ramp (constructed pre-September 11)
This heavily damaged ramp connected the WTC Site to Barclay Street (under 7 WTC) and remains visible near the north wall.
- d. Bathtub Floor
The bathtub was generally excavated to its concrete floor within the slurry walls. The north and south Towers (1 WTC and 2 WTC), the hotel (3 WTC) and 6 WTC originally stood above the bathtub. The concrete floor of the bathtub lies over a layer of gravel that varies in thickness.

In addition to portions of 6 WTC, the temporary WTC PATH Station, operations and maintenance facilities, and elements identified above, other features and structures present in the bathtub include:

- e. Tower Perimeter Column Bases ("footprints"; constructed pre-September 11)
The original subgrade column grid for the Twin Towers spanned the former H&M tunnels, traversing the bathtub as well as the new PATH tracks. During recovery and site cleanup, the perimeter column bases that demarcate the space where the Twin Towers stood were cut off at or above the concrete floor of the bathtub, leaving visible square remnants. 84 perimeter columns extend into the concrete floor of the bathtub, delineating the North Tower, while 73 perimeter columns outline the

South Tower. Of the 73 perimeter columns of the South Tower, 34 stood within the PATH facility, which occupied the east half of the South Tower's footprint.

- f. Other Column Bases (constructed pre-September 11)
These column bases supported other structures and infrastructure that previously existed in the bathtub, including column bases inside the perimeter of the Twin Towers. Most of the columns were arranged in a 30x30-foot grid, with notable exceptions, and an irregular grid occurring in the areas of the PATH tracks at the north and south ends of the bathtub.
- g. Infrastructure (constructed pre-September 11)
Other infrastructure elements, including elevator pits, sump pumps, ejector pumps and drainage lines, are located within the bathtub.

5. WTC Site, Eastern Portion

The eastern portion of the WTC Site stands completely outside of the bathtub area, east of the alignment of Greenwich Street and the restored No. 1/9 subway. The temporary WTC PATH station concourse level and street entrance is located in the north half of this area. There are no surviving remnants of buildings 4 WTC and 5 WTC which previously stood in this area.

Significant features include:

- a. Temporary WTC PATH Station - Main Entrance and Concourse (constructed post-September 11)
The temporary PATH Station entrance is located on Church Street at Fulton Street. The station is composed of two wings rising from a central truss supported on two vertical trusses. The concourse is located one level below-grade and connects to the pre-existing downtown platform of the NYCT N/R/W line under Church Street and to the NYCT E line at the northeast corner of the WTC Site.
- b. WTC PATH Terminal Underpass (constructed pre-September 11)
This pedestrian underpass connects the mezzanine level with the concourse level located under the No. 1/9 subway line, just as it did in the former WTC complex. The underpass remained intact after the September 11 attacks. New escalators were installed post-September 11.
- c. Restored NYCT No. 1/9 Subway Line (constructed post-September 11)
A concrete box encloses the subway tracks, including portions of the former Cortlandt Street station, just east of the slurry wall. NYCT completely rebuilt the tracks and enclosure after September 11.
- d. Plaza and Subway Access from Vesey Street (constructed pre-September 11)

The heavily damaged stair and escalator structure on Vesey Street originally led to the Plaza and bridge to 7 WTC. It also housed the entrance to the NYCT No. 1/9 Cortlandt Street subway station, located under the WTC.

- e. Cortlandt Street Subway Station
The NYCT No. 1/9 Cortlandt Street subway station remains intact but heavily damaged under the stair and escalator structure on Vesey Street. Stairs, ticket booths, and gates are extant.
- f. Remnants of the Hudson Terminal and the H&M Railroad (constructed pre-September 11)
When the new WTC PATH Terminal opened in 1971, unused portions of the Hudson Tubes located along Church Street between Fulton and Cortlandt Streets were converted to truck ramps. Sections of these unused portions of cast-iron tubes remain extant. Below-grade portions of the former terminal, used for truck loading, parking, and commercial storage after 1971, remain visible and include columns and ceiling joists. All components of the former H&M Terminal substation were removed during construction of the WTC; the only surviving features are large openings in the ground.
- g. Sidewalks and Fencing (constructed post-September 11)
Sidewalks and fencing located around the perimeter of the WTC Site were constructed during recovery efforts to secure the area.
- h. Passageway to the NYCT WTC Subway Station (constructed pre-September 11)
Remnants of the WTC passageway to the NYCT E line are located below-grade and include steps, a ramp, doors and flooring. This passageway remains in use and connects with the temporary WTC PATH station.
- i. Steel Cross (erected post-September 11)
During the recovery effort, workers made a steel cross from two beams and set it near 6 WTC. It was subsequently relocated to its present site near Church Street.

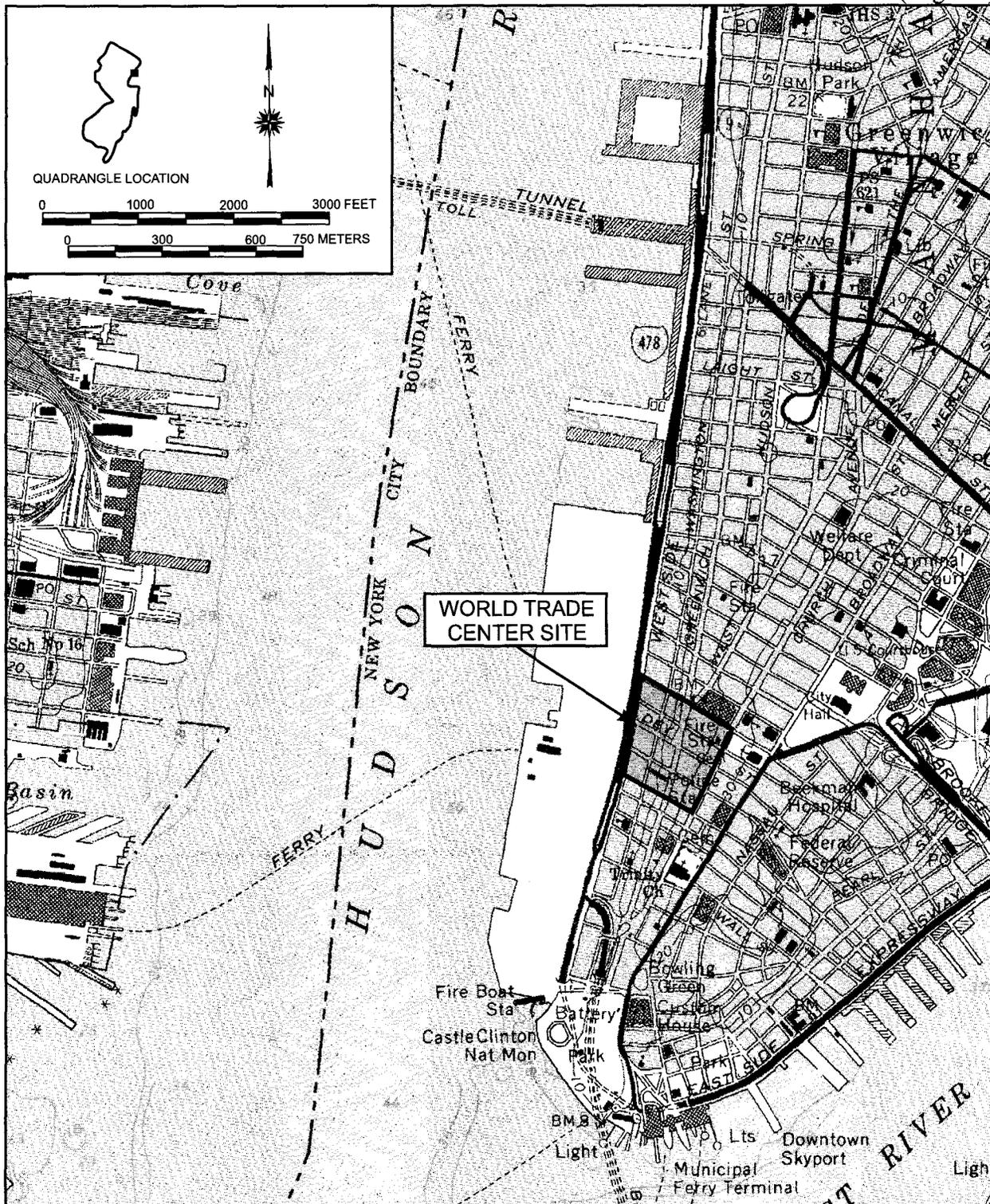
PART IV. SOURCES OF INFORMATION

AKRF, Inc., and The Louis Berger Group, Inc. Coordinated Determination of National Register Eligibility - World Trade Center Site, New York City, New York, March 31, 2004.

Brennan, Joseph. "Hudson Terminal." Abandoned Stations. Access online at <http://www.columbia.edu/~brennan/abandoned/hudterm.html>, January 12, 2005.

Burk, Andrea, AKRF, Inc. to Jerrold Dinkels, PANYNJ, Memorandum, re: Field Inspection of the Former H&M Terminal. August 19, 2003.

London's Transport Museum. "From Omnibus to Ecobus, 1851-1875." Accessed online at http://www.ltmuseum.co.uk/learning/online_resources/ecobus_omnibus/pg/1851c.htm#34c, January 12, 2005.



Location Map (USGS 7.5-Minute Quadrangle, Jersey City, NJ- NY 1981)