

# Technical Memorandum/Evaluation

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**Subject:** Environmental Assessment of the proposed World Trade Center Memorial and Cultural Program General Project Plan Amendments and LEED Gold Alternative Path to Achieve Goals of the Sustainable Design Guidelines

**Date:** February 7, 2007

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## A. INTRODUCTION

In April 2004, the Lower Manhattan Development Corporation (LMDC), a subsidiary of the New York State Urban Development Corporation, doing business as the Empire State Development Corporation (a political subdivision and public benefit corporation of the State of New York), as lead agency, in cooperation with the United States Department of Housing and Urban Development (HUD) and The Port Authority of New York and New Jersey (the Port Authority), prepared the Final Generic Environmental Impact Statement (FGEIS) for the World Trade Center Memorial and Redevelopment Plan (Approved Plan). In June 2004, LMDC adopted the Record of Decision and Lead Agency Findings Statement (ROD) for the Approved Plan and affirmed the amendments to the General Project Plan (GPP) for LMDC's World Trade Center Memorial and Cultural Program. Implementation of the Approved Plan began with a formal groundbreaking for Freedom Tower on July 4, 2004.

Preliminary design and engineering led to certain adjustments and refinements in the Approved Plan, which were analyzed in an Environmental Assessment in April 2005 (2005 EA). The 2005 EA concluded that the environmental impacts of the Approved Plan with such refinements would not differ significantly from those set forth in the FGEIS and ROD. The refinements were approved by LMDC in May 2005, and a Finding of No Significant Impact (FONSI) was issued.

On-going work on the design and engineering of Freedom Tower, particularly in response to security concerns expressed by the New York City Police Department (NYPD), led to revisions to the Freedom Tower design from the design described in the FGEIS and the 2005 EA. A Technical Memorandum was prepared to consider the potential environmental impacts resulting from the changes to the Freedom Tower design. The Technical Memorandum was finalized in September 2005 and concluded that there would be no significant adverse impacts from the design changes and, accordingly, that there was no need to supplement or amend the FGEIS or the ROD, or take any other further action pursuant to the National Environmental Policy Act (NEPA) or the New York State Environmental Quality Review Act (SEQRA).

As planning and implementation advanced, LMDC, working in cooperation with HUD, the Port Authority, The City of New York (the City), and World Trade Center Properties, LLC and its affiliates (Silverstein) as the Port Authority's Net Lessees (collectively, Net Lessees), continued to refine the Approved Plan. Because the Approved Plan was generic, preliminary design and engineering led to certain adjustments and refinements based on coordination with oversight agencies as well as market, design, and financial considerations. In September 2006, LMDC adopted the Environmental Assessment for Proposed Further Refinements to the Approved Plan (2006 EA) to document and assess the potential environmental impacts of these changes in the planning, engineering, design, and construction of the WTC Site since the 2005 EA and Technical Memorandum. The 2006 EA specifically addressed 1) modifications to the Southwest Quadrant of the WTC Site, including the Memorial design and the programming of cultural facilities; 2) a reduction in the proposed use of river water-cooling on the WTC Site; 3) the

elimination of an oil-water separator at the intersection of Fulton and Greenwich Streets; and 4) revisions to the construction staging and phasing of components of the Approved Plan. LMDC issued a FONSI for the 2006 EA in October 2006.

On November 9, 2006, LMDC released proposed amendments to the GPP (Proposed GPP Amendments). The Proposed GPP Amendments would update the GPP to include 1) the proposed refinements addressed in the 2006 EA; 2) a formal delineation of the WTC Site boundaries to include areas south of Liberty Street (Southern Site) and north of Vesey Street (Northern Site); 3) modifications to the programming of office, retail, and cultural uses on the project site; 4) modifications and refinements to proposed and potential new streets; and 5) modifications for the implementation of the Commercial Design Guidelines. LMDC established a public comment period for review of the Proposed GPP Amendments, which ended on January 12, 2007. The LMDC Board must formally adopt the Proposed GPP Amendments to complete the process.

Appendix D of the ROD set forth Sustainable Design Guidelines for the Approved Plan. Under the proposed LEED Gold Alternative Path discussed and analyzed below, developers of commercial buildings would have the option, on a building-by-building basis, to achieve the goals of the Sustainable Design Guidelines through an alternative method.

This Technical Memorandum considers the potential for environmental impacts resulting from the proposed GPP Amendments, including the potential extension of Greenwich Street, and the Alternative Compliance Path and concludes, for the reasons set forth below, that there would be no significant adverse impacts from such design changes and, accordingly, that there is no need to supplement the FGEIS or take any other further action pursuant to NEPA or SEQRA.

## **B. PROJECT DESCRIPTION**

### **2005 GPP**

The GPP was last updated in May 2005. The GPP includes the area bounded by Vesey Street, Route 9A/West Street, Liberty Street, and Church Street; the right of way of Liberty Street between West Street and Greenwich Street; and the Southern Site, comprising 1) two city blocks, one bounded by Liberty, Washington, Albany and Greenwich Streets, and the other bounded by Liberty, West, Cedar and Washington Streets, 2) subsurface portions of Liberty Street from the eastern side of West Street to the western side of Greenwich Street, 3) Washington Street from the northern side of Cedar Street to the southern side of Liberty Street, and 4) subsurface portions of Cedar Street from the eastern side of West Street to the eastern side of Washington Street. The programming of the GPP includes 1) a memorial and memorial center; 2) 500,000 square feet of cultural space; 3) 10 million square feet of office space; 4) up to 1,000,000 square feet of retail space; 5) an up to 800-room hotel with 150,000 square feet of conference space; and 6) a reconstructed Saint Nicholas Greek Orthodox Church. The Approved Plan also includes the extension of Fulton and Greenwich Streets through the WTC Site and the creation of new parks and plazas throughout the WTC Site.

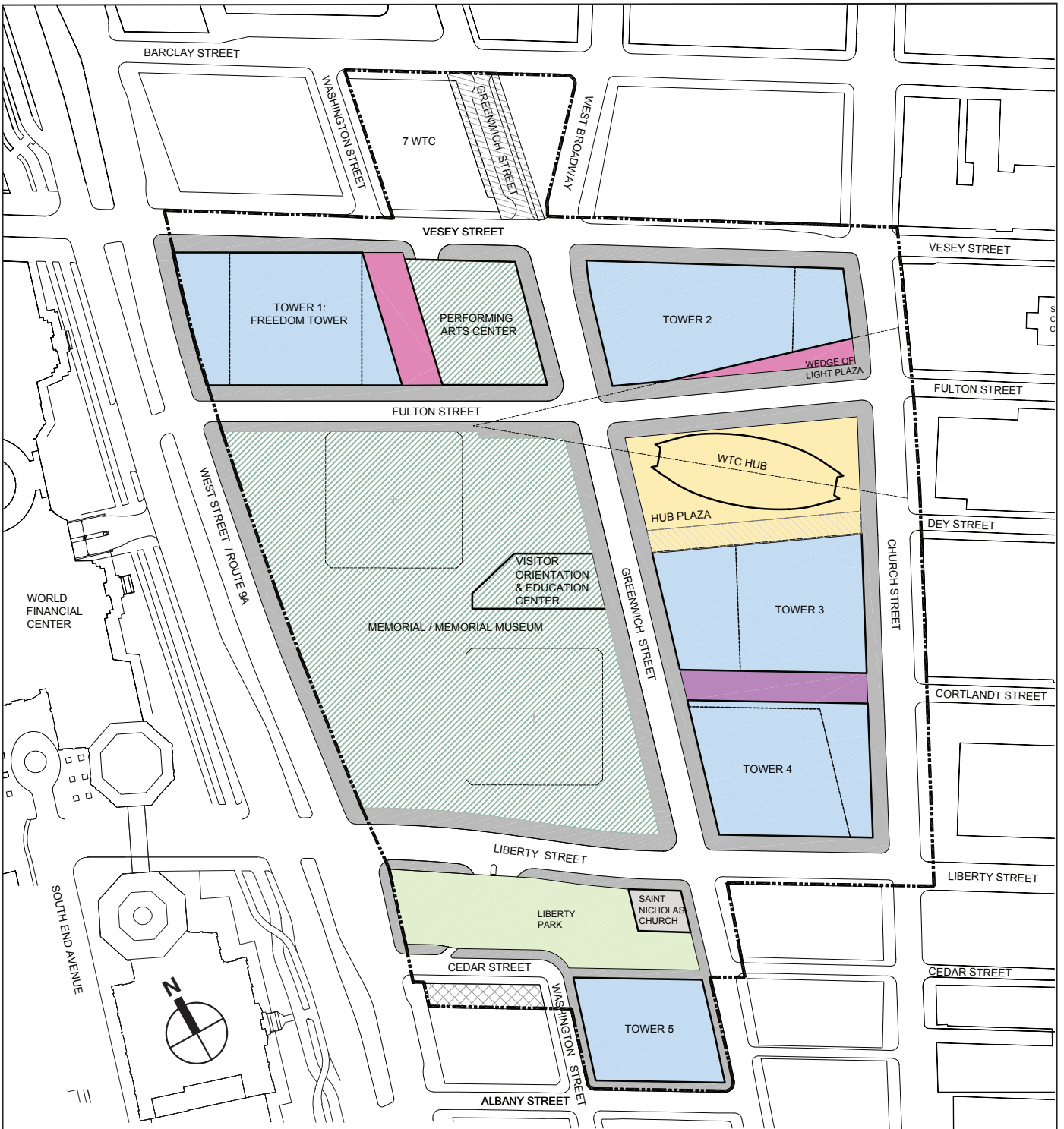
### **GPP AMENDMENTS**

The Proposed GPP Amendments include a number of modifications to the GPP. As shown in Figure 1 and as described below, the amendments call for an extension of the project site boundaries, modifications to the programming of uses within the project site, refinements to potential new streets, and refinements to the implementation of the commercial design guidelines.

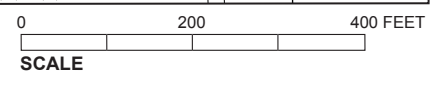
#### *PROJECT SITE BOUNDARIES*

With the Proposed GPP Amendments, the boundary of the project site would include three sites: 1) the WTC Site; 2) the Southern Site; and 3) the Northern Site. As shown in Figure 1, the overall site boundary would include:

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- Project Location Boundary
- Commercial Building
- WTC Hub / Plaza
- Memorial / Cultural Sites
- Sidewalk
- Park
- Plaza
- Cortlandt Street R.O.W.
- Dey Street R.O.W.
- Extent of Possible/Potential Sub-surface Tie-backs on Privately Owned Property
- Includes Certain Portions of Former Greenwich Street (Future Dimensions and Use of this Area are Still Being Studied)



Proposed GPP Amendments  
**Figure 1**

- The WTC Site
  - Beginning at the intersection of the eastern right of way line of Route 9A/West Street and the northern curb line of Vesey Street;
  - East along the north curb line of Vesey Street to the western right of way line of West Broadway;
  - North along the western curb line of West Broadway to the northern right of way line of Vesey Street;
  - East along the northern right of way of Vesey Street to the eastern right of way line of Church Street;
  - South along the eastern right of way line of Church Street to the southern right of way line of Liberty Street;
  - West along the southern right of way line of Liberty Street to the intersection with the eastern right of way line of Route 9A/West Street; and
  - North along the eastern right of way line of Route 9A/West Street to the point of beginning.
- The Southern Site
  - Beginning at the intersection of the eastern right of way line of Route 9A/West Street and the southern right of way line of Liberty Street;
  - East along the southern right of way line of Liberty Street to the eastern right of way line of Greenwich Street;
  - South along the eastern right of way line of Greenwich Street to the southern right of way line of Cedar Street;
  - West along the southern right of way line of Cedar Street to the western curb line of Greenwich Street;
  - South along the western curb line of Greenwich Street to the northern curb line of Albany Street
  - West along the northern curb line of Albany Street to the eastern curb line of Washington Street
  - North along the eastern curb line of Washington Street to the southern right of way line of Cedar Street
  - West along the southern right of way line of Cedar Street to the intersection with the eastern right of way line of Route 9A/West Street and including subsurface property below a depth of approximately 32 feet 10 inches from the top of the existing grade and extending up to 50 feet 5 inches south from the southern right of way line of Cedar Street, and
  - North along the eastern right of way line of Route9A/West Street to the point of beginning.
- The Northern Site
  - Beginning at the intersection of the eastern right of way line of Washington Street and northern curb line of Vesey Street,
  - North along the eastern right of way line of Washington Street to the southern curb line of Barclay Street,
  - East along the southern curb line of Barclay Street to the western curb line of West Broadway,
  - Southwesterly along the western curb line of West Broadway to the northern curb line of Vesey Street
  - West along the northern curb line of Vesey Street to the point of beginning.

As compared to the GPP, the Proposed GPP Amendments would extend the boundaries of the WTC Site east from the western curb line of Church Street to the eastern right of way line of Church Street. The boundaries of the Southern Site would be extended east between Liberty and Cedar Streets from the western curb line of Greenwich Street to the eastern right of way line of Greenwich Street and south of Cedar Street to include a subgrade right of way beneath 90 West Street and 130 Cedar Street. The boundaries of the WTC Site and the Southern Site are being extended to provide for subsurface area needed to tie back and anchor slurry walls. The Proposed GPP Amendments do not propose surface level changes to Church, Liberty, or Cedar Streets within the extended boundaries, to the New York City Transit tunnel along Church Street, or to the building at 90 West Street.

The Proposed GPP Amendments would also extend the project site boundaries to include the reconstructed 7 WTC, Greenwich Street between Barclay and Vesey Street, and the adjacent parcel, collectively referred to as the Northern Site. Before September 11, 2001, 7 WTC occupied a superblock site, prohibiting the continuation of Greenwich Street from Barclay Street to Vesey Street. Consistent with LMDC's early planning principles, 7 WTC was redesigned and constructed to preserve the possibility of reintroducing Greenwich Street as a public street through the former 7 WTC superblock. The Proposed GPP Amendments extend the boundaries to include the Northern Site to facilitate the transfers of certain property interests within the Northern Site among the involved governmental entities and possibly the net lessee of 7 WTC. The extension of the boundaries to include the Northern Site is not intended to subject the Northern Site to any other requirements or procedures for any other purpose.

#### *DEVELOPMENT PROGRAM*

The FGEIS included an illustrative development program that was the basis of analysis of the potential impacts and proposed mitigation measures for the build-out of the project site. As planning and design have advanced, there have been modifications of the development program that have resulted in an up to 100,000 square foot increase in the maximum allowable office space and a reduction in cultural and retail space. Table 1 provides a comparison of the development program that was analyzed in the FGEIS and the development program proposed with the Proposed GPP Amendments.

#### *NEW STREETS*

As described above, the boundaries of the project site would be extended to include the Northern Site, which is intended to facilitate the potential opening of Greenwich Street as a public thoroughfare between Barclay and Vesey Streets. As proposed in the Proposed GPP Amendments, this segment of Greenwich Street, if opened to traffic, would operate as one-way southbound with two moving lanes for traffic.

**Table 1**

**Comparison of FGEIS Program and Proposed GPP Amendments Program**

<b>Use</b>	<b>FGEIS Development Program</b>	<b>Proposed GPP Amendments Development Program</b>
Memorial, Memorial-related uses, and Cultural Facilities	Memorial, memorial center, up to 2,200-seat Performing Arts Center, and 240,000 square feet of other cultural institutions	Memorial, memorial museum, visitor orientation and education center, and up to 1,800-seat Performing Arts Center
Office	10.0M SF	Up to 10.1M SF
Retail	Up to 1M SF	Up to 600,000 SF
Hotel	Up to 800 rooms and 150,000 SF of conference space	Up to 800 rooms and 150,000 SF of conference space
Other	Public open space; public streets; and reconstruction of St. Nicholas Greek Orthodox Church	Public open space; public streets; and reconstruction of St. Nicholas Greek Orthodox Church

*COMMERCIAL DESIGN GUIDELINES IMPLEMENTATION*

The Proposed GPP Amendments further define the role of agencies in the long-term implementation of the commercial design guidelines and name the Port Authority rather than LMDC as the administrator of this effort.

**ALTERNATIVE PATH TO ACHIEVE THE OBJECTIVES OF THE SUSTAINABLE DESIGN GUIDELINES**

Under the proposed LEED Gold Alternative Path, developers of commercial buildings would have the option to achieve the goals of the Sustainable Design Guidelines through the proposed alternative method discussed and analyzed below. To allow the use of this LEED Gold Alternative Path, LMDC would addend Appendix D of the ROD with Addendum D-1.

*PROPOSED ADDENDUM TO THE RECORD OF DECISION*

Under the proposed LEED Gold Alternative Path, the Net Lessees would design for and attain Leadership in Energy and Environmental Design (LEED) Gold certification from the U.S. Green Building Council. For commercial office buildings, the LEED-CS system (Core and Shell) may be used. In addition, the Net Lessees would complete the following enhancements beyond the requirements for LEED Gold certification:

- Implement all construction-period environmental protection measures identified in SEQ-5, including the use of ultra low-sulfur diesel and adoption of U.S. Environmental Protection Agency (EPA) diesel retrofit recommendations, in addition to all applicable Environmental Performance Commitments promulgated by the Lower Manhattan Recovery Project Sponsors.
- Achieve net zero CO<sub>2</sub> emissions for all base building electricity consumption via commercially purchased wind certificates for 100% of purchased electricity.
- Reduce energy costs 20 percent beyond American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) 90.1-1999 standards, as defined in EEQ-3, and reduce whole building energy consumption by 20% relative to levels required by the New York Energy Conservation Construction Code, as required by Executive Order-111 (EO-111).
- Satisfy all indoor air quality requirements of EO-111 and IEQ-3, including requirements for indoor air quality monitoring, commissioning and air quality management.
- For each commercial office building that implements LEED-CS, construct a 1,500 square foot exemplar space that satisfies the requirements, other than square footage, set forth in the Sustainable Design Guidelines.
- For each commercial office building where the LEED Gold Alternative Path has been adopted, supply part of the energy required for the commercial office building by fuel cells built into the towers.
- Create and execute the following management plans: Construction Storm Water Pollution Prevention Plan (SEQ-6); Construction Waste Management Plan (MEQ-2); Indoor Air Quality Management Plan (IEQ-1); Construction IAQ Management Plan (IEQ-5); and Integrated Pest Management Plan (IEQ-9).

If a Net Lessee fails to obtain LEED Gold certification or fails to satisfy any elements listed above for any project and/or building for which the LEED Gold Alternative Path has been adopted, the Net Lessee would, subject to approval by LMDC, promptly identify and diligently carry out, at its expense, such alternative mechanism and actions as are required to satisfy the goals of such unsatisfied elements of the LEED Gold Alternative Path.

For each project and building for which the LEED Gold Alternative Path would be adopted, the substantive objectives of the Sustainable Design Guidelines would be achieved. For each such

project and building, a Construction Environment Plan as required by SEQ-5 of the Sustainable Design Guidelines and a Comprehensive Material Management Plan as required by MEQ-1 of the Sustainable Design Guidelines would not need to be prepared, although all substantive requirements of SEQ-5 and MEQ-1 would be met.

At each major project milestone during the design and construction phases of each commercial office building (i.e., Schematic Design, Design Development, Construction Documents), the Net Lessees would submit commensurate plans and specifications documentation to the Port Authority, in accordance with the Port Authority's tenant construction application process, to demonstrate conformance with the environmental measures (consistent with the requirements of the Port Authority Manual) and shall simultaneously furnish LMDC with copies of such plans and specifications. For each project and building for which the LEED Gold Alternative Path has been adopted, this documentation shall describe the progress in achieving the requirements of the LEED Gold Alternative Path (including a LEED point checklist and associated narrative). This documentation shall also describe the progress in meeting the substantive requirements of SEQ-5 and MEQ-1.

#### *COMPARISON OF THE SUSTAINABLE DESIGN GUIDELINES AND THE LEED GOLD ALTERNATIVE PATH*

Most elements of the Sustainable Design Guidelines are also part of the LEED Gold requirements. Despite minor differences in the descriptive language, the substantive requirements are essentially the same. Several others are included in the above-described LEED Gold Alternative Path. Thus, the goals of the following Sustainable Design Guidelines are reflected in the list of LEED items from which sufficient items would be selected in order to achieve LEED Gold certification.

- Urban Environmental Qualities (UEQ)
  - UEQ-1: Support Urban Development
  - UEQ-2: Expanded Public Transit and Bicycle Access
  - UEQ-3: Regional Mass Transit
  - UEQ-6: Outdoor Environmental Comfort
  - UEQ-7: Wayfinding
  - UEQ-8: Vehicular Emissions
- Site / Parcel Environmental Qualities (SEQ)
  - SEQ-2: Stormwater Use
  - SEQ-3: Heat Island Effect Mitigation
  - SEQ-4: Light Pollution Reduction
  - SEQ-6: Construction Stormwater Runoff and Pollution Prevention
  - SEQ-7: Use Existing Site Structures
  - SEQ-8: Plant/Vegetation Selection
  - SEQ-9: Daylight/Exterior Public Spaces
  - SEQ-12: Use of Underdeveloped Parcels
- Water Environmental Qualities (WEQ)
  - WEQ-2: Wastewater Reuse
  - WEQ-3: Water Use Efficiency
  - WEQ-4: Landscape Hydrology
- Energy Environmental Qualities (EEQ)
  - EEQ-2: Building Systems Commissioning
  - EEQ-3: Optimize Energy Performance
  - EEQ-4: Ozone Layer Protection
  - EEQ-5: Renewable Energy Plan
  - EEQ-6: Energy Systems Control and Maintenance
  - EEQ-7: End User Metering
- Materials Environmental Qualities (MEQ)

- MEQ-2: Construction Waste Management
- MEQ-3: Resource Reuse
- MEQ-4: Materials with Recycled Content
- MEQ-5: Material Proximity
- MEQ-6: Wood Certification
- MEQ-7: Agricultural Materials
- Indoor Environmental Qualities (IEQ)
  - IEQ-1: Indoor Air Quality Performance
  - IEQ-2: Daylight and Views
  - IEQ-3: Air Quality Monitoring
  - IEQ-4: Ventilation Air Quality
  - IEQ-5: Construction Indoor Air Quality Management Plan
  - IEQ-6: Reduce Contaminants from Materials
  - IEQ-7: Chemical and Particulate Control
  - IEQ-8: Thermal Comfort
  - IEQ-10: Occupant Control
  - IEQ-11: Acoustics
  - IEQ-12: Lighting Quality

However, the LEED Gold Alternative Path would not include the following Sustainable Design Guidelines. Generally, these guidelines have either 1) been met by overall planning efforts for the project site, 2) would be met by the above-described requirement for interim reporting, or 3) have in the time since the development of the Sustainable Design Guidelines been shown to be impractical as explained below.

- UEQ-4 Pedestrian Movement: Pedestrian circulation was a major consideration in the preparation of the Master Plan for the project site, and the requirements of UEQ-4 are not considered necessary in light of the extensive planning and design efforts to date. Further, all necessary signage to improve wayfinding would be provided and would be defined during the final design stages for individual projects. Therefore, further submissions by the Net Lessees would not alter this conclusion.
- UEQ-5 Green Infrastructure: The location of vegetation on the project site has already been defined by the Master Plan, which would result in many trees and other vegetation within the Memorial and Liberty Park. The Route 9A median, Zuccotti Park, and the parcel adjacent to 7 WTC, which are located nearby, also contain trees and other plantings. Therefore, further submissions by the Net Lessees would not alter this conclusion.
- SEQ-1 Comprehensive Resource Management Plan: Conservation of water, material and energy resources has been a major consideration of the Master Plan and the design of individual buildings and continues to be an important factor in the ongoing design process. Further, the design of building systems, including cooling towers, would be consistent with energy conservation regulations, and finally, the Port Authority has reviewed the proposed energy conservation measures as part of the integrated site plan. Therefore, further submissions by the Net Lessees would not alter this conclusion.
- SEQ-5 Construction Environment Plan: A Construction Environment Plan, as required by SEQ-5, would not be prepared. However, all of the substantive requirements of SEQ-5 have been or would be met with the LEED Gold Alternative Path as follows:
  - A materials staging and construction access plan has been developed;
  - Truck staging zones have been placed for minimum disruption and impact;
  - Unnecessary idling time on diesel powered engines has been limited to 3 minutes;
  - Non-road construction of 50 hp or greater includes diesel emissions control technology according to EPA diesel retrofit recommendations, unless not technically feasible;

- All non-road diesel equipment utilizes ultra-low-sulfur diesel fuel (limit sulfur levels to 15 parts per million (ppm));
- Implementation of proposed EPA emission standards for non-road diesel equipment has been accelerated;
- Fixed diesel powered exhausts are located away from fresh air intakes;
- Noise and vibration impacts are reduced through scheduling and coordination with adjacent construction activities;
- If needed and practicable, enclosures will be utilized around high noise-generating equipment;
- The condition of surrounding buildings, structures, infrastructure and utilities is considered where appropriate;
- Construction activities in adjacent and nearby locations are coordinated to avoid or minimize impacts;
- Construction plans are communicated to the public; and
- Contingency measures have been formulated in the event established limits are exceeded.

For those substantive requirements of SEQ-5 that have not yet been met, the Net Lessees would provide documentation of progress toward meeting them as part of the above-described submissions to the Port Authority and LMDC.

- SEQ-10 Solar Access/Harvesting: Silverstein and the Port Authority have each evaluated the photovoltaic potential of the commercial office towers and other buildings on the project site. Following consultation with several leading manufacturers of façade and roof integrated products, it was determined that these technologies have not yet advanced to the point where the economics are favorable. In other words, the cost of purchasing and installing the photovoltaic cells far exceeds the energy cost savings. However, Silverstein Properties and the Port Authority have determined that fuel cells are an economically sound and environmentally desirable alternative. Accordingly, the Port Authority and Silverstein have committed to install fuel cells with a capacity of 1.2 megawatts (MW) in each of Towers 1, 2, 3 and 4, which would substantively meet the energy efficiency goal of SEQ-10.
- SEQ-11 Recovery of Resources: Silverstein identified the preliminary program space requirements for on-site waste recovery, such as anaerobic digestion, at the scale commensurate with the anticipated waste stream of the commercial program of the project site and concluded that it was infeasible to implement SEQ-11 as part of the commercial development because there is insufficient available below grade space on the project site for these activities. This conclusion has been affirmed by ongoing difficulties among LMDC, the Port Authority, and the Net Lessees in identifying program space for other essential below-grade functions for the site. Further, on-site waste recovery would pose difficult environmental and hygiene issues relating to biogas emissions, wastewater, and vectors.
- MEQ-1 Comprehensive Material Management Plan: A Comprehensive Material Management Plan, as required by MEQ-1, would not be prepared. However, all of the substantive requirements of MEQ-1 have been or would be met by the following:
  - Implementing a Construction Waste Management Plan in accordance with the requirements of MEQ-2;
  - Specifying of materials with stipulated recycled content;
  - Utilizing local/regional material consistent with MEQ-5;
  - Obtaining sustainable harvest certifications;
  - Providing space within buildings to facilitate the separation, collection and storage of glass, plastics, metals and paper products; and
  - Providing access for bulk collection and removal of recyclables

For those substantive requirements of MEQ-1 that have not yet been met, the Net Lessees would provide documentation of progress toward meeting them as part of the above-described submissions to the Port Authority and LMDC.

- WEQ-1 Comprehensive Water Management Plan: Silverstein has studied all applicable water management strategies and concluded that capture and storage of rainwater from the commercial building roofs and setbacks is feasible and would be implemented, consistent with the requirements of LEED for stormwater runoff reduction and reduced irrigation requirements. Silverstein Properties and the Port Authority identified the preliminary program space requirements for on-site waste water treatment at the scale commensurate with the anticipated waste water stream of the commercial program of the project site and concluded, in consultation with the Port Authority and LMDC, that there was no opportunity to implement this measure as part of the commercial development since there is not enough available program space within below grade levels of the site. Further plan submissions by the Net Lessees would not alter this conclusion.
- WEQ-2 Wastewater Reuse: Silverstein has evaluated all applicable technologies for reducing the use of potable water for sewage conveyance and concluded that the use of low flow toilet fixtures for all projects is a feasible approach. Low flow toilet fixtures would be implemented for all projects. In addition, the available technologies for waterless urinals would continue to be evaluated for applicability to the projects.
- EEQ-1 Energy Management Plan: Consistent with the requirements of the LEED rating system, a comprehensive set of energy conserving measures will be implemented for all commercial projects (including high efficiency air conditioning, high performance curtain walls, high efficiency lighting and lighting controls, variable frequency drives, demand controlled ventilation, etc.) to reduce the overall consumption of energy by these projects.

LMDC, the Port Authority, and Silverstein have participated in extensive site-wide energy management planning. Large scale gas-fired cogeneration was evaluated and found to be not feasible due to lack of available program space, detrimental impacts from products of combustion emissions and the lack of a feasible heat of rejection approach. A central cooling plant that would serve the entire site program was extensively evaluated and was found to be infeasible due to regulatory restrictions on the use of river water for cooling heat exchange, relating to concerns about the adverse impact that the withdrawal of cooling water from, and its discharge in heated form back into, the Hudson River could have on aquatic life. As such, a central cooling plant will only be implemented for the public program of the site. Other applicable onsite generation technologies were evaluated for each of the commercial office towers, and through a collaborative arrangement with various New York State agencies, a memorandum of understanding has been executed to implement approximately 1.2 MW of fuel cells for each office tower.

Further plan submissions by the Net Lessees would not alter these conclusions.

- EEQ-5 Renewable Energy Plan: Silverstein has evaluated various applicable renewable energy technologies and concluded that the only renewable energy source that would potentially be feasible for the high-rise urban commercial buildings is photovoltaic electrical power generation. This technology is rapidly developing, but it is too early to determine what specific form or configuration these products would take when they become economically viable in the future. The commercial towers would include vertical pathways for future electrical distribution that would be available for future photovoltaic installations, should a future decision be made to pursue this option. However, given the status of this technology, additional provisions would not be incorporated into the buildings in anticipation of future photovoltaic potential. As noted above, fuel cells will be installed in each tower. They will initially be fueled by natural gas. It is possible that in the future a renewable fuel will become

available that can be used in the fuel cells. Further plan submissions by the Net Lessees would not alter this conclusion.

### **C. ENVIRONMENTAL EFFECTS**

The following describes the potential environmental effects of the Proposed GPP Amendments, the potential opening of Greenwich Street between Barclay and Vesey Streets, and the proposed LEED Gold Alternative Path to achieve the goals of the Sustainable Design Guidelines. The analysis has been prepared consistent with NEPA and SEQRA requirements.

#### **LAND USE, ZONING, AND PUBLIC POLICY**

The Proposed GPP Amendments would not materially alter land use at the redeveloped project site as compared to analysis presented in the FGEIS and subsequent environmental documentation. The Proposed GPP Amendments would allow for a modest increase in the amount of office space proposed on the site and would reduce the program for cultural and retail space, but it would not change the siting of these uses as compared to the Approved Plan.

The Proposed GPP Amendments would extend the project boundaries to include 7 WTC, Greenwich Street between Barclay and Vesey Streets, and the adjacent parcel. This proposal to include the Northern Site would allow for the potential extension of Greenwich Street between Barclay and Vesey Streets, which is consistent with LMDC's early planning principles for the project site. The project site boundaries would also be extended east and south to include subsurface areas beneath public streets and beneath 90 West Street and 130 Cedar Street. This would allow for the permanent occupation of subsurface areas with infrastructure needed to support the slurry walls of the project site; however, the extension of these boundaries would not result in changes in existing land uses above-ground.

The Proposed GPP Amendments would also transfer the long-term oversight of the Commercial Design Guidelines from LMDC to the Port Authority. However, the Proposed GPP Amendments would not alter the intent of the Commercial Design Guidelines, which call for the reintegration of the project site within Lower Manhattan, excellence in design, consistency with the vision for the Site, and compatibility with the WTC Memorial and Redevelopment Plan.

Therefore, the Proposed GPP Amendments would not alter the conclusions of the ROD with respect to land use, zoning, and public policy.

#### **SOCIOECONOMIC CONDITIONS**

The Proposed GPP Amendments would not materially change the future employment on the project site. While there would be additional office employees, this would be offset by the reduction in employees associated with the retail and cultural facilities. The Proposed GPP Amendments would not result in new long-term effects on surrounding businesses and residents as compared to the Approved Plan. Therefore, the Proposed GPP Amendments would not alter the conclusions of the ROD with respect to socioeconomic conditions.

#### **COMMUNITY FACILITIES**

The Proposed GPP Amendments would allow for the potential extension of Greenwich Street between Barclay and Vesey Streets. The extension of Greenwich Street would provide an additional southbound route for emergency vehicles in Lower Manhattan, which could improve emergency response times.

The Proposed GPP Amendments would not change the programming or location of community facilities on the project site as compared to the Approved Plan. There would be a reduction in the programming of cultural facilities on the project site, but these facilities were not and are not planned to be schools, libraries, hospitals, day care facilities, police stations, or fire houses and are not defined as community facilities pursuant to SEQRA and New York City Environmental Quality Review.

Therefore, the Proposed GPP Amendments would not alter the conclusions of the ROD with respect to community facilities.

### **OPEN SPACE AND RECREATIONAL RESOURCES**

The Proposed GPP Amendments would not change the programming or location of public open space and recreational resources on the project site as compared to the Approved Plan. The increase in open space on the Memorial Quadrangle with the removal of 240,000 square foot building that would have housed another cultural institution (not a part of the Memorial or the Visitor Orientation and Education Center) would offset the minimal reduction in the parcel of open space on the Northern Site required to open Greenwich Street as now proposed. In terms of users, the increase in employees associated with the 100,000 additional square feet of office space would be more that offset by the reduction in visitors associated with the removal of the cultural institution, the reduction in retail space, and the reduction in seating at the Performing Arts Center. Therefore, the Proposed GPP Amendments would not alter the conclusions of the ROD with respect to open space and recreational resources.

### **SHADOWS**

The 2006 EA included a shadows analysis to account for changes in building heights as compared to the analysis presented in the FGEIS, and the 2006 EA concluded that the revised heights would not alter the conclusions of the ROD with respect to shadows. The GPP amendments would not change the heights of the proposed buildings on the project site as compared to the 2006 EA. Therefore, the GPP amendments would not alter the conclusions of the ROD with respect to shadows.

### **CULTURAL RESOURCES**

The Proposed GPP Amendments would be undertaken in accordance with the stipulations of the Programmatic Agreement for the WTC Memorial and Redevelopment Plan, which was prepared pursuant to Section 106 of the National Historic Preservation Act. The Proposed GPP Amendments would not result in new effects on architectural resources as compared to the FGEIS and subsequent environmental documents and would not result in construction activities within 90 feet of historic resources that were not previously identified in these environmental documents. Specifically, construction work for the installation of tiebacks for the southern bathtub in the expanded Southern Site area under 90 West Street would be covered by the Construction Protection Plan anticipated in the FGEIS and the ROD.

The Vesey Street Stair Remnant is subject to ongoing consultation pursuant to the Programmatic Agreement, and is not affected by the Proposed GPP Amendments or the LEED Gold Alternative Path.

Construction preparation activities have revealed the presence of human remains from the tragic events of September 11, 2001. A protocol has been developed with the Office of the Chief Medical Examiner, New York City Department of Design and Construction, and the Port Authority. That protocol is being implemented within the project site and would not be affected by the Proposed GPP Amendments or the LEED Gold Alternative Path.

With respect to archaeological resources, subsurface site disturbance in the expanded site area is anticipated in some limited locations:

- 90 West Street – As the area under 90 West Street was disturbed during construction for that building, tieback installation is unlikely to encounter any resources not previously disturbed. Further, the adjacent street and block to the north were previously documented for the FGEIS.
- Liberty Street between Greenwich and Church Streets: New tiebacks would extend from the eastern bathtub into the area below Liberty Street. Uses in the block on north side of the street were previously documented as part of the FGEIS. It is unlikely that research on the

street bed in front of this block would yield additional documentary information. Further research has indicated that the lots identified as potentially sensitive were in fact disturbed by construction of the WTC. Sections of Liberty Street to the east and the west were studied for the Permanent World Trade Center Path Terminal FEIS and the FGEIS for the Approved Plan, respectively. No potentially sensitive areas were identified in either segment of the street. Given the previous documentation and the utility disturbance in Liberty Street, no further analysis is warranted. Installation of tiebacks in this segment of Liberty Street is not expected to have a significant adverse impact on archaeological resources.

- Church Street from Liberty Street to Vesey Street: New tiebacks would extend from the eastern bathtub into the area below Church Street. This area was previously disturbed by construction of the subway line which runs under Church Street. Installation of new tiebacks is unlikely to have a significant adverse impact on archaeological resources.
- Vesey Street between Greenwich and Church Streets: New tiebacks would extend from the eastern bathtub into the area below Greenwich Street. Uses in the block on south side of the street and potentially sensitive lots were previously documented for the FGEIS. It is unlikely that research on the street bed in front of this block would yield additional documentary information. Further, the potentially sensitive lots identified by documentary research have been tested, and one feature, a historic box cistern, was determined eligible for listing on the National Register of Historic Places due to its in situ nature and its association with late 18th and early 19th century residents. However, with recovery of artifacts from this site, it was determined that construction on this block would not have a significant adverse impact on archeological resources. Given the utility disturbance in Vesey Street and the previous documentation, no further analysis is warranted. Installation of tiebacks in this segment of Liberty Street is not expected to have a significant adverse impact on archaeological resources.
- Vesey Street between Greenwich and Route 9A: New tiebacks would extend under Vesey Street from the existing bathtub. This area was previously disturbed by tiebacks for the existing bath tub and utility installations including those associated with the telephone building on the north side of the street. Installation of new tiebacks is unlikely to have a significant adverse impact on archaeological resources.

Therefore, the Proposed GPP Amendments would not alter the conclusions of the ROD with respect to historic resources.

## **URBAN DESIGN AND VISUAL RESOURCES**

The Proposed GPP Amendments would not change the forms or heights of the proposed office buildings on the project site as compared to the 2006 EA. The removal of the 240,000 square foot building that would have housed another cultural institution (not a part of the Memorial or the Visitor Orientation and Education Center) would increase the open space area on the southwest quadrant of the WTC Site. This would offset the minimal reduction in the open space on the parcel adjacent to 7 WTC, which may be required if Greenwich Street is opened to traffic. The Proposed GPP Amendments would not alter the conclusions of the ROD with respect to urban design and visual resources.

## **NEIGHBORHOOD CHARACTER**

The Proposed GPP Amendments would not result in significant adverse impacts on the various environmental categories that together comprise neighborhood character, including: land use, zoning, and public policy; socioeconomic conditions; community facilities; open space and recreational resources; urban design and visual resources; traffic; and noise. Rather, the project is the centerpiece of the planned revitalization of Lower Manhattan and is expected to improve the character of the neighborhood. Therefore, the Proposed GPP Amendments would not alter the ROD conclusions with respect to neighborhood character.

## **HAZARDOUS MATERIALS**

While the Proposed GPP Amendments would modify the boundaries of the project site, no additional in-ground disturbance would result as compared to previous environmental documents prepared by LMDC and the Port Authority. The Proposed GPP Amendments would not change the physical location of proposed subgrade construction activities on the project site, result in new areas of subgrade construction as compared to the Approved Plan, or result in the storage or use of additional hazardous materials once the new structures are operational. As with the Approved Plan, all construction activities would be performed in accordance with an approved Health and Safety Plan (HASP), which will include provisions for any contaminated materials that are encountered during construction, in compliance with federal, state, and local regulations. Therefore, the Proposed GPP Amendments would not alter the ROD conclusions with respect to hazardous materials.

## **NATURAL RESOURCES**

The 2006 EA included a revised analysis of potential natural resources impacts as a result of the reduction of in use of Hudson River water for cooling of heating, ventilation, and air conditioning systems within the project site, the elimination of an oil-water separator, and changes to the dimensions of Towers 2, 3, and 4 to accommodate cooling towers. It concluded that no adverse impacts to surface waters or other natural resources would result. The Proposed GPP Amendments would not introduce any changes to the cooling system or result in other changes to surface waters as compared to the 2006 EA, and the LEED Gold Alternative Path would likely result in benefits to natural resources (e.g., through design aspects encouraging the use of captured stormwater). Therefore, the Proposed GPP Amendments would not alter the ROD conclusions with respect to natural resources.

## **WATERFRONT REVITALIZATION PROGRAM**

The Proposed GPP Amendments would not affect the elements of the Approved Plan that are within the coastal zone, and would not affect the ROD conclusions that the Approved Plan is consistent with the 10 City coastal zone policies.

## **INFRASTRUCTURE AND ENERGY**

### *WATER*

The FGEIS provided estimates of potable water consumption and sanitary sewage and stormwater generation on the project site based on rates presented in the *New York City Environmental Quality Review (CEQR) Technical Manual* and concluded that the Approved Plan would not result in significant adverse impacts with respect to potable water consumption and sanitary sewage and stormwater discharges and that the Sustainable Design Guidelines would reduce potable water consumption and sanitary sewage and stormwater discharges by 30 percent as compared to the CEQR-generated rates. Further, the 2006 EA included a revised infrastructure analysis to assess the proposed increase in consumption of potable water due to the individual cooling towers and refrigeration plants. The 2006 EA also considered the potential for adverse stormwater impacts due to the removal of the oil-water separator. It was determined that the conclusions of the ROD would not change with respect to infrastructure.

The Proposed GPP Amendments would not result in additional potable water consumption or stormwater discharge as compared to the Approved Plan. Further, the LEED Gold Alternative Path would encourage the reduction of water consumption and the reuse of stormwater comparable to the Sustainable Design Guidelines. Therefore, the Proposed GPP Amendments and the LEED Gold Alternative Path would not affect the conclusions of the ROD with respect to water consumption and sanitary and stormwater discharge.

### **SOLID WASTE AND SANITATION SERVICES**

The FGEIS provided estimates of solid waste generation on the project site based on rates presented in the *CEQR Technical Manual* and concluded that the Approved Plan would not result in significant adverse impacts with respect to solid waste and sanitation services and that the Sustainable Design Guidelines would further reduce solid waste generation as compared to the CEQR-generated rates.

With the Proposed GPP Amendments, the overall reduction in the programming of uses on the project site would result in decreased generation of solid waste and demand for sanitation services as compared to the analysis presented in the FGEIS. Further, like the Sustainable Design Guidelines, the LEED Gold Alternative Path would encourage the reduction of solid waste generation on the project site. Therefore, the Proposed GPP Amendments and the LEED Gold Alternative Path would not affect the conclusions of the ROD with respect to solid waste and sanitation services.

### **ENERGY**

The FGEIS provided estimates of energy demand on the project site based on rates presented in the *CEQR Technical Manual* and concluded that the Approved Plan would not result in significant adverse impacts with respect to energy demand and that the Sustainable Design Guidelines would reduce energy demand by 20 percent as compared to the CEQR-generated rates. The 2006 EA included an analysis of the increased energy demand due to the use of cooling tower systems. It concluded that, along with sustainable design measures, use of the cooling tower systems would not affect the conclusions of the ROD.

With the Proposed GPP Amendments, the overall reduction in the programming of uses on the project site would result in decreased energy demand as compared to the Approved Plan. Further, the LEED Gold Alternative Path would result in several energy-saving design elements and reduced energy consumption comparable to the Sustainable Design Guidelines. Therefore, the Proposed GPP Amendments and the LEED Gold Alternative Path would not affect the conclusions of the ROD with respect to energy.

### **VEHICULAR TRAFFIC AND PARKING**

A travel demand analysis has been prepared to estimate the change in person and vehicle trips with the Proposed GPP Amendments as compared to analysis presented in the FGEIS, and the results are shown in Tables 2 and 3. As shown, the Proposed GPP Amendments would result in an overall reduction in person and vehicle trips at the project site as compared to the program analyzed in the FGEIS.

The Proposed GPP Amendments would reduce the number of vehicle trips by a total 155, 54, and 198 in the AM, midday, and PM peak hours as compared to analysis presented in the FGEIS, and there would be a decrease in build traffic volumes at certain study area intersections with the Proposed GPP Amendments as compared to the FGEIS build volumes. Because the Proposed GPP Amendments would result in a reduction in automobile trips to and from the project site, there would also be a reduction in demand for parking as compared to the analysis presented in the FGEIS. However, LMDC would not revise the traffic mitigation plan presented in the ROD, so that build traffic and parking conditions with the Proposed GPP Amendments would be the same as or better than those predicted in the FGEIS.

The Proposed GPP Amendments would facilitate the potential opening of Greenwich Street between Barclay and Vesey Streets. This section of Greenwich Street would serve southbound traffic and would connect with the extension of Greenwich Street through the project site. This would allow a portion of background traffic and trips destined for the project site from the north to travel a complete journey via Greenwich Street, instead of turning from Greenwich Street onto Park Place and then south to West Broadway.

**Table 2**  
**Comparison of Person Trips Generated by the Proposed GPP Amendments Development Program and the FGEIS Development Program**

Peak Hour	Program	Auto	Taxi	Subway	Local Bus	Express Bus	PATH	Ferry	Walk / Other	Total
AM	Proposed GPP Amendments	1,143	1,101	14,731	652	1,982	4,091	933	8,589	33,221
	FGEIS	1,379	1,576	16,534	766	2,181	4,341	1,055	9,598	37,430
	Net Change	- 236	- 475	- 1,803	- 114	- 199	- 250	- 122	- 1,009	- 4,209
Midday	Proposed GPP Amendments	1,523	1,676	5,743	1,303	1,760	1,185	421	34,019	47,630
	FGEIS	1,955	2,587	8,597	1,535	2,909	1,505	616	35,574	55,279
	Net Change	- 432	- 911	- 2,854	- 232	- 1,149	- 320	- 195	- 1,555	- 7,649
PM	Proposed GPP Amendments	1,358	1,506	14,291	1,034	2,464	3,771	947	7,815	33,186
	FGEIS	1,938	2,839	18,587	1,258	3,384	4,273	1,221	8,545	42,043
	Net Change	- 580	- 1,333	- 4,296	- 224	- 920	- 502	- 274	- 730	- 8,857

**Notes:** Numbers reflect total two-way trips for all project components.  
**Source:** World Trade Center Memorial and Redevelopment Plan Final Generic Environmental Impact Statement (April 2004)

**Table 3**  
**Comparison of Vehicle Trips Generated by the Proposed GPP Amendments Development Program and the FGEIS Development Program**

Peak Hour	Program	Auto	Taxi	Tour Bus	Delivery	Total
AM	Proposed GPP Amendments	737	1306	8	352	2,403
	FGEIS	782	1394	8	374	2,558
	Net Change	- 45	- 88	0	- 22	- 155
Midday	Proposed GPP Amendments	908	1,502	46	394	2,850
	FGEIS	988	1450	52	414	2,904
	Net Change	- 80	52	- 6	- 20	- 54
PM	Proposed GPP Amendments	764	1502	29	66	2,361
	FGEIS	839	1596	38	86	2,559
	Net Change	- 75	- 94	- 9	- 20	- 198

**Notes:** Numbers reflect total two-way trips for all project components.  
**Source:** World Trade Center Memorial and Redevelopment Plan Final Generic Environmental Impact Statement (April 2004)

Three intersections were selected to assess the potential impacts of opening Greenwich Street between Barclay and Vesey Streets: 1) West Broadway at Barclay Street; 2) West Broadway and Greenwich Street at Vesey Street; and 3) Greenwich Street at Barclay Street. Analysis was performed for the 2015 future condition for the AM, midday and PM peak hours.

With the block of Greenwich Street fully accessible, there would be localized diversions of traffic along Greenwich Street and West Broadway in the vicinity of Barclay Street and Vesey Street. Approximately 300 vehicles per hour (vph) would use the new link during the AM peak hour, with about 80 vph turning left onto Vesey Street and 220 vph continuing through on Greenwich Street. During the midday peak hour, about 245 vph would use the block, with 75 vph turning left and about 170 vph going through. During the PM peak hour, there would be 220 vph; 80 vph would turn left onto Vesey Street, and 140 vph would continue straight. Furthermore, volumes

that would use the opened Greenwich Street section would be diverted from the West Broadway through movements at Barclay Street and Vesey Street as well as the West Broadway left-turn onto Vesey Street.

The intersection of West Broadway and Greenwich Street with Vesey Street would require a new approach for the open block as well as a third signal phase for Greenwich Street traffic. The new approach adjacent to 7 WTC would consist of two moving lanes. The intersection's cycle length would remain at 90 seconds for all periods, but the green-time splits would be specifically modified to accommodate traffic demand during the three peak hours.

Table 4 shows the analysis results alongside the results of the FGEIS and the Pre-September 11, 2001 No Action condition, by which all significant adverse impacts were determined. As shown, no new impacts would be created due to the potential opening of Greenwich Street. Furthermore, the significant adverse impact at Barclay Street and West Broadway during the AM and PM peak hours, identified in the FGEIS, would remain unchanged because the Greenwich Street extension would not impact volumes along Barclay Street.

Therefore, the Proposed GPP Amendments, including the potential opening of Greenwich Street between Barclay and Vesey Streets, would not alter the ROD conclusions with respect to traffic and parking.

### **TRANSIT AND PEDESTRIANS**

As shown in Table 2, the Proposed GPP Amendments would result in a reduction in subway, local and express bus, PATH, and ferry trips as compared to the analysis presented in the FGEIS. The Proposed GPP Amendments would also result in a reduction in walk trips within and surrounding the project site. However, the potential opening of Greenwich Street between Barclay and Vesey Streets would create new pedestrian crosswalks and signal timing modifications at the intersection of Greenwich, West Broadway, and Vesey Streets that were not previously analyzed.

For the purpose of the FGEIS analyses, it was assumed that Greenwich Street between Barclay Street and Vesey Street was closed to vehicular traffic and that the Greenwich Street, West Broadway, Vesey Street intersection would be controlled by a two-phase signal. The north and south crosswalks were allotted 14 seconds of green time for pedestrians corresponding with the green time provided for eastbound and westbound traffic on Vesey Street. The east and west crosswalks were allotted 56 seconds of green time for pedestrians corresponding with the southbound traffic on West Broadway. The green time allotted for these pedestrian movements was the same for the AM, midday, and PM peak periods. The assumptions used in the FGEIS crosswalk analysis are summarized in Table 5.

It was assumed in the FGEIS that new crosswalks proposed for the project site would be 15 feet wide. Based on the pedestrian analysis results, the FGEIS reported that the west crosswalk at the Greenwich Street, West Broadway, Vesey Street intersection would be impacted in 2015 during the midday peak period, and as stated in the FGEIS and ROD, this impact could be mitigated by a widening to 20 feet.

The Proposed GPP Amendments would allow for the potential future extension of Greenwich Street between Barclay and Vesey Streets, and as a result, the Greenwich Street, West Broadway, Vesey Street intersection would be controlled by a three-phase signal instead of a two-phase signal resulting in a modification of the green time for each phase. The revised traffic signal timing for this intersection would also vary by time period to account for variances in traffic patterns throughout the day. As a result of this revised timing plan, the pedestrian crossing time would increase for the north and south crosswalks and would decrease for the east and west crosswalks. In the FGEIS analysis, pedestrians were allowed to cross both the east and west crosswalks while southbound traffic on West Broadway was permitted to move. With the Proposed GPP Amendments analysis, however, pedestrians using the west crosswalk

**Table 4**

**Capacity Analysis of Greenwich Street and West Broadway Intersection for the 2015 Pre-September 11, 2001 No Action Scenario, 2015 GPP, and 2015 Proposed GPP Amendments**

Intersection and Approach	Pre 9/11 2015 No Action				2015 GPP				2015 Proposed GPP Amendments				
	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	Mvt.	V/C	Control Delay	LOS	
<b>AM Peak Hour (8:15 - 9:15 AM)</b>													
<i>West Broadway at Barclay Street</i>													
West Broadway	SB	TR	0.57	11.9	B	TR	0.87	19.3	B	TR	0.63	12.9	B
Barclay Street	WB	LT	0.90	41.2	D	LT	0.99	57.6	E	LT	0.99	57.6	E
Overall Intersection		-	0.71	23.1	C	-	0.92	31.3	C	-	0.79	30.2	C
<i>West Broadway/Greenwich Street at Vesey Street</i>													
Greenwich Street	SB	-	-	-	-	-	-	-	-	LT	0.70	40.5	D
West Broadway	SB	L	1.21	180.0	F	L	0.88	44.0	D	L	0.73	29.6	C
		R	0.77	29.4	C	LT	0.88	36.3	D	LT	0.74	24.7	C
Vesey Street	EB	T	0.39	16.2	B	TR	0.77	30.3	C	TR	0.93	43.6	D
	WB	T	0.23	14.6	B	-	-	-	-	-	-	-	-
Overall Intersection		-	0.80	77.1	E	-	0.83	35.4	D	-	0.80	35.0	C
<i>Greenwich Street at Barclay Street</i>													
Greenwich Street	SB	T	-	-	-	-	-	-	-	T	0.68	28.2	D
		R	0.05	11.5	B	R	0.08	14.3	B	R	0.08	14.3	B
<b>Midday Peak Hour (12:00 - 1:00 PM)</b>													
<i>West Broadway at Barclay Street</i>													
West Broadway	SB	TR	0.43	10.4	B	TR	0.82	17.4	B	TR	0.63	12.9	B
Barclay Street	WB	LT	0.46	21.3	C	LT	0.72	27.9	C	LT	0.72	27.9	C
Overall Intersection		-	0.45	13.7	B	-	0.78	20.2	C	-	0.67	17.8	B
<i>West Broadway/Greenwich Street at Vesey Street</i>													
Greenwich Street	SB	-	-	-	-	-	-	-	-	LT	0.67	41.8	D
West Broadway	SB	L	0.63	22.7	C	L	0.67	31.1	C	L	0.62	29.3	C
		R	0.83	33.3	C	LT	0.67	28.4	C	LT	0.64	24.8	C
Vesey Street	EB	T	0.32	15.4	B	TR	0.89	36.8	D	TR	0.95	42.4	D
	WB	T	0.23	14.6	B	-	-	-	-	-	-	-	-
Overall Intersection		-	0.57	21.0	C	-	0.78	32.9	C	-	0.78	35.8	D
<i>Greenwich Street at Barclay Street</i>													
Greenwich Street	SB	T	-	-	-	-	-	-	-	T	0.59	24.6	C
		R	0.19	12.5	B	R	0.39	19.6	C	R	0.39	19.6	C
<b>PM Peak Hour (5:00 - 6:00 PM)</b>													
<i>West Broadway at Barclay Street</i>													
West Broadway	SB	TR	0.54	11.5	B	TR	0.82	17.3	B	TR	0.67	13.4	B
Barclay Street	WB	LT	0.97	51.7	D	LT	1.08	83.1	F	LT	1.08	83.1	F
Overall Intersection		-	0.73	28.7	C	-	0.94	41.1	D	-	0.85	42.5	D
<i>West Broadway/Greenwich Street at Vesey Street</i>													
Greenwich Street	SB	-	-	-	-	-	-	-	-	LT	0.48	35.7	D
West Broadway	SB	L	1.25	149.4	F	L	0.83	39.2	D	L	1.06	95.0	F
		R	0.95	49.2	D	LT	0.82	33.4	C	LT	0.92	38.7	D
Vesey Street	EB	T	0.33	15.5	B	TR	0.94	41.6	D	TR	0.95	41.4	D
	WB	T	0.25	14.7	B	-	-	-	-	-	-	-	-
Overall Intersection		-	0.79	64.7	E	-	0.89	38.2	D	-	0.90	45.2	D
<i>Greenwich Street at Barclay Street</i>													
Greenwich Street	SB	T	-	-	-	-	-	-	-	T	0.62	29.4	D
		R	0.06	11.9	B	R	0.02	15.4	C	R	0.02	15.4	C

**Note:** Shaded cells indicate a significant adverse impact. The significant adverse impact would be the same for the GPP and the Proposed GPP Amendments.

**Table 5**  
**FGEIS Crosswalk Analysis Assumptions for the Intersection**  
**of Greenwich Street, West Broadway, and Vesey Street**

Peak Period	Crosswalk Location	Conflicting Vehicle Movement	Pedestrian Green Time
AM	North	0	14
	East	12	56
	South	7	14
	West	7	56
MD	North	0	14
	East	8	56
	South	9	14
	West	8	56
PM	North	0	14
	East	12	56
	South	9	14
	West	8	56

**Table 6**  
**Proposed GPP Amendments Crosswalk Analysis Assumptions for the**  
**Intersection of Greenwich Street, West Broadway, and Vesey Street**

Peak Period	Crosswalk Location	Conflicting Vehicle Movement	Pedestrian Green Time
AM	North	0	24
	East	12	33
	South	5	24
	West	0	45
MD	North	0	30
	East	8	29
	South	7	30
	West	0	39
PM	North	0	29
	East	12	27
	South	7	29
	West	0	40

would cross during both the southbound Greenwich Street and southbound West Broadway phases while pedestrians using the east crosswalk would only cross during the southbound West Broadway phase. The assumptions used in the revised crosswalk analysis for the Greenwich Street, West Broadway, Vesey Street intersection are summarized in Table 6. Furthermore, if Greenwich Street is opened to traffic, it is contemplated that the north and south crosswalks would be 15 feet wide, the east crosswalk would be 22 feet wide, and the west crosswalk would be 24 feet wide. These proposed crosswalk widths are typical for intersections throughout Manhattan.

Table 7 presents the analysis of crosswalks at the Greenwich Street, West Broadway, Vesey Street intersection with the proposed GPP Amendments. Based on the CEQR criteria, there would be no significant adverse pedestrian impacts at this location in the AM, midday, and PM peak periods.

**Table 7**

**Pedestrian Crosswalk Analysis of Greenwich Street, West Broadway, Vesey Street Intersection for the 2015 Proposed GPP Amendments Condition**

Crosswalk Analysis	AM Peak Period				Midday Peak Period				PM Peak Period			
	North	East	South	West	North	East	South	West	North	East	South	West
Level of Service (LOS)	E	D	C	D	E	D	D	D	E	D	C	D
Square Foot Per Pedestrian	9	15	25	18	13	15	19	15	10	15	27	15

Therefore, the Proposed GPP Amendments, including the potential opening of Greenwich Street between Barclay and Vesey Streets, would not alter the ROD conclusions with respect to transit and pedestrians.

### AIR QUALITY

The FGEIS examined project-generated mobile source emissions at three locations: 1) Route 9A/West Street at Vesey Street; 2) Route 9A/West Street between Albany and Liberty Streets; and 3) Greenwich Street between Fulton and Liberty Streets. These locations were selected because the incremental increase in vehicle volumes from project-generated trips would be the highest of all of the study area intersections (upwards of 1,375 vehicles during peak hours), which would result in the highest incremental increase in vehicle emissions as compared to the No Action Alternative. The FGEIS concluded that project-generated trips would not result in significant adverse impacts at these locations. The FGEIS also concluded that impacts on air quality at any other location that would be impacted by the Project would be lower than those presented for the three analysis locations, and since no significant adverse air quality impacts were predicted at the three worst-case intersections, none would be expected at any other intersections within the study area, including those defined as level of service D, E, or F.

As described in the "Vehicular Traffic and Parking" section above, the Proposed GPP Amendments would result in a reduction in vehicle trips as compared to the analysis presented in the FGEIS, and there would be a corresponding reduction in project-generated mobile source emissions at many of the receptor sites analyzed in the FGEIS.

The Proposed GPP Amendments would allow for the possible future extension of Greenwich Street between Barclay and Vesey Streets. As described above in the Vehicular Traffic and Parking section, the potential opening of this segment of Greenwich Street would divert traffic from West Broadway to Greenwich Street. These diversions would not change vehicle volumes at the intersections of Greenwich Street and Park Place or Greenwich Street, West Broadway, and Vesey Street, and they would reduce volumes at the intersections of West Broadway and Park Place and West Broadway and Barclay Street. However, there would be an increase in volumes at the intersection of Greenwich and Barclay Streets, which would range from 220 to 300 vph during peak hours. As described above, the FGEIS did not identify significant adverse air quality impacts at receptors with a predicted increase of 1,375 vph; therefore, the potential 300 vph increase in volumes at the intersection of Greenwich and Barclay Streets would also not result in significant adverse air quality impacts.

The Proposed GPP Amendments would reduce the overall programming of space at the project site, which would not increase demand for and emissions from heating, air conditioning, and ventilation systems within the project site, and stationary source emissions with the Proposed GPP Amendments would be lower than those previously predicted for Approved Plan.

Therefore, the Proposed GPP Amendments, including the potential opening of Greenwich Street between Barclay and Vesey Streets, would not alter the ROD conclusions with respect to air quality.

**NOISE**

As described in the "Vehicular Traffic and Parking" section above, the Proposed GPP Amendments would result in a reduction in vehicle trips as compared to the analysis presented in the FGEIS, and there would be a corresponding reduction in project-generated noise at many of the receptor sites analyzed in the FGEIS.

As described above, the proposed extension of Greenwich Street would result in an increase in volumes at its intersection with Barclay Street since vehicles would be diverted from West Broadway. The intersection of Greenwich Street and Barclay Street is adjacent to two sensitive noise receptors: 1) Fitterman Hall (institutional use) and 2) the parcel adjacent to 7 WTC (open space). However, both of these receptors are also bounded by West Broadway. Therefore, although there would be a diversion of traffic from West Broadway to Greenwich Street, the volumes passing total traffic volumes passing these receptor sites would not change, and there would not be a substantial change in noise for sensitive receptor sites as compared to the FGEIS.

Therefore, the Proposed GPP Amendments, including the potential opening of Greenwich Street between Barclay and Vesey Streets, would not alter the ROD conclusions with respect to noise.

**CONSTRUCTION IMPACTS**

The 2006 EA included an analysis of a revised construction schedule for the World Trade Center Memorial and Redevelopment Plan, and concluded that the revised schedule would not alter the conclusions of the ROD with respect to construction impacts and mitigation measures. The Proposed GPP Amendments would not change the construction schedule as compared to the 2006 EA, and construction activities undertaken by the Net Lessees pursuant to the LEED Gold Alternative Path would continue to conform to the Environmental Performance Commitments for the Lower Manhattan Recovery Projects. Therefore, the Proposed GPP Amendments and the LEED Gold Alternative Path would not alter the conclusions of the ROD with respect to construction impacts and mitigation measures.