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FTA
Federal Transit Administration

Approach to Cumulative Effects Analysis for the Lower Manhattan Recovery Effort

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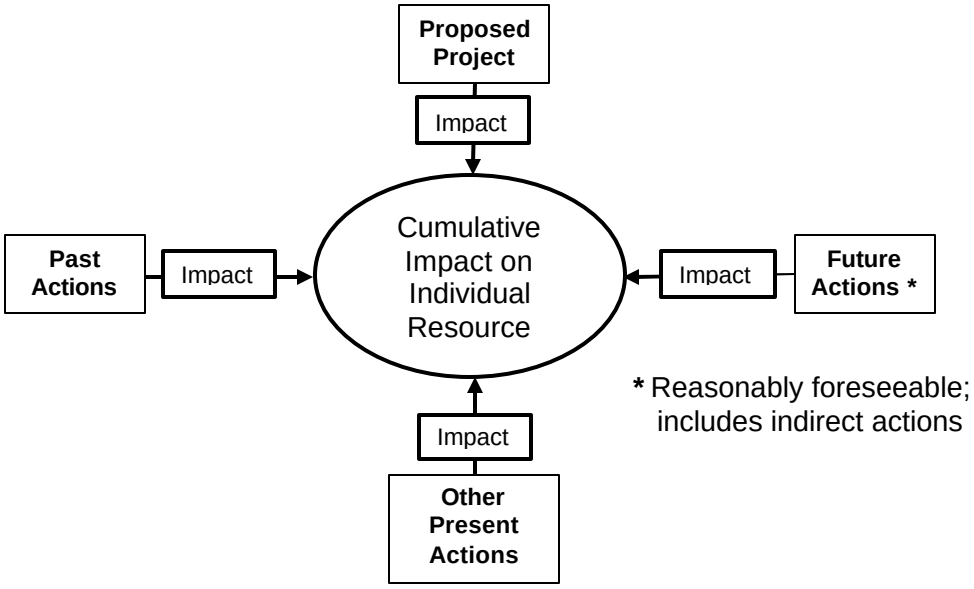
The goal of the cumulative effects analysis for the Lower Manhattan Transportation Recovery Projects is to provide decision makers and the public considering the implementation of individual projects with comprehensive information on the combined effects of many actions over time. According to the U.S. Environmental Protection Agency (EPA):

While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (federal, non-federal, or private) is taking the actions. (U.S. EPA, "Consideration Of Cumulative Impacts In EPA Review of NEPA Documents", EPA 315-R-99-002, May 1999.)

In general terms, cumulative effects may arise from single or multiple actions, and may result in additive or interactive effects. Figure A illustrates the potential sources of impacts associated with both project specific activities and the effects of other projects that must be addressed as part of the cumulative effects analysis.

Figure A – Sources of Cumulative Impacts



Source: U.S. DOT, FHWA, "Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process", January 31, 2003.

Cumulative Effects Analysis Approach

The Federal Transit Administration's (FTA) approach to a cumulative effects analysis associated with the restoration and rebuilding of transportation infrastructure in Lower Manhattan can be described as a "*coordinated cumulative effects analysis*." This approach to the cumulative effects analysis would maintain the individual flexibility needed to advance each project as swiftly as possible while providing decision-makers and the public with an understanding of cumulative effects associated with each project. The foundation of this approach is based on two important principles:

- A commitment to the application of a single, consistent framework, methodology and set of assumptions for the evaluation of cumulative effects across projects; and

- Adherence to environmental performance commitments to reduce the potential for adverse impacts across projects, and to lower the potential severity or magnitude of the adverse impacts.

The approach is consistent with the placement of the Lower Manhattan Transportation Recovery Projects are on the national project priority list created as a result of the President's September 18, 2002 Executive Order *Environmental Stewardship and Transportation Infrastructure Project Reviews*. On February 27, 2003 U.S. Transportation Secretary Mineta announced the selection of the Lower Manhattan Recovery Projects as part of a group of nationally recognized transportation projects designated to receive high-level attention from a Cabinet-level Task Force to avoid potential associated with environmental issues. This designation as priority projects will help to expedite the rebuilding of the transportation system in the aftermath of the events on September 11, 2001 to restore lost infrastructure and replace functionality. The proposed approach for the *coordinated cumulative effects analysis* assumes that each transportation project will have the ability to advance at its own pace, and supports the advancement of the first three projects identified in the February 6, 2003 letter from New York Governor George Pataki: the World Trade Center Transportation Hub (PANYNJ); the Fulton Street Transit Center (MTA); and the South Ferry Subway Terminal (MTA).

The approach will be coordinated under the *Memorandum of Understanding – Environmental Coordination and Review Among the Federal Partners*, which was signed by the participating federal agencies in August of 2002. The key features and benefits of the *coordinated cumulative effects analysis* are:

- **Promoting Efficient Project Delivery and Environmental Stewardship -** The *coordinated cumulative effects analysis* approach creates an opportunity for environmental stewardship through the comprehensive and proactive consideration of environmental factors, while incorporating measures to streamline both the environmental process and overall project delivery. This approach enhances environmental management principles in the traditional "identify-impact-mitigate" framework for the NEPA process, by proactively managing the avoidance and reduction of impacts through the adoption of environmental performance commitments. These environmental performance commitments, known as EPCs, would involve environmentally-friendly design features or construction practices that would preserve the capacity of the environment to accommodate implementation of all of the transportation recovery projects. The EPCs would sustain or enhance the long-term capacity of the resources of concern in Lower Manhattan (e.g. access and circulation, air quality, noise, cultural resources, and economic factors) to absorb changes and impacts associated with transportation project delivery, and would maintain or improve their condition.

- **Advancing Each Project Independently, but in a Coordinated Manner -** The proposed *coordinated cumulative effects analysis* is a "building-block" approach, managed to reduce redundancy and foster consistency across projects, and to ensure that opportunities for reductions in potential adverse cumulative effects are made on each and every project. This is

achieved through the progressive completion of the cumulative effects analysis on a project-by-project basis using a consistent set of analysis assumptions and methodologies in a common evaluation framework. Project sponsors would commit to the framework, assumptions, and methodologies in advance of initiating the NEPA process. As each of the projects matures through the NEPA process, the knowledge gained will be incorporated as part of the cumulative effects analysis for each of the subsequent projects. As each of the Lower Manhattan Transportation Recovery Projects is completed or as each analysis addresses the environmental resource areas for cumulative effects, the identified associated impacts will be incorporated into the analysis for future projects as "background impacts." This will allow for progressive, up to date, real-time cumulative effects analysis.

- **Focusing Attention on Critical Environmental Factors -** The cumulative effects analysis will be focused only on those environmental areas identified as subject to potentially significant adverse cumulative effects. In a coordinated effort, the Federal partners and project sponsors identified five key environmental assessment areas as having the highest potential: air quality, access and circulation, noise and vibration, cultural and historic resources, and economic factors. The local project sponsors are advancing the development of the specific technical methodologies to support the *coordinated cumulative effects analysis* during the NEPA review of each project, in cooperation with FTA and EPA. The technical methodologies will address data sources, assumptions, analytical parameters, analysis characteristics, and approach.

Next Steps and Recommendations

The following actions are required to advance the *coordinated cumulative effects analysis* for the Lower Manhattan Transportation Recovery Projects:

- Finalize implementation of the approach with project sponsors, including the application of technical methodologies and the adoption of environmental performance commitments (EPCs) for each of the five environmental areas of concern (air quality, noise and vibration, access and circulation, cultural and historic resources, and economic factors).

- Continue coordination with EPA and the Federal partners to assess progress on implementation of the approach.

- Provide technical support to project sponsors during advancement of the environmental process for Fulton Street Transit Center "demonstration" project, and other projects as they advance.

- Conduct a Peer Review of the *coordinated cumulative effects approach* during implementation.

- Document the demonstration project methodologies and process for use by future projects.

1.0 Introduction

1.1 Overview and Purpose

The Federal Transit Administration (FTA) Lower Manhattan Recovery Office (LMRO) is charged with oversight of the restoration and reconstruction of transportation infrastructure damaged or otherwise adversely impacted by the September 11, 2001 terrorist attacks. The Lower Manhattan recovery effort includes a number of identified transportation improvement projects in the affected area. The LMRO is responsible for ensuring that project planning and development activities for these projects are completed in accordance with the intent and requirements of the National Environmental Policy Act (NEPA) and related environmental laws and regulations.

The FTA and representatives of other Federal agencies have formalized their commitment to prevent project delays by partnering to develop environmentally responsible projects using a streamlined yet environmentally responsible process that completes the review of projects under NEPA and associated laws. The basis for this coordinated and streamlined project delivery process is provided by the *Memorandum of Understanding – Environmental Coordination and Review Among the Committee (ECR MOU)*, dated August, 2002 (Appendix A). The agencies that are party to the MOU are as follows: Federal Emergency Management Agency, Federal Transit Administration, Federal Highway Administration, US Department of Housing and Urban Development, US Environmental Protection Agency, US Army Corps of Engineers, US Coast Guard, US Fish and Wildlife Service, National Marine Fisheries Service, New York State Urban Development Corporation d/b/a the Empire State Development Corporation, and the Lower Manhattan Development Corporation. These Federal partners have committed to expediting environmental reviews for projects associated with the recovery effort by adhering to specific review periods during the environmental process.

In accordance with the agreement between FTA and the Federal Emergency Management Agency (FEMA) regarding administration and oversight of the federal funds in the Supplemental Appropriations Act, FTA is the lead federal agency responsible for coordinating the environmental review of $4.55 billion of transportation restoration and improvement projects and programs under NEPA and related laws and regulations. In a letter dated November 18, 2002, FEMA transitioned the Federal leadership for environmental management to FTA as part of the transition from the initial disaster recovery phase to the long-term project recovery phase (Appendix B). The NEPA review and related environmental laws and regulations apply to projects to replace, rebuild and enhance transportation infrastructure in Lower Manhattan under the $4.55 billion *Supplemental Appropriations Act for Further Recovery From and Response To Terrorist Attacks on the United States* that was signed into law (P.L. 107-206) by President Bush in August 2, 2002.

Through a coordinated process, the Transportation Working Group, a group of local decision–makers including the State of New York, the City of New York, the Metropolitan Transportation Authority, the Port of New York and New Jersey and the Lower Manhattan Development Corporation, set forth a list of three priority projects and other additional projects that were formally identified by New York Governor George Pataki. (see Appendix C - February 6, 2003 letter from Governor Pataki to FEMA and FTA). These three projects (and sponsoring agencies) are as follows**:**

- The Fulton Street Transit Center (MTA)
- The South Ferry Subway Terminal (MTA)
- The World Trade Center Transportation Hub (PANYNJ)

On February 27, 2003, U.S. Transportation Secretary Norman Y. Mineta announced the selection of the Lower Manhattan Transportation Recovery Projects as part of a group of nationally recognized transportation projects designated to receive bring high-level attention under President Bush's September 18, 2002 Executive Order 13274, *Environmental Stewardship and Transportation Infrastructure Project Review.* (Appendix D). This designation as priority projects will help expedite the rebuilding of the transit system damaged in the terrorist attacks as these projects advance through the environmental review process under NEPA. The Executive Order calls for a Cabinet-level task force that is chaired by Secretary Mineta and includes representation such as the Administrator of the Environmental Protection Agency, Chair of the Advisory Council on Historic Preservation, Secretary of Agriculture, Secretary of Commerce, Sectary of Interior, and Chair of the Council on Environmental Quality. The task force will work to avoid project delays associated with environmental issues at the regional/local level for priority projects.

To expedite the recovery effort and accommodate the mix of federal funding sources, FTA is committed to streamlining the project delivery process while promoting environmental stewardship. This streamlined project delivery process, illustrated in Figure 1, is to be applied separately to each of the Lower Manhattan Recovery Transportation Projects. The process is predicated on the issuance of a single project grant from FTA to cover the project delivery from inception to construction. This single grant would identify a maximum level of federal funding and specific funding levels to be "drawn-down" by grantee as eligible costs are incurred for approved budget grant items. This process for the release of funding differs from the conventional FTA project delivery process for major capital investments by replacing multiple grants with a single grant instrument.

Due to the confluence of projects that are likely to be underway during the rebuilding of Lower Manhattan, a key issue in the consideration of environmental consequences during the NEPA review process for each project will be the evaluation of cumulative effects. This document has been prepared by the FTA to outline how the analysis of cumulative effects will be addressed during environmental review under NEPA for the restoration, reconstruction, and improvement of transportation projects in Lower Manhattan.

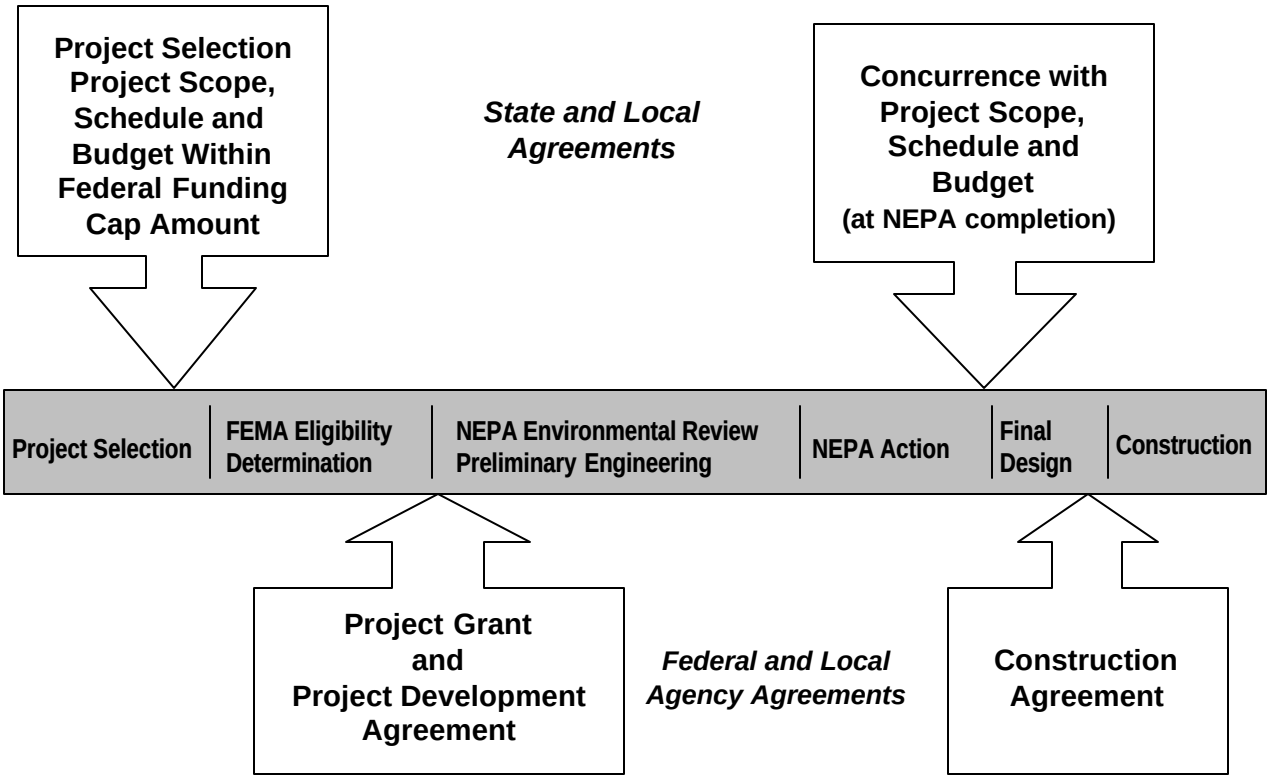
This document represents the first step in formalizing the proposed approach to address cumulative effects for the Lower Manhattan Recovery Projects. It is a working document that will form the basis for further coordination and discussion among the Federal Partners, local agencies, and sponsors of transportation projects funded by FTA as they develop and finalize an approach that consistently will be applied by the project sponsoring agencies. It outlines several fundamental findings based on coordination to date that serve as a foundation upon which to proceed with a *coordinated cumulative effects analysis*:

- For environmental review purposes, the "baseline" to be used for the "No Build" comparison required under NEPA and for the cumulative effects analysis will be defined as the existing conditions as of September 10, 2001. This baseline may be modified for analysis of construction impacts for five specific areas of concern (air quality, access and circulation, noise and vibration, cultural and historic resources, and economic factors) on an as needed basis.

- The transportation projects advanced as part of the Lower Manhattan recovery effort will apply a consistent approach for the evaluation of cumulative effects, based upon an adopted common approach, framework, and methodologies pre-approved by FTA in consultation with Federal partners and project sponsors.

- When applicable, each transportation project will address cumulative effects as part of its own independent NEPA review process, based upon the baseline and any other reasonably foreseeable projects that either have advanced, or are substantively advancing, through the project development process.

Figure 1 - Lower Manhattan Recovery Effort Project Delivery Process



Key Milestones for Each Project

Eligibility Determination by FTA and FEMA: As part of review and acceptance of each project, must determine if project meets eligibility for FEMA assistance.

Project Development Agreement between FTA and Project Sponsor: Agreement addressing environmental action necessary, project scope, schedule for project development and implementation, initial project budget, maximum amount of federal funding, and project management plan.

Single Project Grant from FTA: Single grant identifying a maximum level of federal funding and specific funding levels are available to be "drawn-down" by grantee as eligible costs are incurred for approved budget grant items.

Completion of NEPA and Preliminary Engineering and Concurrence of Governor and Transportation Working Group: Before FTA issues its environmental determination, need confirmation of project scope and budget from State and Local officials, with particular concern if project budget and federal funding request change from Project Development Agreement.

Independent Cost Estimate: FTA may decide to engage a second project management oversight review and an independent cost estimate during final design and prior to Construction Agreement.

Construction Agreement between FTA and Project Sponsor: Agreement identifying final project scope, baseline schedule, baseline cost estimate, maximum amount of federal funding, additional funding sources if necessary, protocols for project management and oversight, and environmental mitigation provisions.

- The cumulative effects analysis will be focused on those environmental factors of concern that have been identified as having significant potential for adverse cumulative effects. These are: air quality, access and circulation, noise and vibration, cultural and historic resources, and economic factors.

- A foundation of the cumulative effects analysis for these environmental factors of concern will be the adherence of the project sponsors to a set of adopted environmental performance commitments (EPCs) to lower the potential for adverse environmental impacts, thereby lessening the potential for each project to contribute to the overall adverse cumulative effects.

These findings are presented and discussed in more detail in the subsequent sections of this document.

It should be noted that the approach, framework and methodologies for the *coordinated cumulative effects analysis* are one component of the FTA's Environmental Management Oversight Plan for the Lower Manhattan Transportation Recovery Projects. The FTA-LMRO environmental oversight responsibilities are illustrated in Figure 2. As illustrated in Figure 2, FTA is performing three strategic environmental oversight functions: Customized Program Management and Coordination, Efficient Project Delivery, and Risk-Based Oversight. Under its goal of promoting efficient project delivery as part of it responsibilities in providing technical guidance, FTA is leading the development of a *coordinated cumulative effects analysis* framework to guide each of the Lower Manhattan Recovery Transportation Projects that restore, replace, and enhance the rebuilding of transportation infrastructure. A primary goal is to ensure that the *coordinated cumulative effects analysis* is an integrated part of FTA's overall monitoring and evaluation framework conducted by LMRO, so that outcomes of both the environmental review and the accompanying cumulative effects analysis will be factored into project decision-making.

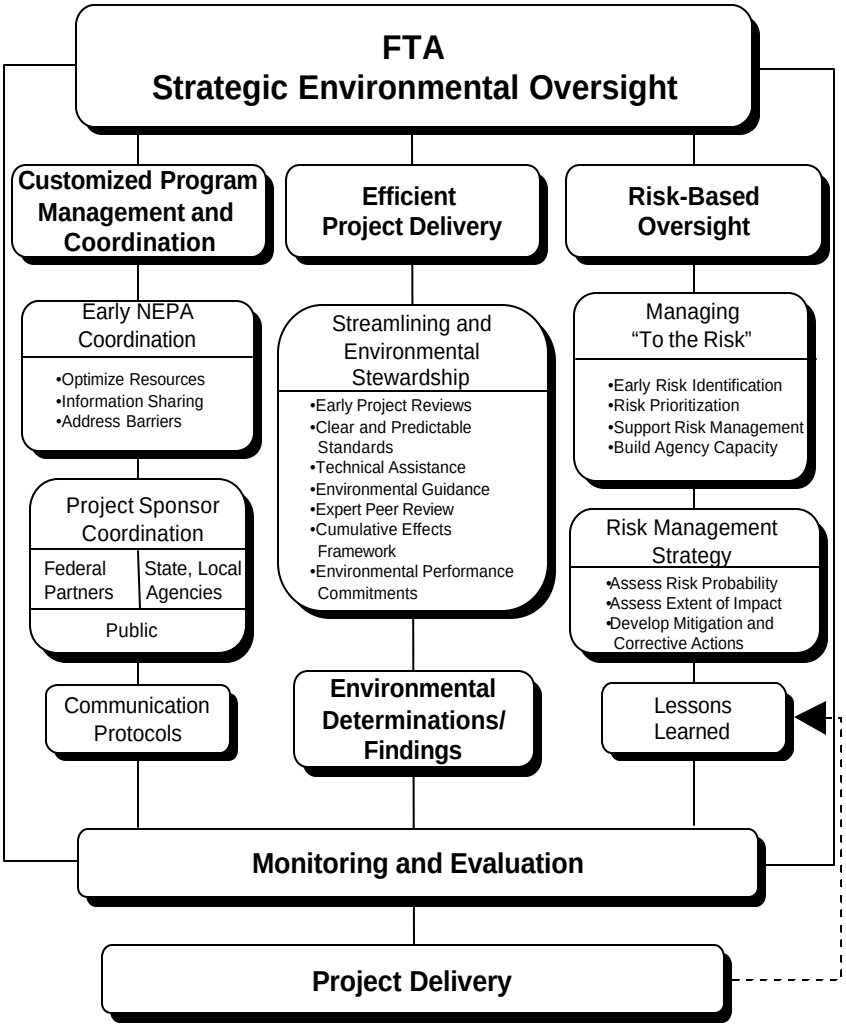
1.2 Document Organization

This document consists of the following sections:

- Section 1.0 – Introduction
- Section 2.0 – Background and Context
- Section 3.0 – Coordinated Cumulative Effects Analysis for Lower Manhattan Recovery Transportation Projects
- Section 4.0 – Implementation Roles and Responsibilities
- Section 5.0 – Next Steps and Recommendations
- Appendix A – August 2002 Memorandum of Understanding – *Environmental Coordination and Review Among the Federal Partners* (ECR MOU)
- Appendix B – November 18, 2003 Federal Emergency Management Agency (FEMA) Letter Regarding Transition of EPRC to FTA
- Appendix C – February 6, 2003 Governor George E. Pataki Letter to Mr. Allbaugh and Ms. Dorn on Recommended Projects for the Lower Manhattan Recovery Effort.
- Appendix D – February 27, 2003 U.S. Transportation Secretary Norman Y. Mineta Press Release Placing Lower Manhattan Recovery Projects on Priority List
- Appendix E – Stakeholder Environmental Review Commitments and Responsibilities

Section 1.0, Introduction, describes the project background and the purpose of this document. Section 2.0 frames the challenges and issues faced by FTA in addressing cumulative effects during the environmental review of proposed transportation project restoration or improvements in Lower Manhattan. Section 3.0 presents the proposed approach to the cumulative effects analysis for the Lower Manhattan

Figure 2 - FTA Strategic Environmental Oversight



Recovery Transportation Projects in terms of the relationship to the overall NEPA process, the specific analysis of the key areas in which cumulative effects are a concern, and the development of a "demonstration" project for the Fulton Street Transit Center. The roles of the major stakeholders in advancing the reconstruction and restoration of lost transportation functions and infrastructure in terms of their NEPA responsibilities and cumulative effects analysis are outlined in Section 4.0. Section 5.0 summarizes the next steps required to advance implementation of the proposed approach, with particular attention to issues requiring further coordination among stakeholders.

The Appendices contain supporting background materials leading to the development of the approach for *coordinated cumulative effects analysis*. The ECR MOU is included in Appendix A, and the FEMA letter transitioning the Federal environmental leadership to FTA is in Appendix B. Appendix C includes a letter from Governor George Pataki identifying a list of projects recommended for the Lower Manhattan recovery effort. Appendix D includes a Press Release by U.S. Transportation Secretary Norman Y. Mineta placing Lower Manhattan Recovery Transportation Projects on the Priority List. Appendix E describes in more detail stakeholder environmental review commitments and responsibilities.

2.0 Background and Context

This section:

- describes requirements for cumulative effects analysis under NEPA and the implications of these requirements for the Lower Manhattan recovery effort;
- documents the range of cumulative effects analysis approaches that were considered; and
- recommends an approach for the Lower Manhattan recovery effort.

2.1 Cumulative Effects Analysis Requirements

The analysis of potential cumulative effects is a crucial element in completing the NEPA environmental review process for the projects associated with the restoration, rebuilding and enhancement of transportation infrastructure in Lower Manhattan. The basic concept of a cumulative effects analysis is to identify and consider the total effects of many actions over time that would be missed by evaluating each action individually. The goal of cumulative effects analysis is to provide decision makers and the public considering the implementation of individual projects with comprehensive information on the potential changes in the affected environment conditions resulting from the combined, incremental impacts of the project action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). According to the U.S. EPA:

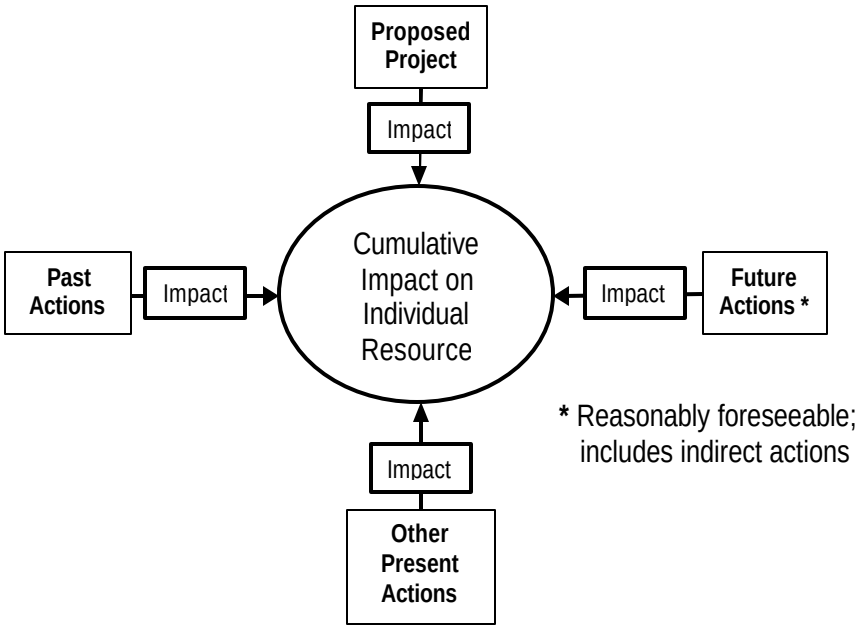
While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource no matter what entity (federal, non-federal, or private) is taking the actions. (U.S. EPA, "Consideration Of Cumulative Impacts In EPA Review of NEPA Documents", EPA 315-R-99-002, May 1999.)

In general terms, cumulative effects may arise from single or multiple actions, and may result in additive or interactive effects. According to a recent U.S. Department of Transportation, Federal Highway Administration document, "Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process" (January 31, 2003):

> *Cumulative impacts include the total of all impacts to a particular resource that have occurred, are occurring, and will likely occur as a result of any action or influence including the direct and reasonably foreseeable indirect impacts of a Federal activity. Accordingly, there may be different cumulative impacts on different environmental resources.*

Figure 3 (from the 2003 FHWA document noted above) illustrates the potential sources of impacts associated with both project specific activities and the effects of other projects that must be addressed as part of the cumulative effects analysis.

Figure 3 – Sources of Cumulative Impacts



Source: U.S. DOT, FHWA, "Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process", January 31, 2003.

2.2 Cumulative Effects Analysis - Approaches Considered

The development of a cumulative effects analysis approach for the Lower Manhattan recovery effort presents a number of unique challenges caused by the urgency of the rebuilding effort and the large number of projects and agencies. These challenges are defined by the following needs and conditions:

- **Maintain the autonomy of individual projects, as well as the flexibility to advance projects independently, but in a coordinated manner.** The initial transportation projects advancing under the Lower Manhattan recovery effort include the World Trade Center Transportation Hub (PANYNJ); Fulton Street Transit Center (MTA); and South Ferry Subway Terminal (MTA). These three projects are located in the same physical area, and are estimated to be complete between 2007 and 2009. In addition, there are other potential projects identified in Governor Pataki's letter (Appendix C) that would also be implemented within the same timeframe. Thus, the cumulative effects analysis framework must provide the flexibility to advance individual projects as each comes "on line". Yet, the analysis also must provide a mechanism for the systematic evaluation of the potential environmental effects in a comprehensive manner for subsequent projects.

- **Focus the environmental evaluation resources on those human and natural factors identified as potentially subject to significant adverse impacts as a result of cumulative effects.** A large volume of environmental analyses will be conducted as the transportation projects advance through the NEPA process. Consequently, the management and focusing of analysis of cumulative effects on the areas most likely to affect decision-making will be an important component of promoting understanding of the trade-offs and choices by decision-

makers and the public. Five areas of concern for cumulative effects analysis were identified during the initial FEMA scoping process as part of early NEPA activities for the initial disaster recovery phase. Following a meeting with the U.S. EPA on December 17, 2002, FTA subsequently refined and confirmed five areas of concern as: air quality, noise and vibration, access and circulation, cultural and historic resources, and economic considerations.

- **Meet the intent of NEPA with respect to cumulative effects analysis.** Although each project will advance independently, to meet the spirit and requirements under NEPA, each project must individually and collectively address cumulative effects.

FTA is committed to the following actions to manage the cumulative effects analysis to meet the needs and conditions stated above:

- **Early, proactive and continuous coordination with project sponsors and cooperating agencies.** Efficiencies in the environmental review process can be gained through early, focused coordination with project sponsors, cooperating agencies, and stakeholders to ensure that they understand roles and responsibilities with respect to the NEPA review process and the cumulative effects analysis. This shared understanding is essential to ensuring that the selected approach to cumulative effects analysis is coordinated and implemented across all transportation projects, irrespective of sponsoring agency.

- **Stewardship and streamlining through a common analysis framework**. A common analysis framework for the evaluation of cumulative effects across projects has the potential to be a valuable stewardship and streamlining tool. Stewardship and streamlining can be promoted by reducing the duplication of the analysis framework at the outset of each project, and by limiting the learning curve for both project sponsors and reviewers through standardization of the technical methodologies. An added benefit would be the familiarity provided for decision-makers and the general public. To be effective, there must be clear direction, widespread consensus and rigorous adherence to a standardized analysis framework among all the stakeholders.

- **Integrate cumulative effects analysis with NEPA process.** To be most effective, the cumulative effects analysis needs to be fully integrated into the NEPA decision-making process, and the timing of the cumulative effects analysis must be consistent with the overall timing of the NEPA project review.

- **Incorporate and enforce Environmental Performance Commitments**. The incorporation of environmental performance commitments within the cumulative effects analysis approach would potentially avoid and reduce adverse impacts, and provide flexibility for project sponsors to advance their projects in a streamlined environmental review process and fulfill environmental stewardship objectives. Examples of environmental performance commitments include the use of ultra low sulfur fuel in off-road construction vehicles, recycling of construction material and waste, “green” design of buildings, and implementation of other environmentally-friendly techniques.

Three conceptual approaches to address the cumulative effects analysis were considered:

A. ***Option 1*** - Comprehensive cumulative effects analysis of priority transportation projects as a precursor to the advancement of any individual project;

B. ***Option 2*** - Independent cumulative effects analysis on a project-by-project basis; and

C. ***Option 3*** - Coordinated cumulative effects analysis across individual projects.

The relative advantages and shortcomings of each of these concepts are discussed below. **FTA has elected to proceed with Option 3 - coordinated cumulative effects analysis.** This approach provides the flexibility to advance each project expeditiously in accordance with its own unique schedule, while still maintaining analytical consistency across projects. The reasons for this recommendation are detailed below. Table 1 compares the advantages and disadvantages of the three approaches.

Table 1 - Summary of Advantages and Disadvantages By Option

Options Considered for Cumulative Effects Analysis Approach	Advantages	Disadvantages
Option 1 – Comprehensive Cumulative Effects Analysis	• Analysis completed all at once. • Single methodology and set of assumptions ensure compatibility and comparability of findings. • A single analysis review for decision-makers and the public. • Early identification of opportunities to reduce adverse impacts.	• Delay in initial project start-up. • Timing is premature. • Lack of data availability and accuracy with respect to both project descriptions and potential impacts. • Limited shelf life could cause delays in projects as updates are completed.
Option 2 – Independent Cumulative Effects Analysis	• Projects can start immediately. • Uses most current data and assumptions. • Maintains total project autonomy.	• Variation in analysis and lack of comparability. • Difficulty for public and decision-makers to assess cumulative effects. • Greatest potential to delay decision-making. • Increased potential to miss opportunities to reduce environmental impacts.
Option 3 – Coordinated Cumulative Effects Analysis	• No delay in project start-up – each can proceed at own pace. • Common methodologies and assumptions ensure compatibility. • Decision-makers and the public provided with real time, accurate information. • Early identification of opportunities to reduce adverse impacts. • Can more easily accommodate the addition and/or revision of a project	• Requires highest degree of interagency coordination. • Some loss of independent project evaluation. • Requires higher degree of oversight. • Slightly limits the flexibility of decision makers as a project moves forward at its own pace.

A. Option 1 - Comprehensive Cumulative Effects Analysis

This concept involved the completion of a single, comprehensive cumulative effects analysis as a baseline document that would be incorporated by reference into subsequent NEPA documents for each of the individual projects whether it is the Fulton Street Transit Center, South Ferry Subway Terminal, World Trade Center Transportation Hub, or other subsequent transportation projects. The cumulative impact analysis would be completed "up-front" prior to the advancement of the NEPA process for each individual project. Projects would only complete the NEPA process after the comprehensive cumulative effects analysis was completed. No project would commence construction until after the comprehensive cumulative effects analysis for all projects was completed.

The advantage of this approach is that a single, cumulative effects analysis would be completed using a common set of methodologies and assumptions, thus ensuring full comparability and consistency in data. Another advantage is that decision-makers and the public would have access to a comprehensive analysis, all in one document that could be used as a reference as each project subsequently entered the NEPA process. Lastly, the approach provides flexibility by looking at analyses comprehensively and in minimizing any overall adverse impacts. Disadvantages to this approach relate to the accuracy of the data and the level of project definition available at this time. This disadvantage could result in delays in project delivery of any of the three projects or other projects caused first by the delays inherent in collecting and awaiting the receipt of data, and second by the constant need to update, adjust and revise the analysis to reflect changes in project definition and assumptions.

In coordination with EPA and project sponsors, FTA elected not to pursue this approach for the following reasons:

- The difficulty inherent in deciding which projects are foreseeable and should be included and which projects should not be included in the analysis due to the changeable nature of local priorities and decision-making;

- The lack of data available regarding the nature, extent, and timing of each project, and the propensity of the project definitions to change over the course of the project development process;

- The limited "shelf-life" of the analysis, due to the volatility of the assumptions that would need to be made at this time, would be inconsistent with both streamlining and stewardship objectives; and

- The limitations of a "one-time-look" both to meet the flexibility required to implement the projects in a timely manner, as well as the potential for the completed analysis to inaccurately reflect the actual cumulative effects due to changes in project definition and sequencing as projects continue to move towards implementation.

B. Option 2 - Independent Cumulative Effects Analysis

Under this option, each project whether it is the Fulton Street Transit Center, South Ferry Subway Terminal, World Trade Center Transportation Hub, or other subsequent transportation projects, would be responsible for developing and completing its own cumulative effects analysis, independent of the analyses underway for other projects. Using this approach, each cumulative effects analysis could be tailored to the specific conditions of each project, and the background assumptions formulated on a case-by-case basis, at the time the analysis is necessary.

The advantage of this approach is that the cumulative effects analysis would be conducted using the most current information available, tailored to the specific conditions at the time of the analysis. This approach would allow the use of the most "current" data and assumptions, although they would likely vary from project to project. It is this variation in data and the cumulative effects analysis among the projects that is the greatest disadvantage of this approach. As a result of the variable assumptions and methodologies employed, it would be difficult for decision-makers, reviewing agencies, and the public to make comparisons among the projects, to understand the trade-offs to be made, and to assimilate the implications of progressive impacts to the environment.

FTA elected not to pursue this option any further at this time, as a result of preliminary coordination with EPA and project sponsors. The reasons for this determination are as follow:

- Of the options considered, Option 2 has the greatest risk of project delay due to the increased potential for confusion among agency reviewers, decision-makers and the public;

- Under this option, because of the lack of a standardized methodology and assumptions, there is a greater potential that supplemental analyses would be required to make the project data comparable to the information provided on previous projects, potentially lengthening the environmental review process; and

- Because there is no provision for a common methodology that promotes a comprehensive understanding of the cumulative effects, the potential to miss opportunities to reduce adverse cumulative effects is greater, as opportunities to reduce impacts could be precluded before the effects are clearly known.

C. Option 3 - Coordinated Cumulative Effects Analysis

Option 3 would entail management of the cumulative effects analysis to foster consistency across projects, and to ensure that opportunities for reductions in potential adverse cumulative effects are made on each and every project. Under this approach, FTA, working in concert with EPA and in coordination with Federal Partners and project sponsors, would develop a standardized approach and guidance for the cumulative effects analysis. The cumulative effects analysis for each project would be completed sequentially on a project-by-project basis as part of the overall NEPA review for each individual project, but in accordance with a single evaluation framework composed of a consistent set of analysis assumptions and common methodologies. Project sponsors of each of the three transportation projects (World Trade Center Transportation Hub; Fulton Street Transit Center; and South Ferry Subway Terminal) and other subsequent projects would commit to the methodology in advance of initiating the NEPA process. This approach would be supplemented by the agreement of the project sponsors to incorporate into their project development process "environmental performance commitments." These environmental performance commitments would reduce the potential for adverse impacts across projects, and lower the potential severity or magnitude of the impacts. Environmental performance commitments would include environmentally friendly construction or design features or specifications, and would serve to preserve environmental capacity to absorb impacts associated with all projects by avoiding impacts before they occur.

The advantage of this approach is that projects would be able to proceed at their individual pace, but in a manner that would allow for comparability across projects. This comparability would both facilitate wider consideration of cumulative effects analysis during decision-making, as well as the monitoring of the cumulative effects as each project comes on line. In addition, the single, consistent framework, methodology and set of assumptions, combined with the environmental performance commitments, will function to reduce the possibility that opportunities to reduce cumulative effects will be overlooked or precluded. The potential disadvantages of this approach relate to oversight and monitoring, as sizeable deviations by any individual project from either the standardized methodology or the environmental performance commitments would undermine the effectiveness of the approach.

FTA has elected to pursue Option 3, C*oordinated Cumulative Effects Analysis*, for the restoration and rebuilding of transportation infrastructure in Lower Manhattan. This option has the greatest potential to meet the project delivery streamlining objectives for the Lower Manhattan recovery effort without compromising environmental stewardship objectives.

The cornerstone of the FTA approach is the development of and agreement to a common framework and methodology for the evaluation of cumulative effects that will be used consistently for all FTA sponsored projects completed as part of the Lower Manhattan recovery effort. The adherence to a single, common

framework would achieve the following objectives important to the timely restoration and delivery of reconstructed and enhanced transportation improvements in Lower Manhattan:

- Each project would have the flexibility to advance independently at its own pace, unencumbered by "attachment" to other projects that could cause delays.

- The evaluation of cumulative effects would be based on the most current information available at the time each project was ready to advance, and each project would build on the findings of the previous cumulative effects analysis so that emphasis could be placed on the issues that are truly of concern, thereby streamlining the analysis, ensuring that resources are appropriately focused, and environmental performance commitments are implemented.

- The use of a single, coordinated approach to cumulative effects analysis on all FTA projects would facilitate the understanding and comparison of the cumulative effects across projects, eliminating the uncertainties that could be caused as a result of unique, one of a kind, analysis specific to individual projects.

- Because the approach would be consistent from project to project, the learning curve required for agency review would be reduced, thereby streamlining the environmental review process.

Equally important to the common methodology is the incorporation of and adherence to environmental performance commitments during the NEPA process and throughout the project development and delivery process. Through the incorporation of these principles, it is possible to systematically reduce the adverse environmental effects by avoiding, reducing or eliminating impacts at every possible instance. An added advantage would be to preserve the capacity of the environment to absorb the adverse effects of project implementation, ensuring that opportunities for environmental benefits are not overlooked or precluded through systematically lowering the potential for impact, project by project.

3.0 Coordinated Cumulative Effects Analysis for the Lower Manhattan Recovery Transportation Projects

This section discusses the *coordinated cumulative effects analysis* for the Lower Manhattan Recovery Transportation Projects in terms of the following:

- Key Principles and Features of the Coordinated Cumulative Effects Analysis
- NEPA Review and Cumulative Effects Analysis Process Overview
- Demonstration Project - Fulton Street Transit Center
- Coordinated Cumulative Effects Analysis - Technical Approach and Methodologies

3.1 Key Principles and Features of the Coordinated Cumulative Effects Analysis

The FTA's approach of a *coordinated cumulative effects analysis* for the restoration and rebuilding of transportation infrastructure in Lower Manhattan would maintain the individual flexibility needed to advance each project as quickly as possible while providing decision-makers and the public with an understanding of cumulative effects associated with each project. The foundation of this proposed approach is based on two important principles:

- A commitment to the application of a single, consistent framework, methodology and set of assumptions for the evaluation of cumulative effects across projects; and

- Adherence to environmental performance commitments to reduce the potential for adverse impacts across projects, and to lower the potential severity or magnitude of the adverse impacts.

The key features of the *coordinated cumulative effects analysis* are:

- **Promoting Efficient Project Delivery and Environmental Stewardship -** The *coordinated cumulative effects analysis* approach creates an opportunity for environmental stewardship through the comprehensive and proactive consideration of environmental factors, while incorporating measures to streamline both the environmental process and overall project delivery. This approach enhances environmental management principles in the traditional "identify-impact-mitigate" framework for the NEPA process, by proactively managing the avoidance and reduction of impacts through the adoption of environmental performance commitments. These environmental performance commitments, known as EPCs, would involve environmentally-friendly design features or construction practices that would preserve the capacity of the environment to accommodate implementation of all of the transportation recovery projects. The EPCs would sustain or enhance the long-term capacity of the resources of concern in Lower Manhattan (e.g. access and circulation, air quality, noise, cultural resources, and economic factors) to absorb changes and impacts associated with transportation project delivery, and would maintain or improve their condition.

- **Advancing Each Project Independently, but in a Coordinated Manner - The** proposed *coordinated cumulative effects analysis* is a "building-block" approach, managed to reduce redundancy and foster consistency across projects, and to ensure that opportunities for reductions in potential adverse cumulative effects are made on each and every project. This is achieved through the progressive completion of the cumulative effects analysis on a project-by-project basis using a consistent set of analysis assumptions and methodologies in a common evaluation framework. Project sponsors would commit to the framework, assumptions, and methodologies in advance of initiating the NEPA process. As each of the projects matures through the NEPA process, the knowledge gained will be incorporated as part of the cumulative

effects analysis for each of the subsequent projects. As each of the Lower Manhattan Transportation Recovery Projects is completed or as each analysis addresses the environmental resource areas for cumulative effects, the identified associated impacts will be incorporated into the analysis for future projects as "background impacts." This will allow for progressive, up to date, current cumulative effects analysis.

- **Focusing Attention on Critical Environmental Factors -** The cumulative effects analysis will be focused only on those environmental areas identified as subject to potentially significant adverse cumulative effects. In a coordinated effort, the Federal partners and project sponsors identified five key environmental assessment areas as having the highest potential: air quality, access and circulation, noise and vibration, cultural and historic resources, and economic factors. The local project sponsors are advancing the development of the specific technical methodologies to support the *coordinated cumulative effects analysis* during the NEPA review of each project, in cooperation with FTA and EPA. The technical methodologies will address data sources, assumptions, analytical parameters, analysis characteristics, and approach.

The potential benefits of the proposed approach include:

- A lasting framework for collaborative problem solving among the participating agencies to meld the traditional NEPA process roles of "proponent" and "reviewer" into a productive partnership with a common goal.

- Transparency among the technical methodology, assumptions, and data requirements to be used throughout the NEPA process for the affected environment, environmental consequences, and cumulative effects analysis.

- Greater certainty in the implementation of future transportation projects to avoid adverse cumulative effects through the early identification and resolution of environmental issues to avoid the loss of resources, as well as reduce the potential for schedule delays and increases in costs.

- Creation of a common data base to be used by project sponsors during the project delivery process so that information, materials and technical knowledge of best practices can be shared across projects, thereby streamlining the analysis process, optimizing economies of scale, and avoiding redundancy of effort. This will also allow for progressive, up-to-date transfer of current information pertaining to the cumulative effects analysis.

- Streamlining the environmental review process through a reduction in the learning curve required for both project sponsors and agency reviewers by adhering to a suite of coordinated technical assessment methodologies familiar to both.

- Environmental stewardship through reduction or avoidance of environmental impacts and preservation of the capacity of the resource to absorb impacts or renew itself through the use of environmental performance commitments into project design and construction practices.

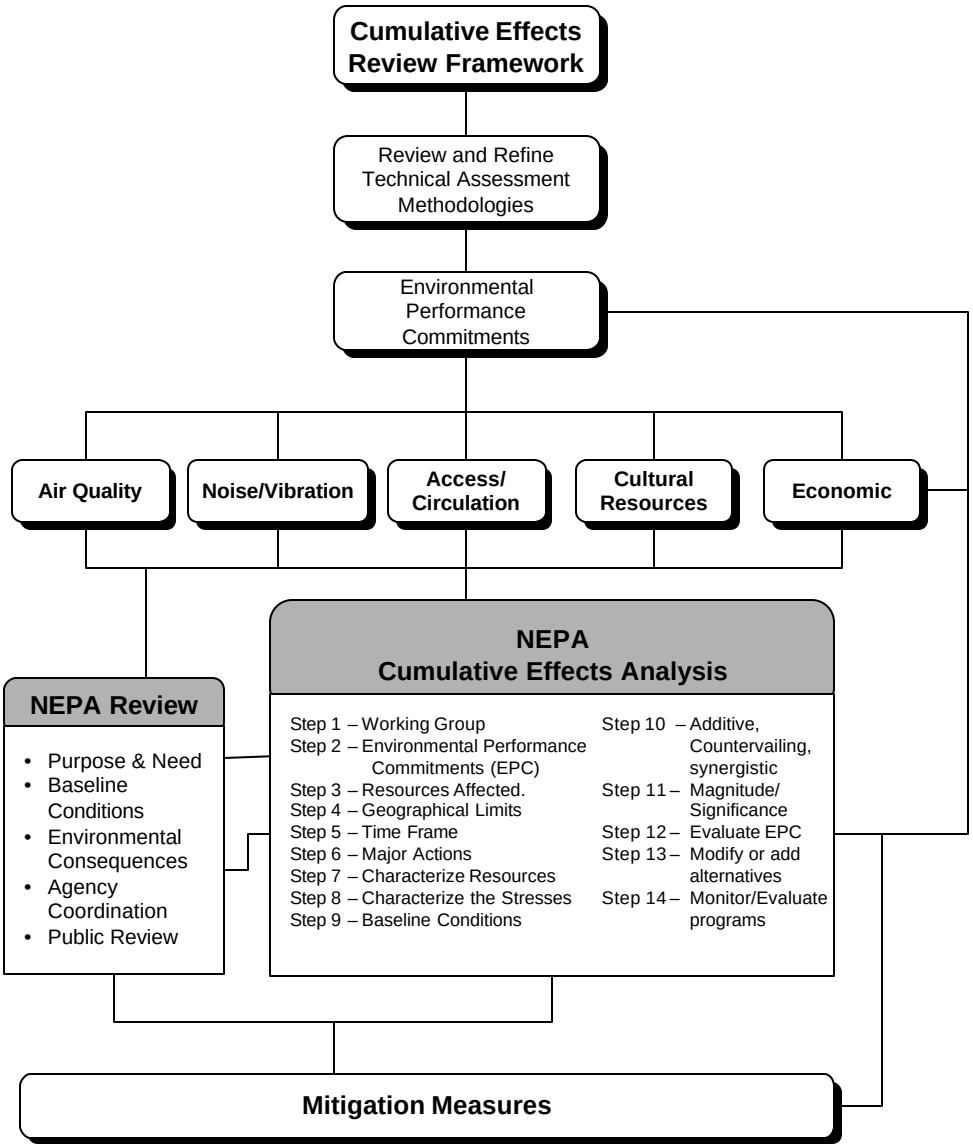
3.2 NEPA Review and Coordinated Cumulative Effects Analysis Process

Figure 4 illustrates the inter-relationship and sequence of the primary components of the *coordinated cumulative effects analysis*. The steps needed to advance the *coordinated cumulative effects analysis* are as follow:

- Finalize and document cumulative effects review framework.
- Draft and coordinate technical assessment methodologies.
- Secure and document environmental performance commitments.

- Convene working groups on each of the technical assessment areas.
- Document technical methodologies for cumulative effects environmental resources of concern (e.g., air quality, noise and vibration, access and circulation, cultural resources, and economic factors).
- Standardize approaches through the NEPA review process.
- Conduct technical evaluations for identified cumulative effects environmental resources of areas of concern.
- Coordinate findings through the NEPA review process.
- Address need for additional mitigation measures.

Figure 4 – Coordinated Cumulative Effects Analysis Process



A critical first step to implement the *coordinated cumulative effects analysis* framework, and a primary foundation for its success, is the adoption of a standardized suite of technical assessment methodologies

for each environmental area of concern identified as having a high potential for cumulative effects. Additional discussion of the technical assessment methodologies for each of these areas is included in Section 3.4. As part of the development of these technical assessment methodologies, the baseline conditions for assessment of long-term impacts will be established using conditions as of September 10, 2001, so that the projects can all begin with a common, consistent baseline. If needed, this baseline can be adjusted as necessary on a case by case basis for specific resources, dependent on project timing and sequencing. This is most likely to be required with respect to construction impacts as opposed to long-term impacts.

Following the development of methodologies for these five environmental resource areas, environmental performance commitments (EPCs) will be identified for each area of concern. EPCs are items such as design elements and specifications, construction techniques, or operating procedures that will be documented and committed to by project sponsors at the project outset to lower the potential for adverse cumulative effects. The use of EPCs within each project analysis will facilitate FTA's fulfillment of both environmental stewardship and environmental streamlining objectives by:

- Streamlining the environmental process through avoidance of impacts before they occur; and
- Preserving the environmental capacity, one project at a time, for subsequent projects by ensuring that opportunities to reduce impacts are not missed, thereby reducing the potential for cumulative impacts.

An important element guiding the overall effectiveness of the *coordinated cumulative effects analysis* review framework is the interrelationship with the NEPA review process. The greatest efficiencies in the process can be obtained by coordinating the cumulative effects analysis as an integrated part of the following NEPA process elements:

- Purpose and Need
- Baseline Conditions
- Environmental Consequences
- Agency Coordination
- Public Review

As part of the overall Environmental Management Oversight Plan for the Lower Manhattan Recovery Projects, FTA will provide technical guidance for the development of each of these sections of the NEPA documents, to facilitate consistency across projects. This guidance will be provided through early and continuous coordination with project sponsors as activities progress through the NEPA process. Findings and lessons learned will be recorded and monitored to inform subsequent projects.

3.3 Demonstration Project – Fulton Street Transit Center

Coordination with Federal partners and project sponsors to develop an approach to complete the *coordinated cumulative effects analysis* for the Lower Manhattan recovery effort, concluded that a "demonstration" project would assist in quickly initiating, developing, refining the approach, methodology and assumptions. Factors considered in the identification of an appropriate demonstration project include the following:

- Clarity of project definition;
- Local commitment and community support;
- Project readiness to proceed;
- Range of potential cumulative effects relating to the five critical environmental resource areas;
- Readiness of the sponsoring agency to implement environmental performance commitments; and

- Readiness of the demonstration project to effectively advance the three priority projects identified in the February 6, 2003 Governor Pataki letter (Appendix C).

Through coordination with EPA and project sponsors, FTA selected the Fulton Street Transit Center as the demonstration project to advance the *coordinated cumulative effects analysis* for Lower Manhattan transportation projects. Figure 5 shows the location of the Fulton Street Transit Center project and other priority transportation projects.

Figure 5 – Location of Priority Transportation Projects

The Fulton Street Transit Center project entails a rehabilitated, reconfigured, and enhanced multi-level, underground complex of subway stations serving nine different lines, with improved platforms, mezzanines and connection corridors and a new central concourse with a new above-ground presence.

Over 225,000 movements (passengers entering, exiting, or transferring) are served by these subway stations daily. In addition, the proposed design for this complex will extend westward one block underneath Dey Street to Church Street via a new underground pedestrian passageway providing a new link to two additional subway lines. The estimated cost is $750 million in year of construction dollars and completion is expected by year 2007.

The project, sponsored by MTA/NYCT, was selected for the following reasons:

- The design scope and project description for the Fulton Street Transit Center are defined with clear project limits and the project is ready to enter the NEPA process.
- MTA/NYCT is proposing to initiate preparation of an Environmental Impact Statement, which would provide a good platform for the comprehensive evaluation of cumulative effects associated with all three priority transportation projects.
- The Fulton Street Transit Center project involves potential effects on the five critical environmental resource areas.
- MTA/NYCT has already initiated public coordination on the Fulton Street Transit Center project.
- MTA/NYCT is International Standards Organization (ISO) 14001 certified, and has in place an adopted, audited Environmental Management System that permeates agency activities. As a result of this certification, MTA/NYCT is ready to implement environmental performance commitments.
- The scale of the Fulton Street Transit Center is such that a full range of environmental issues need to be addressed, but the project is not so complex that it will be difficult to illustrate lessons learned.

The benefits of using the Fulton Street Transit Center as the demonstration project for the Lower Manhattan Recovery Projects are as follows:

- Establish efficient communication and coordination networks among agencies required to effectively conduct the *coordinated cumulative effects analysis* in a streamlined manner that is responsive to environmental stewardship mandates.
- Use actual project experiences as a catalyst to proactively identify and resolve “repetitive” issues and actions early in the NEPA process and establish precedents to guide future projects, and avoid revisiting the same issues one project at a time.
- Build a sense of collaborative problem solving among the participating agencies so that the traditional NEPA process roles of “proponent” and “reviewer” are melded into a productive partnership with a common goal.
- Identify and resolve technical issues and provide clarity to the guidance for future projects through real, documented project examples.

The basic activities required to advance the Fulton Street Transit Center as the demonstration project for the *coordinated cumulative effects analysis* are as follows*:*

- Continue coordination with project sponsors, EPA, and other Federal partners to affirm the use of Fulton Street Transit Center as a demonstration project.

- Coordinate procedures for future review of the Fulton Street Transit Center with Federal partners, project sponsors, and local agencies.
- Refine the project definition and alternatives to be considered.
- Conduct a preliminary scan of likely cumulative effects issues and potential environmental performance commitments.
- Finalize NEPA Class of Action for all project components.
- Refine public involvement approach and plan.
- Convene reviewing and resource agencies, including agency scoping.
- Continue public outreach.
- Establish scope of work and technical methodologies.
- Conduct supporting environmental analyses.
- Document technical findings.
- Review findings with reviewing and resource agencies.
- Complete public review of findings.
- Address comments received and refine project as necessary, including environmental performance commitments and any additional mitigation.
- Document environmental determinations and finding.

The proactive involvement of FTA at each stage of the environmental review process will expedite project delivery of the Fulton Street Transit Center by reducing FTA review times and by assisting to focus work activities on those issues salient to FTA's findings. In addition, documentation of findings at each stage will be used to help streamline future projects as they are ready to proceed.

3.4 Coordinated Cumulative Effects Analysis Technical Methodologies

The *coordinated cumulative effects analysis* for the Lower Manhattan recovery effort will be managed to foster consistency across projects as they advance independently, while providing a comprehensive view of project outcomes in relation to each other. One of the key elements essential to implementing the proposed *coordinated cumulative effects analysis* is adherence to a common suite of technical methodologies across projects. This use of common technical methodologies forms the basis for a 'building-block" approach to address cumulative effects, and supports the advancement of each project as it is ready. The use of common technical methodologies has the dual benefit both of enabling a comprehensive consideration of cumulative effects, while potentially streamlining the environmental process by reducing the learning curve required by project sponsors to complete the analysis, and the time it takes for agencies to become familiar with the analysis for each project.

Each of the technical assessment methodologies will be formulated and refined through technical working groups established for each environmental area of concern: air quality, access and circulation, noise and vibration, cultural resources, and economic factors. Although each of these environmental areas of

concern are distinct resources, they also share a cause-effect inter-relationship, highlighting the need for coordination not only across projects, but also across technical working groups. The technical working groups will consist of representatives from the Transportation Working Group, working along with FTA, the Federal partners, and local project sponsors. The ultimate outcome of the technical working group will be a single, consistent framework, and standardized technical assessment methodologies for use in the cumulative effects analysis.

The recent FHWA guidance document (January 31, 2003) on cumulative effects analysis distils a list of nine items that cumulative effects analysis should include in undertaking assessments and developing Technical Methodologies. The content of the following list is also illustrated in a series of steps outlined in Section 3.2, Figure 4 – Coordinated Cumulative Effects Analysis Process.

- Identification and agreement on the roles and responsibilities of participants and cooperating agencies in the project development process;
- Identification of appropriate project study area (study area may vary by environmental resource);
- Complete inventory of resources of concern within the project study or influence area;
- Clarification of major and important versus minor issues associated with the proposed action and alternatives;
- Identification of other actions impacting or potentially affecting the major resources;
- Definition of assessment goals, techniques, and methodology for analysis of identified potential effects;
- Establishment of appropriate resource geographic and temporal boundaries related to the identified scope of analysis;
- Identification of planning considerations in the local area, including direction and goals, land uses, and transportation plans for incorporation into the study; and
- Identification of initial alternatives to the proposal and to avoid and minimize harm to the environment.

The focus of the technical methodologies applied to support the *coordinated cumulative effects analysis* is to enable each agency to deliver its best effort to support the capacity of affected areas and resources to accommodate the implementation of the transportation projects associated with the Lower Manhattan recovery effort. Ideally, the technical methodologies will highlight opportunities to reduce the potential for cumulative impacts to those environmental factors of concern, and to mitigate identified adverse cumulative effects that are potentially significant both for each project, as well as across projects. In order to achieve these purposes, the technical methodologies for consideration of cumulative effects associated with a Proposed Action must be based on a common platform regarding other projects, and consequently will consider as a point of departure other actions that:

- Are reasonably foreseeable;
- Represent a substantive change relative to pre-9/11 conditions;
- Share a substantial temporal and geographic proximity with the Proposed Action; and
- Have the potential to substantially affect the same resource as that potentially affected by the Proposed Action.

Each technical methodology developed by the technical working groups will address the following:

- Description of the potential source or nature of impact;
- Potential data sources;
- Analysis parameters;
- Potential range or level of analysis;
- Analysis characteristics;
- Impact analysis methodologies; and
- Issues/next steps.

Because of the variation in the projects, the technical assessment methodologies will require flexibility to allow for use across different types of projects, at a level appropriate to their scale and character. Within the standard technical assessment methodology for each environmental area of concern, various levels of analysis will be employed to correspond to the class of action, combined with the potential for adverse and significant impacts, whether direct, indirect or cumulative. In so doing, each project would undergo analysis proportional to the expected magnitude of effect. Flexibility within the standardized approach is also required to effectively balance the need for compatible data and methodologies with the potentially differing regulations and guidance required by federal, state, and local regulations and guidance. For example, the technical assessment methodology for noise and vibration must be flexible enough to address the FTA guidance focused on transit facility and vehicle noise and vibration construction and operation, the FHWA regulations applicable to noise generated by vehicles operating on roadway facilities and roadway construction, as well standards under the New York State Environmental Quality Review Act (SEQRA), the New York City CEQR Technical Manual, and local noise ordinances regarding operations and construction. Consequently, the technical methodologies must address the need to "bridge" the results of different analyses, or to include the results of multiple analytical approaches.

Based upon the above considerations, the following sections frame the issues and approach for each environmental area of concern identified as having potentially significant potential for adverse cumulative effects impacts. The discussion forms a point of departure for future detailed technical assessment methodologies that will be generated through the technical working groups for each of the resource areas of concern. The development of the specific technical methodologies by the technical working groups will be informed by project scoping and the recommendations received from agencies and the public. As the technical analysis methodologies for a particular project is refined through scoping, the information will be used to update the *coordinated cumulative effects analysis* for subsequent projects as appropriate. Ongoing coordination through the technical working groups will support the refinement of the specific technical assessment methodologies in support of a single consistent approach.

A. Air Quality Technical Methodology Issues and Approach

The approach to air quality will take advantage of the concurrent analyses planned for the first group of three priority transportation projects in the Lower Manhattan recovery effort as part of the Fulton Street Transit Center demonstration project. The approach also relies on coordination among project proponents and the Interagency Consultation Group (ICG).

The NY-NJ-CT Air Quality Control Region (AQCR) is classified as a severe non-attainment area for ozone. The precursors of ozone are nitrogen oxides (NOx) and volatile organic compounds (VOCs). Manhattan is classified as maintenance for carbon monoxide (CO) and in nonconformity for exceeding NAAQS for $PM_{10.}$ The EPA and other regulators are concerned with the effects of $PM_{2.5}$.

At this time, as a result of the World Trade Center disaster on September 11, 2001, and the loss of NYMTC's (the Metropolitan Planning Organization) files containing regional transportation and air quality data, combined with the damage incurred to the downtown mass transit system, the conformity requirements for the New York Metropolitan area have been temporarily waived until September 30, 2005, pursuant to Public Law 107-230; Stat. 1469, enacted October 1, 2002. The implication is that

NYMTC has until September 30, 2005, to produce a conforming TIP and Plan. Interim interagency consultation procedures were developed, to be in effect during the waiver. These procedures were developed to assist the New York State Department of Transportation (NYSDOT) in the interim reporting to congressional committees, the EPA, and the U.S. Department of Transportation. Thus the air quality analysis as part of the Lower Manhattan recovery effort focuses on the legislative waiver of conformity requirements for the plan and TIP. As such, a way that project sponsors comply with the analysis requirements of NYSDOT's interim interagency consultation procedures is by providing a mesoscale or corridor-level analysis in the environmental analysis. This analysis substitutes for the plan/TIP conformity analysis that has not been undertaken.

The rebuilding, restoration and enhancement of Lower Manhattan's transportation system is expected to create long-term benefits to air quality as a result of the increased potential for use of transit modes that will contribute to an overall reduction in vehicular emissions. However, realizing these long-term benefits to air quality is only possible following the construction activities associated with implementing several large-scale projects. These construction activities have the potential to temporarily adversely affect air quality through the emissions of pollutants from multiple stationary and mobile sources involved in the construction process. The utilization of heavy construction equipment and on-site generators produce hydrocarbon emissions, exhaust fumes, toxics, and contribute to PM concentrations. These potential impacts could be worsened by the coincidence of project construction activities either temporally, or in the same geographic area, or both.

The potential for adverse impacts could be reduced through the use of EPCs. EPCs that could be considered may include, but are not limited to, the following:

- Use environmentally friendly materials, including low VOC paint, specifications of sealants that meet or exceed the VOC limits of California's South Coast Air Quality Management District Rule No. 1168, or adhesives that meet the San Francisco Bay Area Resource Board Regulations.

- Manage and contain of particulate matter by employing alternative construction measures such as deconstruction instead of demolition.

- Minimize PM, NOx and SOx from stationary diesel powered equipment and mobile off-road diesel equipment by: using pre-certified equipment; retrofitting equipment with emission controls from an EPA verified list; using red dye ultra low sulfur diesel fuel (15 ppm)l; or scheduling construction phasing and/or sequencing to reduce concurrent on- and off-road construction and related equipment usage.

- Manage the material and delivery process involving on-road diesel and petrol equipment on-site through the following: pre-certify equipment at and through DOT inspection stations with prominently displayed sticker; ensure all fueling trucks are red dye diesel fueling trucks (to distinguish from regular diesel); permit only recycling trucks; and trucks with EPA Tier 2 compliance.

Next steps and issues to resolve in the development and finalization of the technical analysis methodology for air quality to be undertaken by the project sponsors are:

- Identify and convene technical working group to address air quality issues, and outline the coordination process and expected participation, roles, and responsibilities.

- Finalize a list and description of activities with the potential to cause short-term and long-term impacts to air quality, such as use of construction equipment, idling, materials delivery and removal, demolition activities, airborne dust associated with ground disturbance, increases in vehicle exhausts, and increases in traffic volumes.

- Confirm data sources and establish database for existing and future environmental conditions, current projects, and future projects.

- Establish analysis parameters relative to baseline years for construction and operation, as well as assumptions regarding NAAQS and other standards (CO, $PM_{10,}$ $PM_{2.5}$, etc.), emissions and dispersion modeling protocols (Mobile, CAL3QHC, etc.) and modeling inputs (such as persistence factors and meteorological data), and assess implications of general conformity exemption of September 2002.

- Refine geographical boundaries of analysis to address micro-scale/project site location, area-wide limits, and sensitive receptors.

- Refine temporal parameters.

- Develop analysis characteristics and impact assessment approach including detailed procedural and quantitative assessment protocols based on regulations, guidelines, current professional practice standards, and coordination with appropriate resource agencies including NYMTC and the ICG.

- Refine and commit to EPCs.

- Outline process for identifying and coordination mitigation requirements.

- Document completed technical assessment methodology.

FTA will assist the project sponsors in the advancement and development of the technical methodology by:

- Providing technical assistance and guidance at the request of the project sponsors, including participation in the technical working group on an as needed basis;

- Leading the coordination with the Federal partners under the ECR MOU; and

- Assisting with coordination with resource, regulatory, and review agencies, including the ICG.

B. Access and Circulation Technical Methodology Issues and Approach

The effects of September 11, 2001 resulted in temporary impacts on access to and circulation within Lower Manhattan, some of which still affect regional and local travel. As a result, Lower Manhattan is now faced with balancing the progression of previously planned transportation improvements with the actions required to reconstruct and replace damaged and destroyed transportation infrastructure. This circumstance has the potential to result in temporary, short-term construction impacts, including cumulative effects, on businesses and residents both in terms of accessibility and mobility, as well as the associated implications for air quality and economic vitality. The potential is greatest in locations where multiple projects will be coincident in the same geographic area, or occur at the same or overlapping time periods.

Identification of problem areas as part of the cumulative effects analysis would require coordination among all potentially concurrent projects. This coordination would build upon the weekly construction coordination meetings hosted by New York City DOT. Technical work sessions among project sponsors and NYCDOT will identify key intersections and recommend refined analysis for potential mitigation strategies, as well as environmental performance commitments. These performance commitments could

potentially include construction staging to maintain adequate access and circulation around specific project areas and the region, and/or definition of a process by which staging would be coordinated to reduce impacts.

Next steps and issues to resolve in the development and finalization of the technical analysis methodology for access and circulation to be undertaken by the project sponsors are:

- Identify and convene technical working group to address traffic and circulation issues, and outline the coordination process and expected participation, roles, and responsibilities.
- Finalize a list and description of activities with the potential to cause short-term and long-term impacts to access and circulation, such as lane closures, vehicle rerouting, added congestion from delivery trucks, staging areas, and disruption to pedestrian activities.
- Confirm data sources and establish database for existing and future environmental conditions, current projects, and future projects, and undertake new data collection as appropriate to assess trip generation, multi-modal vehicular traffic volumes, traffic counts and projections, speed, modal split, and transit ridership.
- Establish analysis parameters relative to baseline years for construction and operation, as well as assumptions regarding AM, Midday, and PM Peak hours.
- Refine geographical boundaries of analysis to address micro-scale/project site location, traffic network, area-wide limits, and regional limits.
- Develop analysis characteristics and impact assessment approach including detailed procedural and quantitative assessment protocols to address the effects on travel patterns, connectivity, emergency access, and determine the impact criteria appropriate to assess internal and external circulation and mobility conditions within and to/from Lower Manhattan.
- Refine and commit to EPCs.
- Outline process for identifying and coordination mitigation requirements.
- Document completed technical assessment methodology.

FTA will assist the project sponsors in the advancement and development of the technical methodology by:

- Providing technical assistance and guidance at the request of the project sponsors, including participation in the technical working group on an as needed basis;
- Leading the coordination with the Federal partners under the ECR MOU; and
- Assisting with coordination with resource, regulatory, and review agencies.

C. Noise and Vibration Technical Methodology Issues and Approach

Reconstruction and recovery projects associated with transportation infrastructure could potentially cause changes to existing noise and vibration levels and could result in both short-term and long-term, cumulative effects. Construction activities in the same geographic vicinity or at the same time, or both, could result in short-term cumulative effects to residential areas or other sensitive receptors. Long-term

cumulative effects could result either directly from new or enhanced service (whether buses, or subway) or indirectly from increased services from feeder-bus or changes in traffic patterns in the area.

The range of noise impacts to be addressed within the cumulative effects analysis result from construction methods, traffic diversions, traffic volumes, mode, and surface noise or noise emanating through openings to the street through ventilation shafts and station entrances. Vibration impacts during construction could depend on such factors as volume, speed, construction methods, and soil conditions, and could be conducted through building foundations. Such impacts could also be perceived as noise. Long-term noise and vibration impacts could result from transit system operations.

Important considerations include the establishment of a noise and vibration monitoring program during construction, and a construction noise and vibration management system that provides flexibility in responding to identified exceedances and concerns. Technical working sessions will be necessary among active project sponsors to reconcile the multiple regulations and guidance covering noise and vibration impacts, each developed to address different types of facilities. These sessions should clearly identify methodologies for obtaining baseline data, clear criteria limits, construction noise and vibration mitigation features and monitoring, and potential EPCs, including enclosing construction areas during night time construction or limiting truck idling.

Next steps and issues to resolve in the development and finalization of the technical analysis methodology for noise and vibration to be undertaken by the project sponsors are:

- Identify and convene technical working group to address noise and vibration issues, and outline the coordination process and expected participation, roles, and responsibilities.

- Finalize a list and description of activities with the potential to cause short-term and long-term noise or vibration impacts, such as use of different construction methods, use of heavy equipment, excavation activities, demolition or deconstruction activities, construction vehicles, increased vehicular congestion, and operational changes, such as location, speed and frequency of vehicles.

- Confirm data sources and establish database for existing and future environmental conditions, current projects, and future projects, and undertake new data collection as appropriate to establish existing noise and vibration levels in the vicinity of sensitive receptors.

- Establish analysis parameters relative to baseline years for construction and operation.

- Refine geographical and temporal boundaries of analysis, including the project site as well as primary and secondary impact limits for the study area for peak, midday and night time hourly levels.

- Develop analysis characteristics and impact assessment approach including detailed procedural and quantitative assessment protocols to address potential noise and vibration impacts in accordance with FTA and FHWA guidance and regulations for the range of facilities to be developed and the range of construction activities to be undertaken. Guidance and regulations to be addressed include FTA Transit Noise and Vibration Guidance (DOT-T-95-16; 1995) and FHWA Procedures for the Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772).

- Refine and commit to EPCs.

- Outline process for identifying and coordination mitigation requirements.

- Document completed technical assessment methodology.

FTA will assist the project sponsors in the advancement and development of the technical methodology by:

- Providing technical assistance and guidance at the request of the project sponsors, including participation in the technical working group on an as needed basis;
- Leading the coordination with the Federal partners under the ECR MOU; and
- Assisting with coordination with resource, regulatory, and review agencies.

D. Cultural and Historic Resources Technical Methodology Issues and Approach

Lower Manhattan is rich in history and tradition that reflect the area's central role in finance, commerce, and culture. In general, the range of potential impacts and disturbances to historic or architectural resources can include both direct physical impacts—demolition, alteration, or damage from construction on nearby sites—and indirect, contextual impacts, such as the isolation of a property from its surrounding environment, or the introduction of visual or atmospheric elements that are out of character with a property or that alter its setting or effect the structural integrity of the resource.

As part of the cumulative effects analysis, a detailed scope of work for cultural and historic resources would be developed in consultation with SHPO and the Landmarks Preservation Commission (LPC). The technical analysis methodology will address regulatory requirements under Section 4(f) of the U.S. Department of Transportation Act, Section 106 of the National Historic Preservation Act, and in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation and the New York State Archaeological Council's Standards for Cultural Resource Investigations and Curation of Archaeological Collections. A plan for implementation, including staging of specific construction efforts, should be developed in coordination with project sponsors and agencies. Part of this coordination will be to identify potential EPCs to be used to offset potential impacts to cultural resources before they occur, such as restrictions on the storage of construction equipment that might otherwise result in short-term visual impacts to historic structures, on compaction and damage to archaeological resources. . Likewise, once potential impacts are identified, mitigation measures to reduce impacts should be coordinated with agencies and project sponsors.

Next steps and issues to resolve in the development and finalization of the technical analysis methodology for cultural and historic resources to be undertaken by the project sponsors are:

- Identify and convene technical working group to address cultural resource (historic and archaeological), and outline the coordination process and expected participation, roles, and responsibilities.
- Finalize a list and description of activities with the potential to cause short-term and long-term impacts to cultural resources, such as use of different construction methods, use of heavy equipment, excavation activities, demolition or deconstruction activities, underpinning, new structures and changes in pavement of other contextual items.
- Confirm data sources and establish database for existing and future environmental conditions, current projects, and future projects, and undertake new data collection (research or field surveys) as appropriate to establish existing cultural resources eligible for or potentially eligible for the National of Historic Places in the vicinity of proposed projects.
- Establish the Area of Potential Effect (APE) in consultation with the SHPO.

- Develop analysis characteristics and impact assessment approach including detailed procedural and quantitative assessment protocols to address potential effects on identified cultural resources, and the extent to which those effects may be adverse. The development of the approach should be done in consultation with the SHPO, NYC Landmarks Preservation Committee, and the Landmarks Conservancy, in addition to the Federal partners and the Advisory Council on Historic Preservation, as necessary.

- Refine and commit to EPCs.

- Outline process for identifying and coordination mitigation requirements to address adverse effects.

- Document completed technical assessment methodology.

FTA will assist the project sponsors in the advancement and development of the technical methodology by:

- Providing technical assistance and guidance at the request of the project sponsors, including participation in the technical working group on an as needed basis;

- Leading the coordination with the Federal partners under the ECR MOU; and

- Assisting with coordination with resource, regulatory, and review agencies, including consultation with the Advisory Council on Historic Preservation and the U.S. Department of the Interior, as needed.

E. Economic Considerations Technical Methodology Issues and Approach

According to FEMA estimates, New York City's economy will sustain a gross loss of approximately $83 billion due to the World Trade Center disaster (August 2002). Even after the effect of insurance payments and the Federal emergency funds, the New York City economy faces a net impact of at least $16 billion in lost economic output (NYC Partnership and Chamber of Commerce, 2001). The rebuilding efforts undertaken by FTA and its Federal partners, state and local agencies are designed to restore Lower Manhattan to its original role as an important economic engine for the region, while also improving its accessibility, livability and economic vitality. As part of the rebuilding efforts, the remaining business interests could be subject to additional impacts associated with reconstruction activities. In addition, changes in the transportation network and urban structure of the area created through rebuilding efforts, may generate additional impacts to local and regional economic conditions.

Issues to be addressed as part of the cumulative effects analysis relative to economic effects pertain to both regional and local economic conditions, such as development, tax revenues and public expenditures, employment opportunities, accessibility, retail sales, the economic vitality of existing businesses, and the effect of a restored, enhanced and new transportation infrastructure investment on established business districts. The cumulative effects analysis must take into account both short-term construction impacts and long–term operational (post construction) impacts.

Technical work sessions among project sponsors will identify areas where potentially significant adverse economic effects from concurrent construction activities may result for local businesses, the City of New York, and the region. To the extent practical, EPCs and mitigation measures should be identified as early as possible for implementation prior to, or during the construction process. Areas of anticipated economic improvement associated with completed projects should also be identified and quantified to the extent possible.

Next steps and issues to resolve in the development and finalization of the technical analysis methodology for economic impacts to be undertaken by the project sponsors are:

- Identify and convene technical working group to address economic impacts, and outline the coordination process and expected participation, roles, and responsibilities.

- Finalize a list and description of activities with the potential to cause short-term and long-term economic impacts, such as the effects on utility disruptions on business activities, limitations on pedestrian, vehicular, and transit access to businesses, restricted visual access to businesses, losses or increases in jobs, potential increases or losses in retail sales, effects on the tax base, effects on property valuations and potential for business and residential relocations, among others.

- Confirm data sources and establish database for existing and future environmental conditions, current projects, and future projects, and undertake new data collection (market assessment or property surveys) as appropriate to establish existing and future economic conditions in the vicinity of proposed projects.

- Coordinate with NYMTC on economic data inputs and NYMTC regional econometric model, particularly employment and population projections through 2025.

- Review MTA financial model.

- Establish the geographic and temporal boundaries for analysis to address both micro-scale (site specific) and macro-scale (regional) economic consequences.

- Develop analysis characteristics and impact assessment approach including detailed procedural and quantitative assessment protocols to address potential effects on regional and local economic factors, illustrating the extent to which those effects may be beneficial or adverse. The approach should focus on the trends and outcomes of direct, indirect and cumulative effects of economic and fiscal impacts including changes in business activity, employment, income, population and tax revenues.

- Refine and commit to EPCs.

- Outline process for identifying and coordination mitigation requirements to address adverse effects.

- Document completed technical assessment methodology.

FTA will assist the project sponsors in the advancement and development of the technical methodology by:

- Providing technical assistance and guidance at the request of the project sponsors, including participation in the technical working group on an as needed basis;

- Leading the coordination with the Federal partners under the ECR MOU; and

- Assisting with coordination with resource, regulatory, and review agencies.

4.0 Implementation Roles and Responsibilities

Numerous stakeholders are involved with the Lower Manhattan Recovery Effort and are responsible for funding, project development, project review, concurrence, and permitting. The August 2002 ECR MOU (Appendix A) specified commitments regarding federal agency roles and coordination, as well as a streamlined environmental process (*"Environmental Coordination and Review Among Federal Partners"*). In addition to the Federal partners, other stakeholders include project sponsoring agencies and state and local agencies. The clear articulation and understanding of roles and responsibilities of various stakeholders with respect to the *coordinated cumulative effects analysis* is an important part of defining and implementing a successful framework for the evaluation of cumulative effects.

Successful completion of the *coordinated cumulative effects analysis* will require participation of the federal entities identified in the original MOU, as well as a broader array of stakeholders. Appendix E provides a list of participants in the *coordinated cumulative effects analysis* and outlines their respective roles in the Lower Manhattan Recovery Effort NEPA process, and the cumulative effects analysis. In general, there are five basic levels of participation identified for the *coordinated cumulative effects analysis*:

- **Federal lead agencies**, or their designated representatives, are responsible for developing the cumulative effects analysis approach, providing technical guidance, and ensuring compatibility of approach across projects.

- **Cooperating agencies** are responsible for providing technical assistance, including input into the cumulative effects analysis approach, in addition to fulfilling responsibilities under NEPA by responding to the requests of the lead federal agencies and participating in key milestone activities that affect the treatment of cumulative effects such as scoping, field reviews, public involvement activities, and environmental document review.

- **Resource and regulatory** agencies are responsible for contributing to development of the cumulative effects analysis framework and providing technical assistance regarding proposed methodologies, as well as reviewing and commenting on cumulative effects analysis findings.

- **Review agencies** are responsible for providing comments on cumulative effects analysis methodology and evaluation findings.

- **Project sponsoring agencies** are responsible for preparing cumulative effects analyses for inclusion in NEPA documentation in accordance with the adopted methodology and guidance, as well as consultation and coordination with appropriate federal, state, and local agencies. As part of this responsibility, it is likely that the sponsoring agencies will convene multi-agency technical working groups to address each of the areas of environmental concern.

5.0 Next Steps and Recommendations

The following actions are required to advance the *coordinated cumulative effects analysis* for the Lower Manhattan recovery effort:

- Finalize implementation of the approach with project sponsors, including the application of technical methodologies and the adoption of environmental performance commitments (EPCs) for each of the five environmental areas of concern (air quality, noise and vibration, access and circulation, cultural and historic resources, and economic factors).

- Continue coordination with EPA and the Federal partners to assess progress on implementation of the approach.

- Provide technical support to project sponsors during advancement of the environmental process for Fulton Street Transit Center "demonstration" project, and other projects as they advance.

- Conduct a Peer Review of the *coordinated cumulative effects approach* during implementation.

- Document the demonstration project methodologies and process for use by future projects