

**Metro-North Penn Station Access
Major Investment Study/Draft Environmental Impact Statement**

Task 4

**ALTERNATIVES EVALUATION
METHODOLOGY REPORT**

Prepared for Metro-North Railroad

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Evaluation Methodology Report

A. INTRODUCTION

1. Study Background

Metro-North Railroad (Metro-North) has undertaken a Major Investment Study (MIS)/Draft Environmental Impact Statement (DEIS) to examine the benefits, costs, and potential social, economic, and environmental impacts of reasonable and feasible alternatives for improving access to Pennsylvania Station (Penn Station), New York, to/from the Metro-North East-of-Hudson service area. Options for improving access include connecting Metro-North's Hudson, Harlem, and/or New Haven Line services to Penn Station. Direct access to Penn Station would benefit Metro-North passengers who currently make transfers or walk from Grand Central Terminal, on the East side of Manhattan, to the West Side. Improved access to Penn Station would also improve regional connectivity by providing direct passenger connection between Metro-North Railroad, Long Island Rail Road (LIRR), New Jersey Transit (NJ Transit), and Amtrak services at Penn Station. Access to Penn Station by Metro-North would also complement LIRR East Side Access service.

There are existing track connections from Metro-North's Hudson and New Haven Lines to Amtrak's Empire Connection and Hell Gate Line, respectively, which could potentially be used to provide access for Metro-North trains into Penn Station. Alternatives using the Harlem Line may require track reconstruction. In addition, the study will examine the potential to construct and provide service at new, intermediate station(s) as part of the analysis of Penn Station access alternatives.

The principal elements of the Penn Station Access MIS/DEIS include definition and screening evaluation of potentially feasible and reasonable alternatives for improving access between Penn Station and the Metro-North service area; detailed definition and evaluation of a selected short-list of build alternatives, in addition to No-Action and Transportation System Management (TSM) alternatives; and ongoing public outreach and interagency coordination activities.

2. Purpose and Need for Penn Station Access

The purpose of the Penn Station Access MIS/DEIS is to thoroughly examine the demand for, and the opportunities and constraints related to, providing improved access between Penn Station and the Metro-North East-of-Hudson service territory, and to identify a preferred alternative that addresses the forecasted demand in a cost-effective, environmentally sound, and equitable way.

Current Metro-North service, which terminates at Grand Central Terminal on the East Side of Manhattan, necessitates up to two transfers on additional modes to reach destinations on the West Side. From Penn Station, travelers have immediate pedestrian access to the West Side and to an extensive local and regional transit distribution network available at and near the station. Provision of more direct access between Penn Station and the Metro-North service area would both improve access to West Side destinations and enhance the region's connectivity. Having two terminals in Manhattan which are accessible from the Metro-North service area could also provide added flexibility in the event of service disruptions.

Provision of service to the Penn Station area would address the following types of travel:

- Commutation to Manhattan's West Side (Penn Station and Upper West Side areas);
- Commutation to Long Island and New Jersey (via transfer at Penn Station to LIRR or NJ Transit service);
- Commutation to workplaces in the vicinity of possible new intermediate station(s);
- Reverse commutation from the Penn Station area and possible new station(s) to communities in the Metro-North service area;
- Discretionary (non-work-related) travel to Long Island and New Jersey in peak periods, off-peak periods, and on weekends;
- Discretionary (non-work-related) travel to Manhattan's West Side in peak periods, off-peak periods, and on weekends for visits to shops, shows, museums, and sporting events; and
- Improved access via connection to Amtrak service at Penn Station for long-distance travel.

Penn Station access may also serve to increase Metro-North ridership and improve system flexibility by offering direct service to a second major transportation hub in Manhattan. From a longer-term perspective, Penn Station access might also enhance Metro-North's ability to accommodate potential future ridership growth.

Finally, rail transit systems serving the New York Metropolitan region are currently undergoing a period of growth, change, and enhancement geared toward improving regional connectivity. Significant transportation investments currently contemplated include the LIRR's East Side Access project, the Metropolitan Transportation Authority's (MTA) study of Lower Manhattan Access, and the MTA, NJ Transit, and Port Authority of New York and New Jersey's Access to the Region's Core study, among others. Penn Station access would serve as an element of this improved regional connectivity by providing direct connection between Metro-North Railroad, LIRR, NJ Transit, and Amtrak services at Penn Station. In addition to providing a specific Metro-North service expansion, it would also support regional economic development goals and improvements in regional air quality and quality of life.

3. Goals and Objectives

The mission of Metro-North is to preserve and enhance the quality of life and economic health of the region through the efficient provision of transportation service of the highest quality. The goals and objectives defined specifically for the Penn Station Access MIS/DEIS reflect Metro-North's mission and the identified purpose and need for improved access to Penn Station. The goals and objectives are as follows:

Goal 1: Provide improved access for existing Metro-North customers between Metro-North's service area and the West Side of Manhattan and, from there, to other regional destinations.

Objectives:

- Reduce travel times to destinations on the West Side of Manhattan for daily commuters and excursion travelers.
- Reduce the need for transfers between Metro-North service and other modes for commutation from the Metro-North service area to West Side destinations.

- Provide improved reverse (outbound) service from Manhattan and the Bronx to selected destinations in the Metro-North service area.
- Provide convenient connection and potentially one-seat service from the Metro-North service area to Amtrak, LIRR and NJ Transit service at Penn Station for travel to regional destinations outside the Metro-North service area.

Goal 2: Provide additional transportation options and increased flexibility and connectivity in the New York Metropolitan area's transportation network.

Objectives:

- Provide direct commuter service from the Metro-North service area to destinations on the West Side of Manhattan.
- Provide service between the Metro-North service area and the West Side of Manhattan for discretionary and intermediate travel.
- Provide increased flexibility for commutation between the Metro-North service area and Manhattan destinations during service disruptions.
- Provide additional Metro-North system capacity to accommodate potential future ridership growth.
- Provide improved connections between the Metro-North service area and LIRR, NJ Transit, Amtrak, and NYC Transit services at and near Penn Station.
- Provide a new station(s) as intermediate stop(s) between the Metro-North service area and Penn Station.

Goal 3: Provide cost-effective transportation improvements that can be implemented while minimizing adverse social, economic, and environmental effects.

Objectives:

- Maximize the use of existing rail infrastructure to implement improved Metro-North service between the Metro-North service area and the Penn Station area and the West Side of Manhattan, and to introduce new station(s) in areas not currently served by Metro-North.
- Identify transportation improvements that would minimize acquisition of property or displacement of residential, business, and other viable uses.
- Identify transportation improvements whose construction and operations impacts could be reasonably and cost-effectively mitigated, as appropriate.

Goal 4: Promote the economic and environmental health and vitality of the New York Metropolitan area.

Objectives:

- Provide improved commuter accessibility from the Metro-North service area to employment locations on the West Side of Manhattan.

- Provide improved rail service options that encourage modal shifts from single-occupant-vehicle travel and thereby reduce traffic congestion on the region's roadway network and improve regional air quality.
- Provide transportation improvements that will comply with Clean Air Act Amendments of 1990 and State Implementation Plan provisions.
- Attract new ridership to mass transit.
- Identify transportation improvements for which there is a very reasonable chance that federal, state, and/or local funding will be available for implementation.
- Support local and regional economic growth by improving mobility in the study area.

B. ALTERNATIVES EVALUATION METHODOLOGY

1. Overview

The ultimate purpose of the MIS/DEIS is to inform and facilitate decision-making about major transportation investments. The methodology for evaluating alternatives is structured to provide the information needed to select among competing transportation options that may satisfy the stated goals and objectives. In the broader context of the Metropolitan Transportation Authority's (MTA) Long Range Planning Framework (LRPF), the evaluation methodology for Penn Station Access is consistent with the criteria and measures used to evaluate the MTA's other network expansion studies. It provides a comparable basis for local and regional decision-making among competing transportation investments. Finally, the evaluation of alternatives is intended to produce necessary information relative to Federal Transit Administration (FTA) New Starts criteria, should Metro-North decide to seek federal funds to implement a Penn Station access alternative.

This methodology report is organized around the following levels of alternatives analysis to be conducted during the course of the MIS/DEIS:

- initial qualitative screening analysis of the preliminary list of alternatives, to eliminate those deemed infeasible or not reasonable and to identify an intermediate list of alternatives for further development and evaluation;
- comparative screening analysis of the intermediate list of alternatives surviving the initial screening, to select those which warrant further, detailed evaluation; and
- detailed analysis of the alternatives remaining after the comparative screening analysis, to provide sufficient technical basis for selecting the locally preferred alternative.

Figures 1 and 2 illustrate the progression of analysis to be undertaken in the alternatives evaluation process, in terms of numbers of alternatives and criteria considered, degree of detail required in data and analyses, and levels of agency decision-making. As shown on Figure 1, the number of evaluation criteria and related data requirements increase proportionally from the first to the last of the three tiers of evaluation as the number of alternatives becomes reduced. Figure 2 further illustrates this relationship of increasing specificity and quantification of alternatives' benefits, costs, and impacts as the evaluation process progresses from many to few alternatives and, ultimately, to selection of a locally preferred alternative. Each of these three steps of the Penn Station Access alternatives analysis process is described in the following sections.

Figure 1
Progression of Alternatives Evaluation

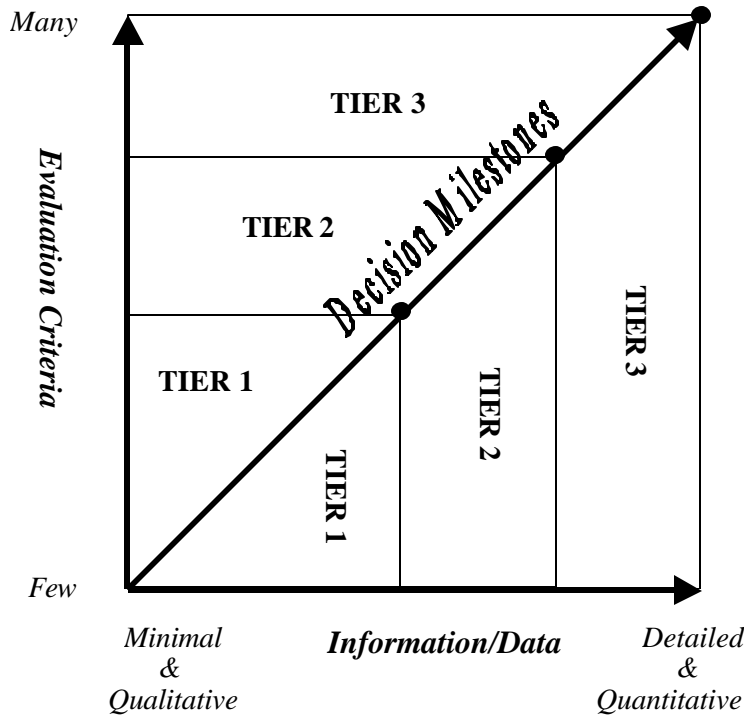


Figure 2
Penn Station Access Alternatives Evaluation Process

| | | | |
|----------------------|--|--|---|
| Analysis Level | Tier 1 Initial Screening | Tier 2 Comparative Screening | Tier 3 Detailed Evaluation |
| Alternatives | Many | 6 – 10 | Short List |
| Degree of Definition | Generalized Definitions | Some Detail in Definitions | Detailed Definitions |
| Criteria | Basic Feasibility Qualitative | Relative Benefits, Impacts, Costs Best Meet Goals and Objectives Qualitative and Quantitative | Detailed Benefits, Impacts, Costs Best Competes for Regional and Federal Funds Mostly Quantitative |
| Documentation | Initial Alternatives Screening Report | Comparative Alternatives Evaluation Report | MIS/DEIS |

2. First-Tier Screening Analysis

The first-tier screening analysis serves to identify and eliminate preliminary alternatives which are clearly infeasible or not reasonable; have severe, obvious defects; or would violate fundamental operational and engineering considerations. This initial screening of preliminary alternatives is largely qualitative, assessing each preliminary alternative's fundamental feasibility and theoretical ability to satisfy the stated goals and objectives. The following criteria are defined to be suitable for initial assessment of different modal options, without bias towards one or against another:

- An alternative must have the theoretical capability to improve access between Penn Station and the Metro-North service area by reducing travel time and/or the need for transfers.
- An alternative must be theoretically operationally and physically feasible.
- An alternative must be theoretically capable of being implemented principally with existing infrastructure and/or committed infrastructure improvements.
- An alternative must substantially support public transportation, economic, and environmental policies and goals to enhance transit and reduce single-occupant auto travel.

On the basis of the first-tier screening, preliminary alternatives which do not warrant further consideration will be eliminated. Results will be documented both in matrix and text format to provide the rationale for elimination or retention of each alternative.

3. Comparative Screening Analysis

Alternatives which survive the first-tier screening will be evaluated against a second set of criteria and related performance measures. These criteria will be defined to evaluate each alternative's relative ability -- compared to other surviving alternatives -- to achieve transportation system and service improvements and benefits, and to effectively address major environmental and other issues of concern. The comparative screening analysis will identify each alternative's principal advantages and shortcomings; highlight essential differences among alternatives; and identify trade-offs inherent in selecting one alternative over another. (The comparative screening criteria will be more specifically defined in a supplement to this methodology report, subsequent to completion of the first-tier screening analysis.)

The analyses of alternatives against the comparative screening criteria will be both qualitative and quantitative and will focus on determining which alternatives offer the most benefits while minimizing potential negative consequences, in terms of the following factors:

- operations and service characteristics;
- ridership and transportation benefits;
- institutional constraints;
- engineering feasibility and constructibility;
- capital costs;
- operating feasibility and costs; and
- major social, economic, and/or environmental constraints and impacts.

The comparative screening analysis will also include a qualitative assessment of the likelihood that implementation of a given alternative would achieve the transportation goals and related objectives (listed in Section A.3. Goals and Objectives). Direct consideration of the underlying

goals and objectives at this point in the evaluation process will supplement the technical analyses and facilitate selection of alternatives for further evaluation.

Each alternative's relative attributes and ability to satisfy the defined technical criteria will be exhibited in a series of matrices with accompanying explanatory text. An additional matrix, and related text, will be prepared to summarize the alternatives' relative ability to achieve the defined goals and objectives. On the basis of the comparative screening analysis, the alternatives which are most reasonable, feasible, and potentially effective in satisfying the goals and objectives will be recommended for further, detailed evaluation in the third phase of alternatives analysis.

4. Detailed Alternatives Evaluation

The final list of alternatives derived from the preceding second-tier screening analysis will be evaluated against criteria and evaluation measures which reflect Metro-North considerations and are consistent with the MTA's Long Range Planning Framework (LRPF) and the FTA's New Starts criteria (Section 5309) for assessing major transportation investments. This detailed alternatives evaluation and complementary comprehensive social, economic, and environmental evaluation, will be documented in the Penn Station Access MIS/DEIS. (Following agency and public review of the MIS/DEIS and Metro-North consideration of comments received at the MIS/DEIS public hearing(s) and during the formal comment period, the Locally Preferred Alternative (LPA) for the Penn Station Access study will be selected.)

Application of the criteria to the short-listed alternatives will be done in accordance with the specific methodologies, calculations, values, and reporting formats described in:

- *MTA Long Range Planning Framework Project Evaluation Measures*, February 1998;
- *MTA Long Range Planning Framework Evaluation Criteria and Measures*, October 1994, Revised November 1995;
- *Technical Guidance on the Section 5309 New Starts Criteria*, FTA, Office of Planning, September 1997; and
- *Addendum to the September 1997 Technical Guidance on the Section 5309 New Starts Criteria*, FTA, Office of Planning, October 1998.

The LRPF does not prescribe specific criteria that must be applied to choose among alternatives, but provides an illustrative list of criteria which may be appropriate and reflective of the stated goals and objectives of a given study. The general categories of criteria are:

- transportation;
- economics;
- social benefit-cost summary;
- automobile usage and emissions reductions;
- construction; and
- environmental and community.

The LRPF and FTA New Starts criteria which will be applied to the short-list of Penn Station Access alternatives, to facilitate selection of the preferred alternative, will address the following:

Transportation Benefits

- Ridership
- Travel Time Savings
- System Capacity
- Accessibility

Economics

- Capital Costs
- Operating Costs
- Cost-Effectiveness

Social Benefit-Cost Summary

- MTA Benefit-Cost Ratio

Automobile Usage and Emissions Reduction

- Change in Vehicle-Miles-Traveled
- Change in Criteria Pollutant/Precursor Emissions

Construction

- Construction Complexity
- Construction Impacts

Environmental and Community

- Significant Adverse Environmental Impacts
- Community Impacts
- Permits/Approvals for Implementation

(The detailed criteria will be more specifically defined in a supplement to this methodology report subsequent to completion of the second-tier, comparative screening analysis.)

5. Reporting of Results

The results of the initial and comparative screening analyses will be reported in Initial Alternatives Screening and Comparative Alternatives Evaluation Reports, respectively. The rationale, results, conclusions, and recommendations of the two screening exercises will be documented.

In the Initial Alternatives Evaluation Report, text will be accompanied by generalized mapping of the preliminary alternatives under consideration and by complementary matrix presentation of each alternative's performance against each criterion. Reasons for elimination of alternatives will be clearly stated and sufficiently supported.

For the comparative screening analysis, the Comparative Alternatives Evaluation Report text will be accompanied by more detailed mapping of the alternatives retained for consideration against the more detailed evaluation criteria. Screening results will also be reported in matrix format to:

- display quantitative data and qualitative assessments, as appropriate, for each alternative against each criterion;
- highlight principal differences among alternatives; and
- identify trade-offs inherent in selecting one alternative over another.

The conclusions of the screening analysis will be summarized, highlighting transportation benefits which would be realized, and the rationale for selection of the most reasonable and feasible alternatives (approximately three, and potentially including options) for subsequent evaluation against the final set of criteria will be documented.

The detailed evaluation of the short-listed alternatives will be documented in the MIS/DEIS, including detailed description and mapping of the alternatives; matrix presentation of the evaluation results for the defined criteria; and accompanying text, describing each alternative's performance against the evaluation criteria, highlighting the principal differences among alternatives, and assessing the extent to which each alternative can achieve the defined goals and objectives.