Cross Harbor Freight Program
Environmental Impact Statement (EIS) Methodology

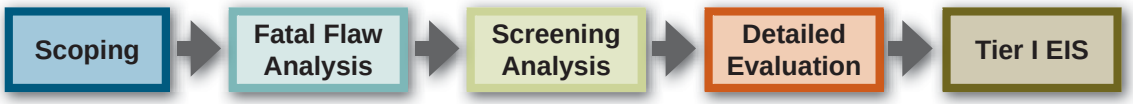
INTRODUCTION

The Federal Highway Administration (FHWA) and the Port Authority of New York and New Jersey (PANYNJ), serving as co-lead agencies, are preparing an Environmental Impact Statement (EIS) to evaluate alternatives to improve the movement of goods in the region by enhancing the transportation of freight across New York Harbor. The Cross Harbor Freight Program EIS will analyze alternatives that would provide near-term and long-term strategies for improving the regional freight network, reducing traffic congestion, improving air quality, and providing economic benefits.

The greater New York/New Jersey/Connecticut region is the financial center of the U.S. economy and the nation's largest consumer market. Regional forecasts of truck growth vary depending on the source, year, and geography, but available sources agree that truck tonnage is anticipated to increase substantially by 2035. The overwhelming dependence on trucking in the freight distribution network is expected to remain, and will result in serious regional highway congestion, deleterious effects on environmental quality, and extended travel delays. The continuation of this trend without improvement will threaten the economic vitality of the greater New York/New Jersey/Connecticut region.

The following describes the process and methodology that will be undertaken for the development and evaluation of project alternatives and the preparation of the EIS, which will ultimately select a Preferred Alternative or Alternatives in the Tier I EIS Record of Decision. The process consists of five major steps—scoping, fatal flaw analysis, screening analysis, detailed evaluation, and the Tier I EIS—that are intended to winnow the number of alternatives through a comprehensive evaluation process. The 5-step process includes numerous tasks involving separate processes, decision points/action items, and analysis modeling that are described in this report (see Appendix A for a diagram illustrating the sequence of these individual tasks). Detailed technical and analytical methodologies associated with the tasks are provided in Appendices B and C. The following is an overview of the five major steps:

1. **Scoping** – Determines the project's goals and objectives, alternatives to be considered, and scope of issues to be examined in the Tier I EIS. Also refines the project purpose and need.
2. **Fatal Flaw Analysis** – Eliminates clearly infeasible alternatives from further consideration.
3. **Screening Analysis** – Reduces the range of reasonable alternatives that do not meet the goals and objectives based on freight demand forecasting and broad qualitative criteria.
4. **Detailed Evaluation** – Evaluates alternatives for potential regional and localized effects based on specific and more rigorous quantitative performance measures.



5. **Tier I EIS** – Documents and presents the results of the detailed evaluation, summarizes the process and results of Steps 1-4, and includes additional environmental analyses and compliance with environmental laws and regulations, as appropriate.

1. SCOPING

The first step is scoping, and it begins with the issuance of a Notice of Intent (NOI) and initiation of the public scoping process. A NOI for the Cross Harbor Freight Program was issued in the Federal Register on May 13, 2010; the Scoping Document is being issued concurrently with this document. As described in the NOI, the EIS analyses will be conducted using "tiering," as described in 40 CFR 1508.28, which is a staged process applied to the environmental review of complex projects. Several pre-scoping meetings were held with the Technical Advisory Committee and Stakeholder Advisory Committee prior to the issuance of the NOI. These initial agency coordination meetings included discussions regarding project goals, alternatives, and the process for the alternatives evaluation and Tier I EIS.

The purpose of the scoping process is to assure that the full range of issues related to the proposed action is addressed in the Tier I EIS, and that potential significant adverse impacts are identified and advanced for further study to Tier II, as appropriate. FHWA and PANYNJ are undertaking an extensive public scoping process that will allow the public and affected agencies to provide comments on the scope of the environmental review process. The Draft Scoping Document will frame the environmental review to follow, and will facilitate a public discussion of project alternatives and the environmental issues to be considered in the EIS.

The two major tasks associated with the scoping process, described below, are: (1) needs assessment; (2) identification of project goals and objectives and (3) development of a long list of alternatives.

NEEDS ASSESSMENT

As the first task, a needs assessment was undertaken to identify the need for the project and to develop a comprehensive statement of the project's purpose. The Cross Harbor Freight Program Needs Assessment, being issued concurrently with the Draft Scoping Document, identified substantial constraints and problems with the existing freight system, including rail, marine, and highway infrastructure, and its ability to accommodate future growth in freight movement across New York Harbor between the east-of-Hudson and west-of-Hudson regions. The scoping process allows for the refinement of the purpose and need.

GOALS AND OBJECTIVES

The primary purpose of the project is to improve the movement of freight across New York Harbor between the east-of-Hudson and west-of-Hudson regions. A project's goals and objectives are the foundation of its purpose and need under the National Environmental Policy Act of 1969 (NEPA). They are used as the basis for developing the criteria and methodology for evaluating the project alternatives. Four goals have been established for the Cross Harbor Freight Program. These goals

are intended to remedy some of the problems stated in the Needs Assessment. Objectives have also been identified that further define the goals and provide specific and measurable means by which to evaluate and compare project alternatives. The four project goals and respective objectives are as follows:

GOAL 1: Reduce the contribution of Cross Harbor trucks trips to congestion along the region's major freight corridors relative to the No Build scenario.

Objectives:

A. Reduce the vehicle miles traveled by freight trucks which cross the Hudson River.
B. Reduce the travel-time and delay on regional highway network.
C. Maximize efficient use of available capacity on existing transportation infrastructure.
D. Maintain or improve regional rail network performance.

GOAL 2: Provide Cross Harbor freight shippers, receivers, and carriers with additional, attractive modal options to existing interstate trucking services.

Objectives:

A. Increase the number of modal options available for Cross Harbor freight transportation.
B. Provide modal options and choices that offer attractive and competitive performance, consistent with business requirements.

GOAL 3: Expand facilities for Cross Harbor goods movement to enhance system resiliency, safety and security, and infrastructure protection.

Objectives:

A. Provide Cross Harbor freight facilities and services that improve system redundancy and resilience in the event of a major interruption of service on existing interstate highway corridors serving the region.
B. Support contingency planning for emergency alternative Cross Harbor goods movement operations.
C. Reduce the number of freight vehicle related accidents.
D. Develop effective alternative options for transporting overweight/non-standard cargo to support infrastructure protection for regional bridges and highway network.

GOAL 4: Support development of integrated freight transportation/land use strategies.

Objectives:

A. Maximize underutilized freight transportation infrastructure and related land uses.
B. Support services to existing freight distribution centers in the region.
C. Integrate rail freight services with local land use and transportation planning objectives.
D. Integrate rail freight development with statewide freight and passenger rail plans.

LONG LIST OF ALTERNATIVES

The alternatives evaluation begins with the development of a long list of alternatives comprising combinations of freight movement methods and existing or potential facility locations. This universe

of project alternatives is appropriate for a Tier I EIS, which aims to select a mode, alignment, and logical termini for the proposed project.

This list includes a variety of alternatives that were identified and studied in previous reports, including the Cross Harbor Freight Movement Major Investment Study (MIS), commissioned by the New York City Economic Development Corporation (NYCEDC) and completed in the spring of 2000. Four alternatives from the MIS were advanced for study in a Draft EIS, which was published in April 2004 by FHWA and the Federal Railroad Administration (FRA), acting as co-lead agencies, and NYCEDC, acting as the project sponsor.

A complete description with figures depicting the long list of alternatives for the Cross Harbor Freight Program is included in the Scoping Document. These alternatives generally fall into the following three classes:

1. No Action Alternative
2. Management Alternatives – Transportation System Management (TSM) and Transportation Demand Management (TDM)
3. Build Alternatives – Float Alternatives, Rail Tunnel Alternatives, and Rail/Vehicle Tunnel Alternatives.

2. FATAL FLAW ANALYSIS

The long list of alternatives will include a wide range of potential alternatives. To ensure a meaningful alternatives analysis and environmental review, NEPA requires consideration of project alternatives that are considered feasible and reasonable. Therefore, the second step in the process is to undertake a fatal flaw analysis, which is intended to eliminate alternatives that are not feasible early in the evaluation process. Basic feasibility criteria will be established for this project to eliminate non-viable alternatives from the long list. The feasibility criteria, or “fatal flaw” criteria, include:

- Clearly inconsistent with or unlikely to meet the project goals and objectives.
- Requires technologies, service concepts, etc., whose feasibility and effects cannot be reliably tested through the evaluation process.
- Requires the use of resources or properties which are highly unlikely to be available, or whose use would create a conflict with the project goals and objectives.
- Incompatible with existing or planned operations of current rail providers.
- Results in severe impacts and/or cost implications to existing rail or highway infrastructure.
- Results in severe adverse environmental effects that would make approval or permitting unlikely.

Public and agency input on the fatal flaw feasibility criteria will also be considered during the scoping process. From the long list of alternatives, each would be evaluated in relation to the feasibility criteria to determine if the alternative will be fatally flawed and eliminated, or it will be carried forward for further evaluation in the next step, the screening analysis.

3. ALTERNATIVES SCREENING PROCESS

As a result of the fatal flaw analysis, a range of potentially feasible project alternatives will be identified and then carried forward to Step 3—the alternatives screening process. The purpose of the screening process is to reduce the number of alternatives to be further analyzed in the detailed evaluation. If similar alternatives have comparable outcomes, the alternative with the best results will be carried forward and the other similar alternatives, with less favorable outcomes, will be eliminated.

The screening process begins with a market analysis to collect detailed information about existing freight logistics and demand. This information is then used to develop the mode choice model. The mode choice model will provide estimates of future freight flows by mode for each alternative. The resultant freight flows will enable a comparison of each alternative's ability to attract freight and provide an important measure in determining a given alternative's ability to meet the first two project goals. The alternatives will also be qualitatively evaluated to determine if they are consistent with the broad objectives associated with the project goals (described above).

The following describes the individual tasks in the screening process. The full extent of the technical methodologies that will be used to evaluate logistics and market demand for the screening analysis can be found in Appendix B.

MARKET ANALYSIS

The screening process and development of the mode choice model begins with a market analysis to understand freight logistics and demand throughout the 54-county Cross Harbor modeling study area. These are closely related issues, because decisions about how to move freight—by what mode, and what route—generate demand over the transportation system. The market analysis comprises three major tasks:

- Determine existing freight flows
- Identify freight markets
- Specify level of service parameters for proposed alternatives

To address freight logistics, research will be undertaken to identify and describe, in qualitative and quantitative terms, the types of existing freight movements that occur today to serve shippers and receivers in the east-of-Hudson market, emphasizing the critical differences between direct moves (from shipper to receiver via a single mode), intermodal moves (from shipper to receiver via multiple modes), and indirect moves (via intermediate warehouse and distribution facilities located in the NY/NJ region). The second task, freight market research, will be undertaken to gather information in order to understand the factors used by decision-makers to select a particular mode of transportation. Based on the information provided from the market research, the third task will be to specify key attributes or level of service parameters for each alternative.

POTENTIAL FREIGHT TRANSPORTATION MARKETS

To understand the market demand for each alternative, the analysis will first examine the four types of freight movements (listed below) that may be well served by Cross Harbor freight improvements. These freight movements are considered domestic moves, because international cargo that enters the country through the region's ports and airports are transported across the harbor in a secondary, domestic move.

1. **Existing rail markets** and services to the east-of-Hudson region, which could increase through normal business growth and improvements to rail services. This category also includes historic rail markets that might be recaptured, as well as emerging opportunities in commodity types that are typically well-served by traditional railcar service. Rail improvements within the market demand and forecasting study area may facilitate rail freight movement, but the specific origin/destination of rail freight moving to/from the east-of-Hudson region is also a critical factor. Some origin/destination regions are better served by rail than others, based on the availability of rail service at attractive prices and schedules, and/or the availability of service from multiple railroads.

2. **Long-haul trucking** (400 miles or more) of full truckloads from west-of-Hudson points to east-of-Hudson points. For freight moving more than 400 to 500 miles, rail is a competitive option because the distance is longer than a trucker can usually drive in a single 24-hour period. Long-haul freight that would otherwise move on truck could move by rail in a variety of ways: as intermodal shipping containers, either single-stacked or double-stacked; or as trailers-on-flatcars; or even as "piggyback" traffic, where the entire truck, including cab, is carried. Most importantly, long-haul truckload shipments already arrive in the east-of-Hudson region every day, and are already served by existing receiving facilities. If these shipments were to be handled by rail instead, they would not require new warehouse/distribution facilities in the east-of-Hudson region. New or expanded rail yards where freight could be lifted or rolled onto and off railcars would, however, be required.

3. **Rail drayage reduction**. Some current rail traffic terminates at rail yards in the west-of-Hudson region, and is broken down and trucked to its ultimate destination in the region. In cases where full rail containers are broken down into smaller truckloads, the operation typically occurs in major warehouse/distribution centers in northern New Jersey, or increasingly in Harrisburg or northeastern Pennsylvania. This operation cannot be relocated to the east-of-Hudson region without adequate investments in warehouse/distribution capacity. These operations also require adequate terminal space, whether the railcar is delivered directly to the customer, or whether its contents must be transferred to trucks, or possibly stored for an interim period. Railcar utilization is another significant factor. Simply put, the more loaded miles per year that railcars travel, the greater the revenues per year they generate. Railroads allocate their equipment to routes and services that generate higher revenues, and their willingness to serve lower-priority markets depends in part on railcar supplies. A final consideration would be whether rail schedules and services would actually provide faster end-to-end service by continuing on rail to east-of-Hudson points, or whether terminating traffic west-of-Hudson and trucking the remaining distance is more efficient. To fully understand this market opportunity, the analysis will consider the number of full loads on rail that are destined for east-of-Hudson today, the number of full loads likely to occur in the future, and the improvements necessary for alternatives involving enhanced cross harbor infrastructure to meet or beat current rail service.

4. **Short-haul trucking**. The region's marine terminals, warehouse/distribution facilities, and major shippers and receivers generate significant container, dry van (including full truckload and less-than-truckload), and bulk traffic. Local traffic is moving almost exclusively by truck due to the short distances. Using rail for these trips involves higher handling costs due to intermodal transfers, and slower end-to-end travel times. However, both old and new technologies could increase the potential to divert traffic from this market. Existing technologies, in addition to railcar floats, include truck floats, trailer-on-barge,

and container-on-barge. New technology includes trains carrying trucks through a tunnel and "automated guided vehicles" (AGVs). The requirements of capturing this market are more speculative at this time, but potentially feasible with existing technology. One benefit of this means of serving this market demand is that no additional warehouse/distribution space would be required, since the same truck moving across the harbor would serve both shippers and receivers.

For each of these types of freight movements, data will be collected regarding commodity and vehicle flows. Several sources of data will be used for this effort, including existing regional models, TRANSEARCH data, Rail Waybill data, as well as truck and rail surveys at key facilities. Detailed methodologies for this data collection effort are included in Appendix B.

FREIGHT MARKET RESEARCH

The second task for the market analysis is to clearly understand and describe the factors used by decision-makers to select a particular mode of transportation. Market research will be undertaken, through one-on-one interviews and focus groups. Specifically, the objectives of this research are to:

- Understand how Cross Harbor shippers make decisions regarding freight transportation, including mode and carrier choices, through a coordinated program of one-on-one interviews and focus groups.
- Understand the role of supply chain logistics on these decisions through a coordinated program of one-on-one interviews and focus groups.
- Obtain detailed information on actual recent shipments in the market demand and forecasting study area via revealed-preference surveys conducted via telephone.
- Obtain detailed information on the extent to which shipping decision-makers would change their choices under different hypothetical transportation scenarios, via stated-preference choice exercises.

Detailed methodologies for the specific efforts associated with the market research, including surveys, focus groups, and interviews, are included in Appendix B.

LEVEL OF SERVICE PARAMETERS

The last task for the market analysis is to specify key attributes or level of service parameters for each proposed alternative. These attributes will be used to test each alternative in the freight flow forecasting effort. These attributes include:

- **Reliability** – Ability to provide predictable delivery of goods within expected time windows.
- **Cost –** The end-to-end price paid by the shipper or receiver, reflecting labor costs, fuel costs, equipment costs, and the time lost to congestion or to the breakdown of efficient supply chains.
- **Speed** – Total end-to-end travel time for delivery of goods.
- **Safety/security/loss/breakage –** Safe and secure operation of freight vehicles and facilities to minimize loss and damage.
- **In-transit visibility** – Ability to track and locate goods throughout shipping process.

Table 1: Screening Criteria

Goals and Objectives	Broad Screening Criteria
Goal 1: Reduce the contribution of Cross Harbor trucks trips to congestion along the region's major freight corridors.	
Reduce the vehicle miles traveled by freight trucks which cross the Hudson River.	Likely change in regional truck vehicle miles of travel (VMT).
Reduced travel-time and delay on regional highway network.	Not evaluated for screening analysis.
Maximize efficient use of available capacity on existing transportation infrastructure.	Qualitative comparison of alternative concepts plans.
Maintain or improve regional rail network performance.	Likely change in regional rail system demand.
Goal 2: Provide Cross-Harbor freight shippers, receivers, and carriers with additional, attractive modal options to existing interstate trucking services.	
Increase the number of modal options available for Cross Harbor freight transportation.	Qualitative comparison of alternative concepts plans
Provide modal options and choices that offer attractive and competitive performance, consistent with business requirements.	Comparison of market demand as measured by the Mode Choice Model
Goal 3: Expand facilities for Cross Harbor goods movement to enhance system resiliency, safety and security, and infrastructure protection.	
Provide Cross Harbor freight facilities and services that improve system redundancy and resilience in event of a major interruption of service on existing interstate highway corridors serving the region.	Provision of new freight capacity other than existing interstate highway corridors.
Support contingency planning for emergency alternative Cross Harbor goods movement operations	Provision of new freight capacity other than existing interstate highway corridors.
Reduce the number of freight vehicle related accidents.	Likely change in regional truck VMT.
Develop effective alternative options for transporting overweight/non-standard cargo to support infrastructure protection for regional bridges and highway network.	Qualitative comparison of alternative concepts plans
Goal 4: Support development of integrated freight transportation/land use strategies.	
Maximize underutilized freight transportation infrastructure and related land uses.	Qualitative comparison of alternative concepts plans
Support services to existing freight distribution centers in the region.	Qualitative comparison of alternative concepts plans
Integrate rail freight services with local land use and transportation planning objectives.	Not evaluated for screening analysis.
Integrate rail freight development with statewide freight and passenger rail plans.	Not evaluated for screening analysis.

- **Equipment availability** – Equipment required for the shipment and storage of goods is available at the appropriate location.

Information regarding these parameters will be obtained from the market research surveys. These parameters vary for a broad range of commodities and origin destinations. Any alternative that can be defined in terms of its level of service can be tested for its estimated potential demand in the mode choice model.

FREIGHT SHIPMENT MODE CHOICE MODEL

The data and information collected from the market analysis will be used to develop a model that predicts how shippers will react to corridor transportation improvements and alternatives. The mode choice model will relate the choice of shipment mode (truck, rail, waterborne) to specific characteristics of the shippers/receiver, the shipments made, and the level of service attributes of each mode. The detailed methodology for developing the mode choice model is included in Appendix B.

For each alternative, the mode choice model will calculate the diversion of freight flows to rail or waterborne modes, as compared to the base traffic moving by truck. This comparative process allows for a range of alternatives to be tested against a broader range of commodities and origin destinations. As a result of the model, the mode diversion of freight and the geographic distribution of freight will be identified for each alternative.

CRITERIA FOR ALTERNATIVES SCREENING

The output of the mode choice model will be freight flow by mode—how much freight will move by rail or waterborne as compared to trucks on the highway system. If similar alternatives result in comparable results, the alternative with the best results will be carried forward and the other similar alternatives with less favorable outcomes will be eliminated.

Alternatives will also be evaluated for consistency with the objectives associated with the project goals. This evaluation will be based on broad qualitative measures for each objective. For some objectives, such an evaluation may not be possible at the screening level since the alternatives and their potential effects have not been defined in enough detail. The proposed screening criteria are shown in Table 1. In this case, criteria will be developed in Step 4—the detailed evaluation. The following describes the broad screening criteria for each of the project goals and objectives.

4. DETAILED EVALUATION

The outcome of the screening analysis will be a limited list of alternatives. The next step in the process is the detailed evaluation that will consider both quantitative and qualitative performance measures and provide a comparative analysis to weight the relative benefits and detriments of each alternative and determine which alternative(s) best meets the project's goals and objectives. One purpose of the detailed evaluation is to analyze potential regional and localized effects based on more quantified measures. The results of the detailed evaluation will also identify the alternatives that will be carried forward in the Tier I EIS. For this step in the process, alternatives will be evaluated to determine their potential effects on:

- Transportation networks – regional rail and highway networks.
- Operational and engineering requirements – right-of-way, yard, facility, and infrastructure requirements.

- Environment – range of social and environmental conditions.
- Economic and financial conditions – cost and benefits, financial value to the railroads, various revenue streams, and funding needs.

For each alternative, the results of the analyses will be evaluated based on performance measures associated with the project goals and objectives. These performance measures will primarily be quantitative; however, some analysis areas will consider potential benefits or detriments that cannot be easily measured but must be characterized qualitatively, such as effects on surrounding land and consistency with local plans. Based on the results of the detailed evaluation, alternatives could be eliminated and therefore not carried forward for the Tier I Draft EIS. The full extent of the technical methodologies that will be used for the detailed evaluation can be found in Appendix C.

REGIONAL TRANSPORTATION EFFECTS

As described above, the screening analysis in Step 4 will result in a comparison of the amount of freight that will be diverted from trucks in the No Action Alternative to alternative modes. The transportation network will be further analyzed in Step 5, by determining how the resulting future freight flows would affect the regional rail and highway networks. The purpose of the transportation evaluation is to understand the impact of potential Cross Harbor improvements on specific rail lines, river crossings, and highway freight corridor segments.

RAIL OPERATIONS ANALYSIS

Cross Harbor rail infrastructure enhancements from the alternatives could lead to substantial changes in rail operations. At the same time, rail traffic growth over the regional rail freight network, absent the improvements, must be accommodated as well. Therefore, a rail operations analysis will be performed by developing high-level rail traffic density projections and evaluating the broad implications in terms of rail network capacity.

Current rail traffic flows will be used to initially set up and develop a regional rail network model. Future baseline growth will then be estimated and applied to the model. The effects from the alternatives—in terms of changes in volumes over existing infrastructure—will then be modeled. The modeling will address float and tunnel services and the lines serving them. Each section of rail line will be evaluated in terms of capacity, based on its physical characteristics, impact on existing operations, traffic mixes, service schedules, signaling, dispatching procedures, time-of-day peaking factors, and other similar attributes.

HIGHWAY NETWORK ANALYSIS

To assess the effects of the alternatives on the regional highway system, regional travel demand models will be used to assess the expected changes in truck trip volumes and origin-destination patterns. Regional model outputs, with and without the proposed alternatives, will be compared to estimate the net benefits to the regional highway system. It is expected that for most alternatives, truck trips over the Hudson River crossings and major corridors accessing these crossings would be somewhat reduced. However, local traffic at certain points, particularly truck to rail transfer facilities, could increase. The regional models provide a framework to evaluate these effects on a regional basis. They can not be used to evaluate the localized increases in trips. This needs to be done on a more micro-scale. The analysis will use a combination of two regional model systems—North Jersey Transportation Planning Authority's (NJTPA) North Jersey Regional Transportation

Model Enhanced (NJRTME) and New York Metropolitan Transportation Council's (NYMTC) Best Practices Model (BPM).

The results of the mode choice model—reductions in truck traffic on key corridors, as well as potential increased concentrations at local facilities—will be exported into the BPM and NJRTME models. Each alternative will be analyzed for its potential to divert truck traffic, as quantitatively measured by decreases in:

- Vehicle miles of travel (VMT)
- Vehicle hours of travel time (VHT)
- Vehicles hour of delay (VHD)
- Change in travel time
- Peak period traffic and truck volumes

OPERATIONAL AND ENGINEERING REQUIREMENTS

An operational analysis, based on conceptual engineering, will be undertaken during this step to determine operational needs, particularly as it relates to the existing rail network and costs associated with the proposed alternatives. For yards and facilities associated with the alternatives, the conceptual engineering will identify the location of yards and facilities, minimum sizes, and any infrastructure needs. The conceptual engineering will also identify any associated right-of-way requirements. Order of magnitude cost estimates for the construction, operation, and maintenance of the alternatives will also be developed.

ENVIRONMENTAL EFFECTS

Environmental analyses of alternatives will also be undertaken in this step. These analyses will consider both direct and indirect effects as well as cumulative effects for a range of social and environmental conditions and evaluate the potential for local environmental effects. The conceptual engineering and operational information described above will be used to consider potential environmental consequences for each alternative. The analyses will be a mix of both quantitative and qualitative, depending on the specific analysis and available information, and the detailed methodology for each of these analyses is included in Appendix C. Environmental analyses will be undertaken in the following areas:

- **Land use, zoning, and public policy** – compatibility with land use, neighborhood character, and development goals and regional public policy.
- **Cultural and historic resources** – direct effects on archaeological and historic resources and parkland.
- **Air quality** – regional (mesoscale) effects and potential local effects on ambient air quality.
- **Energy and greenhouse gases** – change in energy consumption and greenhouse gas emissions in the 54-county Cross Harbor modeling study area.
- **Noise and vibration** – effects from increased rail activity along rail freight routes, activity at rail yards.

- **Natural resources** – direct effects on aquatic biota, terrestrial biota, threatened or endangered species (and their associated habitats, such as wetlands), as well as other resources of special concern, such as essential fish habitat.
- **Contaminated and hazardous materials** – potential to encounter contaminated soil and groundwater during construction, especially those elements that would require excavation, storage, transport, or disposal of contaminated soil.
- **Environmental justice** – potential for disproportionate adverse effects on minority and low-income populations.

ECONOMIC AND FINANCIAL EFFECTS

The detailed evaluation will consider a series of economic and financial effects to address issues associated with the public and private benefits of the alternatives. The analyses will focus on evaluating the effects on economic activity in the 54-county Cross Harbor modeling area. The economic effects will be presented in terms of direct, indirect, and induced economic impacts. Alternatives may also attract local economic development along the alignments and in the vicinity of project elements, such as yards and float facilities. Localized adverse economic impacts may also occur from displacement and relocation of businesses.

As part the screening analysis in Step 4, alternatives are evaluated to estimate their market demand, relative utilization, and modal diversion potential. The alternatives will be further refined based on engineering, operational, environmental, and other considerations in Step 5 (as described above). These revised alternatives will be re-tested with respect to market demand, relative utilization, and modal diversion potential using the mode choice models.

The economic analyses include:

- **Economic impact analysis** – examine the broader implications of the alternatives on freight stakeholders, surrounding communities, and the larger statewide and national implications.
- **Benefit-cost analysis** – estimate benefits from a local, regional, and national perspective based on transportation efficiencies and social and environmental benefits.
- **Market feasibility analysis** – evaluate the acceptance and sustainability of alternatives within the private market world of transportation service providers and customers.
- **Railroad financial analysis** – estimate the potential operational value of alternatives to railroads.
- **Revenue stream and funding needs analysis** – estimate potential revenue streams to the public sector and identify overall funding needs, including needs unmet by revenue streams.
- **Displacement analysis** – identify potential direct displacement of residents and/or businesses.

CRITERIA FOR EVALUATION

For each alternative, the results of the analyses will be evaluated based on performance measures associated with the project goals and objectives. Although these performance measures have not

Table 2: Detailed Evaluation Analysis

Goals and Objectives	Detailed Evaluation Analysis
Goal 1: Reduce the contribution of Cross Harbor trucks trips to congestion along the region's major freight corridors.	
Reduce the vehicle miles traveled by freight trucks which cross the Hudson River.	Transportation
Reduced travel-time and delay on regional highway network.	Transportation
Maximize efficient use of available capacity on existing transportation infrastructure.	Engineering and operational
Maintain or improve regional rail network performance.	Engineering and operational
Goal 2: Provide Cross-Harbor freight shippers, receivers, and carriers with additional, attractive modal options to existing interstate trucking services.	
Increase the number of modal options available for Cross Harbor freight transportation.	Economic and financial
Provide modal options and choices that offer attractive and competitive performance, consistent with business requirements.	Economic and financial
Goal 3: Expand facilities for Cross Harbor goods movement to enhance system resiliency, safety and security, and infrastructure protection.	
Provide Cross Harbor freight facilities and services that improve system redundancy and resilience in event of a major interruption of service on existing interstate highway corridors serving the region.	Transportation
Support contingency planning for emergency alternative Cross Harbor goods movement operations	Engineering and operational
Reduce the number of freight vehicle related accidents.	Transportation
Develop effective alternative options for transporting overweight/non-standard cargo to support infrastructure protection for regional bridges and highway network.	Engineering and operational
Goal 4: Support development of integrated freight transportation/land use strategies.	
Maximize underutilized freight transportation infrastructure and related land uses.	Transportation Environmental
Support services to existing freight distribution centers in the region.	Transportation
Integrate rail freight services with local land use and transportation planning objectives.	Environmental
Integrate rail freight development with statewide freight and passenger rail plans.	Environmental

yet been defined, Table 2 identifies how each of the project goals and objectives will be evaluated by the analyses described above.

5. TIER I DEIS

The final step in the process is the preparation of the Tier I DEIS. The results of all the previously described steps and assessments will be summarized in the Tier I DEIS. The environmental analyses undertaken for the detailed evaluation will be presented in the Tier I DEIS. Some of the environmental analyses may be further refined for the EIS. In addition, the Tier I DEIS will include analyses of visual resources, water resources, coastal zone management, and indirect and cumulative effects, as well as a Section 4(f) evaluation and Section 106 considerations, as appropriate.

The format and content of the Tier I EIS, as well as the review process is described in the Scoping Document. As the EIS process continues, alternatives may be revised, discarded, or added. The preparation of the EIS will ultimately select a Preferred Alternative or Alternatives in the Tier I EIS Record of Decision.