Chapter 7: Secondary and Cumulative Effects

A. INTRODUCTION

The federal Council on Environmental Quality's (CEQ) regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA), set forth in 40 C.F.R. Part 1500 et seq., require federal agencies to also consider the potential for secondary and cumulative effects from a proposed project. Secondary (or indirect) effects are those that are "caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 C.F.R. 1508.8). Secondary and indirect effects can include the full range of impact types, such as changes in land use, economic vitality, neighborhood character, traffic congestion, air quality, noise, vibration, and water and natural resources. For example, transportation projects that provide new service to a neighborhood may result in indirect effects by inducing new growth in that neighborhood. Cumulative impacts result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions (40 C.F.R. 1508.7). The direct effects of an individual action may be negligible, but may contribute to a measurable environmental impact when considered cumulatively with other past and/or future projects.

The analyses presented in Chapters 5 and 6 of this EIS assess the potential direct effects of the project alternatives. Those analyses address a range of transportation, social, and environmental effects within a defined project area that include the project site and a larger project study area (the Northeast Corridor from Swift Interlocking to Secaucus Transfer Station). As explained in Chapter 3, "Project Alternatives," all of the project alternatives have been evaluated assuming that several independent planned projects will be completed by the 2030 analysis year. The analyses presented in Chapters 5 and 6 therefore address, in part, the potential for cumulative effects. These analyses do not, however, fully address the potential for indirect and cumulative effects that could occur within a larger geographic region. Additionally, as discussed in Chapter 3, the Access to the Region's Core (ARC) project is not included in the Portal Bridge's No Action Alternative. The Portal Bridge project is required for implementation of the 2030 Operating Plan proposed for the ARC project (and subsequently, to its benefits and impacts). It is therefore appropriate to consider the Portal Bridge project's indirect effects as they pertain to the ARC project and to consider the cumulative effects of these projects together. The secondary and cumulative effects assessment in this chapter includes the ARC project in addition to other regional transportation and development projects. The assessment relies upon the *Access to the Region's Core Draft Environmental Impact Statement* (February 2007).[1] The sponsors of the ARC project are currently preparing a Supplemental Draft EIS to assess the effects of changes in the design of the project's preferred alternative. With respect to the Portal Bridge project, the most relevant element of the revised design is the relocation of the two ARC tracks to the south of the existing Secaucus Transfer Station. These two tracks will need to connect to the two tracks leading to the new southern bridge, in the area west of Secaucus Transfer Station near the

[1] http://www.accesstotheregionscore.com

Boonton Line. The ARC Supplemental DEIS is expected to be available in the first quarter of 2008.

B. METHODOLOGY

SECONDARY AND INDIRECT EFFECTS METHODOLOGY

The CEQ regulations categorize indirect effects into two categories: (1) alteration of the behavior and functioning of the affected environment caused by project encroachment (physical, chemical, biological); (2) effects related to project-influenced development (e.g., changes in land use and/or demographic shifts). In response to the need for guidance on indirect effects, the National Cooperative Highway Research Program (NCHRP) initiated Project 25-10, the results of which were published as Report 403, "Guidance for Estimating the Indirect Effects of Proposed Transportation Projects," and Report 466, "Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects." These reports recommend an eight-step framework for estimating indirect effects.

- *Step 1–Scoping:* The basic approach, effort required, and geographical boundaries of the study area are determined in this step.
- *Step 2–Identify the Study Area's Direction and Goals:* Information regarding the study area is compiled with the goal of defining the context for assessment.
- *Step 3–Inventory the Study Area's Notable Features:* Additional data on environmental features are gathered and synthesized. The goal is to identify specific environmental issues by which to assess the project.
- *Step 4–Identify Impact-Causing Activities of Proposed Actions and Alternatives:* The component activities of each project alternative are fully described.
- *Step 5–Identify Potentially Significant Indirect Effects for Analysis:* Indirect effects associated with project activities and alternatives are catalogued, and potentially significant effects meriting further analysis are identified.
- *Step 6–Analyze Indirect Impacts:* Qualitative and quantitative techniques are employed to estimate the magnitude of the potentially significant effects identified in Step 5.
- *Step 7–Evaluate Analysis Results:* The uncertainty of the results of the indirect effects analysis is evaluated for its ramification on the overall assessment.
- *Step 8–Assess Consequences and Develop Mitigation:* The consequences of indirect effects are evaluated in the context of the full range of project effects. Strategies to avoid or lessen any effects found to be unacceptable are developed. Effects are reevaluated in the context of those mitigation strategies.

CUMULATIVE EFFECTS METHODOLOGY

CEQ's "Considering Cumulative Effects under the National Environmental Policy Act" (January 1997) offers a framework for examining cumulative effects of a proposed action. The guidance states that an EIS prepared in accordance with NEPA must consider the potential for a project, in combination with other projects and conditions, to have impacts that could not be identified in an examination of the project alone. The CEQ outlines an 11-step process for the identification and evaluation of cumulative effects. The first four steps address scoping, the next three steps focus

on describing the affected environment, and the last four steps discuss how to determine the environmental consequences.

- *Step 1:* Identify the significant cumulative effects associated with the proposed action and define the assessment goals.
- *Step 2:* Establish the geographic scope for the analysis.
- *Step 3:* Establish the timeframe for analysis.
- *Step 4:* Identify other actions affecting the resources, ecosystems, and human communities of concern.
- *Step 5:* Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stresses.
- *Step 6:* Characterize the stresses affecting these resources, ecosystems and human communities and their relation to regulatory thresholds.
- *Step 7:* Define a baseline condition for the resources, ecosystems, and human communities.
- *Step 8:* Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
- *Step 9:* Determine the magnitude and significance of cumulative effects.
- *Step 10:* Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
- *Step 11:* Monitor the cumulative effects of the selected alternative and adapt management.

C. SECONDARY AND INDIRECT EFFECTS

STEPS 1, 2, 3

Steps 1, 2, and 3 involved defining the scope and geographical boundaries for the analysis, gathering information about the study area, and preparing an inventory of the study area's notable features. This began with the preparation of the December 2006 *Scoping Document* for the Portal Bridge project, which identified the need for an indirect effects analysis due to the improved service and increased capacity provided directly by the ARC project, and indirectly by the Portal Bridge project. Because the ARC project would result in increased passenger rail service within the NJ TRANSIT system and increased capacity at New York Pennsylvania Station (PSNY), this assessment considers the potential for adverse effects within the greater New York metropolitan region, including those communities near affected NJ TRANSIT stations and the area near PSNY in Manhattan.

Information about the study area and its notable features were gathered throughout the analyses presented in Chapter 5. Chapter 5.1, "Land Use and Social Conditions," included a review of several important regional planning documents, including the Hudson County Master Plan (2002)**,** the New Jersey Meadowlands Commission (NJMC) Master Plan, and *Meadowlands Mobility* and the *Hudson County Park Master Plan: Plan for Improvement 2007-2013*. Notable features near the Portal Bridge include the Hudson County Park at Laurel Hill Park (Laurel Hill Park), Hackensack River Walk (existing and planned portions), the East Coast Greenway, the Riverbend Wetland Preserve, and Cedar Creek Marsh. Important historic, archaeological, and visual resources were also inventoried.

STEP 4

Step 4 involved identifying which aspects of the proposed project would result in adverse impacts. This was addressed in Chapters 5 and 6, wherein each project alternative (including the No Action Alternative) was analyzed for its potential to result in direct impacts during construction and operation of the project. It was determined that improvements to operations between Swift Interlocking and Secaucus Transfer Station would result in a modest positive effect on transit ridership, vehicular traffic, marine traffic, air quality and energy consumption. The build alternatives would have the potential to result in adverse effects on ecological resources, cultural resources, open space/parklands, and construction-related impacts.

STEPS 5 AND 6

INDIRECT TRANSPORTATION EFFECTS

Step 5 identifies those potential indirect effects that warranted further analysis and Step 6 measures these effects. An important goal of the Portal Bridge project is to improve reliability and provide additional rail capacity over the Hackensack River to allow enhanced Amtrak and NJ TRANSIT operations. This would lead to beneficial indirect effects including: sustained regional economic growth, more efficient transportation systems, and a reduction in automobile vehicle miles traveled (VMT), resulting in regional benefits to vehicular traffic and air quality. While the Portal Bridge project does not by itself result in additional train service to PSNY, it would allow future projects (such as ARC) to do so by expanding Hackensack River capacity. Therefore, the Portal Bridge project would indirectly lead to a greater reduction in regional auto VMT, as rail ridership increases in response to increased rail service from the 2030 Operating Plan and the ARC project. These indirect effects would be negligible in the absence of additional rail service across the Hudson River and into New York City. The benefits to transportation, air quality and energy are therefore discussed in the "Cumulative Effects" section, to account for the cumulative effects of the Portal Bridge and ARC projects.

The Portal Bridge project would, as an independent project, improve service and reliability. This enhanced rail service would indirectly result in some adverse transportation effects by improving service that could induce greater ridership and therefore additional demand on local transportation services in the vicinity of PSNY. These effects would include increased vehicular and pedestrian traffic on the streets surrounding PSNY as well as an increase in transfers to New York City Transit (NYCT) subway lines serving the station. Since the adverse effect is more pronounced in conjunction with the additional service proposed with the 2030 Operating Plan and the ARC project, it is discussed below under Cumulative Effects.

INDIRECT ECOLOGICAL AND ENCROACHMENT EFFECTS

Other indirect effects that may result from the Portal Bridge project pertain to the filling of wetlands, encroachment upon ecological resources, and disturbance of contaminated sediment. Three possible mechanisms could result in adverse indirect effects. The first is the direct loss of wetland and upland habitat and the resulting displacement of the existing wildlife and avian populations in that habitat. This displacement could impact the existing wildlife populations in areas further removed from the project site. Temporary disturbances during construction could also result in the displacement of wildlife and avian species from neighboring habitats. The second mechanism would be related to the short-term effects to water quality from disturbances to sediments and stormwater runoff during construction. Potential indirect impacts could occur if contaminated sediments or other pollutants are transported to locations further removed from the

zone of direct impact. The third mechanism involves the potential long-term effects on adjacent wetlands from alterations of the project site. These alterations could result in changes to the existing hydrology or vegetative characteristics, thereby negatively affecting the value and quality of the remaining wetlands over the long-term.

INDUCED GROWTH-RELATED EFFECTS

The build alternatives would result in beneficial secondary effects including sustained regional economic growth, an increase in regional mobility, and a reduction in automobile use. Since the project would relieve a critical bottleneck on a well-established rail corridor, rather than develop a new rail corridor, the potential for induced growth-related effects is small. Most of the area served by the existing rail network is already highly developed. Future development is planned within some parts of the indirect effects study area; however, the project would be supportive of that development but would not cause it. Therefore, the project would further the goals of sustaining economic and population growth.

STEPS 7 AND 8

For all of the adverse indirect effects identified above, the indirect impacts stem from the direct impacts. If the direct impacts are avoided or mitigated, the indirect impacts could be substantially avoided. As discussed in Chapter 5.6, "Ecology," and Chapter 6, "Construction Impacts," mitigation measures have been proposed. These measures would substantially minimize the potential direct impacts on these resources and therefore any subsequent indirect impacts. With respect to the loss of habitat and the potential displacement of wildlife and avian species, the amount of loss would be small in comparison to the extensive habitat adjacent to and in the surrounding areas. In addition, the project proposes to replace and/or restore wetlands within the Meadowlands District, further minimizing any adverse indirect impacts.

D. CUMULATIVE EFFECTS

As required under NEPA, this EIS analyzes the resources, ecosystems and communities of concern identified in the Scoping Document. Baseline conditions and the environmental consequences of the proposed project on each resource are described and assessed in the preceding chapters of this document according to the CEQ guidance. This chapter looks specifically at the potential for the project to result in cumulative effects on these resources.

STEP 1: ASSESSMENT GOALS

The cumulative effects assessment does not consider resources, ecosystems, and human communities of concern substantially different from those identified in the direct effect assessment; however, the assessment of cumulative effects differs in that the effects are recast for their long-term and interactive significance. If the proposed project does not result in direct or indirect effects to a given resource, then no further assessment of potential cumulative effects is necessary. As part of Step 1 of this analysis, a summary (see Table 7-1) of the direct and indirect effects for each resource category was developed. Based on this summary, the potential for the project to result in substantial cumulative effects and the need for additional analysis were assessed. The resource categories of concern include:

- Transportation: Vehicular traffic; commuter and inter-city rail; bus and rail transit; and pedestrians.
- Social: Land use and social conditions; open space, parklands and recreation; economic conditions; historic and archaeological resources; and environmental justice.

- Environmental: Ecology (wetlands and wildlife); water resources (floodplains and water quality); air quality; noise; contaminated materials; and construction impacts.

STEP 2: GEOGRAPHIC SCOPE AND STEP 3: ANALYSIS TIME FRAMES

Several factors were considered in determining the geographic scope (Step 2) and analysis timeframes (Step 3). First, the selection of the study area for each cumulative effect depends on the character of the resource that may be affected. For the operational and transportation-related issues (traffic, transit, air quality, etc.), two study areas were identified. One study area addressed regional project benefits and therefore included the New York-New Jersey metropolitan area. The second study area focused on localized indirect and cumulative impacts and was therefore centered on PSNY. For resource-related issues (such as ecology and cultural resources), the cumulative effects were assessed using a study area that encompassed nearby projects. For ecological resources and land use and social conditions, the Meadowlands District was defined as the study area. For the assessment of cumulative cultural resource effects, the Pennsylvania Railroad Historic District was included in the study area. The analysis considers the direct effects of project construction up to and including completion of the ARC project (approximately 2017). For cumulative effects associated with project operations, the analysis includes the train service and related transportation effects to the year 2030.

Table 7-1
Potential Direct, Indirect, and Cumulative Effects

Resource	Direct Effect	Indirect Effects	Project's Possible Contribution to Cumulative Effects
Transportation			
Vehicular Traffic	None	Small, negligible reduction in VMT in the region; slight increase in traffic in the vicinity of stations, particularly PSNY	Potential local adverse effect in conjunction with ARC. Regional benefit in conjunction with ARC and the 2030 Operating Plan
Passenger Rail	Potential impact on service and operations during construction	Similar to vehicular traffic	Potential beneficial cumulative effect with ARC due to increased service
Bus and Subway	None	Small, negligible, effect at PSNY	Potential adverse cumulative effect with ARC at PSNY from additional demand for services
Pedestrians	None	Same as subway and bus in the vicinity of PSNY	Similar to bus and subway at PSNY/PSNYE
Social			
Land Use and Social Conditions	None	None	None
Open Space, Parklands and Recreation	Direct effect on the expansion of Laurel Hill Park and the Riverbend Wetland Preserve	None	Cumulative noise effect examined with 2030 Operating Plan; potential for cumulative direct effect with other projects planned in Meadowlands
Economic Conditions	Relocation of one to two businesses	Positive benefit from supporting regional mobility	Cumulative positive regional benefit with 2030 Operating Plan

Table 7-1 (cont'd)
Potential Direct, Indirect, and Cumulative Effects

Resource	Direct Effect	Indirect Effects	Project's Possible Contribution to Cumulative Effects
Historic and Archeological Resources	Adverse effect on the existing Portal Bridge, Pennsylvania RR Historic District and possibly the Historic Cemeteries of Hudson County, Substation 4, and Jersey City Waterworks Pipeline	None	Cumulative effect on the Penn RR Historic District and Historic Cemeteries of Hudson County in conjunction with past actions and the ARC project that have or will alter the context and integrity of these resources
Environmental Justice	None	None	None
Environmental			
Water Resources	Construction related short-term effects only	Possible off-site transport of pollutants during construction	Possible cumulative effects with construction of other nearby projects
Ecology	Permanent loss of wetlands, open water, and benthic habitat	Possible displacement of wildlife and fragmentation of wetlands	Permanent loss of ecological resources
Air Quality	No direct effects	Slight regional benefit due to reduction in vehicular emissions; more pronounced under cumulative effects	Regional benefit/local impacts in conjunction with ARC and proposed increase in service
Energy	None	Increased energy demand from higher grade offset by improvements in service and slight reduction in auto-related travel	Cumulative benefit in conjunction with ARC by reducing auto-related travel
Noise and Vibration	Adverse noise impact on adjacent parkland (similar to No Action Alternative)	None	Adverse local effect from cumulative increase in train operations (i.e., 2030 Operating Plan)
Contaminated Materials	Short-term construction related disturbance to sites known to contain contaminated and/or hazardous materials.	None	Additional disturbance in the project area from ARC-related construction
Construction Impacts	Direct effects on ecological and cultural resources; impacts to navigable waters; rail service disruption	Indirect ecological impacts (such as wetland fragmentation)	Potential effect with construction of ARC loop tracks in Meadowlands; rail service disruption

As stated in the CEQ guidance, the cumulative effects analysis needs to consider "the present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonable foreseeable effect of the project may have a continuing, additive, and significant relationship to those effects." However, the guidance does not require "the consideration of the individual effects of all past actions to determine the present effects of past actions." Where appropriate, the present effect of past actions was determined through a comprehensive documentation of baseline conditions throughout the study area. The most relevant past actions include: the creation of the Hackensack Meadowlands District in 1968; the construction of the Kearny Connection in 1996; the completion of the Secaucus Transfer Station in 2003; construction of New Jersey Turnpike Interchange 15X in 2005; and publication of the updated *NJMC Master Plan* in 2004.

STEP 4: OTHER ACTIONS AND CONDITIONS AFFECTING CUMULATIVE EFFECTS

An important part of assessing cumulative effects is compiling a comprehensive list of relevant actions and long-term trends in or near the study area that may interact with the project's effects to produce broader or more long-term effects on the environment. These types of actions or trends include ecological preservation proposals, development planning, transportation improvements, and anticipated growth trends in general. Chapter 3, "Project Alternatives," describes several transportation projects that are planned to be fully constructed and operational by 2030 and have therefore been included in the No Action Alternative for this EIS. These projects include the Farley Post Office/Moynihan Station Development Project, various improvements to New York Pennsylvania Station, and the Wittpenn Bridge Replacement Project. Additionally, a number of development projects and open space plans proposed in or near the study area were discussed in detail in Chapter 4, "Transportation Effects," and Chapter 5.1, "Land Use and Social Conditions" and are also part of the No Action Alternative. Since these projects are part of the future baseline conditions, their cumulative effect in conjunction with the Portal Bridge project has already been considered in the individual impact analyses presented in Chapters 4 and 5. This cumulative impacts assessment is intended to evaluate the combined effects of all reasonably foreseeable projects. It therefore includes projects not included in the No Action Alternative, such as the ARC project and the potential Kearny Yard lead tracks.

The ARC project will include the construction of New York Pennsylvania Station Expansion (NYPSE) beneath 34th Street in Midtown Manhattan; two new railroad tunnels beneath the Hudson River; dedicated rail infrastructure south of the existing Secaucus Transfer Station feeding into NYPSE; track connections between the Main/Bergen County and Pascack Valley Lines, and a new rail yard in Kearny, New Jersey on the banks of the Hackensack River. NJ TRANSIT may eventually construct a lead track that would connect the planned Kearny Yard to the western approach to the new southern bridge (proposed as part of the Portal Bridge project). Although this lead track is neither part of the Portal Bridge project nor the ARC project, it is a reasonably foreseeable action and has been considered in this cumulative effects analysis, particularly with respect to its potential effects on ecological resources and contaminated materials.

The ARC project will expand existing rail capacity east of the Hackensack River into New York City. In addition to the planning efforts for the ARC project, Amtrak and NJ TRANSIT have formulated a 2030 Operating Plan, which is based in part on the projected growth in population and employment along the Northeast Corridor and in New York and New Jersey. The 2030 Operating Plan would expand peak hour rail service from 23 to 48 trains per hour into New York City (including 23 operating to the existing PSNY and 25 operating to the proposed NYPSE). It is assumed that absent the expansion of capacity across the Hackensack River, Amtrak and NJ TRANSIT will not be able to achieve the full proposed 2030 Operating Plan.

STEPS 5, 6, AND 7: CHARACTERIZATION OF THE RESOURCES, STRESSES, AND BASELINE CONDITIONS

As identified in Table 7-1, the resources of concern and their respective stresses include:

- Long-term operational effects related to the increase in rail service in conjunction with the ARC project and its adverse and beneficial effects on transportation service, air quality, energy consumption, and ambient noise levels;

- The cumulative effect from construction of the proposed project in conjunction with other projects in the Meadowlands District on open space, wetlands and natural resources, and contaminated materials; and
- The cumulative effect of past, current, and future actions on the Pennsylvania Railroad Historic District.

The characterization of each of these resources and their baseline conditions were described previously within their respective subchapters of Chapter 4, "Transportation Effects," and Chapter 5, "Social, Economic, and Environmental Considerations." Steps 8 and 9 below consider these resources and re-examine the potential cumulative effects of the project in conjunction with other actions that could result in foreseeable adverse or beneficial effects.

STEPS 8 AND 9: IDENTIFY CAUSE-AND-EFFECT RELATIONSHIPS AND DETERMINE CUMULATIVE EFFECTS

TRANSPORTATION EFFECTS

Passenger Rail

The Portal Bridge project build alternatives would improve rail service reliability and provide additional rail capacity over the Hackensack River. The project would enable enhanced Amtrak and NJ TRANSIT operations and, in conjunction with the ARC project, allow the implementation of the proposed 2030 Operating Plan. Of the additional 25 peak hour trains reaching Manhattan, 16 would traverse the new Hackensack River crossing(s). Therefore, 39 out of the 48 total planned peak hour trains would cross the new Portal Bridge(s) and contribute to cumulative regional benefits to transportation. The resulting improvements in reliability and reduction in travel time would lead to an improvement in regional mobility and economic growth. As a result of the enhancements in rail service frequency, speed and reliability, rail ridership would increase. The NJ TRANSIT's demand forecasting model and the North Jersey Travel Demand Forecasting model predict that rail ridership into midtown Manhattan would more than double from the existing condition, bringing a substantial number of new rail passengers to midtown Manhattan. As discussed below, this increase in ridership may also affect traffic and parking conditions at transit stations in central and northern New Jersey.

Traffic

By improving rail access over the Hackensack River and enabling NJ TRANSIT and Amtrak to fully implement the 2030 Operating Plan for each railroad, the build alternatives would reduce the daily demand for trans-Hudson auto trips by more than five percent (over 20,000 vehicles).

Analysis of Cumulative Regional Effects

The additional train service would lead to an increase in the number of passengers using NJ TRANSIT and Amtrak service, thereby decreasing the number of vehicle trips into New York City from the west. This would result in a reduction of VMT in the region (both in New York and New Jersey) and translate into a beneficial effect on the region's roadways, including wear and tear. It would also lead to a reduction in the level of congestion and travel times throughout the region, particularly during the commuter peak periods. Furthermore, the reduction in VMT on the region's expressways and river crossings would contribute to enhanced mobility throughout the metropolitan area, thereby supporting the existing and continuing trend of economic growth in the region.

Analysis of Cumulative Local Effects

While these projects would together reduce vehicle trips on a regional level and improve regional travel by making rail transportation more convenient and reliable, they would contribute to a projected increase in vehicular traffic in the immediate vicinity of PSNY and, to a lesser degree, at stations throughout the NJ TRANSIT system. The cumulative effects analysis considered this additional traffic in conjunction with other reasonably foreseeable projects in the study area and their combined effect on the local roadway network. The cumulative increase in rail passenger trips would result in adverse traffic effects near PSNY, due primarily to additional demand for taxis. As stated in the ARC DEIS, taxi vehicle trips would increase by approximately 200 in the AM and PM peak hours. An analysis of future traffic conditions around PSNY indicated that several intersections during the AM and PM peak hours would be adversely affected by the 2030 Operating Plan. The Portal Bridge project alone would not result in measurable effects of this level. Therefore measures to mitigate these potential traffic impacts have been proposed as part of the ARC project and would be the responsibility of that project's sponsors. The cumulative increase in rail passengers would also require the addition of three New York City Transit (NYCT) buses on the M16/M34 line during peak traffic hours, as described in the ARC DEIS. While the additional riders at PSNY would increase demand on the NYCT subway system, none of the lines serving the station would reach or exceed capacity with the increased patronage.

The additional train service would also lead to increases in passenger demand at stations throughout northern and central New Jersey. This would lead to localized increases in traffic and parking demand as ridership at individual stations increased over time. As described in the ARC DEIS, the specific locations of increased station access activity would change as the operating plan is implemented and adjusted to respond to changes in land use and development patterns, demographics or customer preferences. Furthermore, the ARC DEIS discusses how these potential adverse effects on parking and traffic would be assessed as part of NJ TRANSIT's ongoing Station Access Program. The program consists of various proactive measures which are intended to manage potential adverse indirect impacts on local transportation systems resulting from changes in service and increased ridership. Potential measures include: additional station parking; parking expansion at intercept locations; development of new stations to distribute ridership; community-based shuttle bus service; bicycle and pedestrian access improvements; and implementation of Smart Growth/Transit-Oriented Development in various communities.

Pedestrians

On a local basis, by contributing to the overall improvement in rail passenger movement into New York City, the build alternatives together with the ARC project could affect pedestrian conditions in the area surrounding PSNY. The number of pedestrians on sidewalks and subway stations in the West 34th Street area would substantially increase, adversely affecting the level of service on a number of sidewalk segments, street corners, crosswalks, and stairwells during the peak periods. The added pedestrian volumes would affect several sidewalk segments and street corners during the AM and PM peak periods. Several crosswalks would also be affected. A large number of PSNY stairwells would also experience adverse effects during both AM and PM peak periods. Similar to the traffic impacts discussed above, the effect of the Portal Bridge project would only be measurable in conjunction with the ARC project and the 2030 Operating Plan. Mitigation measures that would alleviate these adverse effects were proposed in the ARC DEIS.

While improvements in rail capacity over the Hackensack River would also lead to indirect and cumulative effects at stations throughout New Jersey (and possibly at Amtrak stations as far

away as Washington, D.C.) the effect would be much less pronounced than any potential effects at PSNY. It is expected that the effects would be diffused over a very large area such that no one station (with the exception of PSNY) would experience noticeable cumulative adverse effects. Furthermore, it would be expected that any individual indirect effect of the Portal Bridge project would be a minor contribution to the cumulative effects discussed above.

SOCIAL EFFECTS

Open Space, Parklands and Recreation

The build alternatives for the Portal Bridge project would result in an adverse direct effect on open space and parklands in the study area. All alternatives would require acquisition of a portion of the land recently acquired for the expansion of Laurel Hill Park. In addition, Alternatives DS and FS would require acquisition of a portion of the Riverbend Wetland Preserve. While the ARC project would contribute to an increase in noise levels at the Riverbend Wetland Preserve and Laurel Hill Park from increased train passbys, it would not result in direct encroachment on these or other parklands in the area. As described below under "Ecological Resources," the NJMC is responsible for the preservation of open space and wetlands in the district. Therefore, the project sponsors would work with the NJMC to avoid any adverse cumulative effects by providing mitigation to offset the project's contribution to the loss of open space and parkland. This effort would be in conjunction with the wetland mitigation measures proposed for the temporary and permanent loss of these resources.

Historic Resources

As described in Chapter 5.2, "Historic Resources," the build alternatives would result in direct adverse effects on several resources in the study area. Architectural resources affected include the existing Portal Bridge and the Pennsylvania Railroad Historic District. A Construction Protection Plan (CPP) would be developed to avoid or minimize any potential construction-period effects on Substation 4 and the Jersey City Waterworks Pipeline. In addition, the build alternatives could potentially adversely affect one archaeological resource, the Historic Cemeteries of Hudson County. As noted in Chapter 5.2, while the Historic District retains historic integrity overall, it has undergone extensive alterations since the time of its S/NR eligibility determination. In light of the extensive recent alterations to the fabric and appearance of the Pennsylvania Railroad Historic District in the study area, the proposed project (together with these past projects and the planned ARC project) would constitute an adverse effect. To mitigate these effects of the build alternatives in conjunction with past and future actions on the corridor, the project sponsors have proposed an interpretative exhibit commemorating the Pennsylvania Railroad and the Portal Bridge. Through coordination with Hudson County, NJMC, and other project sponsors and stakeholders, it will be determined if this exhibit can be constructed as part of the planned walkway in the new park parcel.

Both the Portal Bridge and ARC projects may have an adverse effect on the Historic Cemeteries of Hudson County. The adverse effect would only occur if the project work would encroach upon the actual limits of the cemetery and if the area in question had not been affected by previous construction activities. The MOA for the Portal Bridge project addresses these concerns and provides measures to minimize the potential harm to the resource.

Economic Conditions

All build alternatives would require the acquisition of property and relocation of one or two existing businesses. While the ARC project does include acquisition of several properties and

businesses (e.g., a warehouse, a fast food restaurant, and a self-storage facility), none of these are within the Portal Bridge project's study area. In terms of the larger geographic area, the several businesses that would be acquired or relocated by either project would not result in any adverse effects to the overall economy of northern New Jersey. The Portal Bridge build alternatives would not result in any other adverse economic impacts. On a regional level, the proposed project would greatly benefit the economy of New York and New Jersey by providing additional capacity that would enable NJ TRANSIT and Amtrak to increase in rail service to midtown Manhattan.

ENVIRONMENTAL EFFECTS

Ecological Resources

Functioning wetlands provide habitat for plants and animals and breeding grounds for fish, purify water, and help control flooding and soil erosion. The build alternatives, in conjunction with the ARC project and other planned projects, would occur within the Meadowlands District. The Meadowlands District encompass 19,730 acres in Bergen and Hudson Counties and is one of the largest wetland complexes remaining in the Hudson Raritan Estuary ecosystem, as well as one of the largest contiguous blocks of open space in the highly developed landscape of the New York City metropolitan area. The Meadowlands once covered about 20,000 acres of estuarine marsh, freshwater marsh, and Atlantic white cedar swamp. Following many decades of suburban development, dredging, draining, mosquito control, landfilling, and industrial pollution, some 7,700 acres of wetlands (many of which are privately owned) remain in Meadowlands District.

The action that has had the greatest positive effect on the Meadowlands District was the creation of the Hackensack Meadowlands Development Commission (now the NJMC). Since its inception in 1969, NJMC has acquired over 1,700 acres of wetlands for preservation and restoration. The NJMC *Master Plan*, adopted at the beginning of 2004, calls for the preservation of 8,400 acres of open space and wetlands, as well as the revitalization of blighted areas into places for economic and community growth. The Commission acquires degraded wetlands for enhancement on behalf of organizations whose development projects in the Meadowlands District result in the loss of wetlands. Permits for these projects normally require compensation for these losses. The Meadowlands Interagency Mitigation Advisory Committee (MIMAC), a team of experts from various state and federal agencies, meets regularly to make recommendations regarding mitigation proposals for permitted activities within the Meadowlands District. To date, most organizations that have provided land and funds are transportation agencies, although private groups also fund Commission projects. The projects typically consist of controlling the growth of invasive species, reestablishing tidal flows and creating areas for plantings of native vegetation. Wetland restoration projects that were recently completed or are currently planned include Skeetkill Creek Marsh (16.3 acres), Harrier Meadow, Mill Creek Marsh, Berry's Creek Marsh (135 acres), Eastern Brackish Marsh (75 acres), Oritani Marsh (224 acres), Riverbend Wetland Preserve (58 acres), Secaucus High School Marsh (38 acres), Anderson Creek Marsh (53.2 acres), Kearny Freshwater Marsh (236 acres), Kearny Brackish Marsh (155 acres), and Riverside Marsh (31 acres).

The proposed build alternatives would require the permanent filling of up to 14 acres of wetlands, open water, wetland preserve, and planned wetland restoration areas within the Meadowlands District. As discussed previously, these adverse effects would be mitigated at a ratio determined in conjunction with MIMAC and other involved agencies. The ARC project would impact up to 24 acres of wetlands, for which mitigation has been proposed. Other projects in the Meadowlands—such as Allied Junction, Secaucus Transit Village, Meadowlands Rail

Link, Encap Golf Holdings, and Meadowlands Xanadu Redevelopment project—would also impact wetlands and other ecological resources in the Meadowlands. Finally, if the lead tracks were constructed between the planned Kearny Yard and the Northeast Corridor, another 0.7 acres of wetland could be impacted. However, part of NJMC's mission is to prevent adverse cumulative effects and they have established mechanisms to control and coordinate ecological resource impacts and mitigation. For each project in the Meadowlands District that negatively affects wetlands, compensation is required. Based on coordination with MIMAC, the Meadowlands Conservation Trust, and other involved regulatory agencies, the restoration of the Kane Tract (located within the Meadowlands District and previously know as the Empire Tract) is being considered for both the Portal Bridge and the ARC projects as compensatory mitigation for wetland impacts.

Noise

The direct effects of the Portal Bridge project stemming from an increase in the maximum allowable train speed and changes in bridge alignment were discussed in Chapter 5.5, "Noise and Vibration." As discussed, the noise levels within 419 feet from the proposed project would increase, but since there are no existing receptors sensitive to noise within that distance, this effect is not considered to be adverse. In addition, the build alternatives have the potential to increase noise levels in a portion of the planned expansion of Laurel Hill Park. This increase would, however, be similar to the effects of the No Action Alternative, due to the proximity of Laurel Hill Park to the heavily used rail corridor.

Under the 2030 Operating Plan and the ARC project, additional NJ TRANSIT and Amtrak service is proposed. To assess the cumulative effect of the Portal Bridge and ARC projects on existing noise levels, the enhancement in rail service and frequency over the proposed Portal Bridge was analyzed assuming the full 2030 Operating Plan would be implemented. The cumulative effect on existing noise levels would cover a greater area than the direct effect of the proposed project alone. The noise impact area would extend about 473 feet from the proposed project boundary (the impact would be categorized as "severe" within 256 feet of the proposed project boundary). There are currently no sensitive noise receptors within the area that would be affected by these noise impacts. A portion of the planned expansion of Laurel Hill Park would experience greater noise levels in conjunction with the ARC project than from the proposed project alone. The cumulative effect would extend about 54 feet further than the direct effect of the Portal Bridge project alone. This cumulative noise impact would affect a small area within the Laurel Hill Park expansion parcel. The increase would be less than 3 dBA, which would not be perceptible and would not be expected to result in any adverse ecological impacts.

Air Quality and Energy

The VMT reduction in the New York-New Jersey metropolitan area that would result from the build alternatives in conjunction with the ARC project would correspond to a cumulative regional air quality benefit. Energy savings resulting from a shift from auto-based travel to commuter rail would also accrue on a regional basis. On a local level however, the build alternatives (in conjunction with the ARC project) would contribute to the increased passenger levels and taxi demand at PSNY. This would have a measurable but less than significant effect on ambient pollutant concentrations in the vicinity of the station. The cumulative regional and local effects on air quality are discussed below.

Regional (Mesoscale) Analysis

The analyses performed for the ARC project assumed the Portal Bridge project would be completed. Therefore, the air quality effect analyses presented in the ARC DEIS appropriately addressed the cumulative effects of the ARC and Portal Bridge projects on air quality. The analysis of the full 2030 Operating Plan in the ARC DEIS was based on the Environmental Benefits Template (EBT) of the Federal Transit Administration (FTA) New Starts Criteria (2006 version), which applies VMT and vehicle hours of travel (VHT) within the region with and without a project. The analysis in the ARC DEIS of the 2030 Operating Plan indicates that CO, NO_x, VOC, PM_{10}, and $PM_{2.5}$ emissions would decrease, primarily as a result of a reduction in passenger vehicle VMT. Energy consumption and associated greenhouse gas emissions (i.e., CO_2) would also decrease.

Localized (Microscale) Analysis

The cumulative increase in transit ridership into Midtown Manhattan would increase passenger activity and, therefore, traffic volumes in the vicinity of PSNY (and critical intersections along West 34th Street) since some riders will use taxis to their final destination. Bus ridership may also increase in the vicinity of PSNY, leading to possible increases in diesel emissions. Based on the analysis in the ARC DEIS, the greatest traffic volume increase is expected at the Eighth Avenue and West 34th Street intersection. The results of the air quality analysis from the ARC DEIS show that the PM_{10} and CO NAAQS, the CO *de minimis* increment, and New York City Department of Environmental Protection (NYCDEP) $PM_{2.5}$ threshold level would not be exceeded. Therefore, there would be no adverse cumulative effects associated with the Portal Bridge project.

Contaminated Materials

The potential for cumulative effects is related to the construction of certain elements of other projects in the study area that would also potentially result in the disturbance of contaminated and/or hazardous materials. This additional disturbance increases the potential for adverse ecological and human health effects if construction in these areas is not conducted properly. Specific project elements of concern include work proposed within the Malanka Landfill, Standard Chlorine property, and Diamond Shamrock property. As part of the ARC project, tracks will be constructed to connect to the new southern bridge over the Hackensack River. These tracks would require subsurface disturbance to the Malanka Landfill. Similarly, the lead tracks that may be constructed between Kearny Yard and the new southern bridge would require construction through the Diamond Shamrock and Standard Chlorine sites (as discussed in Chapter 5.7, Standard Chlorine is a Superfund site and Diamond Shamrock is a known contaminated site). Construction on these sites requires careful coordination with the ongoing investigations and studies related to the eventual remediation of these properties. Similar to the measures presented in Chapter 5.7 for the Portal Bridge project, the ARC project also includes measures to avoid or minimize the adverse effects of its construction within these contaminated areas. Construction of the Kearny Yard lead tracks through Diamond Shamrock and Standard Chlorine would be implemented with measures to avoid and minimize adverse effects, thereby diminishing the potential for adverse cumulative effects with respect to contaminated materials.

Construction Impacts

The potential for cumulative construction effects from the Portal Bridge and ARC projects is an important component of this analysis. Based on the projected project schedules, construction of the two projects would most likely overlap in the southeastern corner of the study area. In this area, ARC would be constructing the loop tracks from the Main/Bergen County and Pascack

Valley Lines as well as the tracks leading to the southern Portal Bridge. The ARC project would also require modifications to the existing southside of the Secaucus Transfer Station. The Portal Bridge project would be constructing the approach to the southern bridge in this area, including a bridge over the planned loop tracks.

Construction in this area would be closely coordinated between the two projects to minimize disruption and adverse cumulative effects. As discussed previously, the area surrounding the project site is a mix of open space and wetlands, utility and transportation corridors, a rail station and a former landfill. These surrounding land uses would substantially reduce any potential for air quality and noise impacts on sensitive uses or populations. Therefore, the potential for cumulative construction impacts to noise levels and ambient air quality would be very small due to the lack of sensitive receptors. As discussed below, possible cumulative noise effects are a concern with respect to possible wildlife in the area. The potential cumulative issues as they relate to construction of the two projects include:

- Adverse impacts on public transportation (i.e., Amtrak and NJ TRANSIT) along the Northeast Corridor and at Secaucus Transfer Station.
- The cumulative effect on wetlands and ecological resources including the potential adverse effects on existing wildlife in the Riverbend Wetland Preserve. These impacts could include both direct disturbance to the habitat as well as indirect disturbances due to elevated noise levels on nesting birds.
- Potential cumulative effects from disturbance and release of contaminated and/or hazardous materials into the surrounding environment including wetlands and open water such as the Hackensack River.

Each of these issues was discussed in Chapter 6, "Construction Impacts," as they relate to the construction of the Portal Bridge build alternatives. Measures were proposed to avoid, minimize, or mitigate the potential adverse effects of construction on the resources. The ARC project has also proposed mitigation measures in its environmental documents. As both projects move forward into the permitting stage, they will continue their close coordination to ensure that the cumulative effects of construction in this area of the Meadowlands District are minimized to the extent feasible. For example, it may be beneficial for the projects to share access roads, work platforms and other unavoidable disturbances to wetlands and upland habitats.

STEP 10: MODIFY OR ADD ALTERNATIVES TO AVOID, MINIMIZE, OR MITIGATE SIGNIFICANT CUMULATIVE EFFECTS.

As discussed in the previous sections, the potential for cumulative adverse effects for the Portal Bridge project are related primarily to ecological and cultural resources. In an effort to avoid and minimize the project's adverse effect on the ecological resources of the study area, specifically the wetlands and wildlife habitat of the Meadowlands District, the build alternatives have been developed to limit the extent of the project impacts. Wherever feasible, the project proposes to construct the track through wetlands or open water on elevated structures rather than on filled embankment. Toe walls and retained embankments would also be used to limit the disturbance to existing wetlands. In addition, the project proposed mitigation measures including the restoration, enhancement and creation of wetlands as required by the permitting agencies. With respect to potential cumulative effects on the Portal Bridge and the Pennsylvania Railroad Historic District, the impacts of the build alternatives are unavoidable in that the resource itself is part of the project. The needed improvements to the regional rail system require that the

resource be reconstructed and/or replaced. Since the adverse effect is unavoidable, measures have been proposed to mitigate the loss of these historic resources. ✷