

## 29. Indirect Impacts and Cumulative Effects

This chapter addresses the additive effect of the direct impacts associated with the complete SDEIS Preferred Alternative, together with the impacts resulting from the development of other projects in the study area, unrelated to the Northern Branch. The “complete SDEIS” refers to the entire Northern Branch project’s Preferred Alternative, which includes the elements specifically assessed in this SDEIS along with the elements and improvements included as part of the DEIS that were not revised.

In order to determine the cumulative effects of the SDEIS Preferred Alternative combined with other past, present, and reasonably foreseeable major actions, it is necessary to take an overview approach to the projects implemented in the past and planned for the future, in the project study area. The methodology used in this analysis has been developed according to the guidance presented in the 1997 Council on Environmental Quality (CEQ) publication, *Considering Cumulative Effects Under the National Environmental Policy Act*, and other professional guidance publications on the assessment of cumulative impacts.

For the purposes of this SDEIS, cumulative effects are defined as the impact on the environment from the incremental impact of the Preferred Alternative when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal; public or private) or person undertakes such actions (40 CFR-1508.7). Indirect impacts are environmental impacts caused by the Preferred Alternative that occur later in time or are further removed in distance but still reasonably foreseeable (40 CFR-1508.8 (b)). Table 29-1 summarizes the indirect impacts and cumulative effects as a result of the No Build and Preferred Alternative.

For this cumulative effects analysis, the No Build Alternative assumes existing conditions, plus any committed or proposed project as described in Chapter 4 (Land Use and Zoning) and Chapter 6 (Local Plans). Field investigations and a review of available information identified resources potentially affected by indirect impacts and cumulative effects. Table 29-1 below summarizes the indirect impacts and cumulative effects anticipated as a result of the implementation of the Preferred Alternative.

**Table 29-1: Summary of Indirect Impacts and Cumulative Impacts**

Past Action	Indirect Impacts	Cumulative Effects
<b>Land Use, Zoning, and Economic Development</b>		
Over time, zoning regulations have separated incompatible uses.	<p><b>No Build Alternative:</b> The No Build Alternative would result in no indirect impacts. Development would continue to occur based on market factors along the corridor in accordance with local land use policy, guidelines, and regulations.</p> <p><b>Preferred Alternative:</b> As a result of existing development patterns and the minimal amount of vacant land along the rail corridor, a significant amount of project-induced development is not anticipated to occur in the vicinity of any of the proposed station sites. Development and redevelopment would continue to occur based on market factors along the corridor in accordance with local land use policy, guidelines, and regulations.</p>	<p><b>No Build Alternative:</b> Under the No Build Alternative, land use and zoning changes, as well as the development and redevelopment of properties throughout the project corridor may continue to occur regardless of planned transportation improvements in the region and local development policies. Planned residential and commercial redevelopment would also continue. Major improvements would likely have little influence on the location and type of redevelopment that would occur along the project corridor. Commuter rail would not contribute to these land use changes, either beneficially or adversely, under the No Build Alternative.</p> <p><b>Preferred Alternative:</b> Major transportation improvements would have little influence on the location, density, and type of development/redevelopment. The proposed project would not result in significant land use changes. Any development would be in accordance with local land use policy and regulations.</p>

**Table 29-1: Summary of Indirect Impacts and Cumulative Impacts (continued)**

Past Action	Indirect Impacts	Cumulative Effects
<b>Community Facilities</b>		
Overall increase in demand for services results in an increase in their cost.	<p><b>No Build Alternative:</b> Under the No Build Alternative there would be no increase in the response time of emergency services.</p> <p><b>Preferred Alternative:</b> A minimal increase in the response times of emergency services due to the introduction of passenger rail service is anticipated. However, this would only occur when a train is passing through an active grade crossing. The short duration of time it would take for the light rail train vehicle to pass through the grade crossing would minimize the likelihood of impacts. NJ TRANSIT and local municipalities would develop appropriate grade-crossing protection measures to ensure continued circulation for emergency service vehicles and safe access to and from all community facilities.</p>	<p><b>No Build Alternative:</b> For the No Build Alternative, other major regional transportation improvements could affect response times for emergency services if vehicles are impeded at grade crossings. Major development and/or redevelopment projects would likely lead to an increase in demand for community services and the provision of emergency services.</p> <p><b>Preferred Alternative:</b> Major transportation improvements could influence the response times for emergency services. Similarly, major development and/or redevelopment projects would likely lead to an increase in demand for community services and the provision of emergency services. Coordination between the applicable public agencies, local government, and emergency service providers would reduce the likelihood of adverse impacts.</p>
<b>Land Acquisition and Displacement</b>		
Development/redevelopment activities have required the acquisition of property for infill development and transportation improvements, including road widening and the HBLR Tonnelle Avenue Station.	<p><b>No Build Alternative:</b> The study area is nearly entirely built out; consequently, under the No Build Alternative, redevelopment activities would continue, requiring the acquisition of property.</p> <p><b>Preferred Alternative:</b> The SDEIS Preferred Alternative would require property acquisition to develop station sites and parking areas for riders; however, these acquisitions are discrete, one-time property impacts and would not result in the acquisition of additional property after completion of project construction.</p>	<p><b>No Build Alternative:</b> For the No Build Alternative, other major transportation projects, including road widening efforts, may require the acquisition of properties for additional rights-of-way and related improvements. Redevelopment activities are also anticipated to continue, but these projects are not anticipated to require eminent domain takings.</p> <p><b>Preferred Alternative:</b> Combined with other transit and transportation projects, the Preferred Alternative would contribute to a stabilization of traffic demand on local roadways, reducing the likelihood of additional property acquisition for transportation improvements. Redevelopment activities are anticipated to continue.</p>
<b>Parklands</b>		
Municipal, County, and State agencies have contributed funding and land to develop parks and open space areas for public use. Parks are continually undergoing upgrades and improvement.	<p><b>No Build Alternative:</b> Under the No Build Alternative no indirect impacts to parklands would be anticipated.</p> <p><b>Preferred Alternative:</b> The Preferred Alternative would require the development of three areas of parkland; however, the acquisition is considered <i>de minimis</i> in terms of the impact on the value of the parkland as a community resource. The NJDEP Green Acres Program additionally requires that diverted parkland be compensated by the provision of new land for parkland development and/or funds for the development of parks and recreational amenities. As a result, the Preferred Alternative may result in the creation of more community recreational areas while resulting in the loss of only minor and underutilized acreage. Additionally, with the increase in access to parklands, especially Overpeck County Park, it is possible for the number of users to increase. This is considered a positive indirect impact by Bergen County Parks Department.</p>	<p><b>No Build Alternative:</b> Future development needs under the No Build Alternative may result in impacts to parkland and recreational resources in the study area.</p> <p><b>Preferred Alternative:</b> It is anticipated that through the Green Acres process, the implementation of the Northern Branch project would result in the creation of new, additional recreational resources in the study area, resulting in a net benefit to the study area communities. Other planned transportation and development/redevelopment projects could require the acquisition of parkland or affect access to or the functioning of parkland and other open space resources, including the new resources.</p>

**Table 29-1: Summary of Indirect Impacts and Cumulative Impacts (continued)**

Past Action	Indirect Impacts	Cumulative Effects
<b>Traffic and Parking</b>		
<p>Auto use increased as transit service diminished; parking demand increased in downtown business districts.</p>	<p><b>No Build Alternative:</b> The No Build Alternative would result in no indirect impacts. Continued development activity within portions of the study area and the overall region is expected, resulting in an increase in background traffic growth and increase in parking demand.</p> <p><b>Preferred Alternative:</b> Under the SDEIS Preferred Alternative, traffic is expected to increase locally as a result of the addition of the station areas. Mitigation measures, comprised primarily of signal improvements and standard traffic engineering procedures, would minimize indirect impacts. The SDEIS revised the Preferred Alternative to provide almost all stations with parking areas that would include adequately-sized parking lots to accommodate anticipated ridership. The only exception to this is Englewood Town Center Station, where the Preferred Alternative would improve the efficiency, safety, and flow of the existing surface parking, while maintaining the current number of parking spots. Frequent service and walkable stations in the town center area of Englewood may reduce demand on parking in the business areas.</p>	<p><b>No Build Alternative:</b> The No Build Alternative would result in cumulative effects to the transportation network, which serves the project corridor. Based on projected growth in the region, including the development/redevelopment projects in the study area, traffic is expected to increase. The proposed major transportation projects have been planned to reduce the cumulative effects of this growth on the transportation network.</p> <p><b>Preferred Alternative:</b> The SDEIS could result in cumulative effects. The proposed project would cause localized increases in traffic; however, mitigation efforts would minimize these conditions. In addition, the proposed project would provide a new mode of regional transportation that would remove vehicles from the area’s regional roadways, which would also reduce demand on parking in the downtown areas. The other planned transportation improvements would result in minimal transportation impacts beyond what is described in the No Build Alternative.</p>
<b>Transit and Freight Rail</b>		
<p>Rail service was discontinued and replaced by bus transit oriented mainly to New York City. Freight service continued on existing rails.</p>	<p><b>No Build Alternative:</b> The No Build Alternative would result in some indirect impacts. Without an alternative means of transit, additional bus service would likely be required to keep pace with commuter demand as the study area population grows. No indirect impacts to freight service are anticipated.</p> <p><b>Preferred Alternative:</b> The Preferred Alternative provides an alternate means of transportation for study area commuters. The Preferred Alternative would require an adjustment to CSX freight operations to overnight service, which may have an impact on existing freight customers; however, freight access to existing customers would not be affected by the Preferred Alternative.</p>	<p><b>No Build Alternative:</b> Cumulative effects of the No Build Alternative are similar to those described in Indirect Impacts.</p> <p><b>Preferred Alternative:</b> Combined with other planned transit improvements, the Preferred Alternative would likely have a positive cumulative effect on transit service by providing additional options and capacity. No cumulative effects are anticipated for freight service as a combined result of the Preferred Alternative and other planned improvements.</p>
<b>Air Quality</b>		
<p>Mobile source pollution increases with auto use and traffic congestion; some improvements from the Clean Air Act.</p>	<p><b>No Build Alternative:</b> The No Build Alternative could result in minimal indirect effects as a result of increased traffic resulting from projected growth within close proximity of the project corridor.</p> <p><b>Preferred Alternative:</b> The Preferred Alternative would not cause any significant impacts to air quality. At the regional level, rail operations associated with this project would comply with any future State Implementation Plans or any attainment/ maintenance plans, which could be adopted in the future.</p>	<p><b>No Build Alternative:</b> The No Build Alternative could result in cumulative air quality effects that would arise with continued growth in the region. The planned transportation projects would be subject to environmental review resulting in the consideration of mitigation efforts.</p> <p><b>Preferred Alternative:</b> Although the Preferred Alternative would not result in air quality impacts, the addition of other transportation improvements in the region and development/redevelopment projects in the study area could lead to cumulative air quality effects as discussed in the No Build Alternative. The other planned projects would not result in air quality impacts beyond what is described in the No Build Alternative.</p>

**Table 29-1: Summary of Indirect Impacts and Cumulative Impacts (continued)**

Past Action	Indirect Impacts	Cumulative Effects
<b>Noise and Vibration</b>		
<p>Auto and rail traffic generates locally concentrated noise; standards established to abate noise.</p>	<p><b>No Build Alternative:</b> The No Build Alternative could result in minimal indirect effects as a result of increased traffic resulting from projected growth within close proximity of the project corridor.</p> <p><b>Preferred Alternative:</b> Impacts as a result of wayside and whistle noise are expected in association with overnight freight traffic required by the Preferred Alternative’s operating plan. Quiet Zones are proposed in the vicinity of residential areas to minimize the number of residences impacted by the project.</p>	<p><b>No Build Alternative:</b> The No Build Alternative could result in cumulative noise and vibration effects. The planned roadway projects would be subject to environmental review resulting in the consideration of mitigation efforts.</p> <p><b>Preferred Alternative:</b> The Preferred Alternative could result in cumulative effects. The proposed project would cause an increase in noise; however, Quiet Zones would minimize these conditions. In addition, short-term construction-related noise and vibration impacts could result. These temporary impacts would likely occur during rock splitting activities, pile driving, sheeting, excavation, and compaction activities. These impacts would cease with the completion of construction and are considered minor due to the distance between construction activities and sensitive receptors for noise, as well as the use of best management practices (BMPs) to minimize potential vibration impacts. The other planned transportation improvements would not result in noise and vibration impacts beyond what is described in the No Build Alternative.</p>
<b>Water Quality</b>		
<p>Severe reduction in surface and ground-water quality.</p>	<p><b>No Build Alternative:</b> For the No Build Alternative, growth could continue to occur in some areas of the study area resulting in the creation of more impervious surfaces, causing increased stormwater runoff.</p> <p><b>Preferred Alternative:</b> The Preferred Alternative would result in a slight increase in impervious surfaces from new station structures and parking areas. Through strict adherence to regulations laid out by the NJDEP, as well as the utilization of BMPs, no adverse indirect impacts to water quality would occur as a result of the proposed project.</p>	<p><b>No Build Alternative:</b> Other major transportation improvements in the region and development/redevelopment projects in the study area could affect surface water quality and cause an increase in stormwater runoff from impervious surfaces.</p> <p><b>Preferred Alternative:</b> Construction of the Preferred Alternative, in addition to all other major actions, could result in minimal water quality effects beyond those described in the No Build Alternative. BMPs and specific design standards would be required for all major actions.</p>
<b>Wetlands</b>		
<p>Whole filling/reduction in acreage of wetlands.</p>	<p><b>No Build Alternative:</b> The No Build Alternative could cause indirect impacts to wetlands due to growth occurring along the project corridor. Impacts could occur in areas most suitable to development and could include wetland loss and potential degradation of wetland quality and function. All growth activities would be pursuant to federal and state wetland regulations.</p> <p><b>Preferred Alternative:</b> Less than four acres of wetlands would be disturbed as a result of the Preferred Alternative. Mitigation ratios for lost acreage would be at a 2:1 or a 4:1 basis depending on the wetlands resource value classification and amount of impacted acreage.</p>	<p><b>No Build Alternative:</b> The No Build Alternative could result in cumulative effects to wetlands. Other major transportation improvements in the region and development/redevelopment projects in the study area could disturb wetlands. However, the replacement design for wetland functions and values is a standard component of any transportation project; therefore, there it is an opportunity to expand the existing regional wetland base.</p> <p><b>Preferred Alternative:</b> The Preferred Alternative could cause cumulative effects to wetlands. The proposed project would disturb minimal acreage of wetlands and other major projects could also cause some degradation of wetland quality and function. All projects are subject to US Environmental Protection Agency (EPA), US Army Corps of Engineers (USACE), and NJDEP regulations and the permitting process would stipulate measures to mitigate wetlands impacts.</p>

**Table 29-1: Summary of Indirect Impacts and Cumulative Impacts (continued)**

Past Action	Indirect Impacts	Cumulative Effects
<b>Floodplains</b>		
Development occurred in floodplain and flood fringe areas.	<p><b>No Build Alternative:</b> The No Build Alternative would have no indirect impact on floodplains.</p> <p><b>Preferred Alternative:</b> The project corridor is adjacent to, and in some locations located intermittently within, the 100-year flood zone. Permits would be required by the NJDEP including a Flood Hazard Area permit. Mitigation measures would include using structures to cross floodplains instead of fill material, providing adequate flow circulation, reducing grading requirements, and preserving natural drainage when possible. The development of a Floodplain Mitigation Plan prepared in conjunction with local and state agencies would minimize indirect impacts.</p>	<p><b>No Build Alternative:</b> Other transportation improvements and development/redevelopment projects under the No Build Alternative could affect floodplains due to construction activities. All development would occur in accordance with NJDEP regulations.</p> <p><b>Preferred Alternative:</b> Construction of the Preferred Alternative in addition to all other major actions could result in cumulative effects on floodplains. However, the NJDEP would regulate all actions and ensure measures are utilized to protect areas prone to flooding. As such, all projects are required to follow NJDEP regulations, including the replacement of currently inadequate flood prevention features.</p>
<b>Navigable Waterways</b>		
Use of navigable waterways for commerce and waste disposal resulted in water pollution and increased sediment.	<p><b>No Build Alternative:</b> The No Build Alternative would have no indirect impact on navigable waterways.</p> <p><b>Preferred Alternative:</b> The Preferred Alternative would not directly or indirectly affect the use of navigable waterways within the study area as means of transportation of goods and would not degrade navigable channels.</p>	<p><b>No Build Alternative:</b> The No Build Alternative would have no cumulative impact on navigable waterways.</p> <p><b>Preferred Alternative:</b> There are no planned transportation or development projects in the study area that would affect navigable waterways.</p>
<b>Threatened and Endangered Species</b>		
Decrease in numbers and diversity of species from development.	<p><b>No Build Alternative:</b> The No Build Alternative could result in indirect impacts with regard to critical habitat. The potential indirect impacts of disturbance or habitat fragmentation from increased traffic and noise would not likely jeopardize the continued existence of any federal or state threatened or endangered species.</p> <p><b>Preferred Alternative:</b> The Preferred Alternative is not expected to affect federal and state threatened and endangered species.</p>	<p><b>No Build Alternative:</b> The major transportation improvements and development/redevelopment projects in the study area could affect threatened and endangered species through the project corridor.</p> <p><b>Preferred Alternative:</b> No direct impacts to threatened and endangered species are expected as a result of the proposed project in conjunction with other planned projects.</p>
<b>Hazardous Materials</b>		
Unregulated pollution and storage of hazardous materials.	<p><b>No Build Alternative:</b> The No Build Alternative would not result in the exposure of hazardous materials. Environmental regulations prohibit dumping and mandate clean up activity.</p> <p><b>Preferred Alternative:</b> Under the Preferred Alternative, there is the potential of hazardous waste contamination of soil and groundwater at the proposed station sites. Further investigation would be conducted prior to construction to determine locations in order to avoid contact during excavation without proper remediation. If unanticipated hazardous materials are discovered during design or construction the appropriate remedial actions would be implemented.</p>	<p><b>No Build Alternative:</b> For the No Build Alternative cumulative effects from exposure to hazardous materials are not anticipated. Continued regulation, clean-up activity, and incentives to redevelop brownfields would gradually slow pollution and provide for ongoing cleanup of contaminated areas.</p> <p><b>Preferred Alternative:</b> Construction of the Preferred Alternative in addition to all other major actions would possibly result in exposure to hazardous materials during construction. These areas would be remediated prior to or during construction. It is expected that these projects would not introduce new hazardous materials to areas of the region.</p>

**Table 29-1: Summary of Indirect Impacts and Cumulative Impacts (continued)**

Past Action	Indirect Impacts	Cumulative Effects
<b>Energy</b>		
<p>Inefficient consumption and increased demand of fossil fuels create shortages.</p>	<p><b>No Build Alternative:</b> Under the No Build Alternative, growth would continue as projected, resulting in increases in energy expenditures.</p> <p><b>Preferred Alternative:</b> The projected indirect and direct energy expenditures of the Preferred Alternative are marginal when compared to the overall statewide figures for New Jersey. Due to the small sizes of the projected increases in comparison with statewide figures, the projected increases are not considered significant and should be easily managed by existing New Jersey power resources.</p>	<p><b>No Build Alternative:</b> Under the No Build Alternative, increased indirect energy expenditures are anticipated with the construction of the planned transportation improvements in the region and the development/redevelopment projects in the study area. It is expected that the consumption of energy resources becomes increasingly efficient; however direct energy expenditures may continue to increase as a result of growth.</p> <p><b>Preferred Alternative:</b> Construction of the Preferred Alternative in addition to all other major actions planned for the project corridor would result in minimal impacts to direct and indirect energy expenditure. It is expected that the projected increases could be small in comparison with statewide figures; therefore, projected increases would not be considered significant. In addition, construction of several rail projects could reduce regional auto vehicle miles traveled (VMT) and hence reduce energy consumption for automobiles.</p>
<b>Electric and Magnetic Fields</b>		
<p>Electric service distribution lines and substations have been constructed to provide electrical power to residences and business.</p>	<p><b>No Build Alternative:</b> The study area is mostly built-out. Under the No Build Alternative, some additional electric service may be provided, but the overall impact on the study area would be negligible.</p> <p><b>Preferred Alternative:</b> Although the overhead catenary and electrical substations required to power the light rail vehicles would produce electric and magnetic fields, the field strength is within the accepted safe levels, and drops further as distance increases from the right-of-way. Interaction with adjacent magnetic fields is unlikely to result in a magnetic field that exceeds safe limits.</p>	<p><b>No Build Alternative:</b> Same as for Indirect Impacts.</p> <p><b>Preferred Alternative:</b> It is unlikely that any planned transit improvement or development project would generate electric or magnetic fields within close enough proximity or of an intensity great enough to amplify the electric and magnetic fields generated by the light rail vehicle.</p>
<b>Safety and Security</b>		
<p>Grade crossings received minimum, and in some cases inadequate, protection.</p>	<p><b>No Build Alternative:</b> Under the No Build Alternative, safety upgrades relative to freight service on the Northern Branch alignment would occur as-needed.</p> <p><b>Preferred Alternative:</b> Safety measures, including upgraded grade crossing gates and pedestrian crossings, would improve the safety for vehicles and pedestrians in the study area. No indirect impacts are anticipated.</p>	<p><b>No Build Alternative:</b> No impact.</p> <p><b>Preferred Alternative:</b> Planned improvements would incorporate the most recent required safety measures. No adverse cumulative effects are anticipated.</p>

**Table 29-1: Summary of Indirect Impacts and Cumulative Impacts (continued)**

Past Action	Indirect Impacts	Cumulative Effects
<b>Historic and Archeological Resources</b>		
<p>Previously, there was a chronic disregard for historic/cultural resources. Awareness and advocacy resulted from the demolition of key landmarks.</p>	<p><b>No Build Alternative:</b> The No Build Alternative could cause impacts to some historic sites/structures and archaeological resources from increased traffic and noise. Continued development/redevelopment in some areas could also cause alterations of some historic sites or structures.</p> <p><b>Preferred Alternative:</b> Englewood Hospital and Medical Center has noted that a new parking facility, possibly combined with office space, would need to be developed on the northeast portion of their property near Engle Street to replace the parking to be used for commuter parking. Unless federal funding is used for this construction, the new building would not be subject to Section 106 of the National Preservation Act.</p>	<p><b>No Build Alternative:</b> The No Build Alternative could cause cumulative effects to some historic and archaeological resources in the project corridor. Increased potential for cumulative effects could result from privately held historic buildings, which are subject to alteration depending upon the interests of the property owners.</p> <p><b>Preferred Alternative:</b> Although it is not anticipated that adverse cumulative effects to historic and archaeological resources would result from the proposed project, other planned transportation and development/redevelopment projects could cause cumulative effects to some historic and archaeological resources in the corridor. All proposed federal actions are subject to the requirements of Section 106 of the National Preservation Act and extensive coordination with the NJ State Historic Preservation Office (SHPO). As a result of Section 106 requirements, as well as SHPO coordination, any potential impacts would be mitigated.</p>
<b>Environmental Justice</b>		
<p>Unfair disturbance to minority and low-income neighborhoods.</p>	<p><b>No Build Alternative:</b> The No Build Alternative would not result in indirect impacts on minority or low-income neighborhoods.</p> <p><b>Preferred Alternative:</b> Modest concentrations of minority populations and of low-income populations live in close proximity to the rail right-of-way and a number of the proposed station areas. Both minority and low-income populations would share equally with the general population in any positive or negative indirect impacts that would be generated by the proposed project. Therefore, no environmental justice-related impacts would result from the proposed project.</p>	<p><b>No Build Alternative:</b> Under the No Build Alternative, all planned transportation projects would have to comply with the regulations set forth in Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”, Title VI of the Civil Rights Act of 1964, and the ISTEA and its successor laws.</p> <p><b>Preferred Alternative:</b> Under the Preferred Alternative, no adverse cumulative effects to minority and low-income populations are expected. All other planned transportation projects would adhere to the regulations set forth by the federal government. Both minority and low-income populations, as well as the general population, would benefit from the improvements in access and mobility.</p>

Source: Jacobs, 2015.

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