

A. INTRODUCTION

The Council on Environmental Quality (CEQ)'s 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 consider the potential for indirect and cumulative effects from a project. 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). 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. Since the other analyses presented in this Environmental Assessment (EA) assess the potential direct effects of the Proposed Project within the defined project study area through 2040, this chapter addresses the potential for indirect and cumulative effects (ICE) that could occur within a larger geographic region, as discussed in Section D, "Geographic Boundary."

B. METHODOLOGY

This ICE analysis follows the basic framework identified in the CEQ NEPA regulations for examining the indirect and cumulative effects of a proposed action, which are as follows:

- Identify environmental resources of interest;
- Determine geographic and temporal boundaries;
- Identify past, present, and reasonably foreseeable future projects to be considered as a part of the ICE analysis; and
- Assess the indirect and cumulative effects to the environmental resources of interest within the geographic and temporal boundary.

C. ENVIRONMENTAL RESOURCES OF INTEREST

Environmental resources analyzed are those that would be indirectly affected by the construction and operation of the Proposed Project and those that have the potential to experience cumulative effects from the Proposed Project and other reasonably foreseeable actions. The resources assessed in this ICE analysis are:

- Transportation
- Land Use and Community Facilities;

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- Socioeconomic Conditions and Environmental Justice;
- Parks, Trails, and Recreational Resources (includes Section 4(f) and Section 6(f) resources);
- Visual and Aesthetic Conditions;
- Cultural Resources (includes Section 4(f) resources);
- Natural Resources; and
- Public Health, Safety, and Security.

Direct impacts due to contaminated and hazardous materials would be mitigated at the source as part of the Proposed Project and are therefore not considered in the ICE analysis. Elsewhere in this EA, the analyses of air quality (Chapter 12), energy and climate change (Chapter 13), and noise and vibration (Chapter 14) are cumulative in their scope as they study the effects of projected NEC FUTURE train volumes for 2040. Any indirect and cumulative effects on those resource areas are addressed in the respective chapters, and therefore these resources need not be analyzed in this chapter.

D. GEOGRAPHIC BOUNDARY

The geographic limits for the ICE analysis extend beyond those used for the direct impact analysis, which identified resources within or intersecting the 1,000-foot boundary on any side of the current rail right-of-way (ROW). The ICE boundary was established through a synthesis of multiple resource boundaries (i.e. study area, census tracts, rail lines, and watersheds) into one overall ICE boundary (see **Table 18-1**). Based on data available from state and county sources, the resources were mapped using GIS techniques and analyzed to determine the nature and extent of indirect and cumulative effects created by the project.

**Table 18-1
Geographic Boundary Synthesis**

Resource	Sub-Boundaries
Transportation	Includes the NEC from Wilmington to Baltimore
Land Use/Community Facilities	City of Havre de Grace municipal limits; Town of Perryville municipal limits; 1,000-foot study area boundary
Socioeconomic Conditions/ Environmental Justice	Census Block Groups within or intersecting a 1,000-foot radius of the current rail ROW
Parks, Trails, and Recreational Facilities	City of Havre de Grace municipal limits; Town of Perryville municipal limits; 1,000-foot study area boundary
Cultural Resources	Area of Potential Effect (APE), including the Havre de Grace Historic District
Visual and Aesthetic Conditions	Equivalent to study area for direct effects
Natural Resources	Watershed/Sub-watershed boundaries (includes portions of Swan Creek-Bush River, HUC 02130706; Lower Susquehanna River, HUC 02120201; and Furnace Bay-Elk River, HUC 02130609)
Public Health, Safety, and Security	City of Havre de Grace municipal limits; Town of Perryville municipal limits; 1,000-foot study area boundary

E. TEMPORAL BOUNDARY

Temporal boundaries are the timeframes for the ICE analysis, typically ranging from the year in the past when major events within the geographic boundary influenced population and/or land use changes to the foreseeable future. The timeframe used for this analysis was determined to be between 1976, when the bridge ownership was transferred to the National Railroad Passenger Corporation (Amtrak), through 2040.

F. REASONABLY FORESEEABLE ACTIONS

The reasonably foreseeable development projects within the ICE boundary are summarized in **Table 18-2**.

**Table 18-2
Reasonably Foreseeable Actions**

Location	Project/ Development Name	Description
Havre De Grace	Bulle Rock	Continued development of large residential, commercial and retail community within Havre de Grace that is located south of I-95 and north of the historic downtown of Havre de Grace.
	Greenway Farms	Existing residential community located immediately to the east of Bulle Rock; plans to double the number of current homes.
	Havre de Grace Waterfront Redevelopment	City of Havre de Grace plans call for potential new building heights as tall as 10 stories with the goal being to encourage taller development with a smaller footprint rather than “shorter and wider” buildings along the waterfront.
	Havre de Grace Middle/High School Redevelopment	The County has issued a design contract to combine the currently separate high school and middle school into one overall modernized facility along with a new field house for the football stadium and athletic fields.
	Acer Warehouse Expansion	The existing warehouse facility has 25 acres where the company plans to expand in the future.
	Proposed Waterfront Heritage Park	The City plans to create a new Heritage Park with a “Water Shuttle Landing Site”, public waterfront promenade and fishing pier.
Perryville	MARC Northeast Maintenance Facility	Proposed MARC maintenance facility within the northern section of the project limits. FTA issued a FONSI in October 2015.
	Perryville Municipal Complex	Development project which includes a new police department, town hall, and little league baseball field adjacent to the MARC station in Perryville.
	Lower Ferry Park and Pier	Development of a park which includes a comfort station, a band shell, playground equipment, and walking paths.

Table 18-2 (cont'd)
Reasonably Foreseeable Actions

Location	Project/ Development Name	Description
Conowingo, MD	Relicensing of the Conowingo Dam	The Conowingo Dam connects Cecil and Harford Counties in Maryland at river mile 10. The Exelon Generation Company, LLC is licensed by FERC to operate the Conowingo Hydroelectric Project. FERC is reviewing applications to relicense three hydropower projects located on the lower Susquehanna River, including the Conowingo Dam. A Final EIS was issued in March of 2015, outlining the new environmental measures and those that Exelon proposes to continue.
NEC north of Perryville	Chesapeake Connector	WILMAPCO has proposed this project to alleviate a freight rail bottleneck by adding a third track between Perryville and North East, MD. The Proposed Project has been designed so as not to preclude construction of the project, which is located on the eastern edge of the Susquehanna River Rail Bridge Project limits.
NEC north of Perryville	MARC Northward Service Extension	MTA planning documents propose extending service northward, with an eventual shuttle connection to the SEPTA commuter rail network (presumably at the nearest SEPTA station, in Newark, Delaware), by 2030. ¹
Aberdeen, MD	Aberdeen Station Square Master Plan	Aberdeen Station, located south of the study area, is the next stop on the MARC Penn Line after Perryville Station and is also served by Amtrak's Northeast Regional service. The Master Plan proposes future development around the Aberdeen railroad station.
Baltimore, MD: NEC between West Baltimore MARC Station and Baltimore Penn Station	B&P Tunnel Project	FRA, MDOT and Amtrak are studying various improvements to the B&P Tunnel, constructed in 1873. The tunnel is nearing the end of its useful service life and suffers from deficient track geometry and other features that slow rail movement, creating a major bottleneck on the NEC. A Draft EIS was issued in December 2015, outlining alternatives which would replace the existing tunnel with new tunnels aligned in a broad arc north of the existing tunnel. FRA issued the Final EIS in November 2016.

¹ "MARC Growth and Investment Plan Update 2013-2050", dated September 9, 2013, MTA.

**Table 18-2 (cont'd)
Reasonably Foreseeable Actions**

Location	Project/ Development Name	Description
NEC from Odenton to Halethorpe, MD	BWI Rail Station Improvements and Fourth Track Project	MTA, with funding from FRA, has proposed station and track improvements associated with the BWI Marshall Airport Rail Station. The project includes construction of a new platform, improvements to the current station with possible multi-level transit oriented development and the addition of a fourth track along nine miles of the NEC. The general project area is defined as a 500-foot-wide corridor centered on the existing rail line between the Odenton Station and Halethorpe Station. FRA issued a FONSI in January 2016, and the Federal Aviation Administration issued a FONSI in July 2016.
NEC from Boston, MA to Washington, D.C.	NEC FUTURE	The purpose of the FRA-led NEC FUTURE is to upgrade aging infrastructure and improve the reliability, capacity, connectivity, performance, and resiliency of passenger rail service on the NEC between Washington, D.C., and Boston, Massachusetts for both intercity and regional trips, while promoting environmental sustainability and economic growth. The planning effort was initiated in early 2012 and a Tier I Draft EIS was released in November 2015; a Tier I Final EIS was released in December 2016. The Preferred Alternative proposes an investment program that includes numerous upgrades and state-of-good-repair projects along the length of the NEC.
<p>Notes: MARC = Maryland Area Regional Commuter; FERC = Federal Energy Regulatory Commission; MTA = Maryland Transit Administration; EIS = Environmental Impact Statement; NEC = Northeast Corridor; SEPTA = Southeastern Pennsylvania Transportation Authority; B&P = Baltimore and Potomac; BWI = Baltimore-Washington International Airport; FONSI = Finding of No Significant Impact.</p>		

G. INDIRECT EFFECTS ANALYSIS

The purpose of the indirect effects analysis is to assess those impacts caused by an action, such as the Proposed Project, which occur later in time or farther removed in distance than direct effects, but are still reasonably foreseeable. Indirect effects are sometimes referred to as induced impacts because they are the type of impacts that would not or could not occur if it were not for the implementation of the project. Indirect effects include those that occur further away in space or time from the direct effects of the action. Indirect effects may also occur if the action changes

the extent, pace, and/or location of development and if this change affects environmental resources.

The Proposed Project is an effort to remove the bottleneck caused by an aging railroad bridge that is nearing the end of its useful life. For transportation, the primary indirect effect would be to improve existing rail service along the NEC, thereby improving trip times. This could lead to induced growth and improved socioeconomic outcomes in communities served by stations along the NEC due to the improved service and corresponding increases in ridership. However, these effects would be quite small due to the continued existence of other restrictions along the NEC, which would limit the trip time savings enabled by the Proposed Project alone. No indirect effects to parks, trails, and recreational resources, cultural or natural resources, or public health, safety, and security are anticipated to result from the Proposed Project.

H. CUMULATIVE EFFECTS ANALYSIS

In accordance with CEQ regulations, cumulative impact is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR § 1508.7). A cumulative impact includes the total effect on a natural resource, ecosystem, or human community due to past, present, and future activities or actions of Federal, non-Federal, public, and private entities. Cumulative impacts may also include the effects of natural processes and events, depending on the specific resource in question. Cumulative impacts include the total of all impacts to a particular resource that have occurred, are occurring, and would likely occur as a result of any action or influence, including the direct and reasonably foreseeable indirect impacts of a Federal activity. Accordingly, there may be different cumulative impacts on different environmental resources. However, not all of the resources directly impacted by a project will require a cumulative impact analysis. The resources subject to a cumulative impact assessment are determined on a case-by-case basis. **Table 18-3** provides a summary of the cumulative impacts analysis, organized by resource area.

**Table 18-3
Overall Cumulative Impacts Summary**

Resource	Effects of Past Actions	Cumulative Effects with Proposed Project	Projects/Actions Considered in Cumulative Effects Assessment
Transportation	Disinvestment and deterioration of the rail network and associated infrastructure; Efforts to repair past damage, reach a state of good repair, and improve the NEC rail network	Planned investment in rail network to achieve state of good repair and enable service increases, including high-speed rail; associated benefits include reduced highway and airport congestion, faster and easier travel on all modes, VMT reduction, reduced roadway emissions, and economic benefits	NEC FUTURE; Chesapeake Connector; MARC Northeast Maintenance Facility; MARC Northward Service Extension; Aberdeen Station Square Master Plan; B&P Tunnel Project; BWI Rail Station Improvements and Fourth Track Project
Land Use and Community Facilities	Development and redevelopment of residential, commercial, industrial and transportation uses; Development of community facilities to support other development	Increased regional mobility and accessibility to neighborhoods and community facilities; Planning in place to minimize negative impacts to neighborhoods and community facilities	Bulle Rock; Greenway Farms; Havre de Grace Waterfront Redevelopment; Havre de Grace Middle/High School Redevelopment; Acer Warehouse Expansion; Proposed Waterfront Heritage Park; Perryville Municipal Complex; Lower Ferry Park and Pier; Transportation projects listed above
Socioeconomic Conditions and Environmental Justice	Social and economic benefits from development; Regulations to avoid or minimize disproportionately high and adverse effects to minority and low-income populations	Increased mobility, access to transit, and greater employment opportunities through continued development	Bulle Rock; Greenway Farms; Acer Warehouse Expansion; MARC Northeast Maintenance Facility; Perryville Municipal Complex; MARC Northward Service Extension; B&P Tunnel Project; BWI Rail Station Improvements and Fourth Track Project; NEC FUTURE
Parks, Trails, and Recreational Resources	Development of new parks and park facilities; Development of lands adjacent to public parks limit expansion of facilities; Limited opportunities for connectivity	Continuing development of new parks and park facilities; Increased accessibility to public parks; Small taking of parkland with the project	Havre de Grace Middle/High School Redevelopment; Proposed Waterfront Heritage Park; Perryville Municipal Complex; Lower Ferry Park and Pier; NEC FUTURE

Table 18-3 (cont'd)
Overall Cumulative Impacts Summary

Resource	Effects of Past Actions	Cumulative Effects with Proposed Project	Projects/Actions Considered in Cumulative Effects Assessment
Visual and Aesthetic Conditions	Development in viewsheds, including residential, commercial, and transportation uses	Continuing development of residential, waterfront commercial, and park uses along the Susquehanna riverfront; Ongoing development along the NEC including in the vicinity of the Perryville Railroad Station and the Havre de Grace Historic District	Bulle Rock; Greenway Farms; Havre de Grace Waterfront Development; Proposed Waterfront Heritage Park; Perryville Municipal Complex; Lower Ferry Park and Pier; NEC FUTURE
Cultural Resources	Impacts to various cultural resources, primarily from development on private lands	Ongoing preservation of cultural resources; Loss of some cultural resources including historic rail structures; Impacts to historic districts from development	Havre de Grace Waterfront Redevelopment; Havre de Grace Middle/High School Redevelopment; Proposed Waterfront Heritage Park; Perryville Municipal Complex; Lower Ferry Park and Pier; Aberdeen Station Square Master Plan; B&P Tunnel Project; NEC FUTURE
Natural Resources	Loss of resource areas due to draining, ditching or filling by development; Deterioration of water quality; Loss of floodplain areas and RTE habitat due to development	Regulations in place to avoid or minimize effects to water quality, wetland and stream resources, floodplains, and RTE habitat; Regulations in place to govern fill and construction in floodplains; Potential for habitat loss due to land use conversion	Bulle Rock; Greenway Farms; Havre de Grace Waterfront Redevelopment; Acer Warehouse Expansion; Proposed Waterfront Heritage Park; MARC Northeast Maintenance Facility; Lower Ferry Park and Pier; Conowingo Dam Relicensing; BWI Rail Station Improvements and Fourth Track Project; NEC FUTURE
Public Health, Safety, and Security	Public health and safety improvements due to tightened state and federal standards for air and water quality and rail safety; Increased exposure to hazardous materials and high noise levels due to rail activity	Continuing public health improvements due to reduced congestion and VMT, reducing noise and emissions that contribute to air pollution; Improved system-wide passenger rail safety	MARC Northeast Maintenance Facility; Chesapeake Connector; B&P Tunnel Project; BWI Rail Station Improvements and Fourth Track Project; NEC FUTURE

TRANSPORTATION

Direct project impacts to Transportation are discussed in Chapter 3, “Transportation.”

MARC IMPROVEMENTS

MARC’s Northeast Maintenance Facility and the agency’s ongoing study of extending service northward beyond Perryville for eventual connections to SEPTA service would introduce MARC activity north of Perryville station, the current northern terminus of MARC service on the Penn Line. In combination with other projects along MARC’s Penn Line including the Aberdeen Station Square Master Plan, B&P Tunnel Project, and BWI Rail Station Improvements and Fourth Track Project, the extension would enable future service increases to Perryville and points north, which would have the potential to increase noise, pollutant emissions, and other potential effects in the vicinity of Perryville Station and northward along the NEC, while decreasing some air pollutant emissions near other roadways and in the region as a result of reduced regional vehicle miles traveled (VMT). While it is partially enabled by the Proposed Project, this added service is not being proposed as part of the Susquehanna River Rail Bridge Project and would be studied under a separate environmental review.

NEC FUTURE

NEC FUTURE is a planning effort to develop a comprehensive program for upgrading and improving the reliability, capacity, connectivity, performance, and resiliency of passenger rail service on the NEC. The NEC FUTURE Tier I Final EIS was released in December 2016. The Tier I Final EIS evaluates the cumulative benefits of a Preferred Alternative that includes a package of rail improvement projects along the entire NEC, including those of the Proposed Project, as they interact with the improvements programmed as part of NEC FUTURE.² Cumulative benefits include increasing the role of rail as part of the total travel market; providing a better overall transportation network that functions more effectively and efficiently to meet the needs of passengers, freight railroads, residents, and businesses within the Northeast region; reducing emissions of criteria pollutants and greenhouse gases (GHGs) from roadway vehicles; and providing more travel choices, enabling Northeast residents to access a wider selection of jobs and services. Chapter 3, “Transportation,” analyzes the Proposed Project’s impacts in the 2040 timeframe utilizing NEC FUTURE train projections, and is therefore inherently cumulative in its analysis. The Proposed Project would be consistent with the service goals considered in the NEC FUTURE Tier 1 FEIS Preferred Alternative along this section of the NEC.

By increasing capacity, offering improved reliability and better performance between NEC rail markets, expanding service to new markets, and offering a greater range of pricing options, NEC FUTURE would make rail travel more competitive with other modes and substantially expand the accessibility of rail travel along the NEC. Under NEC FUTURE, the volume of intercity passenger trips would more than double, and regional rail passenger trips would increase by approximately 20 percent, while the volume of trips made using other modes (highway, air, intercity bus) would decrease relative to the No Action condition, as some people shift their mode of transportation to rail. This would result in a VMT reduction of approximately four

² FRA, NEC FUTURE Tier I Final EIS, December 2016.

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million automobile miles traveled in 2040³ as compared with the 2040 No Action condition. The VMT reduction would provide a benefit to all travelers in the Northeast region due to reduced congestion of highways and airports. Trip times would also decrease substantially; the rail trip from Washington, D.C. to Boston would be reduced by approximately 1.5 hours. Chokepoint relief projects would also ease movement of freight trains along the corridor, with resulting economic benefits to goods movement. As a necessary improvement to the NEC, the Susquehanna River Rail Bridge Project would contribute to the reduction of VMT and trip times and improvements at chokepoints, with their associated benefits.

LAND USE AND COMMUNITY FACILITIES

Direct project impacts to Land Use and Community Facilities are discussed in Chapter 4, “Land Use and Community Facilities.”

A number of ongoing and reasonably foreseeable development projects in Havre de Grace and Perryville (listed in **Table 18-2**) will continue the current trend for development of residential, commercial, industrial, community facility, and parkland uses in these communities. In combination with the transportation improvements described in the preceding section, the Proposed Project could contribute to inducement of some additional development. This is particularly likely in the vicinity of Perryville station, which will become more desirable for development due to improved and expanded rail service, as well as the development of the Perryville Municipal Complex directly adjacent to the station. However, any incremental new development induced as a result of these improvements would be consistent with existing development trends in Perryville and Havre de Grace. Additional induced development would also be expected along the length of the MARC Penn Line and NEC due to improved and expanded rail service resulting from NEC FUTURE and the other rail improvements described above.

In addition to induced development, the Proposed Project and other transportation improvements would cumulatively lead to an intensification of use in the existing transportation corridor, which could result in the taking of additional lands for transportation use all along the NEC. However, most rail improvements would be made within the existing ROW, and any necessary takings would be spread along the 457-mile NEC, so substantial impacts to any given community or neighborhood would be limited. Each project would independently analyze and address the specific local impacts from land takings and conversion to transportation use, and affected property owners would receive assistance in accordance with applicable federal and/or state requirements. The acquisition of property and the relocation of residents, businesses, farms and non-profit organizations, if needed, would be conducted in accordance with all applicable federal laws, regulations and requirements, including but not limited to 23 CFR 710, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended and its implementing regulations found in 49 CFR 24.

Alternative 9A and Alternative 9B generally follow the existing transportation corridor, and therefore avoid any substantial changes to existing land use. Where acquisition of adjacent land is necessary, the Proposed Project will adhere to the provisions of the Uniform Act and applicable state laws with regard to relocation services, moving and other allowable

³ FRA, NEC FUTURE Tier I Final EIS, December 2016. Appendix BB. “Technical Analysis on the Preferred Alternative.” All information cited is based on the Preferred Alternative of the Tier I Final EIS.

compensation related to the displacement of affected businesses. Where full property acquisition is required, the owners of properties will be compensated for the land acquired and businesses will be provided relocation assistance to facilitate their reestablishment elsewhere. As a result, a substantial contribution toward cumulative effects to land use and community facilities is not anticipated from the Proposed Project.

SOCIOECONOMIC CONDITIONS AND ENVIRONMENTAL JUSTICE

Direct Proposed Project impacts to Socioeconomic Conditions and Environmental Justice are discussed in Chapter 5, “Socioeconomic Conditions and Environmental Justice.”

In combination with the transportation improvements and development projects described in the preceding sections, the Proposed Project would contribute to cumulative increases in mobility and access to transit, as well as greater employment opportunities in Havre de Grace and Perryville and throughout the Northeast region. While population, employment, and housing supply in the local area and throughout the Northeast are expected to continue to grow, the Proposed Project would not make a measurable contribute to these changes. The Proposed Project would not contribute to any reasonably foreseeable disproportionate impacts to Environmental Justice communities. By improving mobility across the Susquehanna River for passenger and freight rail, as well as marine users on the Susquehanna River, the Proposed Project would have a beneficial cumulative impact to socioeconomic conditions and Environmental Justice populations.

PARKS, TRAILS, AND RECREATIONAL RESOURCES

Direct Proposed Project impacts to Parks, Trails, and Recreational Resources are discussed in Chapter 6, “Parks, Trails, and Recreational Resources.”

The Proposed Project would have adverse effects on parks and recreational resources (including Section 4(f) resources), but with mitigation, as detailed in Chapter 6, Chapter 9, “Draft Section 4(f) Evaluation,” and Chapter 10, “Section 6(f) Evaluation,” these adverse effects would not be significant. Alternative 9A would require the acquisition of a strip of the Havre de Grace Middle/High School track and athletic fields, and would require the reconfiguration and reconstruction of the track and football field as well as minor reconfigurations of ballfields. Both Build Alternatives would result in the elimination of public access to Amtrak-owned portions of Jean S. Roberts Park and would further require acquisition of 0.01-acre of the non-Amtrak-owned portion and modification of the existing lease agreement and park infrastructure. Because these impacts are *de minimis*, the project would not substantially contribute to cumulative effects. Therefore, an adverse effect to the resource is not anticipated.

Transportation improvements along the NEC have the potential to impact additional parks, trails, and recreational resources adjacent to the rail corridor, including Section 4(f) and Section 6(f) resources, but these impacts would be spread along the 457-mile NEC, so substantial impacts to these resources in any given area would be limited. Therefore, a substantial contribution to cumulative impacts to parks, trails, and recreational resources is not anticipated as a result of the Proposed Project.

VISUAL AND AESTHETIC CONDITIONS

Direct Proposed Project impacts to Visual and Aesthetic Conditions are discussed in Chapter 7, “Visual and Aesthetic Conditions.”

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The Proposed Project is not expected to substantially alter the overall visual and aesthetic character of the study area or to block important views to or from visually sensitive resources located in the study area. Because the Proposed Project would replace existing rail infrastructure with new rail infrastructure, the overall visual character, atmosphere, and use of the study area would remain largely the same. While other ongoing developments, including those projects listed in **Table 18-3** under “Visual and Aesthetic Conditions,” have the potential to cumulatively alter the visual environment of the study area, the Proposed Project would not contribute to any such cumulative change.

CULTURAL RESOURCES

Direct Proposed Project impacts to Cultural Resources are discussed in Chapter 8, “Cultural Resources.”

The Proposed Project would have adverse effects on cultural resources, but with mitigation, as detailed in Chapter 8 and Chapter 9, these adverse effects would not be significant. Ongoing and reasonably foreseeable future development in the overall geographic boundary has the potential to result in adverse impacts to cultural resources; in particular, private developments on lands where such resources are unprotected pose the greatest threat. Additionally, improvements along the NEC have the potential to impact historic resources in proximity to the rail corridor, and induced development in communities with rail stations could affect cultural resources. However, as a result of federal and state regulations protecting cultural resources, along with local planning efforts to preserve these resources, these effects are not anticipated to be significant. Therefore, a significant contribution toward adverse cumulative effects to cultural resources is not anticipated as a result of the Proposed Project.

NATURAL RESOURCES

Direct Proposed Project impacts to Natural Resources are discussed in Chapter 11, “Natural Resources,” and **Appendix E**, “Natural Environmental Technical Report.”

FLOODPLAINS

Past, present, and reasonably foreseeable future projects constructed in the 100-year floodplain within the geographic boundary, combined with foreseeable sea-level rise resulting from global climate change, may experience more frequent flooding within and beyond the current floodplain. While long, linear features such as the NEC rail alignment would not be able to avoid some encroachment on floodplains, proper design can minimize the potential impacts of flooding on critical infrastructure and reduce the potential for cumulative effects. With the Proposed Project, the rail alignment and associated infrastructure would be situated well above the current floodplain, and therefore would not be susceptible to flooding, even with reasonably foreseeable increases in flood elevations. In addition, cumulative effects of flooding in the geographic boundary would be reduced by implementation of federal and state regulations, and thus the potential effect of flooding on the Proposed Project is not anticipated to have a cumulative contribution to flooding in the study area.

WETLANDS/WATERS OF THE U.S.

Past conversion of native land has adversely affected wetlands/waters of the U.S., and ongoing and reasonably foreseeable future development within the geographic boundary has the potential to result in further impacts to wetlands/waters of the U.S. and contribute to their loss. The

Proposed Project would have relatively minor effects on wetlands and somewhat greater effects on streams. Under Alternative 9A, 0.89 acre of wetlands would be impacted, along with 2.43 acres of wetland buffer area and 3,209 linear feet of streams; under Alternative 9B, 0.77 acre of wetlands would be impacted, along with 1.99 acres of wetland buffer area and 2,962 linear feet of streams. Both alternatives would impact 0.37 acre of Susquehanna riverbed. Through induced development in combination with the reasonably foreseeable future development and transportation projects listed in **Table 18-3** under “Natural Resources,” the Proposed Project could contribute to impacts on wetlands and waters of the U.S. However, the Section 404 permitting process, which implements federal and state regulations for wetlands/waters of the U.S., would reduce temporary and permanent effects on these resources. Unavoidable impacts to waters of the U.S., including wetlands, will follow the Federal Compensatory Mitigation Rule (33 CFR Part 325 and 40 CFR Part 230), and other state compensatory mitigation guidelines, as well as other recommendations from federal and state resource agencies. Therefore, significant adverse cumulative effects to these natural resources are not anticipated.

FOREST RESOURCES

Forest resources within the geographic boundary have been heavily affected by past actions, including the development of communities/neighborhoods outside the city limits of Havre de Grace and Perryville. Alternative 9A would impact approximately 2.92 acres of forest between the existing tracks and the Havre de Grace Middle/High School campus, and Alternative 9B would impact approximately 2.08 acres of forest at the same location. This forest is relatively narrow and disturbed. The Proposed Project, through induced development in combination with the reasonably foreseeable future development and transportation projects listed in **Table 18-3** under “Natural Resources,” would contribute to the ongoing loss of forest resources but would not result in additional fragmentation of existing forested tracts. State regulations regarding projects impacting forests would reduce temporary and permanent effects, and thus contributions to significant cumulative effects to these natural resources are not anticipated.

RARE, THREATENED, AND ENDANGERED SPECIES (RTE)

Past conversion of native land has adversely affected terrestrial habitat and increased sedimentation and runoff affecting aquatic habitat for rare, threatened, and endangered (RTE) species, and ongoing and reasonably foreseeable future development in the overall geographic boundary has the potential to result in further loss of habitat. The Proposed Project is considered “not likely to adversely affect” the Northern Long Eared Bat, and it is considered unlikely that either Build Alternative would affect any state or federally listed terrestrial species as very little natural habitat lies within the limits of disturbance for the project. Through induced development in combination with the reasonably foreseeable future development and transportation projects listed in **Table 18-3** under “Natural Resources,” the Proposed Project could contribute to impacts to RTE species. Cumulative effects on these habitats may be anticipated, but the permitting process, which implements federal and state regulations for RTE species including Section 7 of the Endangered Species Act, would reduce temporary and permanent effects, and thus contributions to significant cumulative effects to RTE species are not anticipated.

PUBLIC HEALTH, SAFETY, AND SECURITY

Direct Proposed Project impacts to Public Health, Safety, and Security are discussed in Chapter 16, “Public Health, Safety, and Security.”

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In combination with other ongoing and reasonably foreseeable projects, in particular the rail transportation improvements detailed above, the cumulative effects of the Proposed Project are generally beneficial to public health, safety, and security. As discussed above, the Proposed Project would contribute toward enabling an increase in passenger rail service on the NEC, which in turn would lower the potential for roadway collisions and reduce congestion and VMT, thereby minimizing exposure to noise and roadway emissions that contribute to air pollution. Diesel emissions from freight locomotives have improved over time and would continue to do so in the future, providing further benefits to air quality over time. The safety risks associated with passenger rail can be limited by such measures as educational programs and traffic controls at grade crossings, such as gates and active warning systems. Safety would also be positively affected by the implementation of state-of-good-repair projects along the NEC, including the Proposed Project, which reduces the likelihood of infrastructure failures. In summary, contributions to significant adverse cumulative effects to public health, safety, and security are not anticipated to result from the Proposed Project.

SUMMARY

The Proposed Project would contribute both positively and negatively to the overall cumulative effects of past and future actions on each of the resources considered. While the Build Alternatives may result in minor amounts of conversion of land use and potential displacement of some commercial uses, existing land use policies and development regulations support the Proposed Project, which would provide a substantial improvement to an established, overburdened rail transportation corridor. The Proposed Project is anticipated to have an overall positive impact on the regional economy by improving railroad mobility and connectivity. Further positive cumulative effects include improvements to regional air quality and a reduction in highway and airport congestion and VMT due to improved rail service. Overall, the Proposed Project is not expected to significantly contribute to any significant adverse cumulative effects.*