Susquehanna River Rail Bridge Project
Environmental Assessment
and Draft Section 4(f) Evaluation

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Maryland Department of Transportation
AMTRAK

Susquehanna River Rail Bridge Environmental Assessment (EA) and Draft Section 4(f) Evaluation

Prepared by:
Federal Railroad Administration (FRA)

Cooperating Agencies:
Federal Transit Administration (FTA)
United States Coast Guard
Army Corps of Engineers (ACOE)

Pursuant to:

National Environmental Policy Act (42 U.S.C. § 4321 et seq.), and implementing regulations (40 CFR Parts 1500-1508), 23 CFR §771, Section 4(f) of the U.S. Department of Transportation Act (49 USC §303) and implementing regulations (23 CFR Part 774); FRA Procedures for Considering Environmental Impacts (64 Fed. Reg. 28545, May 26, 1999); National Historic Preservation Act (54 USC §306101 et seq.) and implementing regulations (36 CFR Part 800); Clean Air Act as amended (42 USC §7401 et seq.) and implementing regulations (40 CFR Parts 51 and 93); the Endangered Species Act of 1973 (16 USC §1531-1544) and implementing regulations (50 CFR Part 402); the Clean Water Act (33 USC §1251-1387) and implementing regulations (33CFR Parts 320 to 324 and 40 CFR Part 230); and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC §4601).

Approved:

3/2/17
Date

Felicia B. Young for
Jamie Rennert
Director, Office of Program Delivery
Federal Railroad Administration

The following person may be contacted for information on the Environmental Assessment:

Brandon Bratcher
Environmental Protection Specialist
Office of Railroad Policy and Development
USDOT Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Table of Contents

APPENDICES

List of Tables

List of Figures

following page

LIST OF ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-Containing Materials
ACS	American Community Survey
Amtrak	National Railroad Passenger Corporation
APE	Area of Potential Effects
AQCR	Air Quality Control Region
ARDS	Alternatives Retained for Detailed Study
AREMA	American Railway Engineering and Maintenance-of-Way Association
BMC	Baltimore Metropolitan Council
BMPs	Best Management Practices
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CAA	Clean Air Act
CARB	California Air Resources Board
CDP	Carbon Disclosure Project
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CETC	Centralized Electrification and Traffic Control
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
COMAR	Code of Maryland Regulations
CPP	Construction Protection Plan
CREATE	Chicago Rail Efficiency and Transportation Efficiency
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Federal Coastal Zone Management Act of 1972
DFE	Design Flood Elevation
DLLR	Maryland Department of Labor, Licensing and Regulation
DNR	Maryland Department of Natural Resources
DOE	Determination of Eligibility
DOTs	State Departments of Transportation
DPF	Diesel Particulate Filters
DPS	Distinct Population Segment
DRO	Diesel Range Organics
EA	Environmental Assessment
ECG	East Coast Greenway
EDR	Environmental Data Resources, Inc.
EFH	Essential Fish Habitat
ERNS	Emergency Response Notification System
ESA	Endangered Species Act
ESD	Environmental Site Design
FAQs	Frequently Asked Questions
FHWA	Federal Highway Administration
FIDS	Forest Interior Dwelling Species
FIRM	Flood Insurance Rate Maps
FONSI	Finding of No Significant Impact

FPPA	Farmland Policy Protection Act
FR	Federal Register
FRA	Federal Railroad Administration
FSD	Forest Stand Delineation
FTA	Federal Transit Administration
GGRA	Greenhouse Gas Emissions Reduction Act
GHG	Greenhouse Gas
GIS	Geographic information System
HAER	Historic American Engineering Record
HCPS	Harford County Public Schools
HEAT	Higher Education Applied Technology
HSIPR	High-Speed Intercity Passenger Rail
HSR	High Speed Rail
HUD	United States Department of Housing and Urban Development
IBI	Index of Biotic Integrity
ICE	Indirect and Cumulative Effects
IDA	Intensely Developed Areas
IRMs	Interagency Review Meetings
JPA	Joint Permit Application
LDA	Limited Development Areas
LEP	Limited English Proficiency
LOD	Limit of Disturbance
LSHG	Lower Susquehanna Heritage Greenway
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Funding
MARA	Maryland Amphibian and Reptile Atlas
MARC	Maryland Area Regional Commuter
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MDP	Maryland Department of Planning
MdTA	Maryland Transportation Authority
MERLIN	Maryland Environmental Resources and Land Information Network
MGP	Manufactured Gas Plant
MGS	Maryland Geological Survey
MHT	Maryland Historical Trust
MHW	Mean High Water
MIHP	Maryland Inventory of Historic Properties
MLW	Mean Low Water
MMAP	Maryland Maritime Archeology Program
MP	Milepost
MPOs	Metropolitan Planning Organizations
MTA	Maryland Transit Administration
MY	Model Year
NAAQS	National Ambient Air Quality Standards
NEC	Northeast Corridor
NEPA	National Environmental Policy Act
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NETR	Natural Environmental Technical Report

NFRAP	No Further Remedial Action Planned
NHD	National Hydrography Dataset
NHL	National Historic Landmarks
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NLEB	Northern Long-Eared Bat
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NPS	National Parks Service
NR	National Register of Historic Places
NS	Norfolk Southern Railway
NWI	National Wetlands Inventory
OCP	Oil Control Program
OSHA	Occupational Safety and Health Administration
OTN	Open Transport Network
PA	Programmatic Agreement
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PFA	Priority Funding Areas
PIA	Public Information Act
POS	Program Open Space
PTC	Positive Train Control
PVC	Polyvinyl Chloride
PW&B	Philadelphia, Wilmington and Baltimore Railroad
RCA	Resource Conservation Areas
RCRA	Resource Conservation and Recovery Act
RCRA	Resource Conservation and Recovery Act
RGGI	Regional Greenhouse Gas Initiative
ROD	Record of Decision
ROW	Right-of-Way
RTE	Rare, Threatened, or Endangered Species
SAV	Submerged Aquatic Vegetation
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SEPTA	Southeastern Pennsylvania Transportation Authority
SHA	State Highway Administration
SHPO	State Historic Preservation Office
SHWS	State Hazardous Waste Site
SIPs	State Implementation Plans
SOI	Secretary of Interior
SRRBP	Susquehanna River Rail Bridge Project
SSPRA	Sensitive Species Project Review Areas
SVOCs	Semi-Volatile Organic Compounds
TCA	Trichloroethane
TCE	Trichloroethene
TCR	The Climate Registry

TMDL	Total Maximum Daily Load
TOD	Transit-Oriented Development
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage and Disposal
TSS	Total Suspended Solids
UG	Undergrade
ULSD	Ultra-low sulfur diesel
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USDHHS	U.S. Department of Health and Human Services
USDOE	U.S. Department of Energy
USDOI	U.S. Department of the Interior
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VA	Veterans Administration
VC	Vinyl Chloride
VMT	Vehicle Miles Traveled
VOCs	Volatile Organic Compounds
WHPA	Wellhead Protection Areas
WHS	Wildlife and Heritage Service
WSSC	Wetland of Special State Concern

A. INTRODUCTION

The Federal Railroad Administration (FRA) and the Maryland Department of Transportation (MDOT) are preparing an Environmental Assessment (EA) to evaluate the potential environmental impacts for the Susquehanna River Rail Bridge Project ("the Proposed Project"). MDOT, the project sponsor, is proposing to improve rail connectivity along the Northeast Corridor (NEC) by replacing or improving the Susquehanna River Rail Bridge between the City of Havre de Grace in Harford County, Maryland and the Town of Perryville in Cecil County, Maryland (see **Figure ES-1**). FRA is the lead federal agency and the National Railroad Passenger Corporation (Amtrak), as the bridge owner and operator, is providing conceptual and preliminary engineering designs and is acting in coordination with MDOT and FRA.

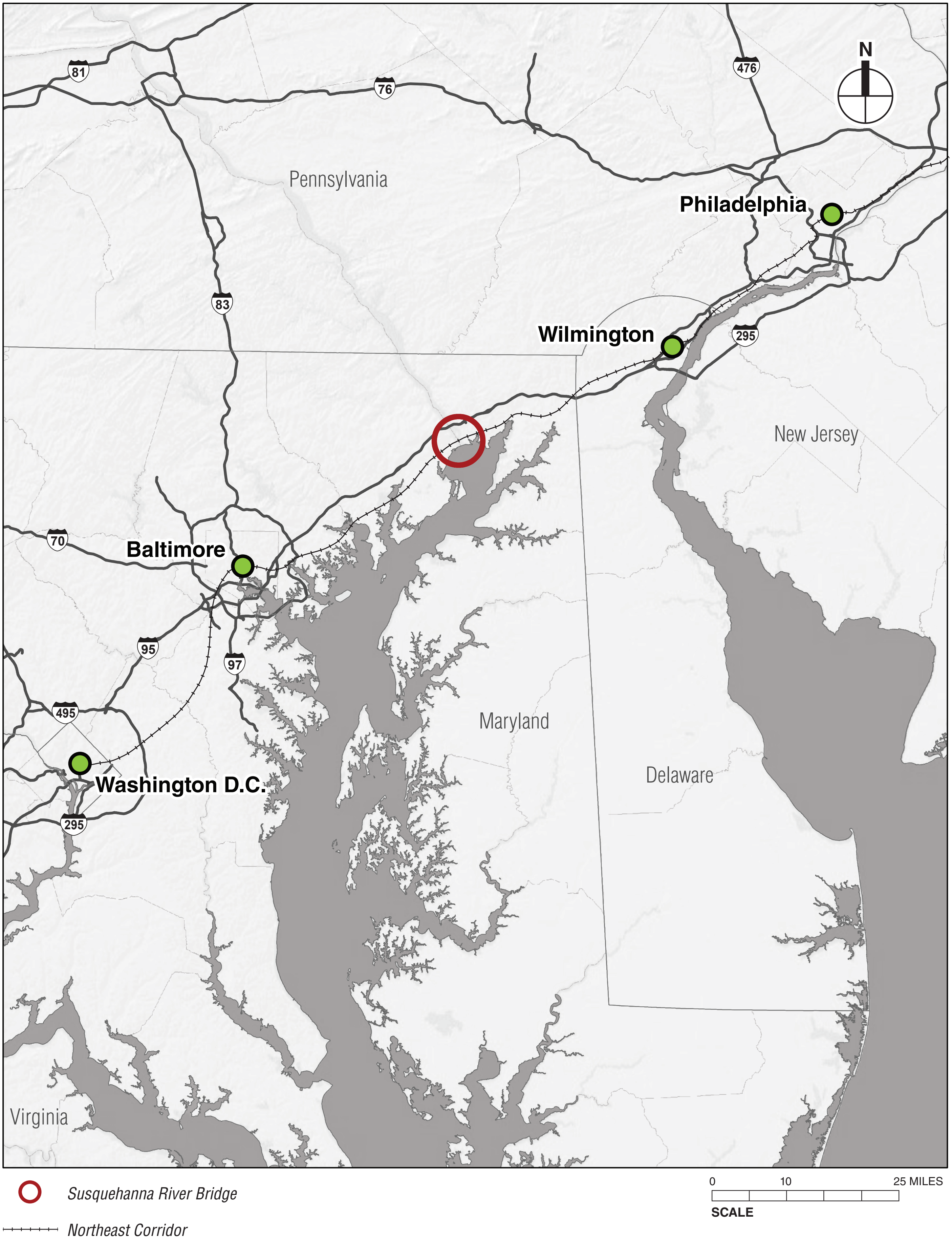
The existing two-track Susquehanna River Rail Bridge is located on Amtrak's NEC at Milepost (MP) 60. It is 110 years old, which is beyond the 100-year design lifespan typical for steel railroad bridges. This rail bridge is a critical link along one of the U.S. Department of Transportation's (USDOT) designated high-speed rail corridors. Amtrak, the Maryland Area Regional Commuter (MARC), and Norfolk Southern Railway (NS) use the bridge to carry intercity, commuter, and freight trains across the Susquehanna River. The existing two-track bridge creates a capacity and speed bottleneck along this segment of the NEC, resulting in conflicts between Amtrak's passenger service, MARC trains, and freight trains operated by NS.

This EA examines two Build Alternatives (Alternative 9A and Alternative 9B) and the No Action Alternative. FRA selected Alternative 9A as the Preferred Alternative.

B. PURPOSE AND NEED

The age of the bridge, its structural condition, and its two tracks curtail speeds and capacity on the bridge. This situation inhibits the rail operators' goals to provide reliable service, MDOT's plans to increase MARC commuter rail service, and Amtrak's plans to increase high-speed passenger rail service on the NEC. **The bridge's functionally-obsolete design and age require increasing major rehabilitation and repairs, which result in increasing maintenance costs and conflicts with the need to maintain continuous rail operations. The primary purpose of the Susquehanna River Rail Bridge Project is to provide continued rail connectivity along the NEC.** The goals of the Susquehanna River Rail Bridge Project include:

- Improve rail service reliability and safety;
- Improve operational flexibility and accommodate reduced trip times;
- Optimize existing and planned infrastructure and accommodate future freight, commuter, intercity, and high-speed rail operations; and
- Maintain adequate navigation and improve safety along the Susquehanna River.



Project Location
Figure ES-1

C. PROJECT ALTERNATIVES

The Build Alternatives were identified through a rigorous alternatives development and screening process. This process considered both alignment alternatives as well as bridge type alternatives. The Project Team prepared a detailed report describing the development of alternatives; input solicited from the public, agencies, and other stakeholders; and the methodology used to screen alternatives and selected those retained for detailed study (see **Appendix A**, “Alternatives Screening Report and Bridge Types”).

NO ACTION ALTERNATIVE

The No Action Alternative assumes the Susquehanna River Rail Bridge would remain in service as-is, with no intervention besides minimal repairs and continuation of the current maintenance regime. Service over the bridge would worsen in the future under the No Action Alternative. The bridge would continue to age, problems would occur more frequently, and the bridge would remain as a bottleneck. Major planned transportation projects within the study area—Amtrak’s State of Good Repair and Service Improvements and MARC Fleet Plan—are expected to be completed by 2025, the Susquehanna River Rail Bridge Project build year.

BUILD ALTERNATIVES

Based on the alternatives development and screening process, Alternative 9A and Alternative 9B were retained for detailed study. Alternative 9A, selected as the Preferred Alternative, would construct a new two-track 90 mph bridge to the west of the existing bridge and a second new two-track 160 mph bridge on the existing bridge alignment**.** The bridge to the west of the existing bridge would be constructed first, including the river spans, approach structures, railroad systems, and embankment. The use of conventional ballasted track is anticipated for the fixed bridge portion of this project. Under normal operations, this bridge would be used primarily by MARC commuter rail and NS freight rail service.

Once the new bridge to the west is completed, the existing bridge would be taken out of service, demolished, and replaced. A new high-speed passenger bridge would be built in the center of the right-of-way of the existing bridge alignment. Alternative 9A design would allow for 160 mph speeds. Since the west bridge will be built first, freight, MARC and Amtrak operations can be maintained throughout construction of both bridges.

Like Alternative 9A, Alternative 9B would result in a new two-track 90 mph bridge west of the existing bridge and a second new two-track bridge replacing the existing bridge. The difference between Alternative 9A and Alternative 9B occurs in Havre de Grace along the east side of the corridor from Lewis Lane to the Susquehanna River and the curve in Havre de Grace, which limits the speed to a maximum of 150 mph with Alternative 9B. This lower speed, as compared to Alternative 9A, reduces the amount of property acquisitions required, including the avoidance of the Havre de Grace Middle/High School athletic fields.

D. TRANSPORTATION

The Proposed Project would eliminate bridge malfunctions resulting from the opening of the existing movable span. This would improve the reliability of the Susquehanna River Rail Bridge and increase speed and capacity over the river. The Proposed Project would remove the bottleneck caused by the existing bridge and would reduce unscheduled train delays. No adverse impacts to intercity rail, freight, or MARC operations will result from the Proposed Project.

There will be no adverse impacts to the local street network upon which bus service or paratransit service relies. The Proposed Project will not affect any bus depots, bus stations, or any depots where paratransit vehicles are stored or maintained. Under both Alternative 9A and Alternative 9B, the Proposed Project will provide a 60-foot vertical clearance over mean high water and, at minimum, a 230-foot horizontal clearance. This will improve safety by reducing the potential for conflicts between the rail and marine traffic. The Proposed Project would also eliminate the need for bridge openings and closings by replacing the Susquehanna River Rail Bridge as two high-level fixed bridges. This would constitute an improvement to navigation along this segment of the Susquehanna River.

The Proposed Project will reduce future vehicle miles traveled (VMT) regionally when compared with the No Action Alternative, which would constitute a benefit to regional highways by lowering congestion levels and resulting in less wear and tear on road surfaces. No adverse impacts to regional highways would result from the Proposed Project.

Alternative 9A would require a slight realignment of Warren Street between N. Adams Street and N. Stokes Street in Havre de Grace. In Perryville, a slight realignment of Avenue A may be necessary under both Alternative 9A and Alternative 9B to accommodate the enlarged bridge abutment. These minor roadway realignments will not have any adverse impacts on local roadway traffic. With Alternative 9A and Alternative 9B, seven local roadway crossings beneath the NEC would require modification. Extension of these crossings would not have any negative impacts on local roadway traffic.

The Project Team designed the Proposed Project to accommodate traffic improvements and provide for a more open gateway to the downtown Havre de Grace commercial district, as requested at public meetings. The Proposed Project under both Alternative 9A and Alternative 9B would not result in a significant adverse impact on transportation. Together with other planned projects along the NEC, the Proposed Project would result in transportation benefits, including state of good repair, better performance, and reliability. Overall, the Proposed Project would not result in significant adverse impacts to Transportation.

E. LAND USE AND COMMUNITY FACILITIES

Either Build Alternative would require the acquisition of all or a portion of several properties located immediately adjacent to the existing right-of-way. Where full property acquisition is required, the owners of properties will be fully compensated for the land acquired and businesses will be provided relocation assistance to facilitate their reestablishment elsewhere, should this be necessary. The total anticipated property acquisition is 2.84 acres for Alternative 9A and 0.35 acres for Alternative 9B.

The Build Alternatives would be located on or just beyond the existing right-of-way. Therefore, the Proposed Project will not substantially change current land uses within the study area and would not result in a significant adverse impact to land use.

MDOT and Amtrak are not subject to local zoning regulations and no zoning designations are mapped on the existing rail right-of-way through the study area. The properties that would be acquired for each of the Build Alternatives have designated zoning under the City of Havre de Grace or the Town of Perryville that would be removed from the affected portions of the property where the land acquisitions are required. This would not result in a significant adverse impact on zoning on the project site or in the study area. Alternative 9A would require the acquisition of a narrow strip of the Havre de Grace Middle/High School athletic fields. Measures to minimize the impact to this community facility have been identified, in cooperation with the Harford County Public Schools (HCPS). The Proposed Project would be compatible and consistent with current policies that govern the project site and study area. Overall, there would be no long-term significant adverse impacts to land use, zoning, public policy, or community facilities from the Proposed Project.

F. SOCIOECONOMIC CONDITIONS AND ENVIRONMENTAL JUSTICE

The socioeconomic conditions analysis uses the guidance set forth in the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR §§ 1500-1508). Alternative 9A would require the full acquisition of one commercial use associated with the National Tire & Glass Sales Inc., in Havre de Grace. The owners of this property would be fully compensated and the business would be provided relocation assistance to facilitate their reestablishment elsewhere. Since the business would be relocated, it is not expected that any jobs will be lost as a result of Alternative 9A. Based on the design to date, no other commercial or residential properties will be fully displaced within the study area by either Alternative 9A or Alternative 9B. The Build Alternatives would not affect the population or housing supply of the area and would not spur rapid development. Overall, the Proposed Project would not adversely affect socioeconomic conditions, employment, or community cohesion.

The environmental justice analysis for the Proposed Project follows the guidance and methodologies recommended in the U.S. Department of Transportation's Final Order on Environmental Justice (updated May 2, 2012), Federal Transit Administration's (FTA) Circular 4703.1 *Environmental Justice Policy Guidance For Federal Transit Administration Recipients*, and principles set forth in Title VI of the Civil Rights Act of 1964 (Title VI). Existing population, employment, age, gender, income, and racial and ethnic characteristics were compiled for Harford and Cecil counties as a whole, as well as within the City of Havre de Grace and Town of Perryville limits. The predominant race within Harford County, Cecil County, the City of Havre de Grace, the Town of Perryville, and the project study area is White. The study area is 75.3 percent White and 24.8 percent minority, of which the largest portion is Black or African American (17.4 percent).The study area median household income is $63,790, which is similar to the median household income of Cecil County, the City of Havre de Grace, and the Town of Perryville, but lower than the State of Maryland and Harford County. Based on the analysis described in Chapter 5, "Socioeconomic Conditions and Environmental Justice", the Proposed Project would not result in any disproportionately high and adverse effects on minority or low-income populations.

G. PARKS, TRAILS, AND RECREATIONAL RESOURCES

Alternative 9A and Alternative 9B both require the permanent use of the entire 0.26-acre, Amtrak-owned portion of Jean S. Roberts Memorial Park as well as the acquisition of 0.01 acre of the City-owned portion of the park. Alternative 9A and Alternative 9B will both construct a new bridge that will cross above the park on an elevated structure that will require the modification of the existing lease agreement and the modification of the park infrastructure. This will prohibit public access within the Amtrak right-of-way and require the taking of the boat ramp area and a portion of the pier located at Jean S. Roberts Memorial Park.

Alternative 9A requires the acquisition of 1.5 acres of the Havre de Grace Middle/High School athletic fields immediately adjacent to the existing rail right-of-way. Alternative 9A will result in minor reconfigurations of the existing and proposed ballfields on the Harford County School property. Alternative 9A will also result in permanent changes to the athletic track just behind the starting block and require that the high jump facility and associated equipment shed be relocated on the site. The project includes provisions for measures minimizing the effects on the Havre de Grace Middle/High School.

Several local bicycle and pedestrian trails exist within the study area. The Proposed Project would not alter or adversely affect the trail routes. Several historic trails highlighting sites of historic importance are also within the study area, including the Maryland Civil War Trail, the Mason Dixon Trail, the Captain John Smith Chesapeake National Historic Trail, Washington-Rochambeau Revolutionary Route National Historic Trail, and the Star-Spangled Banner National Historic Trail. Measures to avoid, minimize, or mitigate any adverse impacts to historic and archaeological resources important to the themes of these trails have been identified and will be further developed in coordination with the Maryland Historical Trust and Section 106 consulting parties. The Proposed Project would not affect public use, enjoyment, or educational value of the trails within the study area. Therefore, no significant adverse impacts to trails or greenways would result from the Proposed Project. Overall, the Proposed Project would not have a significant adverse impact on parks, trails, or recreational resources.

H. VISUAL RESOURCES

The proposed design for the two new bridges will be traditional in character to allow greater views under the bridge and to minimize or avoid the adverse visual effect on resources. To further minimize visual adverse effects, any new physical structures that could adversely affect views of concern would be designed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. In addition, to minimize the visual adverse effects due to the alterations to eight historic undergrade bridges, including four bridges within the Havre de Grace Historic District, any bridge extensions would be designed using a form liner that emulates stone and is stained to be compatible with the color of the existing stone. To minimize the visual adverse effect to the historic Rodgers Tavern from the widening of the bridge approach and the need to construct a retaining wall to run along the embankment, the Project Team will work with the community to determine the appropriate aesthetically-pleasing treatment. With the proposed measures to minimize adverse effects, there would be no potential for significant adverse impacts on visual resources with the Proposed Project, under Alternative 9A or Alternative 9B.

I. CULTURAL RESOURCES

Current and previous studies identified 13 historic resources within the Area of Potential Effect (APE), including three historic districts containing numerous contributing resources. The Build Alternatives (both Alternative 9A and Alternative 9B) would result in an adverse effect on: Susquehanna River Rail Bridge and bridge overpasses; Havre de Grace Historic District; Rogers Tavern; and Perryville Railroad Station. Measures were developed to avoid, minimize, and mitigate these adverse effects. A Phase IA Archaeological Study for the Proposed Project has identified archaeologically sensitive areas in the APE. Additional archaeological studies will be conducted to identify and evaluate archaeological resources that may be affected by the Proposed Project. Measures to avoid, minimize or mitigate effects on any significant archaeological resources will be developed in accordance with the draft Programmatic Agreement (PA) (see **Appendix D**, "Cultural Resources"). With these measures in place, there would be no potential for a significant adverse impact on cultural resources with the Proposed Project, under Alternative 9A or Alternative 9B.

J. DRAFT SECTION 4(F) EVALUATION

A draft Section 4(f) Evaluation is included in this EA, pursuant to the requirements of Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966.[1] Based on this Evaluation, there are no feasible and prudent alternatives that would avoid use of all Section 4(f) properties. Therefore, the Evaluation includes a determination of which of the alternatives using a Section 4(f) property will result in the least overall harm in light of the statute's preservation purposes, and identifies appropriate measures to minimize harm. Alternative 9A and 9B would result in the "use" of the following three Section 4(f) properties:

- The removal of the existing NR-eligible Susquehanna River Rail Bridge and alteration of eight of its nine associated rail undergrade bridges;
- The removal of the Perry Interlocking Tower and the alteration of the Access Road Undergrade Bridge 59.39 (also known as the Perryville Train Station Undergrade Bridge), which are contributing elements of the NR-eligible Perryville Railroad Station;
- The acquisition of a small amount of property within the NR-listed Havre de Grace Historic District and visual and aesthetic effects on the Historic District;

In addition, FRA intends to determine that Alternative 9A and Alternative 9B would result in the *de minimis* use of Jean S. Roberts Memorial Park (acquisition of a narrow strip of the park owned by City of Havre de Grace). For Alternative 9A only, the Proposed Project would require the acquisition of a part of the Havre de Grace Middle/High School athletic fields. FRA intends to determine that the uses would be *de minimis*, based on coordination with property owners. FRA will base the final *de minimis* impact determinations after providing an opportunity for public review. Measures to minimize harm will be implemented.

K. SECTION 6(F)

Harford County Department of Parks and Recreation has confirmed that the Havre de Grace Middle School and Havre de Grace High School received Land and Water Conservation Fund (LWCF) monies for development, thereby making them Section 6(f) resources. Properties that received LWCF Act funding, referred to as Section 6(f) resources, are evaluated within a 1,000-foot buffer study area surrounding the existing rail right-of-way, with the Proposed Project. This Evaluation prepared as part of this EA satisfies the requirements of the LWCF Act (16 U.S.C. 4601–4 through 11), which prescribe the conditions that must be satisfied for the use or transfer of parklands or open spaces that have been improved with funds received through the LWCF.

Alternative 9A would require the permanent acquisition of a small portion of the school's athletic fields— approximately 1.6 acres of fee simple right-of-way. Alternative 9A would also require a 30-foot-wide maintenance easement for the Harford County Department of Public Works. Ten feet of that maintenance easement will be within the proposed acquisition. The

[1] In 1983, Section 4(f) of the USDOT Act was codified as 49 USC §303(c), but this law is still commonly referred to as Section 4(f).

remaining 20 feet of the needed maintenance easement (1.13 acres) will be within the school property. The precise boundaries of Section 6(f) resources within the Havre de Grace Middle School-High School complex are the subject of ongoing discussions between National Parks Service (NPS), DNR, and Harford County. Through coordination with NPS and DNR, a draft LWCF boundary has been established for this EA. Based on this draft boundary, Alternative 9A would require approximately 0.55 acre of land for which LWCF monies were used. FRA and MDOT will continue to coordinate with HCPS to submit an application for land conversion to the NPS Regional Administrator through DNR. A suitable replacement property will be identified, in consultation with NPS, DNR and HCPS, once the project transitions into detailed design and as construction funds become available. For this Environmental Assessment, the Project Team identified three potential replacement sites. FRA and the MDOT have worked with HCPS to minimize and mitigate the impacts that would result from Alternative 9A. Alternative 9B does not extend beyond the existing right-of-way at the Harford County School property, and therefore would not affect this Section 6(f) resource.

With measures to minimize and mitigate the impacts to the school property and with suitable replacement land for the Section 6(f) area (to be further evaluated in the future), the Proposed Project would not result in a significant adverse impact on Section 6(f) resources.

L. NATURAL RESOURCES

Table ES-1 summarizes the total potential effects on natural resources from the Susquehanna River Rail Bridge Project.

Table ES-1
Effects on Natural Resources and Floodplains

Resource Type	Resource Category	Alternative 9A	Alternative 9B
FEMA Floodplain (acres)	100-Year	2.72	2.15
	500-Year	4.83	4.24
Wetlands (acres)	Tidal	0.06	0.06
	Nontidal	0.83	0.71
Streams (linear feet)	Relatively Permanent Waterways	3,190	2,943
	Ephemeral	19	19
Wetland Buffers (acres)	Tidal	0.27	0.27
	Nontidal	2.16	1.72
Forest Resources (acres)	----	2.92	2.08
Chesapeake Bay Critical Area (acres)	----	6.4	6.1
Susquehanna Riverbed / Aquatic Biota (acres)	Permanent Impacts	0.37	0.37
	Construction (Temporary Impacts, including finger piers)	0.23	0.23
Submerged Aquatic Vegetation – SAV (acres)	Permanent Impacts	0.61	0.61

TOPOGRAPHY, GEOLOGY, AND SOILS

Both Alternative 9A and Alternative 9B would affect Prime Farmland Soils and Soils of Statewide Importance. However, on February 8, 2016, the NRCS, using the Farmland Conversion Impact Rating Form (NRCS-CPA-106) for corridor type projects pursuant to FPPA, determined that the Proposed Project is not subject to the provisions of the Policy Act and therefore exempt.

FLOODPLAINS AND WETLANDS/WATERS OF THE U.S.

Based on the current design of the two Build Alternatives and current guidelines, an increase in the base flood elevation (greater than one foot) in the two regulated floodways is not anticipated. The two Build Alternatives would have relatively minor effects on wetlands and somewhat greater effects on streams. Impacts to wetlands, wetland buffers, and streams for each of the Build Alternatives are summarized in **Table ES-1**. Mitigation for floodplain impacts would be addressed in final project design and mitigation for wetlands/waterways impacts would be completed in accordance with United States Army Corps of Engineers (USACE) and Maryland Department of the Environment (MDE) recommendations.

TERRESTRIAL RESOURCES

Neither of the Build Alternatives would affect areas known to support terrestrial state-listed threatened or endangered species or areas that are designated as a Wetland of Special State Concern (WSSC). Because the permanent impacts to forests would be relatively small and the absence of documented northern long-eared bat (NLEB) within the area, neither alternative would likely adversely affect the species. Other than transient species, no other federally proposed or listed threatened or endangered species are known to occur within the project area. No construction-related, short-term impacts to terrestrial federally or state-listed endangered or threatened species are anticipated.

The two Build Alternatives would have minor permanent impacts to forest resources, primarily to narrow forest strips immediately adjacent to the existing tracks and over a mile east of the largest, contiguous forest area (summarized in **Table ES-1**). Mitigation would include reforestation and afforestation in accordance with a Forest Conservation Plan (FCP) approved by the Maryland Department of Natural Resources.

Few wildlife impacts are anticipated, as both alternatives would be constructed immediately adjacent to the existing tracks and would only replace relatively thin and disturbed forest that likely only supports common resident species. These birds, small mammals and a few reptiles and amphibians would be displaced or minimally affected.

The Proposed Project would cross a known historic waterfowl staging area within the Susquehanna River along the Cecil County side. Waterfowl would not be permanently affected by either Build Alternative, but may be temporarily displaced from the active construction area.

AQUATIC RESOURCES

The two Build Alternatives would not affect groundwater and would only minimally change the hydrology through a shift in the arrangement of piers. Potential short-term and long-term impacts to water quality from construction would be minimized through strict adherence to an effective Erosion and Sediment Control Plan and implementation of stormwater best management practices (BMPs). Construction of the proposed temporary finger piers would eliminate the need for dredging and its resulting disturbance to river sediments. Impacts to aquatic resources for each of the Build Alternatives are summarized in **Table ES-1**.

Both bridges would have a height-to-width ratio large enough to preclude significant shading effects. Shading from the relatively narrow temporary finger piers would also not have the potential to result in significant adverse effects to benthic organisms, but would result in adverse effects to submerged aquatic vegetation (SAV) of approximately 0.61 acre. Mitigation for this temporal loss of SAV would include replanting the area at a 3:1 ratio.

Following demolition of the existing bridge and remnant piers, the river bottom would return to benthic habitat, thereby more than offsetting losses from the construction of the replacement bridges, and resulting in a potential net gain of populations of benthic organisms and their predators.

Fish would likely avoid the area of activity during the drilling of the large-diameter piles for the replacement bridges piers. Should pile installation cause any fish to temporarily avoid the portion of the Susquehanna River in the vicinity of the activity, the extent of the area that would be affected at any one time would be negligible relative to the amount of suitable habitat that would remain available nearby, and no significant adverse effects to these individuals would be expected to occur.

Impact pile driving for the finger piers would be attenuated by the use of wooden cushion blocks to levels where they are likely to be discountable according to the National Marine Fisheries Service (NMFS) assessment protocol. Potential impacts of possible demolition activities to remove existing bridge piers on the threatened and endangered Atlantic and short-nosed sturgeon would be minimized by implementing the protective measures such as bubble curtains. Any blasting activities would be scheduled to occur within a work window that corresponds to the time period of the year when sturgeon are least likely to occur in the project area.

Threatened and endangered sea turtles and the freshwater logperch are not expected to occur in the project area, and no impacts are anticipated. DNR Wildlife and Heritage Service may require restrictions on construction projects in order to protect map turtles known to occur within the project area, including nesting surveys, in-stream time-of-year restrictions, and/or removal of turtles from the work zone.

CHESAPEAKE BAY CRITICAL AREA

Alternative 9A involves approximately 6.4 acres of the Chesapeake Bay Critical Area, defined by state statute as “all land within 1,000 feet of Maryland’s tidal waters and tidal wetlands.” Alternative 9B affects approximately 6.1 acres of Critical Area.

Permanent impacts to the Critical Area are expected to result from earth disturbance, removal of vegetation, placement of fill, and increased impervious area. Coordination with the Critical Area Commission would continue during the design phase of the Proposed Project.

COASTAL ZONE MANAGEMENT

The Susquehanna Rail Bridge is located in the state-designated Coastal Zone, but the Proposed Project will be designed in a manner consistent with the Maryland Coastal Zone Plan. Consistency review commences after the submittal of the MDE Joint Permit Application (JPA). The MDE permit authorization, received at subsequent phases of the Proposed Project, would constitute the federal consistency decision.

Overall, with the mitigation measures that will be implemented as part of the Proposed Project, there would be no potential for a significant adverse impact on natural resources.

M. AIR QUALITY

Regulations under the Clean Air Act ("conformity regulations") require that federal agencies, when taking action to assist, fund, permit, or approve projects in areas with a non-attainment or maintenance status regarding any of the National Ambient Air Quality Standards (NAAQS), ensure that the projects conform to the applicable State Implementation Plans (SIPs) for attaining those standards, so as not to interfere with the state's ability to attain and maintain the NAAQS. Cecil County and Harford County are within a nonattainment area for ozone. In addition, Harford County is within a maintenance area for $PM_{2.5}$. The total projected emissions in each Air Quality Control Region represent a small fraction of the *de minimis* levels defined in the conformity regulations. This demonstrates that the operation of the Build Alternatives (Alternative 9A and Alternative 9B) would not require a conformity determination and would not interfere with SIPs for attainment of the ozone NAAQS or maintenance of the $PM_{2.5}$ Overall, the Proposed Project would not substantially affect regional air quality. Emissions would increase as a result of increase in rail traffic and during construction. The Proposed Project would also reduce vehicle miles traveled (from cars and tracks) by improving passenger rail service and freight operations. The Proposed Project (both Alternative 9A and Alternative 9B) would not interfere with SIPs for attainment of the ozone or maintenance of the $PM_{2.5}$ NAAQS.

At the local level, the maximum projected $PM_{2.5}$ (24-hour and annual average), PM_{10} (24-hour average), and annual average NO_2 concentrations with the No Action Alternative and with both Build Alternatives would be lower than the respective NAAQS. With the Build Alternatives local 1-hour average NO_2 concentrations could increase up to 8.6 percent near the proposed bridge. This increase may occur in areas where concentrations exceeding the NAAQS are also predicted to occur with the No Action Alternative. Overall, air quality with and without the Proposed Project is likely to be very similar. Considering the low probability of NAAQS exceedance, the small potential increment, and the limited area potentially affected, these conditions do not represent a significant adverse impact on air quality.

N. GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

The Proposed Project would be consistent with state, regional, and federal policies for greenhouse gas emissions reduction. The Proposed Project would be designed to accommodate any reasonably foreseeable potential future changes in climate and sea levels, and would, therefore, be consistent with state and federal policies requiring climate change resiliency. Amtrak service is 33 percent more energy efficient per passenger-mile than average highway travel (nationwide), and is likely more efficient than that along the NEC where ridership is high. The Build Alternatives are a component of the larger sustained effort to enhance passenger rail and freight rail for the long term, benefitting air quality and reducing pollutant emissions overall.

O. NOISE AND VIBRATION

Based on the general noise analysis, conducted according to FTA and FRA guidance, there would be the potential for a moderate noise impact at five of the sensitive receptors analyzed. Incremental noise level changes would range from imperceptible to readily noticeable. However, considering the total noise levels with the Build Alternatives (which were in the range that is typically considered acceptable for residential or open spaces use and comparable to existing levels in the area), the Project Team estimates low likelihood for these receptors to experience significant adverse impacts.

The Build Alternatives would not have the potential to result in significant adverse impacts relating to airborne noise, vibration, or ground-borne noise at any of the analyzed receptor sites. These receptor sites represent the sites closest to the railway having the greatest potential to experience noise and vibration impacts as a result of the Build Alternatives. Therefore, the Build Alternatives would not result in significant adverse impacts related to noise or vibration.

P. CONTAMINATED AND HAZARDOUS MATERIALS

Construction of the Proposed Project (both Alternative 9A and Alternative 9B) would involve demolition, relocation or other disturbance of existing structures and excavation, relocation and potentially off-site disposal of some existing soil. The exact extent of disturbance associated with the Proposed Project will not be determined until final engineering The Proposed Project would include appropriate health and safety and investigative/remedial measures. The need for additional investigation/remediation will be determined, in consultation with MDE, once the exact extent of disturbance is identified.

The Proposed Project documents and construction specifications will address procedures for stockpiling, testing, loading, transporting (including truck routes), and properly disposing of all excavated materials requiring off-site disposal. Excavated materials will be characterized to classify the materials. Where dewatering is required, it is possible that the water will require treatment prior to its discharge to surface water or existing sewers. Prior to any such discharge, the water will be tested.

With the implementation of these measures, no significant adverse impacts related to hazardous materials will result from the demolition and construction activities associated with the Proposed Project.

In terms of daily operation with the proposed new bridge structures, the threat of hazardous material impacts and accidents diminishes with better designed infrastructure. Since the current bridge is functionally-obsolete and prone to maintenance issues, a new structure would significantly reduce the risk of mishandling contaminated and/or hazardous materials.

Q. PUBLIC HEALTH, SAFETY, AND SECURITY

The Build Alternatives will not result in a significant adverse impact on air quality, noise, or hazardous materials and will not cause a significant adverse impact on public health. The Proposed Project would improve the reliability of traveling across the Susquehanna River and increase the safety of passengers and freight users traveling along the NEC. Due to the highly developed nature of the study area, many residences, schools, public parks, and other publicly-accessible venues are located near the rail right-of-way. FRA data show that 96 percent of rail-related fatalities, most of which are preventable, are the result of incidents at railway-highway crossings (locations where railroad tracks intersect with a roadway at the same elevation) and by trespassers.[1] There are no at-grade crossings within the Susquehanna River Rail Bridge Project's study area. Amtrak is a leader in the installation of Positive Train Control (PTC), a safety

[1] https://www.fra.dot.gov/eLib/Details/L17371. Accessed December 2, 2016.

technology designed to match train speed to track conditions for improved safety.[1] PTC provides an added layer of safety on top of the cab signal and Automatic Train Control safety systems already in place. In December 2015, Amtrak activated PTC on track between New York and Washington, DC, completing installation on most Amtrak-owned infrastructure on the NEC spine. The Proposed Project would improve the structural and operational reliability, increasing the safety of employees who work on and travel over the bridge. The Proposed Project would eliminate bridge malfunctions resulting from the opening of the existing movable span. Overall, the Proposed Project would not result in a significant adverse impact on public health, safety, or security.

R. INDIRECT AND CUMULATIVE EFFECTS

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 would not significantly contribute to significant adverse cumulative effects or result in significant adverse indirect effects.

S. COORDINATION AND CONSULTATION

The Project Team has undertaken public and community outreach efforts for the Proposed Project, along with federal, state, and local agency coordination. Numerous meetings informed the public, stakeholders and agencies about the Proposed Project milestones and sought public and agency input. The Project Team created a website for the Proposed Project: www.susrailbridge.com. Postcards, email blasts, press releases, and public meeting announcements have been sent prior to public outreach information sessions. ✷

[1] https://www.amtrak.com/national-facts. Accessed December 2, 2016.

A. INTRODUCTION

The Federal Railroad Administration (FRA) and the Maryland Department of Transportation (MDOT) are preparing an Environmental Assessment (EA) to evaluate the potential environmental impacts for the Susquehanna River Rail Bridge Project (also referred to herein as "the Proposed Project"). The EA is prepared in accordance with the National Environmental Policy Act (NEPA) (42 United States Code [USC] §4321 *et seq.*), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] parts 1500–1508), and FRA's *Procedures for Considering Environmental Impacts* (64 Federal Register [FR] 28545 [May 26, 1999] and 78 FR 2713 [January 14, 2013]). The EA also documents compliance with other applicable Federal environmental laws and regulations, including Section 106 of the National Historic Preservation Act, as amended (NHPA) (54 USC § 306108) and the Clean Air Act (42 USC § 7401 *et seq.*).

MDOT, project sponsor, is proposing to improve the Susquehanna River Rail Bridge between the City of Havre de Grace in Harford County, Maryland and the Town of Perryville in Cecil County, Maryland to provide continued rail connectivity along the Northeast Corridor (NEC). In 2011, FRA selected MDOT for a grant award of $22 million in federal funding available through the High-Speed Intercity Passenger Rail (HSIPR) Program and the parties entered into a cooperative agreement for the NEPA and preliminary engineering phases of the Proposed Project. FRA and MDOT are the joint lead agencies and the National Railroad Passenger Corporation (Amtrak), the bridge owner and operator, is providing conceptual and preliminary engineering designs and is acting in coordination with MDOT and FRA.

B. EXISTING CONDITIONS

The existing two-track Susquehanna River Rail Bridge is located on Amtrak's NEC at Milepost (MP) 60 (see **Figure 1-1**). This rail bridge is a critical link along the NEC, one of the U.S. Department of Transportation's (USDOT) designated high-speed rail corridors. The NEC is the most heavily used passenger rail line in North America, both in terms of ridership and service frequency, and one of the most heavily traveled rail corridors in the world.[1,2] The existing bridge is roughly 0.75 mile in length and is the longest bridge with a movable span on the NEC. It is a swing-span type bridge; the movable span opens by rotating horizontally using a center pivot mounted on a pier in the river (see **Figure 1-2** and **Figure 1-3**). The existing bridge allows for a 52-foot vertical clearance for marine traffic. The swing span must be opened to allow for taller marine traffic, which disrupts rail operations. Amtrak,

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1 https://www.amtrak.com/ccurl/998/601/Amtrak-National-Fact-Sheet-FY2015.pdf, accessed April 22, 2016.

2 Source: BGL Rail Associates, for the Amtrak Reform Council, "A Recommended Approach to Funding the Estimated Capital Investment Needs of the Northeast Corridor Rail Infrastructure," April 2002.

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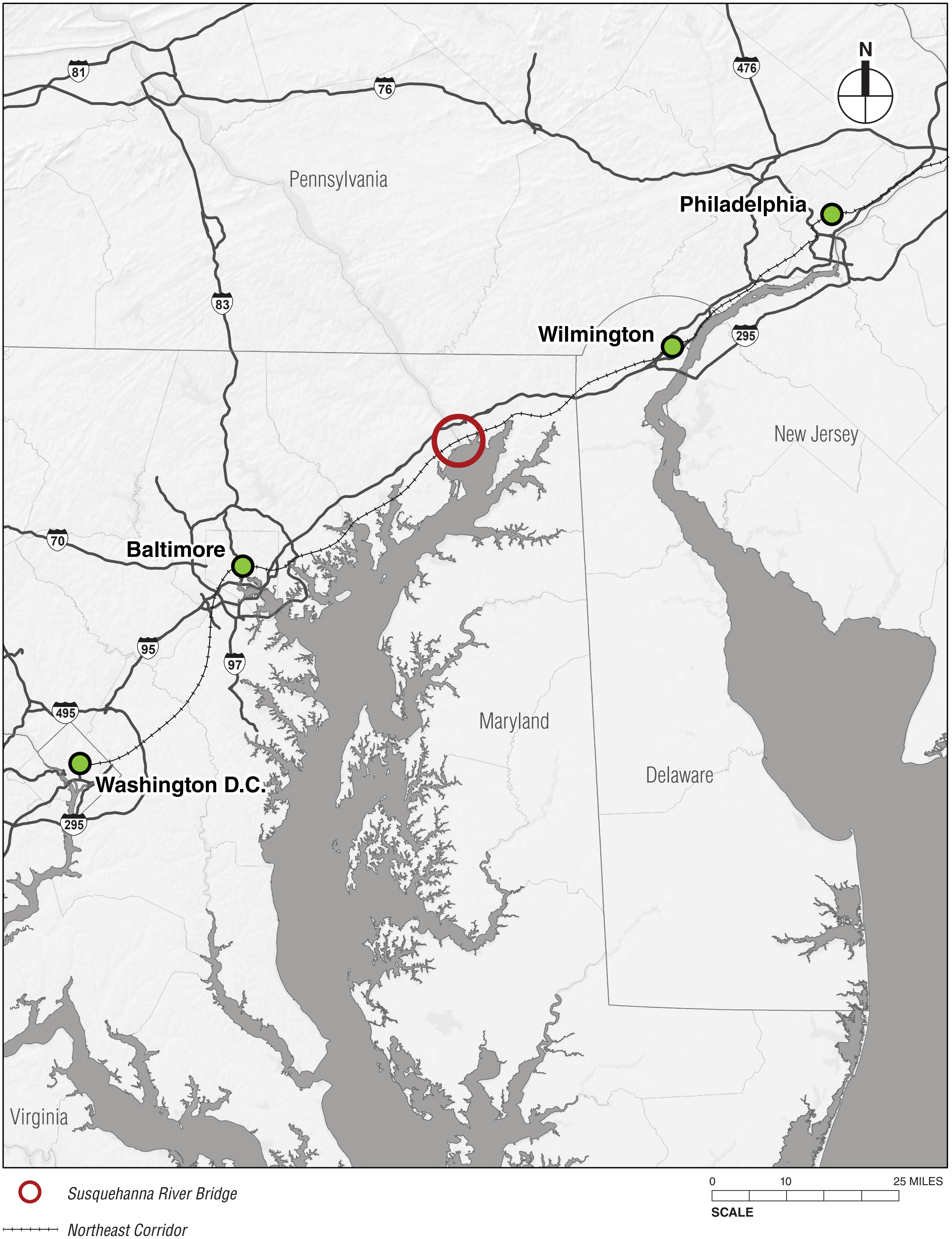
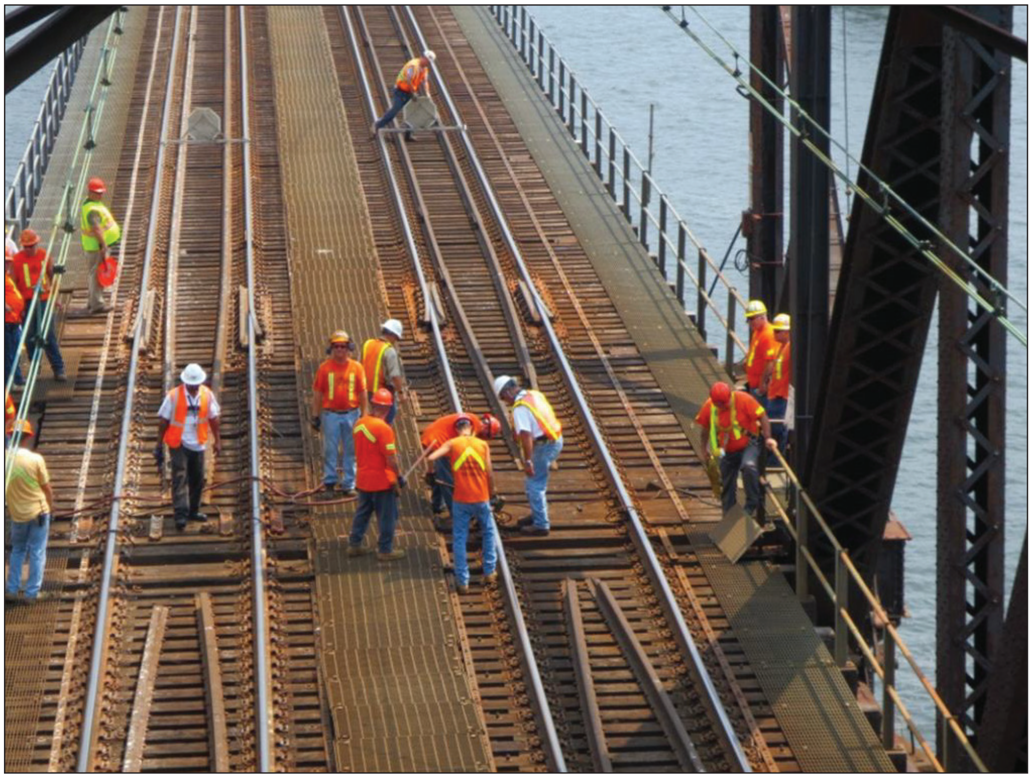


Project Location
Figure 1-1

Existing Susquehanna River Bridge
Figure 1-2



Amtrak crew manually opening the movable bridge span to accommodate marine traffic **1**

Opening swing span to accommodate marine traffic **2**

Existing Susquehanna River Swing Span

Figure 1-3

the Maryland Area Regional Commuter (MARC), and Norfolk Southern Railway (NS) use the bridge to carry intercity, commuter, and freight trains across the Susquehanna River.

PROJECT SETTING

The approaches to the existing rail bridge and the NEC right-of-way extend through the City of Havre de Grace and the Town of Perryville. The Proposed Project is located between the "Oak" Interlocking at MP 63.5 south of Havre de Grace and the "Prince" Interlocking at MP 57.3 north of Perryville (see **Figure 1-4**).

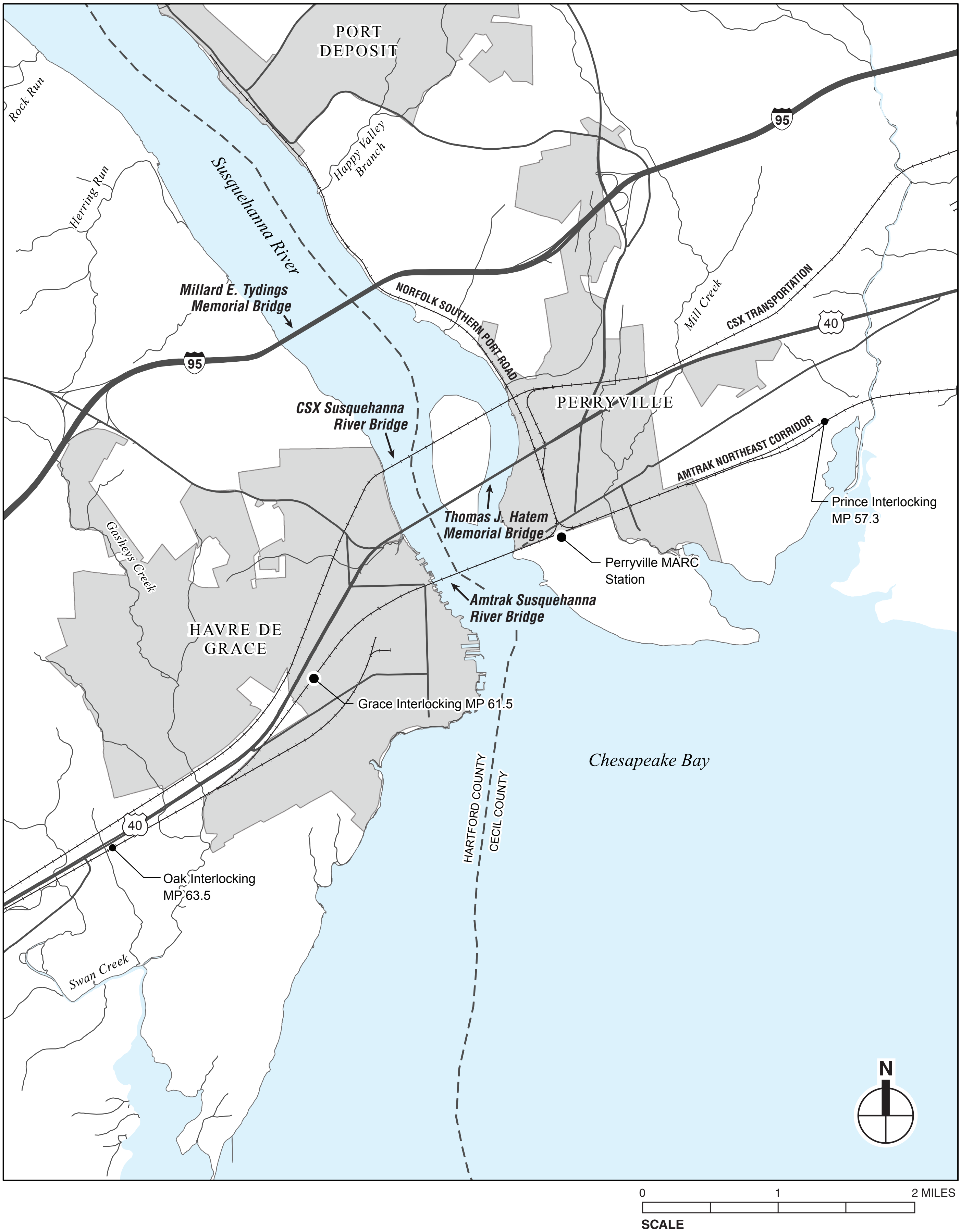
The existing Susquehanna River Rail Bridge is located within Maryland's Chesapeake Bay watershed near the mouth of the Susquehanna River. The adjacent communities of Havre de Grace and Perryville are dominated by a mixture of dense, water-oriented residential and commercial zoning, including historic districts and recreational facilities. Additional railroad infrastructure also supports industrial properties in the vicinity.

BRIDGE CHARACTERISTICS

The Pennsylvania Railroad built the bridge in 1906 to replace an original 1860s parallel structure to the south. The remnant piers of the original 1860s bridge remain visible in the Susquehanna River above the water line. Several of these remnant piers were subject to extensive scour that have exposed the footings and piles. The remaining remnant piers show signs of steel plates, masonry, and concrete deterioration. Congress conveyed the existing bridge to Amtrak in 1976 along with other NEC infrastructure elements.

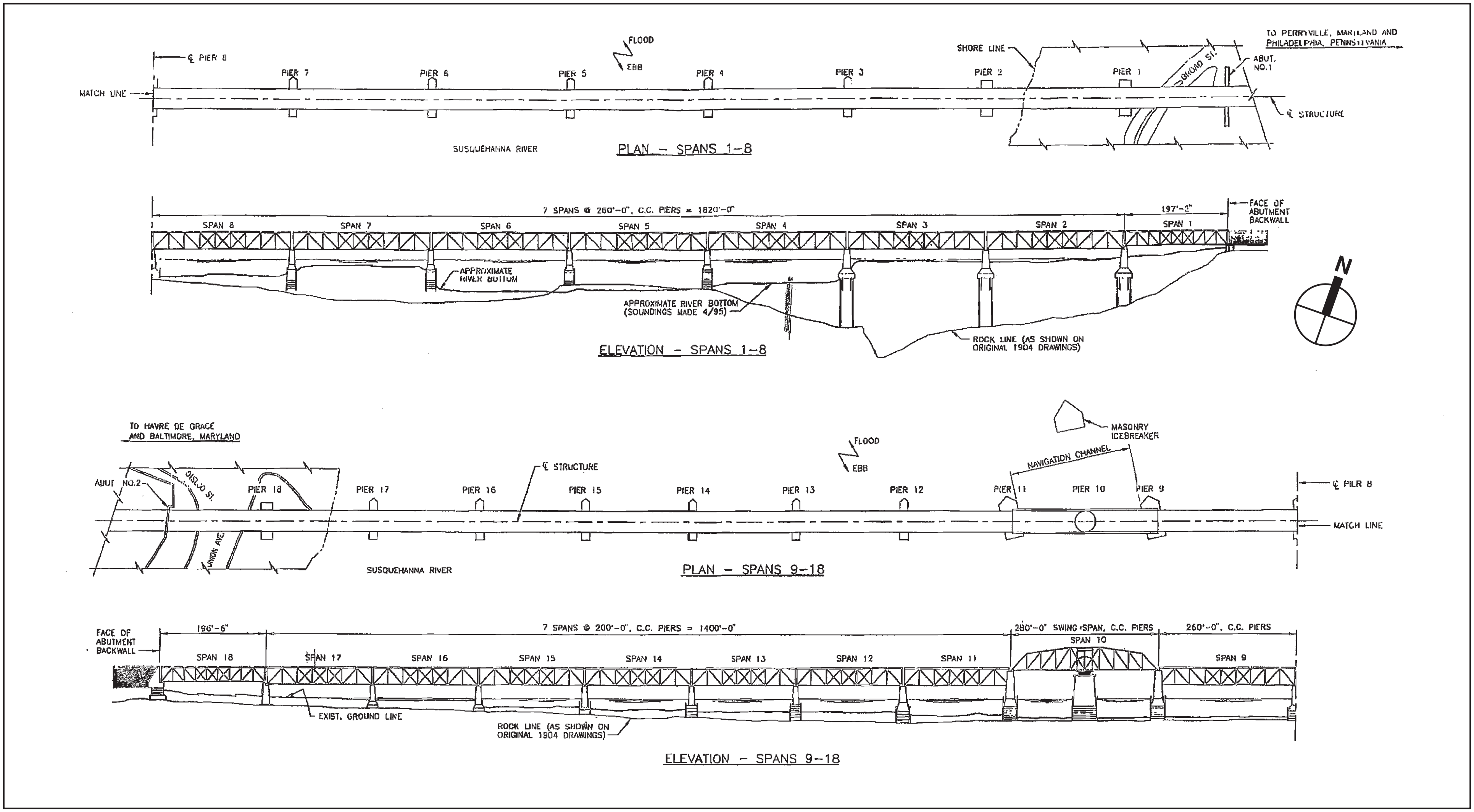
The existing Susquehanna River Rail Bridge is approximately 4,154 feet long from abutment to abutment and comprises 18 spans, which are numbered from north to south. The movable swing span (Span No. 10) is approximately 280 feet long; see **Figure 1-5** for visualization. The existing 110-year-old Susquehanna River Rail Bridge, despite major rehabilitation and repairs, continues to deteriorate, as evidenced by rust, ineffective bearings, cracks in steel members, and wear at pins and eyebars.

11.30.16



Project Site

Figure 1-4



Existing Susquehanna River Bridge Plan and Elevation

Figure 1-5

C. PROJECT PURPOSE AND NEED

PROJECT PURPOSE

The increasing age of the bridge, its structural condition, and its two tracks curtail speeds and capacity on the bridge. This inhibits the rail operators' goals to provide reliable service, MDOT's plans to increase MARC commuter rail service, and Amtrak's plans to increase high-speed passenger rail service on the NEC.

The bridge's functionally obsolete design and age require major rehabilitation and repairs, which result in increasing maintenance costs and conflicts with the need to maintain continuous rail operations. The primary purpose of the Proposed Project is to provide continued rail connectivity along the NEC. The Proposed Project goals include:

- Improving rail service reliability and safety;
- Improving operational flexibility and accommodating reduced trip times;
- Optimizing existing and planned infrastructure and accommodating future intercity passenger, high-speed rail, freight, and commuter rail; and
- Maintaining adequate navigation[3] and improving safety along the Susquehanna River.

PROBLEMS WITH EXISTING BRIDGE

Demand for rail service along the NEC is at record levels. This growth is due to population and employment growth in urban centers along the NEC, increasing delays in highway and air travel, and the growing convenience of intercity and local rail travel.[4] The NEC, however, cannot continue to accommodate rising demand with aging infrastructure that is highly constrained and in need of repair. The Proposed Project is critical to MDOT, Amtrak, and other NEC users.

OBSOLETE DESIGN AND AGING INFRASTRUCTURE

The existing bridge is 110 years old, beyond the 100-year design lifespan typical for steel railroad bridges. While it has undergone major rehabilitation and repairs (1960s, 1985, 1991, and most recently 1998), the bridge structure continues to deteriorate from age and use. Amtrak's most recent bridge inspection in the summer of 2013 indicated that the bridge superstructure is in poor to fair structural condition. The 2013 inspection also determined that many of the structural bridge components are below the load ratings required by American Railway Engineering and Maintenance-of-Way Association (AREMA) and Amtrak criteria.

The structural condition, coupled with the movable-span design, requires extensive effort to open the bridge for marine traffic. Each opening of the swing span requires approximately an hour and a crew of more than 30 workers which is far more labor-intensive and expensive than a modern day movable bridge. While the existing bridge is safe for current and near term operations, it is wearing out and approaching the end of its service life. Replacing aging movable

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[3] Adequate navigation can be maintained by increasing navigational clearances, as discussed in Susquehanna River Rail Bridge Reconstruction and Expansion Project Navigation Study, dated January 21, 2014, HNTB Corporation.

[4] http://www.nec-commission.com/wp-content/uploads/2013/01/necc_cin_20130123.pdf, accessed April 22, 2016.

bridges such as the Susquehanna River Rail Bridge is one of Amtrak's central strategies to improve the reliability and travel times on the NEC.

SPEED AND CAPACITY CONSTRAINTS

The existing two-track bridge creates service conflicts between Amtrak's passenger service, MARC trains, and freight trains operated by NS. It also poses a capacity constraint on planned increases in service frequency by all three railroads. The segment of the NEC south of the bridge comprises three tracks and the segment north comprises four. The existing two-track bridge reduces the on-time performance for Amtrak, MARC trains, and NS traffic. The open deck construction limits the maximum authorized speed to 90 mph. Amtrak passenger trains can travel up to 135 mph on the adjacent NEC segments and have to slow down to cross the bridge. Freight trains crossing the bridge must travel at 30 mph or slower.

The limited number of tracks across the bridge, combined with the variety of trains utilizing the bridge and the need for continual maintenance, results in tightly managed and restrictive operations, little flexibility in scheduling, and train delays. The existing bridge requires that the slow freight trains and the MARC commuter trains share track with higher-speed Amtrak trains, creating congestion conflicts. Because of the geometry of the freight alignment in the Perryville station area, both freight and commuter trains approach and leave the NEC at just 15 mph.

NS attempts to operate its trains at night to minimize conflicts with passenger rail service, although daytime freight service is increasing as marine and refinery operators reduce terminal times for high-value cargo. When the southbound NEC track is in use by an intercity or commuter train approaching the Susquehanna River Rail Bridge (in either direction), NS freight trains coming from the west must stop and wait for an appropriate window to enter the NEC. Similarly, NS trains coming from the south must wait their turn to cross the bridge occupying one of the main tracks. The resulting delays have impacts to the Port of Wilmington, the Port of Baltimore, and rail service destined for the Delmarva Peninsula. These delays create ripple effects in cargo shipments throughout the region and the nation.

MAINTENANCE DIFFICULTIES

Because of the frequency of train service on the bridge, few repairs and/or inspections can be made without disrupting rail operations. The bridge will require more scheduled and unscheduled maintenance as it continues to age.

CONFLICTS WITH MARITIME USES

Opening the existing bridge's movable swing span for marine traffic causes train delays and takes large crews to operate. Each bridge opening introduces risks of significant train delays if a breakdown of the operating mechanisms were to occur. Amtrak performed a Navigation Study in 2013[5] and found that the existing Susquehanna River Rail Bridge opens approximately ten times per year to accommodate marine traffic. The Navigation Study concluded that the existing navigation channel (both height and width) addresses the needs of most mariners and vessels, but, while the existing horizontal clearance is sufficient, further widening of the horizontal clearance could increase sight distance, reduce vessel congestion, and aid tug boat and barge

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[5] Susquehanna River Rail Bridge Reconstruction and Expansion Project Navigation Study, dated January 21, 2014, HNTB Corporation.

navigation through the bridge opening, increasing safety and resilience against potential bridge and fender system strikes.

EXISTING RAIL TRAFFIC

As shown in **Table 1-1**, the existing Susquehanna River Rail Bridge is used by Amtrak trains (approximately 89 trains per weekday), MARC commuter service (18 trains per weekday), and NS freight rail traffic (approximately eight trains per day, mostly at night). Amtrak routes utilizing the bridge include the Acela, Northeast Regional, and long-distance trains.

REGIONAL PASSENGER RAIL

Amtrak's NEC is the busiest rail line in North America.[6,7] It includes a 457-mile rail transportation system extending from Boston's South Station to Washington D.C.'s Union Station. In 2011, USDOT designated the NEC as a high-speed rail corridor. Amtrak owns and operates over much the NEC, running regional service, long distance service, and high-speed Acela Express service along the line. In Fiscal Year 2013, Amtrak carried a record 11.4 million passengers on the NEC between Washington-New York-Boston.

Table 1-1
Existing Weekday Volumes Across the Susquehanna River Rail Bridge

Types of Service		Daily	Peak*
Amtrak	Northeast Regional and Long Distance	57	7
	Acela	32	2
	High-Speed Rail	0	0
MARC Commuter		18	3
NS Freight		8	4
TOTAL		**116**	

Notes: *"Peak" is defined as the weekday hour with the maximum train volume. For Amtrak, the daily peak occurs between 4:10 and 5:10 PM. For MARC the daily peak occurs 5:40-6:40 AM . For freight, the timing of the peak hour varies but it generally occurs at night.
Based on 2016 data, considered to be representative of the existing condition.
Sources: Service volumes provided by Amtrak.

Amtrak currently operates approximately 89 trains over the Susquehanna River Rail Bridge each weekday and nine trains during the peak hour period (4:10 PM to 5:10 PM weekdays). Approximately 17,900 Amtrak passengers travel over the Susquehanna River Rail Bridge each weekday. This volume has grown by 26 percent since 2003.

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6 https://www.amtrak.com/ccurl/998/601/Amtrak-National-Fact-Sheet-FY2015.pdf, accessed April 22, 2016.

7 Source: BGL Rail Associates, for the Amtrak Reform Council, "A Recommended Approach to Funding the Estimated Capital Investment Needs of the Northeast Corridor Rail Infrastructure," April 2002.

COMMUTER RAIL

MARC is a 202-mile, 42-station, commuter rail system operating among multiple stations in Maryland, West Virginia, and the District of Columbia. MARC is managed by the Maryland Transit Administration (MTA), an agency within MDOT. The MARC Penn Line has the greatest ridership and runs from Union Station in Washington D.C., over the Susquehanna River Rail Bridge, to Perryville. MARC currently operates 18 trains over the bridge each weekday and three trains during the peak hour (5:40-6:40 AM weekdays). Limited weekend service is also provided. In 2015, the Penn Line averaged 23,430 riders daily.[8]

FREIGHT RAIL

Norfolk Southern operates between Harrisburg, Pennsylvania, and Baltimore, Maryland, using its "Port Road" route along the Susquehanna River to Perryville, and using trackage rights along the NEC between Perryville and Baltimore. The NS freight connection from the Port Road is critical to servicing the Port of Baltimore and is located within the existing bridge approach limits.

The Port of Baltimore is the closest Atlantic port to major Midwestern population and manufacturing centers.[9] During 2014, the port handled 29.5 million tons of foreign commerce (imports and exports), valued at $52.5 billion.[10]

The Port of Wilmington is becoming an increasingly major port and distribution center for liquid bulk petroleum products. Approximately eight trains per day cross the bridge moving between the Port Road and the Port of Baltimore. Commodities transported by these trains include coal, grain, autos, and intermodal container cargo.[11]

NAVIGABLE WATERS

The Susquehanna River stretches for 444 miles from upstate New York through Pennsylvania to Maryland, where it drains into the Chesapeake Bay. In the vicinity of the project site, the river is technically navigable as far up as the Conowingo Hydroelectric Dam at approximately River Mile 9.9; however, parts of the river south of the dam are too shallow to navigate with larger vessels.

The existing Susquehanna River Rail Bridge is located at Susquehanna River Mile 1.0. The movable swing span provides a 52-foot vertical clearance above mean high water (MHW) in the closed position and a 127-foot vertical clearance in the open position (limited by overhead electric transmission lines). The horizontal clearance for navigation consists of two 100-foot-wide channels.

Three fixed-height Susquehanna River crossings are located to the north of the Susquehanna River Rail Bridge, between the bridge and the Conowingo Dam:

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[8] Maryland Open Data Portal, https://data.maryland.gov/Transportation/MTA-Average-Weekday-Ridership-by-Month/ub96-xxqw/data, accessed October 27, 2016.

[9] http://mpa.maryland.gov/content/port-information.php, accessed April 22, 2016.

[10] http://mpa.maryland.gov/misc/2014ForeignCommerceStatReport.pdf, accessed April 22, 2016.

[11] Rail Projects Impacting the Delmarva, Presentation to the Delmarva Freight Summit, June 20, 2012, Nicole Katsikides, Director, MDOT Office of Freight and Multimodalism.

- The Thomas J. Hatem Memorial Bridge, carrying U.S. Route 40, approximately 0.5 mile north of the Susquehanna River Rail Bridge. That bridge provides an 87-foot vertical clearance and a 320-foot horizontal clearance in the navigation channel.
- The CSX Susquehanna River Rail Bridge, approximately 0.9 mile north of the Susquehanna River Rail Bridge. The CSX Bridge, which carries rail freight, provides an 85-foot vertical clearance and a 500-foot horizontal clearance.
- The Millard E. Tydings Memorial Bridge, carrying Interstate 95, is located approximately 2 miles north of the Susquehanna River Rail Bridge and provides a 90-foot vertical clearance and a horizontal clearance between 119 and 245 feet through its spans.

D. MASTER PLAN CONSIDERATIONS

A number of recent programs and planning studies outline and support the need for an upgraded and expanded railroad crossing over the Susquehanna River Rail.

HIGH-SPEED INTERCITY PASSENGER RAIL (HSIPR) PROGRAM

FRA's *High-Speed Rail Strategic Plan (April 2009)*[12] documented the administration's vision for establishing high-speed rail. Through this program, USDOT awarded a $22 million grant to the State of Maryland for preliminary engineering and environmental studies (of which this EA is a part) for the Proposed Project.

NORTHEAST CORRIDOR

The NEC, the most heavily traveled rail corridor in North America,[13,14] is vital to the sustained economic growth of the region, which includes the economic and political centers of the United States.

NORTHEAST CORRIDOR INFRASTRUCTURE MASTER PLAN

The *Northeast Corridor Infrastructure Master Plan (May 2010)*[15] identified a baseline of infrastructure improvements needed to provide expanded service and reliability to accommodate forecasted demand. It focused on increasing NEC capacity and reliability, including bridges with additional tracks and replacement of movable bridges with high-level fixed structures, where feasible, to eliminate the delays. This plan identifies the Susquehanna River Rail Bridge expansion as a critical priority.

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[12] https://www.fra.dot.gov/eLib/Details/L02833, accessed April 22, 2016.

[13] https://www.amtrak.com/ccurl/998/601/Amtrak-National-Fact-Sheet-FY2015.pdf, accessed April 22, 2016.

[14] Source: BGL Rail Associates, for the Amtrak Reform Council, "A Recommended Approach to Funding the Estimated Capital Investment Needs of the Northeast Corridor Rail Infrastructure," April 2002.

[15] http://www.amtrak.com/servlet/ContentServer?c=Page&pagename=am%2FLayout&p=123760 834501 8&cid=1241245669222, accessed April 22, 2016.

NORTHEAST CORRIDOR INFRASTRUCTURE AND OPERATIONS ADVISORY COMMISSION

The Northeast Corridor Infrastructure and Operations Advisory Commission (the NEC Commission) , in its January 2013 report, *Critical Infrastructure Needs on the Northeast Corridor* identified 32 specific critical needs along the NEC to reduce delays, achieve a state of good repair, and build capacity for growth on the corridor.[16] The report names the Susquehanna River Rail Bridge replacement as one of those critical needs.

NEC FUTURE

NEC FUTURE is a comprehensive planning effort to define, evaluate, and prioritize future investments in the 457-mile NEC from Union Station in Washington, D.C. to South Station in Boston.[17] NEC FUTURE represents a long-term vision and investment program for the NEC, as reflected in the Tier 1 Final Environmental Impact Statement (Tier 1 FEIS) and Service Development Plan. The Proposed Project is within the NEC FUTURE study area and is consistent with the service goals considered in the NEC FUTURE Tier 1 FEIS along this section of the NEC, so that it does not preclude improvements proposed as part of the NEC FUTURE Preferred Alternative.

STATE OF MARYLAND

The State of Maryland has identified the Susquehanna River Rail Bridge Project as one of its most critical rail infrastructure projects. It is critical not only to improving MARC commuter service, but also to optimizing freight and intercity passenger rail service and helping the broader Maryland economy.

MARC GROWTH AND INVESTMENT PLAN

The *MARC Growth and Investment Plan* discusses challenges to future MARC growth and the agency's desired ability to expand service currently constrained by infrastructure and other operators.[18]The plan's long-term timeframe (2020-2029) includes construction of a new station at Elkton, MD; an upgrade at the Perryville Station to handle northbound trains; new stations in Baltimore; and a focus on improved service to/from Washington D.C. The plan's future timeframe (2030-2050) discusses a new and expanded Susquehanna River crossing and mentions the addition of a fourth track between Baltimore's Penn Station and Perryville as a key component to meet and anticipate demand.

MARYLAND STATEWIDE FREIGHT PLAN

The *State of Maryland's Freight Plan* (2009) states that output among Maryland's freight-intensive industries, is expected to grow by 120 percent statewide between 2000 and 2030. As a result, the tonnage of freight transported through Maryland is estimated to increase by

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[16]http://www.nec-commission.com/wp-content/uploads/2013/01/necc_cin_20130123.pdf, accessed on April 22, 2016.
[17]http://www.necfuture.com/, accessed on April 22, 2016.
[18]http://mta.maryland.gov/sites/default/files/mgip_update_2013-09-13.pdf, accessed April 22, 2016.

approximately 105 percent by 2035, as compared with the 2006 tonnage.[19] The plan identifies the replacement of the Susquehanna River Rail Bridge as a high-priority freight improvement project. In addition, the plan states that the State of Maryland must prepare for the expansion of East Coast ports (including the Port of Baltimore) as motivated by the expansion of the Panama Canal, which is being widened to allow for larger container ships.

AMTRAK

AMTRAK'S STATE OF GOOD REPAIR

On April 15, 2009, Amtrak issued the *Northeast Corridor State of Good Repair Spend Plan.*[20] Amtrak's planned state of good repair projects include replacement of infrastructure elements such as: track, bridges, tunnels, overhead catenary wire, power supply systems, cable, transformers and converters, signals, communications and dispatching systems, stations, and facilities. This report references the need to repair the Susquehanna River Rail Bridge and notes the need to expand two-track structures to accommodate projected growth.

AMTRAK'S 2012 UPDATE REPORT

Amtrak's summary document, *The Amtrak Vision for the Northeast Corridor, 2012 Update Report*[21] reaffirmed the Susquehanna River Rail Bridge as one of the critical components for improving NEC operations from Washington D.C. to Boston. The plan noted that the approach of the NEC Capital Investment Program going forward will be to integrate suites of state of good repair projects—designed to repair the network and increase reliability—with capacity enhancements that will allow next-generation initiatives such as high-speed rail service.

FREIGHT RAIL

Freight traffic volume is steady or gradually increasing for most commodities. NS's only practical access to the Ports of Baltimore and Wilmington, as well as to the entire Delmarva Peninsula, is via its Port Road route to Perryville, Maryland, and then along the NEC. For Class I railroads, like NS, the boom in petroleum bulk shipping is replacing shrinking commodity markets such as coal.

The Proposed Project is consistent with FRA, State of Maryland and Amtrak plans and high-speed rail program criteria. Elements to accommodate improved freight service and MARC commuter service are integral, and the Proposed Project could also improve the navigation channel for marine users. The Proposed Project is intended to maintain connectivity along the NEC and to provide future improvements to capacity, trip time, and safety for commuter, freight, and intercity passenger rail services on the NEC consistent with FRA, State, and Amtrak plans. ✷

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[19]http://www.mdot.maryland.gov/Office_of_Planning_and_Capital_Programming/Freight_Planning/Documents/ Freight_Plan_Final.pdf, accessed April 22, 2016.

[20]http://www.amtrak.com/servlet/ContentServer?c=Page&pagename=am%2FLayout&p=1237608345018& cid=1241245669222, accessed April 22, 2016.

[21]http://www.amtrak.com/ccurl/453/325/Amtrak-Vision-for-the-Northeast-Corridor.pdf, accessed on April 22, 2016.

A. INTRODUCTION

This chapter reviews the alternatives development and screening process, describes the No Action Alternative and the Build Alternatives retained for detailed study, and identifies the Preferred Alternative. The estimated project costs and a list of potential permits and approvals required to build the Proposed Project are also provided.

The Proposed Project is located between Philadelphia and Washington D.C. along the National Railroad Passenger Corporation's (Amtrak) Northeast Corridor (NEC). The direction on the rail line from Philadelphia to Washington D.C. is south. Therefore, unless otherwise noted in this Environmental Assessment (EA), north is towards Philadelphia, south is towards Washington D.C., east is downstream or towards the Chesapeake Bay, and west is upstream or towards the Conowingo Dam. Proposed Project construction is scheduled to commence in 2020. Year 2025 is analyzed as the Proposed Project build year (the year when the Proposed Project elements are scheduled to be fully connected to the NEC). For long-term planning this EA also considers a 2040 analysis year. This EA is based on conceptual engineering alignments. The disclosure of effects is based on the design information available at the time of conceptual design completion. The engineering design has since progressed and further refinements and changes will continue to be made. While the Project Team assessed reasonable worst-case effects that are anticipated for the Proposed Project based on the conceptual design, it is possible that future design changes could lead to adverse effects that are not known at this time. If as a result of design changes the Project Team identifies the potential for additional or greater adverse effects in the future, the Project Team will prepare a follow up targeted environmental review.

B. ALTERNATIVES DEVELOPMENT AND SCREENING

The Project Team developed a rigorous alternatives development and screening process for the Proposed Project. This process considered both alignment alternatives as well as bridge type alternatives. **Appendix A**, "Alternatives Screening Report and Bridge Types," includes a detailed report describing alternatives development; input solicited from the public, agencies, and other stakeholders; and the methodology used to screen alternatives and selected those retained for detailed study. The section below presents a summary of that process.

DEVELOPMENT OF ALIGNMENT ALTERNATIVES

The Project Team (including FRA and MDOT) identified design factors to be incorporated into the conceptual alternatives. These design factors, which were considered independently and collectively:

- Geometry—any feasible conceptual alternative must consider the existing geometry of the NEC. Existing alignments of commuter and freight facilities were also considered including use of Norfolk Southern Railway's (NS) Port Road route and service to/from the Perryville

Maryland Area Regional Commuter (MARC) Station. Furthermore, Amtrak has standard plans and specifications that provide detailed geometry requirements for tracks carrying Amtrak passenger service. These standards are required to meet federal regulations, assure passenger comfort, and provide a safe, maintainable design.

- Design Speed—A critical element of the project's Purpose and Need is to reduce trip times and optimize infrastructure to accommodate future high-speed rail operations along the NEC. This approach is consistent with the congressional mandate placed on Amtrak to reduce travel times along the NEC and the desire to identify 160 miles per hour (mph) as the maximum authorized speed, wherever feasible. Feasible conceptual alternatives must provide at least two tracks for high-speed rail service, and at least one track primarily for freight and commuter rail service (supporting speeds of up to 90 mph).
- Bridge Spacing—Maintaining continuous rail service during construction cannot preclude navigation for extended periods of time. Increasing the distance between bridges more than necessary would result in greater property acquisitions. For those conceptual alternatives involving two bridges across the Susquehanna River, a phased construction of the bridges will generally be required to maintain continuous rail traffic across the river (i.e. two bridges will not be built simultaneously nor could the existing bridge be removed from service until a replacement bridge has been constructed).
- Navigational Clearances—A temporary winter closure of the existing movable span may be necessary during the construction period. This closure will temporarily restrict navigation of high-mast vessels during the winter months, which is the time of the year with the least navigation activity. A navigation study[1] for the project determined that a vertical clearance of 60 feet above the mean high water (MHW) elevation for any new river span is the optimal balance between the needs of mariners and of the passenger and freight rail providers. The navigation study also determined that while the existing horizontal clearance (two 100-foot-wide channels) is sufficient, further widening of the horizontal clearance could increase sight distance, reduce vessel congestion, and aid tug boat and barge navigation through the bridge opening, increasing safety and resilience against potential bridge and fender system strikes.
- Grades—Amtrak's standards generally permit up to a 1.5 percent compensated grade on mainline tracks. This grade is consistent with industry standards for maximum grades on freight and passenger mainline track. However, the existing grades on NS's Port Road and Amtrak's NEC are less than this maximum, ranging from 0.14 percent to 0.24 percent for the NS Port Road route and between 0.3 percent and 0.68 percent north and south of the bridge. The conceptual designs considered the existing maximum effective or ruling grade for the route. In coordination with NS, the Project Team determined that, for this project with current and anticipated freight train usage, a 0.65 percent maximum grade is appropriate for tracks primarily dedicated to freight operation.
- Relationships to Other Projects—The Project Team designed all conceptual alternatives so as not to preclude adjacent and related planned transportation projects. Such projects include freight rail improvements (e.g., the Chesapeake Connector Project), Maryland Transit Administration's (MTA) MARC Northeast Maintenance Facility and Penn Line extension, the Federal Railroad Administration's (FRA) NEC FUTURE, regional bicycle and pedestrian trails, and others.

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[1] Susquehanna River Rail Bridge Reconstruction and Expansion Project Navigation Study, dated January 21, 2014, HNTB Corporation.

Using the design factors described above, the Project Team identified 18 conceptual alternatives. The approximate locations of each of the 18 conceptual alternatives are shown in **Figure 2-1**. A brief description of each of the conceptual alternatives is detailed in **Table 2-1**.

Table 2-1
Description of 18 Conceptual Alternatives

Alternative	Alternative Description*
1A	• New high-speed 2-track bridge to east of existing bridge; second bridge in place of existing bridge • Up to 4 tracks total; max speed of 140 mph
1B	• Similar to 1A but closer to existing bridge, requiring temporary closure of swing span • Up to 4 tracks total; max speed of 140 mph
2A	• New high-speed 2-track bridge to the west of existing bridge; second bridge in place of existing bridge • Flyover structure in Perryville • Up to four tracks total; max speed of 135 mph
2B	• Similar to 2A but closer to existing bridge; requiring temporary closure of swing span • Up to 4 tracks total; max speed of 135 mph
3A	• New curved high-speed 2-track bridge to east of existing bridge; second bridge in place of existing bridge • Up to 4 tracks total; max speed of 160 mph
3B	• Similar to 3A but closer to existing bridge, requiring temporary closure of swing span • Up to four tracks total; max speed of 160 mph
4A	• New high-speed 2-track bridge to east of existing bridge; second bridge in place of existing bridge • Requires reconstruction of Lewis Lane overpass • Up to 4 tracks total; max speed of 160 mph
4B	• Similar to 4A but closer to existing bridge, requiring temporary closure of swing span • Up to four tracks total; max speed of 160 mph
4C	• Similar to 4B but with reduced speed • Up to 4 tracks total; max speed of 135 mph
4D	• New high-speed 3-track bridge to the east of existing bridge • Requires reconstruction of Lewis Lane overpass and temporary closure of swing span • 3 tracks total; max speed of 160 mph
4E	• Similar to 4D but with reduced speed • Requires temporary closure of swing span • 3 tracks total; max speed of 135 mph

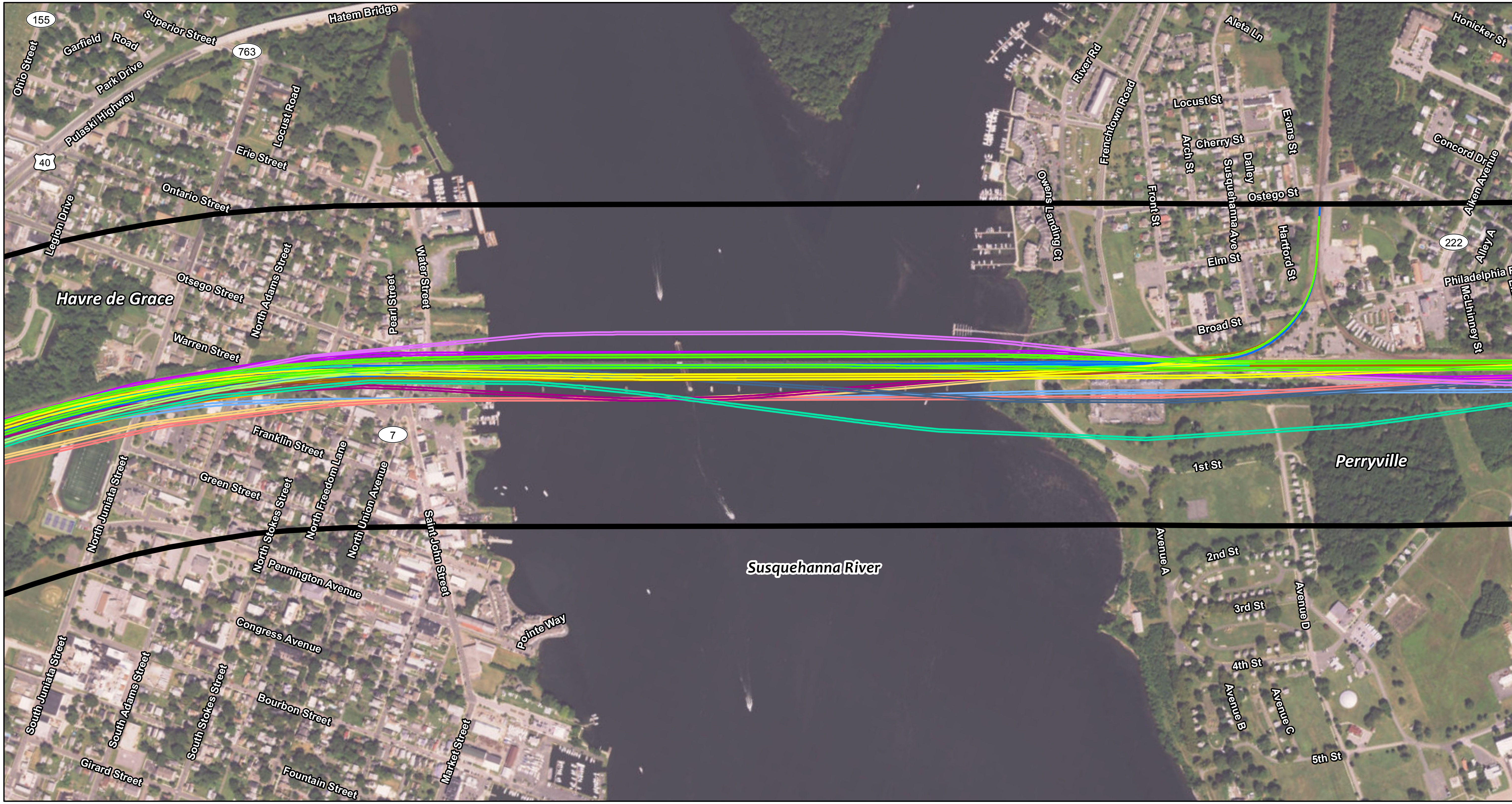
Table 2-1 (cont'd)
Description of 18 Conceptual Alternatives

Alternative	Alternative Description*
5	• New high-speed 2-track bridge to east of existing bridge; second bridge in place of existing bridge • Substantial curve to avoid right-of-way impacts • Up to 4 tracks total; max speed of 130 mph
6	• New high-speed 2-track bridge to east of existing bridge; second bridge in place of existing bridge • Elevated through Havre de Grace; extensive, complicated double decker structure • Requires temporary closure of swing span during winter season • Up to 4 tracks total; max speed of 160 mph
7	• New high-speed 2-track bridge to east of existing bridge; second bridge in place of existing bridge • Significant curvature to avoid Perryville substation • Up to 4 tracks total; max speed of 160 mph
8A	• Similar to 1B but with reduced speed; requires temporary closure of swing span • Up to 4 tracks total; max speed of 120 mph
8B	• New high-speed 3-track bridge to the east of existing bridge • Requires temporary closure of swing span • 3 tracks total; max speed of 120 mph
9A	• New 90-mph bridge to the west of existing bridge; high-speed 2-track bridge in place of existing bridge • Requires reconstruction of Lewis Lane Bridge and temporary closure of swing span • 4 tracks total; max speed of 160 mph
9B	• New 90-mph bridge to the west of existing bridge; high-speed 2-track bridge in place of existing bridge • Requires reconstruction temporary closure of swing span • 4 tracks total; max speed of 150 mph

The Project Team also considered:

- Rehabilitating the existing bridge without modifying the track alignments;
- Converting the swing bridge into a lift bridge during rehabilitation; and
- Rehabilitating the existing bridge for non-rail use.

After the Project Team developed the 18 conceptual alternatives and the Rehabilitation Alternative ("Rehab"), it identified three additional conceptual alternatives ("CE") and considered two alternatives suggested by the public ("P") and a value engineering alternative ("VE"). These additional alternatives are described in **Table 2-2**.



Legend

Alignment - 1A	Alignment - 3A	Alignment - 4C	Alignment - 6	Alignment - 9A
Alignment - 1B	Alignment - 3B	Alignment - 4D	Alignment - 7	Alignment - 9B
Alignment - 2A	Alignment - 4A	Alignment - 4E	Alignment - 8A	1,000 ft Study Area
Alignment - 2B	Alignment - 4B	Alignment - 5	Alignment - 8B	

0 530 1,060 Feet

Susquehanna River Rail Bridge Project

Figure 2-1
Conceptual Alternatives Development

Table 2-2
Description of Additional Alternatives

Alternative	Alternative Description
CE1	• Construction of two 1-track bridges on either side of the existing bridge • A third bridge replacing the existing bridge
CE2	• Utilization of an abandoned grade-separated crossing, located north of the existing bridge
CE3	• Construction of a 3-track high speed bridge, located west of the existing bridge
P1	• Construction of an underground tunnel for high speed rail • Alternative suggested by a member of the public
P2	• Rerouting the NEC to join the existing CSX bridge, located to the north of the existing Amtrak bridge • Alternative suggested by a member of the public
VE	• Two 2-track bridges on either side of the existing bridge • Developed during the value engineering study

In all, the Project Team developed 25 alternatives throughout the course of the alternatives development process.

ALIGNMENT ALTERNATIVES SCREENING PROCESS

As detailed in **Appendix A**, the Project Team used a two-step screening process to evaluate these 25 alternatives. The first step entailed a "fatal flaw screening" and the second step entailed a "detailed screening." Throughout the screening process, the Project Team considered input provided through public outreach efforts, coordination with local officials, Section 106 consulting party meetings, interagency review meetings, and other stakeholder meetings.

The fatal flaw screening evaluated the 25 alternatives based on their ability to satisfy the following criteria. These criteria were developed from the Project's Purpose and Need Statement and through coordination at Interagency Review Meetings (IRM).

- Rail connectivity;
- Navigational requirements;
- Logical termini;
- Feasibility and constructability; and
- Avoidance of critical property impacts.

As shown in **Table 2-3** (and discussed further in **Appendix A**), the fatal flaw screening eliminated the Rehab alternative and nine of the 18 conceptual alternatives. Of the six other alternatives (CE, P, and VE), the VE conceptual alternative passed the fatal flaw screening.

Table 2-3
Fatal Flaw Screening of Conceptual Alternatives

Alt #	Build Scenario	Fatal Flaw Screening Criteria					
		Rail Connectivity	Navigational Requirements	Logical Termini	Feasibility and Constructability	Avoids Critical Property Impacts	Pass or Fail
1A	1	No	Yes	Yes	Yes	No	Fail
1B	1	Yes	Yes	Yes	Yes	Yes	Pass
2A	2	No	Yes	Yes	No	No	Fail
2B	2	No	Yes	Yes	No	No	Fail
3A	1	No	Yes	Yes	Yes	No	Fail
3B	1	No	Yes	Yes	Yes	Yes	Fail
4A	1	No	Yes	Yes	Yes	No	Fail
4B	1	Yes	Yes	Yes	Yes	Yes	Pass
4C	1	Yes	Yes	Yes	Yes	Yes	Pass
4D	3	Yes	Yes	Yes	Yes	Yes	Pass
4E	3	Yes	Yes	Yes	Yes	Yes	Pass
5	1	No	Yes	Yes	Yes	Yes	Fail
6	1	No	Yes	Yes	No	Yes	Fail
7	1	No	Yes	Yes	Yes	Yes	Fail
8A	1	Yes	Yes	Yes	Yes	Yes	Pass
8B	3	Yes	Yes	Yes	Yes	Yes	Pass
9A	4	Yes	Yes	Yes	Yes	Yes	Pass
9B	4	Yes	Yes	Yes	Yes	Yes	Pass
Rehab	N/A	Yes	No	Yes	No	Yes	Fail
CE1	N/A	No	Yes	Yes	No	Yes	Fail
CE2	N/A	No	Yes	No	Yes	No	Fail
CE3	N/A	Yes	Yes	Yes	No	Yes	Fail
P1	N/A	No	Yes	No	No	Yes	Fail
P2	N/A	No	Yes	No	No	No	Fail
VE	N/A	Yes	Yes	Yes	Yes	Yes	Pass

The Project Team based the second step of the screening process on a more detailed evaluation of each of the 10 remaining alternatives. The detailed screening considered each alternative’s impacts to environmental resources – human and natural – as well as each alternative’s ability to meet the project’s operational and engineering goals. Concurrent to conceptual engineering, the Project Team inventoried environmental resources in the study area, and factored that information into the detailed screening. Property impacts were further evaluated beyond the critical property assessment used in the fatal flaw screening, as discussed in **Appendix A**. The Project Team considered input received during public and agency meetings during the screening process. Each conceptual alternative’s ability to meet the following goals and objectives of the Proposed Project were compared and contrasted:

- Improve rail service reliability and safety;
  - Ability to eliminate operational disruptions and delays;

  - Ability to connect to NS wye and provide grades acceptable for freight operations;
  - Ability to provide adequate number of bridge structures;
- Improve operational flexibility and accommodate reduced trip times;
  - Ability to reduce operational conflicts;
  - Ability to eliminate or reduce speed restrictions for intercity trains;
  - Ability to provide flexibility for operational and maintenance work windows;
- Optimize existing and planned infrastructure and accommodate future freight, commuter, intercity, and high-speed rail operations;
  - Ability to eliminate two-track section in this portion of the NEC;
  - Ability to not preclude future high-speed rail;
  - Ability to minimize impacts to Perry Electrical Substation;
  - Ability to allow for potential shared corridor with bike/pedestrian path;
- Maintain adequate navigation and improve safety along the Susquehanna River;
  - Ability to provide suitable vertical and horizontal clearance;
  - Construction-period effects to navigation (i.e. whether the alternative requires temporary winter closure of movable span).

As described above, a total of 10 conceptual alternatives proceeded to detailed screening: Alternatives 1B, 4B, 4C, 4D, 4E, 8A, 8B, 9A, 9B, and VE. All required decommissioning and removing the existing bridge. Among the 10 remaining conceptual alternatives, the maximum achievable speed ranges from a low of 120 mph (which does not meet the design criterion) to a high of 160 mph (which meets the design criterion). Every option includes either three or four tracks. A detailed Alternatives Comparison Matrix evaluating all human environmental considerations, natural environmental considerations, and operational and engineering considerations for each of the 10 conceptual alternatives is presented in **Figure 2-2**.

Based on the detailed screening, the Project Team retained Alternative 9A and Alternative 9B for detailed study in the EA. The primary reasons for selecting Alternatives 9A and 9B for detailed study included: maximum authorized speed, potential property impacts, and the total number of tracks across the river. Based on current operational information, the Project Team deemed a four-track river crossing (or a three-track river crossing with the potential for the addition of a fourth track) superior to a three-track river crossing. Additionally, a maximum authorized speed of 160 mph is needed to optimize the NEC as a high-speed rail corridor. The Project Team determined that Alternative 9A and Alternative 9B best meet the goals and objectives of the project, while minimizing environmental and property impacts. The rationale for eliminating each of the other alternatives, as well as the interagency and public consultation process used during the alternatives screening process is detailed in **Appendix A**.

BRIDGE TYPE ALTERNATIVES

Independent of the alignment alternative screening process and selection of alternatives for detailed study, the Project Team reviewed four bridge types for the project. The bridge types are independent from the two-step screening process, since any of the bridge types could be feasible with the alternative alignments under consideration.

Alternatives Comparison Matrix - Operational and Engineering Considerations

EVALUATION CRITERIA	Units	Alternative 1B	Alternative 4B	Alternative 4C	Alternative 4D	Alternative 4E	Alternative 8A	Alternative 8B	Alternative 9A	Alternative 9B	VE
Improve rail service reliability and safety											
Eliminates operational disruptions/delays	Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Connects to NS wye and provides grades acceptable for freight operations		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of bridge structures	#	2	2	2	1	1	2	1	2	2	2
Improve operational flexibility and accommodate reduced trip times											
Reduces operational conflicts	Level at which alterntaive meets criteria	Excellent	Excellent	Excellent	Fair	Fair	Excellent	Fair	Excellent	Excellent	Excellent
Eliminates or reduces existing speed restrictions for intercity trains		Eliminates	Eliminates	Eliminates	Eliminates	Eliminates	Reduces	Reduces	Eliminates	Eliminates	Eliminates
Provides flexibility for operational and maintenance work windows		Very Good	Very Good	Very Good	Good	Good	Very Good	Good	Very Good	Very Good	Very Good
Ability to provide for NS/MARC Operations during Construction		Good	Good	Good	Good	Good	Good	Good	Excellent	Excellent	Good
Optimize existing and planned infrastructure											
Eliminates two-track section in this portion of NEC and meets corridor wide improvement needs along NEC	# of tracks provided by alternative	4 tracks	4 tracks	4 tracks	3 tracks	3 tracks	4 tracks	3 tracks	4 tracks	4 tracks	4 tracks
Meets future planned 160 mph corridor-wide improvement without future speed restrictions for intercity trains	Y/N - Maximum allowable speed (mph)	No - 140 mph	Yes - 160 mph	No - 135 mph	Yes - 160 mph	No - 135 mph	No - 120 mph	No - 120 mph	Yes - 160 mph	No - 150 mph	No - 140 mph
Impacts to Perry Electrical Substation	Level of impact	Major	Major	Major	Major	Major	Major	Major	Minor	Minor	Major
Allows shared corridor with Bike/Ped path (feasibility evaluation in progress)	Whether alternative precludes	Does not preclude	Does not preclude	Does not preclude	Does not preclude	Does not preclude	Does not preclude	Does not preclude	Does not preclude	Does not preclude	Does not preclude
Maintain adequate navigation and improve safety along the Susquehanna River											
Provides suitable vertical clearance (at least 60')	Y/N - Clearance provided (feet)	Yes - 60'	Yes - 60'	Yes - 60'	Yes - 60'	Yes - 60'	Yes - 60'	Yes - 60'	Yes - 60'	Yes - 60'	Yes - 60'
Maintains or widens horizontal clearance (at least 200')		Yes - 200' +	Yes - 200' +	Yes - 200' +	Yes - 200' +	Yes - 200' +	Yes - 200' +	Yes - 200' +	Yes - 200' +	Yes - 200' +	Yes - 200' +
Requires temporary winter closure of movable span?	Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Retained for further evaluation		**No**	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**No**
Elimination Rationale		**Lower maximum allowable speed than 9B with comparable environmental impacts**	**Impact to Lafayette Senior Housing Facility**	**Impact to Lafayette Senior Housing Facility and low maximum authorized speed**	**Impact to Lafayette Senior Housing Facility; provides three tracks only**	**Impact to Lafayette Senior Housing Facility; offers low maximum authorized speed and three tracks only**	**Undesirable maximum authorized speed**	**Undesirable maximum authorized speed**	**N/A**	**N/A**	**Higher property and natural environmental impacts, but lower speed than 9B**

First Tier of Impacts	Second Tier of Impacts	Third Tier of Impacts

Susquehanna River Rail Bridge Project

Figure 2-2
Detailed Alternatives Comparison Matrix

GIRDER APPROACH / ARCH MAIN SPAN

Under this bridge design type, the proposed east bridge would have a total of 19 in-water piers. The proposed west bridge also would have 19 in-water piers. Sixteen piers would be removed from the existing bridge and 11 remnant piers (from the prior 1860s bridge) would be removed for a net gain of 11 piers. The girder approach / arch main span bridge design is based on typical 170-foot approach spans. As part of the ongoing design effort, longer spans are under consideration.

DELTA FRAME APPROACH / ARCH MAIN SPAN

This bridge design type consists of a network tied arch over the navigable channel with delta frames for the approach spans. Under this bridge design type, the proposed east bridge would have a total of 13 in-water piers. The proposed west bridge would have 13 in-water piers. Sixteen piers would be removed from the existing bridge and 11 remnant piers would be removed for a net reduction of one pier. The delta frame approach / arch main span bridge design is generally based on 200-foot approach spans. Approach spans ranging from 230 to 260 feet were also considered.

TRUSS APPROACH / TRUSS MAIN SPAN

Under this bridge design type, the proposed east bridge would have a total of 13 in-water piers. The proposed west bridge would have 13 in-water piers. Sixteen piers would be removed from the existing bridge and 11 remnant piers would be removed for a net reduction of one pier. The truss approach / truss main span bridge design is generally based on 260-foot approach spans.

GIRDER APPROACH / TRUSS MAIN SPAN

Under this bridge design type, the proposed east bridge would have a total of 19 in-water piers. The proposed west bridge would have 19 in-water piers. Sixteen piers would be removed from the existing bridge and 11 remnant piers would be removed for a net gain of 11 piers. The girder approach / truss main span bridge design is based on typical 170-foot approach spans.

SELECTED BRIDGE TYPE

FRA and MDOT have selected the girder approach / arch main span bridge type for the Proposed Project. The Project Team based this selection on an array of factors, including: environmental resources considerations; engineering and operational factors; agency feedback; and public and mariner input. At various public outreach information sessions, the girder approach / arch main span bridge design received the most support. The top factors of public preference, based on input received, are the overall look, cost minimization, and opening up views to the Susquehanna River. The bridge design types also were presented to various federal and state agencies, and evaluated for their potential to affect various environmental resources—including surface water, submerged aquatic vegetation, and historic resources. Overall, the girder approach / arch main span bridge design is more favorable than the other bridge design types with respect to environmental resources. From an engineering and operations perspective, the girder approach / arch main span bridge design is superior in terms of ease of maintenance for approach spans, structural redundancy for approach space, ease of construction, trespasser resistance from water and land, side-span navigation clearance, and estimated cost. For a detailed discussion of the bridge type screening process, see "Bridge Design Selection Memo" in **Appendix A**.

C. NO ACTION ALTERNATIVE

The No Action Alternative assumes the Susquehanna River Rail Bridge would remain in service as-is, with no intervention besides minimal repairs and continuation of the current maintenance regime. The No Action Alternative will not include any changes to the existing track configuration. Service over the bridge would worsen in the future under the No Action Alternative. The bridge would continue to age, problems would occur more frequently, and the bridge would remain as a bottleneck. The No Action Alternative is used as a baseline scenario against which potential project impacts are measured. The No Action Alternative includes major planned transportation projects within the study area that are expected to be completed by 2025, which is the Proposed Project build year. Such projects include the following:

- **Amtrak State of Good Repair and Service Improvements:** The No Action Alternative would include elements of Amtrak's State of Good Repair program, which involves investments along the NEC to maintain a state of good repair, address deferred maintenance projects, and replace infrastructure that has reached the end of its useful life.
- **MARC Northeast Maintenance Facility:** The MARC Northeast Maintenance Facility would entail construction of a new operation, maintenance, and storage facility located on a 115-acre site in Perryville, adjacent to the NEC. The Federal Transit Administration (FTA) issued a Finding of No Significant Impact (FONSI) to conclude the National Environmental Policy Act (NEPA) review but MTA lacks funding for final design, right of way acquisition or construction. For the analysis of the Proposed Project, it was assumed that by the MARC Northeast Maintenance Facility would be constructed and operational by 2040, the Proposed Project long-term analysis year.

D. BUILD ALTERNATIVES

Based on the detailed screening, the Project Team retained Alternative 9A and Alternative 9B for detailed study. Both would improve rail service and reliability, improve operational flexibility, accommodate reduced trip times, optimize existing and planned infrastructure, maintain adequate navigation, and improve safety along the Susquehanna River. These Build Alternatives vary slightly by alignment and by maximum achievable speed. The Build Alternatives would construct two new high-level fixed bridges. These Build Alternatives could accommodate a four-track scenario or a three-track scenario with an option of a future fourth track expansion. For purposes of a conservative environmental review, the EA analyzes the potential environmental impacts of a full four-track river crossing.

ALTERNATIVE 9A

Alternative 9A would construct a new two-track 90 mph bridge[2] to the west of the existing bridge and a second new two-track 160 mph bridge on the existing bridge alignment (see **Appendix B**, "Engineering Alignments"). The bridge to the west of the existing bridge would be constructed first. Under normal operations, this bridge would be used primarily by MARC commuter rail and NS freight rail service.

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[2] Accommodating speeds of up to 100 mph on this bridge is under consideration as part of the ongoing design effort.

Once the new bridge to the west is completed, the existing bridge would be taken out of service, demolished, and replaced. A new high-speed passenger rail bridge would be built in the center of the right-of-way of the existing bridge alignment. The Alternative 9A design would lessen the curve in Havre de Grace, allow for 160 mph speeds, and require property acquisitions (see Chapter 4, "Land Use and Community Facilities"). Since the west bridge will be built first, freight, MARC and Amtrak operations can be maintained throughout construction of both bridges. As shown in **Appendix B**, "Engineering Alignments" the south wye track (connecting the NS Port Road to the NEC in Perryville) would be realigned to accommodate the revised configuration of Perry Interlocking. Although this alternative is based on a four track scenario, it could accommodate a three-track scenario with an option of a future fourth track expansion.

Alternative 9A would modify Perry Electrical Substation but a substantial reconfiguration is not required. This alternative would also demolish the remnants of the former Havre de Grace train station and require shifting of the Perry Interlocking Tower. The Proposed Project would extend the Havre de Grace abutment south towards Freedom Lane. A summary of all affected existing infrastructure is provided in **Table 2-4**. Alternative 9A has an estimated 5-year construction period and an estimated construction cost of $930 million (2015 dollars), based on the construction of the girder approach / arch main span bridge type.

PROFILE CHANGES

For Alternative 9A the rail bridge structures would extend across the Susquehanna River and Union Avenue in Havre de Grace and Avenue A in Perryville. In Havre de Grace, the track would be supported on an embankment with a retaining wall. On the east side, a retaining wall would extend from Union Avenue to a point between Juniata Street and Lewis Lane. On the west side, the retaining wall would extend from Union Avenue to Juniata Street. South of the Havre de Grace Middle/High School athletic fields to Oak Interlocking, the track would remain in its existing roadbed at grade, except near Lewis Run to maintain an existing Amtrak access road west of the tracks. In Perryville, the track would be supported by an embankment with a retaining wall, extending roughly from Avenue A to Mill Creek on the east side and from Avenue A to the existing south access road on the west side. North of these limits to Prince Interlocking, the track would remain in its existing roadbed at grade. The track would also remain at grade along the south wye track.

The proposed profile will raise the elevation of the tracks between Perryville Station and Adams Street in Havre de Grace. The approximate limits of the raises in elevation (i.e., the increase in track height from existing elevation to proposed) are as follows:

- Access Road Undergrade (UG) 59.52 in Perryville - 1 foot
- North Abutment, Susquehanna River Rail Bridge in Perryville - 2.5 feet
- Navigation Channel of the Susquehanna River - 14 feet
- South Abutment in Havre de Grace - 6 feet
- Stokes Street in Havre de Grace - 3 feet
- Adams Street in Havre de Grace - 2 feet

Alternative 9A provides a vertical clearance of 60 feet above MHW at the channel span. Both the east and west bridges would be approximately 38 feet wide with a top-of-rail elevation of 72 feet above MHW. The top of the proposed arch structure spanning the navigation channel would be approximately 152 feet above MHW. The top of the transmission lines would be 190 feet above MHW.

APPROACH STRUCTURES

There are three existing undergrade structures (located below the railroad) located on the Perryville approach that will require modification to accommodate the proposed track alignments. There are seven undergrade structures and one overhead structure between the Susquehanna River and Grace Interlocking in Havre de Grace that will require modifications to accommodate the proposed track alignments (including reconstruction of the Lewis Lane Bridge). The improvements to Grace Interlocking require Track 4 to shift six feet west, resulting in permanent disturbances extending 35 feet from the existing Track 4. This will require extending the culvert at the Lily and Lewis Run crossings. The required modifications to these structures are shown in **Table 2-4**. Alternative 9A requires long sections of track to be built away from the existing corridor on fill. Retaining walls are recommended in order to minimize right-of-way acquisition.

Table 2-4
Summary of Affected Existing Infrastructure

West Side of Corridor
Replace ballast deck bridge 59.52, over Access Road in Perryville
Retaining wall in Perryville to support the west-bridge tracks
New permanent higher-level UG Bridges in Havre de Grace for new western Tracks
60.51 Freedom Lane - extend existing arch
60.56 Stokes Street - new span
60.61 Centennial Lane - extend existing arch
60.62 Adams Street - new span
60.77 Juniata Street - new span
East Side of Corridor
Relocate C&S/third-party utility duct bank
Extend existing masonry arch culvert 59.01, Mill Creek UG Bridge in Perryville
Relocate signal bungalow "59.0" in Perryville
Extend ballast deck bridge 59.39, over Access Road in Perryville
Relocate Perry Interlocking signal equipment
Relocate or demolish Perry Tower in Perryville
Replace ballast deck bridge 59.52, over Access Road in Perryville
Construct retaining wall and viaduct support structures in Perryville
Modify Perry Electrical Substation in Perryville
New permanent higher-level UG Bridges in Havre de Grace for new eastern tracks
60.51 Freedom Lane - extend existing arch
60.56 Stokes Street - replace existing span
60.61 Centennial Lane - extend existing arch
60.62 Adams Street - new span
60.77 Juniata Street - new span
60.85 Stream (Lily Run) - extend existing culvert
61.72 Lewis Run (also referred to as Unnamed tributary to Lily Run) – extend culvert
Reconstruct Lewis Lane Bridge 61.35 to accommodate track shift (Alternative 9A only)
Source: HNTB.

ALTERNATIVE 9B

The main difference between Alternative 9A and Alternative 9B occurs in Havre de Grace along the east side of the corridor from Lewis Lane to the Susquehanna River. Alternative 9B lessens the curve in Havre de Grace and would limit the speed to a maximum of 150 mph. This lower speed, as compared to Alternative 9A, reduces the amount of property acquisitions required, including at the T&D Enterprise parcels and the avoidance of the Havre de Grace Middle/High School athletic fields (see Chapter 4, “Land Use and Community Facilities”, Chapter 9, “Draft Section 4(f) Evaluation”, and Chapter 10, “Section 6(f) Evaluation”). Reconstruction of the Lewis Lane Bridge would not be required. Alternative 9B has an estimated 5-year construction period and an estimated construction cost of $890 million (2015 dollars) based on the construction of the girder approach / arch main span bridge type.

Alternative 9B is very similar to Alternative 9A. Like Alternative 9A, Alternative 9B would result in a new two-track 90 mph bridge west of the existing bridge and a second new two-track bridge replacing the existing bridge. Alternative 9B would also realign the south wye track and modify Perry Electrical Substation, while maintaining freight, MARC, and Amtrak operations throughout construction. Alternative 9B would result in identical profile changes to the rail bridge structures as Alternative 9A, including a vertical clearance of 60 feet above MHW at the channel span. In addition, all impacts to the approach structures located in Perryville are the same for Alternative 9A and Alternative 9B. A summary of all affected existing infrastructure is provided in **Table 2-4**.

ADDITIONAL PROJECT ELEMENTS

In addition to the new bridges and their approaches, the Proposed Project would require modifications to various railroad components—including communication systems, signal systems, traction power, catenary, and rail interlockings. While this type of work would be the same for either Alternative 9A or Alternative 9B, a brief description is provided below.

RAIL SYSTEMS

Communications System

Continuity of the Open Transport Network (OTN) system must be maintained during all phases of construction. It is a communication system that can connect the stations, the control centers, trackside equipment, signal boxes, and other rail infrastructure. New signal houses and block points will be interfaced via local fiber cable and connected to the OTN for communications to Centralized Electrification and Traffic Control (CETC).

Signal System

The signal system design will be based on the new track configuration. New Grace Interlocking will be constructed to extend the length of the interlocking south. A new signal system will be installed at Grace, Perry and Prince Interlockings. New signal houses will be installed at Grace Interlocking between Perry and Prince Interlockings.

Traction Power

Amtrak’s Perry Electrical Substation is located adjacent to the existing right-of-way. Alternative 9A and Alternative 9B would require minimal modifications to Perry Electrical Substation, within the existing substation footprint. Retaining wall construction immediately adjacent to the transmission tower on the west side of the tracks is under consideration to potentially avoid the relocation of the transmission tower.

Overhead Contact System

Tracks 2 and 3 within the project's limits will be upgraded to an auto-tensioned style catenary. The proposed auto-tensioned catenary will be designed to support the new track speeds in accordance with Amtrak and American Railway Engineering and Maintenance-of-Way Association (AREMA) standards. New catenary structures, wires and power sectionalization configurations will be proposed for Grace, Perry and Prince Interlockings based on the track options and staging plans.

IMPACTS TO INTERLOCKINGS

Prince Interlocking

Prince Interlocking is located at MP 57.3, north of the existing bridge. The limits of Prince Interlocking will not change with Alternative 9A or Alternative 9B. Within Prince Interlocking, an existing 45 mph track switch will be removed and replaced with an 80 mph track switch. A second 45 mph track switch will be removed from service.

Perry Interlocking

Perry Interlocking is located at MP 59.5, south of Prince Interlocking, but north of the existing bridge. Both Alternative 9A and Alternative 9B require raising the grade of the tracks at Perry Interlocking. In addition, they require a reconfigured layout to support the bridge alignments and operational requirements. The portion of Perry Interlocking that leads to the NS Port Road Branch will have the north and south track switches upgraded from 40 mph to 45 mph.

Grace Interlocking

Grace Interlocking is located at MP 61.5, south of the existing bridge and south of the curve in Havre de Grace. Modifications to the curve in Havre de Grace are required to support speed improvements. The spirals of the curve in Havre de Grace extend into the existing turnouts at Grace Interlocking. Grace Interlocking will be substantially modified with either Alternative 9A or Alternative 9B. The southern limits will be extended and the three existing 80 mph track switches will be removed and replaced with seven 80 mph track switches. Changes to Grace Interlocking will require extending the culvert at the Lily and Lewis Run crossings.

Oak Interlocking

Oak Interlocking is currently located at MP 63.5. No changes to Oak Interlocking are anticipated with either Alternative 9A or Alternative 9B.

E. REQUIRED APPROVALS

Both Alternative 9A and Alternative 9B would potentially require a number of federal, state, and local permits and approvals (see **Table 2-5**). In addition to these permits, the project must comply with numerous laws, including those regarding worker and public safety, use of parkland and historic resources, and endangered and protected species.

Table 2-5
List of Potential Federal, State, and Local Permits and Approvals

Permits/Approval	Responsible Agency	Activity
Section 106	Federal Railroad Administration, Advisory Council on Historic Preservation, Maryland Historical Trust	Consultation pursuant to National Historic Preservation Act
Section 7 Consultation	National Marine Fisheries Service/US Fish and Wildlife Service	Impacts to federally-listed rare, threatened, or endangered species
Section 4(f)	U.S. Department of Interior (USDOI) (potentially including concurrence from local entities)	Consultation for Section 4(f) Evaluation
Section 6(f)	USDOI	Consultation for Section 6(f) Evaluation for impacts to properties purchased or developed with Land and Water Conservation Funding (LWCF)
Section 404 Permit	United States Army Corps of Engineers (USACE)	Discharge of dredged or fill material into the waters of the U.S.
Section 10 Permit	USACE	Construction of structures in navigable waters
Section 9 Permit	United States Coast Guard (USCG)	Construction/modification of a bridge over navigable waters
Hazards to Navigation Assessment	USCG	Obstructions in navigable waters
Nontidal Wetlands and Waterways Permit, Water Quality Certification, Construction within a 100-year floodplain	Maryland Department of the Environment (MDE)	Discharge of dredged or fill material into waters of the U.S., wetlands, and 100-year floodplains
Water Appropriations Permit	MDE	Dewatering of surface and groundwater during construction
Tidal Wetland License	MDE/Board of Public Works	Filling of open water and vegetated wetlands and construction of piers and associated structures
Maryland Reforestation Law/Forest Conservation Act compliance	Maryland Department of Natural Resources (DNR)	Impacts to forested areas

Table 2-5 (cont'd)
List of Potential Federal, State, and Local Permits and Approvals

Permits/Approval	Responsible Agency	Activity
State-Listed Rare, Threatened, and Endangered Species	DNR	Impacts to rare, threatened, or endangered species
Stormwater Management Approval	MDE	Inclusion of appropriate drainage structures and/or Environmental Site Design (ESD) techniques to manage stormwater runoff
Erosion & Sediment Control Approval	MDE	Applicable erosion and sediment control practices during construction
Maryland Critical Area Commission Approval	Critical Area Commission for the Chesapeake Bay	Impacts within the Critical Areas resulting from earth disturbance, removal of vegetation, placement of fill, and impervious area
Maryland Heritage Areas Authority, Lower Susquehanna Heritage Greenway	Maryland Department of Planning, Maryland Historical Trust (MHT)	Coordination on the protection and enhancement of natural resources and sites, structures, districts, or landscapes which are deemed to be of historic, archeological, or architectural significance.
Note: Other permits may be required.		

F. PREFERRED ALTERNATIVE

In selecting the Preferred Alternative, FRA and MDOT compared the two Build Alternatives and the No Action Alternative for the ability of each alternative to meet the project's purpose and need and goals and objectives. Since the Build Alternatives were developed in consideration of these goals and objectives, there are few differences among the Build Alternatives; however, a key operational consideration is the Proposed Project's ability to optimize existing and planned infrastructure by providing for a maximum authorized train speed of 160 mph, while taking both benefits and potential impacts into consideration. As described above, Amtrak developed the NEC Master Plan with planned speed increases up to a maximum authorized speed of 160 mph for this location along the NEC. Amtrak's NEC Master Plan is consistent with the congressional mandate placed on Amtrak to reduce travel times along the NEC. In addition, USDOT has developed a way to value time travel saving, based on minutes saved per passenger by value of travel time savings per hour.

As discussed above, Alternative 9A would allow for a maximum speed of 160 mph, while Alternative 9B would limit the speed to a maximum of 150 mph. Therefore, Alternative 9A is consistent with operational goals and with broader plans along the NEC. In addition, Alternative 9A would reduce travel times, which would in turn lead to associated cost savings. Although Alternative 9A would result in a minimal increase in impacts (e.g., a commercial displacement, Havre de Grace Middle/High School impact and floodplain, streams, wetland, forest, and Chesapeake Bay Critical Area impacts) as compared to Alternative 9B, these additional impacts can be mitigated and potentially reduced during final design. Additionally, one of the anticipated benefits of a reliable high-speed passenger rail system would be a reduction in greenhouse gas emissions associated with vehicular travel and roadway congestion. FRA has therefore selected Alternative 9A as the Preferred Alternative. ✷

A. INTRODUCTION AND METHODOLOGY

This chapter assesses the potential benefits and impacts of the Proposed Project on transportation conditions in the project area compared with the No Action Alternative. This transportation analysis also includes a discussion of the current and future regional transportation infrastructure, including intercity rail (Northeast Regional, long distance, Acela, and future high-speed rail), commuter rail, bus service, freight service, navigable waters, and the roadway system. For planning purposes and in anticipation of future increased capacity along the NEC, the passenger rail analysis (including intercity and commuter rail) assumes implementation of the Preferred Alternative from the NEC FUTURE Tier I Final EIS in the 2040 Build condition.[1] 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. It is important to note that the analysis is based on rail traffic volumes that would not result solely from the Proposed Project, but represent the sum of proposed enhancements all along the Northeast Corridor (NEC) that enable the service levels assumed by NEC FUTURE. The Federal Railroad Administration's (FRA) *Procedures for Considering Environmental Impacts* (64 Federal Register [FR] 28545 [May 26, 1999]) states that a transportation assessment should consider all modes of transportation, including bicycle and pedestrian modes. The non-motorized transportation network in the study area, consisting of trails and greenways, is discussed in Chapter 6, "Parks and Recreational Resources." Construction period impacts to transportation in the project area and overall region are documented in Chapter 19, "Construction Effects." As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative.

B. AFFECTED ENVIRONMENT

INTERCITY RAIL

The NEC is the most heavily used passenger rail line in North America, both in terms of ridership and service frequency, and one of the most frequently traveled rail corridors in the world.[2,3] The NEC is a 457-mile rail transportation system extending from Boston's South Station to

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[1] FRA, NEC FUTURE Tier I Final EIS, December 2016. NEC FUTURE is not an approved project as of this writing.

[2] https://www.amtrak.com/ccurl/998/601/Amtrak-National-Fact-Sheet-FY2015.pdf, accessed April 22, 2016.

[3] Source: BGL Rail Associates, for the Amtrak Reform Council, "A Recommended Approach to Funding the Estimated Capital Investment Needs of the Northeast Corridor Rail Infrastructure," April 2002.

Washington D.C.'s Union Station. In 2011, the U.S. Department of Transportation (USDOT) designated the NEC as a high-speed rail corridor.

As stated in Chapter 1, "Purpose and Need," the NEC is a key component of the Northeast region's transportation system. It is vital to the sustained economic growth of the region, which includes the economic and political centers of the United States—Boston, New York, Philadelphia, Baltimore, and Washington, D.C.—all of which are connected by the NEC. Increasing congestion and capacity constraints on the region's interstate highways affect commuters, intercity travelers, and the delivery of goods to and from the region, resulting in the growing popularity of rail as an attractive mode of passenger and freight transportation.

Table 3-1 presents existing train traffic over the Susquehanna River Rail Bridge.

Table 3-1
Existing Volumes Across the Susquehanna River Rail Bridge (Average Weekday)

Types of Service		**Current Utilization (2015)**	
		Daily	**Peak***
Amtrak Intercity	Northeast Regional and Long Distance	57	7
	Acela	32	2
MARC Commuter		18	3
NS Freight		8	2
TOTAL		**116**	

Notes: * "Peak" is defined as 4:10-5:10 PM weekdays for Amtrak, and 5:40-6:40 AM and 6:20-7:20 PM weekdays for MARC. For freight, the timing of the peak hour varies but it generally occurs at night.
Based on 2016 data, considered to be representative of the existing condition.
Source: Service volumes provided by Amtrak.

FREIGHT SERVICE

Norfolk Southern Railway (NS) operates freight service throughout the eastern United States and has rights to run freight trains along the NEC in the study area, including over the Susquehanna River Rail Bridge. NS operates approximately eight trains per day across the bridge moving between the NS Port Road Branch[4] and the Port of Baltimore. Approximately six NS trains per day do not cross bridge, instead traveling north between the NS Port Road Branch and the Port of Wilmington. In addition, CSX Corporation (CSX) operates freight service on a separate structure, the CSX Susquehanna River Rail Bridge, approximately 0.9 mile northwest of the Amtrak Susquehanna River Rail Bridge. CSX has rights to use the Amtrak Susquehanna River Rail Bridge in the event of failure or closure of its own structure. See Figure 1-4 for a map of rail and other transportation routes in the project area. Freight operations across the Amtrak Susquehanna River Rail Bridge are currently limited to 30 miles per hour (mph).

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[4] The NS Port Road Branch connects with the Amtrak NEC via a "WYE" connection at Perry interlocking, just north of the Susquehanna River Bridge. This connection allows freight to move between the Harrisburg, Pennsylvania area and locations north and south of Perryville.

PUBLIC TRANSPORTATION

COMMUTER RAIL SERVICE

As stated in Chapter 1, "Purpose and Need," Maryland Area Regional Commuter (MARC) is a 202-mile, 42-station commuter rail system. MARC rail service connects Cecil County, MD; Baltimore, MD; Washington D.C.; Brunswick, MD; Frederick, MD; and Martinsburg, WV. The Penn Line has the greatest ridership of MARC's three lines (average weekday ridership of 23,430 in 2015)[5] and runs from Washington Union Station over the Susquehanna River Rail Bridge to Perryville, MD. MARC currently operates 18 trains over the bridge each weekday, including three trains during the peak hour. There is currently no weekend service to Perryville. MARC tickets are honored on certain Amtrak trains; however, only one daily Amtrak train services Perryville MARC Station.

BUS SERVICE

Bus service in the study area consists of local transit services provided by Harford County, MD and Cecil County and a commuter bus line to Baltimore provided by the Maryland Transit Administration (MTA). Harford County Transit provides service to and within Havre de Grace and serves Perryville.[6] Cecil County provides a "Perryville Connection" bus which provides service within Perryville and connects to the nearby towns of North East and Elkton. There is also a countywide door-to-door transit service, the C.T. Cruiser, which is available to all residents and must be scheduled in advance.[7] Commuter bus service from Havre de Grace into Downtown Baltimore is provided by MTA via its Route 420.[8]

TRANSPORTATION FOR THE ELDERLY AND DISABLED

FRA's *Procedures for Considering Environmental Impacts* require that an environmental analysis assess impacts on transportation and general mobility of the elderly and disabled. In the study area, transportation options for the disabled are provided by Harford and Cecil Counties.[1,2] Both counties provide curb-to-curb paratransit services by appointment. Additionally, the "Perryville Connection" bus, discussed above, will deviate up to 0.75 mile for functionally disabled passengers.[2] The Perryville MARC Station is equipped with a wheelchair lift to ensure accessibility by disabled passengers. MARC and Amtrak trains are designed to accommodate most wheeled mobility devices in use today, as required by the Americans with Disabilities Act.

NAVIGABLE WATERS

The existing Susquehanna River Rail Bridge is located at Susquehanna River Mile 1.0. The movable swing span is located over the twin navigation channels and provides a 52-foot vertical clearance above mean high water (MHW) in the closed position and a 127-foot vertical

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[5] Maryland Open Data Portal, https://data.maryland.gov/Transportation/MTA-Average-Weekday-Ridership-by-Month/ub96-xxqw/data, accessed 10/27/2016.

[6] Harford County Transit. http://www.harfordcountymd.gov/services/transportation/, accessed 12/22/2014.

[7] Cecil County Community Transit. http://www.ccgov.org/dept_aging/communitytransit.cfm, accessed 12/22/2014.

[8] MTA Commuter Bus. http://mta.maryland.gov/commuter-bus, accessed 12/22/2014.

clearance in the open position, limited by overhead electric transmission lines. The horizontal clearance is 100 feet in each of the two navigation channels.

In the vicinity of the project site, the Susquehanna River is technically navigable up to the Conowingo Hydroelectric Dam, at approximately River Mile 9.9; however, parts of the river south of the dam are too shallow to navigate with larger vessels, with depths of less than 10 feet north of Port Deposit (approximately River Mile 5.0).[9] **Table 3-2** lists those bridges that cross the navigable portion of the Susquehanna River. The Susquehanna River Rail Bridge typically opens fewer than 10 times per year to accommodate marine traffic requiring vertical clearance greater than 52 feet.

Table 3-2
Susquehanna River Bridges South of the Conowingo Dam

Bridge Name	Location (Miles from Mouth of River)	Bridge Type	Vertical Clearance Open* (ft)	Vertical Clearance Closed (ft)	Horizontal Clearance (ft)
Susquehanna River Rail Bridge	1.0	Swing Rail Bridge	127	52	100
Thomas J. Hatem Memorial Bridge	1.5	Fixed Auto Bridge (Rt. 40)	87		320
CSX Susquehanna River Rail Bridge	1.9	Fixed Rail Bridge	85		500
Millard E. Tydings Memorial Bridge	3.2	Fixed Auto Bridge (I-95)	90		119-245

Sources: National Oceanic and Atmospheric Administration (NOAA). *Chart 12274: Head of Chesapeake Bay* [map]. “Office of Coast Survey.” Last updated November 2014. http://www.charts.noaa.gov/OnLineViewer/12274.shtml (accessed February 4, 2015).
HNTB Corporation. Susquehanna River Bridge Reconstruction and Expansion Project Navigation Study, dated January 21, 2014.

To assess current navigation conditions in this stretch of the Susquehanna River, Amtrak conducted a Navigation Study in 2013.[10] The study focused on vessels greater than 50 feet in height. The required vertical clearance for a marine vessel depends upon the size and weight of the vessel and the tide conditions. Commercial vessels typically require the most vertical clearance when traveling empty at high tide, and the least vertical clearance when traveling fully loaded at low tide. Currently, in accordance with federal law (33 CFR 117.575), Amtrak opens the Susquehanna River Rail Bridge on signal if notice is provided at least 24 hours in advance.

[9] NOAA Office of Coast Survey, Navigational Chart 12274. http://www.charts.noaa.gov/OnLineViewer/12274.shtml, accessed 3/8/2016.

[10] Susquehanna River Bridge Reconstruction and Expansion Project Navigation Study, dated January 21, 2014, HNTB Corporation.

In practice, local marinas and commercial users provide up to several days' notice to Amtrak when the need arises for a navigation span opening.

Coordination with U.S. Coast Guard, as a Cooperating Agency, has been ongoing, as detailed in Chapter 20, "Coordination and Consultation" and in **Appendix H**, "Public Involvement and Agency Correspondence." The Coast Guard has been involved in the approval of every project milestone, and has provided input for the Navigation Study. The Navigation Study determined that many of the bridge openings are related to transporting barge cranes for rehabilitation of the existing upstream structures. Some of the bridge openings are for recreational boating. Most tall vessels (greater than 50 feet in height) in the study area are docked at downstream marinas during the boating season. Many of the upstream marine facilities are not limited by the existing bridge's vertical clearance since they: (1) are winter storage facilities that request a group bridge opening once per season; (2) do not store boats taller than can be accommodated by the existing vertical clearance; or (3) are exclusively boat launches and are limited by upland road and bridge clearances. The Navigation Study identified one vessel, the skipjack Martha Lewis, which is currently undergoing a restoration and is expected to be 65 feet in height upon completion; however, this vessel rarely travels upstream. The Navigation Study concluded that the existing navigation channels (both height and width) address the needs of most mariners and vessels.

REGIONAL HIGHWAY SYSTEM

As shown in **Table 3-2**, two regional highways cross over the Susquehanna River in the vicinity of the Susquehanna River Rail Bridge. The Pulaski Highway (U.S. Route 40) traverses the recently renovated Thomas J. Hatem Memorial Bridge, located 0.5 miles from the Susquehanna River Rail Bridge. The John F. Kennedy Memorial Highway (I-95) utilizes the Millard E. Tydings Memorial Bridge, located 2.0 miles north of the Susquehanna River Rail Bridge. The two highways run roughly parallel to each other and to the Chesapeake Bay shoreline between Baltimore and Wilmington, with I-95 providing limited-access highway service, and U.S. Route 40 providing local service to towns along the corridor. See Figure 1-4 for a map of regional highways and other transportation routes in the project area.

LOCAL ROADWAYS

Several existing local roads cross the NEC within the study area, representing a mix of ownership between the State Highway Administration (SHA), the counties, the municipalities, and other public owners (see **Figure 3-1** for a map of these road crossings). In Havre de Grace, Lewis Lane (local/Harford County) and Post Road/Revolution Street (SHA) pass over the NEC, while N. Juniata Street, N. Adams Street, Centennial Lane, N. Stokes Street, N. Freedom Lane (all local/Harford County roads), and N. Union Avenue (SHA) cross underneath the NEC. In Perryville, Avenue A[11] (part of the Perry Point Veterans Administration [VA] Medical Center) and two Amtrak access roads cross beneath the NEC.[12] Broad Street (SHA) crosses below the north and south wye tracks, which connect the NEC to the NS Port Road Branch. Ikea Road (SHA) crosses over the NEC in Perryville, as do several roadways which are not publicly accessible, including the three Amtrak-owned former Philadelphia, Wilmington and Baltimore

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[11]Avenue A becomes Broad Street/Route 7 directly beneath the Susquehanna River Rail Bridge overpass.

[12]Final Feasibility Report: Susquehanna River Rail Bridge Project. Prepared by HNTB Corporation for Amtrak, January 30, 2015.

Legend

Susquehanna River Rail Bridge Overpasses

1. Lewis Run Undergrade Culvert 61.72
2. Lewis Lane Overhead Bridge 61.35
3. Lily Run Undergrade Culvert 60.85
4. North Juniata Street Undergrade Bridge 60.77
5. North Adams Street Undergrade Bridge 60.69
6. Centennial Lane Undergrade Culvert 60.61
7. North Stokes Street Undergrade Bridge 60.56
8. North Freedom Lane Undergrade Culvert 60.51
9. Amtrak access road Undergrade 59.52
10. Broad Street Undergrade Bridge - South Wye Track
11. Perryville Train Station Overpass (Amtrak Access Road Undergrade 59.39)
12. Mill Creek Undergrade Bridge 59.00
13. Coudon Road South Overhead Bridge 58.34
14. Coudon Road North Overhead Bridge 57.85
15. Chesapeake View Road Overhead Bridge 57.60

Data Sources

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

N

0 1,300 2,600 Feet

Susquehanna River Rail Bridge Project

Figure 3-1

Undergrade and Overhead Bridges in the Project Area

Railroad (PW&B) overpasses. One of the PW&B bridges (at Chesapeake View Road) is used by golf carts on the Furnace Bay Golf Course, while the other two (at Coudon Road North and Coudon Road South) are disused.[13]

C. NO ACTION ALTERNATIVE

As discussed in Chapter 2, "Project Alternatives," the No Action Alternative assumes the Susquehanna River Rail Bridge will remain in service as-is, with no intervention besides minimal repairs and continuation of the current maintenance regime. Service over the bridge is already speed-restricted to 90 mph due to the age and deteriorated condition of the bridge, and would continue to worsen in the future under the No Action Alternative, potentially requiring stricter speed and weight restrictions that will further impact the movement of passengers and freight. Cost associated with bridge maintenance would continue to increase over time. The bridge would continue to age, problems would occur more frequently, and the bridge would remain as a bottleneck; it would eventually need to be taken out of service. Without the bridge, local, regional and national rail networks would be disrupted with resultant detrimental effects on the economic activity.

A number of transportation projects are planned within the study area and would be developed by 2040 under the No Action Alternative. These projects are described in Chapter 2, "Project Alternatives," and they include Amtrak's ongoing state of good repair work and service improvements; components of MTA's *MARC Growth and Investment Plan*; and MTA's MARC Northeast Maintenance Facility. The MARC Northeast Maintenance Facility would entail construction of a new operation, maintenance, and storage facility located on a 115-acre site in Perryville, adjacent to the NEC. The Federal Transit Administration (FTA) issued a Finding of No Significant Impact to conclude the NEPA review for this project, but MTA currently lacks funding for final design, right of way acquisition or construction. This EA nevertheless assumes that the project would be completed by 2040. Projects that would be developed after 2040 are discussed in Chapter 18, "Indirect and Cumulative Effects." **Table 3-3** summarizes the expected train traffic across the Susquehanna River Rail Bridge in 2040.

In 2040 with the No Action Alternative, a new high-speed rail category replaces today's Acela service, filling a similar role but with faster speeds and various other enhancements. MARC plans to phase out electric locomotives and move to an all-diesel fleet. Currently, 10 out of 18 daily MARC trains across the bridge are electric. The overall number of MARC trains crossing the Susquehanna River Rail Bridge with the No Action Alternative is projected to decrease to 14 by 2040, assuming the implementation of the MARC Northeast Maintenance Facility. The Maintenance Facility project will eliminate the need to run deadhead trains north over the bridge in the morning and south over the bridge in the evening.

This Environmental Assessment (EA) assumes that freight rail traffic across the Susquehanna River Rail Bridge will increase modestly as a result of additional rail traffic to and from several regional refineries that are expanding their operations. NS does not have any plans in place to increase traffic; rather, the expectation of increased traffic is an assumption based on a generally accepted 1.5 percent annual rate of typical growth in freight rail. Approximately 10 freight trains

[13]"National Historic Preservation Act Section 106 Consultation for MARC Maintenance and Layover Facility, Perryville, Cecil County, Maryland Cultural Resources Management Report: Above-Ground Historic Properties." Prepared by URS Corporation for MTA, February 2014.

per day will cross the bridge en route to Baltimore. The EA further assumes that traffic on local and regional roadways and highways, as well as bus and paratransit ridership will increase naturally due to growth in the regional population. Under the No Action Alternative, navigational traffic near the Susquehanna River Rail Bridge is expected to remain steady.

Table 3-3
Projected 2040 Volumes Across the Susquehanna River Rail Bridge Without the Proposed Project (Average Weekday)

Types of Service		Projected Utilization (2040) Daily	Peak*
Amtrak Intercity	Northeast Regional and Long Distance	58	4
	High-Speed Rail	44	4
MARC Commuter		14	3
NS Freight		10	2
TOTAL		**126**	

Notes: * "Peak" is defined as 4:10-5:10 PM weekdays for Amtrak, and 5:40-6:40 AM and 6:20-7:20 PM weekdays for MARC. For freight, the timing of the peak hour varies but it generally occurs at night.
Source: Service volumes provided by Amtrak, MDOT and FRA, November 2015.

D. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

This section discusses the potential impacts to transportation from the Proposed Project. The Proposed Project would enhance the reliability of the Susquehanna River Rail Bridge and thereby provide benefits to Amtrak service, MARC service, freight operations and marine traffic. **Table 3-4** summarizes the expected train traffic across the Susquehanna River Rail Bridge in 2040. As noted earlier in this chapter, rail traffic volumes presented here do not result solely from the Proposed Project, but represent the sum of proposed enhancements all along the NEC which enable the service levels assumed by the NEC FUTURE Preferred Alternative. [14]

INTERCITY RAIL

The Proposed Project will cause no adverse impacts to intercity rail operations, and, in fact, could offer benefits to rail passengers. The Proposed Project involves construction of two fixed (non-movable) replacement bridges that would be used for rail service. Design speeds over the new bridges would be 90 mph on the new west bridge (Alternatives 9A and Alternative 9B), and either up to 160 mph (Alternative 9A) or 150 mph (Alternative 9B) on the new high-speed bridge, which would be built on the approximate alignment of the existing bridge. As design progresses, speeds up to 100 mph could be provided on the new west bridge. The Proposed Project would eliminate bridge malfunctions resulting from the opening of the existing movable span. This would improve the reliability of the Susquehanna River Rail Bridge and increase speed and capacity over the river. The Proposed Project would remove the bottleneck caused by the existing bridge and would reduce unscheduled train delays, thereby improving service. FRA

[14] NEC FUTURE forecasts are being used as a reasonable assumption but do not represent an approved project, nor are these numbers included in the No Action Alternative.

expects traffic across the river to increase by 2040, including the addition of high-speed rail and a new metropolitan service (envisioned as an intermediate-level service between high-speed rail and existing Northeast Regional service), as shown in **Table 3-4**. Projections indicate more than double the total number of peak period trips over the No Action Alternative, from 102 trips without the Proposed Project, to 222 trips with the Proposed Project.

Table 3-4
Projected 2040 Volumes Across the Susquehanna River Rail Bridge With the Proposed Project and Enhancements Along the NEC (Average Weekday)

Types of Service		Projected Utilization (2040) Daily	Peak*
Amtrak Intercity	Northeast Regional and Long Distance	48	4
	High-Speed Rail	82	8
	Metropolitan Service	92	8
MARC Commuter		44	3
NS Freight		12	2
TOTAL		**278**	

Notes: * "Peak" is defined as 4:10-5:10 PM weekdays for Amtrak. For MARC the daily peak occurs 5:40-6:40 AM. For freight, the timing of the peak hour varies but it generally occurs at night.
Source: Service volumes provided by Amtrak, MDOT and FRA, November 2015.

FREIGHT SERVICE

Improved reliability, speed, and capacity afforded by the Proposed Project would result in an overall benefit to freight service, with no adverse impacts projected. Future projections with the Proposed Project indicate an approximate daily increase of two freight trains over the No Action Alternative; both additional trains would traverse the bridge moving between the NS Port Road Branch and Baltimore. The Proposed Project would eliminate bridge malfunctions resulting from the opening of the existing movable span. This would improve the reliability of the bridge and increase speed and capacity, resulting in a long-term benefit to freight rail service. Connections between the NEC and NS Port Road Branch would remain via the wye track, which would be slightly realigned.

The Proposed Project has been designed so as not to preclude construction of the proposed Chesapeake Connector project on the eastern edge of the project limits, which would alleviate a freight rail bottleneck by adding a third track between Perryville and North East, MD.

PUBLIC TRANSPORTATION

COMMUTER RAIL SERVICE

No adverse impacts to commuter rail operations would result from the Proposed Project. The Proposed Project would improve the reliability of the Susquehanna River Rail Bridge and increase speed and capacity, thereby improving the reliability of MARC service to Perryville. MARC is studying the extension of service northward beyond Perryville for eventual connections to Southeastern Pennsylvania Transportation Authority (SEPTA) service, presumably at the current SEPTA terminus in Newark, Delaware.[15] This EA assumes that such extensions would not occur until after the Susquehanna River Rail Bridge Project. With the extension in place, service would likely increase to 44 daily MARC trains across the river by 2040. The Project Team will coordinate the final design and construction of the Proposed Project with the MARC Northeast Maintenance Facility project, located on the eastern edge of the project limits.

BUS SERVICE

As described below under "Local Roadways," there would be no adverse impacts to the local street network upon which bus service relies. Additionally, the Proposed Project would not affect any bus depots or stations. Therefore, no impacts to bus service would result from operation of the Proposed Project.

TRANSPORTATION FOR THE ELDERLY AND DISABLED

No impacts to paratransit service would result from operation of the Proposed Project. As described below under "Local Roadways," there would be no adverse impacts to the local street network upon which paratransit service relies. Additionally, the Proposed Project would not affect any depots where paratransit vehicles are stored or maintained.

NAVIGABLE WATERS

No significant adverse impacts to navigation would result from the Proposed Project. Under either Alternative 9A or Alternative 9B, the Proposed Project would provide a 60-foot vertical clearance and, at minimum, a 230-foot horizontal clearance. This would provide sufficient vertical clearance while widening the horizontal clearance. A wider horizontal clearance would improve safety by reducing the potential for conflicts between the rail bridge and marine traffic. The Proposed Project would also eliminate the need for bridge openings and closings by replacing the Susquehanna River Rail Bridge as two high-level fixed bridges. This would constitute an improvement to navigation along this segment of the Susquehanna River.

The Navigation Study described earlier in this chapter recommended that bridge design consider a 60-foot vertical clearance. While a 60-foot clearance may limit taller vessels, such as the aforementioned skipjack Martha Lewis (expected to be 65 feet in height upon completion), from traveling upstream of the bridge, it would allow for the bridge to be designed at a lower grade that would not affect freight rail operations, since heavy freight trains typically require lower grades. Furthermore, conceptual design has indicated that a 60-foot clearance would help reduce the need for right-of-way acquisitions and other potential community impacts as compared with bridge designs providing a higher vertical clearance.

The Navigation Study also determined that, while the existing horizontal clearance is sufficient, further widening of the horizontal clearance could increase sight distance, reduce vessel congestion, and aid tug boat and barge navigation through the bridge opening, increasing safety and resilience against potential bridge and fender system strikes by boats. The conditions of the USCG bridge permit, when received, will finalize the legal navigation clearances for a new or reconstructed bridge.

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

REGIONAL HIGHWAY SYSTEM

Impacts to the regional highway system from the Proposed Project would be largely beneficial, with no adverse impacts projected. The Proposed Project has the potential to reduce future vehicle miles traveled (VMT) regionally when compared with the No Action Alternative. This is described further in Chapter 18, "Indirect and Cumulative Effects." This VMT reduction would constitute a benefit to regional highways, which would experience lower congestion levels as a result of reduced VMT, as well as less wear and tear on road surfaces.

LOCAL ROADWAYS

TRAFFIC

While the Proposed Project does not include any additional service to or from Perryville station, FRA and MDOT anticipate there being additional MARC service to Perryville as a result of a number of proposed enhancements along the NEC. The combined effect of these various improvements would be to more than triple service from 14 daily trains under the No Action Alternative to 44 daily trains in the 2040 Build Condition. The potential for additional MARC service is further discussed in Chapter 18, "Indirect and Cumulative Effects." While on a regional level, VMT would decrease as a result of the Proposed Project as described in the previous paragraph, the increased MARC service would likely result in additional traffic on local roadways in Perryville due to the presence of additional MARC commuters traveling to and from the station. A future environmental review for the extension of MARC service northward beyond Perryville would analyze any such traffic increases.

DIRECT ROADWAY IMPACTS

Alternative 9A would require a slight realignment of Warren Street between N. Adams Street and N. Stokes Street in Havre de Grace. In Perryville, a slight realignment of Avenue A may be necessary under Alternatives 9A and Alternative 9B to accommodate the enlarged bridge abutment. These minor roadway realignments would not have any permanent adverse impacts on local roadway traffic. As described in Chapter 17, "Construction Effects," a construction access plan would be put in place to ensure that there would be no adverse impacts to local roadways during construction.

With Alternative 9A and Alternative 9B, seven bridges where local roadways cross beneath the NEC would require modification **(**see **Figure 3-1)**. The existing crossings at N. Juniata Street, N. Adams Street, Centennial Lane, N. Stokes Street, and Freedom Lane in Havre de Grace, and the Amtrak access roads in Perryville would each need extending to accommodate the final track alignments. Extension of these crossings would not have any negative impacts on local roadway traffic.

Alternative 9A and Alternative 9B could require changes to the PW&B overhead bridge at Chesapeake View Road and the unused PW&B overhead bridges at Coudon Road North and Coudon Road South to accommodate the new track profile and train clearance. For Alternative 9A, the Lewis Lane overhead bridge will require significant reconstruction with a temporary detour during a portion of the project, similar to what was done during its last reconstruction.

LOCALLY SPONSORED ROADWAY PLANS

As discussed in Chapter 21, “Public Participation and Agency Coordination,” the City of Havre de Grace has developed plans to redesign the downtown gateway area at the intersection of Otsego Street and N. Union Avenue, adjacent to the existing bridge abutment. The City has requested that the new Susquehanna River Rail Bridge abutment be located as far to the south as possible in order to accommodate these improvements and provide for a more open gateway to the downtown Havre de Grace commercial district. The Project Team designed the Proposed Project to accommodate these improvements, and the City of Havre de Grace will undertake any necessary traffic studies as part of the intersection improvement project. ✷

A. INTRODUCTION

This chapter inventories existing and future land uses within the study area and discusses potential long-term environmental impacts that could result from the implementation of the Susquehanna River Rail Bridge Project as compared with the No Action Alternative**.** The Proposed Project is located primarily in the City of Havre de Grace in Harford County, Maryland and the Town of Perryville in Cecil County, Maryland. Resources were identified within the 1,000-foot buffer study area surrounding the current rail right-of-way, as depicted on **Figure 4-1**. As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. FRA selected Alternative 9A as the Preferred Alternative.

B. REGULATORY CONTEXT AND METHODOLOGY

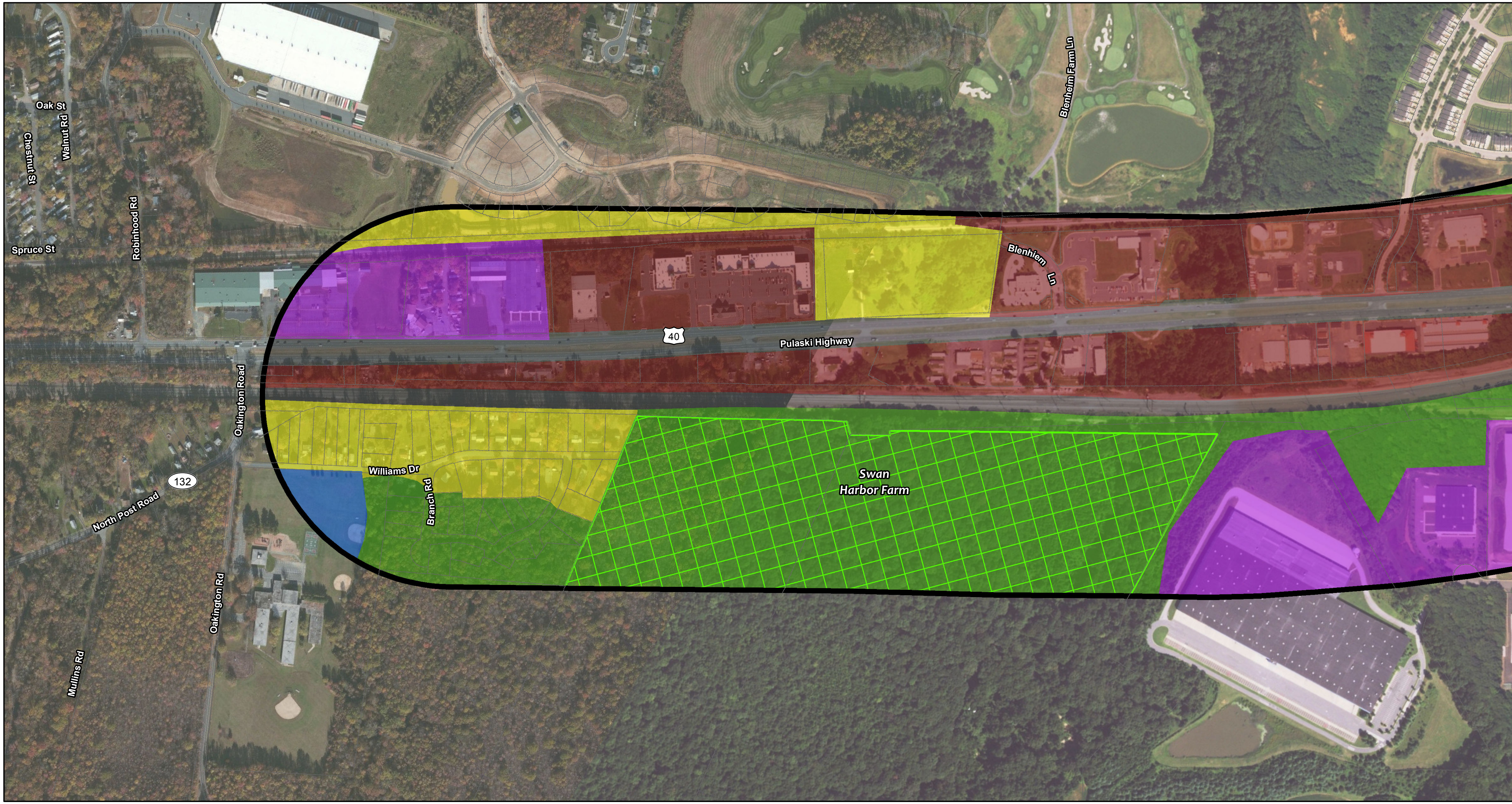
REGULATORY CONTEXT

Transportation projects often require property acquisition and relocation. A federally funded project must adhere to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, as codified in Title 42, Section 4601 et seq. of the United States Code, and the applicable implementing regulations set forth in Title 49, Part 24 of the Code of Federal Regulations (collectively, "the Uniform Act") with regard to relocation services, moving payments, replacement housing payments, and other allowable payments related to commercial and residential moving costs and displacement. The Uniform Act protects the rights of owners and tenants of real property acquired to implement a project; the Act provides for fair uniform and equitable treatment of persons displaced from their homes, businesses, or farms by federal and federally assisted programs. It also recognizes that displacement of businesses often results in their closure, and aims to minimize the adverse impact of displacement to maintain the economic and social well-being of communities. The Uniform Act is designed to ensure that individuals do not suffer disproportionate injuries as a result of programs and projects designed for the benefit of the public as a whole, and to minimize the hardship of displacement on such persons.

In Maryland, project-required displacements and relocation must adhere to the Real Property Article of the Annotated Code of Maryland, Title 2, Section 2-112 and Titles 12, Subtitle 2, Sections 12-201 to 12-212, which govern relocation and assistance for displacements associated with state actions.

METHODOLOGY AND BACKGROUND

The Project Team identified land uses and community facilities within the study area using available planning documents, Geographic Information System mapping layers, Maryland



Legend

1,000 ft Study Area
Parks
Residential
Commercial
Industrial
Institutional
Open Urban Land
Agriculture
Forest
Wetlands
Transportation

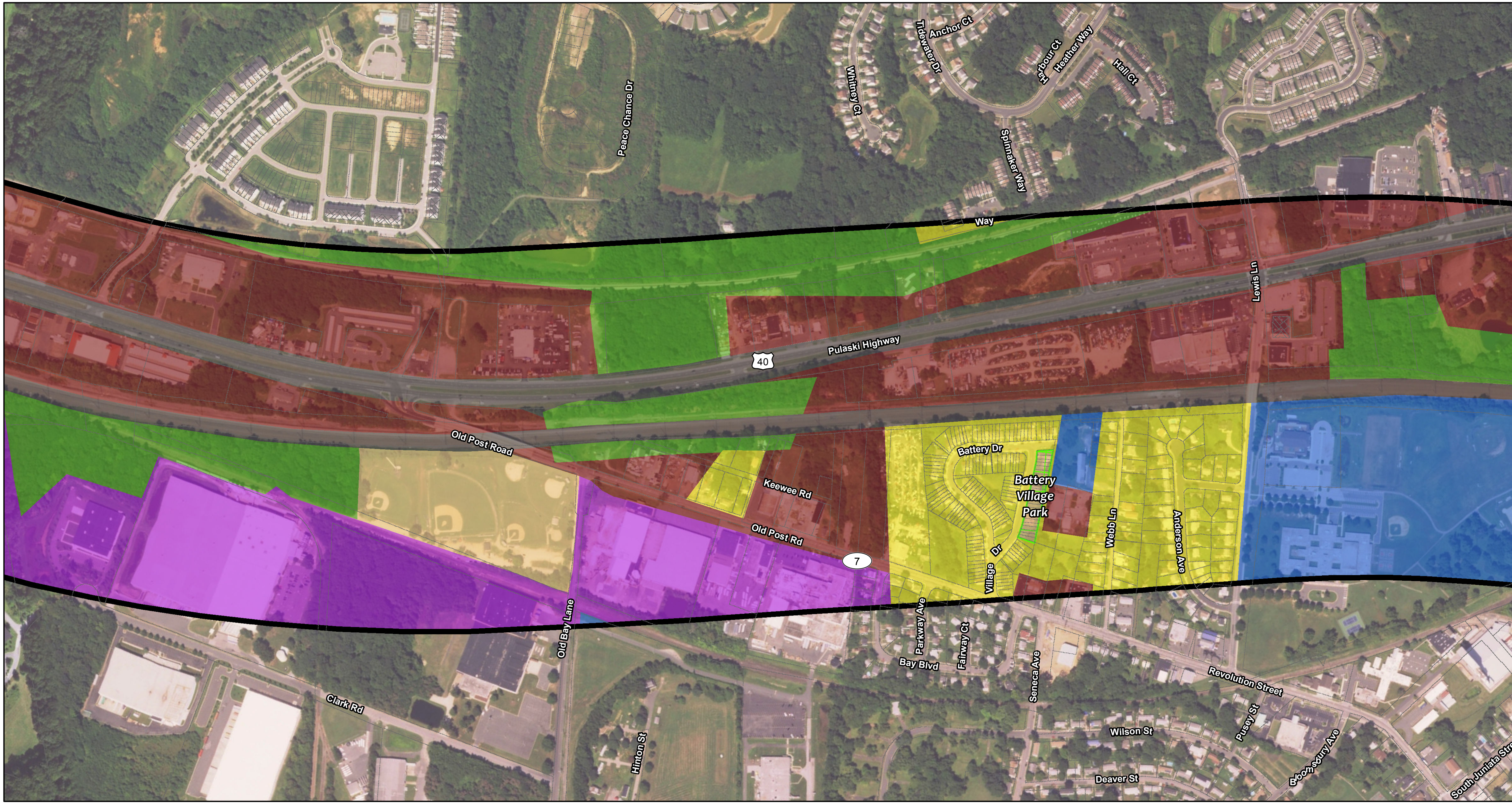
Data Sources

Land Use:
Maryland Department of Planning, 2010;
MD SDAT, 2014
Parks:
Harford County Government, 2013;
MD SDAT, 2014

0 250 500 Feet

Susquehanna River Rail Bridge Project

Figure 4-1
Existing Land Use Mapping
Page 1 of 5



Legend

- 1,000 ft Study Area
- Parks
- Residential
- Commercial
- Industrial
- Institutional
- Open Urban Land
- Agriculture
- Forest
- Wetlands
- Transportation

Data Sources

Land Use:
Maryland Department of Planning, 2010;
MD SDAT, 2014

Parks:
Harford County Government, 2013;
MD SDAT, 2014

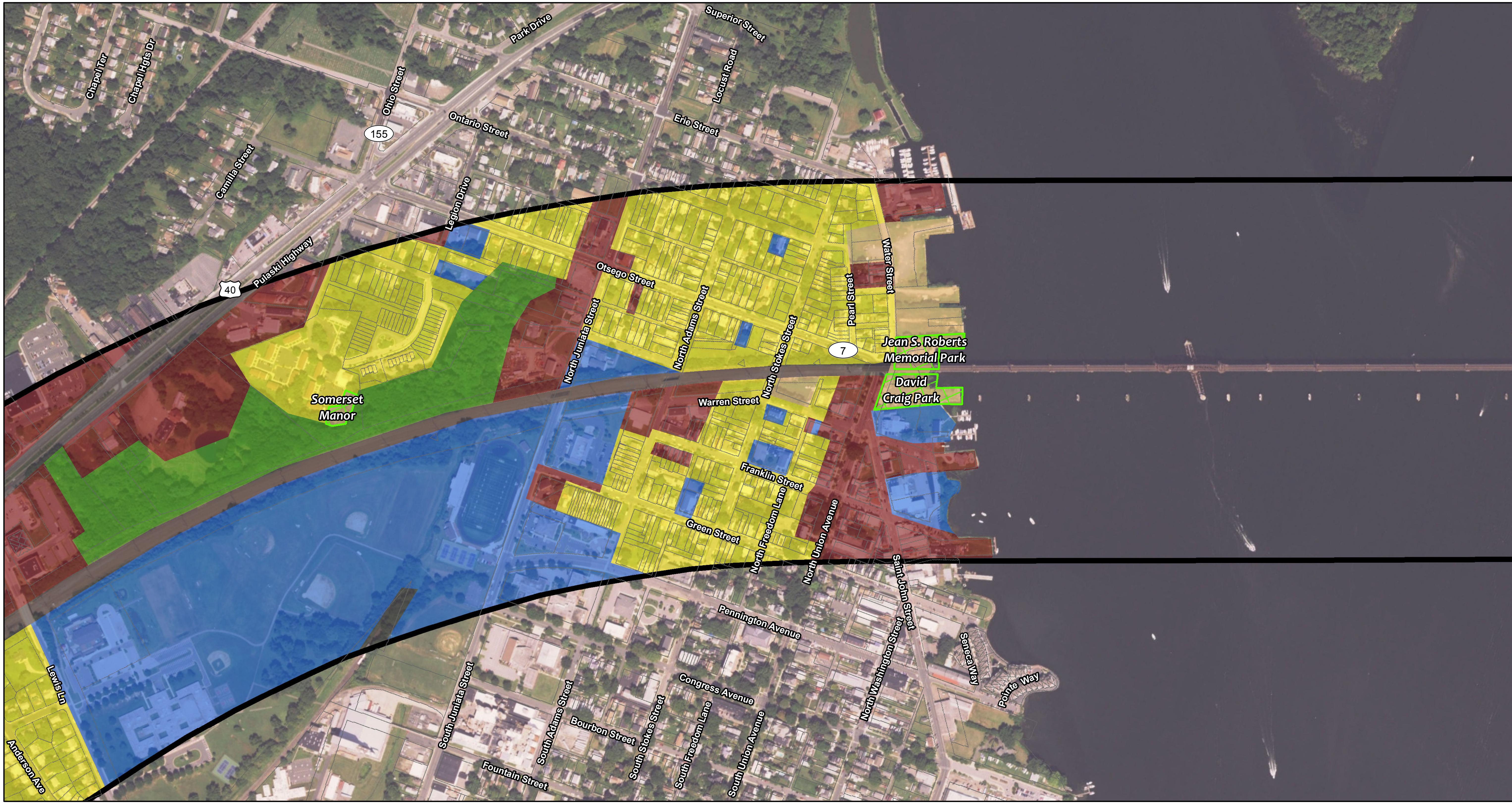
0 250 500 Feet

Susquehanna River Rail Bridge Project

Figure 4-1

Existing Land Use Mapping

Page 2 of 5



Legend

- 1,000 ft Study Area
- Parks
- Residential
- Commercial
- Industrial
- Institutional
- Open Urban Land
- Agriculture
- Forest
- Wetlands
- Transportation

Data Sources

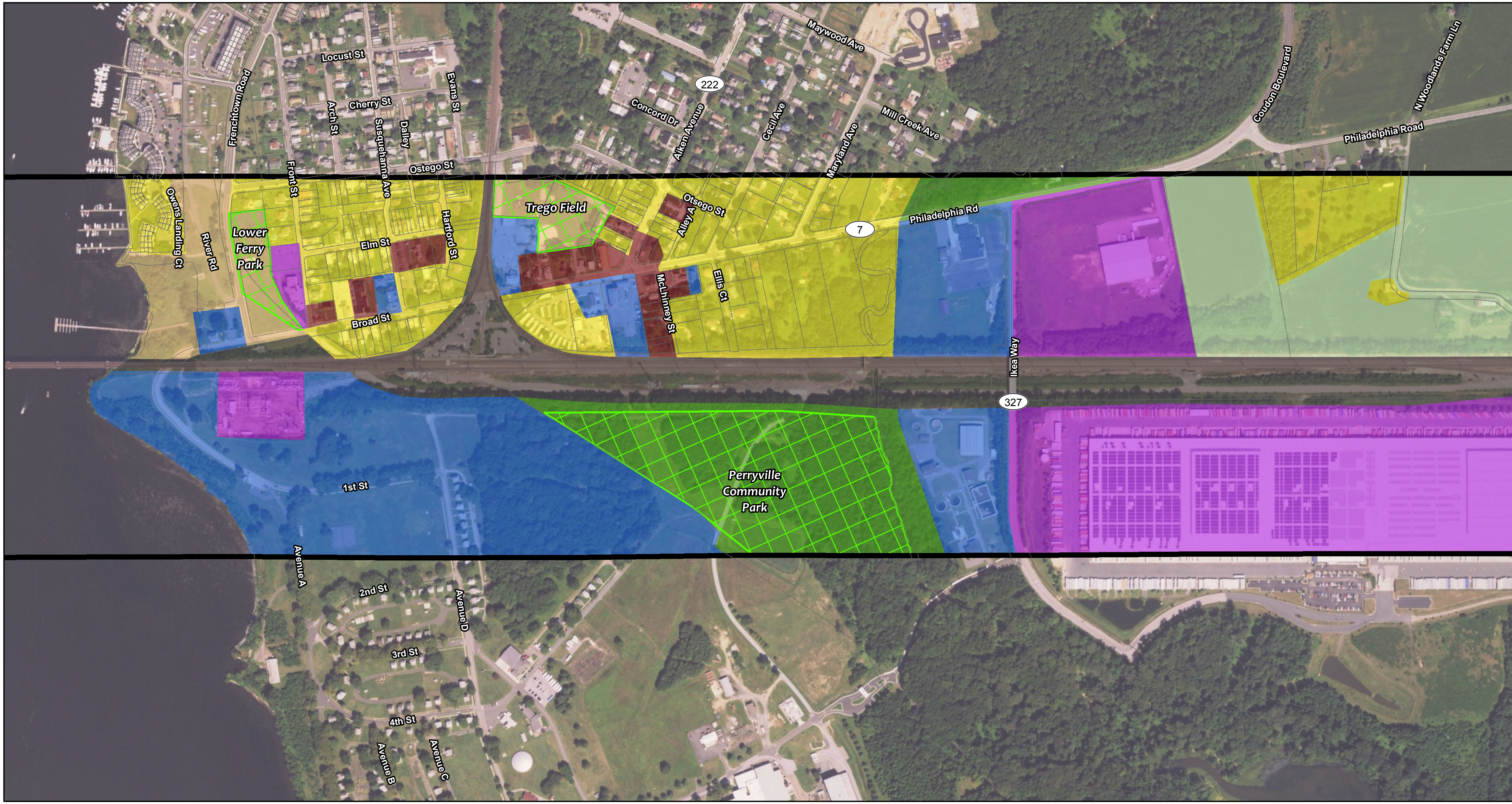
Land Use:
Maryland Department of Planning, 2010;
MD SDAT, 2014
Parks:
Harford County Government, 2013;
MD SDAT, 2014

N

0 250 500 Feet

Susquehanna River Rail Bridge Project

Figure 4-1
Existing Land Use Mapping



Legend

1,000 ft Study Area	Residential	Institutional	Forest
Parks	Commercial	Open Urban Land	Wetlands
	Industrial	Agriculture	Transportation

Data Sources

Land Use:
Maryland Department of Planning, 2010;
MD SDAT, 2014

Parks:
Harford County Government, 2013;
MD SDAT, 2014

0 250 500 Feet

Susquehanna River Rail Bridge Project

Figure 4-1

Existing Land Use Mapping

Legend

- 1,000 ft Study Area
- Parks
- Residential
- Commercial
- Industrial
- Institutional
- Open Urban Land
- Agriculture
- Forest
- Wetlands
- Transportation

Data Sources

Land Use:
Maryland Department of Planning, 2010;
MD SDAT, 2014
Parks:
Harford County Government, 2013;
MD SDAT, 2014

0 250 500 Feet

Susquehanna River Rail Bridge Project

Figure 4-1
Existing Land Use Mapping

Department of Planning (MDP) land use mapping, site visits and coordination with the local jurisdictions. These are the reports used in the development of this chapter:

- MDP Smart Growth http://www.mdp.state.md.us/OurWork/smartgrowth.shtml)
- Harford County *2012 Master Plan and Land Use Element Plan*
- City of Havre de Grace *Comprehensive Plan, March 2004 (and Municipal Growth Element and Water Resources Amendments, 2010)*
- Cecil County *2010 Comprehensive Plan*
- Town of Perryville *2010 Comprehensive Plan*
- Town of Perryville *2012 Transit-Oriented Development Plan*
- Lower Susquehanna Heritage Greenway (LSHG) 2000 *Management Plan*

STATE OF MARYLAND

SMART GROWTH INITIATIVE

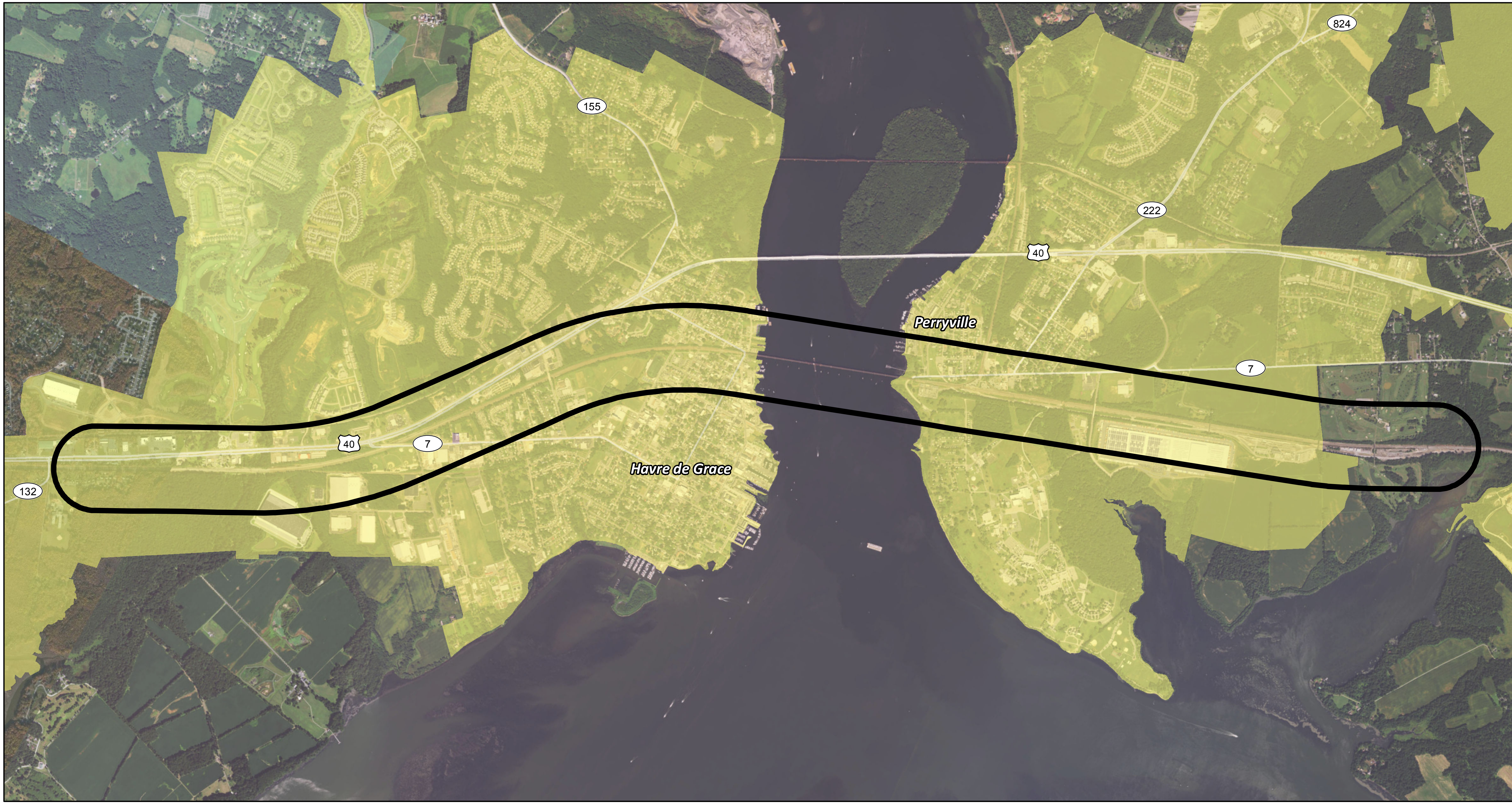
MDP emphasizes the importance of smart growth throughout the State. Smart growth has four overarching goals: (1) supporting development in areas where infrastructure already exists, (2) protecting valuable natural resources, (3) avoiding the high costs associated with building new infrastructure, and (4) providing a high quality of life. The 2009 Smart, Green, and Growing Legislation established 12 planning visions for sustainable growth in the State of Maryland. Through these goals and visions, MDP promotes high-density, mixed-use developments in areas that already have existing infrastructure to avoid urban sprawl into rural areas. Priority Funding Areas emphasize state funding for future growth in locations with existing infrastructure. The project study area is almost entirely within Priority Funding Areas (see **Figure 4-2**). MDP's Smart Growth Initiative serves as guiding principles for local comprehensive plans.

HARFORD COUNTY

2012 MASTER PLAN AND LAND USE ELEMENT PLAN

The Harford County *2012 Master Plan* includes the *Land Use Element Plan* and a series of functional element plans. The *Land Use Element Plan* is the core of the document, since it provides primary direction for achieving its goal and guiding principles. The *Land Use Element Plan* stresses the importance of maintaining rural areas, while concentrating development within its designated growth areas, which is consistent with the State of Maryland's Smart Growth Initiative. These designated growth areas generally contain the MD Route 24/924 corridors west to MD Route 23, U.S. 1 west of Bel Air, and the areas east of I-95 as well as designated rural villages, the Higher Education Conference Center at Higher Education Applied Technology (HEAT), Harford Community College and the municipalities of Bel Air, Aberdeen, and Havre de Grace. The master plan also incorporates Harford County's "Visions," which emphasize growth management, preservation, and sustainability.

A component *Transportation Element Plan* details the relationship between land use and transportation decisions. The primary objective of this plan is to provide for the safe, efficient, and fiscally responsible movement of people and goods through a variety of travel choices that support environmental sustainability. The plan emphasizes establishing a multi-modal transportation system that will help improve the level of service on existing roadways and



Legend

1,000 ft Study Area

Priority Funding Areas

Data Sources

Priority Funding Areas:
MD Dept. of Planning, 2006

0 0.25 0.5 Miles

Susquehanna River Rail Bridge Project

Figure 4-2

Priority Funding Areas

emphasizes increasing transit, rail, and non-motorized transportation options. Pertaining to transit and commuter rail, the *Transportation Element Plan* aims to provide efficient and convenient transit and rail services that address local and regional needs. This includes the need to expand MARC services and facilities, and support the development of land use patterns that facilitate transit and rail use.

HARFORDNEXT: A MASTER PLAN FOR THE NEXT GENERATION—DRAFT MAY 3, 2016

The Department of Planning and Zoning has recently drafted *HarfordNEXT: A Master Plan for the Next Generation* to update and streamline the various elements of the *2012 Master Plan* and *Land Use Element Plan* into one cohesive document. One of the key concepts that *HarfordNEXT* emphasizes is the importance of holistic transportation planning through promoting an efficient, multi-modal transportation system sensitive to community character. *HarfordNEXT* is supportive of investment in transit, rail, and freight facilities in order to remain competitive in the regional economy. Some of *HarfordNEXT*'s relevant goals for improving mobility and connectivity include reducing congestion on roadways, allowing for the efficient movement of freight and agriculture equipment, incorporating multimodal options and connectivity into new projects, and expanding commuter train and bus service along the Northeast Corridor (NEC) to help meet the demand projected by the MARC Growth and Investment Plan.

CITY OF HAVRE DE GRACE

COMPREHENSIVE PLAN, THE CITY OF HAVRE DE GRACE, MARCH 2004 (AND MUNICIPAL GROWTH ELEMENT AND WATER RESOURCES AMENDMENTS, 2010)

The City of Havre de Grace *2004 Comprehensive Plan* (including 2010 updates) emphasizes the need to retain the municipality's historic and small-town feel, while maintaining interconnections between older and newer areas. Key revitalization areas noted in the plan include older neighborhoods, the downtown and waterfront, properties along U.S. 40 within the City limits, major street corridors within the City, and industrial areas. Revitalization of the waterfront includes plans to improve the connection of waterfront with the downtown area as well as the construction of a signature sidewalk along the waterfront connecting public attractions between Tydings Park and North Park.

The transportation section of the comprehensive plan emphasizes the need to plan for safe, efficient, and convenient multi-modal transportation for existing and future needs of the community, while supporting compatible land uses within Havre de Grace. The transportation section discusses the existing street system, rail service (including the National Railroad Passenger Corporation [Amtrak], MARC, and Norfolk Southern), bus service, bicycle/pedestrian facilities, aviation facilities, and water transport, and lists recommendations for each of these areas.

Rail service recommendations include coordinating with MTA to publicize the availability of MARC commuter train service at the Aberdeen station, supporting the City of Aberdeen in strengthening the Aberdeen station as an Amtrak and MARC transit hub, and encouraging the use of multi-modal mass transit as opposed to commuting in individual automobiles.

CECIL COUNTY

2010 COMPREHENSIVE PLAN

The Cecil County *2010 Comprehensive Plan* highlights key growth and development issues that the county must address in the future, such as incentivizing high-density, mixed-use development within growth areas, while reducing pressures on rural areas; retaining the county's rural character and supporting agricultural industry; promoting job creation, economic development, and tourism; and providing public services and facilities to support current and future community needs. In Cecil County, growth areas are generally in the center of the county, located along I-95 and U.S. 40, adjacent to the towns of Elkton, North East, and Perryville. In addition, the comprehensive plan also establishes goals to protect environmentally sensitive resources and encourage a multi-modal public transportation system that will create options for commuters and residents within the area.

TOWN OF PERRYVILLE

2010 COMPREHENSIVE PLAN

The Town of Perryville *2010 Comprehensive Plan* promotes the consideration of Perryville as a growth center for Cecil County, the creation of an attractive and healthy community, and the protection of the natural environment. In addition, the comprehensive plan incorporates goals that include the preservation of land use character and environment with an increasing population, and the maintenance of transportation facilities as well as the promotion of all modes of transportation. The plan stresses the importance of promoting economic development, improving tourism, and revitalizing a downtown area inspired by its railroad history. Perryville contains four key revitalization areas: Rodgers Tavern–waterfront area; MARC station and trailer park area (an adjacent neighborhood of mobile structures); Town Hall and municipal area; and U.S. 40 corridor area. Three of the four revitalization areas are within the study area. The Rodgers Tavern waterfront area revitalization efforts propose connecting the Susquehanna River, historic Rodgers Tavern, a new open space park, and the old Muller-Thym Milk Plant with each other and the town. Plans near the MARC station and trailer park include converting the former adjacent trailer park into a mixed-use area that would provide housing and commercial areas. Plans near the Town Hall and the municipal area include demolishing the old town hall and replacing it with a new police and public safety building and Town Hall Community Center. The U.S. 40 corridor revitalization area is outside of the study area.

2012 TRANSIT-ORIENTED DEVELOPMENT PLAN

The Town of Perryville *2012 Transit-Oriented Development Plan* highlights the importance of transit-oriented development (TOD) in order to enhance the community character of the Town of Perryville, while promoting transit redevelopment. The TOD Plan focuses on three areas within the Town of Perryville: the downtown/Town Hall area, the Amtrak/MARC train station area, and the waterfront. Although there is no specific time frame for the implementation of the TOD Plan, several elements of the plan are currently being implemented, including the Elm Street Road and Storm Drain Reconstruction Project; improvement of a Cecil and Harford county bus link.

LOWER SUSQUEHANNA HERITAGE GREENWAY

LOWER SUSQUEHANNA HERITAGE GREENWAY MANAGEMENT PLAN

The *Lower Susquehanna Heritage Greenway Management Plan* is a blueprint for expansion of heritage tourism and greenway development. The *Management Plan* also provides an inventory of key heritage resources, including historical, architectural, cultural, archaeological, natural, and recreation resources. The key heritage resources within the Proposed Project study area are discussed throughout this Environmental Assessment. According to the *Management Plan*, rail connections in Perryville are a key to furthering the LSHG's ability to attract hiking and bicycling visitors and other outdoor enthusiasts.[1] MARC and Amtrak rail service are also listed as important "physical linkages" that support the growth of heritage tourism.

C. AFFECTED ENVIRONMENT

LAND USE

CITY OF HAVRE DE GRACE AND PORTIONS OF HARFORD COUNTY

The southern half of the study area is located within the City of Havre de Grace and Harford County, at the mouth of the Susquehanna River on the Chesapeake Bay. The study area within the City of Havre de Grace and Harford County contains revitalization areas, newer developing areas, and growth areas. Within the revitalization areas of City of Havre de Grace, the waterfront area consists of approximately three and a half miles of shoreline with land uses including parks and recreational areas, marinas, historic buildings, businesses, and residential uses. South of the City's shoreline and waterfront, and within the study area, is the downtown business district, which is the central hub of Havre de Grace. Land use in this downtown area consists predominately of commercial/retail shops, restaurants, financial institutions, and mixed-use residential/commercial properties. The Old Town portion of the City, which partially overlaps with the downtown business district, is where the majority of historic residences of the City are located. This area consists mostly of residential homes blended with commercial and institutional uses and community facilities. The newer portions of the study area within Havre de Grace are generally located at the southernmost limits, and include many recent residential areas and planned communities, as well as forested areas, parks, industrial, and commercial uses.

TOWN OF PERRYVILLE AND PORTIONS OF CECIL COUNTY

The study area south of the Susquehanna River includes the Town of Perryville and portions of Cecil County. Perryville city limits within the study area include areas along the shoreline of the Susquehanna and portions of the "downtown" or town center area. Within the study area, waterfront areas along the Susquehanna River include the historic Rodgers Tavern, open space uses (e.g., Lower Ferry Park and Pier), residential uses, and institutional uses. The town center of Perryville includes a mix of existing residential, commercial, parkland, and public facility uses. Other land uses on the outskirts of downtown include open space, industrial, and agricultural uses. Areas within the northernmost portion of the study area outside of the Town of

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[1] Lower Susquehanna Heritage Greenway Management Plan, 2000, http://www.hitourtrails.com/PDF/LSHG_ManagementPlan_2009.pdf

Perryville in Cecil County are largely agricultural, open space, and forested areas interspersed with some industrial use.

ZONING

While Maryland Department of Transportation (MDOT) and Amtrak are exempt from local regulations, including zoning, each locality in the study area maintains and enforces zoning codes and designations. More restrictive zoning protects agricultural, forested and environmental sensitive lands in the area. Study area zoning designations are listed in **Table 4-1**.

Table 4-1
Zoning Designations within the Study Area

City of Havre de Grace/Harford County	
RO –Residential Office District	R – Residential District
RB – Residential Business District	R2 - Residential District
C – Commercial District	
Town of Perryville/Cecil County	
I – Industrial	R1 – Single Family Residential
TC – Town Center Mixed Use	R2 – Single Family Residential
RM – Residential Marine	R3 – Multi-Family Residential

COMMUNITY FACILITIES

Table 4-2 lists community facilities found within the study area boundary. Note that parks and recreational resources, as well as impacts to these resources, are discussed separately in Chapter 6, “Parks, Trails, and Recreational Resources.”

Table 4-2
Community Facilities within the Study Area

Community Facilities	
City of Havre de Grace/Harford County	
Schools	Havre de Grace Middle School
	Havre de Grace High School
	Roye-Williams Elementary School
Religious Institutions	Christ the King Church
	Room at The Cross Mission Church
	Havre de Grace Presbyterian Church
	St. James African Methodist Episcopal Church
	Restore Church
	New Beginnings Christian Church
	Lutheran Mission Society Compassion Center
	Zion Temple Church
Study Area Emergency Service Providers	Harford County Department of Emergency Services
Community Recreation Centers	Havre de Grace Activity Center (includes Boys & Girls Club of Havre de Grace)
	Joseph L Davis American Legion Post #47
	Havre de Grace Elks Lodge
Health Care Facilities	N/A
Government Buildings	Havre de Grace City Hall
	Havre de Grace Housing Authority
	Havre de Grace Police Department
	Havre de Grace Post Office
	Susquehanna Hose Company Division 1
	Havre de Grace Water Treatment Plant
Town of Perryville/Cecil County	
Schools	High Road School of Perryville
Religious Institutions	Perryville United Methodist Church
	Perryville Presbyterian Church
Study Area Emergency Service Providers	Cecil County Department of Emergency Services
Community Recreation Centers	N/A
Health Care Facilities	Perry Point Veterans Administration (VA) Medical Center
Government Buildings	Perryville Community Fire Company
	Perryville Town Hall
	Perryville Post Office
	Perryville Police Department
	Historic Rodgers Tavern
	Perryville Train Station
	Perryville Wastewater Treatment Plant

D. NO ACTION ALTERNATIVE

The No Action Alternative assumes the Susquehanna River Rail Bridge would remain in service as in existing conditions, with no intervention besides minimal repairs and continuation of the current maintenance regime. The No Action Alternative will not include any changes to the existing track configuration. Service over the bridge would bridge is already speed-restricted to 90 mph due to the age and deteriorated condition of the bridge, and would continue to worsen in the future and the bridge would continue to age, potentially requiring stricter speed and weight restrictions that will further impact the movement of passengers and freight. Cost associated with bridge maintenance would continue to increase over time. Maintenance problems would occur more frequently, and the bridge would remain as a bottleneck; it would eventually need to be taken out of service. Without the bridge, local, regional and national rail networks would be disrupted with resultant detrimental effects on the economic activity, including those in Havre de Grace and Perryville to some extent. The analysis measures the potential project impacts against the No Action Alternative, which is used as a baseline scenario. The following projects are expected to be completed by the Susquehanna River Rail Bridge Project build year of 2025, and are therefore included in the No Action Alternative.

CITY OF HAVRE DE GRACE

- Proposed Havre de Grace Middle School/High School Replacement Project—Located immediately east of the Amtrak right-of-way on Lewis Lane, this planned project intends to replace the aging schools with a new facility that will serve grades six through 12. Harford County Board of Education has approved an architectural and engineering contract, initiating the design phases of the project.[2]
- Proposed Waterfront Heritage Park—Havre de Grace has approved the purchase of 3.2 acres of property along Water Street, located approximately 150 feet from the closest Build Alternative right-of-way, as part of a proposed plan to develop a new park along the waterfront (see Figure 6-2).[3] Conceptual artist renderings show that plans for Waterfront Heritage Park include a plaza, kayak and boat launch, gateway to the Captain John Smith Chesapeake National Historic Trail,[4] restrooms, amphitheater, lawn, benches, promenade, and fishing pier.[5]
- Residential Infill Projects—Various residential infill projects are being developed in Havre de Grace, including Otsego Street townhouses that are currently under construction and Ivy Hills townhouse development. Located along Legion Drive, Ivy Hills is expected to include approximately 43 townhomes once complete. [6]
- Bulle Rock—Bulle Rock is a large planned residential community within the City of Havre de Grace that is roughly located east of I-95 and west of the historic downtown of the City of Havre de Grace. The community also features a limited amount of commercial and retail as

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[2] Consultation letter from Department of Planning City of Havre de Grace, June 20, 2014.
[3] "Havre de Grace Voters Approve Spending $1.1 Million to Buy Water Street Properties," *The Aegis,* December 28, 2016, accessed December 28, 2016.
[4] See **Appendix D**, "Cultural Resources," for an analysis of the trail resources with respect to the Proposed Project.
[5] Consultation letter from Department of Planning City of Havre de Grace, June 20, 2014.
[6] Ibid.

well as a golf course built in 1998, which has hosted LPGA events in the past. 1,000 homes currently exist at Bulle Rock with plans for the development of 1,000 more homes.[7]

TOWN OF PERRYVILLE

- MARC Northeast Maintenance Facility—The MARC Northeast Maintenance Facility would entail construction of a new operation, maintenance, and storage facility located on a 115-acre site in Perryville, adjacent to the NEC. The Federal Transit Administration (FTA) issued a Finding of No Significant Impact to conclude the NEPA review for this project, but MTA currently lacks funding for final design, right-of-way acquisition or construction. This EA nevertheless assumes that the project would be completed by 2040.
- Perryville Municipal Complex—Located behind the current Town Hall at 515 Broad Street, Perryville, plans for a new development will occur in three separate phases. Phase I is currently being designed and includes the construction of a new police department. Phase II will include the construction of a new town hall, while Phase III consists of the construction of a new little league baseball field. Overall, the development will result in a new police department, town hall, mini-park, and little league field along with parking and improved pedestrian access.[8]
- Lower Ferry Park and Pier—Located at Broad Street and Roundhouse Drive, Perryville, the plans for the park include the construction of a comfort station, a band shell, playground equipment, walking paths, landscaping, bio-retention areas, and some supportive parking.[9]
- 631 Broad Street—This mixed-use residential building with commercial uses below, has conceptual plans for improvements that have been partially funded by the town's Revitalization and Façade Grants. These improvements include the replacement of the roof, the installation of new lighting, the expansion of the outdoor dining area, and the potential to expand the surrounding pedestrian area.[10]
- 950 Principio Furnace Road—Located at the intersection of Principio Furnace Road and IKEA Way, plans have been submitted for the construction of a new warehouse.[11]
- Town of Perryville Transit-Oriented Development—Several elements of the plan are being implemented, including the Elm Street Road and Storm Drain Reconstruction Project; improvement of the Teal Line Bus linking Cecil and Harford Counties; and new warning devices, crosswalks, and lighting projects.

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

As described in Chapter 2, "Project Alternatives," this EA evaluates two Build Alternatives: Alternative 9A and Alternative 9B.

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[7] "Bulle Rock," http://www.lennar.com/New-Homes/Maryland/Baltimore/Havre-De-Grace/Bulle-Rock, accessed October 24, 2014.
[8] Consultation letter from Town Commissioners of Perryville, June 30, 2014.
[9] Consultation letter from Town Commissioners of Perryville, June 30, 2014.
[10] Ibid.
[11] Ibid.

PROPERTY ACQUISITIONS AND DISPLACEMENTS

Either Build Alternative would require the acquisition of all or a portion of several properties located immediately adjacent to the existing right-of-way. Property acquisitions and displacements do not include properties that are encroaching upon Amtrak's existing right-of-way.

POSSIBLE PROPERTY AQUISITION

The properties that may need to be acquired for the construction of the Build Alternatives are listed in **Table 4-3** and shown in **Figure 4-3**. Property acquisitions and displacements have been determined based on conceptual engineering (see **Appendix A**, "Alternatives Screening Report and Bridge Types"). As shown in the table and the figure, most of the acquisition required would constitute only a small portion of each affected property. Alternative 9A would require an acquisition of 2.84 acres, and Alternative 9B an acquisition of 0.35 acre. These acquisitions include the area required for embankments, retaining walls, and a 10-foot extension of the right-of-way beyond the face of retaining wall (and beyond toe-of-slope). As project designs move forward, additional properties may need to be acquired. Such additional acquisitions would need to be considered in future environmental review. The Project Team will coordinate with the potentially affected property owners to ensure that the schedule for land acquisition is consistent with the overall project schedule.

Table 4-3
Potential Land Acquisitions by Build Alternative

Property Name / Owner	Map-Grid-Parcel	Lot Number	Use	Property Size (Acres)	Acreage to be Acquired by Build Alternative	
					9A	9B
Properties in City of Havre de Grace						
Board of Education Harford County	0602-0000-0792	80/80A	Track and Athletic Fields	57.64	1.50	—
T&D Enterprises, LLC	0601-0000-0591-635-1A	82	Private Commercial Driveway	0.50	0.50	0.24
T&D Enterprises, LLC	0601-0000-0990-635-1	83	Commercial Use	0.64	0.64	0.06
Lafayette Limited Partnership	0601-0000-1580	91	Undeveloped Land—Residential	0.40	0.05	—
Mayor and City Council	0601-0000-0473	95	Jean S. Roberts Memorial Park	0.61	0.01	0.01
Warren Street			Public ROW	N/A	0.10	—
Otsego Street			Public ROW	N/A	0.004	0.004
Properties in Town of Perryville						
Private Residence	0801-0020-0157	226	Residential	0.15	0.008	0.008
Broad Street			Public ROW	N/A	0.03	0.03
Total Potential Property Acquisition					2.84	0.35
Note: See **Figure 4-3**.						

HAVRE DE GRACE PROPERTY IMPACTS FROM OPTION 9A: TWO DOUBLE-TRACK BRIDGES

RAILROAD SOUTH TO BALTIMORE — RAILROAD NORTH TO WILMINGTON

HAVRE DE GRACE PROPERTY IMPACTS FROM OPTION 9B: TWO DOUBLE-TRACK BRIDGES

Legend

EXISTING RIGHT-OF-WAY

EXISTING RAILROAD LIMITS

IMPACTS OUTSIDE AMTRAK RIGHT-OF-WAY

NEW RIVER BRIDGE LIMITS

* Since alternate access due to the loss of the driveway cannot be provided to this business, the acquisition would affect the business's ability to function as it currently does; therefore, displacement of the entire commercial parcel would be required.

not to scale

Susquehanna River Rail Bridge Project

Figure 4-3
Potential Property Impacts from Alternatives 9A and 9B

PERRYVILLE PROPERTY IMPACTS FROM OPTIONS 9A AND 9B: TWO DOUBLE-TRACK BRIDGES

Legend

	EXISTING RIGHT-OF-WAY		IMPACTS OUTSIDE AMTRAK RIGHT-OF-WAY
	EXISTING RAILROAD LIMITS		NEW RIVER BRIDGE LIMITS

N

not to scale

Susquehanna River Rail Bridge Project

Figure 4-3
Potential Property Impacts from Alternatives 9A and 9B

Alternative 9A

The 2.84 acres needed under Alternative 9A includes portions of public school parcels, one private commercial driveway, one commercial parcel, one undeveloped parcel (zoned residential), one city park parcel, right-of-way of public streets in Havre de Grace, one residential parcel, and one public street right-of-way in Perryville.

Alternative 9A would require the acquisition of a portion (1.50 acres or 2.6 percent) of the Havre de Grace Middle/High School athletic fields located along the eastern side of the right-of-way, south of Juniata Street. At its widest point, the proposed acquisition extends 35 feet outside Amtrak’s right-of-way. This width includes allowance for the track bed, overhead contact system structures, and a retaining wall. Alternative 9A may require an additional temporary construction easement to build the retaining wall. Alternative 9A would also require a 30-foot-wide maintenance easement for the Harford County Department of Public Works. Ten feet of that maintenance easement will be within the proposed acquisition. The remaining 20 feet of the needed maintenance easement (1.13 acres) will be within the school property.

Alternative 9A would require the full acquisition of the private commercial driveway associated with the National Tire & Glass Sales Inc. (T&D Enterprises, LLC), in Havre de Grace as well as a portion of the commercial parcel itself. Since alternate access due to the loss of the driveway cannot be provided to the business, the acquisition would affect the business’s ability to function as it currently does; therefore, displacement of the entire commercial parcel would be required (0.50 acre associated with the commercial driveway and 0.64 acre associated with the commercial use). A narrow strip (0.05 acre or 12.6 percent) of undeveloped land along Warren Street in Havre de Grace that is zoned residential would need to be acquired.

Approximately 0.26 acre of Jean S. Roberts Memorial Park is owned by Amtrak and leased to the City of Have de Grace. The remainder of the park (0.61 acre) is owned by the City. Because Alternative 9A would construct a new bridge on an elevated structure above Jean S. Roberts Memorial Park, the existing lease agreement of the Amtrak-owned parcel and modification of the park infrastructure would likely need to be modified. Alternative 9A would require the acquisition of a narrow strip (0.01 acre or 2.26 percent) of the City-owned portion of Jean S. Roberts Memorial Park, which would no longer be publicly accessible.

A small portion (0.10 acre) of the public street right-of-way associated with Warren Street would also need to be acquired. To address the City’s request to realign the intersection located at Otsego, Union, and Water Streets, the Proposed Project would extend the Havre de Grace abutment south towards Freedom Lane, which would require the acquisition of an additional portion of a public-street right-of-way along Otsego Street (0.004 acre).

A small portion (0.008 acre or 5.2 percent) of a private residential property in Perryville would need to be acquired. This residential acquisition would result in permanent impacts to the vegetated embankment; it would not require demolition or full acquisition of the residence. A portion of Broad Street in Perryville would also need to be acquired (0.03 acre).

In Perryville, the waterfront land at the existing bridge is owned by Amtrak, but leased to the Federal Government as part of the Veteran’s Administration (VA) hospital access road. Modifications to the existing easement would be required for the new Access Road in Perryville.

Alternative 9B

Alternative 9B would require the acquisition of approximately 0.35 acre, which include portions of one private commercial driveway, one commercial parcel, one city park parcel, one public street right-of-way in Havre de Grace, one residential parcel, and one public street right-of-way in Perryville.

Alternative 9B would require the acquisition of a portion (0.24 acre or 47.76 percent) of the private commercial driveway and 0.06 acre of the commercial use associated with the National Tire & Glass Sales Inc. (T&D Enterprises, LLC) in Havre de Grace; the private commercial driveway would be maintained and full acquisition of the property is not required.

As with Alternative 9A, Alternative 9B would construct a new bridge above Jean S. Roberts Memorial Park on an elevated structure, which would likely require the modification of the existing lease agreement on the Amtrak-owned parcel and modification of the park infrastructure. Alternative 9B would construct a new bridge west of the existing bridge, requiring modifications to the existing easement for the new west bridge in Perryville and a retaining wall. Alternative 9B would require the acquisition of a narrow strip (0.01 acre) of the City-owned portion Jean S. Roberts Memorial Park, which would no longer be accessible to the public.

To address the City's request to realign the intersection located at Otsego, Union, and Water Streets, the Proposed Project would extend the Havre de Grace abutment south towards Freedom Lane, which would require the acquisition of an additional portion of a public-street right-of-way along Otsego Street (0.004 acre).

A narrow strip (0.008 acre) of a private residential property adjacent to the railroad right-of-way along Broad Street in Perryville would need to be acquired. This acquisition would result in permanent impacts to the vegetated embankment; it would not require demolition or full acquisition of the residence. A small portion (0.03 acre) of the Broad Street public-street right-of-way would need to be acquired.

Alternative 9B may require a temporary construction easement at the Havre de Grace Middle/High School athletic fields to build a retaining wall. However, the Project Team will determine the need for this easement as project design develops.

LAND USE

Overall, the Build Alternatives would continue to use the NEC for transportation use. They would also require some widening of the right-of-way and construction of new bridges and other rail infrastructure. The land acquired for the Build Alternatives would be converted to transportation use, which would remain a compatible land use with the surrounding area. With the exception of the commercial property discussed above under Alternative 9A, any property acquisition that is required for either Build Alternative would not adversely affect the ability of remaining existing land uses to continue in their current use. Overall, the Build Alternatives would be located on or just beyond the existing right-of-way; therefore, the Build Alternatives are not expected to substantially change current land uses within the study area.

ZONING

As noted earlier, MDOT and Amtrak are not subject to local zoning regulations and no zoning designations are mapped on the existing rail right-of-way through the study area. The properties that would be acquired for each of the Build Alternatives have designated zoning under the City of Havre de Grace or the Town of Perryville that would be removed from the affected portions of the property where the land acquisitions are required.

PUBLIC POLICY

The Build Alternatives would be consistent with local, regional, and statewide planning. The Susquehanna River Rail Bridge is generally consistent with Maryland's Smart Growth Initiative, as the Proposed Project would improve mobility and minimize adverse land use impacts. As discussed above, the vast majority of the study area is within Priority Funding Areas (PFA). However, any proposed project with greater than five percent located outside of the PFA boundary requires a project exception from MDP. The Project Team met with the Smart Growth and Neighborhood Conservation Coordinating Committee on March 9, 2016. Based on this meeting, the Committee voted to approve this exception to the PFA requirements due to it being a growth-related project involving a commercial or industrial activity, which, due to its operational or physical characteristic, must be located away from development (per §5-7B-06(a)(iii)3.).

The Build Alternatives are also generally consistent with the Harford County *2012 Master Plan and Land Use Element Plan,* the City of Havre de Grace *2004 Comprehensive Plan,* the Cecil County *2010 Comprehensive Plan,* the Town of Perryville *2010 Comprehensive Plan,* the Town of Perryville 2012 *Transit-Oriented Development Plan*, and the *2000 Lower Susquehanna Heritage Greenway Management Plan* through promoting environmental sustainability and providing a safe and efficient transportation system that will improve mobility for freight rail users, commuter rail users, and marine navigation as well as provide for future travel demand. Therefore, the Proposed Project would be compatible and consistent with current policies that govern the project site and study area.

COMMUNITY FACILITIES

ALTERNATIVE 9A

Alternative 9A would require the acquisition of a narrow strip of the Havre de Grace Middle/High School athletic fields. The Havre de Grace Middle/High School athletic fields are a part of a larger community facility complex, including the Havre de Grace Middle School, High School, track and athletic fields, and activity center. Impacts to this location are discussed in Chapter 6, "Parks, Trails, and Recreational Resources."

ALTERNATIVE 9B

Alternative 9B would not require the acquisition of the Havre de Grace Middle/High School athletic fields and would not result in adverse effects on community facilities.

F. MINIMIZATION AND MITIGATION OF IMPACTS

PROPERTY ACQUISITIONS AND DISPLACEMENTS

The Project Team has begun outreach to affected owners and businesses and will continue to coordinate with the affected property owners and tenants to avoid or minimize property acquisitions and displacements. The public, including property owners, has been provided opportunities to offer input on alignment of the Proposed Project through the Project's extensive public involvement program. This participation led to the elimination of certain alignment alternatives that required greater property acquisition. Property acquisitions and displacements will adhere with the Uniform Act and all applicable Maryland State laws. Where full property acquisition is required, Amtrak and MDOT will fairly compensate the owners of properties for the land acquired and will provide relocation assistance to businesses to facilitate their reestablishment elsewhere, should this be necessary.

LAND USE, ZONING, PUBLIC POLICY, AND COMMUNITY FACILITIES

The Project Team worked throughout the alternatives development process to address public input by refining the alignment alternatives. Alternatives 9A and Alternative 9B incorporate measures to minimize impacts to land use, zoning, public policy, and community facilities and generally follow the existing transportation corridor, thereby avoiding any substantial changes to existing land use. The Project Team will continue to ensure the Proposed Project's compatibility with other planned developments and continue to coordinate with the communities and stakeholders to avoid or minimize negative land use effects.

Overall, no long-term significant adverse impacts to land use, zoning, public policy, or community facilities are expected from the Proposed Project. ✷

Chapter 5: Socioeconomic Conditions and Environmental Justice

A. INTRODUCTION

This chapter describes existing socioeconomic conditions within the study area for the Proposed Project and discusses potential environmental impacts that could result from the implementation of the Proposed Project as compared with the No Action Alternative. This chapter also includes an environmental justice analysis to identify and address any disproportionate and adverse impacts on minority or low-income populations that could result from the Proposed Project. As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. FRA selected Alternative 9A as the Preferred Alternative.

B. REGULATORY CONTEXT AND METHODOLOGY

SOCIOECONOMIC CONDITIONS

REGULATORY CONTEXT

Following the Federal Railroad Administration's (FRA) procedures,[1] environmental reviews consider a proposed project's potential to impact the socioeconomic environment—including available jobs, community disruption or cohesion, demographic shifts, and the need for and availability of relocation housing. An environmental review also considers the potential impacts on existing businesses and local government services and revenues.

METHODOLOGY

This analysis uses the guidance set forth in the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR §§ 1500-1508). The Project Team collected socioeconomic data for Harford and Cecil counties as a whole, as well as within the City of Havre de Grace and Town of Perryville limits. More specific data for the analysis were collected within the project study area and census block group boundaries (see **Figure 5-1**). In addition to the master plans and comprehensive plans referenced in Chapter 4, "Land Use and Community Facilities," the following data sources provided useful information in understanding existing conditions and likely trends: U.S. Census Bureau; American Community Survey (ACS) Data; Maryland Department of Labor, Licensing and Regulation; and site visits.

U.S. Census block group data (2010) were used. As outlined in **Table 5-1**, census block groups within or intersecting the 1,000 feet boundary on either side of the current rail right-of-way were included in this analysis. The census block groups that encompass the study area are listed in

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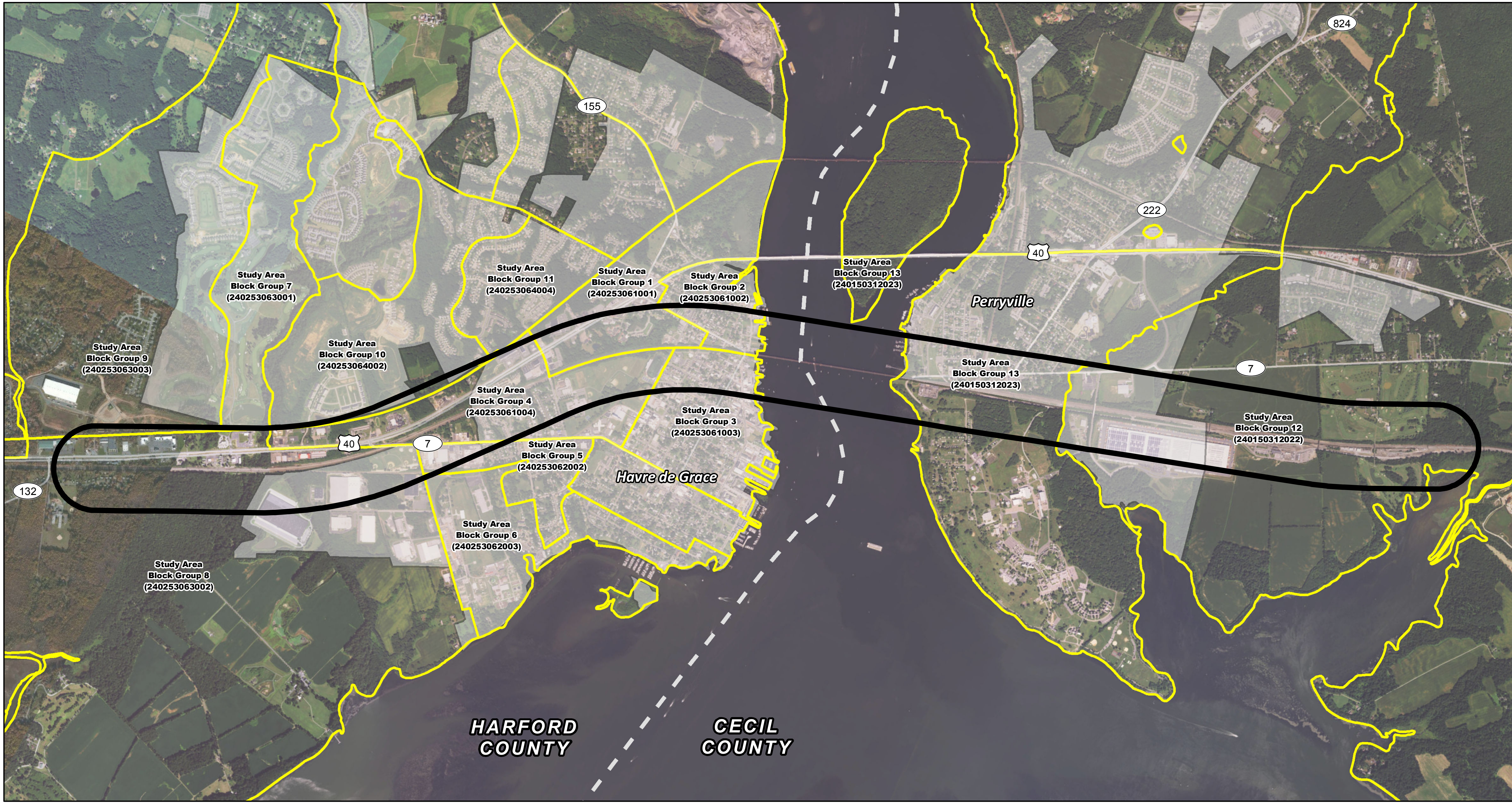
[1] FRA's Procedures for Considering Environmental Impacts (64 Federal Register [FR] 28545 [May 26, 1999]). http://www.fra.dot.gov/eLib/details/L02561, accessed September 2014.



Legend

1,000 ft Study Area | Census Block Groups | City/Town Boundaries | County Boundary

Data Sources

Census Block Groups:
U.S. Census Bureau, TIGER Line Shapefiles, 2010
Town Boundaries:
Maryland Department of Planning, 2006

0 0.25 0.5 Miles

Susquehanna River Rail Bridge Project

Figure 5-1

Census Block Groups

Table 5-1 and depicted on **Figure 5-1**. These census block groups have been renamed with "Block Group" and a number for easier reference.

Table 5-1
Study Area Census Block Groups

2010 Census Block Group Designation	Study Area Reference Name
Harford County Census Block Groups	
240253061001	Block Group 1
240253061002	Block Group 2
240253061003	Block Group 3
240253061004	Block Group 4
240253062002	Block Group 5
240253062003	Block Group 6
240253063001	Block Group 7
240253063002	Block Group 8
240253063003	Block Group 9
240253064002	Block Group 10
240253064004	Block Group 11
Cecil County Census Block Groups	
240150312022	Block Group 12
240150312023	Block Group 13

ENVIRONMENTAL JUSTICE

REGULATORY CONTEXT

In accordance with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), this environmental justice analysis identifies and addresses any disproportionate and adverse impacts on minority or low-income populations that lie within the study area for the Proposed Project. Executive Order 12898 also requires federal agencies to work to ensure greater public participation in the decision-making process.

The environmental justice analysis for the Proposed Project follows the guidance and methodologies recommended in the U.S. Department of Transportation's Final Order on Environmental Justice (updated May 2, 2012), Federal Transit Administration's (FTA) Circular 4703.1 *Environmental Justice Policy Guidance For Federal Transit Administration Recipients*, and principles set forth in Title VI of the Civil Rights Act of 1964 (Title VI). For context, CEQ's *Environmental Justice Guidance under the National Environmental Policy Act* (December 1997) is described below. However, because FTA is a cooperating agency for the Proposed Project and FTA's circular is more inclusive, this analysis of environmental justice has been prepared in accordance with FTA's Circular 4703.1.

USDOT'S Final Order on Environmental Justice

USDOT Order 5610.2(a) Final Order on Environmental Justice (May 2, 2012) establishes the procedures for USDOT to use in complying with Executive Order 12898. The order applies to all of USDOT's operating administrations, including FRA. Following the procedures set forth in Executive Order 12898, the consideration of environmental justice begins with a determination of whether the project will have an adverse impact on minority and low-income populations and whether that adverse impact will be disproportionately high. Disproportionately high and adverse effects on minority and low-income populations are adverse effects that are predominantly borne by a minority population and/or low-income population or that are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the non-minority or non-low-income population. In making determinations regarding disproportionately high and adverse effects, the federal agency may take into account the mitigation and enhancement measures that it will implement and all offsetting benefits to the affected minority and low-income populations, as well as the design, comparative impacts, and relevant number of similar existing system elements in non-minority and non-low-income areas.

Federal agencies must ensure that they only carry out a project having a disproportionately high and adverse effect on minority populations or low-income populations if (1) further mitigation measures or alternatives that will avoid or reduce the disproportionate effect are not practicable; and (2) a substantial need for the program, policy, or activity exists, based on the overall public interest, and alternatives that will have fewer adverse effects will either have other impacts that will be more severe, or will involve increased costs of extraordinary magnitude.

CEQ Guidance

CEQ, which has oversight of the federal government's compliance with Executive Order 12898 and the National Environmental Policy Act (NEPA), developed guidance to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. Federal agencies are permitted to supplement this guidance with more specific procedures tailored to their particular programs or activities, as USDOT has done.

CEQ guidance establishes the following thresholds in identifying low-income and minority populations. Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty. Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Therefore, CEQ guidance limits the analysis of environmental justice to census blocks that exceed these thresholds.

FTA Circular 4703.1

On August 15, 2012, FTA released guidance in compliance with Executive 12898 and USDOT Order 5610.2(a) on how to fully engage environmental justice populations in the public transportation decision-making process; how to determine whether environmental justice populations would be subjected to disproportionately high and adverse human health or environmental effects as a result of a transportation plan, project, or activity; and how to avoid, minimize, or mitigate these effects.

Following FTA guidance, the consideration of environmental justice begins with obtaining an understanding of the socioeconomic conditions of the surrounding community and developing a public engagement plan that promotes meaningful public involvement with environmental justice populations throughout the NEPA process. Determinations of disproportionately high and adverse effects include taking into consideration mitigation and enhancement measures that will be incorporated into the project.

FTA guidance does not set thresholds to limit the analysis to populations that exceed a certain proportion. Instead, this guidance states, “Disproportionately high and adverse effects, not population size, are the bases for environmental justice. A very small minority or low-income population in the project, study, or planning area does not eliminate the possibility of a disproportionately high and adverse effect on these populations.” Overall, under NEPA, the potential for disproportionately high and adverse effects on minority and/or low-income populations should be one of the factors the federal agency considers in making its finding on a project and issuing a Finding of No Significant Impact (FONSI) or a Record of Decision (ROD).

METHODOLOGY

As discussed above and shown in **Table 5-1**, the environmental justice analysis used the same study area as the socioeconomic analysis. Therefore, U.S. Census block groups within or intersecting the 1,000 feet boundary on either side of the current rail right-of-way were included in the environmental justice analysis. Using U.S. Census Bureau and ACS data, minority and low-income populations were identified for each census block group within the study area.

The FTA guidance defines minority population as persons who are American Indian and Alaska Native, Asian, Black or African American, Hispanic or Latino, and Native Hawaiian and other Pacific Islander.

FTA guidance defines “low income” as a person (of any race) whose household income (or in the case of a community or group, whose median household income) is at or below the U.S. Department of Health and Human Services (USDHHS) poverty guidelines. The 2016 USDHHS poverty threshold is $24,300 for a family of four. FTA also encourages the use of local poverty threshold or a percentage of median income for the area, provided that the threshold is at least as inclusive as the USDHHS poverty guidelines. Because USDHHS data is not available below the state level, this analysis uses instead the information on individuals in households below the poverty level as defined by the U.S. Census. The Project Team used the poverty rate in each census block group, as estimated in the 2011-2015 American Community Survey 5-Year Estimates, to identify low-income populations.

The Project Team examined the demographic information to determine how potential impacts and benefits to the total population would affect the environmental justice populations. Finally, the Project Team made a determination whether or not the project would have disproportionately high and adverse impacts on these populations in the study area. Based on FTA guidance, questions to consider when determining if disproportionately high and adverse impacts would occur include whether:

- Adverse effects on environmental justice populations exceed those borne by non-environmental justice populations.
- Cumulative or indirect effects would adversely affect an environmental justice population.
- Mitigation and enhancement measures will be taken for environmental justice and non-environmental justice populations.
- Off-setting benefits exist for environmental justice populations compared to non-environmental justice populations.

C. AFFECTED ENVIRONMENT

POPULATION

The Project Team analyzed population statistics for Harford County, Cecil County, the City of Havre de Grace, and the Town of Perryville. **Table 5-2** shows current and projected population statistics. All four localities experienced an increase in population from 2000 to 2010. Based on U.S. Census data from 2000 and 2010, the populations of Harford County and Cecil County increased by 12 percent and 17.6 percent, respectively. In the same period, the population of the City of Havre de Grace and the Town of Perryville increased by 14.3 percent and 18.8 percent, respectively. The Maryland Department of Planning (MDP) anticipates that these localities will increase in population from 2010 through 2020. As of January 2015, MDP predicts that between 2010 and 2020, the population of Harford County will increase by 5.6 percent and the population of Cecil County will increase 7.4 percent.[2]

Table 5-2
Population Trends

Location	Population in 2000	Population in 2010	Change from 2000 to 2010 (in percent)	Projected Population in 2020	Predicted change from 2010 to 2020 (in percent)
Harford County	218,590	244,826	12.0	258,650	5.6
Cecil County	85,951	101,108	17.6	108,600	7.4
City of Havre de Grace	11,331	12,952	14.3	*N/A	*N/A
Town of Perryville	3,672	4,361	18.8	*N/A	*N/A

Sources: 2000 Census Profile; 2010 Census Profile; MDP Maryland State Data Center.
*N/A = data not available

Table 5-3 shows the data gathered for households and housing units in Harford County, Cecil County, the City of Havre de Grace and the Town of Perryville. The number of total households increased between 2000 to 2010 by 13.2 percent in Harford County, 18.1 percent in Cecil County, 15.4 percent in the City of Havre de Grace and 22.1 percent in the Town of Perryville. Housing units also increased between 2000 to 2010, at a rate of 14.9 percent in Harford County, 19.3 percent in Cecil County, 19.8 percent in the City of Havre de Grace and 30.0 percent in the Town of Perryville.

[2] MDP Maryland State Data Center, http://www.mdp.state.md.us/msdc/, accessed October 2016.

Table 5-3
Household & Housing Unit Trends

Location	Households in 2000	Households in 2010	Percent Change from 2000 to 2010	Housing Units in 2000	Housing Units in 2010	Percent Change from 2000 to 2010
Harford County	79,667	90,218	13.2	83,146	95,554	14.9
Cecil County	31,223	36,867	18.1	34,461	41,103	19.3
City of Havre de Grace	4,557	5,258	15.4	4,904	5,875	19.8
Town of Perryville	1,443	1,762	22.1	1,507	1,959	30.0
Sources: 2000 Census Profile; 2010 Census Profile.						

EMPLOYMENT CHARACTERISTICS

According to 2011-2015 American Community Survey 5-Year Estimates, the national unemployment rate is 8.3 percent, while the State of Maryland is 7.4 percent. The unemployment rate for Harford County is below the national and State unemployment rates at 6.4 percent. The unemployment rate in Cecil County (7.5 percent) is higher than the State unemployment rate, but lower than the national unemployment rate. The unemployment rate in Havre de Grace (9.8 percent) is above the national and State unemployment rates. The Town of Perryville, at 13.0 percent, has the highest unemployment rate of the four localities and is also above the national and State unemployment rates.

Based on 2011-2015 American Community Survey 5-Year Estimates, primary occupations of residents in Harford County, Cecil County, City of Havre de Grace, and Perryville include educational services, healthcare and social assistance; retail trade; professional, scientific, management, and administrative and waste management services; manufacturing, construction; arts, entertainment, and recreation, and accommodation and food services; and public administration. Educational services, health care and social assistance have the highest percentage of employees in the four localities. Major employers for Harford County and Cecil County are listed in **Table 5-4**.

AGE AND GENDER DISTRIBUTION

According to the 2010 U.S. Census, the percentage of the population over the age of 65 is 12.5 percent in Harford County, 11.7 percent in Cecil County, 13.9 percent in the City of Havre de Grace, and 12.5 percent in the Town of Perryville. The study area totals for the 0 to 19, 20 to 44, and 45 to 64 age groups are very similar to the totals for the localities, however, the percentage for persons over the age of 65 (14.5 percent) is higher in the study area than in the four localities. According to 2010 U.S. Census data, the largest age group for Harford County and Cecil County is 20 to 44, while the largest age group for both the City of Havre de Grace and the Town of Perryville is 45 to 64. Males and females are fairly evenly distributed throughout the localities (Harford County, Cecil County, City of Havre de Grace and the Town of Perryville) and the study area.

Table 5-4
Major Employers

Harford County	Cecil County
Kohl's	Union Hospital
Rite Aid	W.L. Gore and Associates
Upper Chesapeake Health Systems	Walmart
Jacob's Technology	Ikea Distribution Services
Shoprite – Klein's Tower Plaza	Terumo Medical Corporation

Sources: Maryland Department of Labor, Licensing and Regulation (DLLR); Hartford County Office of Business and Economic Development; Maryland Department of Business and Economic Development.

RACIAL AND ETHNIC CHARACTERISTICS

According to the 2010 U.S. Census, and outlined in **Table 5-5**, the predominant race within Harford County, Cecil County, the City of Havre de Grace, the Town of Perryville, and the study area is White. Harford County is 81.2 percent White and 18.8 percent minority. Of the minorities in Harford County, the largest portion of the population is Black or African American (12.7 percent). Cecil County is 89.2 percent White, and 10.8 percent minority. Of the minorities in Cecil County, the largest portion of the population is Black or African American (6.2 percent). The City of Havre de Grace is 75.7 percent White, and 24.4 percent minority. Of the minorities within the City of Havre de Grace, the largest portion is Black or African American (16.8 percent). The Town of Perryville is 84.6 percent White, and 15.4 percent minority. Of the minorities in the Town of Perryville, the largest portion is Black or African American (9.6 percent). The study area is 75.3 percent White, and 24.8 percent minority, of which the largest portion is Black or African American (17.4 percent).

Populations of Hispanic origin are outlined in **Table 5-5**. Harford County has a population of Hispanic origin of 8,613 persons or 3.5 percent. Cecil County has a population of Hispanic origin of 3,407 persons or 3.4 percent. The City of Havre de Grace has a population of Hispanic origin of 608 persons or 4.7 percent. The Town of Perryville has a population of Hispanic origin of 181 persons or 4.2 percent. The study area has a population of 608 persons of Hispanic Origin or 4.5 percent.

Table 5-5 also outlines racial and ethnic characteristics for the census block groups. Most census block groups follow the same trend and racial distribution as the localities listed above. Two census block groups have a total minority population greater than 50 percent. Block Group 1 in Harford County has a total minority population of 55.6 percent and Block Group 4, also in Harford County, has a total minority population of 55.3 percent. Of the minorities in these two census block groups, Black or African American populations are the largest at 45.5 percent for Block Group 1 and 43.2 percent for Block Group 4. Block Group 4 is predominately contained within the study area boundaries, whereas Block Group 1 only has a small portion of population located within the boundaries, as highlighted on **Figure 5-1**.

Table 5-5
Population, Race, and Ethnicity

Location/ Census Block Groups	Total	White Alone*	Black or African American Alone*	American Indian and Alaska Native Alone*	Asian Alone*	Native Hawaiian and Other Pacific Islander Alone*	Some Other Race Alone*	Two or More Races*	Total Minority *	Population of Hispanic Origin
State of Maryland	5,773,552	3,359,284	1,700,298	20,420	318,853	3,157	206,832	164,708	2,414,268	470,632
		58.2%	29.4%	0.4%	5.5%	0.1%	3.6%	2.9%	41.8%	8.2%
Harford County Maryland	244,826	198,763	31,058	614	5,826	199	2,318	6,048	46,063	8,613
		81.2%	12.7%	0.3%	2.4%	0.1%	0.9%	2.5%	18.8%	3.5%
Cecil County Maryland	101,108	90,189	6,284	294	1,097	48	1,019	2,177	10,919	3,407
		89.2%	6.2%	0.3%	1.1%	0.0%	1.0%	2.2%	10.8%	3.4%
City of Havre de Grace Maryland	12,952	9,809	2,170	36	310	14	137	476	3,143	608
		75.7%	16.8%	0.3%	2.4%	0.1%	1.1%	3.7%	24.4%	4.7%
Town of Perryville Maryland	4,361	3,689	420	19	57	6	43	127	672	181
		84.6%	9.6%	0.4%	1.3%	0.1%	1.0%	2.9%	15.4%	4.2%
Block Group 1 Harford County	640	284	291	3	11	0	5	46	356	20
		44.4%	45.5%	0.5%	1.7%	0.0%	0.8%	7.2%	55.6%	3.1%
Block Group 2 Harford County	749	568	135	0	11	0	8	27	181	40
		75.8%	18.0%	0.0%	1.5%	0.0%	1.1%	3.6%	24.2%	5.3%
Block Group 3 Harford County	2,046	1,625	290	2	22	2	28	77	421	105
		79.4%	14.2%	0.1%	1.1%	0.1%	1.4%	3.8%	20.6%	5.1%
Block Group 4 Harford County	590	264	255	0	1	0	24	46	326	60
		44.7%	43.2%	0.0%	0.2%	0.0%	4.1%	7.8%	55.3%	10.2%
Block Group 5 Harford County	638	533	65	0	7	0	8	25	105	49
		83.5%	10.2%	0.0%	1.1%	0.0%	1.3%	3.9%	16.5%	7.7%
Block Group 6 Harford County	550	467	49	3	7	0	6	18	83	19
		84.9%	8.9%	0.5%	1.3%	0.0%	1.1%	3.3%	15.1%	3.5%
Block Group 7 Harford County	650	516	70	1	28	0	10	25	134	38
		79.4%	10.8%	0.2%	4.3%	0.0%	1.5%	3.8%	20.6%	5.8%

Table 5-5 (Cont'd)
Population, Race, and Ethnicity

Location/ Census Block Groups	Total	White Alone*	Black or African American Alone*	American Indian and Alaska Native Alone*	Asian Alone*	Native Hawaiian and Other Pacific Islander Alone*	Some Other Race Alone*	Two or More Races*	Total Minority *	Population of Hispanic Origin
Block Group 8 Harford County	400	300	66	10	4	0	0	20	100	8
		75.0%	16.5%	2.5%	1.0%	0.0%	0.0%	5.0%	25.0%	2.0%
Block Group 9 Harford County	1323	965	249	0	51	2	13	43	358	33
		72.9%	18.8%	0.0%	3.9%	0.2%	1.0%	3.3%	27.1%	2.5%
Block Group 10 Harford County	1,065	781	198	3	34	3	11	35	284	64
		73.3%	18.6%	0.3%	3.2%	0.3%	1.0%	3.3%	26.7%	6.0%
Block Group 11 Harford County	1,608	1,229	257	5	46	5	7	59	379	55
		76.4%	16.0%	0.3%	2.9%	0.3%	0.4%	3.7%	23.6%	3.4%
Block Group 12 Cecil County	1154	962	112	7	26	5	9	33	192	31
		83.4%	9.7%	0.6%	2.3%	0.4%	0.8%	2.9%	16.6%	2.7%
Block Group 13 Cecil County	2,232	1,768	338	17	17	4	31	57	464	86
		79.2%	15.1%	0.8%	0.8%	0.2%	1.4%	2.6%	20.8%	3.9%
STUDY AREA TOTALS	13,645	10,272	2,377	51	265	21	160	512	3,386	608
		75.3%	17.4%	0.4%	1.9%	0.2%	1.2%	3.7%	24.8%	4.5%

Notes: *Racial categories were defined in accordance with the U.S. Census Bureau. Data includes Hispanic and non-Hispanic populations.
Sources: 2010 Census Profile.

INCOME

Based on 2011-2015 American Community Survey 5-Year Estimates, the median household income of Harford County is greater than the State of Maryland's median household income of $74,551, while Cecil County, the City of Havre de Grace and the Town of Perryville had lower median household incomes than the State (see **Table 5-6**). The study area median household income is $64,919, which is similar to the median household income of Cecil County, the City of Havre de Grace, and the Town of Perryville, but lower than the State of Maryland and Harford County. The study area census block groups have high and low outliers for median household income. Block Groups 7, 9, and 10 have median household incomes higher than $90,000, while Block Groups 3, 5, 8, and 12 all have median household incomes lower than $50,000.

Table 5-6
Median Household Income and Individuals Below Poverty Level

Location/Census Block Group	Median Household Income	Individuals Below Poverty Level (%)
State of Maryland	$74,551	10.0%
Harford County	$80,456	8.0%
Cecil County	$66,396	10.1%
City of Havre de Grace	$67,813	11.1%
Town of Perryville	$62,963	7.3%
Block Group 1, Harford County	$65,208[1]	36.3%
Block Group 2, Harford County	$52,452	21.7%
Block Group 3, Harford County	$45,197	20.2%
Block Group 4, Harford County	$68,696	29.1%
Block Group 5, Harford County	$34,183	14.6%
Block Group 6, Harford County	$75,625	13.4%
Block Group 7, Harford County	$101,000	0.0%
Block Group 8, Harford County	$34,500	16.6%
Block Group 9, Harford County	$114,750	0.9%
Block Group 10, Harford County	$92,273	0.0%
Block Group 11, Harford County	$61,797	0.0%
Block Group 12, Cecil County	$43,892	9.4%
Block Group 13, Cecil County	$54,375	12.3%
Study Area	$64,919	13.4%

Notes: [1] All information presented in this table is from the 2011-2015 American Community Survey 5-Year Estimates; however, the median household income for Block Group 1 was not available in this dataset and instead the 2010-2014 American Community 5-Year Estimates was used.

Sources: **2011-2015** American Community Survey 5-Year Estimates; **2010-2014** American Community Survey 5-Year Estimates

Based on 2011-2015 American Community Survey 5-Year Estimates, the poverty rate for each census block group has been identified (see **Table 5-6**). Harford County and the Town of Perryville have a lower poverty rate compared to the State of Maryland, while Cecil County, the City of Havre de Grace have higher poverty rates than the State. All census block groups have a poverty rate below 50 percent. Block Groups 7, 10, and 11 do not have individuals below the poverty rate. Block Groups 1, 2, 3, and 4 have the highest poverty rates at 36.3 percent, 21.7 percent, 20.2 percent, and 29.1 percent, respectively. The Lafayette Senior Housing Facility is located at 515 Warren Street in Block Group 3. The Lafayette Senior Housing Facility contains 15 units of affordable housing to the elderly and accepts Section 8 vouchers, which are part of a federal government program to assist very low-income families, the elderly, and the disabled to afford decent, safe, and sanitary housing.

D. NO ACTION ALTERNATIVE

The No Action Alternative assumes the Susquehanna River Rail Bridge would remain in service as in existing conditions, with no intervention besides minimal repairs and continuation of the current maintenance regime. The No Action Alternative will not include any changes to the existing track configuration. Service over the bridge would bridge is already speed-restricted to 90 mph due to the age and deteriorated condition of the bridge, and would continue to worsen in the future and the bridge would continue to age, potentially requiring stricter speed and weight restrictions that will further impact the movement of passengers and freight. Cost associated with bridge maintenance would continue to increase over time. Maintenance problems would occur more frequently, and the bridge would remain as a bottleneck; it would eventually need to be taken out of service. Without the bridge, local, regional and national rail networks would be disrupted with resultant detrimental effects on the economic activity, including those in Havre de Grace and Perryville to some extent. Developments expected to be completed regardless of the Proposed Project, as described in Chapter 4, "Land Use and Community Facilities," could possibly affect population, economic characteristics, age and gender distribution, racial and ethnic characteristics, and income of the surrounding area.

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

The Proposed Project would ensure continued rail connectivity along the NEC, and would provide benefits to local and regional commuter and freight operations in terms of improved operational mobility and safety.

SOCIOECONOMIC CONDITIONS

Alternative 9A would require the full acquisition of one commercial use associated with the National Tire & Glass Sales Inc., in Havre de Grace. The owners of this property would be fully compensated and the business would be provided relocation assistance to facilitate their reestablishment in another appropriate location. Since the business would be relocated, it is not expected that any jobs would be lost as a result of Alternative 9A. The Project Team will obtain additional information about this business as the project proceeds. Acquisition of any properties for the Build Alternatives would remove these property taxes from the tax roll. These acquisitions could affect the property taxes paid at each parcel, although since the amount of acquisition necessary would be small, this effect would not be substantial.

No other commercial or residential properties would be fully displaced within the study area by either Alternative 9A or Alternative 9B. Alternative 9B would require the acquisition of a portion of the private commercial driveway and of the commercial use associated with the National Tire & Glass Sales Inc. in Havre de Grace; however, the private commercial driveway would be maintained and full acquisition of the property is not required. The Build Alternatives would not affect the population or housing supply of the area and would not spur rapid population growth or development. There is no anticipated project-related effect on long-term population or workforce characteristics in Harford or Cecil County. Thus, the Proposed Project would not alter the demographic profile described above. Overall, the Proposed Project would improve conditions in the surrounding communities by ensuring improved mobility across the Susquehanna River Rail Bridge for freight rail, passenger rail, and marine users. Therefore, the Proposed Project would not adversely affect socioeconomic conditions, employment, or community cohesion.

MINORITY AND LOW-INCOME POPULATIONS

As described in each respective chapter, no adverse impact would result from the Proposed Project with regards to transportation; parks, trails, and recreational resources; air quality; greenhouse gases; noise and vibration; public health; indirect and cumulative effects; and commitment of resources, and therefore would not have the potential to result in disproportionately high and adverse effects on environmental justice populations. The remaining areas have the potential to result in an adverse effect and therefore have the potential to result in disproportionately high and adverse effects on environmental justice populations within the study area. These technical areas have been described in more detail below.

As described in Chapter 4, "Land Use and Community Facilities," while the Proposed Project would not result in significant adverse impacts to land use, zoning and public policy, the Proposed Project would require property acquisitions associated with up to nine properties. The parks and public street right-of-ways that would be acquired by the Proposed Project are utilized by a broad spectrum of the study area population, regardless of race, ethnicity, or socioeconomic status and therefore these acquisitions would not disproportionately impact low-income and minority populations. As described above, Alternative 9A would require the full acquisition of one commercial use associated with the National Tire & Glass Sales Inc., in Havre de Grace. The owners of this property would be fully compensated and the business would be provided relocation assistance to facilitate their reestablishment in another appropriate location. Alternative 9B would require the acquisition of a portion of the private commercial driveway and of the commercial use associated with the National Tire & Glass Sales Inc. in Havre de Grace; the private commercial driveway would be maintained and full acquisition of the property is not required. Alternative 9A and Alternative 9B would require the acquisition of a narrow strip of private residential property. All property acquisitions and displacements will adhere with the Uniform Act and all applicable Maryland State laws. Where full property acquisition is required, Amtrak and MDOT will fairly compensate the owners of properties for the land acquired and will provide relocation assistance to businesses to facilitate their reestablishment elsewhere, should this be necessary. As part of the project sponsors' efforts to minimize impacts, the Project Team eliminated those alternatives that would require acquisition of the Lafayette Senior Housing Facility. Overall, property acquisitions associated with the Proposed Project would not disproportionately impact low-income and minority populations.

As described in Chapter 7, "Visual Resources," there is the potential for effects on the overall visual and aesthetic qualities of the study area depending on the viewer's location. In addition, the Project Team identified site specific visual effects for views from waterfront open space areas, the Havre de Grace Historic District, Rodgers Tavern, views of the Perryville Railroad Complex for rail passengers, and the undergrade bridges. However, the chapter describes several ways to avoid or minimize these effects. Since the potential for visual adverse effects are dispersed throughout the study area and some minimization or mitigation measures are possible, the visual effects associated with the Proposed Project would not disproportionately impact low-income and minority population.

The Proposed Project has the potential to result in an adverse effect on four historic architectural resources—the Susquehanna River Rail Bridge and Overpasses, the Havre de Grace Historic District, Rodgers Tavern, and Perryville Railroad Station; however, as detailed in Chapter 8, "Historic Resources," there are ways to avoid or minimize some of these effects. Because certain adverse effects cannot be totally avoided, FRA/MDOT has sought suggestions from the consulting parties and the public on potential ways to mitigate the adverse effects and these mitigation measures are detailed in the chapter. Overall, in addition to the consideration of possible minimization or mitigation measures, since these historic architectural resources do not primarily serve environmental justice populations (nor are they concentrated in low-income or minority neighborhoods), the historic effects associated with the Proposed Project would not disproportionately impact low-income and minority population.

As described in Chapter 9, "Section 4(f) Resources," the Proposed Project would result in the use of several Section 4(f) resources. Considering the measures to minimize harm and that these resources are utilized by a broad spectrum of the study area population, regardless of race, ethnicity, or socioeconomic status, the use of these Section 4(f) resources would not disproportionately impact low-income and minority populations.

Similarly, as described in Chapter 10, "Section 6(f) Resources," the Proposed Project would result in the use of a Section 6(f) resource—the Havre de Grave High School and Middle School Athletic Fields. Taking into account the measures to minimize harm and that this resource is utilized by a broad spectrum of the study area population, regardless of race, ethnicity, or socioeconomic status, the use of this Section 6(f) resource would not disproportionately impact low-income and minority populations.

As described in more detail in Chapter 11, "Natural Resources," the Proposed Project has the potential to result in impacts to floodplains, wetlands, streams, forest resources, Chesapeake Bay Critical Area, aquatic biota, and submerged aquatic vegetation. Overall, impacts to these natural resources are dispersed throughout the study area and Amtrak and MDOT will undertake appropriate mitigation and minimization measures. Therefore, the natural resource impacts associated with the Proposed Project would not disproportionately impact low-income and minority population.

As described in Chapter 15, "Contaminated and Hazardous Materials," construction of the Proposed Project would involve demolition, relocation or other disturbance of existing structures and excavation, relocation and potentially off-site disposal of some existing soil. The presence of contaminated materials only presents a threat to human health if exposure to these materials occurs. To prevent such exposure pathways and doses during construction, the Proposed Project would include appropriate health and safety and investigative/remedial measures. With the implementation of these measures, no significant adverse impacts related to hazardous materials would result either during the demolition and construction activities associated with the Proposed Project or during operation of the Proposed Project and therefore the Proposed Project would not disproportionately impact low-income and minority population.

As described in Chapter 17, "Construction," construction of the Proposed Project may have effects on bus service, mariners, adjacent historic resources, and air quality. However, the effects on bus service and mariners would be temporary. In addition, efforts would be made to undertake a large portion of the required construction activities outside of the recreational boating season, during the winter months, which would further reduce impacts to navigation. In order to avoid accidental damage to adjacent historic resources as a result of construction activities associated with the Proposed Project, a Construction Protection Plan (CPP) would be developed in consultation with SHPO for all historic properties that may be subject to inadvertent damage resulting from construction activities. The potential for adverse air quality impacts during construction of the Build Alternatives would be reduced to the extent practicable using the strategies listed in the chapter that would be specified in construction contracts. Therefore, construction effects would be temporary and have been minimized to the extent practicable. In addition, construction would occur along the entire study area corridor and the adverse effects on environmental justice populations would not exceed those borne by non-environmental justice populations.

Overall, the Proposed Project would not result in any disproportionately high and adverse effects on minority or low-income populations.

F. MINIMIZATION AND MITIGATION OF IMPACTS

SOCIOECONOMIC CONDITIONS

The Project Team has worked diligently to avoid and minimize property acquisition and displacement throughout the environmental review process. The Project Team eliminated conceptual alternatives requiring greater property acquisitions during the alternatives screening process, as discussed in **Appendix A,** "Alternatives Screening Report and Bridge Types."

MINORITY AND LOW-INCOME POPULATIONS

As explained above, the Proposed Project would not result in any disproportionately high and adverse effects on minority and low-income populations. Therefore, no mitigation for environmental justice impacts is required.

G. PUBLIC PARTICIPATION

Executive Order 12898 requires federal agencies to work to ensure greater public participation in the decision-making process. FTA guidance suggests that public engagement should be designed to eliminate barriers to meaningful participation by all members of the community. Similarly, the USDOT's Final Order on Environmental Justice indicates that project sponsors should seek public involvement opportunities, including soliciting input from affected minority and low-income populations in considering alternatives.

The Project Team has engaged in a robust public and community outreach effort as part of the Proposed Project. As described in Chapter 20, "Coordination and Consultation," FRA and MDOT prepared an Agency Coordination and Public Involvement Plan during the early phases of the Proposed Project. Numerous public meetings have been held throughout the environmental process at project milestones. Throughout the alternatives decision-making process and environmental review process, the Project Team encouraged environmental justice communities to attend and participate in public outreach information sessions. The Project Team made concerted efforts to engage potential minority and low-income populations, including performing targeted outreach and posting of information regarding public meetings in local businesses and community centers. To solicit participation from minority populations, the Project Team posted extra invitations to these public meetings in community facilities within census blocks of concern (in addition to direct mailings and email blasts). Public meeting invitations were partially translated into Spanish and translation services were offered. ✷

A. INTRODUCTION

This chapter inventories existing and recreational areas within or intersecting a 1,000-foot boundary on any side of the current rail right-of-way, as depicted on **Figure 6-1**, and discusses proposed parks, trails, and recreational spaces in the area and analyzes potential environmental impacts that could result from the implementation of the Proposed Project as compared with the No Action Alternative. As discussed in Chapter 2, “Project Alternatives,” this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. FRA has selected Alternative 9A as the Preferred Alternative.

B. REGULATORY CONTEXT AND METHODOLOGY

REGULATORY CONTEXT

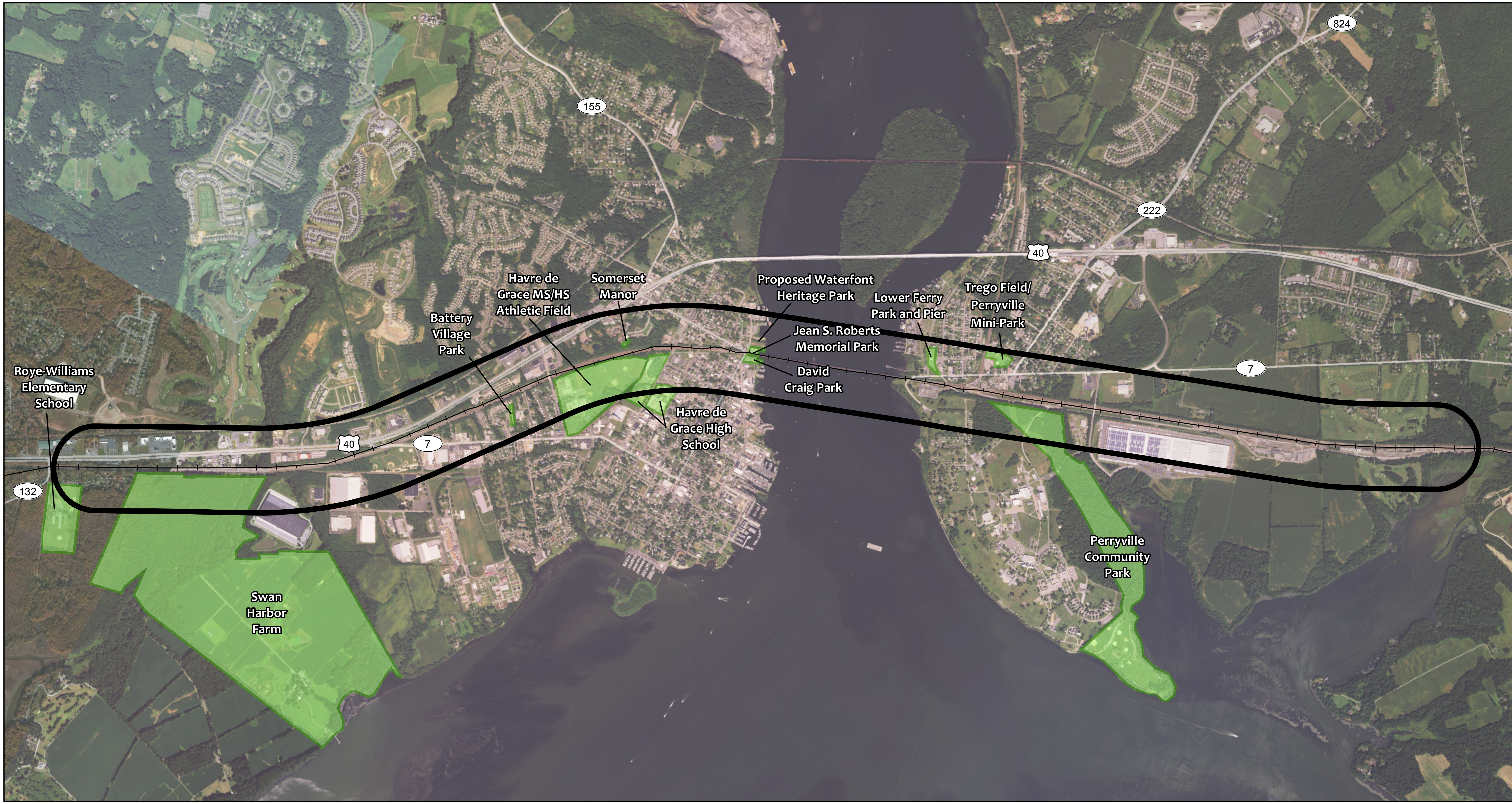
Publicly owned parks and recreational facilities may be subject to Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 (23 United States Code [USC] § 138 and 49 USC § 303), which requires that the proposed use of land from a publicly owned public park, recreation area, wildlife and/or waterfowl refuge, or any significant historic or archaeological site, as part of a federally funded or approved transportation project, is permissible only if: (1) there is no feasible and prudent alternative to the use and (2) the project includes all planning to minimize harm; or (3) if the use is a *de minimis*. The full Section 4(f) evaluation is in Chapter 9, “Draft Section 4(f) Evaluation.”

Section 6(f) of the Land and Water Conservation Fund Act (16 USC § 460) requires that the Secretary of the U.S. Department of the Interior (USDOI) approve any conversion of lands purchased or developed with assistance under this Act to a use other than public, outdoor recreation use. Any park or recreational resource that received grants from the Land and Water Conservation Fund (LWCF) is considered a Section 6(f) resource. Furthermore, some parks and recreational facilities have been funded through the Maryland Department of Natural Resources (DNR) Program Open Space (POS). Additional information regarding LWCF and POS can be found in Chapter 10, “Section 6(f) Evaluation.”

METHODOLOGY AND BACKGROUND

The Project Team obtained information regarding parks, recreational areas, greenways, and trails from the following sources:

- Geographic information System (GIS) data
- Field visits
- Harford County *2012 Master Plan and Land Use Element Plan*
- Harford County *2013 Bicycle and Pedestrian Master Plan*



Legend

1,000 ft Study Area
Parks/Recreation*
Existing Track

** Only public parks and recreational resources within the study area are shown*

Data Sources

Parks:
Harford County Government, 2013;
MD SDAT, 2014

0 0.25 0.5 Miles

Susquehanna River Rail Bridge Project

Figure 6-1
Parks and Recreational Resources

- City of Havre de Grace *Comprehensive Plan, March 2004 (and Municipal Growth Element and Water Resources Amendments, 2010)*
- Harford County *2013 Land Preservation, Parks, and Recreation Plan*
- Cecil County *2010 Comprehensive Plan*
- Cecil County *Bicycle Master Plan* (2012)
- Cecil County 2005 *Land Preservation, Parks, and Recreation Plan*
- Cecil County 2011 *Land Preservation, Parks and Recreation Plan*
- Town of Perryville *2010 Comprehensive Plan*
- Town of Perryville *Annual Report for 2013*
- *Perryville Greenway Plan* (2012)
- National Parks Service (http://www.nps.gov/)
- Maryland Department of Natural Resources (http://www.dnr.state.md.us/)
- Lower Susquehanna Heritage Greenway (http://www.hitourtrails.com/)
- *Lower Susquehanna Heritage Greenway Management Plan* (2000), (http://www.hitourtrails.com/PDF/LSHG_ManagementPlan_2009.pdf)
- Coordination with local governments, non-profit organizations, and other stakeholders.

For each park affected by the Proposed Project, the Project Team calculated the acreage of potential impact and considered the type and extent of recreational activities impacted.

C. AFFECTED ENVIRONMENT

In addition to the parks and other recreational resources described in this section, the Susquehanna River is also used as a recreational resource. Several private marinas and municipal boat ramps (such as the Jean S. Roberts Memorial Park and Havre de Grace Marina) are located near the existing Susquehanna River Rail Bridge, and recreational boaters navigate around and through the study area.

EXISTING PARKS AND RECREATIONAL AREAS

Each locality (Harford County, the City of Havre de Grace, Cecil County, and the Town of Perryville) offers extensive recreational programs within the study area through its respective parks and recreation departments. Programs range from youth sports programs such as soccer, tennis, basketball, lacrosse, youth football, dance, gymnastics, to adult aerobics and activities for seniors.

CITY OF HAVRE DE GRACE AND HARFORD COUNTY

Seven publicly accessible outdoor parks and recreational resources exist within the 1,000-foot study area in Havre de Grace (see **Table 6-1** and **Figure 6-1**). The approximately 0.87-acre Jean S. Roberts Memorial Park lies to the west of the existing railroad right-of-way, off Otsego Street and along the Susquehanna River. The park comprises a parking lot a fishing pier, a picnicking area, a kayak launch, and a boat launch. Havre de Grace owns approximately 0.61 acre and the National Railroad Passenger Corporation (Amtrak) owns 0.26 acre, which Amtrak leases to the City of Havre de Grace. Somerset Manor, a residential development located at 101 Stansbury Court, approximately 100 feet from the closest Build Alternative right-of-way, includes a 1.0-

acre of recreational space with a playground and basketball court. This space is also owned by the City of Havre de Grace.

Table 6-1
Havre de Grace Parks and Recreational Resources within 1,000-Foot Study Area

Park	Location	Acres	Ownership	Amenities	LWCF/POS Funding
Battery Village Park (Bradford Green)	Village Dr.	2.0	Havre de Grace	Parking on street, basketball court, playground	N/A
David Craig Park	Union Ave. btwn Otsego St. and Warren St.	1.5	Havre de Grace	Parking and waterfront views	POS
Havre De Grace Middle/High School Athletic Fields[2]	401 Lewis Ln./ 700 Congress Ave.	57.6	Board of Education Harford County	Harris Stadium, Multi-use fields, baseball/softball diamonds, and tennis courts	LWCF
Jean S. Roberts Memorial Park[1]	Otsego St. and Water St.	0.87	Amtrak / Havre de Grace	Picnicking, parking, fishing pier, kayak and boat launch	N/A
Roye-Williams Elementary School	201 Oakington Rd.	28.0	Board of Education Harford County	Ball fields, activity fields, and playgrounds	N/A
Somerset Manor	101 Stansbury Ct.	1.0	Havre de Grace	Parking, playground, basketball court	N/A
Swan Harbor Farm	401 Oakington Rd.	531	Harford County	Mansion house, meadow areas, farm fields, fishing, vineyards, field for radio controlled aircraft, and exhibit area for agricultural education	POS

Notes: N/A = No LWCF or POS funding identified for subject parkland.
1. Deed is not available for Jean S. Roberts Memorial Park.
2. According to consultation with the Havre de Grace High School, the athletic fields are open to the public outside of school hours, unless reserved for a special event.

Sources: City of Havre de Grace Comprehensive Plan, March 2004 (and Municipal Growth Element and Water Resources Amendments, 2010); Harford County 2013 Land Preservation, Parks, and Recreation Plan; Harford County Government Parks and Recreation website; Maryland Department of Assessments and Taxation, Real Property Search website.

David Craig Park is located east of the existing Northeast Corridor (NEC). This park is owned by the City of Havre de Grace and provides 1.5 acres of open space with waterfront views. According to property deeds, the City of Havre de Grace received funding from Maryland's POS for David Craig Park.

The Havre de Grace Middle/High School athletic fields, owned by the Board of Education, offer more than 57.6 acres of recreational space with multi-use fields, baseball and softball diamonds, and tennis courts.[1] Improvements to the Havre de Grace Middle/High School athletic fields were undertaken utilizing Section 6(f) Land and Water Conservation Act funds (see Chapter 10, "Section 6(f) Evaluation").

Battery Village Park, owned by the City of Havre de Grace, is part of the Battery Village/Bradford Green low-income housing community, and offers basketball courts and a playground.

The largest recreational resource partially within the study area, Swan Harbor Farm, is owned by Harford County and offers more than 500 acres of recreational space with farm fields, vineyards, fishing, and educational exhibits. Harford County received POS monies in 1994 to purchase Swan Harbor Farm.[2]

Another recreational space in Harford County is the Roye-Williams Elementary School, a portion of which is within the study area, and which is owned by the Harford County Board of Education. The school features approximately 28 acres of recreational space, including activity fields and playgrounds, when school is not in session.

In addition to these publicly accessible outdoor park and recreational resources identified in **Table 6-1**, the Havre de Grace Activity Center provides 5.8 acres of indoor recreational space including an indoor gymnasium, basketball court, and bocce court.

Finally, Stancil Field Park, a private recreational resource owned by Have de Grace Little League Inc. and approximately 50 feet from the closest Build Alternative right-of-way, comprises 15 acres with baseball and softball fields.

TOWN OF PERRYVILLE AND CECIL COUNTY

Several parks and recreational resources exist within the 1,000-foot study area in the Town of Perryville (see **Table 6-2** and **Figure 6-1**). All parks within this portion of the study area are owned by the Town of Perryville. These include Trego Field/Perryville Mini-Park, which is located off of Broad Street west of the existing NEC and adjacent to the NS Port Road. Trego Field/Perryville Mini-Park provides approximately 3.8 acres of recreational space with amenities such as a baseball field, basketball courts, playground, pavilion, and picnic area.

A portion of the Perryville Community Park is also located within the study area, east of the existing NEC. Perryville Community Park offers 168.5 acres of recreational space with baseball fields, soccer fields, lacrosse fields, tennis courts, a playground, fishing pier, and a kayak launch.[3] The portion of Perryville Community Park located within the study area comprises open space and the access road to the main park.

Lower Ferry Park and Pier consists of the area on Broad Street and Roundhouse Drive, and provides approximately 1.84 acres of open space.[4] The Town of Perryville received funding from DNR, Maryland's POS, and Maryland Heritage Areas grants for Lower Ferry Park.[5]

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[1] According to consultation with the Havre de Grace High School, the athletic fields are open to the public outside of school hours, unless reserved for a special event.
[2] http://www.swanharborfarm.org/History.html, accessed September 23, 2014.
[3] Consultation letter from Town Commissioners of Perryville, June 25, 2015.
[4] Consultation letter from Town Commissioners of Perryville, June 25, 2015 indicated Lower Ferry Park consists of Town Map 801, 0834 Lots 1, 3, 5, and 7.
[5] Consultation letter from Town Commissioners of Perryville, June 25, 2015

Table 6-2
Perryville Parks and Recreational Resources within 1,000-Foot Study Area

Park	Location	Acres	Ownership	Amenities	LWCF/POS Funding
Lower Ferry Park and Pier	Broad St. and Roundhouse Dr.	1.84*	Perryville	Waterfront views, pier, and benches	POS
Perryville Community Park	100 Marion Tapp Pkwy	168.5*	Perryville	Preserved lands in addition to baseball fields, pavilion, restrooms, playing courts, fields, fishing pier, kayak launch, playground	N/A
Trego Field/ Perryville Mini-Park	Behind Town Hall off Broad St.	3.8	Perryville	Little league baseball field, basketball courts, playground equipment, and pavilion and picnic area	N/A

Notes: N/A = No LWCF or POS funding identified for subject parkland.
* Based on consultation letter from Town Commissioners of Perryville, June 25, 2015.
Sources: Perryville 2010 Comprehensive Plan; Town of Perryville Annual Report for 2013; Cecil County 2005 Land Preservation, Parks, and Recreation Plan; Cecil County 2011 Land Preservation, Parks, and Recreation Plan; Maryland Department of Assessments and Taxation, Real Property Search website.

TRAILS AND GREENWAYS

Several local bicycle and pedestrian trails exist within the study area. These include the Old Town Loop, Old Town/New Town Trail, and the waterfront walkway in Havre de Grace. Old Town Loop crosses the NEC twice in Havre de Grace at N. Union Avenue and N. Juniata Street. The Old Town/New Town Trail in Havre de Grace is collocated with the East Coast Greenway from Juniata Street to MD 155. The waterfront walkway connects North Park to the Tyding's Park and Promenade in Havre de Grace. The waterfront walkway is a part of the Heritage Corridor Plan, which has been implemented for the past 20 years. The walkway is bisected by the NEC at N. Union Avenue.[6]

The Lower Susquehanna Heritage Greenway (LSHG) passes through the City of Havre de Grace and the Town of Perryville as well as other riverfront areas of Harford and Cecil Counties. The non-profit organization aims to stimulate local economic activity by developing a link between natural, historic, and cultural resources within the Lower Susquehanna Region. The LSHG is part of a statewide system of heritage areas; it is planned to eventually comprise a 40-mile network of trails along both shores of the Susquehanna River below from the Conowingo Dam to the river's mouth. Approximately two-thirds of the network is complete. The LSHG crosses the NEC twice in Havre de Grace, via N. Union Avenue and at N. Juniata Street. The LSHG also crosses the NEC in Perryville, via Broad Street.

The East Coast Greenway (ECG) is a planned 3,000-mile, continuous cyclist and pedestrian trail that would stretch from Maine to Florida and connect 25 major cities along the East Coast. The ECG is being planned and promoted by the East Coast Greenway Alliance, a non-profit

[6] Consultation letter from Department of Planning City of Havre de Grace, June 20, 2014.

organization with individual state chapters. Overall, 27 percent of the ECG is complete on trails with 73 percent on interim on-road sections. In Maryland, the ECG runs for 166 miles, 32 percent of which are completed off-road trails.[7] Currently, a gap area exists within the ECG trail network between the Baltimore area and Newark, Delaware. Within the study area, the ECG suggests an on-road route, which crosses the NEC twice in Havre de Grace at N. Union Avenue and Lewis Lane. As of July 1, 2016 cyclists are permitted to use the U.S. 40 Hatem Bridge to provide connectivity between Havre de Grace and Perryville.

Several historic trails highlighting sites of historic importance also exist within the study area; however, public easements or rights-of-way do not exist for these trails. Nonetheless, it is important to note that the Maryland Civil War Trail, the Mason Dixon Trail, the Captain John Smith Chesapeake National Historic Trail, Washington-Rochambeau Revolutionary Route National Historic Trail, and the Star-Spangled Banner National Historic Trail each run through portions of the study area, by way of water or auto-routes, and highlight important historic sites, including Rodgers Tavern on Broad Street in Perryville.[8]

D. NO ACTION ALTERNATIVE

The No Action Alternative assumes the Susquehanna River Rail Bridge will remain in service as-is, with no intervention beside minimal repairs and continuation of the current maintenance regime. Service over the bridge would continue to worsen in the future under the No Action Alternative. The No Action Alternative as a baseline scenario against which potential impacts of the Proposed Project are measured. The following parks and recreational projects are expected to be completed within the study area before the Susquehanna River Rail Bridge Project build year, and are therefore included in the No Action Alternative.

CITY OF HAVRE DE GRACE

Havre de Grace plans to complete their Waterfront Heritage Park along the Susquehanna River, west of the existing NEC by 2020.[9] Havre de Grace recently approved the purchase of four properties, totaling 3.2 acres, as part of a proposed plan to develop the park along the water.[10] Conceptual artist renderings show plans for a plaza, kayak and boat launch, the gateway to the Captain John Smith Chesapeake National Historic Trail, an amphitheater, lawn, benches, promenade, and fishing pier.

The City of Havre de Grace also intends to improve David Craig Park by adding a fishing pier and pavilion along its waterfront by 2018.[11]

[7] "Maryland." East Coast Greenway. http://www.greenway.org/explore-by-state/md.

[8] See **Appendix D**, "Cultural Resources," for an analysis of the trail resources with respect to the Proposed Project and the draft Programmatic Agreement, which includes a commitment to further consider National Historic Trails in the future.

[9] Consultation letter from Department of Planning City of Havre de Grace, June 20, 2014.

[10] "Havre de Grace Voters Approve Spending $1.1 Million to Buy Water Street Properties," *The Aegis,* December 28, 2016, accessed December 28, 2016.

[11] Harford County 2013 Land Preservation, Parks, and Recreation Plan.

TOWN OF PERRYVILLE

The Town of Perryville plans to improve Lower Ferry Park to host town events. Future plans for Lower Ferry Park include the construction of a comfort station, a band shell, picnic area, playground equipment, walking paths, landscaping, bio-retention areas, paths lined with vegetation, and some supportive parking. The comfort station at Lower Ferry Park was awarded a Maryland Heritage Areas Grant.

Perryville also plans to create a new Municipal Complex at 515 Broad Street, located to the north of the north wye track. The approximately 5.5-acre complex will include a police station, a new Town Hall, a new little league baseball field and improved pedestrian access.[12]

TRAILS AND GREENWAYS

Traversing both Harford and Cecil Counties, the September 11th Memorial Trail is a planned 1,100-mile cyclist and pedestrian trail proposed by the September 11th Trail Alliance. The trail would link the World Trade Center in New York, the Pentagon in Washington D.C., and the Flight 93 Memorial in Shanksville, Pennsylvania. The exact route of the trail and its year of completion are yet to be determined; however, within the study area, the trail is expected to overlap with the East Coast Greenway.[13]

Development of the waterfront walkway in Havre de Grace, ECG, LSHG, and September 11 Memorial Trail are expected, with additional trail segments being identified and developed. The waterfront walkway in Havre de Grace is intended to be continuously developed as new projects and public park improvements occur. Trail development is constrained in the study area by the lack of access points across the Susquehanna River, as the only river crossing on the lower Susquehanna that permits bicycle or pedestrian access is at the Conowingo Dam Route 1 crossing. The Thomas J. Hatem Memorial Bridge was recently open to bicyclists in the Summer of 2016, although some safety concerns remain because the bridge does not have shoulders. This bridge does not permit pedestrians.[14] There are no other known planned improvements to pedestrian and bicycle facilities in the Proposed Project study area by the analysis year.

HAVRE DE GRACE MIDDLE SCHOOL/HIGH SCHOOL

Harford County Public Schools (HCPS) is replacing the Havre de Grace Middle School and High School (see **Figure 6-1**). The proposed facility is currently in the final design phase. HCPS's proposed designs require modifications to the existing ball fields. The proposed HCPS enhancements will not require any modifications to the existing track and field facility. According to school representatives, HCPS is currently awaiting construction funding from the Harford County School Board to move forward with the project.

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[12] Consultation letter from Town Commissioners of Perryville, June 30, 2014.

[13] September 11th National Memorial Trail Alliance. http://911memorialtrail.org/?page_id=5, accessed September 2014.

[14] Maryland Transportation Authority, "Hatem Bridge (US 40) Bicycle Access." http://www.mdta.maryland.gov/Toll_Facilities/Hatem_Bike_Access.html#FAQ13, accessed January 2017.

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

BUILD ALTERNATIVES

The Proposed Project would be designed so as not to preclude a future bicycle and pedestrian crossing over the river. The Proposed Project would not alter or adversely affect the trail routes. Each National Historic Trail includes important historic resources within the study area that FRA and MDOT evaluated as part of Chapter 7, "Visual and Aesthetic Conditions" and Chapter 8, "Cultural Resources." Measures to avoid, minimize, or mitigate any adverse impacts to historic and archaeological resources have been identified and will be further developed in coordination with the Maryland Historical Trust and Section 106 consulting parties. The Proposed Project would not affect public use, enjoyment, or educational value of the trails within the study area. Therefore, no significant adverse impacts to trails or greenways would result from the Proposed Project.

ALTERNATIVE 9A

Alternative 9A would require expansion of the existing rail right-of-way. This would involve the acquisition and conversion of narrow areas of park and recreational resources. Alternative 9A would require the permanent acquisition of small portions of two recreational resources (Jean S. Roberts Memorial Park and the Havre de Grace Middle/High School athletic fields) immediately adjacent to the existing right-of-way (see **Table 4-3**). Short-term effects on any park and recreational resources are discussed in Chapter 17, "Construction Effects." Long-term effects on specific parks and recreational resources would be as follows:

- **Jean S. Roberts Memorial Park:** Alternative 9A would require the permanent use of the entire 0.26-acre, Amtrak-owned portion of Jean S. Roberts Memorial Park as well as the acquisition of 0.01 acre of the City-owned portion of the park. Alternative 9A constructs a new bridge that would cross above the park on an elevated structure that would require the modification of the existing lease agreement and the modification of park infrastructure. This would prohibit public access within the Amtrak right-of-way and would require the taking of the boat ramp area and a portion of the pier located at the park. According to public records, Jean S. Roberts Memorial Park has not received funding from the LWCF and is therefore not a Section 6(f) resource. The part of Jean S. Roberts Memorial Park beyond Amtrak's existing right-of-way is considered a Section 4(f) resource and is discussed in Chapter 9, "Draft Section 4(f) Evaluation."
- **Havre de Grace Middle School/High School Track and Athletic Fields:** Alternative 9A would require the acquisition of a strip of the Havre de Grace Middle/High School athletic fields immediately adjacent to the existing rail right-of-way. This acquisition would total approximately 1.5 acres. Since improvements to the Havre de Grace Middle/High School athletic fields were undertaken utilizing Section 6(f) LWCA funds, Section 6(f) applicability is discussed in Chapter 10, "Section 6(f) Evaluation." Section 4(f) applicability is discussed in Chapter 9, "Draft Section 4(f) Evaluation." Alternative 9A has the potential to result in minor reconfigurations of the existing and proposed ballfields on the Harford County School property. Alternative 9A would also result in permanent impacts to the existing pole vault/high jump, long jump and 110-meter hurdle runout area at the existing track and field facility. A storage shed would also be impacted. Overall, Alternative 9A would physically impact this recreational resource and would require mitigation.

ALTERNATIVE 9B

Alternative 9B would also require expansion of the existing rail right-of-way. This would involve the acquisition and conversion of a narrow area of park. As with Alternative 9A, Alternative 9B would require the same permanent acquisition of a narrow strip of land associated with Jean S. Roberts Memorial Park immediately adjacent to the existing right-of-way. Alternative 9B would not impact or require any modifications to the Havre de Grace Middle School/High School athletic fields.

F. MINIMIZATION AND MITIGATION OF IMPACTS

The Project Team made efforts to minimize the impacts to parks, recreational lands, and open space resources and to this end have eliminated several alignments based on greater impacts to parks and recreational resources (see **Appendix A,** "Alternatives Retained for Detailed Study and Bridge Types"). The Project Team is currently coordinating with agencies that have jurisdiction over any affected parks (HCPS and City of Havre de Grace) to develop appropriate minimization and mitigation strategies.

As described in Chapter 9, "Draft Section 4(f) Evaluation," FRA proposes to determine that the use of the City-owned portion of Jean S. Roberts Memorial Park is *de minimis*. FRA and MDOT will work with the City of Havre de Grace to identify appropriate mitigation measures and to ensure that a replacement for the Jean S. Roberts Memorial Park boat ramp is provided in a suitable location.

In addition, as described in more detail in Chapter 9, "Draft Section 4(f) Evaluation," based on the analysis of the potential impacts to the Havre de Grace Middle/High School Athletic Fields and collaboration with the school board, minimization and mitigation include:

- Amtrak would build the railroad on an elevated structure over the 110-meter hurdle runout area. During construction the runout would be reduced to 8.5 meters but after construction would be rebuilt to its current 11.5-meter length.
- Relocate pole vault, high jump, long jump and storage shed.
- The Project would reimburse Harford County Public Schools for the agreed upon additional design cost.
- To the extent practical, construction would be scheduled to minimize disruption to the track and field facilities.
- The baseball field would be redesigned by shifting home plate three feet away from the railroad and rotating the field 2.5 degrees counter clockwise.
- Design consultant working on the baseball fields would redesign the field to provide adequate clear area around Amtrak's proposed retaining wall.
- The Project would reimburse Harford County Public Schools for the agreed upon additional design cost of the baseball fields.
- Amtrak would provide conduit and embedded inserts for installation of a future score board by Harford County Public Schools.
- Amtrak would install a protective netting to shield the railroad from foul balls.
- The water main would be relocated in a casing, allowing future replacement to be done without affecting the athletic facilities.

Based on the analysis of the potential impacts to the Havre de Grace Middle/High School Athletic Fields and the minimization and mitigation measures, FRA proposes to make a *de minimis* finding for the use of the facility. Coordination is ongoing. ✷

A. INTRODUCTION

This chapter assesses the potential effects of the Proposed Project on the visual character and aesthetic conditions of the surrounding area as compared with the No Action Alternative. This chapter serves as a summary of the more detailed analysis presented in **Appendix C**, "Visual and Aesthetic Conditions." The study area for visual resources extends approximately 600 feet north and south of the project site along an approximately six-mile length of the Northeast Corridor (NEC) (see Figure 1 of **Appendix C**). In addition, to account for more distant views of the project site along the Harford and Cecil County waterfronts, the study area extends approximately one half-mile north and south near the waterfront, utilizing the Thomas J. Hatem Memorial Bridge that carries the Pulaski Highway (Route 40) over the Susquehanna River as the northern boundary (see Figure 2, Photo Key and Figure 3, Photo 1 of **Appendix C**). As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative.

B. REGULATORY CONTEXT AND METHODOLOGY

This assessment has been prepared in accordance with Federal Highway Administration (FHWA) guidelines for visual analyses, including *Guidelines for the Visual Impact Assessment of Highway Projects Documents* (2013), *Environmental Impact Statement Visual Impact Discussion* (undated), and *Guidance Material on the Preparation of Visual Impact Assessments* (1986).

To prepare this analysis and determine potential effects, the Project Team collected information through field visits and identified visually sensitive locations, viewer groups, and duration of views. In addition, the Federal Railroad Administration (FRA)/Maryland Department of Transportation (MDOT) requested input through public outreach information sessions and dedicated meetings of Section 106 consulting parties. The information received at those meetings as well as any written comments received have been taken into consideration in this aesthetics analysis as well as in the Proposed Project's design process.

C. AFFECTED ENVIRONMENT

EXISTING VISUAL CHARACTER

The project site consists of a portion of the National Railroad Passenger Corporation's (Amtrak) NEC, a two-track rail line oriented roughly northeast-southwest[1] across the Susquehanna River.

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[1] Unlike Chapter 2, which refers to locations in the study area according to "railroad north" and "railroad south," this analysis uses compass north and south when referring to direction.

The tracks run at-grade and on an embankment in Havre de Grace and Perryville and cross the Susquehanna River on the Susquehanna River Rail Bridge. Prominent visual features in the study area include the City of Havre de Grace and the Town of Perryville, the Susquehanna River, the Susquehanna River Rail Bridge, the Thomas J. Hatem Memorial Bridge, the mouth of the Chesapeake Bay, and the southern tip of Garrett Island, which is part of the Blackwater National Wildlife Refuge, as well as historic resources within Cecil and Harford Counties.

The study area is characterized by a mix of relatively rural agricultural areas; low-rise, medium-density waterfront areas; some suburban development; and light industrial, hotel, and commercial uses along major transportation corridors. The portion of the study area northwest of the NEC in Perryville is characterized by low-rise, urban development consisting of residential, commercial, institutional, and park uses. Development located directly on the Perryville waterfront in this area consists mainly of low-rise condominiums with private marinas on the river.

The Perry Point Veterans Administration (VA) Medical Center, evaluated as eligible for listing on the National Register of Historic Places (NR), is located south of the NEC along the waterfront in Cecil County, and consists of large open spaces and residences of primarily two- to two-and-a-half stories in the study area. At the southern end of the complex is the NR-listed Perry Point Mansion House and Mill. The portion of the study area in Havre de Grace consists mainly of low-rise, medium-density urban development including residential, commercial, institutional, and park uses. Development located directly on the waterfront consists primarily of commercial and light industrial uses, marinas, undeveloped lots, and parks. Portions of Havre de Grace further west include athletic fields, such as Stancil Field Park located at the southwest corner of Old Post Road and Old Bay Lane, and some suburban development.

The entire visual resources study area is within the Lower Susquehanna Heritage Greenway (LSHG), which was designated by the Maryland Heritage Areas Authority as a Certified Heritage Area in 1997 through its *Maryland Heritage Preservation and Tourism Areas Development Program*. As identified in the *Lower Susquehanna Heritage Greenway Management Plan* (May 2000), the visual character of the LSHG includes natural resources such as parks and waterfront areas; the Susquehanna River, Chesapeake Bay, and Garrett Island; rail infrastructure and multiple bridges crossing the Susquehanna River; open space; numerous pedestrian, bicycle, and historic trails; and man-made or cultural resources, including historic structures, districts, and archaeological sites.

VISUALLY SENSITIVE RESOURCES WITHIN THE LOWER SUSQUEHANNA HERITAGE GREENWAY (LSHG)

FHWA's *Guidance Material on the Preparation of Visual Impact Assessments* defines visual resources as those physical features that make up the visible landscape, including land, water, vegetation, and man-made elements to which viewers attach visual value. Visually sensitive resources may include historic buildings, open spaces such as parks and landscaped plazas, and views to natural resources such as water features and natural vegetation. The LSHG includes natural resources and open space, trails, and man-made resources, each of which is listed below and described in more detail in **Appendix C**.

NATURAL RESOURCES/OPEN SPACE

The most prominent natural resource features in the study area are the water-related resources, including the Susquehanna River, the mouth of the Chesapeake Bay, and the southern tip of

Garrett Island, which is part of the Blackwater National Wildlife Refuge. These features are of extremely high value in terms of the area's visual and aesthetic qualities. In addition, there are several public parks and areas of open space located along the waterfront in the visual study area (see Chapter 6, "Parks, Trails, and Recreational Resources" for a more detailed description of parks in the study area). These areas are important for facilitating views to the river and its natural features. Prominent waterfront parks include: Jean S. Roberts Memorial Park; David R. Craig Park; McLhinney Park; and Frank J. Hutchins Memorial Park.

Additional parks and areas of open space are located within the study area, but are far enough removed from the river that they do not contain important views to the river and its natural features. These open space areas include the Roye-Williams Elementary School, the Havre de Grace Middle/High School Athletic Fields, Battery Village Park, Swan Harbor Farm, and Somerset Manor, and in Perryville Trego Field/Perryville Mini-Park and Perryville Community Park.

TRAILS

The LSHG contains a portion of or all of the following trails, which serve to thematically link historic sites and/or open space areas, or provide recreational paths: the East Coast Greenway; Mason-Dixon Trail; Maryland Civil War Western Shore Baltimore Trail; Captain John Smith Chesapeake National Historic Trail; Washington-Rochambeau Revolutionary Route; Star-Spangled Banner National Historic Trail; Old Town Loop; Old Town/New Town Trail; and the Havre de Grace Waterfront Walkway.[2]

MAN-MADE ELEMENTS

Historic resources in the study area, which are further described in Chapter 8, "Cultural Resources," are the existing Susquehanna River Rail Bridge and nine related undergrade bridges; the Havre de Grace Historic District; the Southern Terminus, Susquehanna and Tidewater Canal—South Lock #1 and Toll House; Rodgers Tavern; the Perry Point Mansion House and Mill; the Perryville Railroad Station complex; the Perry Point Veterans Administration Medical Center Historic District; the Perryville United Methodist Church; and the Perryville Presbyterian Church. In addition to these formally identified historic resources, there is another man-made feature of visual prominence: the Thomas J. Hatem Memorial Bridge.

VIEWER GROUPS AND VIEW DURATIONS

Viewer groups are groups of people who are visually affected by a project in a similar way. Viewer groups in the area consist of pedestrians/bicyclists, motorists, rail passengers, and boaters. These viewer groups may be divided into two categories: those that have views of visually sensitive resources and those that have views from those resources. Pedestrians and bicyclists generally have longer view durations than motorists and rail passengers as they are not traveling at high speeds.

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[2] See **Appendix D**, "Cultural Resources" for an analysis of the Captain John Smith Chesapeake National Historic Trail resources with respect to the Proposed Project and the draft Programmatic Agreement, which includes a commitment to further consider National Historic Trails in the future.

PEDESTRIANS AND BICYCLISTS

The majority of the pedestrian and bicyclist traffic in the study area occurs in the streets and waterfront parks in the Havre de Grace Historic District, as well as the waterfront areas near Rodgers Tavern in Perryville, and the Perry Point VA Medical Center (including the Perry Point Mansion and Mill) in Cecil County. View of pedestrians and bicyclists in the four waterfront parks in the Havre de Grace Historic District can be characterized as long, clear views of visually contributing elements of the LSHG, including waterfront areas in Perryville and Cecil County, the Susquehanna River and Chesapeake Bay, Garrett Island, the Susquehanna River Rail Bridge, and the Thomas J. Hatem Memorial Bridge.

MOTORISTS

Motorists travel on multiple roadways that pass through the study area. Major roads in the study area include the Pulaski Highway (Route 40) and Route 7. A dense network of secondary and tertiary roads is located in the Havre de Grace portion of the study area. The network of roads in Perryville is less dense, and roads in the Cecil County portion of the study area south of the project site are primarily tertiary roads. Motorists traveling on Route 40 have a view of the Susquehanna River, Garrett Island, and the Susquehanna River Rail Bridge as they cross the Susquehanna River on the Thomas J. Hatem Memorial Bridge; however, the speed of traffic on this bridge limits the amount of time motorists have for observation. In other areas, like the Perry Point VA Medical Center, motorists travel more slowly along tertiary roads and enjoy longer views of river-related features of the LSHG. In other areas, for example along Broad Street in Perryville, motorists have views of the Susquehanna River Rail Bridge and other historic sites. Views are somewhat obstructed north of the project site in Perryville and in Havre de Grace. Views of river-related visually contributing elements of the LSHG are possible in Havre de Grace at Water Street north of the project site, North Union Avenue south of the project site, and east from North Adams and Otsego Streets in the study area north of the project site. In addition, the bridge abutment, four of the undergrade bridges, and the Havre de Grace Historic District are visible to motorists in Havre de Grace driving along the tertiary streets in close proximity to the bridge. Specific views are described in more detail in **Appendix C**.

RAIL PASSENGERS

Amtrak and Maryland Area Regional Commuter (MARC) rail passengers traveling on the NEC through the study area are afforded brief but clear views of some of the elements that contribute to the visual character of the LSHG, including buildings within the Havre de Grace Historic District. As passengers travel on the Susquehanna River Rail Bridge, they have expansive views south towards the Susquehanna River, Chesapeake Bay, and the Havre de Grace and Cecil County waterfronts. To the north, rail passengers have clear views of the Susquehanna River, Garrett Island, the Thomas J. Hatem Memorial Bridge, and waterfront areas in Havre de Grace and Perryville. Rail passengers are afforded a brief view of Rodgers Tavern. Because the Perryville Railroad Station is a MARC station, the passengers have longer views of the station when the train stops to drop off and pick up commuters, as well as a limited side view of the Perry Interlocking Tower. Similarly, MARC rail passengers using the station to board or exit a train are afforded views of all sides of the station, a historic structure constructed of brick and exhibiting Colonial Revival features such as its large round-arched windows.

BOATERS

The Susquehanna River is used by commercial boats, as well as by recreational vessels. Marinas and boat launches are located in waterfront locations and provide long, clear views of the river-related features of the LSHG, including waterfront areas in Perryville and Cecil County, the Susquehanna River and Chesapeake Bay, Southern Terminus, Susquehanna and Tidewater Canal—South Lock #1 and Toll House, Garrett Island, the Susquehanna River Rail Bridge, and the Thomas J. Hatem Memorial Bridge.

Boaters traveling on the Susquehanna River in the study area have long, expansive views of the LSHG, including the river itself, the Susquehanna River Rail Bridge, buildings on the waterfront in the Havre de Grace Historic District, and waterfront areas in Perryville and Cecil County. The Susquehanna River Rail Bridge's large triangular truss components and large stone piers are prominent visual features for boaters traveling under the bridge. Boaters can see Rodgers Tavern, although views are somewhat obscured by intervening vegetation. Other historic structures located further inland are not visible to boaters on the Susquehanna River in the study area.

D. NO ACTION ALTERNATIVE

As described in Chapter 2, "Project Alternatives," under the No Action Alternative, the existing Susquehanna River Rail Bridge will remain in service, with continued frequent maintenance issues and minimal repairs. The planned development projects discussed in the Chapter 4, "Land Use and Community Facilities," consist primarily of residential and mixed-use infill projects in Havre de Grace and Perryville. Other projects include a proposed Waterfront Heritage Park in Havre de Grace along Water Street, the Havre de Grace Middle School/High School Replacement Project, and the Lower Ferry Park in Perryville at Broad Street and Roundhouse Drive. Additionally, MARC has planned a Northeast Maintenance Facility[3] in the study area, for maintenance and storage on a 115-acre site in Perryville adjacent to the NEC.

The residential infill projects in the Havre de Grace Historic District require review and approval from the Havre de Grace Historic Preservation Commission; therefore, it is anticipated that these projects would be in keeping with the overall visual and aesthetic character of the district. It is also anticipated that the creation of the Waterfront Heritage Park in Havre de Grace and the Lower Ferry Park in Perryville would create publicly accessible open spaces with views of the study area. The projects in the No Action Alternative are not anticipated to result in substantial changes to visually sensitive resources.

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

The Proposed Project's visual effects on the LSHG were evaluated from two perspectives:

- Overall "big picture" effects, looking at the area as a whole, both in close proximity to the bridge and further removed; and
- Site-specific effects, relating to a view to/from a visually sensitive resource.

[3] http://mta.maryland.gov/marc-maintenance-facility, accessed December 31, 2015.

OVERALL VISUAL CHARACTER

The three main factors considered in assessing the Proposed Project's visual effects on the overall visual character were proximity of the viewer to the bridge, the proposed change from one bridge to two bridges, and the proposed new bridge design, including style, materials, pier design, and height. From locations in close proximity to the bridge, defined as either beneath the bridge or within 600 feet of the bridge, there would be an adverse visual effect on the overall viewshed, especially due to the change from one bridge to two bridges. From locations further north and south of the bridge, the visual effect would be minimized by the fact that the two bridges would be adjacent to each other in an area that visually consists of numerous bridge crossings. Looking from many locations within the LSHG, the two adjacent bridges would be consistent with the area's current overall visual character.

The proposed bridge design incorporates a central arch, a girder deck, and "keyhole" arch piers, all elements that would have been found in traditional bridge design, and would therefore be compatible with the area's overall visual character. Although the pier material will change from the existing stone to concrete, this element will be counterbalanced by the fact that the approach spans, which are the portions of the bridge on either side of the bridge's central feature, and the bridge piers will be more streamlined and attenuated than the existing bridge deck and stone piers; therefore, it is anticipated that views through and under the proposed bridge would be more readily available. In addition, the proposed height of the new bridges, which would be a maximum increase of 14 feet at the river's navigational channel, would not have an adverse effect on the area's visual character when looking at the overall area, which contains several other bridges that are higher in elevation.

Pedestrians/bicyclists would have the longest duration of views and there would be an adverse visual effect on their views from either underneath the bridge or in close proximity to the bridge, due to the increased mass from one bridge to two bridges. From points further removed from the Proposed Project, the overall character of the LSHG would not be adversely affected as long as the two new bridges use a design for the bridges and piers that is traditional and allows greater views under the bridges.

The views to visual resources that motorists experience are generally of short duration, due to the relatively high speeds at which they tend to travel through the study area. There would be an adverse visual effect on motorists' views from either underneath the bridge or in close proximity to the bridge. However, motorists traveling on Route 40 across the Thomas J. Hatem Memorial Bridge currently experience brief but expansive views of the LSHG. When looking south from the bridge, the existing Susquehanna River Rail Bridge is a visible but relatively distant element of the LSHG view corridor. Because the alignment, height, and dimensions of the bridges proposed in either Build Alternative would not differ substantially from the existing Susquehanna River Rail Bridge, views to the LSHG would not substantially change, and the change in design of the new bridges, including the use of concrete for the new bridge piers, would be minimally perceptible.

Rail passengers traveling on the NEC would not be able to see both of the proposed bridges at the same time; however, views of the LSHG would be altered by the introduction of the additional bridge. This change would be a significant change, but would not be adverse because the view would be compatible with the area's multiple bridge crossings. This assessment is conditioned on the two new bridges using a traditional design for the bridges and piers.

Commercial and recreational boaters on the Susquehanna River have long, expansive views of the LSHG. The replacement of the existing Susquehanna River Rail Bridge with the two bridges proposed with Alternatives 9A and/or Alternative 9B would somewhat alter views from the boaters' perspective. However, because the alignment, height, and dimensions of the bridges proposed in either Build Alternative would not differ substantially from the existing bridge, the Proposed Project would not block views of the LSHG; expansive views north and south of the Susquehanna River, Chesapeake Bay, and the Havre de Grace and Cecil County waterfronts would still be afforded from the boaters' perspective.

Thus, for all user groups, the effects on the overall visual and aesthetic qualities of the study area depend greatly on the viewer's location, with a visual adverse effect being from underneath the bridge or in close proximity to it. The fact that the proposed design for the two new bridges would be traditional in character and would allow greater views under the bridge would serve to minimize the adverse visual effect on resources within close proximity to the bridges and avoid an adverse effect from resources further removed.

SITE-SPECIFIC EFFECTS

The list below contains discussion of specific sites assessed to have significant visual impacts:

- Pedestrian, bicyclist, and motorist views from waterfront open space areas (i.e., McLhinney Park and Frank J. Hutchins Memorial Park in the Havre de Grace Historic District, viewing areas behind Rodgers Tavern, and waterfront areas along the Perry Point VA Medical Center Historic District) would be altered by the change from one bridge to two bridges as well as the change in the design and materials of the new bridges.
- Havre de Grace Historic District. There would be adverse visual effects from the proposed widening that would result in the NEC and the requisite retaining walls being closer to structures within the Havre de Grace Historic District; the altered views of the Susquehanna River from resources in close proximity to the bridges, including Jean S. Roberts Memorial Park and David R. Craig Park; and alterations to the Historic District's four undergrade bridges.
- Rodgers Tavern. The views from the front of Rodgers Tavern would be adversely affected by the widening of the bridge approach and a retaining wall running along the embankment. In addition, there would be a clear view of one of the bridge piers that would be placed in close proximity to the Broad Street underpass.
- Views of the Perryville Railroad Station Complex for rail passengers would be altered by the proposed retaining walls and the relocation of the Perry Interlocking Tower.
- Undergrade Bridges. The Proposed Project would result in visual adverse effects to eight of the nine undergrade bridges (excluding the Lily Run undergrade bridge).

F. MINIMIZATION AND MITIGATION OF IMPACTS

OVERALL VISUAL CHARACTER

As described above, for all user groups, the effects on the overall visual and aesthetic qualities of the study area depend greatly on the viewer's location, with a visual adverse effect from underneath the bridge or in close proximity to it. The fact that the proposed design for the two new bridges would be traditional in character and allow greater views under the bridge would serve to minimize the adverse visual effect on resources within close proximity to the bridges and avoid an adverse effect from resources further removed.

SITE-SPECIFIC EFFECTS

In terms of site-specific effects within the LSHG, several potential visual adverse effects can be avoided or minimized through the following:

- Pedestrian, bicyclist, and motorist views from waterfront:
    - Traditional bridge design
    - Greater views under the bridge
    - Proposed design for the two new bridges would be traditional in character and would allow greater views under the bridge. This would minimize the adverse visual effect on resources within close proximity to the bridges and avoid an adverse effect from resources further removed
- Havre de Grace Historic District:
    - Traditional bridge design
    - *Secretary of the Interior's Standards for the Treatment of Historic Properties* (SOI) Standards
    - Larger pier openings with greater view
    - See below for undergrade bridge discussion
- Rodgers Tavern:
    - Architecturally pleasing treatment and/or mural for retaining wall (per Town of Perryville's recommendation)
    - Architecturally pleasing materials for retaining wall
    - Traditional design
    - Larger pier openings with greater view
- Perryville Railroad Station Complex:
    - Ensuring historic compatibility (materials, features, size, scale, proportion), to the extent possible
    - SOI Standards
    - Shifting Perry Interlocking Tower rather than demolishing
- Undergrade Bridges:
    - Form lining (emulating stone, appropriately stained)
    - Appropriate staining
    - SOI Standards

✷

Chapter 8: Cultural Resources

A. INTRODUCTION

REGULATORY AUTHORITY

This chapter identifies cultural resources (including architectural and archaeological resources) in the area of potential effects (APE) for the Proposed Project, probable impacts on those resources, any avoidance and minimization measures, and coordination with appropriate agencies and stakeholders. Project alternatives are described in detail in Chapter 2, “Project Alternatives.” Potential in-ground disturbances of the Project site may result from construction of two bridges over the Susquehanna River to replace the existing Susquehanna River Rail Bridge. In addition, modifications and/or additions to existing railroad tracks and other railroad infrastructure could occur throughout the Project site.

The Federal Railroad Administration (FRA) and the Maryland Department of Transportation (MDOT) prepared this analysis in accordance with the National Environmental Policy Act (NEPA), Section 4(f) of the U.S. Department of Transportation (USDOT) Act, and Section 106 of the National Historic Preservation Act (NHPA), as amended, and associated implementing regulations in 36 C.F.R. 800. Per Subpart A, Sections 800.2(a)(3) and 800.2(c)(4) of 36 C.F.R., FRA authorized MDOT as the Project sponsor and applicant for federal approvals, to prepare information, analyses, and recommendations regarding Section 106 consultation for the Proposed Project.

METHODOLOGY

Section 106 of the NHPA mandates that federal agencies consider the effects of their actions on any properties listed on or determined eligible for listing on the National Register of Historic Places (NR). The lead federal agency, in consultation with the State Historic Preservation Office (SHPO) and consulting parties, must determine whether a proposed action would have any adverse effects on cultural resources within the APE. Section 106 requires consultation with the SHPO, federally recognized Indian tribes that might attach religious and cultural significance to historic properties affected by the Proposed Project, and additional consulting parties with a demonstrated interest in the Proposed Project based on a legal or economic relation to affected properties, or an interest in the Proposed Project’s effects on cultural resources.

Section 101(d)(6)(B) of the NHPA requires the lead federal agency to consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by the undertaking. The lead federal agency shall ensure that consultation in the Section 106 process provides the Indian tribe a reasonable opportunity to identify its concerns about historic properties; advise on the identification and evaluation of properties, including those of traditional religious and cultural importance, articulate its views on the undertaking’s effects on such properties; and participate in the resolution of adverse effects. In the event of adverse effect, the federal agency must afford the federal Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings.

APE DELINEATION

To assess the potential effects of the Susquehanna River Rail Bridge Project on cultural resources, FRA/MDOT identified an APE for the Proposed Project in consultation with the Maryland Historical Trust (MHT), Maryland's SHPO. On June 16, 2014, the MHT approved the APE as described below and illustrated on **Figure 8-1**.

The APE has been delineated to take into account the potential for direct and indirect effects of all of the Build Alternatives on significant cultural resources. To facilitate the analysis of effects, the APE has been subdivided into two components: the area in which the Proposed Project could cause potential direct effects, including ground disturbance; and an expanded area in which the Project could cause indirect effects. Unless otherwise specified, references to the APE refer to the entire APE, both the direct Project site as well as the area with the potential for indirect effects.

The APE for archaeological resources includes all areas that could experience direct impacts, including ground disturbance or any disturbance to an archaeological site, under the Build Alternatives. This area includes all property within and adjacent to the National Railroad Passenger Corporation (Amtrak) right-of-way, extending along the right-of-way for 5,200 feet west of the Susquehanna River shoreline in Havre de Grace, 3,400 feet of the Susquehanna River itself, and 5,700 feet east of the Susquehanna River shoreline in Perryville.

Potential effects to architectural resources can include both direct physical effects (e.g., demolition, alteration, or damage from construction on nearby sites) and indirect effects, such as the isolation of a property from its surrounding environment, or the introduction of visual, audible, or atmospheric elements that may alter the characteristics of the historic property that qualify it for inclusion on the NR in a manner that would diminish the property's historic integrity. To incorporate areas with the potential for indirect effects, the APE for historic architectural resources extends beyond the area for direct effects. First, for the majority of the length of the Proposed Project along the rail line, the APE boundary runs parallel to the tracks approximately 600 feet to the north and south. In close proximity to the river, the APE boundary proceeds on a diagonal line to intersect with the river approximately one-quarter of a mile north and south of the Project site. This widening is to account for more distant views of the Project site along the Harford and Cecil County waterfronts.

IDENTIFICATION OF CULTURAL RESOURCES IN THE APE

Once the APE was determined, FRA/MDOT identified historic architectural resources that had been previously evaluated as historically significant, including properties or districts listed on the NR and properties determined eligible for such listing as part of other cultural reviews, National Historic Landmarks (NHL), and archaeological sites on file at the MHT. In addition, FRA/MDOT compiled a list of potential architectural resources (i.e., properties that may be eligible for listing on the NR) within the architectural APE based on field surveys, documentary research, and review of the Maryland Inventory of Historic Properties (MIHP): https://mht.maryland.gov/research_mihp.shtml.

In consultation with the MHT, the Project Team determined which properties warranted evaluation for NR eligibility and then prepared "Determination of Eligibility" (DOE) forms for

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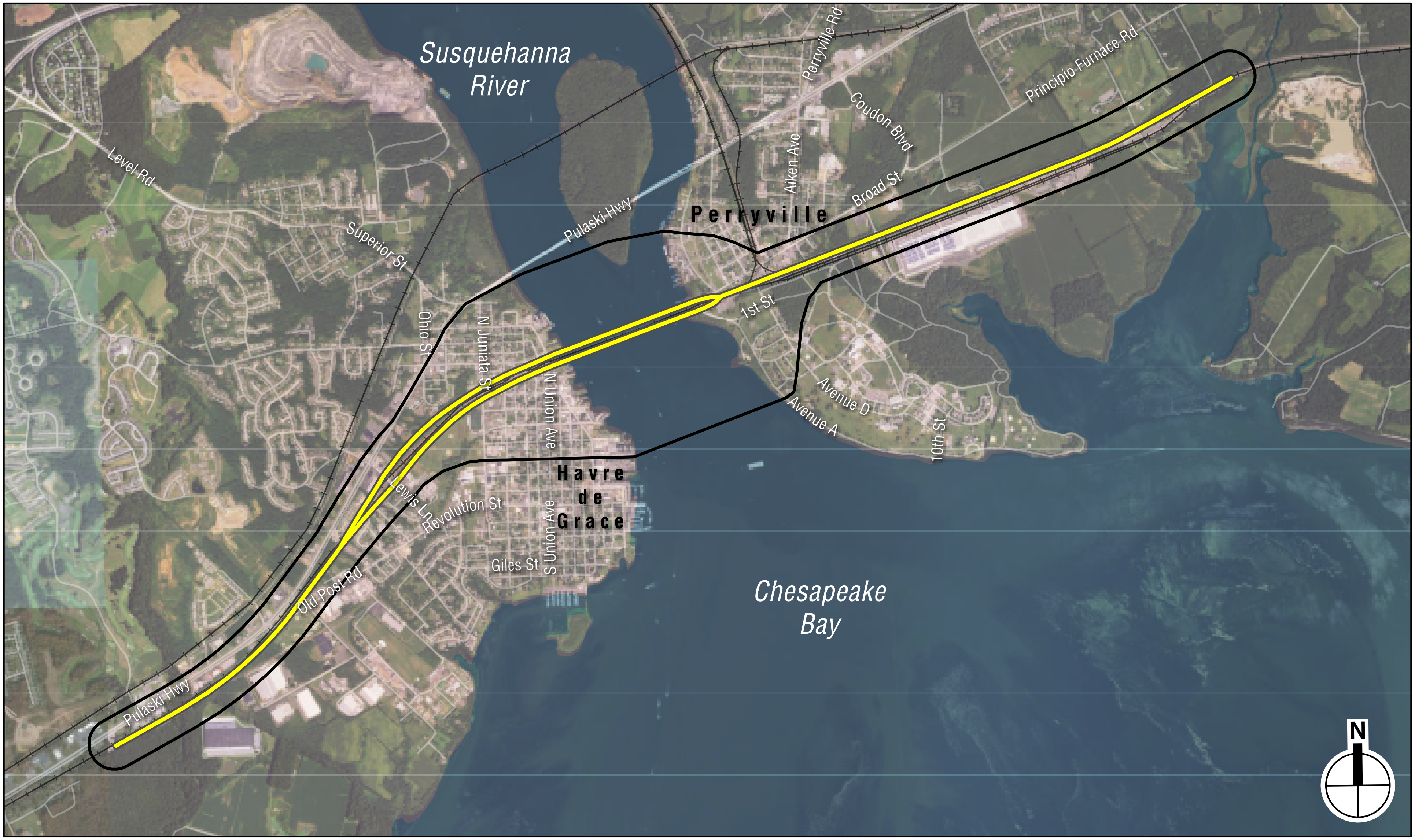

Project Site Archaeological APE

Architectural APE

0 1 MILES

SCALE

Archaeological and Architectural APE

Figure 8-1

the properties that appeared to be potentially significant and short forms for properties that appeared to not be NR-eligible. Based on the fieldwork and research, FRA/MDOT submitted to MHT on February 12, 2015 a DOE Report for the Perryville Historic District, Perryville United Methodist Church, Perryville Presbyterian Church, a grouping of eight houses at 400-413 Webb Lane, and the Susquehanna River Rail Bridge Overpasses, and 71 short forms. On April 22, 2015, the MHT responded that the following resources are eligible for listing on the NR: Susquehanna River Rail Bridge and nine affiliated bridges (collectively known as the "Susquehanna River Rail Bridge Overpasses,") the Perryville United Methodist Church, and the Perryville Presbyterian Church. In addition, the MHT indicated that the Perryville Historic District, 400-413 Webb Lane, and the 71 resources represented on the short forms are not eligible for listing on the NR. As part of the current assessment, the Susquehanna River Rail Bridge and the four undergrade bridges located within the Havre de Grace Historic District have been evaluated as contributing to the historic district, although the MHT has not issued a formal opinion on these evaluations.

In order to assess the sensitivity of the archaeological APE, the Project Team coordinated an archaeological documentary study (Phase IA Study) using documentary sources to identify areas with potential for archaeological deposits. For each area where prehistoric or historic-period activities may have yielded deposits, the Project Team evaluated construction activities and other recent ground disturbances to identify locations where any archaeological resources, if originally present, may have survived.

EVALUATION OF PROJECT EFFECTS

The Project Team assessed the effects of the Proposed Project on identified resources in the APE as compared to the No Action Alternative. Section 106 also requires consideration of reasonably foreseeable and cumulative effects that may occur later or further away from the project. As discussed in Chapter 2, "Project Alternatives," this EA evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative.

B. AFFECTED ENVIRONMENT

ARCHAEOLOGICAL RESOURCES

As noted above, a Phase IA Study evaluated the overall level of disturbance within the archaeological APE and identified areas with potential for archaeological resources. The Project Team achieved this goal through a twofold process:

- Reviewing historical documentation and field observations to determine the potential integrity of soil deposits and:
- Evaluating whether conditions are sufficient for the potential preservation of cultural deposits.

BACKGROUND RESEARCH AND PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL SITES

The review of historic maps revealed two distinct patterns of settlement and development for the Havre de Grace and Perryville sides of the Susquehanna River. By the eighteenth century, Havre de Grace had taken its place as an established point of trade and commerce within the upper Chesapeake Bay, containing a busy commercial and industrial waterfront. Despite this early settlement, however, historic maps revealed that the street grid pattern has remained relatively unchanged since the nineteenth century. This continuity of settlement typically suggests greater potential for preserved archaeological resources compared to other more densely settled and urbanized areas, which experience repeated disturbance through development. In contrast, the APE on the Perryville side of the river was initially more agrarian. The current village of Perryville does not appear to have developed until the advent of railroad service through the area during the mid-nineteenth century. During the first quarter of the twentieth century, Perry Point in particular was selected for industrial and residential development by the federal government as part of its WWI efforts.

Due to the location of the Proposed Project across a major river terrace overlooking the mouth of the Chesapeake Bay estuary, areas within the current APE would have been an extremely attractive place of settlement to Native Americans prior to contact with Europeans. However, due to the intensity of the railroad activities within the APE, the potential for intact precontact deposits is low. Particularly, within Havre de Grace, intact precontact contexts would most likely have to have been deeply buried in order to have avoided disturbance. Given the lower density of settlement during the historic period on the eastern shore of the river (Perryville), this portion of the APE has a higher probability for intact precontact period sites. Several known sites with precontact components have already been identified within the vicinity of Perryville.

With respect to archaeological resources located within or immediately adjacent to the current APE, the most significant previously identified resource located within the limits of the APE is the archaeological component of the extant Rodgers Tavern (18CE15). The tavern itself, listed on the NR in 1972, is a two-story stone structure located on the north side of Broad Street in Perryville. According to MHT files, the boundaries for the archaeological component of this resource are located across Broad Street from the standing tavern structure within a small lot located between the southern edge of Broad Street and the embankment for the railroad corridor. Archaeological investigations conducted in 2004 prior to the rehabilitation of the structure yielded a wide variety of eighteenth and early nineteenth century domestic refuse and architectural debris. However, the NR eligibility of the subsurface deposits has not been formally evaluated.

Another previously identified archaeological site, 18HE266, is located within the Susquehanna River within the vicinity of the APE. Located to the north of the existing bridge structure approximately 700 feet (213 meters) to the east of the Havre de Grace shoreline, 18HE266 has been identified as the wreckage from a twentieth century barge. This resource has not been formally evaluated regarding its eligibility for the NR.

ARCHAEOLOGICAL POTENTIAL OF APE

The APE for the Proposed Project encompasses all of the various Build Alternatives for the Proposed Project. The majority of each design alternative lies within the existing disturbed Amtrak right-of-way (ROW). For the purposes of this study, the portions of the APE outside of the current ROW were divided into six discrete Study Areas.

Study Area 1: Havre de Grace Athletic Field Complex

This area demonstrates heavily modified and disturbed soil profiles. Disturbance is associated with the reconfiguration of the natural landform as part of the construction of the school's ball fields. Because of this disturbance, the Phase IA Study concluded that there is little to no potential for this area to contain intact archaeological deposits.

Study Area 2: North Juniata Street to North Union Avenue, Havre de Grace

Although large portions of this area have been previously disturbed by construction activities associated with the Northeast Corridor (NEC), potentially undisturbed areas are present south of Warren Street and north of the existing rail line, including at the site of the former Havre de Grace Railroad Station and in the yard spaces of existing late nineteenth and early twentieth century houses.

Study Area 3: Havre de Grace Waterfront

Two city parks: Jean S. Roberts Memorial Park and David Craig Park appear to be human-constructed landforms, based on a review of historic mapping. Research indicates this fill was placed along the waterfront sometime during the mid- to late-nineteenth century. Though artificial, these landforms have the potential to contain cultural deposits associated with waterfront-related commercial or industrial enterprises, as well as structural remnants from the nineteenth century rail line that preceded the existing Northeast Corridor.

Study Area 4: Perryville Waterfront

While large portions of this area along the Susquehanna River have been subjected to previous archaeological survey or disturbed by various past construction efforts, sections of Study Area 4 have the potential to contain intact precontact or historic period archaeological deposits. Specifically, intact deposits may exist south of the railway corridor within the strip of land between the electrical substation and the Susquehanna River shoreline, in which a remnant of the earlier nineteenth century bridge abutment is present, and north of the railway corridor, within the vicinity of the extant Rodgers Tavern (18CE15).

Study Area 5: Perry Point VA Medical Center and MARC station area

This area encompasses the northern extremity of the Perry Point VA Medical Center and areas surrounding the MARC station, just north of the existing Amtrak rail corridor at its intersection with the Norfolk Southern Port Road spur line. As with the previous study area, large sections of Study Area 5 have been previously disturbed through various past construction efforts or subjected to archaeological survey. Outside of these sections, the yard areas associated with a group of single and multi-family residences that line the southern edge of Broad Street in Perryville may have the potential to contain intact archaeological resources.

Study Area 6: Susquehanna Submerged Cultural Resources

The Phase IA Study evaluated the potential for submerged cultural resources to exist in the Susquehanna River within the APE. Previous underwater remote sensing efforts in the lower Susquehanna River have identified multiple anomalies related to the original ferry and subsequent bridge across the Susquehanna River, coal wharves, and submerged wreckage within the current Proposed Project APE.

ARCHITECTURAL RESOURCES

KNOWN RESOURCES

Architectural resources located in the APE include properties listed on or determined eligible for the NR. Eleven previously designated (NR-listed or eligible) architectural resources were identified in the APE. As part of this Proposed Project, two additional resources were identified within the APE as potential architectural resources (the Perryville United Methodist Church and the Perryville Presbyterian Church).

A series of undergrade bridges historically associated with the Susquehanna River Rail Bridge were identified as NR-eligible components of the Susquehanna River Rail Bridge historic property. The undergrade bridges at MP 60.51, 60.56, 60.61, and 60.69 contribute to the Havre de Grace Historic District; the undergrade bridge at MP 59.39 contributes to the Perryville Railroad Station complex. MHT concurred that the two churches and the undergrade bridges are eligible for listing on the NR. The architectural resources in the APE are listed in **Table 8-1**, and mapped on **Figures 8-2 and 8-3**, and described in the following summary. More complete information on the historic architectural resources is included in the project's *Effects Assessment for Historic Architectural Resources* (see **Appendix D**, "Cultural Resources").

Table 8-1
Historic Architectural Resources within the APE

No.	Name/Type	Location	Eligibility Criteria	NR-Listed	NR-Eligible	MIHP
1	Havre de Grace Historic District	Havre de Grace	A & C	X		HA-1617
2	Southern Terminus, Susquehanna and Tidewater Canal – South lock #1 and Toll House[1]	Havre de Grace	A & C	X		HA-112; HA-113
3	Martha Lewis (skipjack)	Havre de Grace	A & C	X		HA-2189
4	Rodgers Tavern[1]	Perryville	A & C	X		CE-129
5	Principio Furnace (Principio Iron Works)	Cecil County	A & D	X		CE-112
6	Perry Point Mansion House and Mill[1]	Perryville	A & C	X		CE-146; CE-244
7	Perryville Railroad Station	Perryville	A & C		X	CE-1442
8	Susquehanna River Rail Bridge and Overpasses[2]	Harford and Cecil Counties	A & C		X	HA-1712
9	Perry Point Veterans Administration (VA) Medical Center Historic District[1]	Cecil County	A & C		X	CE-1544
10	Crothers House (Furnace Bay Golf Course Clubhouse)	Cecil County	C		X	CE-1566
11	Woodlands Farm Historic District[3]	Cecil County	A & C		X	CE-145
12	Perryville United Methodist Church	Perryville	A & C		X	CE-1573
13	Perryville Presbyterian Church	Perryville	A & C		X	CE-1574

Notes:
1. Notes resource is also a MHT easement property.
2. The undergrade bridges at mile post (MP) 60.51, 60.56, 60.61, and 60.69 contribute to the Havre de Grace Historic District; the undergrade bridge at MP 59.39 contributes to the Perryville Railroad Station complex. See Figure 3-1 in Chapter 3, "Transportation" for the location of all undergrade bridges discussed in this chapter.
3. This is an expansion of a boundary for the NR-listed Woodlands Farm.

MIHP: Maryland Inventory of Historic Properties.
Sources: MHT Online Resources.

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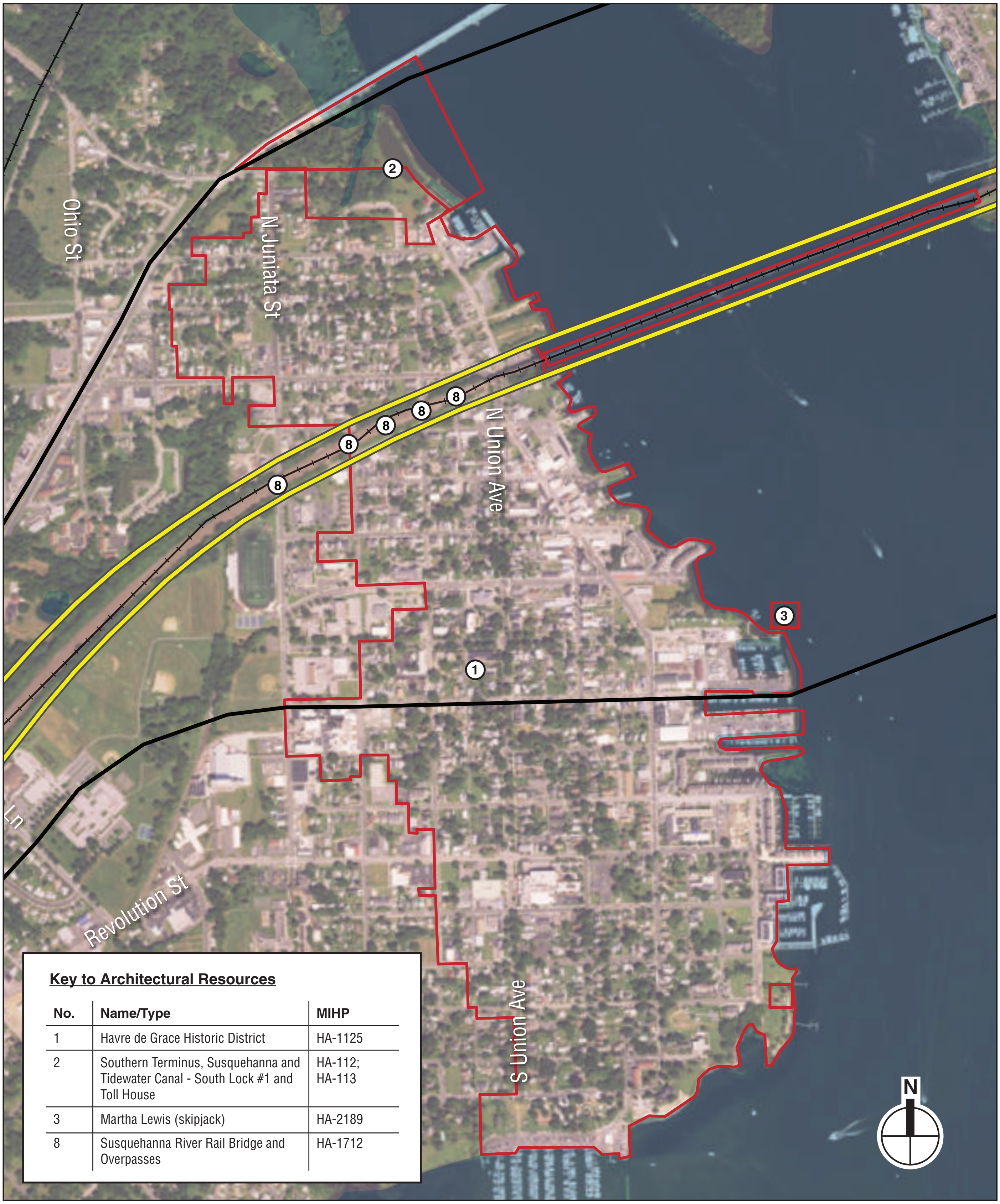

Key to Architectural Resources

No.	Name/Type	MIHP
1	Havre de Grace Historic District	HA-1125
2	Southern Terminus, Susquehanna and Tidewater Canal - South Lock #1 and Toll House	HA-112; HA-113
3	Martha Lewis (skipjack)	HA-2189
8	Susquehanna River Rail Bridge and Overpasses	HA-1712

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Project Site Boundary
Architectural APE
1 *Architectural Resource*

Havre de Grace Architectural Resources
Photo Map and Key
Figure 8-2

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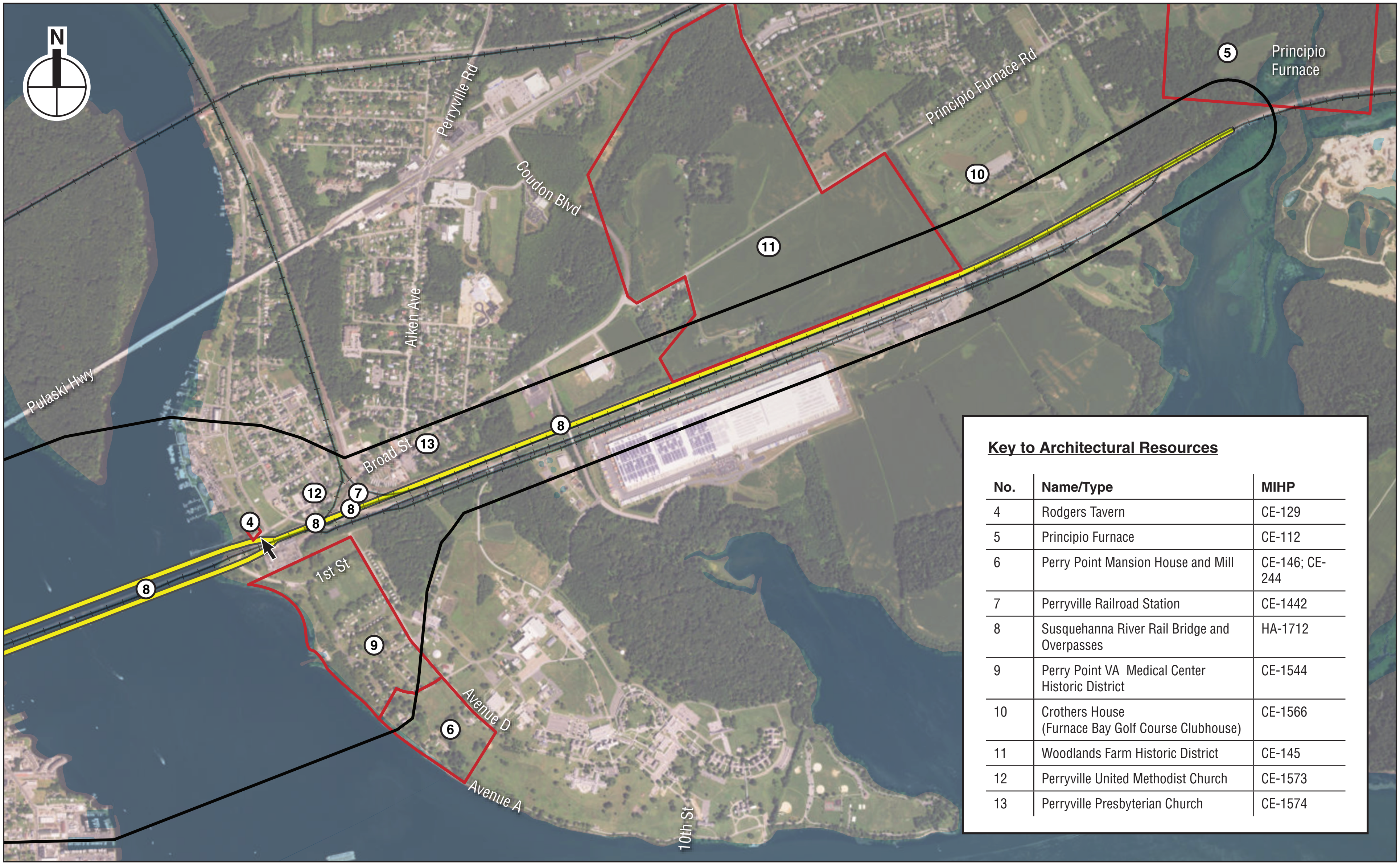

Key to Architectural Resources

No.	Name/Type	MIHP
4	Rodgers Tavern	CE-129
5	Principio Furnace	CE-112
6	Perry Point Mansion House and Mill	CE-146; CE-244
7	Perryville Railroad Station	CE-1442
8	Susquehanna River Rail Bridge and Overpasses	HA-1712
9	Perry Point VA Medical Center Historic District	CE-1544
10	Crothers House (Furnace Bay Golf Course Clubhouse)	CE-1566
11	Woodlands Farm Historic District	CE-145
12	Perryville United Methodist Church	CE-1573
13	Perryville Presbyterian Church	CE-1574

Project Site Boundary

Architectural APE

Architectural Resource

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SCALE

Perryville and Cecil County Architectural Resources
Photo Map and Key

Figure 8-3

Havre de Grace Historic District (HA-1617)

The Project site and APE pass through the northern portion of the Havre de Grace Historic District, which consists of a large part of the City of Havre de Grace. According to the NR nomination, the historic district is important under NR Criteria A and C for its architecture, transportation/commerce, and community planning. Each of these themes is examined below, with special focus on how the area of the historic district in close proximity to the Project site contributes to these themes.

Architecturally, the district contains a mix of nineteenth and early twentieth century residential, commercial, religious, and industrial buildings, representing a range of styles from Federal, Greek Revival, Gothic Revival, Italianate, Queen Anne, and Classical Revival, to variations of the Arts and Crafts movement, such as the Shingle and Bungalow styles.

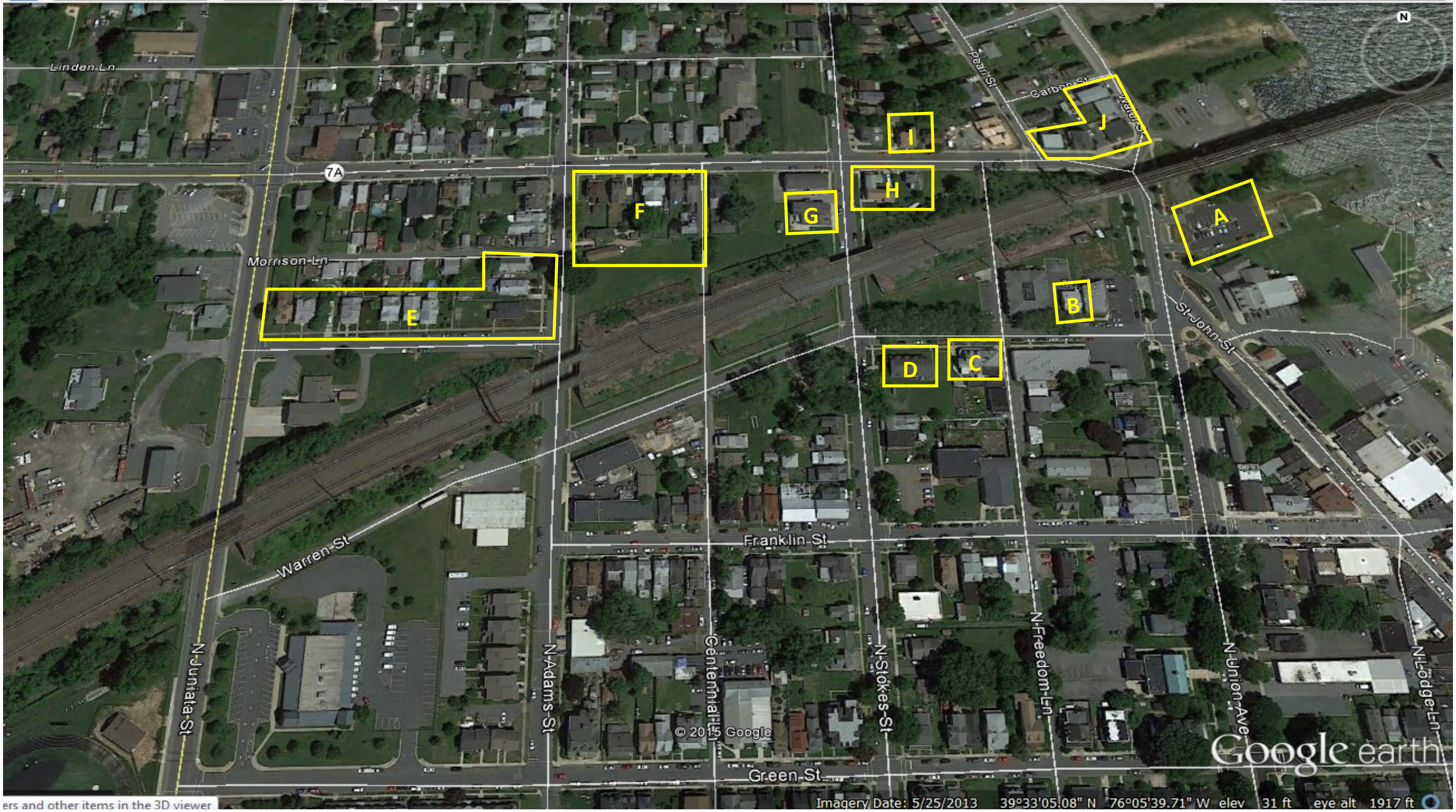
As part of the current study, the Project Team coordinated an evaluation for structures adjacent to the Project site, which have the greatest potential to be affected either physically or visually. The evaluation assessed whether structures contribute to the significance of the historic district, using an approximate 1930 end date for the district's period of significance. This date was used because the National Register nomination for the Havre de Grace Historic District was based on a cultural resources survey of all buildings within the district that pre-date the 1930s.

Based on the analysis, the Project Team evaluated that the following historic resources adjacent to the project site contribute to the Havre de Grace Historic District (see **Figures 8-4 through 8-9**):

- 501 St. John Street, American Legion Building (former Lafayette Hotel)
- 511 Warren Street, early nineteenth century house
- 552 Warren Street, multi-family residential structure
- 429 N. Stokes Street, Room at the Cross Mission Church (former St. Patrick's Catholic Church)
- Warren Street, cluster of early twentieth century bungalows
- Otsego Street, vernacular mid-nineteenth century houses
- 518 N. Stokes Street, mid-nineteenth century Gothic Revival house
- Otsego / N. Stokes Streets, vernacular mid-nineteenth century houses
- 571 Otsego Street, altered mid-nineteenth century French Second Empire house
- Otsego / Water Streets, late nineteenth / early twentieth century houses

Historically, the district is significant for two themes related to its physical location along the Susquehanna River: as a major commercial and transportation center in northern Maryland and for its community planning.

Transportation was important throughout Havre de Grace's history, starting as early as William Claibourne's trading post established on Garrett Island in 1637, continuing with John Rodgers' eighteenth century ferry with a tavern on each side of the river, and throughout the nineteenth century with the establishment of the rail line crossing through Havre de Grace. The Proposed Project's APE is integral to the historic theme of transportation because it contains the existing 1906 Pennsylvania Railroad bridge and the raised bridge approach as well as four of the undergrade bridges (see **Figures 8-10 and 8-11**, **Photos 11-14**) constructed at the same time as the bridge across the river (the North Freedom Lane Undergrade Bridge at MP 60.51; the North Stokes Street Undergrade Bridge at MP 60.56; the Centennial Lane Undergrade Bridge at MP



A. 501 St. John Street: American Legion Building
B. 511 Warren Street: early nineteenth century house
C. 552 Warren Street: multi-family residential structure
D. 429 N. Stokes Street: Room at the Cross Mission Church
E. Warren Street: cluster of early twentieth century bungalows
F. Otsego Street: vernacular mid-nineteenth century houses
G. 518 N. Stokes Street: mid-nineteenth century Gothic Revival house
H. Otsego / N. Stokes Streets: vernacular mid-nineteenth century houses
I. 571 Otsego Street: altered mid-nineteenth century French Second Empire house
J. Otsego / Water Streets: late nineteenth / early twentieth century houses

Resources Contributing to the Havre de Grace Historic District	Susquehanna River Rail Bridge Project Perryville / Havre de Grace, Maryland	Figure 8-4

501 St. John Street: American Legion Building (former Lafayette Hotel); looking east. 1

511 Warren Street: early nineteenth century house, possibly moved from original location; looking northeast. 2

Architectural Resources
Photographs
Figure 8-5

552 Warren Street: multi-family residential structure; looking southeast. **3**

429 N. Stokes Street: Room at the Cross Mission Church (former St. Patrick's Catholic Church); looking southeast. **4**

Architectural Resources
Photographs
Figure 8-6

Warren Street: cluster of early twentieth century bungalows; looking northeast. **5**

Otsego Street: vernacular mid-nineteenth century houses; looking southwest. **6**

Architectural Resources
Photographs
Figure 8-7

518 N. Stokes Street: mid-nineteenth century Gothic Revival house; looking southwest. 7

Otsego / N. Stokes Streets: vernacular mid-nineteenth century houses; looking southeast. 8

Architectural Resources Photographs
Figure 8-8

571 Otsego Street: altered mid-nineteenth century French Second Empire house; looking north. 9

Otsego / Water Streets: late nineteenth / early twentieth century houses; looking east. 10

Architectural Resources
Photographs
Figure 8-9

North Freedom Lane Undergrade Bridge (MP 60.51): view of the railroad east side, which will be altered via removing the existing stone-arch culvert and replacing it with a precast concrete culvert; looking north. **11**

North Stokes Street Undergrade Bridge (MP 60.56): view of the railroad west side, which will be altered via removing a portion of the existing stone masonry abutment and building a new concrete abutment; looking south. **12**

Architectural Resources
Photographs
Figure 8-10

Centennial Lane Undergrade Bridge (MP 60.61): view of the railroad east side, which will be altered via construction of a through plate girder bridge on a concrete abutment; looking north. 13

North Adams Street Undergrade Bridge (MP 60.69): view of the railroad east side, which will be altered via construction of a new concrete abutment; looking north. 14

Architectural Resources Photographs
Figure 8-11

60.61; and the North Adams Street Undergrade Bridge at MP 60.69). These rail structures relate to Havre de Grace's history as a major commercial and transportation center and are therefore considered contributing features of the historic district. In addition, the current Proposed Project's APE includes the extant piers of the 1866 railroad bridge, the canal and locktender's house, and the site of the eighteenth century ferry crossing.

In terms of community planning, the historic district nomination discusses the importance of the views to/from the water, as well as the town's system of alternating streets and alleys. Within the APE, the properties in close proximity to the river have a direct view of the water, although there some large facilities, including marinas and large housing complexes, that block some of the views. Immediately adjacent to the rail line, the main view towards the river is dominated by the bridge and its approaches. The city's layout of streets and alleys is in close proximity to the tracks, with both Freedom Lane and Centennial Lane crossing under the rail line via small stone arch bridges.

Southern Terminus, Susquehanna and Tidewater Canal - South Lock #1 and Toll House (HA-112; HA-113)

The Southern Terminus, Susquehanna and Tidewater Canal - South Lock #1 and Toll House (see **Figure 8-12**, **Photos 15-16**) is located north of Erie Street and east of Park Drive on the western bank of the Susquehanna River (approximately one quarter-mile north of the Project site) in Havre de Grace. The canal was part of a waterway system for shipping goods up the Chesapeake Bay to New York, Pennsylvania, New Jersey, Delaware, and Maryland. Thus, Havre de Grace, at the southernmost terminus of the canal, became an important shipping point for goods traveling north by the early 19th century. The site contains the Lock Master's house, the foundation of a bulkhead wharf along the river, and the outlet lock of the canal.

The Canal and Toll House are listed on the NR under Criterion A based on their association with a larger canal system that served five states and facilitated the development of Havre de Grace as a major transportation and economic center in the nineteenth century and Criterion C for its engineering significance. The MHT holds a preservation easement on this property, which requires that the MHT be provided an opportunity to review any proposed alterations.

Martha Lewis (Skipjack [HA-2189])

The Skipjack *Martha Lewis* (NR-listed) is one of the 35 surviving traditional Chesapeake Bay skipjacks, which were sailboats built specifically for the purposes of oyster dredging.[1] The boat is currently undergoing restoration at Frank J. Hutchins Memorial Park, located approximately one half-mile south of the Project site, but has a permanent docking place at Millard Tydings Memorial Park, which is located over a mile south of the Project site. The Skipjack *Martha Lewis* is listed on the NR under Criterion A for its association with historic events and under Criterion C for embodying a method of construction that represents the work of a master.

Rodgers Tavern (CE-129)

Rodgers Tavern (see **Figure 8-13**, **Photo 17**) is located on the north side of Broad Street in Perryville, approximately 100 feet north of the Project site. It was a popular stop for travelers waiting for the ferry service to Havre de Grace.

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[1] No photo was available at the time of writing as the ship was not on public display in Hutchins Park during the field visit in February 2014.

South Lock #1 and Toll House: Susquehanna Terminus, Susquehanna and Tidewater Canal; looking southeast. 15

Toll House: View of the northeast and northwest elevations; looking south. 16

Architectural Resources
Photographs
Figure 8-12

Rodgers Tavern: View of the front façade; looking north. **17**

Principio Furnace Office Building; looking south. **18**

Rodgers Tavern, constructed circa 1771, is listed on the NR under Criterion A based on its association with prominent national figures such as George and Martha Washington, Marquis de Lafayette, and Lieutenant General Rochambeau. The tavern is also listed under NR Criterion C as an example of eighteenth century building construction and materials.

The MHT holds a preservation easement on this property, which requires that the MHT be provided an opportunity to review any proposed alterations to the tavern interior, exterior, and associated land.

Principio Furnace (Principio Iron Works [CE-112])

The Principio Iron Works (see **Figure 8-13**, **Photo 18**) is located at 1723 Principio Furnace Road. Although the buildings associated with the historic resource are located approximately one-half mile north of the Project site, the southwest corner of the property (containing only a wooded area) is located in the study area. The Principio Furnace was the first iron furnace in Maryland and one of the first in the United States.

The Principio Iron Works is listed on the NR under Criterion A based on its association with the country's early industrial development and under Criterion D for its archaeological potential.

Perry Point Mansion House and Mill (CE-146; CE-244)

The Perry Point Mansion House and Mill are located south of the Perry Point Veterans Administration Medical Center on the Susquehanna River at the mouth of the Chesapeake Bay, approximately one-half mile south of the Project site. This mid- to late-eighteenth century, two-and-a-half-story Georgian mansion (see **Figure 8-14**, **Photo 19**) was home to the Stump family until 1918 when the house and approximately 516-acre farm were sold to the federal government for $150,000. During the Civil War, John Stump turned his farm over to the Union Army for the training of army mules and quartered soldiers in his house. A stone gristmill (see **Figure 8-14**, **Photo 20**) is located approximately 450 feet south of the mansion on the Susquehanna River.

The Perry Point Mansion House and Mill is listed on the NR under Criterion A because of its significance as a large nineteenth century farm owned and operated by a prominent local family and because of its association with housing Union Army soldiers during the Civil War, and under Criterion C for architectural significance.

Perryville Railroad Station (CE-1442)

The Perryville Station (see **Figure 8-15**, **Photo 21**), located at 650 Broad Street within and adjacent to the Project site, was determined eligible for listing on the NR under Criteria A and C due to its association with the larger pattern of system-wide upgrades during the railroad industry's golden age and as an example of an early twentieth century Colonial Revival style train station. The Philadelphia, Baltimore, and Washington (PB&W) Railroad Company constructed the station circa 1905.

Two railroad-related structures are in close proximity to the Perryville Station and contribute to its historic significance: Perry Interlocking Tower (see **Figure 8-15**, **Photo 22**), and the ashlar

Perry Point Mansion House: view of the north façade; looking south. **19**

Perry Point Mill: view of the east façade; looking west. **20**

Perryville Railroad Station: view of the south elevation; looking north. 21

Perry Interlocking Tower: view of the north and east elevations; looking southwest. 22

Architectural Resources
Photographs
Figure 8-15

stone-arch Perryville Railroad Station Undergrade Bridge at MP 59.39[2] (see **Figure 8-16**, **Photo 23**).

Amtrak Railroad or Perryville Road Bridge over the Susquehanna River and Overpasses (HA-1712)

The Pennsylvania Railroad constructed the Amtrak Railroad or Perryville Road Bridge (also known as the Susquehanna River Rail Bridge) in 1906. The bridge, set on stone piers, is a swing bridge with a movable span that rotates horizontally to open (using a center pivot mounted on a pier in the river) and allow boats to pass (see **Figure 8-16**, **Photo 24**).

The Amtrak Railroad or Perryville Road Bridge (the Susquehanna River Rail Bridge) was determined eligible for listing on the NR under Criteria A and C as an example of an early twentieth century railroad bridge built by an important American railroad company and as an example of engineering that acknowledges two different modes of transportation.

The Project Team determined nine bridges (see **Figures 8-17 and 8-18**, **Photo 25-27**) historically associated with the Susquehanna River Rail Bridge eligible for the NR (also under NR Criteria A and C), and modified the existing NR eligibility determination for the Susquehanna River Rail Bridge to include these bridges. These nine bridges were constructed as part of the 1904-1906 building campaign that included the Susquehanna River Rail Bridge. The nine bridges include:

- Mill Creek, MP 59.00
- Perryville RR Station, MP 59.39 (also contributes to the Perryville Railroad Station complex)
- Station Access Road, MP 59.52
- North Freedom Lane, MP 60.51
- North Stokes Street, MP 60.56
- Centennial Lane, MP 60.61
- North Adams Street, MP 60.69
- North Juniata Street, MP 60.77
- Lily Run, MP 60.85

In addition, due to the importance of transportation to the history of the Havre de Grace Historic District, the Susquehanna River Rail Bridge and the four bridges within Havre de Grace Historic District (at MP 60.51, 60.56, 60.61, and 60.69) contribute to the historic district's significance.

Perry Point Veterans Administration Medical Center Historic District (CE-1544)

The Veterans Administration (VA) developed the Medical Center at Perry Point (see **Figure 8-18**, **Photo 28**) primarily in the 1920s through the 1940s as a neuro-psychiatric treatment facility for military veterans. The Colonial Revival architectural style and site layout reflect design principles developed by the VA during this period, which focused on siting buildings to maximize views of the existing landscape.

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[2] A passenger shelter identified in the eligibility determination as contributing to the resource's significance was recently demolished. It was located south of the tracks across from the train station.

Perryville Railroad Station Undergrade Bridge (MP 59.39): View of the ashlar stone tunnel located east of the Perryville Railroad Station; looking south. **23**

Susquehanna River Rail Bridge: View from the Perryville waterfront; looking southwest. **24**

Architectural Resources
Photographs
Figure 8-16

Mill Creek Undergrade Bridge (MP 59.00): View of the east side, which will be extended with a precast concrete culvert; looking northwest. 25

Perryville Railroad Station Undergrade Bridge (MP 59.39): view of the east side, which will be extended with a precast concrete culvert. 26

Architectural Resources
Photographs
Figure 8-17

Access Road Undergrade Bridge (MP 59.52): View of the east side, which will be altered via replacing the existing concrete encased stringer and superstructure and will be extended with a concrete abutment; looking northwest. 27

Perry Point Veterans Administration Medical Center: view of residences along Avenue D from 2nd Street; looking southeast. 28

The VA Medical Center at Perry Point is eligible for listing on the NR under Criterion A for its association with the growth of the federal government's provision of neuro-psychiatric treatment for military veterans and under Criterion C as a cohesive collection of buildings.

Crothers House (Furnace Bay Golf Clubhouse [CE-1566])

The Crothers House (see **Figure 8-19**, **Photo 29**), which is currently used as the clubhouse for the Furnace Bay Golf Course, was built in 1936 as a residence for Omar and Margaret Crothers, both of whom would serve in the Maryland State Senate in the 1950s.

The Crothers House was determined eligible for listing on the NR under Criterion C for its architectural significance as an example of a Colonial Revival house associated with early twentieth century estates for the wealthy and for its notable architectural features.

Woodlands Farm Historic District (CE-145)

The Woodlands Farm Historic District is an extension of the boundary of the NR-listed Woodlands property north of Maryland Route 7 to include the Woodlands Farm South Complex. The NR-listed Woodlands property consists of a main house and several outbuildings set on 69 acres.

The Woodlands Farm South Complex is eligible for listing on the NR under Criteria A and C due to its association with the evolution of the agricultural industry in Cecil County from the early nineteenth to late twentieth centuries, and as representing a cohesive collection of mostly intact agricultural buildings dating to the nineteenth century.

Perryville United Methodist Church (CE-1573)

As part of the Proposed Project, the Project Team – in concert with SHPO – determined the Perryville United Methodist Church eligible for the NR. The congregation of the Perryville United Methodist Church (see **Figure 8-19**, **Photo 30**) constructed the structure in 1896, 30 years after the church formed. The church added an addition to the south façade between 1923 and 1943; a Queen Anne-style Parsonage north of the Church circa 1905; and a Church House immediately south and west of the Church in 1928.

The Church, Parsonage, and Church House are eligible for the NR under Criterion A for their role in the history of the local development of the Methodist Church and under Criterion C as examples of Gothic Revival-style ecclesiastical architecture.

Perryville Presbyterian Church (CE-1574)

As part of the Proposed Project, the Perryville Presbyterian Church was determined to be NR eligible. The Perryville Presbyterian Church (see **Figure 8-20**, **Photo 31**) was constructed circa 1892, four years after the founding of the congregation.

The church is eligible for the NR under Criterion A for its role in the local history of the Presbyterian Church and under Criterion C as a fine example of a Gothic board-and-batten church.

C. NO ACTION ALTERNATIVE

As described in Chapter 2, "Project Alternatives," under the No Action Alternative, the existing Susquehanna River Rail Bridge will remain in service, with continued increased maintenance and minimal repairs. The planned development projects discussed in Chapter 4, "Land Use and

Crothers House (Furnace Bay Golf Clubhouse): View of the west (front) and south elevations; looking northeast. **29**

Perryville United Methodist Church: view of the east elevation; looking west. **30**

Architectural Resources
Photographs
Figure 8-19

Perryville Presbyterian Church: view of the side (east) and front (north) elevations of the church at 710 Broad Street in Perryville; looking southwest. 31

Community Facilities," consist primarily of residential and mixed-use infill projects in Havre de Grace and Perryville. Other proposed projects include a Waterfront Heritage Park in Havre de Grace along Water Street, the Lower Ferry Park and Pier in Perryville at Broad Street and Roundhouse Drive, as well as a 115-acre MARC maintenance facility adjacent to the NEC.

Architectural resources that are listed on the NR or that have been found eligible for listing are given a measure of protection from the effects of federally sponsored or assisted projects under Section 106 of the NHPA. Although the Act does not mandate preservation, federal agencies must attempt to avoid adverse impacts on such resources through a notice, review, and construction process.

The residential infill projects in the Havre de Grace Historic District require review and approval from the Havre de Grace Historic Preservation Commission; therefore, it is anticipated that these projects would be in keeping with the overall character of the Historic District.

D. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

ARCHAEOLOGICAL RESOURCES

Since Alternative 9A and Alternative 9B overlap, their potential effects on archaeological resources will be jointly discussed for each of the five study areas identified in the *Phase IA Archaeological Assessment*, moving from west to east.

STUDY AREA 1: HAVRE DE GRACE ATHLETIC FIELD COMPLEX

Within Study Area 1 there is little to no archaeological sensitivity within the APE for Alternative 9A and Alternative 9B; therefore, no additional archaeological investigation is recommended for this section of the Project area.

STUDY AREA 2: NORTH JUNIATA STREET TO NORTH UNION AVENUE

Within Study Area 2, the area of archaeological sensitivity is located within the northwest corner of the intersection of Warren Street and N. Adams Street between the existing railroad and Warren Street. Approximately 100 feet (30 meters) west of Adams Street, a building was observed to extend under the railroad tracks. This appears to be the location of the former Havre de Grace Train Station with the extant remains of the building observed on both the west and east sides of the tracks. It is possible that intact cultural deposits associated with this structure are present within the APE. Both Alternative 9A and Alternative 9B propose ground disturbance within this portion of the APE with Alternative 9A having a negligible, but slightly larger area of ground disturbance. Within this portion of the APE, a Phase IB/II Archaeological Survey is recommended to confirm the presence of and determine the extent and significance of archaeological resources.

STUDY AREA 3: HAVRE DE GRACE WATERFRONT

Within Study Area 3, the area of archaeological sensitivity is located east of N. Union Street and Water Street along the Havre de Grace Waterfront. Although this portion of the APE is largely man-made as a result of filling activities along the waterfront, the area does have archaeological potential for information pertaining to the development of the waterfront, including the original Philadelphia, Baltimore, and Washington (PW&B) rail alignment, warehouses, wharves, or other industrial activities. The MHT's records identify the entire waterfront as a potential resource as well as the approximate location of a coal wharf.

Along the waterfront, two parks straddle the railroad tracks: the David Craig Park to the south and Jean S. Roberts Park to the north. Both parks were identified as having archaeological potential, with a larger area of sensitivity identified within David Craig Park.

Alternative 9A and Alternative 9B both propose small-scale ground disturbance adjacent to the David Craig Park and a larger area of ground disturbance in the Jean S. Roberts Park, with Alternative 9B having a slightly larger disturbance area where the MHT Quad File #10 is located. While Alternative 9A and Alternative 9B would disturb a larger area within Jean S. Roberts Park, the area of archaeological sensitivity in this location is smaller. For either Alternative 9A or Alternative 9B, a Phase IB Archaeological Survey is recommended to confirm the presence or absence of potentially significant archaeological deposits.

STUDY AREA 4: PERRYVILLE WATERFRONT

Within Study Area 4, the area of archaeological sensitivity is located at the northern bridge approach over the Susquehanna River known as Perry Point between the river and Avenue A on both sides of the existing railroad corridor. Portions of this area are Amtrak property, but are leased to the federal government for the VA facility. There have been previous archaeological investigations in the immediate vicinity of the Proposed Project APE; however, these investigations did not include all areas that may be impacted by the Proposed Project. The previously recorded and potentially eligible Rodger's Tavern site (18CE15) is located on the north side of the existing railroad and north of Broad Street. The archaeological component of Rodgers Tavern is depicted on MHT mapping as being located on the south side of Broad Street directly adjacent to one of the stone abutments supporting the current Susquehanna River Rail Bridge. Given the significance of this resource and the lack of systematic archaeological survey in this area, Phase IB/II investigations are recommended for all areas of ground disturbance associated with the Proposed Project west of Broad Street/Avenue A. These investigations would seek to verify the current extent of 18CE15 as well as to identify additional unrecorded cultural deposits associated with Rodgers Tavern in the vicinity.

Portions of the APE within the construction, staging, and access areas on the east side of the railroad should be considered archaeologically sensitive for both precontact and historic resources and may require Phase IB archaeological survey. This side of the river may contain the Perryville side of a ferry crossing.

Alternative 9A and Alternative 9B (which are identical in this section of the APE) would result in ground disturbance within the archaeologically sensitive areas west of the railroad and adjacent to the Rodgers Tavern site, which has a high potential for significant archaeological resources. Phase IB/II archaeological testing is recommended regardless of alternative selected, given what is known of the archaeological potential on both sides of the railroad and the location of the Rodgers Tavern site.

STUDY AREA 5: PERRY POINT VA MEDICAL CENTER AND MARC STATION AREA

The majority of Study Area 5 has been previously disturbed by the construction of the intersection of the Northeast Corridor with the Norfolk Southern Port Road spur line and its associated parking lots, supply yards, and other support facilities. However, west of this railroad intersection, a group of nineteenth and early twentieth century single and multifamily residences line the southern edge of Broad Street. Each of these properties includes a small yard directly adjacent to the rail corridor. These areas have the potential to contain intact yard features such as wells, privies, trash middens or other cultural deposits.

Both Alternative 9A and Alternative 9B (which are identical in this section of the APE) change the alignment of the Wye Track and encroach into the archaeologically sensitive areas. Phase IB archaeological testing is recommended for archaeologically sensitive areas that would be disturbed under either alternative.

STUDY AREA 6: SUSQUEHANNA SUBMERGED CULTURAL RESOURCES

Past archival research efforts and remote sensing surveys have indicated the potential for submerged historic shipwrecks or other vessels as well as potential structural remains associated with the evolution of the Havre de Grace Waterfront. These surveys have resulted in the identification of several targets that are located within the archaeological APE for the Proposed Project.

According to MHT's records for Havre de Grace, six resources have been identified within the archaeological APE.

- Location of the first railroad bridge across the Susquehanna, identified by the existing PW&B railroad bridge pilings.
- Location of a nineteenth century ferry across the Susquehanna River as identified on historic mapping.
- Location of the historic Havre de Grace Waterfront.
- Location of a coal wharf.
- Location, just south of the existing Susquehanna River Rail Bridge, of a submerged anomaly recorded during the 2002 Lower Susquehanna River survey by Maryland Maritime Archeology Program (MMAP). This anomaly is approximately 400 feet (122 meters) west of the Perryville shoreline.
- Location of another submerged anomaly recorded during the 2002 Lower Susquehanna River, marked on MHT mapping as running the entire length of the existing Amtrak railroad bridge structure.

No additional information is given for these resources.

In addition to the MHT Quad Files, one previously identified archaeological site, 18HE266, is located within the Susquehanna River within the vicinity of the APE. Located to the north of the existing bridge structure approximately 700 feet (213 meters) to the east of the Havre de Grace shoreline, 18HE266 has been identified as the wreckage from a twentieth century barge. This resource has never been formally evaluated for eligibility to the NR.

Due to the imprecise nature of the information available, additional information on the submerged archaeological features would be necessary to determine the potential impacts of the Build Alternatives. Resources identified within the vicinity of the APE should be surveyed and precisely located, to reconfirm their boundaries and verify whether they lie outside of the APE. Submerged cultural resources are subject to the natural effects of the environment. In particular, natural river phenomenon is known to have pushed sites out of the main channels and closer to shore. It appears that Alternative 9A and Alternative 9B may impact the location of the nineteenth century ferry and may be close to the location of the coal wharf. Given the lack of certainty regarding the location and integrity of underwater archaeological resources within the river portion of the APE, additional Phase I underwater archaeological studies are recommended for areas that may be impacted by the Proposed Project.

SUMMARY

Both Alternative 9A and Alternative 9B have the potential to impact archaeologically sensitive areas within Study Areas 2 to 5 and within the Susquehanna River. Both Alternative 9A and Alternative 9B would have the potential to impact the area surrounding the former Havre de Grace Train Station (Study Area 2). Although the proposed areas of ground disturbance in Study Area 2 are not identical under Alternative 9A and Alternative 9B, the differences are slight. Within the Havre de Grace Waterfront (Study Area 3), both Alternative 9A and Alternative 9B would disturb archaeologically sensitive areas. At Perryville Waterfront (Study Area 4), both Alternative 9A and Alternative 9B would cause disturbance within archaeologically sensitive areas with high potential for archaeological resources pertaining to Rodgers Tavern as well as precontact resources. Adjacent to the South Wye Track (Study Area 5), the archaeologically sensitive backyards of the houses to the west of the track may be impacted by both Alternative 9A and Alternative 9B. As discussed above, additional information regarding the potential underwater archaeological resources within the Susquehanna River is required to determine potential impacts to these historic resources.

Phase IB testing is recommended for all identified archaeologically sensitive areas that would be impacted by the Proposed Project. Additionally, a Phase I underwater archaeological survey is recommended for the portion of the APE within the Susquehanna River to confirm the location of potential submerged archaeological resources that could be affected by the undertaking. If Phase IB testing in any of the Study Areas identifies potentially significant (NR-eligible) archaeological resources that could be affected by the Proposed Project, Phase II archaeological testing would be undertaken in these areas to determine the significance and the boundaries of the archaeological deposits. If significant archaeological resources are identified in the APE that would be unavoidably adversely affected by the Proposed Project, appropriate measures to minimize and/or mitigate any such effects would be devised and implemented. A draft Programmatic Agreement (PA) was developed with all appropriate agencies and consulting parties, which includes stipulations for any necessary additional archaeological investigations, as recommended above (see **Appendix D**, “Cultural Resources”).

ARCHITECTURAL RESOURCES

The Project Team assessed Alternative 9A and Alternative 9B for their potential to adversely affect the 13 historic architectural resources within the APE that are either listed on or eligible for listing on the NR. Based on the assessment, the Proposed Project would adversely affect the Susquehanna River Rail Bridge, eight of the nine undergrade rail bridges, the Havre de Grace Historic District, the Perryville Railroad Station complex, and Rodgers Tavern.

A draft Programmatic Agreement includes measures to minimize and mitigate adverse effects to architectural resources (see **Appendix D**, “Cultural Resources”). This document will be implemented in coordination with ACHP, MHT, and involved consulting parties.

SUSQUEHANNA RIVER RAILROAD BRIDGE AND OVERPASSES

The Susquehanna River Rail Bridge and nine undergrade bridges, which were all constructed during the same 1904-1906 building campaign by the Pennsylvania Railroad, are eligible for listing on the NR under Criteria A and C. Because all ten bridges will be impacted by the Build Alternatives, the effect of the Proposed Project on the bridges was evaluated in accordance with the criteria for adverse effect.

Section 106 regulations define “Physical destruction, damage, or alteration of all or part of the property” as an adverse effect; therefore, demolition of the NR-eligible Susquehanna River Rail Bridge would constitute an adverse effect. FRA/MDOT considered whether rehabilitating the existing Susquehanna River Rail Bridge could meet project Purpose and Need and program goals. Based on studies conducted in 2013-2014 (see Chapter 2, “Project Alternatives” for further discussion), FRA/MDOT determined that the rehabilitation alternative is not suitable for either continued freight and/or passenger rail or non-rail use. This conclusion stems from the bridge’s current condition and the infeasibility of reconstructing it to a state of good repair without significant rail disruptions and prohibitive costs.

Although the adverse effect of demolishing the bridge cannot be avoided, FRA/MDOT considered minimizing the adverse effect by designing the two new bridges and their piers to be compatible with the character defining features of the historic bridge. The character defining features of the existing bridge include its traditional railroad architecture, especially its metal trusses, its central projecting section, and its use of Alleghany Mountain sandstone and Port Deposit granite. Amtrak is considering four alternative bridge designs and four pier designs for the proposed new bridges. The bridge designs, and the extent to which they would minimize the adverse effects, are listed below (in descending order of the degree to which the new design helps to minimize the adverse effect of the removal of the historic bridge):

The bridge alternative in **Figure 8-21, Photo 32** combines deck truss approach spans with a through truss main span and is therefore closest to the original bridge in design. Overall, this design rates high in terms of its ability to minimize the adverse effect of demolishing the historic bridge.

The bridge alternative in **Figure 8-21, Photo 33** maintains a through truss center span, yet replaces the deck truss construction with a girder deck. Although this is a change from the existing bridge, a girder is a traditional rail design and therefore appropriate for the replacement of a historic bridge. Overall, this design rates medium in terms of its ability to minimize the adverse effect of demolishing the historic bridge.

The bridge alternative in **Figure 8-22, Photo 34** replaces the through truss of the center span with an arch and the deck truss construction with a girder deck. Although this is a change from the existing bridge, both arch construction and deck girders are traditional rail design and therefore appropriate for the replacement of a historic bridge. Overall, this design rates medium in terms of its ability to minimize the adverse effect of demolishing the historic bridge.

The bridge alternative in **Figure 8-22, Photo 35** replaces the through truss of the center span with an arch and the deck truss construction with a girder deck. The use of arch construction is traditional rail design; however, the remaining design elements, especially the delta piers (see **Figure 8-23, Photo 36**) are not compatible with a historic bridge. Overall, this design rates low in terms of its ability to minimize the adverse effect.

Three of the proposed pier designs, arched “keyhole” (see **Figure 8-23, Photo 37**), fluted (see **Figure 8-24, Photo 38**), or wall (see **Figure 8-21, Photos 32-33**) are traditional designs and would therefore help to minimize the adverse effect of demolishing the bridge. These piers could be constructed with any of the three truss or girder bridge alternatives shown in **Figures 8-21 and 8-22, Photos 32-34**. The delta piers (shown in **Figures 8-22 and 8-23, Photos 35-36**) have

Rendering of a proposed replacement bridge with a truss approach and a truss main span; looking northeast from Havre de Grace. **32**

Rendering of a proposed replacement bridge with a girder approach and a truss main span; looking northeast from Havre de Grace. **33**

Rendering of a proposed replacement bridge with a girder approach and arch main span; looking northeast from Havre de Grace. **34**

Rendering of a proposed replacement bridge with a Delta frame approach and arch main span; looking northeast from Havre de Grace. **35**

Architectural Resources
Photographs
Figure 8-22

Rendering of the piers for the Delta frame approach; looking east from Havre de Grace. **36**

Rendering of possible arched piers to be used with the girder approach; looking east from Havre de Grace. **37**

Rendering of possible fluted piers to be used with the girder approach; looking east from Havre de Grace. 38

a modern appearance and would not help to minimize the adverse effect of demolishing the historic bridge.

The four bridge design options have been shown to consulting parties and the general public at several meetings, including on December 10, 2014, November 10, 2015, and April 14, 2016. The design alternative that received the strongest support was the one with a deck girder and central arch (shown in **Figure 8-22, Photo 34**), primarily due to the more open look of this design.

The Susquehanna River Rail Bridge's stone is an important character-defining feature, especially because of the use of Port Deposit granite from a local quarry. The adverse effect of the bridge's demolition could be minimized by incorporating stone into the two new bridges. However, the Project Team has determined that using stone in the new bridge is not feasible as it would not meet current engineering design standards. In addition, as indicated above, public comment favors a more open pier design (see further discussion on the importance of viewsheds in conjunction with the Havre de Grace Historic District.)

In addition to affecting the Susquehanna River Rail Bridge itself, the Proposed Project would result in a permanent impact to the nine associated masonry rail undergrade bridges that carry the NEC, listed from north to south:

- Mill Creek Undergrade Bridge, milepost (MP) 59.00: a stone-arch bridge with stone abutments resting on spread footings. The bridge appears to remain largely intact, although an I-beam that runs along the edge of the deck is anchored on either end with concrete that appears to be a later repair. The Proposed Project calls for the construction of a precast concrete culvert extension on the east side of the tracks.
- Perryville Railroad Station Undergrade Bridge, MP 59.39: a stone-arch masonry structure with stone abutments on spread footings. The Proposed Project calls for the construction of a precast concrete culvert extension on the east side of the tracks.
- Access Road Undergrade Bridge, MP 59.52: a two-span concrete-encased steel-stringer bridge that sits on stone abutments and a central steel pier, both founded on spread footings. The bridge's masonry abutments, steel pier, and steel deck do not appear to have been substantially altered. The Proposed Project calls for the current structure to be replaced with a precast concrete culvert and the existing abutments to be partially demolished and buried in fill. In addition, the new bridge will extend beyond the limits of the current structure to the east and the west.
- North Freedom Lane Undergrade Bridge, MP 60.51: a stone-arch bridge that consists of a masonry arch and abutments (or wing walls) on spread footings that retain the embankment on which the Northeast Corridor runs in the area. The bridge appears to be in good condition and does not appear to have been visibly altered since its construction as part of the 1904-1906 building campaign. The Proposed Project calls for the construction of a precast concrete culvert extension on the east and west sides of the tracks.
- North Stokes Street Undergrade Bridge, MP 60.56: a bridge comprised of stone abutments (or wing walls) on spread footings supporting steel plate girders. The deck appears to be constructed of reinforced concrete. The masonry abutments and steel plate girders appear to date to the original 1906 construction of the bridge. The Proposed Project calls for removal of a portion of the existing stone masonry abutment on the west side of the tracks and construction of new concrete abutments on both sides of the tracks.
- Centennial Lane Undergrade Bridge, MP 60.61: a stone-arch bridge that consists of a masonry arch and abutments on spread footings. The bridge appears to be in good condition

and does not appear to have been visibly altered since it was built as part of the 1906 construction of the Susquehanna River Railroad Bridge. The Proposed Project calls for the construction of a through plate girder bridge on a concrete abutment on the east side of the tracks for Alternative 9A and a precast concrete culvert extension on both sides of the tracks for Alternative 9B.

- North Adams Street Undergrade Bridge, MP 60.69: The bridge consists of two single-track steel plate girder decks atop stone masonry abutments on spread footings. The masonry abutments and steel plate girders appear to date to the original construction of the 1904-1906 bridge. Some repairs to the upper portions of the masonry abutments are evident. The concrete deck appears to have been replaced and the deck platform appears to have been extended with a metal plate supported by metal brackets affixed to outer sides of the concrete decking. The Proposed Project calls for construction of a new concrete abutment on the east side of the tracks and a concrete abutment extension on the west side.
- North Juniata Street Undergrade Bridge, MP 60.77: The bridge consists of four single-track plate-girder decks atop stone abutments with spread footings. The masonry abutments and steel plate girders appear to date to the original construction of the 1906 Susquehanna River Railroad Bridge. The concrete deck appears to have been replaced and the deck platform appears to have been extended with a metal plate supported by metal brackets affixed to outer sides of the concrete decking. The Proposed Project calls for construction of a new concrete abutment on the east side of the tracks.
- Lily Run Undergrade Bridge, MP 60.85: The bridge is a stone-arch culvert comprised of stone abutments on a spread footing. The Proposed Project calls for spanning over the flood plain with a multi-girder bridge, thereby avoiding the need to extend the culvert.

Project plans to span over and therefore avoid altering the Lily Run Undergrade Bridge (MP 60.85) would result in no adverse effect on that bridge. However, the Proposed Project will have an adverse effect on the other eight historic bridges due to the proposed extension of the bridges with concrete abutments. The adverse effect could be minimized or avoided by using stone in the construction of the new bridge extensions; however, FRA/MDOT have determined that using stone is not feasible as it would not meet current engineering design standards. Therefore, the adverse effect could be minimized by using a form liner that emulates stone and is stained to be compatible with the color of the existing stone. In addition, to ensure that the new retaining walls in close proximity to the bridges do not adversely affect the historic resources, the design of the new walls should be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, so that the walls are compatible with the bridges' historic materials, features, size, scale and proportion, and massing.

The Susquehanna River Rail Bridge Project Advisory Board and the Town of Perryville have recommended that the north face and wing walls of the underpass at MP 59.52 "should be restored to its original architectural appearance," and that "the entire north entrance of this underpass should be thoroughly cleaned and well landscaped along the adjacent embankments and out to Broad Street." In addition, the Susquehanna River Rail Bridge Project Advisory Board and the Town of Perryville have also recommended that the "low tunnel-like underpass [at MP 59.39] that divides the two MARC Station parking lots should be abandoned by sealing it off from the north side. The south side may be left open for historical purposes, provided it is made secure from trespassers." The abandonment and sealing off of the underpass are not part of the Proposed Project and, if added, would constitute an adverse effect under Section 106.

The following components of the Proposed Project will have no direct physical effects and only limited visual effects on the nine historic undergrade bridges: the new communications, overhead contact, and signal systems; minor modifications to the Perry Electrical Substation; the modification or relocation of the transmission tower on the west side of the track; and modifications to the interlockings. Therefore, because these components will not alter a characteristic that makes the undergrade bridges eligible for inclusion in the NR, they will have no effect as defined in 36 CFR Part 800.16.

HAVRE DE GRACE HISTORIC DISTRICT

To assess the Proposed Project's effects on the Havre de Grace Historic District, the following were reviewed:

- Demolition of the existing Susquehanna River Rail Bridge. As the bridge is a contributing feature IN the Havre de Grace Historic District, the proposed demolition of the bridge will have an adverse effect on the historic district.
- Visual effects associated with the proposed replacement of the Susquehanna River Rail Bridge, including the change from one to two bridges, the massing and height of the new bridges and their piers and approaches, and the construction of new retaining walls.
- Alterations to the undergrade bridges within the historic district.
- Physical taking of property within the historic district.
- Damage to historic buildings.
- The proposed installation of new communications, overhead contact, and signal systems.

Demolition of the Susquehanna River Rail Bridge

Because the bridge is a contributing feature of the Havre de Grace Historic District, the proposed demolition of the bridge will have an adverse effect on the district due to the "physical destruction, damage, or alteration of all or part of the property." This adverse effect can be minimized by ensuring that the two new bridges over the river use a traditional design for the bridges and piers as discussed earlier in this section.

Visual Effects

The Proposed Project's potential visual effects on the Havre de Grace Historic District were evaluated according to three considerations: the extent to which the Proposed Project would either block or open up views to/from the historic district; the extent to which the view looking at the Susquehanna River Rail Bridge from the historic district would be altered; and the extent to which the views from structures within the historic district would be altered due to the Proposed Project coming in closer proximity to the structures.

The NR nomination for the Havre de Grace Historic District states that views or "vistas" to and from the water are important: "Another aspect of Havre de Grace's vistas that should not be forgotten relates not only to how the water is seen from in town but to the image which the town projects to the river and Bay. Considering that it has a history of three centuries as a river settlement, it is only in very recent times that the waterway has ceased to be the principal transportation route to Havre de Grace." The fact that the Proposed Project calls for the replacement of one bridge with two will result in greater mass that would potentially block views to/from the historic district. However, this effect on views will to a great extent be counterbalanced by the fact that the bridges will be 14 feet higher in elevation at the navigation channel of the river, thereby opening up views under the bridges. In addition, a girder bridge, versus the existing heavy construction truss bridge, will be shallower and therefore result in more open views.

In terms of vistas from the historic district to the bridge, the most important character defining feature, whether in close proximity to the bridge or further removed is the bridge's long linear nature with a traditional central feature, currently a truss. All four proposed bridge designs will retain this characteristic.

In summary, the Proposed Project will have an effect, but not an adverse effect, on the Havre de Grace Historic District's character-defining feature of views to/from the water and to the bridge.

The extent to which the Proposed Project would have a visual effect on individual structures within the Havre de Grace Historic District was also assessed. In order to accommodate the new tracks, the elevated tracks going through the historic district will need to be expanded in width and height, with new retaining walls added. In terms of height, the approach to the bridge in Havre de Grace will be six feet higher at the south abutment, three feet higher at Stokes Street, and two feet higher at Adams Street near the southern end of the historic district. In terms of width, Alternative 9A and Alternative 9B will result in placing the tracks closer to contributing structures within the historic district as shown in **Table 8-2.**

Table 8-2
Distance to Contributing Structures

<table>
<tr><th>Building/Cluster</th><th>Alternative 9A</th><th>Alternative 9B</th></tr>
<tr><td>511 Warren Street</td><td>Shifted 30 feet east</td><td>Shifted 13 feet east</td></tr>
<tr><td>Cross Mission Church, 429 N. Stokes Street</td><td>Shifted 44 feet east</td><td>Shifted 19 feet east</td></tr>
<tr><td>Bungalows at the intersection of Adams and Warren Streets (west side)</td><td colspan="2">Shifted 4 to 5 feet west</td></tr>
<tr><td>518 N. Stokes Street</td><td colspan="2">Shifted 26 to 28 feet west</td></tr>
<tr><td>Mid-nineteenth century houses on southeast corner of N. Stokes Street and 560-566 Otsego Street</td><td colspan="2">Shifted 30 to 37 feet west</td></tr>
<tr><td>513 Otsego Street</td><td colspan="2">Shifted 46 feet west</td></tr>
<tr><td>509 Otsego Street</td><td colspan="2">Shifted 47 feet west</td></tr>
<tr><td>600 Water Street</td><td colspan="2">Shifted 48 feet west</td></tr>
</table>

The proposed changes, especially the widening that will bring the tracks in much closer proximity to some of the contributing structures within the historic district, will result in "the isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NR," constituting an adverse effect. The areas where the greatest changes would occur would be:

- West side of the tracks:
  - Structures at the intersection of Otsego and Water Streets
  - Vernacular Victorian-period residence at 518 N. Stokes Street

These structures would be impacted by the effect of the widening and the new retaining walls for both Alternative 9A and Alternative 9B. The tracks would be 46 to 48 feet closer to the structures at the intersection of Otsego and Water Streets and 26 to 28 feet closer to 518 N. Stokes Street.

- East side of the tracks:
  - Nineteenth century structure at 511 Warren Street

The tracks would be 40 feet closer in Alternative A, and only 13 feet closer in Alternative B.

Several factors were taken into consideration in assessing the adverse effect on the structures on the west side of the tracks. First, the visual effects of the widening of the bridge approach near the intersection of Otsego and Water Streets will be minimized by the fact that the stone bridge abutment and wingwall across from the houses on Otsego Street will be removed and the new abutment will be placed further south near Freedom Lane. In addition, the retaining wall proposed to be built south of Freedom Lane will help to separate the tracks from the adjoining structures, with the tracks placed 16 feet within the retaining walls. The adverse effect from the widening of the bridge approach can be further minimized by ensuring that the retaining wall is designed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, in order to ensure compatibility with the historic district. The Advisory Board has recommended that the bridge abutments, underpasses, and retaining walls have a consistent architectural design and appearance.

Physical Taking of Property within the Historic District

For Alternative 9A and Alternative 9B, most of the required taking of property beyond the existing Amtrak right-of-way is south of North Adams Street and therefore outside of the boundaries of the historic district. Within the historic district, there are two areas of takings:

- Alternative 9A requires a taking of a small amount of property outside of the existing Amtrak right-of-way including a 0.1-acre tapered area between Adams Street and Stokes Street and a 0.05-acre area between Stokes Street and Freedom Alley. The affected property is undeveloped open space. Due to the small size of the affected land as well as the undeveloped nature, the effect of this taking is minor and therefore not adverse.
- Both Alternatives require the taking of a 0.01-acre area from the Jean S. Roberts Memorial Park on the west side of the bridge. Due to the small size of the affected land, the effect of this taking is minor and therefore not adverse.

Alterations to Overpass Bridges within the Historic District

The four undergrade bridges that contribute to the historic significance of the Susquehanna River Rail Bridge and the Havre de Grace Historic District will need to be modified as part of the Proposed Project. FRA/MDOT evaluated that the Proposed Project will have an adverse effect on these four historic bridges due to the proposed extensions to the bridges, which will alter the bridges' design and materials. This adverse effect could be avoided by using stone in the construction of the new bridge extensions; however, FRA/MDOT have determined that using stone is not feasible as it would not meet current engineering design standards. Therefore, it is recommended that the adverse effect be minimized by using a form liner that emulates stone and is stained to be compatible with the color of the existing stone. In addition, to ensure that the new retaining walls in close proximity to the bridges do not adversely affect the historic resources, the design of the new walls should be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, so that the walls are compatible with the bridges' historic materials, features, size, scale and proportion, and massing.

Two of the undergrade bridges (at Freedom Lane and Centennial Lane) carry the NEC over alleys, which are described in the Havre de Grace Historic District NR nomination as important features within the historic district. Because the Proposed Project proposes to keep the alleys open for passage, the Proposed Project will not have an adverse effect on the alleys. Closing up either alley would constitute an additional adverse effect under Section 106.

Damage to Historic Buildings

Because the Proposed Project will come in close proximity to some of the contributing resources within the Havre de Grace Historic District, the potential for inadvertent construction-period impacts to adjacent structures has been assessed. Construction would occur in close proximity to several resources including 511 Warren Street on the east side of the tracks if Alternative 9A is selected, and the effects on the structures at 509, 513, 560, and 566 Otsego Street and 518 N. Stokes Street, on the west side of the tracks related to either Alternative 9A or Alternative 9B.

To ensure that there is no construction-related damage, the Proposed Project PA will include development of a Construction Protection Plan (CPP). The CPP, which will be prepared in consultation with the MHT, ACHP (as appropriate), consulting parties, and the property owners, will identify all architectural resources to be included in the plan and will set forth the specific measures to be used and specifications that will be applied to protect these architectural resources from damage during the construction period.

FRA/MDOT assessed the potential for the Proposed Project to cause long-term operational damage to adjacent structures and determined that the Proposed Project in its operational condition would not have the potential to result in vibration at a level that could cause damage to nearby historic structures. As described in Chapter 14, "Noise and Vibration," vibration produced by the Proposed Project would not exceed the significant impact thresholds specified in the FTA guidance document's general assessment methodology. These impact thresholds are designed to avoid human annoyance and disruptions to human activity, and as such are substantially lower than those that could potentially result in building damage, even for historic structures. Because the impact thresholds are based on the more stringent criterion of human annoyance, damage to adjacent buildings is not specifically addressed in the FTA's general assessment methodology. However, since operational vibration resulting from the Proposed Project would not result in exceedances of the vibration impact criteria, it would not have the potential to result in vibration levels that could damage historic resources.

New communications, overhead contact, and signal systems

The following components of the Proposed Project will have only limited visual effects on the Havre de Grace Historic District: the new communications overhead contact, and signal systems. Therefore, because these components will not alter a characteristic that makes the Historic District eligible for inclusion in the NR, they will have no adverse effect as defined in 36 CFR Part 800.16.

Summary

The proposed demolition of the Susquehanna River Rail Bridge and the alterations to the four related undergrade bridges will adversely affect the Havre de Grace Historic District. In addition, the widening that will bring the tracks in much closer proximity to some of the contributing structures within the historic district will constitute an adverse effect.

SOUTHERN TERMINUS, SUSQUEHANNA AND TIDEWATER CANAL - SOUTH LOCK #1 AND TOLL HOUSE

The Southern Terminus, Susquehanna and Tidewater Canal - South Lock #1 and Toll House (NR-listed) is located north of Erie Street and east of Park Drive at the north end of Havre de Grace on the western bank of the Susquehanna River (approximately one quarter-mile north of the Project site). The existing Susquehanna River Rail Bridge is distantly visible from this property. The replacement of the bridge would not substantially change the setting of the structure nor would it diminish the integrity of its historic features. The existing bridge does not relate to or contribute to the characteristics that qualify the resource for inclusion in the NR. The Proposed Project would have no adverse effect on this historic resource.

MARTHA LEWIS (SKIPJACK)

The Skipjack *Martha Lewis* (NR-listed), built in 1955 in Wingate, Maryland, is one of the 35 surviving traditional Chesapeake Bay skipjacks built specifically for the purposes of oyster harvesting. It was moved to Havre de Grace in 1993 and continues to carry passengers and dredge for oysters under sail power. It is permanently docked at Millard Tydings Memorial Park, located south of the APE in Havre de Grace; however, it is currently undergoing restoration at Frank J. Hutchins Memorial Park, located approximately one half mile south of the Project site within the APE. When operating, the vessel typically dredges for oysters south of its docking place in the Chesapeake Bay, but occasionally sails north up the Susquehanna River, navigating through the open swing span of the existing Susquehanna River Bridge. In the future with the Proposed Project, under both Alternative 9A and Alternative 9B, the vertical clearance of the proposed bridges would be 60 feet as compared to the 52-foot vertical clearance of the existing Susquehanna River Rail Bridge when in closed position; however, the proposed bridges would be fixed rather than moveable-span structures. The mast of the *Martha Lewis* is currently being replaced and it is anticipated that it will have a height of 65 feet when complete. Therefore, the *Martha Lewis* may be unable to navigate the Susquehanna River north of new bridges in the future with the Proposed Project. Although this could restrict the movement of the *Martha Lewis* to some extent, it would not prevent the vessel from accessing its traditional oyster dredging grounds in the Chesapeake Bay. Therefore, the Build Alternatives would not isolate the resource from important aspects of its setting nor alter the characteristics of the resource that qualify it for inclusion in the NR. Furthermore, the removal of the existing Susquehanna Bridge and its replacement with new bridges would somewhat alter the current setting of the *Martha Lewis*. However, the *Martha Lewis* permanently docks south of the APE in a location relatively far removed from the existing and proposed bridges. The bridges would not be visible from the *Martha Lewis* in its permanent docking location in Millard Tydings Memorial Park. Furthermore, the Skipjack was originally constructed in Wingate, Maryland; therefore, the presence of the Susquehanna River Bridge goes not relate or contribute to its historic setting. Therefore, the Proposed Project would result in no adverse effect on the *Martha Lewis*.

RODGERS TAVERN

Rodgers Tavern (NR-listed) is located on the north side of West Main Street in Perryville, approximately 300 feet east of the Susquehanna River Rail Bridge. Under both Alternative 9A and Alternative 9B, there would be no direct effect on the tavern; however, there would be an indirect visual effect due to the need to expand and elevate the bridge approach in front of the tavern.

Across Broad Street from the tavern there is currently a 30-foot-high railroad embankment, catenary support structures and lines, and a transmission tower. Both Alternative 9A and Alternative 9B would require widening the bridge approach and bringing it approximately 44 feet closer to the tavern. As a result, the distance between the tavern and the tracks would be significantly reduced, from about 102 feet to 57 feet. The proposed difference in elevation would be minor; the current embankment is 30 feet high and the new embankment would be 33 feet high. However, there will be a visual effect due to the need to construct a retaining wall to run along the embankment.

The proposed changes in front of the tavern, especially the need to bring the tracks closer to the tavern and the need to construct a retaining wall, will result in “the isolation of the property from or alteration of the character of the property’s setting when that character contributes to the property’s qualification for the NR,” thus constituting an adverse effect. In order to minimize the adverse effect, MDOT is working with MHT, FRA, Amtrak, and the consulting parties to identify an aesthetic treatment that will allow the wall to better complement the historic tavern. The Proposed Project’s PA will include selecting an appropriate treatment, e.g., use of a form liner for so that the wall imitates the look of stone and better blends with the tavern’s architecture, use of landscaping to screen the wall if there is adequate space, and/or development of an appropriate mural.

As described above in conjunction with the Havre de Grace Historic District, the PA sets forth a process for identifying potential Project construction-related damage to adjacent historic resources. To ensure that there is no damage to the Rodgers Tavern, the Proposed Project’s CPP will include measures to protect the Rodgers Tavern during the construction period. As discussed for the Havre de Grace Historic District, the Proposed Project would not have the potential to result in vibration at a level that could cause damage to nearby historic structures during operation.

In terms of views from the tavern to the bridge, the view from the front of the structure is primarily blocked by vegetation. There is a much more extensive view from the walkway at the rear of the tavern. Similar to some of the views from the base of the bridge in Havre de Grace, the view consists mainly of a long linear view of the bridge, punctuated by the projecting central section of the bridge. As described in the Havre de Grace Historic District analysis, these features will be retained, with all of the bridge designs considered incorporating a traditional central span of either an arch or a truss.

The following components of the Proposed Project will have no direct physical effects and only limited visual effects on the Rodgers Tavern: the new communications, overhead contact, and signal systems; minor modifications to the Perry Electrical Substation; and the modification or relocation of the transmission tower just railroad north of the Tavern. Therefore, because these components will not alter characteristics that make the Rodgers Tavern eligible for inclusion in the NR, they will have no adverse effect as defined in 36 CFR Part 800.16.

PRINCIPIO FURNACE (PRINCIPIO IRON WORKS)

The Principio Iron Works (NR-listed) is located at 1723 Principio Furnace Road. Although the buildings associated with the historic resource are located approximately one-half mile north of the Project site, the southwest corner of the property (containing only a wooded area) is located in the APE. The existing Susquehanna River Rail Bridge is not visible from this property. The replacement of the bridge would not change the setting of the structure nor would it diminish the integrity of its historic features. The existing bridge does not relate to or contribute to the characteristics that qualify the Principio Iron Works for inclusion in the NR. The Proposed Project would have no adverse effects on this historic resource.

PERRY POINT MANSION HOUSE AND MILL

The Perry Point Mansion House and Mill (NR-listed) is located south of the Perry Point Veterans Administration Medical Center on the Susquehanna River at the mouth of the Chesapeake Bay, approximately one-half mile south of the Project site. The existing Susquehanna River Rail Bridge is distantly visible from this property. The replacement of the bridge would not substantially change the setting of the structure nor would it diminish the integrity of its historic features. The existing bridge does not relate to or contribute to the characteristics that qualify the Perry Point Mansion House and Mill for inclusion in the NR. The Proposed Project would have no adverse effect on this historic resource.

PERRYVILLE RAILROAD STATION

The Perryville Railroad Station (NR-eligible), 650 Broad Street, is within the Project site. In addition to the two-story brick Colonial Revival-style station building, two ancillary structures were identified as contributing resources to the historic Station complex: the Perry Interlocking Tower (a two-story circa 1905 brick control tower southwest of the of the station) and an ashlar stone-arch undergrade bridge constructed in the late nineteenth to early twentieth centuries under the platform for Amtrak vehicular use.

The Proposed Project initially planned to demolish the interlocking tower to accommodate both Alternative 9A and Alternative 9B. The Town of Perryville, a consulting party, recommended that, if possible, the tower be left in place. Therefore, the Project Team proposes to shift the tower in order to avoid the adverse effect of demolishing it. The change in location is minor and will not adversely affect the relationship between the interlocking tower and the Perryville Station, thus resulting in a no adverse effect.

The undergrade bridge (MP 59.39) that is considered contributing to the NR-eligible station complex will be altered with the construction of a precast concrete culvert extension on the east side of the tracks. As previously discussed, this action will result in an adverse effect. The adverse effect could be avoided or minimized by using stone in the design of the new bridge extensions; however, FRA/MDOT have determined that using stone is not feasible as it would not meet current engineering design standards. Therefore, as set forth in the PA, measures to minimize the adverse effect by identifying a contextually appropriate design treatment (such as the use of a form liner that emulates stone and is stained to match the color of the existing stone) will be identified and implemented in consultation with SHPO and consulting parties. To ensure that the new retaining walls in close proximity to the bridge and station do not adversely affect the historic resources, the design of the new walls should be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, so that the walls are compatible with the station's and bridge's historic materials, features, size, scale and proportion, and massing. The Susquehanna River Rail Bridge Project Advisory Board and the Town of Perryville have recommended that this underpass "should be abandoned by sealing it off from the north side. The south side may be left open for historical purposes, provided it is made secure from trespassers." The abandonment and sealing off of the underpass are not part of the Proposed Project and, if added, would constitute an adverse effect under Section 106.

The bridge carrying the south leg of the wye track over Broad Street, although not formally identified as contributing to the Perryville Station complex, is within the viewshed of the station complex. Therefore, changes to that bridge could have a visual effect on the NR-eligible Perryville Station. As currently planned, this bridge will not need to be altered, therefore not constituting an effect. However, if the plans change and the bridge needs to be altered, Amtrak will ensure that plans are developed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, so that the bridge continues to be compatible with the station complex's historic materials, features, size, scale and proportion, and massing.

The following components of the Proposed Project will have only limited visual effects on the NR-eligible station complex: the new communications, overhead contact, and signal systems; minor modifications to the Perry Electrical Substation; the modification or relocation of the transmission tower on the west side of the tracks; and modifications to Perry Interlocking at MP 59.4. Therefore, because these components will not alter a characteristic that makes the station complex eligible for inclusion in the NR, they will have no adverse effect as defined in 36 CFR Part 800.16.

The station building itself would not be physically altered. However, the alteration of contributing components of the complex would constitute an adverse effect on the Perryville Station complex.

Perry Point Veterans Administration Medical Center Historic District

The VA Medical Center at Perry Point (NR-eligible) was developed primarily in the 1920s through the 1940s as a neuro-psychiatric treatment facility for military veterans. It is located approximately 400 feet south of the Project site. The existing Susquehanna River Rail Bridge, bridge abutments, and tracks are visible from portions of this large property. Even in locations where the tracks pass the historic district, the distance to the historic buildings and the intervening landscaping minimize the view of the tracks. There is an open vista to the Perry Electrical Substation; however, minor modifications to the Substation will not constitute an effect on the NR-eligible Medical Center Historic District. In parts of the property closer to the bridge, there are close views of the abutments; in parts of the property further south and east, views of the bridge and abutments are distant. Although the replacement of the Susquehanna River Rail Bridge with new bridges under both Build Alternatives would somewhat alter the setting of the Perry Point Veterans Administration Center Historic District, this change would not constitute an adverse effect on the Historic District. The existing bridge does not relate to or contribute to the characteristics that qualify the Historic District for inclusion in the NR. The removal of the existing bridge and construction of two new bridges would not change the significant aspects of the setting of the Historic District nor would it diminish the integrity of its historic features. The Proposed Project would have no adverse effect on the Perry Point Veterans Administration Center Historic District.

Crothers House (Furnace Bay Golf Clubhouse)

The Crothers House (NR-eligible) is a two-and-a-half story Colonial Revival residence built in 1936 and now used as the clubhouse for the Furnace Bay Golf Course. It is located approximately 1,000 feet north of the Project site. The existing Susquehanna River Rail Bridge is not visible from this property. The replacement of the bridge would not change the setting of the structure nor would it diminish the integrity of its historic features. The existing bridge does not relate to or contribute to the characteristics that qualify the Crothers House for inclusion in the NR. The Proposed Project would have no adverse effects on this historic resource.

Woodlands Farm Historic District

The Woodlands Farm Historic District (NR-eligible) is an extension of the boundary of the NR-listed Woodlands property north of Maryland Route 7 to include the Woodlands Farm South Complex. The NR-listed Woodlands property consists of a circa 1810-1820 main house and several outbuildings set on 69 acres. The Woodlands Farm South Complex is located to the south across Maryland Route 7 and consists of a 347-acre farm containing numerous 19th century buildings. The Susquehanna River Rail Bridge is not visible from this property. The replacement of the bridge would not change the setting of the Historic District nor would it diminish the integrity of its historic features. The existing bridge does not relate to or contribute to the characteristics that qualify the Woodlands Farm Historic District for inclusion in the NR. The Proposed Project would have no adverse effects on this resource.

Perryville United Methodist Church

The Perryville United Methodist Church, constructed in 1896 in the Gothic Revival style, was identified as an NR-eligible resource as part of the Proposed Project. The property is located across Broad Street from the Northeast Corridor in Perryville. From the church, the rail line can only be partially seen; the bridge cannot be seen at all. Due to the distance and the limited view, the Proposed Project would have no adverse effect on this resource.

Perryville Presbyterian Church

The Perryville Presbyterian Church, constructed in 1892 in the Gothic Revival style, was identified as an NR-eligible resource as part of the Proposed Project. The property is located on the track side of Broad Street, but is screened from the tracks by extensive landscaping. Neither the rail line nor the bridge can be seen at all. Due to the distance and the obstructed views, the Proposed Project would have no adverse effect on this resource.

E. MITIGATION MEASURES

ARCHAEOLOGICAL RESOURCES

Both Alternative 9A and Alternative 9B have the potential to impact archaeologically sensitive areas within Study Areas 2 to 5 and within the Susquehanna River. Phase IB archaeological investigations will be undertaken to determine the presence or absence of archaeological resources in these areas. If Phase IB testing identifies potentially significant (NR-eligible) archaeological resources in any of the Study Areas that could be affected by the Proposed Project, Phase II archaeological testing would be undertaken to determine the significance and the boundaries of the archaeological deposits. If significant archaeological resources are identified in the archaeological APE that would be unavoidably adversely affected by the Proposed Project, appropriate measures to minimize and/or mitigate any such effects would be devised and implemented. As described in the draft PA, ongoing consultation with MHT and consulting parties would be undertaken to identify and implement specific measures to avoid, minimize or mitigate any effects to NR-eligible resources that may occur as a result of the Proposed Project.

ARCHITECTURAL RESOURCES

FRA/MDOT assessed the Proposed Project's effects on historic architectural resources in accordance with Section 106 of the NHPA, as amended, and determined that Alternative 9A and Alternative 9B would not adversely affect the following significant historic architectural resources: Southern Terminus, Susquehanna and Tidewater Canal – South Lock #1 and Toll House, Martha Lewis (Skipjack), Principio Furnace (Principio Iron Works), Perry Point Mansion House and Mill, Perry Point Veterans Administration Medical Center Historic District, Crothers House (Furnace Bay Golf Clubhouse), Woodlands Farm Historic District, Perryville United Methodist Church, Perryville Presbyterian Church; and the Lily Run Undergrade Bridge (MP 60.85). There would be, however, an adverse effect on the following significant historic architectural resources: the Susquehanna River Rail Bridge (including eight of the nine related undergrade rail bridges), the Havre de Grace Historic District, Rodgers Tavern, and the Perryville Railroad Station, as shown in **Table 8-3**.

Table 8-3
Adverse Effects on Historic Architectural Resources

Known Architectural Resources in the APE	Adverse Effect?	Action	Actions Under Consideration to avoid or minimize adverse effects
Susquehanna River Rail Bridge	Yes	Demolition	Avoidance of demolition not feasible
			Minimize through use of traditional design features in the two new bridges
Nine overpass rail bridges	Yes (all except MP 60.85)	Bridge replacement or concrete extensions	Minimize or avoid through use of stone not feasible
			Minimize by using a form liner that emulates stone and is stained to be compatible with the color of the existing stone
	Possible	Construction of adjacent retaining walls	Avoid additional adverse effect by ensuring design of the new walls is in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*
Havre de Grace Historic District	Yes	Demolition of Susquehanna River Rail Bridge, a contributing feature to the historic district	Avoidance of demolition not feasible (see above for steps to partially mitigate)
	Yes	Visual adverse effects from widening of bridge approaches	Minimize visual adverse effects by locating bridge abutment further south, constructing retaining walls, and ensuring retaining walls are developed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*
	Yes	Extensions to four undergrade bridges, contributing features to the historic district	Avoidance by using stone not feasible due to engineering concerns.
			Minimize by using a form liner that emulates stone and is stained to be compatible with the color of the existing stone
	Possible	Construction-related damage to contributing structures	Avoid adverse effect via a Construction Protection Plan (CPP)

Table 8-3 (cont'd)
Adverse Effects on Historic Architectural Resources

Known Architectural Resources in the APE	Adverse Effect?	Action	Actions Under Consideration to avoid or minimize adverse effects
Rodgers Tavern	Yes	Visual adverse effect from the widening of the bridge approach	Minimize visual adverse effect through development of an aesthetic treatment for the retaining wall and landscaping in front of wall, if possible
	Possible	Construction-related damage	Avoid adverse effect via a CPP
Perryville Railroad Station	Possible	Demolition of Perry Interlocking Tower	Avoid adverse effect by shifting the Interlocking Tower slightly within Amtrak ROW
	Yes	Extension to undergrade bridge at MP 59.39, a contributing feature to the station complex	Avoidance by using stone not feasible due to engineering concerns
			Minimize by using a form liner that emulates stone and is stained to be compatible with the color of the existing stone
	Yes	Construction of retaining walls adjacent to station complex	Avoid additional adverse effect by ensuring design of the new walls should be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*

Because certain adverse effects cannot be totally avoided, FRA/MDOT has sought suggestions from the consulting parties and the public on potential ways to mitigate the adverse effects. Based on a review of the Proposed Project plans and comments received from the public and the Section 106 consulting parties, FRA/MDOT propose the following mitigation measures be considered in development of the Project's PA, which will be finalized in conjunction with the consulting parties:

- Continued review by MHT of design plans to ensure that to the extent possible the plans are compatible with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. Of particular concern is the design of the new bridge, the alterations to eight of nine undergrade bridges associated with the Susquehanna River Rail Bridge, and the new retaining walls.
- Preparation of Historic American Engineering Record (HAER) documentation of the Susquehanna River Rail Bridge and the nine associated undergrade bridges on the NEC.
  - HAER documentation would include narratives that (1) interpret its history, focusing on its construction by the Pennsylvania Railroad; and (2) describe in detail the physical characteristics of the bridge (including its engineering and functional aspects). Primary and secondary resources would be used in the research effort, including historic engineering literature, railroad company archives, newspapers and periodicals, and the collections of libraries, historical societies, and other repositories. The compiled information, which could include historic plans, photographs, and other documents, will be duplicated to appropriate archival standards as part of the recordation document.

- The HAER recordation would also include photographic documentation of the Susquehanna River Rail Bridge that would meet appropriate HAER archival standards.
- In addition, it may be appropriate to produce detailed measured drawings of the existing conditions of Susquehanna River Rail Bridge. Typically, detailed measured drawings of large engineered structures such as the Susquehanna River Rail Bridge are achieved through the use of three-dimensional laser scanning technology.

- Preparation of HAER documentation of the Perry Interlocking Tower, including any interior features.
- Development of an interpretive exhibit in a park, greenway, or public space that would present the history of the Susquehanna River Rail Bridge with a focus on the history of the bridge as an early twentieth century product of the Pennsylvania Railroad and the engineering aspects of the bridge, such as its swing span mechanism. To the extent possible and practical, key features of the 1906 Pennsylvania Railroad bridge should be incorporated into the display, with the overall goal of conveying the advancement of this type of bridge engineering by the beginning of the twentieth century and to explain how certain rail ridge components functioned in that era. The location, format, and specific content of the exhibit would be identified by the Project sponsor in consultation with MHT and consulting parties.
- Development of an educational document such as a lesson plan that could be incorporated into an engineering course curriculum. This lesson plan could focus on the specific engineering aspects of the Susquehanna River Rail Bridge and/or movable bridge types constructed in the early twentieth century by the Pennsylvania Railroad. In addition, it should utilize research knowledge obtained from the archaeological investigations and incorporate the history of all of the area's transportation related historic resources, including the Susquehanna River Rail Bridge and the affiliated nine undergrade bridges; the piers from the 1866 railroad bridge; the eighteenth century ferry crossing; the Southern Terminus, Susquehanna and Tidewater Canal - South Lock #1 and Toll House; the Havre de Grace Historic District; Rodgers Tavern; and Perryville Railroad Station.
- Production of a short film that documents the character-defining historical and engineering aspects of the Susquehanna River Rail Bridge. The film could include footage of the bridge in operation and address the engineering and design of the swing-span bridge, and its historical context as a twentieth century Pennsylvania Railroad bridge. The film could be made available online and/or be provided to railroad organizations and local libraries and historical societies.
- Salvage of elements of the Susquehanna River Rail Bridge, such as truss components, pier materials, tracks, etc. The Project sponsor would develop a list of potentially salvageable items for review and comment by MHT. The Project sponsor would also develop a marketing plan for review by MHT and consulting parties.
- Completion of all archaeological investigations as recommended in the Phase IA Archaeological Assessment.
- Preservation of the abutments from the original (1866) bridge, with consideration given to restoring them to their original appearance and function.
- Development of an interpretative exhibit to be incorporated into the town of Perryville's Railroad Museum located at the Perryville Station. ✷

Chapter 9: Draft Section 4(f) Evaluation

A. INTRODUCTION

This chapter has been prepared pursuant to the requirements of Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966. Based on this Draft Section 4(f) Evaluation (Evaluation), FRA has determined that there are no feasible and prudent alternatives that would avoid use of all Section 4(f) properties. Therefore, this Evaluation includes a determination of which of the alternatives using a Section 4(f) property will result in the least overall harm in light of the statute's preservation purposes, and identifies appropriate measures to minimize harm.

B. REGULATORY CONTEXT AND METHODOLOGY

Section 4(f) of the USDOT Act of 1966 (49 USC § 303) prohibits the Secretary of Transportation from approving any program or project that requires the "use" of (1) any publicly owned parkland, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; or (2) any land from a historic site of national, state, or local significance (collectively, "Section 4(f) properties"), unless there is no feasible and prudent alternative to the use of such land and such program or project includes all possible planning to minimize harm to the park, recreation area, wildlife refuge, or historic site. A historic site is considered to be a property that is listed on, or eligible for listing on, the National Register of Historic Places ("NR-listed" and "NR-eligible").

A "use" of Section 4(f) resources occurs:

- When land is permanently incorporated into a transportation facility;
- When there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or
- When there is a constructive use of land, which occurs "when the transportation project does not incorporate land from a Section 4(f) property, but the proximity impacts are so severe that the protected activities, features, or attributes that qualify property for protection under Section 4(f) are substantially impaired."

In some cases, even if there is a use of a Section 4(f) property, Federal Railroad Administration (FRA) may determine that a use is *de minimis*. FRA may make a *de minimis* determination on a historic site only if, pursuant to the Section 106 consultation process:

- The transportation program or project will have no adverse effect on the historic site, or there will be no historic properties affected by the transportation program or project; and
- FRA's finding has received written concurrence from the applicable State historic preservation officer; and

- FRA has developed its finding in consultation with parties consulting as part of the Section 106 consultation process.

With respect to parks, recreation areas, or wildlife or waterfowl refuges, FRA may make a finding of *de minimis* impact only if:

- After public notice and opportunity for public review and comment, FRA finds that the transportation program or project will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection under this section; and
- The finding has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.

If FRA determines that there is no feasible and prudent avoidance alternative, then FRA may approve from among the alternatives that use Section 4(f) properties only the alternative that causes the least overall harm in light of the statute's preservation purpose.[1] A *feasible and prudent avoidance alternative* would avoid using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property.

An alternative is not feasible if it cannot be built as a matter of sound engineering judgment. An alternative is not prudent if:

1) It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
2) It results in unacceptable safety or operational problems;
3) After reasonable mitigation, it still causes severe social, economic, or environmental impacts; severe disruption to established communities; severe disproportionate impacts to minority or low income populations; or severe impacts to environmental resources protected under other Federal statutes;
4) It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
5) It causes other unique problems or unusual factors; or
6) It involves multiple factors of the above, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

If there is no feasible and prudent avoidance alternative, FRA may approve only the alternative that causes the least overall harm in light of Section 4(f)'s preservation purpose. "Least overall harm" is determined by balancing the following list of factors:

1) The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
2) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;

[1] FHWA regulations are not binding on FRA; however, in the absence of applicable FRA regulations, FRA has chosen to use 23 CFR Part 774 for reference and guidance in this Final Section 4(f) Evaluation.

3) The relative significance of each Section 4(f) property;
4) The views of the official(s) with jurisdiction over each Section 4(f) property;
5) The degree to which each alternative meets the purpose and need for the project;
6) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
7) Substantial differences in costs among the alternatives.

C. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

The Project Team identified all properties within the study area eligible for protection pursuant to Section 4(f). Section 4(f) properties that were identified within the study area include properties that would not be adversely affected by the Proposed Project. Some of these Section 4(f) properties include publicly owned parks such as Trego Field/Perryville Mini-Park, Lower Ferry Park and Pier, Perryville Community Park, David Craig Park, Battery Village Park, and Swan Harbor Farm. See Chapter 6, “Parks, Trails, and Recreational Resources” for a description of each of these parks. Other Section 4(f) properties include historic resources, such as Southern Terminus, Susquehanna and Tidewater Canal—South Lock #1, *Martha Lewis* (skipjack), Principio Furnace, Perry Point Mansion House and Mill, Perry Point Veterans Administration Medical Historic District, Crothers House, Woodlands Farm Historic District, Perryville United Methodist Church, and Perryville Presbyterian Church, See Chapter 8, “Cultural Resources” for a description of each of these historic resources. As the Proposed Project would not adversely affect these properties, the project would not constitute a Section 4(f) use of these properties and no further analysis is necessary.

Section 4(f) regulations apply to archaeological sites (including those discovered during construction) if their value derives from their preservation in place. As described in Chapter 8, “Cultural Resources,” studies to identify the potential for significant historic resources within the project area included a Phase IA archaeological investigation and reconnaissance and historic architectural sites surveys. There is the possibility that archaeological resources are present in the City of Havre de Grace, the Town of Perryville, and the lower Susquehanna River. These potential archaeological resources, if present, would most likely be important for the information they might yield and not for preservation in place. Therefore, at this time, FRA and Maryland Department of Transportation (MDOT) do not consider these potential archaeological resources as Section 4(f) properties. If, however, based on further study and consultation with Maryland Historical Trust (MHT), FRA and MDOT determine that any archaeological resources present within the project site derive their value from preservation in place, FRA and MDOT will supplement this Evaluation to address these properties. The draft Programmatic Agreement (PA) includes specific commitments regarding archaeology (see **Appendix D**, “Cultural Resources”).

The following text discusses the effect of Alternative 9A and Alternative 9B on each of the properties shown in **Figure 9-1** and evaluates whether the effect constitutes a “use”, a *de minimis* use, or documents why the effect does not rise to the level of a 4(f) “use”.

ALTERNATIVE 9A

Alternative 9A would result in the “use” of the following three Section 4(f) properties:

Legend

- Havre de Grace Middle/High School Athletic Fields[1]
- Havre de Grace Historic District
- Jean S. Roberts Memorial Park[1]
- Rodgers Tavern[2]
- Perry Interlocking Tower
- Undergrade (UG) Bridges
- Alternative 9A LOD
- Alternative 9B LOD
- Perryvile Train Station
- Susquehanna River Rail Bridge
- 1,000 ft Study Area

[1]*De minimis* use. [2] Would not rise to level of "use" under Section 4(f).

Data Sources

Historic District and Rodgers Tavern: Maryland Historical Trust

0 1,000 2,000 Feet

Susquehanna River Rail Bridge Project

Figure 9-1

Evaluated Section 4(f) Properties

- The removal of the existing NR-eligible Susquehanna River Rail Bridge and alteration of eight of its nine associated rail undergrade bridges;
- The removal of the Perry Interlocking Tower and the alteration of the Access Road Undergrade Bridge 59.39 (also known as the Perryville Train Station Undergrade Bridge), which are contributing elements of the NR-eligible Perryville Railroad Station;
- The acquisition of a small amount of property within the NR-listed Havre de Grace Historic District and visual and aesthetic effects on the Historic District;

In addition, FRA intends to determine that Alternative 9A would result in the *de minimis* use of the following properties.

- The acquisition of a narrow strip of the city-owned portion of Jean S. Roberts Memorial Park (Alternative 9A and Alternative 9B); and
- The acquisition of a portion of the Havre de Grace Middle/High School athletic fields.

FRA will base the final *de minimis* impact determination after providing an opportunity for public review.

In addition, Alternative 9A would have an adverse effect on the NR-listed Rodgers Tavern in the context of Section 106 of the National Historic Preservation Act (NHPA). The Project Team considered the effect on Rodgers Tavern in this Evaluation because of the Proposed Project's proximity to this Section 4(f) property and documented the evaluation in this chapter. As discussed in more detail in the following text, the Project Team determined that with the implementation of mitigation measures, the proximity issues would not cause a substantial impairment to the resource and the adverse effect in the context of Section 106 would not rise to the level of "use" under Section 4(f).

SUSQUEHANNA RIVER RAIL BRIDGE AND OVERPASSES

As discussed in Chapter 8, "Cultural Resources," the existing Susquehanna River Rail Bridge (also known as the Amtrak Railroad or Perryville Road Bridge), and nine undergrade bridges were all constructed during the same 1904-1906 building campaign by the Pennsylvania Railroad and are NR-eligible. The Susquehanna River Rail Bridge, which is owned by Amtrak, was determined eligible for listing on the NR under National Register Criterion A as an example of an early 20th century railroad bridge built by an important American railroad company and under National Register Criterion C as an example of engineering that acknowledges two different modes of transportation (rail and marine) and allows each to operate without much interference from the other.

With Alternative 9A, the existing Susquehanna River Rail Bridge would be taken out of service and demolished, and two new fixed bridges, which would have 60 feet of vertical clearance, would be constructed. In addition, eight of the nine undergrade bridges associated with the Susquehanna River Rail Bridge would be directly impacted with Alternative 9A. The removal of the existing NR-eligible Susquehanna River Rail Bridge and alteration of these eight rail undergrade bridges would constitute a use of this Section 4(f) property. The Lily Run undergrade bridge at MP 60.85 would be spanned over; therefore, it will not be adversely affected.

PERRYVILLE RAILROAD STATION

As discussed in Chapter 8, “Cultural Resources,” the Perryville Railroad Station, located at 650 Broad Street, is NR-eligible under National Register Criterion A for its role in transportation history, and under National Register Criterion C as an excellent example of the Colonial Revival style of architecture. Constructed circa 1905 by the Philadelphia, Baltimore, and Washington (PB&W) Railroad Company, the station is currently owned by Amtrak. There are two railroad-related structures that are located in close proximity to the Perryville Station, were constructed around the same time as the station, and contribute to its historic significance: the Perry Interlocking Tower, a two-story brick control tower southwest of the station; and the ashlar stone Access Road Undergrade Bridge 59.39 (also known as the Perryville Train Station Undergrade Bridge).[2]

Alternative 9A would require the demolition or removal of the Perry Interlocking Tower and the alteration of the Access Road Undergrade Bridge 59.39, which are contributing structures within the NR-eligible Perryville Railroad Station complex, constituting the use of this Section 4(f) property.

HAVRE DE GRACE HISTORIC DISTRICT

As described in Chapter 8, “Cultural Resources,” the existing Susquehanna River Rail Bridge and NEC pass through the Havre de Grace Historic District (NR-listed). The Historic District is listed on the National Register of Historic Places under National Register Criterion A related to the town’s role as a major commercial and transportation center in northern Maryland and for its community planning; and under National Register Criterion C for its architectural mix of nineteenth and early twentieth century structures and its many examples of locally quarried Port Deposit granite. It is estimated that approximately 800 of the 1,100 buildings within the Historic District contribute to the historic district.

Alternative 9A would result in adverse effects to the NR-listed Havre de Grace Historic District, including the demolition of the Susquehanna River Rail Bridge and the alternation of the undergrade bridges, which are contributing features of the Historic District and other effects described in Chapter 8. Additionally, due to the Proposed Project’s close proximity to some of the contributing elements within the Historic District, there is the potential for an adverse effect due to construction-related damage. The demolition of the Susquehanna River Rail Bridge and the alternation of the undergrade bridges constitute the use of the Historic District as a Section 4(f) resource.

JEAN S. ROBERTS MEMORIAL PARK

As described in Chapter 6, “Parks, Trails, and Recreational Resources,” Jean S. Roberts Memorial Park is a waterfront park in Havre de Grace, located west of the existing railroad right-of-way at Otsego Street and Water Street. A portion of the property is owned by Amtrak and a portion is owned by the City of Havre de Grace. The park offers approximately 0.87 acre (0.61 acre owned by the City and 0.26 acre owned by Amtrak and leased to the City) with amenities such as picnicking area, parking, fishing pier, kayak and boat launch.

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[2] A passenger shelter identified in the eligibility determination as contributing to the resource’s significance was recently demolished. It was located east of the tracks across from the train station.

Alternative 9A would require the use of the entire Amtrak-owned portion of Jean S. Roberts Memorial Park, and therefore this portion would no longer be leased to the City of Havre de Grace. The portion owned by Amtrak is not considered a Section 4(f) property according to 23 CFR 774.11 (h), which states, "When a property formally reserved for a future transportation facility temporarily functions for park, recreation, or wildlife and waterfowl refuge purposes in the interim, the interim activity, regardless of duration, will not subject the property to Section 4(f)." Alternative 9A also requires the acquisition of a narrow strip (0.01 acre or 2.26 percent) of the City-owned portion of Jean S. Roberts Memorial Park beyond the Amtrak right-of-way.

FRA proposed to determine that the use of the City-owned portion of Jean S. Roberts Memorial Park is *de minimis*. The Mayor of the City of Havre de Grace concurred that the Section 4(f) use of the City-owned portion of Jean S. Roberts Memorial Park for the Proposed Project would not adversely affect the activities, features, or attributes qualify this property for protection under Section 4(f). The Mayor was authorized to do so by City Resolution 2016-10 passed by the Mayor and City Council on July 5, 2016. The City of Havre de Grace concurs with the proposed *de minimis* impact finding after taking into account mitigation measures, as discussed in letters from Havre de Grace, included in **Appendix H**, "Public Involvement and Agency Correspondence." FRA will make a final *de minimis* determination following public review.

HAVRE DE GRACE MIDDLE/HIGH SCHOOL ATHLETIC FIELDS

The Havre de Grace Middle/High School athletic fields are school fields owned by the Board of Education of Harford County, as detailed in Chapter 6, "Parks, Trails, and Recreational Resources." Located at 401 Lewis Lane/700 Congress Ave, east of the existing Amtrak right-of-way in Havre de Grace, the school fields offer approximately 57.6 acres with amenities such as the Harris Stadium (a track and field venue), multi-use fields, baseball/softball diamonds, and tennis courts. As described in further detail in Chapter 10, "Section 6(f) Evaluation," the Havre de Grace High School received Land and Water Conservation Funds to construct three tennis courts and one multi-purpose court at the high school in 1966.[3] When the high school was expanded in 1978, the original tennis courts were relocated on the school site. In 1970, the Havre de Grace Middle School received additional Land and Water Conservation Funds to construct one multi-purpose court, four baseball fields, and a cinder running track.

Alternative 9A would result in the acquisition of 1.5 acres of the 57.6 acres used for the Havre de Grace Middle/High School athletic fields. Alternative 9A would require the reconfiguration and reconstruction of the track and football field on the school property.

Based on the analysis of the potential impacts to the Havre de Grace Middle/High School Athletic Fields and the minimization and mitigation measures, FRA proposes to make a *de minimis* finding for the use of the facility. Harford County Public Schools concurred that the Section 4(f) use of the Havre de Grace Middle/High School Athletic Fields for the Proposed Project would not adversely affect the activities, features, or attributes qualify this property for protection under Section 4(f), assuming mitigation and terms discussed in correspondence with the Assistant Superintendent for Operations, Superintendent of Schools, and Board of Education President, included in **Appendix H**, "Public Involvement and Agency Correspondence." FRA will make a final *de minimis* determination following public review.

[3] Consultation letter from Harford County Director of Parks and Recreation, dated June 25, 2015.

RODGERS TAVERN

As described in Chapter 8, "Cultural Resources," Rodgers Tavern (NR-listed) is located approximately 100 feet north[4] of the existing Amtrak right-of-way near Roundhouse Drive and Broad Street. The two-and-a-half-story coursed-stone structure dates to the mid-18th century. Rodgers Tavern is NR-listed under National Register Criterion A for its association with prominent national figures such as George and Martha Washington, Marquis de Lafayette, and Lieutenant General Rochambeau; and under National Register Criterion C as an example of 18th century building construction and materials. In accordance with an easement that the Society for the Preservation of Maryland Antiquities ("grantor") deeded to the Maryland Historical Trust ("grantee") in 1976 and amended in 1986, a preservation easement exists on the interior and exterior of the tavern as well as the associated land. As a result of the covenant, the grantor has agreed to keep and maintain the property and to allow the grantee an opportunity to review any proposed alterations.

Alternative 9A would have no direct effects on Rodgers Tavern. However, as discussed in Chapter 7 "Visual and Aesthetic Conditions," there will be an adverse visual effect due to the need to widen the bridge approach in front of the tavern and to construct a retaining wall along the embankment. The proposed changes in front of the tavern, especially the need to bring the tracks closer to the tavern and the need to construct a retaining wall, will result in "the isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NR," thus constituting an adverse effect in the context of Section 106, as discussed in Chapter 8, "Cultural Resources."

No land that is part of Rodgers Tavern property will be permanently incorporated into the Proposed Project and no temporary occupancy of the property is planned. As stated above, Rodgers Tavern is listed on the NR under Criterion A based on its association with prominent national figures and under NR Criterion C as an example of eighteenth century building construction and materials. The indirect adverse visual effects would not affect the building's history or the structure itself. With the mitigation measures identified in Section E, "Measures to Minimize Harm," the Proposed Project would not result in a proximity impact that is so severe that the attributes that qualify the property for protection under Section 4(f) will be substantially impaired. The adverse effect would therefore not rise to the level of a 4(f) "use". Specifically, the Proposed Project would not affect the tavern's association with prominent national figures, nor would it affect the character of the property's setting to a degree that it would no longer serve as an example of eighteenth century building construction and materials. Therefore, as the Proposed Project would not permanently incorporate land that is part of Rodgers Tavern, temporarily occupy land that is part of Rodgers Tavern, or result in a "constructive use" of Rodgers Tavern, the Proposed Project would not result in the use of this Section 4(f) property.

ALTERNATIVE 9B

Alternative 9B would result in the same use of the following three properties as Alternative 9A:

- Susquehanna River Rail Bridge and Overpasses
- Perryville Railroad Station complex

[4] For consistency with the "Cultural Resources" chapter, true geographic directions were used, not railroad directions.

- Havre de Grace Historic District

Alternative 9B would result in the same *de minimis* use of Jean S. Roberts Memorial Park as Alternative 9A. Alternative 9B would not require the use of the Havre de Grace Middle/High School athletic fields. Alternative 9B would result in the same effect on Rodgers Tavern as Alternative 9A and would not result in a "constructive use" of this Section 4(f) property.

D. AVOIDANCE ANALYSIS

The two alternatives (Alternative 9A and Alternative 9B) retained for detailed study in this EA would result in the use of Section 4(f) properties. An "avoidance alternative" is an alternative that avoids use of *all* 4(f) properties. Therefore this section analyzes alternatives that avoid *all* of the resources described in the previous section, consistent with 23 CFR 774.17 and FHWA Section 4(f) policy.[5] FRA identified two avoidance alternatives—the No Action Alternative and a Rehabilitation Alternative. Several Rehabilitation Alternatives were considered in the alternatives screening process but not selected for detailed study in this EA (see **Appendix A**, "Alternatives Screening Report and Bridge Design Types"). Other alternatives considered included alternatives that would avoid some, but not all of Section 4(f) properties, such as Rehabilitation of the Existing Bridge with Conversion to Lift Bridge; Build New Bridges on New Alignments and Leave Existing Bridge in Place; Double Decker Structure, Build on Existing Alignment, and others. As none of these alternatives avoid the use of *all* Section 4(f) properties, they are not considered Avoidance Alternatives in this Evaluation.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the existing Susquehanna River Rail Bridge would not be removed and would remain in service as is, with no intervention besides minimal repairs and continuation of the current maintenance regime.

Although the No Action Alternative would allow the Susquehanna River Rail Bridge and associated undergrade bridges to remain and would not require any use of Section 4(f) properties, it would not meet the Project's Purpose and Need. The primary purpose of the Proposed Project is to provide continued rail connectivity along the NEC. Under the No Action Alternative, the bridge would continue to deteriorate and problems would occur more frequently as the bridge is approaching the end of its useful life. The bridge would remain as a bottleneck. It would continue to cause operational problems and constraints, including navigation. Continued deterioration could also present safety hazards. The maintenance and repair costs would continue to rise and the bridge would eventually need to be taken out of service to rail traffic. Allowing the bridge to continue to deteriorate to the point of closure would require inefficient rerouting of trains, resulting in further delays. This would create major impacts along the NEC, severely disrupting rail commuters and transport of freight along the corridor. Bringing the bridge to a state of good repair without severe disruptions to rail traffic would be costly and inefficient and would not resolve constraints to projected passenger and freight movement and navigation.

Overall, the No Action Alternative would be feasible, but it would not be prudent, based on the consideration of factors #1, #2, and #4 regarding prudence listed in Section B, "Regulatory Context and Methodology."

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[5] U.S. Department of Transportation, Federal Highway Administration, Section 4(f) Policy Paper, July 2012 https://www.environment.fhwa.dot.gov/4f/4fpolicy.asp, accessed September 2016.

REHABILITATION ALTERNATIVES

Rehabilitation Alternatives would include improvements to the existing Susquehanna River Rail Bridge and associated undergrade bridges to remove structural and seismic deficiencies. Three types of rehabilitation alternatives were evaluated, including rehabilitation of the existing bridge without modifying the track alignments, rehabilitation of existing bridge in conjunction with a new bridge, and rehabilitation with the conversion of the swing bridge to a lift bridge. Only the rehabilitation of the existing bridge without modifying the track alignments would potentially avoid the use of all Section 4(f) properties. As discussed below, it is possible that even with the rehabilitation of the existing bridge without modifying the track alignments the required repairs would be so extensive that they would compromise the historic integrity of the bridge. It is possible that those repairs would amount to a Section 4(f) use of the bridge, in which case the alternative could not be considered an avoidance alternative.

Amtrak conducted its most recent engineering inspection of the Susquehanna River Rail Bridge in 2013 (with a supplemental specialty pin testing program in 2014), which indicated that the bridge superstructure is in poor to fair structural condition. The inspection revealed deficiencies requiring repair; the recommended repairs have been enumerated and prioritized into short, medium, and long-term time horizons. Short-term structural repairs involve addressing numerous cracked members and the installation of retrofits in an attempt to restrain movement and prevent cracking. The cracks and worn pin joints allowing movement are so extensive in the pin-connected trusses and represent such a major portion of the overall bridge system that it is not deemed economical, prudent, or feasible to continue on this course of ongoing repair. Piecemeal repairs of fatigue cracks due to corrosion and section loss and out-of-plane bending, replacement of missing fasteners and patching holes in primary support members will not restore bridge members to their original condition as the fatigue damage has already been done.

- The recommended repairs in the inspection report address specific deficiencies but would not upgrade the bridge to a state of good repair. A state of good repair assumes bridge management practices that minimize asset life-cycle costs and avoid service disruption and load restrictions as well as providing a reliable factor of safety. These goals cannot be achieved with a more than 100-year-old bridge that contains thousands of fractured critical members whose remaining life cannot be precisely determined. The engineering report concluded that the only practical way to restore this bridge to a state of good repair would be to replace the fatigue-damaged pin-connected deck truss spans with truss spans of modern design. This effort would entail removing the existing trusses, erecting new trusses, and installing the track and rail systems to restore service, which would compromise the historic integrity of the bridge.
- Even after repair, the bridge would remain as a bottleneck and would not provide the needed connectivity along the NEC. The Rehabilitation Alternative would continue to subject intercity, commuter, and freight trains to the delays and problems associated with the design and age of the existing bridge and would be cost-inefficient. It would also not improve navigational traffic. The Rehabilitation Alternative would compromise the project to a degree that it would be unreasonable to proceed with it in light of the stated Purpose and Need. Replacing the existing trusses without a new adjacent two-track bridge already in service would result in prolonged and unacceptable shutdowns of rail operations and would significantly and adversely impact Amtrak, MARC and NS.

Overall, the Rehabilitation Alternative would be feasible, but it would not be prudent, based on the consideration of factors #1, #2, and #4 regarding prudence listed in Section B, “Regulatory

Context and Methodology." It is also possible that none of the Rehabilitation Alternatives would completely avoid the use of all Section 4(f) properties.

E. MEASURES TO MINIMIZE HARM

For the reasons discussed above, the No Action and Rehabilitation Alternatives are not considered prudent and feasible. As required by Section 106 of NHPA, FRA and MDOT are participating in an ongoing consultation process with the MHT and consulting parties regarding the potential effects on archaeological and historic architectural resources. Through consultation with MHT, FRA and MDOT have developed measures to minimize or mitigate the adverse effect on the properties protected under Section 4(f). For NR-listed or eligible properties the development of mitigation measures is set forth in the draft PA, to be executed by MHT, FRA, Amtrak and MDOT. The draft PA is included in **Appendix D**, "Cultural Resources." The draft PA lists the historic resources that may be affected by the project and also describes the continuing consultation process that will be conducted as project designs evolve. The draft PA also describes the measures to be implemented during the project's design process, to avoid, minimize, or mitigate adverse effects of the project on historic resources. Coordination with the City of Havre de Grace and Harford County Public Schools will continue as the planning and implementation of the Proposed Project progresses to ensure that appropriate minimization and mitigation measures are implemented for the Jean S. Roberts Memorial Park and for Alternative 9A, Havre de Grace Middle/High School. Mitigation measures under consideration for each resource are described below.

SUSQUEHANNA RIVER RAIL BRIDGE AND OVERPASSES

Measures to minimize adverse effects of the project on the NR-eligible Susquehanna River Rail Bridge and nine undergrade bridges could include:

- For the two new bridges, use a more traditional design (either the truss approach/truss main span, girder approach/arch main span, or the girder approach/truss main span) as well as a more traditional pier design (either the arched keyhole, fluted, or wall);
- For the proposed extensions or replacements of the eight historic undergrade bridges, use a form liner that emulates stone and is stained to be compatible with the color of the existing stone. In addition, new retaining walls in close proximity to the bridges should be designed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*;
- Prepare documentation of the Susquehanna River Rail Bridge and the eight undergrade bridges following Historic American Engineer Record (HAER) standards;
- Develop educational materials interpreting the history and significance of the bridge for use by local libraries, historical societies, and educational institutions;
- Produce a short film that documents the character-defining historical and engineering aspects of the Susquehanna River Rail Bridge;
- Salvage elements of the Susquehanna River Rail Bridge; and/ or
- Develop an interpretive exhibit in a park, greenway, or public space.

PERRYVILLE RAILROAD STATION

To avoid demolishing the structure and creating an adverse effect on the Perry Interlocking Tower, Amtrak is evaluating the possibility of shifting the tower approximately 25 feet within the Amtrak right-of-way. The change in location would be minor and would not adversely affect the relationship between the Perry Interlocking Tower and the Perryville Station. This step would avoid one of several possible adverse effects to the historic station complex.

In addition, as described above, through consultation with MHT and Section 106 consulting parties, FRA and MDOT have developed measures to mitigate the adverse effect on the NR-eligible Perryville Railroad Station complex. Development of these mitigation measures is set forth in the draft PA, to be executed by MHT, FRA, Amtrak and MDOT. The draft PA is included in **Appendix D**. The draft PA lists the historic resources that may be affected by the project and also describes the continuing consultation process that will be conducted as project designs evolve. The draft PA also describes the measures to be implemented during the project's design process, to avoid, minimize, or mitigate adverse effects of the project on historic resources. Such measures could include**:**

- For the proposed extension to the Access Road Undergrade Bridge 59.39, use a form liner that emulates stone and is stained to be compatible with the color of the existing stone. In addition, new retaining walls in close proximity to the bridge and station should be designed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*;
- Prepare HAER recordation to document the two contributing resources that would be altered and/or removed; and
- Develop and install signage interpreting the history of the Perryville Railroad Station.

HAVRE DE GRACE HISTORIC DISTRICT

As detailed in the Alternatives Retained for Detailed Study (see **Appendix A**, "Alternatives Screening Report and Bridge Design Types"), the alternatives screening process minimized direct impacts to contributing resources of the Havre de Grace Historic District. In accordance with the draft PA, the Proposed Project's Construction Protection Plan (CPP) will include consideration of all significant structures within close proximity to the Project in order to protect these architectural resources from damage during the construction period.

Additional steps to minimize or mitigate adverse effects to the Havre de Grace Historic District could include:

- Ensure that the two new bridges over the river use a traditional design for the bridges and piers;
- Ensure that any new physical structures such as the retaining walls are designed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*; and
- For the proposed extensions to the four historic undergrade bridges within the Historic District, use a form liner that emulates stone and is stained to be compatible with the color of the existing stone.

JEAN S. ROBERTS MEMORIAL PARK

In order to limit the impact to Jean S. Roberts Memorial Park, the Project Team reduced construction clearances and future inspection and maintenance clearances to the practical minimum distances. FRA and MDOT will work with the City of Havre de Grace to identify additional appropriate mitigation measures and to ensure that a replacement for the Jean S. Roberts Memorial Park boat ramp is provided in a suitable location.

HAVRE DE GRACE MIDDLE /HIGH SCHOOL ATHLETIC FIELDS

Measures to minimize harm to Havre de Grace Middle/High School have been developed in collaboration with the school board. These measures are described below.

EXISTING TRACK AND FIELD FACILITIES

The proposed retaining wall requires modification or relocation of the existing pole vault/high jump, long jump and 110-meter hurdle runout area at the existing track and field facility. A storage shed would also be impacted. Minimization and Mitigation for impacts to these facilities include:

- Amtrak would build the railroad on an elevated structure over the 110-meter hurdle runout area. During construction the runout would be reduced to 8.5 meters but after construction would be rebuilt to its current 11.5-meter length.
- Relocate pole vault, high jump, long jump and storage shed.
- The Project would reimburse Harford County Public Schools for the agreed upon additional design cost.
- To the extent practical, construction would be scheduled to minimize disruption to these facilities.

PLANNED BASEBALL FIELD CONSTRUCTION

The Project Team has reviewed plans for a new baseball field proposed as part of the High School/Middle School development. Although this field has not yet been constructed, Harford County Public Schools is in the process of designing the facility. As such, FRA and MDOT have taken the future baseball field into account in their assessment of the impacts to the property. It is recommended that baseball fields should be built with a 60-foot clear area behind the foul line. As currently designed, the proposed retaining wall for Alternative 9A would encroach within this clear area by up to 20 feet. To address this impact, MDOT has worked with Harford County Public Schools to develop the following minimization and mitigation measures:

- The baseball field would be redesigned by shifting home plate three feet away from the railroad and rotating the field 2.5 degrees counter clockwise.
- Design consultant working on the baseball fields would redesign the field to provide adequate clear area around Amtrak's proposed retaining wall.
- The Project would reimburse Harford County Public Schools for the agreed upon additional design cost.
- Amtrak would provide conduit and embedded inserts for installation of a future score board by Harford County Public Schools.
- Amtrak would install a protective netting to shield the railroad from foul balls.

EXISTING 20-INCH WATER MAIN

An existing 20-inch water main is located adjacent to Amtrak right of way, approximately 15 feet inside the Athletic Field property and would require relocation due to the proposed retaining wall. Minimization and mitigation for impacts to the water main include:

- The water main would be relocated in a casing, allowing future replacement to be done without affecting the athletic facilities.

Construction would be scheduled around use of the facilities.

RODGERS TAVERN

Through consultation with MHT and Section 106 consulting parties, FRA and MDOT have developed measures to minimize the adverse effect on the NR-listed Rodgers Tavern. Development of these measures, as set forth in the draft PA, could include:

- Ensure that the retaining wall in front of the tavern receives an aesthetic treatment, such as through use of a form-liner so that the wall imitates the look of stone and is compatible with the tavern's architecture;
- Use landscaping to screen the wall if there is adequate space;
- Develop an appropriate mural for the retaining wall; and
- As stipulated in the draft PA, to ensure that there is no construction-related damage to structures within close proximity to the Proposed Project, the project PA will include development of a CPP. The CPP will identify all architectural resources to be included in the plan and will set forth the specific measures to be used and specifications that will be applied to protect these architectural resources from damage during the construction period.

F. LEAST OVERALL HARM ANALYSIS

If there is no feasible and prudent avoidance alternative, FRA may only approve the alternative that results in the least overall harm in light of Section 4(f)'s preservation purpose. FRA conducts the least overall harm analysis by considering the following factors[6]:

- The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
- The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- The relative significance of each Section 4(f) property;
- The views of the official(s) with jurisdiction over each Section 4(f) property;
- The degree to which each alternative meets the purpose and need for the project;
- After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
- Substantial differences in costs among the alternatives.

[6] 23 CFR 774.3(c) (*See* Section 3.3.3.2, *Alternative with Least Overall Harm*)

FRA has evaluated numerous alternatives throughout the NEPA process and determined that there are no feasible and prudent alternatives that completely avoid the use of Section 4(f) properties. Therefore, since all alternatives use Section 4(f) properties, FRA has undertaken a least harm analysis to determine the alternative with the least overall harm. Alternative 9A and Alternative 9B, which were selected for detailed evaluation in this EA, are considered.

Based on the thorough screening, Alternative 9A and Alternative 9B were retained for detailed study in the EA. The Project Team determined that Alternative 9A and Alternative 9B best meet the goals and objectives of the project, while minimizing environmental and property impacts.

ALTERNATIVE 9A

As discussed in Chapter 2, "Project Alternatives," Alternative 9A would construct a new two-track 90 mph bridge to the west of the existing bridge and a second new two-track 160 mph bridge on the existing bridge alignment. Alternative 9A has an estimated 5-year construction period and an estimated cost of $930 million, based on the construction of the girder approach / arch main span bridge type. Alternative 9A will result in a Section 4(f) use of three historic resources, including the Susquehanna River Rail Bridge and Overpasses, Perryville Railroad Station complex, and Havre de Grace Historic District. In addition, FRA intends to determine that Alternative 9A will result in a *de minimis* use *of* Jean S. Roberts Memorial Park and a *de minimis* use of the Havre de Grace Middle/High School athletic fields. Portions of the publicly-owned athletic fields are protected under Section 6(f) and may require replacement. As discussed in Chapter 10, "Section 6(f) Evaluation," Section 6(f) prescribes the conditions that must be satisfied for the use or transfer of parklands or open spaces that have been improved with funds received through the Land and Water Conservation Fund (LWCF).

ALTERNATIVE 9B

Alternative 9B is very similar to Alternative 9A. Like Alternative 9A, Alternative 9B would result in a new two-track 90 mph bridge west of the existing bridge and a second new two-track bridge replacing the existing bridge. The difference between Alternative 9A and Alternative 9B occurs in Havre de Grace along the east side of the corridor from Lewis Lane to the Susquehanna River. Alternative 9B lessen the curve in Havre de Grace and would limit the speed to a maximum of 150 mph. This lower speed, as compared to Alternative 9A, reduces the amount of property acquisitions required, including the avoidance of the Havre de Grace Middle/High School athletic fields. Alternative 9B has an estimated 5-year construction period and an estimated cost of $890 million based on the construction of the girder approach / arch main span bridge type. In terms of Section 4(f), Alternative 9B will result in the same use of the three historic resources as Alternative 9A (Susquehanna River Rail Bridge and Overpasses, Perryville Railroad Station complex, and Havre de Grace Historic District). In addition, as with Alternative 9A, FRA intends to determine that Alternative 9B will result in a *de minimis* use *of* Jean S. Roberts Memorial Park. In terms of Section 4(f), the difference between Alternative 9B and Alternative 9A is that Alternative 9B will not require the *de minimis* use and replacement of the Havre de Grace Middle/High School fields.

EVALUATION OF LEAST OVERALL HARM

Below is a summary of FRA's consideration with respect to each factor considered in least overall harm analysis.

ABILITY TO MITIGATE ADVERSE IMPACTS TO EACH SECTION 4(F) PROPERTY

The impact to the Susquehanna River Rail Bridge and Overpasses, Perryville Railroad Station complex, Havre de Grace Historic District, and Jean S. Roberts Memorial Park will be the same with Alternative 9A and with Alternative 9B. The ability to mitigate the adverse impacts will be the same with both alternatives. Adverse impacts to the Havre de Grace Middle/High School athletic fields with Alternative 9A are able to be mitigated sufficiently to result in an impact that FRA proposes to determine will constitute a *de minimis* use.

RELATIVE SEVERITY OF THE REMAINING HARM, AFTER MITIGATION, TO THE PROTECTED ACTIVITIES, ATTRIBUTES, OR FEATURES THAT QUALIFY EACH SECTION 4(F) PROPERTY FOR PROTECTION

The severity of the remaining harm, after mitigation, to the Susquehanna River Rail Bridge and Overpasses, Perryville Railroad Station complex, Havre de Grace Historic District, and Jean S. Roberts Memorial Park will be the same with Alternative 9A and with Alternative 9B. FRA intends to determine that harm to the Havre de Grace Middle/High School athletic fields after mitigation is *de minimis*. The difference between the *de minimis* harm with Alternative 9A and no harm to the school property with Alternative 9B is negligible and therefore not a significant differentiating factor between the Build Alternatives.

THE RELATIVE SIGNIFICANCE OF EACH SECTION 4(F) PROPERTY

The relative significance of the resources affected by both Build Alternatives is not essential to determine, as the effect of the two Build Alternatives on those resources would be the same. The significance of the Havre de Grace Middle/High School athletic fields, which would be minimally affected under Alternative 9A only, is considered to be less than the significance of the historic resources that would be affected with both Alternative 9A and Alternative 9B.

THE VIEWS OF THE OFFICIAL(S) WITH JURISDICTION OVER EACH SECTION 4(F) PROPERTY

In a letter dated August 24, 2016 (see **Appendix H**, “Public Involvement and Agency Coordination”), MHT agreed with the findings presented in the *Effects Assessment for Historic Architectural Resources* (see **Appendix D**, “Cultural Resources”). In support of FRA’s proposed *de minimis* determination, the City of Havre de Grace concurred that the Section 4(f) use of the City-owned portion of Jean S. Roberts Memorial Park under both Build Alternatives, with mitigation, would not adversely affect the activities, features, or attributes qualifying this property for protection under Section 4(f). In support of FRA’s proposed *de minimis* determination, Harford County Public Schools concurred that the use of the Havre de Grace Middle/High School athletic fields under Alternative 9A, with mitigation, would not adversely affect the activities, features, or attributes qualifying this property for protection under Section 4(f). Consistent with federal guidance, the *de minimis* use of the Havre de Grace Middle/High School athletic fields is not considered to be a significant differentiating factor between the Build Alternatives because the net harm resulting from the *de minimis* impact is negligible.

THE DEGREE TO WHICH EACH ALTERNATIVE MEETS THE PURPOSE AND NEED FOR THE PROJECT

As discussed in Chapter 2, “Project Alternatives,” the two Build Alternatives were compared for their ability to meet the Purpose and Need for the project, considering the project goals and objectives. Since the Build Alternatives were developed in consideration of these goals and objectives, there are few differences among the Build Alternatives. However, a key operational consideration is the project's ability to optimize existing and planned infrastructure by providing for a maximum authorized train speed of 160 mph, while taking both benefits and potential impacts into consideration. Amtrak developed the NEC Master Plan with planned speed increases up to a maximum authorized speed of 160 mph for this location along the NEC. Amtrak's NEC Master Plan is consistent with the congressional mandate placed on Amtrak to reduce travel times along the NEC.

As discussed above, Alternative 9A would allow for a maximum speed of 160 mph, while Alternative 9B would limit the speed to a maximum of 150 mph. Therefore, Alternative 9A is consistent with operational goals and with broader plans along the NEC. Overall, Alternative 9A better meets the Purpose and Need for the project and the broader goals for the NEC, and was therefore selected as the Preferred Alternative.

AFTER REASONABLE MITIGATION, THE MAGNITUDE OF ANY ADVERSE IMPACTS TO RESOURCES NOT PROTECTED BY SECTION 4(F)

Alternative 9A would result in slightly greater impacts to resources not protected by Section 4(f) (e.g., a commercial displacement, as discussed in Chapter 4, "Land Use and Community Facilities;" and floodplains, streams, wetland, forest, and Chesapeake Bay Critical Area impacts, as discussed in Chapter 11, "Natural Resources") as compared to Alternative 9B. However, these additional impacts can be mitigated for and potentially reduced during final design.

SUBSTANTIAL DIFFERENCES IN COSTS AMONG THE ALTERNATIVES

The construction cost of Alternative 9A is greater slightly greater than the construction cost of Alternative 9B (less than five percent of the overall project cost). Considering the greater long-term societal benefits and travel time cost savings associated with Alternative 9A, the greater construction cost is not a significant distinguishing factor between the Build Alternatives.

G. COORDINATION

The Project Team has undertaken extensive public and community outreach efforts as part of the Proposed Project, along with federal, state, and local agency coordination (see Chapter 20, "Coordination and Consultation"). Numerous public meetings have been held throughout the environmental process at project milestones. In addition to public outreach information sessions, the Project Team has held numerous Interagency Review Meetings and key stakeholder meetings, including meetings with local officials, the Susquehanna River Rail Bridge Project Advisory Board, bicycle-pedestrian stakeholders, and Harford County Public Schools. As documented in **Appendix H**, "Public Involvement and Agency Coordination," Harford County Public Schools and the City of Havre de Grace concurred that the Proposed Project would "not adversely affect the activities, features, or attributes qualifying" Havre de Grace Middle/High School Athletic Fields and Jean S. Roberts Memorial Park for protection under Section 4(f).

The Section 106 consultation process for the Susquehanna River Rail Bridge began in April 2014. Section 106 consulting parties were invited to public outreach information sessions held on August 13, 2014, December 10, 2014, November 10, 2015, and April 14, 2016. Dedicated Section 106 meetings were held on March 9, 2015, August 18, 2015, and October 11, 2016. The Project Team has coordinated with MHT throughout the environmental review process.

Coordination included efforts to: determine the Area of Potential Effects (APE), identify historic properties within the APE, determine effects to historic properties, develop minimization and mitigation measures and develop the PA. Consultation between the Project Team and MHT is ongoing.

Public review of this Evaluation is being held concurrently with public review of the EA. Through consultation with Section 106 consulting parties and MHT, FRA and MDOT have developed measures to minimize harm on the Section 4(f) properties to be used for implementation of the project, as described above and provided in the draft PA contained in **Appendix D**, "Cultural Resources."

H. SECTION 4(F) REVIEW PROCESS

The draft Section 4(f) evaluation will be made available for a minimum 30-day public review, in tandem with public review of the EA. After public comments on this draft Evaluation are received, a final Section 4(f) evaluation will be prepared. The final Section 4(f) evaluation will contain the conclusions of the Section 4(f) evaluation, encompassing:

- A description of the basis for concluding that there are no prudent and feasible alternatives to the use of the Section 4(f) property, including a demonstration that there are unique problems or unusual factors involved in the use of alternatives that avoid these properties, or that the cost, social, economic, and environmental impacts or community disruption resulting from the alternatives reach extraordinary magnitudes;
- A description of the basis for concluding that the Proposed Project includes all possible planning to minimize harm; and
- A summary of appropriate formal coordination with the U.S. Department of the Interior (USDOI).

FRA, acting as the lead federal agency, will make its final Section 4(f) finding, including the final *de minimis* determination, when it issues its findings on the EA. ✷

A. INTRODUCTION

This Section 6(f) Evaluation assesses all properties within the study area that received Land and Water Conservation Fund (LWCF) Act funding, referred to herein as "Section 6(f) resources". The study area for this Evaluation includes a 1,000-foot buffer surrounding the Proposed Project site. This Evaluation satisfies the requirements of the LWCF Act (16 USC § 4601-4 through 11, commonly known as Section 6(f)), which prescribes the conditions that must be satisfied for the use or transfer of parklands or open spaces that have been improved with funds received through the LWCF. As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A (the Preferred Alternative) and Alternative 9B. The Preferred Alternative would potentially require use of one Section 6(f) resource—portions of the publicly owned athletic fields at the Havre de Grace Middle School-High School complex.

B. REGULATORY CONTEXT AND METHODOLOGY

REGULATORY CONTEXT

The LWCF Act established the LWCF State Assistance Program, a nationwide program for funding the acquisition and development of public outdoor recreation resources. The U.S. Department of the Interior (USDOI), through the National Parks Service (NPS), provides funding under the LWCF for state and local efforts to plan, acquire, or develop land to advance outdoor recreational activities (16 USC § 4601-4). The Maryland Department of Natural Resources (DNR) Office of Land Acquisition and Planning serves as the state delegate/state liaison officer that administers LWCF Act funding received by Maryland from USDOI.

Under Section 6(f) of the LWCF Act, land purchased with LWCF monies cannot be converted to a non-recreational use without coordination with and approval from USDOI, acting through the NPS, at the request of the state delegate/state liaison officer. If any portion of a Section 6(f) resource is proposed to be converted to a non-recreational use, replacement of the land used is required. NPS must approve the conversion and replacement of Section 6(f) resources and any NPS approval must be based on a determination that the conversion meets the conditions under Section 6(f) described in more detail below (16 USC § 4601-8[f][3]) and 36 CFR Part 59.

In Maryland, some parks and recreational facilities have been funded through DNR Program Open Space (POS), established in 1969. Although POS is not part of the LWCF, the two programs work in parallel to protect the recreational areas they fund, and the two carry similar requirements for conversions of use. The conversion of land acquired or developed using POS funding requires the written approval of the Secretary of DNR, the Secretary of the Department of Budget and Management, and the Secretary of the Department of Planning. Funding for POS is made available to local communities through the Outdoor Recreation Land Loan of 1969 and through the LWCF of the USDOI.

PREREQUISITES OF CONVERSION

Under the LWCF Act and applicable USDOI regulations (36 CFR Part 59), conversion of Section 6(f) resources may be approved only if NPS finds that the following nine criteria have been met:

1) All practical alternatives to the proposed conversion have been evaluated and rejected;

2) The fair market value of the park property to be converted has been established and that the property proposed for substitution is of at least equal fair market value, as established by an approved appraisal in accordance with the Uniform Appraisal Standards for Federal Land Acquisition, excluding the value of structures or facilities that will not serve recreational purposes;

3) The proposed replacement property is of reasonably equivalent usefulness and location as the converted property;

4) The property proposed for substitution meets the eligibility requirements for LWCF-assisted acquisition;

5) For properties that are proposed to be partially rather than wholly converted, the impact of the converted portion on the remainder must be considered and the unconverted area must remain recreationally viable, or be replaced as well;

6) All necessary coordination with other federal agencies has been satisfactorily accomplished, including compliance with Section 4(f) of the U.S. Department of Transportation Act of 1966;

7) The guidelines for environmental evaluation have been satisfactorily completed and considered by the NPS during its review of the conversion proposal;

8) If the proposed conversion constitutes a significant change to the original LWCF project, State intergovernmental clearinghouse review procedures have been adhered to; and

9) The proposed conversion is in accordance with the applicable Statewide Comprehensive Outdoor Recreation Plan (SCORP) and/or equivalent recreational plans.

According to the NPS 2008 LWCF State Assistance Program Manual, a small conversion is a conversion that will affect no more than 10 percent of the Section 6(f) protected area or five acres, whichever is less, and meets the following criteria: 1) results in minor or no environment impacts due to removal from Section 6(f) protection/replacement of 6(f) property; 2) is not controversial; and 3) replacement property is contiguous to the original Section 6(f) protected area or another existing park or recreation area. A small conversion may simplify the NPS review and decision-making process. The Project Team will determine the appropriate level of conversion for the Proposed Project after selecting the most appropriate replacement property, in cooperation with Harford County Public Schools, DNR, and NPS.

METHODOLOGY

Generally, if a transportation project may impact parkland or recreational facilities that were acquired or developed using LWCF and/or POS funds, the project sponsor should obtain the following information and take the following actions:

- Identify parkland or recreational areas that were purchased or developed with LWCF or POS funds;

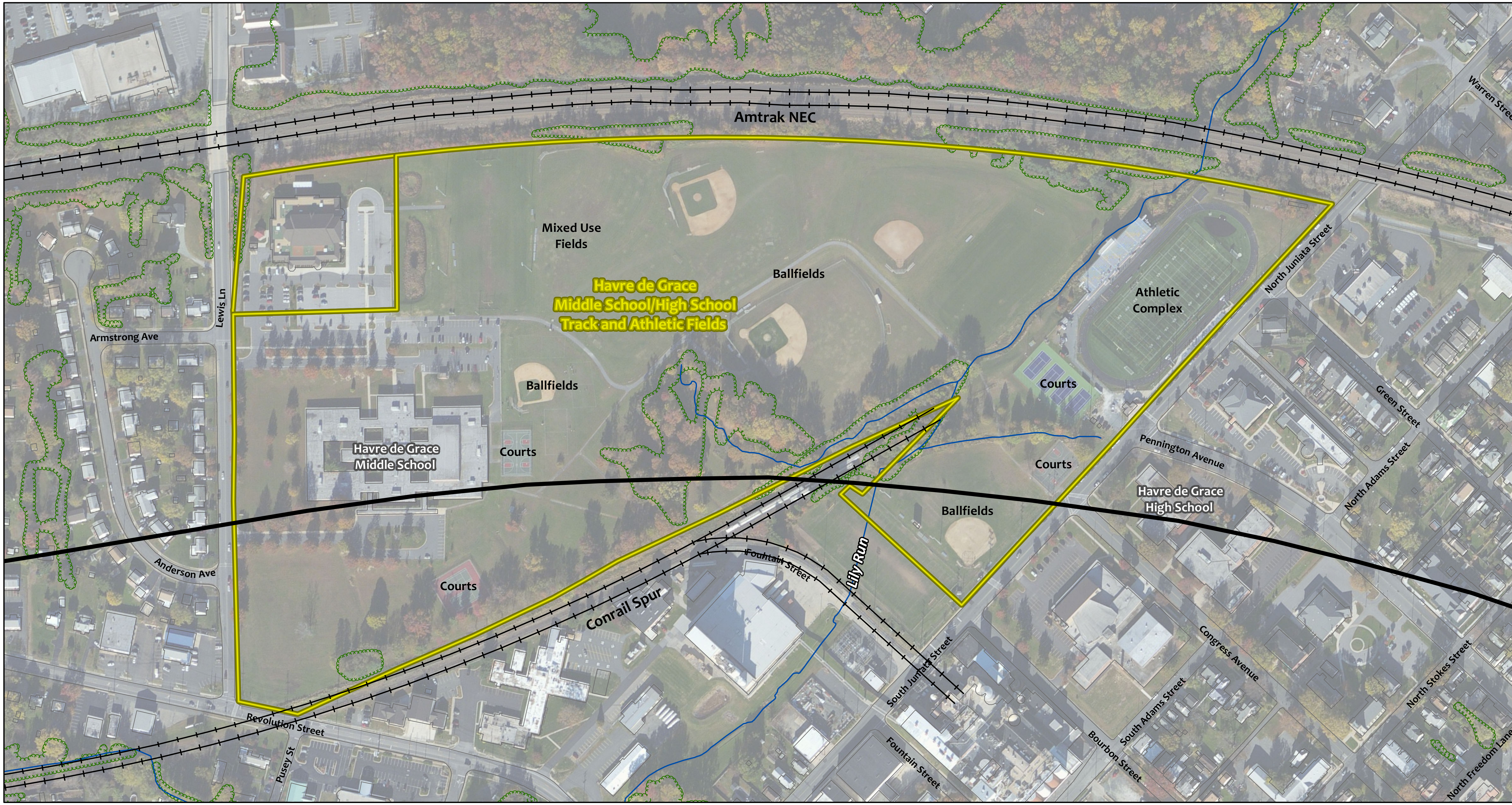
- Identify public parkland or recreational area right-of-way needs, in fee and/or temporary easements;
- Contact the official or agency with jurisdiction over the property to inform them of the proposed project/impact and request information on potential replacement properties;
- Prepare mapping showing potential replacement sites and develop an estimate of acquisition cost;
- Continue coordination with the official or agency with jurisdiction over the property to agree on mutually acceptable replacement site;
- Continue coordination with official/agency with jurisdiction through meetings, letters, and minutes of meetings during conversion process;
- Meet the requirements of Section 4(f) (described in Chapter 9, "Draft Section 4(f) Evaluation");
- Identify a replacement site of at least equal fair market value and of reasonably equivalent recreational value, usefulness, and location as the impacted area;
- Complete appropriate appraisals when plans are developed, as required by law for POS or Section 6(f) property conversions; and
- Forward appraisals for impacted property and the selected replacement site to the official/agency with jurisdiction over the property.

The Project Team obtained information regarding Section 6(f) and POS resources within the study area using Geographic Information Systems (GIS) data, field visits, online LWCF project reports, and information from the Harford County Department of Parks and Recreation and DNR. The Project Team identified properties within the study area that were either partially or wholly bought or developed using LWCF monies, thereby triggering an Evaluation. For each property affected by the Proposed Project that contains a Section 6(f) resource, the Project Team calculated the acreage of potential impact (i.e., conversion of potential 6(f) land), and the type and extent of impacts to recreational facilities. The Project Team is continuing to coordinate with DNR and NPS.

C. APPLICABILITY OF SECTION 6(F) TO THE PROJECT

Harford County Department of Parks and Recreation has confirmed that portions of the Havre de Grace Middle School-High School complex received LWCF monies for development, (see **Figure 10-1** and response letter from the Harford County Department of Parks and Recreation regarding the use of LWCF monies at the Havre de Grace Middle and High Schools in **Appendix H**, "Public Involvement and Agency Correspondence.")

In 1966, NPS granted $7,070.00 to the high school for the construction of three tennis courts and one multi-purpose court (Project 24-00008). In 1970, the middle school was granted $16,143.00 for the construction of one multi-purpose court, four little-league baseball fields, and a cinder running track (Project 19-00139-13-012). Records from 1978 indicate that the tennis courts originally constructed under LWCF project 24-00008 were relocated on the school site as part of a Havre de Grace High School expansion project. In addition, the athletic facilities constructed under LWCF project 19-00139-13-012 have undergone several reconfigurations including the relocation of the original cinder running track and original ball field (see **Figure 10-2**). The precise boundaries of Section 6(f) resources within the Havre de Grace Middle School-High School complex are the subject of ongoing discussions between NPS, DNR, and Harford



Legend

Havre de Grace Middle School/High School Track and Athletic Fields*

1,000 ft Study Area

*Property partially developed using LWCF Funds (6(f) resource)

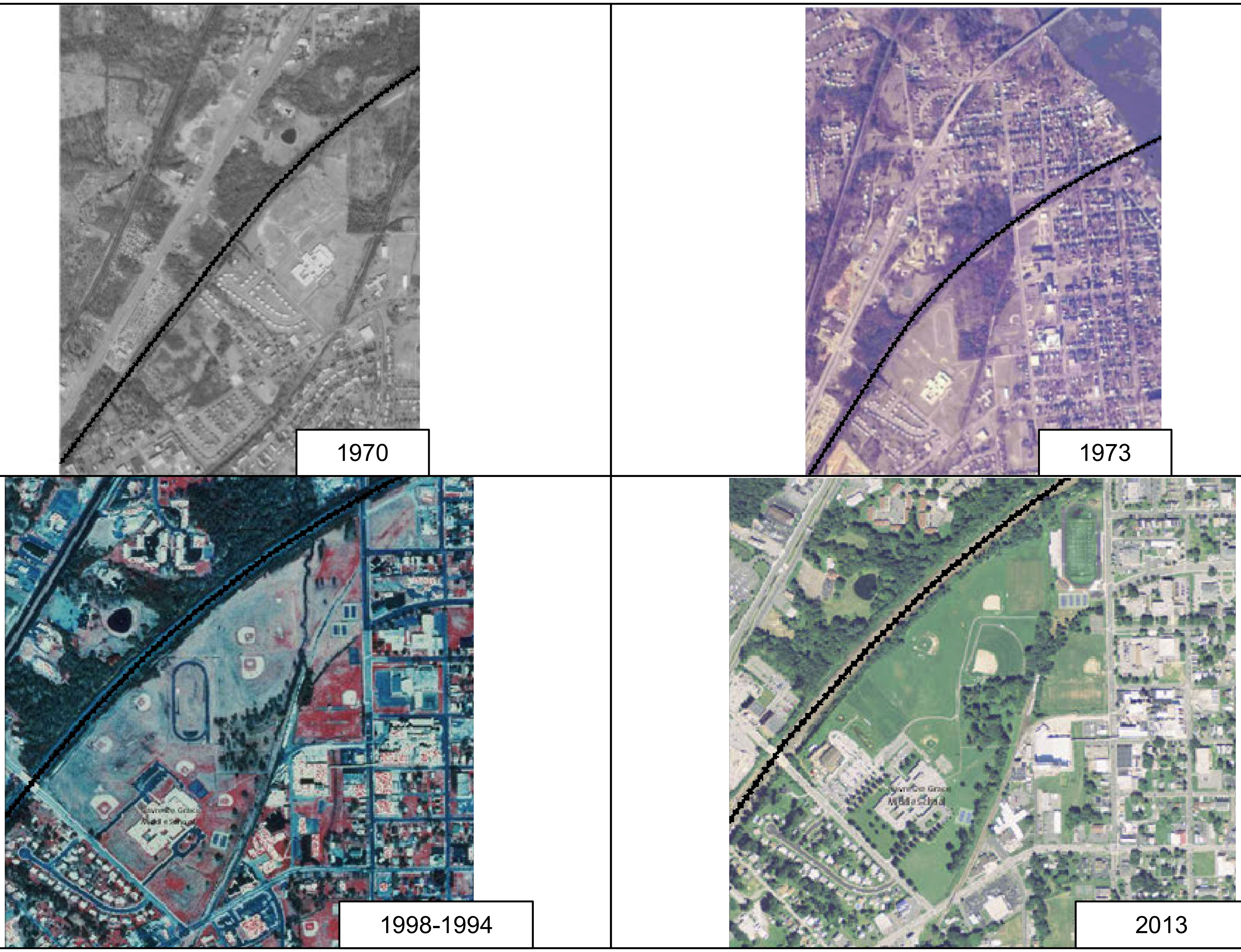
Data Sources

Athletic Field Complex Boundary: Harford County Government, 2011

0 250 500 Feet

Susquehanna River Rail Bridge Project

Figure 10-1
Havre de Grace Middle/High School Athletic Complex



Not to Scale

Susquehanna River Rail Bridge Project

Figure 10-2
Development History of Havre de Grace Middle/High School Athletic Complex

County. Through coordination with NPS and DNR, a draft LWCF boundary has been established for this EA (discussed in Section E, "Potential Impacts of the Build Alternatives").

In 2015, Harford County Public Schools reported a total student population of 37,451; of these, 584 students attended the Havre de Grace Middle School and 775 students attended the Havre de Grace High School.[1] The middle and high school buildings are not connected; however, they share athletic facilities that host a range of recreational activities including football, soccer, baseball, and track and field events. The portion of the property that includes the shared recreational facilities is approximately 57 acres and is located between the middle and high school buildings. The facilities currently include five baseball fields, two multi-purpose courts, five tennis courts, two soccer fields, open space, and the James R. Harris Stadium that contains a track and football field. According to consultation with Havre de Grace High School, these athletic fields are used for school-related sporting events and practices, and are open to the public outside of normal school hours and after-school programs unless reserved for a special event.

In addition to the school athletic fields, three parks within the study area—the David Craig Park, Swan Harbor Farm, and Lower Ferry Park—have been funded through DNR's POS (see Chapter 6, "Parks, Trails, and Recreational Resources"). As described above, funding for POS is made available through the Outdoor Recreation Land Loan of 1969 and the LWCF of the USDOI. These parks are therefore considered Section 6(f) resources.

D. NO ACTION ALTERNATIVE

The No Action Alternative assumes the Susquehanna River Rail Bridge will remain in service as-is, with no intervention apart from the undertaking of minimal repairs and the continuation of the current maintenance regime. Service over the bridge would continue to worsen in the future under the No Action Alternative. The No Action Alternative is a baseline scenario against which potential impacts from the Proposed Project will be measured. As part of the No Action Alternative, Harford County Public Schools is in the process of finalizing design plans to combine the existing Havre de Grace High School located on Congress Avenue with the Havre de Grace Middle School currently located on the southern end of the existing school property near Lewis Lane. Harford County's plans to reconstruct the Middle School-High School complex are independent of the Susquehanna River Rail Bridge Project. The new complex would include new baseball fields and improved pedestrian accommodations.

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

Alternative 9A and Alternative 9B would require expansion of the existing rail right-of-way, requiring the acquisition and conversion of narrow strips of land within the Proposed Project area, including within the Havre de Grace Middle School-High School complex.

ALTERNATIVE 9A

Under Alternative 9A (the Preferred Alternative), the proposed new retaining walls supporting the rail tracks would encroach upon the Havre de Grace Middle School-High School complex—including the existing running track and the planned athletic fields. The Lewis Lane overpass near the school complex would be reconstructed to accommodate the new track alignment.

[1] https://www.hcps.org/schools/SchoolProfile.aspx?schoolID=78; accessed December 29, 2016.

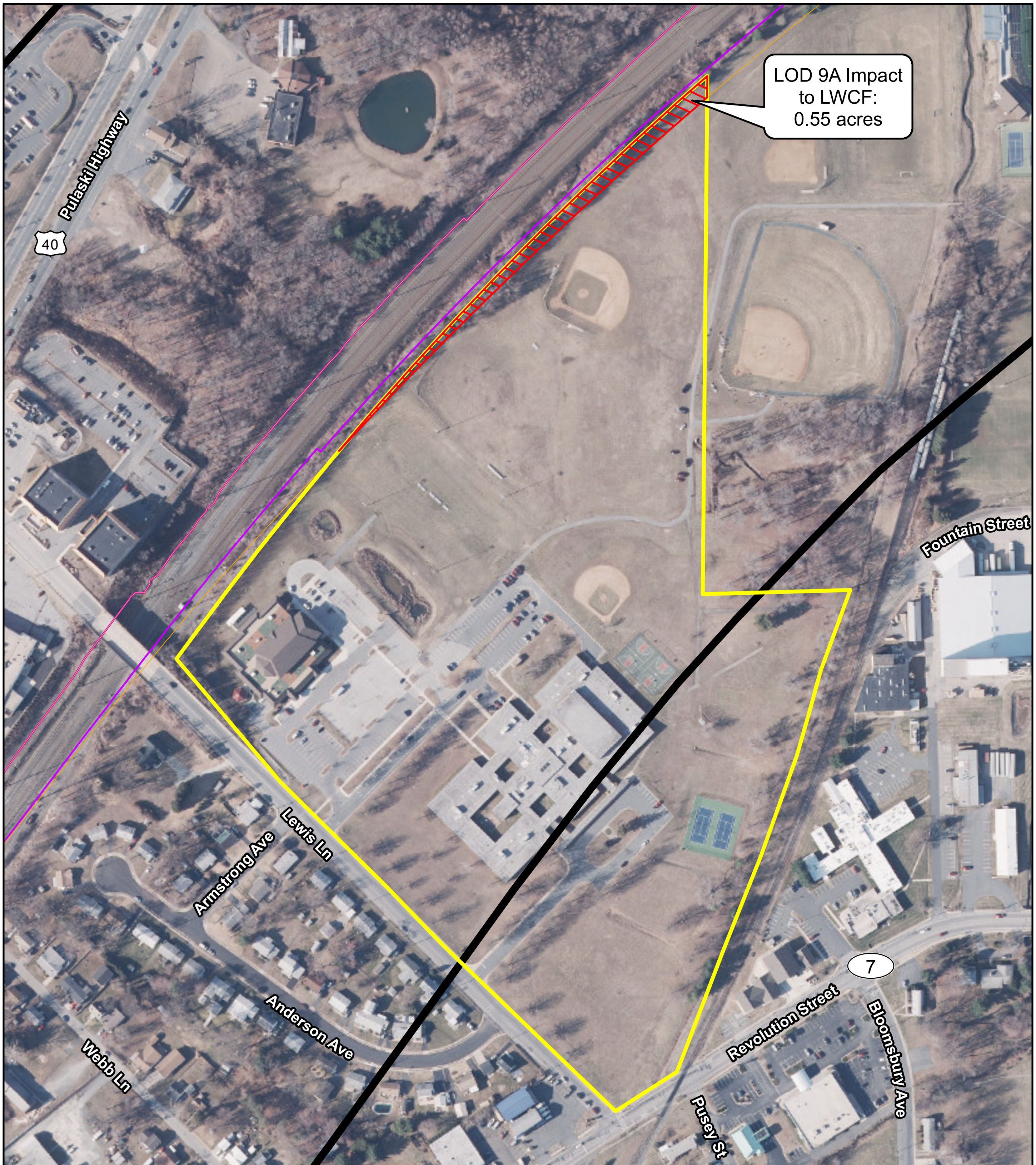
Alternative 9A would require the permanent acquisition of a small portion of the athletic fields—approximately 1.5 acres of fee simple right-of-way for Amtrak and approximately 1.2 acres of utility easement for the Harford County Department of Public Works for a total potential property impact of approximately 2.7 acres.

The fee-simple right-of-way is needed to accommodate a retaining wall, which would be constructed parallel to the tracks to the south and would be situated mostly on the current school property. Fencing would be installed along the top of the retaining wall, which would be approximately 17 to 18 feet tall, with a maximum height of 25 feet. An additional temporary construction easement may be required to build the retaining wall. Alternative 9A would also require a 30-foot-wide maintenance easement for the Harford County Department of Public Works. Ten feet of that maintenance easement would be within the proposed acquisition area. The remaining 20 feet of the needed maintenance easement (approximately 1.2 acres) would be within the school property.

The proposed rail track would impact only open space, but the proposed retaining wall and the associated construction/maintenance easement would impact track and field amenities, including the 110-meter hurdle runout area, the high jump/pole vault facility, the long jump facility, and storage shed. In addition, the retaining wall and easement would affect the conceptual design of the planned baseball fields, which Harford County intends to build to the west of the track.

Alternative 9A would require minor reconfigurations of the existing and planned ballfields at the school complex. Alternative 9A would also physically impact the starting block for the existing running track. As mentioned earlier, LWCF monies were used for the construction of the original cinder running track, which has since been moved to its current location. The functional use of the original LWCF monies acquired for the construction of the original track are no longer relevant due to the relocation of that recreation facility. Based on DNR and NPS's current understanding of the Section 6(f) resource boundaries, the existing track and field amenities are not subject to Section 6(f). A portion of the land required for Alternative 9A, however, falls within the Section 6(f) resource boundaries. NPS and DNR have delineated a draft LWCF boundary (see **Figure 10-3**); Harford County input on this boundary is pending. Alternative 9A would require approximately 0.55 acre of land for which LWCF monies were used (see **Figure 10-3**). There are no existing or planned athletic fields or other recreational facilities within this 0.55-acre area. The track and field elements impacted by the Proposed Project are within HCPS property, but are outside of the established draft LWCF boundary.

The Proposed Project may qualify for a small conversion as discussed under the above "Prerequisites of Conversion". Additionally, according to NPS 2008 LWCF State Assistance Program Manual, underground utility easements within a Section 6(f) area may not trigger a conversion if the site is restored to its pre-existing condition to ensure the continuation of public outdoor recreational use of the easement area within 12 months after the ground within the easement area is disturbed. The existing water main relocation would result in a 30-foot-wide water main easement. Of this 30-foot-wide easement, approximately 10 feet would be located on the Amtrak property and approximately 20 feet would be located on the school property. According to Section 6(f) guidance (*LWCF State Assistance Program Manual, Chapter 8-12),* the water main easement can be excluded from the overall Section 6(f) conversion acreage since it would be restored to prior conditions shortly after construction has been completed allowing any surface level recreational activities to proceed as intended. Coordination with NPS and DNR will continue to confirm that the utility easement area would not be subject to conversion



LOD 9A Calculation Area
LOD 9B Calculation Area
1,000 ft Study Area
LOD 9A LWCF Impact
LWCF Boundary

N

1 inch = 300 feet

0 100 200 Feet

Susquehanna River Rail Bridge Project

Figure 10-3

LWCF Boundary
LOD Comparison

Harford County, MD

requirements. Alternative 9A would not impact David Craig Park, Swan Harbor Farm, or Lower Ferry Park—the parks within the study area that have received POS funding.

ALTERNATIVE 9B

Alternative 9B is similar to Alternative 9A, but would entail a more curved rail alignment design, which would limit the rail speed to a maximum of 150 mph and result in fewer right-of-way impacts. As shown in **Figure 10-3**, Alternative 9B would not extend beyond Amtrak's existing right-of-way at the Havre de Grace Middle School-High School complex, and therefore would have no adverse impacts to this resource. Alternative 9B would not impact other Section 6(f) resources, including David Craig Park, Swan Harbor Farm, and Lower Ferry Park.

F. MINIMIZATION AND MITIGATION OF IMPACTS

As a first prerequisite of conversion, all practical alternatives to the proposed conversion must be evaluated and rejected." A two-step screening process (i.e. fatal flaw screening followed by a detailed screening) was used to evaluate 25 preliminary alternatives for the project (see Chapter 2, "Project Alternatives"). A "fatal flaw" screening eliminated all but 10 alternatives based on rail connectivity, navigational requirements, logical termini, feasibility and constructability, and avoidance of critical property impacts. The Project Team conducted a subsequent detailed screening of the 10 remaining alternatives based on potential impacts to the human and natural environment (including Section 6(f) impacts) as well as operational and engineering considerations. The screening determined that Alternative 9A and Alternative 9B best meet the goals and objectives of the project, while minimizing environmental and property impacts.

Six of the alternatives screened in detail (1B, 4C, 4E, 8A, 8B and VE) would have avoided impacts to Section 6(f) resources, but were removed from further consideration because they either required full acquisition of a low-income senior housing facility, supported less desirable train speeds, and/or required similar or higher environmental impacts as Alternative 9B while offering fewer operational and engineering benefits. The fatal flaw and detailed screenings satisfy the first conversion prerequisite. In addition, Alternative 9A was determined to have the least overall harm in light of the preservation purpose of Section 4(f) (see Chapter 9, "Draft Section 4(f) Evaluation").

The Project Team made efforts to minimize the impacts to Section 6(f) resources during the alternatives development and screening process, and have eliminated several alignments that could have resulted in greater impacts to Section 6(f) properties, including more extensive impacts to the Havre de Grace Middle School-High School athletic fields (see "Alternatives Retained for Detailed Study" in **Appendix A**, "Alternatives Screening Report and Bridge Types"). Alternative 4B and Alternative 4D, which were removed from further consideration, would have required more than two acres of fee-simple right-of-way from the Havre de Grace Middle/High School facility.

The Federal Railroad Administration (FRA) and the Maryland Department of Transportation (MDOT) have been coordinating closely with Harford County Public Schools to develop proposed measures to minimize and mitigate the impacts that would result from Alternative 9A. Proposed minimization and mitigation for Alternative 9A impacts to the Havre de Grace Middle/High School Athletic Fields are discussed in Chapter 9, "Draft Section 4(f) Evaluation".

G. POTENTIAL SECTION 6(F) REPLACEMENT LAND

Coordination with DNR, NPS, and the property owner—Harford County Public Schools (HCPS)—regarding potential Section 6(f) impacts and replacement parkland opportunities will continue as the Proposed Project progresses to the final design phase and once construction funding has been allocated for right-of-way purchases. The Proposed Project will likely result in a Section 6(f) impact (pending finalization of the draft LWCF boundary). Therefore, the Project Team will adhere to the nine LWCF prerequisites for conversion listed in Section B, "Regulatory Context and Methodology", as well as the Small Conversion Policy established in 1990 and recently amended (codified at 54 USC §2000305(f)(3), on January 3, 2017). The Project Team will also provide documentation per the LWCF Act and applicable USDOI regulations for the conversion of parkland (36 CFR 59). FRA and MDOT will continue to coordinate with Harford County Public Schools to submit an application for land conversion to the NPS Regional Administrator through DNR.

For this Environmental Assessment, the Project Team identified three potential replacement sites for further evaluation and coordination with the appropriate parties including DNR, NPS, FRA, MDOT and HCPS. The goal of the potential replacement land site search was to adhere to the eligibility requirements outlined in the Land and Water Conservation Fund Act of 1965.

Table 10-1 provides an overview of the potential replacement parcels that the Project Team identified. **Figure 10-4** shows the locations of the parcels.

Table 10-1
Potential Replacement Land

Property	Parcel Number	Lot Number	Zoning	Area (acre)
Property 1 Consolidated Gas & Electric Company	1021	1	Commercial	1.47
Property 2 Pepco Energy Power Company	182	1, 2, 3, and 4	Commercial	5.1
Property 3 T&D Enterprises LLC	0990	1	Commercial	0.7

POTENTIAL PROPERTY CONSIDERATIONS:

PROPERTY 1 (OWNER: BG&E)

- This parcel is contiguous to the proposed LWCF boundary but currently has public recreational uses on the site.
- Due to the private ownership of the parcel, the property could potentially be considered as replacement land under LWCF guidance and could comply with the small conversion requirements. Further coordination regarding the current use agreement between HCPS and the land owner BG&E is needed. The Project Team will evaluated the viability of using this property as replacement land, once the project transitions into detailed design and as construction funds become available.

Legend

Potential Replacement Sites:

- Property 1
- Property 2
- Property 3

Data Sources

Parcel Boundaries:
Harford County Government, 2011

0 280 560 Feet

Susquehanna River Rail Bridge Project

Figure 10-4

Potential Replacement Sites

PROPERTY 2 (OWNER: PEPCO ENERGY POWER COMPANY)

- This parcel is made up of open space that is contiguous to North Park, which would make it eligible for a small conversion.

PROPERTY 3 (OWNER: T & D ENTERPRISE LLC)

- This parcel is slightly over 1,000 feet from the school following existing roadway surface streets.
- The site could potentially be used for open space or park and recreation amenities.
- Since this parcel is not contiguous to the school athletic fields or to another existing park or recreation area, it will not fall under the small conversion requirements, but could still be evaluated as a full conversion option.

As previously mentioned, once the project transitions into detailed design and as construction funds become available, the Project Team will coordinate with NPS, DNR, and HCPS to finalize the LWCF Boundary, identify specific replacement parcel uses and evaluate the potential replacement sites, along with any other locations that may be identified in the future as suitable with respect to the replacement guidelines. ✷

A. INTRODUCTION

This chapter describes existing natural resource conditions within the study area for the Proposed Project. The natural resources analysis considered topography, geology, and soils; floodplains and wetlands/waters of the U.S.; terrestrial resources; aquatic resources; Chesapeake Bay Critical Area; coastal zone management; and unique and sensitive areas. This chapter also identifies potential adverse impacts on these resources from the Proposed Project, and discusses potential avoidance, minimization, and mitigation alternatives to offset these potential impacts. As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative.

B. REGULATORY CONTEXT AND METHODOLOGY

Regulatory context is summarized in **Table 11-1** and described in more detail in **Appendix E**, "Natural Environmental Technical Report (NETR)." Methodology is described below.

TOPOGRAPHY, GEOLOGY, AND SOILS

Maps published by the United States Geological Survey (USGS) and the Maryland Geological Survey (MGS) were used to obtain information on the topography and geology of the study area. Information on soil types within the study area was obtained from the USDA NRCS in the form of County Online Soil Surveys.

FLOODPLAINS AND WETLANDS/WATERS OF THE U.S.

Floodplains were identified within the study area using *Flood Insurance Rate Maps* (FIRM) produced by FEMA. Two sets of floodplain maps were available for Harford County, the effective FEMA floodplain and a preliminary FEMA floodplain that provides proposed updates to the current effective floodplain maps. Both were assessed. Acreages of the 100-year and 500-year floodplain within the corridor were calculated using a geographic information system (GIS) overlay of the FIRM map limits.

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) and the Maryland Department of Natural Resources (DNR) Wetlands Inventory GIS layers were initially used to investigate the potential presence of wetlands within the study area. Where the DNR wetlands and NWI wetlands overlapped, the combined outer limits of each layer were used to create the wetland polygon. NRCS hydric soil layer was also used to note the potential location of wetlands within the study area. Estimated wetland limits within the study area were drawn using a combination of an inventory level field assessment in April 2014 and August 2014, agency field review in March 2015, mapped wetlands, and hydric soils limits. In October 2015, a wetland delineation was conducted within the proposed limits of disturbance for the alternatives retained for detailed study (Alternative 9A and Alternative 9B). Wetlands were identified in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0* (USACE 2010). The wetland delineation was conducted within the existing the National Railroad Passenger Corporation (Amtrak) ROW. All identified wetlands and waterways were flagged in the field and the flags surveyed. Stream resources within the 1,000-foot study area were identified and classified using the National Hydrography Dataset (NHD) from USGS, Harford and Cecil County hydrology GIS layers, FEMA FIRMs, and from the 2015 delineation.

Table 11-1
Regulatory Context Summary Table

Technical Area	Regulatory Context
Topography, Geology, and Soils	Maryland Department of Environment Erosion and Sediment Control Regulations (COMAR 26.17.02)
	Farmland Policy Protection Act (FPPA) of 1981
Floodplains and Wetlands/Waters of the U.S.	Executive Order 11988
	Executive Order 13690 on “Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input”
	National Flood Insurance Program
	Section 404 of the Clean Water Act and Maryland Wetlands Regulations
Terrestrial Resources	Maryland Reforestation Law & Maryland Forest Conservation Act
	Nongame Endangered Species Conservation Act
	Forest Interior Dwelling Species (FIDS) (COMAR 27.01.09.04C(2)(b)(iv)
Aquatic Resources	Clean Water Act (33 USC § 1251-1387)
	Safe Drinking Water Act (42 USC § 330f-300j)
	Section 7 of the Endangered Species Act (ESA)
	Executive Order 13508 on Chesapeake Bay Protection and Restoration
	National Pollutant Discharge Elimination System (NPDES) (Annotated Code of Maryland, Environment Article, Environment Article, Title 9, Subtitle 3, and implementing regulations in COMAR 26.08.04)
Chesapeake Bay Critical Area	Chesapeake Bay Critical Area Protection Act
Coastal Zone Management	Section 307 of the Federal Coastal Zone Management Act of 1972 (CZMA)
	The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA)
Unique and Sensitive Areas	Natural Heritage Areas (COMAR 08.03.08)
	Scenic and Wild Rivers System Act of 1968
	Maryland’s Green Infrastructure Assessment
	Forest Conservation Act Easements
	Federal Lands

TERRESTRIAL RESOURCES

Forest boundaries were identified using the most recent publically available aerial imagery and vegetation GIS layers from both counties. Forest resources were assessed on a broad scale using the Vegetation Map of Maryland (Brush et al. 1976). Forest interior habitat was identified using guidelines from A Guide to the Conservation of Forest Interior Dwelling Birds in the Critical Area (Jones et al. 2000) and is explained in detail within the NETR in **Appendix E**, Section C. FIDS habitat areas were mapped within the project study area. Forest resources were characterized, including the size class and dominant species of trees, understory conditions, and degree of disturbance.

Information on terrestrial wildlife was obtained using data available through DNR Wildlife and Heritage Service (WHS) online resources, the 2nd Atlas of the Breeding Birds of Maryland and District of Columbia (Ellison 2010), and preliminary data of the Maryland Amphibian and Reptile Atlas (MARA) project (MARA Database Online Resource 2010). Wildlife observed during the field inventory were recorded and listed in tables within the NETR in **Appendix E**, Section C.

To assess potential terrestrial rare, threatened, or endangered (RTE) species, project review letters, were sent to the DNR-WHS, DNR Integrated Policy Review Unit, and the USFWS. Mapped DNR Sensitive Species Project Review Areas (SSPRA) were also reviewed to determine areas supporting or providing habitat buffers for RTE species within the study area. The lists of current and historic RTE species of Harford and Cecil Counties (DNR 2010) were also reviewed to determine which species could potentially occur within the study area.

AQUATIC RESOURCES

- Published literature, including information obtained from governmental and non-governmental agencies, such as DNR, Maryland Department of Planning, and MDE.
- Data mapping tools provided by state agencies, including tools for watershed boundaries and health; designated use classes for surface waters; water quality assessments; and stream health data including fish and benthic sampling results.
- DNR's response to a request for information on fisheries data, including rare, threatened, or endangered species in the study area.

CHESAPEAKE BAY CRITICAL AREA

METHODOLOGY

The Critical Area is defined as all land within 1,000 feet of Maryland's tidal waters and tidal wetlands. It also includes the waters of the Chesapeake Bay, the Atlantic Coastal Bays, their tidal tributaries and the lands underneath these tidal areas. The 1,000 foot Critical Area located within the study area limits have been determined using statewide mapping developed and maintained by DNR as well as written coordination with the CAC. Impacts to the Critical Area were calculated using the limit of disturbance (LOD) for Alternative 9A and Alternative 9B (i.e., project alternative footprint).

COASTAL ZONE MANAGEMENT

The "Guide to Maryland's CZMP and Federal Consistency Process" issued by MDE was reviewed to determine the federal consistency requirements established by the federal CZMA and how those requirements are administered through the Maryland CZMP.

UNIQUE AND SENSITIVE AREAS

NHAs, Green Infrastructure, and Wild and Scenic Rivers within the study area were determined through a review of existing literature and coordination with DNR.

C. AFFECTED ENVIRONMENT

TOPOGRAPHY, GEOLOGY, AND SOILS

TOPOGRAPHY

The topography at the study area ranges from less than 20 feet above sea level to greater than 100 feet. The topography in the Atlantic Coastal Plain physiographic province (south of the study area) is fairly flat. The topography in the Piedmont physiographic province is generally rolling hills, rising to over 400 feet north of the study area.

GEOLOGY

Harford and Cecil Counties lie within the Fall Line separating two physiographic provinces, the Piedmont and the Atlantic Coastal Plain. The study area is primarily located within the Atlantic Coastal Plain, with a small portion located within the Piedmont Province. The Atlantic Coastal Plain Province is underlain by a wedge of unconsolidated sediments including gravel, sand, silt, and clay whereas the Piedmont is composed of hard, crystalline igneous and metamorphic rocks. These geological formations are depicted in Figure E-1 in **Appendix E**. In addition to the existing geology, mining occurs near the study area. There is a ready source of sand and gravel at the Havre de Grace Quarry (Vulcan Havre de Grace Quarry), approximately 7,800 feet northwest of the bridge.

SOILS

According to the USDA Web Soil Survey, there are 31 soil series and 47 mapping units within the study area (see **Table 11-2**).

The Drainage Class identifies the natural drainage conditions of the soil (e.g., very poorly drained, poorly drained). Study area soils range from poorly drained (Leonardtown silt loam and Othello silt loam) to well drained soils (Elsinboro loam, Matapeake silt loam, Nassawango silt loam, and Sassafras and Croom). However, the majority of soil types in the Cecil County portion of the study area are Urban soil. Urban soils are mapped in areas where either the native soil has been removed or covered with fill. The urban map unit consists of land that has been so altered or disturbed by urban works and structure that classifying the soil is no longer feasible. Soil mapping units are depicted in Figure E-2 in **Appendix E**.

Prime Farmland Soils are defined by NRCS as "having the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops" (NRCS 2011). Soils of Statewide Importance are defined by NRCS as "having early Prime Farmland quality and that economically produce high yields of crops when treated and managed according to acceptable Methodology" (NRCS 2011). Figure E-2 in **Appendix E** illustrates Prime Farmland Soils and Soils of Statewide Importance within the study area. However, as shown in the figure, most of this land is part of the existing railroad ROW, and, therefore, is not used for agriculture.

Table 11-2
Soil Characteristics

Map Unit	Description	Drainage Class (Dominant)	Hydric Classification	Farmland Classification	Erosion Class
AqA	Aquasco silt loam	Somewhat poorly drained	Partially hydric	Statewide importance	Not highly erodible
BeA	Beltsville silt loam	Moderately well drained	Partially hydric	Prime farmland	Not highly erodible
EsA	Elsinboro loam	Well Drained	Not hydric	Prime farmland	Not highly erodible - potentially highly
Lr	Leonardtown silt loam	Poorly drained	All hydric	Not prime	Not highly erodible
MkB	Matapeake silt loam	Well drained	Not hydric	Statewide importance	Not highly erodible
MlA	Mattapex silt loam	Moderately well drained	Partially hydric	Prime farmland	Not highly erodible
NsA	Nassawango silt loam	Well Drained	Partially hydric	Prime farmland	Not highly erodible
Ot	Othello silt loam	Poorly drained	All hydric	Statewide importance	Not highly erodible
SME	Sassafras and Croom soils, (*15 - 25% slopes*)	Well drained	Partially hydric	Not prime	Highly erodible

FLOODPLAINS AND WETLANDS/WATERS OF THE U.S.

FLOODPLAINS

Floodplains have been mapped within the study area along: the Susquehanna River, an unnamed tributary to Swan Creek, an unnamed tributary to Gashey's Creek, Gashey's Creek, an unnamed tributary to Lily Run, Lily Run, Mill Creek, and Principio Creek (see Figure E-3 in **Appendix E**). Floodplains along the Susquehanna River are primarily used for waterfront commercial properties, parkland and other developed properties. Floodplains within the Harford County portion of the study area are dominated by urban development with some isolated open space. Within the Cecil County portion of the study area, Mill Creek and Principio Creek floodplains largely consist of forest cover. According to the effective FEMA floodplain maps, the majority of the 1,560-acre study area is outside the 100- and 500-year floodplain.

Where floodplains exist within the 1,560-acre study area, there are approximately 320 acres of FEMA-designated 100-year floodplains. This includes approximately 160 acres within the Susquehanna River. For Harford County, the total amount of effective 100-year floodplain within the study area is 220 acres. For Cecil County, the total amount of effective 100-year floodplain within the study area is 100 acres. The total effective 500-year floodplain within the study area is approximately 345 acres, including 222 acres in Harford County and 123 acres in Cecil County. Harford County has proposed revised floodplain limits. This preliminary floodplain mapping would result in a slight decrease in the 100-year and 500-year floodplain area within the study area to 203 acres and 209 acres, respectively.

FEMA floodplain mapping indicates that within the study area, two of the waterways, an unnamed tributary to Lily Run and Lily Run, also have a regulated floodway within the overall floodplain. FEMA defines a floodway as "the channel of a…watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height." These floodways were designated through detailed hydrologic studies conducted by FEMA and are regulated by FEMA, MDE, and localities through the permitting process to ensure that development in the floodplain does not raise the base elevation of a designated floodway by more than a maximum of 1 foot or a smaller increment as determined by MDE (see **Appendix E**, Section B).

WETLANDS/WATERS OF THE U.S.

Across the entire study area, 22 waters of the U.S., including wetlands, were identified. All waters of the U.S., including wetlands are depicted in Figure E-4 in **Appendix E**. The majority of the identified systems included nontidal forested wetlands. These systems included a few emergent/open water wetland stormwater management ponds or drainage swales and a forested wetland ditch along the Amtrak railroad tracks. Two identified forested wetlands and one emergent wetland appeared to be hydrologically isolated. Two systems were identified as tidal emergent, scrub shrub, or forested wetlands, one along the Susquehanna River and the other along the perimeter of Furnace Bay.

In Harford County, 12 potential nontidal wetlands were identified within the study area (**Table 11-3**). These include natural palustrine forested (PFO)/scrub shrub (PSS)/emergent (PEM) wetlands and manmade palustrine emergent/open water (POW and PUBH) wetlands. (Note that a description of each wetland at stream classification included in **Table 11-1** can be found in **Appendix E**, Section B, **Table E-3**). Eight nontidal intermittent or perennial streams also cross the Amtrak ROW within Harford County.

In Cecil County, two tidal wetland systems and six potential nontidal wetland systems were identified within the project study area (see **Table 11-3**). Mill Creek is the only perennial stream that crosses the study area in Cecil County. There are also three intermittent streams that flow parallel to the tracks on the south side and one ephemeral channel that drains into Wetland 9. Ephemeral channels contain a defined, natural bed and bank, and convey surface water to relatively permanent waters following precipitation or snow-melt events.

The total area of the potential wetlands identified within the Harford County portion of the study area is 77.3 acres of PFO/PSS/PUBHx and 2.2 acres of PEM/POW/PUBHx. The total area of potential wetlands identified within the Cecil County portion of the study area is 2.3 acres of estuarine intertidal with scrub shrub (E2SS), 8.3 acres of estuarine intertidal with an unconsolidated bottom (E2US), 4.9 acres of PFO, 2.9 acres of PEM, and 0.1 acre of POW. A brief description of each wetland and waters of the U.S. system is provided in **Appendix E**, Section B.

Table 11-3
Mapped and Delineated Wetlands and Waters of the U.S.

System Number	Waters of the U.S. Classification[1]	Wetland Type	Approximate Area of Wetland (Acre)	Approximate Length of Stream (Linear Feet)
Harford County				
1	PFO1A/PFO1C/PSS1A R2UB1 (Unnamed tributary to Gashey's Creek)	Nontidal	53.7 -	- 2,800
2	PEM1/POWHx R2UB1(Two unnamed tributaries to Swan Creek)	Nontidal	0.2 -	- 2,500
3	PFO1A/C R3UB1 (Gashey's Creek) R2UB3 (Unnamed tributary to Gashey's Creek)	Nontidal	7.8 - -	- 2,275 2,297
4	PEM1/POWHx	Nontidal	1.0	-
5	PFO1C R2UB1/2 (Unnamed tributary to Lily Run)	Nontidal	5.4 -	- 1,953
6	PFO1A/C PEM1C PUBHx R3UB1 (Unnamed tributary to Lily Run) R4SB3/5 (Unnamed tributary to Lily Run)	Nontidal	4.9 0.2 0.6 - -	- - - 2,659 4,546
7	PFO1A	Nontidal	1.1	-
8	PFO1A/PUBHx	Nontidal	3.3	-
14	Susquehanna River (R1UBV/R1OWV)	Tidal	-	2,000
17	PEM1C R2UB1/2 (Lily Run)	Nontidal	0.05 -	- 2,893
18	PEM1C	Nontidal	0.04	-
19	PFO1C PEM1C R4SB3/4 (Unnamed tributary to Lily Run) R2UB1 (Unnamed tributary to Lily Run)	Nontidal	0.2 0.1 - -	- - 725 228
20	PFO1C	Nontidal	0.9	-
21	R4SB3	Nontidal	-	4,197
Cecil County				
9	PFO1R PEM1N PEM1/5N Ephemeral	Tidal Nontidal	0.9 0.4 0.8 -	- - - 128
10	PFO1E R3UB1 (Mill Creek)	Nontidal	0.9 -	- 2,495
11	PFO1S E2SS1P6 E2USN6 (Including Furnace Bay)	Tidal	2.5 2.3 8.3	- - -

Table 11-3 (cont'd)
Mapped and Delineated Wetlands and Waters of the U.S.

System Number	Waters of the U.S. Classification[1]	Wetland Type	Approximate Area of Wetland (Acre)	Approximate Length of Stream (Linear Feet)
Cecil County (cont'd)				
12	PFO1C R4SB4 (unnamed tributary to Susquehanna River	Nontidal	0.4 -	- 2,500
13	PFO1C PEM1C R4SB3 (unnamed tributary to Mill Creek)	Nontidal	0.2 0.3 -	- - 1,100
15	PEM1C	Nontidal	1.1	-
16	POW R4SB3 (unnamed tributary to Furnace Creek)	Nontidal	0.1 -	- 1,500
22	PEM1C	Nontidal	0.3	-

TERRESTRIAL RESOURCES

Terrestrial resources within the study area include forest resources; wildlife; and threatened, endangered, or special concern terrestrial species.

FOREST RESOURCES

According to Brush et al. (1976), the majority of the study area is mapped within the Tulip Poplar Association, with a narrow area of the Sycamore-Green Ash-Box Elder-Silver Maple Association mapped within the Mill Creek floodplain in Cecil County. The Tulip Poplar Association is dominated by tulip trees (tulip poplar), red maple, white oak, and flowering dogwood. The Sycamore-Green Ash-Box Elder-Silver Maple Association is dominated by these species and red maple and white oak. The field assessment corroborated the mapped associations except in smaller areas of forested wetlands located within the mapped Tulip Poplar Association. Within these areas, the dominant trees were red maple and sweet-gum trees with scattered tuliptree, pin oak, and sycamore. Mapped forest associations are depicted in Figure E-5 in **Appendix E**.

A majority of the forest resources within the study area consist of smaller patches of deciduous forest that lie between the Amtrak ROW and residential or commercial properties. Therefore, these forests are not likely of high quality. One of the exceptions is a large, forested area in the southern portion of the study area in Harford County. This area is associated with unnamed tributaries to Swan Creek and Gashey's Creek and the largest wetland crossed by the Proposed Project, which contains a Wetland of Special State Concern (WSSC). The interior of this forested area may also be considered regulated FIDS habitat, as it is a part of a large (>500 acres) contiguous forest that lies within the Critical Area.

Specimen trees with a diameter of 30 inches or greater were not common, but did occur mostly as isolated trees on developed properties, such as on the grounds of Rodgers Tavern.

WILDLIFE

The majority of the study area is characterized by urban, suburban, commercial, and agricultural land uses with few natural habitat areas remaining. Forests in the study area are generally fragmented by development and/or past and present agricultural use. Terrestrial habitat within the study area consists mostly of smaller patches of low quality deciduous forest that lie between the Amtrak ROW and residential or commercial properties. However, there are also several deciduous forests present within the study area along stream corridors. The remainder of the terrestrial habitat in the study area consists of commercial/residential properties with scattered trees and landscaping, undeveloped meadows, agricultural fields, and residential yards. Aquatic wildlife habitat within the study area consists of the Susquehanna River, Furnace Bay, numerous wetlands, and several perennial and intermittent streams.

Preliminary data from the MARA indicate that 30 species of reptiles and amphibians have been documented within portions of the Aberdeen and Havre de Grace USGS quadrangles that are crossed by the study area. The *2nd Atlas of the Breeding Birds of Maryland and the District of Columbia* (Ellison 2010) indicates that 120 species of breeding birds have been documented within portions of the Aberdeen and Havre de Grace USGS quadrangles crossed by the study area. Similar statewide distributional data are lacking for mammals. However, the study area provides habitat for numerous mammals that are adapted to urban/suburban environments, as well as more natural areas.

The smaller, disturbed forest habitats within the study area would be expected to support disturbance tolerant wildlife and edge adapted species. These habitats could support herpetofauna species such as eastern toads, common five-lined skink, eastern redbacked salamander, northern black racer, eastern ratsnake, eastern garter snake, and the eastern box turtle, among other species. Mammals such as mice, voles, the eastern mole, bats, squirrels, foxes, raccoon, woodchuck, and white tailed deer, among other species, likely inhabit terrestrial areas within the study area. More urban environments such as Havre de Grace may also support species such as the Norway rat and the black rat. Bird species likely to occur within the smaller, more disturbed forests with abundant edge habitat would be common species such as red-bellied woodpecker, downy woodpecker, eastern wood-pewee, American crow, blue jay, Carolina chickadee, tufted titmouse, white-breasted nuthatch, Carolina wren, American robin, and northern cardinal. With the exception of the eastern wood-pewee, all of these bird species were observed during the inventory level field assessment in early April 2014.

One large, contiguous forest habitat is located within the study area and occurs southeast of the Amtrak ROW at the southwestern end of the study area. This forest may support forest interior birds known as FIDS. A list of the 25 FIDS potentially occurring within the Critical Area are provided in **Appendix E**, Section C. According to the *2nd Atlas of the Breeding Birds of Maryland and the District of Columbia* (Ellison 2010), 20 of the 25 FIDS have been documented within breeding bird atlas blocks near the study area. It is likely that at least some of these species would be found within the forest interior habitat mapped within the study area.

Wetlands and vernal pools within the study area could support herpetofauna species, such as the eastern cricket frog, spring peeper, American bullfrog, northern green frog, pickerel frog, wood frog, painted turtle, snapping turtle, northern watersnake, and spotted salamander, among other species. The spring peeper was observed during the early spring inventory level field assessment. Smaller streams could support the northern two-lined salamander and the long-tailed salamander. Larger waterbodies within the study area, such as the Susquehanna River, are also habitat for species such as the northern map turtle, red-bellied cooter, American beaver, muskrat, and the northern river otter. The northern map turtle is a state-endangered aquatic turtle discussed in the Aquatic Resources section below. Bird species using forested wetlands would include those listed above, including some FIDS. Within tidal marsh and riverine habitats along the Susquehanna River, birds, such as geese, ducks, egrets, herons, rails, and red-winged blackbird would be expected. In addition, many species of waterfowl, gulls and terns, and raptors, such as the osprey and bald eagle, forage in and rest on the Susquehanna River during different seasons.

THREATENED, ENDANGERED, OR SPECIAL CONCERN TERRESTRIAL SPECIES

Listed Species

On April 2, 2015, USFWS listed the northern long-eared bat (NLEB) as threatened under the Endangered Species Act (ESA). The NLEB spends winter months hibernating in caves and mines (hibernacula) that have constant temperatures, high humidity, and no air currents. During the summer months, NLEB roost underneath bark, in cavities or in crevices of trees. Breeding begins in late summer or early fall. A response from USFWS dated January 15, 2016 indicated that the NLEB is a threatened species that has the potential to occur within the boundary of the Proposed Project, but is not likely to be adversely affected by the Proposed Project.

The Project Team solicited information on RTE species from DNR. DNR responded by identifying a known site within the Furnace Bay wetlands at the eastern end of the study area that supports a population of state-listed endangered water horsetail and vetchling, two aquatic plant species. DNR also identified a WSSC located within the Swan Creek drainage just south of the Amtrak ROW at the western end of the study area and a historic waterfowl concentration and staging area within the Susquehanna River. No other state-listed species were documented by the DNR as potentially occurring within the study area. Copies of all correspondence are included in **Appendix E**, Attachment E. Coordination is ongoing.

Waterfowl Concentration Areas & Colonial Waterbird Colonies

The Critical Area law has identified types of natural resources that should be protected from excessive development along the Chesapeake Bay and its tidal tributaries. These habitat protection areas include significant plant and wildlife habitat, including colonial water bird nesting areas and aquatic areas of historic waterfowl concentration. The intent of the CBCA law is to protect these sensitive areas from water-dependent development activities, such as docks, piers, bulkheads, etc.

According to the Maryland Environmental Resources and Land Information Network (MERLIN) online mapping tool, two waterfowl areas occur within the study area, one in the Susquehanna River crossed by the existing Susquehanna River Rail Bridge and the other within Furnace Bay at the extreme eastern end of the study area. These are historic waterfowl staging areas and wintering sites for waterfowl, such as diving ducks, swans, and geese that forage on fish and shellfish near the mouth of the Susquehanna River and within Furnace Bay. Prior to the 1960s, the expansive submerged aquatic vegetation (SAV) beds at the mouth of the Susquehanna River supported hundreds of thousands of these waterfowl (USFWS 2013). The rich SAV growth began declining in the 1960s as increased development in the watershed above the Conowingo Dam led to poorer water quality and quantity. Remaining SAV beds were destroyed by Hurricane Agnes in 1972. Since then, SAV have generally rebounded, providing increasing habitat for wintering waterfowl. The boundary of the waterfowl area within the Susquehanna

River lies primarily within Cecil County, from the US 40 Bridge to the mouth of the river. The Furnace Bay waterfowl area lies outside of the Proposed Project's limits of disturbance.

Colonial water bird colonies are nesting colonies for colonial water bird species, such as herons and egrets. No colonial water bird nesting areas occur within the study area. The closest colonial water bird nesting site occurs along the Cecil County shoreline of the Susquehanna River near the Conowingo Dam.

AQUATIC RESOURCES

The study area for aquatic resources comprises the Lower Susquehanna River from the head of tide north of Port Deposit to the confluence with the Upper Bay, and the Upper Bay down to the Elk River at Turkey Point to include the shallow Susquehanna Flats area where much of the larger grained sediment discharged by the Susquehanna River is deposited (STAC 2000). The study area also includes the following streams: an unnamed tributary to Swan Creek, an unnamed tributary to Gashey's Creek, Gashey's Creek, an unnamed tributary to Lily Run, Lily Run, Mill Creek, and Principio Creek.

HYDROLOGY

The Susquehanna River Rail Bridge crosses the Lower Susquehanna River[1], just north of its confluence with the Chesapeake Bay, the largest estuary in the United States. Estuaries are partially enclosed bodies of water where fresh water from rivers and streams mix with salt water from the ocean. The Susquehanna River supplies most of the freshwater (about 60 percent) to the Bay (Cerco et al. 2013). Flow within the Lower Susquehanna River is affected by natural flow of the river and operation of the Safe Harbor Corporation's Safe Harbor Dam located upriver from the Conowingo Dam.

The Chesapeake Bay is partially mixed. Freshwater from the tributaries flows downstream toward the Atlantic Ocean and saltier water from the Atlantic Ocean flows upstream along the bottom. Salinity and tidal gradients exist throughout the Bay, with higher salinities and greater tidal fluctuations occurring closer to the mouth. The Lower Susquehanna is tidal up to the northern end of Robert Island north of Port Deposit, where Deer Creek discharges to the river on the western bank (Gomez and Sullivan Engineers, P.C. 2011). Within the study area, the tide ranges from 0.2 feet at Mean Low Water (MLW) to 2.1 feet at MHW at Havre de Grace. The Susquehanna River empties into the head of Chesapeake Bay between Concord Point and Perry Point.

Riverbed depths within the Susquehanna River near the project study area were determined by a review of the NOAA Nautical Chart: Head of the Chesapeake Bay (NOAA Chart 12274). Where the Susquehanna River discharges to the Upper Bay, water depths are up to approximately 42 feet at MLLW (mean lower low water) and decrease rapidly to the shallow depths of the Susquehanna Flats area of the Upper Bay. Near the existing bridge on the Lower Susquehanna River, depths at MLLW in the deeper channel range from about 19 feet on the west bank of the deeper channel to about 51 feet at MLLW on the east bank where the Susquehanna River flows to the east of Garrett Island. Shallow waters on either bank range in depth from about three feet to five feet at MLLW.

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[1] The Lower Susquehanna River is an approximately 10-mile length of the river in Cecil and Harford Counties, Maryland, that extends from Conowingo Dam to the Upper Chesapeake Bay

A review of Maryland's Tier II Waters within the study area identified Mill Creek 1 and Principio Creek 3 as the only Tier II Catchments, or high quality waters, under the COMAR Antidegradation Policy.

GROUNDWATER

The groundwater system within the project study area is controlled by the thickness of the residual weathered bedrock (saprolite) and the degree of fracturing in the bedrock. The flow water table water-bearing zone generally mimics the land surface contours. The flow system is recharged by precipitation that infiltrates the saprolite and percolates to the water table unit. Groundwater is utilized in Cecil County by public and private water systems and private on-lot wells. The latter includes industrial, commercial, institutional, agricultural enterprises, and individual domestic wells. The depth of the weathering and topography are such that there appears to be little potential for a well of more than 25 gallons per minute (gpm) within the vicinity of the study area. In Harford County, the City of Havre de Grace owns and operates a surface water treatment plant for which the source is the Susquehanna River. Havre de Grace maintains its own water distribution system. Only a small portion of residents utilize private groundwater wells since the reported low well yields (average reported well yields of 10 to 15 gpm with higher yields of about 50 gpm in draws and valleys) are not sufficient for consideration as a major groundwater source.

Designation of wellhead protection areas (WHPA's) has been established under the Safe Drinking Water Act and is implemented through the Maryland Department of the Environment (MDE). A WHPA is a designated area, either surface or subsurface, that is regulated to prevent contamination of a well or well-field supplying a public water system. Several Source Water Assessment Program reports have been conducted within Cecil and Harford counties in order to identify and delineate areas that contribute to the water source and identify potential sources of contamination.

WATER QUALITY

Water quality of the Chesapeake Bay is generally poor, though it varies among the segments of the Bay. High nutrient concentrations (i.e., nitrogen and phosphorus) promote algal blooms that die and sink to the bottom of the Bay and consume oxygen, leading to zones of low oxygen (hypoxic) where fish and shellfish cannot survive. High concentrations of suspended sediment and algal blooms limit the penetration of light into the water important to the growth and survival of SAV and other aquatic biota. Because of these high nutrient and suspended sediment concentrations, the waters of the mainstem and tidal tributaries of the Chesapeake Bay are considered impaired for aquatic life resources (USEPA 2010). This impairment has persisted despite extensive restoration efforts implemented within the Bay over the last 25 years, prompting the USEPA to establish the Chesapeake Bay Total Maximum Daily Load (TMDL) on December 29, 2010. The Chesapeake Bay TMDL, as required by the Clean Water Act, establishes a comprehensive "pollution diet" for the Bay with respect to nitrogen, phosphorus, and sediment to improve water quality in the Chesapeake Bay watershed.

The MDE classifies the Lower Susquehanna River and Upper Chesapeake Bay within the study area as Use Class II-P for tidal freshwater estuaries. Individual designated uses within the Use Class II-P grouping for the study area include: growth and propagation of fish, other aquatic life and wildlife, water contact sports, leisure activities involving direct contact with surface water, fishing, agricultural and industrial water supply, seasonal migratory fish spawning and nursery use, seasonal shallow-water SAV use, open-water fish and shellfish use, and public water supply. Tidal tributary reaches of the Lower Susquehanna River within the aquatic resources study area are classified as Use II streams, with sub-designations within the segment for migratory fish spawning and nursery use, shallow water submerged aquatic vegetation, and open water fish and shellfish use.[2]

The 8-digit Lower Susquehanna River Watershed is listed on the 2012 303(d) list as impaired for total nitrogen, total phosphorus, and polychlorinated biphenyls (PCBs) in fish tissue (MDE 2012). The 8-digit Conowingo Dam/Susquehanna River Watershed was listed on the 2010 303(d) list as impaired by nutrients and sediment, both originally designated in 1996. Since then, MDE and USEPA have both supported the removal of these listings. Therefore, there are currently no TMDL impairments for the Conowingo Dam/Susquehanna River Watershed. The Upper Chesapeake Bay is listed as impaired for total nitrogen and total phosphorus. USEPA also considers Total Suspended Solids (TSS) to be an “unlisted impairment” for this region of the Bay, meaning that a TMDL is required for the parameter, but it is not listed as an official impairment in the current 303(d) list.

The project study area crosses an unnamed tributary to Swan Creek, an unnamed tributary to Gashey’s Creek, Gashey’s Creek, an unnamed tributary to Lily Run, and Lily Run on the western shore of the Susquehanna, and Mill Creek and Principio Creek on the eastern shore. All of these tributaries, except Principio Creek, are nontidal and classified as Use I streams, for water contact recreation and protection of aquatic life. Principio Creek is tidal within the rail corridor, and its tributaries near the site are classified as Use III streams (natural trout waters). Biological monitoring has been conducted by the Maryland Biological Stream Survey or volunteer groups on several streams within the study area. Excluding Principio Creek, biological monitoring has generally characterized fish and benthic macroinvertebrate communities within the study area as “Fair” or “Poor” based on Index of Biotic Integrity (IBI) scoring. The fish and benthic macroinvertebrate communities in Principio Creek were rated as “Good” by the IBI. Detailed information on recent biomonitoring can be found in **Appendix E**, Section D.

The Chesapeake Bay scientific and management community, which includes a number of public and private institutions, produces an annual assessment (or report card) each spring of the Bay’s ecosystem health. The overall Bay Health score in 2012 for all regions of the Bay combined was 47 percent, or a C, which was improved from a D+ in 2011.

DNR conducts regular water quality monitoring of tidal tributaries and the mainstem of the Chesapeake Bay. Water temperature, DO, chlorophyll-*a*, total nitrogen, total phosphorus, and TSS were monitored for one DNR sampling station on the Lower Susquehanna River and two Chesapeake Bay mainstem sampling locations within the study area. While seasonal and annual fluctuations were observed, DO and total nitrogen were generally above criteria at all three stations. Excess nutrients, especially nitrogen and phosphorus, can lead to eutrophication and excess growth of plant matter. This results in an initial increase in DO levels followed by a sharp decline. When these plants decompose, the decomposition process depletes the water of

[2] According to DNR (October 22, 2014 correspondence), several very small tributaries to the Susquehanna River on the Cecil County side have been classified as Use Class III and have been documented to support wild trout, either consistently or occasionally. Two new Use Class III designations include Happy Valley Branch and its tributaries and an unnamed tributary to the Susquehanna River crossing Frenchtown Road in Cecil County. These tributaries discharge to the portion of the Lower Susquehanna River within the aquatic resources study area but are not crossed by the rail corridor.

available oxygen, which can lead to hypoxic (low DO) or anoxic (lack of DO) conditions and result in a loss of aquatic life. Detailed information on water quality monitoring can be found in **Appendix E**, Section D.

SEDIMENT QUALITY & CONTAMINANTS

The Lower Susquehanna River bottom within the study area comprises boulders and imbedded rock covered with silt that is deposited in this section due to the drop in current associated with the widening and deepening of the river in this section (NAI and Gomez and Sullivan 2011a). Sediment grain size characteristics demonstrate a distinct gradient from fine to coarse grained particles from north to south in the deeper portions of the Bay mainstem; in the tributaries, sediments tend to be muddier upstream and coarser near the mouths of the rivers (Hartwell and Hameedi 2007). The rate of sediment deposition throughout much of the Bay is less than about 0.06 inches/year. In the Upper Bay, however, rates of sediment accumulation are influenced by the large sediment loads supplied by the Susquehanna River.

Contaminants enter the Bay via atmospheric deposition, dissolved and particulate runoff from the watershed, or direct discharge, and sediments tend to accumulate most toxic contaminants (Hartwell and Hameedi 2007). Higher concentrations of contaminants (e.g., PCBs, PAHs, DDT, pesticides, and metals) are observed in depositional areas in the Susquehanna Flats and other areas where sedimentation rates are high and sediments are fine. In a 2006 sediment quality study, there was no toxicity contributing to mortality or reduced rates of reproduction for benthic organisms in samples taken in the Lower Susquehanna River (MDE 2008).

AQUATIC BIOTA

Phytoplankton & Zooplankton

Phytoplankton are microscopic plants whose movements within the system are largely governed by prevailing tides and currents. From 2010-2012, phytoplankton samples in the Upper Bay were dominated by *Diatoma*, *Melosira*, *Cyanobium*, *Kirchneriella, Cyclotella* spp, *Synechococcus* spp., and unidentified flagellates (DNR 2014a). Zooplankton are an integral component of aquatic food webs. They are primary grazers on phytoplankton and detritus material, and are themselves used by organisms of higher trophic levels as food. Cladocerans, cyclopoid Copepods, and calanoid Copepods are the most abundant zooplankton within the freshwater portions of the Bay.

Benthic Macroinvertebrates

Tidal-fresh and transitional habitats tend to be the most productive regions in estuarine systems. In the Lower Susquehanna River Basin, dominant benthic macroinvertebrate species typically include mayflies, non-biting midges, blackflies, and caddisflies (Millard et al. 1999). Polychaete and oligochaete worms are the dominant macroinvertebrates in terms of abundance and number of taxa within the Susquehanna Flats portion of the study area, followed by clams, snails, and amphipods (Hartwell and Hameedi 2007; Holland et al. 1989). Freshwater mussel species may occur in the study area; new field data are being developed, and further coordination with DNR would determine which species occur in the area.

SAV

SAV, also referred to as bay grasses, are submerged plants that grow in the shallow waters of the Chesapeake Bay and its tributaries. SAV is of critical importance to the health of the estuary, by providing food and shelter for waterfowl, fish, shellfish and invertebrates; by adding oxygen to the water; and by their capacity to trap sediments, absorb nutrients, and reduce erosion (USEPA 2004). More than 20 species of bay grasses grow in the Bay and its tributaries, with more diversity in less saline areas. Eurasian watermilfoil, wild celery, hydrilla, coontail, water stargrass and brittle waternymph are the SAV most commonly found within the Susquehanna Flats (Orth et al. 2010 in URS and Gomez and Sullivan 2012). Eurasian watermilfoil and hydrilla were the two SAV species found within the Susquehanna River in the northern portion of the study area around Robert, Wood, and Spencer Islands (URS and Gomez and Sullivan 2012). Over a five-year period (2009 to 2013), the location of the SAV beds in the Lower Susquehanna River portion of the study area have remained relatively consistent (see Figure E-11 in **Appendix E**). Dense beds present in 2009 and 2010 were negatively affected by Hurricane Irene in 2011. However, throughout the Chesapeake Bay region SAV increased 21 percent between 2014 and 2015 (VIMS 2016)

Oyster Beds

The region of the Chesapeake Bay near the mouth of the Susquehanna River, and the Upper Chesapeake Bay in general, does not contain suitable habitat for eastern oysters. Both the current and historic northern ranges for eastern oysters are well downstream of the study area. Salinity, DO, and depth conditions in the Upper Bay are not suitable for oysters in wet, dry, or normal hydrological years (USACE 2012). There are no oyster beds present within the study area.

Fish

The tidal fluctuations, presence of SAV beds, range of water depths and variety of bottom habitats within the Lower Susquehanna and Upper Chesapeake Bay create spatially and temporally dynamic abiotic conditions, which influence the species composition and relative abundance of fishes within the study area (Nordlie 2006; Lefcheck et al. 2014). While the relative abundance of different fish species has fluctuated over time, the most abundant species within the study area are generally gizzard shad, American shad, blueback herring, American eel, white perch, channel catfish, banded killifish, sunfish, largemouth bass, and yellow perch. A number of anadromous species have been documented as spawning near and/or migrating through the study area, including: yellow perch (semi-anadromous), white perch, herring, and shad. Game fish known to occur in the mainstem of the Susquehanna River include striped bass, walleye, largemouth bass, smallmouth bass, and catfish species (Steffy 2013).

Comely shiner, a state-threatened species, is also known to occur in the Lower Susquehanna River but was not specifically referenced as a species of concern on the Proposed Project by the DNR-WHS. Special attention has been given to the management of American eel in recent years due to their ecological and economic importance and their declining population numbers due to fish blockages. Since the construction of the Conowingo Dam in the 1920s, the Lower Susquehanna River has not supported large runs of Atlantic sturgeon or shortnose sturgeon. Recent observations of these federally endangered species in the Susquehanna River are similarly scant and limited to just a few individuals in as many years (NMFS 1998; NAI and Gomez and Sullivan 2011b).

The nontidal and tidal tributaries to the Susquehanna River support a number of fish species not found in the Susquehanna mainstem, including: blacknose dace, creek chub, common shiner, rosyside dace, white sucker, cutlip minnow, swallowtail shiner, northern hogsucker, river chub, margined madtom, and satinfin shiner. Additionally, rainbow trout were found within Principio Creek. Rainbow trout, a non-native, but intolerant of polllution, gamefish, is often indicative of high quality streams.

Aquatic Invasive Species

Some of the aquatic invasive species currently known to occur in the Lower Susquehanna River Basin include zebra mussels, quagga mussels, Asian clam, purple loosestrife, water chestnut, rusty crayfish, and flathead catfish.

THREATENED, ENDANGERED, OR SPECIAL CONCERN AQUATIC SPECIES/SECTION 7 CONSULTATION

Federally Listed Species

An on-line project review with the USFWS indicated that there are no federally listed species within the study area, but critical habitat is present for the federally endangered Maryland darter, which has not been found in the study area since 1965 (DNR 2016). The shortnose sturgeon, Atlantic sturgeon, Kemp's ridley sea turtle, green sea turtle, and leatherback turtle were identified by NMFS as endangered species that may occur within the project area. Threatened species that may be found within the study area include Atlantic sturgeon (Gulf of Maine Distinct Population Segment) and the loggerhead sea turtle. In June 2016, the entirety of the action area was proposed for designation as critical habitat for the Chesapeake Bay Distinct Population Segment (DPS) of the Atlantic sturgeon.

The southern portion of the study area in the vicinity of Turkey Point is designated as providing essential fish habitat (EFH) for adult and juvenile stages of windowpane flounder (Chang et al. 1999). No other EFH has been designated for the study area. The study area is also an important migration area for diadromous fish species such as American shad, alewife, blueback herring, striped bass, hickory shad, gizzard shad, and American eel.

Shortnose sturgeon is a federally and state-listed endangered species found along the Atlantic coast of North America in estuaries and large rivers, including the Susquehanna (Chesapeake Bay). It is considered "amphidromous" – that is, like anadromous species it spawns in freshwater but regularly enters saltwater. Shortnose sturgeon may occur in the study area year round, but are most likely to occur there between January and April based on previous observations (NOAA 2007). In preparation for spawning, shortnose sturgeon in many rivers migrate in the fall to overwintering areas located in the furthest upstream areas of rivers and in close proximity to spawning grounds (Crance 1986; Kynard et al. 2012 Life History and Behaviour of Sturgeon). Spawning occurs the following spring, usually during April and May. The Susquehanna River may contain suitable spawning habitat and adult shortnose sturgeon have been documented in the river in February, April, and June, consistent with spawning time periods. However, it is unknown if adequate spawning or nursery habitat is present below the Conowingo Dam, which is the first barrier to upstream passage (NMFS 2014).

Atlantic sturgeon is a federally listed endangered[3] species that also occurs along the Atlantic coast of North America in estuaries and large rivers, including the Susquehanna (Chesapeake Bay). Similar to the shortnose sturgeon, the Atlantic sturgeon is also typically anadromous, sharing much of its range within rivers with the shortnose sturgeon. Although Atlantic sturgeon are expected to occur at least intermittently in the study area, it is not found there in exceptionally high abundance (USFWS 2007 Atlantic sturgeon reward program). Atlantic sturgeon may occur in the study area year round as juveniles and sub-adults (NOAA 2007). The Chesapeake Bay DPS spawns in the James River in Virginia (NMFS 2014). There is not a spawning population in the Susquehanna River due to the presence of the Conowingo Dam (SRAFRC 2010); therefore, Atlantic sturgeon eggs, larvae, and early juveniles are not expected to occur in the study area.

Several species of sea turtles are known to be present in the Chesapeake Bay and off the Atlantic coast of Maryland. Leatherback sea turtles are present off the Maryland coast but are predominantly pelagic (open ocean) and not expected to occur in the study area. Loggerhead, Kemp’s ridley, and green sea turtles are present in the Chesapeake Bay area mainly during late spring, summer, and early fall when water temperatures are relatively warm. Sea turtles are expected to be present in the Chesapeake Bay between April 1 and November 30.

State Listed Species

DNR identified American eel as an important fishery within the study area, as well as noting the presence of shortnose and Atlantic sturgeon. There is also potential for threatened or endangered mussel species to be found within the study area, which will require further coordination during later phases of project design. The logperch is a state-listed threatened species in Maryland. Adult logperch may occur year-round upstream of the study area between the Conowingo Dam and the Interstate 95 bridge. The state-listed endangered Northern Map Turtle is also documented in the project study area both within and along the banks of the Susquehanna River. The shores of the Susquehanna River are used by the Map Turtle for habitat, nesting, and foraging and the turtles hibernate on the river bottom in winter.

CHESAPEAKE BAY CRITICAL AREA

The Critical Area is defined by the CAC for the Chesapeake and Atlantic Coastal Bays as *all land within 1,000 feet of the mean high water line of tidal waters or the landward edge of tidal wetlands and all waters of, and lands under, the Chesapeake Bay and its tributaries*. In addition, state regulations and local Critical Area ordinances require the establishment and maintenance of a minimum 100-foot buffer adjacent to all tidal waters, tidal wetlands, and tributary streams. In some cases, the Buffer is expanded beyond 100 feet in areas where there are adjacent sensitive resources such as steep slopes or soils with development constraints.

DNR classifies all land within the Critical Area based on the predominant land use and intensity of development present. These classifications include:

- Intensely Developed Areas (IDA)—developed areas where residential, commercial, institutional, and industrial land uses predominate.

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[3] On February 6, 2012, certain DPS were designated as federally endangered. Atlantic sturgeon from the Chesapeake Bay and New York Bight Distinct Population Segment may occur in the study area.

- Limited Development Areas (LDA)—developed areas that include residential and some light commercial uses, as well as natural areas, wetlands, forests, and developed woodlands.
- Resource Conservation Areas (RCA)—nature-dominated areas and may include wetlands, surface water, and open space.

Approximately 208 acres of the study area is located within the Critical Area. Acreages of each Critical Area land use designation within the study area boundary are listed in **Table 11-4**. The study area is located within designated RCA and IDA Chesapeake Bay Critical Area. The study area is primarily designated as IDA around the Susquehanna River within the Corporate Limits of the City of Havre de Grace and the Town of Perryville. The study area also encompasses smaller portions of RCA designated Critical Area in Harford County near Gashey's Creek and Swan Creek and in Cecil County near the eastern terminus of the study area at Principio Creek (see Figure E-12 in **Appendix E**).

Table 11-4
Critical Area within the Study Area

Study Area Location	Land Use Designation	CA Acreage within Study Area
Harford County	RCA	35.19
City of Havre de Grace/ Susquehanna River Area	IDA	50.15
Town of Perryville/ Susquehanna River Area	IDA	61.04
Cecil County	RCA	61.40
Total 1,000 Foot Critical Area Located Within the Study Area		**207.78**

The 100-foot Critical Area Buffer is located within the Corporate Limits of Havre de Grace and Perryville, as well as the RCA designated portions of the Critical Area located within Harford and Cecil Counties.

COASTAL ZONE MANAGEMENT

The Maryland coastal zone is composed of the land, water and subaqueous land between the territorial limits of Maryland in the Chesapeake Bay, Atlantic Coastal Bays, and the Atlantic Ocean, as well as the towns, cities and counties that contain and help govern the thousands of miles of Maryland shoreline. The Maryland coastal zone extends from three miles out in the Atlantic Ocean to the inland boundaries of the 16 counties (including Harford and Cecil Counties) and Baltimore City that border the Atlantic Ocean, Chesapeake Bay, and the Potomac River. The entire study area is located within Maryland's Coastal Zone.

UNIQUE AND SENSITIVE AREAS

Unique and Sensitive Areas describes all lands of unique natural resource value, including protected lands (Natural Heritage Areas, Forest Conservation Easements, Federal Lands) and waters (Scenic Rivers), and lands providing ecosystem connectivity (Green Infrastructure).

NATURAL HERITAGE AREAS

According to COMAR 08.03.08, there are no NHAs within or near the study area.

GREEN INFRASTRUCTURE

Green infrastructure is the strategically planned and managed networks of natural lands, working landscapes, and other open spaces that conserve ecosystem functions and provide associated benefits to human populations. The DNR, using satellite imagery, road and stream locations, and biological data, has identified a green infrastructure network for the state of Maryland. The green infrastructure network is comprised of core areas, hubs, and corridors. Core areas are well-functioning natural ecosystems that provide high-quality habitat for native plants and animals. Hubs are slightly fragmented aggregations of core areas, plus contiguous natural cover. Hubs are intended to be large enough to support populations of native species, and serve as sources for emigration into the surrounding landscape, as well as providing other ecosystem services like clean water, flood control, carbon sequestration, and recreation opportunities. Corridors link core areas together, allowing wildlife movement and seed and pollen transfer between them, and thereby promoting genetic exchange.

Gaps are another component of the green infrastructure network. Gaps are areas within the Green Infrastructure that do not currently have natural vegetation, such as agricultural, barren, or lawn areas. Re-vegetation of these areas with natural land cover would strengthen the integrity of hubs and corridors, decrease negative edge effects, ease wildlife movement, and decrease opportunities for invasive plants.

Based on the DNR Green Infrastructure Atlas of Harford and Cecil Counties, a large continuous hub of green infrastructure is located near Gashey's Creek stream valley in Harford County and Principio Creek stream valley in Cecil County. These run north and south perpendicular to the study area.

WILD AND SCENIC RIVERS

There are no state wild and scenic rivers or their tributaries located within the study area. In addition, there are no nationally listed wild or scenic rivers located within the study area.

FOREST CONSERVATION ACT EASEMENTS

According to MERLIN, one forest conservation easement, Frenchman Land Company, occurs within the study area in Cecil County. The 0.86 acre easement lies along the north side of the existing railroad ROW just east of Firestone Road. The easement comprises a thin strip of deciduous forest that lies between the railroad ROW and a developed parcel.

FEDERAL LANDS

Federally designated National Wildlife Refuge lands occur on Garrett Island within the Susquehanna River just north of the study area. Garrett Island was established as a National Wildlife Refuge by legislation in 2005 (Lutz 2009). The approximately 198-acre island is the only rocky island in the Chesapeake Bay and forms a link between the Bay and the River. The island is part of the Chesapeake Marshlands National Wildlife Refuge complex under the jurisdiction of the Blackwater National Wildlife Refuge.

D. NO ACTION ALTERNATIVE

The No Action Alternative assumes the Susquehanna River Rail Bridge remains in service as-is. The No Action Alternative is used as a baseline scenario against which potential project impacts will be measured. No significant effects are anticipated from the No Action Alternative for any of the natural resources assessed for this EA. Changes to soils, river bathymetry, erosion and sedimentation may change due to siltation and other natural processes. Existing floodplains, wetlands/waters of the U.S., terrestrial resources, Chesapeake Bay Critical Area, Coastal Zone Management, and unique and sensitive areas are expected remain as described in Affected Environment above. Water quality and the condition of aquatic communities in the Chesapeake Bay watershed are expected to continue to gradually improve as a result of many ongoing large- and small-scale public and private initiatives to restore and protect the bay. Otherwise, aquatic resources within the study area would be expected to remain much the same as at present in the future without the Proposed Project. No significant in-water construction projects are currently planned or ongoing nearby. Hydrology and other abiotic conditions within the Susquehanna River would not change under the No Action Alternative, and the same assemblages of aquatic organisms would be expected to occur.

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

TOPOGRAPHY, GEOLOGY, AND SOILS

Minimal impacts and/or changes to topography and geology are anticipated in the study area, and the anticipated changes are similar for both Alternative 9A and Alternative 9B. Local topography would be altered by excavation and grading that would be required for bridge and rail approach construction. The majority of the slopes within the vicinity of the Build Alternatives are classified as 0 to 15 percent slopes. Highly erodible soils and/or steep slopes associated with the Sassafrass and Croom Soils in Cecil County or Elsinboro loam in Harford County would not be impacted by either of the Build Alternatives.

Both Build Alternatives would affect other soils through earthmoving and soil storage and through potential erosion and subsequent sedimentation during the construction phase. Removal of existing vegetation, primarily at the termini of both Alternative 9A and Alternative 9B, would result in increased exposure of soils to weather and runoff potential. Sites where surface water currently causes erosion, particularly along the Susquehanna River shorelines, would have a greater potential for erosion and sedimentation.

Both Alternatives 9A and Alternative 9B would affect Prime Farmland Soils and Soils of Statewide Importance (see **Table 11-5**). However, as previously noted, the majority of these soil types are located within the existing ROW, which means that they are not subject to FPPA since they are in an existing ROW purchased on or before August 4, 1984. For the Prime Farmland and/or Soils of Statewide Importance located outside of the ROW, Alternative 9A would affect 1.37 acres of Prime Farmland and 0.62 acre of Soils of Statewide Importance.

Table 11-5
Effects to Prime Farmland Soils & Soils of Statewide Importance

	Prime Farmland Soils (Acres)		**Soils of Statewide Importance (Acres)**	
	Alternative 9A	***Alternative 9B***	***Alternative 9A***	***Alternative 9B***
Harford County	1.37	0.18	0.58	0
Cecil County	0	0	0.04	0.04
Total	**1.37**	**0.18**	**0.62**	**0.04**

However, on February 8, 2016, the NRCS, using the Farmland Conversion Impact Rating Form (NRCS-CPA-106) for corridor type projects pursuant to FPPA, determined that the Proposed Project is not subject to the provisions of the Policy Act and therefore exempt. No further coordination is required.

FLOODPLAINS AND WETLANDS/WATERS OF THE U.S.

FLOODPLAINS

Both Build Alternatives would occur within regulated floodplains. As noted, Harford County has a preliminary FEMA floodplain map that is proposed to replace the effective FEMA floodplain map. Portions of each Build Alternative occurring within the Harford County effective and preliminary 100-year and 500-year floodplains, as well as potential permanent impacts to the Cecil County effective 100- and 500-year floodplains, are included in **Table 11-6**. These values represent project footprint encroachments within the floodplain only and do not reflect actual fill volumes. Alternative 9A would have slightly higher permanent floodplain impacts than Alternative 9B, as result of its broader footprint at the Lily Run crossing. The majority of floodplain encroachments would be from transverse crossings for each of the alternatives (encroachment that crosses the valley width of floodplains).

Table 11-6
Potential Effects on Natural Resources from the Susquehanna River Rail Bridge Project

Alignment Alternatives			
Resource Type	**Resource Category**	**Alternative 9A**	**Alternative 9B**
Effective FEMA Floodplain (acres)	100-Year	2.72	2.15
	500-Year	4.83	4.24
Preliminary FEMA Floodplain* (acres)	100-Year	3.09	2.63
	500-Year	3.16	2.69
Wetlands (acres)	Tidal	0.06	0.06
	Nontidal	0.83	0.71
Streams (linear feet)	Relatively Permanent Waterways	3,190	2,943
	Ephemeral	19	19
Wetland Buffers (acres)	Tidal	0.27	0.27
	Nontidal	2.16	1.72
Forest Resources (acres)	----	2.92	2.08
Chesapeake Bay Critical Area (acres)	----	6.4	6.1
Susquehanna Riverbed / Aquatic Biota (acres)	Permanent Impacts	0.37	0.37
	Construction (Temporary Impacts, including finger piers)	0.23	0.23
Submerged Aquatic Vegetation – SAV (acres)	Permanent Impacts	0.61	0.61
Note: * *Preliminary floodplain available for Harford County only*			

Based on the current design of the two Build Alternatives and current guidelines, an increase in the base flood elevation (greater than one foot) in the two regulated floodways is not anticipated. However, the Proposed Project will require fill in both of these floodways. The new crossings of the Susquehanna River will occur with the bridge piers aligned with the river to minimize any change in the flow characteristics. More detailed hydrologic and hydraulic studies will be undertaken later in design, allowing for more precise floodplain impacts and scour analyses at that time. In addition, as the Proposed Project moves into the design phase, regulatory guidance issued regarding Executive Order 13690 and/or revisions to Executive Order 11988 will be reviewed and incorporated into the overall design of the Proposed Project (e.g., design standards and specifications for culvert design and bridge and approach heights), as applicable.

WETLANDS/WATERS OF THE U.S.

The two Build Alternatives will have relatively minor effects on wetlands and somewhat greater effects on streams. Overall, the proposed new alignments will occur within and immediately adjacent to the existing rail alignment where wetlands and streams that are potentially affected by the Proposed Project have been historically altered to a considerable degree for the construction and maintenance of the existing rail alignment. Potential effects to tidal and nontidal wetland buffers take into consideration the existing land use within the buffers. For example, areas of existing impervious surfaces, such as pavement or buildings, were not included in the buffer impact totals. Permanent impacts to wetlands, wetland buffers, and streams for each of the Build Alternatives are summarized in **Table 11-6**. Wetland impacts by system and cover type are shown in more detail in **Appendix E**, **Table E-5**).

Alternative 9A would result in permanent direct impacts to tidal and nontidal wetland resources along the Amtrak ROW. Permanent nontidal wetland impacts in Cecil County would occur within a wetland that lies between the existing railroad tracks and the access road to the Perryville Maintenance Facility, just east of the Perryville Station. The only tidal wetland in the study area would also be slightly affected by the construction of the west bridge over the Susquehanna River. In Harford County, permanent nontidal wetland impacts would occur on the north side of the ROW east and west of Lewis Lane, and on the south side of the ROW east of Lewis Lane.

Alternative 9A would also cross four perennial nontidal streams and three intermittent nontidal streams, resulting in minor permanent impacts to these waterways. The total permanent stream impact includes 251 linear feet of impact to replace existing culverts and 2,939 linear feet of impact for new crossings. This also includes approximately 613 linear feet of intermittent stream that currently flows within a maintained ditch along the base of the existing track fill slope in an area where no track bed widening is being proposed. An additional 19 linear feet of ephemeral channel will also be affected on the Cecil County portion adjacent to the tidal wetland along the Susquehanna River. The crossing impacts to Lily Run and an unnamed tributary of Lily Run in Harford County and Mill Creek in Cecil County would result from the extension of culverts to accommodate the new tracks. For the Mill Creek crossing, the existing stone masonry arch culvert will be extended to the south by attaching a culvert extension. A similar culvert extension design is proposed for the south side of the existing stone masonry culvert of the Lily Run crossing. Smaller concrete culverts would need to be extended for the unnamed tributary to Lily Run. The intermittent stream that drains west along the existing tracks may be shifted slightly north to accommodate a shift in the track bed, if needed. The intermittent stream on the south side of the existing tracks that flows east from east of Lewis Lane would likely need to be placed in a culvert, as new ROW will be needed from Havre de Grace Middle School/High School to accommodate the track shift in that location, thus likely precluding a shift in the stream channel farther to the south.

Alternative 9B follows the same alignment as Alternative 9A in Cecil County, but has a slightly reduced footprint relative to Alternative 9A within Harford County, resulting from slightly lower design speeds. As a result, overall permanent wetland and stream impacts are slightly less for Alternative 9B. Permanent wetland buffer impacts are also slightly lower overall for Alternative 9B. Alternative 9B would cross the same streams that Alternative 9A crosses, but total permanent stream impacts would be slightly less, resulting from a narrower crossing of Lily Run and the unnamed tributary of Lily Run.

The girder approach/arch main span bridge design over the Susquehanna River would include 37 in-water piers, with a pier diameter of 5.67 feet for all piers except for the piers on either side of the navigation channel that will be 6.67 feet in diameter. Eight of the piers, five along the Cecil County shoreline and three along the Harford County shoreline, will be encased in permanent cofferdams. The remaining piers will be encased in permanent caissons. Permanent pier impacts to the riverbed of the Susquehanna River would be 0.37 acre for both alternatives (see **Table 11-6**). Potential impacts to SAV within the Susquehanna River are discussed in the “Aquatic Resources” section.

In addition to the permanent impacts discussed above, temporary wetland impacts could occur during construction. Temporary impacts could result from construction staging operations and access needs. However, these impacts would likely be minimal and such areas would be restored upon completion of construction. Any temporary stream crossings would also be removed. Construction of bridge piers for the crossing of the Susquehanna River would likely be conducted from barges in the river. Temporary finger piers are proposed on the Cecil County side of the river, both upstream and downstream of the bridge crossings, for material access by barge. These temporary piers would result in potential impacts to a tidal emergent wetland located just upstream of the existing bridge and to SAV located upstream and downstream of the proposed bridges (see discussion under “Aquatic Resources”). The temporary tidal wetland impact from the upstream finger pier would be approximately 1,743 square feet or 0.04 acre.

TERRESTRIAL RESOURCES

FOREST RESOURCES

The two Build Alternatives will have permanent impacts to forest resources, primarily to narrow forest strips immediately adjacent to the existing tracks. The largest, contiguous forest resources occur at the far western end of the project study area. The Build Alternatives both terminate over a mile east of this forested area, thereby avoiding any impact to these resources.

Alternative 9A would have the larger permanent forest impacts of the two Build Alternatives. Permanent impacts would occur to forested habitat between the existing tracks and the Havre de Grace Middle School/High School. This forest is relatively narrow and disturbed. Preliminary permanent forest impacts from Alternative 9A would total 2.92 acres (see **Table 11-6**). Alternative 9B would also result in permanent impacts to the same forested habitat adjacent to Havre de Grace Middle School/High School. However, the footprint for Alternative 9B is narrower than that of Alternative 9A, resulting in a potential permanent impact of approximately 2.08 acres.

Before a sediment and erosion control permit is issued for a project, the Maryland Forest Conservation Act requires that a Forest Stand Delineation (FSD) and a Forest Conservation Plan (FCP) be submitted and approved by the DNR, Forestry Division. A more detailed forest assessment, including preparation of a FSD and FCP, would need to be completed for the Proposed Project during final design and permitting.

Construction related short-term impacts could result in additional tree clearing for staging and access for either alternative. Staging and construction access should be avoided on the north side of the ROW between North Juniata Street and Lewis Lane, where larger forest tracts occur along Lily Run and unnamed tributaries of Lily Run. In Cecil County, a large forest tract occurs south of the existing railroad tracks between a power substation and Firestone Road. Short-term impacts to this forest during construction are anticipated to be avoided, as an existing access road lies between the forest and the existing tracks, except for a short distance immediately east of the power substation.

WILDLIFE

Few wildlife impacts are anticipated from either of the two Build Alternatives, as both alternatives will be constructed immediately adjacent to and within the same alignment as the existing tracks. As noted in "Forest Resources," permanent impacts to forest will occur only adjacent to the Havre de Grace Middle School/High School. This forest is relatively thin and disturbed and likely only supports common resident species of wildlife, primarily birds and a few species of small mammals. However, mammals and birds would be displaced by the clearing of forest habitat. The habitat may also support a few common species of amphibians and reptiles that could also be minimally affected or displaced. During construction in this area, birds and mammals may be displaced by the clearing of trees and brush. Smaller amphibians and reptiles may be crushed by equipment during construction, while more motile species will be displaced.

THREATENED, ENDANGERED, OR SPECIAL CONCERN TERRESTRIAL SPECIES

In a letter dated January 15, 2016 (see **Appendix E**, Attachment E), USFWS indicated that because the permanent impacts to forests would be relatively small and the absence of documented NLEB within the area, the Proposed Project is "not likely to adversely affect" the species. The USFWS correspondence further indicated that for these reasons, there would be no time of year restrictions on forest clearing related to the NLEB. The letter also stated that other than transient species, no other federally proposed or listed threatened or endangered species are known to occur within the project area.

Neither of the Build Alternatives will affect areas known to support terrestrial state-listed threatened or endangered species or areas that are designated as a WSSC. The WSSC, and associated state listed species, lies over a mile west of the termination of Alternative 9A and Alternative 9B. Likewise, the state listed species found within the Furnace Bay wetlands lie over a mile and a half east of the termination of both alternatives. As very little natural habitat lies within the limits of disturbance for the two Build Alternatives, it is unlikely that state or federally listed terrestrial species would occur within the project area.

The Proposed Project will cross a known historic waterfowl staging area within the Susquehanna River along the Cecil County side. Waterfowl will not be permanently affected by either build alternative, but may be temporarily displaced from the active construction area.

No construction related short-term impacts to terrestrial federally or state-listed endangered or threatened species are anticipated. Temporary displacements of waterfowl within the Susquehanna River are likely during the construction phase of the Proposed Project.

AQUATIC RESOURCES

HYDROLOGY

During operation of the Proposed Project under Alternative 9A, the piers supporting the new west and east bridges would not be expected to significantly change river hydrology in the project site relative to the existing condition. For the girder approach/arch main span bridge design, there would be a net decrease of 4,074 square feet of structure volume below the water surface after removal of the existing bridge and the remnant piers. In addition, the majority of the west and east bridge piers would be aligned, or nearly aligned with each other and parallel with the direction of the river's incoming and outgoing tidal flow. Replacement of the existing bridge with the proposed west and east bridges would likely cause a small shift in the current spatial distribution of areas receiving scour and sediment deposition. In-water structures of the new bridges under Alternative 9B would be identical to those of Alternative 9A; any differences between the two alternatives in other ways would be inconsequential with regard to potential operational effects on hydrology.

GROUNDWATER

The Proposed Project would be constructed mostly within, or immediately adjacent to, the existing ROW and would not introduce a new source of potential pollutants. In addition, treatment of surface water runoff from project construction and permanent stormwater best management practices (BMPs) will further reduce these negligible project-related impacts on groundwater.

WATER QUALITY

Construction of Alternative 9A or Alternative 9B would require in-water work with the potential to resuspend bottom sediment, resulting in minimal, temporary, and localized effects on water quality of the Susquehanna River in the vicinity of the project site. These activities include construction of temporary finger piers, construction of west and east replacement bridge piers, and demolition of the existing bridge and remnant piers. Aside from minor potential changes in sedimentation and scouring, there would be no differences between the operation of the new bridges under Alternative 9A and the operation of the existing bridge that would have the potential to influence water quality. Operational differences between Alternative 9A and Alternative 9B would be inconsequential with regard to potential operational effects on water quality. Construction-phase staging areas and haul roads, if needed, could also disturb the ground, potentially causing erosion and sedimentation. However, with the minimization techniques discussed below, long-term and short-term construction-related impacts to water quality from the Proposed Project are expected to be minimal. Potential short-term and long-term impacts to water quality will be minimized through strict adherence to an effective Erosion and Sediment Control Plan and implementation of stormwater BMPs that meet the conditions of the Maryland Stormwater Act of 2007.

SEDIMENT QUALITY & CONTAMINANTS

Sediment containment techniques, such as turbidity curtains and other approved BMPs, will be used during construction to minimize sediment releases from the Proposed Project. However, under Alternative 9A and Alternative 9B, some minor resuspension of sediment and changes in sedimentation properties within the Proposed Project area may occur. Sediment types within the study area are primarily sand and gravely sand, which are not easily resuspended and would quickly settle. Construction of the proposed temporary finger piers would eliminate the need for dredging that would otherwise be required for construction barges to access the project site, and would thereby avoid the more substantial disturbance to river sediments that would be caused by dredging. Operational differences between Alternative 9B and Alternative 9A would be inconsequential with regard to potential operational effects on sediment quality and contaminants. Operational effects would be minor and temporary under both alternatives.

AQUATIC BIOTA

As discussed above in "Water Quality," under Alternative 9A and Alternative 9B, operation of the replacement bridges in place of the existing bridge would not have effects on water quality or other habitat characteristics that would alter the biological community present within the project area. Impacts to aquatic biota are anticipated to primarily be construction related. Minimal bottom disturbance and sediment resuspension may occur with the drilling of large-diameter piles for the replacement bridges and the driving of small-diameter piles for the temporary finger piers; however, these disturbances will be temporary and localized and are not expected to substantially affect aquatic biota.

Although the replacement bridges under Alternative 9A and Alternative 9B would result in a net increase of 21,095 square yards of shading**,** both bridges would have a large height to width ratio (0.8 [44 feet high by 52 feet wide at their widest point]) that would slightly exceed the level below which shading impacts to aquatic organisms (including SAV) are generally considered to occur (0.7; Struck et al. 2004). Shading from the relatively narrow temporary finger piers would also not have the potential to result in significant adverse effects to benthic organisms, but would result in permanent adverse effects to SAV (see below).

For both Alternative 9A and Alternative 9B, approximately 0.37 acre of the Susquehanna Riverbed would be permanently affected and 0.23 acre would be temporary affected from construction activities. Construction of the replacement bridges under Alternative 9A and Alternative 9B would result in the temporary loss of approximately 680 square feet of benthic habitat within the footprint of the piles supporting the temporary finger piers. The temporary loss of benthic habitat for temporary cofferdam construction for the bridge piers would total approximately 7,926 square feet (0.18 acre) for the girder approach/arch main span bridge design. Temporary impact to the riverbed for existing and remnant pier demolition using either blasting techniques (inside temporary sheet piles) or cutting using a wire saw would total approximately 1.4 acres. However, following demolition of the existing bridge and remnant piers this area of river bottom will return to benthic habitat, thereby more than offsetting losses from the construction of the replacement bridges. As such, construction of Alternative 9A and Alternative 9B would result in a potential net gain of populations of benthic organisms and their predators higher in the food web.

The low-speed vibratory drilling method that would be used to install the five- to six-foot diameter piles for the replacement bridge piers would not generate impulse noise underwater, and, therefore, would not have significant adverse noise impacts to fish. The smaller, 18 to 24 inch piles that would support the temporary finger piers would be installed by impact hammering, but would not be expected to cause physical impacts to fish because noise levels generated during the driving of small piles typically do not exceed 200 dB re 1 μPa_{peak} at a distance of 10 meters from the pile (Caltrans 2009). Following best practices for pile installation (NOAA 2008), noise from the driving of the finger pier piles would be minimized by first allowing piles to sink into the sediment under their own weight before impact hammering the remainder of the pile. In addition, impact hammering would begin with a series of light taps of gradually increasing strength, which is an effective method to avoid sudden disturbances to fish and provide them with an opportunity to move away from the site of the activity (FHWA 2003). The most likely response of fish to the underwater sound produced during pile driving for the finger piers would be temporary avoidance of the area. Fish would also potentially avoid the area of activity during the drilling of the large-diameter piles for the replacement bridges piers. Should pile installation cause any fish to temporarily avoid the portion of the Susquehanna River in the vicinity of the activity, the extent of the area that would be affected at any one time would be negligible relative to the amount of suitable habitat that would remain available nearby, and no significant adverse effects to these individuals would be expected to occur.

As noted above, demolition of the existing bridge piers and remnant piers would be largely achieved through the use of mechanical means and methods (e.g., barge cranes, wire saws), which will have negligible impacts on aquatic biota. Blasting is not anticipated; however, removal of the existing and remnant bridge piers may require the use of blasting techniques as per the contractor's means and methods. Any blasting would be conducted in such a manner as to minimize adverse effects on fish.

SAV

SAV is regulated at the federal and state levels (see **Appendix E**, Section D). Alternative 9A and Alternative 9B would each have the same number of bridge piers within the Susquehanna River. Both alternatives include four bridge piers that would intercept SAV resources in slightly different amounts and locations. Permanent cofferdam bridge pier design is proposed immediately adjacent to the two shorelines. The permanent impacts to SAV for the girder approach / arch main span bridge design would total approximately 3,357 square feet (0.08 acre) under both Alternative 9A and Alternative 9B. Indirect SAV shading impacts of the new bridge are also possible; however, the new bridges will be slightly higher than the existing bridge, providing the potential for sufficient light to support SAV beneath the bridge.

Impacts to SAV may also occur during the construction of the bridges. Dredging is not currently proposed to provide access for bridge pier construction in this location. However, if dredging is required, this would uproot SAV species and temporarily displace sediments necessary for SAV growth. The suspended sediments could block sunlight necessary for SAV growth and cover SAV beds. To avoid the need for dredging, finger piers are proposed in shallow water to allow for deep water construction access. These finger piers would remain for at least three years during construction build-out of the two rail bridges. Because of the low profile of the finger piers and their long-term use during bridge construction, permanent impacts to SAV would be expected to occur from finger pier piles as well as shading effects of the finger pier footprint. Therefore, though the finger piers would ultimately be considered a temporary construction element, owing to the length of time the piers would be in place, they would likely result in permanent SAV impacts totaling approximately 0.48 acre. Other SAV impacts could occur from the installation of temporary cofferdams in shallow water. The impact to SAV from cofferdam installation during construction would be approximately 2,298 square feet (0.05 acre) for the girder approach / arch main span bridge design. These structures would be removed once piers are completed; however, the cofferdams will likely be in place for longer than six months, causing SAV impacts to be considered permanent rather than temporary. Additional disturbance of SAV by sediments from the installation of cofferdams could also affect SAV as described above for potential dredging operations.

For both Alternative 9A and Alternative 9B, the total permanent SAV impact from bridge construction would total approximately 0.61 acre, based on the permanent impacts to SAV for the girder approach / arch main span bridge design, finger piers, and cofferdam installation.

THREATENED, ENDANGERED, OR SPECIAL CONCERN AQUATIC SPECIES/SECTION 7 CONSULTATION

As discussed above, under "Aquatic Biota," operation of the replacement bridges under Alternative 9A and Alternative 9B would not be expected to result in significant changes to water quality or other aquatic habitat parameters that would affect aquatic organisms. As such, the Proposed Project would not have significant adverse impacts to any Atlantic sturgeon, shortnose sturgeon, sea turtles, freshwater mussels, logperch, or map turtles potentially occurring in the project area.

Construction of Alternative 9A or Alternative 9B is anticipated to have negligible direct or indirect effects on Atlantic and shortnose sturgeon potentially occurring in the Susquehanna River. By drilling rather than driving the large-diameter piles for the replacement bridges' piers, underwater noise levels would be minimal and well below both the physical and behavioral effect thresholds that have been established by the Fisheries Hydroacoustic Working Group and adopted by NMFS for evaluations of underwater noise impacts to sturgeon and other fish species. Impact pile driving for the finger piers would be attenuated by the use of wooden cushion blocks to levels where they are likely to be discountable according to the NMFS assessment protocol. Potential impacts of demolition activities to remove existing bridge piers would be minimized by implementing the protective measures discussed above. In particular, any blasting activities would be scheduled to occur within a work window that corresponds to the time period of the year when sturgeon are least likely to occur in the vicinity of the project area.

Construction of Alternative 9A or Alternative 9B would not have significant adverse impacts to sea turtles at the individual or population level. Kemp's ridley, green, and loggerhead sea turtles have the potential to occur within the project area, while the leatherback sea turtle is a more pelagic species that is not expected to occur within the Susquehanna River. By drilling rather than driving large-diameter piles for the replacement bridges' piers, and by driving only small-diameter piles to support the finger piers, underwater noise levels during construction of Alternative 9A or Alternative 9B would not be expected to have harmful effects on any sea turtles potentially occurring nearby. As described for sturgeon, the potential impacts of demolition activities required to remove existing bridge piers would be minimized by implementing the protective measures discussed above and any blasting activities would be scheduled to occur within a work window corresponding to the period of the year when sea turtles are least likely to occur in the vicinity of the project area. The work barges, delivery barges, and crew vessels for this project are expected to have drafts of less than 6 to 8 feet in most cases and, therefore, provide vessel clearance above the river bottom of at least 12 feet. Because both Atlantic and shortnose sturgeons are demersal (bottom-dwelling) species and spend the majority of the time within a few feet of the bottom while foraging, the risk of vessel interaction with sturgeon is small.

As there is a potential for freshwater mussel species to be found within the study area, further coordination will be necessary on the potential mussel presence and BMPs for their protection. This will include using construction and demolition methods to reduce impacts to freshwater mussel species.

The logperch is a freshwater fish that occurs within the non-tidal portion of the Susquehanna River, above the Conowingo Dam. Logperch would not be expected to occur within the project area, where conditions are brackish during flood tides. In addition, construction of Alternative 9A or Alternative 9B would not have significant adverse effects on water quality or other habitat conditions for fish, and drilling of the large-diameter piles would avoid potentially harmful underwater construction noise levels. Protective measures would be identified in coordination with the U.S. Fish and Wildlife Service and implemented during any blasting activities to minimize the potential impacts to logperch, should they occur. As such, construction of Alternative 9A or Alternative 9B and demolition of the existing bridge and remnant bridge piers would not have the potential to cause adverse impacts to the logperch.

DNR-WHS may require restrictions on construction projects in order to protect map turtles, including, but not limited to; conducting nesting surveys during the nesting season to identify the presence/absence of nests within the project area, in-stream time-of-year restrictions, and/or removal of turtles from the work zone using trained scuba divers. Map turtles are known to occur within the project area and could potentially be affected by construction and demolition. Further coordination with DNR-WHS will occur as the Proposed Project progresses, and the above-referenced avoidance and minimization measures will be implemented as appropriate.

CHESAPEAKE BAY CRITICAL AREA

Permanent impacts to the Critical Area resulting from the Proposed Project are expected to result from earth disturbance, removal of vegetation, placement of fill, and increased impervious area. The anticipated Critical Area impacts resulting from Alternative 9A are 6.4 acres and for Alternative 9B are 6.1 acres. All impacts to Critical Area are limited to the Corporate Limits of Havre de Grace and Perryville; no impacts to RCA designated Critical Area are anticipated.

The CAC for the Chesapeake and Atlantic Coastal Bays was contacted about the Proposed Project. In a response letter, the CAC requested continued coordination as the Proposed Project becomes more defined to determine whether a full CAC review is required. Copies of all agency correspondence can be found in **Appendix E**, Attachment E. Coordination with the CAC will continue during the design phase of the Proposed Project to ensure compliance with all Critical Area criteria, mitigation requirements, and regulations.

COASTAL ZONE MANAGEMENT

Because the Proposed Project is subject to the provisions of Section 307 of CZMA, the Coastal Zone consistency decision is coordinated through the Coastal Zone Consistency Division of the MDE. Applicants for federal licenses/permits (including U.S. Army Corps of Engineers' Section 10 and Section 404 activities) must certify that their proposed action will be conducted in a manner consistent with Maryland's CZMP. MDE is responsible for coordinating the review with appropriate state agencies, consolidating the state's comments, and forwarding the state's response and decision to the USACE. Examples of state approvals and other state agency actions related to the federal consistency decision and the overall review process are provided in **Appendix E**, Attachment B.

Pursuant to Section 307 of the CZMA, Coastal Zone consistency review will commence after the submittal of the MDE Joint Permit Application (JPA). The MDE permit authorization, received at subsequent phases of the Proposed Project, will constitute the federal consistency decision.

UNIQUE AND SENSITIVE AREAS

As there are no NHAs or Wild and Scenic Rivers within the study area, no impacts are anticipated. Although Green Infrastructure hubs and corridors occur within the study area, neither Alternative 9A or Alternative 9B will affect Green Infrastructure resources. One forest conservation easement occurs within the limits of the study area, but lies outside the limits of disturbance for either Alternative 9A or Alternative 9B. No impacts to the conservation easement are anticipated. The federally protected Garrett Island lies outside the study area limits to the north, and will not be impacted by the Proposed Project.

F. MINIMIZATION AND MITIGATION OF IMPACTS

TOPOGRAPHY, GEOLOGY, AND SOILS

For both Alternative 9A and Alternative 9B, several methods could be implemented to decrease erosion effects, including structural, vegetative and operational methods during construction. These control measures may include:

- Seeding, sodding, and stabilizing slopes as soon as possible to minimize the exposed area during construction,
- Stabilizing ditches at the tops of cuts and at the bottoms of fill slopes before excavation and formation of embankments,
- Using sediment traps, silt fences, slope drains, water holding areas, and other control measures, and
- Using diversion dikes, mulches, netting, energy dissipaters, and other physical erosion controls on slopes where vegetation cannot be supported.

A grading plan and erosion and sediment (E&S) control plan will be prepared and implemented in accordance with MDE regulations. The grading and E&S control plans will minimize the potential for impacts to water quality from erosion and sedimentation that would occur before, during, and after construction. Furthermore, temporary and permanent controls will be reviewed and approved by MDE prior to initiation of construction. Additionally, the Proposed Project must obtain a Notice of Intent under the 2014 National Pollution Discharge Elimination System (NPDES) General Permit for Stormwater Associated with Construction Activity designed to control pollution runoff, including sediment, during construction.

FLOODPLAINS AND WETLANDS/WATERS OF THE U.S.

FLOODPLAINS

Efforts to minimize permanent impacts to 100- and 500-year floodplains are ongoing, and will continue throughout the project planning and design process. Longitudinal crossings have been avoided where possible to reduce the potential for greater floodplain fill and resulting reductions in flood conveyance and floodplain storage. Any construction within the 100-year floodplain would require a Waterway Construction Permit from MDE. To ensure that floodwater impacts resulting from rail construction are minimized, drainage structures are required to maintain the current flow regime and prevent associated flooding. This is being investigated for the proposed Lily Run crossing where a new bottomless culvert may be installed to increase the hydraulic capacity, resulting in desirable flood relief for the area of Havre de Grace upstream of the rail project. Other minimization and mitigation efforts that may be investigated in later planning and design phases for impacted 100- and 500-year floodplains could also include:

- Bridge spans over the 100- and 500-year floodplain,
- Reducing encroachments by using 2:1 minimum slopes for rail berms, and
- Building retaining walls where practicable.

As part of the MDE Waterways Construction Permit application process, hydrologic and hydraulic studies will be performed for the selected alternative to determine the effects of the proposed track bed fill on floodplain elevations during the design and permitting phase.

WETLANDS/WATERS OF THE U.S.

Unavoidable impacts to wetlands and other waters of the U.S. will require federal and state permit authorizations. These permits and associated agencies include:

- Section 404 Individual Permit from the USACE for the discharge of dredged or fill materials into waters of the U.S. (greater than 2,000 linear feet), including wetlands (greater than 1 acre)
- Section 10 permit from the USACE for construction of bridge structures over the navigable waters of the Susquehanna River
- Section 9 (Rivers and Harbors Act) permit from the U.S. Coast Guard (USCG) for construction of a new bridge over a navigable waterway
- Section 401 Water Quality Certification from MDE in conjunction with the Section 404 permit
- Nontidal Wetland and Waterways permit from MDE for impacts to nontidal wetlands and streams, including a 25-foot buffer surrounding the wetland
- Waterway Construction Permit from MDE for work in streams and floodplains
- Tidal Wetland License issued by the Board of Public Works for impacts to tidal wetlands and waters associated with the Susquehanna River

The two Build Alternatives would have direct permanent impacts to both nontidal and tidal wetland resources and their corresponding buffers (see **Table 11-3**). Both alternatives would also have permanent impacts to streams from culvert extensions, possible relocations, and piping, and would have permanent impacts to the riverbed of the Susquehanna River from bridge pier installation. Impacts to Waters of the U.S., including wetlands, from the Build Alternatives would total less than an acre of wetlands and more than 3,000 linear feet of streams. After all practicable measures have been taken to avoid and minimize impacts to aquatic resources, unavoidable impacts will require mitigation in the form of creation, enhancement, or preservation to replace the loss of wetland, stream, and/or other aquatic resource (e.g., SAV) functions.

The two Build Alternatives retained for detailed study were selected in part because of their reduced impacts to wetlands/waterways and other natural resources. These alternatives lie closer to the existing track ROW than other alternatives studied, and generally involve replacement of the existing track with the new eastbound and westbound tracks. The Project Team has incorporated avoidance and minimization measures with respect to wetland impacts, in part by optimizing the use of the existing rail ROW. The Project Team will continue to explore minimization measures during final design. Construction of the culvert extensions, or replacements as needed, will include the minimum extent necessary to provide support for the additional rail tracks. Also, these necessary extensions or replacements will use bottomless culverts to provide for a more natural stream bed through the culvert.

Compensatory mitigation must be evaluated in accordance with state and federal regulations and guidance. Compensatory mitigation focuses on the replacement of the functions provided by an aquatic resource or wetland, in addition to the acreage affected. Traditionally, mitigation requirements under Section 404 and COMAR are determined by the ratio of wetland acres replaced to wetland acres lost, based on the following ratios:

- Nontidal emergent wetlands are often mitigated on a 1:1 replacement ratio;
- Nontidal forested and scrub-shrub wetlands are mitigated on a 2:1 ratio;
- Tidal emergent wetlands are replaced at a 2:1 ratio; and
- Tidal forested and scrub-shrub wetlands are mitigated on a 2:1 ratio.

Table 11-7 summarizes the wetland and stream impacts and potential required mitigation for each of the two Build Alternatives.

Few on-site mitigation options are likely available to compensate for unavoidable nontidal wetland impacts given the linear nature of the Amtrak ROW. Even so, opportunities will be investigated during project design. If Alternative 9A is selected, wetland creation may also be possible within the expanded ROW adjacent to Havre de Grace Middle School. For the tidal wetland impacts along the Cecil County shoreline, mitigation could occur in the form of control of existing, invasive common reed and establishment of native, tidal wetland species. The area of degraded tidal wetland is approximately two acres, more than sufficient size to accommodate the higher enhancement ratio of at least 4:1. Other potential onsite mitigation options will also be investigated as the Proposed Project advances through later design phases. If further on-site mitigation is not an option, compensation could be sought through the purchase of credits at an approved mitigation bank or through permittee sponsored mitigation at an approved offsite location.

Table 11-7
Wetland and Stream Impacts and Estimated Minimum Required Mitigation

Resource	Alternative 9A			Alternative 9B		
	Impact (Ac/Lf)	Replacement Ratio	Mitigation (Ac/Lf)	Impact (Ac/Lf)	Replacement Ratio	Mitigation (Ac/Lf)
Nontidal Forest (ac)	0.25	2:1	0.5	0.17	2:1	0.34
Nontidal Emergent (ac)	0.58	1:1	0.58	0.54	1:1	0.54
Tidal Forest (ac)	0.05	2:1	0.1	0.05	2:1	0.1
Tidal Emergent (ac)	0.01	2:1	0.02	0.01	2:1	0.02
Intermittent and Perennial Streams (lf)	3,190	1:1	3,190	2,943	1:1	2,943

The agencies also typically require compensatory stream mitigation projects to replace stream functions when feasible. In addition to stream channel improvements, mitigation measures for waterway impacts consider the size, stream order, and location of the stream to determine appropriate stream mitigation. Other mitigation measures, such as removal of fish blockages, riparian buffer enhancements, in-stream habitat improvements, and water quality improvements, may also be used at the agencies' discretion.

Based on the currently identified permanent stream impacts, the Proposed Project would be expected to provide stream restoration totaling at least 3,190 linear feet for Alternative 9A and 2,943 linear feet for Alternative 9B (see **Table 11-7**). However, of these stream impacts, over 2,500 linear feet of impact is to previously disturbed headwater streams running parallel to the existing track that had been relocated during construction of the original rail track. These stream reaches are currently linear ditches with mostly rock ballast or sand substrates and little habitat structure. To mitigate for these permanent stream impacts resulting from track widening, the reaches would be relocated to the new track toe of slope. As part of this relocation, opportunities for in-stream habitat and water quality improvements will be investigated. Further mitigation options will be determined as the Proposed Project moves forward in design.

To address the potential need for off-site mitigation, a preliminary desk-top level mitigation site search was conducted within the Lower Susquehanna River and Swan Creek watersheds, as project impacts will occur within those two watersheds. All nontidal wetland impacts will occur within the Lower Susquehanna River watershed so the site search for nontidal wetlands was conducted only within that watershed. Site search criteria included non-forested sites located within topographic depressions or floodplains with areas of mapped hydric soils providing at least an acre of created wetland. The site search also targeted potential tidal wetland creation or restoration sites and hardened shoreline areas where more natural shoreline protection measures might allow for creation or enhancement of aquatic habitat. For stream mitigation, riparian areas within the Lower Susquehanna River and Swan Creek watersheds were investigated for their restoration potential, including stream channel stabilization, fish blockage removal, in-stream habitat improvements, riparian buffer enhancements, and water quality improvements. After potential wetland and stream mitigation sites were selected during the desk-top level site search, a windshield survey of publicly accessible sites was conducted to confirm landscape position and land use within the potential site.

Based on the windshield surveys, a total of eight potential nontidal wetland creation sites were carried forward. For potential stream restoration sites, one site was extended and the overall number of potential stream sites to carry forward was reduced to 17. Sites were eliminated for various reasons, including changed site conditions, steep topography, presence of utilities, etc. Additionally, an offsite potential tidal wetland enhancement area was identified along the Susquehanna River in Harford County. During the subsequent final design and permitting phase, these potential sites will be explored in more detail, and property access notification letters will be sent seeking permission to conduct more detailed on-site investigations. More detailed information on the site search process and full mitigation site descriptions are located in **Appendix E**, Attachment D.

Any mitigation measures employed due to unavoidable project impacts to waters of the U.S., including wetlands, will follow the Federal Compensatory Mitigation Rule (33 Code of Federal Regulations [CFR] Parts 325 and 40 CFR Part 230), and Maryland state compensatory mitigation guidelines, as well as other practicable recommendations from federal and state resource agencies. Mitigation options under both the Federal Rule and state mitigation guidelines could include mitigation banking credits, in-lieu fees, or permittee-responsible mitigation using a watershed approach in that order of preference.

FOREST RESOURCES

Avoidance of a larger forest tract at the western end of the study area was accomplished by reducing the scope of the Proposed Project to tie back into the existing tracks prior the start of the large forest tract. Incorporation of tree protection measures during the development of the FCP will be coordinated, reviewed, and approved by DNR.

Where unavoidable permanent forest impacts occur, Amtrak will offset those impacts by planting trees in cleared areas (reforestation) and/or in areas not previously forested (afforestation). During the final design and permitting stage, Amtrak will develop and implement a DNR-approved FCP that prescribes the reforestation and afforestation acreage, mitigation site selection process, planting requirements and specifications, and monitoring plan.

Goals of the FCP are to: protect all priority forests, specimen trees, and sensitive areas on-site where possible; minimize impacts to other on-site vegetated areas to the greatest extent practicable; and define mitigation areas for unavoidable impacts to forest resources and specimen trees. Priority forests are those that include wetlands, streams, 100-year floodplains, endangered species, and specimen trees.

Forest mitigation must comply with Forest Conservation Act requirements for linear transportation projects. Based on afforestation and reforestation rules under this law, preliminary calculations of required mitigation for effects including forested and non-forested areas would total approximately 5.0 acres of tree planting for Alternative 9A and 3.4 acres of tree planting for Alternative 9B. This meets the requirements of the *State Forest Conservation Technical Manual* as defined in the Forests Section, Section III.

AQUATIC RESOURCES

The Project Team minimized aquatic impacts through refined engineering design and reducing the number of in-water piers required for the proposed bridges. Further minimization of aquatic impacts is mandated by MDE sediment and erosion control regulations in the form of time of year in-stream work restrictions for the protection of fish spawning or migration. These stream closure periods prohibit in-stream work from March 1 through June 15 for Use I streams and from June 1 through September 30 and December 16 through March 14 for Use II streams.

Sediment containment techniques, such as turbidity curtains and other approved best practices, will be used during construction to minimize sediment releases that could harm SAV. In addition, MDE sediment and erosion control regulations require time of year work restrictions within designated SAV beds. The closure period for work within designated SAV areas is from April 1 through October 15.

Mitigation for unavoidable permanent impacts to SAV will follow the Federal Compensatory Mitigation Rule (33 CFR Parts 325 and 40 CFR Part 230), and other state compensatory mitigation guidelines, as well as other recommendations from federal and state resource agencies. The typical in-kind compensation ratio for SAV impacts is 3:1. For the estimated permanent impacts to SAV from the two selected alternatives, replacement of at least 1.83 acres would be required. Mitigation options under both the Federal Rule and state mitigation guidelines could include mitigation banking credits, in-lieu fees, or permittee-responsible mitigation using a watershed approach in that order of preference. A preliminary site search was conducted to identify potential mitigation sites to offset wetland, stream, and SAV. Details of the mitigation site search are included in **Appendix E**, Attachment D. The NMFS has indicated that mitigation of SAV impacts should include replanting the beds disturbed during construction following project completion. This will be investigated along with other out-of-kind mitigation alternatives as the Proposed Project advances to later design phases. The final decision to replace function, acreage, or both may be adjusted at the discretion of the USACE or MDE, depending on the practicability of the proposed mitigation.

CHESAPEAKE BAY CRITICAL AREA

Minimization efforts to avoid the Critical Area were incorporated as part of the early design for the Proposed Project. Also, whenever possible, the Critical Area has been further avoided by the proposed Alternatives. Further minimization and mitigation measures for unavoidable impacts to the Critical Area could include:

- Erosion and sediment control measures would be provided and strictly enforced to minimize impacts.
- Replacement lands of equal or greater natural resource and economic value.
- Additional appropriate mitigation measures, such as landscaping (where applicable with respect to the resource), would be developed through coordination with the appropriate parties.

Additional discussions are anticipated to occur regarding the Proposed Project’s potential impacts to the Critical Area and mitigation measures that could lessen potential impacts.

COASTAL ZONE MANAGEMENT

Although minimization/mitigation are not typically identified specifically for Coastal Zone Management, appropriate avoidance, minimization, and mitigation of impacts to wetlands, waterways, and floodplains will be addressed as part of the permit application/authorization process with MDE and the USACE, and will be considered the Coastal Zone Management consistency review.

UNIQUE AND SENSITIVE AREAS

With no impacts anticipated to NHAs or Wild and Scenic Rivers, avoidance and minimization measures for these resources are not appropriate for the Proposed Project. Impacts to Green Infrastructure hubs have been minimized by placing the Proposed Project within and adjacent to the existing rail alignment. In addition, the proposed new alignments tie into the existing alignment as close to the river bridge as possible to avoid impacts to a large forested area that serves as a hub. Any reforestation requirements due to tree and forest loss could consider locations that would promote Green Infrastructure efforts, such as buffer enhancement, forest connectivity (FIDS habitat development), and reforestation near, or adjacent to, existing hubs and corridors.

G. REFERENCES

See **Appendix E**. ✷

Chapter 12: Air Quality

A. INTRODUCTION

This chapter assesses how operation of the Proposed Project would affect ambient air quality. The potential short-term temporary impact on air quality from construction of the Build Alternatives is discussed in Chapter 17, "Construction Effects."

The air quality analyses are based on the anticipated changes in train operations with the Build Alternatives, as described in Chapter 3, "Transportation." (The alternatives are described in detail in Chapter 2, "Project Alternatives.") This chapter examines the effect of changes in train operations and track alignment on both regional (mesoscale) emissions and local (microscale) concentrations of air pollutants. The Project would not introduce any new, permanent stationary emission sources, such as boilers or generators.

B. REGULATORY CONTEXT AND METHODOLOGY

The methodology, including train volumes and other assumptions, regulatory context, and detailed discussion of the results are presented in **Appendix F**, "Air Quality, Noise, and Vibration."

C. AFFECTED ENVIRONMENT

Cecil County and Harford County are within a nonattainment area for ozone. In addition, Harford County is within a maintenance area for $PM_{2.5}$, as described in more detail in **Appendix F**. Pollutant levels measured at area monitoring stations are used to characterize existing conditions. **Table 12-1** shows relevant regulated pollutants studied, including:

- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- PM_{10}: Particulate matter (PM) with aerodynamic diameter of less than or equal to 10 micrometers
- $PM_{2.5}$: Particulate matter with aerodynamic diameter of less than or equal to 2.5 micrometers
- Nitrogen dioxide (NO_2)
- Ozone (measured in 2014 at monitoring stations closest to the project area)

These values are the most recent data available at the time the analysis was undertaken, and are consistent with the background conditions used in the future conditions analyses (see below). Monitored levels of ozone exceed the National Ambient Air Quality Standards (NAAQS), as discussed in **Appendix F**.

While the measured concentrations of pollutants other than ozone are lower than the NAAQS, the monitors are not located adjacent to specific sources such as highways or rail lines and do not represent concentrations specifically-affected by such operations, but rather the background concentrations in the area in general. Concentrations of PM, CO, and NO_2 in the existing condition near the tracks are likely higher than those presented in **Table 12-1**.

Table 12-1
Representative Monitored Ambient Air Quality Data

Pollutant	Location	Units	Averaging Period	Concentration(1)	NAAQS
CO	Essex, Baltimore County	Ppm	8-hour	1.3	9
			1-hour	1.8	35
SO_2	Essex, Baltimore County	$\mu g/m^3$	3-hour	N/A	1,300
			1-hour	68	196
PM_{10}	Baltimore, Baltimore County	$\mu g/m^3$	24-hour	41	150
$PM_{2.5}$	Fair Hill, Cecil County	$\mu g/m^3$	Annual	8.6	12
	Edgewood, Harford County			10.3	
	Fair Hill, Cecil County	$\mu g/m^3$	24-hour	24	35
	Edgewood, Harford County			21	
NO_2	Essex, Baltimore County	$\mu g/m^3$	Annual	21	100
			1-hour	87	188
Ozone	Fair Hill, Cecil County	Ppm	8-hour	**0.074**	0.070
	Churchville, Harford County			0.070	

Notes: 1. All concentrations presented are based on 2014 data. CO and PM_{10} concentrations are the second-highest values. SO_2 1-hour is the 99th percentile of daily maximum 1-hour average concentrations. NO_2 1-hour is the 98th percentile of daily maximum 1-hour average concentrations averaged over the 3-year period of 2012 to 2014. 24-hour average $PM_{2.5}$ is the 98th percentile. Annual value is the mean for the year. 8-hour average ozone concentrations are the 4th highest-daily values for 2014. Concentrations in **bold** exceed the NAAQS.

Sources: USEPA, Air Data, Monitor Values Report for 2014 http://www.epa.gov/airdata/ad_rep_mon.html, accessed January 6, 2016.

D. NO ACTION ALTERNATIVE

REGIONAL (MESOSCALE) ANALYSIS

Regional (mesoscale) emissions are assessed on an incremental basis (emissions change resulting from a Build Alternative as compared with the No Action Alternative). Therefore, a mesoscale analysis is not presented for the No Action Alternative separately.

LOCAL (MICROSCALE) ANALYSIS

Projected maximum concentrations of pollutants in 2040 at locations near the south wye track for the No Action Alternative are presented in **Table 12-2**. The reasons why this location was selected for the microscale analysis are discussed in **Appendix F**. Maximum projected $PM_{2.5}$ (24-hour and annual average), PM_{10} (24-hour average), and annual average NO_2 concentrations would be lower than the respective NAAQS. However, 1-hour average NO_2 concentrations could potentially exceed the NAAQS in the No Action Alternative. Exceedances could potentially occur all along the tracks, up to 500 feet to the east and west of the at-grade crossing of the Norfolk Southern (NS) Port Road at Ostego Street in Perryville; and up to 200 feet to the north and south of the Susquehanna River Rail Bridge approach in Perryville (see **Figure 12-1**). Concentrations at other locations along the track, including areas outside the study area, may be lower due to lower engine loads (lower grade and/or less track curvature), fewer freight trains, and a lack of idling locomotives; however, 1-hour NO_2 exceedances are, nonetheless, possible in all areas where this level of diesel operations would occur, as discussed in more detail in **Appendix F**. Note that while detailed concentrations in existing conditions were not analyzed, it is expected that the concentrations near the tracks in the existing conditions would be similar to those projected for the No Action Alternative.

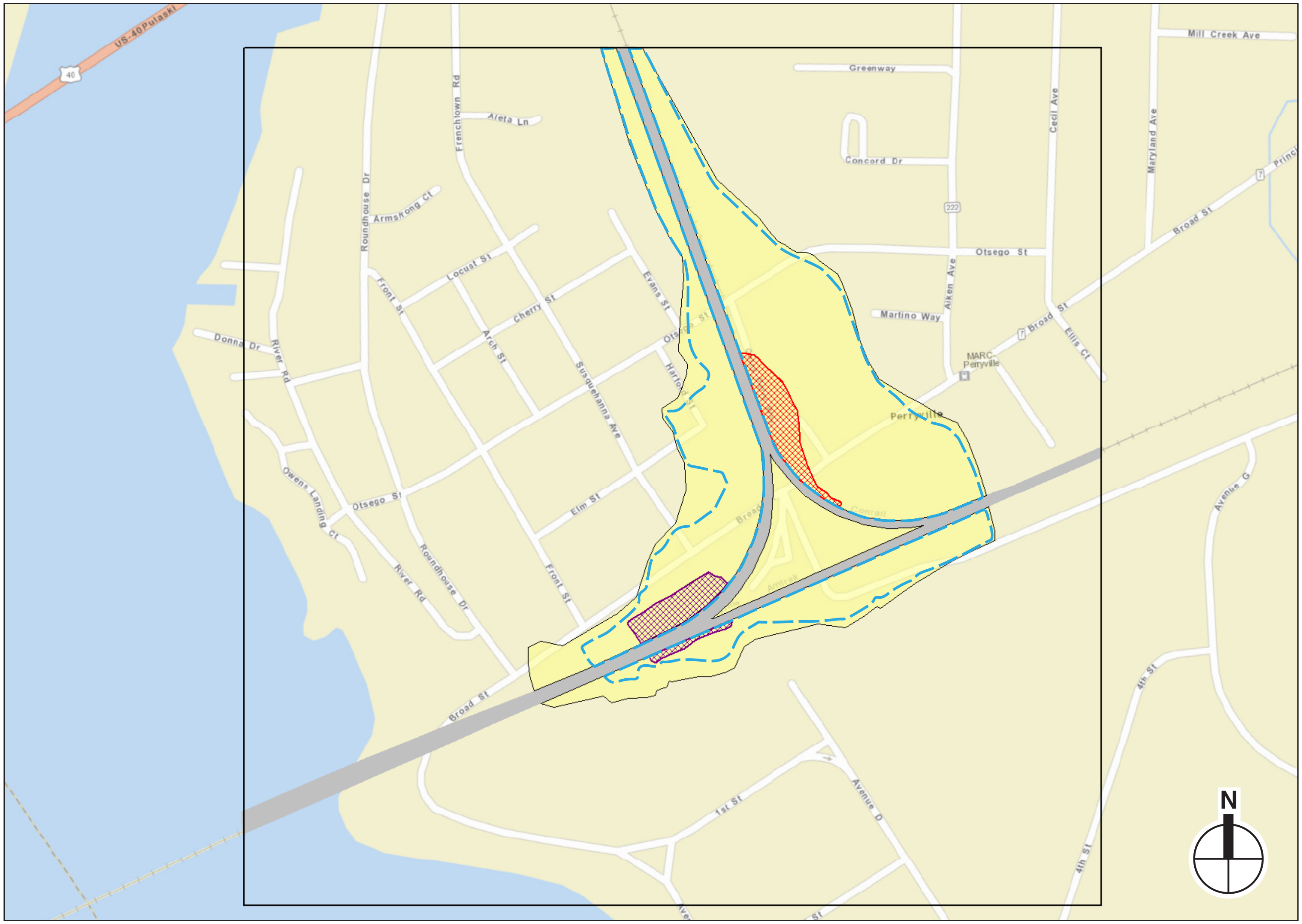
Table 12-2
Maximum Projected Concentrations— No Action Alternative (µg/m^3)

Pollutant	Time Period	Background Concentration	No Action Modeled Concentration	No Action Total Concentration	NAAQS
NO_2	1-Hour	(1)	(1)	**283**	188
	Annual	24.7	8.29	33.0	100
$PM_{2.5}$	24-Hour	23.5	0.5	24.0	35
	Annual	10.9	0.1	11.0	12
PM_{10}	24-Hour	44	0.5	44.5	150

Notes:
Results in **bold** exceed the NAAQS.
1. Consistent with EPA guidance, total NO_2 1-hour concentrations include seasonal hourly background concentrations developed from hourly monitored NO_2 concentrations at the Fair Hill monitoring station over the years 2010 to 2014.

The above 1-hour average NO_2 concentrations were predicted using a conservative modeling approach where peak activity within the overnight and daytime periods were modeled throughout these respective periods at all hours. Peak overnight activity assumed in the model includes three diesel powered freight locomotives, while daytime activity assumed includes one diesel powered freight locomotive and three diesel powered MARC locomotives. The approach of applying peak activity to all hours a peak may occur ensures that the combination of worst-case emission rates and worst-case meteorological conditions, resulting in peak potential concentrations at each of the nearby receptors, are captured. However, due to the infrequent number of times that peak activity would occur, it is unlikely that peak activity would consistently occur during worst-case meteorological conditions at any one receptor, and therefore, this approach results in conservatively high estimates of potential 1-hour NO_2 concentrations. To demonstrate this effect, the Project Team analyzed the effect of actual hourly freight train activity recorded on the Northeast Corridor (NEC) from September 2015 to April 2016. With actual recorded hourly freight activity (including hourly number of freight trains by direction and train tonnage) projected 1-hour NO_2 concentrations resulting from freight rail fell below the NAAQS threshold of 188 µg/m^3. While concentrations are only representative of freight locomotive sources, these sources would result in the worst-case 1-hour concentrations.

12.8.16



Extent of Potential Exceedance – Build Alternatives

Extent of Potential Exceedance – No Action Alternative

Area of Highest Potential Concentrations

Area of Highest Potential Increment

Extent of Model Projections

Modeled Railroad Source

Areas of Potential Exceedance of the 1-Hour NO_2 Standard

Figure 12-1

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

REGIONAL (MESOSCALE) ANALYSIS

Table 12-3 illustrates projected increases in emissions associated with the Build Alternatives within each Air Quality Control Region (AQCR) in the study area. These represent the total increase in emissions with the Build Alternatives, associated with increased freight movement along the rail track between areas to the north towards Pennsylvania and either Baltimore or Wilmington. Additionally, the increased MARC train volumes traveling between Baltimore and Elkton as well as the exclusive utilization of diesel powered trains are included in the regional annual emissions. Note that this analysis does not present the net change in emissions in the non-attainment areas, nor does it account for the overall benefits of the NEC FUTURE region-wide. This analysis conservatively compares only the increments with the de minimis thresholds for general conformity, demonstrating that the Build Alternatives would not require a conformity determination. The projected increases presented do not take into account the shift in intercity travel within the nonattainment area from motor vehicles to the improved Amtrak high speed rail and MARC service. The Build Alternatives would promote this shift to more fuel efficient transportation, reducing vehicle miles traveled—and consequently pollutant emissions—within the region.

Table 12-3
Predicted Increases in Regional Annual Emissions

Criteria Pollutant	Emissions Increases (ton/year)		De Minimis Threshold
	Baltimore	Philadelphia-Wilmington-Atlantic City	
NO_x	39	14	100
$PM_{2.5}$	0.5	0.2	100
VOC	1.5	0.5	50

Note: This table conservatively present potential increases only, and does not show the net change which would include decreases associated with the shift from highway travel to rail.

Regulations under the Clean Air Act ("conformity regulations") require that federal agencies, when taking action to assist, fund, permit, or approve projects in areas with a non-attainment or maintenance status regarding any of the NAAQS, ensure that the projects conform to the applicable State Implementation Plans (SIPs) for attaining those standards, so as not to interfere with the state's ability to attain and maintain the NAAQS. The total projected emissions in each AQCR represent a small fraction of the *de minimis* levels defined in the conformity regulations. This demonstrates that the operation of the Build Alternatives would not require a conformity determination and would not interfere with SIPs for attainment of the ozone NAAQS or maintenance of the $PM_{2.5}$ NAAQS within each AQCR. Emissions increases may also occur in other non-attainment areas traversed by affected rail lines beyond the project study area; those emissions increases would likely be on the order of those shown in **Table 12-3**; therefore, no conformity determinations would be required for any other non-attainment or maintenance areas. Overall, the Proposed Project would not substantially affect regional air quality in the nonattainment areas.

As described above, the conformity analysis for the non-attainment area does not include the benefits of shifting of travel from highway to the more efficient rail mode. Furthermore, in the larger region including the NEC, the NEC FUTURE would promote the more efficient passenger rail service. As described in Chapter 13, "Greenhouse Gas Emissions and Climate Change," overall, Amtrak service is 33 percent more efficient per passenger-mile than average highway travel (nationwide), and is likely more efficient than that along the NEC where ridership is high. The Build Alternatives are a component of the larger sustained effort to enhance passenger rail and freight rail for the long term, benefitting air quality and reducing pollutant emissions overall.

LOCAL (MICROSCALE) ANALYSIS

Table 12-4 presents maximum total concentrations projected to occur at locations near the south wye track west of Perryville Station due to track realignment and increased locomotive activity. The projected maximum concentrations and increments presented in **Table 12-4** are the same for with Alternative 9A and Alternative 9B. **Appendix F** includes a more detailed discussion of results. Similar to the No Action Alternative, maximum projected $PM_{2.5}$ (24-hour and annual average), PM_{10} (24-hour average), and annual average NO_2 concentrations with the Build Alternatives would be lower than the respective NAAQS. As with the No Action Alternative, the 1-hour average NO_2 concentrations were projected to potentially exceed the NAAQS up to 500 feet to the east and west of the at-grade crossing of the NS Port Road at Otsego Street in Perryville. Peak hourly freight train volume and alignment will be the same with the Build Alternatives and the No Action Alternative; therefore the 1-hour NO_2 exceedances in these areas would occur in both the No Action Alternative and Build Alternatives, and would not be a result of the Proposed Project. The 1-hour average NO_2 concentrations were projected to potentially exceed the NAAQS up to 280 feet north and south of the Susquehanna River Rail Bridge approach in Perryville where diesel locomotives operate—80 feet farther from the freight track than in the No Action Alternative because of the track realignment and grade changes.

Table 12-4
Maximum Projected Concentrations

Pollutant	Time Period	Background Concentration (µg/m^3)	No Action Concentration (µg/m^3)	Build Concentration (µg/m^3)	NAAQS (µg/m^3)
NO_2	1-Hour	[1]	**283**	**292**	188
	Annual	24.7	33.0	34.2	100
$PM_{2.5}$	24-Hour	23.5	24.0	24.3	35
	Annual	10.9	11.0	11.1	12
PM_{10}	24-Hour	44	44.5	44.8	150

Notes:
Results in **bold** exceed the NAAQS.
Project concentrations represent results at the wye track under Alternative 9A and Alternative 9B.
1. Consistent with EPA guidance, NO_2 1-hour concentrations utilized seasonal hourly background concentrations developed from hourly monitored NO_2 concentrations at Fair Hill monitoring station over the years 2010 to 2014.

While total concentrations at residences adjacent to the track curve re-alignment (south of Broad Street and west of the wye track) are projected to be lower than the above maximums (at most 209 µg/m^3 and 226 µg/m^3 in the No Action and Build Alternatives, respectively), the concentrations at those locations would nonetheless also potentially exceed the NAAQS, and would represent an increase of up to 3 percent over the levels predicted under the No Action Alternative (see **Figure 12-1**). (Note that this section focuses only on potential local effects; for discussion of the benefits of efficient rail travel and freight in region-wide air quality and greenhouse gas emissions, see the "Regional (Mesoscale) Analysis" section above and Chapter 13, "Greenhouse Gas Emissions and Climate Change.")

As described for the No Action scenario, the above Build Alternative concentrations were predicted using a modeling approach that necessarily results in conservative estimates of potential 1-hour NO_2 concentrations. Due to the infrequent number of times that peak activity would occur, it is unlikely that peak conditions would consistently occur during worst-case meteorological conditions at any one receptor. To demonstrate this effect, additional modeling was performed using actual hourly freight train activity recorded on the NEC from September, 2015 to April, 2016. When actual hourly freight train activity was modeled, projected 1-hour NO_2 concentrations fell below the NAAQS threshold of 188 $\mu g/m^3$. While concentrations are only representative of freight locomotive sources, these sources would result in the worst-case 1-hour concentrations. Therefore, it is possible that the predicted 1-hour average NO_2 NAAQS exceedance shown in **Table 12-4** is purely due to the conservative nature of the regulatory modeling approach. Actual 1-hour NO_2 concentrations and the increase in those concentrations with the Build Alternatives will likely be lower than shown in **Table 12-4**.

The increment as compared with the No Action Alternative is associated with the proposed track realignments described above and the increase in freight movement and MARC diesel train volumes with the Build Alternatives. Concentrations at other locations near the freight tracks between the wye track in Perryville and areas to the north and areas along the NEC to the south of the bridge (Havre de Grace and farther south) are also anticipated to increase somewhat with the Build Alternatives when compared with the No Action Alternative due to the growth in daily and annual freight movement, but would be less than the results presented above since there would be no change in track location or grade at those locations. However, peak hourly concentrations, including 1-hour average NO_2, would not increase in areas outside the study areas as compared with the No Action Alternative since peak hour freight train volume would not increase.

In summary, local 1-hour average NO_2 concentrations may increase near the proposed bridge that would be used by MARC and freight trains. Concentrations with the Build Alternatives (both the Preferred Alternative 9A and Alternative 9B) could increase by up to 8.6 percent in areas where the model predicts an exceedance of the 1-hr NO_2 NAAQS under the No Action Alternative. Given the necessarily conservative modeling approach required to address the complex form of the 1-hour NO_2 standard, actual increases of 1-hour NO_2 concentrations would likely be much lower than the modeled 8.6 percent and actual total concentrations would likely not exceed the NAAQS. Furthermore, concentration increases would likely be limited to smaller areas than those shown in **Figure 12-1**. Overall, local air quality with and without the Proposed Project is likely to be very similar. Considering all of the above, the low probability of NAAQS exceedance, the small potential increment, and the limited area potentially affected, the Build Alternatives would not result in a significant adverse impact on air quality.

F. MINIMIZATION AND MITIGATION OF IMPACTS

Measures to minimize and mitigate the effects of the Proposed Project on air quality that can be implemented by the Project Team are discussed in Chapter 17, "Construction Effects." During operation, the Project Team will have limited influence on emissions from rail.

Amtrak trains are electric and therefore have zero emissions at the local level. Furthermore, Amtrak actively works on increasing ridership and efficiency. This helps to avoid emissions from personal vehicle travel and to minimize per passenger use of electricity (and associated regional emissions) to operate the trains.

Freight trains have diesel locomotives and are operated by Norfolk Southern. Their emissions are subject to USEPA regulations and cannot be reduced by the Proposed Project. MARC currently has a program to purchase diesel locomotives meeting Tier IV emission standards. While Tier IV locomotives would emit less than the diesel locomotives in the existing fleet, further emission reductions would be possible if MARC trains were electric. The electrification of MARC fleet is beyond the control of the Proposed Project and is therefore not part of minimization and mitigation measured for the Proposed Project.

Should MARC switch to an electric fleet independent of the Proposed Project, total concentrations would be only slightly lower than those shown for the Proposed Project in **Table 12-4**. However, excluding ambient backgrounds, the 24-hour average and annual concentrations would decrease by approximately 5 percent and 22 percent, respectively. The emission reduction benefits of possible electrification of MARC service would not decrease the 1-hour average NO_2 concentrations reported in **Table 12-4**, as the 1-hour NO_2 concentrations are affected by diesel freight trains to a much greater extent than by MARC trains (whether they run on diesel or electricity). ✷

Chapter 13: Greenhouse Gas Emissions and Climate Change

A. INTRODUCTION

This chapter discusses energy use, energy savings, greenhouse gas (GHG) emissions, and GHG emissions reduced as a result of the Proposed Project, and its consistency with established sustainability measures and GHG reduction goals. As discussed in the Council on Environmental Quality's (CEQ) guidance,[1] climate change is projected to have wide-ranging effects on the environment, including rising sea levels, increases in temperature, and changes in precipitation levels. Although this is occurring on a global scale, the environmental effects of climate change are also likely to be observed at the local level. The U.S. has established sustainability initiatives and goals for greatly reducing GHG emissions and for adapting to climate change.

While the contribution of any single project to climate change is infinitesimal, the combined GHG emissions from all human activity impact the global climate. The nature of the impact dictates that all sectors identify practicable means to reduce GHG emissions. Following the CEQ guidance and given that the Proposed Project operation would reduce GHG emissions and energy use, this chapter does not specify the incremental contributions of the Proposed Project to climate effects, but rather identifies opportunities to further reduce energy consumption and GHG emissions during operation and construction. GHG emissions and energy are discussed in Section B.

The Proposed Project would constitute a major public investment in infrastructure with a useful life on a timescale at which the effects of climate change may become more noticeable. Effects of climate change that could affect the rail bridge, its approaches, and associated infrastructure include, but are not limited to, more frequent and intense heat waves, severe cold weather, more frequent and intense downpours and flooding, sea-level rise, and more intense or more frequent storms. Therefore, this chapter discusses the need to consider the potential effects of climate change when designing or upgrading the proposed infrastructure. The discussion is consistent with the available National Environmental Policy Act (NEPA) guidance. The Proposed Project's resiliency to future climate conditions is discussed in Section C.

As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative.

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[1] Executive Office of the President, CEQ. *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*. August 1, 2016.

B. GREENHOUSE GAS EMISSIONS AND ENERGY USE

POLICY, REGULATIONS, STANDARDS, AND BENCHMARKS

As a result of the growing consensus that human activity resulting in GHG emissions has the potential to profoundly affect the Earth's climate, countries around the world have undertaken efforts to reduce emissions by implementing both global and local measures addressing energy consumption and production, land use, and other sectors. Although the U.S. has not ratified international agreements which set emissions targets for GHGs, in December 2015, the U.S. signed the international Paris agreement[2] that pledges deep cuts in emissions, with a stated goal of reducing emissions to between 26 and 28 percent lower than 2005 levels by 2025[3] to be implemented via existing laws and regulations with executive authority of the President.

The U.S. Environmental Protection Agency (USEPA) is required to regulate greenhouse gases under the Clean Air Act (CAA), and has begun preparing and implementing regulations. In coordination with the National Highway Traffic Safety Administration (NHTSA), USEPA currently regulates GHG emissions from newly manufactured on-road vehicles. In addition, USEPA regulates transportation fuels via the Renewable Fuel Standard program, which will phase in a requirement for the inclusion of renewable fuels increasing annually up to 36.0 billion gallons in 2022. The U.S. Department of Transportation (USDOT) is also involved in many activities, programs, and partnerships, including collaborations with other federal agencies and international organizations, aimed at reducing GHG emission.[4,5]

Various federal policies are aimed at reducing GHG emissions. For example, Executive Order 13514 of October 5, 2009 establishes the policy of the United States that "*Federal agencies increase energy efficiency; measure, report, and reduce their GHG emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services; design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; strengthen the vitality and livability of the communities in which Federal facilities are located … agencies shall prioritize actions based on a full accounting of both economic and social benefits and costs ...*" USDOT's implementation and reporting under this order[6] includes a focus on enhancing, expanding, and improving the efficiency of the national freight and passenger rail networks.

There are also regional and state efforts to reduce GHG emissions. Maryland is a participant in the Regional Greenhouse Gas Initiative (RGGI), a cooperative effort by Northeast and Mid-Atlantic states to reduce carbon dioxide emissions from power plants by 10 percent by 2019, through a regional cap-and-trade program. The RGGI program is mandated by State law and is fully implemented and enforceable through regulations (COMAR 26.09) adopted and enforced by Maryland Department of the Environment (MDE).

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[2] Conference of the Parties, 21st Session. *Adoption of The Paris Agreement, decision -/CP.21*. Paris, December 12, 2015.

[3] United States of America. *Intended Nationally Determined Contributions (INDCs).* March 31, 2015.

[4] http://climate.dot.gov/policies-legislation-programs/federal-org-directory.html

[5] http://climate.dot.gov/policies-legislation-programs/dot-partnerships/international-activities.html

[6] http://www.transportation.gov/mission/sustainability/our-sustainability-efforts-0

In 2009, Maryland Governor O'Malley and the Maryland General Assembly passed the *Greenhouse Gas Emissions Reduction Act of 2009* (GGRA). The law requires the State to develop and implement a plan to reduce GHG emissions 25 percent from a 2006 baseline by 2020; the bill was reauthorized in 2016 with a new target of 40 percent reduction by 2030. The State has also established a goal of doubling transit ridership by 2020 from the 2006 levels. These and other strategies for reducing GHG emissions at the state level are described in *Maryland's Greenhouse Gas Emissions Reduction Act Plan*.[7]

METHODOLOGY

Currently, there are no standards or regulations applicable to GHG emission levels or impacts from actions subject to environmental review. Accordingly, the potential effects of the Proposed Project are evaluated in the context of their consistency with the objectives stated in federal and state policies. Potential GHG emissions and emission savings from the Proposed Project are qualitatively assessed, and the feasibility and practicability of various measures available for reducing GHG emissions are discussed. This level of analysis is commensurate with the level of NEPA analysis per the CEQ guidance.

POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

The National Railroad Passenger Corporation (Amtrak) and Maryland Area Regional Commuter (MARC) enable travel by a mode that is more energy efficient and emits less GHG per passenger-mile, and usually per net-trip, than travel by car alone. The U.S. Department of Energy (USDOE) has reported that intercity (Amtrak) rail travel (in terms of energy used per passenger-mile) is 33 percent more efficient than travel by car.[8] Amtrak has made efforts to reduce CO_2 emissions from its diesel locomotive fleet and has made additional voluntary commitments and efforts to reduce and report emissions, through the Carbon Disclosure Project (CDP) and The Climate Registry (TCR).[9] Based on Federal Transit Administration (FTA) ridership and energy data,[10] travel via MARC is 9 percent more efficient than by car (in terms of energy used per passenger-mile). MARC is planning for growth in ridership and support of transit oriented development (TOD).[11] There are several factors indicating that this efficiency will increase and associated GHG emission from these passenger rail modes will continue to decrease in the future. Passenger rail projects that may result in increased ridership, such as NEC FUTURE, will result in higher efficiency per passenger mile because they will result in higher ridership per car and/or locomotive. GHG emissions will also decrease in the future as the generation of electric power (used by Amtrak trains) becomes more efficient and increasingly relies on renewable energy.

Rail is also an efficient way to move freight. While there is a large variability in efficiency based on route, equipment, and other characteristics of freight movement via truck and rail, rail is generally much more efficient. For example, a study of a wide variety of competitive freight

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[7] Maryland Department of the Environment. *Maryland's Greenhouse Gas Reduction Act Plan Update*. October, 2015.
[8] Oak Ridge National Laboratory. *Transportation Energy Data Book*. Ed. 34. August 2015.
[9] Amtrak. *How Amtrak Commits to Sustainability*. The Official Blog of Amtrak. January 22, 2014.
[10] FTA. *National Transit Database (NTD) 2014 Data Tables*. Tables 17 and 19. http://www.ntdprogram.gov, accessed 3/10/2016.
[11] MTA Maryland. *MARC Growth and Investment Plan*. September 2007.

routes that analyzed 23 routes found rail to be more fuel efficient in all cases, by a factor ranging from 1.9 to 5.5.[12]

Freight rail operators are also seeking to further improve energy efficiency in their operations. Norfolk Southern (NS) has reported that over five years, from 2010 through 2014, the company reduced its GHG emissions by 8.5 percent per revenue ton-mile of freight; this is the result of several factors, including but not limited to a 2.2 percent increase in locomotive operational efficiency, various idle-emissions reduction measures, and efficiency improvements at facilities.[13] In 2009, NS also introduced a prototype battery-operated switcher locomotive, the NS 999, and has continued to refine it. NS continues to investigate cleaner fuel options and additional energy efficiency measures, with the intent of continuing this trend and setting a new longer-term emission reduction goal. In 2015, NS scored 99 for carbon disclosure in the Climate Disclosure Project's Leadership Index and ranked in the top 10 percent of S&P 500 companies that participated in the voluntary survey.[14]

Therefore, the shift of passengers and freight from on-road modes to rail, enabled by the Proposed Project and components of NEC FUTURE, would result in a net reduction in operational energy use and ensuing GHG emissions.

GHG emissions associated with construction of the Proposed Project would result from direct sources, such as on-road and non-road vehicles, and other engines. GHG emissions would also result from indirect sources, including the energy and emissions associated with producing and transporting materials used in construction, especially energy intensive and carbon intensive materials, such as cement and steel.

ELEMENTS THAT WOULD REDUCE GHG EMISSIONS

As a routine part of designing railway projects, energy efficiency is a primary concern. Track grade and curvature—the main design elements affecting energy consumption[15]—are scrutinized to the extent practicable within the constraints of a rail project (such as land use and acquisition, connection to existing track). This would be the case for the Proposed Project design.

Regarding construction, the Proposed Project would use cement replacements, such as slag, fly-ash, silica fume, and calcined clay to the extent practicable. While the vast majority of structural steel and rebar available are from recycled sources, the Proposed Project would nonetheless set a minimum target of 25 percent of recycled steel to be used and tracked as part of the contract requirements.

Overall, the Proposed Project would result in long-term reductions in GHG emissions from freight transport due to the efficient nature of rail versus on-road modes, as described above. In general, system-wide, including energy and emissions embedded in construction of roadway and railway infrastructure, there is a net energy and GHG benefit of rail systems versus on-road

[12] Federal Railroad Administration. *Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors*. November 19, 2009.

[13] Norfolk Southern. *Norfolk Southern 2015 Sustainability Report*. 2015.

[14] CDP. https://www.cdp.net, accessed 3/11/16.

[15] Increased grade requires more power to overcome gravity, and the power conserved in the downhill direction does not fully compensate for the increase in the uphill direction. Added curvature requires more power to overcome friction.

systems.[16,17] The Proposed Project would be consistent with state, regional, and federal policies for GHG emissions reduction.

C. CLIMATE CHANGE RESILIENCE

DEVELOPMENT OF POLICY TO IMPROVE CLIMATE CHANGE RESILIENCE

In recognition of the important role that the federal government has to play to address adaptation to climate change, a federal executive order signed October 5, 2009 charged the Interagency Climate Change Adaptation Task Force, composed of representative from more than 20 federal agencies, with recommending policies and practices that can reinforce a national climate change adaptation strategy. The 2011 progress report by the Task Force included recommendations to build resilience to climate change in communities by integrating adaptation considerations into national programs that affect communities, facilitating the incorporation of climate change risks into insurance mechanisms, and addressing additional cross-cutting issues, such as strengthening resilience of coastal, ocean, and Great Lakes communities.[18] In February 2013, federal agencies released Climate Change Adaptation Plans for the first time. The President's Climate Action Plan[19] outlines a plan for resiliency that includes building stronger and safer infrastructure through agency support in investment, developing standards, and other measures, and was followed by an executive order[20] directing agencies to implement the plan. In January 2015, a Presidential executive order was issued[21] requiring that federal actions use natural systems and approaches where possible when developing adaptation alternatives for consideration. The executive order also redefined the floodplain elevation as either:

- Future projected levels;
- The level that results from adding 2 feet (or 3 feet for critical actions) to the current base flood elevation;
- The "500-year" elevation (elevation of the flood with 0.2 percent probability in any given year); or
- The level obtained via other methods yet to be developed.

USDOT is currently working with State Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) to develop approaches to conduct climate change vulnerability and risk assessments of transportation infrastructure.

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[16] Nahlik et al. *Journal of Industrial Ecology*. Goods Movement Life Cycle Assessment for Greenhouse Gas Reduction Goals. May 2015.

[17] Horvath, A. *Int J Life Cycle Assessment.* 11: 229. doi:10.1065/lca2006.02.244 February 2006.

[18] The White House Council on Environmental Quality. *Progress Report of the Interagency Climate Change Adaptation Task Force: Federal Actions for a Climate Resilient Nation*. October, 2011.

[19] Executive Office of the President. *The President's Climate Action Plan*. June 2013.

[20] The White House. *Executive Order—Preparing the United States for the Impacts of Climate Change*. November 1, 2013.

[21] The White House. *Executive Order [13690]—Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*. January 30, 2015.

PROJECTED CHANGES IN CLIMATE IN THE STUDY AREA

Due to its low-lying topography and proximity to the mid-Atlantic coast, the State of Maryland is one of the most vulnerable states in the country to sea level rise. Tide gauge measurements show that Maryland has experienced approximately one-foot of sea level rise over the last century and impacts, such as increased coastal flooding, inundation of low-lying lands, more shoreline erosion, and salt-water intrusion, have been detected.[22] The Scientific and Technical Working Group to the Maryland Climate Change Commission[23] recommended that while it may be acceptable to use the “Best” projection of sea-level rise of 3.7 feet (end of century) for planning facilities or public infrastructure that would have a relatively short useful life (not extending beyond this century) or which could tolerate very occasional inundation, the “High” estimate of 5.7 feet may be more appropriate for investment in infrastructure or facilities with longer expected lifetimes or where there is a very low acceptance of any flooding risk. The Working Group also recommended that planners and engineers take into consideration anticipated changes in storm surge heights and tidal flood levels as a result of future sea-level rise.

Other changes potentially relevant to the Proposed Project would include temperature, wind, and precipitation. The Working Group found that

- Average temperature is projected to increase by approximately 3 degrees Fahrenheit (°F) by mid-century; the amount of warming later in the century is dependent on the mitigation of GHG emissions, with summer temperatures projected to increase by as much 9°F, and heat waves extending throughout most summers.
- Projections of precipitation are much less certain than those for temperature, but modest increases are more likely in the winter and spring. Because of more intermittent rainfall and increased evaporation with warmer temperatures, droughts lasting several weeks are projected to be more likely during the summer.

The Working Group did not provide specific projections for Maryland regarding wind. However, based on general projections for the region, it is possible that there would be an increase in the frequency and/or severity of severe storms, including high wind gust events.

RESILIENCE OF THE PROPOSED PROJECT TO CLIMATE CHANGE

Given the scope and anticipated 100-year lifespan of the proposed replacement bridges, and based on the above federal guidance, the most appropriate design flood elevation (DFE) for the Proposed Project would be the best available estimates for future end-of-century flood elevations—in the range of 3.7 to 5.7 feet above the current “100-year flood” elevation (the flood elevation with a probability of one percent of occurrence in any given year). Based on the current data from FEMA, the future 100-year flood elevation would range up to 13 feet NAVD88 over water in the center of the bridge, 11 feet NAVD88 on land in Havre de Grace, and 10 feet NAVD88 on land in Perryville.

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[22] State of Maryland, *Climate Change and Coast Smart Construction Infrastructure Siting and Design Guidelines*, January 2014.

[23] Boesch, et al. Updating Maryland’s Sea-level Rise Projections. Special Report of the Scientific and Technical Working Group to the Maryland Climate Change Commission. University of Maryland Center for Environmental Science, Cambridge, MD, June 26, 2013.

The bridge itself would be designed to provide a 60-foot vertical clearance above MHW to reasonably meet current and future demand of the navigation traffic, and would, therefore, be well above the future potential flooding levels described above. This clearance would be reduced over time by sea level rise, estimated to be between 3.7 feet and 5.7 feet by the end of the century. The current moveable swing span provides a 52-foot vertical clearance above MHW in the closed position and a 127-foot vertical clearance in the open position, limited by overhead electric transmission lines. Based on a detailed navigation study,[24] the existing navigation channel addresses the needs of most mariners without requiring an opening, with only 3 to 11 openings per year since 2007. The proposed increase in vertical clearance, from 52 feet to 60 feet, may provide additional clearance for some vessels, which may be reduced in the future as the sea level rises. However, these few vessels do currently pass under the existing bridge at low tide, and could continue to do so in the future with the additional 8 feet of elevation. Overall, while there may be a small degradation in the benefit of additional clearance provided by the new bridge, the penalty for additional elevation beyond that considered for the Proposed Project would be substantial energy demand for freight moving across the bridge, and the need for additional property acquisition to design the approaches to a higher bridge.

The bridge approaches, landings, and track elevations modified or constructed by the Proposed Project would all be well above the above-mentioned flood elevations and, therefore, no special design considerations are necessary.

In addition to flooding, railways are potentially vulnerable to high temperatures and wind gusts. The Proposed Project would include auto-tensioned catenary designed to ensure that overhead electrical contact systems do not sag during heatwaves. Track design generally accounts for track buckling via design criteria—for the bridges criteria for structural steel temperature addresses a range of zero to 120°F. This generally prevents buckling even at rail temperatures of up to 150°F.[25] The bridge design will also accommodate changes in length of spans due to thermal movement. In general, track buckling occurs predominately on continuously welded track, though it also can occur on older jointed track when the ends of the track become frozen in place.[26] Track buckling is most prevalent on an isolated hot day in the springtime or early summer, rather than mid- to late summer when temperatures are more uniformly hot. Buckling also is more likely to occur in alternating sun/shade regions and in curves. Since the track is more stable when the rail is in tension at temperatures below the neutral temperature, the target neutral temperature is generally 75 percent of the expected maximum temperature of the region. An increase in temperature may slightly raise the neutral temperature used for installation but be unlikely to necessitate track design changes.[25]

Since there is currently no reliable indication that wind climate will substantially change, the bridge and catenary will be designed to resist wind based on the latest wind load design criteria.

Overall, the Proposed Project would be designed to accommodate any reasonably foreseeable potential future changes in climate, and would, therefore, be consistent with state and federal policies requiring climate change resiliency. ✷

[24] HNTB for Amtrak. *Susquehanna River Bridge Project Navigation Study*. January 2014.

[25] European Commission. *Impacts of Climate Change on Transport: A Focus on Road and Rail Transport Infrastructures.* Available: http://ftp.jrc.es/EURdoc/JRC72217.pdf. 2012.

[26] FHWA. *U.S. Climate Change Science Program Synthesis and Assessment Product 4.7: Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study, Phase I.* March 2008.

A. INTRODUCTION

This chapter assesses the potential noise impacts due to operation of the Proposed Project by comparing existing noise levels with the projected future noise levels at sensitive receptors near the project site. The potential for significant vibration impacts with regard to operation of the Proposed Project is also assessed.

The analysis was conducted according to methodology set forth in a guidance manual prepared by the Federal Transportation Authority (FTA), *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006 as well as a manual prepared by the Federal Railroad Administration (FRA), *High-Speed Ground Transportation Noise and Vibration Impact Assessment*, DOT/FRA/ORD-12/15, October 2005. The FTA guidance manual is used for analysis of “conventional” rail activity (i.e., at speeds less than 125 mph), and the FRA guidance manual is used for “high speed” rail activity (i.e., at speeds of 125 mph or greater). The guidance documents set forth methodologies for analyzing noise and vibration from commuter and intercity rail operations and as such are the standard methodology for assessing potential impacts of new rail bridges and transit systems. This chapter briefly describes the methodology used and results of the analysis conducted.

As discussed in Chapter 2, “Project Alternatives,” this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative.

B. NOISE FUNDAMENTALS, STANDARDS, AND IMPACT CRITERIA

AIRBORNE NOISE FUNDAMENTALS

Sound pressure levels are measured in units called “decibels” (dB). The particular character of the noise that we hear is determined by the rate, or “frequency,” at which the air pressure fluctuates, or “oscillates.” Frequency defines the oscillation of sound pressure in terms of cycles per second. One cycle per second is known as 1 Hertz (Hz). People can hear over a relatively limited range of sound frequencies, generally between 20 Hz and 20,000 Hz, and the human ear does not perceive all frequencies equally well. High frequencies are more easily discerned and therefore more intrusive than many of the lower frequencies[1].

“A”-WEIGHTED SOUND LEVEL (DBA)

To bring a uniform noise measurement that simulates people’s perception of loudness and annoyance, the decibel measurement is weighted to account for those frequencies most audible to the human ear. This is known as the A-weighted sound level, or “dBA,” and because of the

[1] Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006.

weighting based on human perception, it is the most often used descriptor of noise levels where community noise is the issue. As shown in **Table 14-1**, the threshold of human hearing is defined as 0 dBA; very quiet conditions (as in a library, for example) are approximately 40 dBA; levels between 50 dBA and 70 dBA define the range of normal daily activity; levels above 70 dBA are considered noisy, and then loud, intrusive, and deafening as the scale approaches 130 dBA. For most people to perceive an increase in noise, it must be at least 3 dBA. At 5 dBA, the change will be readily noticeable (Bolt, Beranek and Newman, 1973). An increase of 10 dBA is generally perceived as a doubling of loudness.

Table 14-1
Common Noise Levels

Sound Source	(dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Freight train at 30 meters	95
Train horn at 30 meters	90
Heavy truck at 15 meters	
Busy city street, loud shout	80
Busy traffic intersection	
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Light car traffic at 15 meters, city or commercial areas or residential areas close to industry	
Background noise in an office	50
Suburban areas with medium density transportation	
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0

Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.
Source: Cowan, James P. Handbook of Environmental Acoustics. Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.

Combinations of different sources are not additive in an arithmetic manner, because of the decibel scale’s logarithmic nature. For example, two noise sources—a vacuum cleaner operating at approximately 72 dBA and a telephone ringing at approximately 58 dBA—do not combine to create a noise level of 130 dBA, the equivalent of a jet airplane or air raid siren. Rather, the noise produced by the telephone ringing may be masked by the noise of the vacuum cleaner and not be heard, and the logarithmic combination of these two noise sources would be 72.2 dBA.

EFFECTS OF DISTANCE ON NOISE

Noise varies with distance. For example, highway traffic 50 feet away from a receptor (such as a person listening to the noise) typically produces sound levels of approximately 70 dBA. The same highway noise measures 66 dBA at a distance of 100 feet, assuming soft ground conditions (such as grass). This decrease is known as “drop-off.” The outdoor drop-off rate for line sources, such as traffic, is a decrease of approximately 4.5 dBA (for soft ground) for every doubling of distance between the noise source and receptor. For hard ground (such as concrete), the outdoor drop-off rate is 3 dBA for line sources. Assuming soft ground, for point sources, such as amplified rock music, the outdoor drop-off rate is a decrease of approximately 7.5 dBA for every doubling of distance between the noise source and receptor (for hard ground the outdoor drop-off rate is 6 dBA for point sources).[2]

NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

The sound-pressure level unit of dBA describes a noise level at just one moment, but since very few noises are constant, other ways of describing noise over more extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific period as if it were a steady, unchanging sound (i.e., as if it were averaged over that time period). For this condition, a descriptor called the “equivalent sound level” (L_{eq}) can be computed. L_{eq} is the constant sound level that, in a given situation and period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted as $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound.

A descriptor for cumulative 24-hour exposure is the day-night average sound level, abbreviated as L_{dn}. This is a 24-hour measurement that accounts for the moment-to-moment fluctuations in A-weighted noise levels due to all sound sources, combined. Mathematically, the L_{dn} noise level is the energy average of all $L_{eq(1)}$ noise levels over a 24-hour period, where nighttime noise levels (10 PM to 7 AM) are increased by 10 dBA before averaging because of increased noise sensitivity during nighttime when people are typically sleeping.

Following FTA guidance, either the maximum $L_{eq(1)}$ sound level or the L_{dn} sound level is used for impact assessment, depending on land use category as described below.

VIBRATION FUNDAMENTALS

Fixed railway operations have the potential to produce high vibration levels, since railway vehicles contact a rigid steel rail with steel wheels. Train wheels rolling on the steel rails create vibration energy that is transmitted into the track support system. The amount of vibrational energy is strongly dependent on such factors as how smooth the wheels and rails are and the vehicle suspension system. The vibration of the track structure “excites” the adjacent ground, creating vibration waves that propagate through the various soil and rock strata to the foundations of nearby buildings. As the vibration propagates from the foundation through the remaining building structure, certain resonant, or natural, frequencies of various components of the building may be excited.

The effects of ground-borne vibration may include discernable movement of building floors, rattling of windows, and shaking of items on shelves or hanging on walls. In extreme cases, the vibration can cause damage to buildings. The movement of building surfaces and objects within the building can also result in a low-frequency rumble noise. The rumble is the noise radiated from the motion of the room surfaces, even when the motion itself cannot be felt. This is called ground-borne noise.

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[2] FTA Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06.

All vibration levels in this document are referenced to 1×10^{-6} inches per second as is recommended in the FTA guidance manual for vibration analysis. "VdB" is used for vibration decibels to reduce the potential for confusion with noise decibels.

EFFECT OF PROPAGATION PATH

Vibrations are transmitted from the source to the ground, and propagate through the ground to the receptor. Soil conditions have a strong influence on the levels of ground-borne vibration. Stiff soils, such as some clay and rock, can transmit vibrations over substantial distances. Sandy soils, wetlands, and groundwater tend to absorb movement and thus reduce vibration transmission. Because subsurface conditions vary widely, measurement of actual vibration conditions, or transfer mobility, at the site can be the most practical way to address the variability of propagation conditions[3].

HUMAN RESPONSE TO VIBRATION LEVELS

Although the perceptibility threshold for ground-borne vibration is about 65 VdB, the typical threshold of human annoyance is 72 VdB. As a comparison, buses and trucks rarely create vibration that exceeds 72 VdB unless there are significant bumps in the road, and these vehicles are operating at moderate speeds[1]. Vibration levels for typical human and structural responses and sources are shown in **Table 14-2**.

Table 14-2
Typical Levels of Ground-Borne Vibration

Human/Structural Response	Velocity Level (VdB)	Typical Sources (at 50 feet)
Threshold, minor cosmetic damage fragile buildings	100	Blasting from construction projects
		Bulldozers and other heavy tracked construction equipment
Difficulty with vibration-sensitive tasks, such as reading a video screen	90	Locomotive powered freight train
Residential annoyance, infrequent events	80	Rapid Transit Rail, upper range
		Commuter Rail, typical range
Residential annoyance, frequent events		Bus or Truck over bump
	70	Rapid Transit Rail, typical range
Limit for vibration-sensitive equipment. Approximate threshold for human perception of vibration	60	Bus or truck, typical
	50	Typical background vibration
Source: U.S. Department of Transportation, FTA, *Transit Noise and Vibration Impact Assessment,* May 2006.		

[3] Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006.

NOISE STANDARDS AND CRITERIA

AIRBORNE NOISE STANDARDS AND CRITERIA

The FTA guidance manual[4] defines noise criteria based on the specific type of land use that would be affected, with explicit operational noise impact criteria for three land use categories. These impact criteria are based on either peak 1-hour L_{eq} or 24-hour L_{dn} values. **Table 14-3** describes the land use categories defined in the FTA report, and provides noise metrics used for determining operational noise impacts. As described in **Table 14-3**, categories 1 and 3—which include land uses that are noise-sensitive, but where people do not sleep—require examination using the 1-hour L_{eq} descriptor for the noisiest peak hour. Category 2, which includes residences, hospitals, and other locations where nighttime sensitivity to noise is very important, requires examination using the 24-hour L_{dn} descriptor.

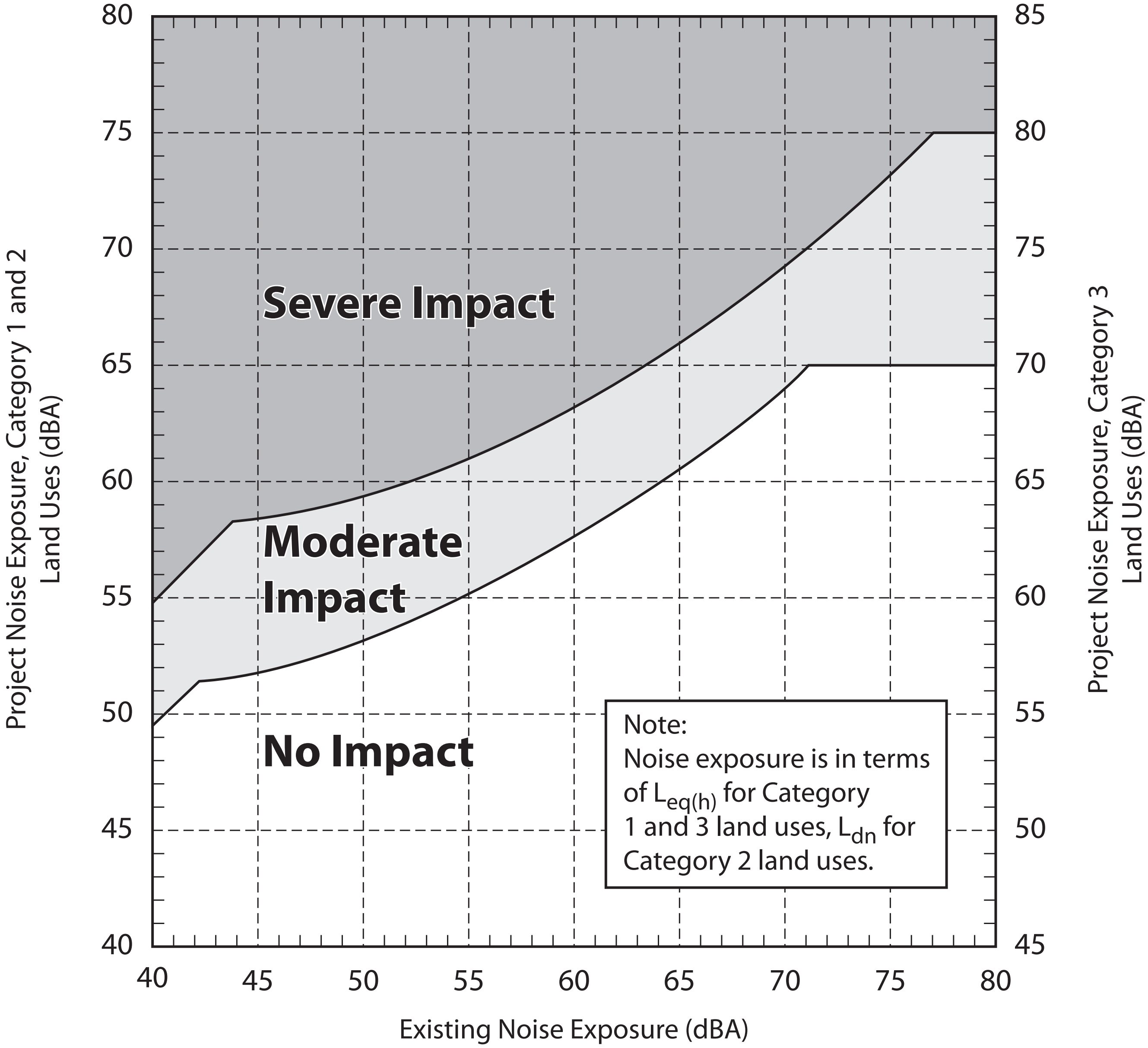
Table 14-3
FTA's Land Use Category and Metrics for Transit Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq(h)}$*	Tracts of land where quiet is an essential element in the intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels, where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq(h)}$*	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches, where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for study or meditation associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.

Note: *L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.
Source: *Transit Noise and Vibration Impact Assessment*, FTA, May 2006.

Figure 14-1 shows FTA's noise impact criteria for transit projects. The FTA impact criteria are keyed to the noise level generated by the project (called "project noise exposure") in locations of varying existing noise levels. Two types of impacts—moderate and severe—are defined for each land use category, depending on existing noise levels. Thus, where existing noise levels are 40 dBA, for land use categories 1 and 2, the respective L_{eq} and L_{dn} noise exposure from the project would create moderate impacts if they were above approximately 50 dBA, and would create severe impacts if they were above approximately 55 dBA. For category 3, a project noise exposure level above approximately 55 dBA would be considered a moderate impact, and above

[4] The FRA guidance manual includes noise impact evaluation criteria identical to those in the FTA guidance manual.



Source: Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006

FTA Noise Impact Criteria for Transit Projects

Figure 14-1

approximately 60 dBA would be considered a severe impact. The difference between "severe impact" and "moderate impact" is that a severe impact occurs when a change in noise level occurs that a significant percentage of people would find annoying, while a moderate impact occurs when a change in noise level occurs that is noticeable to most people but not necessarily sufficient to result in strong adverse reactions from the community.

VIBRATION STANDARDS AND CRITERIA

With the construction of new rail rapid transit systems in recent years, the acoustical industry has gained considerable experience about how communities react to various levels of building vibration. This experience, combined with the available national and international standards, represents a good foundation for predicting annoyance from ground-borne noise and vibration in residential areas (see **Table 14-2**).

The FTA criteria for environmental impact from ground-borne vibration and noise are based on the maximum levels for a single event. The impact criteria as defined in the FTA guidance manual are shown in **Table 14-4**. The criteria for acceptable ground-borne vibration are expressed in terms of root-mean square velocity levels in decibels and the criteria for acceptable ground-borne noise are expressed in terms of A-weighted sound level. As shown in the table, the FTA methodology provides three different impact criteria—one for "infrequent" events, when there are fewer than 30 vibration events per day, one for "occasional" events, when there are between 30 and 70 vibration events per day, and one for "frequent" events, when there are more than 70 vibration events per day. It should be noted that these impacts occur only if a project causes ground-borne noise or vibration levels that are higher than existing vibration levels. Thus, if the vibration level for a building in Category 1 is already 70 VdB (5 VdB above the 65 VdB threshold listed in **Table 14-4**) but a hypothetical project will not increase that level, then the project will not be considered to have an impact.

The limits are specified for the three land use categories defined below:

- **Category 1: High Sensitivity**—Buildings where low ambient vibration is essential for the operations within the building, which may be well below levels associated with human annoyance. Typical land uses are vibration-sensitive research and manufacturing, hospitals, and university research operations.
- **Category 2: Residential**—This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals. No differentiation is made between different types of residential areas. This is primarily because ground-borne vibration and noise are experienced indoors and building occupants have practically no means to reduce their exposure. Even in a noisy urban area, the bedrooms often will be quiet in buildings that have effective noise insulation and tightly closed windows. Hence, an occupant of a bedroom in a noisy urban area is likely to be just as sensitive to ground-borne noise and vibration as someone in a quiet suburban area.
- **Category 3: Institutional**—This category includes schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.

Table 14-4
Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Assessment

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch/sec)			GBN Impact Levels (dB re 20 micro Pascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Notes:
1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail systems.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
5. Vibration-sensitive equipment is not sensitive to ground-borne noise.

There are some buildings, such as concert halls, TV and recording studios, auditoriums, and theaters that can be very sensitive to vibration and ground-borne noise, but do not fit into any of these three categories. Special vibration level thresholds are defined for these land uses.

In addition, FTA has established vibration criteria for fragile buildings (94 VdB, 0.2 in/sec) and very fragile buildings (90 VdB, 0.12 in/sec). The operational activities associated with the project will not reach these levels and therefore, these criteria are only evaluated in the construction impacts assessment (see Chapter 19, "Construction Effects").

C. METHODOLOGY

AIRBORNE NOISE ANALYSIS METHODOLOGY

The analysis of airborne noise was conducted according to methodology set forth in the FTA's *Transit Noise and Vibration Impact* guidance manual and the FRA's *High-Speed Ground Transportation Noise and Vibration Impact Assessment* guidance manual. Following the methodologies set forth in these documents, airborne noise impacts are analyzed using a three-step process that consists of a screening procedure, a general noise assessment, and potentially a detailed noise analysis. The screening procedure is performed first to determine whether any noise-sensitive receptors are within distances where impacts are likely to occur. If the screening reveals that there are noise-sensitive receptors in locations where impacts are likely to occur, then a general noise assessment is performed to determine locations where noise impacts could occur. If this general assessment indicates that a potential for noise impact does exist, then a detailed noise analysis may be necessary. The detailed analysis methodology is used to predict impacts and evaluate the effectiveness of mitigation with greater precision than can be achieved with the general noise assessment. The methodology and results of the noise analysis screening procedure are presented below.

ANALYSIS PROCEDURE

The Project Team employed the following procedures for the noise analysis:

- Identified noise-sensitive land uses (i.e., residential, church, certain parks, etc.) within the screening distance from the rail corridor;
- Selected representative noise receptor sites to represent those noise-sensitive land uses identified within the screening distance. The selected noise receptor sites provide geographic coverage of the study area and represent those locations with the greatest potential to experience a significant increase in noise levels associated with the Proposed Project;
- Determined existing noise levels at the aforementioned receptor sites by performing field measurements and using acoustical fundamentals. For sites at which direct access to conduct noise level measurements was not available, measurements occurred at a nearby location with a comparable level of non-rail noise;
- Calculated existing rail noise levels at each receptor site using a combination of the FTA's Chicago Rail Efficiency and Transportation Efficiency (CREATE) model for rail activity at speeds less than 125 mph and the FRA's High Speed Rail (HSR) model for rail activity at speeds at or above 125 mph as well as data associated with the existing conditions on the railway;
- Subtracted the calculated existing rail noise levels for each receptor site from measured existing noise levels to determine the non-rail component of the noise level (e.g., noise from vehicular traffic, aircraft, parking lots, etc.) at each site;
- Calculated future rail noise levels for each Build Alternative according to the CREATE and HSR models;
- Determined future noise levels for each Build Alternative at each receptor site as the sum of calculated rail noise level and the calculated non-rail noise level;
- Used the future noise levels for each Build Alternative to determine the project noise exposure at each receptor site; and
- Compared the project noise exposure for each analysis alternative to the FTA criteria to identify potential impacts.

STEP 1: NOISE SCREENING

The FTA methodology begins with a noise screening to determine whether any noise-sensitive receptors are within a distance where an impact is likely to occur. According to the FTA screening methodology, potential impacts may occur if noise receptors are within 750 feet of the centerline of a commuter rail mainline if the pathway between the track and the receptor is unobstructed, or 375 feet from the track centerline if the pathway is obstructed (since obstructions block some noise and therefore reduce the distance the noise will travel). Based on a review of current aerial photography, site visits, and land use maps, the Project Team determined that noise-sensitive receptors are located within the screening distances of the Proposed Project site.

STEP 2: GENERAL NOISE ASSESSMENT

Since sensitive receptors are present within the screening distance, a general noise assessment was conducted to examine the effect of the Proposed Project (including the replacement bridge as well as changes in train volume and speed) on noise levels. The assessment used the procedures contained in the FTA guidance manual and the calculation method contained in the FRA guidance manual for "high speed" rail activity. According to FTA's guidance document, the potential for noise impacts at sensitive land use locations will occur if the project-generated noise levels, or "noise exposure," exceed the levels shown in **Figure 14-1**.

The general noise assessment methodology consists of determining the project noise exposure at 50 feet from the centerline of track, adjusting the noise level based on the actual distance from the rail right-of-way (ROW) and the receptor, and comparing the calculated levels with the criteria based on land use categories. In order to perform the general noise assessment, FTA's CREATE railroad noise model and FRA's HSR noise model were used to determine the rail component of the total noise level at a receptor location. Both models calculate hourly-equivalent (L_{eq}) or day-night (L_{dn}) noise levels taking into account the type of trains and types of locomotives (freight vs. passenger, diesel vs. electric), the number of locomotives on each train and length of train, the number of trains per day, the speed of the trains, characteristics of the track, and the time of day. The calculations predict the noise levels from the proposed increased train volume, the new rail alignments, and the expected increase in train speeds.

The (total) noise level at a receptor location near the project site is the sum of the noise generated by rail operations and non-rail sources. As described below non-rail noise levels at receptor sites were calculated based upon field measurements of existing noise levels.

VIBRATION AND GROUND-BORNE NOISE METHODOLOGY

STEP 1: VIBRATION SCREENING

The FTA methodology begins with a vibration screening to determine whether any vibration-sensitive receptors are within a distance where an impact is likely to occur. According to the FTA screening methodology, potential impacts may occur if high-sensitivity vibration receptors are within 600 feet of the centerline of a commuter rail mainline, or if residential receptors are within 200 feet from the track centerline. Based on a review of current aerial photography, site visits, and land use maps, the Project Team determined that residences are located within the screening distance of the Proposed Project as shown in Figure 4-1.

STEP 2: GENERAL NOISE ASSESSMENT

As mentioned above, there are sensitive receptors within the screening distances from the Proposed Project area, so the general assessment methodology was used to evaluate vibration associated with the Proposed Project.

The Project Team used the following procedures for the general vibration assessment:

- Identified vibration-sensitive land uses (i.e., residential, school, etc.) within the screening distance from the rail corridor;
- Selected a representative worst-case vibration receptor site to represent vibration-sensitive land uses identified within the screening distance. The selected receptor site represents the location with the greatest potential to experience a significant increase in vibration associated with the Proposed Project;
- Calculated future rail vibration levels for each Build Alternative according to the FTA general vibration assessment guidance; and
- Compared the predicted vibration levels for each Build Alternative to the FTA criteria to identify potential impacts.

D. AFFECTED ENVIRONMENT

AIRBORNE NOISE

SELECTION OF NOISE RECEPTOR LOCATIONS

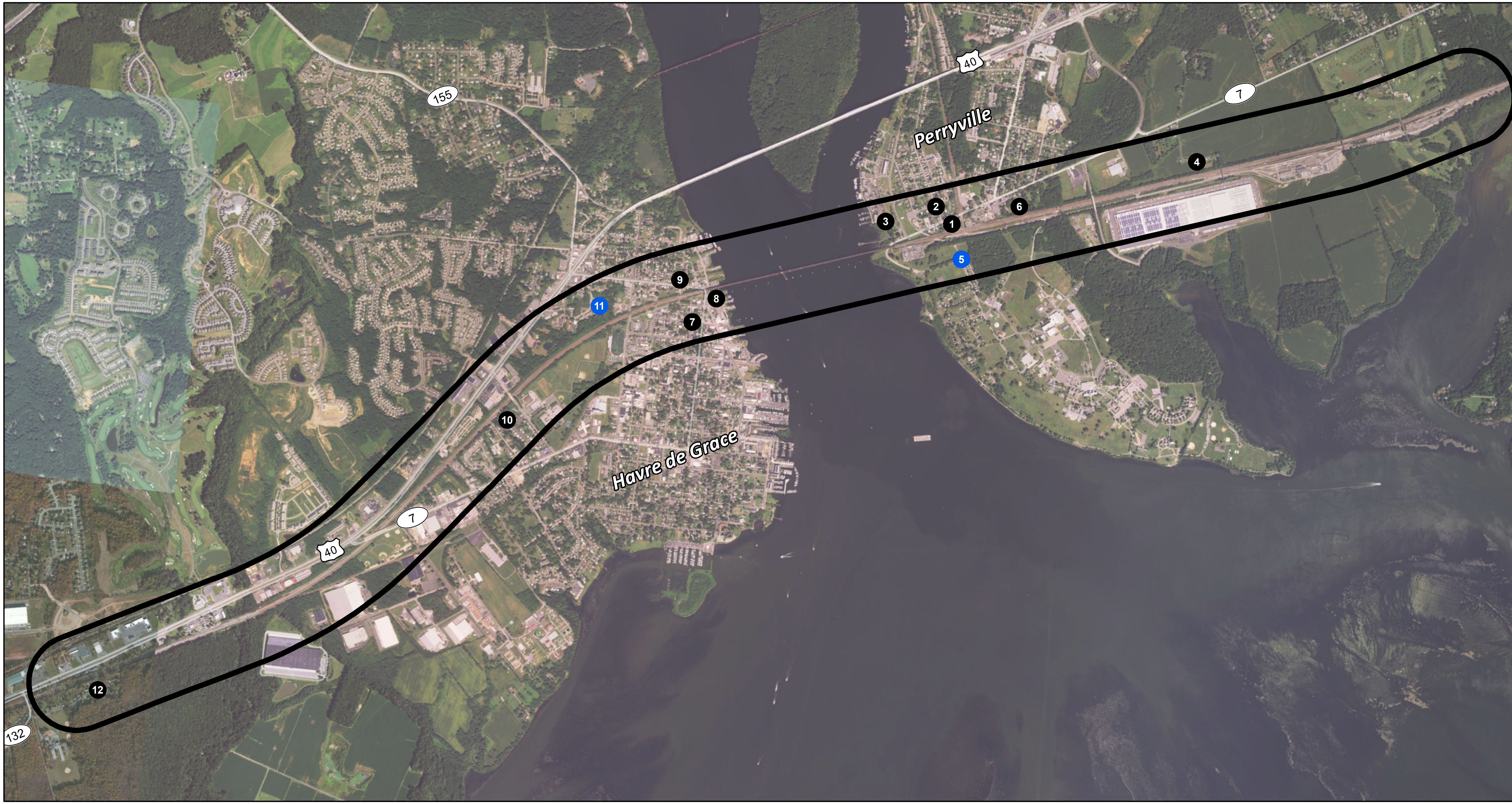
In order to assess potential project impacts, 12 representative noise receptor sites were selected to represent all noise receptor sites within the screening distance. Noise analysis results at each of the representative receptor sites were applied to other receptors nearby and with comparable distance from the rail ROW. The Project Team used information on land use and proximity to existing railway to identify those locations that would be particularly sensitive to noise increases (e.g., residences, places of worship, parkland, etc.) or that would be likely to experience the greatest increases in noise from the project to select representative receptor sites. At each of the representative receptor sites, the Project Team performed noise measurements to establish existing conditions.

A combination of 24-hour continuous noise level measurements and 1-hour spot noise measurements were conducted at the selected receptor sites. Due to site access and security concerns, it was not possible to conduct 24-hour measurements at all of the selected representative noise receptor sites. Because the dominant noise source in the study area is the existing rail activity, the 24-hour temporal distribution of the noise levels is consistent at each site, following the pattern of rail activity over the course of the day. Consequently, at locations where the Project Team conducted 1-hour spot noise level measurements, the Project Team developed 24-hour noise levels by prorating the 1-hour noise level based on the 24-hour distribution of noise levels at the nearest 24-hour noise measurement location.

The locations of the noise receptor sites considered in this analysis and their land use categories are shown in **Table 14-5** and on **Figure 14-2**.

Perryville

Of the six noise representative receptor sites selected in Perryville, the Project Team conducted a 24-hour continuous noise level measurement at one location and 1-hour spot noise level



Legend

1,000 ft Study Area

1-hour spot noise measurement location

24-hour continuous noise measurement location

Data Sources

Aerial Image Source:
Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 0.25 0.5 Miles

Susquehanna River Rail Bridge Project

Figure 14.2

Noise Receptor Locations

measurements at the other five locations.[5] Due to site access and security concerns, it was not possible to conduct 24-hour measurements at all of the selected representative noise receptor sites. Because the dominant noise source in the study area is the existing rail activity, the 24-hour temporal distribution of the noise levels is consistent at each site, following the pattern of rail activity over the course of the day. Consequently, the Project Team applied the temporal distribution of noise levels in the area as measured at the 24-hour measurement location to each of the other measurement locations to determine hourly noise levels over a 24-hour period. The locations are described below.

- Site 1 is in the Perryville MARC Station overflow parking area at southeast corner of Broad Street and Susquehanna Avenue. A 1-hour spot measurement was conducted at this intersection to represent existing noise levels at the residences immediately adjacent to the railways in Perryville.
- Site 2 is at the corner of Elm Street and Susquehanna Avenue. The Project Team conducted a 1-hour spot measurement at this intersection to represent existing noise levels at the residences in the area bounded by Broad Street, Roundhouse Drive, Locust Street, and Evans Street.
- Site 3 is on River Road north of Broad Street. The Project Team conducted a 1-hour spot measurement at this location to represent existing noise levels at the residences along the east bank of the Susquehanna River, including the park and piers located immediately north of the Susquehanna Bridge.
- Site 4 is at the south end of South Woodland Farms Lane. The Project Team conducted a 1-hour spot measurement at this location to represent existing noise levels at the residence on South Woodland Farms Lane.
- Site 5 is at the corner of Avenue D and 1st Street. The Project Team conducted a 24-hour continuous measurement at this intersection to represent existing noise levels at residences and other noise receptors in Perryville south of the railway.
- Site 6 is on Ellis Court south of Broad Street. The Project Team conducted a 1-hour spot measurement at this location to represent existing noise levels at the residences in the area north of the railway between Aiken Avenue and Coudon Boulevard.

Havre de Grace

Of the six representative receptor sites for noise selected in Havre de Grace, the Project Team conducted a 24-hour continuous noise level measurement at one location and 1-hour spot noise level measurements at the other five locations. The 24-hour measurement showed the temporal distribution of noise levels in the area, which was applied to each of the other measurement locations to determine hourly noise levels over a 24-hour period. The locations are described below.

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[5] The Project Team conducted measurements on Wednesday, April 2, and Thursday, April 3, 2014 using Brüel & Kjær Noise Level Meters Type 2260 and 2250, Brüel & Kjær Sound Level Calibrators Type 4231, and Brüel & Kjær ½-inch microphones Type 4189. The measuring instruments were mounted at a height of approximately five feet above the ground on a tripod. The Project Team calibrated the meters before and after readings using Brüel & Kjær Type 4231 sound-level calibrators using the appropriate adaptors. All measurement procedures conformed to the requirements of ANSI Standard S1.13-2005.

- Site 7 is in the parking lot at the intersection of Freedom Lane and Franklin Street. The Project Team conducted a 1-hour spot measurement at this intersection to represent existing noise levels at the residences in the area south of the railway between South Juniata Street and St. John Street.
- Site 8 is in David Craig Park. The Project Team conducted a 1-hour spot measurement at this location to represent existing noise levels at David Craig Park and Jean S. Roberts Memorial Park.
- Site 9 is at the intersection of North Stokes Street and Otsego Street. The Project Team conducted a 1-hour spot measurement at this intersection to represent existing noise levels at the residences in the area bounded by the railway, Linden Lane, Water Street, and North Juniata Street.
- Site 10 is at the end of the Anderson Avenue cul-de-sac. The Project Team conducted a 1-hour spot measurement at this location to represent existing noise levels at the residences in the area south of the railway and west of Lewis Lane.
- Site 11 is in the parking area south of Warren Street at Legion Drive. The Project Team conducted a 24-hour continuous measurement at this intersection to represent existing noise levels at residences north of the railway and west of North Juniata Street.
- Site 12 is on Williams Drive east of Oakington Road. The Project Team conducted a 1-hour spot measurement at this location to represent existing noise levels at the residences along Williams Drive.

Table 14-5
Noise Receptor Sites

Site	Location	Noise Land Use Category	Duration of Existing Conditions Noise Level Measurement
1	Broad Street at Susquehanna Avenue, Perryville	2	1 hour
2	Elm Street at Susquehanna Avenue, Perryville	2	1 hour
3	River Road North of Broad Street, Perryville	2	1 hour
4	Woodlands Farm Road South, Perryville	2	1 hour
5	Avenue D at 1st Street, Perryville	2	24 hours
6	Ellis Court South of Broad Street, Perryville	2	1 hour
7	Freedom Lane at Franklin Street, HdG	2	1 hour
8	David Craig Park, HdG	3	1 hour
9	North Stokes Street at Otsego Street, HdG	2	1 hour
10	Anderson Avenue Cul-de-Sac, HdG	2	1 hour
11	Warren Street at Legion Drive, HdG	2	24 hours
12	Williams Drive East of Oakington Road, HdG	2	1 hour

Notes: For definition of land use categories, see **Appendix F**, "Air Quality, Noise, and Vibration."

MEASURED NOISE LEVELS

Table 14-6 shows measured existing noise levels at each noise survey location. The L_{dn} values shown are the calculated values. Data from the measurement program, as well as details of the calculations of the L_{dn} value, are contained in **Appendix F**, “Air Quality, Noise, and Vibration.” Noise levels at each location are a function of traffic on the adjacent roadways as well as passenger and freight rail activity. In general, the noise monitoring results reflect the level of traffic on the roadway and railway near and adjacent to the noise receptor locations. Based on FTA and FRA noise impact criteria, when existing noise levels are high, the allowable increase in cumulative noise level with the Proposed Project versus the existing noise level must be relatively small to avoid a potential moderate impact or severe impact.

Table 14-6
Existing Noise Levels (in dBA)

Site	Location	FTA Land Use Category	Noise Descriptor	Noise Level (dBA)
1	Broad Street at Susquehanna Avenue, Perryville	2	L_{dn}	67.4
2	Elm Street at Susquehanna Avenue, Perryville	2	L_{dn}	60.5
3	River Road North of Broad Street, Perryville	2	L_{dn}	67.8
4	Woodlands Farm Road South, Perryville	2	L_{dn}	57.8
5	Avenue D at 1st Street, Perryville	2	L_{dn}	65.0
6	Ellis Court South of Broad Street, Perryville	2	L_{dn}	66.8
7	Freedom Lane at Franklin Street, HdG	2	L_{dn}	52.6
8	David Craig Park, HdG	3	Peak Hour $L_{eq(1h)}$	63.5
9	North Stokes Street at Otsego Street, HdG	2	L_{dn}	68.8
10	Anderson Avenue Cul-de-Sac, HdG	2	L_{dn}	53.8
11	Warren Street at Legion Drive, HdG	2	L_{dn}	62.4
12	Williams Drive East of Oakington Road, HdG	2	L_{dn}	59.0

Notes: Field measurements were performed by AKRF, Inc. on April 2 and 3, 2014.

VIBRATION AND GROUND-BORNE NOISE

The analysis of vibration and ground-borne noise does not involve an assessment of existing vibration and ground-borne noise levels per FTA and FRA guidance.

E. POTENTIAL EFFECTS OF THE PROJECT ALTERNATIVES

AIRBORNE NOISE

NO ACTION ALTERNATIVE

The No Action Alternative assumes the Susquehanna River Rail Bridge will remain in service as-is. However, increases in train service (including Northeast Regional and Long Distance, Intercity Express, MARC Commuter, and freight) are expected to occur even without the replacement of the Susquehanna River Rail Bridge. This will result in noise level increases at all of the analyzed receptors. **Table 14-7** shows the noise levels and incremental change in noise levels for the No Action Alternative. The No Action Alternative noise levels shown in **Table 14-7** are the sum of the rail noise component (calculated using the CREATE and HSR models) and the non-rail noise component (which is assumed to be the same level calculated for existing conditions). The No Action noise exposure is the level of noise produced by the No Action Alternative, and is compared to the impact criteria to determine whether this alternative could potentially result in a noise impact.

As shown in **Table 14-7**, noise levels with the No Action Alternative would be somewhat higher than the existing condition as a result of the increase in train volume, but the increases would be imperceptible, and the noise exposure would be considered neither a moderate nor a severe impact at any analyzed receptor according to FTA and FRA noise impact criteria.

Table 14-7
No Action Alternative Noise Levels (in dBA)

Site	FTA Land Use Category	Existing Noise Level	Moderate Impact Threshold[1]	Severe Impact Threshold[1]	No Action Noise Exposure	Total No Action Noise Level	No Action Noise Level Increment	Impact[2]?
1	2	67.4	62.5	67.7	51.6	67.5	0.1	No
2	2	60.5	58.1	63.7	44.0	60.6	0.1	No
3	2	67.8	62.7	68.0	54.4	68.0	0.2	No
4	2	57.8	56.6	62.3	54.3	59.4	1.6	No
5	2	65.0	60.8	66.2	47.1	65.1	0.1	No
6	2	66.8	62.0	67.3	57.4	67.3	0.5	No
7	2	52.6	54.3	60.3	42.2	53.0	0.4	No
8	3	63.5	64.9	70.3	58.4	64.7	1.2	No
9	2	68.8	63.5	68.7	53.7	68.9	0.1	No
10	2	53.8	54.8	60.7	51.2	55.7	1.9	No
11	2	62.4	59.2	64.7	50.1	62.6	0.2	No
12	2	59.0	57.2	62.9	52.2	59.8	0.8	No

Notes:
1. Impact criteria are based on the existing noise level, as shown in **Figure 14-1**.
2. The noise exposure for the alternative is compared to the moderate impact and severe impact thresholds to determine whether a moderate impact and/or sever impact are predicted to occur; severe impacts are considered significant adverse impacts and moderate impacts may or may not be considered significant adverse impacts depending on site-specific context.

ALTERNATIVE 9A

Alternative 9A would construct a new two-track 90 mph bridge to the west of the existing bridge and a second new two-track 160 mph bridge on the existing bridge alignment. With this alternative, the volume and speed of train service (including Northeast Regional and Long Distance, Intercity Express, MARC Commuter, and freight) would increase within the study area compared with the existing condition or the No Action Alternative. As discussed in Chapter 3, "Transportation," the intercity rail analysis assumes implementation of NEC FUTURE in the 2040 Build condition[6]. **Table 14-8** shows the noise levels and incremental change in noise levels for Alternative 9A. Noise levels shown for Alternative 9A in **Table 14-8** are the sum of the rail noise component (calculated using the CREATE and HSR models) and the non-rail noise component (which is assumed to be the same level calculated for existing conditions). The Alternative 9A noise exposure is the level of noise produced by Alternative 9A, and is compared with the impact criteria to determine whether this alternative could potentially result in a noise impact. It is important to note that the analysis is based on rail traffic volumes that would not result solely from the Proposed Project, but represent the sum of proposed enhancements all along the NEC which enable the service levels assumed by NEC FUTURE.[7]

Table 14-8
Alternative 9A Noise Levels (in dBA)

Site	FTA Land Use Category	Existing Noise Level	Moderate Impact Threshold[1]	Severe Impact Threshold[1]	Alternative 9A Noise Exposure	Total Alternative 9A Noise Level	Alternative 9A Noise Level Increment	Impact[2]?
1	2	67.4	62.5	67.7	60.2	68.2	0.8	No
2	2	60.5	58.1	63.7	50.6	60.9	0.4	No
3	2	67.8	62.7	68.0	63.1	69.1	1.3	Moderate
4	2	57.8	56.6	62.3	61.2	62.9	5.1	Moderate
5	2	65.0	60.8	66.2	55.3	65.4	0.4	No
6	2	66.8	62.0	67.3	63.1	68.4	1.6	Moderate
7	2	52.6	54.3	60.3	49.5	54.3	1.7	No
8	3	63.5	64.9	70.3	68.9	70.0	6.5	Moderate
9	2	68.8	63.5	68.7	61.6	69.5	0.7	No
10	2	53.8	54.8	60.7	58.5	59.8	6.0	Moderate
11	2	62.4	59.2	64.7	57.2	63.5	1.1	No
12	2	59.0	57.2	62.9	59.5	62.3	3.3	Moderate

Notes:
1. Impact criteria are based on the existing noise level, as shown in **Figure 14-1**.
2. The noise exposure for the alternative is compared to the moderate impact and severe impact thresholds to determine whether a moderate impact and/or sever impact are predicted to occur; severe impacts are considered significant adverse impacts and moderate impacts may or may not be considered significant adverse impacts depending on site-specific context.

As shown in **Table 14-8**, the project noise exposure predicted for Alternative 9A at receptor sites 1, 2, 5, 7, 9, and 11 would be considered neither a moderate nor a severe impact according to FTA and FRA noise impact criteria. Additionally, incremental changes in noise levels between Alternative 9A and existing condition would be less than 2 dBA at these receptors, which would

[6] FRA, NEC FUTURE Tier I FEIS, December 2016.

[7] NEC FUTURE forecasts are being used as a reasonable assumption but do not represent an approved project, nor are these numbers included in the No Action condition.

be imperceptible to barely perceptible. Consequently, Alternative 9A would not result in any significant adverse noise impacts at these receptor sites.

At receptor site 3, which is representative of the residences along the east bank of the Susquehanna River west of the rail ROW in Perryville, the project noise exposure predicted for Alternative 9A would constitute a moderate impact but not a severe impact according to FTA and FRA noise impact criteria. However, the incremental change in noise level between Alternative 9A and existing condition at this location would be less than 1.5 dBA, which would be considered imperceptible. Consequently, Alternative 9A would not result in any significant adverse noise impacts at this receptor site.

At receptor site 4, which is representative of the residence on Woodlands Farm Road immediately west of the rail ROW in Perryville, the project noise exposure predicted for Alternative 9A would constitute a moderate impact but not a severe impact according to FTA noise impact criteria. The incremental change in noise level between Alternative 9A and existing condition at this location would be 5.1 dBA, which would be considered readily noticeable. The total noise level predicted to occur at this receptor with Alternative 9A would be in the low 60s dBA, which is generally considered acceptable for residential uses[8] and is comparable to existing noise levels measured at the other receptor sites in Perryville as shown in **Table 14-6**. Furthermore, based on the results of noise level measurements, railroad noise is already the dominant noise source at this receptor, so the change in noise levels would not represent a change in the character of noise at the receptor. Consequently, the moderate impact predicted to occur at this receptor site with Alternative 9A would not constitute a significant adverse impact.

At receptor site 8, which the David Craig Park directly under the existing Susquehanna River Rail Bridge in Havre de Grace, the noise exposure predicted for Alternative 9A would constitute a moderate impact but not a severe impact according to FTA and FRA noise impact criteria. The incremental change in noise level between Alternative 9A and existing condition at this location would be 6.5 dBA, which would be considered readily noticeable. The peak hourly noise level predicted to occur at this receptor with Alternative 9A would be 70.0 dBA, which is generally slightly higher than recommended for open space uses[9]. However, this noise level represents the peak hourly level in the location of the park closest to the proposed replacement bridge. During quieter hours of the day and at locations further from the bridge, levels would be lower and would likely be in the acceptable range for open space uses. Furthermore, based on the results of noise level measurements, railroad noise is already the dominant noise source at this receptor, so the change in noise levels would not represent a change in the character of noise at the receptor. Consequently, the moderate impact predicted to occur at this receptor site with Alternative 9A would not constitute a significant adverse impact.

At receptor site 10, which is representative of residences immediately east of the rail ROW near Anderson Avenue in Havre de Grace, the noise exposure predicted for Alternative 9A would constitute a moderate impact but not a severe impact according to FTA and FRA noise impact criteria. The incremental change in noise level between Alternative 9A and the existing condition at this location would be 6.0 dBA, which would be considered readily noticeable. The total noise level predicted to occur at this receptor with Alternative 9A would be in the high 50s

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[8] Based on United States Department of Housing and Urban Development (HUD) noise exposure standards as described in the HUD Noise Guidebook, March 2009.

[9] Based on Federal Highway Administration (FHWA) Noise Abatement Criteria as shown in Table 3-4 of the FTA guidance manual.

dBA, which is generally considered acceptable for residential uses[1] and is comparable to or lower than existing noise levels measured at the other receptor sites in Havre de Grace as shown in **Table 14-6**. Furthermore, based on the results of noise level measurements, railroad noise is already the dominant noise source at this receptor, so the change in noise levels would not represent a change in the character of noise at the receptor. Consequently, the moderate impact predicted to occur at this receptor site with Alternative 9A would not constitute a significant adverse impact.

At receptor site 12, which is representative of residences in the vicinity of Oakington Road east of the rail ROW in Havre de Grace, the project noise exposure predicted for Alternative 9A would constitute a moderate impact but not a severe impact according to FTA noise impact criteria. However, the incremental change in noise level between Alternative 9A and existing condition at this location would be 3.3 dBA, which would be considered barely perceptible. Consequently, Alternative 9A would not result in any significant adverse noise impacts at this receptor site.

Based on the above discussion, Alternative 9A would not be expected to result in any significant adverse noise impacts.

ALTERNATIVE 9B

Alternative 9B would construct a new two-track 90 mph bridge to the west of the existing bridge and a second new two-track 160 mph bridge on the existing bridge alignment. The difference between Alternative 9A and Alternative 9B occurs in Havre de Grace along the east side of the corridor from Lewis Lane to the Susquehanna River. Alternative 9B improves the curve in Havre de Grace and would allow for a maximum speed of 150 mph. With this alternative, the volume and speed of train service (including Northeast Regional and Long Distance, Intercity Express, MARC Commuter, and freight) would increase within the study area as compared with the existing condition or the No Action Alternative. The potential effects of the proposed replacement bridge and increase in train volume and speed on noise levels at the receptors in the study area were analyzed using the methodology described above. As discussed, the train volumes considered for intercity rail assume implementation of the NEC FUTURE 2040 Build condition.[10] **Table 14-9** shows the noise levels and incremental change in noise levels for Alternative 9B. Noise levels shown for Alternative 9B in **Table 14-9** are the sum of the rail noise component (calculated using the CREATE and HSR models) and the non-rail noise component (which is assumed to be the same level calculated for existing conditions). The Alternative 9B noise exposure is the level of noise produced by Alternative 9B, and is compared with the impact criteria to determine whether this alternative could potentially result in a noise impact. It is important to note that the analysis is based on rail traffic volumes that would not result solely from the Proposed Project, but represent the sum of proposed enhancements all along the NEC which enable the service levels assumed by NEC FUTURE.[11]

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[10] FRA, NEC FUTURE Tier I FEIS, December 2016.

[11] NEC FUTURE forecasts are being used as a reasonable assumption but do not represent an approved project, nor are these numbers included in the No Action condition.

Table 14-9
Alternative 9B Noise Levels (in dBA)

Site	FTA Land Use Category	Existing Noise Level	Moderate Impact Threshold[1]	Severe Impact Threshold[1]	Alternative 9B Noise Exposure	Total Alternative 9B Noise Level	Alternative 9B Noise Level Increment	Impact[2]?
1	2	67.4	62.5	67.7	60.2	68.2	0.8	No
2	2	60.5	58.1	63.7	50.6	60.9	0.4	No
3	2	67.8	62.7	68.0	63.1	69.1	1.3	Moderate
4	2	57.8	56.6	62.3	61.2	62.9	5.1	Moderate
5	2	65.0	60.8	66.2	55.3	65.4	0.4	No
6	2	66.8	62.0	67.3	63.1	68.4	1.6	Moderate
7	2	52.6	54.3	60.3	49.4	54.3	1.7	No
8	3	63.5	64.9	70.3	68.8	69.9	6.4	Moderate
9	2	68.8	63.5	68.7	60.1	69.3	0.5	No
10	2	53.8	54.8	60.7	58.5	59.8	6.0	Moderate
11	2	62.4	59.2	64.7	57.4	63.6	1.2	No
12	2	59.0	57.2	62.9	59.5	62.3	3.3	Moderate

Notes:
1 Impact criteria are based on the existing noise level, as shown in **Figure 14-1**.
2. The noise exposure for the alternative is compared to the moderate impact and severe impact thresholds to determine whether a moderate impact and/or sever impact are predicted to occur; severe impacts are considered significant adverse impacts and moderate impacts may or may not be considered significant adverse impacts depending on site-specific context.

As shown in **Table 14-9**, the noise exposure predicted for Alternative 9B at receptor sites 1, 2, 5, 7, 9, and 11 would be considered neither a moderate nor a severe impact according to FTA and FRA noise impact criteria. Additionally, incremental changes in noise levels between Alternative 9B and existing condition would be less than 2 dBA at these receptors, which would be imperceptible to barely perceptible. Consequently, Alternative 9B would not result in any significant adverse noise impacts at these receptor sites.

At receptor site 3, which is representative of the residences along the east bank of the Susquehanna River west of the rail ROW in Perryville, the noise exposure predicted for Alternative 9B would constitute a moderate impact but not a severe impact according to FTA and FRA noise impact criteria. However, the incremental change in noise level between Alternative 9B and existing condition at this location would be less than 1.5 dBA, which would be considered imperceptible. Consequently, Alternative 9B would not result in any significant adverse noise impacts at this receptor site.

At receptor site 4, which is representative of the residence on Woodlands Farm Road immediately west of the rail ROW in Perryville, the project noise exposure predicted for Alternative 9B would constitute a moderate impact but not a severe impact according to FTA and FRA noise impact criteria. The incremental change in noise level between Alternative 9B and existing condition at this location would be 5.1 dBA, which would be considered readily noticeable. The total noise level predicted to occur at this receptor with Alternative 9B would be in the low 60s dBA, which is generally considered acceptable for residential uses[12] and is comparable to existing noise levels measured at the other receptor sites in Perryville as shown in **Table 14-6**. Furthermore, based on the results of noise level measurements, railroad noise is already the dominant noise source at this receptor, so the change in noise levels would not represent a change in the character of noise at the receptor. Consequently, the moderate impact predicted to occur at this receptor site with Alternative 9B would not constitute a significant adverse impact.

At receptor site 8, which is the David Craig Park, directly under the existing Susquehanna River Bridge in Havre de Grace, the noise exposure predicted for Alternative 9B would constitute a moderate impact but not a severe impact according to FTA and FRA noise impact criteria. The incremental change in noise level between Alternative 9B and existing condition at this location would be 6.4 dBA, which would be considered readily noticeable. The peak hourly noise level predicted to occur at this receptor with Alternative 9B would be 69.9 dBA, which is generally higher than recommended for open space uses[13]. However, this noise level represents the peak hourly level in the location of the park closest to the proposed replacement bridge. During quieter hours of the day and at locations further from the bridge, levels would be lower and would likely be in the acceptable range for open space uses. Furthermore, based on the results of noise level measurements, railroad noise is already the dominant noise source at this receptor, so the change in noise levels would not represent a change in the character of noise at the receptor. Consequently, the moderate impact predicted to occur at this receptor site with Alternative 9B would not constitute a significant adverse impact.

At receptor site 10, which is representative of residences immediately east of the rail ROW near Anderson Avenue in Havre de Grace, the project noise exposure predicted for Alternative 9B would constitute a moderate impact but not a severe impact according to FTA noise impact criteria. The incremental change in noise level between Alternative 9B and the existing condition at this location would be 6.0 dBA, which would be considered readily noticeable. The total noise level predicted to occur at this receptor with Alternative 9B would be in the high 50s dBA, which is generally considered acceptable for residential uses[14] and is comparable to or lower than existing noise levels measured at the other receptor sites in Havre de Grace as shown in **Table 14-6**. Furthermore, based on the results of noise level measurements, railroad noise is already the dominant noise source at this receptor, so the change in noise levels would not represent a change in the character of noise at the receptor. Consequently, the moderate impact predicted to occur at this receptor site with Alternative 9B would not constitute a significant adverse impact.

At receptor site 12, which is representative of residences in the vicinity of Oakington Road east of the rail ROW in Havre de Grace, the noise exposure predicted for Alternative 9B would constitute a moderate impact but not a severe impact according to FTA noise impact criteria. However, the incremental change in noise level between Alternative 9B and existing condition at

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[12] Based on United States Department of Housing and Urban Development (HUD) noise exposure standards as described in the HUD Noise Guidebook, March 2009.

[13] Based on Federal Highway Administration (FHWA) Noise Abatement Criteria as shown in Table 3-4 of the FTA guidance manual.

[14] Based on U. S. Department of Housing and Urban Development (HUD) noise exposure standards as described in the HUD Noise Guidebook, March 2009.

this location would be 3.3 dBA, which would be considered barely perceptible. Consequently, Alternative 9B would not result in any significant adverse noise impacts at this receptor site.

Based on the above discussion, Alternative 9B would not be expected to result in any significant adverse noise impacts.

VIBRATION

As described above, there are receptors located within the screening distance from the railway within the Proposed Project area, so a general vibration analysis was conducted for the project. The nearest residences to the railway are located at a distance of approximately 90 feet. A representative residence at this distance was selected for analysis. This residence is located on North Stokes Street south of Otsego Street in Havre de Grace and roughly corresponds to receptor site 9 from the airborne noise analysis.

Vibration levels resulting from rail activity with the Build Alternatives (the differences between Alternative 9A and Alternative 9B would not affect the level of vibration at this receptor) were calculated for site 9 using the general vibration assessment methodology previously described. The frequency of rail activity in the existing condition, with the No Action Alternative, or with either of the Build Alternatives would fall into the "Frequent Events" category as described above in **Table 14-4**. Consequently, the vibration impact threshold is 72 VdB for category 2 uses (i.e., residences) or 75 VdB for category 3 uses (i.e., open space), and the ground-borne noise impact threshold is 35 dBA for category 2 uses or 40 dBA for category 3 uses. **Table 14-10** shows the results of the general vibration assessment, and **Table 14-11** shows the results of the ground-borne noise assessment.

Table 14-10
Vibration Impact Evaluation

Site	Vibration Land Use Category	Distance from Track Center Line (feet)	Existing		No Action Alternative		Alternative 9A/9B	
			Vibration Level at Receptor (VdB)	Impact Exceedance?	Vibration Level at Receptor (VdB)	Impact Exceedance?	Vibration Level at Receptor (VdB)	Impact Exceedance?
9	2	90	68	No	69	No	72	No

Table 14-11
Ground-Borne Noise Impact Evaluation

Site	Vibration Land Use Category	Distance from Track Center Line (feet)	Existing		No Action Alternative		Alternative 9A/9B	
			Ground-Borne Noise Level at Receptor (dBA)	Impact Exceedance?	Ground-Borne Noise Level at Receptor (dBA)	Impact Exceedance?	Ground-Borne Noise Level at Receptor (dBA)	Impact Exceedance?
9	2	90	33	No	34	No	37	Yes

As shown in **Table 14-10**, the predicted level of vibration at site 9 would not exceed the vibration impact threshold in the No Action or either of the Build Alternatives. The level of vibration predicted to occur at the worst-case receptor location with the Build Alternatives would be right at the vibration impact threshold, but would not exceed the threshold. This receptor location represents the closest point at the closest residence to the railway. At other locations and other sensitive receptors, which would be located further from the railway, vibration levels would be lower and would consequently also not exceed the vibration impact threshold. Consequently, the Build Alternatives would not result significant adverse vibration impacts at any nearby receptors.

The Proposed Project in its operational condition would not have the potential to result in vibration at a level that could cause damage to nearby historic structures. As described above, vibration produced by the Proposed Project would not exceed the significant impact thresholds specified in the FTA guidance document's general assessment methodology. These impact thresholds are designed to avoid human annoyance and disruptions to human activity, and as such are substantially lower than those that could potentially result in building damage, even at historic structures. Because the impact thresholds are based on the more stringent criterion of human annoyance, damage to adjacent buildings is not specifically addressed in the FTA's general assessment methodology. However, since operational vibration resulting from the Proposed Project would not result in exceedances of the vibration impact criteria, it would not have the potential to result in vibration levels that could damage historic resources.

As shown in **Table 14-11**, the predicted level of ground-borne noise at site 9 would not exceed the ground-borne noise impact threshold in the No Action Alternative, and the predicted level of ground-borne noise with Alternative 9A, as well as with Alternative 9B, would be 37 dBA, which would exceed the ground-borne noise impact threshold for category 2 (i.e., residential) uses. However, while the predicted level of ground-borne noise would exceed the impact threshold, the predicted difference between the existing condition ground-borne noise level and the ground-borne noise level with the Build Alternatives would be 4 dBA, which would be considered a barely perceptible change in the level of ground-borne noise. Consequently, ground-borne noise produced by the Build Alternatives at site 9 would not constitute a significant adverse ground-borne noise impact. At other receptors located further from the railway, levels of ground-borne noise would be lower, and the Build Alternatives would also not result in a significant adverse impact.

Based on the above discussion, Alternative 9A and Alternative 9B would not be expected to result in any significant adverse vibration or ground-borne noise impacts.

Overall, the general noise analysis conducted according to FTA and FRA analysis guidance found that there would be the potential for a noise impact at five of the receptors. At these five receptors, moderate impacts were predicted to occur, but based on the incremental change in the noise levels, which would be considered imperceptible to readily noticeable, and considering the total noise levels with the Build Alternatives, which were in the typically acceptable range and comparable to existing levels measured in the surrounding area, these receptors were predicted not to experience significant adverse impacts. The general vibration and ground-borne noise analysis found that there would be no potential for exceedances of the vibration impact criteria, and that while the ground-borne noise level with the Build Alternatives would have the potential to exceed the ground-borne noise impact criteria, the change in ground-borne noise would be barely perceptible, and consequently the ground-borne noise would not constitute a significant adverse impact.

Based on the conclusion that the Build Alternatives would not have the potential to result in significant adverse impacts relating to airborne noise, vibration, or ground-borne noise at any of the analyzed receptor sites, and that these receptor sites represent the sites closest to the railway having the greatest potential to experience noise and vibration impacts as a result of the Build Alternatives, the Build Alternatives would not be expected to result in any significant adverse impacts related to noise or vibration. ✷

Chapter 15: Contaminated and Hazardous Materials

A. INTRODUCTION

When conducting construction activities there is potential for contaminated materials to be encountered. The term "contaminated materials" refers to soil, groundwater, or building materials that contain substances potentially harmful to human health and/or the environment. Contaminated materials are most often encountered during construction activities in industrial areas or in areas historically used for industrial purposes. This chapter assesses the potential for the presence of contaminated materials within the study area, the potential risks to human health and/or the environment that may be posed by disturbing any such materials and specific measures that would be employed to mitigate any such risks.

The potential for contaminated materials to be present within the study area was evaluated through the use of historical maps and aerial photographs to identify areas of past or present industrial use within the study area, a review of regulatory records and databases to identify sites known or suspected to contain contaminated materials within the study area, and a review of regulatory files for those sites identified.

As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative.

POTENTIAL CONTAMINANTS

Historical and regulatory research indicated that portions of the study area were used for various purposes that may have contaminated soil and/or groundwater. These uses included railroad operations, railroad car repair and maintenance, ship building, electrical substation operations, aircraft engine manufacturing, cleaning product, aerosol, and acrylics manufacturing, adhesives manufacturing, bulk petroleum/pesticide storage and distribution, dry cleaning, gasoline filling stations, automobile maintenance and repair, manufactured gas plant (MGP) operations, and polyvinyl chloride (PVC) resin manufacturing. Based on these land uses, there is potential for the following contaminants to be encountered during the construction phase of the Proposed Project: polychlorinated biphenyls (PCBs), heavy metals (such as arsenic and lead), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, herbicides, petroleum compounds, and asbestos.

The use of PCBs began in the 1930s in electrical capacitors and transformers, hydraulic fluids, and in heat transfer systems. Rail lines, railroad maintenance facilities, and electrical transformers are potential sources for PCBs in the study area. Arsenic and other herbicides may also be present along rail lines as they were often used to control vegetation. Many train engines use diesel fuel and therefore diesel range organics (DRO) are a common contaminant in rail yards and along rail lines.

Other heavy metals such as antimony, copper, lead, mercury, and vanadium could potentially be encountered in the study area as they are widely used in various industrial applications. Slag,, historically used as a fill material in industrial areas or as railroad track ballast, is a source of heavy metals that could potentially be encountered in the study area. Research has shown that heavy metals can leach from slag into soil and groundwater.

VOCs that may potentially be encountered within the study area include tetrachloroethene (PCE) in the vicinity of Havre de Grace as well as 1,1 dichloroethene, 1,1-dichloroethane, 1,1,1-trichloroethane (TCA), trichloroethene (TCE), and vinyl chloride (VC) in the vicinity of Havre de Grace. Degreasing and parts washing fluids are also sources of PCE and TCE and are widely used in various industrial applications. Other VOCs that could potentially be encountered in the study area include benzene, toluene, ethylbenzene, and xylenes (BTEX) found in various petroleum products. SVOCs that may be encountered in the study area include polycyclic aromatic hydrocarbons (PAHs) that are found in petroleum products and also may be formed by incomplete combustion of carbon-containing fuels like coal. Partially combusted coal and coal ash were historically used as fill materials in industrial areas or as railroad track ballast. Coal tar and coal tar derived products such as creosote are also sources of PAHs that may be present in the study area. Wooden railroad ties were often treated with creosote for preservation.

Based on the age of the existing bridge, there is also the potential that asbestos-containing materials (ACM) are present in the bridge or in the approaches to the bridge (e.g., in electrical insulation, tar paper, caulks or utility lines). Asbestos could also potentially be encountered within the study area in buildings or areas where buildings were located or in materials have been dumped. Removal or disturbance of asbestos is subject to extensive regulatory requirements, including those relating to testing, agency notification, licensing and certifications, removal and disposal. Similarly, the bridge and other structures in the study area may include lead-based paint. Activities with the potential to disturb lead-based paint are also subject to multiple regulatory programs including Occupational Safety and Health Administration (OSHA) 29 CFR 1926.62 - Lead Exposure in Construction).

B. METHODOLOGY

REGULATORY CONTEXT

There are numerous state and federal regulations applicable to the above potential contaminants. NEPA, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), the National Emissions Standards for Hazardous Air Pollutants (NESHAPS), and the Toxic Substances Control Act (TSCA) are examples of federal regulations applicable to these contaminants. Many laws and regulations have been enacted throughout the U.S. at the state level to implement these federal regulations. The Maryland Department of the Environment (MDE) is the regulatory agency responsible for enacting and enforcing these federal regulations in Maryland. MDE regulations are described in the Code of Maryland Regulations (COMAR) under Title 26.

REGULATORY RECORDS SEARCH

The Maryland Department of Transportation (MDOT) subcontracted Environmental Data Resources, Inc. (EDR) to search federal, state, and/or local agency databases to find information about any sites that may pose environmental concerns within the study area and surrounding properties. The EDR search boundary consisted of the study area plus a one-mile buffer and is depicted on Figure 1 of **Appendix G**, "Contaminated Materials Technical Report." The EDR Corridor Report is included in **Appendix G**. Federal and state regulatory agencies maintain databases of investigated sites that are then used to identify potential environmental concerns. These databases include, but are not limited to, the following:

- National Priority List (NPL) (also known as Superfund sites)
- Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
- CERCLIS No Further Remedial Action Planned (NFRAP) list
- State Hazardous Waste Site (SHWS) - State of Maryland HWS list
- Maryland Oil Control Program (OCP) Case Sites
- State of Maryland Historic (HIST) Leaking Underground Storage Tank (LUST) list
- Maryland Solid Waste Facilities list
- Maryland Brownfields List
- Resource Conservation and Recovery Act (RCRA) Information System:
  - RCRA Treatment, Storage and Disposal (TSD) Sites
  - RCRA CORRACTS and non-CORRACTS (Corrective Action Sites)
- Emergency Response Notification System (ERNS)

The Project Team evaluated the location of the sites and the (generally limited) information provided in the EDR Corridor Report to assess which sites could present potential environmental hazards within the study area. The Project Team submitted Public Information Act (PIA) requests to MDE to obtain additional information for those sites that appeared to present potential environmental concerns based on their listings. After reviewing the information obtained from the PIA request, the Project Team conducted a reconnaissance to visually evaluate the identified sites of potential concern and other potential environmental hazards within the study area not identified in regulatory databases.

C. AFFECTED ENVIRONMENT

The historic research, the EDR Corridor Report, and documents obtained from the PIA requests to MDE were evaluated to determine sites of potential concern for the Proposed Project. After these sites were determined, the available information for each site was evaluated and the sites were categorized as green, yellow, or orange. Green sites are low potential environmental hazard sites and would generally be regarded as not needing further evaluation or investigation. Green sites have minimal environmental issues or are sufficiently far from the study area to likely have little or no environmental impact. Yellow sites are moderate potential environmental hazard sites that may be impacted by the Proposed Project. These should be regarded with caution because moderate contamination may remain in site soil and/or groundwater. Orange sites are high potential environmental hazard sites, to be regarded with additional caution due to the likelihood of encountering soil and/or groundwater contamination and/or treatment system components.

A total of 58 sites of potential concern were identified based on the historic research and regulatory file reviews. Of the 58 sites, 37 were classified as green, 19 as yellow, and 2 as orange. The yellow and orange sites are listed in **Table 15-1**. The site locations maps and a list of green sites are provided in **Appendix G**.

Table 15-1
Sites of Potential Concern

Yellow Sites	
GAF Transportation	Pulaski Highway - East Shoulder, Aberdeen
Pool Concepts Inc.	2226 Pulaski Highway, Havre de Grace
Bay Oil, Inc.	2110 Pulaski Highway, Havre de Grace
Friendly Oil Company - Aero Energy	1757 Pulaski Highway, Havre de Grace
Osborne Boat Sales	1754 Pulaski Highway, Havre de Grace
F.W. Haxel Co.	1750 Pulaski Highway, Havre de Grace
Havre de Grace Exxon	1609 Pulaski Highway, Havre de Grace
Cytec Engineered Materials, Inc.	1300 Revolution Street, Havre de Grace
A-1 Sales, Inc.	1200 Pulaski Highway, Havre de Grace
Auto Ranch - Harbor Station	1005 Pulaski Highway, Havre de Grace
MCK Trucking Co.	963 Pulaski Highway, Havre de Grace
Former Carroll's Laundry	Franklin Street and Adams Street, Havre de Grace
Former Gas Stations	Warren Street and N. Union Ave., Havre de Grace
Gilbert Tank Farm – Gilbert Enterprises	Water Street, Havre de Grace
Former Pennsylvania Railroad Shops	Broad Street and Front Street, Perryville
Perryville Electrical Substation	Ave A, Perryville
Norfolk Southern Railroad	450 - 452 Harford Street, Perryville
Perryville Chevron - Former Perryville Texaco	636 Broad Street, Perryville
The National Railroad Passenger Corporation (Amtrak) Maintenance Facility Yard - Amtrak MOW	644 Broad Street, Perryville
Orange Sites	
Ames Shopping Plaza - Master Cleaners	2015-2113 Pulaski Highway, Havre de Grace
Cleaning Solutions Group Site - Cello Site	1354 Old Post Road, Havre de Grace

The Ames Shopping Plaza-Master Cleaners site is approximately 500 feet west of the study area at 2015-2213 Pulaski Highway in Havre de Grace. Dry cleaning operations were conducted at the site between 1969 and 2003. Investigations have indicated groundwater PCE concentrations up to 77,000 µg/L; well above the MDE groundwater clean-up standard of 5 µg/L. Recent investigations have indicated that a significant PCE plume is present in groundwater beneath the site and that the plume is migrating east (i.e., towards the study area). Review of a contaminant plume cross section prepared by MDE in 2012 indicates that concentrations of PCE as high as 5,000 µg/L are present within the study area. These concentrations may have increased since 2012 or may increase over time as significantly higher concentrations of PCE were detected in groundwater up-gradient of the study area.

The Cleaning Solutions Group Site - Cello Site is located partially within the study area at 1354 Old Post Road in Havre de Grace. Hexall first used the Cello site during the 1940s to manufacture aircraft engines. Subsequently Alcolac operated the site, and later, beginning the in 1960s, the site was operated by Fuild-Stauford, a subsidiary of Alcolac. The operations that occurred during Fuild-Stauford's use are unknown. In 1977, Cello Corporation, purchased the site and used it to manufacture cleaning products, aerosols, and acrylics. In 1995, Cello was purchased by ICI. In March 1996, the Sherwin Williams Company purchased Cello from ICI. Site operations under Sherwin Williams have remained essentially the same as the historical operations of Cello. Between July 1985 and August 1987, MDE observed the unauthorized discharge of pollutants from the Cello site and the placement of pollutants in locations likely to result in unauthorized discharges. In 1988, an Administrative Consent Order required that Cello conduct an investigation to determine the extent of contamination that may have resulted from these unauthorized discharges. Investigations indicated the presence of VOCs in groundwater at the site at concentrations exceeding regulatory criteria. VOCs detected in groundwater at the site included 1,1-dichloroethene, 1,1-dichloroethane, TCA, trichloroethene (TCE), VC, chloroethane, 1,2-DCA, 1,2-dichloroethene (1,2-DCE), carbon tetrachloride, 1,1,2-trichloroethane, xylenes, acetone, and methylene chloride. The investigations indicated that groundwater beneath the site flows north and then east, i.e., away from the study area.

D. NO ACTION ALTERNATIVE

Under the No Action Alternative, the demolition and subsurface disturbance associated with the Proposed Project will not occur. Although the assessment above identified a high potential for contaminated materials (including groundwater contaminated with chlorinated solvents), without subsurface disturbance there would be no significant potential for exposure (and associated potential for adverse impacts) to occur. The sites near the study area would continue to be addressed by state and federal regulatory agencies, independent of the Proposed Project.

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

This section analyzes the potential for impacts from Alternative 9A and Alternative 9B. Because of the similarity in alignments and the existing areas of contamination presented above, the following discussion applies to both Build Alternatives.

Construction of the Proposed Project would involve demolition, relocation or other disturbance of existing structures and excavation, relocation and potentially off-site disposal of some existing soil. Dewatering might also be required. The exact extent of disturbance associated with the Proposed Project will not be determined until final engineering, and the presence of contaminated materials would only present a threat to human health if exposure to these materials occurs. A health risk requires both a complete exposure pathway to the contaminants and a sufficient dose to produce adverse health effects. To prevent such exposure pathways and doses during construction, the Proposed Project would include appropriate health and safety and investigative/remedial measures. The need for additional investigation/remediation will be determined, in consultation with MDE, once the exact extent of disturbance is identified.

The most likely route of exposure would be breathing volatile/semi-volatile compounds or particulate-laden air released during demolition, excavation, or construction activities. In order to prevent this and other exposure pathways, the Proposed Project would include measures such as:

- Follow established regulatory requirements for pre-construction removal of asbestos and appropriate management of lead-based paint and of PCB-containing equipment.
- Develop and implement an environmental Construction Health and Safety Plan (CHASP), conforming to applicable local, state, and federal regulatory requirements, including procedures for:

- Managing known or potential contamination (e.g., railroad ties, creosote-contaminated soil and any underground storage tanks unexpectedly encountered);
- Minimizing and monitoring the generation of dust;
- Characterizing surplus materials requiring off-site disposal;
- Dewatering, including pre-treatment prior to discharge if needed;
- Importing clean fill for grading during construction.

The Proposed Project documents and construction specifications will address procedures for stockpiling, testing, loading, transporting (including truck routes), and properly disposing of all excavated materials requiring off-site disposal. Excavated materials will be characterized to classify the materials (e.g., as hazardous waste, petroleum-contaminated wastes, chromate-contaminated soils, historical fill containing construction and demolition debris, or uncontaminated native soils). Wastes containing hazardous materials require special handling, storage, transportation, and disposal methods to prevent releases that could impact human health or the environment. Depending on the nature of the materials, federal, state, and local regulations require the use of special containers or stockpiling practices for on-site storage of the materials to prevent the release of hazardous materials to the environment. The federal, state, and local departments of transportation have requirements for transportation of wastes containing hazardous materials. Facilities that receive hazardous materials require federal, state, and local permits to accept the waste, and generally require that specific representative waste sampling and laboratory analysis protocols be conducted prior to accepting materials for disposal. The extent and parameters of testing are dependent on the requirements of the waste disposal facilities, each of which may have different requirements for representative waste sampling and laboratory analysis prior to accepting materials for disposal.

Dewatering of groundwater will most likely be required in specific locations. Where dewatering is required, it is possible that the water will require treatment prior to its discharge to surface water or existing sewers. Prior to any such discharge, the water will be tested. Discharge of water will be conducted in accordance with applicable requirements, including state requirements for discharge to surface water, and state and local requirements for sewer discharge.

With the implementation of these measures, no significant adverse impacts related to hazardous materials will result from the demolition and construction activities associated with the Proposed Project. In addition, no significant adverse impacts related to hazardous materials would be expected to result from operation of the Proposed Project. ✷

A. INTRODUCTION

This chapter assesses potential public health, safety, and security impacts and benefits related to the operation of the Proposed Project. The Proposed Project's potential public health impacts as they relate to air quality, noise and vibration, and hazardous materials are described below. The safety procedures and security systems that would be implemented to protect rail employees, passengers, marine users, freight users, and the general public during the operation of the Proposed Project are also described. All potential environmental impacts associated with the construction of the Proposed Project are described in Chapter 17, "Construction Effects."

As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative.

B. REGULATORY CONTEXT AND METHODOLOGY

This environmental review is based on the Federal Railroad Administration's (FRA) Procedures for Considering Environmental Impacts (64 Federal Register [FR] 28545 [May 26, 1999]), and therefore considers a project's potential to adversely impact public health and public safety, including any impacts due to hazardous materials. FRA guidance requires that environmental reviews address safety and security concerns, including the short-term construction effects and long-term operational effects on residents and other users of the study area. The review should also include potential pedestrian and traffic hazards as well as transit user and employee security issues.

C. AFFECTED ENVIRONMENT

PUBLIC HEALTH

Public health may be jeopardized by poor air quality, hazardous materials, significant adverse impacts related to noise or odors, solid water management practices, and/or actions that result in exceedances in state or federal standards. Federal, state, and local government entities have a variety of laws and regulations to protect public health.

SAFETY AND SECURITY

EMPLOYEES

The National Railroad Passenger Corporation (Amtrak) complies with all applicable federal safety regulations and industry standards. Adequate signaling and communications are currently in place to prevent any trains from entering the bridge when the movable span is open or when personnel are on site for repairs. Personnel undergo Amtrak Safety Training before they are permitted on site. Amtrak inspects all bridge structural components regularly and repairs them as needed.

In 2006, Amtrak instituted a System Safety Program Plan that applies to all Amtrak facilities, including the project site. The program provides guidance on hazard management, incident reporting, inspection, maintenance and repair of current facilities and stock, training and certification, emergency response, environmental management, drug and alcohol programs, and a number of security policies. One section of the System Safety Program is devoted to employee safety, with a particular focus on field safety. In August of 2009, Amtrak launched *Safe-2-Safer*, a company-wide program designed to improve employee safety and security.[1] This program changes at-risk behavior to safe behavior and fosters a more collaborative work environment. Safe-2-Safer places emphasis on reporting all potential incidents and removing barriers to performing safely in the workplace.

PASSENGERS

Amtrak maintains and updates a Passenger Train Emergency Response Plan that must be approved by FRA. The plan includes train operations on the Northeast Corridor (NEC) and covers the project site. Amtrak also conducts Passenger Train Emergency Response Training. In 2014, training was conducted for more than 3,000 first responders along Amtrak routes across the U.S.[2] A passenger safety specialist position was created in 2014 within Amtrak's System Safety department to address passenger injuries on trains, platforms, and in stations.[3]

MARINE USERS

To assess current conditions, Amtrak commissioned a Navigation Study in 2013.[4] The study focused on vessels greater than 50 feet in height. It found that the existing Susquehanna River Rail Bridge opens approximately 10 times per year to accommodate marine traffic. The Navigation Study concluded that the existing navigation channel (both height and width) addresses the needs of most mariners and vessels. The Navigation Study also determined that while the existing horizontal clearance is sufficient, further widening of the horizontal clearance could increase sight distance, reduce vessel congestion, and aid tug boat and barge navigation through the bridge opening, increasing safety and resilience against potential bridge and fender system strikes.

FREIGHT USERS

Norfolk Southern (NS) operates between Harrisburg, Pennsylvania, and Baltimore, Maryland, using its "Port Road" route along the Susquehanna River between Harrisburg and Perryville, and using trackage rights along the NEC between Perryville and Baltimore. NS also provides freight service from points north of Perryville to and through Baltimore. NS has rights to conduct freight operations along the NEC in the study area, including over the Susquehanna River Rail

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[1] https://www.amtrak.com/ccurl/369/338/2014-Amtrak-Sustainability-Report.pdf. Accessed April 22, 2016.

[2] https://www.amtrak.com/ccurl/259/724/Amtrak-Ink-March-Apri-2015.pdf. Accessed April 22, 2016.

[3] https://www.amtrak.com/ccurl/369/338/2014-Amtrak-Sustainability-Report.pdf. Accessed April 22, 2016.

[4] Susquehanna River Rail Bridge Reconstruction and Expansion Project Navigation Study, dated January 21, 2014, HNTB Corporation.

Bridge. In addition, CSX Corporation operates freight service on the CSX Susquehanna River Rail Bridge approximately 0.9 mile to the northwest of the Amtrak Susquehanna River Rail Bridge, and under agreement with NS, has rights to use the Amtrak bridge in the event of failure or closure of its own bridge.

The existing bridge requires that the slow, heavy freight trains and Maryland Area Regional Commuter (MARC) trains share track with higher-speed Amtrak trains. The long, slow-moving freight trains can create congestion conflicts. For example, when the southbound NEC track is in use by an intercity or commuter train approaching the Susquehanna River Rail Bridge (in either direction), NS freight trains coming from the west must stop on the Port Road rail line and wait for an appropriate window to enter the NEC. Similarly, NS trains coming up from the south must wait in Havre de Grace, occupying one of the main tracks to wait their turn to cross the bridge. Amtrak works with these freight users to ensure safe scheduling to cross the Susquehanna River Rail Bridge.

RESIDENTS ALONG THE NEC

Due to the highly developed nature of the study area, many residents live in close proximity to the active NEC. Schools, public parks, and other publicly-accessible venues also are located near the rail right-of-way.

FRA's Office of Railroad Safety promotes and regulates safety throughout the nation's railroad industry. The office executes its regulatory and inspection responsibilities through a diverse staff of railroad safety experts.[5] FRA data show that 96 percent of rail-related fatalities, most of which are preventable, are the result of incidents at railway-highway crossings and by trespassers.[6] Railway-highway crossings are commonly referred to as “at-grade crossings” or “street-level crossings”, defined as locations where railroad tracks intersect with a roadway at the same elevation—thereby increasing the potential for conflict. There are no at-grade crossings within the Susquehanna River Rail Bridge Project’s study area.

Amtrak is a leader in the installation of Positive Train Control (PTC), a safety technology designed to match train speed to track conditions for improved safety.[7] PTC provides an added layer of safety on top of the cab signal and Automatic Train Control safety systems already in place. In December 2015, Amtrak activated PTC on track between New York and Washington, DC, completing installation on most Amtrak-owned infrastructure on the NEC spine.

D. NO ACTION ALTERNATIVE

Under the No Action Alternative, the existing public health, safety, and security measures will remain unchanged. Amtrak and MDOT will continue to adhere to current regulations regarding public health and safety. The Susquehanna River Rail Bridge will remain as in existing conditions. Service over the bridge would worsen in the future under the No Action Alternative. The bridge would continue to age, problems would occur more frequently, and the bridge would remain as a bottleneck; it would eventually need to be taken out of service.

In the future, FRA and Amtrak will continue to implement multiple measures to ensure public safety and minimize the potential for accidents. As described above, PTC is a control technology

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[5] https://www.fra.dot.gov/Page/P0010. Accessed December 2, 2016.
[6] https://www.fra.dot.gov/eLib/Details/L17371. Accessed December 2, 2016.
[7] https://www.amtrak.com/national-facts. Accessed December 2, 2016.

used to prevent or avoid train collisions and derailments. The purpose of PTC is to slow or stop a train that is operating at an excessive speed or operating in a manner inconsistent with the section of track that it is traversing.[8] In the future, railroads throughout the U.S. will likely continue to implement PTC.

E. POTENTIAL IMPACTS OF THE BUILD ALTERNATIVES

The Proposed Project would be designed, built, and operated to comply with all relevant federal, state, and local regulations.

PUBLIC HEALTH

Potential health effects during operation of the Proposed Project would be related to air quality, noise and vibration, and hazardous materials.

AIR QUALITY

As described in Chapter 12, "Air Quality," the Proposed Project would not substantially affect regional air quality. Increases in local concentrations will occur near the tracks used by trains running on diesel. With the Build Alternatives 1-hour average concentrations of nitrogen dioxide (NO_2) will increase up to 8.6 percent, as compared with the No Action Alternative. Like the No Action Alternative, the Build Alternatives could result in concentrations above the National Ambient Air Quality Standards (NAAQS). The maximum projected increase in 1-hour average NO_2 concentrations (8.6 percent) would occur in a very limited area affected by both the increase in diesel train activity and the Proposed Project changes in grade and alignment; in other areas potential increases would be much smaller, and in areas where the new track alignment would relocate tracks away from sensitive receptors concentrations would decrease. Additionally, 1-hour average NO_2 concentrations are projected using conservative assumptions and would likely be lower overall. While concentrations above the NAAQS in general are considered to potentially adversely affect public health, due to the limited magnitude and area affected by the small increases in concentrations, the Proposed Project itself would not cause a significant adverse impact on public health.

NOISE AND VIBRATION

Based on the information detailed in Chapter 14, "Noise and Vibration," the Build Alternatives would not have the potential to result in significant adverse impacts relating to airborne noise, vibration, or ground-borne noise at any of the analyzed receptor sites. Therefore, the Build Alternatives would not be expected to result in any significant adverse impacts related to noise or vibration.

HAZARDOUS MATERIALS

As described in Chapter 15, "Contaminated and Hazardous Materials," construction of the Proposed Project would involve demolition, relocation or other disturbance of existing structures and excavation, relocation and potentially off-site disposal of some existing soil. The presence of contaminated materials only presents a threat to human health if exposure to these materials occurs. A health risk requires both a complete exposure pathway to the contaminants and a sufficient dose to produce adverse health effects. To prevent such exposure pathways and doses

[8] http://www.necfuture.com/pdfs/tier1_deis/c07_18.pdf. Accessed December 2, 2016.

during construction, the Proposed Project will include appropriate health and safety and investigative/remedial measures. The need for additional investigation/remediation will be determined, in consultation with Maryland Department of Environment (MDE), once the exact extent of disturbance is identified. With the implementation of these measures, no significant adverse impacts related to hazardous materials will result either during the demolition and construction activities associated with the Proposed Project or during operation of the Proposed Project.

SAFETY AND SECURITY

The Proposed Project would improve the reliability of traveling across the Susquehanna River and increase the safety of passengers and freight users traveling along the NEC. The Proposed Project would provide navigational benefits by improving the reliability of the bridge and minimizing delays during bridge openings and closings.

EMPLOYEES

Amtrak will design, build, and operate the Proposed Project to comply with all relevant federal, state, and local safety regulations. The Proposed Project would improve the structural and operational reliability of the Susquehanna River Rail Bridge, increasing the safety of employees that work on and travel over the bridge.

PASSENGERS

The Proposed Project would improve the structural and operational reliability of the Susquehanna River Rail Bridge, thereby increasing the safety of passengers traveling over the bridge.

MARINE USERS

The Proposed Project would eliminate the need for bridge openings and closings by replacing the Susquehanna River Rail Bridge as two high-level fixed bridges. Under either Alternative 9A or Alternative 9B, the Proposed Project would provide a 60-foot vertical clearance and, at minimum, a 230-foot horizontal clearance. This would provide sufficient vertical clearance, while widening the horizontal clearance. A wider horizontal clearance would improve safety by reducing the potential for conflicts between the rail bridge and marine traffic.

FREIGHT USERS

The Proposed Project would eliminate bridge malfunctions resulting from the opening of the existing movable span. The Proposed Project would also provide a separate track that would be used primarily by MARC commuter rail and NS freight rail service. This would improve scheduling and help to prevent freight trains from having to wait for an appropriate window to cross the bridge. This would improve the reliability of the bridge and scheduling, resulting in a long-term benefit to the safety of freight rail service across the bridge. Amtrak will continue to coordinate with freight users of the Susquehanna River Rail Bridge to minimize any potential impacts to freight operations.

RESIDENTS ALONG THE NEC

Amtrak is committed to creating a safe environment for both their passengers and the communities surrounding their infrastructure. FRA continually updates passenger equipment safety standards and safety regulations. The safety provisions included in the construction and operation of the Proposed Project would comply with all Amtrak policies and Federal safety regulations. These provisions would help minimize the potential for significant adverse impacts to public safety.

F. MINIMIZATION AND MITIGATION OF IMPACTS

Specific impact minimization and mitigation measures pertaining to air quality and hazardous materials are presented in Chapter 12 and Chapter 15, respectively. ✷

Chapter 17: Construction Effects

A. INTRODUCTION

This chapter describes the construction process for the Proposed Project and assesses the potential environmental impacts associated with these activities. Section B gives an overall description of the construction sequence and schedule, Section C includes a description of the construction methods and equipment that would likely be used to complete each of the key project elements, and Section D discusses potential environmental impacts and mitigation measures.

As discussed in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates two Build Alternatives: Alternative 9A and Alternative 9B. Alternative 9A was selected as the Preferred Alternative. The Build Alternatives (Alternative 9A or Alternative 9B) would likely be constructed using the same general construction sequencing and methods. The No Action Alternative would not involve any construction and is therefore not discussed further.

The construction means and methods presented in this chapter are based on the current conceptual engineering design and the project sponsors' past experience on similar projects. While the construction techniques ultimately utilized for the Proposed Project may vary, the potential for environmental impacts and types of mitigation measures described herein would not be substantially different.

B. CONSTRUCTION SCHEDULE AND SEQUENCE

CONSTRUCTION SCHEDULE

The Proposed Project requires careful scheduling and coordination between various stakeholders. Before a construction contract can be awarded, preliminary design, final design, environmental permitting, and contractor procurement must be completed. Based on the work that needs to be completed prior to the contractor procurement, the Proposed Project schedule assumes that contracted construction will commence in 2020, subject to project funding. Certain force account work (work performed by railroad personnel rather than a contractor), which also requires design and procurement phases, must be completed prior to commencement of contracted construction.

This section presents a construction schedule that is typical for a rail bridge replacement project. The schedule for the Proposed Project will comply with in-water restrictions and other limitations likely to be required by permits. Federal and state natural resource and permitting agencies typically enforce seasonal in-water work restrictions to prevent disturbance to the channel bottom during shellfish gestation and development or disturbance of migratory fish during spawning. These agencies may impose additional schedule restrictions to protect birds or other species. Any federal or state restrictions on in-water work will be more clearly defined during the final design and permitting stage.

With these potential limitations to the schedule, the Federal Railroad Administration (FRA) and Maryland Department of Transportation (MDOT) anticipate that contracted construction work for Alternative 9A and Alternative 9B can be completed over approximately 5 years, beginning in 2020 and ending in 2025. The initial track work and catenary infrastructure installation and construction of the new bridges are the critical path elements.

CONSTRUCTION SEQUENCE

Construction will be carried out in three phases, plus early action work that would occur prior to the start of Phase A.

Table 17-1
Construction Sequence and Duration

Phase	Key Components	Estimated Duration
Early Action (Pre-Phase A)	Construct OCS/transmission structures	12 months prior to Phase A (Continues concurrent with Phase A)
Phase A	Construct new west bridge approach spans; complete modifications to existing bridges and construction of retaining walls. Complete modifications to Prince, Perry and Grace Interlockings.	24 months
Phase B	Construct main channel span and install track and systems on bridge. Shift service to new west bridge. Demolish existing swing span.	5 months
Phase C	Demolish existing bridge approaches. Construct new east bridge and approaches. Construct track/systems and cut new bridge into service.	36 months
	Total Phases A-C:	**65 months**
Source: HNTB		

C. CONSTRUCTION OF KEY ELEMENTS

SUBSTRUCTURE

Substructure construction is similar for the two Build Alternatives. Material transport and debris removal would be accomplished through a combination of barge and truck transport. To enable barge delivery of materials and equipment access in shallow water areas, finger piers (temporary docks) will be constructed both east and west of the proposed bridge alignment in Perryville. The finger piers would be constructed within the National Railroad Passenger Corporation (Amtrak) right-of-way (ROW) east of the proposed alignment, and in a vacant Town-owned lot (Plot #231) west of the proposed alignment[1] (see **Figure 17-1**). The upstream finger pier would have an estimated overwater length of 495 feet and width of 38 feet; the downstream finger pier would have an approximate overwater length of 260 feet and width of 38 feet. Light required to support any submerged aquatic vegetation (SAV) in this area would likely reach 15 feet in on each side of the finger piers, but may adversely affect SAV survival over the 3 to 5 years they

[1] HNTB Constructability Memo, January 2015.

Legend

Finger Pier

1,000 ft Study Area

N

0 200 400 Feet

Susquehanna River Rail Bridge Project

Figure 17-1

Proposed Finger Piers

are in place, so mitigation is planned. Precast concrete, concrete, steel reinforcement bars, and structural steel members could be transported to the Proposed Project site by barge.

IN-RIVER STRUCTURES

Construction work is assumed to begin simultaneously at multiple locations. Foundations in water are time-consuming but are completely off-line from the existing bridge; therefore, construction will start with drilled shafts for in-water piers using barge-mounted equipment. The use of several barges is anticipated for the construction of the drilled shafts, caps and piers—including barges used for mounted cranes, storage barges, and barges to hold materials. In shallow water, a temporary finger pier supported on piles or a causeway would be used for access and construction; dredging would have considerable adverse effects to benthic habitat and is not proposed. For piers located in shallow water, typical cofferdams may be used. For those in deeper water, float-in precast forms are anticipated to minimize on-site construction and to function as formwork for the caps.

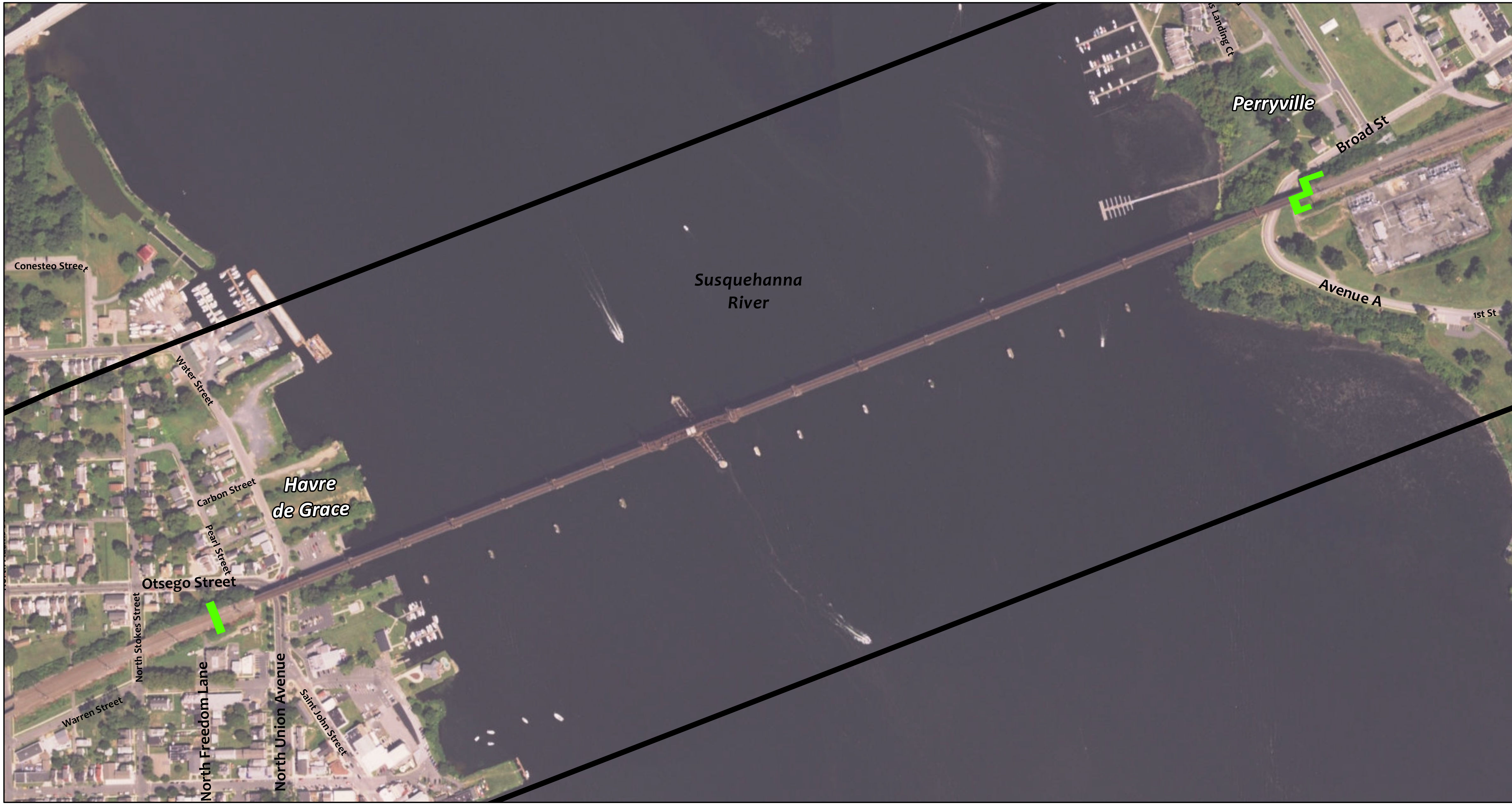
Once the foundations have been completed, the piers will be constructed using the arrangement put in place for the construction of the drilled shafts. During this step, construction activity will be above the MHW level. Construction of the fender system could start after completion of the piers adjacent to the navigable channel. Overall, the loss of 0.37 acre of bottom habitat for aquatic biota from construction of the new bridges will be more than offset by the approximately 0.5 acre of river bottom that would return to benthic habitat upon demolition of the existing bridge and remnant piers. All other impacts will be temporary, including the potential loss of SAV from the finger piers that will be mitigated; this is expected to result in a potential net gain in the populations of benthic organisms and their predators who are higher in the food web.

LAND-SIDE STRUCTURES

New abutments can be built simultaneously with the erection of the piers in the water. New concrete walls will be built adjacent to existing masonry to support the new structure where feasible. New concrete backwalls will be installed. Existing masonry walls may be reinforced using tie-backs and wall heights extended as needed. Consolidation surcharge (the pre-compression of soft soils to avoid future structural damage from soil settlement) may be applied at the beginning of construction to minimize settlement of future embankment. Widening of the existing embankment will likely be accomplished with the use of modular precast systems (T-walls or similar).

In Havre de Grace, the alignments of Alternative 9A and Alternative 9B mostly overlap with the existing alignment, with a slight westward shift near the waterfront and the abutment. To realign the intersection of Otsego Street and North Union Avenue, as requested by the City, the new abutment will be located farther south (toward North Freedom Lane). At Perryville, the new abutment will be adjacent to the existing abutment, and a slight realignment of Avenue A (at the location of the existing abutment) may be necessary to accommodate the shifted abutment (see **Figure 17-2**).

Along the north and south bridge approaches, one existing overhead bridge (in Havre de Grace) and 10 existing undergrade bridges (four in Perryville and six in Havre de Grace) will require modification to accommodate the proposed track alignments (see Figure 3-1). Two of the undergrade bridges in Perryville and one in Havre de Grace will be extended with a precast concrete culvert to extend the existing stone masonry arch; the remaining undergrade bridges will likely need to have their superstructures replaced in full, while further engineering studies



Legend

Bridge Abutment

1,000 ft Study Area

0 300 600 Feet

N

Susquehanna River Rail Bridge Project

Figure 17-2

Proposed Abutments

will determine whether their substructures can be replaced or retained and expanded. The Lewis Lane overhead bridge in Havre de Grace will need to be replaced under Alternative 9A.

SUPERSTRUCTURE

The preferred bridge type combines plate girder approach spans with a network tied arch navigation span. The 170-foot-long plate girder approach spans will likely be lifted into place by crawler cranes or barge-mounted cranes, based on their location. The network tied arch navigation span would be constructed off-site to reduce the schedule and minimize impacts to marine traffic in the channel. Upon erection of the approach spans and installation of the channel span bearings, the fully assembled network tied arch would be transported by barge to the site and lifted into position. Reinforced concrete deck will be cast in place on each of the spans.

Due to the proximity of the existing and proposed alignments, the existing swing span cannot operate once the installation of the new channel span superstructure has started. Therefore, the installation of the superstructure over the channel span can only be accomplished between November and March, when no openings of the swing span typically occur. The erection of the superstructure should be scheduled early during this time window as the track work and removal of the existing through truss must also occur during this period.

DEMOLITION OF THE EXISTING STRUCTURE

For both Alternative 9A and Alternative 9B, after erection of the channel span and opening of the new structure to rail traffic, the swing span of the existing bridge will not be able to operate and will need to be removed. The demolition of the existing structure will most likely use a combination of barge crane(s) and barges equipped with transporters to lower the existing truss. Once the new bridge is in service, the existing swing span will need to be removed immediately in order to reopen the navigation channel. To prevent buckling, the existing truss spans may have to be modified prior to demolition. It is presumed that no blasting would be required; the anticipated method for removal of the substructure would require divers equipped with wire saws to cut the piers down to two feet below the mudline, after which the material would be removed with barge-mounted cranes. Another method of construction, which would involve blasting, is a cofferdam with blast mats and controlled explosives.

ADDITIONAL STRUCTURES AND SYSTEMS

Other railroad components will need to be replaced and/or reconstructed as part of Alternative 9A and Alternative 9B. Fiber optic communications will need to be maintained during all phases of construction, as well as other communications infrastructure such as CCTV, telephones, and radio equipment. The rail signal system will be redesigned based on the new track configuration and new interlockings. A new compound auto-tensioned style catenary system is proposed. This will require replacement of some existing catenary structures and modification of others.

Alternative 9A and Alternative 9B would have minimal impact to the Perryville Electrical Substation. The transmission tower on the west side of the tracks may require relocation, but any relocation would be in close proximity to the existing tower. It is imperative to maintain the existing connections to the power grid throughout the construction period.

CONSTRUCTION ACCESS AND STAGING

The Proposed Project reserves 10 feet from the embankment toe of slope or face of retaining wall for future maintenance along the corridor. In general, this width is sufficient for future maintenance with the exception that, at certain intervals, the width must be increased to allow for vehicles to pass each other and/or turn around. Based on conceptual design, these turn-around zones can likely be accommodated within Amtrak's existing ROW and outside sensitive environmental resources, avoiding the need for property acquisition and further environmental impacts.

The construction access road for the embankment and retaining walls along the corridor would be built to remain in place as the permanent access road. As the corridor approaches the structures on each side of the Susquehanna River, maintenance access is available utilizing local roads. However, staging areas temporarily required for construction fall outside Amtrak's ROW. The staging areas include a vacant Town-owned lot in Perryville, which may be temporarily affected to build Pier 1W and Pier 2W. In Havre de Grace, staging and construction access will be avoided on the north side of the ROW between North Juniata Street and Lewis Lane, where larger forest tracts occur along Lily Run and Lewis Run. This area contains portions of three private commercial properties, one nonprofit commercial property (an Elks Club Lodge), and one property owned by the Havre de Grace Housing Authority[2].

Construction access for equipment and materials is not expected to be a major constraint. The project area is readily accessible from Interstate 95, US Route 40, several rail lines and the Susquehanna River, which supports commercial marine traffic. Access to the undergrade bridges along the NEC is achievable through the local roadway network. Access to the existing ROW for rubber-tired and rail equipment is available at several points in the project area. A construction access plan will be developed in coordination with the community to determine appropriate highway access routes and acceptable street closure schedules.

The contractor would require a large area for site facilities including field offices, equipment and material storage, etc. The preferred solution would be to have access to an area within Amtrak's ROW. One option is the area adjacent to the Perryville Electrical Substation. This appears to be the only viable location within Amtrak's ROW; lease of privately owned land is another possibility.

SOLID WASTE DISPOSAL

The contractor will dispose of solid waste, including excavated soil or sediment, in accordance with all applicable regulations and the requirements of off-site waste disposal facilities. Most of the construction and demolition debris, including the existing river bridge structure, would be removed by barge. Some debris would be removed by truck. Special provisions will be made for handling and disposal of any contaminated or hazardous materials encountered during construction and demolition; these procedures are described in Chapter 15, "Contaminated and Hazardous Materials."

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[2] Maryland Department of Planning, *FINDER* Online Light. http://mdpgis.mdp.state.md.us/finderonlinejs/pi/index.html, accessed 3/8/2016.

D. SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS

TRANSPORTATION

Alternative 9A and Alternative 9B allow for construction during normal hours while maintaining train operations without substantial impediment. This would be accomplished by pre-constructing the components of the replacement bridge along the new alignment off-site. The new bridge would be tied in and rail service would be redirected to it before starting demolition and reconstruction of the second new bridge along the existing alignment.

INTERCITY RAIL, FREIGHT SERVICE, AND COMMUTER RAIL

During the construction period, intercity, freight, and commuter trains operating through the project area may need to operate at slower speeds to ensure safety. Limited track outages may also be required to connect the newly constructed bridge approach spans to the existing track.

PUBLIC TRANSPORTATION

Bus Service

Construction of the Proposed Project would have only minimal effects on bus service. Some riders may temporarily switch to bus service to avoid any train service delays caused by the construction of the new bridge; however, this effect would be temporary.

Transportation for the Elderly and Disabled

Construction of the Proposed Project would have no adverse effects on paratransit service.

NAVIGABLE WATERS

To reduce the need for ROW acquisitions for the Proposed Project, the new bridge would be constructed within the swing of the existing movable span. This will prevent the existing bridge from opening for mariners while the channel span is being constructed, restricting navigation to vessels less than 52 feet high until the new bridge is placed into service and the existing movable through truss is removed. Typically, the existing bridge does not open for a five-month period from November 1 to March 31 due to low demand outside the recreational boating season. For Alternative 9A and Alternative 9B, it is anticipated that construction of the new channel span and removal of the existing swing span could be completed within the five-month window when the bridge typically does not open.

During the swing bridge closure period, there will be some impacts to river navigation beyond the restriction of swing bridge openings. Coordination will be required between the contractor, the U.S. Coast Guard, and local mariners to permit safe passage of vessels during construction activities. The contractor will be working in the channel to construct new bridge elements including the channel span piers and superstructure. Most of the contractor's work can be performed while maintaining one of the existing navigation channels for mariner use. Brief channel closure periods will be needed for erecting superstructure elements, demolishing the existing through trusses, and performing selected overhead work.

In order to avoid damage to commercial fishing equipment during the construction period, waterborne construction traffic would use navigation routes selected in consultation with the local fishermen’s organization. Additional consultation with the commercial fishing community would occur as needed during the construction process. Provisions to avoid damage to commercial fishing equipment will be included in construction documents for the Proposed Project.

In summary, construction of the Proposed Project would result in some limited, temporary disruptions to mariners. Impacts to navigation will be temporary and limited to the construction of the replacement bridge. In addition, efforts will be made to undertake a large portion of the required construction activities outside of the recreational boating season, during the winter months, which will further reduce impacts to navigation.

REGIONAL HIGHWAY SYSTEM

Construction of the Proposed Project would have no adverse effects on regional highways.

LOCAL ROADWAYS

Construction access will be primarily from public streets. A construction access plan will be developed in coordination with the community, to determine appropriate highway access routes and acceptable street closure schedules. With these measures in place, construction of the Proposed Project would have no adverse effects on local roadways.

LAND ACQUISITION, DISPLACEMENT, AND RELOCATION

In addition to the necessary land acquisitions discussed in Chapter 4, “Land Use and Community Facilities,” Alternative 9A and Alternative 9B would require temporary acquisition of several parcels for construction access and staging. These temporary acquisitions are discussed further under “Construction Access and Staging,” above. No significant adverse impacts to local land uses are expected from construction of the Proposed Project.

PARKS AND RECREATIONAL RESOURCES

The City of Havre de Grace recently approved the purchase of four properties, totaling 3.2 acres, as part of a proposed plan to develop Waterfront Heritage Park along the Susquehanna River, west of the existing NEC. The contractor may consider using this as yet undeveloped site as a construction staging area through a lease or other agreement with the City before the onset of park development.

Beyond this potential use and the permanent impacts to parks discussed in Chapter 6, “Parks, Trails, and Recreational Resources,” there are no additional temporary impacts caused by construction.

SOCIOECONOMIC CONDITIONS

Local businesses will not be significantly affected during the construction period. There will be a detour to reconstruct the Otsego-Union Street alignment and local marinas and their customers may be affected by the short-term navigation restrictions. Therefore, no significant adverse impacts to socioeconomic conditions are expected from construction of the Proposed Project.

VISUAL AND AESTHETIC CONDITIONS

During construction, there would be an increase in the level of activity within the study area. As the Proposed Project proceeds, cranes and other large pieces of equipment would be visible from much of the study area. As described previously in Chapter 7, "Visual Resources," the locations in the study area from which substantial views of the Susquehanna River Rail Bridge are currently available are recreational resources along the Susquehanna River, the roadways and rail corridors that transect the study area, and the river itself, from which boaters have uninhibited views of the bridge. The views to visual resources that motorists and rail passengers experience are generally of short duration, due to the relatively high speeds at which they tend to travel through the study area. Boaters in the immediate vicinity of the bridge and pedestrians in nearby recreational areas would experience the longest duration and closest range views of the replacement bridge construction area. For the duration of construction, cranes, barges and other construction equipment, as well as staging areas on both sides of the Susquehanna River would be visible to boaters and pedestrians. These temporary changes would not constitute an adverse impact to visual resources.

CULTURAL RESOURCES

Cultural resources include both architectural and archaeological resources. As described in Chapter 8, "Cultural Resources," no adverse effects on archaeological resources are expected to result from the construction of the Proposed Project. In terms of architectural resources, the S/NR-eligible Susquehanna River Rail Bridge would be replaced under both Build Alternatives. The removal of this resource constitutes an adverse effect under Section 106. Additionally, adverse effects on the undergrade bridges along the approaches to the Susquehanna River Rail Bridge, the Havre de Grace Historic District, the Rodgers Tavern, and the Perryville Railroad Station are anticipated as a result of constructing the Proposed Project, as described in Chapter 8. In order to avoid accidental damage to adjacent resources as a result of construction activities associated with the Proposed Project, a Construction Protection Plan (CPP) will be developed in consultation with SHPO for all historic properties that may be subject to inadvertent damage resulting from construction activities. Mitigation measures are discussed in further detail in Chapter 8.

AIR QUALITY

For a full description of the pollutants of concern and the regulatory context for air quality analyses, see **Appendix F**, "Air Quality, Noise, and Vibration." The pollutants of concern include particulate matter (both $PM_{2.5}$ and PM_{10}) including dust and diesel engine emissions and nitrogen dioxide (NO_2) from engine emissions.

FUGITIVE EMISSIONS

Fugitive dust emissions from land clearing and grading operations can occur from excavation, hauling, dumping, spreading, grading, compaction, wind erosion, and traffic over unpaved areas. Actual quantities of emissions depend on the extent and nature of the clearing operations, the type of equipment employed, the physical characteristics of the underlying soil, the speed at which construction vehicles are operated, wind speed, direction and duration, and the types of fugitive dust control methods employed. Much of the fugitive dust generated by construction activities consists of relatively large-sized particles, which are expected to settle within a short distance from the construction site.

Common construction practices include extensive mitigation measures that would be implemented to suppress dust emissions. Appropriate fugitive dust control measures that could be employed include: temporarily paving areas expected to be used extensively, watering of exposed areas regularly and/or using approved non-toxic soil stabilizers, minimizing the time that bare soil is exposed, requiring the use of continuous water spray on all materials transfer (e.g., excavation, loading/unloading) and demolition operations, covering lose materials and protecting them from wind, temporary vegetation planting on stockpiled soils, truck wash down stations at each exit from each site required to be used by all exiting vehicles, and use of dust tarps on trucks. Contracts will require the submission and approval of a detailed dust control plan for each site prior to the beginning of operations; the plan will define the precise measures to be used for each operation type and location and the enforcement mechanism so as to ensure that significant adverse impacts from fugitive emissions do not occur.

MOBILE SOURCE EMISSIONS

Mobile source emissions are emissions of air pollutants from vehicles operating off-site en route to and from the site, such as delivery vehicles, employee vehicles, and tug boats, and from on-road and non-road vehicles and engines operating on-site such as dump trucks, readymix concrete trucks, tug boats, cranes, excavators, portable generators, and more. Mobile source emissions are categorized according to whether they are from on-road sources (vehicles on public roadways) or non-road sources (marine engines, construction equipment and locomotives). Ultra-low sulfur diesel (ULSD) fuel is the primary fuel, although some smaller engines may use gasoline.

Non-road Engines

Major construction activities associated with the Build Alternatives would occur simultaneously at a number of locations throughout the project area. In order to reduce pollutant emissions from non-road engines and to reduce or avoid potential adverse impacts on air quality in the area surrounding the Proposed Project, construction contracts would include the following requirements along with appropriate enforcement mechanisms.

Tier 4 engines or, where Tier 4 is not available or practicable, Tier 3 engines retrofitted with EPA, California Air Resources Board (CARB), or VERT[3]-approved after-market diesel particle filters (DPF) would be used where technically feasible (including safety considerations) for all non-road diesel engines greater than 60 horsepower (hp). After-market DPF for Tier 3 engines with ULSD fuel achieve nearly the same particulate matter emissions as the newer Tier 4 engines, and the use of Tier 3 engines ensures the lowest practicable NO_x emissions so as to minimize NO_2 concentrations in the nearby areas to the extent practicable. These requirements will apply to all construction engines including but not limited to marine engines, nonroad engines, and portable and/or truck mounted equipment such as generators, pumps, and drills, including all phases of construction and any exploratory work such as test drilling. Material and equipment delivery via rail is not proposed at this time. A reevaluation would be needed if deliveries via rail are proposed in the future.

On-Road Engines

In order to reduce pollutant emissions from on-road vehicles and to reduce or avoid potential adverse impacts on air quality in the area surrounding the Proposed Project, construction contracts would include the following requirements along with appropriate enforcement mechanisms. Localized effects due to increases in on-road mobile source emissions would be minimized through the use of barges or materials transport where feasible and the use of

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[3] An association dedicated to the promotion of best available technology for emission control.

appropriate routes for truck deliveries (that avoid residential areas to the extent practicable); these truck routes would be identified and specified in all construction contracts as appropriate. Truck idling will be strictly prohibited by contract and enforced, other than in cases where a truck engine is required to operate auxiliary devices such as loading and unloading or concrete mixing. All trucks expected to operate on site, including but not limited to concrete mixing trucks and dump trucks, would be required to be of model year (MY) 2007 or newer or equipped with DPF-approved similar to the above non-road requirements; MY 2007 or newer vehicles are equipped with advanced systems to substantially reduce both PM and NO_x emissions.

STATIONARY SOURCE EMISSIONS

Electric power at land-based sites would be provided by applying for an electric grid power connection in advance and distributing grid power throughout the various sites where power would be needed. The use of small portable generators (including truck-mounted generators) up to 50 hp would be allowed at land-based sites only for sites where construction duration would be limited (less than two weeks) and at which obtaining a grid connection would be impracticable. Large generators would not be used at land-based sites.

POTENTIAL EFFECTS

Diesel particulate matter and NO_2 are a concern, particularly from non-road engines that have traditionally been subject to lower emission standards than on-road sources. The potential for adverse air quality impacts during construction of the Build Alternatives would be reduced to the extent practicable using the strategies listed above. These measures would be specified in all construction contracts, including implementation details, reporting, and enforcement procedures.

With these measures in place, the construction-related impacts on air quality would be substantially reduced, and any remaining impacts would be temporary and limited to the local vicinity. Therefore, no significant adverse impacts on air quality are expected from construction of the Proposed Project.

Total maximum annual emissions from construction were estimated at 31 tons per year (tpy) of NO_x, 4 tpy of VOC, and 3 tpy of $PM_{2.5}$ in each of the adjacent non-attainment and maintenance areas—substantially lower than the *de minimis* levels defined in the general conformity regulations. Therefore, the construction of the Proposed Project would not substantially impact region-wide pollutant concentrations, would not interfere with the SIP for region–wide attainment of the ozone NAAQS or maintenance of the $PM_{2.5}$ NAAQS, and would not require a conformity determination.

NOISE AND VIBRATION

Noise and vibration from construction equipment operation and noise from construction vehicles and delivery vehicles traveling to and from the Proposed Project area may occur during construction of the Proposed Project. The level of impact of these noise sources depends on the noise characteristics of the construction equipment and activities, the schedule, and the location of potentially sensitive noise receptors. Noise and vibration levels at a given location are dependent on the type and number of pieces of construction equipment being operated, as well as the distance from the construction site. Like most construction projects, construction of the Build Alternatives would result in increased noise and vibration levels for a limited time period.

NOISE

Typical noise levels of construction equipment that may be employed during the construction process are provided in **Table 17-2**. Noise from construction equipment is regulated by U.S. Environmental Protection Agency (USEPA) noise emission standards. These federal requirements mandate that: (1) certain classifications of construction equipment and motor vehicles meet specified noise emissions standards; and (2) construction materials be handled and transported so as not to create unnecessary noise. These regulations would be carefully followed. Appropriate low-noise emission level equipment would be used and operational procedures implemented to ensure equipment noise emission levels that do not exceed the values shown in **Table 17-2**. Compliance with noise control measures would be ensured by including them in the contract documents as material specifications and by directives to the construction contractor. The contractor would be encouraged to use quiet construction equipment.

Noise generated by construction equipment would decrease with distance. In general, the outdoor drop-off rate for moving noise sources is a decrease of 4.5 dBA for every doubling of distance between the noise source and the receiver. For stationary sources, the outdoor drop-off rate is a decrease of 6 dBA for every doubling of distance between the noise source and the receiver. In general, noise caused by construction activities would vary widely in volume, duration and location, depending on the task being undertaken and the piece of equipment used. Noise caused by delivery trucks, employees traveling to and from the site, and other construction vehicles would not be severe in volume or duration, and would be limited to the major access roadways leading to the project site. Highway access to the project site is good, minimizing the need for project-related trucks to travel on local roads. Major elements of the Proposed Project, such as the steel trusses for the river crossings, would be assembled off-site and delivered by barge. Some components would be delivered by truck, with the number of daily deliveries by estimated to range between 25 and 50 during peak construction activity. This level of truck traffic would not be expected to result in noise levels at any residential receptors that would constitute significant adverse impacts.

The Federal Transit Administration's (FTA) General Analysis methodology for construction noise was used to evaluate the potential for noise impacts resulting from construction of the Proposed Project. The General Analysis methodology considers the noise level produced by the two loudest pieces of construction equipment compared with construction noise impact criteria, which is 90 dBA during daytime hours and 80 dBA during nighttime hours[4]. In the case of the Proposed Project, two impact pile drivers were assumed to represent the two noisiest pieces of equipment. **Table 17-3** shows the results of the general construction noise analysis.

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[4] While most construction is expected to occur during daytime hours, some specific activities may be required to occur during the evening, and schedule constraints may require some night-time work.

Table 17-2
Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA) 50 feet from source
Air compressor	81
Backhoe	80
Bulldozer	85
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Generator	81
Grader	85
Impact Wrench	85
Jackhammer	88
Loader	85
Paver	89
Pile Driver (Impact)	101
Pile Driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88
Source: Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06, May 2006.	

Table 17-3
Construction Noise Levels in dBA

Site	Receptor Location	Distance to Work Area (feet)	Construction Noise Level
1	Broad Street at Susquehanna Avenue, Perryville	118	62.6
2	Elm Street at Susquehanna Avenue, Perryville	820	45.7
3	River Road North of Broad Street, Perryville	744	46.6
4	Woodlands Farm Road South, Perryville	>5000	49.5
5	Avenue D at 1st Street, Perryville	728	46.8
6	Ellis Court South of Broad Street, Perryville	1200	53.7
7	Freedom Lane at Franklin Street, HdG	719	46.9
8	David Craig Park, HdG	109	63.3
9	North Stokes Street at Otsego Street, HdG	87	65.2
10	Anderson Avenue Cul-de-Sac, HdG	>5000	61.7
11	Warren Street at Legion Drive, HdG	787	53.4
12	Williams Drive East of Oakington Road, HdG	>5000	59.2

As shown in **Table 17-3**, the predicted levels of construction noise are well below the 80 dBA threshold that is considered significant even during nighttime hours according to FTA's construction noise evaluation criteria. However, construction activities related to the bridges, approach structures, embankment and retaining walls, and new track and ancillary equipment along each alignment would result in short-term noise increases in the vicinity of the actual work site. At receptors located along the waterfront and along the approach structures, construction activity would be audible and would result in perceptible increases in noise level during the periods of heavy construction activity, such as excavation and foundation construction. Like many corridor-type transportation projects, construction in any given area would be limited as the work progresses, minimizing the adverse noise impacts on any one site.

However, because of the distance between the construction work areas and adjacent receptors, no significant adverse noise impacts are expected to result from construction of the Proposed Project.

VIBRATION

Tables 17-4 and Table 17-5 show architectural and structural damage risk and perceptibility distances for residential and historic structures in proximity to the types of construction activities that would occur during construction of the Proposed Project. Architectural damage includes cosmetic damage, such as cracked plaster, etc. Architectural damage is not considered potentially dangerous. As shown in **Table 17-4**, pile driving has the greatest potential to result in architectural damage to most building types. While not shown in the table, controlled blasting also can result in high vibration levels in excess of 100 VdB with resultant damage to existing structures. Most other construction activities require very small (i.e., less than 25 feet) distances between the structure and the construction equipment or the presence of highly fragile buildings for impacts to occur. For fragile and highly fragile buildings respectively, FTA recommends a limit of peak particle velocities of 0.2 and 0.12 inch per second (in/sec) or 94 and 90 VdB.

Table 17-4
Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 ft (in/sec)	Approximate L_{v*} at 25 ft
Pile Driver (impact)	0.644	104
Pile Driver (sonic)	0.170	93
Clam Shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall in soil)	0.008	66
Hydromill (slurry wall in rock)	0.017	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Note: * RMS velocity in decibels (VdB) re 1 micro-inch/second
Source: *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006.

Table 17-5
Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_{v*}
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Note: * RMS velocity in decibels (VdB) re 1 micro-inch/second
Source: *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006.

The structure of most concern with regard to the potential for structural or architectural damage due to vibration is Rodgers Tavern in Perryville, west of the north approach to the proposed new bridge. Pile driving is the construction activity with the greatest potential to result in high levels of vibration. No pile driving is expected to occur within 80 feet of this structure, and consequently the maximum Peak Particle Velocity (PPV) expected to occur is less than 0.12 in/sec, which is the threshold of potential for damage suggested by the FTA for buildings most susceptible to vibration damage. Consequently, the vibration resulting from construction of the Proposed Project would not have the potential to cause damage at this location. At other buildings and structures, which would be located still farther from construction activity, maximum PPV values resulting from construction of the Proposed Project would be even lower.

While the predicted level of PPV is below the threshold that would have the potential to result in architectural or structural damage, vibration would be perceptible and have the potential to result in annoyance within approximately 500 feet of pile driving activities, or within approximately 95 feet of other heavy construction activity. While vibration within these ranges would be perceptible, it would be of limited duration because construction activity would move along the Proposed Project corridor. Consequently, vibration in the perceptible range would not occur over a prolonged period of time at any one receptor location. Typically, pile driving in a single pile location will take no more than two to five days, depending on the number and size of piles in the group to be driven for a single bridge support. Depending on the number of bridge supports within 500 feet of a given receptor, the duration of perceptible vibration at the receptor may last multiple weeks. Consequently, the vibration resulting from construction of the Proposed Project would not constitute a significant adverse impact.

Special Provisions for Historic Structures

In addition to the establishment of a project-wide Construction Protection Plan (CPP), special measures set forth by the Maryland Historical Trust (MHT) would be followed to protect historic resources from increased vibration levels associated with construction activities. At any construction location where historic resources, and particularly older fragile buildings, are within an area of potential effect (see Chapter 8 for more details), construction contractors would be required to implement special vibration protection measures. These measures, to be included as part of the construction protection program for historic resources (discussed above under "Cultural Resources"), would likely include the following:

- Inspect and report on the current foundation and structural condition of any historic resources.
- Set up a vibration monitoring program to measure vertical and lateral movement and vibration to the historic structures within 150 feet of pile-driving activities. Details as to the frequency and duration of the vibration monitoring program would be determined as part of the Proposed Project's ongoing consultation process with MHT.
- Establish and monitor construction methods to limit vibrations to levels that would not cause structural damage to the historic structures, as determined by the condition survey.
- Issue "stop work" orders to the construction contractor, as required, to prevent damage to the structures, based on any vibration levels that exceed the design criteria in lateral or vertical direction. Work would not begin again until the steps proposed to stabilize and/or prevent further damage to the designated buildings were approved.

With these measures in place, the construction-related vibration impacts would be minimized, and any remaining impacts would be temporary and of short duration. Therefore, no significant adverse impacts to vibration conditions are expected from construction of the Proposed Project.

NATURAL RESOURCES AND PERMITTING

An analysis of construction period impacts on natural resources is provided in **Appendix E**, "Natural Environmental Technical Report."

CONTAMINATED AND HAZARDOUS MATERIALS

An analysis of construction period impacts related to contaminated and hazardous materials is provided in Chapter 15, "Contaminated and Hazardous Materials."

INFRASTRUCTURE AND UTILITIES

As described above, construction of Alternative 9A and Alternative 9B would require minor modifications to Amtrak's Perryville Electrical Substation. A transmission tower on the west side of the tracks provides power to the substation from the Safe Harbor Generating Station. Given the importance of the substation and its close proximity to the proposed installation of a new large retaining wall, the substation must be protected during construction so as to maintain power to the Proposed Project throughout the work.

Alternative 9A would require that a county-owned water main currently located on Havre de Grace Middle School/High School property be relocated beneath the schools' track and field facility. This would temporarily affect the use of the facility. Alternative 9B will not require relocation of the water main, and will not affect the track and field facility.

Another utility consideration for Alternative 9A and Alternative 9B is a fiber optic duct bank that carries Amtrak, AT&T, Qwest, and Verizon Business. The duct bank runs along the east side of existing rail for the full length of the proposed alignment; these utilities are carried across the existing bridge. Other known utilities that would be affected by the Proposed Project include lines owned by Zayo Fiber Optics, Comcast Communication, BGE (electric and gas), Delmarva Power (electric), and a Town of Perryville sewer line. The presence of additional aboveground and underground utilities may be determined during the final engineering stage. Relocation of the known utilities described above will be coordinated with the utility provider to minimize service disruptions. Therefore, no significant adverse impacts to utilities are expected from construction of the Proposed Project. ✷

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;

- 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.

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.

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.

million automobile miles traveled in 2040[3] 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."

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 Propose Project impacts to Public Health, Safety, and Security are discussed in Chapter 16, "Public Health, Safety, and Security."

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. ✷

Chapter 19: Commitment of Resources

A. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

In accordance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ)'s implementing procedures under Title 40, Part 1502 of the CFR, this Environmental Assessment (EA) includes an analysis of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity, and of any irreversible or irretrievable commitments of resources that would occur if the Proposed Project is constructed. An irreversible or irretrievable commitment of resources results in the permanent loss for future or alternate use of a resource that cannot be replaced or recovered.

Construction of the Proposed Project would require the irreversible and irretrievable commitment of building materials, including construction materials such as concrete, steel, and aggregate. The Proposed Project would also consume energy in the form of fossil fuels and electricity during the construction and operation of the facility. These materials are available and their use for the Proposed Project would not have adverse impacts on their continued availability for other purposes. In addition to materials, the Maryland Department of Transportation (MDOT) and the National Railroad Passenger Corporation (Amtrak) would require funding and human labor to design, build, and operate the Proposed Project.

As described in previous chapters, MDOT and Amtrak have worked to avoid or minimize impacts to resources. MDOT and Amtrak endeavor to minimize the use of irretrievable resources and to conserve and reuse resources whenever possible.

B. RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term effects on the environment typically result from construction impacts. Long-term effects relate to the maintenance and enhancement of long-term productivity, including consistency of a project with local and regional economic, social, planning, and sustainability objectives. This section compares the short-term uses of the environment with the long-term productivity of the Proposed Project.

SHORT-TERM USES

Construction of the Proposed Project would have greater short-term effects on the environment than the No Action Alternative; however, these effects would be temporary and non-significant, as discussed in greater detail in Chapter 17, "Construction Effects." MDOT and Amtrak will endeavor to reduce any construction-related environmental impacts through the implementation of best management practices.

LONG-TERM PRODUCTIVITY

The Proposed Project would result in the long-term improvement of connectivity for the intercity rail, commuter rail, and freight rail systems that cross the Susquehanna River along the Northeast Corridor (NEC).

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

Based on the information presented above, the localized short-term impacts that would result from construction of the Proposed Project would be temporary, and would facilitate the overall enhancement of rail connectivity along the NEC. ✷

Chapter 20: Coordination and Consultation

A. INTRODUCTION

This chapter presents a summary of the coordination efforts used to encourage public and agency participation for the Proposed Project's environmental review phase. Federally funded or permitted projects are required to be developed in accordance with the National Environmental Policy Act (NEPA), which provides a role for the public in the planning and decision-making process. The Federal Railroad Administration (FRA) guidance encourages citizen involvement at every stage of the environmental assessment. As described below, the Project Team has undertaken public and community outreach efforts for the Proposed Project, along with federal, state, and local agency coordination.

AGENCY COORDINATION AND PUBLIC INVOLVEMENT PLAN

During the early phases of the Proposed Project, FRA and the Maryland Department of Transportation (MDOT) prepared an Agency Coordination and Public Involvement Plan (the Plan). The Plan identified a proactive approach to effectively engage the public and agencies throughout the environmental review process. For the purposes of public outreach, a broad distribution list was prepared, which included elected officials, representatives from the City of Havre de Grace and the Town of Perryville, representatives from Harford County and Cecil County, individuals and organizations who signed up for the mailing list through the project's website, owners of adjacent properties, stakeholder groups, community facilities, agency contacts, and potential Section 106 consulting parties. The Project Team has presented the Proposed Project at Interagency Review Meetings (IRMs) and public outreach information sessions. Members of IRM include representatives from the Federal Highway Administration (FHWA), Maryland State Highway Administration (SHA), Federal Transit Administration (FTA), FRA, Maryland Department of Natural Resources (DNR), Maryland Department of Planning (MDP), Maryland Department of the Environment (MDE), MDOT, Maryland Historical Trust (MHT), Maryland Port Administration, Maryland Transportation Authority (MdTA), National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS), Susquehanna River Basin Commission, U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (USACE), U.S. Department of the Interior (USDOI), U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), and National Parks Service (NPS).

The Project Team has used a variety of methods to obtain feedback from the public and interested stakeholders throughout the planning process. Postcards, press releases, and public meeting announcements have been sent prior to public outreach information sessions and a variety of comment mechanisms are available. The following goals were established at the initiation of the outreach program:

- Engage with agencies, local entities, the general public, and other interested parties throughout the project.

- Provide opportunities for agencies, local entities, the general public, and other interested parties to participate in the development of the project by sharing information and providing various ways to collect comments, feedback, and suggestions.
- Specific agency coordination objectives of the Plan include:
- Build working relationships with agency partners and identify cooperating and coordinating agencies to be involved in ongoing agency coordination.
- Establish the timing and format for agency involvement in: developing the project's purpose and need, study area, analysis methodologies, and range of alternatives to be investigated; reviewing the EA; selecting the preferred alternative; and developing conceptual mitigation strategies.
- Establish the timing and format for involvement by local governments that may be affected by the Proposed Project.
- Consult with appropriate agencies under Section 106 and Section 4(f).
- Describe methods that have been and will be employed by the Project Team to communicate with agencies and local governments.
- Specific public involvement objectives of the Plan include:
- Establish the timing and format for public input on: environmental, cultural, and community resources; the project's purpose and need; the study area, the range of alternatives to be investigated; comment on the EA; selecting the preferred alternative; and developing conceptual mitigation strategies.
- Determine the need for targeted public involvement by identifying tribal entities, environmental justice populations, and limited English proficiency (LEP) populations.
- Describe the communication methods that will be implemented to inform the community about the project.

EARLY COORDINATION

During the spring and summer of 2013, FRA, MDOT, and the National Railroad Passenger Corporation (Amtrak) initiated early coordination with cooperating and coordinating agencies, local municipalities and counties, and various regional planning organizations. Cooperating agencies include FTA, USACE, and USCG. FTA is a cooperating agency because of the Proposed Project's potential to affect MARC commuter rail services along the NEC. USACE is a cooperating agency because permits are required under Section 404 of the Clean Water Act and under Section 10 of the Rivers and Harbors Act. USCG is a cooperating agency because an approval will be required pursuant to Section 9 of the Rivers and Harbors Act. As part of this early coordination, a project notification letter was sent to select agencies and local entities (see **Appendix H**, "Public Involvement and Agency Correspondence" for a copy of the May 15, 2013 letter and the list of recipients). The letter included general information about the project and requested that each respondent provide feedback that may be useful for the planning stage of the project by June 30, 2013.

Amtrak received 25 response letters and emails from May through September of 2013. Most of this correspondence was in direct response to the May 15, 2013 project notification letters; the remainder was from citizens who learned about the project by media coverage or through other sources. All agencies, organizations, and individuals who submitted comments or questions to the Project Team were added to the project mailing list (discussed below). The information received from this early coordination helped the Project Team identify environmental, cultural, and community resources and understand local priorities. This valuable input also was considered during conceptual engineering.

EARLY COORDINATION MEETINGS

At the request of the City of Havre de Grace and the Town of Perryville and to promote early agency coordination, FRA, MDOT and Amtrak gave an introductory presentation to local officials on June 10, 2013. Comments received at the meeting included concerns about potential impacts to the surrounding natural, socioeconomic and cultural resources.

On July 17, 2013, FRA, MDOT, and Amtrak delivered a project presentation to federal and state agencies as part of an IRM, which is described in detail below. The IRM presentation focused on general project background, the project site location, and future planned interagency meetings, and served as an initial project introduction for the agencies.

Also, during the summer of 2013, Amtrak and its representatives reached out to local marina owners and operators, shippers, dock managers, the USCG, and other members of the maritime community. The purpose of this outreach was to understand the current navigational uses along this segment of the Susquehanna River and the anticipated USCG requirements for the vertical clearance of any potential fixed bridge. This information was factored into conceptual engineering.

INFORMATIONAL MATERIALS

PROJECT WEBSITE

The Project Team created a dedicated website for the Proposed Project: www.susrailbridge.com. The website was launched in April 2014 (prior to the first public outreach information session) and the site has been updated as needed as the Proposed Project progressed. The project website provides up-to-date information regarding the project and any upcoming meetings or events. Information on the website includes project description, project history, Purpose and Need, frequently asked questions (FAQs), study area map, a description of the NEPA process and EA, project schedule and public involvement efforts. The site provides contact information for the Project Team, meeting information, and a form to submit comments online.

MEETING PUBLICITY

Postcards, email blasts, press releases, and public meeting announcements have been sent prior to public outreach information sessions. Public outreach information sessions were publicized through meeting postcards mailed to the entire project mailing list, as well as local libraries and community centers to be publicly posted. Extra efforts were made by posting more notices in environmental justice areas. Meeting information was also posted on the project website.

PROJECT DOCUMENT REPOSITORIES

The project website will identify where documents are available for public review, how the public can provide input, comment period deadlines, and whom to contact with comments or for additional information. Copies of the EA documents will be available for public inspection at local municipal offices and libraries.

B. PUBLIC INVOLVEMENT

PUBLIC OUTREACH INFORMATION SESSIONS

Numerous public meetings have been held throughout the environmental process (see **Table 20-1**). Each public outreach information session has been held on at project milestones, including project purpose and need, development of feasible alternatives, alternatives retained for detailed study, and release of the NEPA document. The public was encouraged to attend and participate in these meetings as well as submit any written comments.

APRIL 28, 2014—PURPOSE & NEED / PROJECT INTRODUCTION

The first public outreach information session was held in an open house format where stakeholders reviewed project displays and a Fact Sheet handout, spoke with Project Team members, and submitted written comments. This format allowed stakeholders flexibility to participate at their convenience and allow them to engage with the Project Team. Topics presented to the public included the Purpose and Need, environmental resources and constraints within the study area, conceptual alternatives, and the anticipated project schedule. Feedback from comment sheets allowed the Project Team to gauge the priorities and concerns of the public. This meeting offered the opportunity for new conceptual alternatives or design considerations to be suggested by the public and other stakeholders. No interpreters were requested for the meeting. All display materials and handouts were posted on the project website within one week of the meeting.

This public outreach information session was held at the Havre de Grace Activity Center on April 28, 2014, from 5 PM to 8 PM. Approximately 115 people attended and 30 written comments were provided to the Project Team that night. The major themes of the public comments received include: importance of aesthetics and bridge design; construction of a bicycle/pedestrian path across the river; transit/traffic/parking improvements; minimizing property acquisition; maintaining jobs; enhancing public parks; and encouraging tourism and local businesses. At the meeting and in the days following this public outreach information session, the public provided input on the long list of alternatives considered in the initial screening process, and reiterated critical properties to be avoided if possible.

AUGUST 13, 2014—FEASIBLE ALTERNATIVES

Based on the input from the April 2014 public outreach information session, the IRMs, and the results of conceptual engineering, the Project Team presented the feasible alternatives to the public. This included the comprehensive “long list” of all conceptual alternatives identified to date. The presentation explained the fatal flaw screening rationale used for eliminating conceptual alternatives deemed infeasible. The Project Team developed a summary of comments after the meeting and posted all display materials and handouts on the project website within one week of the public meeting. As described below, this meeting also served as a Section 106 consulting parties meeting.

Table 20-1
All Meetings Held to Date

Meeting Date	Meeting Topic
Public Involvement Meetings	
April 28, 2014	POIS Purpose & Need/ Project Introduction
August 13, 2014	POIS Feasible Alternatives
December 10, 2014	POIS Alternatives Retained for Detailed Study
November 10, 2015	POIS Alternatives Retained for Detailed Study and Bridge Types
April 14, 2016	POIS Review Preliminary Environmental Analyses Results / Conceptual Mitigation
Stakeholders Meetings	
June 6, 2014	Bicycle-Pedestrian stakeholders meeting
June 17, 2014	Presentation to the Town of Perryville
July 1, 2014	Presentation to Cecil County
November 6, 2014	Meeting with Susquehanna River Rail Bridge Project Advisory Board
December 2, 2014	Bicycle-Pedestrian Coordination Meeting
March 9, 2015	Section 106 Consulting Parties
March 26, 2015	Meeting with Susquehanna River Rail Bridge Project Advisory Board
July 8, 2015	Meeting with Harford County Public Schools
July 28, 2015	Baltimore Metropolitan Council (BMC) Meeting
August 17, 2015	Meeting with Harford County Public Schools
August 18, 2015	Section 106 Consulting Parties
January 20, 2016	Meeting with Harford County Public Schools
March 17, 2016	Meeting with Susquehanna River Rail Bridge Project Advisory Board
October 11, 2016	Section 106 Consulting Parties
Agency Coordination Meetings	
July 17, 2013	IRM Project Introduction
February 19, 2014	IRM Purpose & Need Meeting
March 19, 2014	Project Coordination Meeting with NS/FRA/MDOT/Amtrak
April 16, 2014	IRM Purpose & Need/ Conceptual Alternative
June 18, 2014	IRM Feasible Alternatives
February 18, 2015	IRM Preliminary Alternatives Retained for Detailed Study
March 12, 2015	IRM Agency Field Visit
April 15, 2015	IRM ARDS Field Visit Recap
June 17, 2015	IRM Refined Alternatives Retained for Detailed Study
September 16, 2015	IRM Revised ARDS Report
December 9, 2015	IRM Bridge Types
December 14, 2015	WILMAPCO Presentation
March 9, 2016	Smart Growth Coordinating Committee Presentation
March 17, 2016	WILMAPCO Presentation
April 20, 2016	IRM Detailed Presentation of NETR

Notes: See **Appendix H**, "Public Involvement and Agency Correspondence."
POIS = Public Outreach Information Session
IRM = Interagency Review Meeting
NS = Norfolk Southern
FRA= Federal Railroad Administration
MDOT= Maryland Department of Transportation

This public outreach information session was held at the Perryville Fire House on August 13, 2014 from 5 PM to 8 PM. Approximately 60 people attended and 10 written comments were received by the Project Team that night. The major themes of the public comments received include: construction of a bicycle/pedestrian path across the river; importance of aesthetics and bridge design; alternatives preference; removal of remnant piers/existing bridge; and transit improvements/concerns.

A few comments indicated a preference for a particular alternative. From the August 13, 2014 public information session, one attendee commented in favor of Alternative 9B. Another comment from the August 13, 2014 public information session favored Alternative 8A. A written submission received September 2, 2014 favored the alternative with the construction of a new bridge as well as the replacement of the existing bridge to allow for a total of four tracks. The majority of public input did not indicate the preference for a particular alternative.

DECEMBER 10, 2014—ALTERNATIVES RETAINED FOR DETAILED STUDY

A third public outreach information session was held at the Havre de Grace High School on December 10, 2014 from 5 PM to 8 PM. As described below, this meeting also served as a Section 106 consulting parties meeting. This presentation explained the screening process used to determine the alternatives retained for detailed study. A comprehensive alternative comparison matrix was presented to the public to explain the detailed screening rationale used to determine the alternatives that would progress to detailed study in the EA. Potential property impact maps for the alternatives retained for detailed study were shared with the public. Public comments received at the meeting indicated no preference for any of the three remaining alignments. Overall, the Project Team received positive feedback regarding minimization of permanent property impacts.

NOVEMBER 10, 2015—ALTERNATIVES RETAINED FOR DETAILED STUDY AND BRIDGE TYPES

A fourth public information session was held at Perryville High School on November 10, 2015 from 5 PM to 8 PM. As described below, this meeting also served as a Section 106 consulting parties meeting. The open house-style format gave an overview of the two alternatives retained for detailed study, as well as the four bridge design types. A comprehensive bridge-type comparison matrix board was prepared for the meeting, and provided an easy to understand visual of the strengths and weaknesses of each bridge type. Street view renderings of all four bridge types were also presented from the perspective of both Perryville and Havre de Grace. A new comment card was developed for the meeting, which included a bridge survey. The survey was designed to receive feedback on bridge type preference and the top three factors of most importance to meeting attendees. Based on the completed surveys, the girder approach/arch main span bridge design type was overwhelmingly the favorite.

APRIL 14, 2016—REVIEW PRELIMINARY ENVIRONMENTAL ANALYSES RESULTS/ CONCEPTUAL MITIGATION

This public information session was held at the Havre de Grace Activity Center on April 14, 2016 from 5 PM to 8 PM. The meeting also served as a Section 106 consulting parties meeting. The open house-style format gave an overview of all potential environmental impacts from Alternative 9A and Alternative 9B, including property acquisitions, parks and Section 6(f) properties, Section 4(f) properties, natural resources, historic and archaeological resources, visual and aesthetic resources, air quality, and noise and vibration considerations. Approximately 60 people attended and seven written comments were received by the Project Team.

COORDINATION WITH LOCAL OFFICIALS

The Proposed Project is located within Cecil County, Harford County, the Town of Perryville and the City of Havre de Grace. Coordination with these local governments is ongoing. Briefings with local government officials have been used as an opportunity to introduce the project to county/local officials, provide updates at project milestones, and facilitate the flow of information between the officials, FRA, MDOT, and Amtrak.

The Project Team has exchanged written correspondences with municipal representatives and elected officials. The Project Team delivered presentations to the Town of Perryville, Cecil County, and Havre de Grace. Early input from the Town of Perryville and the City of Havre de Grace regarding important local properties was factored into conceptual engineering and the fatal flaw screening.

Three meetings were held with representatives from Harford County Public Schools on July 8, 2015, August 17, 2015, and January 20, 2016. During the first meeting, the Project Team presented plans for Alternative 9A and Alternative 9B and the potential impacts to the Havre de Grace High School and Middle School recreational facilities. Alternative 9A would not directly impact the football field and grandstands. However, Alternative 9A would impact the existing pole vault, shed, and long running start. After the meeting, Harford County provided design plans for planned future recreational improvements, including new tennis courts and realigned ballfields near the track.

During the meeting on August 17, 2015, Harford County Public Schools representatives provided an overview of their comments on the project alternatives. Key concerns included impacts to the race track starting block area, space limitations associated with potential ball field relocations, and potential impacts to a proposed City of Havre de Grace floodplain mitigation site along Lily Run. Based on the information provided, school officials verbally expressed a preference for Alternative 9B over Alternative 9A. Alternative 9B would not require any acquisition of school property and would not directly impact the athletic fields.

At the meeting on January 20, 2016, the Project Team provided updates on design evaluation, mitigation options, and the applicability of Section 6(f) and Section 4(f). Key concerns from the Harford County Public Schools representatives included the changes to the proposed North Baseball Field required under Alternative 9A, safety, construction effects, and the need for additional coordination and outreach.

SUSQUEHANNA RIVER RAIL BRIDGE PROJECT ADVISORY BOARD

The Project Team is coordinating with Susquehanna River Rail Bridge Project (SRRBP) Advisory Board. The SRRBP Advisory Board is a group of community representatives self-organized to proactively convey input to the Project Team. The Project Team has been invited on two occasions to attend SRRBP Advisory Board meetings (November 6, 2014 and March 26, 2015). At a meeting on November 6, 2014, the SRRBP Advisory Board itemized the following top six priorities:

- Request for a Special Briefing;

- Bridge Architecture;
- Bridge Abutment Area;
- Westerly Right-of-Way and Alignments;
- Street and Lane Underpasses; and
- Rail Commuter Station.

Since the initial meeting, the Project Team has continued to coordinate with the SRRBP, who have provided additional advisory bulletins regarding river navigation, the safe harbor jetty proposal, pedestrian and bicycle river crossing, bridge historical preservation and display, easterly right-of-way and alignments in Perryville, street underpasses in Perryville, and rail operation noise control in Perryville. The Project Team has evaluated the feasibility of developing these suggestions in conjunction with the Proposed Project, and the bridge abutment area surrounding the Otsego Street and Union Avenue intersection in Havre de Grace would be improved as a part of the Proposed Project. To address the Advisory Board's request to realign the intersection located at Otsego, Union, and Water Streets, the Proposed Project would extend the Havre de Grace abutment south towards the alley between Union Avenue and Stokes Street.

BICYCLE-PEDESTRIAN STAKEHOLDERS

The Project Team has received substantial public input requesting inclusion of a bicycle and pedestrian river crossing into the Proposed Project. Several organizations responsible for trail planning (such as the Lower Susquehanna Heritage Greenway and the Maryland DNR), advocacy organizations (such as the East Coast Greenway Alliance and the September 11th National Memorial Trail Alliance), a number of elected officials, and members of the public have expressed support for a multi-use path across the river. Specifically, some commenters have noted that a connection between Cecil and Harford Counties would fulfill a "missing link" in several regional trails and provide a new multi-modal option for travel between communities. While bicycle and pedestrian facilities were not expressly addressed in the scope of the project grant, as part of the public involvement process, FRA, MDOT, and Amtrak are working with government agencies and interested organizations to assess the feasibility of coordinating the Proposed Project with potential bicycle and pedestrian access across the river.

Connectivity to the existing road network and existing or planned trails (and the attendant property acquisitions and environmental impacts) must be evaluated in the context of regional bicycle-pedestrian planning. MDOT and the Project Team have hosted stakeholder meetings (June 2014 and December 2014) with trail planning organizations and bicycle-pedestrian advocacy groups to discuss the Proposed Project in the context of ongoing trail and greenway planning efforts (including MDOT's 2014 *Maryland Twenty-Year Bicycle & Pedestrian Master Plan and MDOT's 2002 Susquehanna River Pedestrian Bridge Crossing Feasibility Study*).

Furthermore, to respond to the input received regarding a multi-use path, MDOT and Amtrak are conducting a feasibility evaluation. The evaluation entails: reviewing prior studies of Susquehanna River bicycle/pedestrian crossings; ensuring that the Proposed Project does not adversely affect the existing bicycle and pedestrian trails within the Proposed Project's study area; making efforts not to preclude the potential for a future multi-use path across the Susquehanna River; and assessing the feasibility of constructing a multi-use path in conjunction with a new rail bridge.

The Project Team is considering a multitude of factors, including visual impacts, safety and security, constructability, effects to rail alignments, cost, noise and vibration, in-water impacts, functionality, and community impacts. The Project Team will continue to evaluate the feasibility of accommodating a multi-use path within the project limits in coordination with the high-speed rail project. The Project Team is conducting a Susquehanna River Rail Bridge Project Bicycle/Pedestrian Crossing Hazard Analysis and Security Risk Assessment. If deemed feasible, a separate project would be required for design, environmental review, and identification of potential funding for a bicycle/pedestrian crossing. The Project Team will continue to obtain input from stakeholders on the feasibility evaluation.

U.S. COAST GUARD AND MARINERS

Upon project inception, Amtrak and its representatives reached out to local marina owners and operators, shippers, dock managers, the USCG, and other members of the maritime community. The purpose of this outreach was to understand the current navigational uses along this segment of the Susquehanna River and the anticipated USCG requirements for the vertical clearance of any potential fixed bridge. This information was factored into conceptual engineering. As stated above, the navigation survey concluded that any new high-level fixed bridge should provide a minimum 60-foot vertical clearance. The navigation survey was transmitted to USCG on February 18, 2014.

FREIGHT RAILROADS

The Project Team has been coordinating with NS and CSX regarding their current and planned freight rail operations in the area (CSX trains currently use a separate Susquehanna River crossing located to the north of the Susquehanna River Rail Bridge). NS trains currently use the Susquehanna River Rail Bridge. A coordination meeting with NS, Amtrak, FRA, and MDOT was held on March 19, 2014. The Project Team will continue to seek input from the freight rail operations throughout preliminary and final design.

MARC

The Project Team is also coordinating with Maryland Transit Administration (MTA). MTA is the operator of the MARC Penn Line service over the bridge. Coordination between the Project Team and MTA is also essential to ensuring the Proposed Project's compatibility with MTA's proposed MARC Northeast Maintenance Facility.

SECTION 106 CONSULTATION

Since the Susquehanna River Rail Bridge is NR-eligible, FRA (as the lead federal agency) has initiated consultation in accordance with Section 106 of the National Historic Preservation Act (NHPA). All correspondence related to Section 106 is attached to **Appendix D**, “Cultural Resources.” This correspondence is summarized in **Table 20-2**. FRA has invited the Advisory Council on Historic Preservation (ACHP) to participate in the Section 106 consultation. On August 22, 2014, ACHP declined to participate and will instead rely on the Maryland Historic Trust (MHT) to provide comments and concurrence. FRA submitted to MHT a Section 106 consultation initiation package (dated April 10, 2014), including the proposed APEs, analysis methodologies, and a list of potential consulting parties. MHT sent a response letter on June 16, 2014. The Project Team sent a letter to MHT on September 24, 2014 regarding potential historic resources. The Project Team received a letter from MHT on November 12, 2014 providing guidance regarding cultural resources and has proceeded accordingly with the cultural resources inventory and the effects assessment. The Project Team submitted the *Effects Assessment for Historic Architectural Resources* (see **Appendix D)** to MHT on May 19, 2016. In a letter dated August 24, 2016, MHT agreed with FRA's effect determinations and encouraged continued coordination with the Section 106 consulting parties (see **Appendix H**).

Table 20-2
Section 106 Correspondence Summary

Letter Date	Recipient/Topic
April 10, 2014	Project Initiation Letter to MHT
June 16, 2014	MHT Response to Project Initiation Letter
September 24, 2014	Section 106 Resources Letter to MHT
November 12, 2014	MHT Response to Section 106 Resources Letter
December 17, 2014	Phase IA Archaeological Study to MHT
January 27, 2015	MHT Response to Phase IA
February 12, 2015	Determination of Eligibility Forms to MHT
April 22, 2015	MHT Response to Determination of Eligibility Forms
May 19, 2016	Effects Assessment submitted to MHT
July 13, 2016	Letter from City of Havre de Grace Regarding Section 106
July 15, 2016	Letter from Town of Perryville Regarding Section 106
July 15, 2016	Letter to Star-Spangled Banner National Historic Trail
July 15, 2016	Letter to Washington-Rochambeau Revolutionary Route National Historic Trail
July 20, 2016	Letter from Lower Susquehanna Heritage Greenway Regarding Effects Assessment
August 5, 2016	NPS Response Regarding Star-Spangled Banner National Historic Trail
August 24, 2016	MHT Response Regarding the Effects Assessment
October 11, 2016	SRRBP Advisory Board Letters Regarding Alterations to Undergrade Bridges and Case for a Longer Span
November 1, 2016	Letter to Lower Susquehanna Heritage Greenway in Response to Comments on the Effects Assessment
November 22, 2016	Letter from Lower Susquehanna Heritage Greenway regarding stipulations for agreement on mitigation
January 18, 2017	Correspondence with National Parks Service to transmit the Analysis of Captain John Smith Chesapeake National Historic Trail Resources with Respect to the Susquehanna River Rail Bridge Project.
Notes: See **Appendix D**, "Cultural Resources" and **Appendix H**, "Public Involvement and Agency Correspondence."	

All Section 106 consulting parties were invited to each public outreach information session and a dedicated Section 106 meeting was held on March 9, 2015. The dedicated Section 106 meeting was held at the Havre de Grace Activity Center at 1 PM. Several Section 106 consulting parties were in attendance. Topics presented included an overview of Section 106 regulations and process, and how the Section 106 process would run parallel with the environmental studies following the compliance process for NEPA. The Project Team and the consulting parties discussed the known adverse effects to the Susquehanna River Rail Bridge and Overpasses and the Perry Interlocking Tower, along with conceptual ideas for mitigation. The Project Team will continue to coordinate with MHT and consulting parties throughout the Section 106 process.

A second dedicated Section 106 consulting parties meeting was held in Perryville on August 18, 2015 at 1 PM. Topics included potential project impacts on various historic resources, potential avoidance/mitigation measures, and opportunities for design input. The Perry Interlocking Tower—a contributing element of the NR-eligible Perryville Railroad Station—was discussed at length. The Perry Interlocking Tower was determined to conflict with the proposed rail alignment for Alternative 9A and Alternative 9B, but not for other alternatives under consideration at the time. The Project Team is investigating the feasibility of shifting the tower, rather than demolishing it. Several consulting parties expressed a preference for preserving the tower, either in place or in a new location.

The third dedicated Section 106 consulting parties meeting was held the Havre de Grace Activity Center, on October 11, 2016 at 1 PM. Topics included a discussion of adverse effects, input received from Section 106 consulting parties and proposed measures to avoid, minimize and mitigate adverse effects. The Project Team shared an outline of a draft agreement on implementing avoidance, minimization, and mitigation measures and continuing consultation.

C. AGENCY COORDINATION

INTERAGENCY REVIEW MEETINGS

This section describes the IRM presentations delivered by the Project Team to date (see **Table 20-1**). The Maryland IRM process is intended to achieve the timely and efficient identification, evaluation, and resolution of environmental and regulatory issues. IRMs have been held at project milestones.

PROJECT INTRODUCTION IRM MEETING (JULY 17, 2013)

FRA, MDOT, and Amtrak presented the general history, project goals, and anticipated schedule at the IRM.

PURPOSE AND NEED IRM MEETING (FEBRUARY 19, 2014)

The goal of the second IRM was to review the project introduction, purpose and need, project description, environmental resources, and public involvement.

PURPOSE AND NEED/CONCEPTUAL ALTERNATIVE IRM MEETING (APRIL 16, 2014)

The Purpose and Need Statement was circulated to the IRM agencies two weeks prior to the meeting. During the presentation, the Project Team solicited agency feedback on the Purpose and Need Statement. The remainder of the presentation provided information regarding the conceptual alternatives development process. The Project Team responded to agency comments regarding the conceptual alternatives.

FEASIBLE ALTERNATIVES IRM MEETING (JUNE 18, 2014)

Based on the input from the April IRM, the public outreach information session (described below), and the results of conceptual engineering, the Project Team presented the feasible project alternatives to the IRM. This included the comprehensive "long list" of all conceptual alternatives identified to date (including alternatives suggested by members of the public). The presentation explained the "fatal flaw screening" rationale used for eliminating conceptual alternatives deemed infeasible.

ALTERNATIVES RETAINED FOR DETAILED STUDY IRM MEETING (FEBRUARY 18, 2015)

The purpose of the IRM was to review the Project Team's alternatives screening process, present the alternatives retained for detailed study (ARDS) and provide an update on public outreach efforts to date. The Project Team reviewed the two-step alternatives screening process that included the fatal flaw screening and the more detailed screening based on specific project goals. An Alternatives Comparison Matrix along with a Natural Environmental Impacts Matrix was presented and used as the basis for choosing Alternative 9A and Alternative 9B for further study. The meeting concluded with an agreement to schedule a field visit to allow the agencies to observe the range of resources potentially affected by the Proposed Project.

AGENCY FIELD VISIT (MARCH 12, 2015)

In response to request made during the February 18, 2015 IRM, the resource agencies attended a field visit to evaluate the quality of the natural and human environmental resources within the study area. As a result of the field review some of the original resources were re-characterized and in some cases new resources were identified.

ARDS FIELD VISIT RECAP (APRIL 15, 2015)

The purpose of the IRM was to recap the results of the agency field review, update the agencies on the status of the engineering design and to explain the status of the ARDS package. The Project Team reviewed the updated natural environmental features including a re-characterized wetland/stream system and a newly discovered potential wetland close to the Perryville Railroad Station. The Project Team also updated the group on design modifications that would ultimately affect the natural and human environmental impacts for the project, relayed updates on the bike/pedestrian path feasibility study and presented next steps for the Proposed Project.

REFINED ALTERNATIVES RETAINED FOR DETAILED STUDY (JUNE 17, 2015)

The purpose of the IRM was to provide a project update and overview of the key operational considerations associated with maximum allowable speeds and travel times. The Project Team presented the agencies with a revised Alternatives Comparison Matrix, which was based on updated human/natural resource information and new design details. The Project Team also discussed the approach for ARDS package resubmittal.

IRM REVISED ARDS REPORT (SEPTEMBER 16, 2015)

The purpose of this IRM was to update agency representatives on the ongoing efforts with the Susquehanna River Rail Bridge Project. Topics included recent key stakeholder and Section 106 meetings, a presentation of the ARDS—Alternative 9A and Alternative 9B, a review of responses to agency comments on the ARDS report, and a discussion of the anticipated ARDS concurrence milestone and next steps for the project.

IRM BRIDGE TYPES (DECEMBER 9, 2015)

The purpose of this IRM was to present a comparison of bridge types and explain the rationale for moving forward with the girder approach span/arch main span bridge type. The meeting began with a brief overview of the project, followed by a recap of the November 2015 Public Outreach Informational Session. The detailed bridge comparison matrix was presented and discussed, with the Project Team recommending only taking the girder approach span/arch main span bridge type into the EA document. None of the agency representatives objected to proceeding with this bridge type in the EA document. Also discussed was an update on wetlands delineation.

IRM DETAILED PRESENTATION OF NETR (APRIL 20, 2016)

The purpose of this IRM was to present the detailed findings of the Natural Resources Technical Report in order to discuss avoidance and minimization measures, describe proposed wetland mitigation approach, describe potential on-site or off-site mitigation locations, and provide a summary of the mitigation site search results. A summary of all potential environmental impacts from Alternative 9A and Alternative 9B was distributed at the meeting.

OTHER AGENCY COORDINATION

Other agency coordination includes consultation with WILMAPCO and the Smart Growth Coordinating Committee. The Project Team presented to WILMAPCO in December 2015 and March 2016. WILMAPCO is the federally designated Metropolitan Planning Organization for Cecil County, Maryland and New Castle County, Delaware. The purpose of these presentations was to give WILMAPCO an introduction to the Proposed Project and discuss the alternative screening process, bridge design types, special considerations, and next steps.

The Project Team presented to the Smart Growth Coordinating Committee in March 2016. The Smart Growth Coordinating Committee is responsible for reviewing and commenting on projects to be funded under Extraordinary Circumstances that are not within a Priority Funding Area. The purpose of this meeting was to review the project introduction and background, discuss the alternatives retained for detailed study and environmental considerations, and receive an exception to allow the state to fund a project that is partially outside of the Priority Funding Area.

In addition, correspondence related to natural resources is discussed in **Appendix E**, "Natural Environmental Technical Report." Attachment E of this appendix includes all correspondence letters. These letters are summarized in **Table 20-3**. Other correspondence is listed in **Table 20-4**.

Table 20-3
Natural Resources Correspondence Summary

Letter Date	Recipient/Topic
February 14, 2014	Critical Area Commission
February 18, 2014	Response from Critical Area Commission
February 14, 2014	National Marine Fisheries Service
March 5, 2014	Response from National Marine Fisheries Service
February 14, 2014	Wildlife and Heritage Service Maryland Department of Natural Resources
March 20, 2014	Response from Wildlife and Heritage Service Maryland Department of Natural Resources
September 1, 2015	Response from Wildlife and Heritage Service Maryland Department of Natural Resources
February 14, 2014	U.S. Fish and Wildlife Service
December 18, 2015	Response from U.S. Fish and Wildlife Service
January 15, 2016	Response from U.S. Fish and Wildlife Service
February 14, 2014	Integrated Policy and Review Unit Department of Natural Resources
October 22, 2014	Response from Integrated Policy and Review Unit Department of Natural Resources
February 14, 2014	Maryland Department of Planning
April 7, 2016	Wildlife and Heritage Service Maryland Department of Natural Resources
May 9, 2016	Response from Department of Natural Resources
May 10, 2016	National Marine Fisheries Service
June 14, 2016	Department of Natural Resources
November 28, 2016	National Marine Fisheries Service

Notes: See **Appendix E**, “Natural Environment Technical Report.”

Table 20-4
Other Correspondence

Letter Date	Recipient/Topic
April 15, 2016	Letter to Havre de Grace Planning regarding *de minimis* Section 4(f) use
April 22, 2016	Letter to Harford County Public Schools regarding *de minimis* Section 4(f) use
April 25, 2016	Letter to Harford County Public Schools regarding *de minimis* Section 4(f) use
June 15, 2016	Havre de Grace Planning response regarding *de minimis* Section 4(f) use
September 7, 2016	Horford County Public Schools response regarding *de minimis* Section 4(f) use
October 7, 2016	Letter to Harford County Public Schools regarding *de minimis* clarifications
December 21, 2016	Harford County Public Schools letter regarding construction schedule
January 24, 2017	Letter from C.A. Dutch Ruppersberger, Member of Congress, regarding bridge design
February 14, 2017	Letter from Volney H. Ford, Susquehanna River Rail Bridge Advisory Board Chair, to Mayor William T. Martin regarding bridge design and accompanying report
February 15, 2017	Letter from Mayor William T. Martin regarding bridge design
Notes: See **Appendix H**, "Public Involvement and Agency Correspondence."	

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