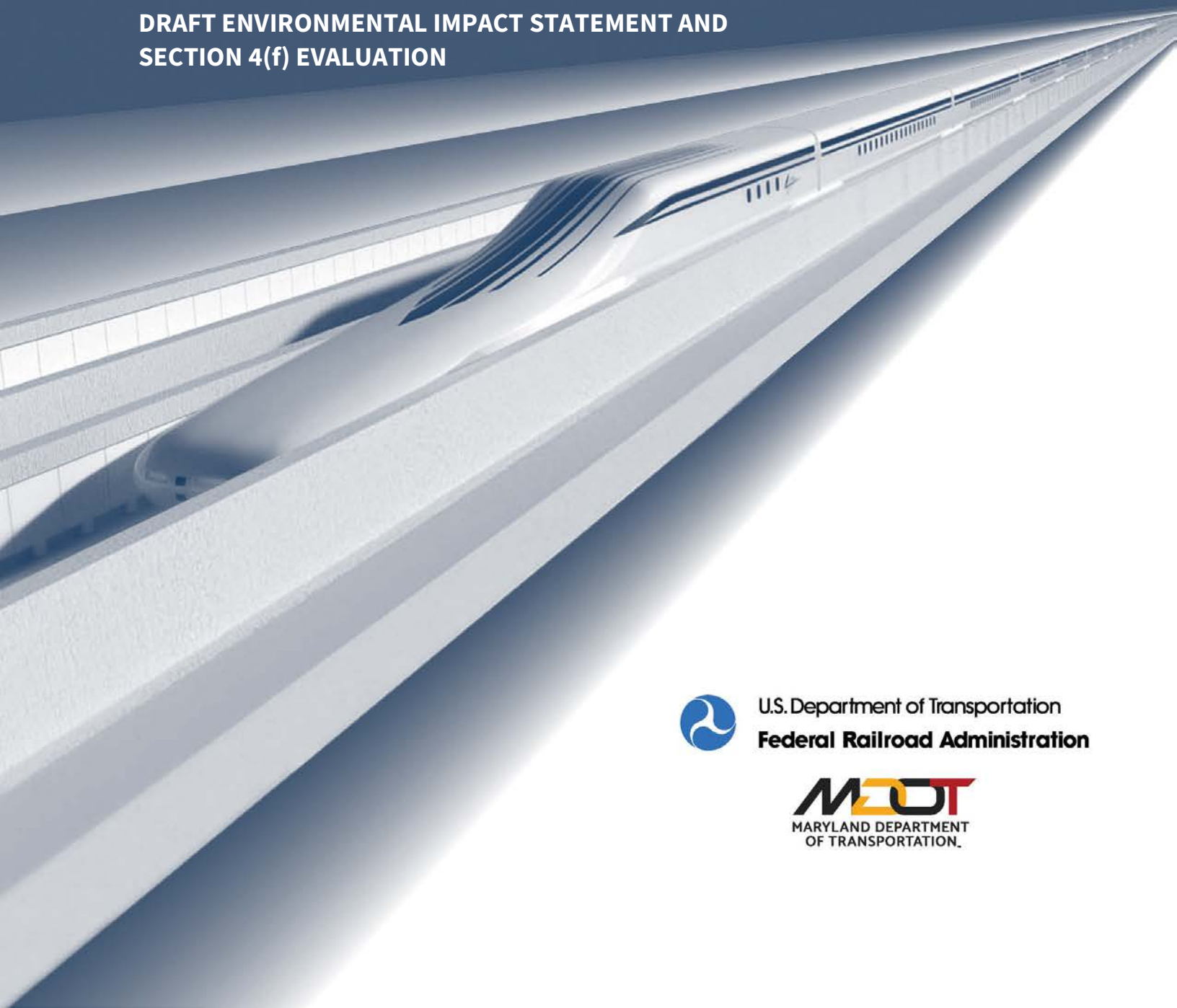
Section 4.9

Aesthetics, Visual Quality, and Light Emissions

BALTIMORE-WASHINGTON SUPERCONDUCTING MAGLEV PROJECT

DRAFT ENVIRONMENTAL IMPACT STATEMENT AND SECTION 4(f) EVALUATION



U.S. Department of Transportation
Federal Railroad Administration

MARYLAND DEPARTMENT OF TRANSPORTATION

4.9 Aesthetics, Visual Quality, and Light Emissions

4.9.1 Introduction

This section identifies resources or elements that are sensitive to visual changes and/or light emissions and the effects of the Superconducting Magnetic Levitation Project (SCMAGLEV Project) on those resources. Visual changes result from the introduction of new features or facilities into the existing environment by the SCMAGLEV Project and include new infrastructure, SCMAGLEV operations, and safety features such as fencing and lighting. For more detailed information related to regulations, assessment methodology, potential impacts, and to see additional illustrative renderings, please see Appendix D.6.

4.9.2 Regulatory Context and Methodology

4.9.2.1 Regulatory Context

In accordance with the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 et seq., the Council on Environmental Quality (CEQ) regulations, 40 C.F.R. Parts 1500 - 1508, and the Federal Rail Administration's (FRA) Procedures for Considering Environmental Impacts, 64 Fed. Reg. 28545 (May 26, 1999) FRA assessed visual quality and aesthetic impacts from implementation of the SCMAGLEV Project. In addition, the following Federal, state and local laws, regulations and guidance were used to complete this assessment:

- National Scenic Byways program (23 U.S.C. § 162)
- U.S. Department of Transportation Act (Section 4(f)) (49 U.S.C. § 303)
- Lands and Water Conservation Fund Act (Section 6(f)) (54 U.S.C. § 20031 et seq)
- U.S. Commission of Fine Arts Executive Order (EO) 1862
- National Historic Preservation Act (NHPA) (54 U.S.C. § 300101 et seq)
- Antiquities Act of 1906 (16 U.S.C. § 431 et seq.)
- Federal Land Policy and Management Act (43 U.S.C. § 1701 et seq)
- Executive Order 11593, Protection and Enhancement of the Cultural Environment (May 13, 1971)
- National Capital Planning Act of 1952
- The Height of Buildings Act of 1910
- Approved local area planning documents (for more details on plans see Appendix D.3).

4.9.2.2 Methodology

FRA assessed the visual effects of the alignment (viaduct and deep tunnel), stations, and miscellaneous fixed support facilities on adjacent and nearby communities, general public areas, sensitive viewsheds, historic sites, and other special features considered to be visually sensitive.

FRA considered a 2,000-foot viewshed as an Area of Visual Effects (AVE) from all proposed facilities and contributing elements required for the long-term safety and operations of the SCMAGLEV system. For this resource assessment, the AVE is synonymous with the SCMAGLEV Project Affected Environment defined for other resources and additional details are provided in Appendix D.6. For above-ground resources (buildings, structures, districts, and objects) in Maryland, the AVE includes the geographic area within 2,000 feet of the Limits of Disturbance (LOD), defined as the construction footprint of the Build Alternatives, including any permanent and temporary easements, access roads, all locations of ancillary facilities, and any other SCMAGLEV Project-specific locations. The AVE is inclusive of the Area of Potential Effects (APE) for the assessment of cultural and archaeological resources identified in Section 4.8 Cultural Resources and Appendix D.5 for Maryland and Washington, D.C.

Due to the substantial size of the SCMAGLEV Project, FRA established Common Aesthetic Areas (CAAs), similar to a traditional Landscape Unit (LU), defined as select areas within the AVE that have contiguous, consistent visual features and/or homogeneous visual character. Due to the numerous and varied geographical areas that needed to be evaluated for this Project, FRA is utilizing the more concise CAA as the spatial element to give greater attention to those locations with cohesive community features. FRA identified twenty CAAs for which existing conditions and impacts are evaluated. Additional information regarding CAAs provided in Appendix D.6.

FRA collected data for aesthetic and scenic resources using desktop research, topographic maps to identify resources within the AVE, and a review of draft conceptual engineering to identify the location of the Build Alternatives in relation to key viewpoints. Desktop research identified Maryland Scenic Byways, scenic vistas, historical and cultural sites, and other specific views along the Build Alternatives. These views could include residential areas or farmlands, areas of scenic beauty, parks and recreational areas, historically and/or culturally significant features, urban landmarks, water bodies, public facilities, and protected public lands.

FRA used a multi-step process to identify and assess impacts to visually sensitive resources. The first step focused on identifying resources and the visual quality of the resource. FRA ranked visual resources in one of five categories: low, moderately low, moderate, moderately high, and high. Following, FRA evaluated the visual quality impacts resulting from the Build Alternatives based on compatibility, viewer sensitivity, and degree of impact. The ranking of visual resources, viewer sensitivity, and impacts are defined below in **Table 4.9-1**. For additional detail regarding FRA's multi-step process, see Appendix D.6.

Table 4.9-1: Visual Resource Ranking

Category	Ranking
Visual Resource Ranking	**Low** refers to areas having degraded or lower quality visual resources with no aesthetically pleasing composition or lacking any cohesive visual identity. An example would be a disjointed, abandoned industrial area adjacent to a heavily trafficked highway or railroad. **Moderately low** refers to areas containing some visual resources but lacking a coherent and aesthetically pleasing composition and some disruptive visual detractors. An example would be poorly maintained commercial area adjacent to a well maintained or newer community center or park. **Moderate** refers to areas primarily of visual resources combined in an aesthetically pleasing composition with few disruptive visual detractors. An example would be a cohesive, well-maintained development. This could be urban, suburban or protected lands. **Moderately high** refers to areas of visual resources combined in an aesthetically pleasing composition, expressing a sense of place and lacking prominent disruptive visual detractors. An example would be a planned development that includes open space and trails, or well-maintained protected public lands with open vistas. **High** refers to areas comprising visual resources free of disruptive visual detractors and with a strong sense of place. An example would be federally protected, undeveloped land with unique, scenic vistas.
Viewer Sensitivity	**Low sensitivity** may exist when there are few viewers who experience a defined view, when potential views of the project are screened or filtered by intervening terrain, structures or landscaping, or where viewers are not particularly concerned about the quality of views due to their activity type, such as a commuter on the highway. **Moderate sensitivity** may occur where views of a project are distant enough that the project does not dominate the view or where viewer activity is not focused on visual quality and expectations are moderate, such as office workers, field laborers or an organized sporting event. **High sensitivity** occurs where a project is highly prominent, open to view, and seen by relatively high numbers of viewers and where viewer concern and expectations of visual quality is also high, as in a rural park where scenery is a primary focus, or in a residential neighborhood.
Degree of impact	**Relatively imperceptible** – no effect **Lower** – minimal to very little effect **Moderate** – average but mostly insignificant effect **Higher** – substantial to detrimental effect

4.9.3 SCMAGLEV Project Affected Environment

The AVE is densely developed in the metropolitan areas of Washington, D.C. and Baltimore, all of which are surrounded by large, relatively densely populated suburban areas. Large areas of Forest/Shrub and Wetlands land covers occur in Anne Arundel, and Prince George's Counties, MD. Twenty CAAs are within the AVE for the SCMAGLEV Project (see **Figure 4.9-1**).

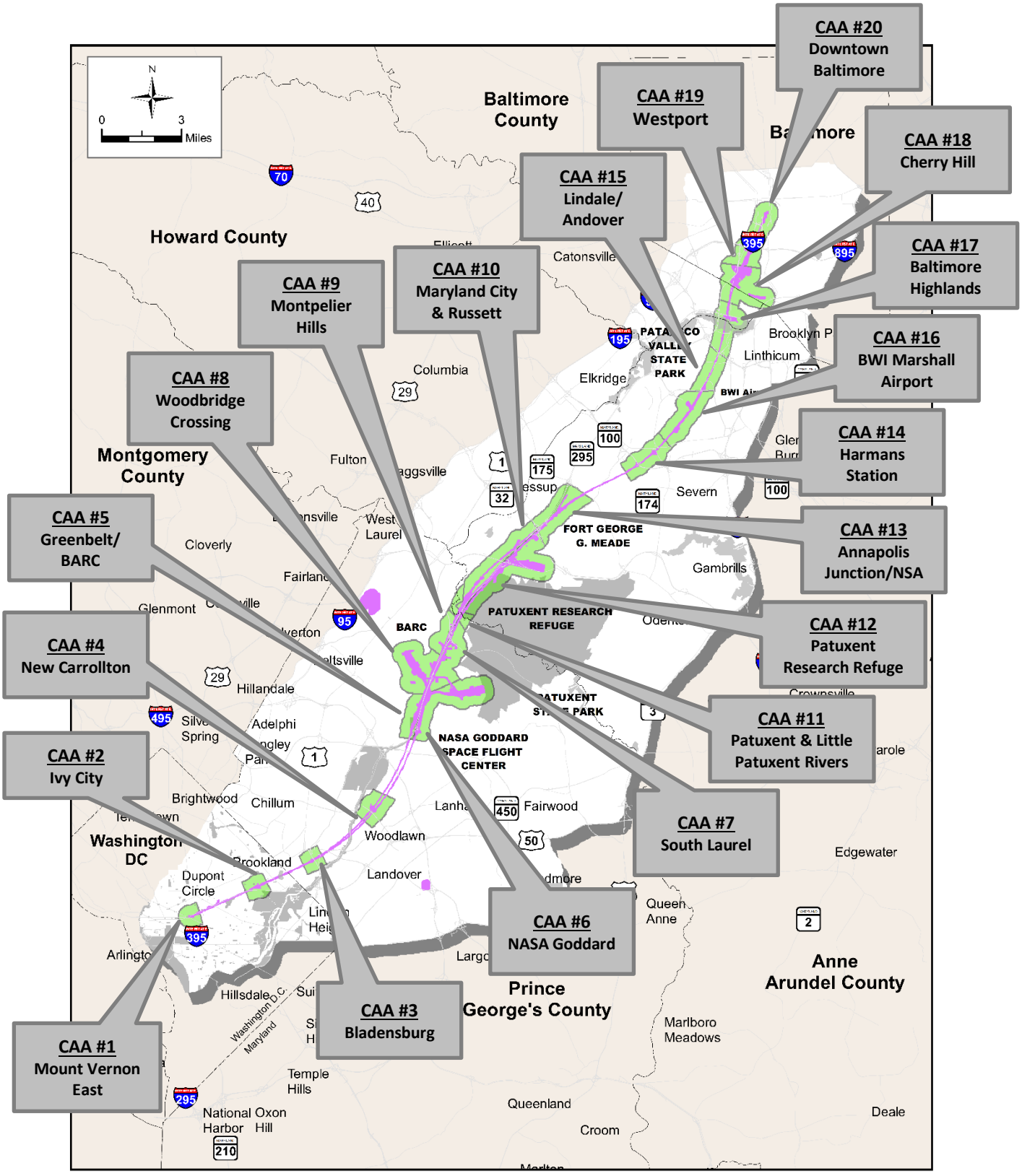
Visual and aesthetic resources vary, consisting of cultural resources, developed park settings, and natural settings consisting of either water, wooded, or open views. Smaller, developed park resources are more prevalent in the Washington, D.C. and Baltimore City areas, as well as scattered throughout the suburban cities and towns in central Maryland. Undeveloped resources like the Patuxent Research Refuge (PRR) in Maryland are located within tributaries to larger watersheds or ecosystems such as the Chesapeake Bay. Larger, undeveloped resources can also be found around Beltsville, MD in the Beltsville Agricultural Research Center (BARC) property as well as the National Park Service (NPS)-owned Baltimore-Washington Parkway (BWP). The greatest numbers of cultural sites are typically found in municipalities that date from the 18th to early 20th centuries and therefore contain older buildings and structures. Municipalities with many cultural sites include Baltimore City, MD, Washington, D.C., and the central Maryland suburban towns of Bladensburg, Greenbelt, and Linthicum. Appendix B.4 Cultural Resources Mapping shows the locations of many of these resources.

4.9.4 Environmental Consequences

4.9.4.1 No-Build Alternative

Under the No Build Alternative, the SCMAGLEV Project will not be built and therefore no impacts related to the construction or operation of a SCMAGLEV system will occur. However, other planned and funded transportation projects will continue to be implemented in the area and could result in changes to the visual and aesthetic qualities of the SCMAGLEV Project Affected Environment.

Figure 4.9-1: Common Aesthetic Areas (CAA) within the AVE



4.9.4.2 Build Alternatives

Visual impacts occur where elements related to the Build Alternatives are near or within sight of a visually sensitive resource. Potential impacts could also occur where the Build Alternatives would require the removal of an existing visual feature (such as clearing an existing forested area) and changes in existing topography (which would occur through land acquisitions or construction). Potential changes to visually sensitive areas, areas where the proposed SCMAGLEV infrastructure would have unique aesthetic qualities (such as graded embankments, aerial structures, and tunnel portals), and support facilities (such as stations, parking structures, maintenance facilities), would introduce new elements into the existing visual settings. Lighting associated with infrastructure proposed as part of the Build Alternatives may also result in visual impacts in the form of light emissions.

This section presents an overview of visual impacts identified as moderate or high through the impact analysis. Detailed information for each CAA identified and impacts assessments are provided in Appendix D.6. Design details and profiles of the Build Alternatives are provided in Appendix G.2. Visualizations for various SCMAGLEV Project elements are provided in this section. These artistic renderings are based upon preliminary designs and are provided for illustrative purposes. These figures are draft and subject to change and will continue to be revised and refined as the project development process continues. Before and After visualizations are provided in Appendix D.6

Table 4.9-2 provides a summary of the number of visually sensitive resources impacted by each proposed Build Alternative. The narrative that follows provides a more detailed breakdown of the impacts by major SCMAGLEV system features (alignments, stations, and trainset maintenance facilities (TMF).

Table 4.9-2: Number of Visually Sensitive Resources Impacted by Build Alternatives

Build Alternative	Number of State/Local/ Community Resources	Number of Federal Resources	Total
J-01	43	8	51
J-02	41	8	49
J-03	44	8	52
J-04	41	11	52
J-05	39	11	50
J-06	42	11	53
J1-01	41	7	48
J1-02	37	6	43
J1-03	40	6	46
J1-04	39	10	49
J1-05	35	9	44
J1-06	38	9	47

Alignments

The alignment of the Build Alternatives is primarily located in tunnel, but includes a portion of viaduct (elevated structure), as well as surface features such as fresh air and emergency egress facilities and power substations, which will introduce a new visual element into the existing landscape. Alignment J would have a longer viaduct segment, which would result in impacts to additional visually sensitive resources, compared to the shorter viaduct segment of Alignment J1. FRA does not anticipate any visual impacts from the guideway within tunnel segments of either Build Alternatives J or J1 alignments, as this segment of the guideway would be located within a deep tunnel beyond the viewshed of resources within the AVE. Build Alternatives J includes 25 percent viaduct and 75 percent tunnel whereas Build Alternatives J1 includes 14 percent viaduct and 86 percent tunnel. However, FRA determined that surface features of both alignments, including the viaduct tunnel portal and ancillary facilities, would result in visual impacts to resources within the AVE ranging from *relatively imperceptible* to *higher level* degrees.

According to the Project Sponsor, because revenue service operations would not occur throughout the night, the viaducts would not have a need for permanent lighting illuminating the guideway. Rather, lighting on the viaduct sections will only be required for maintenance of the guideway, would be temporary, and transported by maintenance crews to active work zones and removed at the conclusion of maintenance activities. If permanent lighting is required due to Federal, state, or local requirements, impacts from permanent lighting would be avoided, minimized, and mitigated during final engineering design, to the extent feasible.

Visually sensitive resources identified as having a moderate to high visual impact from the Build Alternatives alignments features are summarized below in **Table 4.9-3**.

Build Alternatives J an J1 alignments in Prince George's County

n Prince George's County, as the Build Alternatives J and J1 alignments run north towards Baltimore in deep tunnel from Washington, D.C., a proposed Fresh Air and Emergency Egress (FA/EE) facility is proposed in the New Carrollton area of Prince George's County in the vicinity of the Martins Woods Historic District, Patterson Park, and the Wildercroft-Riverdale Road residential communities. Proposed construction of a building approximately 50 feet tall to house ventilation systems and emergency egress access from the tunnel in an existing forested area and would result in a visual impact to the surrounding area. Under the Build Alternatives J alignments, FRA determined the resources in the CAA #4 viewshed would experience *moderate to higher level* degrees of visual impact, due to the relatively undisturbed existing forested landscape and encroachment of construction activities towards the Martins Woods Historic District. Under the Build Alternatives J1 alignments, FRA has determined the resources in the viewshed would experience *lower level to moderate level* degrees of visual impact, due to the partially disturbed nature of the existing developed and forested landscape. **Figure 4.9-2** provides an illustrative rendering of the proposed FA/EE in New Carrollton.

Figure 4.9-2: CAA #4 – Illustrative Rendering of FA/EE Proposed in New Carrollton, Looking East

The Build Alternatives J and J1 alignments transition from tunnel to viaduct in the vicinity of the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center's (GSFC) Explorer Road interchange with the BWP. They run through the City of Greenbelt Historic District and they pass over BARC, Beaver Dam Road, Powder Mill Road, past the US Secret Service James J. Rowley Training Center and head north through South Laurel and past Woodbridge Crossing and Montpelier Hills. These resources in the CAAs #5, #6, #7, #8, #9 viewsheds would experience moderate to higher level degrees of visual impact. See **Figures 4.9-3 and 4.9-4** .

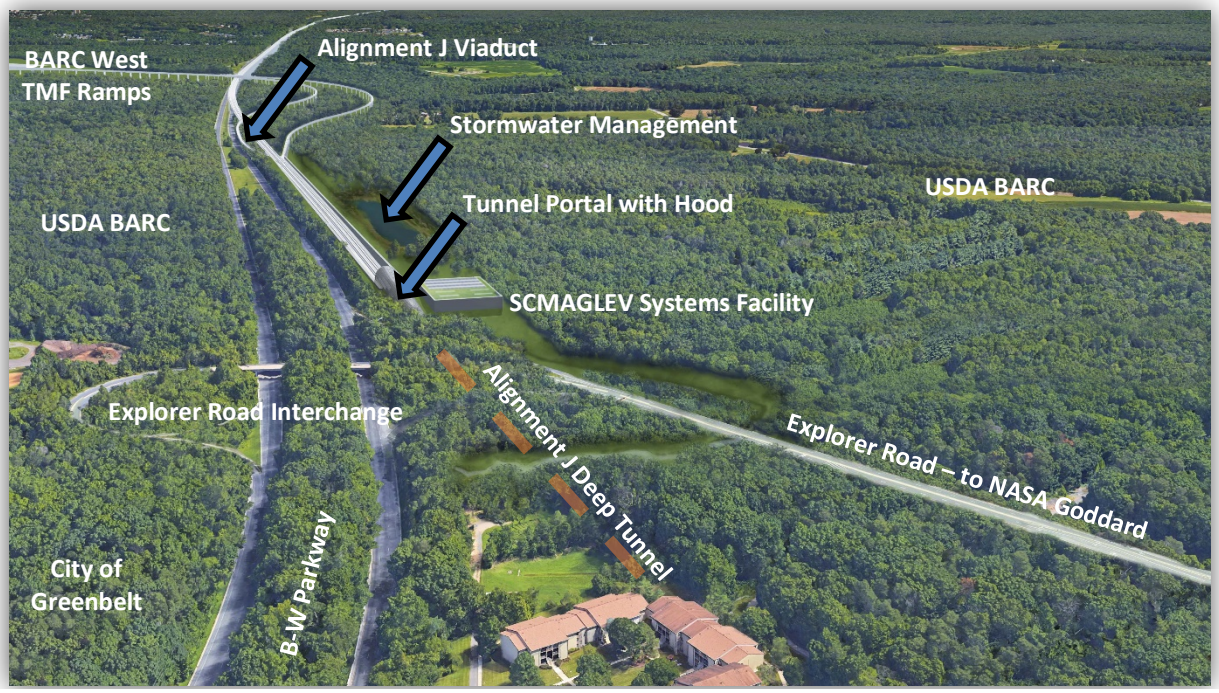


Figure 4.9-3: CAAs #5, #6, #7, #8, #9 – Illustrative Rendering of Alignment J Tunnel Portal at Explorer Road Interchange with Ramps to BARC West TMF, Looking North

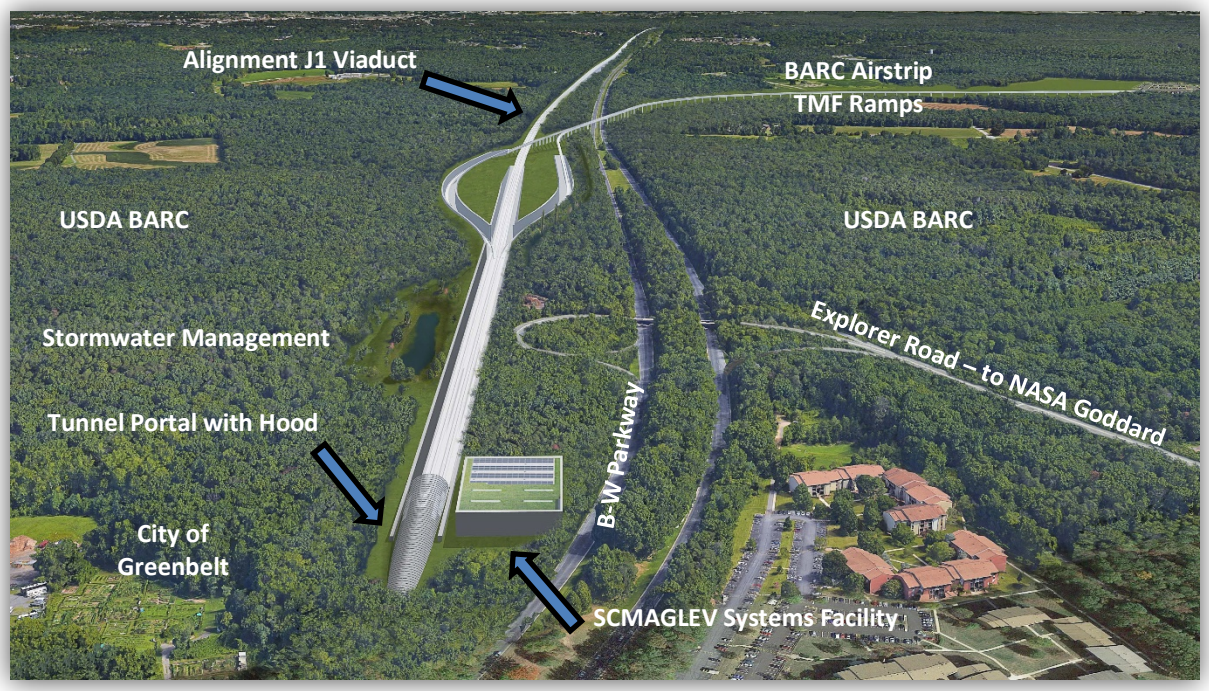


Figure 4.9-4: CAAs #5, #6, #7, #8, #9 – Illustrative Rendering of Alignment J1 Tunnel Portal at Explorer Road Interchange with Ramps to BARC Airstrip TMF, Looking North

Build Alternatives J and J1 alignments in Anne Arundel County

In Anne Arundel County, the Build Alternatives viaducts would continue to be carried at high elevations (between 30 feet and 130 feet high, depending upon the existing topography) adjacent to the BWP and would present potential visual impacts to surrounding resources like Maryland City Park, the Patuxent River and Patuxent River Park, and PRR. Through Anne Arundel County the Build Alternatives J alignments continue to the east of the BWP at higher elevations and transitions back to deep tunnel at Fort Meade. Similarly, the Build Alternatives J1 alignments continue to the west of the BWP and transitions back to deep tunnel at Maryland City Park adjacent to Brock Bridge Elementary School. Under the Build Alternatives J alignments, FRA determined the resources in CAAs #10, #11, and #12, specific to Patuxent River and Patuxent River Park, PRR, and BWP would experience a *higher-level* degree of visual impact, due to the undisturbed and natural landscape. Under Build Alternatives J1 alignments, FRA determined theses same resources for Patuxent River, PRR, Maryland City Park, and BWP would experience *moderate to higher level* degrees of visual impact, due to the location of the viaduct through park-like and neighborhood resources. **Figure 4.9-5** provides an illustrative rendering of the proposed Build Alternative J1 viaduct crossing the Patuxent River.

Figure 4.9-5: CAA #11 and #12- Illustrative Rendering of Proposed Build Alternative J1 Parallel to Southbound BWP Crossing the Patuxent River, Looking Southwest

In addition, other sensitive resources, such as Maryland City Park, Patuxent River Park, Brock Bridge Elementary School, and Thomas J.S. Waxters Children's Center near the Maryland City, Sudlersville South and Barbersville communities fall within the viewshed for the Build Alternatives J and J1 alignments; however, these resources are at a distance where existing topography and vegetation would only partially shield/block the Build Alternative structures and lights. For Build Alternatives J1 alignments in this area, FRA determined impacts to these resources in CAAs #10, #11, and #12 would experience *higher level* degrees of visual impacts, depending upon relative distance and elevation of existing and proposed features. For these same CAAs, Build Alternatives J alignments would have *relatively imperceptible* visual impacts. **Figure 4.9-6** provides an illustrative rendering of the proposed Build Alternatives J1 tunnel portal and contributing elements.

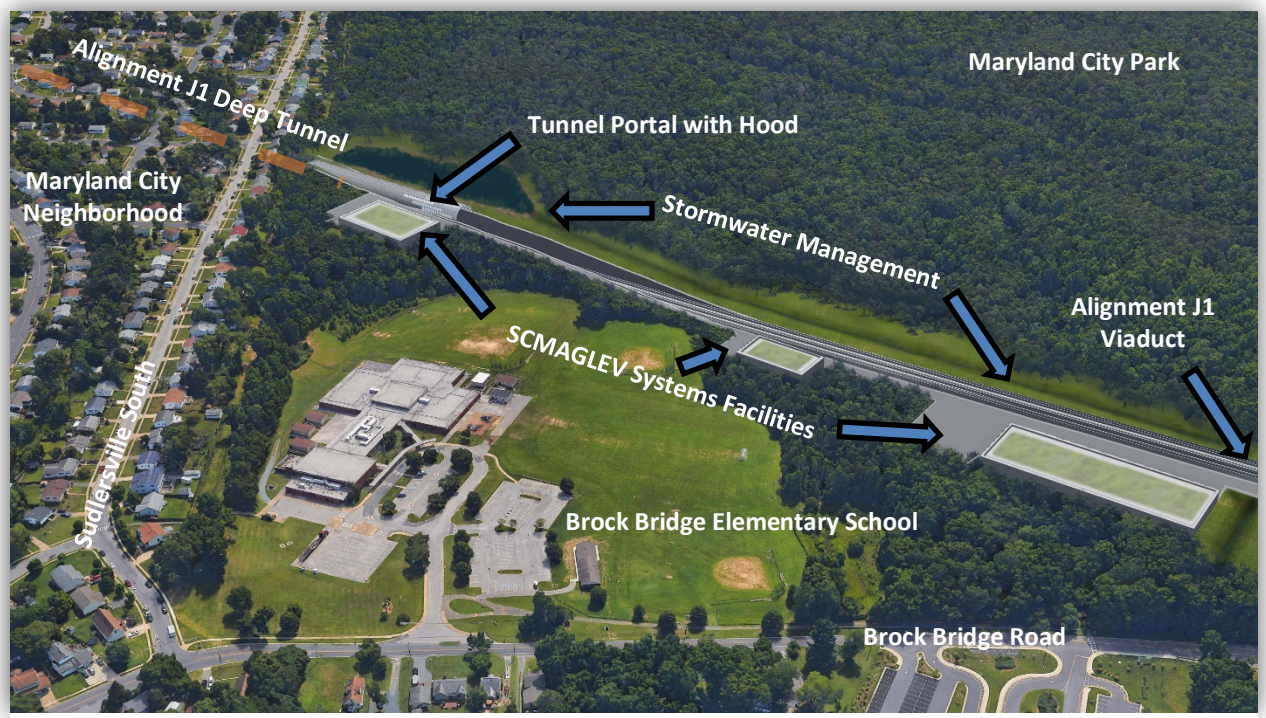


Figure 4.9-6: CAA #10 - Illustrative Rendering of Proposed Build Alternative J1 Tunnel Portal near Brock Bridge Elementary School and Maryland City, Looking East

A short distance to the north, and inside the northern boundary of Maryland City Park, prior to the Sudlersville South neighborhood within the CAA #10 viewshed, Build Alternatives J1 alignments transition from viaduct to deep tunnel via a tunnel portal. FRA determined that the viaduct and tunnel portal would have *higher levels* of impact on the surrounding properties due to the proximity of the Build Alternatives (within the Maryland City Park and within 50 feet of the Sudlersville South neighborhood).

East of the Russett Community in Anne Arundel County, the viaduct on the Build Alternatives J alignments would be built at high elevations (60 to 100 feet above the existing surface in some locations) above and over the MD 198 interchange through the

northwestern portion of the PRR and adjacent to the BWP. FRA determined the viaduct would result in a *higher-level* degree of visual impact to those resources in CAAs #10 and #12. The viaduct would comply with Federal Aviation Administration (FAA) Notice of Proposed Construction or Alteration (FAA-7460), Maryland Department of Transportation/Maryland Aviation Administration (MDOT MAA) regulations for safe operations due to its close proximity to Tipton Airport. **Figure 4.9-7** provides an illustrative rendering of the proposed FA/EE near Fort George G. Meade.

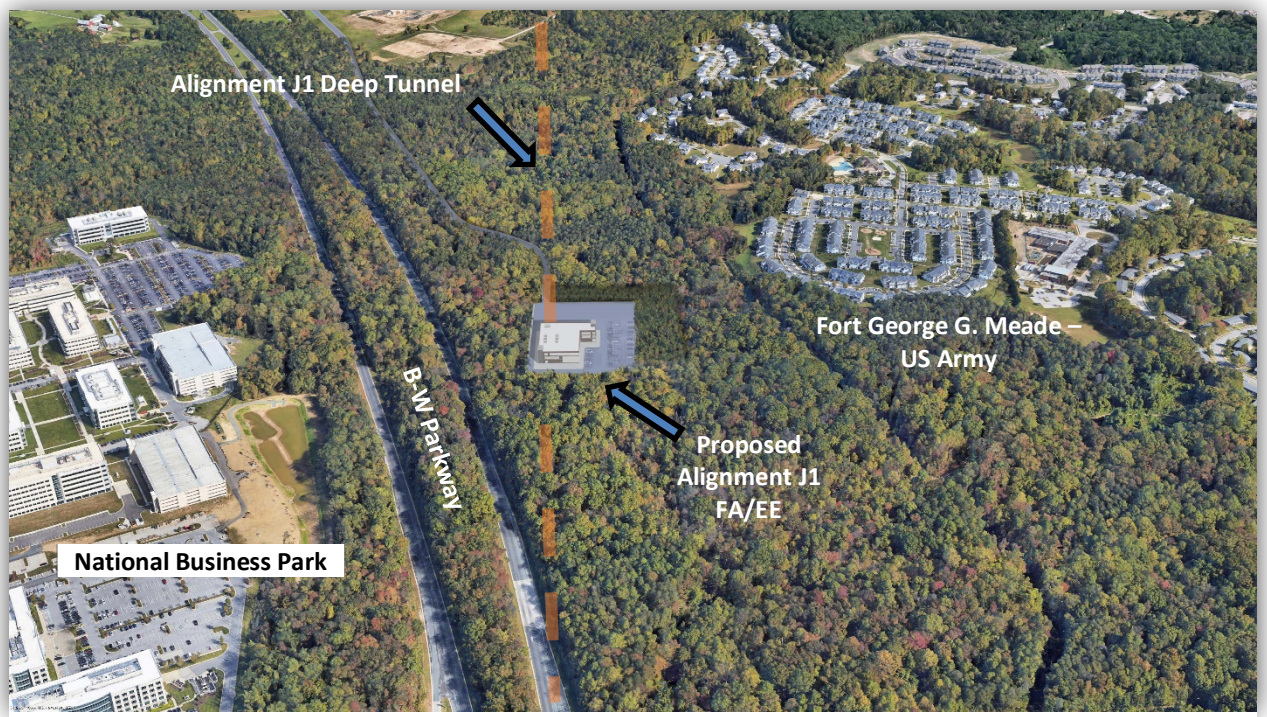


Figure 4.9-7: CAA #13 - Illustrative Rendering of Proposed Alignment J1 FA/EE near Fort George G. Meade and Baltimore-Washington Parkway, Looking North

Heading north from the portal, Build Alternatives J1 alignments would be in underground tunnel up to Baltimore City; however, a proposed SCMAGLEV FA/EE, approximately 50-feet tall, would be installed on Fort George G. Meade (U.S. Army) property. This facility would be built in an area that is currently forested, adding a structure and lighting in an area currently undeveloped. This facility would have visual impacts to BWP and Fort Meade. FRA determined that the proposed facility within the CAA #13 viewshed would result in a *higher-level* degree of visual impact resulting from disturbances to the surrounding natural features and undeveloped land.

The Build Alternatives J alignments continue adjacent to the east side of BWP, over the Little Patuxent River, and over the Patuxent Freeway (MD 32) interchange where it would pass by the Annapolis Junction, National Security Agency (NSA) and the U.S. Army Fort George G. Meade properties before re-entering a tunnel portal north of the Connector Road interchange. FRA determined that due to the proposed height of this segment of viaduct (up to 50 feet) and surrounding park-like aesthetics of the existing

landscape, the viaduct and tunnel portal would have *moderate to higher level* degrees of visual and light emission impacts on the Little Patuxent River, as well as on the NSA and Fort George G. Meade properties within CAAs #12 and #13. Efforts would be made by the Project Sponsor to minimize and mitigate potential impacts to these resources using walls and/or other barriers or vegetative screens. North of Fort George G. Meade, the guideway would be in underground tunnel up to Baltimore City.

North of the portal, FRA does not anticipate any visual impacts for this segment in underground tunnel; however, a proposed FA/EE facility on a parcel located adjacent to MD 100 and Harmans Road would have potential visual impacts to the surrounding residential neighborhoods along Matthewstown Road, Post Road, David Victoria Road, and Hekla Lane. This facility would be built in an area that is currently forested, adding a structure and lighting in an area currently undeveloped. FRA determined that the proposed facility within the CAA #14 viewshed would result in *moderate to higher level* degrees of visual impact resulting from disturbances to the surrounding natural features and undeveloped land.

Build Alternatives J and J1 alignments in Baltimore County and Baltimore City

FRA does not anticipate any visual impacts associated with the Build Alternatives J and J1 alignments through Baltimore County and City since the majority of the mainline guideway in this area is in deep tunnel. The only exception would be in Cherry Hill, where if the Cherry Hill Station were to be constructed, there would be a length of above ground viaduct and tail track that would introduce a visual impact. There are additional FA/EE facilities proposed in Baltimore County and City; however, the facilities conform to the surrounding land uses. Therefore, no alignment-related visual or light emissions impacts are anticipated. There are; however, visual and light emission impacts anticipated within Baltimore County and City related to proposed stations, as documented in the section below.

Stations

FRA determined that visual and aesthetic resources within the immediate vicinity of SCMAGLEV stations would be impacted within the viewsheds of CAAs #1, #16, #18, #19, and #20. Elements associated with new stations might include buildings, platforms, guideway, parking, elevated roadways and ramps, and other supporting structures. Mount Vernon Square East, Baltimore-Washington International Thurgood Marshall (BWI Marshall) Airport and Camden Yard Stations are proposed to be underground. Proposed underground stations would result in minimal effects to visual and aesthetic resources since the majority of the station infrastructure would be underground. Underground stations may include above-ground features such as entrances and parking structures. The Cherry Hill Station is the only above-ground station proposed.

The stations (Mount Vernon Square East Station, BWI Marshall Airport Station, Cherry Hill Station, Camden Yards Station) would feature permanent lighting roughly equivalent to those currently experienced at train stations like Union Station in Washington, D.C., and Penn Station in Baltimore.

Visually sensitive resources identified as having a moderate to high visual impact from the proposed stations are summarized below in **Table 4.9-3**.

Mount Vernon Square East Station

Head house entrance structures would introduce new visual elements to the existing area. The new buildings will be designed to be architecturally cohesive with the surrounding neighborhood, with contemporary accents and facility lighting that could be built separately and/or integrated into neighboring structures. The introduction of these conforming structures into the existing visual landscape would not introduce disproportional visual impacts or light emissions within the CAA #1 viewshed as the proposed buildings would merge with the existing surroundings and not disrupt any sensitive views. Therefore, the degree of visual and light emission impacts is categorized by FRA as *lower to moderate*. **Figure 4.9-8** provides an illustrative rendering of the proposed Mount Vernon Square East Station Entrance.

Figure 4.9-8: CAA #1 - Illustrative Rendering of Possible Entrance to Proposed Mount Vernon Station, Looking Northeast

BWI Marshall Airport Station

The proposed station at BWI Marshall Airport would be built directly underneath the existing short-term parking structure near the passenger arrival/departure area of the BWI Marshall Airport Station terminals. In order to build the station, the existing short-term parking structure would be demolished and re-built. The new parking structure and station terminal would be designed to closely match the existing visual character of the surrounding airport. All exterior lighting proposed as part of the BWI Marshall Airport Station would comply with FAA Notice of Proposed Construction or Alteration (FAA-

7460), MDOT MAA and BWI Marshall Airport lighting policies and will receive agency approvals prior to construction. Therefore, FRA has determined that the proposed station within the CAA #16 viewshed would have a *relatively imperceptible to lower level* degree of visual impact. **Figure 4.9-9** provides an illustrative rendering of the proposed BWI Marshall Airport station and contributing elements.

Figure 4.9-9: CAA #16 - Illustrative Rendering of Proposed Station at BWI Marshall Airport – Parking Garage and Terminal, Looking East

Cherry Hill Station

Within the neighborhoods of Cherry Hill and Westport in Baltimore City, and directly adjacent to the existing Cherry Hill Light Rail Station, an aboveground SCMAGLEV station is proposed. Associated with the proposed Cherry Hill Station is a tunnel portal located to the north of Patapsco Avenue and east of BWP (MD 295). This portal would transition the underground guideway to a viaduct that would span over the adjacent/existing CSX railroad tracks to the proposed elevated Cherry Hill Station. The elevated station concept also allows for potential elevated terminal facilities, known as tail tracks. Potential terminal facilities would be located on nearby property and property just east of the Kloman Street between Waterview Avenue and I-95 and would be approximately 50 feet high. A new electrical substation is also proposed just south of I-95 and north of Clare Street. In addition to the tail tracks and Power Substation, a Maintenance of Way (MOW) facility, garage parking, systems operation center, and other support facilities have been proposed. **Figure 4.9-10** provides an illustrative rendering of the proposed Cherry Hill Station, MOW, and contributing elements.

Figure 4.9-10: CAAs #18 and #19 - Illustrative Rendering of Proposed Cherry Hill Station, Tunnel Portal, Maintenance of Way Facility, and Parking Structures, Looking North

The elevated Cherry Hill Station would provide vertical access to the Light Rail station directly below it, as well as to a proposed parking garage along Cherry Hill Road. The optimum anticipated height of these proposed station elements is 90 feet above the existing surface topography. The entire combined surface area for this station and support facilities is estimated to be approximately 235 acres. Within the viewshed buffer of the proposed station are several visually sensitive resources, including Northeast Highlands Park/Ungers Field, Lakeland Park, Middle Branch Park and Trail, and the Westport Historic District, Indiana Avenue Park, The Gwynns Falls Trail, the Middle Branch Patapsco River, The Gwynns Falls River, Arundel Elementary School, Westport Elementary School, and Mt. Auburn Cemetery. The area is characterized by industrial, light industrial, commercial, and residential land uses. The area is also bisected and bound by a series of major transportation corridors, including interstates, highways, and rail lines. Given the context of the area and surrounding existing land uses, FRA determined that the proposed station and its related elements within the CAA #18 viewshed would result in *moderate to high level* degrees of visual impact and light emissions to the existing landscape. In addition, FRA determined that visually sensitive resources located close to the proposed station within CAA #19 viewshed (including Middle Branch Park and Trail, Indian Avenue Park, the Gwynns Falls Trail, the Gwynns Falls River, Westport HDC, and the Middle Branch Patapsco River) would experience *moderate to high level* degrees of visual and light emission impacts. FRA determined that other visually sensitive resources located within the CAA #18 viewshed (Northeast

Highlands Park/Ungers Field, Lakeland Park, and Middle Branch Park), would have *lower to moderate level* degrees of visual and light emissions impact.

Camden Yards Station

Located in downtown Baltimore, the proposed Camden Yards Station would be an underground station adjacent to Camden Yards below the Baltimore Convention Center. The station cavern would extend underground on a diagonal from approximately Martin Luther King, Jr. Boulevard to just north of Pratt Street. Station entrances would be at three possible locations: the corner of Howard and Camden Streets; the Camden Maryland Area Regional Commuter (MARC) Station; or adjacent to the Convention Center along Conway Street. The proposed station would be constructed using similar methods to those used for the Washington, D.C. Mount Vernon Square East Station, utilizing temporary top-down construction methods. However, unlike in D.C. where primarily only New York Avenue would be disturbed during construction, the Camden Yards Station would require substantial demolition of surrounding buildings. Uniquely recognizable buildings and historic cultural resources like the Baltimore Convention Center, the Federal Reserve Bank-Richmond, the historic Old Otterbein United Methodist Church and Otterbein Historic District would be demolished. In addition, the Edward A. Garmatz United States Courthouse and Federal Services building, and the Bank of America Financial Center building would also be demolished to build the proposed station. FRA determined that the razing of these buildings and sensitive resources within CAA #20 viewshed would result in a *moderate to higher level* degree of visual impact to the sensitive resources that would remain.

The remaining visually sensitive resources potentially affected include McKeldin Square, Solo Gibbs Park, the Business and Government HDC, the George H. Fallon Federal Service Building, the Patapsco River, and various other potential community and cultural resources noted above that would be demolished and replaced with the new structure. FRA determined these resources within CAA #20 viewshed would potentially be subjected to *moderate to higher level* degrees of visual and light emissions impact resulting from the changes proposed within the viewshed buffer. **Figure 4.9-11** provides an illustrative rendering of the proposed Camden Yards Station entrance.

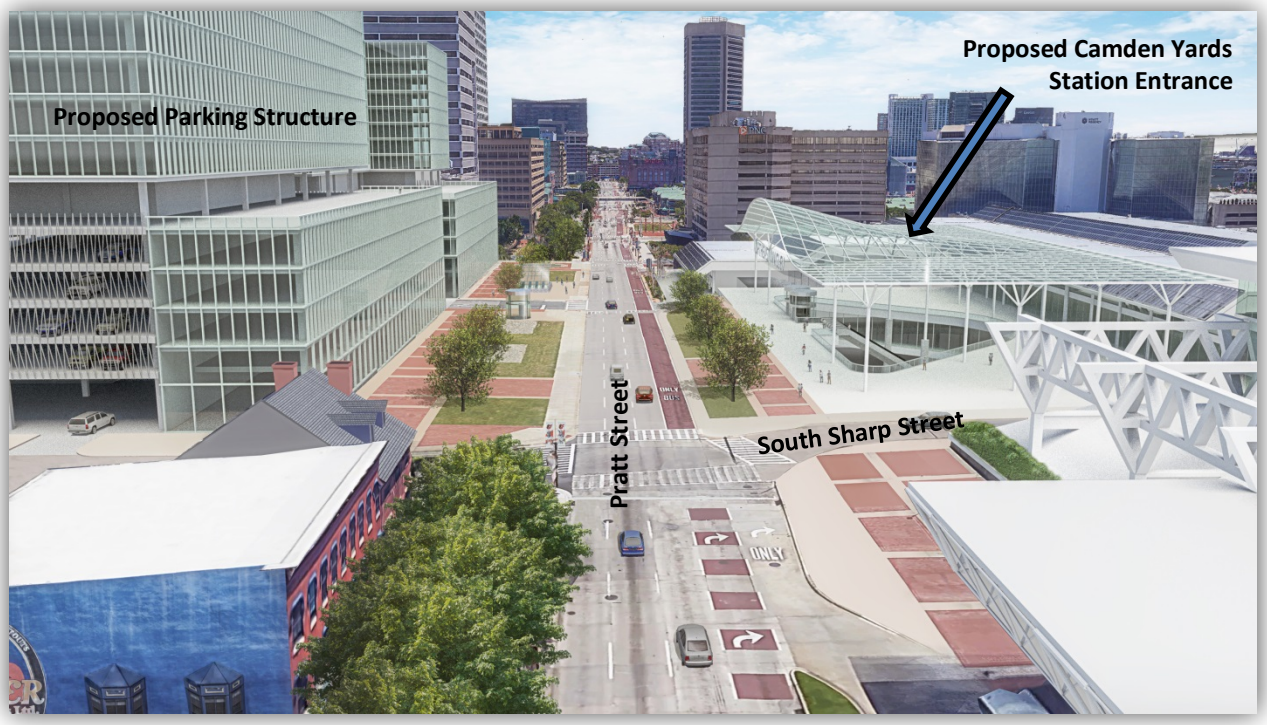


Figure 4.9-11: CAA #20 - Illustrative Rendering of Proposed Station near Camden Yards in Downtown Baltimore on Pratt Street, Looking East

Trainset Maintenance Facilities (TMFs)

FRA determined that visual and aesthetic resources located within the immediate vicinity of TMF sites and contributing elements within CAAs #5, #6, #7, #8, #10, #11, and #12 would be impacted. The BARC West, BARC Airstrip, and MD 198 TMF sites would feature permanent lighting equivalent to those found at current Amtrak and MDOT MTA light rail maintenance facilities.

Visually sensitive resources identified as having a moderate to high visual impact from the proposed TMF sites are summarized in **Table 4.9-3.**

BARC Airstrip TMF

The BARC Airstrip TMF is an approximate 180-acre site located on the east side of BWP on US Department of Agriculture's (USDA) BARC property and is comprised of various maintenance and repair buildings which are joined by a maintenance of way facility, substations, staff parking, access roads and viaduct ramps. More specifically, the BARC Airstrip TMF would be on the portion of the BARC property that is on the east side of the BWP, south of Powder Mill Road and crosses over Springfield Road (Springfield Road would be realigned to the west to accommodate the TMF footprint). The facility would be on an existing airfield surrounded by relatively undeveloped land that is mostly used for agricultural research. The surface of the BARC Airstrip TMF would be at approximately the same elevation as the existing ground surface at the airstrip. BARC land adjacent to the south of the airstrip is leased to NASA Goddard

Geophysical and Astronomical Observatory (GGAO) which contains highly sensitive scientific equipment.

For access to and from the guideway, two viaduct ramps would branch off from the main line Alignments J and J1 and run parallel to the respective alignment on BWP property before turning toward the TMF. The distances of the ramps along the mainline alignment and BWP property would be 1.6 miles. For BARC Airstrip TMF, the ramps to Alignment J1 would cross over the BWP property via viaduct, presenting a visual impact. FRA determined that the BARC Airstrip TMF and ramps within CAA's #5 and #6 would result in a *higher-level* degree of visual and light emission impacts to the BARC, BWP, and City of Greenbelt properties. NASA Goddard is forcefully vocal regarding their concerns about light emission impacts to their GGAO facility, noting that their instruments are highly sensitive to light and vibrations. While the overall light emissions that would come from the TMF are not fully known at this time, the relatively short distance between the TMF and GGAO suggests there is the potential for substantial light emission impacts. The Project Sponsor would work with NASA Goddard to avoid, minimize and/or mitigate the impacts once the design is further refined. **Figure 4.9-12** provides an illustrative rendering of the proposed BARC Airstrip TMF.

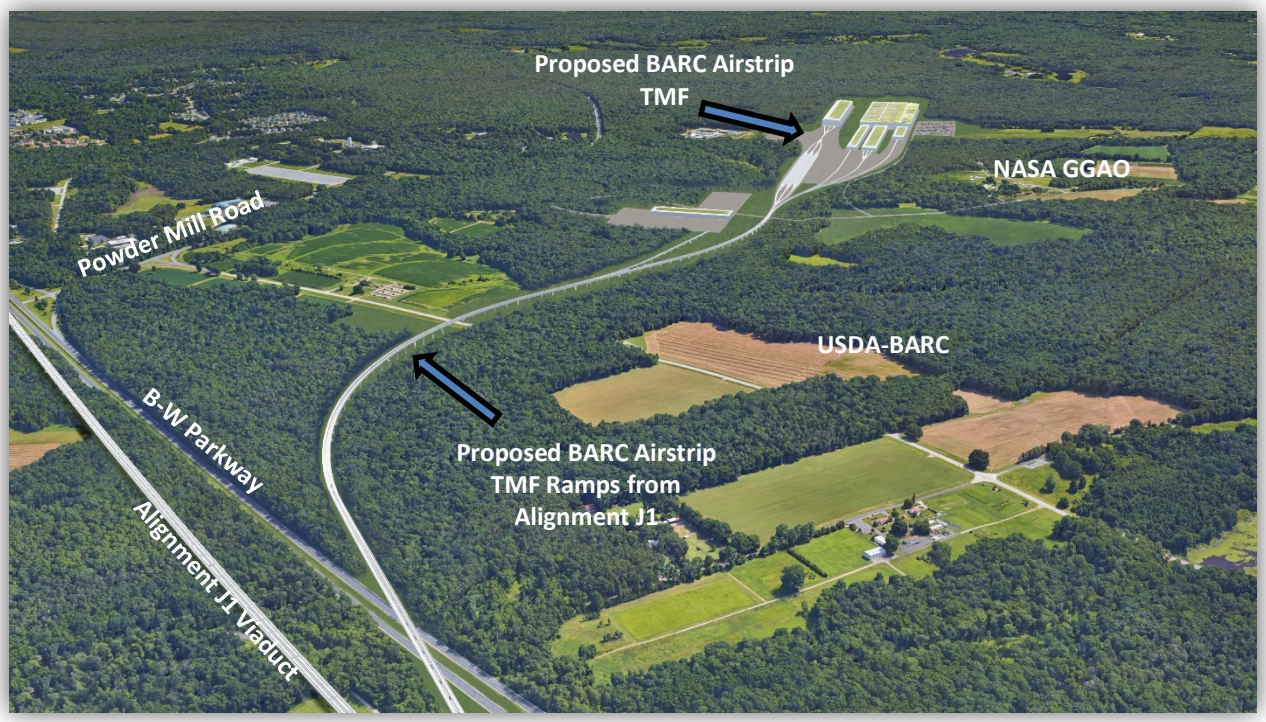


Figure 4.9-12: CAAs #5 and #6 - Illustrative Rendering of Proposed BARC Airstrip TMF and Corresponding Ramps with Alignment J1, Looking East

BARC West TMF

The BARC West TMF is an approximate 180-acre site located on the west side of BWP on USDA's BARC property and comprised of various maintenance and repair buildings which are joined by a MOW facility, substations, staff parking, access roads and viaduct ramps. The facility would be on forested land between Powder Mill Road and Odell Road. Because the site slopes downward toward the northwest and Odell Road, the Project Sponsor would provide up to 56 feet of fill to raise the northwestern portion of the site to a level grade with the rest of the TMF site. The fill would be supported by perimeter retaining walls. For access to and from the guideway, two viaduct ramps would branch off from the main line Alignments J and J1 and run parallel to the respective alignment on BWP property before turning toward the TMF. The distances of the ramps along the mainline alignment and BWP property would be 1.4 miles. In making the turn toward the BARC West TMF, the two ramps would cross over the BWP property via viaduct, presenting a visual impact. FRA determined that the BARC West TMF and ramps within CAAs #5, #6, and #8 would result in a higher-level degree of visual and light emission impacts to the BARC, BWP, and City of Greenbelt properties. In addition, FRA determined that the BARC West TMF would result in a higher-level degree of visual and light emissions impact to the adjacent residential properties and neighborhoods along Odell Road, Gross Lane, and Ellington Drive within CAA #8. **Figure 4.9-13** provides an illustrative rendering of the proposed BARC West TMF.

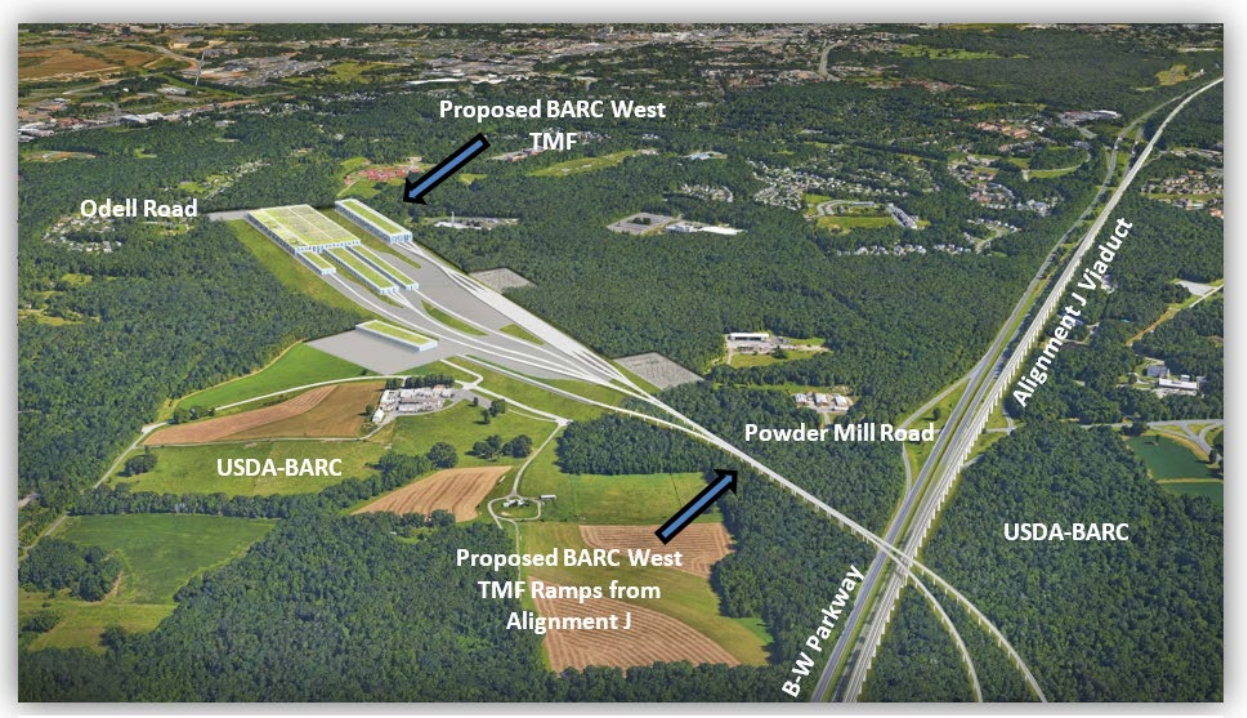


Figure 4.9-13: CAAs #5, #6, and #8 - Illustrative Rendering of Proposed BARC West TMF and Corresponding Ramps with Alignment J, Looking North

MD 198 TMF

Access ramps associated with Build Alternatives J alignments run parallel along the east side of the BWP through the PRR property. FRA determined that these ramps would within CAA's #10, #11, and #12, result in a *high-level* degree of visual impact to the BWP and the PRR. Similarly, the ramps associated with the Build Alternatives J1 alignments run parallel along the west side of BWP and cross over the BWP at MD 198 to reach the TMF. The TMF and associated ramps would also cause *higher level* degrees of visual and light emission impacts on the adjacent DC Children's Center-Forest Haven District, Tipton Airport, PRR, Fort George G. Meade, and residential communities of Sudlersville South, Maryland City, Watershed and Welchs Court within CAAs #10 and #12. The MD 198 TMF would also be highly noticeable to the motoring public travelling on MD 198 and the BWP. **Figures 4.9-14** and **4.9-15** below provide illustrative renderings of the proposed MD 198 TMF and contributing elements.

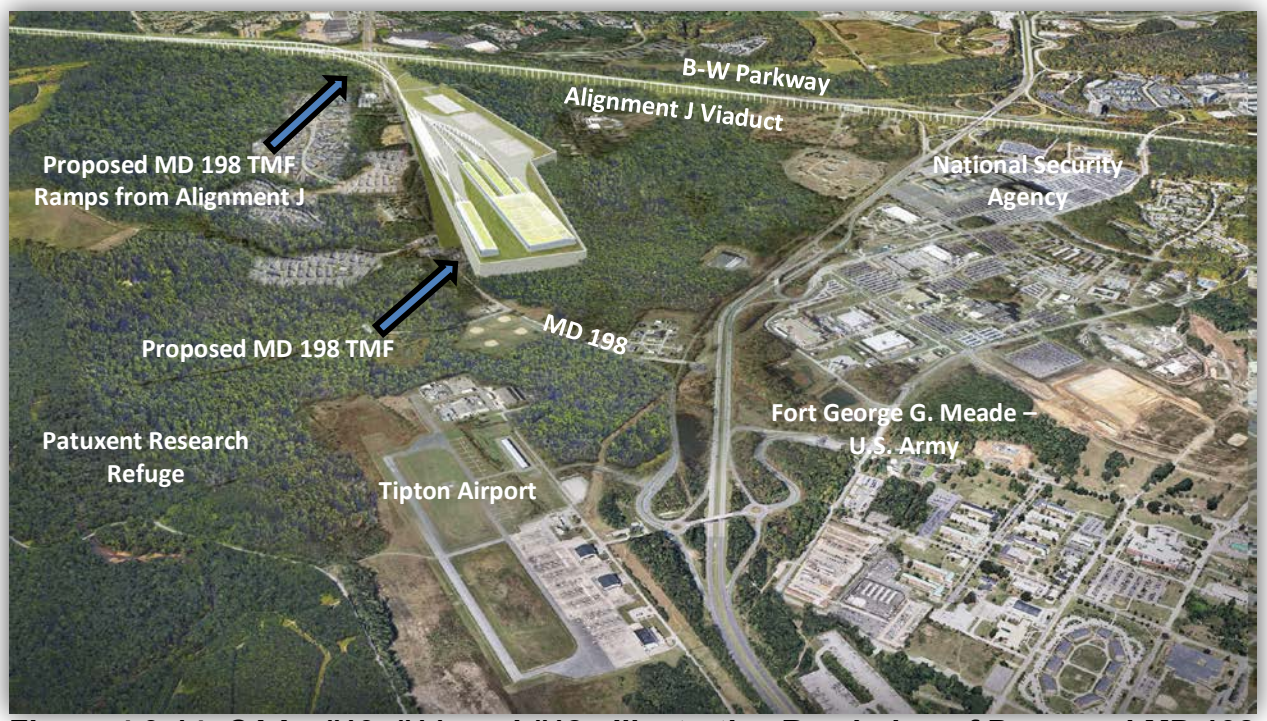


Figure 4.9-14: CAAs #10, #11, and #12 - Illustrative Rendering of Proposed MD 198 TMF and Corresponding Ramps with Alignment J near Tipton Airport, Fort George G. Meade, and NSA, Looking West

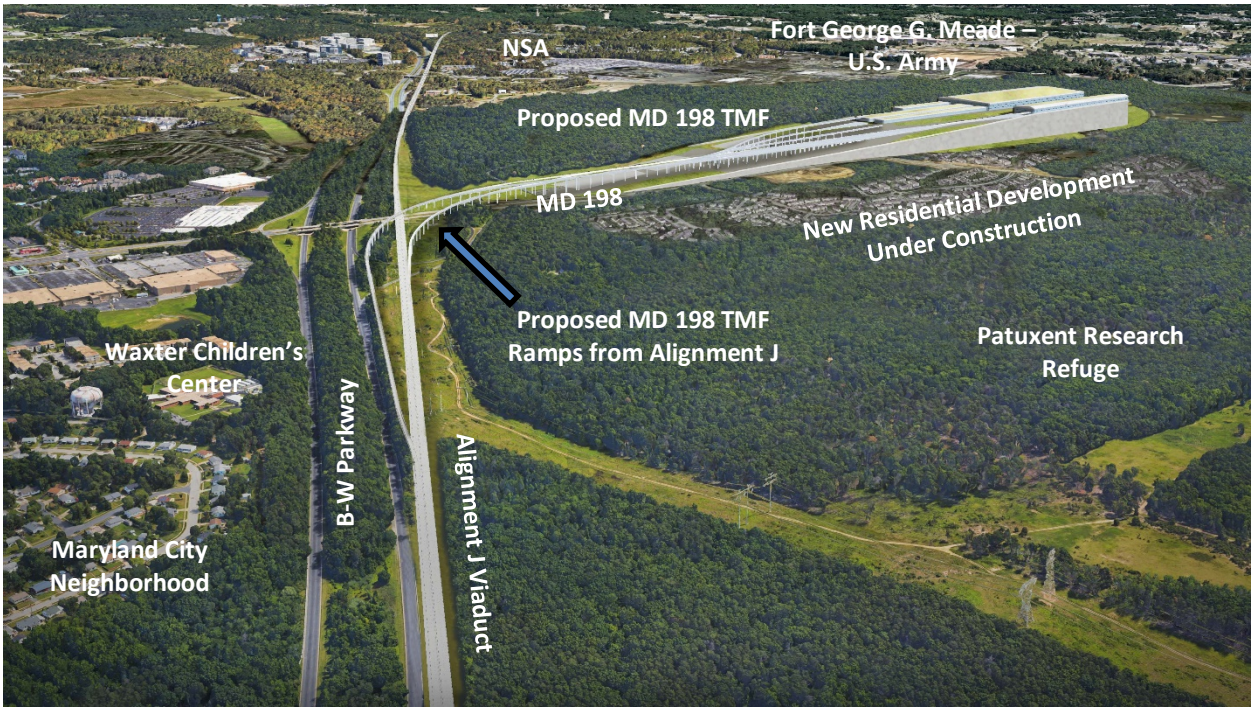


Figure 4.9-15: CAAs #10 and #12 - Illustrative Rendering of Proposed MD 198 TMF and Corresponding Ramps with Alignment J near Patuxent Research Refuge, Fort George G. Meade, and NSA, Looking North

Table 4.9-3: Detailed Summary of Visually Sensitive Resources Impacted by Build Alternatives

Resource Name	Type of Resource & Visual Sensitivity of Existing Resource	Build Alternatives (*X indicates resource is present in a Build Alternatives*)												Degree of Anticipated Visual Impact*	
		J-01	J-02	J-03	J-04	J-05	J-06	J1 01	J1 02	J1 03	J1 04	J1 05	J1 06	Build Alternatives J Alignments	Build Alternatives J1 Alignments
Prince George's County, MD (CAA #4, #5 #6 #7, #8, #9 Viewsheds)															
Martins Woods / Patterson Park	Public Lands - Moderate	X	X	X	X	X	X	X	X	X	X	X	X	M to H	L to M
Wildercroft-Riverdale Road	Residential communities - Moderate	X	X	X	X	X	X	X	X	X	X	X	X	M to H	L to M
NASA Goddard Space Flight Center	Research facility – High	X	X	X	X	X	X	X	X	X	X	X	X	M	M
Beltsville Agricultural Research Center	Research facility – High	X	X	X	X	X	X	X	X	X	X	X	X	H	H
NASA GGAO	Research and Operations Facility - High	-	X	-	X	-	-	-	X	-	X	-	-	H	H
Odell Road / Gross Ln / Ellington Dr Neighborhoods	Residential District – Moderately-High	-	-	X	-	-	X	-	-	X	-	-	X	RI to H	RI to H
Baltimore-Washington Parkway	Public Lands/Historic Cultural Landscape/Transportation Infrastructure/Park Resource – High	X	X	X	X	X	X	X	X	X	X	X	X	H	H
Greenbelt Historic District	Historic District – High	X	X	X	X	X	X	X	X	X	X	X	X	L to M	H

Resource Name	Type of Resource & Visual Sensitivity of Existing Resource	Build Alternatives (X indicates resource is present in a Build Alternatives)												Degree of Anticipated Visual Impact*	
		J-01	J-02	J-03	J-04	J-05	J-06	J1 01	J1 02	J1 03	J1 04	J1 05	J1 06	Build Alternatives J Alignments	Build Alternatives J1 Alignments
City of Greenbelt Observatory and Northway Field/James N. Wolfe Field	Recreational Resource – Moderate	X	X	X	X	X	X	X	X	X	X	X	X	M	H
United States Secret Service James J. Rowley Training Center	Public Lands - High	X	X	X	X	X	X	X	X	X	X	X	X	H	M
Montpelier Hills and Woodbridge Crossing Neighborhoods	Residential Communities – Moderately-Low	X	X	X	X	X	X	X	X	X	X	X	X	RI to L	M to H
Montpelier Elementary School and Montpelier Park	Public Lands - Low	X	X	X	X	X	X	X	X	X	X	X	X	RI to L	M to H
Evergreens at Laurel Apartments and Villages at Montpelier	Residential Communities – Moderately-Low	X	X	X	X	X	X	X	X	X	X	X	X	M to H	M to H
Pheasant Run Dr / Snowden Rd	Residential Communities - Moderate	X	X	X	X	X	X	-	-	-	-	-	-	L to M	N/A
Anne Arundel County, MD (CAA #7, #8, #9, #10, #11, #12, #13 Viewsheds)															
Patuxent River	Ecological Resource – High	X	X	X	X	X	X	X	X	X	X	X	X	H	H
Patuxent Research Refuge	Public Lands – High	X	X	X	X	X	X	X	X	X	X	X	X	M to H	M
Little Patuxent River	Ecological Resource – High	X	X	X	X	X	X	-	-	-	-	-	-	H	N/A
Maryland City Park	Park Resource-High	-	-	-	-	-	-	X	X	X	X	X	X	RI	H

Resource Name	Type of Resource & Visual Sensitivity of Existing Resource	Build Alternatives (X indicates resource is present in a Build Alternatives)												Degree of Anticipated Visual Impact*	
		J-01	J-02	J-03	J-04	J-05	J-06	J1 01	J1 02	J1 03	J1 04	J1 05	J1 06	Build Alternatives J Alignments	Build Alternatives J1 Alignments
Brock Bridge Elementary School	Public Lands – Moderate	X	X	X	X	X	X	X	X	X	X	X	X	RI	H
Thomas J.S. Waxters Children's Center	Public Lands – High	X	X	X	X	X	X	X	-	-	X	-	-	RI	M to H
Maryland City, Sudlersville South, Barbersville, Russett Neighborhoods	Residential Communities – Moderately-High	X	X	X	X	X	X	X	X	X	X	X	X	RI	M to H
DC Children's Center	Hospital Campus - High	X	X	X	X	X	X	X	-	-	X	-	-	L to H	RI to H
Tipton Airport	Transportation infrastructure – High	X	X	X	X	X	X	X	-	-	X	-	-	L to H	RI to H
Watershed and Welchs, Ct Neighborhoods	Residential Communities – Moderately-Low	X	-	-	X	-	-	X	-	-	X	-	-	L to H	RI to H
National Security Agency	Public Lands – Moderately High	X	X	X	X	X	X	-	-	-	-	-	-	H	N/A
Annapolis Junction	Commercial District – High	X	X	X	X	X	X	-	-	-	-	-	-	H	N/A
Fort George G. Meade (U.S. Army)	Public Lands – Moderately-High	X	X	X	X	X	X	X	X	X	X	X	X	L to M	H
Matthewstown Rd/Post Rd / David Victoria Ln / Hekla Ln Neighborhoods	Residential Communities – Moderate	X	X	X	X	X	X	X	X	X	X	X	X	M to H	M to H

Resource Name	Type of Resource & Visual Sensitivity of Existing Resource	Build Alternatives (*X indicates resource is present in a Build Alternatives*)												Degree of Anticipated Visual Impact*	
		J-01	J-02	J-03	J-04	J-05	J-06	J1 01	J1 02	J1 03	J1 04	J1 05	J1 06	Build Alternatives J Alignments	Build Alternatives J1 Alignments
Baltimore County and Baltimore City (CAA #18, #19, #20 Viewsheds)															
Cherry Hill, Westport Neighborhoods	Residential communities – Moderate	X	X	X	-	-	-	X	X	X	-	-	-	L	H
Middle Branch Patapsco River, Gwynns Falls, Gwynns Falls Trail, Middle Branch Park and Trail	Ecological, Park, and Recreational Resources – Moderately-High	X	X	X	-	-	-	X	X	X	-	-	-	H	M to H
Westport Historic District	Historic District – Moderately-High	X	X	X	-	-	-	X	X	X	-	-	-	H	H
Arundel Elementary School, Westport Elementary School	Public Lands – Moderate	X	X	X	-	-	-	X	X	X	-	-	-	M to H	M to H
Baltimore Convention Center, Edward A. Garmatz US District Courthouse, Bank of America Financial Center, Federal Reserve Bank-Richmond	Commercial buildings and Public Lands - Moderate	-	-	-	X	X	X	-	-	-	X	X	X	M to H	H
McKeldin Square, Solo Gibbs Park, Patapsco River	Park and Ecological Resources – Moderate	-	-	-	X	X	X	-	-	-	X	X	X	H	H

Resource Name	Type of Resource & Visual Sensitivity of Existing Resource	Build Alternatives (*X indicates resource is present in a Build Alternatives*)												Degree of Anticipated Visual Impact*	
		J-01	J-02	J-03	J-04	J-05	J-06	J1 01	J1 02	J1 03	J1 04	J1 05	J1 06	Build Alternatives J Alignments	Build Alternatives J1 Alignments
Camden Station and B&O Warehouse / Baggage Depot	Transportation Building – Moderately-Low	-	-	-	X	X	X	-	-	-	X	X	X	M to H	M to H
Wilkens-Robins Building	Cast-iron Commercial Building – Moderately-Low	-	-	-	X	X	X	-	-	-	X	X	X	M to H	M to H
George H. Fallon Federal Building	Government Building - Moderate	-	-	-	X	X	X	-	-	-	X	X	X	M to H	M to H
Business and Government Historic District	Historic District - Moderate	-	-	-	X	X	X	-	-	-	X	X	X	M to H	M to H
Otterbein Church	Religious Building - Moderate	-	-	-	X	X	X	-	-	-	X	X	X	M to H	M to H
Otterbein Historic District	Historic District – Moderately-High	-	-	-	X	X	X	-	-	-	X	X	X	H to H	M to H
Northeast Highlands Park / Ungers Field, Lakeland Park, Indiana Avenue Park	Park Resources – Moderately-High	X	X	X	-	-	-	X	X	X	-	-	-	L to M	L to M
Mt. Auburn Cemetery	Cemetery – Moderate	X	X	X	-	-	-	X	X	X	-	-	-	M to H	M to H

Source: AECOM, 2020.
*"X" indicates resource applicability to an alternative; Degree of Visual Impacts = RI – Relatively imperceptible, L – Lower levels, M – Moderate levels, H – Higher levels

4.9.4.3 Short-Term Construction Effects

Each CAA would experience variable levels of temporary impacts to the visual environment from construction activities associated with each Build Alternatives and its options. Tunneling efforts, such as cut/cover work, site clearing for buildings/facilities, grading, staging and work areas. At the end of construction, these elements would be removed and temporarily disturbed areas would be restored to the extent practicable. The location of the temporary construction staging, and work areas are shown in the Build Alternatives Mapping in Appendix B.1.

4.9.4.4 Mitigation Strategies

As engineering design progresses, the Project Sponsor, Baltimore-Washington Rapid Rail (BWRR), will continue to identify opportunities to avoid, minimize, and mitigate potential visual impacts to the extent practicable. This may include blending proposed SCMAGLEV system elements and support facilities with existing transportation, industrial, and utility corridors to optimize compatibility with existing aesthetic and scenic views. Preliminary station, TMF, and support facility designs would be developed to be compatible with the surrounding natural and cultural environment in order to minimize visual impacts.

Programmatic mitigation measures may be used for visual and aesthetic resources including development of context-sensitive design measures of more visually prominent facilities, such as stations, viaducts and support facilities, to improve the aesthetic characteristics. In areas where cultural resources, parks, and/or residences are located, design of structural elements, retaining walls, and other buildings the Project Sponsor will consider aesthetic treatments that are consistent with the context of the surrounding landscape and environment. These may include development of visual barriers, creative landscaping to screen or enhance views or innovative design features on ancillary facilities. Context-sensitive design measures will also be important for resources where new features related to the Build Alternatives would be introduced to the visual environment. Consultation with agencies having jurisdiction over the cultural resources and parks, as well as area residents, will be performed, as appropriate, to obtain input into the development of project design and mitigation concepts.

The following mitigation measures would potentially minimize the aesthetic and scenic impacts of the Build Alternatives.

1. **Public Outreach**: Public Meetings with Impacted Neighborhoods and Stakeholders. As part of the programmatic mitigation approach, BWRR would continue to incorporate stakeholder input into design throughout the SCMAGLEV Project to inform their decision-making process. Prior to construction, BWRR or its contractors would present visual impact mitigation strategies to the following neighborhoods (additional neighborhoods may be identified as the SCMAGLEV Project proceeds): Mount Vernon Square District, Ivy City, Langdon, Gateway, Brentwood, Bladensburg, Wildercroft, Woodlawn, West Lanham Hills, Montpelier, South Laurel, Woodbridge Crossing, Montpelier Hills, Evergreens at Laurel

Apartments, Maryland City, Sudlersville South, Barbersville, Harmons Station, Baltimore Highlands, Lansdowne, Dorchester Heights, Cherry Hill, Westport, Otterbein, Downtown Baltimore Business District.

In addition, public comments from the DEIS will be incorporated into the Final Environmental Impact Statement (FEIS) to allow all other communities, neighborhoods and concerned stakeholders the opportunity to provide testimony for the official record. The responses and comments will be used to guide mitigation measures implemented during construction and operation of the SCMAGLEV system.

2. **Design Criteria**: Incorporate design criteria for viaduct, station, TMF, and support facility elements that can adapt to local context and surroundings. During final design, BWRR would implement the following, to the extent feasible:
   - Integrate hardscape and landscape elements into the station, TMF, and operational/support facility streetscapes along with street trees and vegetation where possible to soften and screen the appearance of proposed contributing elements.
   - Design SCMAGLEV Project stations and associated structures such as passenger support facilities, head houses, elevator sha/escalator shafts and other supporting access and pedestrian facilities to be attractive architectural elements or features that add visual interest to the streetscapes near them.
   - Design SCMAGLEV Project station parking structures and adjacent departure/arrival/taxi stand/kiss-and-ride areas to integrate visually into Washington, D.C., Baltimore City, and BWI Marshall Airport.
3. **Vegetation Management/Preservation**: During construction, in areas which require clearing for temporary or permanent use, BWRR would minimize the clearing of forested areas and existing groundcover vegetation. Minimizing forest and vegetated area disturbances helps reduce adverse visual quality impacts because of the removal of existing vegetative screens and buffers. Preserving existing forested areas and groundcover vegetation also provides indirect visual benefits by minimizing runoff infiltration, soil erosion and reduces the introduction of invasive vegetation, two effects which can ultimately lead to future adverse visual contrasts. In some instances, it may be necessary to completely remove vegetation that would present a technical and safety concern.

   Where design and safety requirements do not necessitate removal of forested areas and groundcover vegetation, efforts should be made to trim trees instead of truncate and truncate instead of clear. Additionally, vegetation should be mowed, covered with protective surface matting, or temporarily beaten-down, rather than removed. Where areas do not have to be regraded, the crowns and roots from cut and/or remaining forested and groundcover vegetation should be left undisturbed in order to allow for re-growth.

4. **Vegetation Management/Partial Clearings and Feather Edges of right of way (ROW).**

   Prior to construction, BWRR would incorporate partial ROW clearing where feasible, including topping or truncating rather than removing trees that exceed the allowable height and leaving irregular edges within the ROW. Trees that would not present a safety or engineering hazard or otherwise interfere with operations should be left on the ROW.

   This would include feathering ROW edges where feasible (i.e., the progressive and selective thinning of trees and groundcover vegetation) combined with varying tree heights to create an irregular vegetation outline. Cutting forested areas and groundcover vegetation only at the edge of the ROW can create a strong line contrast between vegetation and the cleared ROW that can be visible for many miles. Partial ROW clearing and feathering of ROW edges creates a more natural appearance.

5. **Apply minimum lighting standards:**

   - Limit artificial outdoor lighting to safety and security requirements and designed using Illuminating Engineering Society's design guidelines and in compliance with approved fixtures.
   - Lighting should provide minimum impact to the surrounding environment by utilizing downcast, cut-off type fixtures that are shielded and direct the light only towards objects requiring illumination.
   - Install lights at the lowest allowable height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties, open spaces, or backscatter into the nighttime sky.
   - Utilize the lowest allowable wattage for all lighted areas and minimize the amount of nighttime lights needed to light an area as much as possible.
   - Light fixtures will have non-glare finishes that will not cause reflective daytime glare.
   - Design all lighting to optimize energy efficiency, safety and security, and to be aesthetically pleasing.
   - All lighting proposed within specified distances of BWI Marshall Airport and Tipton Airport would be designed to comply with FAA Notice of Proposed Construction or Alteration (FAA-7460) and Runway Protection Zone requirements. Lighting will also need to meet MAA and airport lighting standards so that there would be no negative impacts to airport safety.

Additional illustrative renderings provided in Appendix D.6.