



Technical Report: Proposed Midfield Cargo Facility Improvements

Baltimore/Washington International
Thurgood Marshall Airport

Prepared for
U.S. Department of Transportation
Federal Aviation Administration

Sponsored by
Maryland Department of Transportation
Maryland Aviation Administration

October 2018

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1. INTRODUCTION AND BACKGROUND

This Technical Report examines improvements to the existing Midfield Cargo Facility at Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall Airport) that are proposed to complete the cargo facilities in the midfield area as considered in previous National Environmental Policy Act (NEPA) documentation. The existing Midfield Cargo Facility area in relation to Airport property is illustrated on **Figure 1**.

The proposed Midfield Cargo Facility Improvements (subject of this Technical Report) would implement projects that complete the existing Midfield Cargo Facility plan considered in the 1998 EA. The proposed Midfield Cargo Facility Improvements include refinements to projects that were identified and first assessed in the 1998 *Final Environmental Assessment (EA) for the Proposed Expansion of Air Cargo Facilities at BWI Marshall Airport* (“1998 EA”). The 1998 EA and associated Finding of No Significant Impact (FONSI) reviewed potential projects as part of the full buildout of the Midfield Cargo Facility, as illustrated on **Figure 2** which illustrates the 1998 EA Preferred Alternative (Alternative 4R) (“1998 EA Proposed Action”). An initial portion of the planned facilities was constructed following the 1998 EA, as discussed in *Section 1.2*. Additionally, a six-acre apron expansion was constructed in 2017 following an approved Re-Evaluation of the 1998 EA in August of 2017. However, full buildout of the preferred alternative from the original 1998 EA has still not been implemented.

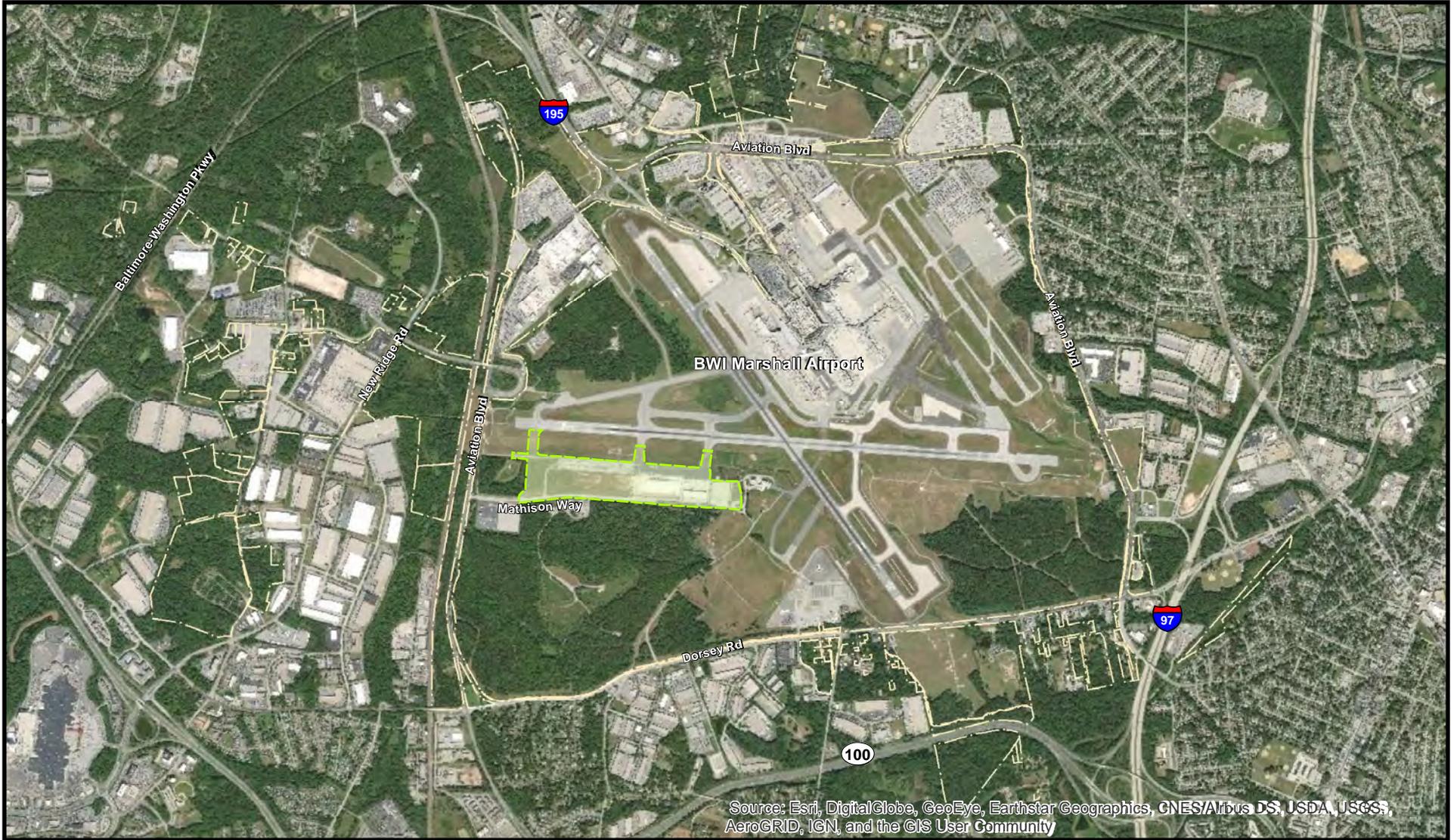
The potential environmental impacts of the Midfield Cargo Facility Improvements (“2018 Proposed Action” in this Technical Report) were initially identified and evaluated in the 1998 EA as part of a larger Midfield Cargo Facility construction effort. Given that the full development was not implemented within the FAA’s three-year timeline for major steps toward implementation after issuance of the FONSI and given updates in FAA Orders and other environmental regulations, consideration of the potential environmental impacts of the proposed improvements under NEPA is undertaken in this Technical Report.

1.1 BACKGROUND

Air cargo operations at BWI Marshall Airport represent a large portion of the Airport’s support facilities and play a vital role in the operations of the Airport. There are three primary air cargo facility areas at BWI Marshall Airport: North Cargo Complex, Elm Road Cargo Complex, and the Midfield Cargo Facility. These cargo areas combined contain approximately 412,000 square feet of building space on 100 acres of cargo-related land uses at the Airport. Access to the North Cargo Complex is via Aviation Boulevard and access to the Elm Road Complex is via Aviation Boulevard to Elm Road. Access to the Midfield Cargo Facility is via Mathison Way off Aviation Boulevard. Aircraft parking positions on the ramps are assigned by MDOT MAA with the cargo apron parking positions essentially operating as “preferential use” rather than “exclusive use” parking positions.¹

The North Cargo Complex has six cargo buildings (A-F), the Elm Road Cargo Complex has three cargo buildings (107, 111, 112), and the Midfield Cargo Facility currently has one building (G). Each of the cargo areas also have airside cargo apron areas; the ramp areas at the North Cargo Complex/Elm Road Complex are identified as Cargo Apron I and Cargo Apron II and encompass approximately 24 acres. The ramp area at the Midfield Cargo Facility includes approximately 25 acres of aircraft ramp and taxiway/taxilane movement area (including the 2017 expansion). There is limited land area available around the North Cargo and Elm Road Cargo complexes as it is almost entirely developed. There is, however, additional space/capacity preserved around the Midfield Cargo Complex for the development of additional facilities.

Overall, cargo operations (enplaned and deplaned short tons, including belly and all-cargo freight and mail) at the Airport have been on the rise, with a 1.2% increase in annual volume between 2015 (128,633 tons) and 2016 (130,155 tons), and an increase of 42.1% between 2016 and 2017 (185,049 tons). Cargo activity

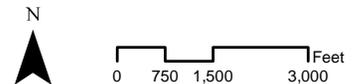


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, GNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

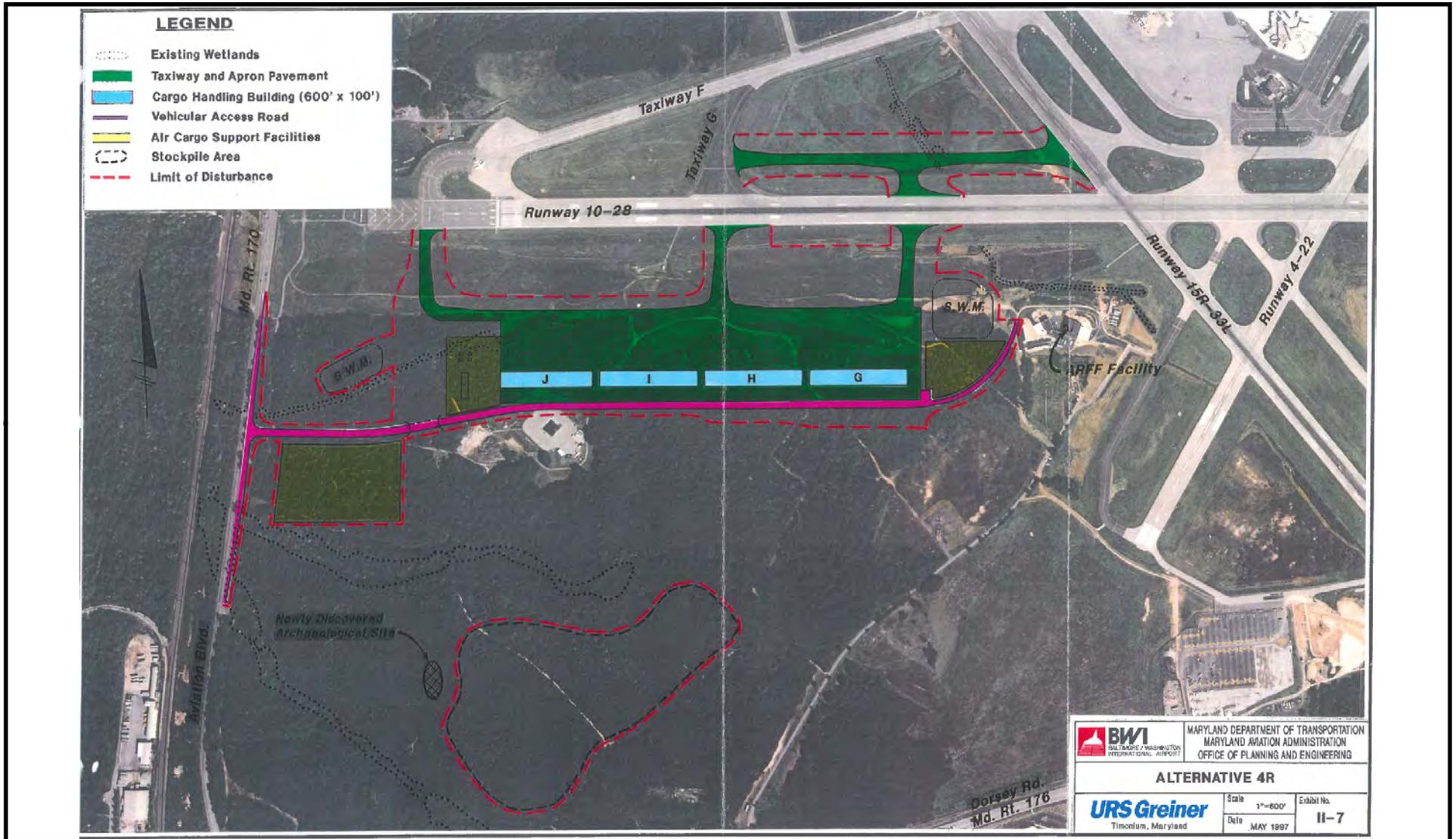
LEGEND

-  Study Area
-  Airport Property Boundary

Project Location Figure 1



Midfield Improvements



**1998 EA Proposed Action (Alternative 4R)
Figure 2**

Not to Scale

at the Airport continues to rise in 2018 with January and February volumes 74.3% and 65.5% above the same months in 2017 respectively. ² Virtually all of the recent growth is attributable to the Midfield Cargo Operator. Daily jet departures among the two major non-Midfield Operators – FedEx and UPS — have remained unchanged since 2016 - and remain consistent with the forecasts in the *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* (January 2018). Discussions with the Midfield Cargo Operator indicate additional growth in cargo aircraft operations through 2020. The existing facilities are anticipated to satisfy operator demand through the 2018-2019 timeframe, however expanding the Midfield Cargo Facilities as considered in the 1998 EA is needed to accommodate the 2020 demand anticipated by the Midfield Cargo Operator.

The Re-Evaluation of the 1998 EA in August of 2017 was prepared prior to the increase in Midfield Cargo activity noted above. Therefore, the projections used in that study were based on recent historical cargo growth at BWI Marshall and FAA national domestic cargo forecasts. This current Technical Report incorporates more recent cargo activity data and input from the Midfield Cargo Operator. This additional information has resulted in a higher projected growth rate than in the 2017 Re-Evaluation.

Post-2020, there are no indications that the non-Midfield Operators will grow at rates that are inconsistent with their current or past historical trends and/or that they are therefore unlikely to require expanded facilities in the near future. Demand from the Midfield Cargo Operator may continue to increase; however, any material increase beyond what is projected for 2020 would require new or expanded facilities that will trigger separate environmental review commensurate with the level of potential environmental impact associated with those facilities. This is discussed in more detail in Section 4.4.9.

1.2 1998 EA PROPOSED ACTION

The Proposed Action for the 1998 EA was approval of a revision to the Airport Layout Plan (ALP) based on the “Alternative 4R” design concept. Alternative 4R (Preferred Alternative) proposed to construct new all-cargo facilities in a new midfield area of the Airport, southwest of Runway 10-28 and Runway 4-22, as illustrated in Figure 2.

The 1998 EA Proposed Action included construction of the Midfield Cargo Facility (Cargo Buildings G, H, I and J), as well as a new connecting and partial parallel taxiway to the north of Runway 10-28 for aircraft to access the existing runway system. Vehicular access to the new cargo complex would be provided by upgrading the unimproved access road connecting Aviation Boulevard at Gate 13 with the new ARFF facility to the east of the cargo complex. Approximately 43 acres south of the proposed access road of the Midfield Cargo Facility near Aviation Boulevard would be available for development of cargo support facilities and other uses.³

It was anticipated that development of the proposed facilities would occur over a ten-year period, with the initial development phase to include the construction of the first two buildings (G and H) and access road, along with grading operations for the full development area. Ultimate development of the remaining buildings (I and J) and the support area south of the access road was anticipated to occur over the next eight years, with anticipated construction for Building I and J in 2003 and 2007, respectively, based on expected growth and demand.⁴

Following the 1998 EA/FONSI, the improvements were only partially implemented. Building G, along with approximately six acres of ramp area and four acres of air cargo support facility pavement (vehicle parking) were constructed, and the grading operations for the full development area were completed. The access road improvements were also implemented, along with the majority of the associated connecting and partial parallel taxiways. The full improvements were not implemented at the time because it was expected that, “...facilities will be developed as the need arises rather than on speculation of future use. In the MAA’s planning process, timing of actual development is reviewed on an ongoing basis...”⁵

1.3 MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

As illustrated on **Figure 3**, the Midfield Cargo Facility Improvements (2018 Proposed Action) being evaluated in this Technical Report includes the following improvements for completion of the Midfield Cargo Facility.

- Construct approximately 11.0 acres of additional apron pavement, including 0.6 acres of dedicated truck staging;
- Construct approximately 7.6 acres of additional truck parking/staging area pavement;
- Construct approximately 9.2 acres of vehicular parking space (5.4 acres) and vehicular pavement (3.8 acres) associated with the proposed building;
- Construct an approximately 200,000 SF warehouse/cargo processing building;
- Construct three (3) 10,000-barrel (1 barrel = 42 US gallons) Jet-A fuel tanks (49' diameter x 30' tall) to store additional volume as well as minor mechanical improvements to accommodate additional fuel storage needs for the midfield cargo facility;
- Construct a taxiway connection to Runway 10 (approximately 2.8 acres of pavement);
- Rehabilitate the existing taxilane and two taxiway connectors in the area north of the proposed new apron pavement up to the Taxiway G and Taxiway R1 hold lines (approx. 21.1 acres);
- Construct storm drain pipes to connect into the existing storm drain system draining to Pond B6; and
- Provide associated site infrastructure such as security fencing and area lighting.

Glycol would continue to be collected using Glycol Recovery Vehicles (GRVs), stored temporarily in movable tanks, and transported to other areas of the Airport for disposal.

The project is consistent with the approved BWI Marshall Airport Layout Plan (ALP). Figure 3 also illustrates the Study Area, which identifies the proposed area to be used for construction staging and laydown.

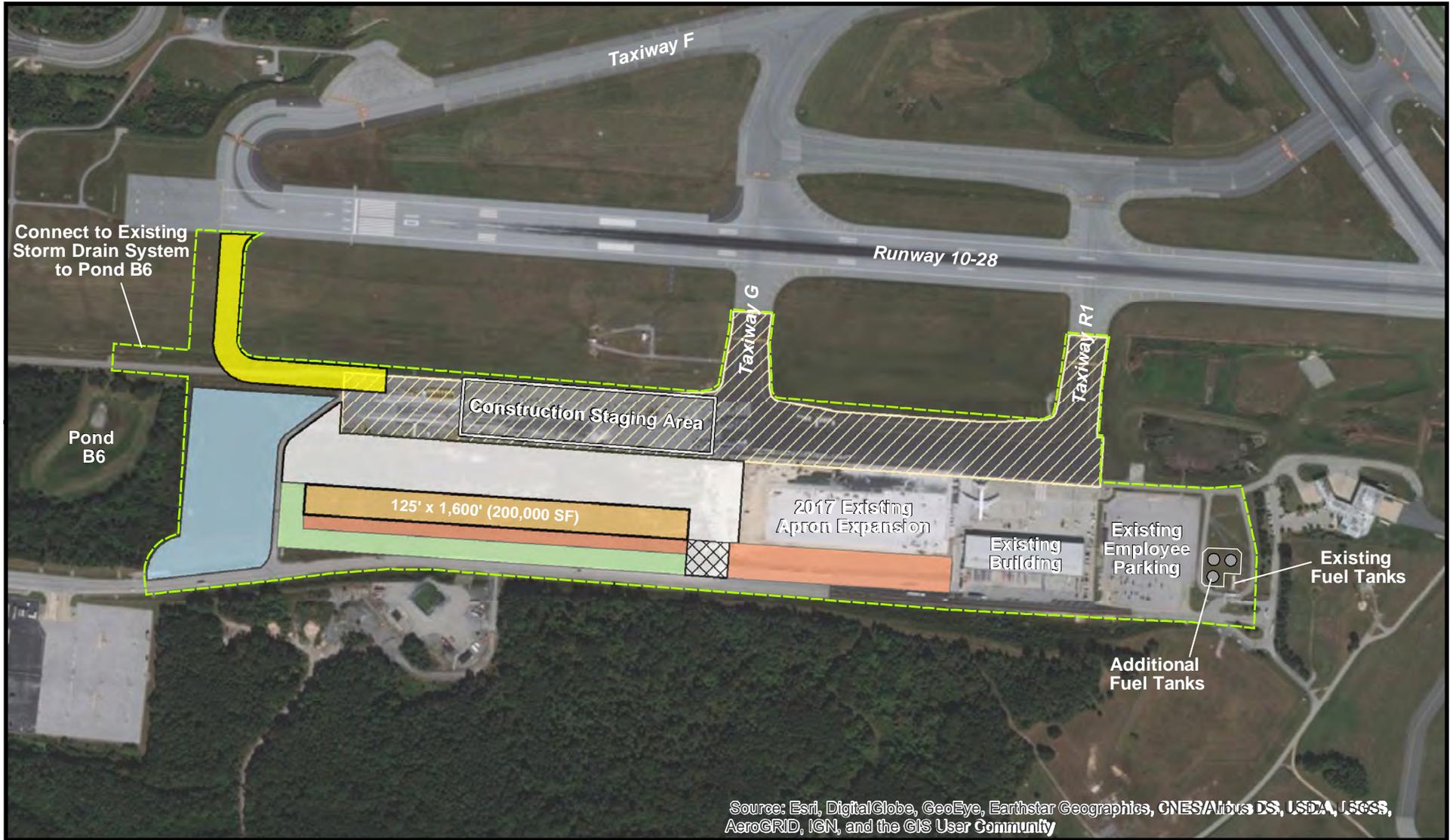
Table 1.1 explains the differences between the Midfield Cargo Facility Improvements (2018 Proposed Action) and the 1998 EA Preferred Alternative. *Section 4.1, Environmental Setting*, provides detailed information related to how the Proposed Action Study Area currently being considered is different in size from the 1998 EA Limits of Disturbance (LOD) and impervious area.

Table 1.1

Midfield Cargo Facility Improvements (2018 Proposed Action) – Variation from 1998 EA

Midfield Cargo Facility Improvements (2018 Proposed Action)	Project Included in 1998 EA	Within 1998 EA LOD	Explanation
Construct approximately 11.0 acres of additional apron pavement, including 0.6 acres of dedicated truck staging.	Yes	Yes	This project was proposed in the 1998 EA as apron pavement.
Construct approximately 7.6 acres of additional truck parking/staging area pavement.	No	Yes	This project was not a standalone project in the 1998 EA, but is within a portion of the area called out as Air Cargo Support Facilities. The truck

Midfield Improvements



LEGEND

- | | |
|--|--|
|  Study Area |  Proposed Building (200,000 SF) |
|  Proposed Apron Pavement (11.0 Acres) |  Proposed Taxiway (2.8 Acres) |
|  Proposed Truck Parking/Staging Area Pavement (7.6 Acres) |  Proposed Truck Staging Area (0.6 Acres) |
|  Proposed Vehicle Pavement (3.8 Acres) |  Mill and Overlay (21.1 Acres) |
|  Proposed Vehicle Parking (5.4 Acres) | |

2018 Proposed Action Figure 3

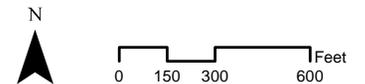


Table 1.1

Midfield Cargo Facility Improvements (2018 Proposed Action) – Variation from 1998 EA

Midfield Cargo Facility Improvements (2018 Proposed Action)	Project Included in 1998 EA	Within 1998 EA LOD	Explanation
			parking/staging area pavement of the Proposed Action extends beyond the 1998 EA impervious footprint but is within the 1998 EA LOD and the entire area was previously graded.
Construct approximately 9.2 acres of vehicular parking space (5.4 acres) and vehicular pavement (3.8 acres) associated with the proposed building.	No	Yes	This project was not a standalone project in the 1998 EA, but is fully within the 1998 EA LOD and impervious areas identified as air cargo support facilities, apron pavement and cargo buildings.
Construct an approximately 200,000 SF warehouse/cargo processing building.	Yes	Yes	This project was proposed in the 1998 EA as a cargo building; the 1998 EA proposed four cargo buildings, totaling approximately 240,000 SF; there is currently one-70,000 SF cargo building on the Midfield Cargo apron.
Construct three (3) 10,000-barrel (1 barrel = 42 US gallons) Jet-A fuel tanks (49' diameter x 30' tall) to store additional volume as well as minor mechanical improvements to accommodate additional fuel storage needs for the midfield cargo facility.	No	Yes	This project was not a standalone project in the 1998 EA, but is adjacent to the area identified as Air Cargo Support Facilities; the fuel tank area is outside of the 1998 EA impervious footprint but is within the 1998 EA LOD.
Construct a taxiway connection to Runway 10 (approximately 2.8 acres of pavement).	Yes	Yes	This project was proposed in the 1998 EA as taxiway pavement; the proposed taxiway connection pavement extends outside of the 1998 EA impervious footprint but is within the 1998 EA LOD and the entire area was previously graded.
Rehabilitate the existing taxilane and two taxiway connectors in the area north of the proposed new apron pavement up to the Taxiway G and Taxiway R1 hold lines (approx. 21.1 acres).	N/A	Yes	These areas were proposed in the 1998 EA and constructed in 1999-2000; the rehabilitation area is fully within the 1998 EA LOD.
Construct storm drain pipes to connect into the existing storm drain system draining to Pond B6.	Yes	No, but was graded	Pond B6 was proposed in the 1998 EA and constructed in 1999-2000 to treat the full build out of the Midfield Cargo area. While storm drain connections were proposed as part of the 1998 EA, their specific locations

Table 1.1

Midfield Cargo Facility Improvements (2018 Proposed Action) – Variation from 1998 EA

Midfield Cargo Facility Improvements (2018 Proposed Action)	Project Included in 1998 EA	Within 1998 EA LOD	Explanation
			were not identified. The current proposed connection to the existing storm drain extends just beyond the 1998 EA LOD (due to existing storm drain locations) but within an area that was previously graded. The current proposed connection is a modification of what was considered in the 1998 EA.
Provide associated site infrastructure such as security fencing and area lighting.	Assumed	Yes	

Source: HNTB analysis, 2018.

Estimated Schedule

Rehabilitation of the existing apron and taxilanes is anticipated to occur by the end of 2018. The other improvements associated with the Proposed Action are anticipated to begin in November 2018 and be complete in October 2019 (11 months).

2. PURPOSE AND NEED

Based on the approved 1996 “Expected Growth” forecast, the 1987 Master Plan Study, and the 1995 evaluation of the Air Cargo Complex, it was projected that the (then) existing cargo facilities would not be able to accommodate expected growth in cargo activity through 2015 and that the demand for air cargo facilities would exceed available facilities through the planning period (Year 2015).

The facilities required to accommodate the expected cargo activity growth included additional aircraft parking apron, landside facilities, and cargo buildings. The (then) existing Cargo Complex and Elm Road cargo area were constrained in terms of apron expansion and cargo building expansion, and any measures to expand these areas by relocating existing facilities would have been inappropriate and expensive.

Specifically, the 1998 EA stated the following need for additional cargo facilities:

“Using industry planning guidelines for cargo complex layouts, approximately 65 acres [were] needed to contain 220,000 square feet of cargo building space and adjacent parking apron capable of supporting wide-body aircraft. In addition, an area of approximately 25 acres [was] needed to provide cargo support facilities, such as truck and employee/customer parking, fueling facilities, ground support equipment (GSE) storage, truck wash etc.

Considering land requirements for vehicle access and circulation, it [was] estimated that an area comprising approximately 100 acres will be needed for locating additional air cargo facilities at BWI.”⁶

The 1998 EA emphasized that the facilities would be developed as the need arises rather than on speculation of future use. The EA states, “In the MAA’s planning process, timing of actual development is

reviewed on an ongoing basis and another evaluation of the demand for future cargo development is likely to occur before construction commences.”⁷

Update to Purpose and Need

In the 20 years following the approval of the 1998 EA, major changes in aviation have occurred, as well as in the world economy. The future cargo growth that was expected in the late 1990s is now coming to fruition. Activity levels of the current cargo operations at BWI Marshall Airport are growing, thus requiring additional aircraft parking, cargo processing, and intermodal connection facilities beyond what is currently available. To accommodate this activity trend, the proposed Midfield Cargo Facility Improvements (2018 Proposed Action) are needed.

Forecast operator demand indicates the need for six to seven additional aircraft parking spaces by 2020, capable of accommodating Airplane Design Group (ADG) IV aircraft – such as the Boeing 767, with some ADG III aircraft and rare operation of Group-V and VI aircraft – such as the Airbus A330 and Boeing 747-8F – during peak seasonal activity. In association with the additional cargo spaces and area for aircraft and vehicular movement, a second warehouse is needed to process cargo.

Improvements to the existing fuel facility would be needed to store additional volume (the three tanks' combined storage capacity would offer approximately 5.1 days' supply on-site) to accommodate the Midfield Cargo Facility operations and would include minor mechanical improvements to handle the anticipated loading and unloading demands for the Midfield Cargo Facility. The facility would continue to be dedicated to servicing the cargo operation only and would continue to utilize airfield fueling vehicles to transfer the fuel from the tanks to the aircraft.

A new taxiway connection to Runway 10 is needed to allow adequate access to Runway 10-28 or other parts of the airfield during the times that aircraft are active on the existing taxilane between Taxiways G and R1. Without the proposed taxiway connection aircraft taxiing to or from the proposed warehouse/cargo processing building will need to hold on the new apron or in other areas of the airfield until the taxilane between Taxiway G and R1 is available which will reduce the efficiency of the Midfield Cargo Facility.

The existing taxilane and taxiways north of the existing and proposed new apron pavement need rehabilitation (i.e. mill and overlay). The entire length of the taxilane is functionally failing and represents a foreign object debris (FOD) risk to operations. The existing pavement surface is severely weathered and the resultant exposed aggregate is loose and subject to engine ingestion, or becoming a projectile, which poses a threat to persons and property. Portions of the adjoining Taxiways G and R1 are exhibiting areas of rutting and shoving. Finally, security fencing and additional lighting will be needed to adequately protect the proposed Midfield improvements.

The Midfield Cargo Facility Improvements would help accommodate the Airport's existing and forecast growth in air cargo operations. The need discussed in the 1998 EA for the air cargo facility improvements was based upon a forecast that met the expectations for cargo growth as understood in the mid-1990s, whereas the need for the 2018 Proposed Action is based upon the specific needs of the Midfield Cargo Operator. However, the general purpose and need for the completion of the Midfield Cargo area remains valid: to support cargo operations as demand dictates at BWI Marshall Airport.

3. ALTERNATIVES

The 1998 EA considered five build alternatives in detail. Alternative 4R as recommended in the 1998 EA remains valid. Alternative 4R provided for incremental development of new cargo facilities as demand increased through the planning period. The proposed Midfield Cargo Facility Improvements continue to meet the evaluation criteria of the 1998 EA and continue to satisfy the general purpose and need for additional cargo facilities. There are three primary air cargo facility areas at BWI Marshall Airport (North

Cargo Complex, Elm Road Cargo Complex, and the Midfield Cargo Facility). The North Cargo and Elm Road Cargo complexes are both almost entirely developed and could not accommodate the needs of the Cargo Operator in either location. There is adequate space and capacity in the Midfield Cargo Facility to accommodate the needs of the Cargo Operator and there are no unresolved conflicts concerning alternative uses of available resources. No alternative locations to the 2018 Proposed Action were considered in detail.

4. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 ENVIRONMENTAL SETTING

BWI Marshall Airport is bordered on the west, north, and east by Aviation Boulevard (MD 170/MD 162) and by Dorsey Road (MD 176) on the south. Interstate 195 (I-195) provides access to the passenger terminal. BWI Marshall Airport includes airfield, passenger terminal, landside, air cargo, general aviation, and support facilities. The Airport's physical layout and surroundings are depicted on Figure 1. As shown, the Proposed Action would occur in an existing, previously disturbed cargo area of the Airport, consistent with designated land uses at BWI Marshall Airport. The Study Area is designated as "Aviation Support" on the approved ALP.

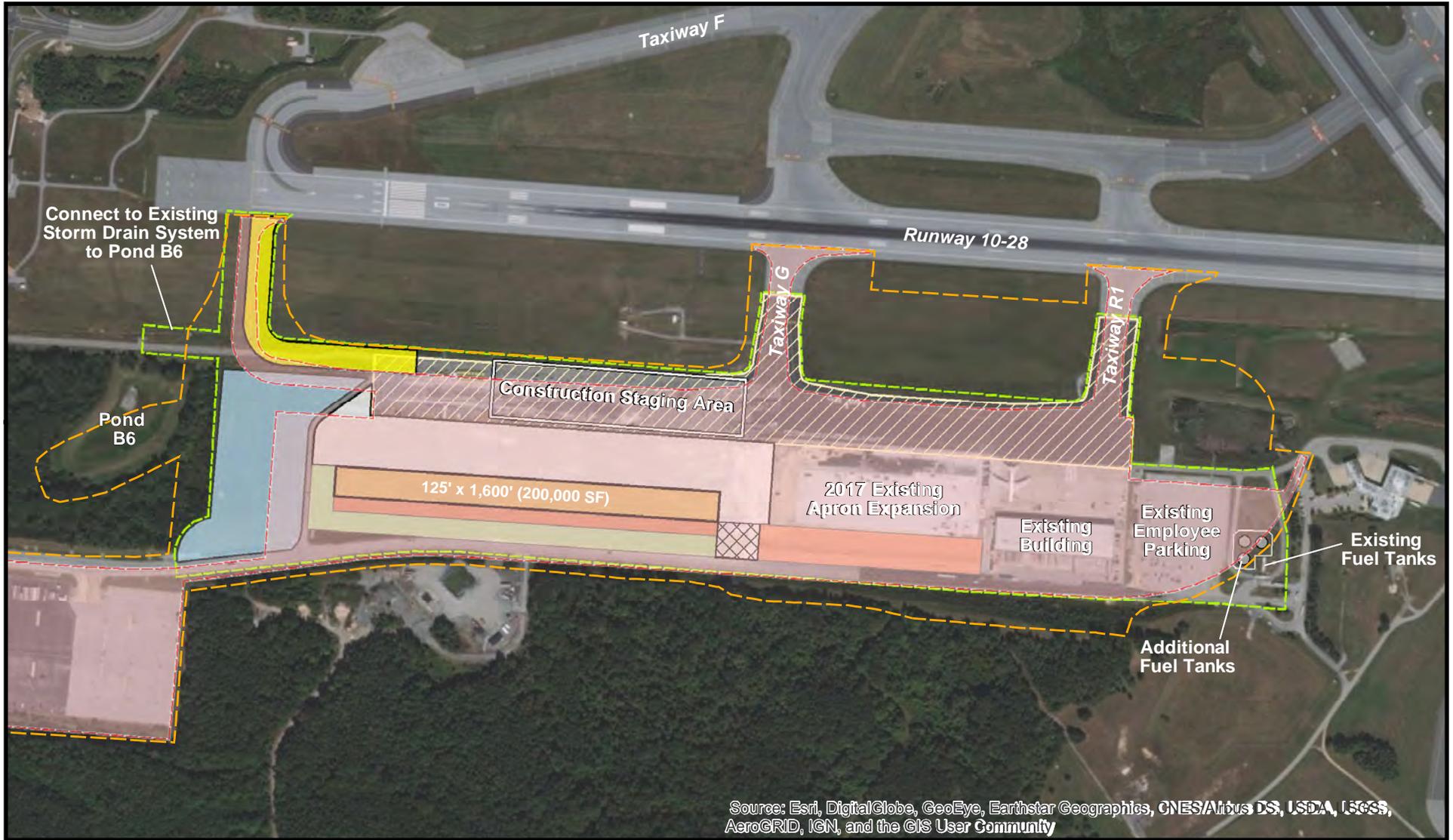
The environmental setting remains similar as provided in the 1998 EA. Several changes to the airfield and terminal area have occurred since 1998, including the development of the initial phases of the Midfield Cargo Facility and other projects specified in the 1998 EA Proposed Action, including the parallel taxiway north of Runway 10-28 and the six-acre apron expansion of the 2017 Re-Evaluation. Additionally, grading operations for the EA's full development area were conducted following the 1998 EA/FONSI, and therefore the Study Area for the 2018 Proposed Action is either fully developed or partially developed as building pads for future buildout, or flat and mowed/maintained.

No changes have occurred to the Airport's land uses or the surrounding land uses, however. Any changes to the existing conditions at the Airport or the Airport's surroundings are noted within the pertinent environmental category in *Section 4.4*. The Airport's physical layout and surroundings are depicted on Figure 3, along with the Study Area, which incorporates the area to be used for construction staging and laydown.

Comparison of Study Area to the 1998 EA

Though a slightly different configuration than conceptualized in the 1998 EA, the extents of development are primarily within the limits of disturbance (LOD) originally evaluated. **Figure 4** illustrates the current Proposed Action, along with the original 1998 EA LOD and impervious area.⁸ The 1998 EA LOD encompassed approximately 146 acres, and the proposed impervious surface within this LOD included approximately 87 acres. Of the 87 acres evaluated in the 1998 EA, approximately 61 acres of impervious area have been constructed, of which 56 acres are within the original 1998 EA footprint. The additional six acres of impervious area are within the 1998 EA LOD but include wider taxiways and the northern portion of the Midfield Cargo apron.

The 2018 Proposed Action proposes approximately 35.3 acres of new impervious surface. The 2018 Proposed Action impervious area is within the 1998 EA LOD, but includes approximately 7.4 acres of impervious surface outside the 1998 EA impervious surface footprint (see **Table 4.1** for a summary of the 2018 Proposed Action impervious area improvements in relation to the 1998 EA impervious areas).



LEGEND

- Study Area
- 1998 EA Limit of Disturbance
- 1998 EA Proposed Action Impervious Area
- Proposed Apron Pavement (11.0 Acres)
- Proposed Truck Parking/Staging Area Pavement (7.6 Acres)
- Proposed Vehicle Pavement (3.8 Acres)

- Proposed Vehicle Parking (5.4 Acres)
- Proposed Building (200,000 SF)
- Proposed Taxiway (2.8 Acres)
- Proposed Truck Staging Area (0.6 Acres)
- Mill and Overlay (21.1 Acres)

Comparison of 2018 Proposed Action to the 1998 EA
Figure 4

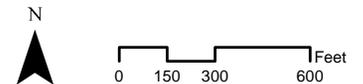


Table 4.1

Comparison of Impervious Area – Midfield Cargo Facility Improvements vs. 1998 EA

	Within 1998 EA LOD		
	Within 1998 EA Impervious Area	Outside 1998 EA Impervious Area	Total
1998 EA Impervious Area	87	--	87
Currently Developed (Existing)	55.7	5.7	61.4
2018 Proposed Action			
Apron Pavement	11.0		11.0
Truck Parking/Staging	2.3	5.3	7.6
Vehicular Pavement/Parking Area	9.2		9.2
Warehouse/Cargo Building	4.6		4.6
Fuel Tanks		0.1	0.1
Taxiway Connection	0.8	2.0	2.8
<i>*Taxiway/Apron Rehabilitation</i>	16.7	4.4	21.1
Storm Drains	--	--	--
Fencing/Security	--	--	--
Proposed Action Total	27.9	7.4	35.3
Total Currently Developed and 2018 Proposed Action Development	83.6	13.1	96.7

**Taxiway/Apron Rehabilitation area is entirely within existing impervious area and is not included in the 2018 Proposed Action Impervious Area Total.*

Source: HNTB GIS Analysis, September 2018.

4.2 SUMMARY OF CHANGES TO REGULATORY REQUIREMENTS

The FAA’s policy and procedures for compliance with NEPA and implementing regulations issued by the Council on Environmental Quality (CEQ) have been updated since the 1998 EA was approved. The 1998 EA was conducted in accordance with FAA Order 1050.1D, Change 4, “Policies and Procedures for Considering Environmental Impacts” (June 14, 1999) and FAA Order 5050.4A, “Airport Environmental Handbook.” Both Orders have been cancelled and replaced with subsequent guidance. The following current Orders are applicable to this Technical Report:

- **FAA Order 1050.1F**, *Environmental Impacts: Policies and Procedures*, became effective 7/16/15 and replaced Order 1050.1D, and subsequently Order 1050.1E. This Order serves as the FAA’s policies and procedures for compliance with NEPA and implementing regulations issued by the CEQ.
- **FAA Order 5050.4B**, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, became effective in April 2006 and replaced FAA Order 5050.4A. This Order is a supplement to Order 1050.1F and is intended to provide instruction on evaluating those environmental effects.

To ensure all the environmental impact categories that were evaluated in the 1998 EA are considered in this Technical Report, **Table 4.2** provides a list of the resource categories analyzed in the 1998 EA, along

with the updated environmental impact categories evaluated for this Technical Report in accordance with Order 1050.1F, the 1050.1F Desk Reference, and Order 5050.4B. Since the publication of Order 1050.1D, several of the resource categories have either been renamed or combined, any changes to terminology of environmental resource categories analyzed or relevant significance thresholds are included in Table 4.2.

Any changes to local or state requirements that are relevant to the potential impacts of the Midfield Cargo Facility Improvements (2018 Proposed Action) are identified and discussed in the relevant impact category in *Section 4.4, Potentially Affected Environmental Resource Categories*.

Table 4.2

FAA Order 1050/5050.4 Significance Threshold Updates

FAA Orders 1050.1D and 5050.4A (1998 EA)	FAA Orders 1050.1F and 5050.4B (Technical Report)	Relevant Changes (if applicable)
Noise Compatible Land Use	Noise and Noise-Compatible Land Use	Combined Noise and Compatible Land Use as it relates to noise compatibility into a single impact category.
Social Impacts	Socioeconomics, environmental justice, and children’s environmental health and safety risks	Renamed and updated to include environmental justice and children’s environmental health and safety risks. Demographic information of the geographic area of potentially significant impacts is used for purposes of anticipating and responding to public concerns about EJ and children in accordance with applicable Executive Orders, directives, and guidance issued by the CEQ and EPA was added.
Induced Socioeconomic Impacts	N/A	Integrated with Socioeconomics, environmental justice, and children’s environmental health and safety risks category.
Air Quality	Air Quality	National Ambient Air Quality Standards (NAAQS) have been updated. Section also added clarifying language to the significance threshold: “to include instances where the increase in frequency or severity of an existing violation would be significant.”

Table 4.2
FAA Order 1050/5050.4 Significance Threshold Updates

FAA Orders 1050.1D and 5050.4A (1998 EA)	FAA Orders 1050.1F and 5050.4B (Technical Report)	Relevant Changes (if applicable)
Water Quality	Water Resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)	Combined water quality, wetlands and floodplains; No federal change applicable to Proposed Action.
Wetlands		
Floodplains		
Wild and Scenic Rivers		
Department of Transportation Act, Section 4(f)	Department of Transportation Act, Section 4(f)	No federal change applicable to Proposed Action.
Historical, architectural, archeological, and cultural resources	Historical, architectural, archeological, and cultural resources	No federal change applicable to Proposed Action.
Biotic Communities (including both Flora and Fauna)	Biological resources (including fish, wildlife, and plants)	Combined; special status species added (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats.
Endangered and Threatened Species of Flora and Fauna		
Coastal Zone Management Program	Coastal Resources	Combined; No federal change applicable to Proposed Action.
Coastal Barriers		
Farmlands	Farmlands	No federal change applicable to Proposed Action.
Energy Supply and Natural Resources	Natural Resources and Energy Supply	No federal change applicable to Proposed Action.
Light Emissions	Visual Effects (including light emissions)	Added visual effects to resource category. Desk Reference states Visual effects are broken into two categories: 1) Light Emission Effects; and 2) Visual Resources and Visual Character.
Solid Waste Impacts	Hazardous Materials, Solid Waste, and Pollution Prevention	Added hazardous materials and pollution prevention.

Table 4.2

FAA Order 1050/5050.4 Significance Threshold Updates

FAA Orders 1050.1D and 5050.4A (1998 EA)	FAA Orders 1050.1F and 5050.4B (Technical Report)	Relevant Changes (if applicable)
Construction Impacts	--*	*In Order 1050.1F, this category is to be analyzed within each applicable environmental impact category.
N/A	Climate	New Category.
N/A	Cumulative Impacts	Cumulative impact analysis was required in the Order, but not as its own resource category.

Sources: FAA Orders 1050.1D, 5050.4A (10/8/1985), FAA Order 1050.1F (8/6/2015), and Order 1050.1F Desk Reference (July 2015).

4.3 ENVIRONMENTAL RESOURCES NOT AFFECTED BY THE PROPOSED ACTION

The MDOT MAA has determined that the following resource areas as evaluated in the 1998 EA will not be affected by the implementation of the 2018 Proposed Action and therefore will not be evaluated in this Technical Report. **Table 4.3** presents the environmental resource as well as the rationale for no further review of these categories. In accordance with guidance provided in FAA Orders 5050.4B and 1050.1F, no further analysis of these resources is required.

Table 4.3

Environmental Resource Categories Not Affected

Resource Category	Reason Not Included
Department of Transportation Act, Section 4(f) and Section 6(f) of the Land and Water Conservation Fund Act	There are no Section 4(f) or 6(f) Resources in the Study Area.
Farmlands	There are no farmlands present in the Study Area.
Water Resources (Floodplains, and Wild and Scenic Rivers)	There are no floodplains in the Study Area. There are also no river segments listed in the Wild and Scenic River System nor the Nationwide River Inventory located within the vicinity of BWI Marshall Airport.

4.4 POTENTIALLY AFFECTED ENVIRONMENTAL RESOURCE CATEGORIES

The MDOT MAA has determined that the following resource area evaluations contained in the 1998 EA could potentially be affected by the implementation of the 2018 Proposed Action, and therefore are further evaluated in this Technical Report:

- Air Quality
- Biological Resources (including fish, wildlife and plants)

- Climate
- Coastal Resources
- Land Use
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archeological, and Cultural Resources
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Socioeconomic Impacts, Environmental Justice, and Children’s Environmental Health and Safety Risks
- Visual Effects (including light emissions)
- Water Resources (Wetlands, Surface Waters, Groundwater)
- Cumulative Impacts

Table 4.4 provides the regulatory framework and analysis criteria for each resource area. The following environmental resource categories address FAA Orders 1050.1F and 5050.4B requirements and significance thresholds.

Table 4.4
Regulatory Framework and Analysis Criteria

Impact Category	Regulatory Framework	Analysis Criteria¹
Air Quality	Under the Clean Air Act (CAA) the U.S. Environmental Protection Agency (EPA) developed the National Ambient Air Quality Standards (NAAQS) for six common air pollutants (carbon monoxide (CO), nitrogen dioxide (NO ₂), ozone (O ₃), particulate matter (PM), sulfur dioxide (SO ₂), and lead (Pb). The EPA regulates these pollutants to permissible levels through human health - based (primary standards) and environmental - based (secondary standards) criteria.	Whether the action would cause pollutant concentrations to exceed one or more of the NAAQS, as established by the EPA under the CAA, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.
Biological Resources (including fish, wildlife and plants)	The Endangered Species Act requires all Federal agencies to seek to conserve threatened and endangered species. Section 7(a)(2) requires Federal agencies, in consultation with the Services (U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS)), to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. The Fish and Wildlife Coordination Act requires that Federal agencies consult with the USFWS, NMFS (in some instances), and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed Federal projects may result in control or modification of the water of any stream or other water body.	A significant impact to biological resources would occur when the USFWS or the NMFS determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat. The FAA has not established a significance threshold for non-listed species. <i>* FAA Order 1050.1F provides additional factors to consider in evaluating the context and intensity of potential environmental impacts for biological resources.</i>

Table 4.4
Regulatory Framework and Analysis Criteria

Impact Category	Regulatory Framework	Analysis Criteria ¹
Climate	<p>In response to Executive Order 13514, the Council on Environmental Quality developed Federal Greenhouse Gas Accounting and Reporting Guidance (October 6, 2010) (hereafter “Federal protocol”), which serves as the Federal government’s official GHG reporting protocol. In accordance with the Federal protocol, and to provide a single metric that embodies all GHGs, emissions should be discussed and reported in metric tonnes of CO₂ equivalent (MT CO₂e). In December 2014, CEQ issued revised draft NEPA guidance for considering the effects of climate change and GHG emissions. The draft guidance recommended consideration of: (1) the potential effects of a proposed action or its alternatives on climate change as indicated by its GHG emissions; (2) the implications of climate change for the environmental effects of a proposed action or alternatives.²</p>	<p>The FAA has not established a significance threshold for Climate.</p>
Coastal Resources	<p>The Coastal Zone Management Act provides for management of the nation’s coastal resources, including the Great Lakes. The Coastal Barrier Resources Act prohibits, with some exceptions, Federal financial assistance for development within the Coastal Barrier Resources System that contains undeveloped coastal barriers along the Atlantic and Gulf coasts and Great Lakes.</p>	<p>The FAA has not established a significance threshold for coastal resources. * <i>FAA Order 1050.1F provides additional factors to consider in evaluating impacts to this category.</i></p>
Land Use	<p>Section 1502.16(c) of the Council on Environmental Quality (CEQ) Regulations requires the discussion of environmental impacts including “[p]ossible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.” Where an inconsistency exists, the NEPA document should describe the extent to which the agency would reconcile its action with the plan (see Section 1506.2(d) of the CEQ Regulations).</p>	<p>The FAA has not established a significance threshold for land use, and the FAA has not provided specific factors to consider in making a significance determination. The determination that significant impacts exist in the land use impact category is normally dependent on the significance of other impact categories.</p>
Hazardous Materials, Solid Waste, and Pollution Prevention	<p>The Comprehensive Environmental Response, Compensation, and Liability Act (as amended by the Superfund Amendments Reauthorization Act of 1986 and the Community Environmental Response Facilitation Act of 1992) establishes joint and several liability for those parties responsible for hazardous substance releases to pay cleanup costs and establishes a trust fund to finance cleanup costs in situations in which no responsible party could be identified. Enables the creation of the NPL, a list of sites with known releases or threatened releases of</p>	<p>The FAA has not established a significance threshold for hazardous materials, solid waste, or pollution prevention. * <i>FAA Order 1050.1F provides additional factors to consider in evaluating impacts to this category.</i></p>

Table 4.4
 Regulatory Framework and Analysis Criteria

Impact Category	Regulatory Framework	Analysis Criteria ¹
	<p>hazardous substances in the United States and its territories used to guide the EPA in determining which sites warrant further investigation. The Emergency Planning and Community Right to Know Act requires hazardous chemical emergency planning by Federal, state, and local governments, Indian tribes, and industry. It also requires industry to report on the storage, use, and releases of hazardous chemicals to Federal, state, and local governments. The Hazardous Materials Transportation Act establishes procedures, reporting requirements, and approval processes for the transport of hazardous materials by common, contract, and private carriers and by aircraft, railcar, vessel, and motor vehicle. The Pollution Prevention Act requires pollution prevention and source reduction control so that wastes would have less effect on the environment while in use and after disposal.</p>	
<p>Historical, Architectural, Archeological, and Cultural Resources</p>	<p>The National Historic Preservation Act (NHPA) establishes the Advisory Council on Historic Preservation (ACHP), an independent agency, and the National Register of Historic Places (NRHP) within the National Park Service (NPS). Section 106 of the NHPA requires Federal agencies to consider the effects of their undertaking (or action) on properties listed on or eligible for listing on the NRHP. Section 110 of the NHPA governs Federal agencies' responsibilities to preserve and use historic buildings; designate an agency Federal Preservation Officer; and identify, evaluate, and nominate eligible properties under the control or jurisdiction of the agency to the NRHP. Section 112 of the NHPA addresses professional standards. Section 314 discusses confidentiality requirements that may apply to an undertaking.</p>	<p>The FAA has not established a significance threshold for the full range of historical, architectural, archeological, and cultural resources.</p> <p><i>* FAA Order 1050.1F provides an additional factor to consider in evaluating this category: situations in which the proposed action or alternative(s) would result in a finding of Adverse Effect through the Section 106 process.</i></p>
<p>Natural Resources and Energy Supply</p>	<p>The <i>Energy Independence and Security Act</i> requires Federal agencies to take actions to move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas (GHG) capture and storage options, and to improve the energy performance of the Federal government.</p>	<p>The FAA has not established a significance threshold for natural resources and energy supply.</p>

Table 4.4
Regulatory Framework and Analysis Criteria

Impact Category	Regulatory Framework	Analysis Criteria ¹
Noise and Noise-Compatible Land Use	The <i>Aviation Safety and Noise Abatement Act of 1979</i> directs the FAA to establish, by regulation, a single system for measuring noise and determining the exposure of people to noise which includes noise intensity, duration, frequency, and time of occurrence; and to identify land uses normally compatible with various noise exposures.	Whether the action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65dB level due to a DNL 1.5dB or greater increase, when compared to the No-Action alternative for the same time frame.
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks	Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970 contains provisions that must be followed if acquisition of real property or displacement of people would occur as a result of implementing the selected alternative.	In general, the significance of socioeconomic impacts is determined by the magnitude and duration of the impacts, whether beneficial or adverse. The FAA has not established a significance threshold for socioeconomics. <i>* FAA Order 1050.1F provides additional factors to consider in evaluating impacts to this category.</i>
Visual Effects (including light emissions)	Not applicable.	The FAA has not established a significance threshold for visual effects. <i>* FAA Order 1050.1F provides additional factors to consider in evaluating impacts to this category.</i>
Water Resources (Wetlands, Surface Waters, Groundwater)	Sections 401 and 404 of the Rivers and Harbors Act protect the navigability of waters used for commerce in the United States. The Safe Drinking Water Act prohibits Federal agencies from funding actions that would contaminate an EPA designated sole source aquifer or its recharge area.	Whether the action would: 1. Exceed water quality standards established by Federal, state, and local, regulatory agencies; or 2. Contaminate public drinking water supply such that public health may be adversely affected. <i>* FAA Order 1050.1F provides additional factors to consider in evaluating impacts to this category.</i>

Table 4.4
Regulatory Framework and Analysis Criteria

Impact Category	Regulatory Framework	Analysis Criteria ¹
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¹ See Exhibit 4-1 (Significance Determination for FAA Actions), FAA Order 1050.1F.

² In August 2016, CEQ released Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews on the effects of climate change and GHG emissions as they relate to NEPA. CEQ subsequently withdrew this final guidance, effective April 5, 2017. However, CEQ's withdrawal of the guidance does not alter NEPA responsibilities and environmental reviews should continue to consider GHG impacts as appropriate.

Sources: FAA Order 1050.1F (8/6/2015), and Order 1050.1F Desk Reference (July 2015).

4.4.1 AIR QUALITY

SUMMARY OF 1998 EA – ALTERNATIVE 4R

At the time of the air quality analysis for the 1998 EA, Anne Arundel County (within the Baltimore region) was designated as a “severe” non-attainment area for O₃. In accordance with the Clean Air Act, a revised State Implementation Plan (SIP) was developed by the MDE demonstrating attainment of the US EPA’s established National Ambient Air Quality Standards (NAAQS) for O₃ by the year 2005. In order to assess air emissions associated with BWI Marshall Airport specifically, the MAA commissioned a BWI Marshall Air Quality Plan in 1994. The plan addressed aircraft, ground service vehicles, motor vehicles, fuel facility and other small sources of air emissions at the Airport. The results of the plan and the associated report served as a basis for evaluating existing and future air quality impacts and control measures associated with BWI Marshall Airport and its development.

The 1998 EA determined that total air emissions at BWI Marshall Airport with the proposed air cargo facility expansion were expected to be less than, or equal to, the levels contained in the BWI Marshall Air Quality Plan through the Year 2015 under all Build Alternatives. This conclusion was based on the comparison of forecasted operational levels developed in support of this EA and the Air Quality Plan. While operational levels were consistent for all Build Alternatives, the aircraft taxi-in and taxi-out times were the potential variables between the Build Alternatives that could affect air emissions. Because Alternative 4R was located in the midfield area of the Airport, it was determined that it would operate less taxi-related emissions compared to the alternatives located in the southeast and southwest quadrants of the Airport.

Because forecasted operations at BWI Marshall Airport with the proposed air cargo facility expansion were consistent with those used to develop the air emission inventories contained in the Air Quality Plan, the project was found to conform to the SIP.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

Anne Arundel County is presently designated by the EPA as moderate non-attainment for ozone (O₃) and maintenance for particulate matter equal to or less than 2.5 micrometers (PM_{2.5}) in diameter.

This Technical Report provides and compares the incremental emissions associated with the 2018 Proposed Action and the total airport emissions including the 2018 Proposed Action to the airport inventories from the 1998 EA, as well as to *de minimis* thresholds contained in the Clean Air Act General Conformity Rule to determine if the conclusions of the 1998 EA remain valid and whether a conformity determination is needed. Pursuant to 40 C.F.R. Section 93.157, a new conformity determination is not needed if incremental emissions associated with a modified action are below the *de minimis* thresholds in the General Conformity Rule.

Airport Operations Emissions

The project is expected to be fully operational in the year 2020. The emissions associated with the Midfield Cargo Facility Improvements (2018 Proposed Action) including the operations associated with the existing apron and facilities in the year 2020 are provided in **Table 4.5**. These emissions include ground support equipment (GSE) and auxiliary power units (APU) for the estimated operations.

Vehicular traffic associated with the 2018 Proposed Action were estimated using ITE assumptions for trip generation associated with 200,000 square feet of warehouse development. This use was the closest use related to cargo processing. It is estimated that the project would include 200 trips for AM peak and 165 trips for PM peak hours (365 trips/day), inclusive of all vehicle types. Surface vehicle traffic was considered to occur 365 days/year. Therefore, the total surface traffic volume is expected to be approximately 133,225 annually, with 70% tractor trailer and 30% passenger vehicle traffic. Additional on-Airport vehicle miles traveled (VMT) are contained along Mathison Way, with an assumed two (2) VMT per trip (one mile in and one mile out). As shown in Table 4.5, the total increase in surface vehicle emissions on-Airport are minimal. Annual roadway volumes on the Airport loop are projected to be approximately 14,778,300 for 2020 (*BWI Marshall Peak Summer of 2012 Traffic Counts* (by Daniels Consultants)). The increase to vehicular traffic volumes to on-Airport roadways from the proposed improvements would be approximately 1%.

The additional Airport operations emissions with the proposed Midfield Cargo Facility Improvements would not exceed *de minimis* levels and therefore no General Conformity determination or re-determination is necessary under the Clean Air Act. 40 C.F.R. Section 93.157(a). Additionally, the State Implementation Plan (*Maintenance Plan for the Washington DC-MD-VA 2008 Ozone NAAQS Nonattainment Area*, submitted December 20, 2017) includes emissions for BWI Marshall including: 2,028.54 tons/year of NO_x, 229.92 tons/year of SO_x, 57.07 tons/year of PM_{2.5}, and 448.99 tons/year of VOC, which were much higher than modeled emissions from the Airport, including the project emissions (*Appendix B1b: Technical support document for the development of area, and marine, airport, and railroad source (non-Nonroad model, MOVES2014a sources) emissions inventories for Maryland, 6/19/17*). As a result, the air quality conclusions of the 1998 EA relating to operational emissions remain valid.

Table 4.5

2020 Airport Operations Emissions (tons per year)

Emission Type	CO	NOx	SO ₂	PM ₁₀	PM _{2.5}	VOC
2020 Airport Operations ¹	1,465	1,116	107	21	18	197
2020 Midfield Cargo Facility Improvements Operations (2017 Expansion and 2018 Proposed)						
Aircraft, APU, GSE ²	43	66	6	0.3	0.3	4
Surface Vehicle (On-Airport) ³	0.5	1	0.004	0.05	0.04	0.001
Total with 2018 Proposed Action Associated Emissions	1,509	1,183	113	21	18	201
Potential BWI Marshall Construction in 2020 ⁴	23	7	0.03	41	4	2
Additional Emissions in 2020	67	74	6	41	4	6
<i>De Minimis Levels</i>	--	100	100	--	100	50
<i>Exceed De Minimis?</i>	--	No	No	--	No	No

Note: Airport operations include emissions from the following: aircraft, auxiliary power units, ground support units, on-airport roadways, curbsides, parking lots, boilers, generators, and training fires.

Sources:

¹ KBE analysis, *BWI Air Quality and GHG Management Plan Update (August 2017)*. Inventory did not include 2017 Expansion.

² AEDT, HNTB analysis, September 2018. Includes emissions for entire Midfield Cargo area and therefore overestimates emissions for the 2018 Proposed Action.

³ USEPA's MOVES "rate per distance" emission factors, HNTB analysis, 2018.

⁴ *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport*, Table 5.1-2 (January 2018).

The 1998 EA compared overall operations projected for the Airport with the overall operations included in the 1994 BWI Marshall Air Quality Plan. Emission values specifically for Alternative 4R included in the 1998 EA were not developed. However, the emissions included in the 1994 BWI Marshall Air Quality Plan for the level of operations expected in 2015 were higher than those estimated in this Technical Report for the year 2020 for all criteria pollutants. **Table 4.6** compares the forecasted operations and emissions from the 1998 EA to this Technical Report. This comparison also shows that completion of the Midfield Cargo Facility does not change the conclusions of the 1998 EA.

Table 4.6

Comparison to 1998 EA Airport Operations Emissions

Emission Type	Operations	Emissions (tons/year)					
		CO	NOx	SO ₂	PM ₁₀	PM _{2.5}	VOC
1998 EA - 2015 Operations ¹	376,904	2,059	1,321	455	149 ²		569
Tech Report - 2020 Operations	277,181	1,509	1,183	113	21	18	201

Sources:

¹ 1998 EA emissions are based on the 1994 BWI Marshall Air Quality Plan emissions for 2006 Build scenario. The operational levels associated with the 1998 EA Alternatives (376,904) in 2015 were well within the operational levels associated with the 2006 Build Scenario in the 1994 BWI Marshall Air Quality Plan for (376,695).

² Particulate matter emissions were not broken into PM₁₀ and PM_{2.5} emissions in the 1994 BWI Marshall Air Quality Plan.

Construction Emissions

A construction emissions analysis was completed for the project using the Airport Construction Emissions Inventory Tool (ACEIT).

Project types modeled for the midfield improvements include the following:

- Cargo Apron
- Taxiway
- Building (a combination of two-100,000 SF building project types)
- Parking Lot (represents all vehicle pavement and truck staging area)
- Fuel Tanks
- Runway Rehabilitation (represents the mill and overlay of existing apron and taxilane area)

To be conservative, all default construction activities and diesel equipment were selected for project types, with the exception of identifying pavement types. Default ACEIT construction activities includes both concrete and asphalt placement for pavement project types. Cargo apron and fuel tank (for tank pad) activities were updated in the model to include concrete placement. Taxiway, Parking Lot, and Runway Rehab (mill and overlay) activities were updated in the model to include asphalt placement.

Table 4.7 summarizes the construction emissions inventory for the two construction years modeled (2018 and 2019). The results from the ACEIT analysis indicate that construction emissions would not exceed the *de minimis* threshold levels and therefore do not require a conformity determination or re-determination.

It should be noted that 98% of the calculated VOC emissions are a result of fugitive emissions from asphalt drying. ACEIT includes a default application rate of 1.81 l/m² of liquefied asphalt. The *Hot Mix Asphalt (HMA) Paving Handbook* (FAA AC 150/5370-14B) includes typical asphalt emulsion application rates for various activities. For new HMA pavements, the prime coat application rate ranges from 0.651 l/m² (for very tight base surfaces) to 1.81 l/m² (for very porous base surfaces). For existing HMA pavements, the tack coat application rate (specifically for milled surfaces) is a maximum of 0.555 l/m² (calculated from a maximum 0.361 l/m² residual asphalt content and assumed 35% water content).

ACEIT's default application rate of 1.81 l/m² assumes all asphalt is applied on very porous base surfaces, and does not differentiate an application rate for new HMA pavements vs. existing HMA pavements (which have a much lower application rate). Therefore, the VOC emissions calculated in ACEIT are a very conservative estimate of emissions. ACEIT allows the user to modify default fugitive emission inputs. When the model is modified to include an application rate of 0.651 l/m² for new HMA pavements, and 0.555 l/m² for mill and overlay, the resulting VOC emissions are calculated as 13.3 and 12.6 tons for 2018 and 2019, respectively.

Appendix A, Air Quality includes the ACEIT model input and output (for default and modified asphalt application rates), and preliminary construction schedule.

Table 4.7
Construction Operations Emissions (tons per year)

Year	CO	NOx	SO ₂	PM ₁₀	PM _{2.5}	VOC
2018	6.8	5.6	0.05	1.4	0.24	40.4
2019	19.1	15.4	0.08	2.6	0.77	29.3
<i>De Minimis Levels</i>	--	100	100	--	100	50
<i>Exceed De Minimis?</i>	--	No	No	--	No	No

Sources : HNTB analysis, June 2018 (See *Appendix A, Air Quality*), and EPA, *De Minimis* Emission Levels, <https://www.epa.gov/general-conformity/de-minimis-emission-levels>

Conclusion: There would be no significant air quality impacts associated with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no conformity re-determination is needed and no air quality mitigation measures are required for this project, however construction emission mitigation measures would be implemented in an effort to further reduce emissions, as discussed in *Section 5, Mitigation*.

Table 4.8
 Summary of Potential Changes to Air Quality

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements 2018 Proposed Action		
No significant impact.	<p>No significant impact.</p> <p><i>Operations Emissions:</i> The additional Airport operations emissions with the proposed Midfield Improvements would not exceed <i>de minimis</i> levels and therefore no General Conformity determination or re-determination is necessary under the CAA. The emissions associated with completing the Midfield Cargo Facility would be less than those estimated in the 1998 EA for overall airport generated emissions. See Tables 4.5 and 4.6 for updated impact analysis.</p> <p><i>Construction:</i> Construction emissions would not exceed the <i>de minimis</i> threshold levels and therefore do not require a conformity determination or re-determination. See Table 4.7 for updated impact analysis.</p>	N	N/A

4.4.2 BIOLOGICAL RESOURCES (INCLUDING FISH, WILDLIFE AND PLANTS)

SUMMARY OF 1998 EA – ALTERNATIVE 4R

The 1998 EA describes the impacts to *Biotic Communities*, and *Endangered and Threatened Species of Flora and Fauna* resulting from Alternative 4R.

Biotic Communities – Alternative 4R would impact 105 acres of forest and 115 acres of mowed grassland. Approximately 48 acres of these impacts were due to impacts from the proposed stockpiling of 2.4 million cubic yards of excess material generated by the earthwork to construct this alternative.

After construction, the stockpile sites would be graded and seeded. Impacts were to be coordinated with MDNR for compliance with the 1991 Forest Conservation Act (FCA). The Master Reforestation Plan that was being prepared at the time outlined the required replanting and preservation techniques for each project at BWI Marshall. An individual Forest Conservation Plan (FCP) was also coordinated with MDNR and was found to comply with the FCA. The MAA had sufficient reforestation credit at the time to compensate for the impacts associated with a new air cargo complex.

Endangered and Threatened Species of Flora and Fauna – There were no known rare, threatened or endangered (RTE) species on the existing or planned development areas of Alternative 4R.

Conclusion: Due to the impact to forest and mowed grassland, development of an FCP was required to identify the impacts and necessary reforestation to comply with the FCA. There would be no significant impacts to endangered or threatened species associated with Alternative 4R, therefore, no mitigation measures were required for this project.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

The Study Area was graded and prepared for development following the 1998 EA/FONSI and is currently mowed and maintained for airfield operations. According to the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool, there are no threatened, endangered, or candidate species present in the Study Area. There are also no Critical habitats, National Wildlife Refuges, or Fish Hatcheries present in the Study Area. Refer to **Appendix B, USFWS IPaC**.

Certain birds are protected under the Migratory Bird Treaty Act (MBTA); any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the USFWS. The project is confined to an existing cargo area of the Airport and either paved or currently mowed and maintained and would not impact birds protected by the Migratory Bird Treaty Act. In accordance with the BWI Marshall Wildlife Hazard Management Plan (WHMP) (Approved April 25, 2018), habitat management control efforts would be implemented to actively reduce wildlife attractions to the project areas during and after construction.

Conclusion: There would be no significant impacts to Biological Resources (including fish, wildlife and plants), or any biotic communities such as forested area associated with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.9

Summary of Potential Changes to Biological Resources

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements 2018 Proposed Action		
<i>Biotic Communities</i> – No significant impact with mitigation. <i>Endangered and Threatened Species</i> –No significant impact.	No significant or non-significant impacts associated with the revision to the 1998 EA Proposed Action.	N	N/A

4.4.3 CLIMATE

SUMMARY OF 1998 EA

Evaluation of impacts to Climate was not required for the EA because it was not a resource category identified in FAA Order 1050.1D/5050.4A.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

Research has shown there is a direct correlation between fuel combustion and greenhouse gas (GHG) emissions. According to the 1050.1F Desk Reference, “GHG emissions result from anthropogenic sources including the combustion of fossil fuels. GHGs are defined as including carbon CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). CO₂ is the most important anthropogenic GHG because it is a long-lived gas that remains in the atmosphere for up to 100 years. Climate change is a global phenomenon that can have local impacts...Research has shown there is a direct correlation between fuel combustion and GHG emissions.”⁹

No quantitative data on GHG emissions is available for the Study Area, however GHG emissions can be discussed qualitatively in relation to the air quality impacts. The Proposed Action would not result in exceedances of the applicable *de minimis* threshold for criteria pollutants, therefore it is assumed that there would be a minimal increase of emissions of greenhouse gases during the short-term construction period. Notably, there are no *de minimis* thresholds by which you could evaluate the magnitude of the increase in greenhouse gases.

Conclusion: There would be no significant impacts to Climate associated with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.10

Summary of Potential Changes to Climate

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements 2018 Proposed Action		
N/A	No significant impact. The Proposed Action would not result in exceedances of the applicable <i>de minimis</i> threshold for criteria pollutants, therefore it is assumed that there would be a minimal increase of emissions of greenhouse gases during the short-term construction period.	N	N/A

4.4.4 COASTAL RESOURCES

SUMMARY OF 1998 EA – ALTERNATIVE 4R

The *Coastal Zone Management Program* and *Coastal Barriers* of the 1998 EA discuss these resources as they relate to Alternative 4R.

Coastal Zone Management Program – The Alternative 4R development was located within the Maryland Coastal Zone, as defined by the Maryland Coastal Zone Management Program. In a response dated January 6, 1998, the MDE provided concurrence that the proposed activities were consistent with the State’s CZMP, as required by Section 307 of the Federal CZMA, as amended. The concurrence was conditioned on the applicant’s receipt of a Nontidal Wetlands and Waterways permit and adherence to the conditions of the permit, which was received February 13, 1998.

Coastal Barriers – The Alternative 4R development was not located in the Coastal Barrier Resources System and will not impact coastal barriers.

Conclusion: There would be no significant impacts to the Coastal Zone Management Program or Coastal Barriers associated with Alternative 4R, therefore, no mitigation measures were required for this project.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

Coastal Zone Management Program – The Study Area is in Anne Arundel County, which continues to be considered part of Maryland’s Coastal Zone, thus MAA is required to comply with the regulations set forth and administered by MDE and MDNR. MAA contacted MDE to request a Coastal Zone Management Consistency determination for the project. MDE responded June 13, 2018 that the project¹⁰ is consistent with the Maryland CZMP, as required by Section 307 of the Coastal Zone Management Act. Correspondence with MDE is included in **Appendix C, Coastal Resources**.

Coastal Barriers and Other – The project would not occur in or impact the Coastal Barrier Resource System and is not located in a National Marine Sanctuary or a Wilderness Area.

Conclusion: Confirmation that the Midfield Cargo Facility Improvements (2018 Proposed Action) remains consistent with the CZMP, as required by Section 307 of the CZMA, was requested and received. The improvements would be consistent with the CZMA and thus no mitigation measures are required for this project. See *Appendix C, Coastal Resources*.

Table 4.11
Summary of Potential Changes to Coastal Resources

1998 EA Alternative 4R	Impacts	Change (Y/N)	If yes, proposed mitigation
	Midfield Improvements 2018 Proposed Action		
Coastal Zone Consistency Determination received; conditions of Nontidal Wetlands and Waterways permit applicable.	No significant impact. Coastal Zone Consistency Determination received. No impacts to Coastal Resources associated with the revision to the 1998 EA Proposed Action.	N	N/A

4.4.5 HAZARDOUS MATERIALS, SOLID WASTE AND POLLUTION PREVENTION

SUMMARY OF 1998 EA – ALTERNATIVE 4R

There is no hazardous materials section in the 1998 EA and information about hazardous materials is not included in the EA. The primary sources of solid waste produced by Alternative 4R development were expected to be trees and excavated earth needed in order to construct the development. Alternative 4R would require the clearing of approximately 220 acres of land, including 55 acres of stockpile area and generation of approximately 2.4 million cubic yards of excess fill material. The fill material would not require off-site hauling, but would be stockpiled on-site.

The EA stated that all solid waste generated by the proposed action would be disposed of in the Annapolis sanitary landfill. However, it was determined that this landfill did not have a current refuse disposal permit from the Waste Management Administration. Therefore, as a mitigation measure, the FONSI stated that the Airport Sponsor must ensure that all solid waste would be disposed of in a facility that has a current refuse disposal permit issued by the Waste Management Administration. *Update: The disposal location during construction of the initial 1998 EA improvements is not known, however, Airport waste is generally hauled to the Millersville Landfill in Anne Arundel County, Maryland.*

Conclusion: There would be no significant impacts to Hazardous Materials or Solid Waste associated with Alternative 4R, however, as mitigation, the MAA was to ensure that all solid waste would be disposed of in a facility that had a current refuse disposal permit issued by the Waste Management Administration.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

Hazardous Materials – There are no National Priorities List (NPL) sites or facilities at BWI Marshall Airport, or the vicinity. During construction of the 1998 EA improvements, petroleum-contaminated soils were encountered at the project site. Any soils that were encountered that could not be aerated and returned to usable condition on site were treated at Soil Safe¹¹ in Brandywine, Maryland.

The 2018 Proposed Action would store fuel (e.g. Jet-A) in fuel tanks and as is currently the case, spent glycol would continue to be stored temporarily in movable tanks until it is transported to other areas of the Airport for disposal. To the extent that hazardous materials would be used on site, they would continue to be handled, used, stored, transported, and disposed of pursuant to applicable State, federal, and local regulations.

Solid Waste and Pollution Prevention – The operation of the Midfield Cargo Facility Improvements, once constructed, would not generate additional solid waste.

Construction

Minimal excavation is expected for completion of the project, as the area was previously graded, however, if contaminated soils or hazardous wastes are encountered during construction and cannot be aerated, they would be disposed of at a licensed facility in accordance with State and local regulations for any disposal of materials.

Any solid waste generated during construction and operation of the project would be properly disposed of in a manner compliant with all federal, State, and local regulations at a permitted solid waste facility, or recycled, if possible. Airport waste is generally hauled to the Millersville Landfill, located approximately 10 miles from BWI Marshall Airport, however it is dependent on the waste hauler chosen for the project.

Conclusion: There would be no significant environmental impacts related to hazardous materials or solid waste associated with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.12

Summary of Potential Changes to Hazardous Materials, Solid Waste and Pollution Prevention

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements 2018 Proposed Action		
No significant impact with mitigation.	No significant impact. Contaminated soils may exist in the Study Area, however minimal excavation is expected as the area was previously graded and much of it paved. If contaminated soils are encountered that cannot be aerated for use, they would be disposed of in a licensed facility. No other impacts to Hazardous Materials, Solid Waste and Pollution Prevention associated with the revision to the 1998 EA Proposed Action.	N	N/A

4.4.6 HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

SUMMARY OF 1998 EA – ALTERNATIVE 4R

In 1994, the MAA undertook the preparation of a comprehensive Historic Preservation Plan (“1996 HPP”), for the entire Airport property in order to assist in National Historic Preservation Act (NHPA) compliance for future development projects that would involve federal participation. The studies for the HPP included intensive coordination with the Maryland Historical Trust (MHT), archival research, and extensive field work. The results of this effort determined that while no historical structures existed within the project area, there was an early 20th century burial ground known as Friendship Cemetery which was studied in detail during the planning process to construct the new Aircraft Rescue and Firefighting (ARFF) Building south of Runway 10-28.

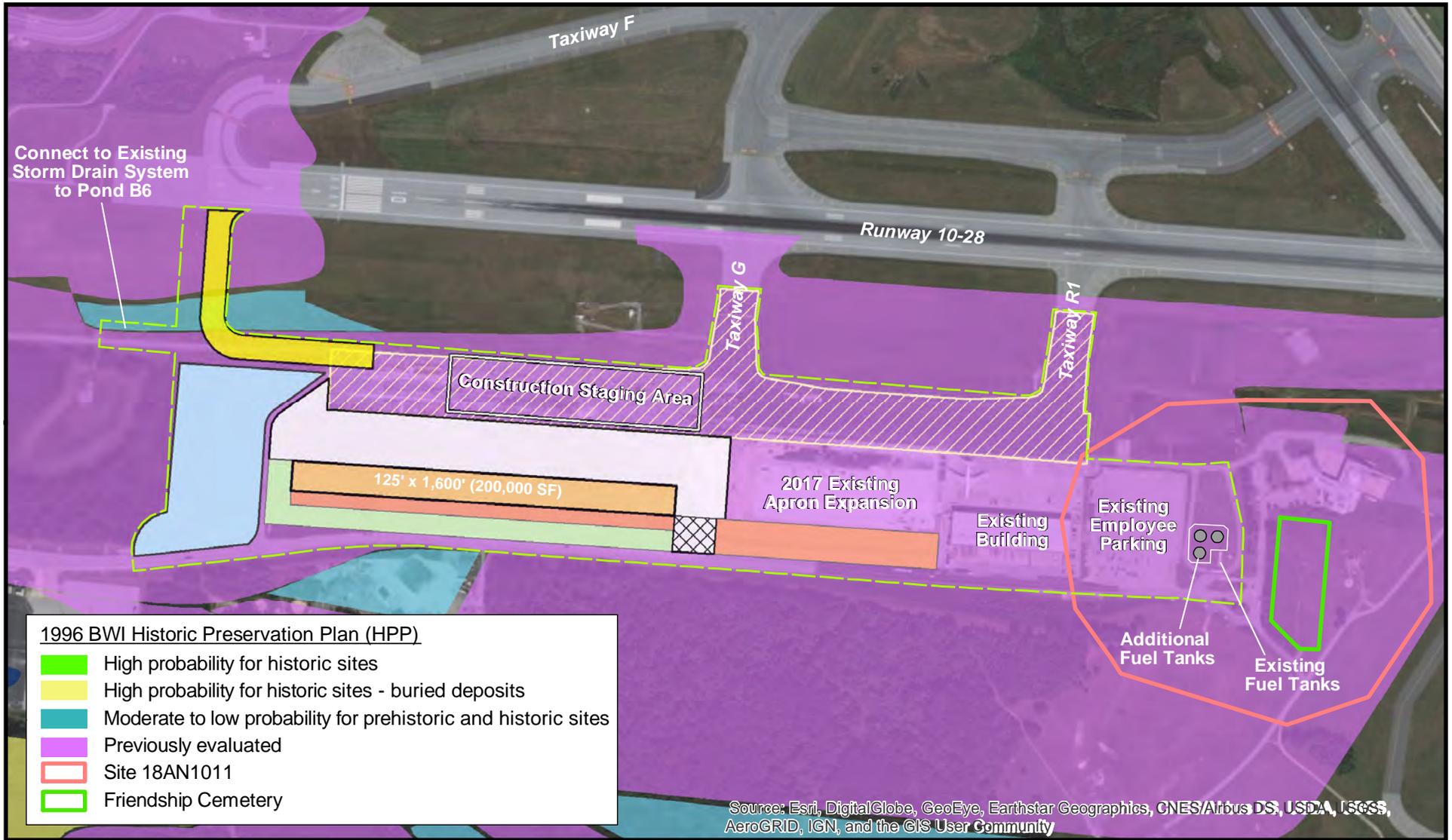
During coordination with the MHT for the original Proposed Action, design changes to one of the original alternatives (Alternative 4) were carried out based on input from the MHT in order to establish the preferred alternative (Alternative 4R). Based on these design changes, a Phase I and Phase II archaeological survey was conducted in the Area of Potential Effect (APE). This survey identified five archaeological sites. Of the five sites, only one was determined to be eligible for listing in the National Register of Historic Places (NRHP). A June 1997 letter from the MHT confirmed the status of this site (18AN1051, a mid- to late 19th century farmstead) and further stated that the air cargo facility would have no effect on this archaeological site. The spoil area in the vicinity of the site was reconfigured to avoid the site for Alternative 4R.

Conclusion: There would be no significant adverse impact associated with Alternative 4R, however, as mitigation, the 1998 EA/FONSI stated that a fence would be placed around the archaeological site during and after construction.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

All project areas in the Study Area are either developed or were graded/prepared for future construction following the 1998 EA, and the project is in an area of the Airport that is largely developed and actively used for cargo operations. The Midfield Cargo Facility Improvements (2018 Proposed Action) were compared to the HPP resource areas, as illustrated on **Figure 5**. As shown, there is one project component (the proposed taxiway connection) that is not within the HPP’s “previously evaluated (and thus no additional study required)” or having “no probability of sites.” This area has been disturbed for grading purposes between Runway 10/28 and the apron edge with the construction of the initial Midfield Cargo facilities, however because the proposed taxiway connection is in an area identified on the HPP as having “moderate to low probability for prehistoric and historic sites,” coordination with MHT was conducted. Coordination with MHT noted that a maximum of 3.5’ of disturbance below the surface would be assumed for this project, with potential for 6-7’ below the surface in the location where a storm drain may be needed.

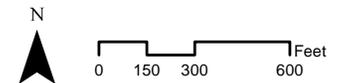
In response to the information received from MDOT MAA, the MHT responded on June 6, 2018, that pursuant to Section 106 of the NHPA and the Maryland Historical Trust Act of 1985, the MHT concurred with MDOT MAA’s determination that the undertakings will have no effect on historic properties. Refer to **Appendix D, Cultural Resources** for coordination and concurrence from the MHT.¹² After this coordination was completed it was determined that the 2018 Proposed Action would be considered by the FAA through a written re-evaluation of the 1998 EA. Due to this decision, coordination with MHT was undertaken again to describe the type of NEPA documentation to be used, to revise the project description and to include the potential for indirect impact on historic resources due to the difference in noise exposure between the 1998 EA Proposed Action (Year 2015) DNL 65+ dB contour and the 2018 Proposed Action (Year 2020) DNL 65+ dB contour.



LEGEND

- Study Area
- Proposed Apron Pavement (11.0 Acres)
- Proposed Building (200,000 SF)
- Proposed Truck Parking/Staging Area Pavement (7.6 Acres)
- Proposed Taxiway (2.8 Acres)
- Proposed Vehicle Parking (5.4 Acres)
- Proposed Vehicle Pavement (3.8 Acres)
- Proposed Truck Staging Area (0.6 Acres)
- Mill and Overlay (21.1 Acres)

2018 Proposed Action and 1996 HPP Cultural Resources
Figure 5



There were no historic resources within the area of noise change when comparing the two contours. See detailed discussion of noise analysis in *Section 4.4.9, Noise and Noise-Compatible Land Use*. The project would not impact tribal land or land of interest to tribes. On September 24, 2018, the MHT again concurred with MDOT MAA’s determination that the undertaking will have no effect on historic properties. Refer to *Appendix D, Cultural Resources* for coordination and concurrence from the MHT.

Construction

No impacts to historic resources are anticipated, however, if during construction, any unmarked burial sites, or prehistoric or historic artifacts are encountered, construction would stop and the MAA would follow the procedures established in the BWI Marshall Airport HPP.

Conclusion: There would be no adverse effects related to historic, architectural, archeological, or cultural resources associated with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.13

Summary of Potential Changes to Historical, Architectural, Archeological, and Cultural Resources

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements 2018 Proposed Action		
No significant adverse impact.	No adverse effect. MHT concurred on September 24, 2018, that the undertaking associated with the revision to the 1998 EA Proposed Action will have no effect on historic properties.	N	N/A

4.4.7 LAND USE

SUMMARY OF 1998 EA – ALTERNATIVE 4R

As the development of Alternative 4R would be entirely contained on Airport property, there would be no direct impacts to land uses adjacent to the Airport. The proposed project was consistent with Anne Arundel County’s General Development Plan. Additionally, the EA stated that the proposed project would enhance the area’s position as a regional industrial center in the Baltimore region and would be likely to stimulate additional economic activity around the Airport.

Conclusion: There would be no significant impacts to land use compatibility associated with Alternative 4R, therefore, no mitigation measures were required for this project.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

The Midfield Cargo Facility Improvements would occur in an existing cargo area of the Airport, near Aviation Support Areas, and would be consistent with the designated land uses at BWI Marshall Airport. The Study Area is designated as “Aviation Support” on the approved ALP. The majority of the Airport is still zoned Residential, which does not reflect the current use. The Airport’s land uses are consistent with the County’s most up-to-date General Development Plan (2009). The Airport is bordered by industrial, residential, open space, and small areas of commercial zones. Industrial zones are concentrated in the area west of the airport. Residential zones are scattered around the airport and are concentrated northeast of the airport.

Conclusion: There would be no significant impacts to land use associated with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.14

Summary of Potential Changes to Land Use

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements 2018 Proposed Action		
No significant impact.	No significant impact.	N	N/A
	No impacts to Land Use Compatibility associated with the revision to the 1998 EA Proposed Action.		

4.4.8 NATURAL RESOURCES AND ENERGY SUPPLY

SUMMARY OF 1998 EA –ALTERNATIVE 4R

The 1998 EA stated that increases in energy consumption directly and indirectly caused by the proposed expansion of air cargo facilities at the Airport would not result in significant impacts to energy supply or natural resources because (1) Baltimore Gas and Electric (BGE) had demonstrated sufficient capacity to provide for increased consumption of electric power associated with the proposed additional facilities; and (2) the proposed project would not involve the use of any unusual natural resources, or those in short supply. Additionally, there would be no interference with the Airport’s existing or planned utilities or circuits/facilities.

Conclusion: There would be no significant impacts to natural resources and energy supply associated with Alternative 4R, therefore, no mitigation measures were required for this project.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

Once operational, the project would require additional energy use to provide lighting, electricity, and potentially water, heating, and air conditioning, to the proposed warehouse/cargo processing building. Additional exterior lighting for the Midfield Cargo Facility Improvements and the taxiway connection lighting would also be needed. The change in net energy demand required would not amount to a significant percent of total Airport use and would not create a substantial increase or decrease in demand for local resources and utilities or strain the capacity/supply of these resources/ utilities to the meet the additional demand.

The new taxiway connection would allow aircraft more options to access the Midfield Cargo Facility, however any changes would be minimal and would not noticeably alter fuel usage. Similarly, vehicles would have more options for movement and parking within the facility, however changes to their traffic patterns would not noticeably alter fuel usage.

Fuel will be stored in the proposed additional fuel tanks once in operation. It is assumed the fuel will be brought in by an outside supplier and transferred into the fuel tanks for distribution to the Midfield Cargo Facility only. The anticipated increase in fuel storage capabilities required by the additional cargo activity would not amount to a significant percent of overall fuel usage locally or regionally. The additional fuel supply/usage would not exceed available supply. Glycol would continue to be collected using GRVs, stored temporarily in movable tanks, and transported to other areas of the Airport for disposal.

Additionally, the Proposed Action would not involve the use of any unusual or scarce materials and would not cause a demand for the use of any unusual natural resource or the use of any resource that is in short supply. There are no known deposits of valuable natural resources located on or near the Study Area that would be affected by the Proposed Action and the Proposed Action would not cause a substantial increase in demand for local resources and utilities or strain the capacity/supply of these resources/utilities to the meet the additional demand.

Construction

During construction activity, fuel would be required for construction vehicles and equipment, however the amount needed would not amount to a significant percent of overall fuel usage locally or regionally.

Conclusion: There would be no significant impacts to natural resources or energy supply associated with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.15

Summary of Potential Changes to Natural Resources and Energy Supply

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements 2018 Proposed Action		
No significant impact.	No significant impact.	N	N/A
	No impacts to Natural Resources and Energy Supply associated with the revision to the 1998 EA Proposed Action.		

4.4.9 NOISE AND NOISE-COMPATIBLE LAND USE

SUMMARY OF 1998 EA – ALTERNATIVE 4R

Noise analysis was conducted to compare between the Build and No Build Scenarios during selected years. Eight scenarios were developed: 1995 Base Year, 1999 No Build, 1999 Build-Expected Growth, 1999 Build-High Growth, 2015 No Build, 2015 Build-Expected Growth, 2015 Build-High Growth, and 2015 Build-High Growth with a cumulative impact scenario with proposed parallel 10-28 Runway. The Build scenarios assumed growth in air cargo operations only if the proposed facilities were built.

It was determined that the noise effects of the proposed cargo facility were not considered significant. Noise contours increased by between 0.2 and 0.5 dBA, assuming the “worst case” scenario in 2015. These levels were well below the significance threshold of a 1.5 dBA increase in noise sensitive areas within a DNL 65 area as established by the FAA. Ground noise from the proposed Midfield Cargo Facility (taxiing, engine start-up, use of auxiliary power units, etc.) was also evaluated and would not be expected to cause any significant noise impacts in the closest residential areas to the south of the Airport. During construction, short term effects of noise would occur and would be controlled by construction contract specifications.

Conclusion: There would be no significant impacts to noise exposure associated with Build Alternative 4R, therefore, no mitigation measures were required for this project.

MIDFIELD CARGO FACILITY IMPROVEMENTS (2018 PROPOSED ACTION)

This Technical Report considers the noise effects of the Midfield Cargo Facility Improvements, based on the Midfield Cargo Operator's estimates of additional aircraft operations that they would accommodate. Prior to receiving the approval to use detailed operator information the MDOT MAA completed an analysis of potential impacts using general planning assumptions. This initial analysis is included in **Appendix E, AEDT Noise and Emissions Analysis using General Planning Assumptions**. The initial noise analysis was more conservative, i.e., higher impact associated with the Proposed Action, because higher aircraft utilization rates were assumed for the new parking positions than were subsequently provided by the Midfield Cargo Operator. However, the conclusions from that initial noise analysis were the same as those reached with the more specific data.

The Proposed Action completes the original vision of the Midfield Cargo Facility and is expected to accommodate increased cargo operations based on current forecast operator demand. The operator at the existing (including the 2017 six-acre expansion) Midfield Cargo Facility accounted for slightly over 1,600 aircraft operations during the last four months of 2017, the typical air cargo busy period. This represents about 1.95 operations per day per aircraft parking position (around one average turn per day) but the demand was still sufficient to encourage the operator to request additional ramp and building capacity. Increasing utilization of the existing Midfield Cargo Facility is not practical because existing utilization (operations per parking position) is already near the maximum at comparable airports. Further, there is not sufficient building or ramp capacity to allow the coordinated, simultaneous sort operation contemplated by the proposed Midfield Cargo Operator. Likewise, adding operations at non-Midfield facilities is not practical because the lack of a consolidated facility would significantly complicate cargo sorting operations and because of the potential conflicts with other all-cargo operations.

To determine if the 1998 EA analysis of noise and noise-compatible land use is still substantially valid, and to confirm that there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, the 2018 Proposed Action was compared to not completing the proposed improvements (i.e., 2018 No Action). The following defines the operations forecast used for the 2018 No Action and 2018 Proposed Action and compares the operations defined in the 1998 EA Proposed Action.

2018 No Action Operations Forecast

Table 4.16 summarizes the 2018 No Action Alternative forecast representing estimated 2020 average annual day (AAD) aircraft operations. Operations attributable to existing parking positions at the Midfield facility are included in the 2018 No Action Alternative. These operations had not been not envisioned when the operational forecast and fleet mix was developed for the *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* (January 2018) and therefore had not been incorporated in that EA analysis. Likewise, these operations were not explicitly envisioned in the 2017 Re-Evaluation, which based growth projections on historical growth rates and national cargo projections. The 2018 No Action forecast projects 273,652 annual operations in 2020 (269,182 annual 2020 operations from the *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* plus 4,380 annual operations attributable to the existing Midfield Cargo parking positions, as provided by the Midfield Cargo Operator).

Table 4.16

No Action Average Annual Day Operations Forecast

	BWI 2016-2020 Improvements EA ¹			Existing Midfield Facility ²			2018 No Action Alternative ³		
	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total
Daytime									
Heavy Jets	3.8	2.7	6.5	3.0	4.0	7.0	6.8	6.7	13.5
Other Large Jets	264.9	262.2	527.1				264.9	262.2	527.1
Other (Light Jets, GA, Military)	41.6	41.5	83.1				41.6	41.5	83.1
Total	310.3	306.4	616.7	3.0	4.0	7.0	313.3	310.4	623.7
Nighttime									
Heavy Jets	3.3	4.4	7.6	3.0	2.0	5.0	6.3	6.4	12.6
Other Large Jets	50.6	53.3	103.8				50.6	53.3	103.8
Other (Light Jets, GA, Military)	4.6	4.7	9.2				4.6	4.7	9.2
Total	58.4	62.3	120.7	3.0	2.0	5.0	61.4	64.3	125.7
Total									
Heavy Jets	7.1	7.1	14.1	6.0	6.0	12.0	13.1	13.1	26.1
Other Large Jets	315.5	315.5	631.0	0.0	0.0	0.0	315.5	315.5	631.0
Other (Light Jets, GA, Military)	46.2	46.2	92.3	0.0	0.0	0.0	46.2	46.2	92.3
Total	368.7	368.7	737.4	6.0	6.0	12.0	374.7	374.7	749.4

¹ Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport. Activity levels for 2020.

² Estimated aircraft operations for existing cargo parking positions provided by Midfield Cargo Operator. Activity levels for 2020.

³ BWI 2016-2020 Improvements EA plus Existing Midfield Facility operations.

2018 Proposed Action Operations Forecast

Table 4.17 provides the Midfield Cargo Operator's estimates of average annual day operations for 2020 if the proposed expansion is implemented. These operations include both weekday and weekend operations and represent an annual average. The operator indicated that the Boeing 767-300 aircraft would be the predominant aircraft, with some operations also performed by Boeing 767-200 and Boeing 737 aircraft. It did not provide a numerical breakdown of its anticipated fleet mix; therefore, Midfield cargo operations were assumed to be performed by the Boeing 767-300, the anticipated predominant aircraft. The operations attributable to proposed parking positions are the induced/accommodated operations resulting from the 2018 Proposed Action.

Based on the forecasting estimates in Table 4.17, the project is expected to accommodate an additional 3,650 annual operations. Under the 2018 Proposed Action forecast, the total annual operations in 2020 would be 277,212 (3,650 operations added to the 2018 No Action year 2020 forecast operations). The FAA's January 2018 Terminal Area Forecast (TAF) projects 277,503 annual operations for BWI Marshall Airport in 2020 and therefore anticipated BWI Marshall Airport operations, including the Midfield activity, remain very consistent with the TAF.

Table 4.17

Proposed Action Average Annual Day Operations Forecast

	2018 No-Action Alternative ¹			Proposed Parking Positions ²			2018 Proposed Action ³		
	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total
Daytime									
Heavy Jets	6.8	6.7	13.5	4.0	2.0	6.0	10.8	8.7	19.5
Other Large Jets	264.9	262.2	527.1				264.9	262.2	527.1
Other (Light Jets, GA, Military)	41.6	41.5	83.1				41.6	41.5	83.1
Total	313.3	310.4	623.7	4.0	2.0	6.0	317.3	312.4	629.7
Nighttime									
Heavy Jets	6.3	6.4	12.6	1.0	3.0	4.0	7.3	9.4	16.6
Other Large Jets	50.6	53.3	103.8				50.6	53.3	103.8
Other (Light Jets, GA, Military)	4.6	4.7	9.2				4.6	4.7	9.2
Total	61.4	64.3	125.7	1.0	3.0	4.0	62.4	67.3	129.7
Total									
Heavy Jets	13.1	13.1	26.1	5.0	5.0	10.0	18.1	18.1	36.1
Other Large Jets	315.5	315.5	631.0				315.5	315.5	631.0
Other (Light Jets, GA, Military)	46.2	46.2	92.3				46.2	46.2	92.3
Total	374.7	374.7	749.4	5.0	5.0	10.0	379.7	379.7	759.4

¹Table 4.16.

² Estimated aircraft operations for proposed cargo parking positions provided by Midfield Cargo Operator. Activity levels for 2020.

³ No-Action Alternative plus Proposed Midfield Facility operations.

As a crosscheck, the above assumptions were compared with current cargo ramp utilization rates at BWI Marshall Airport and other comparable airports, shown in **Table 4.18**. For airports where the specific parking positions were unknown the acreage allotted to cargo apron was considered.

Table 4.18
Cargo Ramp Utilization Rates at Comparable Airports

Airport	Cargo Ramp Capacity	2017 All-Cargo Ops	Utilization Rate (annual all-cargo operations)	BWI New Midfield Cargo Facility Operations Using Utilization Rate from Comparable Airport
BWI	25 parking positions	8,042	321.7 ops/position	2,252
ATL	28 parking positions	13,362	477.2 ops/position	3,341
LAS	16 parking positions	4,394	274.6 ops/position	1,922
CLT	50 acres	3,990	79.8 ops/acre	878
RIC	17 acres	3,768	218.8 ops/acre	2,407
TPA	14 acres	5,118	361.3 ops/acre	3,975

Sources: BWI Marshall Airport Master Plan, 2011, US DOT T100 database, individual airport websites, and HNTB analysis, August 2018.

The utilization rates from the comparable airports were separately applied to the ramp capacity of the proposed new Midfield Cargo Facility (7 parking positions and 11 acres) to develop alternative estimates of annual operations associated with the new facility. Of these, TPA had the highest utilization rate, and if applied to the acreage proposed for the new Midfield Cargo Facility, would generate an estimate of 3,975 annual operations, slightly higher than the 3,650 operations estimated for the new parking positions by the Midfield Cargo Operator. Utilization rates from the other airports all generate an estimate that is lower than that of the Midfield Cargo Operator. Based on the comparisons, the 3,650 annual operations estimate provided by the Midfield Cargo Operator is considered a reasonable and conservative estimate of the annual operations that would be accommodated by the new facility.

The utilization rates at BWI cargo facilities outside the Midfield Cargo Facility are lower than those at the Midfield Cargo Facility and theoretically suggest that some, but not all of the projected new operations could be accommodated at those facilities. For this to happen, however, the Midfield Cargo Operator would need to split their operations among facilities and thereby incur burdensome operational inefficiencies related to towing aircraft and repeatedly moving equipment and personnel. Modern parcel cargo operations are inherently time sensitive in that aircraft arrive, typically at a similar time so there are multiple aircraft on the ground at the same time, cargo is unloaded, sorted, placed on delivery vehicles and then some time later the reverse is accomplished, and aircraft depart. The Midfield Cargo Operator has identified a need for a consolidated facility so that they can efficiently transfer cargo between aircraft within a tight time schedule.

Table 4.19 compares the total aircraft departures modeled in the 1998 EA with those projected for 2020 and **Table 4.20** compares the all-cargo aircraft departures modeled in the 1998 EA with those currently projected for 2020. Note that the tables present only departures, as the day/night split of aircraft arrivals used in the 1998 EA was not provided in the document. As shown, both the total number of aircraft departures and all-cargo aircraft departures, with the 2018 Proposed Action, are less than had been forecast in the 1998 EA. Although the number of departures accounted for by heavy aircraft such as the Boeing 767 is higher in the revised forecast, the number of nighttime cargo departures is significantly lower. The nighttime estimates in the 1998 EA were based on day/night distributions at the time. The nighttime distributions in this report are based on updated day/night distribution data plus estimates from the Midfield Cargo Operator. Additionally, the fleet mix from the 1998 EA used for the 2015 scenario included Stage II aircraft that are no longer allowed

to operate and the total number of AAD departures under the 2018 Proposed Action (379.7) is substantially less than in the 1998 EA High Scenario (523.0). The cargo activity levels now projected for 2020 represent a reasonable level of activity that is consistent with the assumptions in the 1998 EA.

Table 4.19
Comparison of Average Annual Day Aircraft Departures

	1998 EA 2015 High Growth¹	BWI 2016-2020 Improvements EA 2020²	2018 No Action³	2018 Proposed Action⁴
Daytime				
Heavy Jets	10.2	2.7	6.7	8.7
Other Large Jets	262.6	262.2	262.2	262.2
Other (Light Jets, GA, Military)	195.3	41.5	41.5	41.5
Total	468.1	306.4	310.4	312.4
Nighttime				
Heavy Jets	3.4	4.4	6.4	9.4
Other Large Jets	29.4	53.3	53.3	53.3
Other (Light Jets, GA, Military)	22.1	4.7	4.7	4.7
Total	54.9	62.3	64.3	67.3
Total				
Heavy Jets	13.6	7.1	13.1	18.1
Other Large Jets	292.0	315.5	315.5	315.5
Other (Light Jets, GA, Military)	217.4	46.2	46.2	46.2
Total	523.0	368.7	374.7	379.7

¹ Final Environmental Assessment and Finding of No Significant Impact for the Proposed Expansion of Air Cargo Facilities, June 1998. Document did not provide day/night split of aircraft arrivals. Activity levels for 2015 High Growth Scenario.

² Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport. Activity levels for 2020.

³ Table 4.16.

⁴ Table 4.17.

Table 4.20
Comparison of Average Annual Day All-Cargo Aircraft Departures

	1998 EA 2015 High Growth ¹	BWI 2016-2020 Improvements EA ² 2020	2018 No Action ³	2018 Proposed Action ⁴
Daytime				
Heavy Jets				
DC-8	0.6			
DC-8S	0.4			
MD-11	0.4			
B-767-300	0.0	1.1	5.1	7.1
B-767-200	0.0	0.4	0.4	0.4
B-747-400	0.0	0.1	0.1	0.1
A-300-600		0.0	0.0	0.0
Subtotal	1.3	1.7	5.7	7.7
Other Large Jets				
DC-9	0.4			
A-310	1.0			
B-727	1.6			
B-757	0.8	1.0	1.0	1.0
Subtotal	3.7	1.0	1.0	1.0
Other (Light Jets, GA, Military)	1.4	2.6	2.6	2.6
Total	6.4	5.3	9.3	11.3
Nighttime				
Heavy Jets	3.4	3.4	5.4	8.4
DC-8	1.4			
DC-8S	0.9			
MD-11	1.0			
B-767-300		2.4	4.4	7.4
B-767-200		0.7	0.7	0.7
B-747-400		0.3	0.3	0.3
A-300-600		0.0	0.0	0.0
Subtotal	3.4	3.4	5.4	8.4
Other Large Jets	9.6	0.3	0.3	0.3
DC-9	1.0			
A-310	2.5			
B-727	4.1			
B-757	1.9	0.3	0.3	0.3
Subtotal	9.6	0.3	0.3	0.3
Other (Light Jets, GA, Military)	3.6	1.2	1.2	1.2
Total	16.6	4.9	6.9	9.9
Total				
Heavy Jets				
DC-8	2.0			
DC-8S	1.3			
MD-11	1.4			
B-767-300	0.0	3.5	9.5	14.5
B-767-200		1.1	1.1	1.1
B-747-400	0.0	0.4	0.4	0.4
A-300-600	0.0	0.1	0.1	0.1
DC-10-10	0.0			
Subtotal	4.7	5.1	11.1	16.1
Other Large Jets				
DC-9	1.4			

	1998 EA 2015 High Growth ¹	BWI 2016-2020 Improvements EA ² 2020	2018 No Action ³	2018 Proposed Action ⁴
A-310	3.5			
B-727	5.7			
B-757	2.7	1.3	1.3	1.3
Subtotal	13.3	1.3	1.3	1.3
Other (Light Jets, GA, Military)	5.0	3.8	3.8	3.8
Total	23.0	10.2	16.2	21.2

Notes: Columns may not sum exactly because of rounding.

¹ BWI Mid-Field Cargo Facility Ground Noise Assessment, HMMH, July 1996. Document did not provide day/night split of aircraft arrivals. Activity levels for 2015.

² Draft EA and Section 4(f) Determination Proposed Improvements 2016-2020 at BWI Marshall Airport. Activity levels for 2020.

³ Estimated aircraft operations provided by Midfield Cargo Operator. Activity levels for 2020.

⁴ BWI Midfield Cargo Facility Ground Noise Assessment, HMMH, July 1996, plus operations from new Midfield Cargo Facilities. Activity levels for 2020.

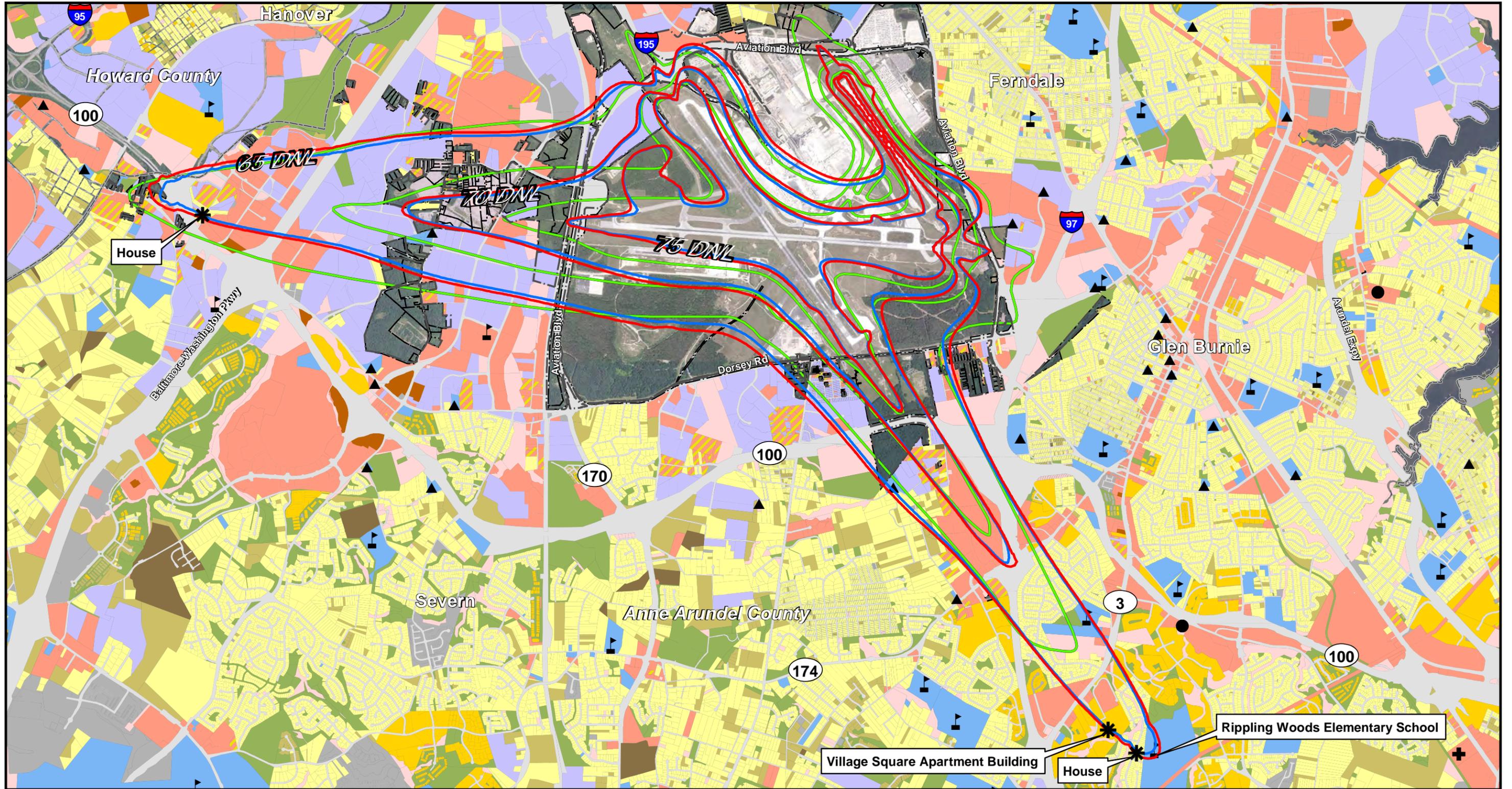
Sources: As noted and HNTB analysis, September 2018.

Post-2020, there are no indications that the non-Midfield Operators will grow at rates that are inconsistent with their current or past historical trends, and they are therefore unlikely to require expanded facilities in the near future. Demand from the Midfield Cargo Operator may continue to increase; however, any material increase in operations by the Midfield Cargo Operator beyond what is projected for 2020 will likely require new or expanded facilities that will trigger a separate environmental review commensurate with the level of potential environmental impact associated with those facilities.

Noise Analysis

An AEDT model analysis was created to determine the potential change in contour area for the projected increase in cargo operations specific to the 2018 Proposed Action by the year 2020. It should be noted that the contours from the *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* (January 2018) which are the base of the noise analysis in this Technical Report were verified in response to public comments on the Draft EA and Section 4(f) Determination, see **Appendix F, Noise (Attachment 1)**. Additional review of the noise model input data was completed by MDOT MAA in response to comments provided by the public on the incorporation of flight paths and procedures implemented at BWI Marshall Airport by the FAA. Both the 2018 No Action and 2018 Proposed Action contours reflect FAA's most recent airspace changes made as part of or separate from the D.C. Metroplex, as well as airport improvement projects that have been made in the past. See *Section 4.4.13, Cumulative Impacts*.

The 2018 Proposed Action fleet mix for the analysis of the Midfield Cargo Improvements includes the 2018 No Action operations plus the operations associated with the proposed new parking positions at the Midfield Cargo Facility. All the Midfield Cargo Facility aircraft operations were assumed to be performed by Boeing 767-300 aircraft as provided by the Midfield Cargo Operator and consistent with existing activity at the Facility. The day/night distributions from Tables 4.18 and 4.19 were applied. Using the 2018 No Action and 2018 Proposed Action fleet mixes, AEDT estimated an increase of approximately 6.5% in terms of DNL 65+ dB area. **Table 4.21** shows the noise area comparisons for the AEDT analysis and the 1998 EA Proposed Action (Alternative 4R High Growth Scenario, Year 2015), and **Figure 6** shows a comparison of the 2018 No Action (Year 2020), 2018 Proposed Action (Year 2020) and 1998 EA Proposed Action (Year 2015) contours.



LEGEND

- 2018 No Action Noise Contour (Year 2020)
- 2018 Proposed Action Noise Contour (Year 2020)
- 1998 Proposed Action Noise Contour (Year 2015)

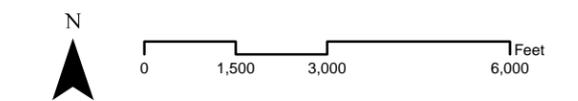
- Hospital
- Nursing Home
- School
- Place of Worship
- Historic Resource
- Table 4.21 Listed Housing Unit

Existing Land Use

- Single Family
- Multi-Family Residential
- Mobile Home
- Transient Lodging
- Public Use
- Recreational Open Space
- Mixed Use
- Commercial Use
- Commercial Use Exempt
- Manufacturing and Production

- Transportation
- Vacant / Undefined
- Undeveloped Zoned Residential
- BWI Airport Property
- County Boundary

Noise Contours with Land Use
Figure 6



Source: Aerial - MDOT MAA (2016), National Park Service, Maryland Department of Planning, Google Earth

Table 4.21

Noise Analysis – Comparison of the 2018 No Action, 2018 Proposed Action and 1998 EA Proposed Action Contours

	Year 2020		Year 2015	% Change from 2018 No Action to 2018 Proposed Action	% Change from 1998 EA Proposed Action to 2018 Proposed Action
	2018 No Action	2018 Proposed Action	1998 EA Proposed Action ¹		
Annual Operations	273,562	277,212	381,790	1.3%	-37.7%
Average Annual Day Operations	749.4	759.4	1046.0	1.3%	-37.7%
AEDT 65+ DNL Area (Square Miles)	6.2	6.6	6.6 ²	6.5%	0.0%

Notes: ¹1998 EA Proposed Action (Year 2015) = Alternative 4R High Growth Scenario.

² As digitized from 1998 EA.

Sources:

- (a) Final Environmental Assessment and Finding of No Significant Impact for the Proposed Expansion of Air Cargo Facilities, June 1998.
- (b) HNTB analysis, September 2018

There were additional housing units (approximately 870 units) and one school (Rippling Woods Elementary School) within the DNL 65 dB contour area south of the Airport when comparing the 2018 Proposed Action (Year 2020) to the 1998 EA Proposed Action (Year 2015). There was also one additional house within the DNL 65 dB contour area west of the Airport when comparing the 2018 Proposed Action (Year 2020) to the 2018 No Action; however, this house would have been in the 1998 EA Proposed Action (Year 2015). As illustrated in Figure 6, the noise exposure associated with the completion of the Midfield Cargo Facility would be less off of all runway ends with the exception of Runway 33L, as compared to the 1998 EA Proposed Action (Year 2015) noise contours. The projected contour south of Runway 33L is longer than the 1998 EA Proposed Action (Year 2015) contour. This change is unrelated to the Midfield Cargo area; rather, it is due to runway use changes that have occurred at the Airport in response to changes in fleet mix, changes in air carriers, changes in terminal use, etc. For example, in the 1998 EA, nighttime departures for heavy jets were projected to occur off of Runway 28 approximately 82% of the time whereas with the current projections for the year 2020, nighttime departures off of Runway 28 are expected only 62% of the time. Conversely, in the 1998 EA, nighttime departures for heavy jets were projected to occur off of Runway 15R approximately 10% of the time whereas they are projected to occur 35% of the time in this analysis. See *Appendix F, Noise (Attachment 2)* for a complete runway use comparison of heavy and large jets between the 1998 EA and 2018 Proposed Action.

Additionally, as another data point for determining existing and future runway use at BWI Marshall Airport, the 2016 Noise Exposure Maps Update estimated that nighttime departure use of Runway 28 for heavy jets would be approximately 67% by 2019. Nighttime departures for heavy jets off of Runway 15R were estimated to be approximately 29% by 2019. The Noise Exposure Maps Update disclosed that the noise contours were expected to increase by the year 2019 southeast of the Airport near Runway 33L due to increased air carrier arrivals to Runway 33L and departures off Runway 15R. The 2016 Noise Exposure Maps Update discusses the mitigation for non-compatible land uses in the area southeast of Runway 33L.

When comparing the 2018 No Action (Year 2020) to the 2018 Proposed Action (Year 2020), a grid point analysis determined the noise levels over noise sensitive areas not included in the DNL 65+ dB contour only increase by approximately DNL 0.2 dB (or less), as summarized in **Table 4.22**. Notably, Rippling Woods Elementary School was included within the DNL 65+ dB contour in the most recently approved 2016

Noise Exposure Maps Update. It was determined that the school is adequately protected from aircraft noise and that the school does not require any acoustical modification. MDOT MAA’s 1989 BWI Marshall NCP identified Rippling Woods Elementary School (ES), within the 65 DNL (or Ldn) contour. A consultant working for MDOT MAA at the time concluded “that the interior of Rippling Woods ES is adequately protected from aircraft noise and that school does not require any acoustical modification.” This opinion was confirmed by an independent study commissioned by the Anne Arundel County Board of Education.¹³ Additional housing units included in Table 4.21 are indicated on Figure 6 by a black asterisk. The housing units to the south of the Airport, at the southernmost end of the 2018 Proposed Action DNL 65+ dB contour are also included in the 2016 Noise Exposure Maps Update contour. The apartment building indicated in Table 4.21 is within the Village Square Apartments complex that is included in the Residential Sound Insulation Program (RSIP) defined in the 2016 Noise Exposure Maps Update.

The noise model from the 1998 EA was not available to determine specific noise levels estimated for the year 2015 with the Alternative 4R high growth scenario however it is expected that the projected noise levels at the Rippling Woods ES, Village Square Apartment Building, and the house to the south would have been in the range of DNL 60 to 61 and the house to the west would have been in the range of DNL 66. The change in noise exposure between the 1998 EA Proposed Action (Year 2015) and the 2018 Proposed Action (Year 2020) would range from -0.8 to potentially 5 DNL. However, the existing noise levels for these noise sensitive land uses as identified in the *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* (January 2018), which is the most recent publicly reviewed noise exposure for BWI Marshall Airport, are well beyond the 1998 EA Proposed Action (Year 2015) DNL 65 contour to the south of Runway 33L. The expansion of the contours south of Runway 33L are due to runway use changes that have occurred at BWI Marshall Airport over the last 20 years as described on the page that follows.

Table 4.22

Noise Levels over Noise Sensitive Areas (DNL) –
2018 No Action (Year 2020) vs. 2018 Proposed Action (Year 2020)

Noise Sensitive Land Use	2018 No Action (Year 2020)	2018 Proposed Action (Year 2020)	1998 EA (Year 2015) ²	Change from 2018 No Action to 2018 Proposed Action	Change from 1998 EA Proposed Action to 2018 Proposed Action
Rippling Woods Elementary School (South)	65.0	65.2	60-61	0.2	4.2-5.2
Village Square Apartment Building (South) ¹	64.9	65.0	60-61	0.1	4.0-5.0
House (South) ¹	64.9	65.0	60-61	0.1	4.0-5.0
House (West)	65.0	65.2	66	0.2	-0.8

Note: ¹ The housing units to the south represent the apartment building and house furthest outside the 2018 No Action (Year 2020) contour, but within the 2018 Proposed Action (Year 2020) contour. Both units are within the 2016 Noise Exposure Maps Update DNL 65+ dB contour.

² Exact values at these points are not provided in the 1998 EA, estimated values provided by visual analysis of previous contours.

Sources: *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* (January 2018), FAA AEDT, and HNTB Analysis, 2018.

The AEDT analysis determined the noise increase over noise sensitive areas brought into the DNL 65+ dB noise contour as a result of the 2018 Proposed Action to be approximately DNL 0.2 dB when compared to the 2018 No Action. See *Appendix F, Noise (Attachment 2)*. This level of increase will not constitute a significant impact because the increases are below DNL 1.5 dB over noise sensitive areas. This level of change is similar to the expected change reported in the 1998 EA at grid points analyzed when comparing the 1995 No Action (Year 2015) and the 1998 Proposed Action (Year 2015). The range of change reported was between DNL 0.2 and 0.5 dB.

Because of these changes in runway use over the span of 20 years, there are differences between the shape of the noise contours projected for the 2018 Proposed Action in the year 2020 and the 1998 EA Proposed Action projected for the year 2015. However, the overall area of noise exposure remains consistent between the two analyses at 6.6 square miles (see Table 4.20). When comparing the change in noise level between the 2018 No Action and 2018 Proposed Action in the year 2020, there are no significant noise impacts. Additionally, as previously noted, a more conservative scenario, i.e., higher impact associated with the 2018 Proposed Action because higher aircraft utilization rates were assumed for the new parking positions than were subsequently provided by the Midfield Cargo Operator (see *Appendix E*), also demonstrated that there are no significant noise impacts.

As described in Tables 4.16 and 4.17, completion of the Midfield Cargo Facility has the potential to accommodate approximately 6.0 daytime cargo AAD departures and 5.0 nighttime cargo AAD departures (4.0 daytime and 2.0 nighttime departures from existing positions and 2.0 daytime and 3.0 nighttime departures from proposed positions). The 1998 EA estimated that cargo operations by 2015 at the Midfield Cargo Facility would be approximately 6.4 daytime departures and 16.6 nighttime departures under the high growth scenario, still higher than the 2018 Proposed Action. In addition, the 2018 No Action and 2018 Proposed Action both involve operations by modern quieter aircraft and a lower percentage of nighttime departures. The determination that there are no significant noise impacts associated with development, and in this case, the completion of the Midfield Cargo Facility, remains valid.

Further, per FAA Order 1050.1F, paragraph 9-3: (1) the proposed action considered in the 1998 EA and the 2018 Proposed Action have no substantial changes; both envisioned a cargo facility as described in Section 1.3 of this Technical Report; (2) there are no significant new circumstances or information that paints a dramatically different picture of impacts compared to the description of impacts in the 1998 EA relevant to environmental concerns and bearing on the proposed action or impacts. While the specific boundaries of the noise exposure may vary west of Runway 10-28 and south of Runway 15R-33L, the expected change in noise associated with completing the Midfield Cargo Facility remains consistent with the change described in the 1998 EA which was a change between DNL 0.2 and 0.5 dB. In neither circumstance would there be any significant change in aircraft noise. Further, the overall shape and location of the noise contours are similar between the 1998 EA and the analysis within this Technical Report. And, as discussed, the areas in the southern noise contour lobe greater than DNL 65 dB are included in the most recent BWI Marshall Airport Noise Exposure Maps Update (approved 2016) and the Residential Sound Insulation Program.

Construction

Overall, the construction phase of this project would be expected to create minor and temporary impacts at the project site and in the surrounding airfield and terminal area. These impacts would be short-term in nature, lasting for the duration of construction activities. Temporary noise impacts would be generally localized at the vicinity of the construction site and the localized increase in noise levels would not disrupt normal airport operations or activities.

HIGH GROWTH SENSITIVITY ANALYSIS

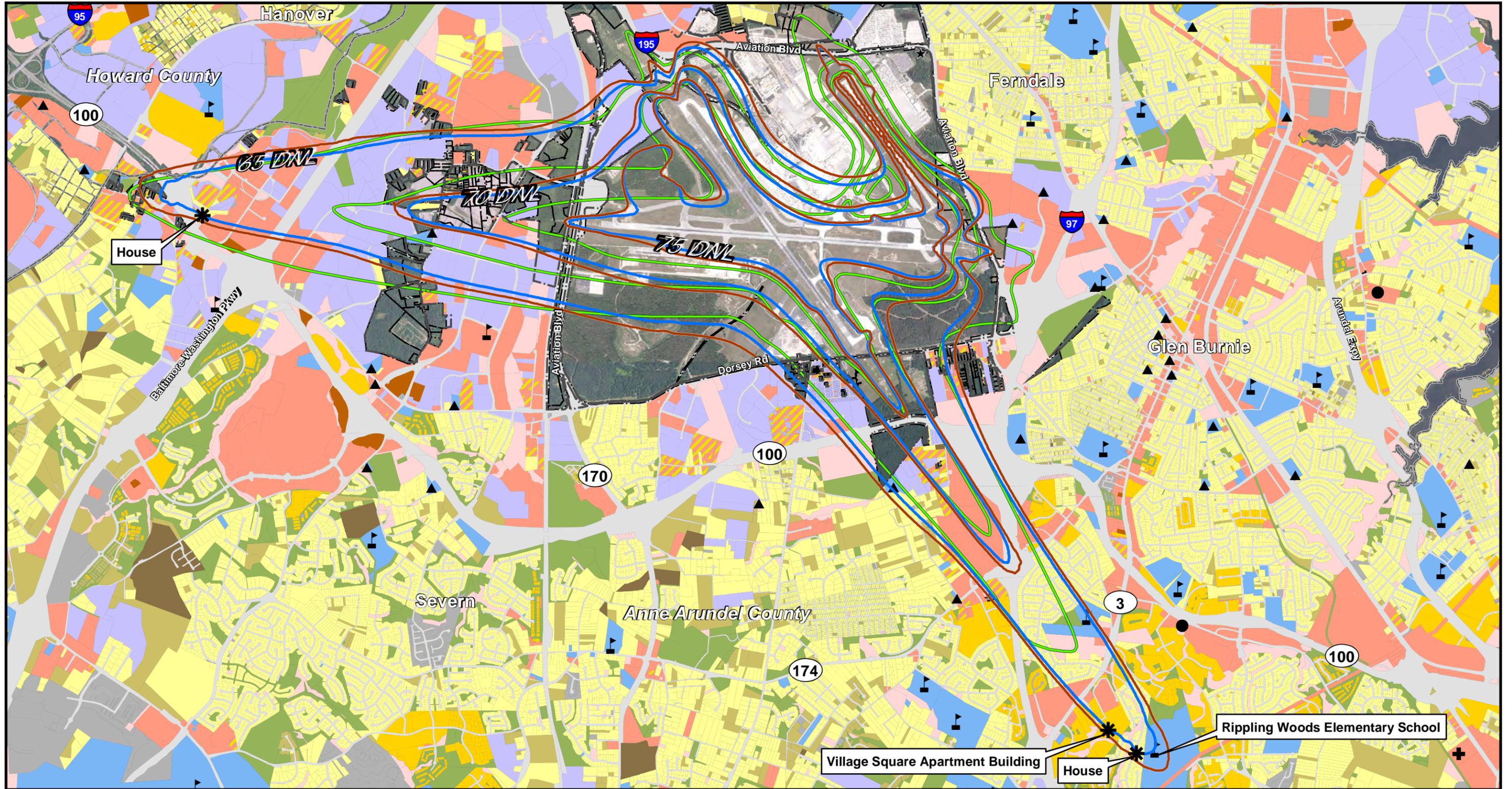
An alternative way of examining the impacts of the Midfield Cargo Project would be to assume that the Midfield Cargo Operator would significantly increase the utilization of the aircraft parking positions far beyond what is projects. This is something it has not achieved in its current operations nor incorporated in the forecast it has made available to MDOT MAA. This level of utilization of the aircraft parking positions would be beyond the utilization rates experienced at other airports. Nevertheless, a more conservative, high growth scenario based on the analysis in Appendix E was developed to address this possibility and test whether there would be any substantial changes from the 1998 EA.

2018 High Growth Scenario Forecast

Table 4.23 shows a high growth scenario in which users of the Midfield Cargo Project are able to generate 10 AAD day aircraft departures or 7,300 annual aircraft departures from the proposed seven additional cargo positions. These operations include both weekday and weekend operations and represent an annual average. Note that this utilization rate would be almost twice as high as the utilization rate in the highest comparable airport, TPA (see Table 4.18). This would result in a total of 21 AAD departures from the Midfield Facility, still less than the 23 AAD departures projected in the 1998 EA High Growth Scenario. Additionally, the High Growth scenario in Table 4.21 assumes quieter, more modern aircraft and a smaller percentage of nighttime departures than the 1998 EA High Growth Scenario based on actual recent usage. Finally, the 2018 High Growth Scenario would generate an airport total of 769.4 AAD operations, compared to the 1046.0 AAD operations (523.0 departures x 2) projected in the 1998 EA High Growth Scenario for the year 2015. Therefore, even a High Growth scenario would still be consistent with the projections developed in the 1998 EA.

Noise Analysis

An AEDT model was created to determine the potential change in contour area for the projected increase in cargo operations specific to the 2018 High Growth Scenario. **Table 4.24** shows the noise area comparisons for the AEDT analysis of the High Growth Scenario and the 1998 EA Proposed Action (Alternative 4R High Growth Scenario, Year 2015), and **Figure 7** shows a comparison of the 2018 No Action (Year 2020), 2018 High Growth Scenario, and 1998 EA Proposed Action (Year 2015) contours. See *Appendix F, Noise (Attachment 3)* for details on the development of the High Growth Scenario contour.



LEGEND

- 2018 No Action Noise Contour (Year 2020)
- 2018 High Growth Scenario Noise Contour
- 1998 Proposed Action Noise Contour (Year 2015)

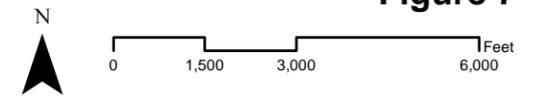
- Hospital
- Nursing Home
- School
- Place of Worship
- Historic Resource
- Table 4.21 Listed Housing Unit

Existing Land Use

- Single Family
- Multi-Family Residential
- Mobile Home
- Transient Lodging
- Public Use
- Recreational Open Space
- Mixed Use
- Commercial Use
- Commercial Use Exempt
- Manufacturing and Production

- Transportation
- Vacant / Undefined
- Undeveloped Zoned Residential
- BWI Airport Property
- County Boundary

High Growth Sensitivity Analysis
Noise Contours with Land Use
Figure 7



Source: Aerial - MDOT MAA (2016), National Park Service, Maryland Department of Planning, Google Earth

Table 4.23
 High Growth Sensitivity Analysis

	2018 No-Action Alternative ¹			Proposed Parking Positions ²			2018 High Growth Scenario ³		
	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures	Total
Daytime									
Heavy Jets	6.8	6.7	13.5	5.0	5.0	10.0	11.8	11.7	23.5
Other Large Jets	264.9	262.2	527.1				264.9	262.2	527.1
Other (Light Jets, GA, Military)	41.6	41.5	83.1				41.6	41.5	83.1
Total	313.3	310.4	623.7	5.0	5.0	10.0	318.3	315.4	633.7
Nighttime									
Heavy Jets	6.3	6.4	12.6	5.0	5.0	10.0	11.3	11.4	22.6
Other Large Jets	50.6	53.3	103.8				50.6	53.3	103.8
Other (Light Jets, GA, Military)	4.6	4.7	9.2				4.6	4.7	9.2
Total	61.4	64.3	125.7	5.0	5.0	10.0	66.4	69.3	135.7
Total									
Heavy Jets	13.1	13.1	26.1	10.0	10.0	20.0	23.1	23.1	46.1
Other Large Jets	315.5	315.5	631.0				315.5	315.5	631.0
Other (Light Jets, GA, Military)	46.2	46.2	92.3				46.2	46.2	92.3
Total	374.7	374.7	749.4	10.0	10.0	20.0	384.7	384.7	769.4

¹ Table 4.16.

² Appendix E, AEDT Noise and Emissions Analysis using General Planning Assumptions.

³ No Action Alternative plus Proposed Midfield Facility operations from Appendix E.

Table 4.24

Noise Analysis – Comparison of the 2018 No Action, 2018 High Growth and 1998 EA Proposed Action Contours

	Year 2020		Year 2015	% Change from 2018 No Action to 2018 High Growth	% Change from 1998 EA Proposed Action to 2018 High Growth
	2018 No Action	2018 High Growth	1998 EA Proposed Action ¹		
Annual Operations	273,562	280,831	381,790	2.7%	-36.0%
Average Annual Day Operations	749.4	759.4	1046.0	2.7%	-36.0%
AEDT 65+ DNL Area (Square Miles)	6.2	6.9	6.6 ²	11.3%	4.5%

Notes: ¹1998 EA Proposed Action (Year 2015) = Alternative 4R High Growth Scenario.

²As digitized from 1998 EA.

Sources:

- (a) Final Environmental Assessment and Finding of No Significant Impact for the Proposed Expansion of Air Cargo Facilities, June 1998.
- (b) HNTB analysis, September 2018

A grid point analysis was completed to determine the noise levels over the same noise sensitive levels analyzed in Table 4.22, but for the 2018 High Growth Scenario contour, as summarized in **Table 4.25**. The analysis determined that the noise increase over these areas as a result of the 2018 High Growth Scenario would be approximately DNL 0.5 dB when compared to the 2018 No Action. This level of increase would not constitute a significant impact because the increases are below DNL 1.5 dB over noise sensitive areas.

Table 4.25

Noise Levels over Noise Sensitive Areas (DNL) –
2018 No Action (Year 2020) vs. 2018 High Growth Scenario (Year 2020)

Noise Sensitive Land Use	2018 No Action (Year 2020)	2018 High Growth Scenario (Year 2020)	1998 EA (Year 2015) ²	Change from 2018 No Action to 2018 High Growth Scenario	Change from 1998 EA Proposed Action to 2018 High Growth Scenario
Rippling Woods Elementary School (South)	65.0	65.5	60-61	0.5	4.5-5.5
Village Square Apartment Building (South) ¹	64.9	65.3	60-61	0.4	4.3-5.3
House (South) ¹	64.9	65.3	60-61	0.6 ³	4.4-5.4
House (West)	65.0	65.4	66	0.4	-0.6

Notes:

¹ The housing units to the south represent the apartment building and house furthest outside the 2018 No Action (Year 2020) contour, but within the 2018 Proposed Action (Year 2020) contour. Both units are within the 2016 Noise Exposure Maps Update DNL 65+ dB contour.

² Exact values at these points are not provided in the 1998 EA, estimated values provided by visual analysis of previous contours.

³ The actual noise increase at the House (South) is DNL 0.5 dB, but due to rounding of noise levels under the 2018 No Action and 2018 High Growth Scenarios, the change is shown as DNL 0.6 dB.

As summarized in Table 4.23 under the 2018 High Growth Scenario (conservative case), the Midfield Cargo Facility could accommodate 9.0 daytime and 7.0 nighttime total departures (4.0 daytime and 2.0 nighttime from existing positions and 5.0 daytime and 5.0 nighttime from proposed positions). The 1998 EA estimated that cargo operations by 2015 at the Midfield Cargo Facility would be approximately 6.4 daytime departures and 16.6 nighttime departures under the high growth scenario, still higher than the 2018 High Growth Scenario (conservative case). In addition, the 2018 No Action and 2018 High Growth Scenario both involve assume operations by modern quieter aircraft. The determination that there are no significant noise impacts associated with development, and in this case, the completion of the Midfield Cargo Facility, remains valid.

Conclusion: There would be no significant impacts to noise and noise-compatible land use associated with the expansion of the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.26
 Summary of Potential Changes to Noise and Noise-Compatible Land Use

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements Proposed Action		
No significant impact.	<p>No significant impact.</p> <p>The total number of aircraft departures and all-cargo aircraft departures in the 2018 Proposed Action are less than had been forecast in the 1998 EA, with the number of nighttime cargo departures being significantly lower in the 2018 Proposed Action. The analysis determined that noise levels over noise sensitive areas increase by approximately 0.2 dB (or less) when comparing the 2018 No Action to the 2018 Proposed Action, which does not constitute a significant impact. Due to changes in runway use over the span of 20 years, there are differences between the shape of the noise contours projected for the 2018 Proposed Action in the year 2020 and the 1998 EA Proposed Action projected for the year 2015. However, the overall area of noise exposure remains consistent between the two analyses at 6.6 square miles. The determination that there are no significant noise impacts associated with the revision to the 1998 EA Proposed Action remains valid.</p>	N	N/A

4.4.10 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

SUMMARY OF 1998 EA – ALTERNATIVE 4R

Alternative 4R in the 1998 (as with all Build Alternatives) would be constructed on airport property and would not divide or disrupt any of the established communities within the area. The 1998 EA determined that expansion of cargo facilities would have a positive impact on the economic growth in the Airport vicinity and the Baltimore metropolitan region. The EA noted that additional employment would be created, regardless of the Build Alternative selected.

Surface Transportation

The EA stated that the Build alternatives would increase traffic volumes on the adjacent roadways, particularly Aviation Boulevard, MD Route 100, Dorsey Road, and I-95, however it was determined that the area roadway network had sufficient capacity to accommodate the increased post-construction traffic volumes. The analysis applied an annual growth rate of 2 percent (consistent with previous traffic projections conducted for Airport activities) to the 1994 Average Daily Traffic (ADT) volumes at the MD Route 170 (Aviation Boulevard) and MD Route 176 (Dorsey Road) intersection and the Aviation Boulevard and I-95 intersection to determine a preliminary Year 2000 traffic volume projection. The proposed project was not likely to increase average annual traffic volumes at either intersection in the future by more than the 2 percent growth rate used for the Year 2000 projects; thus, the project was not anticipated to generate a need for additional roadway or intersection improvements in the short-term, with the exception of possible turning lanes at the facility entrance. Four buildings were included as part of Alternative 4R.

Conclusion: There would be no significant impacts to socioeconomics associated with Build Alternative 4R, therefore, no mitigation measures were required for this project.

MIDFIELD CARGO FACILITY IMPROVEMENTS

The Proposed Action would not cause any impacts to surrounding communities or shift any business or economic activity in the community. No residents or businesses will be relocated as part of the project. The project is restricted to existing Airport property in an existing cargo area. Thus, the project would not disrupt an established community.

The project would not disrupt traffic patterns or substantially reduce the levels of service of roads serving the airport or its surrounding communities. Although there would be an increase in surface vehicle traffic at Aviation Boulevard and Mathison Way, as discussed below in *Surface Transportation*, the level of service (LOS) would operate at an LOS B, which is considered acceptable. Although there are minority and/or low-income populations in the vicinity of the Airport, they are not near the Study Area and no disproportionately high or adverse impacts to minority or low-income populations would occur as a result of the project.

The project would result in indirect socioeconomic benefits related to the increase in employment for construction of the project and operation of the proposed cargo processing building.

Surface Transportation

The Proposed Action would result in added surface vehicle traffic to the intersection of Aviation Boulevard and Mathison Way. A Synchro traffic modeling analysis was completed as part of the *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* (January 2018) for the intersections around the Airport. The analysis indicated that this intersection would operate at an LOS A in both the 2020 and 2025 Proposed Action Alternatives.

An Institute of Transportation Engineers (ITE) trip generation analysis was completed for the proposed building to determine the potential impacts to surface traffic. (The project includes a 200,000-square foot cargo processing building.) The closest land use type provided in ITE trip generation for the cargo processing building was #156 high-cube parcel warehouse. This land use type is for a warehouse that acts as a consolidation point with short term storage (quick turnaround), and a high degree of automation and logistic management, which is similar to the proposed use of the cargo processing building. It was assumed there would be two shifts/day with shift changes occurring at AM and PM roadway peak.

The ITE trip generation analysis resulted in approximately 200 trips in the AM peak (70 in/130 out) and 165 trips in the PM peak (100 in/65 out) at the intersection of Aviation Boulevard and Mathison Way. The trip generation for the proposed buildings was input into the *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* (January 2018) 2020 Proposed Action Alternative Synchro model which indicated that the intersection of Aviation Boulevard and Mathison Way would operate at an LOS B. Per Maryland State Highway Administration (SHA) requirements, operations are considered acceptable at LOS D or better. Therefore, no roadway improvements would be necessary at the intersection due to the increase in trips. The project would not disrupt traffic patterns or substantially reduce the levels of service of roads serving the airport or its surrounding communities.

Construction

No direct or indirect economic impact analysis was conducted for this Technical Report, however it is expected that there would be an increase in the availability of construction jobs during the construction period.

Conclusion: There would be no significant impacts to Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks associated with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.27

Summary of Potential Changes to Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements Proposed Action		
<p>No significant impact.</p> <p>The project was not likely to increase average annual traffic volumes by more than the 2 percent growth rate used for the Year 2000 projects, however no LOS was determined. The project was not anticipated to generate a need for additional roadway or intersection improvements in the short-term, with the exception of possible turning lanes at the facility entrance.</p>	<p>No significant impact.</p> <p>The Midfield Improvements Proposed Action would result in a reduced level of service (from LOS A to LOS B) at the intersection of Aviation Boulevard and Mathison Way.</p>	Y	<p>N/A</p> <p>Per Maryland SHA requirements, operations are considered acceptable at LOS D or better, therefore no mitigation would be necessary at the intersection due to the increase in trips.</p>

4.4.11 VISUAL EFFECTS (INCLUDING LIGHT EMISSIONS)

SUMMARY OF 1998 EA – ALTERNATIVE 4R

The 1998 EA discusses impacts to light emissions under the Energy Supply and Natural Resources section for the Build Alternatives. The Build Alternatives would result in an increase of light emissions from the Airport, however, none of the light sources were expected to significantly increase light emissions to residential uses. The EA noted that shielding and screening techniques would be considered in the construction of the additional air cargo buildings/apron as well as all associated support facilities to minimize any potential impacts on residential areas.

Evaluation of visual effects/impacts was not required for the EA because it was not a resource category identified in FAA Order 1050.1D/5050.4A.

Conclusion: There would be no significant impacts to light emissions associated with Alternative 4R, therefore, no mitigation measures were required for this project.

MIDFIELD CARGO FACILITY IMPROVEMENTS

Light Emission Effects – Additional lighting associated with the project would occur. The midfield cargo improvements may require alterations to existing site and taxiway lighting, however all of the improvements would occur on Airport property and there is already lighting in or around the project areas. The Airport currently has light emissions from aircraft, ground operations, work area lighting and security lighting. Therefore, any additional light from the improvements would not significantly change the light emissions from current conditions. Lighting for the Midfield Cargo Facility would be designed to comply with FAA and airport lighting standards in order to ensure there would be no negative impacts to runway operations or aircraft safety.

The land uses surrounding the Study Area are additional Airport landside facilities with the nearest residential uses located over ½-mile from the project.

Visual Resources and Visual Character – The project would be consistent with the existing cargo area and would not have any visual/aesthetic impacts. The proposed buildings would match existing facilities and would be constructed with similar building materials. It is not anticipated that the project would impact the visual/aesthetic integrity of the area.

Conclusion: There would be no significant impacts from light emissions or visual resources/visual character with the Midfield Cargo Facility Improvements (2018 Proposed Action), therefore, no mitigation measures are required for this project.

Table 4.28

Summary of Potential Changes to Visual Effects (Including Light Emissions)

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements Proposed Action		
No significant impact.	No significant impact. Evaluation of visual effects was not required for the 1998 EA because it was not a resource category identified in FAA Order 1050.1D/5050.4A, however no impacts to Visual Effects (Including Light Emissions) associated with the revision to the 1998 EA Proposed Action.	N	N/A

4.4.12 WATER RESOURCES (WETLANDS, SURFACE WATERS, GROUNDWATER)

SUMMARY OF 1998 EA – ALTERNATIVE 4R

The 1998 EA describes the impacts to *Water Quality and Wetlands* resulting from Alternative 4R.

Water Quality – The EA analyzed impacts of Alternative 4R by drainage area. The analysis noted that the development would result in drainage area diversions and land use changes. The Kitten Branch drainage area would increase by 10.2 acres and would include an additional 50 acres of impervious area from the proposed cargo complex. Stormwater runoff would be directed into a new infiltration basin to handle the increased flow. The new basin would be constructed in the infield area between the proposed north parallel taxiway and Taxiway F. Additionally, infiltration trenches would be installed with level spreading devices to help reduce peak flow.

The Signal Branch drainage area would decrease by 10.7 acres and would include an additional 49 acres of impervious area from the proposed cargo complex. Open channel flow and new infiltration trenches would be utilized where possible. Hawkins Branch would also be impacted by the proposed cargo support area, and stormwater management would potentially include open channel flow and stone check dams.

Alternative 4R also included the stockpiling of approximately 2.4 million cubic yards between the Clark Branch and Hawkins Branch wetland areas. Peak flows through this area would be managed by outlet structures on the sediment basin at the base of the stockpile which would serve as a temporary stormwater management facility.

The 1998 EA identified permit requirements and potential mitigation measures. In accordance with Section 404 of the Clean Water Act (CWA) and the Maryland Nontidal Wetlands Protection Act, a Joint Federal and State Permit Application for the Alteration of any Floodplain, Waterway, Tidal or Nontidal Wetland was submitted to the U.S. Army Corps of Engineers (USACE). In accordance with Section 401 of CWA, a Water Quality Certification (WQC) was obtained by MDE. The Airport’s existing National Pollutant Discharge Elimination System (NPDES) permit was not expected to be revised based on the proposed Alternative 4R.

The analysis references the 1993 BWI Comprehensive Stormwater Management Plan for measures that can be implemented to control stormwater quantity and enhance overall water quality. As a mitigation

measure, the WQC included the condition that the first ½ inch of runoff from new impervious surfaces would be controlled by water quality structures prior to discharge to receiving waters.

Wetlands - The EA analyzed impacts of Alternative 4R on wetlands and streams by drainage area. The analysis states that Alternative 4R would impact 0.2 acres of wetlands and 45 linear feet of stream within the Hawkins Branch and Clark Branch wetland system; 0.9 acres of wetlands and 617 linear feet of stream within the Signal Branch wetlands system; and 0.04 acres of wetlands and 667 linear feet of stream within the Kitten Branch wetland system. A Section 404 Wetlands Permit was obtained from USACE (97-63850, January 9, 1998) and a wetland mitigation feasibility study was conducted on MAA-owned property west of the Airport.

Groundwater – There is no analysis of impacts to groundwater in the 1998 EA. The EA describes the existing groundwater in Anne Arundel County and around BWI Marshall Airport. The EA notes that BWI is located over the Patapsco Aquifer, which is recharged by surface infiltration of precipitation.

Conclusion: Impacts to water quality within Kitten Branch, Signal Branch, Hawkins Branch and Clark Branch due to construction and operation of Alternative 4R would be minimized through design modification and mitigated through stormwater management systems (quantity and quality controls) approved prior to construction. Impacts to wetlands would be mitigated for on an MAA-owned property west of the Airport.

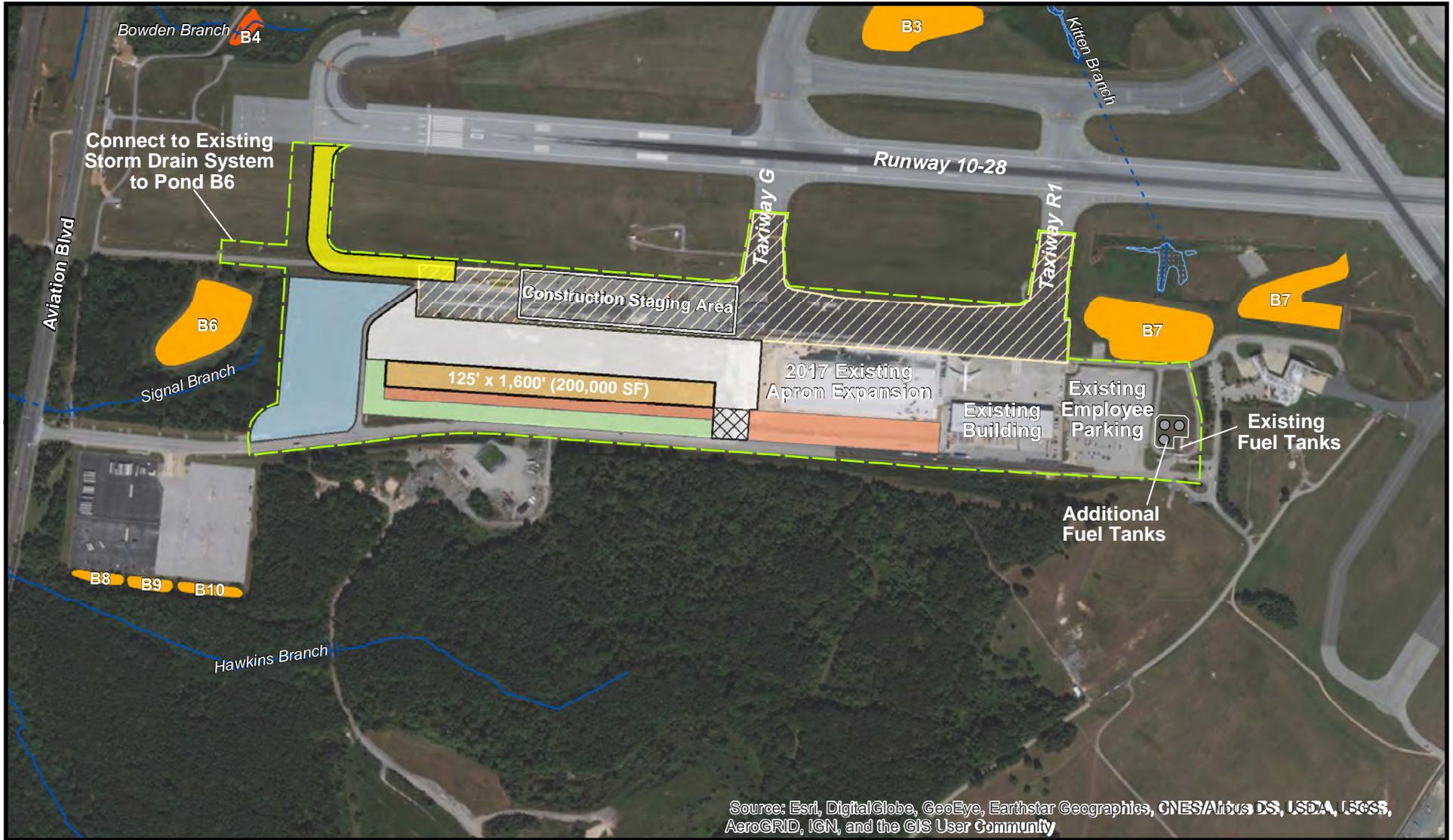
MIDFIELD CARGO FACILITY IMPROVEMENTS

Wetlands - There are no wetlands in or directly adjacent to the Study Area. There are waters of the U.S. (streams) located near the Study Area. The headwaters of Kitten Branch are located to the north of the proposed fuel tank pads, and the headwaters of Signal Branch are located west of the proposed truck staging area. The Proposed Action does not include any impacts to wetlands or streams. Therefore, no permits or mitigation would be required.

Surface Water – Since the completion of the 1998 EA, there have been changes to Maryland's stormwater management regulations. The Maryland *Stormwater Management Act of 2007* (amended in 2009) requires environmental site design (ESD) to the maximum extent practicable (MEP). The Act resulted in the development of updated guidance on implementing the new regulations. The *2000 Maryland Stormwater Design Manual* was revised in May 2009 to reflect the updated regulations. Additionally, MDE published the *Maryland Stormwater Management Guidelines for State & Federal Projects* (April 15, 2010) for further guidance.

Similar to the 1998 EA Alternative 4R, the current Proposed Action includes impacts to multiple drainage areas: Kitten Branch and Signal Branch. As shown on **Figure 8**, Kitten Branch and Pond B7 are located to the northeast of the project area, and Signal Branch and Pond B6 are located to the west of the project area. The project has a footprint of approximately 35.3 acres of new impervious area. The project is located on area that has already been cleared and graded as part of the construction that occurred following the 1998 EA to facilitate ultimate buildout of the site.

The existing Midfield Cargo Facility apron has a high point near the connection with Taxiway G, with area to the east draining to Kitten Branch and area to the west draining to Signal Branch. The majority of the project area (including the new apron, cargo building, and truck staging area) currently drains west via swales before it outfalls into either Pond B6 or directly into Signal Branch. Pond B6 was designed to treat the buildout of the Midfield Cargo Facility and currently has capacity to treat an additional 37.54 acres of impervious area. The project area draining to Kitten Branch (including the proposed fuel tank area, and parking south of the existing apron) currently enters the closed stormwater drainage system either through an inlet or the existing trench drains, where it continues east to outfall into Pond B7. Pond B7 has capacity to treat an additional 2.01 acres of impervious area. Note that the original design for the Midfield Cargo Facility included stormwater management for the anticipated ultimate site development.



LEGEND

- | | |
|--|---|
| Study Area | Mill and Overlay (21.1 Acres) |
| Proposed Apron Pavement (11.0 Acres) | Proposed Truck Staging Area (0.6 Acres) |
| Proposed Building (200,000 SF) | Stream |
| Proposed Truck Parking/Staging Area Pavement (7.6 Acres) | Culverted Stream |
| Proposed Taxiway (2.8 Acres) | 100-Year Floodplain |
| Proposed Vehicle Parking (5.4 Acres) | Stormwater Management Pond |
| Proposed Vehicle Pavement (3.8 Acres) | USACE Jurisdictional Pond |

2018 Proposed Action and Water Resources Figure 8



In accordance with the updated MDE regulations, stormwater management for new development includes implementing ESD to the MEP to provide water quality and quantity treatment of the new impervious area.

Signal Branch

The project would require treatment of approximately 32.0 acres of impervious surface in Signal Branch (an ESD volume of 6.58 ac-ft). The proposed apron expansion area would include a continuation of the trench drain facilities currently located on the apron area to the east. The proposed trench drains would connect to a closed storm drain system, and drain west to connect to the existing storm drain system to outfall into Pond B6. Pond B6 was designed for the ultimate buildout and has capacity to treat an additional 37.54 acres of impervious area. The project area within Signal Branch would be graded to allow all new impervious area runoff to enter a closed storm drain system to outfall into Pond B6. The combination of new trench drains and excess capacity available in Pond B6 could be utilized to meet stormwater quality and quantity treatment requirements in Signal Branch.

Kitten Branch

The project would require treatment of approximately 3.3 acres of impervious surface in Kitten Branch (an ESD volume of 0.68 ac-ft). Runoff from the project area south of the existing apron would enter the existing trench drains or a closed storm drain system and continue east to outfall into Pond B7. Runoff from the proposed fuel tank area would also enter the storm drain system through existing inlets and drain into Pond B7. Pond B7 has capacity to treat an additional 2.01 acres of impervious area. Additional treatment could be provided in infiltration trenches constructed in the open area north of the proposed fuel tank. See **Appendix G, Stormwater** for the calculation of treatment requirements.

Groundwater –There would be no impacts to groundwater as a result of the Proposed Action. There are no sole source aquifers in the vicinity of the Airport and the improvements to the Midfield Cargo Facility would not impact groundwater such that water quality standards set forth by Federal, state, or local agencies would be exceeded or would have the potential to contaminate an aquifer used for public water supply.

Construction

The proposed construction staging area is located on the existing taxiway north of the proposed apron expansion, as shown on Figure 7. If uncontrolled, construction activities have the potential to cause erosion and sedimentation that can impact water quality. Short-term construction impacts would be minimized by strict adherence to erosion and sediment control procedures. BMPs would be used to avoid and minimize any potential impacts to the environment during construction and for the control of stormwater for quantity and quality.

Conclusion: There would be no significant impacts to water resources with the Midfield Cargo Facility Improvements (2018 Proposed Action). MDE SWM requirements would be met through a combination of (1) new trench drain facilities; (2) excess capacity available downstream in Pond B6 (Signal Branch) and Pond B7 (Kitten Branch); and (3) an additional infiltration trench in Kitten Branch. MDE stormwater, and erosion and sediment control permits would be obtained prior to construction.

Table 4.29

Summary of Potential Changes to Water Resources (Wetlands, Surface Waters, Groundwater)

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements Proposed Action		
No significant impact.	<p>No significant impact.</p> <p>The Proposed Action would increase impervious area by 35.3 acres, with 27.9 of those acres within the 1998 EA – Alt 4R impervious area. The remaining 7.4 acres associated with the revision to the Proposed Action are still within the 1998 EA LOD. Stormwater runoff conditions in Signal Branch and Kitten Branch would be similar to the conditions proposed in the 1998 EA for full buildout of the Midfield Cargo area.</p> <p>The Proposed Action would be permittable through the use of existing and proposed stormwater facilities to meet MDE SWM requirements, including existing Pond B6 which was designed for the full build out of the Midfield Cargo area.</p> <p>No other impacts to water resources (from operation or construction) associated with the revision to the 1998 EA Proposed Action.</p>	Y	<p>N/A</p> <p>The change in impervious area from the 1998 EA to the Proposed Action does not require additional mitigation. The Proposed Action would still be permittable and designed to meet MDE SWM requirements.</p>

4.4.13 CUMULATIVE IMPACTS

SUMMARY OF 1998 EA – ALTERNATIVE 4R

The 1998 EA contains a description of the potential cumulative impacts associated with other airfield development projects in the vicinity of the potential cargo development resulting from Alternative 4R. The assessment included review of present, recent past, and reasonably foreseeable actions in the project vicinity. The analysis noted that the other airport projects to be considered cumulatively with the Proposed Action had and would be occurring in previously developed or disturbed areas of BWI Marshall Airport property.

The cumulative impact analysis for each environmental resource concluded that Alternative 4R, when considered with other combined projects, would not contribute to a significant impact to environmental resources.

MIDFIELD CARGO FACILITY IMPROVEMENTS

Rehabilitation of the existing apron and taxilanes is anticipated to occur by the end of 2018. The other improvements associated with the Proposed Action are anticipated to begin in November 2018 and be complete in October 2019 (11 months).

On-Airport Projects

Table 4.30 shows the list of on-airport projects considered for potential cumulative impacts, along with the potential resource categories the project would impact. Note that these projects may or may not occur and even when a timeframe is provided there is no certainty that this project will actually be accomplished.

Table 4.30
BWI Marshall On-Airport Cumulative Projects

Time	Project Name	Year	Potential Impact Categories
Recently Completed (3 years)	Comprehensive Paving Improvements (A)	2011 - 2014	--
	Runway 10-28 Improvements (Including Runway 15R-33L Intersection) (A)	2011-2014	--
	Concourse B/C Connector Improvements (T)	2011 - 2015	--
	Runway 15L-33R FAA Standards Compliance (A)	2012-2015*	--
	International Terminal Bag Screening Improvements (T)	2014-2015*	--
	Homeowner Assistance Program (M)	2012 - 2016	--
	Sheraton Four Points Demolition (L)	2014-2015*	Haz. Mat.
	Runway 15L-33R FAA Improvements (A)	2015*	--
	Runway 15R-33L Improvements (A)	2015*	--
	Runway 10-28 Improvements (as part of Airfield Standards and Pavement Rehabilitation Project) (A)	2015*	--
	Taxiway Uniform (U) Relocation (A)	2015*	--
	Airfield Standards and Pavement Rehabilitation Project (A)	2015*	--
	Expansion of CUP (S)	2015*	--
	On-Airport Roadway Improvements (S)	2015*	--
	Parking Revenue Control System (Maryland CTP)	2015	-
Current (2016-2017)	DC Metroplex Airspace Route and Procedure Changes	2013-2016	AQ, Noise
	Loading Bridge Replacement Program (Maryland CTP)	2014-2017	--
	Conversion of Runway 4-22 into new Taxiway P (Maryland CTP)	2015-2017	--
	Apron Fill at North Cargo Positions F18/F20 (A)	2016-2017	--
	Concourse E (2-Gate Expansion) (Phase 1 of 4-Gate Expansion)	2016-2018	Water
	Concourse D-E Connector (T)	2015-2017*	--
	Stairtower at Concourse B	2017	--
	Midfield Apron Expansion	2017	Water
	Consolidated Rental Car Facility Shuttle Bus Fleet Replacement (Maryland CTP)	2018	AQ
	RTR Relocation	2019	--
	Taxiway T and Pier B Gate Apron Reconstruction (A)	2019	--
	Taxiway B Reconstruction	2019	--
	Demolish and Relocate Taxiway Foxtrot (Stub)	2019	--
	Upgrade BHS at Concourse B-C	2019	--
Expand SWA Concourse A-B BHS	2019	--	

Table 4.30

BWI Marshall On-Airport Cumulative Projects

Time	Project Name	Year	Potential Impact Categories
Future (5 years)	Concourse A Extension (T)	2019	--
	Proposed Improvements 2016-2020 (currently being reviewed environmentally)	2019-2020	AQ, Water, Noise, Section 4(f), Historic
	• Second FBO (S)		
	• Northrop Grumman Hangar (S)		
	• ARFF Expansion Bays (S)		
	• New Airline Maintenance Facility (A)		
	• Runway Deicing Chemical Storage and Access Road (S)		
	• Airport Maintenance Complex Relocation and Consolidation (S)		
	• Relocate Fire Training Facility (S)		
	• Building 113 Demolition (S)		
• Relocate Taxiways R, F, K, L, H, V (A)			
• Taxiway U3 – Phase 1 (A)			
• International Terminal Area Taxiway Fillets/Shoulders (A)			
• New Infill Pavement Near Taxiways T, P and Future P (A)			
• RON Apron (A)			
• Runway 28 Deicing Pad Expansion (A)			
• Obstruction Removal			
• New Sky Bridge C (T)			
• Terminal Roadway Widening and Access Improvements (L)			
• Northwest Quadrant Perimeter Road (L)			
• Runway 15R Deicing Pad Expansion (A)			
• Upper Level Roadway Widening at Concourse E (L)			
• VSR Connector (L)			
	Hotel Construction, Hourly Garage Expansion, and Sky Bridge E (L)	2020	Traffic
	Ramp BC and Pier B and C Gate Apron Rehabilitation/Reconstruction	2021	--
Future (5 years)	Concourse E (2-Gate Expansion) (Phase 2 of 4-Gate Expansion) (T)	Construct or Under Construction by 2020*	Water
	Helipad Relocation (A)		--
	Taxiway Connectors (between Taxiways T-P) (A)		Water
	New Terminal Response Fire Rescue Station (L)		Water, Traffic
	New Air Traffic Control Tower (S)		--
	Service Station Plaza (M)		Water, Haz. Mat.
	Taxiway Uniform (U) 3 – Phase 2 (A)		Water
	Runway 15R-33L Extension (A)	2021-2025*	Water, Noise, Traffic, EJ
	Widening of Taxiway J (A)		Water
	Airline Cargo Demolition		Haz. Mat.
	Demolition of Maintenance Facilities (A)		Haz. Mat.
	Perimeter Road Improvements (A)		--
	Substation Relocations/Expansions (A)		Water

Table 4.30

BWI Marshall On-Airport Cumulative Projects

Time	Project Name	Year	Potential Impact Categories
	Relocation of I-195/Aviation Blvd (L)		Traffic, Water
	Relocation of Light Rail Tracks and Light Rail Station (L)		Traffic
	Daily Garage Expansion (L)		Traffic
	Limo/Bus/Shared Ride Staging (L)		Water
	New Police Station – northeast of existing GA terminal area (L)		Water
	Co-Gen and Chiller Plant Expansion (L)		Haz. Mat.
	Pump Stations (L)		Haz. Mat.
	Bus Staging Fuel Facility (L)		Haz. Mat.
	Hiker/Biker Trail Relocation (L)		EJ, Traffic
	Consolidation of Long-Term Parking Lots (L)		Traffic

Notes:

¹Type of Project: (A) – Airfield and Airside improvements; (T) – Terminal enhancement; (S) – Support facility; (L) – Landside; (P) – Private investment project; (M) – MDOT MAA project; (G) – General Aviation.

*Indicates Project Name and/or Year updated based on Draft BWI Marshall ALP Narrative, January 2015. Construction years may vary as airport planning is ongoing.

Off-Airport Projects

The majority of off-airport projects are related to transportation improvements (roadways, MARC stations, MAGLEV) or mixed-use developments. These projects would likely result in temporary construction related impacts (noise, air, transportation). The government agency responsible for the development of each cumulative project would be responsible for obtaining all necessary approvals and permits to minimize impacts. Off-airport transportation and development projects would generally benefit the surrounding communities, and local/regional economy.

Construction

Any impacts associated with construction of the project would be temporary and below significance thresholds. Permit requirements would be adhered to and would minimize or mitigate any potential temporary impacts due to construction. Temporary pollution controls employed by MDOT MAA could include restricting open burning; wetting of active equipment work areas; covering of all trucks hauling loose materials; stabilizing materials, mulch, sandbags, slope drains, sediment checks, artificial covering, and berms. All applicable local, state, and Federal environmental construction controls should be incorporated into the specifications and construction plans necessary for the individual cumulative projects. Further, the noise, emissions and traffic analyses all incorporated both project emissions and expected background emissions that would account for cumulative effects. As the project would only include minor temporary impacts during construction and would not result in any significant impacts to any of the environmental resource categories, the project, when combined with past, present or reasonably foreseeable future actions, would not result in any significant cumulative impacts.

Operations

Any cumulative impacts associated with additional operations related to the Midfield Cargo Facility Improvements (2018 Proposed Action) are inherently cumulative, as the technical analyses conducted for this Technical Report include all of the other non-project operations. Specifically, the noise, air quality, and traffic analyses conducted incorporate the Airport’s, FAA’s, and/or the State’s planning assumptions for growth in future operations at BWI Marshall Airport, as well as new infrastructure and airspace procedures.

The noise and air quality analyses were based on noise contours and air quality baseline emissions that were the subject of extensive comments by the public regarding airspace changes and cumulative noise in early 2018, as well as responses to these comments¹⁴. As the Midfield Cargo Facility Improvements project would not result in any significant impacts to any of the environmental resource categories, the project, when combined with past, present or reasonably foreseeable future actions, would not result in any significant cumulative impacts.

Conclusion: Based on the types of cumulative projects planned at BWI Marshall Airport and for the area surrounding the Airport, MDOT MAA has concluded that the implementation of the Proposed Action, when combined with past, present or reasonably foreseeable future actions, would not result in any significant cumulative impacts along with the cumulative projects would not result in a significant cumulative impact.

Table 4.31

Summary of Potential Changes to Cumulative Impacts

Impacts		Change (Y/N)	If yes, proposed mitigation
1998 EA Alternative 4R	Midfield Improvements Proposed Action		
No significant impact.	No significant impact.	N	N/A

Independent Utility

The proposed project has independent utility as construction of the project is not dependent on subsequent phases or projects. Per 40 CFR 1508.25(a) the proposed project is an unconnected single action in that it will not automatically trigger another action; the construction can proceed without other previous or simultaneous actions; and no other actions are necessary to justify the project. Specifically, this project is fully independent of all other proposed projects at the airport (see Table 5.20). It does not depend on any of these projects (e.g., passenger terminal improvements, passenger carrier maintenance, general aviation facilities, runway deicing fluid facilities, etc.) for its justification nor does it require any of these projects to be implemented. None of the future projects listed in Table 5.20 relate to cargo facility improvements in the midfield. Similarly, none of these other projects rely on this Midfield Cargo Facility Improvement project for their justification or implementation. Further, the project does not overlap geographically with other proposed or ongoing projects or affect reasonable alternatives to them.

5. MITIGATION

This chapter identifies the construction mitigation measures the MDOT MAA proposes in order to reduce or minimize the environmental impacts identified in this Technical Report. The following explanations describe each measure's benefits by noting how the measure would avoid or reduce the adverse environmental effects during construction.

Air Quality

Although construction-related emissions associated with the proposed project would not impact air quality or violate air quality standards during construction and would be temporary in duration, these emissions would be further reduced by employing the following measures: Reduction of exposed erodible surface area through appropriate materials and equipment staging procedures; Cover of exposed surface areas with pavement or vegetation in an expeditious manner; Reduction of equipment idling times; Ensure contractor knowledge of appropriate fugitive dust and equipment exhaust controls; Soil and stock-pile

stabilization via cover or periodic watering; Use of low- or zero-emissions equipment; Use of covered haul trucks and conveyors during materials transportation; Reduction of electrical generator usage, wherever possible; Suspension of construction activities during high-wind conditions; Creation of dust, odor and nuisance reporting system; Daily watering of exposed surfaces and demolition activities; Reduction of vehicles speeds onsite; and Prohibition of open burning for waste disposal.

Biological Resources

In accordance with the BWI Marshall Wildlife Hazard Management Plan (WHMP) (Approved April 25, 2018), habitat management control efforts would be implemented to actively reduce wildlife attractions to the project areas during and after construction.

Hazardous Materials, Solid Waste and Pollution Prevention

If contaminated soils or hazardous wastes are encountered during construction and cannot be aerated, they would be disposed of at a licensed facility in accordance with State and local regulations for any disposal of materials.

Any solid waste generated during construction and operation of the project would be properly disposed of in a manner compliant with all federal, State, and local regulations at a permitted solid waste facility, or recycled, if possible. Airport waste is generally hauled to the Millersville Landfill, located approximately 10 miles from BWI Marshall Airport, however it is dependent on the waste hauler chosen for the project.

Historical, Architectural, Archeological, and Cultural Resources

If during construction, any unmarked burial sites, or prehistoric or historic artifacts are encountered, construction would stop and the MAA would follow the procedures established in the BWI Marshall Airport HPP.

Noise and Noise-Compatible Land Use

Noise during construction would be short-term in nature, lasting for the duration of construction activities. Temporary noise impacts would be generally localized at the vicinity of the construction site and the localized increase in noise levels would not disrupt normal airport operations or activities.

Water Resources

If uncontrolled, construction activities have the potential to cause erosion and sedimentation that can impact water quality. Short-term construction impacts would be minimized by strict adherence to erosion and sediment control procedures. BMPs would be used to avoid and minimize any potential impacts to the environment during construction and for the control of stormwater for quantity and quality.

6. REQUIRED PERMITS AND NOTIFICATIONS

- MAA Building Permit
- MAA Airport Zoning Permit
- FAA 7460/Construction Safety and Phasing Plan (CSPP) approval
- NPDES Construction General Permit
- MDE Stormwater Management and Erosion and Sediment Control Permit

7. AGENCY AND PUBLIC INVOLVEMENT

7.1 AGENCY COORDINATION

Coordination with the MHT and the MDE Coastal Consistency Coordinator was conducted for the Proposed Action to ensure that updates to impacts for these resource categories remained valid. Agency coordination documentation is included in the appendices identified within the relevant resource category section.

7.2 PUBLIC INVOLVEMENT

The designation of the land use and the development of improvements for use of the Midfield as a cargo area had extensive public involvement and opportunities for comment through the 1998 EA. The current project reflects implementation of that planning process. It does not create any new or unanticipated use of the Midfield Cargo Facility.

In accordance with FAA Order 1050.1F, Re-Evaluations should be reviewed internally and may be made public at the discretion of the FAA, however no public notification is required. Following completion of the Written Re-Evaluation by the FAA (and any subsequent analysis, if any, that FAA conducts), it will be posted for public disclosure (notice) on the MDOT MAA website.

8. CONCLUSION

Based on the analysis presented in *Section 4.4*, there are no meaningful differences of impacts to any environmental criteria between the 1998 *Final Environmental Assessment (EA) for the Proposed Expansion of Air Cargo Facilities at BWI Marshall Airport* and the proposed Midfield Cargo Facility Improvements (Proposed Action). All impacts and mitigation efforts identified in the 1998 EA that pertain to the Proposed Action have been updated to incorporate new federal, state and local guidance.

NOTES

¹ MAA, BWI Master Plan Technical Report, 2011, p. 1-120 through 1-128.

² Includes both freight and mail volumes, MAA Monthly Statistical Report Summaries

³ MAA, *Final Environmental Assessment (EA) for the Proposed Expansion of Air Cargo Facilities at BWI Marshall Airport*, May 1998, pp. II-12 through II-14.

⁴ MAA, *Final Environmental Assessment (EA) for the Proposed Expansion of Air Cargo Facilities at BWI Marshall Airport*, May 1998, pp. II-12 through II-14.

⁵ MAA, *Final Environmental Assessment (EA) for the Proposed Expansion of Air Cargo Facilities at BWI Marshall Airport*, May 1998, pp. I-15.

⁶ MAA, *Final Environmental Assessment (EA) for the Proposed Expansion of Air Cargo Facilities at BWI Marshall Airport*, May 1998, p. I-15.

⁷ MAA, *Final Environmental Assessment (EA) for the Proposed Expansion of Air Cargo Facilities at BWI Marshall Airport*, May 1998, p. I-15.

⁸ The 1998 EA LOD encompassed three areas: the proposed taxiway area north of Runway 10-28, the Midfield Cargo Area, and the stockpile area. The current Proposed Action is limited to the Midfield Cargo Area LOD and therefore this is the only 1998 EA LOD discussed and shown on Figure 4.

⁹ FAA Order 1050.1F Desk Reference (July 2015), p. 3-1, http://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/faa_nepa_order/desk_ref/media/3-climate.pdf, accessed 9/8/16.

¹⁰ At the time MDOT MAA initiated coordination with MDE for the project, the MDOT MAA believed the project was to be environmentally reviewed using a Categorical Exclusion to fulfill NEPA requirements. In cooperation with the FAA, it was subsequently determined that a Re-Evaluation of the 1998 EA was a more appropriate means to fulfill NEPA requirements. Additionally, note that coordination with the MDE originally included a project that has since been eliminated from the Proposed Action (proposed gravity pipe with glycol collection tanks).

¹¹ <http://www.soilsafe.com/index.php/facilities/brandywine> (accessed 9/18/18).

¹² At the time MDOT MAA initiated coordination with MHT for the project, the MDOT MAA believed the project was to be environmentally reviewed using a Categorical Exclusion to fulfill NEPA requirements. In cooperation with the FAA, it was subsequently determined that a Re-Evaluation of the 1998 EA was a more appropriate means to fulfill NEPA requirements. Additionally, note that coordination with the MHT originally included a project that has since been eliminated from the Proposed Action (proposed gravity pipe with glycol collection tanks).

¹³ The independent study is referenced in the 1989 BWI NCP (Sec. 4.5 pg. 170), as "Aircraft Noise Impact on Anne Arundel County Public Schools In the Vicinity of BWI Airport."

¹⁴ The *Draft EA and Section 4(f) Determination for Proposed Improvements 2016-2020 at BWI Marshall Airport* (January 2018) received extensive comments on the impacts to the community due to implementation of the D.C. Metroplex Project. Confirmation of the incorporation of the D.C. Metroplex proposed procedures into the noise analysis included in the Draft EA and Section 4(f) Determination was undertaken to respond to these comments. The Draft EA and Section 4(f) Determination is expected to be re-issued in early 2019 with responses provided to comments on this topic which clarify the incorporation of the D.C. Metroplex project within the noise analysis for the years 2016, 2020 and 2025.

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