

## 5 Environmental Consequences

This chapter of the Environmental Assessment (EA) discusses the potential environmental impacts that could result from implementation of the Proposed Action and the No Action Alternative on all relevant environmental resource categories described in Appendix A of Federal Aviation Administration (FAA) Order 1050.1E, Change 1 (FAA Order 1050.1E). Both the Proposed Action and No Action Alternative were evaluated under forecasted 2013 conditions, the first year of implementation for the Proposed Action, and under forecasted 2018 conditions, five years after the expected implementation of the Proposed Action. This impact evaluation includes consideration of the direct, indirect, and cumulative effects associated with the Proposed Action and No Action Alternative, as required under FAA Order 1050.1E.

Potential environmental impacts are identified for the environmental resource categories described in Section 4.3. Neither the Proposed Action nor the No Action Alternative would involve land acquisition; physical changes to the environment resulting from ground disturbance or construction activities; changes in patterns of population movement or growth, increases in public service demands, or business and economic activity; or generation, disturbance, transportation, or treatment of hazardous materials. Therefore, neither alternative would be expected to result in impacts to certain environmental resource categories (please see Section 4.2 for a list of excluded categories). The excluded environmental resource categories are not further discussed in this chapter.

**Table 5-1** identifies the environmental impact categories analyzed in this EA, the thresholds of significance used to determine the potential for impacts, and a side-by-side comparative summary of the potential environmental impacts resulting from implementation of the Proposed Action and No Action Alternative.

**Table 5-1 Summary of Potential Environmental Impacts (1 of 2)**

Environmental Impact Category	Threshold of Significance	Impact?	
		2013	2018
Noise	A significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe.	No	No
Compatible Land Use	A significant noise impact would occur if analysis shows that the proposed action will cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe.	No	No

**Table 5-1 Summary of Potential Environmental Impacts (2 of 2)**

<b>Environmental Impact Category</b>	<b>Threshold of Significance</b>	<b>2013</b>	<b>2018</b>
Department of Transportation Act, Section 4(f) Resources	A significant impact would occur pursuant to NEPA when a proposed action either involves more than a minimal physical use of a section 4(f) property or is deemed a "constructive use" substantially impairing the 4(f) property, and mitigation measures do not eliminate or reduce the effects of the use below the threshold of significance (e.g., by replacement in kind of a neighborhood park). Substantial impairment would occur when impacts to section 4(f) lands are sufficiently serious that the value of the site in terms of its prior significance and enjoyment are substantially reduced or lost.	No	No
Historic and Cultural Resources	A significant impact would occur when an action adversely affects a protected property and the responsible FAA official determines that the information from the State and/or Tribal Historic Preservation Officer addressing alternatives to avoid adverse effects and mitigation warrant further study	No	No
Wildlife (Avian and Bat Species)	A significant impact to federally-listed threatened and endangered species would occur when the FWS or NMFS determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of Federally-designated critical habitat in the affected area. An action need not involve a threat of extinction to federally listed species to meet the NEPA standard of significance. Lesser impacts including impacts on non-listed species could also constitute a significant impact.	No	No
Environmental Justice	A significant impact would occur if there were disproportionately high and adverse human health or environmental effects on minority and low-income populations.	No	No
Energy Supply (Aircraft Fuel)	A significant impact would occur When an action's construction, operation or maintenance would cause demands that would exceed available or future (project year) natural resources or energy supplies and the responsible FAA official determines that additional analysis in an EIS is necessary	No	No
Air Quality	Potentially significant air quality impacts associated with an FAA project or action would be demonstrated by the project or action exceeding one or more of the NAAQS for any of the time periods analyzed.	No	No
Greenhouse Gases and Climate Change	No significance thresholds have been established.	No	No
Visual Impacts	No significance thresholds have been established.	No	No

Source: FAA Order 1050.1E, Chg 1, Appendix A; ATAC Corporation, April 2013.  
Prepared By: ATAC Corporation, June 2013.

The following sections describe the impact findings for each environmental resource category, followed by a discussion of potential cumulative impacts. In summary, no significant impacts to any environmental resource category has been identified.

## 5.1 Noise

This section discusses the analysis of aircraft noise exposure under the Proposed Action and the No Action Alternative under both 2013 and 2018 conditions. This discussion includes identification of the differences in noise exposure between the Proposed Action and the No Action Alternative. This comparison is used to determine if implementation of the Proposed Action would result in significant noise impacts. Additional information on noise metrics and the basics of noise can be found in **Appendix E**. The *DC OAPM Noise Technical Report*, providing detailed information on the noise analysis prepared for the DC OAPM Project is available by request (refer to **Appendix C** for contact information).

### 5.1.1 Summary of Impacts

Aircraft noise exposure was modeled for both the Proposed Action and the No Action Alternative under 2013 and 2018 conditions. The noise analysis demonstrates that noise exposure resulting from implementation of the Proposed Action would not result in a day-night average sound level (DNL) increase of 1.5 dBA or higher in noise sensitive areas exposed to DNL 65 dB or higher. Therefore, the Proposed Action would not result in significant noise impacts.

### 5.1.2 Methodology

The noise analysis evaluated noise exposure to communities within the General Study Area generated by aircraft forecasted to be operating under an Instrument Flight Rules (IFR) filed flight plan (IFR-filed) in areas between the surface and up to 10,000 feet above ground level (AGL). IFR-filed aircraft activity was forecasted for the years 2013 and 2018 and used to model conditions under both the Proposed Action and the No Action Alternative. Noise modeling was conducted using the Noise Integrated Routing System (NIRS) Version 6.1, the FAA's noise model for projects involving air traffic changes over broad areas.

If the Proposed Action is approved, FAA expects to begin and complete implementation in 2013; therefore, aircraft noise modeling was completed for 2013 and five years later (2018) as required by FAA Order 1050.1E. Future year noise exposure levels modeled for the Proposed Action and the No Action Alternative were compared to determine whether there is a potential for noise impacts.

Under both 2013 and 2018 conditions, the Proposed Action and the No Action Alternative have the same number and type of aircraft operations. The Proposed Action does not include development or construction of facilities, such as runways or terminal expansions that would be necessary to accommodate an increase in aviation activity; therefore, no additional growth in operations is anticipated. The noise analysis reflects the change in noise exposure resulting from the proposed changes in aircraft routes (i.e., flight tracks) under the Proposed Action compared to the No Action Alternative.

Detailed information on IFR-filed aircraft operations within the General Study Area was assembled for input into NIRS, and included the following:

**Average Annual Day IFR-Filed Aircraft Flight Schedules:** The IFR-filed aircraft flight schedules identify arrival and departure times, aircraft types, and origin/destination information for an average annual day (AAD) in 2013 and in 2018. The AAD represents all the aircraft operations for every day in a study year divided by 365, the number of days in a year. The AAD does not reflect a particular day, but is meant to represent a typical day over a period of a year. The forecast was based on the FAA's 2012 Terminal Area Forecast (TAF),<sup>56</sup> modified for 2013 and 2018 with additional details using previously identified arrival/departure times, aircraft types, and origin/destination information. For 2013, a total of 3,021 AAD IFR operations were modeled for all Study Airports. For 2018, a total of 3,390 AAD IFR operations were modeled for all Study Airports.

**Flight Tracks:** The flight tracks used in modeling were based on radar data collected for the existing conditions (2011) noise analysis and information provided by FAA Air Traffic Control (ATC) personnel. Aircraft routings under both the Proposed Action and the No Action Alternative are depicted on **Exhibits 3-7** through **3-24** in Chapter 3, Alternatives. For the Proposed Action, flight tracks were developed from the aircraft procedures created by the DC OAPM Design & Implementation (D&I) Team using the Terminal Area Route Generation, Evaluation, Traffic and Simulation (TARGETS) program. The majority of the No Action Alternative modeled flight tracks are based on the existing conditions noise analysis. The flight tracks for amended or new procedures that are part of the No Action Alternative were modeled based on input from ATC subject matter experts who developed the procedures.

**Runway Use:** Runway use percentages were identified for all runways at the Study Airports. Forecasted aircraft operations were assigned to particular runways representing operating conditions at the Study Airports under Proposed Action and No Action Alternative conditions. The Proposed Action Alternative was not expected to change runway use patterns at the Study Airports compared to the No Action Alternative.

More detail related to the development of the NIRS model input files is provided in the *DC OAPM Noise Technical Report*, which is available upon request (please see **Appendix C** for contact information).

As discussed in Section 4.3.1.1, the NIRS model was used to compute DNL values for 2013 and 2018 Proposed Action and No Action Alternative conditions at three sets of data points throughout the General Study Area:

1. 222,656 2010 Census block centroids, of (126,316 centroids represent areas with population and the remaining 96,340 centroids represent areas with no population);
2. 4,433 uniform grid points at 0.5-nautical mile intervals on a uniform grid covering the General Study Area and used to calculate DNL values at potential Department of Transportation (DOT) Act, Section 4(f) resources and historic sites; and,
3. 14,395 unique points representing Section 4(f) resources and historic sites too small to be captured in the uniform grid.

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<sup>56</sup> Federal Aviation Administration, Terminal Area Forecast (2012)( <https://aspm.faa.gov/main/taf.asp>)(Accessed March 2013.)

As discussed in Section 4.3.1.1, Section 14, paragraph 14.5e of Appendix A to FAA Order 1050.1E, requires analysis of aircraft noise using the DNL metric. **Table 5-2** provides the criteria used to assess the changes in aircraft noise exposure attributable to the Proposed Action compared with the No Action Alternative. FAA Order 1050.1E describes an increase of DNL 1.5 dB at a noise sensitive land use (e.g., residences, schools, etc.) exposed to aircraft noise of DNL 65 dB or higher under the Proposed Action as a significant impact. For example, an increase from 63.5 dB to 65 dB is considered a significant impact.

In addition, in response to a recommendation made in 1992 by the Federal Interagency Committee on Noise (FICON), FAA Order 1050.1E also recommends that in instances where there are increases of DNL 1.5 dB or more at noise sensitive locations in areas exposed to aircraft noise of DNL 65 dB and higher, that noise increases of DNL 3 dB or more in areas exposed to aircraft noise between DNL 60 dB and 65 dB should also be evaluated and disclosed. It is important to note that increases of DNL 3 dB in areas exposed to aircraft noise below DNL 65 dB are not considered “significant impacts” but are to be considered in the environmental evaluation of a proposed project.

FAA Order 1050.1E also stipulates that changes in exposure of DNL 5 dB or greater in areas exposed to aircraft noise between DNL 45 dB and 60 dB should be considered for airspace actions, such as changes to air traffic routes. This threshold was established in 1990, following issuance of an FAA noise screening procedure to evaluate whether certain airspace actions above 3,000 feet AGL might increase DNL levels by DNL 5 dB or more. The noise screening procedure was prepared as a result of FAA experience that indicates that increases in noise of DNL 5 dB or more at cumulative levels well below DNL 65 dB could be disturbing to people and become a source of public concern.

**Table 5-2 Criteria for Determining Impact of Changes in Aircraft Noise**

DNL Noise Exposure Level	Increase in DNL with Proposed Action	Aircraft Noise Exposure Change Consideration
DNL 65 and higher	DNL 1.5 dB or more <sup>1/</sup>	Exceeds Threshold of Significance
DNL 60 to 65	DNL 3.0 dB or more <sup>2/</sup>	Considered When Evaluating Air Traffic Actions
DNL 45 to 60	DNL 5.0 dB or more <sup>3/</sup>	Information Disclosed When Evaluating Air Traffic Actions

*Notes:*

- <sup>1/</sup> Source FAA, Order 1050.1E, Appendix A, Paragraph 14.3; Title 14 C.F.R. Part 150.21 (2)(d); and Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Issues, August 1992.
- <sup>2/</sup> Source FAA Order 1050.1E, Appendix A, Paragraphs 14.4c and 14.5e; and Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Issues, August 1992.
- <sup>3/</sup> Source FAA Order 1050.1E, Appendix A, Paragraph 14.5e.

Source: FAA Order 1050.1E, Appendix A. June 8, 2004.  
Prepared By: ATAC Corporation, March 2013.

### 5.1.3 Potential Impacts – 2013

**Table 5-3** summarizes the results of the noise analysis for 2013 conditions. The results indicate that the Proposed Action when compared to the No Action Alternative would not result in a DNL 1.5 dBA or higher increase in noise in sensitive areas exposed to DNL 65 dB or higher. Furthermore, no population would experience a reportable noise increase in areas exposed to DNL between 60 dB and 65 dB. However, a total of 17,445 people, associated with 252 population centroids located west of RIC would experience a DNL 5 dB increase in areas exposed to DNL between 45 dB and 60 dB. This reportable noise

increase is attributable to aircraft operating on the KALLI ONE SID, which includes a level segment for the first waypoint on the procedure that requires aircraft to be at 5,000 feet. The level segment is required to ensure aircraft are safely separated from aircraft operating above KALLI ONE. Not all departures from RIC heading west would remain level over the waypoint. If there are no aircraft present above KALLI ONE, RIC departures would be instructed to continue the climb. The reportable noise increase is associated with those aircraft forecasted to stay level above the first waypoint.

**Exhibit 5-1** shows the location of the population centroids that would experience the reportable noise increase under 2013 conditions. Although there is a reportable noise increase in 2013, these results indicate that the Proposed Action would not result in a significant noise exposure impact on population exposed to DNL 65 dB or higher levels under the Proposed Action. Detailed information on the population centroids that would experience a reportable noise increase is provided in **Appendix H**.

**Table 5-3 Change in Potential Population Exposed to Aircraft Noise - 2013**

DNL Noise Exposure Level Under the Proposed Action	Increase in DNL with the Proposed Action	Population Exposed to Noise that Exceeds the Threshold
DNL 65 and higher	DNL 1.5 dB or greater	0
DNL 60 to 65	DNL 3.0 dB or greater	0
DNL 45 to 60	DNL 5.0 dB or greater	17,445

Source: 2010 U.S. Census (population centroid data), August 2012; ATAC Corporation, April 2013 (NIRS modeling results).

Prepared By: ATAC Corporation, April 2013.

### 5.1.4 Potential Impacts – 2018

Potential impacts were also evaluated under 2018 conditions for both the Proposed Action and No Action Alternative using the same methodology and criteria employed to analyze impacts under 2013 conditions. **Table 5-4** summarizes the results of the noise change analysis prepared for 2018.

The noise analysis results indicate that the Proposed Action when compared to the No Action Alternative would not result in a DNL 1.5 dBA or higher increase in sensitive areas exposed to DNL 65 dB or higher. In addition, no population would be exposed to reportable noise increases between DNL 60 dB and 65 dB. However, a total of 20,239 people associated with 290 population centroids would experience a DNL 5 dB increase in areas exposed to DNL between 45 dB and 60 dB. All the population centroids with the exception of one are located to the west of RIC. The reportable noise increases for the population centroids located west of RIC are attributable to aircraft operating on the KALLI ONE SID in the same way as described under 2013 conditions.

The reportable noise increase associated with the single centroid located to the east of RIC is attributable to aircraft operating on the LUCYL ONE SID. In particular, the noise increase can be attributed to a shift and concentration of departure traffic to the TEAZZ waypoint, approximately 12 nmi northeast of RIC.

**Exhibit 5-2** shows the location of the population centroids that would experience the reportable noise increase. Although there is a reportable noise increase in 2018, these results indicate that the Proposed Action would not result in a significant noise exposure impact on population exposed to DNL 65 dB or higher levels under the Proposed Action.

Detailed information on the population centroids that would experience a reportable noise increase is provided in **Appendix H**.

**Table 5-4 Change in Potential Population Exposed to Aircraft Noise - 2018**

<b>DNL Noise Exposure Level Under the Proposed Action</b>	<b>Increase in DNL with the Proposed Action</b>	<b>Population Exposed to Noise that Exceeds the Threshold</b>
DNL 65 and higher	DNL 1.5 dB or greater	0
DNL 60 to 65	DNL 3.0 dB or greater	0
DNL 45 to 60	DNL 5.0 dB or greater	20,239

Source: 2010 U.S. Census (population centroid data), August 2012; ATAC Corporation, April 2013 (NIRS modeling results).

Prepared By: ATAC Corporation, April 2013.

## **5.2 Compatible Land Use**

This section discusses potential impacts to compatible land use under the Proposed Action and the No Action Alternative.

### **5.2.1 Summary of Impacts**

Under both the Proposed Action and No Action Alternative, there would be no changes in aircraft noise exposure that would exceed the FAA's significance thresholds for noise impacts on people. Therefore, neither the Proposed Action nor the No Action Alternative would result in compatible land use impacts.

### **5.2.2 Methodology**

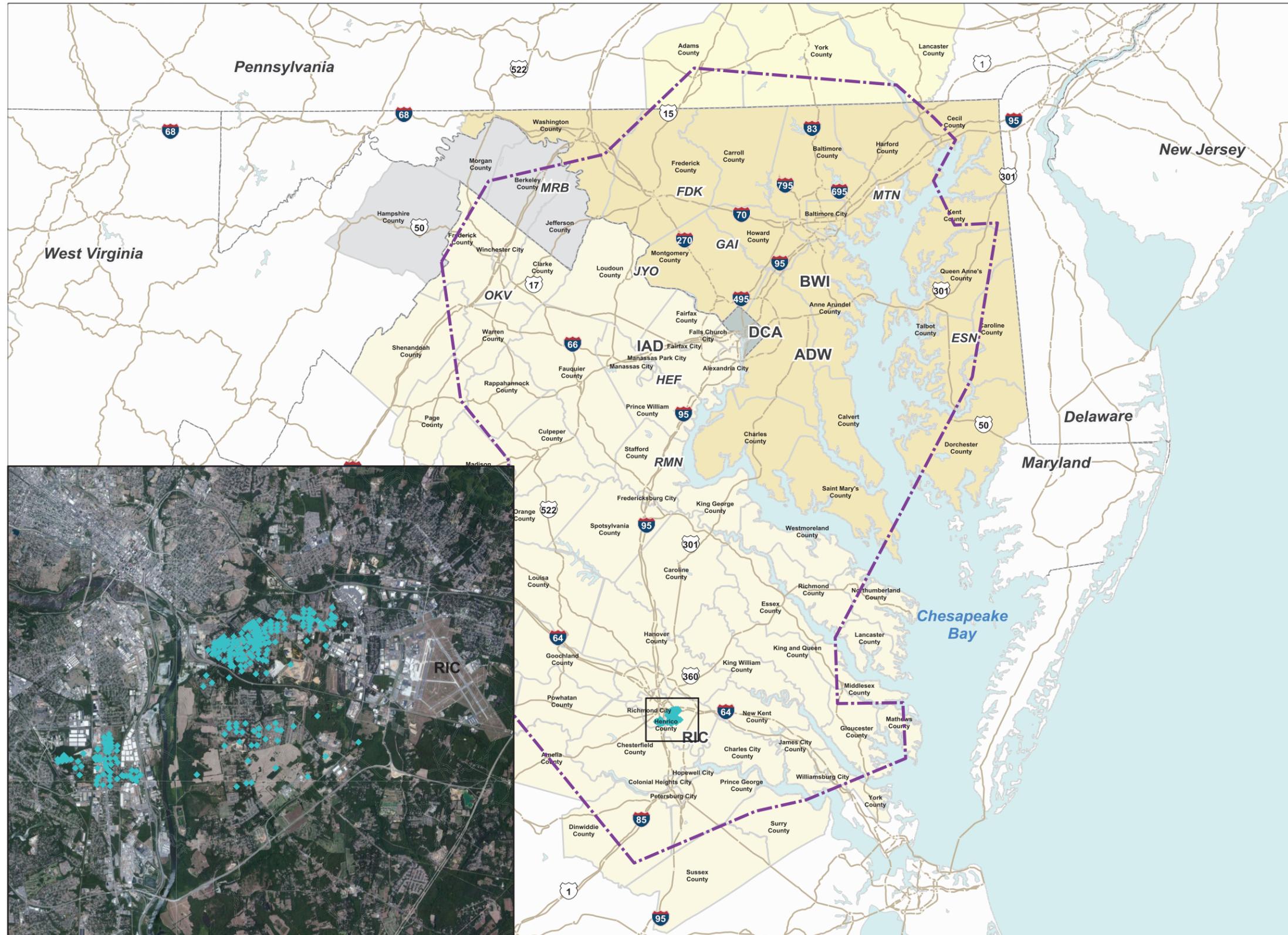
Potential impacts to compatible land use were focused on changes in aircraft noise exposure resulting from implementation of the Proposed Action. FAA Order 1050.1E states, "The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts.... If the noise analysis ... concludes that there is no significant impact, a similar conclusion usually may be drawn with respect to compatible land use." (FAA Order 1050.1E, Appendix A, Sec, 4,1.a.) Accordingly, the compatible land use analysis relies on changes in aircraft noise exposure between the Proposed Action and the No Action Alternative (discussed in Section 5.1), as the basis for determining compatible land use impacts within the General Study Area.

### **5.2.3 Potential Impacts – 2013 and 2018**

As stated in Section 5.1, the Proposed Action, when compared with the No Action Alternative, would not result in changes in aircraft noise exposure in 2013 or 2018 that would exceed FAA's significance thresholds. Therefore, the Proposed Action would not result in significant compatible land use impacts.

Under the No Action Alternative, there would be no changes to air traffic routing in the General Study Area and no changes in aircraft noise exposure would be anticipated to occur in either 2013 or 2018. Therefore, the No Action Alternative would not result in significant compatible land use impacts.

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**LEGEND**

- General Study Area
- District of Columbia
- Maryland County in Study Area
- Pennsylvania County in Study Area
- Virginia County in Study Area
- West Virginia County in Study Area
- State Boundary
- U.S. and Interstate Highways
- Water
- Population centroids experiencing a DNL 5.0 dB increase in areas exposed to DNL 45 dB - 60 dB

Notes:  
The electronic version of this document is zoomable.

- DCA Ronald Reagan Washington National Airport
- IAD Washington Dulles International Airport
- BWI Baltimore Washington International Airport
- ADW Andrews Air Force Base
- RIC Richmond International Airport
- MTN Martin State Airport
- ESN Easton/Newnam Field
- FDK Frederick Municipal Airport
- GAI Montgomery County Airpark
- RMN Stafford Regional Airport
- JYO Leesburg Executive Airport
- HEF Manassas Regional Airport
- OKV Winchester Regional Airport
- MRB Eastern West Virginia Regional Airport

Projection: Lambert Conformal Conic  
Scale: 1,750,000

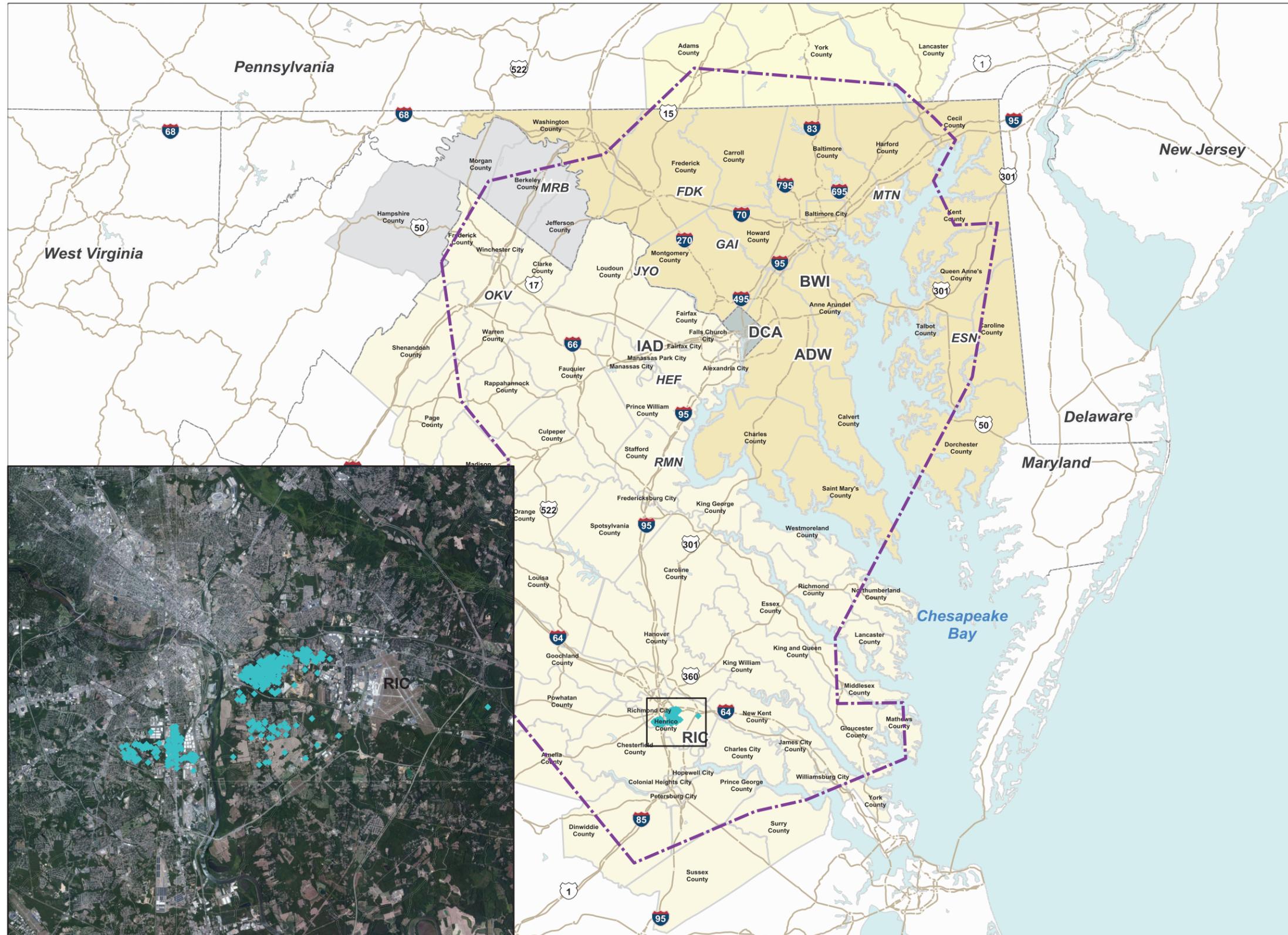


Sources: National Atlas of the United States of America: U.S. County Boundaries, 2005; U.S. State Boundaries, 2005; and Water Bodies, 2005; Bureau of Transportation Statistics: National Transportation Atlas Database National Highway Planning Network, 2012; FAA: NFDC Airport database, 2012; Virtual Earth: Satellite Imagery, 2013; ATAC Corporation: Study Area Boundary, 2012, and Noise Levels, 2013.  
Prepared by: ATAC Corporation, June 2013.

Exhibit 5-1

**Change in Potential Population Exposed to Aircraft Noise - 2013**

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**LEGEND**

- General Study Area
- District of Columbia
- Maryland County in Study Area
- Pennsylvania County in Study Area
- Virginia County in Study Area
- West Virginia County in Study Area
- State Boundary
- U.S. and Interstate Highways
- Water
- Population centroids experiencing a DNL 5.0 dB increase in areas exposed to DNL 45 dB - 60 dB

Notes:  
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- DCA Ronald Reagan Washington National Airport
- IAD Washington Dulles International Airport
- BWI Baltimore Washington International Airport
- ADW Andrews Air Force Base
- RIC Richmond International Airport
- MTN Martin State Airport
- ESN Easton/Newnam Field
- FDK Frederick Municipal Airport
- GAI Montgomery County Airpark
- RMN Stafford Regional Airport
- JYO Leesburg Executive Airport
- HEF Manassas Regional Airport
- OKV Winchester Regional Airport
- MRB Eastern West Virginia Regional Airport

Projection: Lambert Conformal Conic  
Scale: 1,750,000



Sources: National Atlas of the United States of America: U.S. County Boundaries, 2005; U.S. State Boundaries, 2005; and Water Bodies, 2005; Bureau of Transportation Statistics: National Transportation Atlas Database National Highway Planning Network, 2012; FAA: NFDCA Airport database, 2012; ATAC Corporation: Study Area Boundary, 2012, and Noise Levels, 2013.  
Prepared by: ATAC Corporation, June 2013.

Exhibit 5-2

**Change in Potential Population Exposed to Aircraft Noise - 2018**

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## 5.3 Department of Transportation Act, Section 4(f) Resources

This section discusses potential impacts to Department of Transportation (DOT) Act, Section 4(f) Resources. Section 4(f) resources within the General Study Area are described in Section 4.3.3, and are depicted on **Exhibit 4-4**.

### 5.3.1 Summary of Impacts

Potential impacts to Section 4(f) were focused on changes in aircraft noise exposure resulting from implementation of the Proposed Action. Under the Proposed Action, the aircraft noise exposure analysis indicates that the Proposed Action would not substantially change the noise environment at any Section 4(f) resource identified within the General Study Area when compared with the No Action Alternative. Therefore, no constructive use of a Section 4(f) resource associated with the Proposed Action would occur and no impacts would be anticipated.

Under the No Action Alternative, no changes in air traffic routes in the General Study Area would occur; therefore, no changes to aircraft noise exposure or aircraft overflight patterns would occur over Section 4(f) resources and no impacts would be anticipated.

### 5.3.2 Methodology

The FAA evaluates potential effects on Section 4(f) resources in terms of both direct impacts (physical use) and indirect impacts (constructive use). A direct impact would occur as a result of land acquisition, construction, or other ground disturbance activities that would result in physical use of all or a portion of a Section 4(f) property. As land acquisition, construction, or other ground disturbance activities would not occur under either the Proposed Action or the No Action Alternative, neither alternative would have the potential to cause a direct impact to a Section 4(f) resource. Therefore, analysis of potential impacts to Section 4(f) resources is limited to identifying indirect impacts resulting from “constructive use.” A constructive use of a Section 4(f) resource would occur if there is a substantial impairment of the resource to the degree that the activities, features, or attributes of the site that contribute to its significance or enjoyment are substantially diminished. This could occur as a result of both visual and noise impacts. Visual Impacts are further discussed in Section 5.10. As regards aircraft noise, a constructive use would occur should noise levels substantially impair the resource.

Noise exposure levels were calculated for grid points placed at Section 4(f) properties. The grid points used are further discussed in Section 5.1.2. The analysis of potential impacts to Section 4(f) resources considered whether these properties would experience a significant noise increase, when comparing the Proposed Action with the No Action Alternative, using the applicable thresholds shown in **Table 5-2**.

FAA Order 1050.1E requires that additional factors be weighed in determining whether to apply the thresholds listed above in determining the significance of noise impacts on Section 4(f) properties. If a reportable noise increase were to occur, the Section 4(f) properties would be evaluated further to determine if the project-related effects would constitute a constructive use. Further evaluation may include confirming that the property is in fact a Section 4(f) resource as well as identifying the specific attributes for which the property is managed (e.g., for traditional recreational uses or where other noise is very low and a quiet setting is a generally recognized purpose and attribute).

With regard to Land and Water Conservation Fund (LWCF) resources, FAA Order 1050.1E stipulates that replacement satisfactory to the Secretary of the Interior is specifically required for recreation lands aided by the Department of Interior’s LWCF in cases where such a resource is “used” by a transportation project. Therefore, these resources are considered as a part of the Section 4(f) impact analysis process.

### 5.3.3 Potential Impacts – 2013 and 2018

A reportable change in noise level meeting the criteria described in Section 5.3.2 was identified at six grid points representing five Section 4(f) resources. These resources include three local parks/recreational facilities (Davee Gardens Fitness Park, Hickory Hill Community Center, and the Ruffin Road Elementary School Annex) and two historic resources listed on the National Register of Historic Places (NRHP) (Richmond National Cemetery and the Clarke-Palmore House) These facilities are located between three and seven miles west of RIC. The cause for the reportable change in noise is attributable to the KALLI SID for RIC, discussed in greater detail in Sections 5.1.3 and 5.1.4.

**Table 5-5** describes the change in DNL at these facilities under the Proposed Action compared to the No Action Alternatives under both 2013 and 2018 conditions. While the difference in noise conditions represent reportable noise increases, FAR Part 150 compatible land use guidelines recognize all land uses as being compatible in areas exposed to DNL 50 dB and below. Therefore, the Proposed Action would not result in a direct or constructive use of potential Section 4(f) resources in 2013 or 2018.

**Table 5-5 Summary of Noise Exposure at Potential Section 4(f) Properties (2013 and 2018)**  
 (1 of 2)

Year	Property Name	Address	No Action Alternative	DNL	
				Proposed Action	Change
2013	Clarke-Palmore House	904 McCoul St., Richmond, VA 23231	40.4	46.1	5.7
2013	Clarke-Palmore House	904 McCoul St., Richmond, VA 23231	40.1	45.6	5.6
2013	Davee Garden Fitness Park	3412 Ryburn St., Richmond, VA 23234	40.3	46.2	5.8
2013	Hickory Hill Community Center	3000 E. Belt Blvd. Richmond, VA 23224	40.4	45.5	5.1
2013	Richmond National Cemetery	1701 Williamsburg Rd. Richmond, VA 23231	41.9	48.5	6.6
2013	Ruffin Road Elementary School Annex	2001 Ruffin Rd. Richmond, VA 23224	40.0	46.1	6.1
2018	Clarke-Palmore House	904 McCoul St., Richmond, VA 23231	40.5	46.4	5.9
2018	Clarke-Palmore House	904 McCoul St., Richmond, VA 23231	40.2	45.9	5.7

**Table 5-5 Summary of Noise Exposure at Potential Section 4(f) Properties (2013 and 2018)  
(2 of 2)**

<b>Year</b>	<b>Property Name</b>	<b>Address</b>	<b>No Action Alternative</b>	<b>DNL Proposed Action</b>	<b>Change</b>
2018	Davee Garden Fitness Park	3412 Ryburn St., Richmond, VA 23234	40.6	46.6	6.00
2018	Hickory Hill Community Center	3000 E. Belt Blvd. Richmond, VA 23224	40.3	46.5	6.2
2018	Richmond National Cemetery	1701 Williamsburg Rd. Richmond, VA 23231	40.5	46.4	5.9
2018	Ruffin Road Elementary School Annex	2001 Ruffin Rd. Richmond, VA 23224	40.2	45.9	5.7

Notes:

*Totals may not add up due to rounding.*

Source: ATAC Corporation, May 2013 (NIRS modeling results).

Prepared By: ATAC Corporation, June 2013.

Under the No Action Alternative no changes to air traffic routes in the DC Metroplex would occur in either 2013 or 2018 and no effects related to changes in aircraft noise exposure would be anticipated. Therefore, the No Action Alternative would not result in potential impacts to Section 4(f) resources.

## **5.4 Historic and Cultural Resources**

This section discusses the analysis of impacts to historic resources and tribal lands under the Proposed Action and the No Action Alternative. Information on historic resources and tribal lands within the General Study Area is provided in Section 4.3.4. The FAA has initiated consultation with the appropriate State Historic Preservation Officers (SHPOs) and Tribal Historic Preservation Officer (THPOs), as well as relevant local agencies, in accordance with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. § 470 *et seq.*) and the implementing regulations at 36 C.F.R. Part 800.

### **5.4.1 Summary of Impacts**

The aircraft noise exposure analysis indicates that there would be no substantial change to the noise environment at any historic resource or tribal land under the Proposed Action compared with the No Action Alternative. Furthermore, any changes in aircraft traffic patterns are expected to occur at altitudes and distances from viewers that would not substantially impair the view or setting of historic resources or tribal lands. Therefore, no adverse indirect effects to historic resources or tribal lands under the Proposed Action would be anticipated for 2013 or 2018.

Under the No Action Alternative no changes to air traffic routes in the DC Metroplex would occur in either 2013 or 2018 and no changes to aircraft noise exposure or changes in aircraft overflight patterns over historic resources or tribal lands would be anticipated. Therefore, historic resources or tribal lands would not be affected by aircraft noise nor would viewers at historic resources or tribal lands experience visual impacts under the No Action Alternative.

## 5.4.2 Methodology

The National Historic Preservation Act of 1966 requires the FAA to consider the effects of its undertakings on properties listed or eligible for listing in the NRHP. In assessing whether an undertaking, such as the Proposed Action, affects a property listed or eligible for listing on the NRHP, FAA must consider both direct and indirect effects. Direct effects include the physical removal or alteration of an historic resource. Indirect effects include changes in the environment of the historic resource that could substantially alter the characteristics that made it eligible for listing on the National Register. Such changes could include changes in noise exposure and visual impacts. Visual Impacts are further discussed in Section 5.10.

To assess the potential indirect effects of the Proposed Action on historic resources, an area of potential effect (APE) was defined. Federal regulations define the APE as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

For purposes of this analysis, the APE was defined as being contiguous with the General Study Area. Potential historic resources were identified within the General Study Area and their locations are shown on **Exhibit 4-5** in Section 4.3.4. No Indian reservations or tribal lands were identified within the General Study Area. Any historic and cultural resources identified as being within the APE would require further evaluation by the FAA to determine if the property may experience a potential adverse effect. For purposes of determining potential adverse effects, noise exposure levels were calculated at points representing these properties.

The analysis of potential impacts to historic resources considers whether these properties would experience a significant noise increase, when comparing the Proposed Action with the No Action Alternative, using the applicable thresholds shown in **Table 5-2**.

Properties exposed to DNL 65 dB or higher under the Proposed Action and an increase of DNL 1.5 dB or higher may be considered to be potentially adversely effected by the project. Formal consultation with the appropriate SHPO/THPO would be conducted to confirm the determination. If reportable increases in noise are detected for properties exposed to DNL between DNL 45 dB and lower than 65 dB, the FAA would consider further whether the increase would result in an adverse effect on historic properties. If the noise analysis indicates a reportable change for the resources, further research and/or survey on the subject property may be conducted to determine if the reportable increase would diminish the integrity of a property's setting for which the setting contributes to historical or cultural significance.

## 5.4.3 Potential Impacts – 2013 and 2018

A reportable change in noise level meeting the criteria described in Section 5.4.2 was identified at two facilities, the Richmond National Cemetery and the Clarke-Palmore House, depicted on **Exhibit 5-3**. Both resources are listed on the NRHP. **Table 5-6** describes the change in DNL at these facilities under the Proposed Action compared to the No Action Alternative in both 2013 and 2018. The cause for the reportable change in noise is attributable to the KALLI SID for RIC, discussed in greater detail in Sections 5.1.3 and 5.1.4.

**Table 5-6 Summary of Noise Exposure at Historic Resources (2013 and 2018)**

<b>Year</b>	<b>Property Name</b>	<b>Address</b>	<b>No Action Alternative</b>	<b>DNL Proposed Action</b>	<b>Change</b>
2013	Clarke-Palmore House	904 McCoul St., Richmond, VA 23231	40.4	46.1	5.7
2013	Clarke-Palmore House	904 McCoul St., Richmond, VA 23231	40.1	45.6	5.6
2013	Richmond National Cemetery	1701 Williamsburg Rd. Richmond, VA 23231	41.9	48.5	6.6
2018	Clarke-Palmore House	904 McCoul St., Richmond, VA 23231	40.5	46.4	5.9
2018	Clarke-Palmore House	904 McCoul St., Richmond, VA 23231	40.2	45.9	5.7
2018	Richmond National Cemetery	1701 Williamsburg Rd. Richmond, VA 23231	40.5	46.4	5.9

*Notes:*

*Totals may not add up due to rounding.*

Source: ATAC Corporation, May 2013 (NIRS modeling results).

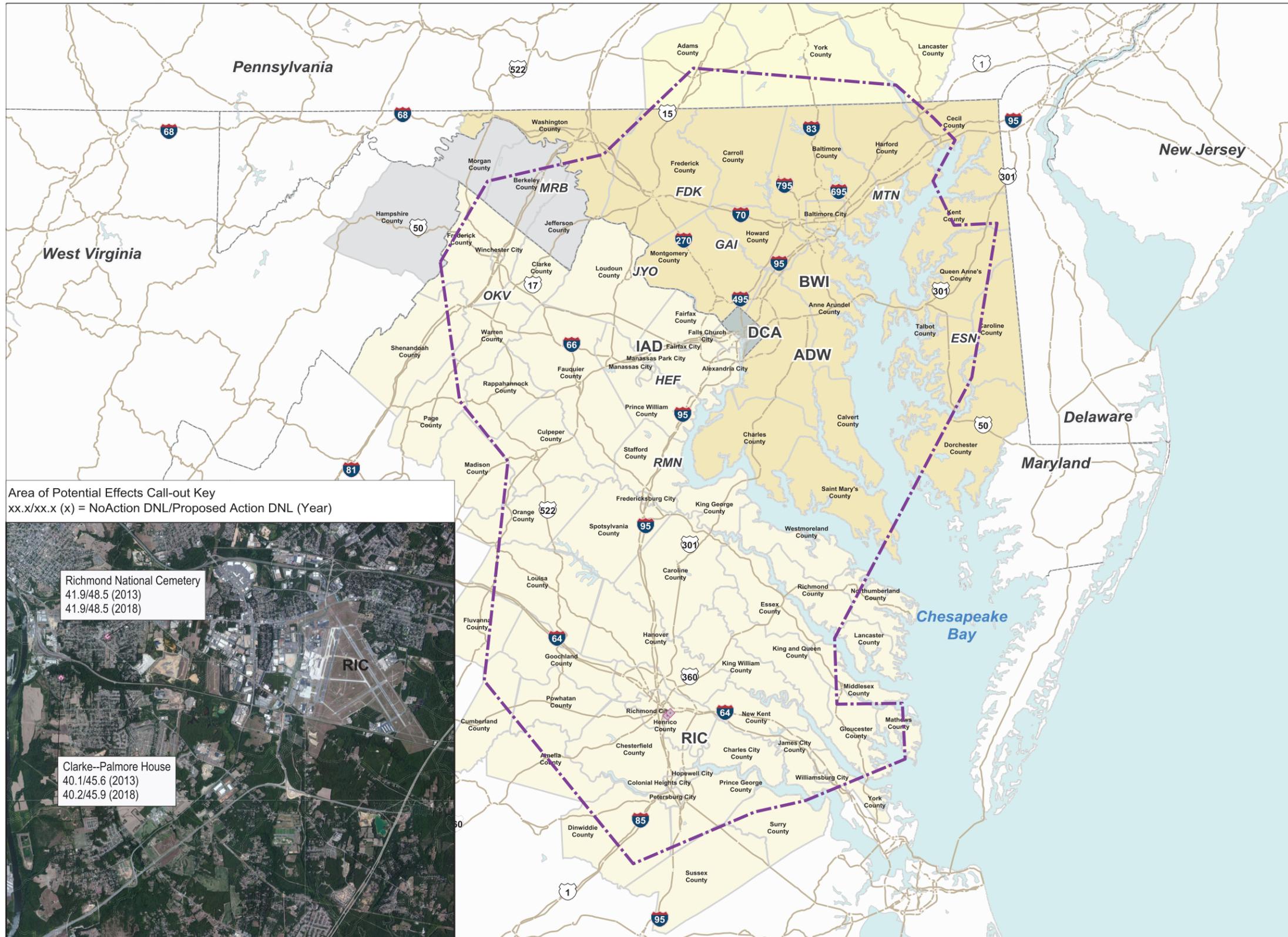
Prepared By: ATAC Corporation, June 2013.

While the DNL levels calculated at these facilities represent reportable noise increases, noise exposure at both these resources would remain below the significance threshold.

The National Register nomination form for the Richmond National Cemetery identifies the facility as being eligible for listing due to its historic role as a Civil War Era cemetery and for its historic architecture. Similarly, the National Register nomination form for the Clarke-Palmore House identifies the facility as being eligible for listing due to its historic architecture. The reportable noise increase calculated for these facilities would not affect these attributes. Furthermore, analysis indicates that both the Richmond National Cemetery and the Clarke-Palmore house are situated in a residential area within an urbanized environment exposed to typical noise levels associated with human activity (e.g., automobile traffic). Accordingly, any increase in noise associated with the Proposed Action would be unlikely to diminish the integrity of the property's setting in a historical or cultural context. Therefore, the Proposed Action would not result in an adverse effect to Historic and Cultural Resources in either 2013 or 2018.

Under the No Action Alternative no changes to air traffic routes in the DC Metroplex would occur in either 2013 or 2018 and no effects related to changes in aircraft noise exposure would be anticipated. Therefore, the No Action Alternative would not result in impacts to cultural resources.

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**LEGEND**

- Area of Potential Effects
- District of Columbia
- Maryland County in Study Area
- Pennsylvania County in Study Area
- Virginia County in Study Area
- West Virginia County in Study Area
- State Boundary
- U.S. and Interstate Highways
- Water
- Historic Resource  
(Richmond National Cemetery)  
(Clarke - Palmore House)

Area of Potential Effects Call-out Key  
xx.x/xx.x (x) = NoAction DNL/Proposed Action DNL (Year)



- Notes:
- DCA Ronald Reagan Washington National Airport
  - IAD Washington Dulles International Airport
  - BWI Baltimore Washington International Airport
  - ADW Andrews Air Force Base
  - RIC Richmond International Airport
  - MTN Martin State Airport
  - ESN Easton/Newnam Field
  - FDK Frederick Municipal Airport
  - GAI Montgomery County Airpark
  - RMN Stafford Regional Airport
  - JYO Leesburg Executive Airport
  - HEF Manassas Regional Airport
  - OKV Winchester Regional Airport
  - MRB Eastern West Virginia Regional Airport

Projection: Lambert Conformal Conic  
Scale: 1,750,000



Sources: National Atlas of the United States of America: U.S. County Boundaries, 2005; U.S. State Boundaries, 2005; and Water Bodies, 2005; Bureau of Transportation Statistics: National Transportation Atlas Database National Highway Planning Network, 2012; FAA: NFDCA Airport database, 2012; Virtual Earth: Satellite Imagery, 2013; ATAC Corporation: Study Area Boundary/Area of Potential Effects, 2012/2013.  
Prepared by: ATAC Corporation, June 2013.

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## 5.5 Wildlife (Avian and Bat Species)

This section discusses the analysis of potential impacts to avian and bat species under the Proposed Action and the No Action Alternative.

### 5.5.1 Summary of Impacts

The greatest potential for impacts to wildlife species would result from wildlife strikes on avian and bat species at altitudes below 3,000 feet AGL. Changes to air traffic flows under the Proposed Action would primarily occur above 3,000 feet AGL and operation levels would remain the same as the No Action Alternative; therefore, there would be no significant impacts to avian and bat species under the Proposed Action compared with the No Action Alternative.

The No Action Alternative would not involve changes to air traffic flows, land acquisition, construction, or other ground disturbance activities; therefore, no impacts to fish, wildlife, or plants would occur.

### 5.5.2 Methodology

The FAA's Wildlife Strike Database is the best information available for assessing potential impacts of aircraft on wildlife. Strike reports over the past 22 years aggregated nationally as well as for individual airports are available from the database to understand existing conditions. Strike reports are comparable to known information on the presence of specific species of concern to corroborate the reports.

This analysis involved a review of arrival and departure flight tracks for the Study Airports under both the Proposed Action and No Action Alternative. Additionally, the altitude of flight tracks above and below 3,000 feet AGL were reviewed, because research has documented that 90 percent of all wildlife strikes nationwide occur below 3,000 feet AGL.<sup>57</sup> The FAA compared modifications in flight procedures to the occurrence of species and populations of concern to assess if existing wildlife strike reports might change under the Proposed Action.

### 5.5.3 Potential Impacts – 2013 and 2018

Since 1990, the FAA has compiled reports of wildlife strikes with aircraft. The information is available to the public through the National Wildlife Strikes Database and through an analysis provided in an annually issued report. The Wildlife Strike Database reports 133,159 wildlife strikes nationally over a 22-year period between 1990 and 2011.<sup>58</sup> Of the records that indicate the type of animal involved in the strike incident, birds represent 97.1 percent of all strikes.<sup>59</sup> Of those records, 92 percent of the strikes occurred below 3,000 feet AGL.<sup>60</sup> The Wildlife Strike Database reports that gulls have the highest occurrence of strikes (16 percent), followed by doves/pigeons (15 percent).<sup>61</sup>

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<sup>57</sup> U.S. Department of Transportation, Federal Aviation Administration, *FAA Wildlife Strike Database* ([http://www.faa.gov/airports/airport\\_safety/wildlife/database/](http://www.faa.gov/airports/airport_safety/wildlife/database/))(Accessed March 15, 2013; last accessed April 25, 2013.)

<sup>58</sup> Id.

<sup>59</sup> Id.

<sup>60</sup> Id.

<sup>61</sup> Id.

The Wildlife Strike Database provides strike information that is reportable by airport, including species struck, height of strike, and type and extent of aircraft damage. **Table 5-7** provides a summary of wildlife strikes reported by Study Airport between 1990 and April 2013. In total, 3,100 records provide strike altitude for incidents involving birds and bats. Of these, a total of 2,812 reported strikes (91 percent of all strike records) occurred at altitudes below 3,000 feet. As discussed above, 1,169 of the strikes reported from the Study Airports included species identification.

The Migratory Bird Treaty Act of 1918 (MBTA), (16 U.S.C. §§ 703–712) protects all the bird species identified in these reports. Furthermore, state and federal laws protect listed endangered and threatened species. The U.S. Fish and Wildlife Service identifies seven federally-listed bird and bat species in Maryland, Pennsylvania, Virginia, and West Virginia. These species include the Gray Bat (*Myotis grisescens*), the Indiana Bat (*Myotis sodalis*), the Virginia big-eared Bat (*Corynorhinus (=Plecotus) townsendii virginianus*), the Piping Plover (*Charadrius melodus*), the Roseate Tern (*Sterna dougallii dougallii*), and the Red-cockaded Woodpecker (*Picoides borealis*). None of these species were identified in strike reports for the Study Airports. However, strike reports for Study Airport in the State of Maryland identified two state-listed species associated with strikes: Peregrine falcon (*Falco peregrinus anatum*) (one report) and the upland sandpiper (*Bartramia longicauda*) (three reports).

The number of aircraft operations between the Proposed Action and No Action Alternative would be the same. Therefore, the assessment of the potential impacts focuses on changes to flight paths and the potential for impact due to wildlife strikes. As shown in **Table 5-7**, only nine percent of bird/bat strikes (288 records) were at altitudes above 3,000 feet AGL. The decline in the number of strike reported above 3,000 feet AGL indicates that there is less likelihood of bird/bat strikes at these altitudes. Under the Proposed Action, the majority of changes to proposed flight paths would occur above 3,000 feet AGL and no significant changes to arrival and departure corridors below 3,000 feet AGL would be expected. In addition, under the Proposed Action, the FAA anticipates increased use of the narrower arrival and departure corridors associated with the RNAV procedures. As narrower corridors would reduce the area in which RNAV equipped aircraft operate, the Proposed Action would not be expected to result in increased impacts to avian and bat species when compared to the No Action Alternative. Therefore, there would be no significant impacts to bird or bat species.

The No Action Alternative would not involve changes to air traffic flows, land acquisition, construction, or other ground disturbance activities; therefore, no impacts to avian and bat species would occur.

**Table 5-7 FAA Wildlife Strike Database Records for Study Airports by Altitude (1990 - 2013)**

Type of Strike <sup>1</sup>	Airport	3,000 ft. AGL or less	>3,000 ft. AGL to ≤ 10,000 ft. AGL	Greater than 10,000 ft. AGL	Total
Identified Bird and Bat Species	ADW	6	0	0	6
	BWI	332	10	0	342
	DCA	329	8	0	337
	ESN	4	0	0	4
	FDK	7	0	0	7
	GAI	2	0	0	2
	HEF	30	0	0	30
	IAD	307	10	1	318
	JYO	2	0	0	2
	MRB	21	0	0	21
	MTN	16	0	0	16
	OKV	0	0	0	0
	RIC	82	2	0	84
	<b>Total</b>		<b>1,138</b>	<b>30</b>	<b>1</b>
Unknown Bird and Bat Species	ADW	6	0	0	6
	BWI	500	102	2	604
	DCA	340	37	1	378
	ESN	3	0	0	3
	FDK	4	0	0	4
	GAI	0	0	0	0
	HEF	24	0	0	24
	IAD	609	99	4	712
	JYO	8	1	0	9
	MRB	30	0	0	30
	MTN	20	0	0	20
	OKV	1	0	0	1
	RIC	129	10	1	140
	<b>Total</b>		<b>1,674</b>	<b>249</b>	<b>8</b>
<b>Grand Total</b>		<b>2,812</b>	<b>279</b>	<b>9</b>	<b>3,100</b>
<b>Percentage</b>		<b>91%</b>	<b>9%</b>	<b>&lt;1%</b>	<b>100%</b>

*Notes:*

<sup>1</sup> Includes both unknown and identified species.  
The table does not include 1,438 strike reports that did not report altitudes.  
Percentages may not add up due to rounding.

Source: U.S. Department of Transportation, Federal Aviation Administration, *FAA Wildlife Strike Database* (<http://wildlife-mitigation.tc.faa.gov/wildlife/default.aspx>) (accessed March 14, 2013, last accessed April 25, 2013).

Prepared by: ATAC Corporation, June 2013.

## 5.6 Environmental Justice

This section presents a summary of the analysis of environmental justice impacts under the Proposed Action and the No Action Alternative.

### **5.6.1 Summary of Impacts**

Neither the Proposed Action nor the No Action Alternative would displace people or businesses; therefore, implementation of the Proposed Action and No Action Alternative would not result in direct impacts in this category.

No areas within the General Study Area would experience a significant impact related to a change in DNL exposure to people (refer to Section 5.1); therefore, no disproportionately high and adverse effects to children, minority populations, or low-income populations would occur under either the Proposed Action or the No Action Alternative.

### **5.6.2 Methodology**

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that federal agencies include environmental justice as part of their mission by identifying and addressing as appropriate, the potential for disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations, low-income populations, and Native American tribes. Environmental justice applies to all environmental resources. Therefore, a disproportionately high and adverse human health or environmental effect on minority and low-income populations may represent a significant impact.

### **5.6.3 Potential Impacts – 2013 and 2018**

Under the Proposed Action, neither people nor businesses would be displaced. As discussed in Section 5.1, under the Proposed Action, no census block centroids in the General Study Area would experience a change in noise exposure in 2013 or 2018 that exceeds any of FAA's thresholds defining significant noise impacts on people. Therefore, no adverse direct or indirect effects would occur to any environmental justice populations within the General Study Area under the Proposed Action for 2013 and 2018.

Under the No Action Alternative, neither people nor businesses would be displaced. Furthermore, air traffic routes would not change and there would be no change in aircraft noise exposure in 2013 or 2018 that could result in an indirect impact. Therefore, the No Action Alternative would not result in disproportionately high and adverse human health or environmental effects on minority and low-income populations.

## **5.7 Energy Supply (Aircraft Fuel)**

This section discusses whether changes in the movement of aircraft would result in measurable effects on local energy supplies under the Proposed Action and the No Action Alternative.

### **5.7.1 Summary of Impacts**

The Proposed Action would involve changes to air traffic flows; however, the optimized air traffic routes under the Proposed Action would improve route efficiency and would be expected to reduce aircraft fuel consumption overall. Therefore, the Proposed Action would not result in the depletion of local supplies of energy.

The No Action Alternative would not involve changes to air traffic flows, construction, or other ground disturbance activities; therefore, the No Action Alternative would not result in the depletion of local energy supplies.

### 5.7.2 Methodology

The Proposed Action would not change the number of aircraft operations relative to the No Action Alternative, but it would involve changes to air traffic flows during the departure, descent, and approach phases of flight. These changes affect both the route an aircraft may follow as well as its climb-out and descent profiles. This in turn may directly affect aircraft fuel burn (or fuel expended). Aircraft fuel burn is considered a proxy for determining whether the Proposed Action would have a measurable effect on local energy supplies when compared with the No Action Alternative.

In addition to calculating aircraft noise exposure, the FAA's NIRS noise model calculates aircraft-related fuel burn (e.g., AAD flight schedules, flight tracks, and runway use). See Section 5.1.2 for further discussion on NIRS input data. Determining the difference in fuel burn between alternatives can be used as an indicator of changes in fuel consumption resulting from implementation of the Proposed Action when compared with the No Action Alternative.

### 5.7.3 Potential Impacts – 2013 and 2018

**Table 5-8** presents the results of the fuel burn analysis for the Proposed Action and No Action Alternative. Compared with the No Action Alternative, the Proposed Action would result in a decrease in total metric tons of aircraft fuel burned: 20.93 fewer metric tons in 2013 and 23.73 fewer metric tons in 2018. Therefore, there would be no significant impact to energy supply.

**Table 5-8 Energy Consumption Comparison**

	<u>2013</u>		<u>2018</u>	
	<u>No Action Alternative</u>	<u>Proposed Action</u>	<u>No Action Alternative</u>	<u>Proposed Action</u>
<b>Fuel Burn (MT)</b>	2,302.10	2,281.17	2,607.77	2,584.03
<b>Volume Change (MT) (Proposed Action – No Action Alternative)</b>		-20.93		-23.73
<b>Percent Change from No Action Alternative</b>		-0.91%		-0.91%

*Note:*

*MT: Metric Ton*

Source: ATAC Corporation, March 2013 (NIRS modeling results).

Prepared by: ATAC Corporation, April 2013.

## 5.8 Air Quality

This section discusses the analysis of air quality impacts under the Proposed Action and the No Action Alternative.

## 5.8.1 Summary of Impacts

The Proposed Action when compared to the No Action Alternative would result in a decrease in emissions due to a reduction in fuel burn and is presumed to conform to State Implementation Plans (SIP) for Maryland, Virginia, Pennsylvania, and the District of Columbia, the jurisdictions that fall within the General Study Area. Accordingly, implementation would not cause or contribute to a new violation of the National Ambient Air Quality Standards (NAAQS). Therefore, air quality impacts arising from implementation of the Proposed Action would not be anticipated.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no impacts to air quality would be anticipated.

## 5.8.2 Methodology

Typically, significant air quality impacts would be identified if an action would result in the exceedance of one or more of the NAAQS for any time period analyzed.<sup>62</sup> Section 176(c) of The Clean Air Act (CAA) requires that federal actions conform to the appropriate SIP in order to attain the air quality goals identified in the CAA. However, a conformity determination is not required if the emissions caused by a federal action would be less than [the] *de minimis* levels established in regulations issued by EPA.<sup>63</sup> FAA Order 1050.1E provides that further analysis for NEPA purposes is normally not required where emissions do not exceed EPA's *de minimis* thresholds.<sup>64</sup> The EPA regulations identify certain actions that would not exceed these thresholds, including ATC activities and adoption of approach, departure, and enroute procedures for aircraft operations above the mixing height specified in the applicable SIP (or 3,000 feet AGL in places without an established mixing height). In addition, the EPA regulations allow federal agencies to identify specific actions as "presumed to conform" (PTC) to the applicable SIP.<sup>65</sup> In a notice published in the Federal Register, the FAA has identified several actions that "will not exceed the applicable *de minimis* emissions levels" and are therefore presumed to conform, including ATC activities and adoption of approach, departure, and enroute procedures for air operations.<sup>66</sup> The FAA's PTC notice explains that aircraft emissions above the mixing height do not have an effect on pollution concentrations at ground level. The notice also specifically notes that changes in air traffic procedures above 1,500 ft. AGL and below the mixing height "would have little if any effect on emissions and ground concentrations."<sup>67</sup>

## 5.8.3 Potential Impacts – 2013 and 2018

Under the Proposed Action a decrease in fuel burn would be anticipated compared to the No Action Alternative. Therefore, no further air quality analysis is necessary and a conformity determination is not required.

The No Action Alternative would not result in a change in the number of aircraft operations or air traffic routes; therefore, no impacts to air quality would be anticipated.

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<sup>62</sup> FAA Order 1050.1E, Chg.1, App. A, sec. 2.3.

<sup>63</sup> 40 C.F.R. § 93.153(b).

<sup>64</sup> FAA Order 1050.1E, Chg. 1, App. A, sec. 2.1c.

<sup>65</sup> *Id.* at 93.153(f).

<sup>66</sup> U.S. National Archives and Records Administration, "Federal Presumed to Conform Actions Under General Conformity," Federal Register 72, no. 145 (July 20, 2007): 41565-41580.

<sup>67</sup> *Id.*

## 5.9 Climate

This section discusses greenhouse gas (GHG) emissions and effects to the climate as they relate to the Proposed Action and the No Action Alternative.

### 5.9.1 Summary of Impacts

Fuel burn would decrease under the Proposed Action compared to the No Action Alternative (see Section 5.8) and no significant project-related effects on climate are anticipated.

### 5.9.2 Methodology

In accordance with FAA guidance, estimated CO<sub>2</sub> emissions were calculated from the amount of fuel burned under the No Action Alternative and the decreased fuel burn projected for the Proposed Action in 2013 and 2018 (see Section 5.8). The resulting CO<sub>2</sub> emissions were then calculated as CO<sub>2</sub>e.

### 5.9.3 Potential Impacts – 2013 and 2018

**Table 5-9** shows project-related CO<sub>2</sub>e emissions. In 2013, the Proposed Action would produce approximately 7,197.10 metric tons (MT) of CO<sub>2</sub>e and the No Action Alternative would produce approximately 7,263.13 MT of CO<sub>2</sub>e. This represents a reduction of 66.03 MT of CO<sub>2</sub>e or 0.91 percent under the Proposed Action when compared to the No Action Alternative. Similarly, in 2018, the Proposed Action would produce approximately 8,152.62 MT of CO<sub>2</sub>e and the No Action Alternative would produce approximately 8,227.50 MT of CO<sub>2</sub>e. This represents a reduction of 74.88 MT of CO<sub>2</sub>e or 0.91 percent under the Proposed Action when compared to the No Action Alternative. Therefore, no increase in GHGs would result from implementation of the Proposed Action when compared to the No Action Alternative and no impacts would be anticipated.

**Table 5-9 CO<sub>2</sub>e Emissions - 2013 and 2018**

	2013		2018	
	No Action Alternative	Proposed Action	No Action Alternative	Proposed Action
<b>CO<sub>2</sub>e Emissions (MT)</b>	7,263.13	7,197.10	8,227.50	8,152.62
<b>Volume Change (MT)</b>		-66.03		-74.88
<b>(Proposed Action – No Action Alternative)</b>		-0.91%		-0.91%

*Note:*

*CO<sub>2</sub>e: Carbon Dioxide Equivalent*

Source: ATAC Corporation, April 2013 (NIRS modeling results).

Prepared by: ATAC Corporation, April 2013.

## 5.10 Visual Impacts

This section discusses the analysis of visual impacts under the Proposed Action and the No Action Alternative.

### **5.10.1 Summary of Impacts**

As stated in Section 5.1, implementation of the Proposed Action would not increase the number of aircraft operations at the Study Airports compared with the No Action Alternative. Changes in aircraft traffic patterns under the Proposed Action are expected to be at altitudes and distances sufficiently removed from viewers that visual impacts would not be anticipated.

Under the No Action Alternative, no changes in air traffic routes would occur and no changes in aircraft overflight patterns would be expected. Therefore, the No Action Alternative would not result in visual impacts.

### **5.10.2 Methodology**

As discussed in FAA Order 1050.1E, Appendix A, Section 12.2b, visual, or aesthetic, impacts are difficult to define and evaluate because of the subjectivity involved. Aesthetic impacts deal more broadly with the extent that the project contrasts with the existing environment and whether the difference is considered objectionable by the agency responsible for the location in which the project is set. Visual impacts are normally related to the disturbance of the aesthetic integrity of an area caused by development, construction, or demolition, and thus, do not typically apply to airspace changes.

To evaluate the potential for indirect impacts resulting from changes in aircraft routings and visual intrusion, the general altitudes at which aircraft route changes occur beyond the immediate airport environs, which experience overflights on a routine basis, are considered to evaluate the potential for visual impacts.

### **5.10.3 Potential Impacts – 2013 and 2018**

According to FAA Order 1050.1E, Appendix A, the visual sight of aircraft, aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact. Changes in aircraft routes associated with the Proposed Action would generally occur at altitudes above 3,000 feet AGL; therefore, the visual sight of aircraft and aircraft lights would not be considered intrusive. Consequently, the Proposed Action would not result in significant visual impacts. Air traffic routes under the No Action Alternative would not change, and therefore, would not result in changes in light emissions to people on the ground, so no significant impacts relating to light emissions would occur. Accordingly, significant visual impacts resulting from the Proposed Action or the No Action Alternative would not be anticipated.

## **5.11 Cumulative Impacts**

Consideration of cumulative impacts applies to the impacts resulting from the implementation of the Proposed Action with other actions. CEQ regulations define cumulative impact as the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of the agency, federal or nonfederal, undertaking such actions and state that cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

### 5.11.1 Summary of Impacts

The implementation of the Proposed Action when considered with other past, present, and reasonably foreseeable future actions would not be expected to result in significant cumulative impacts.

### 5.11.2 Methodology

Projects within the vicinity of the Study Airports were reviewed to evaluate the potential for cumulative impacts. A list of potential projects proposed on or near the Study Airports is provided in **Table 5-10**. Due to the nature of the resources affected by the Proposed Action, only projects with direct or indirect effects on aviation within the General Study Area were considered.

Potential impacts related to implementation of the Proposed Action, although demonstrated to not be significant in the preceding sections of this chapter fell into one category:

- Aircraft Noise—Effects related to changes in aircraft noise exposure, including potential impacts on populations in the General Study Area, compatible land use, potential Section 4(f) resources, historic and cultural resources.

Other categories of impacts considered in this EA, but demonstrated to not affect the resource, include:

- Fuel Burn—The Proposed Action results in lower quantities of fuel burned and correspondingly lower amounts air pollutants and greenhouse gases emitted; therefore, the Proposed Action would not cumulatively contribute to potential effects on energy use, air pollutants emitted, and greenhouse gases emitted of other past, present, and reasonably foreseeable future projects.
- Avian and Bat Species—The Proposed Action is not expected to result in a change in the occurrence of wildlife strikes; therefore, the Proposed Action would not cumulatively contribute to potential effects on avian and bat species of other past, present, and reasonably foreseeable future projects.
- Other Categories—As the Proposed Action would not involve land acquisition or other shifts in population or communities, physical changes such as ground disturbance or facility development, or construction activities, it would not affect the other environmental resource categories specified in FAA Order 1050.1E, as listed in the introduction to this Chapter.

Therefore, only other past, present, and reasonably foreseeable proposed projects with the potential for impacts related to changes in aircraft noise exposure were considered. The projects identified in **Table 5-10** were evaluated for their potential to collectively, with the Proposed Action, contribute to significant noise impacts affecting population, Section 4(f) resources, and historic and cultural properties.

### 5.11.3 Potential Impacts – 2013 and 2018

For each of the relevant past, present, and reasonably foreseeable future projects identified by the FAA, **Table 5-10** presents a summary of the potential for cumulative effects. Additional discussion of potential cumulative impacts, by environmental resource category, follows the table.

**Table 5-10 Past, Present, and Reasonably Foreseeable Future Actions (1 of 5)**

<b>Airport Runway Related Projects</b>		
<b>Project</b>	<b>Description</b>	<b>Cumulative Effects Analysis</b>
DCA-Construct Runway Safety Area for Runways 01/19	This project involves bringing the RSA for Runway 01/19 into compliance with FAA guidelines. This project extends the Runway 01 landing threshold 300 feet south and relocating the approach lights for Runway 01 caused by the extension.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on March 17, 2010. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
DCA-Construct Runway Safety Area for Runways 04/22	This project involves bringing the RSA for Runway 04/22 into compliance with FAA guidelines. This project extends Runway 04 end pavement 460 feet and the landing threshold 260 feet to the southwest; shifts Runway 22 end 371 feet southwest; and install EMAS at the end of Runway 22. Approach aids are relocated as a result of the new runway end locations.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 4, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
DCA-Construct Runway Safety Area for Runways 15/33	This project involves bringing the RSA for Runway 15/33 into compliance with FAA guidelines. The project shifts Runway 15/33 270 feet to the southeast along its centerline, and install EMAS at the end of Runway 15 and relocated end of Runway 33. Approach aids are relocated as a result of the new runway end locations.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 4, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
IAD Runway Status Lights	– This project involves installing status lights at major runway and taxiway intersections. It is planned to be completed by 2013.	

**Table 5-10 Past, Present, and Reasonably Foreseeable Future Actions (2 of 5)**

<b>Airport Runway Related Projects</b>		
<b>Project</b>	<b>Description</b>	<b>Cumulative Effects Analysis</b>
BWI – Proposed Airport Improvements – Runway 15R/33L RSA Improvements	This project involves bringing the RSA for Runway 15R/33L into compliance with FAA guidelines. Runway 15R landing threshold is displaced 300 ft. Runway 33L landing threshold is displaced 500 feet. Approach aids are relocated as a result of the new runway end locations.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 25, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
BWI – Proposed Airport Improvements – Runway 10/28 RSA Improvements	This project involves bringing the RSA for Runway 10/28 into compliance with FAA guidelines. The Runway 28 Localizer is located within the RSA on the Runway 10 approach. The localizer is proposed to be located 1,010 feet from the runway threshold to outside of the RSA.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 25, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
BWI – Proposed Airport Improvements – Runway 10 Glide Slope	Runway 10 Glide Slope needs to be relocated to provide a standard separation from the runway centerline (currently 399 feet from the runway centerline). The proposed Runway 10 Glide Slope would be relocated approximately 420 feet from the runway centerline outside of the ROFA.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 25, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
BWI – Proposed Airport Improvements – Runway 15R Glide Slope	The proposed Runway 15R Glide Slope would be relocated approximately 280 feet from the existing location which results in a distance of 1,109 feet from the relocated landing threshold to meet RSA requirements.  The Runway 33R glide slope is planned to be relocated 681 feet south of its current location in order to be clear of the Runway Object Free Area.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 25, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.

**Table 5-10 Past, Present, and Reasonably Foreseeable Future Actions (3 of 5)**

<b>Airport Runway Related Projects</b>		
<b>Project</b>	<b>Description</b>	<b>Cumulative Effects Analysis</b>
BWI – Proposed Airport Improvements – Runway 15L/33R RSA Improvements	Visibility minimums for an instrument approach is increased to ¾ statute mile or greater to reduce RSA area requirements. The Runway 33R Localizer (located on the Runway 15L end) is located within the RSA limits and must be relocated to outside the RSA (approximately 600 feet from the end of the runway) to meet current FAA design standards. Similar to Runway 33R, Runway 15L Localizer is located within the proposed RSA limits and must be relocated to outside the RSA to meet current FAA design standards.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 25, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
BWI – Proposed Airport Improvements – Runway 28 Glide Slope	The Runway 28 Glide Slope needs to be relocated to provide a standard separation from the runway centerline. The existing Glide Slope is currently located on the left side of the Runway 28 approach within the ROFA approximately 375 feet from the runway centerline. The proposed Glide Slope antenna would be located 35 feet from its current location at a total of 410 feet from the runway centerline.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 25, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
BWI – Proposed Airport Improvements – Runway 10/28 Mid-Point RVR	The existing Runway 10-28 mid-point RVR is located within the ROFA and, as such, does not meet current FAA design standards. The existing mid-point RVR would be relocated to outside of the ROFA.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 25, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
BWI – Proposed Airport Improvements – Runway 04/22 Conversion to a Taxiway	Runway 4-22 is planned to be converted to a Group V taxiway to serve the other commercial service runways.	This project received a Finding of No Significant Impact (FONSI) Record of Decision (ROD) on April 25, 2012. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.

**Table 5-10 Past, Present, and Reasonably Foreseeable Future Actions (4 of 5)**

<b>Airport Runway Related Projects</b>		
<b>Project</b>	<b>Description</b>	<b>Cumulative Effects Analysis</b>
HEF – Runway 16L/34R 500 feet Extension	This project involves bringing the RSA for Runway 16L/34R into compliance with FAA guidelines. This project extends the end of Runway 34R 500 feet to the south; widen existing bridges supporting Runway 16L/34R and Taxiway B to the required width of the RSA and Taxiway Safety Area (TSA); install new localizer antenna 2,000 feet south of the existing Runway 16L/34R landing threshold on the extended runway centerline; install medium intensity approach light system (MALSR) on the Runway 24R end; and relocate Runway 24R Precision Approach Path Indicator (PAPI).	This project received a Finding of No Significant Impact (FONSI) on July 10, 2009. The environmental analysis prepared for this project found no significant noise impacts, no significant impacts to Section 4(f) resources, and no adverse effects to historic resources. No significant cumulative impacts are anticipated with the Proposed Action.
ESN – Five Year Capital Improvement Program for Easton/Newman Field Airport	Runway 04 end would be extended 1,896 south with an 800' displaced landing threshold, and Runway 22 would be relocated 1,000 ft. As a result, the PAPI for both runway ends will be relocated. The project also includes a MALSR for the Runway 04 approach.	No environmental documentation for the runway relocation was located. However, the airport is located in a largely rural, agricultural setting and the runway is being relocated away from its current location near residential development. Accordingly, it is assumed that the proposed action would not result in increased noise exposure to sensitive land uses. No significant cumulative impacts are anticipated with the Proposed Action.

**Table 5-10 Past, Present, and Reasonably Foreseeable Future Actions (5 of 5)**

Airspace Related Projects		
Project	Description	Cumulative Effects Analysis
GIBBZ ONE (RNAV) STAR DOCCS ONE STAR RNLDI ONE (RNAV) SID BUNZZ ONE (RNAV) SID	Changes to arrival and departure procedures serving IAD.	The procedures were categorically excluded on May 29, 2012. GIBBZ, DOCCS, and BUNZZ are included as part of the Proposed Action and No Action Alternative. No noise impacts are anticipated. No significant cumulative impacts are anticipated with the Proposed Action.
FRDMM ONE (RNAV) STAR TRUPS ONE (RNAV) STAR NUMMY ONE STAR	Changes to arrival procedures serving DCA.	The procedures were categorically excluded on May 29, 2012. All three are included as part of the Proposed Action and No Action Alternative. No noise impacts are anticipated. No significant cumulative impacts are anticipated with the Proposed Action.

Source: Federal Aviation Administration, 2012, 2013.  
 Prepared by: ATAC Corporation, March 2013.

### 5.11.3.1 Potential Cumulative Noise Impacts

Noise and noise-related impacts include changes in noise exposure for populations, compatible land use, potential Section 4(f) resources, historic properties, and tribal lands. Implementation of the Proposed Action would not result in significant changes in noise exposure, as discussed in Section 5.1. Excluding one project identified in **Table 5-10**, environmental documentation completed for all the cumulative projects identified no significant noise impacts. No environmental documentation was available for the ESN Five Year Capital Improvement Program for Easton/Newman Field Airport which includes relocation of a runway and associated NAVAIDs. However, as ESN is situated in a rural, largely agricultural environment and the runway would be moved away from existing residential development, no noise impacts associated with that project would be anticipated. Therefore, none of the past, present, and reasonably foreseeable projects identified in **Table 5-10** have the potential to cumulatively contribute to the noise impacts of the Proposed Action and they would not be expected to contribute to changes in noise exposure that would cumulatively result in significant impacts.