



U.S. Department
of Transportation
**Federal Aviation
Administration**

Eastern Service Center

1701 Columbia Avenue
College Park, Georgia 30337

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Ms. Brona Simon
State Historic Preservation Officer/Executive Director
Massachusetts Historical Commission
220 Morrissey Blvd
Boston, MA 02125

Reference: Additional Information Regarding FAA's Proposed Finding of No Adverse Effect for the Boston Logan International Airport RNAV (GPS) RWY 4L Approach Procedure, Boston, MA (MHC# RC.68314)

Dear Ms. Simon,

The FAA and MHC have engaged in correspondence since June 2020 regarding the proposed Boston Logan International Airport RNAV (GPS) RWY 4L Approach Procedure (the undertaking), which is proposed to enhance safety at the airport. Letters from the MHC dated July 21, 2021, and September 10, 2021, have briefly discussed the MHC's concerns with the Proposed Finding of No Adverse Effect as a result of the undertaking. The FAA has attempted to address those concerns by providing additional information and responding to your questions in correspondence dated August 9 and October 12, 2021. In our most recent October 12th letter, we asked to continue consultation to better understand MHC's position that the undertaking would meet the criteria to cause adverse effects and for further information on the types of resources the MHC believes would be adversely affected by the undertaking. In that letter, as well as in previous telephone conversations with your staff, we offered to meet with MHC to discuss this further. MHC responded by letter dated November 15, 2021 with further information on the types of resources it believes would be adversely affected by the undertaking through the introduction of visual or audible elements.

As contemplated in 36 CFR 800.5(c)(2), the FAA is interested in consulting with MHC to resolve the disagreement with our proposed finding. We have reviewed the information you provided and offered additional analysis of potential effects to six resources described below, which include the four resources cited in your letter and two additional resources we believe are representative of the effects of the undertaking. Based on that further analysis, we are reaffirming our Proposed Finding of No Adverse Effect, re-notifying you pursuant to 36 CFR § 800.5(b), and providing the supporting documentation specified in 36 CFR § 800.11(e).

This letter summarizes and provides additional information about the analysis undertaken to support the FAA's Proposed Finding of No Adverse Effect and includes additional discussion and information regarding the specifics of that analysis. We request that you review this information and advise the FAA within 30 days whether you now concur with, or have no objection to, our Proposed Finding of No Adverse Effect.

Undertaking Summary

The undertaking would enhance aviation safety and efficiency by providing lateral and vertical guidance to aircraft landing on Runway 4L over four different paths converging onto a common final approach path. The undertaking is a RNAV (GPS) Instrument Arrival Procedure (IAP)¹, which requires that an aircraft flying the procedure remain within one nautical mile of the procedure centerline 95% of the total flight time. The expected change to airport operations from the proposed undertaking would be comprised of the following:

- A net annual increase of 255 arrivals at Boston Logan. This increase is attributable to previously scheduled arrivals that will no longer need to be cancelled due to increased Airport efficiency during instrument meteorological conditions (IMC) or “poor weather.” With the availability of the 4L RNAV procedure, these arrivals will now be able to land on Runway 4L instead of being cancelled.
- A shift of 104 annual arrivals from Runway 4R to Runway 4L. These 104 arrivals represent flights that would otherwise have been delayed for a landing on Runway 4R, but with the availability of a 4L RNAV procedure would instead be able to land on Runway 4L earlier in the day.
- Combined, there will be an expected increase of 359 arrivals to Runway 4L, representing 255 flights that no longer need to be cancelled and 104 flights no longer delayed due to poor weather conditions.² All other airport operations in the No Action Alternative and Proposed Action Alternative are expected to be the same.

The net increase in 255 annual arrivals resulting from the undertaking would be the result of aircraft being able to access Runway 4L during IMC, which is not currently possible. The undertaking is not expected to result in any changes in flight tracks of arrivals for aircraft currently flying a visual (as opposed to an instrument) approach.

Area of Potential Effects

In a letter dated June 18, 2020, the FAA proposed an initial approach for determining the Area of Potential Effects (APE). After receiving feedback from MHC on October 29, 2020, the FAA proposed an updated methodology that focused the APE. This APE was determined by reviewing the altitudes of aircraft flying in and out of the airport and calculating the increase in overflights from the proposed undertaking in order to identify those areas that would be most impacted by the proposed undertaking. The MHC did not disagree with the proposed focused APE as stated in

¹ The term RNAV means “area navigation” in this context. Within RNAV procedures, there are two categories of navigation specifications, area navigation (RNAV) and required navigation performance (RNP). RNP is a system that allows for more precise flying due to additional equipment on the aircraft. In the United States, RNP approach or arrival procedure are titled RNAV(GPS) procedures. For more information about RNAV and RNAV (GPS) procedures, refer to https://www.faa.gov/air_traffic/publications/atpubs/aip_html/part2_enr_section_1.17.html.

² This estimate of additional flights only includes aircraft flying in instrument meteorological conditions (IMC) or “poor weather”; aircraft flying in visual meteorological conditions (VMC) or “good weather” are not expected to use the proposed undertaking. Aircraft flying VMC would continue to fly the same current path until within approximately five nautical miles of the Airport. At this point, they would have the option to utilize the proposed undertaking for reference purposes because all aircraft converge on the runway at this point; aircraft flight paths would not meaningfully differ from those associated with a visual approach.

a letter dated December 8, 2020. (A map of the APE can be found in **Attachment A** of this letter.)

Summary of Historic Properties

The online electronic files of the National Register of Historic Places (NRHP), MHC, and the Boston Landmarks Commission were used to compile a comprehensive list of historic properties previously identified within the APE.³ Additionally, the FAA requested input from the historical commissions and planning boards from Milton, Quincy, Stoughton, Sharon, Randolph, Norton, Mansfield, Canton, Easton, Foxborough, and Boston, Massachusetts, as well as the Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head to identify additional properties not previously identified as eligible for the NRHP. This effort identified 4,242 properties listed in or potentially eligible for listing in national, state, or local historic registers. Of these, 58 properties within the APE are currently listed in or have been formally determined eligible for listing in the NRHP. These properties are listed by name along with their NRHP-designated area of significance and city in **Table 1**. For the purposes of the analysis, FAA assumed all 4,242 properties within the APE are eligible for listing in the NRHP.

The FAA received correspondence from MHC dated November 15, 2021. In this letter, the MHC states that historic resources “would be adversely effected by the increased flight events through the introduction of visible and audible elements.” They also identified four specific “important historic resources” under or near the 4L RNAV flight path that the MHC believes would be “impacted by audible and visible flight events” introduced by the proposed undertaking. These identified historic resources are Cedar Grove Cemetery, Governor Hutchinson’s Field, Captain R.B. Forbes House, and the Blue Hills Reservation Multiple Resource Area (MRA).⁴ These properties were identified or had multiple historic resources found within the MRA as part of the initial inventory of 4,242 historic resources.

Because the undertaking would not have physical effects (see discussion below), this identification effort focused on identifying properties for which *setting* and *feeling* are characteristics contributing to the property’s NRHP eligibility. These may include isolated properties where a cultural landscape is part of the property’s significance, rural historic districts, outdoor spaces designed for meditation or contemplation, and certain traditional cultural properties in continuous use. These property types are more susceptible to auditory and visual impacts and include sacred spaces such as cemeteries, places of worship and sites of religious significance to tribes; parks and open recreational lands; historic properties that include designed or vernacular landscapes, and areas culturally significant to tribes and other distinct populations.

³ “National Register Database and Research, Searchable Table,” *National Park Service*, <https://www.nps.gov/subjects/nationalregister/database-research.htm#table>; “MassGIS Data: MHC Historic Inventory,” *State of Massachusetts Bureau of Geographic Information*, <https://www.mass.gov/info-details/massgis-data-mhc-historic-inventory>; “Boston Landmarks Commission (BLC) Historic Districts,” *Boston Landmarks Commission*, <https://bostonopendata-boston.opendata.arcgis.com/datasets/boston-landmarks-commission-blc-historic-districts/explore>.

⁴ The Blue Hills Reservation MRA is 7,000 acres spanning from Quincy to Dedham, Milton to Randolph. This resource is a multiple property listing that includes individually-listed resources in the NRHP. The MRA includes prehistoric and historic sites where location data is restricted and not available.

We have selected six examples of properties that fall within these property types to demonstrate the anticipated effects as a result of the proposed undertaking. This includes the four properties identified by MHC on November 15, 2021, and two others identified by FAA as exemplifying the significant historic features that could be affected by the proposed undertaking.

Many of the historic resources within the APE were designated in the 1970s, 1980s, and 1990s. As such, they have been potentially subject to decades of change including the introduction of visual and audible elements. This includes incremental changes, such as the increase in surface and aircraft traffic throughout the APE, as well as large changes such as widening of Interstate 93 through the Blue Hills Reservation. These changes may have diminished the integrity of the properties setting or feeling, although other aspects of integrity may be sufficient to convey the properties' significance, and none have been removed from the National Register. However, for purposes of this analysis FAA looked specifically at whether the properties retain integrity of setting and feeling under existing conditions. Therefore, the FAA assumes that all retain sufficient integrity to be considered historic resources for the purposes of this study.

Table 1: National Register of Historic Places Properties and Properties Identified by MHC to be Considered Eligible for NRHP within the APE

<i>NRHP Property Name</i>	<i>Area of Significance</i>	<i>City in Massachusetts</i>
All Saints' Church	Art; Architecture	Boston
Belcher-Rowe House	Architecture; Social History	Milton
Bent, G.H., Company Factory	Industry; Commerce; Architecture	Milton
Blue Hills Headquarters*	Community Planning and Development; Entertainment/Recreation; Architecture	Milton
Blue Hills Reservation and the Neponset River Reservation MRA	Archeology—Prehistoric; Conservation; Industry	Canton, Milton, Quincy, Randolph, Braintree
Blue Hills Parkway	Community Planning and Development; Engineering; Landscape Architecture; Transportation	Boston, Milton
Blue Hills Reservation Parkways-Metropolitan Park System of Greater Boston	Community Planning and Development; Conservation; Engineering; Entertainment/Recreation; Landscape Architecture; Transportation	Braintree
Borderland Historic District	Agriculture; Historic - Aboriginal; Architecture; Art; Commerce; Engineering; Industry; Invention; Landscape Architecture; Science	North Easton
Boston Young Men's Christian Association	Architecture; Education; Social History	Boston
Boyden, Seth, House	Architecture	Foxboro

<i>NRHP Property Name</i>	<i>Area of Significance</i>	<i>City in Massachusetts</i>
Brookwood Farm*	Agriculture; Exploration/Settlement	Milton
Calf Pasture Pumping Station Complex	Community Planning and Development; Engineering; Architecture; Invention	Boston
Canton Corner Historic District	Architecture; Community Planning and Development; Landscape Architecture; Social History	Canton
Canton Viaduct	Engineering; Transportation; Architecture	Canton
Carpenter, Ezra, House	Industry; Commerce; Architecture	Foxborough
Cary, Otis, House	Industry; Politics/Government; Architecture	Foxboro
Cedar Grove Cemetery	Considered eligible for NRHP determination but not currently listed	Dorchester
Chickatawbut Observation Tower*	Entertainment/Recreation	Quincy
Clapp, Lucius, Memorial	Community Planning and Development; Architecture	Stoughton
Cobb's Tavern	Communications; Social History	Sharon
Comfort Station*	Entertainment/Recreation; Architecture	Milton
Dorchester Park	Community Planning and Development; Landscape Architecture	Boston
Dorchester Pottery Works	Industry; Historic - Non-Aboriginal; Art; Architecture	Boston
Dorchester South Burying Ground	Art; Community Planning and Development; Landscape Architecture; Social History	Boston
Dorchester-Milton Lower Mills Industrial District	Industry; Commerce; Architecture	Boston
Eliot Memorial Bridge*	Entertainment/Recreation	Milton
Fisher-Richardson House	Architecture; Conservation; Education; Social History	Mansfield
Forbes, Capt. Robert B., House (NHL)	Commerce; Architecture; Maritime History	Milton
Foxboro Grange Hall	Industry; Architecture; Social History	Foxboro
Foxborough Pumping Station	Architecture; Community Planning and Development; Engineering	Foxborough
Furnace Village Historic District	Industry; Prehistoric; Historic - Aboriginal; Historic - Non-Aboriginal; Health/Medicine; Architecture	Easton

<i>NRHP Property Name</i>	<i>Area of Significance</i>	<i>City in Massachusetts</i>
Great Blue Hill Observation Tower*	Entertainment/Recreation	Milton
Great Blue Hill Weather Observatory (NHL)*	Science; Architecture; Invention	Milton
Green Hill Site*	Prehistoric	Canton (location data restricted)
Harrison Square Historic District	Architecture; Community Planning and Development; Landscape Architecture; Social History	Boston
Holbrook, Dr. Amos, House	Art; Health/Medicine; Architecture	Milton
House at 155 Reservoir	Architecture	Brookline
Hutchinson's, Gov. Thomas, Ha-ha	Landscape Architecture; Politics/Government	Milton
Loring, Harrison, House	Industry; Architecture	Boston
Lyon's Turning Mill*	Industry; Architecture	Quincy (location data restricted)
Massachusetts Hornfels-Braintree Slate Quarry*	Industry; Prehistoric	Milton (location data restricted)
Memorial Hall	Architecture	Foxboro
Metropolitan District Commission Stable*	Community Planning and Development; Entertainment/Recreation; Architecture	Milton
Milton Cemetery	Art; Architecture; Community Planning and Development; Landscape Architecture; Social History	Milton
Milton Centre Historic District	Community Planning and Development; Architecture	Milton
Milton Hill Historic District	Conservation; Community Planning and Development; Architecture	Milton
Old Barn*	Exploration/Settlement; Architecture	Milton
Old Harbor Reservation Parkways, Metropolitan Park System of Greater Boston	Community Planning and Development; Conservation; Engineering; Entertainment/Recreation; Landscape Architecture; Transportation	Boston
Peabody, The	Architecture; Community Planning and Development	Boston
Pierce House	Industry; Architecture	Reading
Ponkapoag Camp of Appalachian Mountain Club*	Entertainment/Recreation	Randolph

<i>NRHP Property Name</i>	<i>Area of Significance</i>	<i>City in Massachusetts</i>
Pratt, Capt. Josiah, House	Military; Politics/Government; Architecture	Foxboro
Redman Farm House*	Agriculture; Architecture	Canton
Refreshment Pavillion*	Entertainment/Recreation	Milton
Savin Hill Historic District	Architecture; Community Planning and Development	Boston
Scott's Woods Historic District	Agriculture; Architecture	Milton
Sharon Historic District	Exploration/Settlement; Architecture	Sharon
Soldiers' Memorial Library	Architecture; Community Planning and Development; Social History	Mansfield
Spring Brook Cemetery	Art; Community Planning and Development; Social History	Mansfield
Stoneholm	Industry; Politics/Government; Architecture	Sharon
Stoughton Railroad Station	Transportation; Architecture	Stoughton
Suffolk Resolves House	Politics/Government	Milton
Wilber, Charles R., School	Education; Architecture	Sharon
NOTES: * Part of the Blue Hills and Neponset River Reservations MRA.		
SOURCE: National Register Database; https://www.nps.gov/subjects/nationalregister/database-research.htm#table , Massachusetts Historic Commission, Adapted by Environmental Science Associates, 2021.		

Assessment of Effects

The undertaking would have an effect on a historic property if it alters the characteristics qualifying that property for the National Register. Such effects are considered "adverse" if they would diminish the integrity of a property's significant historical features (including its setting, provided the setting is a contributing factor to the property's historical significance). The undertaking does not require land acquisition, construction, or ground disturbance, and the FAA anticipates no physical effects to historic properties. However, the FAA recognizes that for certain types of historic properties, particularly those where the property's setting contributes to its historical significance, the introduction of visual, atmospheric, or audible elements could diminish the integrity of a property's significant historical features, and therefore aircraft operations could result in non-physical effects.

Therefore, the FAA focused its assessment of effects on the potential for the undertaking to introduce visual or audible elements that would diminish the integrity of setting or feeling for historic properties where those are significant historical features. The FAA also considered the extent to which those aspects of integrity have already been diminished under existing conditions.

Assessment of Auditory Effects

In order to assess the auditory impacts of the undertaking on historic properties, the FAA first modeled the projected noise attributable to additional arrivals using a metric known as Day-Night Average Sound Level (DNL). DNL is the standard noise metric used for all FAA studies of aviation noise exposure in airport communities and was used to assess the potential noise exposure of every identified historic property within the APE.

DNL is a 24-hour, time-weighted average noise metric, expressed in terms of decibel units of sound heard by the human ear, which accounts for the noise levels of individual aircraft events, the number of times those events occur, and the time of day they occur. DNL takes the contribution of noise from average aircraft operations and allows for a single number to represent aviation noise over a 24-hour period. There is one unique modification in that there is a “noise penalty” of any noise generated during “nighttime hours” (10:00 p.m. to 7:00 a.m.). In the calculation of DNL, for each hour during nighttime hours, the sound levels are increased by a 10 decibel-weighting penalty (equivalent to a 10-fold increase in aircraft operations) before the 24-hour value is computed.

The FAA’s procedures for compliance with the National Environmental Policy Act (NEPA) define a significant noise impact as an increase of a DNL by 1.5 dB in areas exposed to aircraft noise of DNL 65 dB and higher.⁵

As presented in section 4.6 of the Draft EA, the noise impacts resulting from the proposed undertaking are an order of magnitude below the significance threshold given above. Using the DNL metric, the largest noise change at a historic resource is 0.2 dB across the APE, which is a change in noise that is imperceptible to the human ear.⁶ Many historic resources within the APE experience either no difference or a small decrease in noise exposure between the Proposed Action and the No Action Alternative. These locations are currently affected by the noise from 78,879 annual flights. The additional net 255 annual flights introduce a relatively small noise change reflective of an average of less than one additional daily flight and a projected decrease of 52 nighttime arrivals.⁷

However, FAA’s NEPA procedures also note that special consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within historic sites, including traditional cultural properties, where the land use compatibility guidelines in 14 CFR Part 150 are not relevant to the value, significance, and enjoyment of the area in question. For example, the DNL 65 dB threshold may not adequately address the impacts of noise on areas

⁵ Specifically, 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 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe. FAA Order 1050.1F, Ex. 4-1 at p. 4-8.

⁶ World Health Organization. Hansen, Colin. (1951). *Fundamentals of acoustics*. American Journal of Physics - AMER J PHYS. 19. Accessed in December 2021 at https://www.who.int/occupational_health/publications/noise1.pdf?ua=1 https://www.who.int/occupational_health/publications/noise1.pdf?ua=1

⁷ “Nighttime” is referring to its definition relative to the DNL noise metric, 10:00 p.m. to 7:00 a.m.

where other noise is very low, and a quiet setting is a generally recognized purpose and attribute.

In order to assess the potential for incremental changes in noise levels or changes in the character of aircraft noise that may result in alteration of those characteristics of historic properties that qualify them for inclusion in the NRHP, the FAA considered the projected increase in the number or concentration of overflights over these areas. This analysis also informed the assessment of visual effects described below. As illustrated in the examples below, increasing overflights by an average of less than one per day would not introduce audible elements that would alter those characteristics of a historic property that qualify it for inclusion in the NRHP.

Assessment of Visual Effects

Recognizing that some types of historic properties may be affected by overflights due to visual impacts, the FAA also considered the potential for the introduction of visual elements that could diminish the integrity of the property's historical features. In order to assess the potential visual impacts on historic properties, the data for a year of overflights at the airport was overlain on the APE in ArcGIS.⁸ The APE experiences 78,879 arrival and 18,989 departure overflights annually, which corresponds to 216.1 daily arrival overflights and 52.0 daily departure overflights within the APE. Looking at the APE as a whole, the undertaking is estimated to add 255 annual arrival overflights or 0.70 daily average overflights to the APE. This is a 0.26% increase in overflights within the APE. This shows that the APE is already heavily overflowed as a whole. However, existing flights are not evenly distributed over the APE but follow flight paths which converge close to and in line with the runways. In order to further assess the impact of the undertaking on individual historic resources within the APE, the FAA considered the possibility that the undertaking could increase flights over parts of the APE that are not heavily overflowed under current conditions. This was done by mapping the dataset of departure overflights and arrival overflights over the APE (see **Attachments B** and **C**) to look for specific areas within the APE that would experience overflights from the undertaking in locations that are not already heavily overflowed. Attachment B shows that when looking only at departures, the APE areas closest to the airport are already dense with overflights but the flight tracks become more dispersed as the APE moves to the southwest. However, when arrivals are considered, this pattern disappears. Attachment C, which displays a year of arrival radar tracks, shows that the APE is already heavily overflowed over the full extent of the APE. The combined effect is that historic properties throughout the entire APE are heavily overflowed under current conditions.

When considering the potential for introduction of visual elements to historic properties, the analysis compared the numbers and locations of existing overflights within the APE against the undertaking. The undertaking would increase overflights within the APE from 268.1 daily overflights to 268.8 daily overflights, an average of less than one per day. A visual analysis of the current flight tracks shows that the entire APE is densely overflowed. As noted above, the increase in overflights attributable to the undertaking is very small compared to the existing level of overflights (a 0.26% increase). As illustrated in the examples below, the additional 0.7 average daily overflights would not be expected to introduce visual elements that would change the existing characteristics of a historic property that qualify it for inclusion in the NRHP.

⁸ The year of overflight data used was from November 1, 2018, to October 31, 2019.

Analysis of Potential Auditory and Visual Effects on Representative Historic Properties

To exemplify the potential impacts on historic properties within the APE that are especially sensitive to overflights (i.e., where the introduction of visual or audible elements could diminish the integrity of a property’s significant historical features), the FAA looked more closely at six properties: Milton Cemetery, Dorchester Park, Cedar Grove Cemetery, Governor Hutchinson’s Field, the Captain R. B. Forbes House, and the Blue Hills Reservation MRA. Milton Cemetery and Dorchester Park were selected from the NRHP properties in the APE as property types sensitive to noise and visual intrusions that could experience the maximum potential impact from the undertaking as they are located as close as possible to where the aircraft flying on the proposed procedure are closest to the ground. The other four properties were identified by MHC in their November 15, 2021, letter as “other important historic resources” that warranted a closer analysis of the potential impacts of the undertaking. These six properties are pictured with the proposed undertaking and the overflight radar data in **Attachments D1 and D2**.

Milton Cemetery was established in 1672, covers 104 acres, and has gravestones ranging back to the late 1600s. It was listed in the NRHP in 2004 under Criterion A (events) and C (architecture) as a landscape representative of the evolution of traditional New England burial sites, and for being designed by noted landscape architects Robert Morris Copeland, Horace William Shaler Cleveland, and Ernest W. Bowditch in the 19th century “rural” cemetery movement.⁹ The gravestones represent a valuable collection of folk and burial arts spanning over 300 years, and several are attributed to master craftsmen. It has a period of significance of 1672-1954.¹⁰ As an example of the rural cemetery movement, it is a property where a pastoral setting and a feeling of serenity are attributes of significance.¹¹ The Milton Cemetery is completely within the APE, is 6.3 nautical miles from Boston Logan, and would be directly overflowed by aircraft using the proposed undertaking.

Dorchester Park was established in 1891 and stretches over 28.45 acres in the Dorchester neighborhood of Boston. It was listed in the NRHP in 2008 under Criterion A (events) and C (architecture) for both its association with the Colonial period and early development of the Dorchester neighborhood as evidenced in the mile marker located on Adams Street, and as the work of a master designer, the notable landscape design firm of Olmsted, Olmsted, and Eliot.¹² It has multiple periods of significance. The first is 1734, the date of the mile marker. The second is 1891 to 1957, corresponding to when the park was established through 1957.¹³ The Park contains athletic fields and a forest with scenic pathways. As a park that was designed by Frederick Law Olmsted’s successor firm that forms part of Boston’s “Emerald Necklace,” it represents the naturalistic design that is characteristic of Olmsted’s work. The landscape setting and the feeling of escape from city life are characteristics of its significance. Dorchester Park is completely within the APE, is 5.9 miles from Boston Logan, and is 0.35 miles from the center path of the undertaking.

⁹ Edith Clifford, *National Register of Historic Places Nomination: Milton Cemetery*, 2004.

¹⁰ Ibid.

¹¹ See National Register Bulletin 41, *Guidelines for Evaluating and Registering Cemeteries and Burial Places* (National Park Service, 1992) at p.6.

¹² Shary Page Berg, *National Register of Historic Places Nomination: Dorchester Park*, 2007.

¹³ Ibid.

Cedar Grove Cemetery was established in 1868 to provide additional burial grounds for the Town of Dorchester. The land along “the Neponset with its low-lying hills, marshland and wooded areas constituted a text book-perfect [*sic*]location for a rural garden cemetery... The peace and charm of this place was apparent to fashionable strollers of the mid 19th century [*sic*].”¹⁴ It was purchased for \$17,648.83 and laid out by architect Luther Briggs Jr. It was constructed between c.1880 and 1930 as part of a small residential settlement and large public park in the Dorchester neighborhood of Boston.¹⁵ It is associated with early residential development as well as with the rural cemetery movement of the mid- to late-19th century. While not formally listed in the NRHP, MHC has indicated that this historic resource is considered eligible for listing in the NRHP.¹⁶ Like Milton Cemetery above, it is a property where a pastoral setting and feeling of serenity are attributes of its historical significance. The Cedar Grove Cemetery is located immediately east and across Adams Street from Dorchester Park. It is completely within the APE, is 5.4 nautical miles from Boston Logan, and would be directly overflowed by aircraft using the proposed undertaking.

Governor Hutchinson’s Field is a contributing element of the Milton Hill Historic District. As such, it was listed on the NRHP in 1995 under Criterion A (events) and C (architecture) as “a residential area that contains the most significant concentration of 19th and early 20th century high-style and period architecture in [Boston].”¹⁷ It has a period of significance of 1740 – 1945, marking the district’s rise to prominence as an estate district with the founding of Governor Thomas Hutchinson’s summer estate in 1742, through to the 50-year significance cutoff of the nomination.¹⁸ The district contains a number of features, including Governor Hutchinson’s Field. This feature is a 9.65-acre rectangular open area that extend from the Neponset River to the crest of Milton Hill. It once functioned as a fruit orchard associated with the Hutchinson estate. Since 1898 it has been maintained as a public open space used for passive recreation and “affords an unobstructed view of the Neponset River and Boston from the summit of Milton Hill.”¹⁹ While not recognized individually as a historic resource, it contributes to the Milton Hill Historic District as an open space historically associated with both agriculture and recreation. Governor Hutchinson’s Field functions as a reminder of the early history of the district when it was part of a more rural setting and represents late 19th-century efforts to preserve remnants of a pastoral landscape for public recreation. As such, it is a property where a rural and pastoral setting are attributes of its historical significance. It is completely within the APE, approximately 6.5 nautical miles from Boston Logan, and would be directly overflowed by aircraft using the proposed undertaking.

The Captain R. B. Forbes House (215 Adams Street, Milton, MA) is individually listed as a National Historic Landmark and is located within the Milton Hill Historic District. It is recognized as exemplifying both the Greek Revival style, as designed by the Boston architect Isiah Rogers, and the influences of 18th and 19th century trade with China. The house, built in

¹⁴ Edward Gordon, *Massachusetts Historical Commission Inventory Form: Cedar Grove/Richview*, 1995.

¹⁵ *Ibid.*

¹⁶ Massachusetts Historical Commission (MHC), letter to FAA, November 15, 2021.

¹⁷ Edith Gifford, *National Register Nomination Form: Milton Hill Historic District*, 1995.

¹⁸ *Ibid.* The nomination was submitted in 1995.

¹⁹ *Ibid.*

1833, is decorated with Chinese and nautical motifs and furnished with period furniture and art imported from China. It has a “large octagonal cupola enabling the captain’s mother and sister to watch for ships entering and leaving Boston Harbor.”²⁰ Its owner, Captain R.B Forbes, was head of the Chinese trade firm Russell and Company. It was listed as a National Historic Landmark in 1966.²¹ It has a period of significance of 1833 and is presumably listed under Criterion C (architecture) as both its date of construction (1833) and design are presented prominently in the documentation.²² As a residence constructed at the top of a local prominence (Milton Hill) and within an established residential community (Milton Hill neighborhood/historic district), this resource could be considered to have special visual characteristics that could be attributes of its historical significance. It is within the APE, approximately 6.6 nautical miles from Boston Logan, and would be directly overflowed by aircraft using the proposed undertaking.

Blue Hills Reservation Multiple Resource Area includes both prehistoric and historic archeological sites and historic-era architectural and landscape resources.²³ This resource area encompasses the entirety of the Blue Hills Reservation and includes multiple properties individually listed in the NRHP. While a comprehensive inventory of sites has not been completed, notable contributors to the Multiple Resource Area (MRA) include areas where Quincy’s granite industry flourished (Lyons Turning Mill and Fuller Quarry, both outside the APE), as well as natural landscapes that were identified for preservation in the late 19th century and developed for passive and active recreation in the early 20th century. Even before it was established as part of the Metropolitan Park System, the area was a popular destination for outdoor recreation such as hiking, as well as for early meteorological experimentation. The views from Great Blue Hill were enjoyed by visitors and provided unobstructed sightlines to the shoreline, prompting construction of an observatory tower in 1885 (Blue Hills Meteorological Observatory). The Blue Hill Meteorological Observatory is documented as “the most important historic building in the Blue Hills Area.”²⁴ It was listed as a National Historic Landmark in 1989.²⁵ In the 1930s, the Civilian Conservation Corps built a second tower on Great Blue Hill (Eliot Tower) which provides views of the skyline of Boston to the north, the harbor islands to the northeast, Houghton’s and Ponkapoag ponds to the east, and Mount Wachusett to the west. The park structures in the area were designed in the early 20th century by the master architectural firm Stickney and Austin, and areas for camping and nature study were later developed by the Appalachian Mountain Club in the 1920s-40s. The area has been altered by the reconstruction of Route 128 in the 1960s to expand it to a six-to-eight lane highway. As a landscape that derives part of its historical significance from views of Boston as well as sightlines to the coast, the Blue Hills Reservation MRA is sensitive to visual effects. It is almost completely within the APE and approximately 7.4 nautical miles from Boston Logan. Given the size of the MRA, there are portions that would be directly overflowed by aircraft using the proposed undertaking.

²⁰ Patricia Heintzleman, *National Register Nomination Form: Captain R.B. Forbes House*, 1975

²¹ The digital file for this resource includes correspondence and earlier documentation associated with listing of the house as a National Historic Landmark in 1966.

²² Specific criteria are not listed, although both “architecture” and “commerce” are checked as areas of significance.

²³ Stephen Cole and Sara Chase, *National Register of Historic Places Nomination: Blue Hills and Neponset River Reservation Multiple Resource Area*, 1980. No specific criteria or period of significance is noted in the nomination. Many of the individual contributing elements have been documented separately.

²⁴ Sara Chase, *Massachusetts Historical Commission Form B: Great Blue Hill Weather Observatory*, 1979.

²⁵ National Park Service, “List of NHLs by State,” <https://www.nps.gov/subjects/nationalhistoriclandmarks/list-of-nhls-by-state.htm>

Auditory Effects

The noise impact on the six properties discussed above was calculated and compared against the existing noise exposure from aircraft as measured in DNL. The current noise conditions for each resource are as follows:

- Milton Cemetery – DNL 53.4 dB
- Dorchester Park – DNL 51.3 dB
- Governor Hutchinson’s Field (part of Milton Hill Historic District) – DNL 52.1 dB
- Captain R. B. Forbes House – DNL 52.4 dB
- Cedar Grove Cemetery – DNL 54.0 dB
- Blue Hills Reservation MRA –DNL 39.2 to 50.7 dB across the entire MRA

These noise levels are consistent with a quiet urban environment, and all properties appear to retain integrity of setting and feeling under the existing conditions.²⁶ The cumulative noise exposure of these properties, measured in DNL, would be unchanged under the proposed undertaking.²⁷

In addition, FAA considered whether there might be a change in the character of aircraft noise over the area that could affect these properties.²⁸ Because the area is already densely overflown and the undertaking would increase overflights by an average of less than one per day, we have concluded that the incremental increase in overflights caused by the undertaking would not introduce any audible elements that would diminish the integrity of these properties’ significant historical features.

Visual Effect

The visual impact on the six properties attributable to the increase in overflights was calculated and compared against the existing conditions. This includes consideration of both direct overflights and flights that may be visible from the historic resource.²⁹ The visual impacts for properties where the undertaking would likely result in direct and/or visible overflights is discussed below.

- Milton Cemetery is currently directly overflown by 177.1 average daily overflights. The undertaking would increase the number of daily overflights by 0.7 flights, for a total of

²⁶ “Fundamentals of Noise and Sound,” *Federal Aviation Administration*, https://www.faa.gov/regulations_policies/policy_guidance/noise/basics/. It should be noted that the figure referencing the “quiet urban environment” is an A-weighted SEL level while the calculated values above are DNL, which is weighted over 24 hours instead of 1 second and includes a nighttime penalty. As a point of reference, noise exposure levels below DNL 65 dB are considered compatible with residential use, parks, churches, and concert halls. 14 CFR part 150, appendix A.

²⁷ When analyzing the potential noise impacts to historic resources, the current and future no-action conditions were modeled with consideration to the less precise level of dispersion of flights that would be reflective of conditions without the proposed undertaking. When the future action alternative was modeled, the more concentrated flight tracks that would result from use of the proposed undertaking were used.

²⁸ For example, a shift from small numbers of relatively loud operations to large numbers of relatively quiet operations can result in the same DNL but have different effects on historic properties.

²⁹ Visual impacts were assessed by determining the total number of arrival and departures (e.g., overflights) that would be considered visible at each property. Aircraft were assumed to be visible if the overflight was within five miles of the historic resource.

177.8 average daily overflights. Milton Cemetery also currently experiences a daily average of 288.7 visible flights. The undertaking would increase the number of visible flights by 0.7, for a total daily average of 289.4.

- Dorchester Park is currently directly overflowed by 4.5 average daily overflights. It is located 0.35 nautical miles laterally from the proposed procedure's centerline but aircraft on the final approach to Runway 4L are flying on such a straight line that they do not directly overfly Dorchester Park, and the undertaking would not increase the number of direct overflights over Dorchester Park. It would increase the number of daily visible flights. Dorchester Park currently experiences a daily average of 321.2 visible flights. The undertaking would increase the number of visible flights by less than one per day, for a daily total average of 321.9.
- Cedar Grove Cemetery is currently directly overflowed by 11.4 average daily overflights. The undertaking would increase the number of daily overflights by 0.7 flights, for a total of 12.1 average daily overflights. Cedar Grove Cemetery also experiences a daily average of 323.8 visible flights. The undertaking would increase the number of visible flights by 0.7, for a total daily average of 324.5.
- Governor Hutchinson's Field (part of Milton Hill Historic District) is currently directly overflowed by 3.0 average daily overflights. The undertaking would increase the number of daily overflights by 0.7 flights, for a total of 3.7 average daily overflights. This resource also currently experiences a daily average of 293.7 visible flights. The undertaking would increase the number of visible flights by 0.7 flights, for a total daily average of 294.4.
- Captain R. B. Forbes House is currently directly overflowed by 1.7 average daily overflights. It is located 0.06 nautical miles laterally from the proposed undertaking. Although this resource is very close to the final approach centerline of the undertaking, aircraft would be expected to fly on such a straight line as to not directly overfly the House. Therefore, the undertaking would not increase the number of direct overflights but would increase the number of daily flights that are visible to visitors. The House currently experiences a daily average of 293.6 visible flights. The undertaking would increase the number of visible flights by 0.7, for a total daily average of 294.3.
- The entire Blue Hills Reservation MRA is currently directly overflowed by 213.0 average daily overflights across the 7,000-acre resource. The undertaking would increase the number of daily average overflights by 0.7, for a total of 213.7 average daily overflights. The Blue Hills Reservation MRA also experiences a daily average of 225.7 visible flights. The undertaking would increase the number of visible flights by a daily average of 0.7, for a total of 226.4 daily average of visible flights.

The average altitude of direct overflights was estimated for the six properties and compared against the undertaking to assess the visual impacts. The average altitude of overflights for the properties that would result in less than one direct and/or visible overflight as a result of the undertaking is discussed below.

- Milton Cemetery currently experiences overflights at an average altitude of 2,090 feet above ground level (AGL) for arriving aircraft and 3,470 feet AGL for departing aircraft.

The undertaking would result in an increase of less than one direct overflight per day with an altitude between 2,140 to 2,340 feet AGL.

- Dorchester Park currently experiences overflights traveling at 1,880 feet AGL for arriving aircraft and 3,260 feet AGL for departing aircraft. The resource is located 0.35 nautical miles laterally from the proposed undertaking but aircraft on final approach to Runway 4L are flying on such a straight line that they do not directly overfly Dorchester Park. Therefore, the undertaking would not increase the number of direct overflights over Dorchester Park but would increase the number of daily visible flights by less than one per day with an altitude between 1,690 to 1,790 feet AGL.
- Cedar Grove Cemetery currently experiences overflights at an average altitude of 1,800 feet AGL for arriving aircraft and 3,140 feet AGL for departing aircraft. The undertaking would result in an increase of less than one direct overflight per day with an altitude between 1,720 to 1,820 feet AGL.
- Governor Hutchinson's Field (part of Milton Hill Historic District) currently experiences direct overflights at an average altitude of 1,960 feet AGL for arriving aircraft and 3,360 feet AGL for departing aircraft. The undertaking would result in an increase of less than one direct overflight per day with an altitude between 1,880 to 2,080 feet AGL.
- Captain R. B. Forbes House currently experiences overflights at an average altitude of 2,000 feet AGL for arriving aircraft and 3,680 feet AGL for departing aircraft. This resource is located 0.06 nautical miles laterally from the proposed undertaking. Although this resource is very close to the undertaking's final approach centerline, aircraft would be expected to fly on such a straight line as to not directly overfly the historic resource. Therefore, the proposed undertaking would not increase the number of direct overflights, but the proposed undertaking would increase visible flights by less than one per day with an altitude between 1,870 to 2,070 feet AGL.
- The entire Blue Hills Reservation MRA currently experiences overflights with an average altitude of 2,680 feet AGL for arriving aircraft and 6,210 feet AGL for departing aircraft. The undertaking would result in an increase of less than one direct overflight per day with an average altitude between 2,410 to 2,610 feet AGL.

These examples represent types of historic properties that are most sensitive to aircraft overflights and are located where the undertaking's effects would be the most pronounced. Although some of the six properties would experience additional overflights at a lower altitude on average as a result of the proposed undertaking, each area is already directly overflown, and the undertaking would increase overflights by an average of less than one per day. Given that overflights and visible flights would increase by an average of less than one per day, we conclude that the incremental increase in overflights caused by the undertaking would not introduce any visual elements that would diminish the integrity of these properties' significant historic features and therefore would not adversely affect the historic properties. This indicates that historic properties that are less sensitive to noise or visual intrusions and/or are farther removed from the centerline of the proposed procedure would also not be adversely affected by the undertaking.

Finding of No Adverse Effect Criteria

To support a Finding of No Adverse Effect, an undertaking must not meet any of the criteria set forth in the Advisory Council on Historic Preservation's Section 106 regulations at 36 CFR § 800.5(a). This section presents why the undertaking does not meet any of these criteria.

- Does the undertaking physically destroy or damage the property?
 - The undertaking would not have any physical impact on any property.
- Does the undertaking alter the property in any way that is inconsistent with the Secretary of the Interior's Standards for Treatment of Historic Properties (36 CFR Part 68)?
 - The undertaking is located in the airspace above the historic resources and would not result in any alteration or physical modifications to these resources.
- Does the undertaking remove a property from its historic location?
 - The undertaking would not remove any property from its location.
- Does the undertaking change the character of the property's use, or of physical features within the property's setting that contribute to its historic significance?
 - The undertaking would not change the character of any property's use or any physical features in any historical property's setting.
- Does the undertaking introduce an atmospheric, audible, or visual element to the area that would diminish the integrity of the property's significant historic features?
 - As discussed above and illustrated by the six examples (of Milton Cemetery, Dorchester Park, Cedar Grove Cemetery, Governor Hutchinson's Field, the Captain R. B. Forbes House, and the Blue Hills Reservation MRA), the small increase in overflights attributable to the undertaking, less than one additional overflight per day, would not introduce audible or visual elements that would diminish the integrity of the significant historical features of any historic resource in the APE.
- Does the undertaking result in neglect of a property which would result in its deterioration, transfer, sale, or lease?
 - The undertaking would not cause any property to be neglected, sold, or transferred.

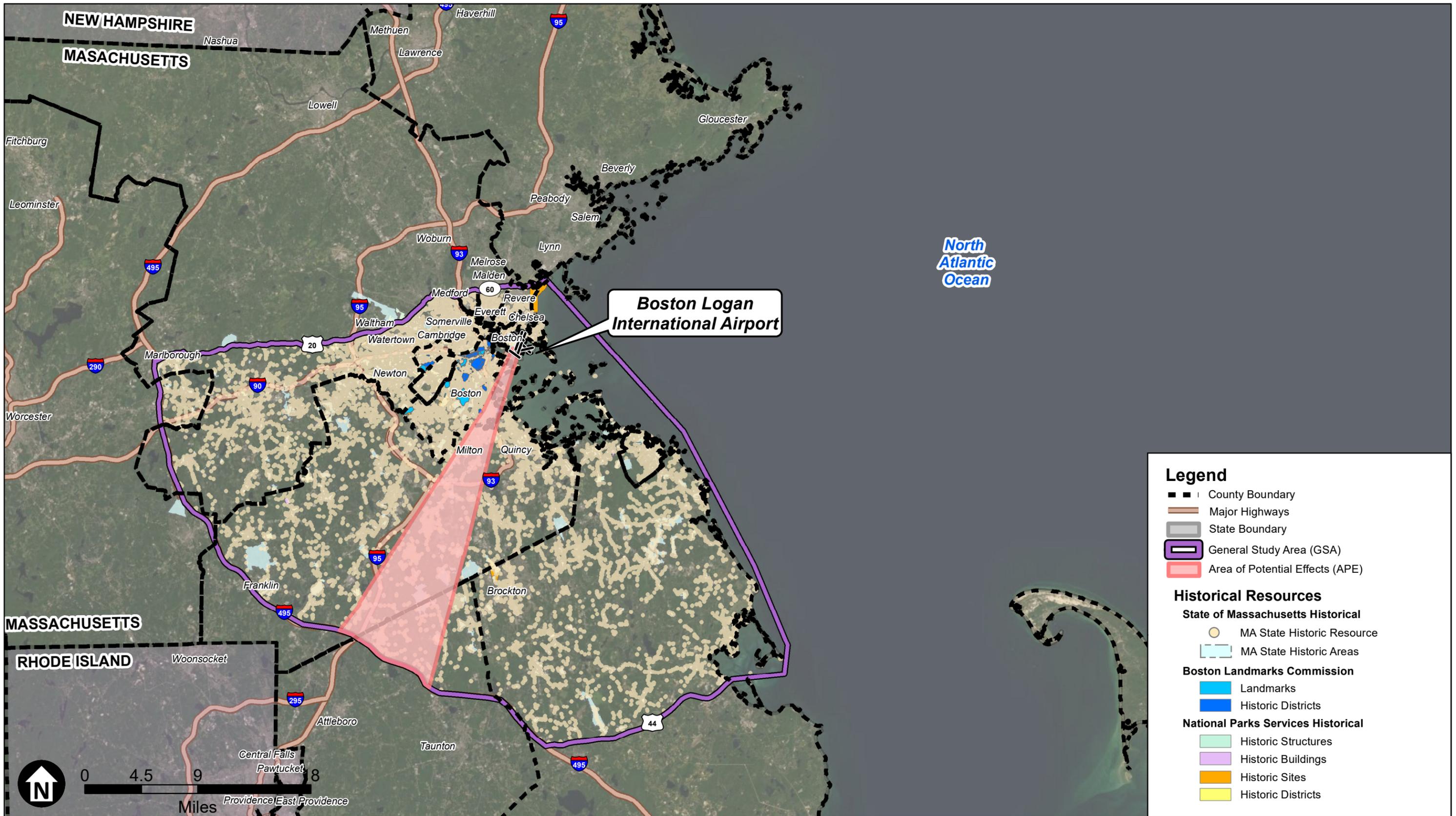
Based on the analysis offered above, the FAA is reaffirming our Proposed Finding of No Adverse Effect. Although the undertaking potentially affects the setting and feeling of certain types of historic properties that would be overflown by aircraft using the proposed procedure, the incremental increase in overflights (an average of less than one per day) in an area already densely overflown would not diminish the integrity of any historic properties' significant historical features. We hope this additional information and analysis responds to your concerns and addresses your previous non-concurrence to the FAA's Proposed Finding of No Adverse Effect. The FAA has attempted to address those concerns by providing additional information and analysis responding to your questions in correspondence.

We request that you review this information and advise the FAA within 30 days of receipt of this letter whether you now concur with, or have no objection to, our Proposed Finding of No Adverse Effect.

Sincerely,

Veronda Johnson

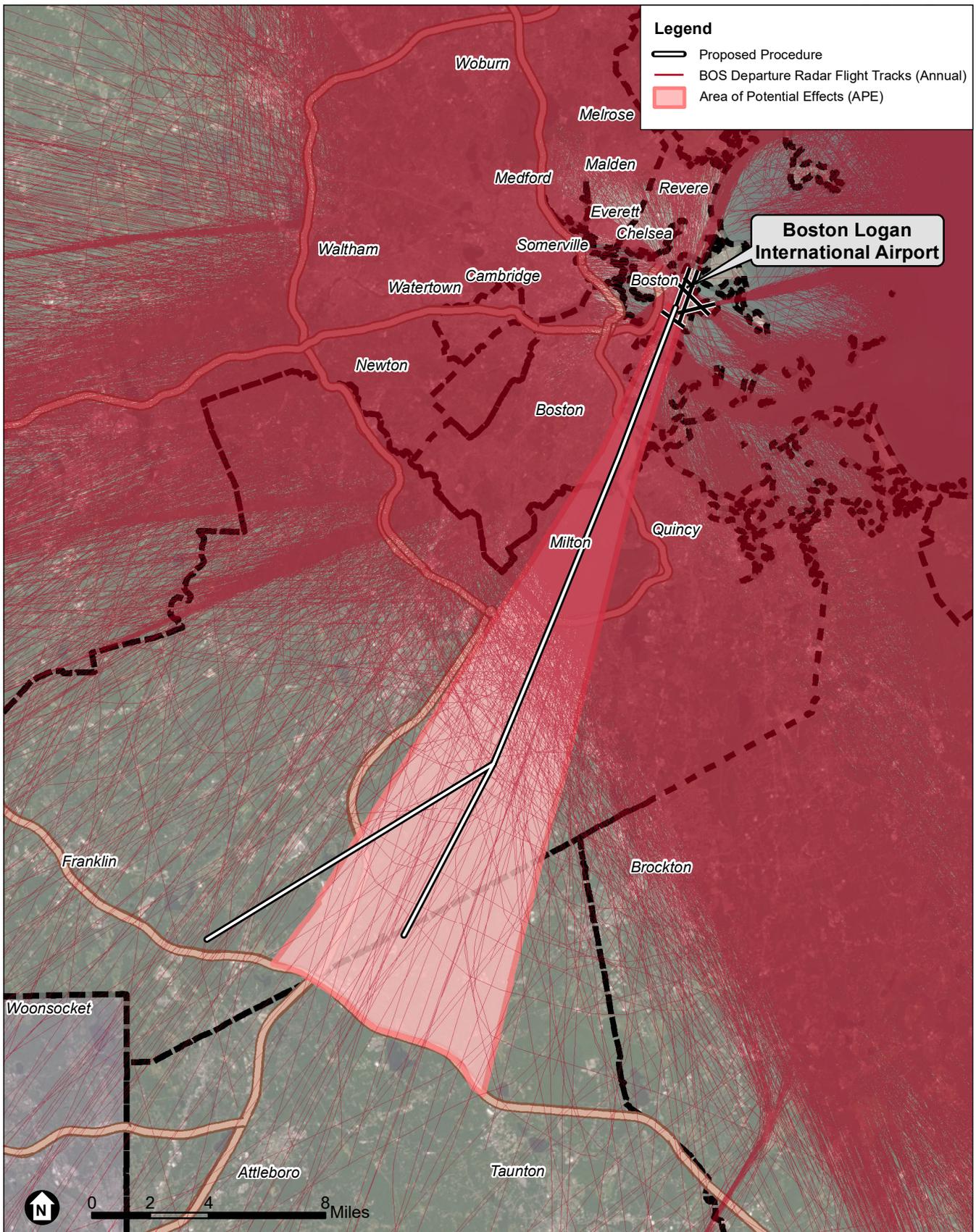
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SOURCE: Esri; Prepared by Jacobsen Daniels, 2020

Boston Logan RNAV (GPS) RWY 4L EA

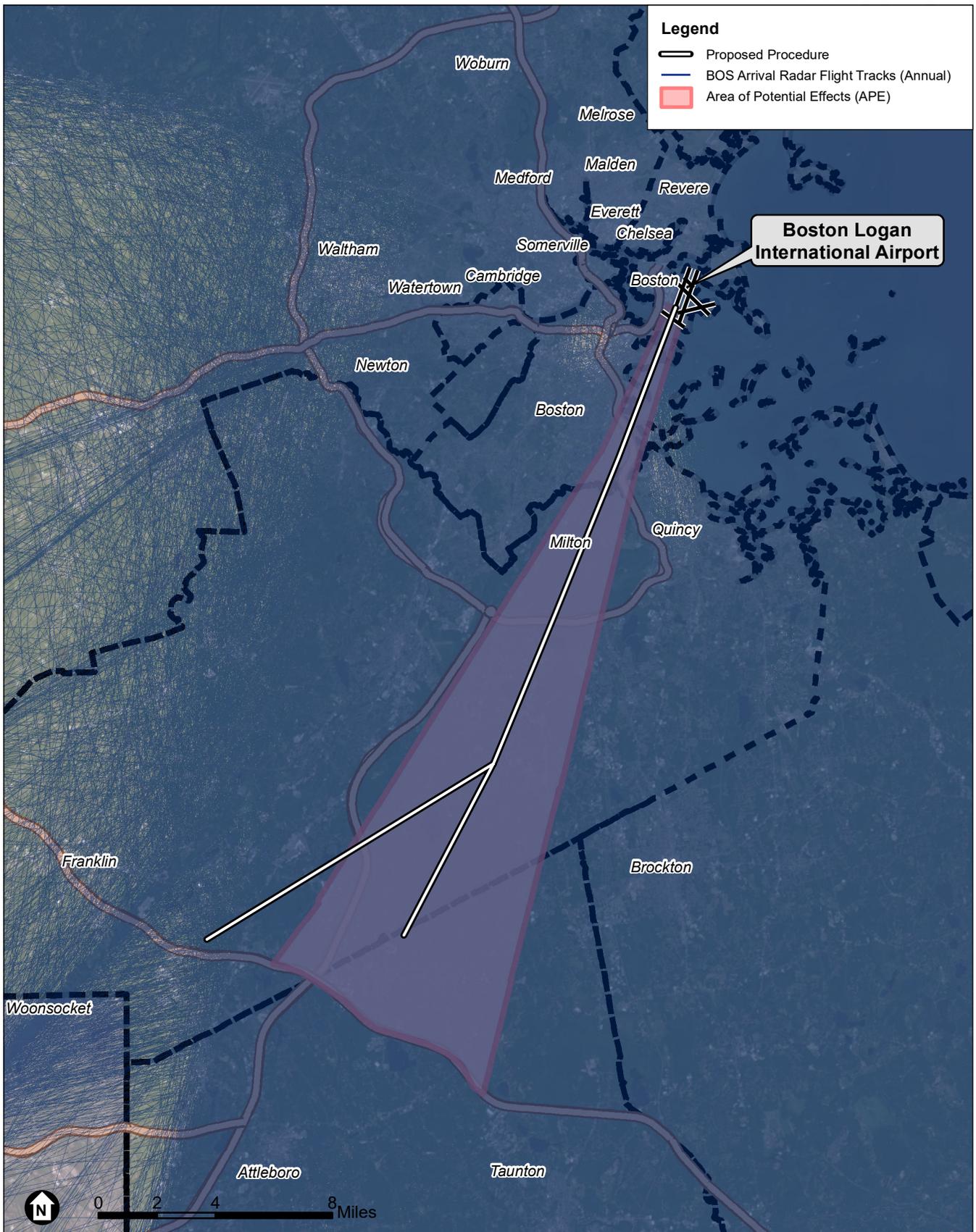




SOURCE: Esri; RoVolus, 2021; ESA, 2021

Boston Logan RNAV (GPS) RWY 4L EA

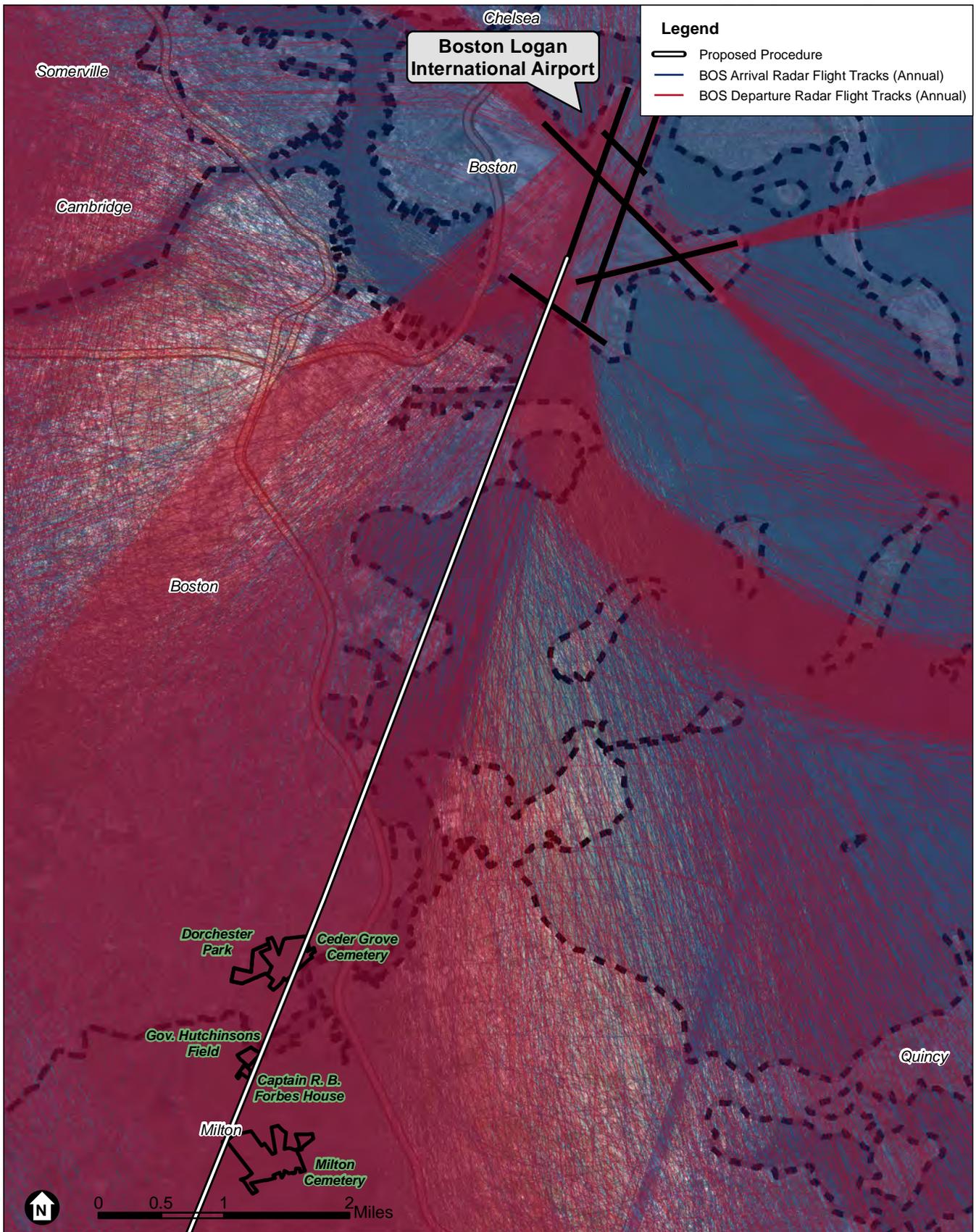




SOURCE: Esri; RoVolus, 2021; ESA, 2021

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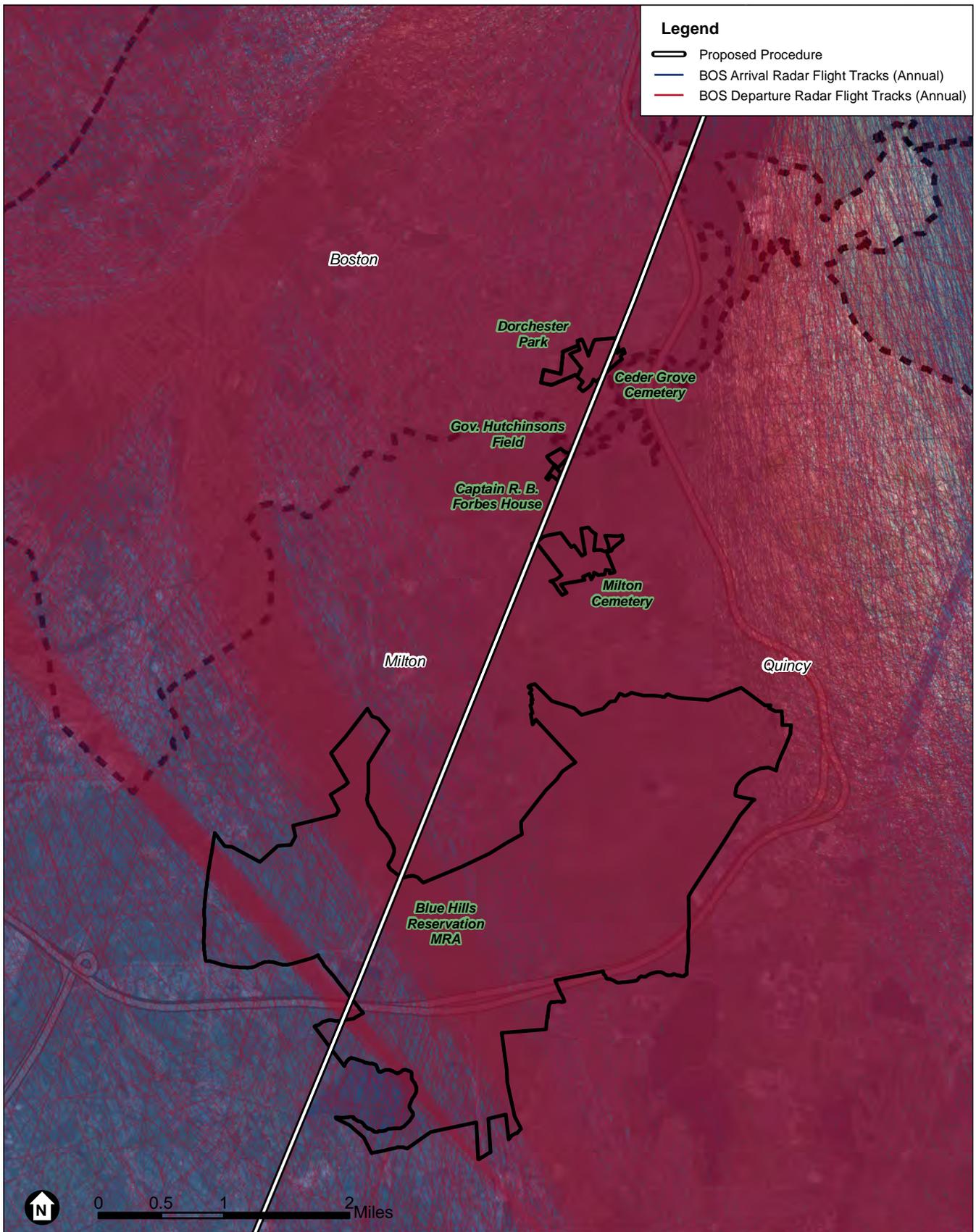




SOURCE: Esri; RoVolus, 2021; ESA, 2021

Boston Logan RNAV (GPS) RWY 4L EA





SOURCE: Esri; RoVolus, 2021; ESA, 2021

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