



Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909
Telephone (617) 568-5000
www.massport.com

December 19, 2022

Ms. Gail Lattrell
Director, Airports Division (ANE-600)
Federal Aviation Administration New England Region
1200 District Avenue
Burlington, MA 01803

Dear Ms. Lattrell:

Re: Boston Logan (BOS) 2021 Noise Exposure Map

On behalf of the Massachusetts Port Authority (Massport), owner and operator of Boston Logan International Airport (Boston Logan), I have attached for your review and approval the 2021 Boston Logan Noise Exposure Map (NEM). As we have discussed with the FAA, Massport's intention is to submit updated NEMs on a regular basis to better reflect the Boston Logan noise environment and any potential changes, particularly as we recover from the COVID impacts to the aviation industry.

As you are aware, we are currently implementing the Pilot Phase of the Residential Sound Insulation Program based on the approved 2020 NEM and made possible by the FAA's recent grant award. Reflecting the industry recovery, the 2021 NEM 65 DNL contour is larger than the 2020 NEM and it includes all the residences currently being assessed for the Pilot Phase.

With the FAA's approval, Massport will utilize this NEM to inform future phases of the residential sound insulation process. We look forward to continuing to work with you and your staff in implementing the current Pilot Phase and future phases of Boston Logan's RSIP program.

Sincerely,

A handwritten signature in blue ink, appearing to read "FLA", written over a light blue horizontal line.

Flavio Leo
Director of Aviation Planning and Strategy
Massachusetts Port Authority

Cc: Lisa Lesperance, Cheryl Quaine (FAA); Lisa Wieland, Ed Freni, Luciana Burdi, Alaina Coppola, Todd Smith, Steve Sulprizio (Massport)

Attachment



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

Federal Aviation Administration
New England Region

1200 District Avenue
Burlington, MA 01803

April 11, 2023

Mr. Flavio Leo
Massachusetts Port Authority
1 Harborside Drive
East Boston MA 02128

Dear Flavio:

The FAA Airports Division, New England Region is in receipt of your Logan Airport 2021 Noise Exposure Map Technical Memorandum, dated 12/12/22. The Boston-Logan International Airport noise mitigation program predates the FAA Part 150 program. Massport has agreed to follow many Part 150 technical and procedural requirements. These include standard noise modeling using the AEDT model, pre-construction acoustical testing of homes, and public notification at key points in the process. This mirroring of the Part 150 program requirements provides some continuity with the airport noise mitigation program nationwide.

After review of the technical memorandum, we confirmed it was based on standard noise modeling. We jointly reviewed the “humanized” noise contour and agreed to its location. The FAA New England Region, Airports Division hereby accepts the “Logan Airport 2021 Noise Exposure Map”. This Noise Exposure Map (NEM) is valid for 2021 conditions, and it is anticipated that future submittals will include updated/current conditions.

This acceptance does not commit the FAA to fund sound insulation. Potential funding will generally follow the standard AIP funding requirements. Funding is made possible so long as the FAA funding authorization includes the pre-Part 150 “grandfathering” language. Please inform us when the NEM document is posted on the Massport website.

Sincerely,

**GAIL B
LATTRELL**

Gail B. Lattrell
Director, Airports Division

Digitally signed by GAIL B
LATTRELL

Date: 2023.04.11 11:34:02
-04'00'

TECHNICAL MEMORANDUM

To: Flavio Leo
Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, MA 02128

From: Kate Larson
Bryan Rand
Robert C. Mentzer, Jr.

Date: 12/13/2022

Subject: Logan Airport 2021 Noise Exposure Map

Reference: HMMH project number 310830.006

Massport has been conducting a Residential Sound Insulation Program (RSIP) around Logan Airport since the 1980s, providing sound insulation treatments to 11,515 housing units in 5,467 residential buildings between the years of 1986 and 2014. In 2019, Massport began coordination with the FAA to restart the RSIP by preparing and submitting a current Noise Exposure Map (NEM) with appropriate documentation. It was decided in 2020 that the best course of action would be to restart the program using the 2020 DNL contours as prepared for Massport's annual environmental reporting. The 2020 DNL contours are unusually small because of the sharp drop in air carrier passenger operations that year, due to the global pandemic; the residential areas within the DNL 65 contour for 2020 are exposed to higher levels of aircraft noise under more normal volumes of airport traffic.

The re-started RSIP received its initial FAA grant in 2022, and identification of eligible homes for Phase 1 is underway. The majority of homes exposed to aircraft noise of DNL 65 or above have already been soundproofed. The current soundproofing effort revisits homes that were treated prior to 1993, and also reaches out to owners of residences that have never previously participated in the program.

This memo has been prepared for Massport to submit to the FAA in support of the current RSIP objectives and to maintain a recent Noise Exposure Map on file with the FAA. The most recent set of DNL contours represents calendar year 2021, as prepared for the Boston Logan International Airport 2020/2021 Environmental Data Report.

The purposes for which this memorandum is prepared are:

- to provide an updated set of Day-Night Average Sound Level (DNL) contours for the RSIP;
- to update the land use assessment based on the 2021 DNL contour
- to provide a "humanized" 2021 DNL 65 contour, including tabulation of population and housing unit counts

Day-Night Average Sound Level Contours for 2021

This section describes the results of noise modeling using the FAA Aviation Environmental Design Tool (AEDT) for the 2021 DNL contours. The DNL contours are presented graphically and the dwelling units and population living within contour intervals are tabulated. DNL 65 dB is the focus of much of the noise analysis, as it is the threshold for noise incompatibility with residential land use,^{1,2} for both FAA and the U.S. Department of Housing and Urban Development.

1 14 Code of Federal Regulations Part 150, Appendix A to Part 150 Noise Exposure Maps, Sec. A150.101(d)).

2 24 Code of Federal Regulations Part 51, Subpart B Noise Abatement and Control, Sec. 51.103(c)).

The 2021 DNL contours were prepared using the most recent version of FAA's AEDT model at the time of the start of the modeling process, version 3d. **Figure 1** shows the 2021 DNL 65 to 75 dB contours, in 5-decibel increments, overlaid on the land use base map.

The only residential land uses within the 2021 DNL 65 dB contour are in Winthrop (Point Shirley), Revere and East Boston (Orient Heights and Eagle Hill). All of the residential areas within the 2021 DNL 65 dB contour are in areas previously included under Massport's RSIP. Historically, Massport has reached out to property owners that are still eligible but have not participated in the program.

In the annual EDR/ESPR documentation, Massport reports population counts within selected 5 dB increments of airport noise exposure each year. The newly released 2020 U.S. Census data³ forms the basis of the population counts for the 2021 DNL contours.

In recent years, the method of calculating population impact has been adapted to GIS software. The DNL contours and U.S. Census block centroids and population data are imported into GIS. Then, for each census block, the process determines the fraction of the area of the block that is residential land use and that is within the contour. That fraction is then applied to the census block population and dwelling units counts. **Table 3** shows the total number of dwelling units and people estimated from 2020 U.S. Census data as residing within the 2021 DNL 65 dB contour, listed by community and by 5-decibel increments.

Table 1. Noise-Exposed Dwelling Units and Population within the 2021 DNL 65 dB Contour

Dwelling Units	> 75 DNL	70-75 DNL	65 ¹ -70 DNL	Total (65+) ¹ DNL
Boston ²	0	0	298	298
Chelsea	0	0	0	0
Everett	0	0	0	0
Revere	0	0	497	497
Winthrop	0	0	164	164
Total (All communities)	0	0	959	959
Population	> 75 DNL	70-75 DNL	65 ¹ -70 DNL	Total (65+) ¹ DNL
Boston ²	0	0	885	885
Chelsea	0	0	0	0
Everett	0	0	0	0
Revere	0	0	1,260	1,260
Winthrop	0	0	352	352
Total (All communities)	0	0	2,497	2,497

Source: HMMH, 2022.

Notes: Population counts use the 2020 U.S. Census block data, merged with 2016 Residential Land Use. 2021 yes, noise analysis uses AEDT version 3d.

- 1 Day-Night Average Sound Level (DNL) 65 decibel (dB) is the federally-defined noise criterion used as a guideline to identify where residential land use is considered noncompatible with aircraft noise.
- 2 The Boston area within the contours only includes areas of Orient Heights and Eagle Hill, in East Boston.

³ accessed 10/6/2021 from https://services.arcgis.com/P3ePLMys2RVChkXj/arcgis/rest/services/USA_Census_2020_Redistricting_Blocks/FeatureServer



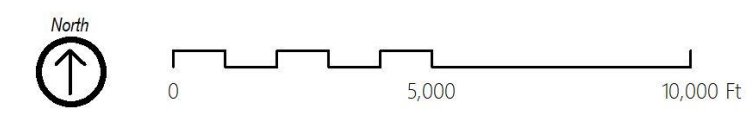
massport

Boston Logan International Airport

Figure 1
2021 RSIP DNL Contours

- 2021 DNL 65 Contour
- 2021 DNL 70 Contour
- 2021 DNL 75 Contour
- BOS Airport Boundary
- Runways
- ▲ Permanent Noise Monitor

- | | |
|---|---|
| Residential - Single Family | Right-of-way |
| Residential - Multi-Family | Agriculture |
| Residential - Other | Open Space |
| Commercial | Forest |
| Industrial | Bare Land |
| Mixed Use | Wetland |
| Other Impervious | Water |



Author: Michael Hamilton Document Path: G:\Projects\310XXX\310830_Massport_Noise_2019-2024\GIS\310830_006_BOS_RSIP_NEM_Figure1_2021_DNL_Contour.mxd

Source: Harris Miller Miller & Hanson Inc. 2018, U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP), 2018; MassGIS

Land Use within 2021 Day-Night Average Noise Contours

The 2021 DNL 65 dB contour encompasses much of the airport property and an additional 1.6 square miles of area, over 83 percent of which is water, shore, or wetlands. **Table 2** lists the off-airport area within the contours by land use classification, broken down by contour intervals.

Table 2. Land Use Area Contained within the 2021 DNL 65 dB Contour

Land Use (Off Airport Property)	65-70 dB DNL	70-75 dB DNL	>75 dB DNL
	Area (SqMi)	Area (SqMi)	Area (SqMi)
Residential - Multi-Family	0.025	0	0
Residential - Single Family	0.018	0	0
Mixed Use - Primarily Residential	0.001	0	0
Commercial/Industrial	0.010	0	0
Transportation	0.130	0.006	0.001
Water/Wetlands	1.339	0.147	0.008
Undeveloped/Open Space	0.102	0	0
TOTAL	1.625	0.153	0.009
Source: HMMH, 2022			

Humanized Day-Night Average Sound Level Contour for 2021

Where the computer-generated noise contours cut through residential land use areas, Massport applies a “humanization” process⁴ in the implementation of its soundproofing program, drawing the eligibility line beyond the contour extents slightly where the contour passes through property boundaries. The goal is to encompass, where practicable, connected neighborhood blocks, rather than dividing a block. **Figure 2** shows the 2021 DNL 65 dB contour with the humanization adjustments. **Figure 3** presents the individual areas where the contour intersects residential land use. **Figures 3a – 3e** present enlargements of each of these individual areas.

4 Following guidance in FAA Airport Improvement Program Appendix R Section R-9 Block Rounding



massport

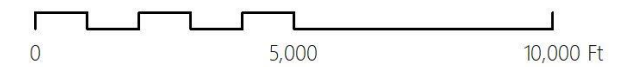
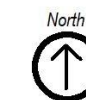
Boston Logan International Airport

Figure 2

2021 RSIP DNL 65 Humanized Contour

- 2021 RSIP Humanized Contour Line
- 2021 RSIP Forecast Contour Line
- BOS Airport Boundary
- Runways
- Permanent Noise Monitor

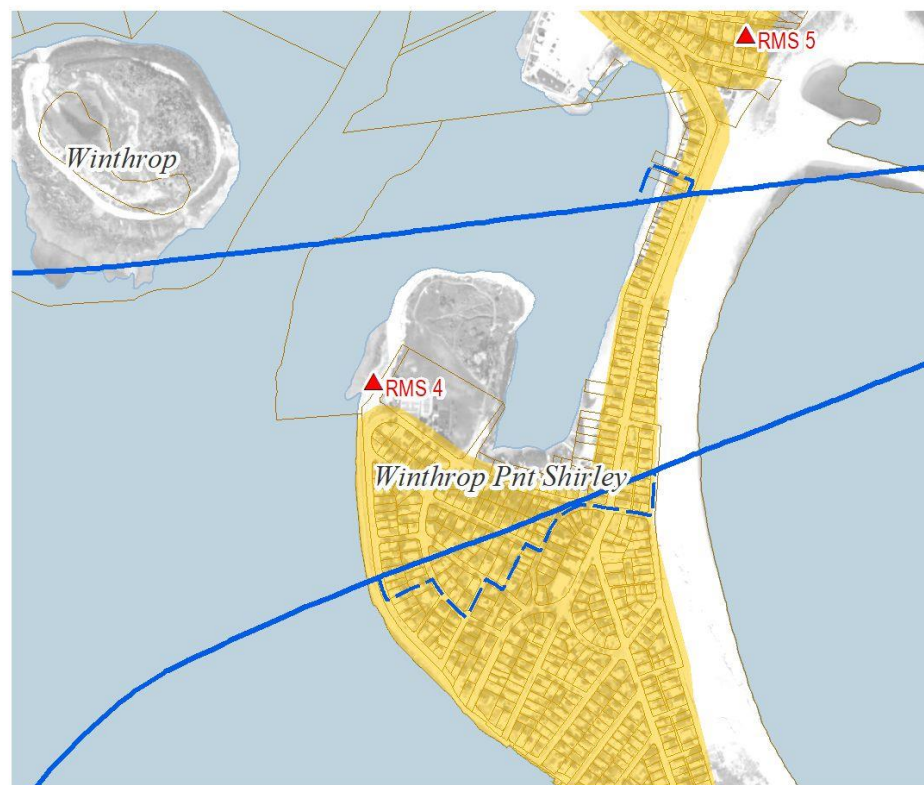
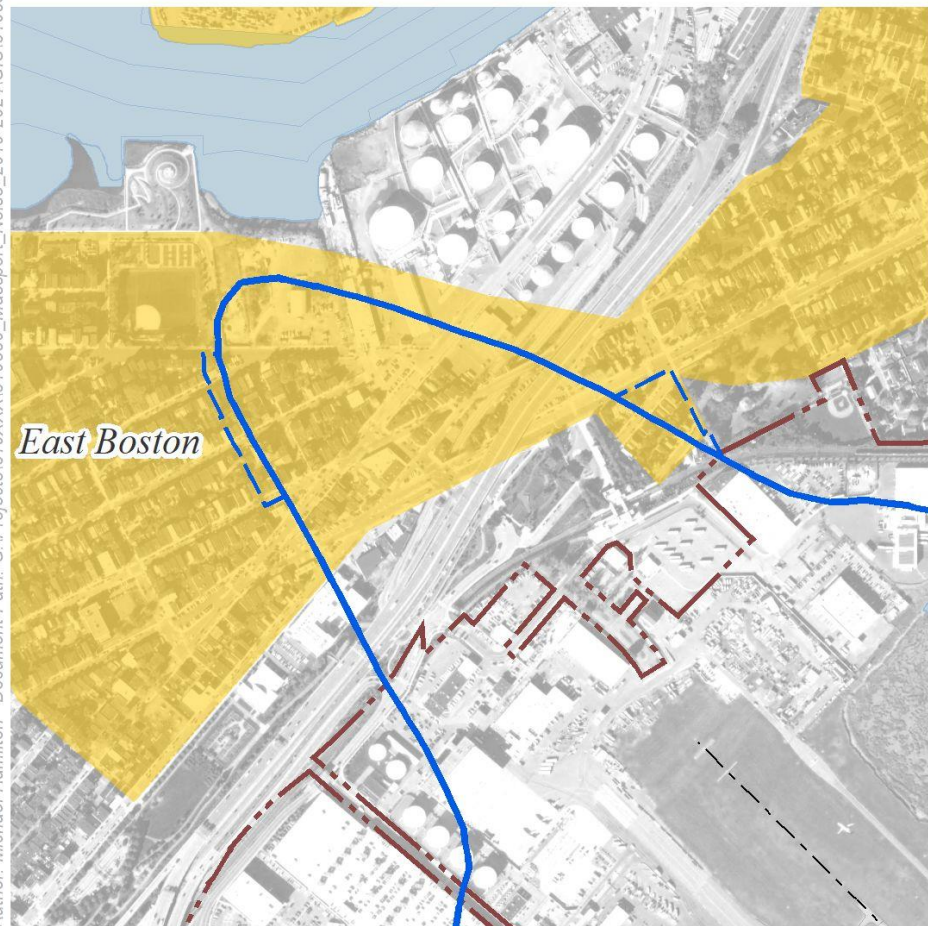
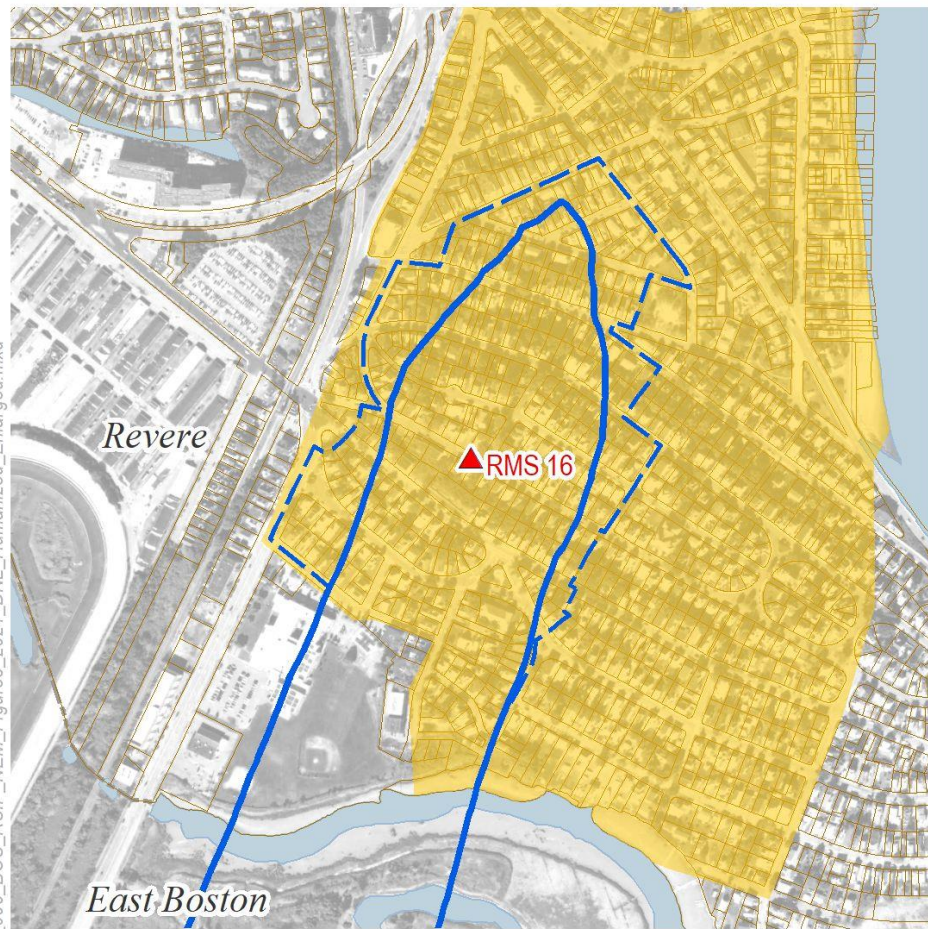
- | | |
|-----------------------------|--------------|
| Residential - Single Family | Right-of-way |
| Residential - Multi-Family | Agriculture |
| Residential - Other | Open Space |
| Commercial | Forest |
| Industrial | Bare Land |
| Mixed Use | Wetland |
| Other Impervious | Water |



Author: Michael Hamilton Document Path: G:\Projects\310XXX\310830_Massport_Noise_2019-2024\GIS\310830_006_BOS_RSIP_NEI_Figure2_2021_DNL_Humanized_Contour.mxd

Source: Harris Miller Miller & Hanson Inc. 2018, U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP), 2018; MassGIS








Author: Michael Hamilton Document Path: G:\Projects\310XXX\310830_Massport_Noise_2019-2024\GIS\310830_006_BOS_RSIP_NEW_Figure3_2021_DNL_Humanized_Enlarged.mxd



massport
Boston Logan International Airport

Figure 3

2021 RSIP DNL 65 Humanized Contour Over Residential Areas

-  2021 RSIP Humanized Contour Line
-  2021 RSIP Forecast Contour Line
-  BOS Airport Boundary
-  Runways
-  Permanent Noise Monitor
-  Sound Insulation Areas
-  Parcel Boundary



Author: Michael Hamilton Document Path: \\files\vol1\Projects\310XXX\310830_Massport_Noise_2019-2024\GIS\310830_006_BOS_RSIP_NEM_Figure3a_2021_DNL_Humanized_Enlarged.mxd

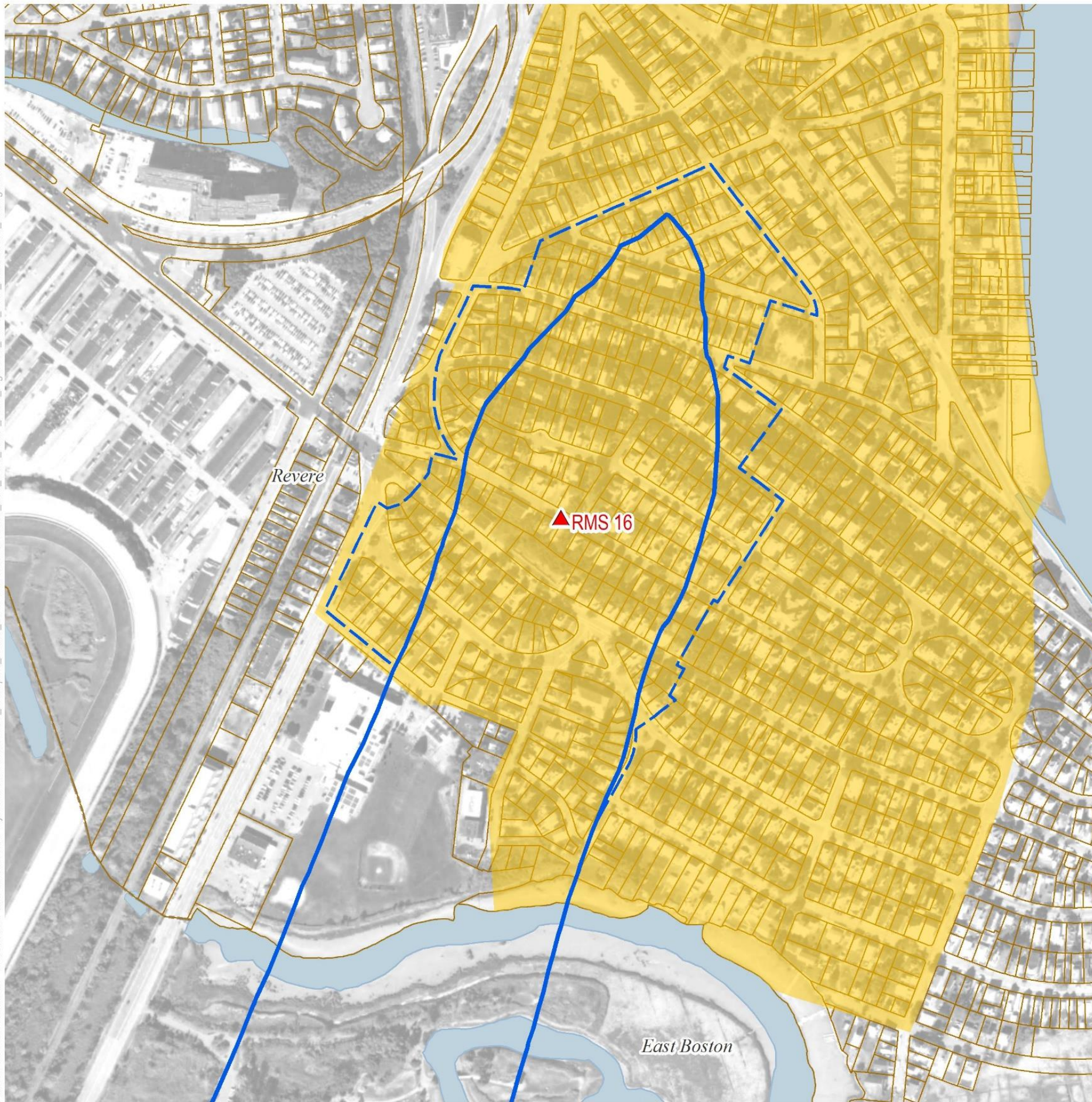







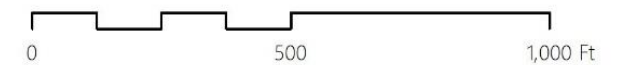


Figure 3a

2021 RSIP DNL 65 Humanized Contour Over Residential Areas

-  2021 RSIP Humanized Contour Line
-  2021 RSIP Forecast Contour Line
-  BOS Airport Boundary
-  Runways
-  Permanent Noise Monitor
-  Sound Insulation Areas
-  Parcel Boundary



Author: Michael Hamilton Document Path: \\files\vol1\Projects\310XXX\310830_Massport_Noise_2019-2024\GIS\310830_006_BOS_RSIP_NEM_Figure3b_2021_DNL_Humanized_Enlarged.mxd

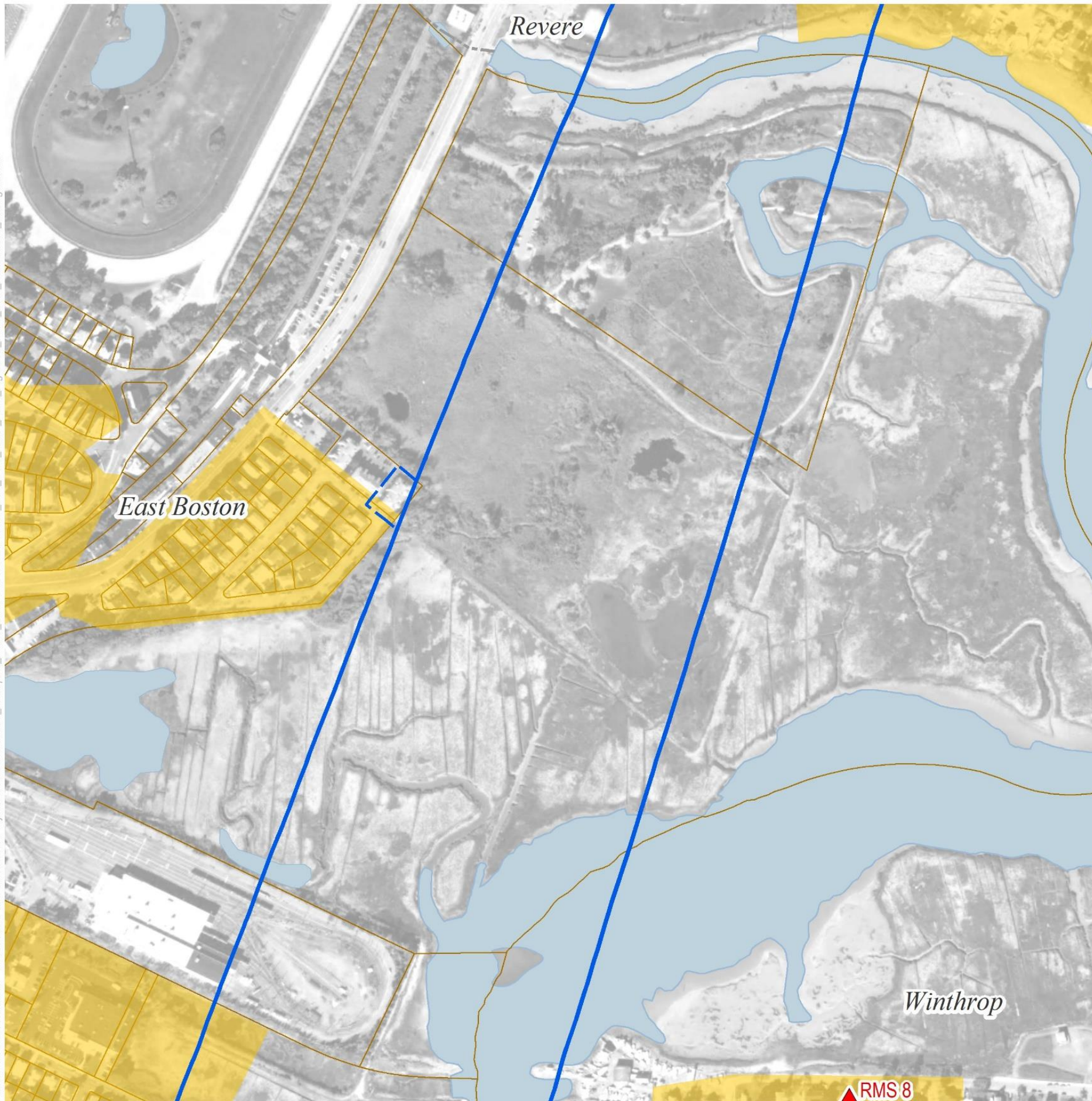







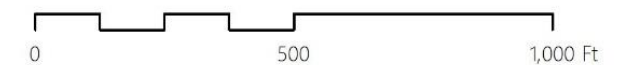


Figure 3b

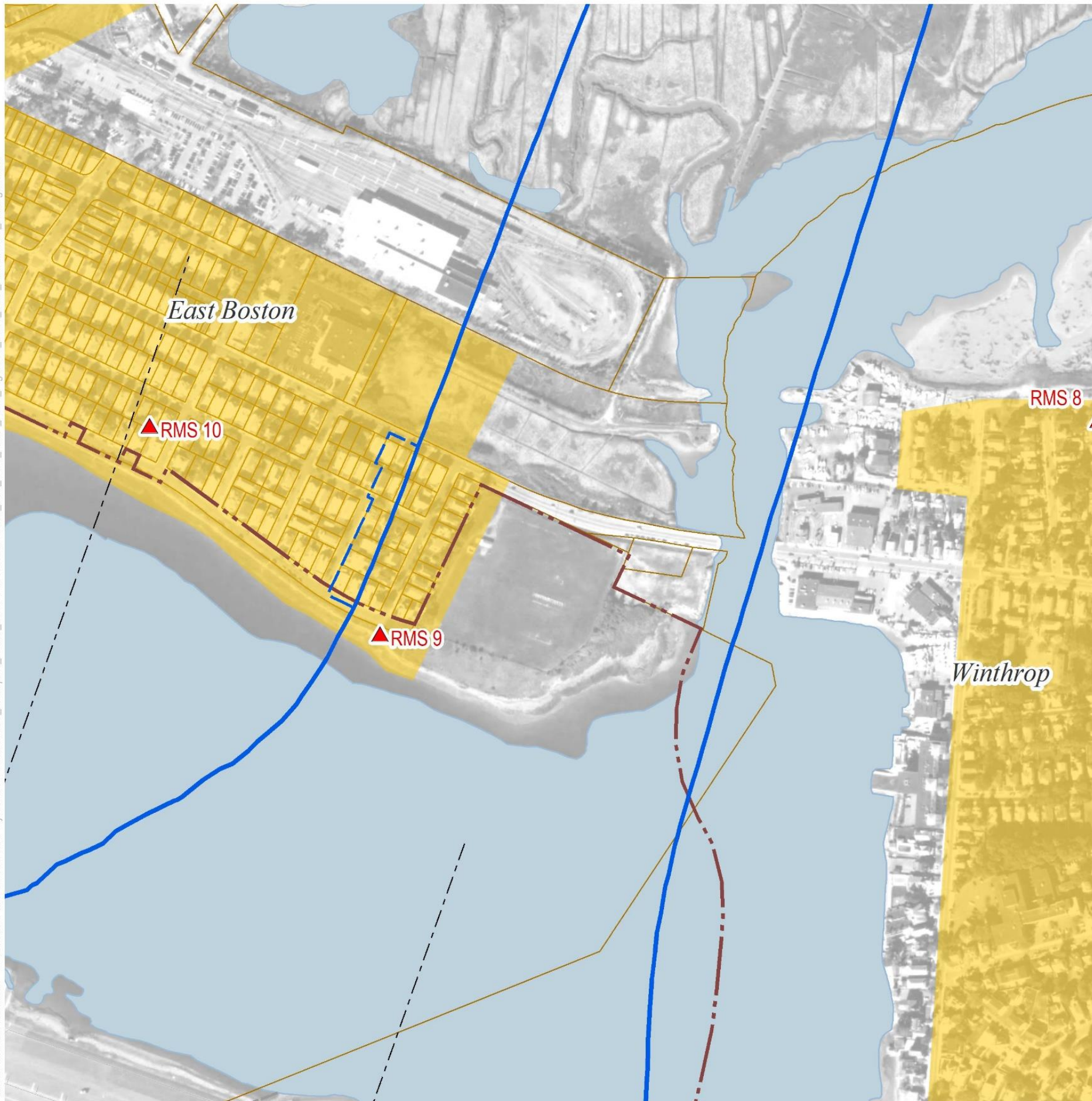
2021 RSIP DNL 65 Humanized Contour Over Residential Areas

-  2021 RSIP Humanized Contour Line
-  2021 RSIP Forecast Contour Line
-  BOS Airport Boundary
-  Runways
-  Permanent Noise Monitor
-  Sound Insulation Areas
-  Parcel Boundary



Source: Harris Miller Miller & Hanson Inc. 2018, U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP), 2018; MassGIS

Author: Michael Hamilton Document Path: \\files\vol1\Projects\310XXX\310830_Massport_Noise_2019-2024\GIS\310830_006_BOS_RSIP_NEM_Figure3c_2021_DNL_Humanized_Enlarged.mxd



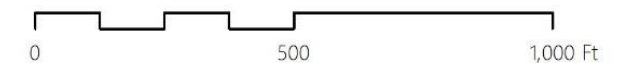
massport

Boston Logan International Airport

Figure 3c

2021 RSIP DNL 65 Humanized Contour Over Residential Areas

- 2021 RSIP Humanized Contour Line
- 2021 RSIP Forecast Contour Line
- BOS Airport Boundary
- Runways
- Permanent Noise Monitor
- Sound Insulation Areas
- Parcel Boundary










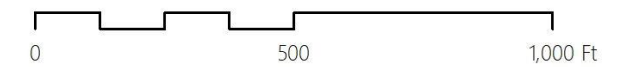
Author: Michael Hamilton Document Path: G:\Projects\310XXX\310830_Massport_Noise_2019-2024\GIS\310830_006_BOS_RSIP_NEW_Figure3d_2021_DNL_Humanized_Enlarged.mxd



Figure 3d

2021 RSIP DNL 65 Humanized Contour Over Residential Areas

-  2021 RSIP Humanized Contour Line
-  2021 RSIP Forecast Contour Line
-  BOS Airport Boundary
-  Runways
-  Permanent Noise Monitor
-  Sound Insulation Areas
-  Parcel Boundary










Author: Michael Hamilton Document Path: \\files\vol1\Projects\310XXX\310830_Massport_Noise_2019-2024\GIS\310830_006_BOS_RSIP_NEM_Figure3e_2021_DNL_Humanized_Enlarged.mxd

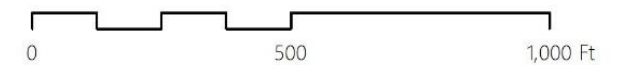


massport
Boston Logan International Airport

Figure 3e

2021 RSIP DNL 65 Humanized Contour Over Residential Areas

-  2021 RSIP Humanized Contour Line
-  2021 RSIP Forecast Contour Line
-  BOS Airport Boundary
-  Runways
-  Permanent Noise Monitor
-  Sound Insulation Areas
-  Parcel Boundary



The humanization process adds approximately 945 more people in 369 more dwelling units⁵ to the region enclosed by the 65 DNL contour. **Table 3** lists the dwelling unit and population counts by community, noting the difference made by expanding the eligibility line. The majority of those homes have already been soundproofed. Massport will use RSIP records to produce an estimate of the properties currently eligible for participation in the program. Field verification of the individual neighborhoods is required in order to determine an accurate count of the number of dwelling units within the 65 DNL line that have not been sound-insulated or which were treated prior to 1993.

Table 3. Noise-Exposed Dwelling Units and Population within the Humanized 2021 DNL 65 dB Contour

Dwelling Units	70-75 DNL	65 ¹ -70 DNL	Total (65+) ¹ DNL	Estimated Additional due to Humanization Process
Boston	0	385	385	87
Chelsea	0	0	0	0
Everett	0	0	0	0
Revere	0	729	729	232
Winthrop	0	214	214	50
Total (All communities)	0	1,328	1,328	369
Population	70-75 DNL	65 ¹ -70 DNL	Total (65+) ¹ DNL	Estimated Additional due to Humanization Process
Boston	0	1,100	1,100	215
Chelsea	0	0	0	0
Everett	0	0	0	0
Revere	0	1,889	1,889	629
Winthrop	0	453	453	101
Total (All communities)	0	3,442	3,442	945
Source: Massport and HMMH, 2022.				
Notes: Population counts use the 2020 U.S. Census block data, merged with 2016 Residential Land Use. 2021 noise analysis uses AEDT version 3d; The humanization process extends contour line outward to include whole neighborhood blocks, if possible.				
1 Day-Night Average Sound Level (DNL) 65 decibel (dB) is the federally-defined noise criterion used as a guideline to identify when residential land use is considered noncompatible with aircraft noise.				

⁵ These estimates are calculated with GIS software that determines the fraction of the area of each census block that is residential land use and that is within the contour. That fraction is applied to the census dwelling units and population counts for that block.