4 Affected Environment

This chapter describes the human, physical, and natural environmental conditions that could be affected by the Proposed Action. Specifically, this Environmental Assessment (EA) considers effects on the environmental resource categories identified in Federal Aviation Administration (FAA) Order 1050.1F, *Environmental Impacts: Policies and Procedures* (FAA Order 1050.1F) and 1050.1F *Desk Reference*. The potential environmental impacts of the Proposed Action and No Action Alternatives are discussed in Chapter 5, *Environmental Consequences.*

The technical terms and concepts discussed in this chapter are explained in Appendix A: *Basic Concepts of Performance Based Navigation (PBN) and Air Traffic Control (ATC)* and Appendix I: *Basics of Noise*.

4.1 Resource Categories or Sub-Categories Not Affected

This section discusses the environmental resource categories or sub-categories that would remain unaffected by the Proposed Action. These resource categories would remain unaffected because the resource either does not exist within the General Study Area or the types of activities associated with the Proposed Action would not affect them. The resource categories or sub-categories are:

- **Coastal Resources**: The Proposed Action would not involve any actions (physical changes or development of facilities) that would be inconsistent with management plans for designated Coastal Barrier Resource System (CBRS) areas, which are not found in the General Study Area. The Proposed Action is not expected to directly affect shorelines or change the use of shoreline zones, or be inconsistent with a NOAA−approved state Coastal Zone Management Plan (CZMP).
- **Farmlands**: The Farmland Protection Policy Act (FPPA)[30] regulates federal actions with potential to convert farmland to non−agricultural uses. Implementation of Proposed Action would not normally involve the development of land regardless of use, nor do they have the potential to convert farmland to non−agricultural uses.
- **Biological Resources (including fish and plants only)**: The Proposed Action would not involve ground disturbing activities and would not normally impact critical habitats. The Proposed Action would not normally affect habitat for non−avian animals, fish, or plants.
- **Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)**
    - **Wetlands**: The proposed action would not involve the construction of facilities or infrastructure and would therefore not impact wetlands or navigable waters. Therefore, no further analysis is required.
    - **Floodplains**: The Proposed Action would not involve the construction of facilities. Therefore, it would not impact nor be affected by locations designated as a 100−year flood event area as described by the Federal Emergency Management Agency (FEMA), and no further analysis is required.
    - **Water Quality**: The Proposed Action would not involve any discharges or changes to existing discharges to water bodies, create a new discharge that would result in impacts to water quality, or modify a water body. Therefore, the

30 7 CFR Part 658

Proposed Action would not result in any direct or indirect impacts to water quality, and no further analysis is required.

- **Groundwater**: The Proposed Action does not involve land acquisition or ground disturbing activities that would withdraw groundwater from underground aquifers or reduce infiltration or recharge to ground water resources through the introduction of new impervious surfaces, and thus, no further analysis is required.
- **Wild and Scenic Rivers**: A portion of the Rio Grande River is designated Wild and Scenic River west from the Val Verde – Terrell County line. Both Counties are beyond the General Study Area. The Proposed Action would not adversely impact any wild, scenic, or recreational status of a river or river segment included in the Wild and Scenic River System and therefore, no further analysis is required.

- **Hazardous Materials, Solid Waste, and Pollution Prevention:** The Proposed Action would not involve construction or development, or any physical disturbances of the ground. Therefore, the potential for impact from hazardous materials, pollution, or solid waste is not anticipated, and no further analysis or pollution prevention actions would be required.
- **Historical, Architectural, Archeological, and Cultural Resources –Archeological and Architectural sub-category only**: The Proposed Action would not involve any construction, development, or any physical disturbance of the ground, or excavation that could impact archaeological resources on Federal, State, or Indian lands, and therefore, would not impact cultural resources, or affect the physical integrity or access to American Indian sacred or culturally significant sites. The Proposed Action would not involve any construction, development, or any physical disturbance of the ground. Therefore, the potential for impact in relation to architectural compatibility with the character of a surrounding historic district or property is not anticipated. However, in certain circumstances, some analysis of the potential for impacts related to aircraft noise may be required.
- **Land Use:** The Proposed Action would not involve any changes to existing, planned, or future land uses within the General Study Area. Therefore, no further analysis is required.
- **Visual Effects – Light Emissions only**: There are no special purpose laws for light impacts and visual impacts. Aviation lighting is required for security, obstruction clearance, and navigation and is the chief contributor to light emissions from airports. The proposed action will not normally involve aviation lighting. Therefore, no further analysis is required.
- **Natural Resources and Energy Supply – Natural Resources sub-category only**: The Proposed Action would not require the need for unusual natural resources and materials, or those in short supply. Therefore, no further analysis is required.
- **Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks** –
  - **Socioeconomic Impacts sub-category**: The Proposed Action would not involve acquisition of real estate, relocation of residents or community businesses, disruption of local traffic patterns, loss in community tax base, or changes to the fabric of the community.

- **Children's Environmental Health and Safety Risks sub-categories**: The Proposed Action would not affect products or substances that a child would be likely to come into contact with, ingest, use, or be exposed to, and would not result in environmental health and safety risks that could disproportionately affect children.

4.2 Potentially Affected Resource Categories or Sub-Categories

This section provides information on the current conditions within the General Study Area for environmental resource categories or components that the Proposed Action could potentially affect. These environmental resource categories or sub-categories include:

- **Noise and Compatible Land Use** (Section 4.2.1)
- **Department of Transportation Act, Section 4(f)** (Section 4.2.2)[31]
- **Historic, Architectural, Archeological, and Cultural Resources – Historic and Cultural Resources sub-categories only** (Section 4.2.3)[32]
- **Biological Resources – Wildlife sub-category only** (Section 4.2.4)[33]
- **Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks – Environmental Justice sub-category only** (Section 4.2.5)
- **Natural Resources and Energy Supply – Energy Supply sub-category only (Aircraft Fuel only**) (Section 4.2.6)
- **Air Quality** (Section 4.2.7)
- **Climate** (Section 4.2.8)
- **Visual Effects (Visual Resources / Visual Character Only)** (Section 4.2.9)

The following sections discuss each of the above listed environmental resource categories in detail.

4.2.1 Noise and Compatible Land Use

Aircraft noise is often the most noticeable environmental effect associated with any air traffic project. This section discusses FAA guidance on conducting noise analyses, noise model input development, and existing aircraft noise conditions. Appendix F: *Basics of Noise* provides background information on the physics of sound, the effects of noise on people, and noise metrics. Detailed application and use of two specific noise models and results of the combined noise analyses are included in Appendix I: *Noise Technical Report*.

4.2.1.1 Noise Modeling Methodology

To comply with NEPA requirements, the FAA has issued policies and procedures for assessing aircraft noise in Order 1050.1F. This Order requires that aircraft noise analysis use the yearly Day-Night Average Sound Level (DNL) metric. The DNL metric is a single value representing the aircraft sound level over a 24-hour period and includes all of the sound energy generated within

31 In addition to the 18,000 Foot Study Area and the General Study Area, the SNIDR Supplemental Study Area is similarly considered for this resource for screening and reporting purposes only.
32 In addition to the 18,000 Foot Study Area and the General Study Area, the SNIDR Supplemental Study Area is similarly considered for this resource for screening and reporting purposes only.
33 In addition to the General Study Area, the SNIDR Supplemental Study Area is being analyzed for this resource as a comprehensive measure for reporting purposes despite altitudes of the screened procedures being above 10,000' AGL.

that period. The DNL metric includes a 10-decibel (dB) weighting for noise events occurring between 10:00 p.m. and 7:00 a.m. (nighttime). This weighting helps account for the greater level of annoyance caused by nighttime noise events. Accordingly, the metric essentially equates one nighttime flight to 10 daytime flights. The DNL metric is further discussed in Appendix F.

Order 1050.1F also requires the FAA to evaluate aircraft noise using the current FAA-approved computer model at the beginning of the environmental analysis process. In accordance with this requirement, the FAA is using the Aviation Environmental Design Tool Version 3d (AEDT 3d). Also in this project, due to the presence of a significant population of military aircraft originating from a dedicated military base (RND), and a primarily military joint-use facility (SKF), the FAA Office of Environment and Energy (AEE) directed the use of NOISEMAP issued under the BaseOPS version 7.368 software suite. Both models were used to analyze noise associated with Existing Conditions, the Proposed Action Alternative, and No Action Alternative.

Although the noise environment around major airports comes almost entirely from jet aircraft operations, the DNL calculations reflect noise from many types of jet and propeller aircraft on IFR flight plans that could be affected by the Proposed Action.

When operating outside certain categories of controlled airspace, aircraft operating under Visual Flight Rules (VFR) are not required to be in contact with ATC. Because these aircraft operate at the pilot's discretion and are often not required to file flight plans, the FAA has very limited information about these operations. Consequently, there is no known source for comprehensive route, altitude, aircraft type, and frequency information for VFR operations in the General Study Area. However, even if complete information were available for VFR operations, the Proposed Action would not require any changes to routing or altitudes to accommodate these operations. If they could be modeled, they would use the same flight routes and altitudes under the Proposed Action and No Action Alternative scenarios. Their operations would not be affected by the forecast conditions in 2023 (the proposed first year of implementation) and 2028 (five years after implementation) for either the Proposed Action or the No Action Alternative. Therefore, VFR aircraft were not included in the analysis.

AEDT 3d requires a variety of inputs, including local environmental data temperature and humidity, runway layout, number and type of aircraft operations, runway use, and flight tracks. Accordingly, the FAA assembled detailed information on aircraft operations for the Study Airports for input into AEDT 3d. This includes specific aircraft fleet mix information such as aircraft type, arrival and departure times, and origin/destination airport.

NOISEMAP required extensive knowledge and forecasting for the specific military aircraft at SKF and RND. The models for SKF and RND were developed from recent Air Installations Compatible Use Zones (AICUZ) studies directed by the U.S. Air Force Civil Engineer Center. The FAA provided two studies, with a NOISEMAP model and report for each study. The first study was focused on RND, while the second study focused on SKF, each with an accompanying report.[34][35] Information and data within these reports supported assumptions and decisions made during the modeling process. An additional resource for T-38C and T-7A operation levels for the modeled scenarios was referenced as needed.[36]

Radar data obtained from the FAA's Performance Data Analysis and Reporting System (PDARS) identified 248,030 IFR-filed flights to and from the Study Airports for 2021/2022. The 2021/2022 usable data spans all seasons and runway usage configurations for the Study Airports. The FAA

34 Department of the Air Force, *Joint Base San Antonio-Randolph and Seguin Auxiliary Airfield, Texas: Air Installations Compatible Use Zones (AICUZ) Study Final*, 2017.
35 Department of the Air Force, *Final Joint Base San Antonio-Lackland, Texas, Air Installations Compatible Use Zones (AICUZ) Study*, October 2019.
36 Department of the Air Force, *Final Environmental Impact Statement for T-7A Recapitalization at Joint Base San Antonio, Texas*, February 2022.

used this data to develop the average annual day (AAD) fleet mix, time of day and night, and runway use input for AEDT 3d. More detailed information about the AEDT 3d and NOISEMAP input for Existing Conditions can be found in Appendix I: *Noise Technical Report*.

The PDARS data provided tracks for each relevant flight that occurred during the 2021/2022 sample. The data was used to define the Average Annual Day (AAD) track locations, also referred to as "trajectories," as representing a typical day's traffic flow, as well as the typical climb and descent patterns that occur along each flow. All trajectories were "bundled" into a set of tracks representing a flow. The flows comprise all the typical flight routings within the General Study Area for an AAD.[37] AEDT 3d tracks are then developed based on the group of radar tracks representing each flow. NOISEMAP flight tracks were derived from the respective AICUZ studies. Overall, 180,460 radar flight tracks were used to evaluate and model typical flight routes and flows throughout the General Study Area, irrespective of AEDT 3d or NOISEMAP usage.

The AEDT 3d and NOISEMAP models were used to calculate noise levels for the following specific locations on the ground:

Census Block Centroids: The AEDT 3d and NOISEMAP models were used to calculate DNL at the geographic centers (centroids) of census blocks to estimate the population exposed to varying levels of aircraft noise. This EA analyzed population within the General Study Area using 2020 U.S. Census block geometry. A census block is the smallest geographical unit that the United States Census uses to collect data. The census block population centroid DNL represents the DNL for the total maximum potential population within that census block. Because noise levels are analyzed only at the centroid point and applied to the entire census block area population, and because the area represented by each centroid varies depending on the density of population, the actual noise exposure level for individuals will vary from the reported level based on their proximity to the geographic centroid.

Grid Points: The AEDT 3d and NOISEMAP models calculated noise exposure at evenly spaced grid points. This EA covered the 18,000 Foot Study Area, General Study Area, and the SNIDR Supplemental Study Area with a grid of noise receptor points spaced evenly at 0.5 nautical mile (NM) intervals. Noise at regular intervals was calculated for these grid points as identified in Appendix I: *Noise Technical Report*. In addition, these grid points were evaluated for noise at any Section 4(f) resource or historic property not captured using unique points as described below.

Unique Points – Section 4(f) and Historical and Cultural Resources: The AEDT 3d and NOISEMAP models analyzed noise levels at sites of interest that are more specific and finite than those captured in the 0.5 NM grid. These sites include individual Section 4(f) resources that are less than one square NM in area (such as public parks or trails), and specific historic sites listed on the National Register of Historic Places (such as individual buildings)[38][39]. See Section 4.2.2 for a discussion of what constitutes a Section 4(f) resource and Section 4.2.3 for a discussion of historic properties and cultural resources.

Unique Points – Noise Sensitive Areas and Uses: In addition to the unique points identified for individual Section 4(f) resources and specific listed historic sites, the AEDT 3d and NOISEMAP models were used to analyze noise at noise sensitive areas and uses generally exposed to existing noise of DNL 65 dB and above. These locations are further discussed in Section 4.2.1.3.

37 Appendix H: Flight Schedules Technical Report.
38 Multiple state and federal databases were used, resulting in duplicates of the same point. To best capture all named resources from various federal and state sources, some points are duplicated in name but represented by and reported for the same receptor point.
39 Appendix I: Noise Technical Report.

In total, noise exposure levels were calculated at 46,954 census block centroids, 118,489 grid points, and 46,453 unique points (Section 4(f) and Historical and Cultural Resources) and 198 unique points (Noise Sensitive Areas and Uses).

4.2.1.2 Existing Aircraft Noise Exposure

Table 4-1 identifies the total population exposed to aircraft noise between DNL 45 dB and 60 dB, DNL 60 dB and 65 dB, and DNL 65 dB and higher. This data establishes a baseline for existing aircraft noise exposure. **Exhibit 4-1** provides a graphical representation, by DNL 5 dB differences, of existing noise exposure based on radar data collected for 2021/2022 within the General Study Area. Each point on the exhibit represents a Census block population centroid. As shown in **Exhibit 4-1**, areas exposed to higher DNL are generally aligned with Study Airport runways and areas with existing aircraft traffic.

Table 4-1 Population Exposed to Aircraft Noise (DNL) within the General Study Area

DNL Range (dB)	Population
DNL 45 dB to DNL 60 dB	556,088
DNL 60 dB to less than DNL 65 dB	24,555
DNL 65 dB and higher	7,899
Total above DNL 45 dB	588,542

Sources: AEDT version 3d; US Census Bureau, 2020 Tracts, American Community Survey Selected Economic Characteristics, 2011-2015.
Prepared by: ATAC Corporation, October 2022.

4.2.1.3 Noise Sensitive Areas and Uses

Appendix B to FAA Order 1050.1F, paragraph B-1.3, *Affected Environment,* requires the FAA to identify the location and number of noise sensitive uses in addition to residences (e.g., schools, hospitals, parks, recreation areas) that could be significantly impacted by noise. As defined in Paragraph 11-5.b(10) of FAA Order 1050.1F, a noise sensitive area is "[a]n area where noise interferes with normal activities associated with its use. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites." Potential impacts to residential population are considered using US Census block population centroids as described in Section 4.2.1.2. Parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites are further discussed in Sections 4.2.2 and 4.2.3, below. Appendix I: *Noise Technical Report*, Table S6.1 lists those locations identified as noise sensitive in the General Study Area and reports the noise values associated with each location.

4.2.1.4 Compatible Land Use

The Noise compatibility of land use is determined by comparing the aircraft DNL values at a site to the values of the FAA's land use compatibility guidelines in Title 14, Code of Federal Regulations, Part 150, Appendix A, Table 1.

Existing land types that suggest potential land uses in the General Study Area are depicted in **Exhibit 4-2**. It is characterized using generalized land coverage data from the USGS National Land Cover Database 2019 (NLCD 2019). As depicted in the exhibit, the majority of the General Study Area is dominated by shrub/scrub. Portions of the southeastern area are dominated by hay/pasture with the central and southwestern area interspersed by cultivated crops. Four large lakes represent the open water with no coastal presence. The majority of urban development lies in the central to north central part of the General Study Area, predominantly characterized by areas of low-, medium-, and high-density urban development around San Antonio and extending

northeast along the I-35 corridor toward the Austin area. The General Study Area also includes numerous large parks, recreational areas, wilderness areas, and other types of resources managed by local, state, and federal agencies. These resources potentially affected are further discussed in Section 4.2.2.

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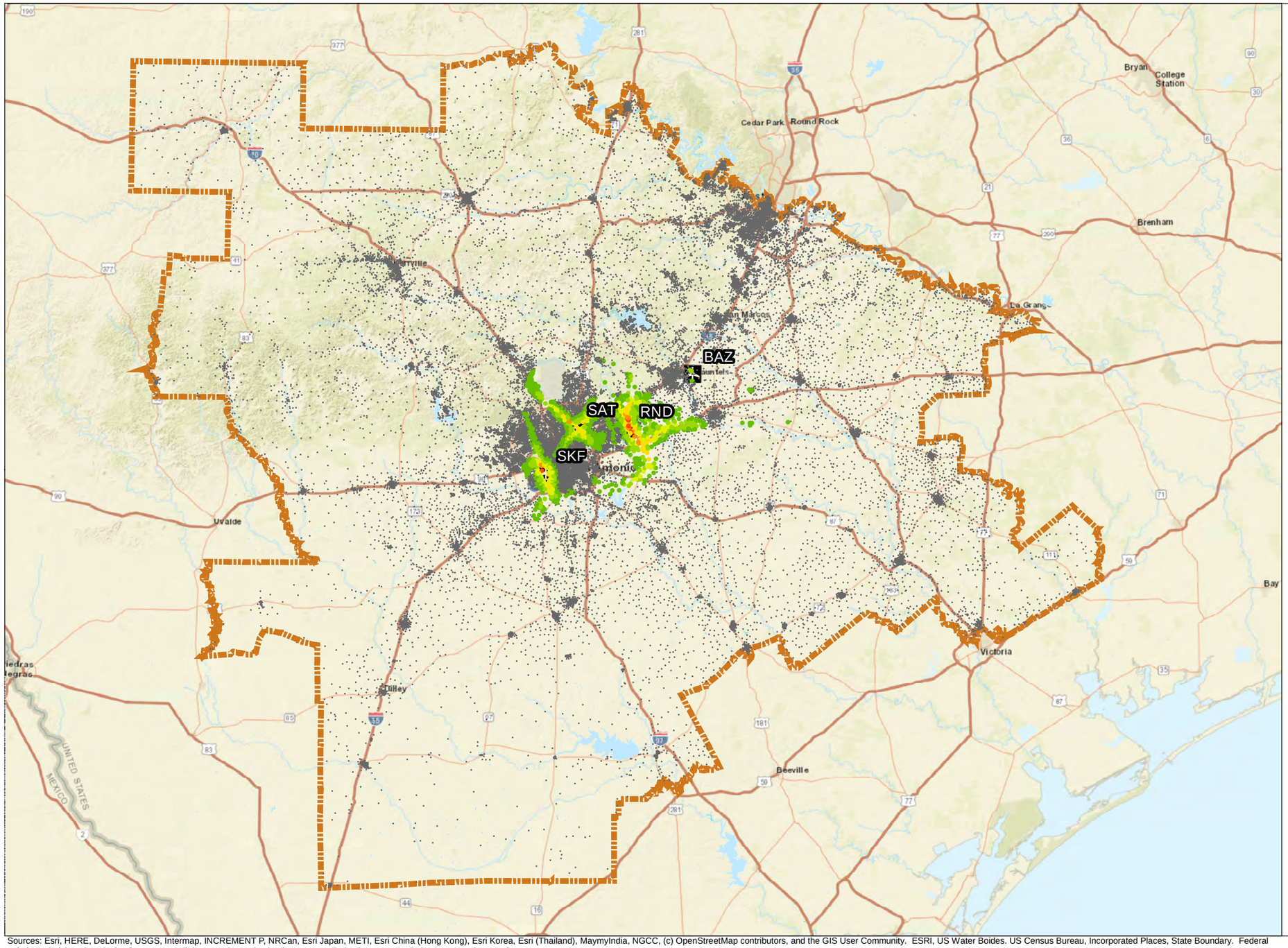

LEGEND

Noise Levels (DNL)

- <45 dB
- 45-50 dB
- 50-55 dB
- 55-60 dB
- 60-65 dB
- 65-70 dB
- 70-75 dB
- >75 dB
- Study Airport
- General Study Area (GSA)

Water Bodies

- Inundation Area
- Lake/Pond
- Playa
- Reservoir
- Stream/River
- Swamp/Marsh
- US States

Notes:

Major Study Airports
San Antonio International Airport **SAT**

Satellite Study Airports
Kelly Field **SKF**
New Braunfels National Airport **BAZ**
Randolph Air Force Base Airfield **RND**

Projection :GCS North American 1983
Scale: 1:2,631,162

0 5 10 20 Miles

N

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MaymyIndia, NGCC, (c) OpenStreetMap contributors, and the GIS User Community. ESRI, US Water Boides. US Census Bureau, Incorporated Places, State Boundary. Federal Aviation Administration, Code of Instrument Flight Procedures, Study Airports. ATAC, Study Area Boundaries, AEDT Noise Levels.
Prepared by: ATAC Corporation, September 2022.

Exhibit 4-1

Baseline DNL - Noise Exposure by Census Block

SAN ANTONIO AIRSPACE MODERNIZATION PROJECT

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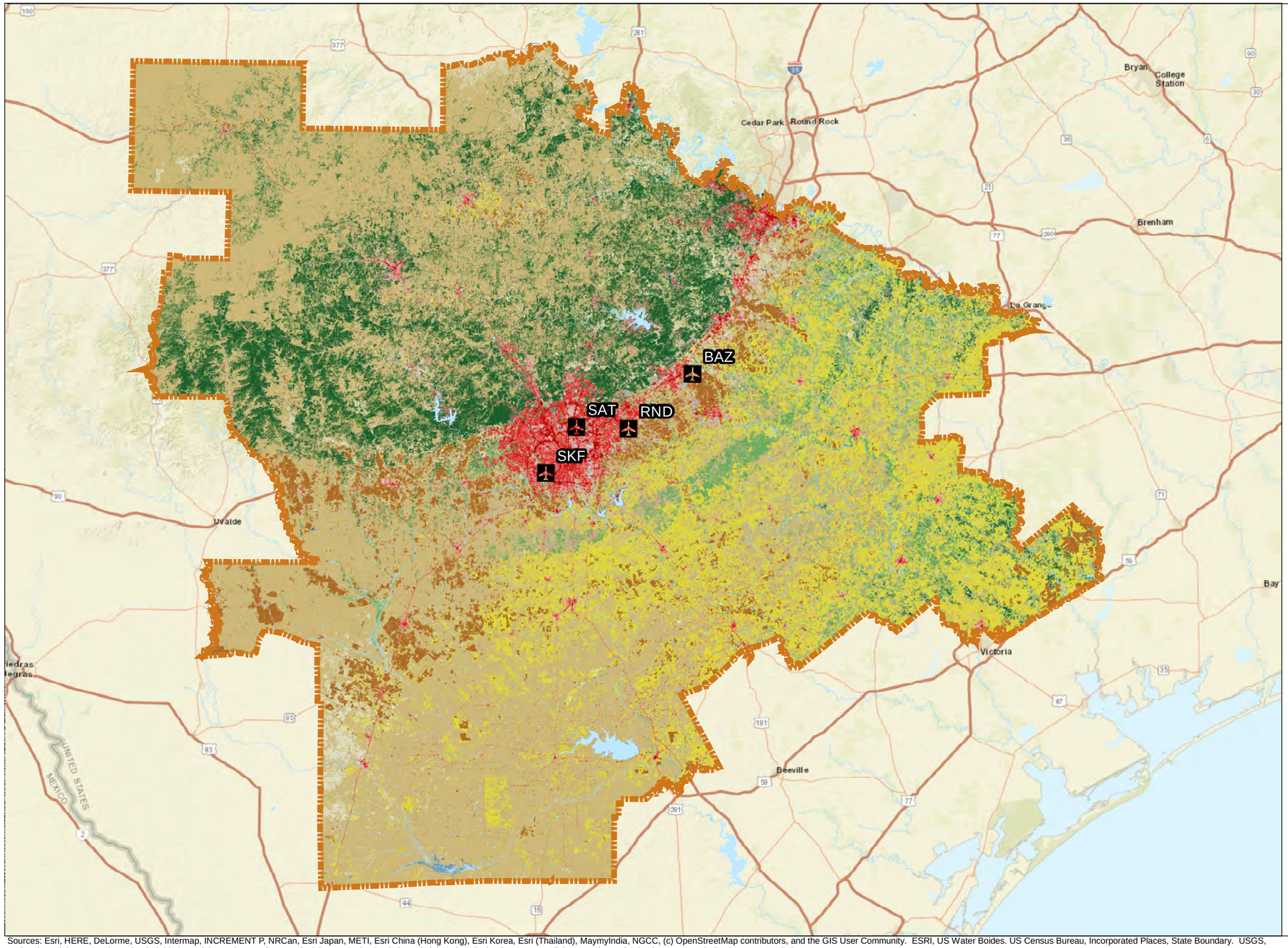

LEGEND

- Study Airport
- General Study Area (GSA)

Water Bodies

- Inundation Area
- Lake/Pond
- Playa
- Reservoir
- Stream/River
- Swamp/Marsh
- US States

National Land Cover Data

- Woody Wetlands
- Shrub/Scrub
- Open Water
- Mixed Forest
- Herbaceous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceous Wetlands
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, High Intensity
- Deciduous Forest
- Cultivated Crops
- Barren Land

Notes:

Major Study Airports
San Antonio International Airport **SAT**

Satellite Study Airports
Kelly Field **SKF**
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Randolph Air Force Base Airfield **RND**

Projection :GCS North American 1983
Scale: 1:2,631,162

0 5 10 20 Miles

N

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MaymyIndia, NGCC, (c) OpenStreetMap contributors, and the GIS User Community. ESRI, US Water Boides. US Census Bureau, Incorporated Places, State Boundary. USGS, National Land Cover Database (NLCD) 2019 Land Cover Conterminous United States. Federal Aviation Administration, Code of Instrument Flight Procedures, Study Airports. ATAC, Study Area Boundaries.
Prepared by: ATAC Corporation, September 2022.

Exhibit 4-2

Land Coverage in the General Study Area

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4.2.2 Department of Transportation Act, Section 4(f)

Section 4(f) of the DOT Act (codified at 49 U.S.C. § 303(c)), states that, subject to exceptions for *de minimis*[40] impacts:

> the Secretary may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if--
>
> (1) there is no prudent and feasible alternative to using that land; and
>
> (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

The term "use" includes both physical and indirect or "constructive" impacts to Section 4(f) resources. Direct use is the physical occupation or alteration of a Section 4(f) property or any portion of a Section 4(f) property. A "constructive" use does not require direct physical impacts or occupation of a Section 4(f) resource. A constructive use would occur when a proposed action would result in substantial impairment of a resource to the degree that the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished. The determination of use must consider the entire property and not simply the portion of the property used for a proposed project.

Parks and natural areas where a quiet setting is a generally recognized purpose and attribute receive special consideration. In these areas, the FAA "…must consult all appropriate Federal, State, and local officials having jurisdiction over the affected Section 4(f) resources when determining whether project-related noise impacts would substantially impair the resource." Privately-owned parks, recreation areas, and wildlife refuges are not subject to the Section 4(f) provisions.

4.2.2.1 Section 4(f) Resources

Data from federal and state sources identified 46,453 Section 4(f) resources catalogued in Appendix I: *Noise Technical Report*. **Exhibit 4-3** depicts the locations of Section 4(f) resources, other than those listed or eligible for listing in the National Register of Historic Places (NRHP). The locations of Section 4(f) resources that are listed or eligible for listing in the NRHP are discussed in Section 4.2.3 and depicted in **Exhibit 4-4**. A list of the Section 4(f) resources identified in the General Study Area, the type of resource (i.e., federal, state, or local), the county in which they are located, site acreage, and DNL calculated for each resource under existing conditions is included in the Appendix I: *Noise Technical Report*.

40 A *de minimis* impact is one that, after taking into account any measures to minimize harm (such as avoidance, minimization, mitigation or enhancement measures), results in either: a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f); or a Section 106 finding of no adverse effect or no historic properties affected on a historic property.

4.2.3 Historic, Architectural, Archeological, and Cultural Resources – Historic Properties and Cultural Resources Sub-Categories

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. §470 et seq., as amended) requires federal agencies to consider the effects of their undertakings on properties listed or eligible for listing in the NRHP. Compliance requires agencies to consider the effects of such undertakings on properties listed, or eligible for listing, in the National Register of Historic Places (NRHP). Regulations implementing Section 106 of the NHPA are located in Title 36 CFR Part 800, *Protection of Historic Properties*. In accordance with Executive Order 13175 Consultation and Coordination with Indian and Tribal Governments and FAA Order 1210.20 American Indian and Alaska Native Tribal Consultation Policy and Procedures the FAA invited identified tribal government-to-government consultations regarding any concerns that uniquely or significantly affect a Tribe related to the proposed project.

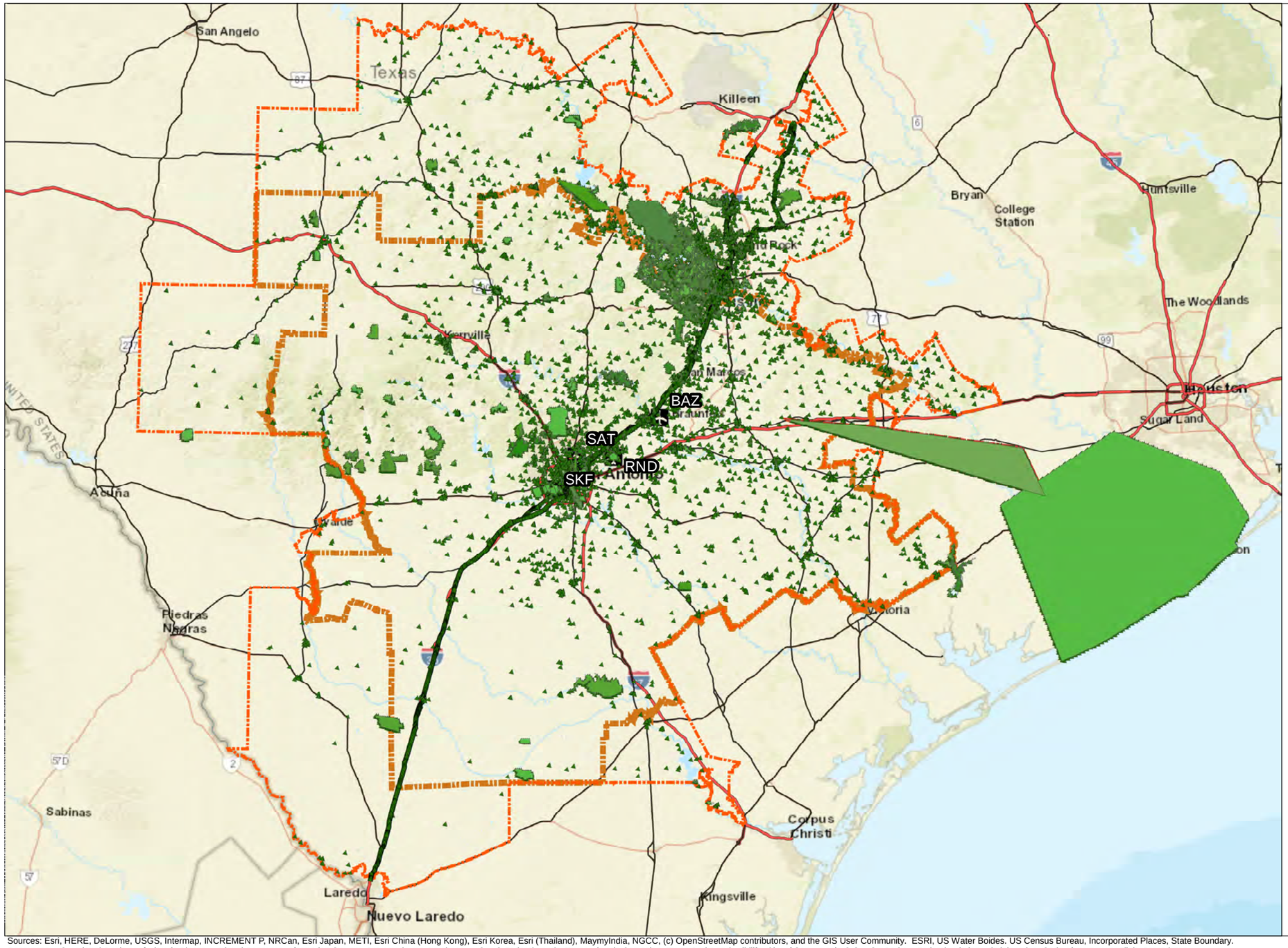
Consistent with Section 106, this EA defines "historic property" as "…any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the NRHP criteria."[41] It is possible that changes in aircraft flight routes associated with the Proposed Action could introduce or increase aircraft routing over historic properties and result in potential adverse noise impacts. As noted in Section 4.2, the Proposed Action would not involve ground disturbance that, including FAA-defined significant noise, would physically impact archaeological or architectural resources. The Proposed Action is located above the ground and would not involve the construction, disturbance, or alteration of any physical structure on, in, or emanating from the ground. Thus, the EA does not further discuss these resources.

4.2.3.1 Historic Properties in the Study Areas

Exhibit 4-4 shows the location of historic properties and cultural resources identified in the Study Areas. Over 500 NRHP listed properties were initially identified and consultations to identify other listed or eligible resources are on-going. A list of the historic and cultural resources identified and DNL calculated for each resource under existing conditions is included in the Appendix I: *Noise Technical Report*.

Federal regulations require the FAA to define an area of potential effect (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.[42] The FAA initially defined the APE as contiguous with the General Study Area boundary. The FAA subsequently determined that the Proposed Action would not introduce aircraft overflights to any area within the General Study Area where they do not already occur. Accordingly, the FAA redefined the APE to focus on the potential for the Proposed Action to cause adverse noise effects on Section 106 resources. Therefore, the resulting APEs are based on where noise modeling showed any reportable noise (no significant noise was identified through the analyses) and these noise grid points were sorted and bounded to define the smaller and focused APEs.

41 Title 36 CFR Part 800.16(l)(1)
42 Title 36 CFR 800.16(d).



LEGEND

- Section 4F, Section 106, Cultural, Historic Resource Points
- Study Airport
- Additional Section 4(f), Historic, and Cultural Resources Screening Area
- 18K Study Area
- General Study Area (GSA)

Water Bodies

- Inundation Area
- Lake/Pond
- Playa
- Reservoir
- Stream/River
- Swamp/Marsh
- US States

Section 4F, Section 106, Cultural, Historic Resource Areas

- Unlisted Properrty
- Alamo Viewshed
- Cemeteries in GSA
- Cemeteries in 18K Boundary
- Federal Lands
- Golden-cheeked Warbler Habitat
- Historic Landmark Sites
- Historic Districts
- LWRCRP Boundary in GSA
- LWRCRP_Boundary in 18K Boundary
- Mission Protection Overlay District
- National Registry Information System Buildings NRIS
- NRIS Districts
- NRIS Sites
- NRIS Trusts
- Protected Area Data - United States - Tribal Areas PADUS2
- PADUS2 - Designated Region 6
- PADUS2 - Easement Region 6
- PADUS2 - Fee Region 6
- PADUS2 - Proclamation Region 6
- Park Boundaries
- River Improvement Overlay Districts
- State Historic Sites
- State Historic Sites
- TPWD State Parks Boundary
- USA Parks
- Wildlife Management Areas
- World Heritage Buffer

Notes:

Major Study Airports
San Antonio International Airport **SAT**

Satellite Study Airports
Kelly Field **SKF**
New Braunfels National Airport **BAZ**
Randolph Air Force Base Airfield **RND**

Projection :GCS North American 1983
Scale: 1:2,631,162

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N

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MaymyIndia, NGCC, (c) OpenStreetMap contributors, and the GIS User Community. ESRI, US Water Boides. US Census Bureau, Incorporated Places, State Boundary.
Resources: US National Registry of Historic Places, National Resource Information System, Protected Area Database - US, US Federal Lands, Texas Historic Comssion, Texas Parks and Wildlife, City of San Antonio GIS, USA Parks, Federal Aviation Administration, Code of Instrument Flight Procedures, Study Airports. ATAC, Study Area Boundaries.
Prepared by: ATAC Corporation, September 2022.

Exhibit 4-3

Section 4(f) Resources in the Study Areas

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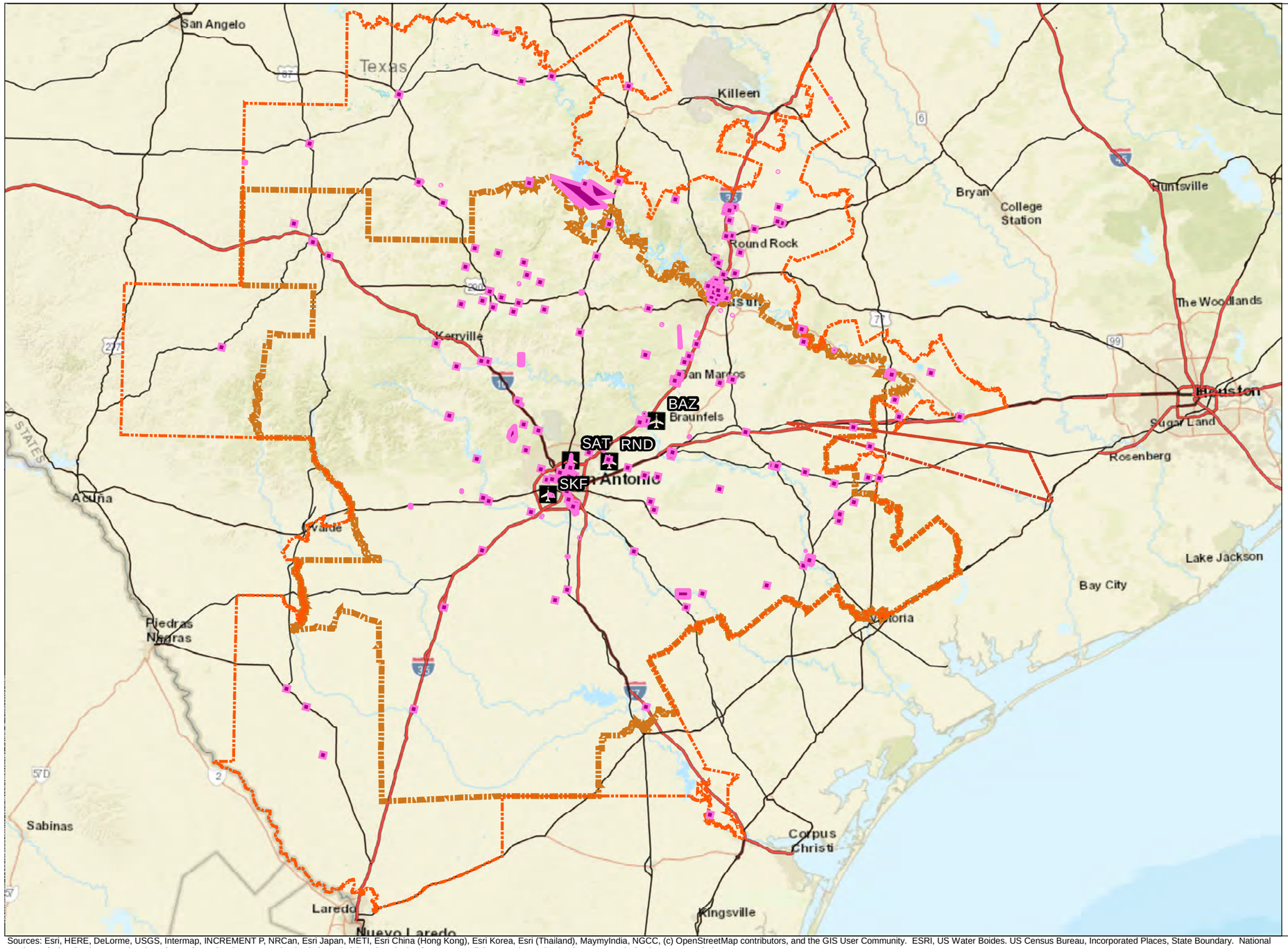

LEGEND

- Historic/Cultural Resources Points
- Historic/Cultural Resources Areas
- Study Airport
- Additional Section 4(f), Historic, and Cultural Resources Screening Area
- 18K Study Area
- General Study Area (GSA)

Water Bodies

- Inundation Area
- Lake/Pond
- Playa
- Reservoir
- Stream/River
- Swamp/Marsh
- US States

Notes:

Major Study Airports
San Antonio International Airport **SAT**

Satellite Study Airports
Kelly Field **SKF**
New Braunfels National Airport **BAZ**
Randolph Air Force Base Airfield **RND**

Projection :GCS North American 1983
Scale: 1:2,631,162

0 5 10 20 Miles

N

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MaymyIndia, NGCC, (c) OpenStreetMap contributors, and the GIS User Community. ESRI, US Water Boides. US Census Bureau, Incorporated Places, State Boundary. National Registry of Historic Places, National Registry Information System. Federal Aviation Administration, Code of Instrument Flight Procedures, Study Airports. ATAC, Study Area Boundaries.
Prepared by: ATAC Corporation, September 2022.

Exhibit 4-4

Historic and Cultural Resources in the Study Areas

SAN ANTONIO AIRSPACE MODERNIZATION PROJECT

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4.2.4 Biological Resources – Wildlife Sub-Category

This section discusses the existing wildlife resources within the General Study Area. The Proposed Action involves redesigning standard instrument arrival and departure procedures and the supporting airspace management structure serving the Study Airports. Accordingly, the discussion is limited to avian and bat species that may be present within the 18,000 Foot Study Area (of which the General Study Area is a contained subset) and identifies the SNIDR Supplemental Study Area species for screening and reporting purposes.

4.2.4.1 Threatened and Endangered Species and Migratory Birds

The Endangered Species Act (ESA) of 1973, (16 U.S.C. § 1531 et seq. (1973)), requires the evaluation of all federal actions to determine whether a Proposed Action is likely to jeopardize any proposed or listed threatened or endangered species or proposed or designated critical habitat. A federal action is one conducted, funded, or permitted by a federal agency. Section 7 of the ESA requires the lead federal agency (in this case the FAA) to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) Fisheries to determine whether the proposed federal action would jeopardize the continued existence of any species listed or proposed for listing as threatened or endangered or result in the destruction or adverse modification of designated or proposed critical habitat. Critical habitat includes areas that will contribute to the recovery or survival of a listed species. Federal agencies are responsible for determining if an action "may affect" listed species. If so, the federal agency is required to prepare a Biological Assessment (BA) to determine if the action is "likely to adversely affect the species." The potential for federal and state listed avian and bat species was assessed based on agency lists and reports. Data from the USFWS was used to identify and geo-reference federally-listed species and Texas Parks & Wildlife Department was used to identify and geo-reference state-listed species.

4.2.4.2 Migratory Birds

The Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. §§ 703-712) prohibits the taking of any migratory bird and any part, nest, or egg of any such bird, without a permit issued by the USFWS. "Take" under the MBTA is defined as the action or attempt to "pursue, hunt, shoot, capture, collect, or kill." Migratory birds listed under the ESA are managed by the agency staff members who handle compliance with Section 7 of the ESA; management of all other migratory birds is overseen by the Migratory Bird Division of the ESA. Several migratory bird species occur in, or migrate through, the General Study Area.

Birds migrate along four main routes or flyways in North America: the Atlantic, the Central, the Mississippi, and the Pacific flyways, which are loosely delineated in these geographic regions. The General Study Area is located within the Central flyway. These flyways are not specific lines the birds follow but broad areas through which the birds migrate.

Migration routes may be defined as the various lanes birds travel from their breeding ground to their winter quarters. The actual routes followed by a given bird species differ by distance traveled, starting time, flight speed, and geographic position and latitude of the breeding and wintering grounds. Hundreds of bird species make the round-trip each year along the Central Flyway from their breeding grounds in the Arctic tundra and northern United States to wintering grounds found in eastern Mexico.

Table 4-2 lists the Federal bird species of concern which are known or believed to occur within the 18,000 Foot Study Area or SNIDR Supplemental Study Area by County. **Table 4-3** lists the State of Texas bird species of concern which are known or believed to occur within the 18,000

Foot Study Area or SNIDR Supplemental Study Area by County. No bat species of concern are listed by the State of Texas or Federal government.

Table 4-2 Federally Listed Bird Species

Federal Status	Species	Type	18,000 Foot Study Area County of Occurrence
Endangered	Attwater's Greater Prairie-Chicken (*Tympanuchus cupido attwateri*)	Bird	Colorado, DeWitt, Fayette, Jackson, Lavaca, San Patricio, Victoria
Threatened	(Eastern) Black Rail (*Laterallus jamaicensis ssp. jamaicensis*)	Bird	San Patricio
Endangered	Golden Cheeked Warbler (*Setophaga chrysoparia*)	Bird	Bandera, Bell, Bexar, Blanco, Burnet, Comal, Edwards, Gillespie, Hays, Kendall, Kerr, Kimble, Lampasas, Llano, Mason, Medina, Real, San Saba, Travis, Uvalde, Williamson
Threatened	Piping Plover (*Charadrius melodus*)	Bird	Bastrop, Bell, Bexar, San Patricio, Travis, Williamson
Threatened	(Rufa) Red Knot (*Calidris canutus rufa*)	Bird	Atascosa, Bandera, Bastrop, Bell, Bexar, Blanco, Burnet, Caldwell, Colorado, Comal, DeWitt, Dimmit, Edwards, Fayette, Frio, Gillespie, Gonzales, Guadalupe, Hays, Jackson, Karnes, Kendall, Kerr, Kimble, La Salle, Lampasas, Lavaca, Live Oak, Llano, Mason, McCulloch, McMullen, Medina, Menard, Milam, Real, San Patricio, San Saba, Travis, Uvalde, Victoria, Webb, Williamson, Wilson, Zavala
Endangered	Whooping Crane (*Grus Americana*)	Bird	Atascosa, Bastrop, Bell, Bexar, Blanco, Burnet, Caldwell, Colorado, Comal, DeWitt, Fayette, Gonzales, Guadalupe, Hays, Jackson, Karnes, Lampasas, Lavaca, Live Oak, McMullen, Milam, San Patricio, Travis, Victoria, Williamson, Wilson
Federal Status	**Species**	**Type**	**Supplemental Study Area County of Occurrence**
Endangered	Attwater's Greater Prairie-Chicken (*Tympanuchus cupido attwateri*)	Bird	Colorado, Fayette, Lavaca, Wharton
Threatened	(Rufa) Red Knot (*Calidris canutus rufa*)	Bird	Colorado, Fayette, Gonzales, Lavaca, Wharton
Endangered	Whooping Crane (*Grus Americana*)	Bird	Colorado, Fayette, Gonzales, Lavaca, Wharton

Sources: US Fish and Wildlife Service, https://ecos.fws.gov/ecp/report/species-listings-by-state?stateAbbrev=TX&stateName=Texas&statusCategory=Listed (accessed June 14, 2022).
Prepared by: ATAC Corporation, June 2022.

Table 4-3 State of Texas Listed Bird Species

State Status	Species	Type	18,000 Foot Study Area County of Occurrence
Endangered	Attwater's Greater Prairie-Chicken (*Tympanuchus cupido attwateri*)	Bird	Colorado, Victoria
Threatened	(Eastern) Black Rail (*Laterallus jamaicensis ssp. jamaicensis*)	Bird	Bastrop, Bell, Caldwell, Colorado, DeWitt, Fayette, Gonzales, Guadalupe, Jackson, Karnes, Lampasas, Lavaca, Milam, San Patricio, Travis, Victoria, Williamson, Wilson
Endangered	Golden Cheeked Warbler (*Setophaga chrysoparia*)	Bird	Bandera, Bell, Bexar, Blanco, Burnet, Comal, Edwards, Gillespie, Hays, Kendall, Kerr, Kimble, Lampasas, Llano, Mason, Medina, Real, San Saba, Travis, Uvalde, Williamson
Threatened	Piping Plover (*Charadrius melodus*)	Bird	Atascosa, Bastrop, Bell, Bexar, Caldwell, Colorado, Comal, DeWitt, Fayette, Gonzales, Guadalupe, Hays, Jackson, Karnes, Lavaca, Live Oak, McMullen, Milam, San Patricio, Travis, Victoria, Williamson, Wilson
Threatened	(Rufa) Red Knot (*Calidris canutus rufa*)	Bird	Bastrop, Bell, Caldwell, Colorado, DeWitt, Fayette, Gonzales, Jackson, Karnes, Lavaca, Milam, San Patricio, Victoria, Williamson
Endangered	Whooping Crane (*Grus Americana*)	Bird	Atascosa, Bastrop, Bell, Bexar, Blanco, Burnet, Caldwell, Colorado, Comal, DeWitt, Fayette, Frio, Gillespie, Gonzales, Guadalupe, Hays, Jackson, Karnes, Kendall, La Salle, Lampasas, Lavaca, Live Oak, Llano, McMullen, Medina, Milam, San Patricio, San Saba, Travis, Victoria, Williamson, Wilson

State Status	Species	Type	Supplemental Study Area County of Occurrence
Endangered	Attwater's Greater Prairie-Chicken (*Tympanuchus cupido attwateri*)	Bird	Colorado, Wharton
Threatened	(Eastern) Black Rail (*Laterallus jamaicensis ssp. jamaicensis*)	Bird	Colorado, Fayette, Gonzales, Lavaca, Wharton
Threatened	Piping Plover (*Charadrius melodus*)	Bird	Colorado, Fayette, Gonzales, Lavaca, Wharton
Threatened	(Rufa) Red Knot (*Calidris canutus rufa*)	Bird	Colorado, Fayette, Gonzales, Lavaca, Wharton
Endangered	Whooping Crane (*Grus Americana*)	Bird	Colorado, Fayette, Gonzales, Lavaca, Wharton

Sources: 31 TAC §65.175 *State listed Threatened Species*, https://texreg.sos.state.tx.us/fids/202001043-1.pdf (accessed June 14, 2022); 31 TAC §65.176 *State listed Endangered Species*, https://texreg.sos.state.tx.us/fids/202001043-2.pdf (accessed June 14, 2022); https://tpwd.texas.gov/gis/rtest using "*Quick Download (All species for all counties)*" (accessed June 14, 2022).

Prepared by: ATAC Corporation, June 2022.

4.2.5 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks – Environmental Justice Sub-Category

This section is limited to a discussion of Environmental Justice as it pertains to potential aircraft noise impacts in the General Study Area. An environmental justice analysis considers the potential of the proposed project alternatives to cause disproportionate and adverse effects on low-income or minority populations. In the event that adverse effects are determined, applicable mitigation ensures that no low-income or minority population bears a disproportionate burden of effects.

The FAA's 1050.1F *Desk Reference* notes that Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* and the accompanying Presidential Memorandum, as well as DOT Order 5610.2a, *Final Order to Address Environmental Justice in Low-Income and Minority Populations,* require the FAA to provide for meaningful public involvement by minority and low-income populations. These documents encourage considering environmental justice impacts in EAs to determine whether a disproportionately high and adverse impact may occur.

The socioeconomic and racial characteristics of the population within the General Study Area are based on data from the U.S. Census, 2011-2015 American Community Survey (ACS) 5-Year Data Release. Minority and low-income populations for each census block group within the General Study Area are identified using the AEDT 3d noise model and depicted in **Exhibit 4-5** using geographical information systems (GIS).[43] This analysis defines and identifies minority population and low-income population as follows:

- A **minority census block group** is a census block group with a minority population percentage greater than the average minority population percentage of the overall General Study Area. Based on U.S. Census data, the average percentage of minority population residing in the General Study Area was 64.43 percent. Therefore, every census block group with a percentage of minority population greater than 64.43 percent is designated a census block group of environmental justice concern.
- A **low-income population census block group** is a census block group with a greater percentage of low-income population than the average percentage of low-income population in the overall General Study Area. The average percentage of low-income population residing in the overall General Study Area was 18.43 percent. Therefore, every census block group with a low-income population greater than 18.43 percent is designated a census block group of environmental justice concern.

Given these demographics in the region, the FAA promoted and conducted two virtual public workshops in English and Spanish on May 31, 2022 and June 1, 2022 prior to issuing a Notice of Intent to Prepare an EA on July 28, 2022. The FAA's Notice of Intent was published in select regional and local newspapers and their online components in English and Spanish to ensure broad visibility among minority communities in the General Study Area. See Appendix B: *Agency Coordination, Community Involvement, and List of Receiving Parties* for the notices and a list of online and print publications. FAA also selected "La Prensa," the first and oldest English and Spanish publication in the state of Texas, to publish EA-related releases as another direct avenue to best reach groups of environmental justice concern. **Exhibit 4-5** depicts areas of environmental justice concern in the General Study Area. **Table 4-4** presents minority and low-income populations by county within the General Study Area.

43 All GIS work was conducted using ESRI ArcGIS version 10.5.1, QGIS 3.2.0, and Manifold System 8.0.30.0

Table 4-4 Low-Income and Minority Populations by County in General Study Area

County	Population	Minority	% of Total	Low Income	% of Total
Atascosa County[1,2]	7,395	6,236	*84.33%*	1,877	*25.38%*
Bandera County	9,900	1,911	19.30%	1,375	13.89%
Bexar County[1]	1,569,917	1,124,289	*71.61%*	277,494	17.68%
Caldwell County	16,934	8,637	51.00%	1,932	11.41%
Comal County	63,852	21,415	33.54%	6,226	9.75%
DeWitt County	12,759	4,155	32.57%	1,536	12.04%
Fayette County	10,609	2,735	25.78%	1,189	11.21%
Gillespie County	11,504	2,223	19.32%	1,136	9.87%
Gonzales County[2]	18,070	10,450	57.83%	3,561	*19.71%*
Guadalupe County	81,713	43,594	53.35%	9,712	11.89%
Hays County	41,226	16,392	39.76%	6,389	15.50%
Jackson County	9,576	4,674	48.81%	1,324	13.83%
Karnes County	7,926	3,861	48.71%	1,418	17.89%
Kendall County	14,654	3,898	26.60%	1,003	6.84%
Kerr County	22,923	7,033	30.68%	3,711	16.19%
Kimble County[2]	3,372	925	27.43%	777	*23.04%*
Lavaca County	14,726	4,026	27.34%	1,237	8.40%
Live Oak County	6,324	2,672	42.25%	1,005	15.89%
Llano County	4,798	521	10.86%	573	11.94%
Medina County[2]	19,292	11,372	58.95%	3,653	*18.94%*
Real County	3,356	687	20.47%	541	16.12%
Travis County[2]	131,225	71,768	54.69%	24,354	*18.56%*
Uvalde County	3,199	1,616	50.52%	527	16.47%
Victoria County	17,176	5,591	32.55%	2,238	13.03%
Wilson County	34,931	14,534	41.61%	4,228	12.10%
Zavala County[1,2]	2,464	2,074	*84.17%*	619	*25.12%*

Notes: 1/ County with minority population census block group or groups of environmental justice concern
2/ County with low-income population census block group or groups of environmental justice concern

Source: US Census Bureau, 2011-2015 American Community Survey (ACS) 5-Year Estimate.
Prepared by: ATAC Corporation, July 2022.

4.2.6 Energy Supply (Aircraft Fuel)

This section describes fuel consumption by IFR military and civilian aircraft arriving at and departing from the SAT and BAZ Study Airports. Using the AEDT 3d noise model, aircraft fuel consumption was calculated to estimate fuel consumption associated with air traffic flows under existing conditions. AEDT 3d calculates fuel consumption using the same input used for calculating noise. NOISEMAP does not calculate fuel consumption for military aircraft (See Appendix I: *Noise Technical Report* for a discussion of AEDT 3d and NOISEMAP model inputs.) Based on the 2021/2022 AEDT 3d calculation, IFR civilian and military aircraft arriving at and departing from the SAT and BAZ Study Airports consume approximately 376,620 gallons of fuel[44] on an annual average day. NOISEMAP does not calculate fuel consumption, thus no fuel consumption was calculated for IFR military aircraft arriving and departing RND and SKF.

44 For fuel consumption purposes, Jet A-1 at 15C/59F is 6.71lbs/gal. Jet A-1 is the most common jet fuel for the US. Approximately 376,620 lbs. of fuel are consumed by IFR military and civilian aircraft arriving and departing the SAT and BAZ Study Airports on an existing conditions annual average day.

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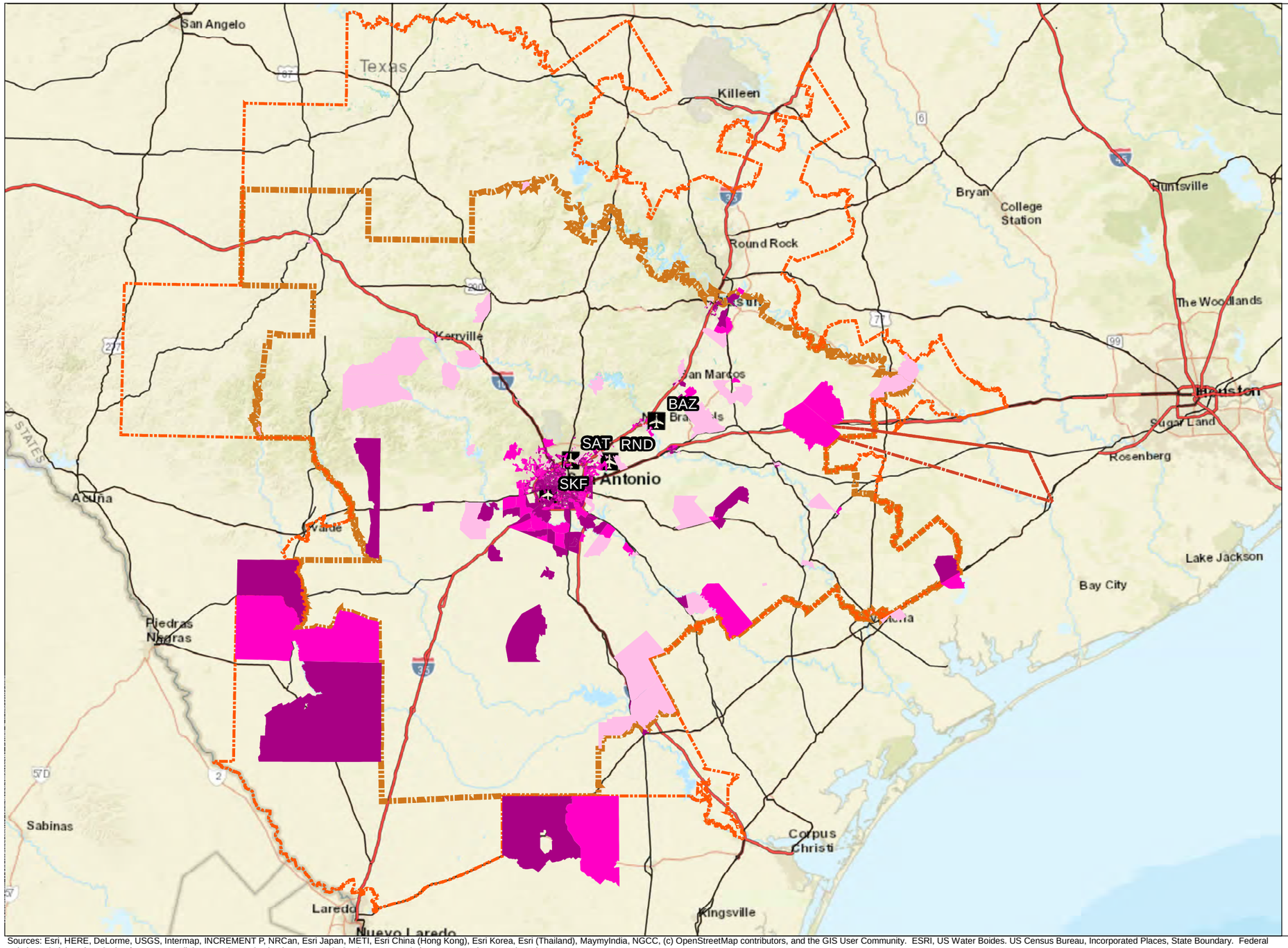

LEGEND

- Study Airport
- Additional Section 4(f), Historic, and Cultural Resources Screening Area
- 18K Study Area
- General Study Area (GSA)

Water Bodies

- Inundation Area
- Lake/Pond
- Playa
- Reservoir
- Stream/River
- Swamp/Marsh
- US States
- Low Income Population
- Minority Population
- Low Income/Minority Population

Notes:

Major Study Airports
San Antonio International Airport **SAT**

Satellite Study Airports
Kelly Field **SKF**
New Braunfels National Airport **BAZ**
Randolph Air Force Base Airfield **RND**

Projection :GCS North American 1983
Scale: 1:2,631,162

0 5 10 20 Miles

N

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MaymyIndia, NGCC, (c) OpenStreetMap contributors, and the GIS User Community. ESRI, US Water Boides. US Census Bureau, Incorporated Places, State Boundary. Federal Aviation Administration, Code of Instrument Flight Procedures, Study Airports. ATAC, Study Area Boundaries, AEDT Environmental Justice Areas.
Prepared by: ATAC Corporation, September 2022.

Exhibit 4-5

Environmental Justice Communities in the Study Areas

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4.2.7 Air Quality

This section describes air quality conditions within the General Study Area. In the United States, air quality is generally monitored and managed at the county or regional level. The U.S. EPA, pursuant to mandates of the federal Clean Air Act, (42 U.S.C. § 7401 et seq. (1970)), has established the National Ambient Air Quality Standards (NAAQS) to protect public health, the environment, and quality of life from the detrimental effects of air pollution. Standards have been established for the following criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), and sulfur dioxide (SO_2). PM standards have been established for inhalable coarse particles ranging in diameter from 2.5 to 10 micrometers (µm) (PM_{10}) and fine particles less than 2.5 µm ($PM_{2.5}$) in diameter.

In accordance with the Clean Air Act Amendments (CAAA) of 1997, (91 Stat. 685, P.L. 95-95), the U.S. EPA uses air monitoring data it compiles, as well as data collected by local air quality agencies, to classify counties and some sub-county geographical areas by their compliance with the NAAQS. An area with air quality at or below the NAAQS is designated as an attainment area. An area with air quality that exceeds the NAAQS is designated as a nonattainment area. Nonattainment areas are further classified as extreme, severe, serious, moderate, and marginal by the extent the NAAQS are exceeded. Areas that have been reclassified from nonattainment to attainment are identified as maintenance areas. An area may be designated as unclassifiable when there is a temporary lack of data on which to base its attainment status. **Table 4-5** identifies those areas that fall within the General Study Area that are in nonattainment or maintenance status for these pollutants.

Table 4-5 NAAQS Nonattainment and Maintenance Areas in the General Study Area

Pollutant	Status	Area
Ozone (O3) – (8-Hour Standard [2015])	Nonattainment (Marginal)	Bexar County (San Antonio, TX)
Ozone (O3) – (1-Hour Standard [1979])	Nonattainment (Moderate)	Victoria County (Victoria, TX)

Source: US Environmental Protection Agency Green Book (http://www.epa.gov/airquality/greenbook/ancl.html [Accessed July 2022]).
Prepared by: ATAC Corporation, September 2022.

Both the EPA and the FAA have determined that aircraft operations at or above a mixing height of 3,000 feet AGL have a very small effect on pollutant concentrations at ground level.[45,46,47] The mixing height represents the height of the completely mixed portion of the atmosphere that begins at the earth's surface and extends to a few thousand feet overhead where the atmosphere becomes fairly stable.[48] Mixing heights will vary based on a variety of factors including topography, time of day, temperature, wind, and season. A mixing height of 3,000 feet AGL represents the annual national average mixing height. While 3,000 feet AGL is the threshold established by the EPA and the FAA, FAA research on mixing heights indicates 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.[49]

45 Wayson, Roger, and Fleming, Gregg, "Consideration of Air Quality Impacts by Airplane Operations at or Above 3000 feet AGL," Volpe National Transportations Systems Center and FAA Office of Environment & Energy, FAA-AEE-00-01-DTS-34, September 2000. (http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/)
46 40 C.F.R. § 93.150(c)(2) (xxii).
47 72 Fed. Reg. 6641 (February 12, 2007).
48 U.S. Department of Transportation, Federal Aviation Administration, Air Quality Procedures For Civilian Airports & Air Force Bases, April 1997.
(http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/media/Handbook.PDF)
49 Report on ''Consideration of Air Quality Impacts by Airplane Operations At or Above 3,000 feet AGL,''FAA–AEE–00–01, September 2000, p. 5.

4.2.8 Climate

Greenhouse gases (GHGs) are naturally occurring and man-made gases that trap heat in the earth's atmosphere. These gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). According to the EPA, domestic aviation contributed approximately three percent of total national CO_2 emissions.[50] The only GHG emissions AEDT 3d calculates are CO_2 emissions from aircraft engines, thus this EA will only consider CO_2 emissions.[51]

In January 2021, Section 7(e) of Executive Order 13990[52] directed the Council on environmental Quality (CEQ) to rescind their 2019 Draft GHG Guidance and review, revise, and update its 2016 GHG Guidance. CEQ rescinded their 2019 Draft GHG Guidance. That action does not change any law, regulation, or other legally binding requirement. CEQ has not yet addressed its review of and any appropriate revisions and updates to the 2016 GHG Guidance. CEQ directs that, "In the interim, agencies should consider all available tools and resources in assessing GHG emissions and climate change effects of their proposed actions, including, as appropriate and relevant, the 2016 GHG Guidance."[53]

Accordingly, this Draft EA calculated total Metric Tons (MT) of CO_2, reported as MT CO_2e, using AEDT 3d estimates of the amount of fuel consumed by IFR civilian and military aircraft arriving and departing from SAT and BAZ Study Airports in the 18,000 Foot Study Area and applying the accepted Global Warming Potential Environmental Protection Agency factor of one (1) for CO_2 to calculate CO_2e. Fuel consumption calculations are discussed in Section 4.2.6, *Energy Supply*.

4.2.9 Visual Effects (Visual Resources / Visual Character Only)

Visual Effects deal with the extent to which a Proposed Action would result in visual impacts within the General Study Area. The Proposed Action includes IFR procedure changes that would generally occur at altitudes at or above 3,000 feet AGL (with IFR procedure lateral and/or vertical changes at and below that altitude occurring within the footprint of existing flight operations). Currently, portions of the General Study Area are exposed to the sight of aircraft arriving and departing from the Study Airports. Any potential visual impacts would only arise from changes in the visibility of aircraft within the General Study Area as perceived from the ground.

50 U.S. Environmental Protection Agency. https://www.epa.gov/regulations-emissions-vehicles-and-engines/control-air-pollution-airplanes-and-airplane-engines-ghg, Accessed October 2022 to obtain EPA Finalizes Airplane Greenhouse Gas Emission Standards
51 US Department of Transportation, Federal Aviation Administration, *Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA, Section 1.1.3 Fuel burn and greenhouse gas emissions*, https://aedt.faa.gov/Documents/guidance_aedt_nepa.pdf, Accessed September 2022.
52 Executive Office of the President. Executive Order 13990 of January 20, 2021 "Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis," 86FR7037.
53 Council on Environmental Quality, "National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions." 86FR10252, February 19, 2021.