Antonio B. Won Pat International Airport

14 CFR Part 150

Noise Exposure Map Update

December 2024

Guam International Airport Authority
355 Chalan Pasaheru
Tamuning, Guam 96913

A.B. WON PAT INTERNATIONAL AIRPORT GUAM
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WE'RE ON IT 24/7

December 26, 2024

Mr. Gordon Wong
Manager
FAA, Honolulu Airports District Office
300 Ala Moana Blvd, Rm 7-128
Honolulu, HI 96850-7128

Subject: Noise Exposure Map (NEM) Update Submission pursuant to Title 14 of the Code of Federal Regulations, Part 150 for Won Pat International Airport (GUM)

Dear Mr. Wong:

The Antonio B. Won Pat International Airport Authority (GIAA) is pleased to submit updated Noise Exposure Maps (NEMs) and supporting documentation for Antonio B. Won Pat International Airport (GUM) prepared in accordance with 14 CFR Part 150 ("Airport Noise Compatibility Planning"). The aircraft operations at A. B. Won Pat International Airport within this document are hereby certified by the GIAA to be consistent with the fleet mix, forecast operational levels, and flight procedures depicted for calendar years 2024 and 2029.

In accordance with 14 CFR Part 150, Section 150.21 (c), GIAA requests that Federal Aviation Administration (FAA) confirm receipt of these Existing (2024) and Forecast (2029) Noise Exposure Maps (NEMs) and indicate whether they are in compliance with the applicable requirements. Both the Existing (2024) and Forecast (2029) NEMs were prepared using the forecast operations reviewed and approved by the FAA.

As discussed in Chapter 5 of the document, the GIAA provided all interested parties adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft noise exposure map and description of forecast aircraft operations, consistent with Part 150,s150.21 (b). The Sponsor's Certification, the formal certification required by Part 150, is provided on page viii of the document.

The GIAA is grateful for the participation provided throughout this project by the Honolulu Airports District Office, the Western Pacific Region Office and the A. B. Won Pat International Traffic Control Tower.

Please do not hesitate to contact me with any questions.

Sincerely yours

John M. Quinata
Executive Manager

enc.

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Executive Summary

Executive Summary

The A.B. Won Pat International Airport Authority, Guam (GIAA) is committed to being a good neighbor and a responsible operator of the Antonio B. Won Pat International Airport (GUM, Airport). As the Airport proprietor, GIAA is updating its Noise Exposure Map (NEM) in accordance with the Federal Aviation Administration's (FAA's) process codified under Title 14 of the Code of Federal Regulations Part 150 (14 CFR Part 150 or Part 150). This is the first step in the process of updating the GIAA Part 150. GIAA completed the original Part 150 Study for the Airport in 2003. The FAA accepted the NEM in May 2003 and provided a Record of Approval for the GIAA-recommended Noise Compatibility Program (NCP) measures in November 2003.

A Part 150 Study is a voluntary and federally supervised formal process for airport operators to address aircraft noise in terms of land use compatibility. A Part 150 Study includes the following two principal elements:

- The **Noise Exposure Map** (NEM) element describes the airport layout and operation, aircraft-related noise exposure, land uses in the airport environs, and the resulting noise/land use compatibility. Part 150 requires that the documentation address aircraft operations during two time periods: the year of submission and a forecast year at least 5 years following the year of submission.
- The **Noise Compatibility Program** (NCP) element describes the actions the airport proprietor recommends to address existing and future noncompatible land use with aircraft operations. When GIAA submits its NCP to the FAA, the FAA will review, evaluate, and make determinations on the individual proposed measures in the FAA's Record of Approval.

The GIAA Part 150 Study Update is divided into two phases:

- **Phase 1** focuses on the development and submittal of the NEM to the FAA for acceptance as being completed in accordance with 14 CFR Part 150, and
- **Phase 2** determines the GIAA-recommended measures to minimize noncompatible land uses from aircraft operations with the development and submittal of the NCP to the FAA for review and evaluation of the individual measures and FAA's determination of their consistency with the purposes of Part 150 that will be documented in the FAA's Record of Approval.

This document presents the results of the NEM element of the ongoing Part 150 Study update including quantifying noise exposure from aircraft operations and assessing land use compatibility near the Airport. This NEM documentation assesses aircraft noise exposure resulting from the existing condition (2024) and a 5-year forecast condition (2029). The Part 150 Study is part of the broader effort to address noise exposure resulting from aircraft operations; it covers a study area that includes the Airport and adjacent communities on Guam.

Noise Exposure Maps

The 2024 and 2029 noise exposure contours are presented below in **Figure ES-1, Figure ES-2**, and in Chapter 3 of this document.[1] The resulting land use compatibility analysis is summarized in **Table ES-1** and **Table ES-2**, which includes the population and housing units within the Day-Night Average Sound Level (DNL) 65 decibel (dB) contour and noise-sensitive sites. The 2029 Forecast DNL 65 dB contour is slightly larger and fully encompasses the 2024 Existing DNL 65 dB contour. The land use analysis shows that there are 155 residential units and one noise-sensitive site (transient lodging) within the Existing Condition 2024 DNL 65 dB contours and 303 residential units and the same noise-sensitive site within the Forecast Condition 2029 DNL 65 dB contours as a result of the 2029 contours encompassing a larger area than the 2024 contours. For the Existing Condition 2024 analysis, 118 of the 155 units and the one noise-sensitive site are potentially noncompatible with noise from Airport operations and for the Forecast Condition 2029 analysis, 251 of the 303 units and the one noise sensitive site are potentially noncompatible with noise from Airport operations. Part 150, Land Use Compatibility guidelines[2] consider all land uses compatible with aircraft noise less than 65 dB in terms of the DNL metric.

GIAA considers housing units as compatible with aircraft noise within the DNL 65 dB and greater contour if they were mitigated as part of the prior Residential Sound Solutions Program or if they were constructed after October 1, 1998. Per FAA policy,[3] as of October 1, 1998, the FAA will approve, under Part 150, only remedial mitigation measures for existing noncompatible development and only preventive noise mitigation measures for new noncompatible development that may be eligible for Airport Improvement Program funding.

[1] The Official Noise Exposure Maps at 1' to 2,000' scale can be found in Appendix F.
[2] Appendix A, Table 1 of 14 CFR Part 150 – Reproduced in this report in Table 4-2.
[3] Final Policy on Part 150 Approval of Noise Mitigation Measures: Effect on the Use of Federal Grants for Noise Mitigation Projects", Federal Register 63:46 (April 3, 1998) p.16409.

Table ES-1. Existing (2024) and Forecast (2029) Land Use Compatibility

Contour Interval	Area (Acres)		Population Census 2020				Housing Units			
			Total		Noncompatible[1]		Total		Noncompatible[1]	
	2024	2029	2024	2029	2024	2029	2024	2029	2024	2029
65-70 DNL	521.1	574.5	465	909	354	753	155	303	118	251
70-75 DNL	236.4	248.2	0	0	0	0	0	0	0	0
>75 DNL	262.3	281.9	0	0	0	0	0	0	0	0
Total >65 DNL	1,019.8	1,104.5	465	909	354	753	155	303	118	251

DNL = Day-Night Average Sound Level
Notes:
The number of buildings that participated in the RSSP was delineated based on research of available records maintained by GIAA. Land use and housing units within the DNL 65 dB contours were verified by windshield survey in May 2024.
The number of people is estimated based on a population factor (3,004 people per unit) developed from the 2020 U.S. Census block data within 1,000 feet of the 2029 DNL 65 dB contour.
[1] The noncompatible number subtracts those units that have received sound insulation treatment and an avigation easement or were constructed after October 1, 1998.
Sources: U.S. 2020 Census data, GIAA 2024

Table ES-2. Existing (2024) and Forecast (2029) Noise Sensitive Sites

Contour Interval	Schools		Places of Worship		Day Care		Transient Lodging	
	2024	2029	2024	2029	2024	2029	2024	2029
65-70 DNL	0	0	0	0	0	0	1	1
70-75 DNL	0	0	0	0	0	0	0	0
>75 DNL	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**

DNL = Day-Night Average Sound Level
Source: GIAA 2024

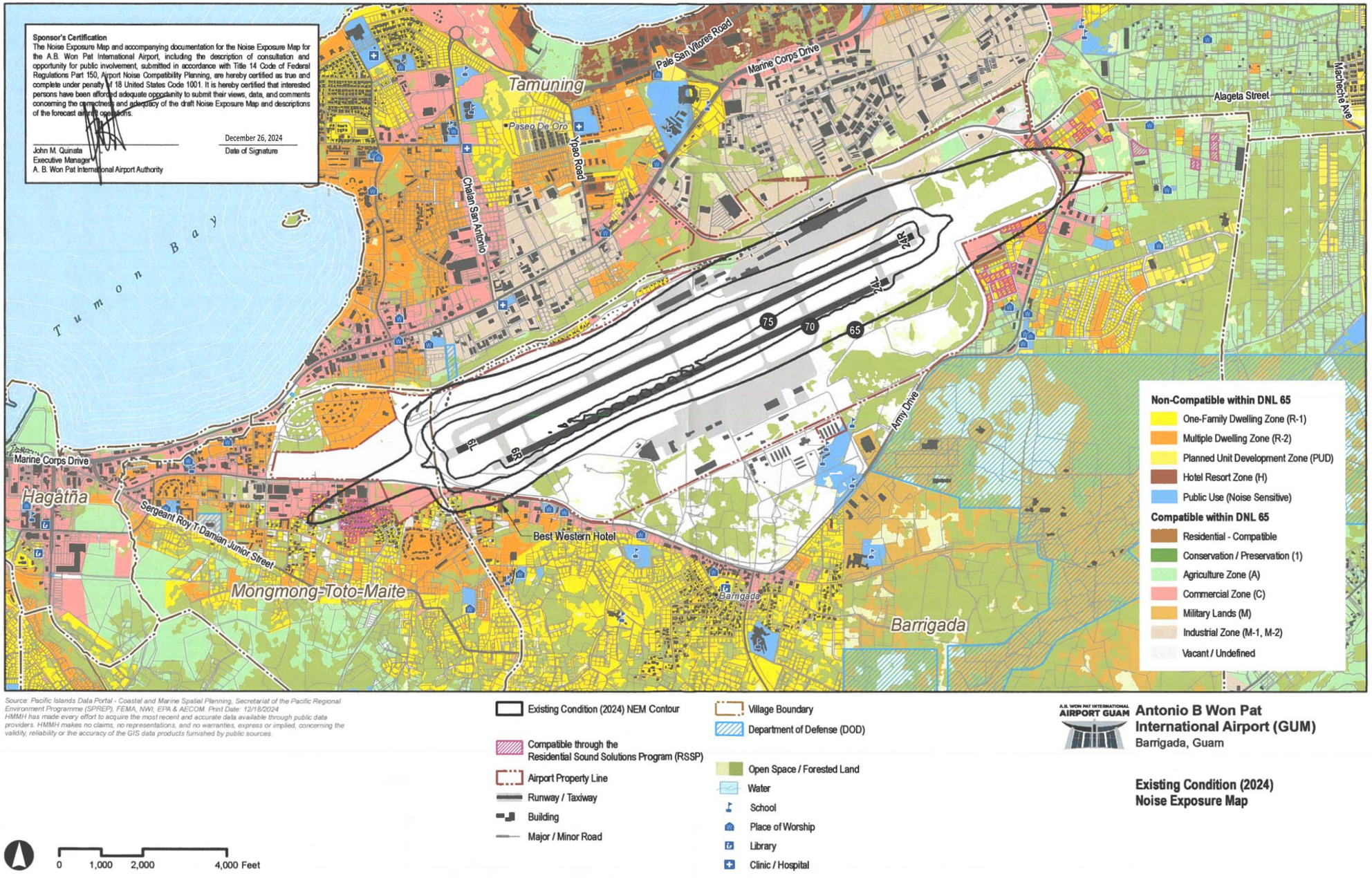


Figure ES-1. Existing Condition (2024) Noise Exposure Map

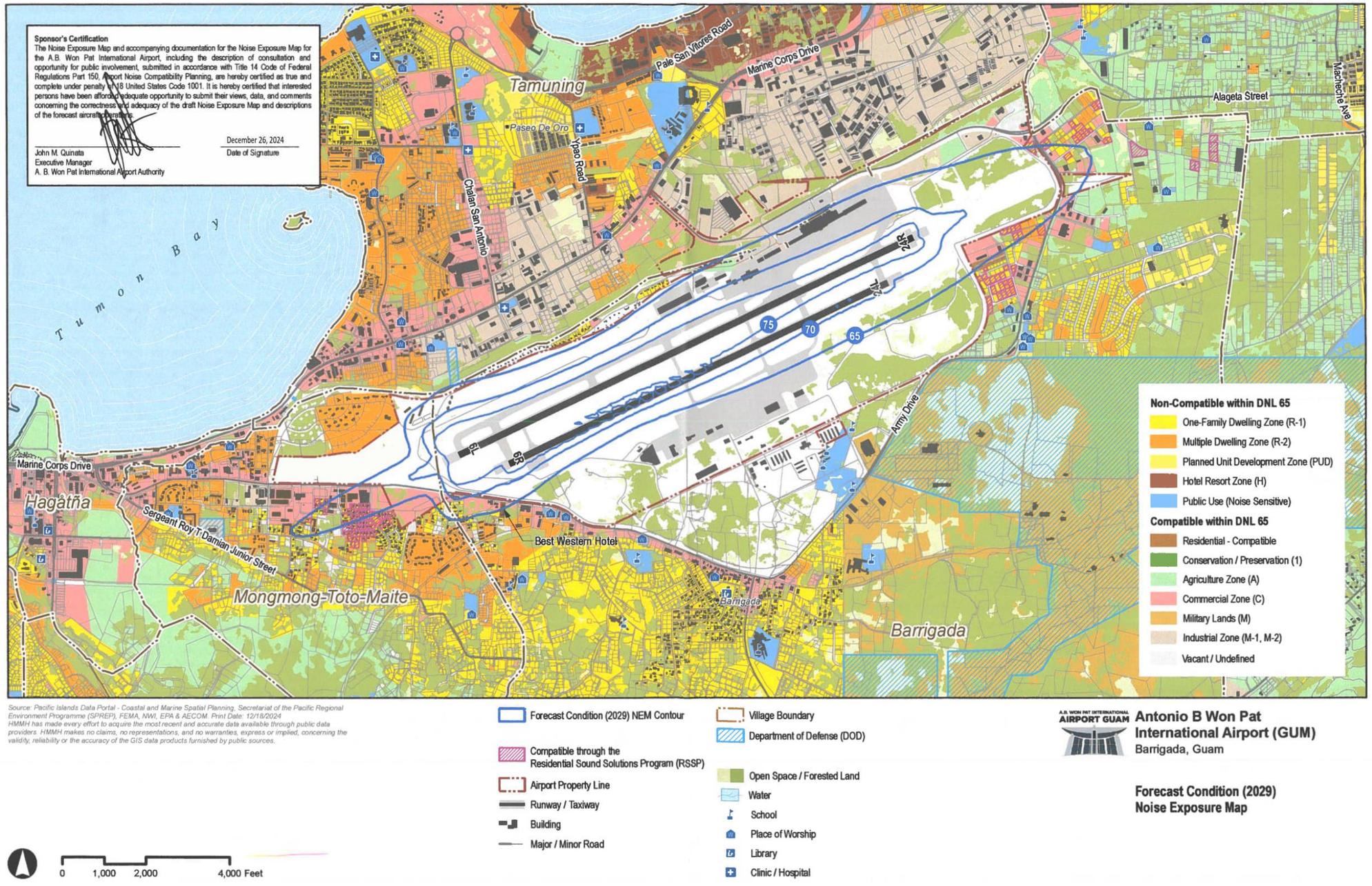


Figure ES-2. Future Conditions (2029) Noise Exposure Map

Sponsor's Certification

GIAA has completed a comprehensive *Noise Exposure Map Update* in accordance with Title 14 of the Code of Federal Regulations Part 150 for the Antonio B. Won Pat International Airport. ***This is to certify the following:***

1. The 2024 and 2029 Noise Exposure Maps for the Antonio B. Won Pat International Airport and the associated documentation that GIAA submitted in this volume to the Federal Aviation Administration under Title 14 CFR Part 150, Subpart B, Section 150.21, are true and complete, under penalty of 18 U.S.C. 1001.
2. The "Existing Condition (2024) Noise Exposure Map" (**Figure 3-9** from Chapter 3) accurately represents current conditions for calendar year 2024.
3. The "Future Condition (2029) Noise Exposure Map" (**Figure 3-10** from Chapter 3) accurately represents forecast conditions for calendar year 2029 consistent with the Federal Aviation Administration approved forecasts.
4. Pursuant to Title 14 CFR Part 150, Subpart B, Section 150.21(b), all interested parties have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft noise exposure maps and the descriptions of forecast aircraft operations.

The operations at the Antonio B. Won Pat International Airport are hereby certified to be consistent with the fleet mix, forecast operational levels, and flight procedures depicted for 2024 and 2029 within this document. Further information regarding development of the forecast, can be found in Section 3.2, "Aviation Forecast", and Appendix B. Further Information on the fleet mix, and procedures can be found in Chapter 3 "Aircraft Noise Exposure," and Appendix C.

ANTONIO B. WON PAT INTERNATIONAL AIRPORT

By:	John M. Quinata
Title:	Executive Manager
Date:	December 26, 2024
Airport Name:	Antonio B. Won Pat International Airport
Airport Owner/Operator:	A.B. Won Pat International Airport Authority, Guam
Address:	355 Chalan Pasaheru, Tamuning, Guam 96913

FAA Checklist

The FAA produced Advisory Circular 150/5020, "*Airport Noise and Land Use Compatibility Planning*," that includes a checklist for FAA's use in reviewing NEM submissions. The FAA prefers that the Part 150 documentation include a copy of the checklist with appropriate page numbers or other references and pertinent notes and comments to assist in the document's review, as presented in Table ES-3 below.

Table ES-3. Part 150 Noise Exposure Map Checklist

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
I. Submitting and Identifying The NEM:			
A. Submission is properly identified:			
1. 14 C.F.R. Part 150 NEM?	X		NEM Update
2. NEM and NCP together?		X	This document is the NEM Update. An NCP update will be prepared and submitted as a separate document, after acceptance of the NEM by the FAA. Sponsor Certification, page viii.
3. Revision to NEMs FAA previously determined to be in compliance with Part 150	X		Cover letter, Chapter 3, page 3-22.
B. Airport and Airport Operator's name are identified?	X		Sponsor Certification, page viii.
C. NEM is transmitted by airport operator's dated cover letter, describing it as a Part 150 submittal and requesting appropriate FAA determination?	X		Cover letter.
II. Consultation: [150.21(b), A150.105(a)]			
A. Is there a narrative description of the consultation accomplished, including opportunities for public review and comment during map development?	X		Chapter 5, page 5-1, Appendix D– Stakeholder Consultation.
B. Identification of consulted parties:			
1. Are the consulted parties identified?	X		Chapter 1, Section 1.3, Chapter 5, Section 5.1, Appendix D– Stakeholder Consultation.
2. Do they include all those required by 150.21(b) and A150.105(a)?	X		Chapter 1, Section 1.3.2, Chapter 5, Section 5.1, and Appendix D– Stakeholder Consultation.
3. Agencies in 2., above, correspond to those indicated on the NEM?	X		Agencies identified on the NEM participated as part of the Planning Advisory Committee (PAC), Chapter 5 Section 5.1.
C. Does the documentation include the airport operator's certification, and evidence to support it, that interested persons have been afforded adequate opportunity to submit their views, data, and comments during map development and in accordance with 150.21(b)?	X		Certification language is provided on page viii. Information on the consultation process is provided in Chapter 5 and Appendix D– Stakeholder Consultation.
D. Does the document indicate whether written comments were received during consultation and, if there were comments, that they are on file with the FAA regional airports division manager?	X		One Public Open House and three PAC presentations were held. Chapter 5, Section 5.2 lists the public meetings. Appendix E contains copies of the public comments, which by submission of this document will be on file with the FAA's Regional Airports Division Manager.
III. General Requirements: [150.21]			

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
A. Are there two maps, each clearly labeled on the face with year (existing condition year and one that is at least 5 years into the future)?	X		Figure 3-9 (page 3-23) presents the 2024 Map with existing conditions. Figure 3-10 (page 3-24) presents the 2029 Map with 5-year conditions.
B. Map currency:			
1. Does the year on the face of the existing condition map graphic match the year on the airport operator's NEM submittal letter?	X		See cover letter and Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23).
2. Is the forecast year map based on reasonable forecasts and other planning assumptions and is it for at least the fifth calendar year after the year of submission?	X		See cover letter and certification language on page viii. See Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24). Forecast is provided in Appendix B.
3. If the answer to 1 and 2 above is no, the airport operator must verify in writing that data in the documentation are representative of existing condition and at least 5 years' forecast conditions as of the date of submission?		X	Not Applicable since the Existing Condition map year matches the year of submittal and the forecast map is at least the fifth calendar year and based on the FAA approved forecast.
C. If the NEM and NCP are submitted together:			
1. Has the airport operator indicated whether the forecast year map is based on either forecast conditions without the program or forecast conditions if the program is implemented?		X	Not Applicable - The NEM is being submitted separately.
2. If the forecast year map is based on program implementation:		X	Not Applicable - The NEM is being submitted separately.
a. Are the specific program measures that are reflected on the map identified?		X	Not Applicable - The NEM is being submitted separately.
b. Does the documentation specifically describe how these measures affect land use compatibilities depicted on the map?		X	Not Applicable - The NEM is being submitted separately.
3. If the forecast year NEM does not model program implementation, the airport operator must either submit a revised forecast NEM showing program implementation conditions [B150.3(b), 150.35(f)] or the sponsor must demonstrate the adopted forecast year NEM with approved NCP measures would not change by plus/minus 1.5 DNL? (150.21(d))		X	Not Applicable - The NEM is being submitted separately.
IV. Map Scale, Graphics, And Data Requirements: [A150.101, A150.103, A150.105, 150.21(a)]			
A. Are the maps of sufficient scale to be clear and readable (they must not be less than 1" to 2,000'), and is the scale indicated on the maps? (*Note (1) if the submittal uses separate graphics to depict flight tracks and/or noise monitoring sites, these must be of the same scale, because they are part of the documentation required for NEMs.*) (*Note (2) supplemental graphics that are not required by the regulation do not need to be at the 1" to 2,000' scale*)	X		The "Existing Condition (2024) Noise Exposure Map" (Figure 3-9) and "Future Condition (2029) Noise Exposure Map" (Figure 3-10) are provided at the scale of 1" to 2,000'. Supplemental figures at 1" to 2,000' are provided in Appendix F – Official Noise Exposure Maps and in pockets near the rear of this document, as required per 14 CFR Part 150.
B. Is the quality of the graphics such that required information is clear and readable? (Refer to C. through G., below, for specific graphic depictions that must be clear and readable)	X		The "Existing Condition (2024) Noise Exposure Map" (Figure 3-9) and "Future Condition (2029) Noise Exposure Map" (Figure 3-10) are presented at 1" to 2,000'. Supplemental figures at 1" to 2,000' are provided in Appendix F – Official Noise Exposure Maps.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
C. Depiction of the airport and its environs:			
1. Is the following graphically depicted to scale on both the existing condition and forecast year maps?			
a. Airport boundaries	X		Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24).
b. Runway configurations with runway end numbers	X		Existing Condition (2024) Noise Exposure Map Figure 3-9, page 3-23, Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24).
2. Does the depiction of the off-airport data include?			
a. A land use base map depicting streets and other identifiable geographic features	X		Land uses, streets, and other features are shown over the entire mapped area on the NEMs. Land use coverage is shown in Figure 2-4 and Figure 2-6. Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24).
b. The area within the DNL 65 dB (or beyond, at local discretion)	X		Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24).
c. Clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the DNL 65 dB (or beyond, at local discretion)	X		As noted directly on the map portion of the NEM figures (which extends in both cases well beyond the 65 dB DNL contour), the mapped area is within the jurisdictional boundaries of the Guam Department of Land Management. Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24).
D. 1. Continuous contours for at least the DNL 65, 70, and 75 dB?	X		Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map - (Figure 3-10, page 3-24).
2. Has the local land use jurisdiction(s) adopted a lower local standard and if so, has the sponsor depicted this on the NEMs?		X	No lower local standard has been adopted.
3. Based on current airport and operational data for the existing condition year NEM, and forecast data representative of the selected year for the forecast NEM?	X		Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24). Details on the Forecast can be found in Appendix B.
E. Flight tracks for the existing condition and forecast year timeframes (these may be on supplemental graphics which must use the same land use base map and scale as the existing condition and forecast year NEM), which are numbered to correspond to accompanying narrative?	X		Section 3.6 (page 3-12), Figure 3-5 (page 3-18), Figure 3-6 (page 3-19), Figure 3-7 (page 3-20), and Figure 3-8 (page 3-21). Official flight track maps on the same base map and scale as the NEM's in Appendix F– Official Noise Exposure Maps.
F. Locations of any noise monitoring sites (these may be on supplemental graphics which must use the same land use base map and scale as the official NEMs)		X	Noise monitoring was not included in this study.
G. Noncompatible land use identification:			

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
1. Are noncompatible land uses within at least the DNL 65 dB noise contour depicted on the map graphics?	X		Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24).
2. Are noise sensitive public buildings and historic properties identified? (Note: If none are within the depicted NEM noise contours, this should be stated in the accompanying narrative text.)	X		Sections 2.5 and 2.6 (Table 2-3, page 2-15; Table 2-4, page 2-16). Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24).
3. Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?	X		Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23), Future Condition (2029) Noise Exposure Map (Figure 3-10, page 3-24).
4. Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative?	X		Prior noise sensitive parcels that have been mitigated are identified.
V. Narrative Support Of Map Data: [150.21(a), A150.1, A150.101, A150.103]			
A. 1. Are the technical data and data sources on which the NEMs are based adequately described in the narrative?	X		See Chapter 5, page 5-1.
2. Are the underlying technical data and planning assumptions reasonable?	X		The Planning Advisory Committee (including FAA) carefully vetted all assumptions. Chapter 5, Section 5.1, page 5-1, and Appendix D-1.
B. Calculation of Noise Contours:			
1. Is the methodology indicated?	X		As discussed in Chapter 3, the DNL contours contained in these NEMs were prepared using the most recent release of the FAA's Aviation Environmental Design Tool (AEDT) available at the time the NEMs were prepared, i.e., "Version 3f."
a. Is it FAA approved?	X		
b. Was the same model used for both maps? (Note: The same model also must be used for NCP submittals associated with NEM determinations already issued by FAA where the NCP is submitted later, unless the airport sponsor submits a combined NEM/NCP submittal as a replacement, in which case the model used must be the most recent version at the time the update was started.)	X		
c. Has AEE approval been obtained for use of a model other than those that have previous blanket FAA approval?		X	No non-standard modeling was included in this study.
2. Correct use of noise models:			
a. Does the documentation indicate, or is there evidence, the airport operator (or its consultant) has adjusted or calibrated FAA-approved noise models or substituted one aircraft type for another that was not included on the FAA's pre-approved list of aircraft substitutions?		X	Not applicable – The FAA approved noise model was not adjusted or calibrated and no substitutions were used.
b. If so, does this have written approval from AEE, and is that written approval included in the submitted document?		X	Not applicable.
3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?		X	Not applicable; no noise monitoring was used in this study.

PROGRAM REQUIREMENT	YES	NO	SUPPORTING PAGES/REVIEW COMMENTS
4. For noise contours below DNL 65 dB, does the supporting documentation include an explanation of local reasons? (Note: A narrative explanation, including evidence the local jurisdiction(s) have adopted a noise level less than DNL 65 dB as sensitive for the local community(ies), and including a table or other depiction of the differences from the Federal table, is highly desirable but not specifically required by the rule. However, if the airport sponsor submits NCP measures within the locally significant noise contour, an explanation must be included if it wants the FAA to consider the measure(s) for approval for purposes of eligibility for Federal aid.)		X	Not applicable; no lower local standard was used.
C. Noncompatible Land Use Information:			
1. Does the narrative (or map graphics) give estimates of the number of people residing in each of the contours (DNL 65, 70 and 75, at a minimum) for both the existing condition and forecast year maps?	X		Table 4-3 (page 4-4) and Table 4-4 (page 4-4).
2. Does the documentation indicate whether the airport operator used Table 1 of Part 150?	X		Chapter 4, Section 4.1, see Table 4-2 (page 4-1).
a. If a local variation to table 1 was used:			
(1) Does the narrative clearly indicate which adjustments were made and the local reasons for doing so?		X	Not applicable; no local variation was used.
(2) Does the narrative include the airport operator's complete substitution for table 1?		X	Not applicable; no local variation was used.
3. Does the narrative include information on self-generated or ambient noise where compatible or noncompatible land use identifications consider non-airport and non-aircraft noise sources?		X	The text narrative in the NEM does not include information on self-generated or ambient noise.
4. Where normally noncompatible land uses are not depicted as such on the NEMs, does the narrative satisfactorily explain why, with reference to the specific geographic areas?	X		Existing Condition (2024) Noise Exposure Map (Figure 3-9, page 3-23).
5. Does the narrative describe how forecast aircraft operations, forecast airport layout changes, and forecast land use changes will affect land use compatibility in the future?	X		Sections 4.2 and 4.3, page 4-5
VI. Map Certifications: [150.21(b), 150.21(e)]			
A. Has the operator certified in writing that interested persons have been afforded adequate opportunity to submit views, data, and comments concerning the correctness and adequacy of the draft maps and forecasts?	X		Sponsor Certification, page viii.
B. Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete under penalty of 18 U.S.C. § 1001?	X		Sponsor Certification, page viii.

Source: FAA APP-600, Washington, DC, March 1989; revised June 2005; reviewed for currency 12/2007

Acronyms

Acronym	Definition
AAD	Average Annual Day
AAFB	Andersen Air Force Base
AC	Air Carrier
ACI	Aviation Concepts, Inc.
ADA	Americans with Disabilities Act
ADO	Airports District Office
AEDT	Aviation Environmental Design Tool
AEE	Office of Environment and Energy
ANP	Aircraft Noise and Performance
AOA	Air Operations Area
APA	Asia Pacific Airlines
ARFF	Aircraft Rescue and Firefighting
ARTCC	Air Route Traffic Control Center
ASDA	Accelerate-Stop Distance Available
ASNA	Aviation Safety and Noise Abatement Act of 1979
AT	Air Taxi
ATCT	Airport Traffic Control Tower
CERAP	Combined En Route Approach Control
CFR	Code of Federal Regulations
CMNI	Commonwealth of the Northern Mariana Islands
dB	Decibel (A-weighted unless otherwise stated)
DLM	Department of Land Management
DNL	Day-Night Average Sound Level
EIS	Environmental Impact Study
FAA	Federal Aviation Administration
FTZ	Foreign Trade Zone
FY	Fiscal Year
GA	General Aviation
GIAA	A.B. Won Pat International Airport Authority, Guam
GIAT	Guam International Airport Terminal
GUM	Antonio B. Won Pat International Airport
HMMH	Harris, Miller, Miller & Hanson, Inc.
ICAO	International Civil Aviation Organization
LDA	Landing Distance Available
MACS	Micronesian Air Cargo Services
MP	Master Plan
MSL	Mean Sea Level
NA	Noise Abatement
NAS	Naval Air Station
NAVAID	Navigational Aid
NCP	Noise Compatibility Program
NCTS	Naval Computer and Telecommunications Station
NEM	Noise Exposure Map
NEPA	National Environmental Policy Act of 1969
NLR	Noise Level Reduction
NPIAS	National Plan of Integrated Airport Systems
OPSNET	Operations Network
PAC	Planning Advisory Committee
PAPI	Precision Approach Path Indicator
Part 150	Title 14 of the Code of Federal Regulations Part 150 “Airport Noise Compatibility Planning”
PGRO	Benjamin Taisacan Manglona (Rota) International Airport
PGSN	Francisco C. Ada/Saipan International Airport
PGUA	Andersen Air Force Base
PGWT	Tinian International Airport

Acronym	Definition
PM	Program Management
RIMPAC	Rim of the Pacific
ROA	Record of Approval
RSSP	Residential Sound Solution Program
SLUCM	Standard Land Use Coding Manual
TAF	Terminal Area Forecast
TFR	Temporary Flight Restriction
TODA	Takeoff Distance Available
TORA	Takeoff Run Available
TRACON	Terminal Radar Approach Control
UPS	United Parcel Service
USGS	United States Geological Survey

1.
Introduction to Noise Compatibility Planning

1 Introduction to Noise Compatibility Planning

Antonio B. Won Pat International Airport (GUM, Airport) is undertaking a Noise Compatibility Planning Study in accordance with Title 14 of the Code of Federal Regulation Part 150 (14 CFR Part 150, or Part 150; herein referred to as "Study" or "Part 150 Study"). The purpose of this Part 150 Study is to develop an accurate Noise Exposure Map (NEM) that reflects current and future airport operations, communicate noise exposure levels and land use compatibility associated with aircraft operations to the surrounding communities, identify noncompatible land uses resulting from aircraft noise in the surrounding communities, and collaboratively develop recommendations aimed at addressing noncompatible land use using potential noise abatement, noise mitigation, and/or program management measures through a Noise Compatibility Program (NCP). The NEM and NCP prepared under this Study will be subject to Federal Aviation Administration (FAA) acceptance and ultimate approval of the Airport-recommended NCP measures.

Part 150 describes a formal process for airport operators to address airport noise in terms of land use compatibility. The regulation establishes thresholds for aircraft noise exposure for specific land use categories. Part 150 studies are voluntary and allow airports to apply for federal funds to implement FAA-approved measures to reduce or eliminate noncompatible land use.

A.B. Won Pat International Airport Authority, Guam (GIAA) is committed to reducing the effects of aircraft noise in nearby communities and has a long history of addressing community noise concerns associated with aircraft operations from the Airport. GIAA completed its first Part 150 Study in 2003. The NEM was accepted by the FAA in May 2003, NCP measures were approved by the FAA in November 2003, and the GIAA began providing sound insulation treatment to the eligible residential units as part of its NCP. The current Study is expected to be completed in 2025.

1.1 Part 150 Process

In 1968, Congress responded to widespread community concern with aircraft noise resulting from the dawn of the jet age by passing the Aircraft Noise and Sonic Boom Act, which set standards for measurement of aircraft noise and established noise abatement regulations associated with the certification of aircraft. The FAA's emphasis on the relationship between aircraft noise and land use compatibility planning began with the passage of the Aviation Safety and Noise Abatement Act of 1979 (ASNA). This act gives the FAA the authority to issue regulations on noise compatibility planning.

The Airport and Airway Improvement Act of 1982 provides a means for federal funding of projects to improve land use compatibility around airports. In response to ASNA, the FAA developed implementing regulations as currently codified in Title 14 of the Code of Federal Regulations (14 CFR Part 150), "Airport Noise Compatibility Planning."[4]

These voluntary Part 150 regulations set forth standards for airport operators to use when documenting noise exposure around airports and for establishing programs to minimize aircraft noise-related noncompatible land use. By regulation, a Part 150 Study includes the following two principal elements (described in Sections 1.1.1 and 1.1.2):

1. Noise Exposure Map (NEM)
2. Noise Compatibility Program (NCP)

Acceptance of an NEM by the FAA is a prerequisite to its subsequent review and approval of measures recommended in an NCP. **Figure 1-1** provides an overview of the FAA Part 150 process.

This Part 150 Study is divided into two phases: Phase 1 covers the development and submittal of the NEM, and Phase 2 is focused on the development and submittal of the NCP. This document is the final report for Phase 1 and includes all required elements for FAA acceptance of the 2024 and 2029 NEMs.

[4] U.S. Government Publishing Office. Electronic Code of Federal Regulations, Title 14 CFR Part 150 – Airport Noise Compatibility Planning. Accessed at https://www.ecfr.gov/current/title-14/chapter-I/subchapter-I/part-150?toc=1 on 12/07/2022.

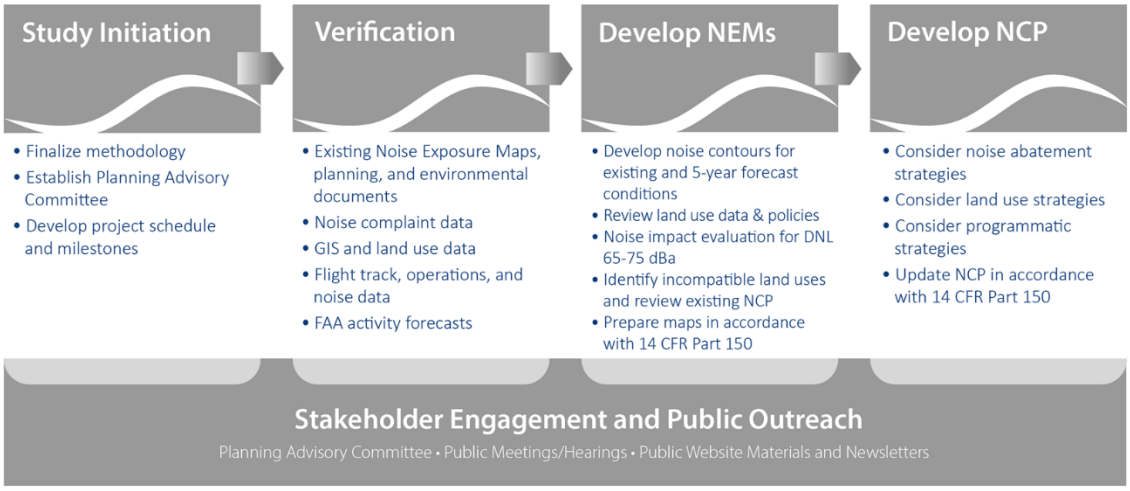


Figure 1-1. Overview of the FAA Part 150 Process

1.1.1 Noise Exposure Map

The NEM document describes the Airport layout and operation, aircraft-related noise exposure, land uses in the Airport environs, and the resulting noise and land-use compatibility. Part 150 requires that NEM documentation address aircraft operations during two time periods:

1. The year of submission (the “existing conditions”) and
2. A forecast year that is at least 5 years following the year of submission (the “forecast conditions”).

The main elements in the NEM document are the two maps representing aircraft noise exposure and land use compatibility. The FAA maintains an NEM document checklist to ensure the documents include all of the requirements contained in the Part 150 regulation, including tabulated data and results, and clear descriptions of the data collection and analysis undertaken in the development of the NEM.

1.1.2 Noise Compatibility Program

An NCP is a list of actions an airport proprietor recommends to address existing and future noncompatible land use resulting from the noise of aircraft operations.

In addition to the NEM checklist, the FAA maintains an NCP checklist to ensure the documents include all of the requirements of Part 150, such as:

- The development of the program
- Each measure the airport sponsor considered
- The reasons the airport sponsor elected to recommend or exclude each measure
- The entities responsible for implementing each recommended measure
- Implementation and funding mechanisms
- The predicted effectiveness of both the individual measures and the overall program

The FAA reviews and approves specific measures based on information contained in the NCP. GIAA may apply for grant funding for implementation of FAA-approved measures. A GIAA-recommended and FAA-approved measure does not require implementation of the measure but merely demonstrates that the measure is in compliance with Part 150. Additionally, if a measure requires subsequent FAA action, its implementation may require environmental study under the National Environmental Policy Act of 1969 (NEPA).

1.2 Antonio B. Won Pat International Airport Part 150 Study

GIAA began the Part 150 Update in the summer of 2023 and, under Phase 1 of this Study, submitted the final NEM report to FAA in December 2024 for acceptance of the document to be in accordance with 14 CFR Part 150 requirements. Chapter 3 provides the official Noise Exposure Maps for the existing conditions in 2024 and the 5-year forecast conditions in 2029.

Phase 2 of the Study is underway as of mid-2024, with a focus on updating the Airport's NCP to address the noncompatible land uses documented in the NEMs. Once complete, there will be a 30-day public comment period on the NCP, a second public open house to answer questions related to the NCP, and a public hearing for the community to comment on the Airport-recommended measures aimed at addressing noncompatible land uses resulting from the noise of Airport operations. GIAA expects to submit the updated NCP with its recommendations to address the noncompatible land uses to the FAA in late 2025.

1.2.1 History of Noise Compatibility Planning at Antonio B. Won Pat International Airport Guam

Aviation is important to the economic health of Guam and the quality of life of its residents, businesses, and visitors. One of the major challenges is to balance aviation needs with the needs of the local community. GIAA is committed to reducing the effects of aircraft noise and has a long history of addressing noncompatible land use at the Airport. GIAA completed its first Part 150 Study for the Airport in 2003. The NEM was accepted by the FAA in May 2003 as adhering to the requirements of Part 150, and the FAA issued its Record of Approval (ROA) in November 2003 for the Airport-recommended NCP measures.

GIAA works closely with Airport partners to reduce noise in the surrounding community by encouraging the use of noise abatement procedures and other takeoff/landing methods that reduce aircraft noise over noise-sensitive areas. The success of a noise abatement strategy depends largely on the cooperation of pilots, air traffic controllers, and Airport officials.

GIAA established a Residential Sound Solution Program (RSSP), which provides sound insulation treatments to eligible homes identified in the FAA-accepted NEM. The RSSP began after the 2003 Part 150 was approved by the FAA and had seven implementation phases. As part of this program, 183 single-family houses and 24 multi-family buildings with 59 units have been acoustically treated resulting in them becoming compatible with the noise from aircraft operations at the Airport.

1.3 Roles and Responsibilities

Several groups are involved in the preparation of the Part 150 Study and have provided important information to the Study Team that has been incorporated into this NEM document, including:

- GIAA, including its staff and consultant team
- The Part 150 Planning Advisory Committee (PAC)
- The FAA
- The public

1.3.1 GIAA

As the Airport operator, GIAA is the sponsor of this Study and submits the NEM, recommends NCP measures, pursues implementation of the adopted NCP measures, and manages the consultant team. GIAA also leads public engagement efforts related to the Part 150 Study.

1.3.2 Planning Advisory Committee

Part 150 studies benefit from the creation and participation of a PAC. Representatives invited to serve on the PAC represent their respective groups and/or constituencies. The purpose of the PAC is to bring a broad range of stakeholder perspectives to the Study. PAC members participate in regular meetings, distribute information about the Study to their constituencies/organizations, and review technical components of the Study. The PAC's role is advisory in nature; members do not have decision-making authority over elements of the Study. That is, the PAC may offer opinions, advice, and guidance to the Study, but GIAA as the operator of the Airport has the sole discretion to accept or reject the PAC recommendations in accordance with Part 150 regulations.

PAC membership includes:

- GIAA staff
- FAA Airport District Office (ADO)
- FAA airport traffic control tower (ATCT)
- Airport tenants, users, and operators
- Guam Department of Land Management
- Andersen Air Force Base

1.3.3 Federal Aviation Administration

The FAA reviews the operational forecast for consistency with its Terminal Area Forecast (TAF) and any non-standard noise modeling requests. The FAA reviews the Part 150 submission to determine whether the technical work, consultation, and documentation comply with Part 150 requirements. The FAA accepts the NEM as being completed in accordance with 14 CFR Part 150.

The FAA evaluates recommended NCP measures individually with respect to a criteria framework and determines whether each measure merits approval, disapproval, or further review for the purposes of Part 150. In addition, the FAA reviews the details of the technical documentation for broader issues of safety and ensures consistency of recommended noise abatement measures with applicable federal law. Finally, the FAA issues the Record of Approval (ROA) for the recommended measures in the NCP.

FAA involvement includes participation by staff from at least three parts of the agency:

- The Office of Environment and Energy
- The Air Traffic Organization
- The Office of Airports

The **Office of Environment and Energy** (AEE), located in FAA headquarters, reviews complex technical, regulatory, and legal matters of national environmental policy significance.

The **Air Traffic Organization** includes the Air Traffic Controllers and support staff. The Airport's ATCT provides input on operational data, safety and capacity effects of alternative noise abatement measures, and shares input on implementation requirements.

Three groups in the **Office of Airports** are involved:

1. The Honolulu Airport District Office (ADO) is the main point of contact for reviews, compliance, and direction as the Part 150 Update study progresses.
2. The Western-Pacific Region Office is responsible for determining if the documentation satisfies all Part 150 requirements and has final review of the NCP for adequacy in satisfying technical and legal requirements.
3. Headquarters ensures consistency with Part 150 regulations and reviews of national importance.

Prior to acceptance of the NEM/NCP documentation and approval of the Airport-recommended NCP measures, the FAA conducts a Lines-of-Business review, which includes Air Traffic, Flight Standards, Legal, Special Programs, Planning and Requirements, Flight Procedures, and Regional Review.

1.3.4 Public

Members of the public were given opportunities to follow the Study's progress and provide input. The public was encouraged to stay abreast of progress by reviewing project-related information, participating in the public open house, and submitting comments on the draft documents.

1.4 Introduction to Noise Terminology

Information presented in this NEM document relies upon a reader's understanding of the characteristics of noise (unwanted sound), the effects noise has on persons and communities, and the metrics or descriptors commonly used to quantify noise. The properties, measurement, and presentation of noise involve specialized terminology. This section presents an overview, and **Appendix A** contains more information on noise metrics.

Sound is a physical phenomenon consisting of minute vibrations (waveforms) that travel through a medium such as air or water. **Noise** is sound that is unwelcome.

Noise metrics may be thought of as measures of noise 'dose.' There are two main types, describing (1) single noise events (single-event noise metrics) and (2) total noise experienced over longer time periods (cumulative noise metrics). Single-event metrics indicate the intrusiveness, loudness, or noisiness of individual aircraft events. Cumulative metrics consider the frequency of noise events as well as the time of day in which they occur. Unless otherwise noted, all noise metrics presented in Part 150 documentation are reported in terms of the A-weighted decibel or dB.

Noise sensitivity is greater at night because background (ambient) sound levels tend to be lower at night and people tend to be sleeping. Day-Night Average Sound Level, or DNL, represents noise as it occurs over a 24-hour period, treating noise events occurring at night (10 p.m. to 7 a.m.) with a 10 dB weighting.[5] This 10 dB weighting is applied to account for greater sensitivity to nighttime noise and the fact that events at night are often perceived to be more intrusive than daytime (see **Figure 1-2**). An alternative way of describing this adjustment is that each event occurring during the nighttime period is calculated as if it were equivalent to 10 daytime events. For purposes of Part 150, DNL is normally calculated using aircraft operations data averaged over a longer period, such as a year, to smooth out fluctuations occurring in day-to-day operations. The DNL depicted by an NEM is often referred to as the annual average daily DNL.

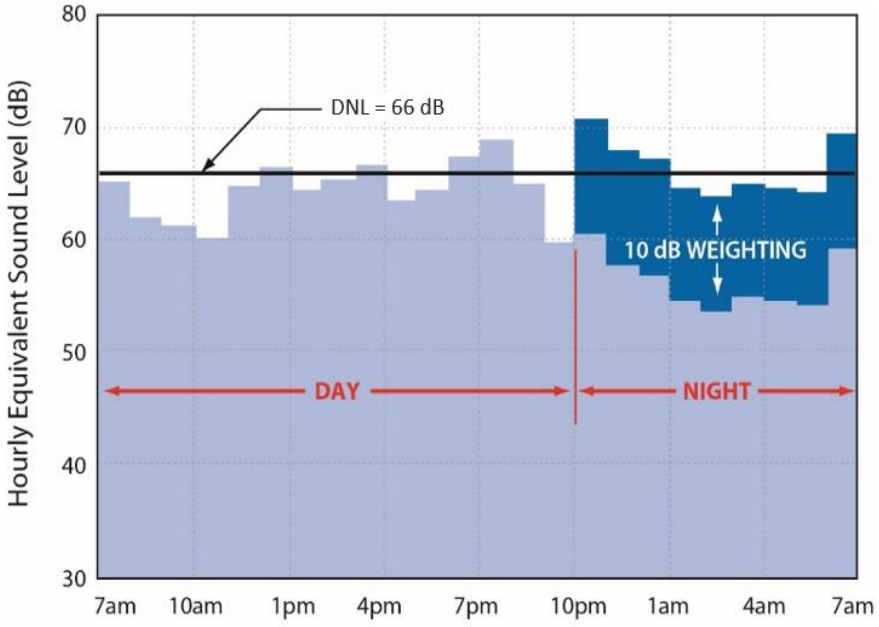


Figure 1-2. Example of a Day-Night Average Sound Level Calculation

1.5 How to Use This Document

This document and the Part 150 Study it represents were undertaken in accordance with the requirements of the Part 150 regulation in Title 14 of the Code of Federal Regulations. The FAA-maintained NEM checklist provided on Page ix enumerates specific FAA requirements and identifies the associated location of the supporting text in this document and its appendices.

This document is organized as follows:

- Chapter 1 introduces Part 150 and the history of noise compatibility planning at the Airport.
- Chapter 2 provides an inventory and background information regarding the Airport.
- Chapter 3 describes the development of the aircraft noise exposure contours, including the noise modeling methodology and inputs, and presents the official 2024 and 2029 Noise Exposure Maps.
- Chapter 4 describes land use in the Part 150 Study area.
- Chapter 5 reports stakeholder engagement efforts undertaken during the Part 150 process.

[5] For the regulatory definition of DNL see 14 CFR Part 150 §150.7 Definitions. http://www.ecfr.gov/cgi-bin/text-idx?SID=f8e6df268e3dad2edb848f61b9a0fb51&mc=true&node=pt14.3.150&rgn=div5; Accessed on 12/07/2022.

2.
Inventory

2 Inventory

The purpose of the Inventory chapter is to establish a baseline about existing airport facilities and types of operations. The inventory includes data concerning airport facilities and land use and policies that guide land use on Guam to give context for the Part 150 Study.

2.1 Airport Location and Background

The Antonio B. Won Pat International Airport (Airport) is situated in the central part of Guam spanning the villages of Tamuning and Barrigada. In 1943, the original Airport was built by the Japanese Navy during World War II. After the liberation of Guam, the Airport was used by the U.S. Air Force until 1947, when the Airport was transferred to the U.S. Navy and was ultimately renamed Naval Air Station (NAS) Agana. In January 1976, the A.B. Won Pat International Airport Authority, Guam (GIAA) took over civilian operations of the Guam International Airport Terminal (GIAT) and a joint agreement with the U.S. Navy was developed that allowed civil operations on the NAS's runways, taxiways, and even use of the ATCT. In 1989, the GIAT was officially renamed the Antonio B. Won Pat International Airport in honor of Guam's first elected delegate to the U.S. House of Representatives, Antonio Borja Won Pat. Then, the 1993 Base Realignment and Closure Act recommended NAS Agana for closure, and in April of 1995, GIAA took over full control of the airfield.

The Airport is enclosed by Route 10A and Tiyan Parkway (East Sunset Boulevard) to the north, Route 8 to the west, Mariner Avenue to the south, and Route 16 to the east. The Airport overlooks much of Guam's western coast, shoreline, and the Philippine Sea. It is located approximately 6 miles northeast of Hagåtña, the capital of Guam, and approximately 2 miles from the island's main tourist area, Tumon. The Airport elevation sits at 305.0 feet above mean sea level (MSL), and Airport property consists of 1,654 acres of land including air and noise space, flight clearance easements, and utility easements.

2.1.1 Airport Role

The 2025–2029 National Plan of Integrated Airport Systems (NPIAS) recognizes the Airport as a primary, small-hub airport within the national airport system. The Airport serves both passenger and cargo flights to and from the United States, Asia, Australia, and various islands in the Pacific region and serves as a hub for both Asia Pacific Airlines and United Airlines. It is the only commercial service airport serving Guam. The majority of the travel demand is driven by visitors to and from the top tourism markets, e.g., Japan, Korea, and Taiwan, as well as a large portion of government/military-related travel for U.S. visitors.

2.1.2 Air Service

In 2022, 10 operating signatory air carriers provided scheduled service at the Airport, including United Airlines (United, UA), Korean Air (KE), Japan Airlines (JL), Philippine Airlines (PR), Jin Air (LJ), Jeju Air (7C), T'way Air (TW), Air Busan (BX), Air Seoul (RS), and Southern Airways Express (9X). In addition, Star Marianas Air, Arctic Circle Air, and Micronesian Air Cargo Services (MACS) provide commuter services to the Commonwealth of the Northern Mariana Islands (CNMI) from Guam under Part 135 certification and uses aircraft with nine passenger seats or less.

In terms of air cargo, the majority of imports are from the U.S., followed by Italy, China, Singapore, Korea, Japan, and Taiwan, while the majority of exports are from the Federated States of Micronesia, Marshall Islands, Palau, Japan, Hong Kong, Korea, and Taiwan. The major cargo airlines that service the Airport are Asia Pacific Airlines (APA), United Parcel Service (UPS), FedEx, United Cargo, Korean Cargo, and Polar Cargo.

In total, in fiscal year (FY) 2022, the Airport served over 327,483 enplanements and 34,995 aircraft operations which include commercial air carrier, air taxi, General Aviation (GA), and military operations. Additionally, 17,080 metric tons of cargo were transported, and the Airport was home to 36 based aircraft.

2.2 Existing Facilities

The existing facilities at the Airport can be categorized as airfield; commercial passenger terminal; and GA, cargo, and support facilities.

2.2.1 Airfield

The airfield consists of two parallel runways, which are designated as 6L/24R and 6R/24L, and are oriented in a northeast/southwest configuration. Runway 6L/24R measures 12,014 feet in length by 150 feet wide, while Runway 6R/24L measures 10,014 feet in length by 150 feet wide. The ends of both Runway 6L and Runway 24L have displaced thresholds. A displaced threshold shifts the landing point farther down the runway while allowing aircraft to

use the pavement for departures. The displaced threshold for Runway 6L measures 1,000 feet long, while the displaced threshold for Runway 24L measures 1,004 feet long. **Table 2-1** summarizes the runway characteristics.

The taxiway system at the Airport connects multiple areas of the airfield, particularly the two parallel runways with the north and south aprons. The taxiway system at the Airport includes one partial parallel taxiway (Taxiway K) that connects the Runway 6L end with the north apron, multiple connector taxiways (specifically between the parallel runways), and three taxilanes within the non-movement areas.

The airfield is also made up of visual, instrument, and weather navigational aids (NAVAIDs). In terms of visual NAVAIDs, each runway end is equipped with one Precision Approach Path Indicator (PAPI) box, and the Runways 6L and 6R ends are each equipped with a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) approach system. Additionally, the instrument aids located at or around the Airport include:

- Localizer (LOC) – Equipped with Distance Measuring Equipment Antenna (2)
- Glide Slope Antenna (2)
- Very High Frequency Omnidirectional Range Collocated Tactical Air (VORTAC) (1)
- Non-Directional Beacon (1)

There is only one weather aid at the Airport, which is an Automated Surface Observing System, located near the south apron in front of the GA aircraft parking portion of the apron.

See **Figure 2-1** for the existing airfield facilities at the Airport.

Table 2-1. Existing Runway Data

Runway Characteristics	Runway 6L	Runway 24R	Runway 6R	Runway 24L
Runway Bearing	64º	244º	64º	244º
Length	12,014'	12,014'	10,014'	10,014'
Width	150’	150’	150’	150’
Runway End Latitude/Longitude	13º28’39.86” N 144º46’53.12” E	13º29’30.30” N 144º48’43.45” E	13º28’37.77” N 144º47’05.33” E	13º29’19.82” N 144º48’37.28” E
Runway End Elevations	233.7’	305.0’	231.0’	301.0’
Displaced Threshold	1,000’	None	None	1,004’
Displaced Threshold Latitude/Longitude	13º28’44.07” N 144º47’02.33” E	None	None	13º29’19.82” N 144º48’37.28” E
Displaced Threshold Elevation	239.9’	None	None	293.0’
Declared Distances	TORA: 12,014’ TODA: 12,014 ASDA: 12,014’ LDA: 11,014’	TORA: 12,014’ TODA: 12,014’ ASDA: 12,014’ LDA: 12,014’	TORA: 10,014’ TODA: 10,014’ ASDA: 10,014’ LDA: 10,014’	TORA: 9,714’ TODA: 9,714’ ASDA: 9,714’ LDA: 8,710’

ASDA = Accelerate-Stop Distance Available
LDA = Landing Distance Available
TODA = Takeoff Distance Available
TORA = Takeoff Run Available
Sources: AirNav, FAA 5010 Airport Master Record, FAA National Flight Data Center, accessed November 29, 2021

2.2.2 Commercial Passenger Terminal

The Antonio B. Won Pat Guam International Air Terminal, built in 1980, is the main commercial passenger terminal for both inter-island (commuter) flights and major international airline flights. This four-level facility consists of approximately one million square feet of space and is serviced by 17 contact gates and one remote/bus gate within the north apron. The four levels are Basement, Apron, Concourse, and International Arrivals, with the International Arrivals level being constructed in 2021 to facilitate international passenger movement to immigration and customs areas without having to intermingle with departing passengers. Adjacent to the commercial passenger terminal is the light aircraft commuter terminal, which is serviced by two remote gates via the north apron.

2.2.3 GA, Cargo, and Support

The existing GA, cargo, and support facilities at the Airport can be divided geographically by the northern, northeastern, and southern parts of the Airport. The majority of air cargo facilities are located in the northern part of the Airport. Some of these facilities include the Guam Integrated Air Cargo Facility, Triple B Forwarders, CTSI Logistics, and DHL. The northeastern portion of the Airport consists of the aircraft fuel farm, water reservoir compound, and Airport Industrial Park.

The southern portion of Airport property consists of aircraft hangars such as the HC-5, VQ-1, and Nose Dock hangars. The HC-5 hangar is currently being used by Aviation Concepts, Inc. (ACI) and Sky Dive Guam. ACI serves as a fixed-base operator and provides aircraft storage, maintenance, fueling, and other aviation services to business aircraft. The VQ-1 hangar is currently being operated by United Airlines, while the current tenants at the Nose Dock hangar include Sky Guam Aviation, Silver Fox LLC, Aire Services, Trend Vector Aviation International, and Micronesian Air Cargo Services. Services out of the Nose Dock hangar include charter activities, recreational flying, sightseeing, flight training, and ground handling activities. Aircraft parking positions are available for maintenance and service at all three hangars. Additional facilities in the southern portion of the Airport property include the Aircraft Rescue and Firefighting (ARFF) station, the ATCT, and aircraft maintenance and warehouse facilities. All facilities within the Air Operations Area (AOA) can be accessed via the south apron, which includes nine remote stands to the east and GA aircraft parking to the west.

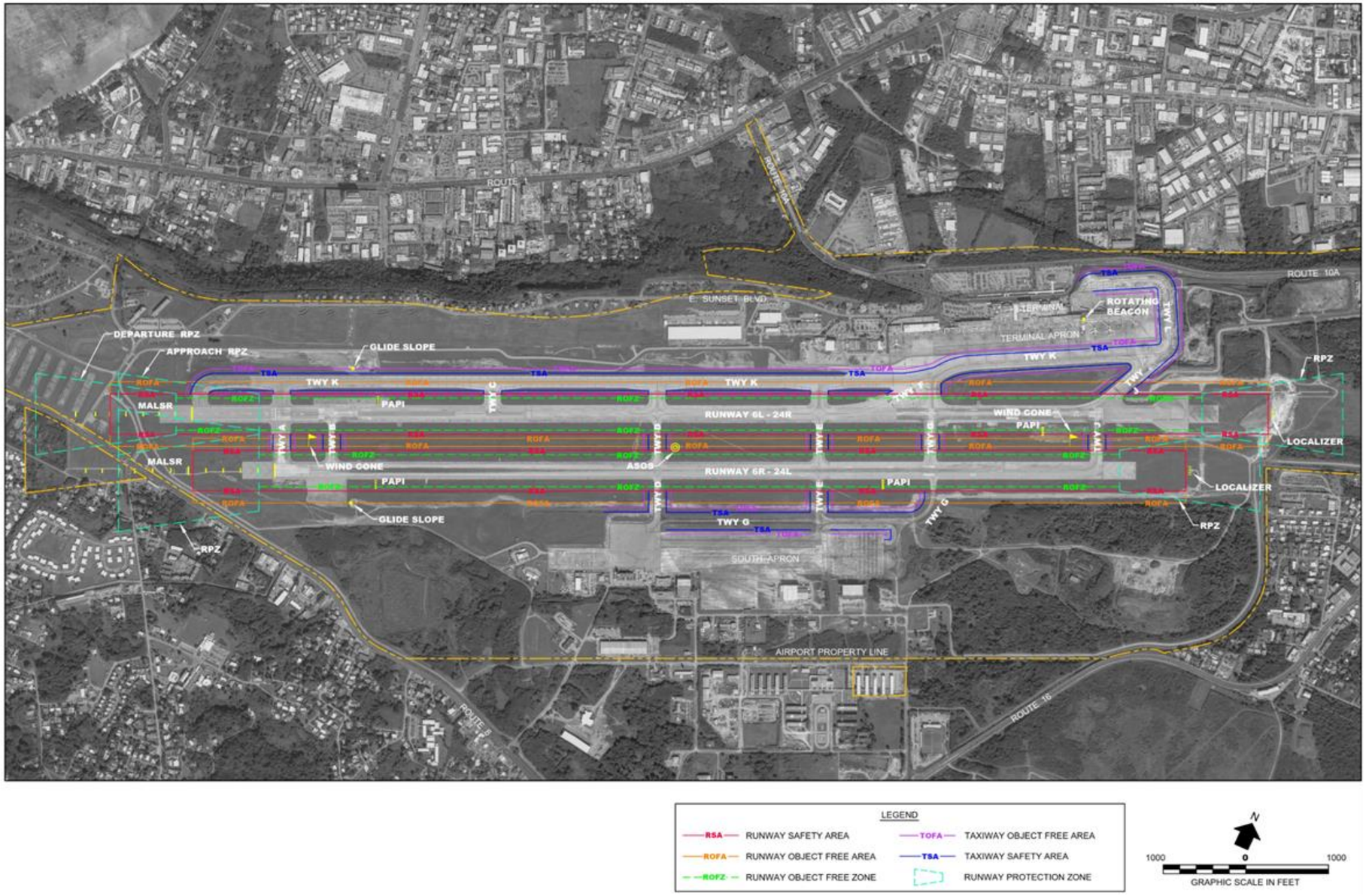


Figure 2-1. Existing Airfield Facilities

Source: GIAA Master Plan 2023

2.3 Airspace

The National Airspace System (NAS) separates airspace into controlled and uncontrolled airspace and is further divided into Classes A through G (excluding F), where all but Class G airspace is considered controlled airspace. Additionally, the NAS consists of special use airspace, which involves airspace wherein activities must be confined because of their nature, or limitations are imposed upon aircraft operations that are not a part of those activities, or both. Due to the Airport's proximity to Andersen Air Force Base (AAFB), special use airspace is common in this area. Special use airspace includes military operations areas, prohibited areas, restricted areas, warning areas, alert areas, and controlled firing areas.

2.3.1 Air Traffic Control

The Airport is surrounded by Class D airspace. This airspace around the Airport starts at the surface and has a ceiling of 2,600 feet above the Airport elevation. The configuration of each Class D airspace area is individually tailored, and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Each aircraft in Class D airspace must be equipped with two-way radio communications and a 4096-code transponder. These aircraft must maintain communication with air traffic control prior to entering and while actively flying in Class D airspace (see **Figure 2-2**).

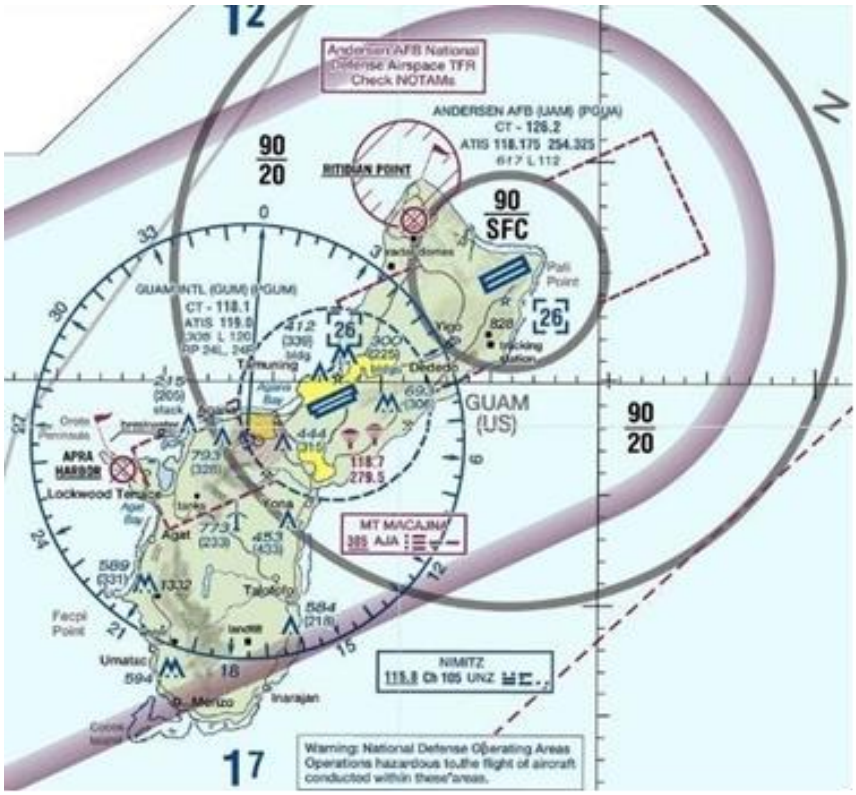


Figure 2-2. Guam Sectional Chart
Source: SkyVector

The ATCT facility sits roughly mid-field, south of the airfield and on the southwest side of the south apron. In addition to the ATCT, the facility houses the Guam Combined En Route Approach Control (CERAP), which includes the Guam Air Route Traffic Control Center (ARTCC) and the Guam Terminal Radar Approach Control (TRACON). Owned and operated by the FAA, the Guam CERAP is responsible for nearly 260,000 square miles of airspace and provides air traffic services for the Airport, AAFB, and the airports in the Northern Mariana Islands, which include Rota, Saipan, and Tinian. Additionally, the CERAP supports military exercises such as Cope North, Rim of the Pacific (RIMPAC), and Valiant Shield.

2.3.2 Area Airports

Due to Airport's location, there are only a few neighboring airports, with only one other on the island of Guam. The airports within a 150-nautical mile (NM) radius of the Airport include:

- Andersen Air Force Base (UAM)
- Benjamin Taisacan Manglona (Rota) International Airport (GRO)
- Tinian International Airport (TNI)
- Francisco C. Ada/Saipan International Airport (GSN)

As mentioned, Andersen AFB, located just 11 miles northeast of the Airport, has a major impact on the airspace around the island. Not only is this air force base located close to the Airport, but it conducts multi-national military training exercises throughout the year, creating strict Temporary Flight Restrictions (TFRs). When TFRs are active, they can create a large overlap with the Airport's Class D airspace.

The other airports that surround the island of Guam, shown in **Figure 2-3**, also play a large part in Airport airspace. Specifically, inter-island travel through airlines like MACS, Arctic Circle Air, and Star Marianas Air. These airlines serve Saipan, Tinian, and Benjamin Taisacan Manglona Rota International Airports.

Figure 2-3. Airports Surrounding Guam
Source: Google Earth

2.4 Airport Environs

This section discusses the multiple zoning districts and land uses near the Airport that may affect or be affected by Airport operations.

2.4.1 Regulatory Framework

On Guam, the Department of Land Management (DLM) has the authority to perform comprehensive planning and prepare zoning ordinances to guide development. The Guam Legislature also significantly impacts land use planning through "spot zoning." The DLM administers those parts of Guam Code Annotated Title 21, Division 2, that pertain to land zoning and use. The Guam Land Use Commission is a decision-making body empowered to grant subdivision approvals, zone changes, conditional uses, and variances from land use laws and regulations as well as Seashore Reserve and Wetland permits.

2.4.2 On-Airport Land Uses

On-airport land use is characterized as Airfield Operations, Commercial Passenger Terminal Facilities, Landside Facilities, GA Facilities, Cargo Facilities, and Support Facilities (**Figure 2-4**).

The largest area is the Airfield Operations area, which includes the runways, taxiways, land underneath the critical airfield safety areas, and other areas throughout Airport property that are reserved for aeronautical use. The Commercial Passenger Terminal Facilities include the commercial passenger terminal building, the north apron, and Taxilanes K and L. The Landside Facilities are located to the north of the commercial passenger terminal and light aircraft commuter terminal. They contain the Airport access road, the vehicle parking lots, and the arrivals and departures road in front of the commercial passenger terminal. The GA Facilities are located along the westernmost portion of the south apron, which also includes the Nose Dock Hangar. Cargo Facilities can be found in both the northern portion of the airfield and the remainder of the south apron that doesn't include the GA Facilities. The northern portion of the airfield contains cargo sorting facilities, while the southern portion contains cargo aircraft parking, hangars, and maintenance. Lastly, the Support Facilities can be found by the ARFF station along the south apron and the fuel farm located in the northeastern portion of Airport property.

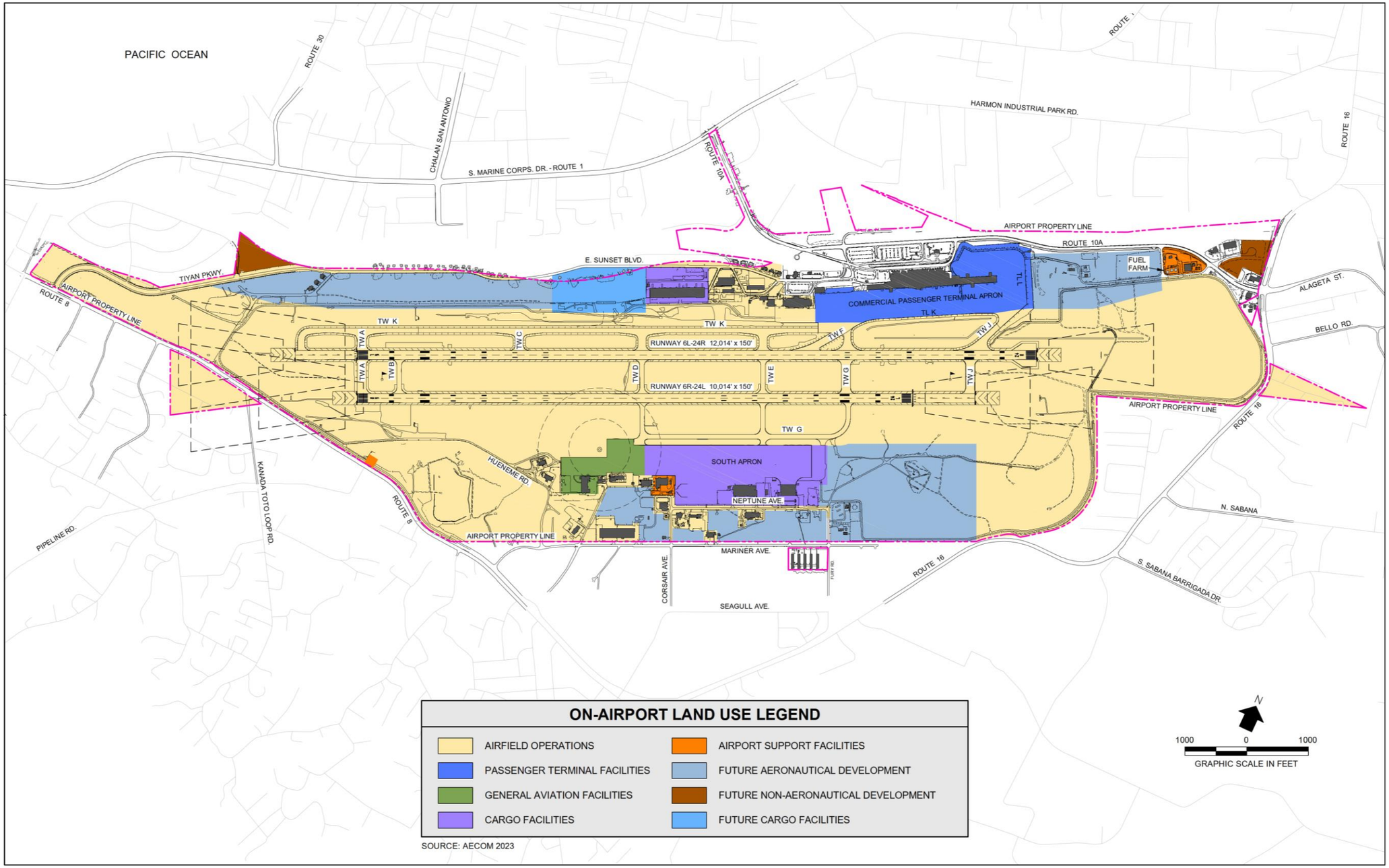


Figure 2-4. On-Airport Land Use
Source: GIAA Master Plan

2.4.3 Surrounding Land Uses

For the purposes meeting Part 150 regulatory minimum requirements,[6] the study area extends 30,000 feet from the runway ends. This area includes the entirety of the Tamuning, Barrigada, Mongmong-Toto-Maite, Hagåtña, Sinajana, Agana Heights, Chalan Pago-Ordot, Asan, and Mangilao villages as well as portions of Dededo, Yigo, Piti, and Yona villages. This study area is depicted on **Figure 2-5. Table 2-2** summarizes zoning types that are used in Guam's Zoning Map to categorize real property.

Table 2-2. Land Use Within the Study Area

Land Use Designation	Type of Land Use	Permitted Uses
A	Agricultural	• One-family dwellings and duplexes. • Farming and fisheries, including all types of activities and pursuits customarily carried out in the field of agriculture and fisheries including the raising of crops and fruits, poultry and livestock, grazing and dairying, and tree and other vegetative production, whether for commercial or personal uses. • Uses customarily accessory to any of the above uses, including home occupations and private automobile parking areas as well as accessory buildings and structures such as private garages, warehouses, barns, corrals, or other similar structure.
R-1	Single-Family Dwelling	• One-family dwellings. • Gardening and the keeping of pets for non-commercial purposes. • Uses customarily accessory to any of the above uses, including home occupations and private parking areas with accessory buildings and structures.
R-2	Multiple-Family Dwelling	• One-family dwellings. • Duplexes. • Multi-family dwellings. • Hotels, private groups, and institutions. • Accessory uses and structures for the above.
C	Commercial	• One-family dwellings. • Duplexes. • Wholesale and retail stores, shops, and businesses. • Amusement enterprises. • Automobile service stations, including minor repairs. • Bakeries. • Mortuaries. • Offices, business or professional, inclusive of professional healing arts offices and clinics and banks. • Personal service shops, including barber shops, beauty parlors, laundromats, and the like. • Repair shops and service shops, including shoe repair shops, plumbing shops, dressmaking shops, and the like, but not • including automobile repair shops for major work. • Restaurants and cafes. • Studios. • Other uses which, in the judgment of the Commission as evidenced by resolution in writing, are similar to those listed herein. • Uses customarily accessory to any of the above-listed uses, including only those accessories to manufacturing, storage, compounding, or processing activities which are necessary for the ordinary conduct of said listed uses and which are an integral • part thereof. • Accessory structures for the above.

[6] Part 150 requires the study area to cover at least out to 30,000 feet from each runway end. Sec. A150.103(b)(1).

Land Use Designation	Type of Land Use	Permitted Uses
P.U.D.	Planned Unit Development	• Planned Unit Development District: A substantial area in which development follows an approved plan integrating a combination of uses in an appropriate and unified manner. [Added by Public Law 9-232, effective August 10, 1968.]
H	Hotel/Resort	• Cultural and recreational facilities, hotels, restaurants, tourism-related shops and offices, dwellings, parks, marinas, zoos, amusement activities, and supportive services. • Permitted accessory uses and structures. Uses and structures which are customarily accessory and clearly complementary to permitted principle uses and structures shall be permitted. Service stations shall be permitted only within, and as accessory to, parking garages containing 250 or more parking spaces.
M-1	Light Industrial	• Any use permitted with or without condition in the commercial zone. • The manufacturing, compounding, processing, or treating of such products as drugs, cosmetics, and food products (not • including fish and meat products nor the rendering of fats and oils). • The manufacturing, compounding, assembling or treating of articles or merchandise from previously prepared materials. • Automobile repair shops including painting, body and fender work, and rebuilding; truck and tractor repairing; and tire retreading. • Bottling and packaging plants. • Ceramic products manufacturing. • Laundries and cleaning and dyeing establishments. • Machine shops and sheet metal shops. • Warehouses and cold storage plants. • Lumber yards, building material sales yard, contractor’s equipment storage yards, and the like. • Other uses which, in the judgment of the Commission as evidenced by resolution in writing, are similar to those listed herein. • Uses customarily accessory to any of the above-listed and accessory buildings.
M-2	Heavy Industrial	• Any uses permitted in the “M-1” zone, except residential use. • Junk yards, under the special provisions set forth in Chapter X of Title XVIII, Government Code of Guam. • Any other uses not specifically prohibited by law, including those which are or may be objectionable, obnoxious, or offensive by reason of odor, dust, smoke, noise, gas fumes, cinders, vibrations, or water-carried waste. • Uses customarily accessory to any of the uses herein permitted, and accessory buildings and structures.

Source: 2022 Guidebook to Development Requirements on Guam, Guam Coastal Zone Management Program

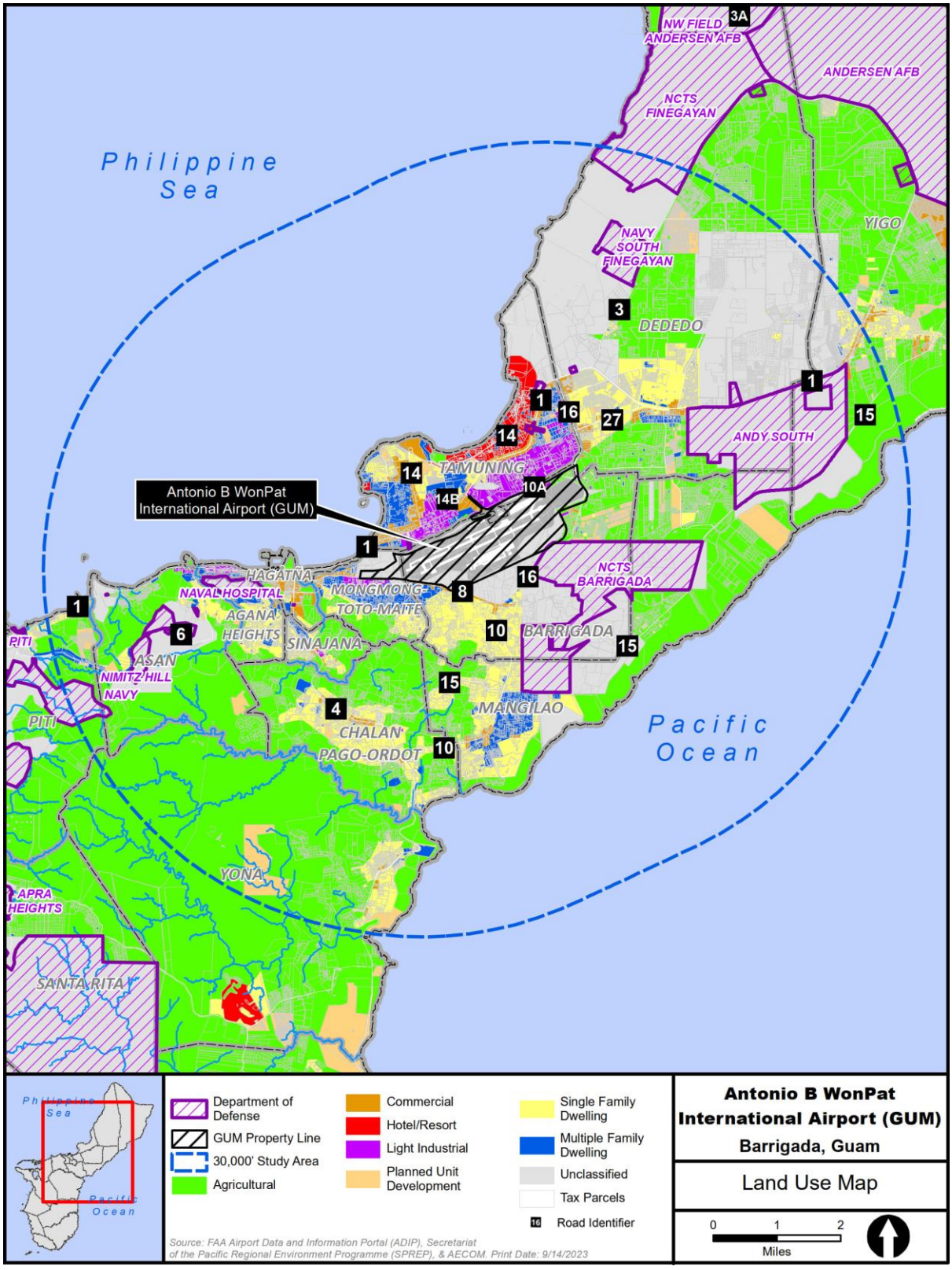


Figure 2-5. Zoning Map
Source: FAA Airport Data and Information Portal (ADIP), Secretariat of the Pacific Regional Environment Programme (SPREP), Print Date: 9/14/2023

The following sections describe the land uses near the Airport, which are depicted in **Figure 2-6**.

2.4.4 Land Uses West of the Airport

This section describes the land uses to the west of Airport property.

2.4.4.1 Mongmong-Toto-Maite

While the northeastern portion of Mongmong-Toto-Maite is located on Airport property, the majority of the village is located west of the Airport. Adjacent to Route 8, the majority of land uses within Mongmong-Toto-Maite are zoned as Commercial and Limited Light Industrial. Farther away from the Airport, parcels within the village are zoned as Multiple-Family Dwelling, Single-Family Dwelling, and Agricultural. In the 2020 Census, there were 2,277 total housing units in Mongmong-Toto-Maite, down by 20 from the 2010 Census (2,297).

2.4.4.2 Sinajana and Chalan Pago-Ordot

Located adjacent to the east of Agana Heights, Sinajana's land uses are very similar. The majority of the village's land use is zoned Single- or Multiple-Family Dwelling. Other than a few parcels zoned Limited Light Industrial, the remainder of the village is zoned Agricultural. In the 2020 Census, there were 836 total housing units in Sinajana, a decrease of 81 from the 2010 Census (917).

While the northern tip of Chalan Pago-Ordot, zoned as Agricultural, is located close to the flight paths west of Airport property, the majority of the village, zoned as Single-Family Dwelling and Commercial, is located toward the southern portion of the island, approximately 2.5 miles from the Airport. In the 2020 Census, there were 2,129 total housing units in Chalan Pago-Ordot, a decrease of 18 from the 2010 Census (2,111).

2.4.5 Land Uses East of the Airport

This section describes the land uses to the east of Airport property.

2.4.5.1 Dededo

Dededo, the second largest and most populated village on Guam, is located east of Airport property. The village's western boundary is Route 16, coincident with a majority of the Airport's eastern property line. While the southern portion of the village, the area closest to the Runway 24 ends, is designated as Agricultural and Planned Unit Development, the main area of Dededo is composed of Single- and Multiple-Family Dwelling and Commercial land uses. This main area is located right along the flight path off of the Runway 24 ends. Farther away from the center of the village, the majority of land use is Agricultural, and the village incorporates the western half of Andy South, a small housing area for AAFB, and a portion of Naval Computer and Telecommunications Station (NCTS) Finegayan and Navy South Finegayan, which provides multi-spectral connectivity, network operations, and information assurance to the U.S. Navy. In the 2020 Census, there were 13,651 total housing units in Dededo, an increase of 822 from the 2010 Census (12,829). This municipality saw the most residential development over the 10-year period between census counts.

2.4.6 Land Uses North of the Airport

This section describes the land uses to the north of the Airport.

2.4.6.1 Tamuning

Tamuning is the economic center of Guam and the lone village located due north of the Airport. The village is the most diverse village on Guam in terms of land use, as it contains Tumon, the main tourist area. Tamuning is bordered by the Airport to the south and the Pacific Ocean to the north and is composed of mostly Limited Light Industrial, Single- and Multiple-Family Dwelling, Commercial, and Hotel/Resort land uses along the coast. In the 2020 Census, there were 8,692 total housing units in Tamuning, a decrease of 330 from the 2010 Census (9,022).

2.4.7 Land Uses South of the Airport

This section describes the land uses to the south of Airport property.

2.4.7.1 Barrigada

The majority of the Airport is situated at the northern border of Barrigada. The borders of Barrigada are unique, as the rest of the village is located to the south of the Airport property, except for a portion of the village that wraps around the Airport's eastern border that incorporates Route 16. Approximately half of the parcels within this northeastern portion of Barrigada, located off of the Runway 24L and 24R ends, is designated as Agricultural; however, the other half is composed mostly of Planned Unit Development land uses associated with Barrigada Heights, a small community just to the south of the Runway 24L flight path.

The western portion of Barrigada includes Commercial and Multiple-Family Dwelling land uses along Route 8 and Single-Family Dwelling toward the southwestern portion of the village, while the southeastern portion of Barrigada is mostly comprised of The Naval Base Guam Barrigada site. Naval Base Guam, located entirely within Barrigada. NCTS transmission antennas are located at the site.

In the 2020 Census, there were 2,355 total housing units in Barrigada, a decrease of 117 from the 2010 Census (2,650).

2.4.7.2 Mangilao

Similar to the borders of Barrigada, the majority of Mangilao is located south of the Airport, along the eastern coast of the island; however, a portion of the village is located east of the Airport. The eastern portion contains parts of Andy South and NCTS Barrigada along with Agricultural and Planned Unit Development land uses near the Runway 24L and 24R flight paths. The village's main area is located in the southern portion of the village along the coast and is composed of Single- and Multiple-Family Dwelling and Commercial land uses and the southern tip of NCTS Barrigada. In the 2020 Census, there were 4,656 total housing units in Mangilao, a decrease of 190 from the 2010 Census (4,466).

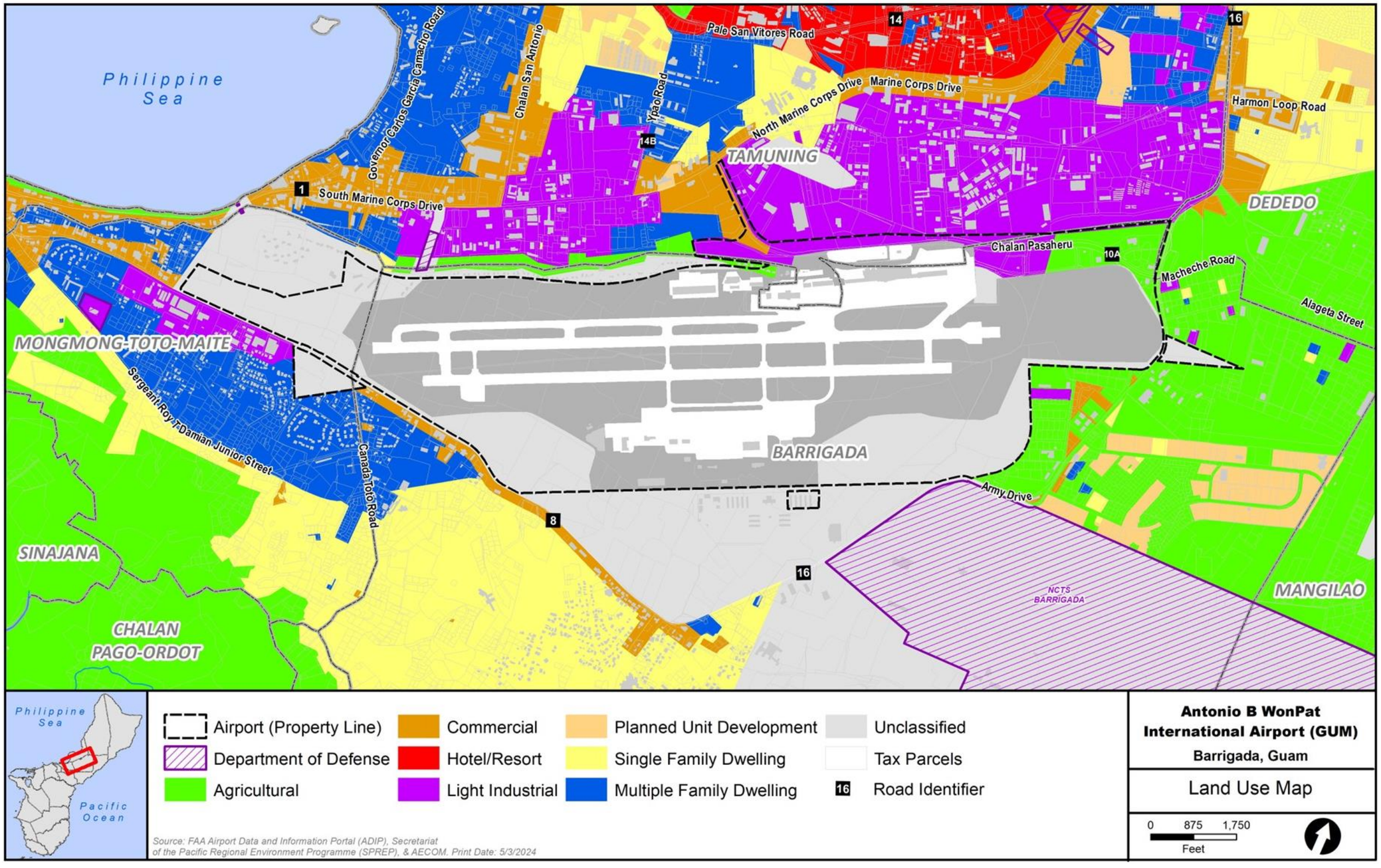


Figure 2-6. Land Use Near the Airport

Source: Secretariat of the Pacific Regional Environment Programme (SPREP) Print Date: 5/8/2024

2.5 Noise-Sensitive Public Facilities

Noise-sensitive public facilities include schools, libraries, places of religious worship, and medical facilities. Facilities of these types near the Airport are summarized in **Table 2-3** and depicted on **Figure 2-7.**

Table 2-3. Noise-Sensitive Sites – Public Facilities

Public Facility	Village
Schools	
B P Carbullido Elementary School	Barrigada
Grace Christian Academy	Mongmong-Toto-Maite
Guahan Academy Charter School	Barrigada
Guam High School	Hagåtña
Harvest Christian Academy	Barrigada
iLearn Academy Charter School	Dededo
John F. Kennedy High School	Tamuning
Juan M Guerrero Elementary School	Dededo
Juan Q San Miguel Elementary School	Mongmong-Toto-Maite
P.C. Lujan Elementary School	Barrigada
Saint John's School	Tamuning
SIFA Learning Academy Charter School	Barrigada
St. Paul Christian School	Dededo
Tiyan High School	Barrigada
Libraries	
Barrigada Branch Library	Barrigada
Places of Religious Worship	
Bayview Church	Mongmong-Toto-Maite
Castle Zion Church	Barrigada
Christ’s Bible Fellowship	Barrigada
Church of St. Andrew Kim	Dededo
Episcopal Church of St. John the Divine	Tamuning
Fo Guang Shan Guam Temple	Dededo
Grace Baptist Church	Barrigada
Guam Christian Alliance Church	Barrigada
Guam Good News Evangelical Formosan Church	Tamuning
Harvest Baptist Church	Barrigada
House of Guam Church	Tamuning
Immaculate Heart of Mary Catholic Church	Mongmong-Toto-Maite
Indian Temple	Tamuning
Island Hope Foursquare Church Guam	Barrigada
Jehovah's Witnesses Micronesia Branch Office and Kingdom Halls	Barrigada
Jesus Baptist Church of Guam	Barrigada
Korean Pacific Presbyterian Church	Barrigada
Life in the Son Christian Fellowship	Mongmong-Toto-Maite
Marianas Christian Fellowship	Tamuning
Nuestra Señora de las Aguas Church	Mongmong-Toto-Maite

Public Facility	Village
Palauan Evangelical Church of Guam	Tamuning
San Vicente Ferrer-San Roke Church	Barrigada
The Church of Jesus Christ of Latter-Day Saints	Barrigada
Top Church Guam	Tamuning
Medical Facilities	
Skilled Nursing Unit	Barrigada
St. Dominic's Senior Care Home	Barrigada

Source: Secretariat of the Pacific Regional Environment Programme (SPREP)

2.6 Noise-Sensitive Cultural Resources

The FAA also recognizes the evaluation of the significance of noise level on historic sites, including traditional cultural properties. Cultural resources listed on the National Register of Historic Places (NRHP) are shown in **Table 2-4** and **Figure 2-7**.

Table 2-4. Noise-Sensitive Sites – Cultural Resources

Historic and Cultural Resources	
Canada Water Wells	Mangilao
Spanish Dikes	Sinajana
Tomhum Cliffline Fortification I	Tamuning
Tomhum Cliffline Fortification II	Tamuning

Source: Secretariat of the Pacific Regional Environment Programme (SPREP)

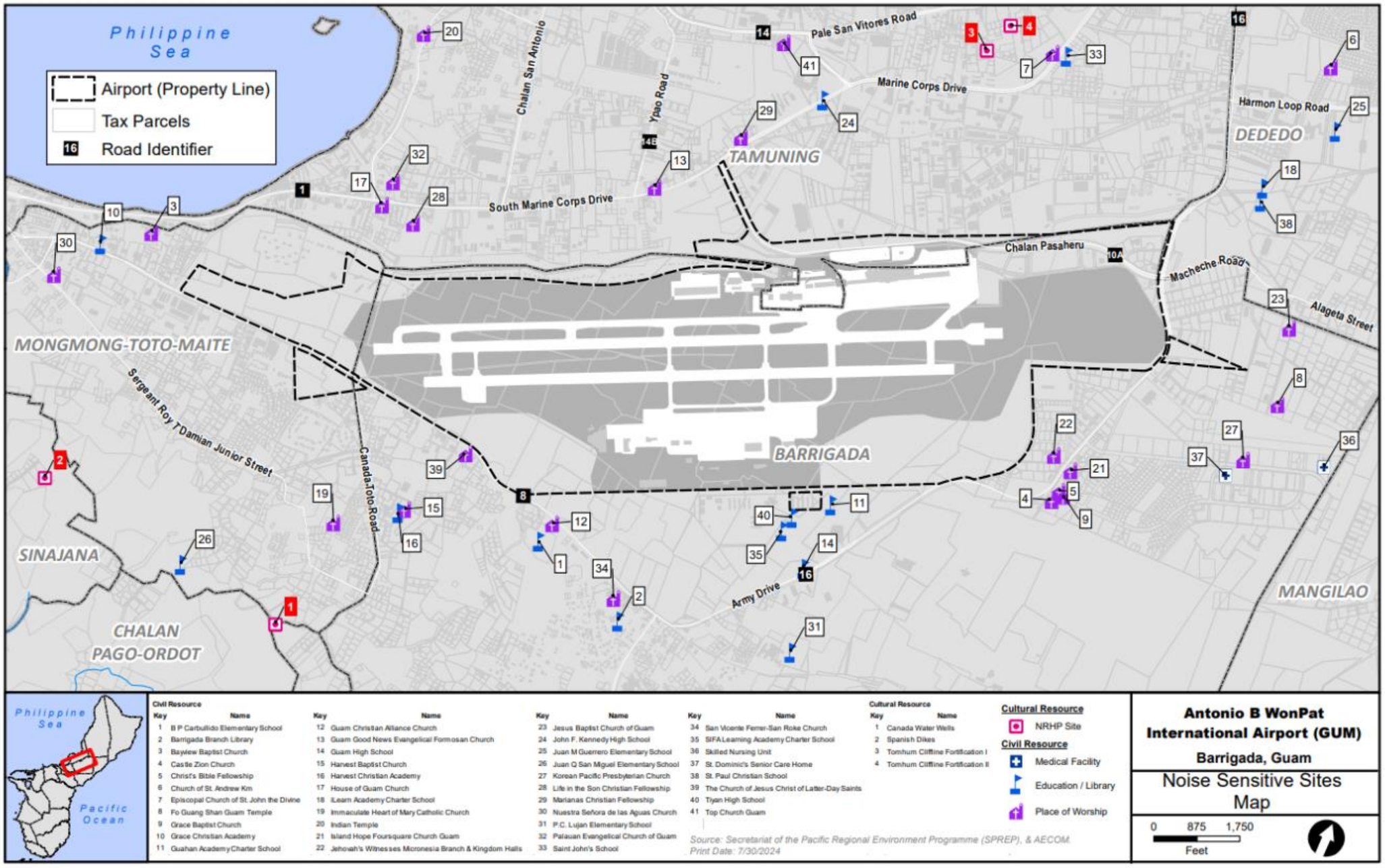


Figure 2-7. Noise-Sensitive Sites Near the Airport

2.7 Future Land Use

Comprehensive, long-range plans serve as a guide to provide quality growth and development. The Bureau of Statistics and Plans, Government of Guam, prepared the North and Central Guam Land Use Plan in 2009 to identify a vision and establish goals and policies to achieve that vision through 2030. Although the initial Plan was limited to North and Central Guam, the vision, goals, and policies were intended to have Island-wide application, with the remaining villages to be included in a later planning phase. As of the summer of 2024, future land use planning for areas west of the airport have not been developed.

Figure 2-8 depicts the 2030 Future Land Use Plan developed in 2009. The most notable differences in future land use categories from the current Guam Zoning are the proposed residential areas east of the Airport in Barrigada and Dededo and west of the Airport in Mongmong-Toto-Maite. This proposed change was developed on a predicted civilian population increase of approximately 50,000 people between 2009 through 2025. And, assuming that North and Central Guam would absorb 80 percent of this growth, a total of approximately 10,800 new housing units would be needed to absorb this growth.[7] However, 2020 census data indicate that the number of housing units between 2010 and 2020 only increased by 2 percent with the addition of 988 housing units. Discussions with the Guam Department of Land Management[8] indicated that only one new residential subdivision is currently in the planning phase, and this is located in Mongmong-Toto-Maite village.

DLM indicated that there are numerous single-family residential properties within urban areas zoned as Agricultural, particularly east of the Airport. When an owner of an undeveloped property or a property with a single-family home that is zoned "A" wants to build new dwelling units or a small business establishment, then that owner needs to apply for change of the zoning. When DLM reviews the application, they are using the noise contours developed as part of the Air Installation Compatible Use Zone (AICUZ) dated 2013 for evaluating spot zoning changes and currently do not consider the GIAA Noise Exposure Map. The future predicted noise contours for Year 2029 being developed as part of this study should be used in addition to the AICUZ noise contours for evaluating future zoning change applications for areas near the Airport.

2.8 Residential Sound Solution Program (RSSP)

FAA approval allowed the Airport to obtain federal noise discretionary funding for approved measures in the Noise Compatibility Program (NCP), such as maintaining a Residential Sound Solution Program (RSSP), which insulates the homes of certain residents affected by aircraft noise. Approximately 287 parcels with 314 housing units were identified for the insulation program. The building insulation program started after the 2003 Part 150 was approved by the FAA and had seven phases. The number of buildings that participated in the RSSP was delineated based on research of available records maintained by GIAA. As part of this program, 121 housing units on 116 parcels were acoustically treated through the third phase of the program. The remaining housing units were in various stages of design and acoustical testing through 2018.

[7] Guam North and Central Land Use Plan, Guam Bureau of Statistics and Plans, 2009
[8] AECOM Team meeting with Guam Department of Land Management on July 26, 2023

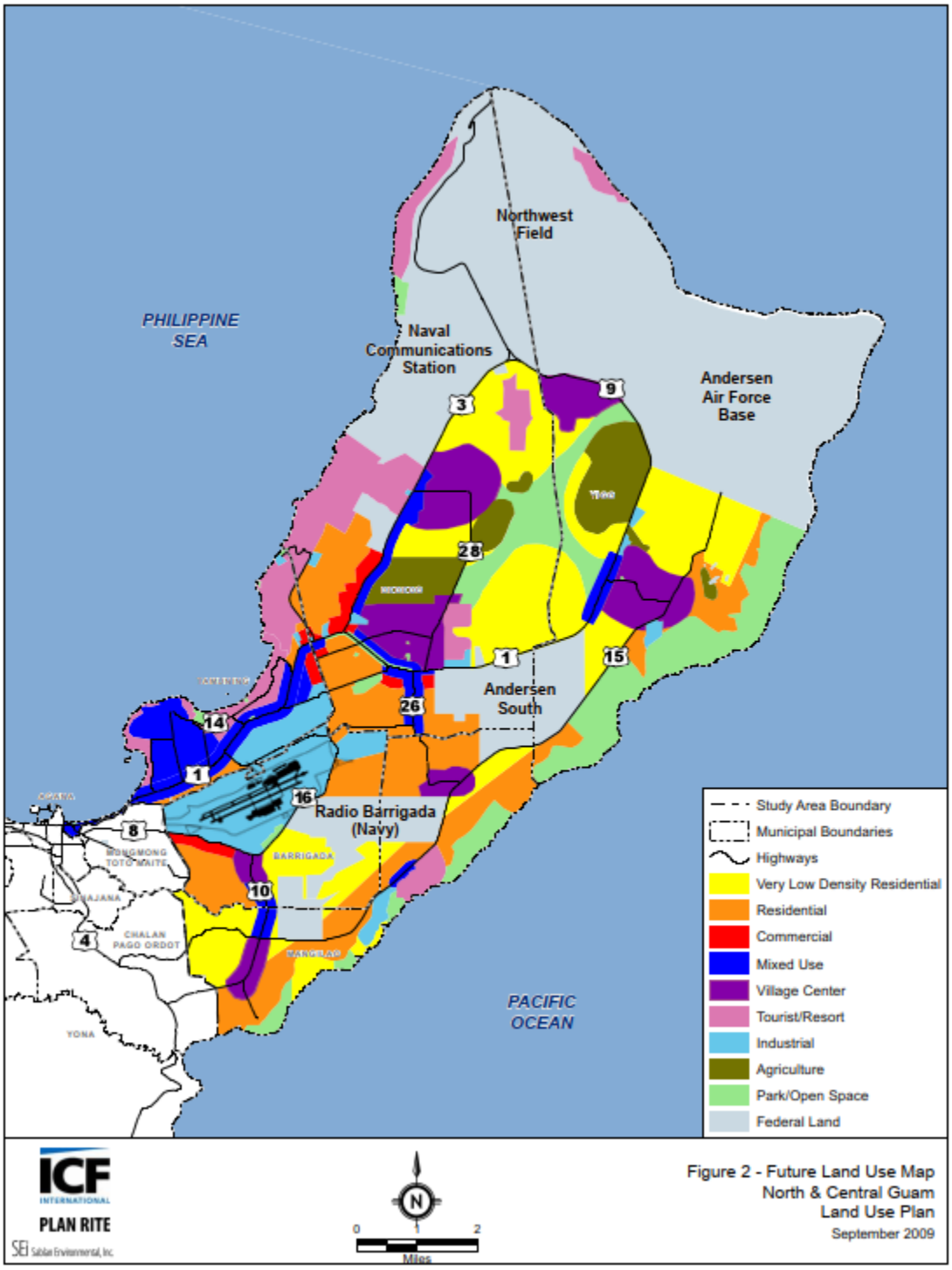


Figure 2-8. Guam 2030 Future Land Use Plan
Source: Bureau of Statistics and Plans – Government of Guam

3.
Aircraft Noise Exposure

3 Aircraft Noise Exposure

The aircraft noise exposure contours for the Antonio B. Won Pat International Airport (Airport) Part 150[9] Update were prepared using the most recent release of the Federal Aviation Administration's (FAA's) Aviation Environmental Design Tool (AEDT) that was available at the outset of the Study, which is Version 3f. AEDT is a software system developed by the FAA that models aircraft performance in space and time to estimate fuel consumption, emissions, noise, and air quality consequences.[10] AEDT is the FAA-approved tool for determining the cumulative effect of aircraft noise exposure around airports. Statutory requirements for AEDT use are defined in Part 150 regulations.

All Airport aircraft operations (civil, transient military, and cargo aircraft) were modeled in AEDT. The AEDT generates noise exposure contours for the average annual daily aircraft operations using the day-night average sound level (DNL) noise metric. In accordance with the DNL metric, daytime is defined as the period between 7 a.m. and 10 p.m., and nighttime is between 10 p.m. and 7 a.m. These day and night definitions are used throughout this Noise Exposure Map (NEM) update document unless otherwise specified.

Sections 3.1 through **3.8** describe the required AEDT inputs, which include:

- Runway Input Data
- Aviation Forecast
- Annual Aircraft Operations
- Aircraft Noise and Performance Characteristics
- Runway Use
- Aircraft Flight Tracks
- Meteorological Data
- Terrain Data

The 2024 and 2029 Noise Exposure Maps are provided in **Section 3.9**.

3.1 Runway Input Data

Table 3-1 provides the runway input data details used in the AEDT noise modeling.

Table 3-1. AEDT Runway Input Data

Runway End	Latitude	Longitude	Elevation (ft MSL)	Length (ft)	Approach Angle (degrees)	Threshold Crossing Height (ft)	Displaced Thresholds (ft)
6L	13-28.6643N	144-46.8853E	233.7	12,014	3.0	55	1,000
24R	13-29.5051N	144-48.7242E	305.0	12,014	3.0	75	N/A
6R	13-28.6295N	144-47.0888E	231.0	10,014	3.0	57	N/A
24L	14-29.3303N	144-48.6213E	301.0	10,014	3.0	55	1,004

Note: Runway 6L, 6R Threshold Crossing Height (TCH) from Instrument Landing System (ILS) and Runway 24L, 24R TCH from the aRea NAVigation (RNAV) Y Approach
Sources: GIAA Master Plan 2023, FAA 5010 Master Record Data. Accessed on October 13, 2023.

Additional details on the runway layout and descriptions of the airport environs can be found in **Section 2.2**. **Figure 3-1** displays the current airport diagram and layout of runways and facilities.

While the 2023 Master Plan is not final as of January 2024, GIAA does not expect any changes to the runway layout based on the Airport Layout Plan within the 5-year Part 150 update time period. Therefore, the same runway specifications will be used for the existing and forecast conditions of the Noise Exposure Maps.

[9] Airport Noise Compatibility Planning, Title 14 of the Code of Federal Regulations (CFR) Part 150.

[10] https://aedt.faa.gov/3f_information.aspx; Accessed on 12/27/2023.

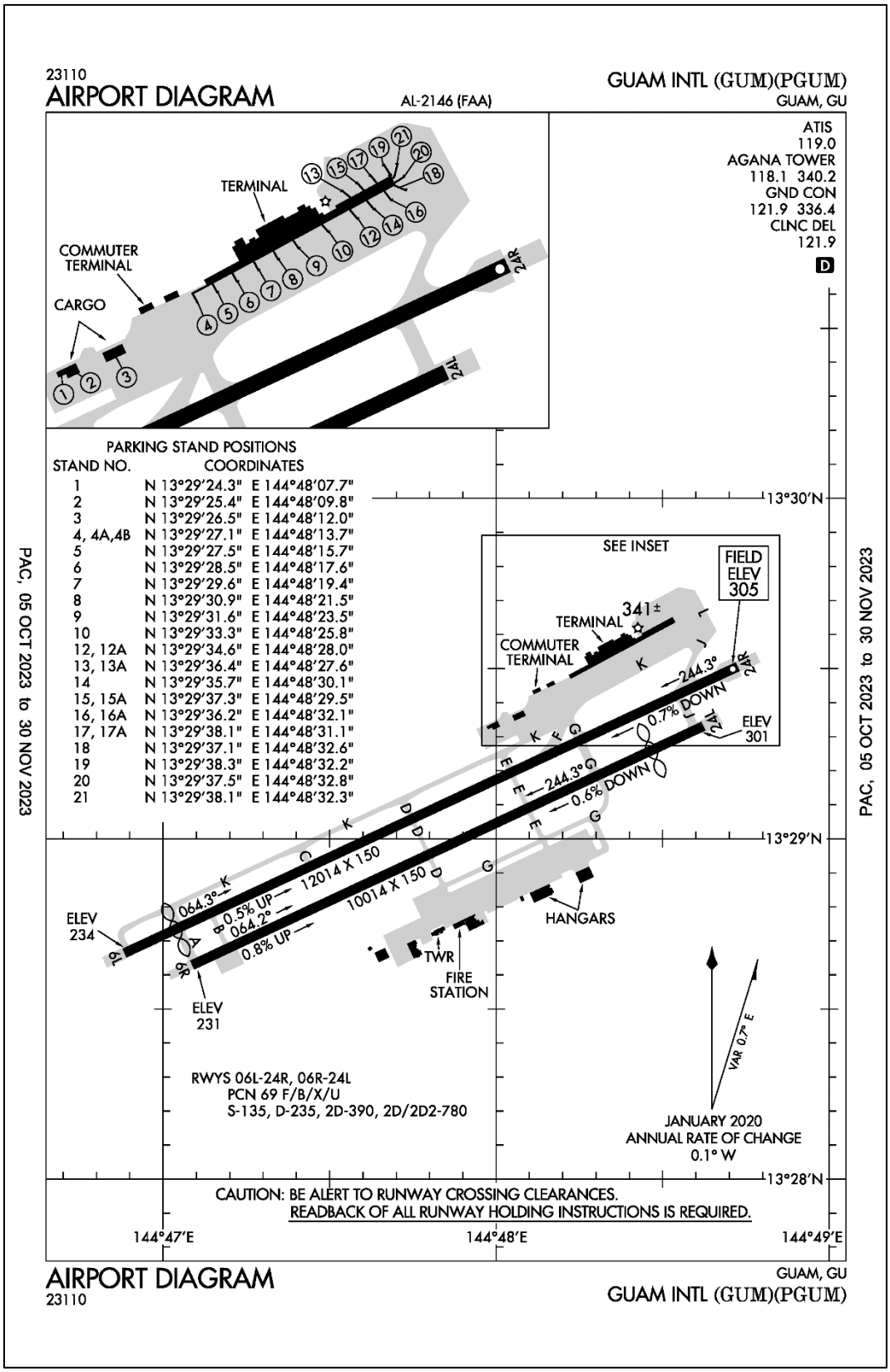


Figure 3-1. Airport Diagram

Source: GIAA and https://www.faa.gov/airports/runway_safety/diagrams/, obtained October 13, 2023

3.2 Aviation Forecast

GIAA was conducting two separate projects at the Airport along coinciding time tracks: the Master Plan Update and the Part 150 Study. Both projects relied upon the use of an FAA approved aviation forecast for completion of the projects. The FAA recommended that GIAA utilize the same FAA approved forecast developed under the Master Plan Update Project for the Part 150 NEM Update so that a single aviation forecast would be utilized for cohesiveness and consistency in the assumptions for the overlapping time periods.

Forecast scenarios in the A.B. Won Pat International Airport, Master Plan Update, Aviation Demand Forecasts (aviation forecasts) were developed for enplaned passengers, air cargo tonnage, aircraft operations, and based aircraft. The detailed methodology and results of the aviation forecasts are provided in **Appendix B.1** for reference. The 2029 Part 150 fleet mix was adjusted from the 2024 Part 150 fleet mix based on the future trends analysis in the aviation forecasts.

The use of the aviation forecasts was approved for use in completing the Part 150 Study in a letter from the FAA dated April 10, 2024, and is provided in **Appendix B.2** for reference.

3.3 Annual Aircraft Operations

The FAA organizes aircraft operations into categories per FAA Order 7210.3 “Facility Operation and Administration,” namely, Air Carrier (AC), Air Taxi (AT), General Aviation (GA), and Military (ML). AC and AT are commercial categories distinguished by aircraft capacity, while GA includes all non-commercial, non-military operations. FAA personnel at the Airport’s ATCT provide counts of operations that are reported by FAA’s Operations Network (OPSNET) and then used in preparation of the FAA’s Terminal Airport Forecast (TAF).

The Study Team obtained flight track and aircraft identification data from FlightAware[11] for the 12-month period from July 2022 to June 2023, inclusively, that represents civilian (AC, AT, and GA) operations. This was the most recent twelve months of data available at the start of the study. This data was used to develop the existing fleet mix, day/night aircraft operations, runway usage and modeled flight tracks. Most military operations were not available in the radar data sample; therefore, FAA Traffic Flow Management System Counts for the same 12-month period were obtained and used to develop the military fleet mix operating at the Airport. The operations data were assigned to the FAA categories and adjusted to the FAA tower counts for the same 12-month period. The existing fleet mix were then scaled by category to the FAA-approved aviation forecasts for 2024 and 2029 as described in Appendix B.1.

Table 3-2 presents the total annual operations for the 12-month data collection period (July 2022 to June 2023) shown for reference, and the 2024 existing condition and 2029 forecast condition NEM operations developed in accordance with the approved aviation forecasts. Since the FAA approved aviation forecasts for 2024 and 2029 were already greater than the TAF, the forecast totals for fiscal year 2024 and 2029 were used unadjusted to represent calendar year 2024 and 2029. Table 3-2 compares the Part 150 forecast totals to the latest TAF published in January 2024. The TAF forecasts are reported in fiscal year format, so they were converted to a calendar year format to compare to the Part 150 operations. The Part 150 forecast for 2024 is approximately ten percent higher than the TAF but the forecast for 2029 is approximately two percent higher than the TAF. This trend continues to reflect the general increase in operations to pre-pandemic levels.

[11] FlightAware is a digital aviation company with offices in Houston and New York; it operates the world’s largest flight tracking and data platform. FlightAware uses the integration of more than 50 sources of information spread around the world, combined with the most powerful, intuitive, and truthful web-based interface, capable of providing a very useful flight tracking service. https://www.flightaware.com/about/.

Table 3-2. Operation Counts by Tower Category

Year	ITINERANT					LOCAL			Total Operations	FAA TAF
	Air Carrier	Air Taxi	General Aviation	Military	Total	Civil	Military	Total		
07/22 – 06/23*	13,790	1,489	8,806	992	**25,077**	17,045	688	17,733	**42,810**	
2024	22,062	3,842	16,538	927	**43,369**	15,592	1,000	16,592	**59,960**	**CY 2024 TAF 54,169**
2029	26,512	4,331	26,951	927	**58,721**	23,933	1,000	24,933	**83,655**	**CY 2024 TAF 81,699**

** FlightAware flight track and aircraft identification 12-month data sample*

Note: Totals may not match exactly due to rounding.

*Note: The TAF is reported in Fiscal Year values. The Calendar Year values equal (¾ * FY) + (1/4* FY+1)*

The fleet mix was derived using existing aircraft operations at the Airport and included AC, AT, GA, and itinerant ML operations. The operations described below comprise the existing and forecast conditions input into AEDT to generate the aircraft noise exposure contours for the Airport NEM update. The aircraft operations data entered into AEDT includes the number of day and night arrivals, departures, and pattern (circuit) operations.

Pattern (circuit) operations are local pattern operations modeled on closed-circuit flight paths, which are flight tracks that depart and turn into a downwind pattern before landing back on the same runway. It should be noted that a "local" operation departs and lands at the Airport rather than going to or arriving from another airport, but a local operation is not necessarily a closed-circuit flight path. Any aircraft that arrives and departs from the same airport but uses a different runway end or flies a different path than a unidirectional turn would be considered a "local" operation, but not a closed-circuit flight path. These local operations were modeled as equal numbers of arrivals and departures in the AEDT and are noted in the tables below. Japan Airlines also conducts pilot training at the Airport, and those local operations and circuit tracks have been included. For the purposes of this analysis, all other local operations are modeled as circuits.

Table 3-3 provides the average daily operations, by aircraft type, that were developed for the NEM existing condition (2024). The average daily number of aircraft arrivals, departures, and circuits for the existing condition are calculated by determining the total annual operations and dividing by 365 (days in a year). The existing condition average annual day (AAD) operations included 164 total operations, 11.3 percent of which occurred during the nighttime hours of 10 p.m. to 7 a.m. per the definition of the FAA-required noise compatibility DNL metric.

Table 3-3. Modeled 2024 Average Annual Day Operations

Category	Engine Type	AEDT Type	Arrivals		Departures		Local		Total
			Day	Night	Day	Night	Day	Night	
Air Carrier	**Jet**	737800	14.4	6.9	16.8	4.5	1.2	--	43.9
		7378MAX	<0.1	--	<0.1	--	--	--	<0.1
		747400	0.2	<0.1	0.2	<0.1	--	--	0.3
		7478	0.1	--	<0.1	<0.1	--	--	0.1
		757PW	0.8	0.1	0.7	0.2	--	--	1.8
		7673ER	0.2	--	0.2	--	--	--	0.4
		777200	0.3	<0.1	0.4	<0.1	--	--	0.7
		7773ER	2.5	0.3	2.3	0.6	--	--	5.8
		A321-232	0.6	1.9	0.7	1.8	--	--	5.1
		A330-301	1.4	<0.1	1.3	<0.1	--	--	2.7
		MD11GE	0.1	--	<0.1	0.1	--	--	0.2
		MD11PW	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
	Turboprop	C130	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
	Subtotal		**20.8**	**9.4**	**22.8**	**7.4**	**1.2**	**--**	**61.7**

Category	Engine Type	AEDT Type	Arrivals		Departures		Local		Total
			Day	Night	Day	Night	Day	Night	
Air Taxi	Jet	FAL900EX	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
		GIIB	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
	Turboprop	CNA208	0.1	--	0.1	<0.1	--	--	0.2
	Piston	BEC58P	0.2	<0.1	0.2	<0.1	--	--	0.5
	Subtotal		**0.4**	**<0.1**	**0.4**	**<0.1**	**--**	**--**	**0.7**
General Aviation	Jet	CNA55B	<0.1	--	<0.1	<0.1	--	--	<0.1
		CNA680	<0.1	--	<0.1	--	--	--	<0.1
		GV	0.5	0.1	0.5	0.2	--	--	1.3
		LEAR35	0.6	<0.1	0.6	<0.1	--	--	1.2
	Turboprop	CNA208**	22.0	0.1	21.3	1.0	--	--	44.3
	Piston	BEC58P	5.8	<0.1	5.8	<0.1	--	--	11.7
		CNA172	4.0	<0.1	4.1	<0.1	14.1	<0.1	22.2
		GASEPF	0.3	--	0.3	<0.1	12.5	<0.1	13.2
		GASEPV	1.0	--	1.0	--	--	--	2.1
	Subtotal		**34.5**	**0.5**	**33.7**	**1.2**	**26.6**	**<0.1**	**96.6**
Military	Jet	767300	<0.1	<0.1	<0.1	--	--	--	<0.1
		767CF6	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
		777200	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
		F16PW0**	2.2	--	2.2	--	--	--	4.3
		F-18**	0.2	--	0.2	--	--	--	0.5
	Turboprop	C130AD	0.1	--	0.1	--	--	--	0.3
	Subtotal		**2.6**	**<0.1**	**2.6**	**<0.1**	**--**	**--**	**5.2**
Total			**58.3**	**9.9**	**59.5**	**8.6**	**27.8**	**<0.1**	**164.3**

AEDT = Aviation Environmental Design Tool
Note: The local operations flown by Skydive Guam and military fighter aircraft were modeled as equal numbers of arrivals and departures.
Sources: FlightAware, GIAA Aviation Forecasts 2023

Table 3-4 lists the average daily aircraft operations information for the NEM forecast condition (2029). The forecast condition AAD operations included 229 total operations, 10.0 percent of which occurred during the nighttime hours of 10 p.m. to 7 a.m. per the definition of the FAA-required noise compatibility DNL metric. Aircraft type adjustments expected to occur within the 2029 forecast year as discussed in **Appendix B.1** were applied to the 2029 fleet mix.

Table 3-4. Modeled 2029 Average Annual Day Operations

Category	Engine Type	AEDT Type	Arrivals		Departures		Local		Total
			Day	Night	Day	Night	Day	Night	
Air Carrier	Jet	737800	17.3	8.3	20.2	5.4	1.9	--	53.0
		7378MAX	<0.1	--	<0.1	--	--	--	<0.1
		747400	0.2	<0.1	0.2	<0.1	--	--	0.4
		7478	0.1	--	<0.1	<0.1	--	--	0.1
		757PW	1.0	0.1	0.9	0.2	--	--	2.2
		7673ER	0.3	--	0.3	--	--	--	0.5
		777200	0.4	<0.1	0.4	<0.1	--	--	0.8
		7773ER	3.1	0.4	2.8	0.7	--	--	6.9

Category	Engine Type	AEDT Type	Arrivals		Departures		Local		Total
			Day	Night	Day	Night	Day	Night	
		A321-232	0.8	2.3	0.9	2.2	--	--	6.1
		A330-301	1.6	<0.1	1.6	<0.1	--	--	3.2
		MD11GE	0.2	--	<0.1	0.1	--	--	0.3
		MD11PW	0.1	<0.1	<0.1	<0.1	--	--	0.1
	Turboprop	C130	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
	Subtotal		**25.1**	**11.3**	**27.4**	**8.9**	**1.9**	**--**	**74.5**
Air Taxi	**Jet**	FAL900EX	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
		GIIB	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
	Turboprop	CNA208	0.2	--	0.2	<0.1	--	--	0.4
	Piston	BEC58P	0.4	<0.1	0.4	<0.1	--	--	0.7
	Subtotal		**0.6**	**<0.1**	**0.6**	**<0.1**	**--**	**--**	**1.1**
General Aviation	**Jet**	CNA55B	<0.1	--	<0.1	<0.1	--	--	<0.1
		CNA680	<0.1	--	<0.1	--	--	--	<0.1
		GV	0.9	0.2	0.8	0.3	--	--	2.1
		LEAR35	1.0	0.1	1.0	0.1	--	--	2.3
	Turboprop	CNA208**	34.5	0.2	33.3	1.4	--	--	69.3
	Piston	BEC58P	8.2	<0.1	8.2	<0.1	--	--	16.4
		CNA172	6.6	0.2	6.7	<0.1	21.6	<0.1	35.0
		GASEPF	0.5	--	0.5	<0.1	19.3	<0.1	20.3
		GASEPV	1.1	--	1.1	--	--	--	2.3
	Subtotal		**52.9**	**0.7**	**51.7**	**1.9**	**40.9**	**0.1**	**148.3**
Military	**Jet**	767300	<0.1	<0.1	<0.1	--	--	--	<0.1
		767CF6	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
		777200	<0.1	<0.1	<0.1	<0.1	--	--	<0.1
		F16PW0**	2.2	--	2.2	--	--	--	4.3
		F-18**	0.2	--	0.2	--	--	--	0.5
	Turboprop	C130AD	0.1	--	0.1	--	--	--	0.3
	Subtotal		**2.6**	**<0.1**	**2.6**	**<0.1**	**--**	**--**	**5.2**
Total			**81.1**	**12.1**	**82.3**	**10.8**	**42.7**	**0.1**	**229.2**

AEDT = Aviation Environmental Design Tool
Note: The local operations flown by Skydive Guam and military fighter aircraft were modeled as equal numbers of arrivals and departures.
Sources: FlightAware, GIAA Aviation Forecasts 2023

3.4 Aircraft Noise and Performance Characteristics

AEDT requires the use of specific noise and performance data for each aircraft type operating at the Airport. Noise data is in the form of Sound Exposure Level at a range of distances (from 200 feet to 25,000 feet) from a particular aircraft with engines at a range of thrust levels. Performance data include thrust, speed, and altitude profiles for takeoff and landing operations. The AEDT database contains standard noise and performance data for over 300 different fixed-wing aircraft types, most of which are civilian aircraft. The aircraft data in AEDT is referred to as aircraft noise and performance (ANP) data.

Within the AEDT database, it is standard for aircraft takeoff or departure profiles to be defined by a range of trip distances identified as “stage lengths.” Higher stage lengths (longer trip distances) are associated with a heavier aircraft due to the increase in fuel requirements for the flight. For this Part 150 Study, stage lengths are defined using city pair distances, determined by the great-circle distance from the originating airport (Guam) to the planned arrival city.

3.4.1 Flight Profiles

Aside from identifying the aircraft type in the database, AEDT has STANDARD and International Civil Aviation Organization (ICAO) aircraft flight profiles for takeoffs, landings, and flight patterns or touch-and-go operations. Four of the main ANP types in use at the Airport were evaluated and determined that all U.S.-based carriers typically use STANDARD profiles, and all international carriers typically use ICAO-A profiles. Therefore, the departure profiles in AEDT were assigned to each aircraft type based on use by U.S.-based (STANDARD) or international carriers (ICAO-A if available) in AEDT for all civilian aircraft types in the existing and forecast conditions.

Figure 3-2 displays stage length 4 departure flight profiles from Runways 6L and 6R for the Boeing 737-800 compared to the AEDT stage length 4 STANDARD and ICAO-A profiles. The 737-800 is flown by several international airlines at Guam. Most of these departures are using the ICAO-A flight profile. Details of this analysis are provided in **Appendix C.1**.

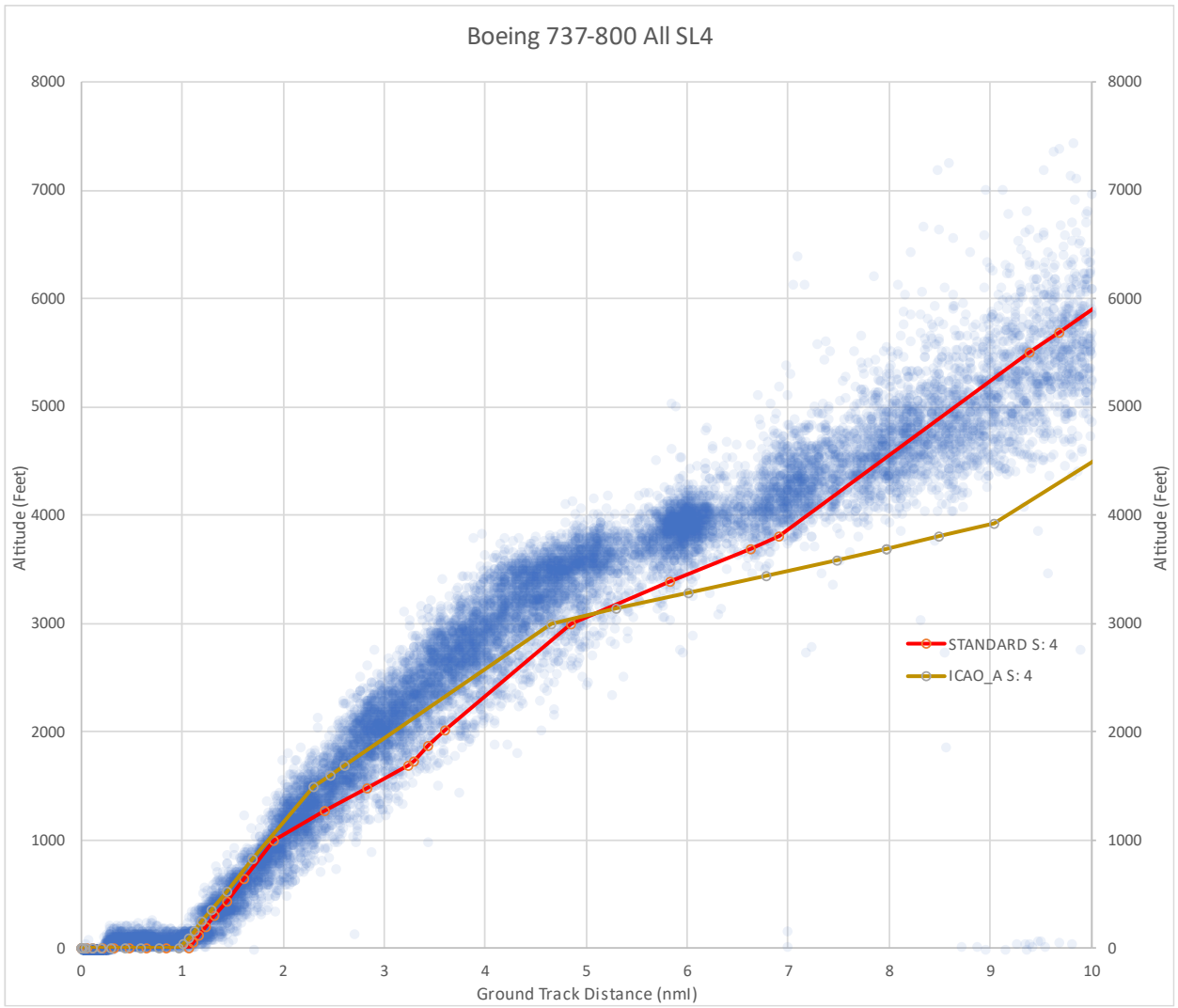


Figure 3-2. Boeing 737-800 Runway 6L/R Departures
Source: FlightAware, AEDT 3f

3.5 Runway Use

The primary factor affecting runway use at airports is weather; specifically, the wind direction and speed. Trade winds are dominant in Guam throughout the year, which usually blow from an easterly direction. An additional factor that may affect runway use includes the position of the facility or ramp relative to the runway.

Data obtained from FlightAware from July 2022 to June 2023 was used to compile runway use tables. Due to the runway rehabilitation project on Runway 6L/24R, which was completed in March 2023, the 12-month period was used

to develop the annual average flow of the Airport (northeast or southwest), then used the split between the parallels from the four months both runways were open (March to June 2023) and applied it to the whole year to develop an average annual condition.

This information was categorized by arrival, departure, or circuits (pattern training flights), as well as day and night. Data was separated by category and engine type (i.e., jet and non-jet) since these categories of aircraft types may use the runways differently. The forecast operational levels grow at different rates between 2024 and 2029; however, the runway usage remains the same within each operational category. **Table 3-5** presents the runway utilization rates developed for the existing (2024) and forecast (2029) conditions.

Figure 3-3 displays the overall arrival runway use percentages for the 24-hour period and for the day and night DNL periods, respectively. **Figure 3-4** displays the overall departure runway use percents for the 24-hour period and for the day and night DNL periods, respectively. Overall, the Airport use is in northeast flow direction more than 90 percent of the time, and in both figures, there is a higher use of northeast flow at night than during the day.

Table 3-5. Runway Utilization

Category	Propulsion Class	Operation Type	Time of Day	Runway				Total
				6L	6R	24L	24R	
Air Carrier	Jet	Arrivals	Day	90.3%	3.0%	0.2%	6.4%	100.0%
			Night	96.5%	2.5%	<0.1%	0.9%	100.0%
		Departures	Day	87.1%	2.5%	0.3%	10.1%	100.0%
			Night	89.0%	1.9%	0.2%	8.9%	100.0%
		Circuits	Day	89.4%	--	--	10.6%	100.0%
			Night	--	--	--	--	--
	Non-jet	Arrivals	Day	90.3%	3.0%	0.2%	6.4%	100.0%
			Night	96.5%	2.5%	<0.1%	0.9%	100.0%
		Departures	Day	87.1%	2.5%	0.3%	10.1%	100.0%
			Night	89.0%	1.9%	0.2%	8.9%	100.0%
Air Taxi	Jet	Arrivals	Day	85.3%	7.8%	0.6%	6.4%	100.0%
			Night	68.3%	27.3%	1.2%	3.1%	100.0%
		Departures	Day	69.7%	21.8%	2.0%	6.5%	100.0%
			Night	86.9%	9.7%	0.3%	3.1%	100.0%
	Non-jet	Arrivals	Day	79.1%	12.1%	1.2%	7.7%	100.0%
			Night	86.8%	13.2%	--	--	100.0%
		Departures	Day	81.8%	11.7%	0.8%	5.7%	100.0%
			Night	87.5%	12.5%	--	--	100.0%
General Aviation	Jet	Arrivals	Day	85.3%	7.8%	0.6%	6.4%	100.0%
			Night	68.3%	27.3%	1.2%	3.1%	100.0%
		Departures	Day	69.7%	21.8%	2.0%	6.5%	100.0%
			Night	86.9%	9.7%	0.3%	3.1%	100.0%
	Non-jet	Arrivals	Day	86.8%	6.7%	0.5%	6.0%	100.0%
			Night	92.8%	7.2%	--	--	100.0%
		Departures	Day	75.2%	18.6%	1.2%	5.0%	100.0%
			Night	82.1%	13.7%	0.6%	3.6%	100.0%
		Circuits	Day	56.5%	39.2%	4.4%	--	100.0%
			Night	53.6%	42.8%	3.6%	--	100.0%
Military	Jet	Arrivals	Day	90.3%	3.0%	0.2%	6.4%	100.0%
			Night	96.5%	2.5%	<0.1%	0.9%	100.0%
		Departures	Day	87.1%	2.5%	0.3%	10.1%	100.0%
			Night	89.0%	1.9%	0.2%	8.9%	100.0%

Category	Propulsion Class	Operation Type	Time of Day	Runway				Total
				6L	6R	24L	24R	
	Non-jet	Arrivals	Day	90.3%	3.0%	0.2%	6.4%	100.0%
			Night	96.5%	2.5%	<0.1%	0.9%	100.0%
		Departures	Day	87.1%	2.5%	0.3%	10.1%	100.0%
			Night	89.0%	1.9%	0.2%	8.9%	100.0%

Note: Totals may not match exactly due to rounding.
Sources: FlightAware

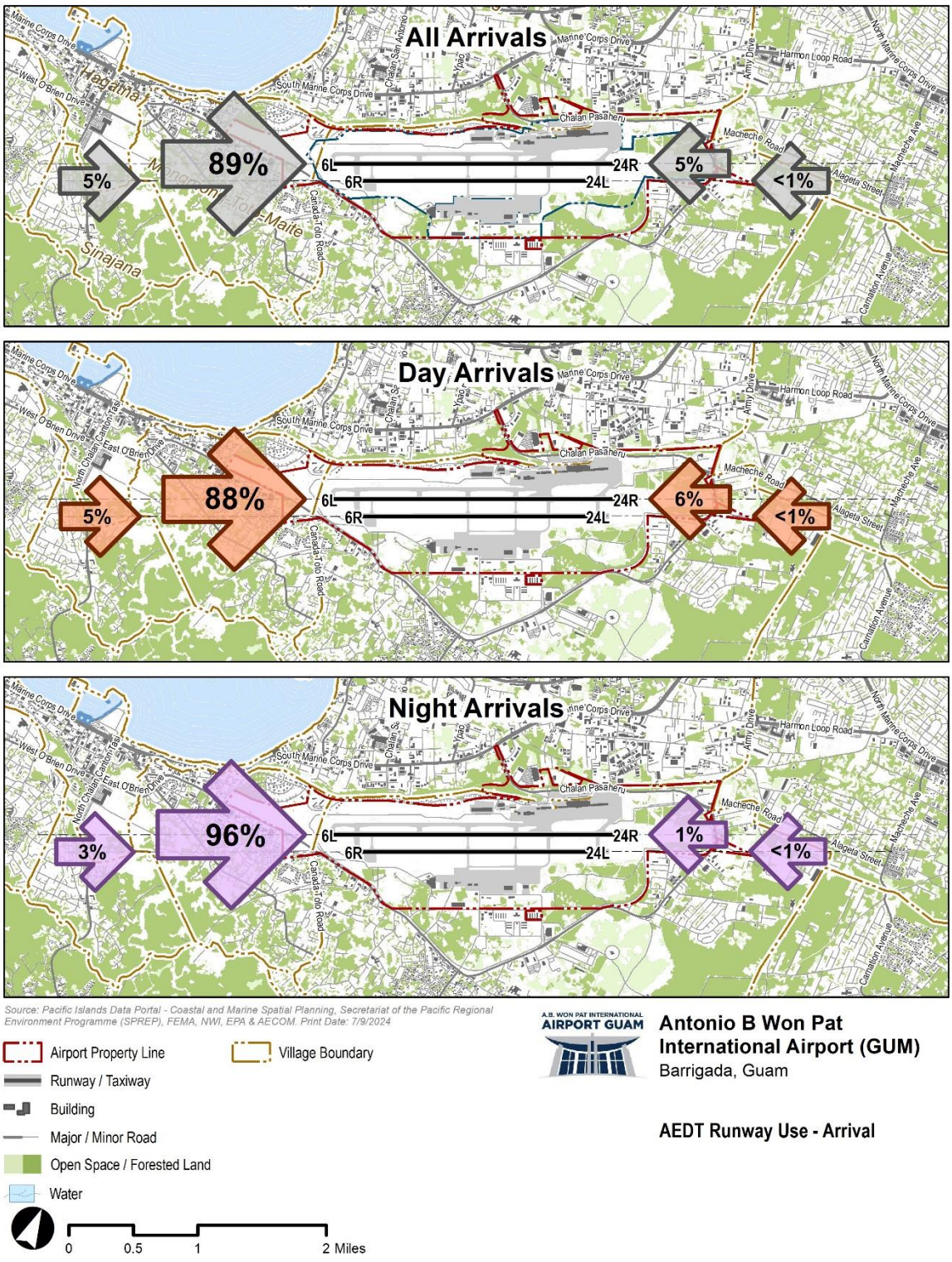


Figure 3-3. Runway Use – Arrivals
Source: FlightAware

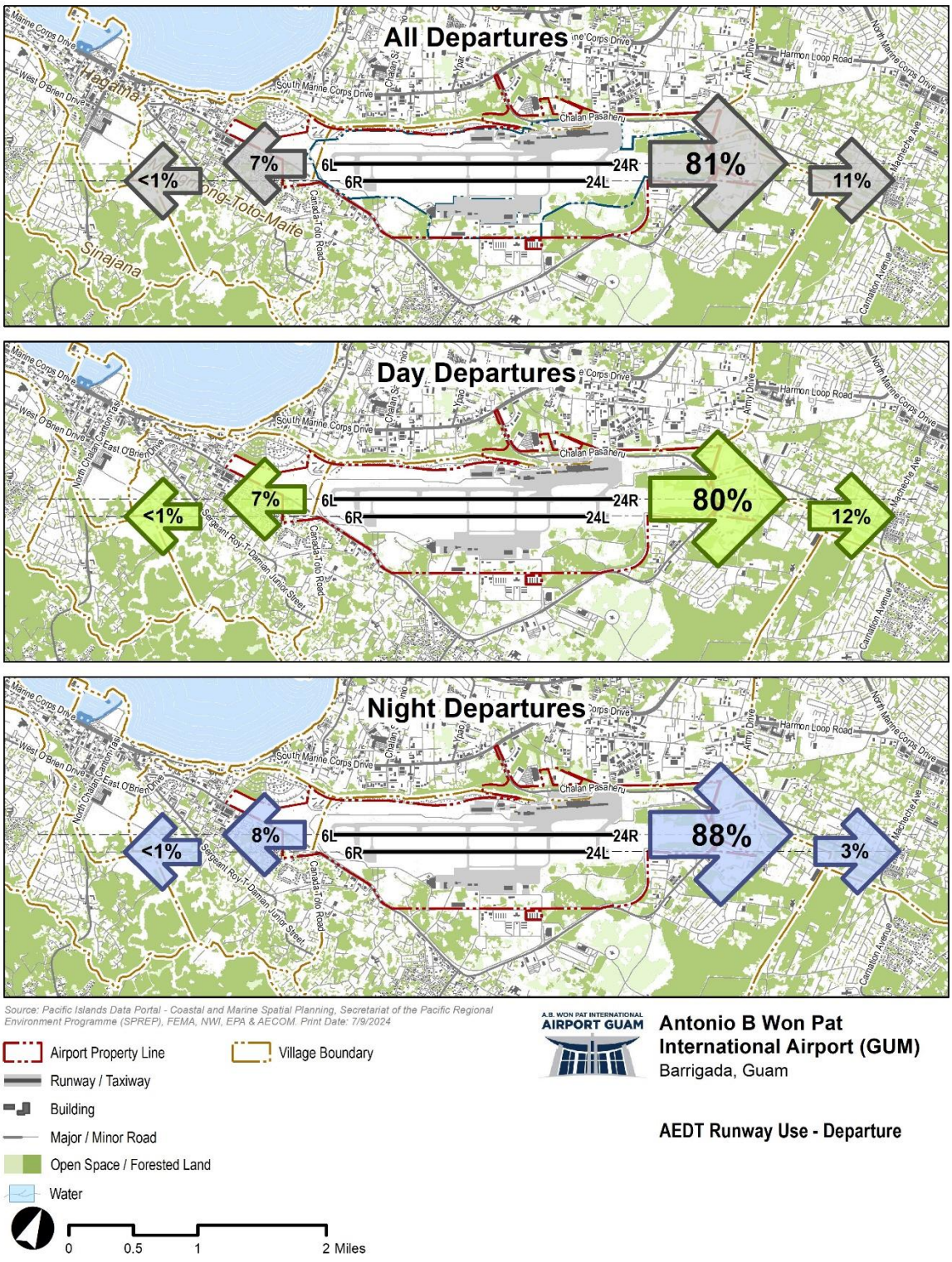


Figure 3-4. Runway Use – Departures
Source: FlightAware

3.6 Aircraft Flight Tracks

The flight tracks for 2024 and 2029 used in the noise modeling were developed from the FlightAware data from July 2022 to June 2023. No change in flight tracks or their usage is expected within the 5-year forecast period of this project.

For civilian operations, an industry-standard method was used to develop model flight tracks that entails analyzing all radar data for the Airport by splitting the flight tracks into similar and manageable groups. The standard procedure separates tracks by operation type, (i.e., arrival, departure, circuit) and runway end, aircraft type (i.e., jet, piston prop, turboprop, helicopter) and destination/direction. Flight tracks were analyzed with the same operation type, runway end, and destination direction for similar geometry, and this resulted in the final radar track bundles used to create model tracks. Geometrically similar groups with wide dispersion have a "backbone" track and one, two, or three "dispersion" sub-tracks on either side of the backbone, for three, five, or seven total tracks (e.g., one backbone and two, four, or six sub-tracks).

All model track bundles developed as part of this process and the assigned model percent usage are shown in **Table 3-6** through **Table 3-9**. The backbone and dispersion tracks are listed as one master bundle name in each table. Track figures for each runway end displaying all developed AEDT model tracks follow the track use tables. The figures include a flight track analysis boundary that depicts the 30,000-foot minimum flight track depiction distance required by Part 150.[12]

Table 3-6 presents the flight track use for air carrier passenger jet arrivals and departures separated by airline regions. **Table 3-7** presents the flight track use for air carrier cargo jet, air taxi, general aviation, and military transient jet arrivals and departures. All flight tracks identified in **Table 3-6** and **Table 3-7** are depicted according to their respective runways in **Figure 3-5** through **Figure 3-8.**

Detailed flight track development figures separated by runway end and operation type are provided in **Appendix C.2**.

Table 3-6. AEDT Modeled Itinerant Air Carrier Passenger Jet Model Flight Track Utilization

Operation Type	Runway	Figure Number	Track Group	Air Carrier – Passenger Jet							
				United Airlines		Northeast Asia Airlines		Southeast Asia Airlines		Other Airlines	
				Day	Night	Day	Night	Day	Night	Day	Night
Arrivals	6L	Figure 4-5	AJ06L01	<1%	--	--	--	--	--	4%	--
			AJ06L02	82%	98%	100%	100%	100%	100%	96%	100%
			AJ06L03	3%	--	<1%	--	--	--	--	--
			AJ06L04	7%	<1%	--	--	--	--	--	--
			AJ06L05	7%	1%	--	--	--	--	--	--
	6R	Figure 4-6	AJ06R01	<1%	--	--	--	--	--	--	--
			AJ06R02	<1%	--	--	--	--	--	--	--
			AJ06R03	<1%	--	--	--	--	--	--	--
			AJ06R04	84%	98%	100%	100%	100%	100%	100%	100%
			AJ06R05	2%	<1%	<1%	--	--	--	--	--
			AJ06R06	4%	--	--	--	--	--	--	--
			AJ06R07	7%	2%	<1%	--	--	--	--	--
	24L	Figure 4-7	AJ24L01	100%	100%	100%	100%	100%	100%	100%	100%
	24R	Figure 4-8	AJ24R01	100%	100%	100%	100%	100%	100%	100%	100%
Departures	6L	Figure 4-5	DJ06L01	1%	3%	3%	12%	--	--	--	--
			DJ06L02	6%	1%	<1%	<1%	29%	70%	23%	19%
			DJ06L03	<1%	--	--	--	14%	4%	--	--
			DJ06L04	1%	<1%	<1%	<1%	36%	4%	--	--
			DJ06L05	3%	22%	<1%	<1%	--	3%	--	--

[12] 14 CFR Part 150 Section A150.103(b)(1)

Operation Type	Runway	Figure Number	Track Group	Air Carrier – Passenger Jet							
				United Airlines		Northeast Asia Airlines		Southeast Asia Airlines		Other Airlines	
				Day	Night	Day	Night	Day	Night	Day	Night
			DJ06L06	<1%	2%	<1%	--	--	7%	9%	--
			DJ06L07	3%	--	--	--	--	--	5%	6%
			DJ06L08	11%	5%	<1%	--	--	1%	18%	13%
			DJ06L09	2%	5%	2%	1%	--	--	5%	6%
			DJ06L10	6%	14%	<1%	1%	--	--	9%	13%
			DJ06L11	13%	5%	9%	8%	--	--	--	13%
			DJ06L12	6%	3%	8%	1%	--	1%	--	--
			DJ06L13	37%	36%	64%	55%	21%	9%	27%	13%
			DJ06L14	8%	5%	12%	19%	--	1%	5%	19%
	6R	Figure 4-6	DJ06R01	2%	3%	8%	13%	--	--	--	--
			DJ06R02	3%	1%	<1%	<1%	--	<1%	7%	--
			DJ06R03	6%	<1%	<1%	--	30%	33%	--	20%
			DJ06R04	<1%	--	<1%	1%	--	--	--	--
			DJ06R05	1%	1%	<1%	--	--	6%	7%	40%
			DJ06R06	2%	15%	<1%	<1%	30%	20%	--	--
			DJ06R07	2%	4%	<1%	--	--	18%	13%	--
			DJ06R08	9%	4%	1%	--	--	<1%	--	20%
			DJ06R09	1%	2%	<1%	--	--	--	7%	--
			DJ06R10	5%	3%	7%	2%	--	<1%	--	--
			DJ06R11	8%	9%	<1%	2%	--	<1%	27%	--
			DJ06R12	47%	40%	60%	70%	20%	12%	20%	20%
			DJ06R13	2%	3%	8%	--	--	<1%	--	--
			DJ06R14	2%	1%	<1%	--	10%	6%	--	--
			DJ06R15	<1%	2%	<1%	--	10%	2%	7%	--
			DJ06R16	10%	10%	10%	11%	--	--	13%	--
	24L	Figure 4-7	DJ24L01	5%	12%	1%	--	--	--	33%	50%
			DJ24L02	5%	6%	--	--	--	--	--	--
			DJ24L03	5%	1%	<1%	--	--	7%	33%	--
			DJ24L04	17%	52%	4%	--	100%	47%	33%	--
			DJ24L05	19%	10%	7%	17%	--	43%	--	50%
			DJ24L06	5%	1%	5%	8%	--	3%	--	--
			DJ24L07	16%	9%	76%	75%	--	--	--	--
			DJ24L08	25%	4%	6%	--	--	--	--	--
			DJ24L09	3%	4%	--	--	--	--	--	--
	24R	Figure 4-8	DJ24R01	34%	50%	--	--	100%	93%	33%	--
			DJ24R02	17%	5%	30%	8%	--	--	--	--
			DJ24R03	17%	--	10%	17%	--	--	--	50%
			DJ24R04	17%	27%	59%	75%	--	--	--	--
			DJ24R05	5%	12%	1%	--	--	--	33%	50%
			DJ24R06	5%	6%	--	--	--	--	--	--
			DJ24R07	5%	1%	<1%	--	--	7%	33%	--

Operation Type	Runway	Figure Number	Track Group	Air Carrier – Passenger Jet							
				United Airlines		Northeast Asia Airlines		Southeast Asia Airlines		Other Airlines	
				Day	Night	Day	Night	Day	Night	Day	Night

Note: Totals may not match exactly due to rounding.
Northeast Asia Airlines = Jeju Air, Jin Air, Korean Air, T'way Air, Air Seoul, Japan Airlines, Air Busan, Starlux Airlines
Southeast Asia Airlines = Philippine Airlines, Singapore Airlines, Lion Air, Batik Air Malaysia
Other Airlines = Omni Air, Hawaiian Airlines, Elan Express, FIJI Airways, Gol Linhas Aereas Intl, Air Madagascar, Naruru Airlines
Source: FlightAware

Table 3-7. AEDT Modeled Itinerant Cargo, Military, Air Taxi, and GA Jet Model Flight Track Utilization

Operation Type	Runway	Figure Number	Track Group	Cargo & Military				Air Taxi & General Aviation	
				Asia Pacific Airlines		Other Airlines & Military			
				Day	Night	Day	Night	Day	Night
Arrivals	6L	Figure 4-5	AJ06L01	11%	--	--	--	--	--
			AJ06L02	89%	100%	100%	100%	100%	100%
			AJ06L03	--	--	--	--	--	--
			AJ06L04	--	--	--	--	--	--
			AJ06L05	--	--	--	--	--	--
	6R	Figure 4-6	AJ06R01	--	--	--	--	1%	--
			AJ06R02	6%	--	--	--	--	--
			AJ06R03	6%	--	--	--	1%	--
			AJ06R04	88%	100%	100%	100%	97%	100%
			AJ06R05	<1%	--	--	--	--	--
			AJ06R06	--	--	--	--	--	--
			AJ06R07	--	--	--	--	--	--
	24L	Figure 4-7	AJ24L01	100%	100%	100%	100%	100%	100%
	24R	Figure 4-8	AJ24R01	100%	100%	100%	100%	100%	100%
Departures	6L	Figure 4-5	DJ06L01	--	--	4%	26%	--	--
			DJ06L02	--	--	7%	5%	13%	--
			DJ06L03	--	--	--	--	7%	--
			DJ06L04	--	--	4%	--	--	--
			DJ06L05	16%	--	2%	--	20%	--
			DJ06L06	3%	--	4%	--	7%	--
			DJ06L07	3%	50%	--	--	--	11%
			DJ06L08	31%	13%	--	5%	20%	22%
			DJ06L09	25%	38%	11%	11%	--	11%
			DJ06L10	13%	--	25%	--	27%	22%
			DJ06L11	--	--	11%	11%	--	11%
			DJ06L12	--	--	2%	--	--	--
			DJ06L13	6%	--	16%	26%	--	22%
			DJ06L14	3%	--	15%	16%	7%	--
	6R	Figure 4-6	DJ06R01	--	--	6%	2%	--	--
			DJ06R02	--	2%	3%	4%	--	--
			DJ06R03	<1%	2%	13%	4%	6%	--
			DJ06R04	--	--	--	--	--	5%

Operation Type	Runway	Figure Number	Track Group	Cargo & Military				Air Taxi & General Aviation	
				Asia Pacific Airlines		Other Airlines & Military			
				Day	Night	Day	Night	Day	Night
			DJ06R05	3%	--	--	--	--	11%
			DJ06R06	4%	--	--	--	11%	16%
			DJ06R07	7%	5%	6%	--	7%	11%
			DJ06R08	34%	19%	3%	--	26%	--
			DJ06R09	17%	14%	--	--	6%	5%
			DJ06R10	3%	--	6%	--	--	--
			DJ06R11	17%	12%	3%	--	20%	16%
			DJ06R12	3%	24%	31%	60%	17%	32%
			DJ06R13	--	--	3%	13%	--	--
			DJ06R14	<1%	5%	--	2%	1%	--
			DJ06R15	--	--	--	--	1%	--
			DJ06R16	11%	17%	25%	15%	4%	5%
	24L	Figure 4-7	DJ24L01	40%	67%	--	--	13%	--
			DJ24L02	32%	--	--	--	--	--
			DJ24L03	4%	--	--	--	38%	--
			DJ24L04	24%	--	--	50%	13%	100%
			DJ24L05	--	33%	67%	--	25%	--
			DJ24L06	--	--	--	--	--	--
			DJ24L07	--	--	--	50%	13%	--
			DJ24L08	--	--	33%	--	--	--
			DJ24L09	--	--	--	--	--	--
	24R	Figure 4-8	DJ24R01	24%	--	--	50%	13%	100%
			DJ24R02	--	--	--	--	--	--
			DJ24R03	--	33%	67%	--	25%	--
			DJ24R04	--	--	33%	50%	13%	--
			DJ24R05	40%	67%	--	--	13%	--
			DJ24R06	32%	--	--	--	--	--
			DJ24R07	4%	--	--	--	38%	--

Note: Totals may not match exactly due to rounding.
Other Cargo Airlines = FedEx Express, United Parcel service, Kalitta Air, National Airlines, Western Global Airlines, Atlas Air, Antonov Airlines, Aloha Airlines
Source: FlightAware

Table 3-8 presents the flight track use for all civilian propeller and military non-jet arrivals and departures. The arrival and departure flight tracks identified in **Table 3-8** are depicted in **Figure 3-5** through **Figure 3-8** by their respective runway.

Table 3-8. AEDT Modeled Itinerant Non-Jet Fixed Wing Model Flight Track Utilization

Operation Type	Runway	Figure Number	Track Group	Air Taxi		General Aviation		General Aviation Skydive Local	
				Day	Night	Day	Night	Day	Night
Arrivals	6L	Figure 4-5	AN06L01	--	--	1%	--	--	--
			AN06L02	6%	--	3%	50%	--	--

Operation Type	Runway	Figure Number	Track Group	Air Taxi		General Aviation		General Aviation Skydive Local	
				Day	Night	Day	Night	Day	Night
			AN06L03	7%	--	2%	--	--	--
			AN06L04	74%	100%	87%	50%	--	--
			AN06L05	6%	--	4%	--	--	--
			AN06L06	--	--	1%	--	--	--
			AN06L07	7%	--	<1%	--	--	--
			AN06L08	--	--	--	--	100%	100%
	6R	Figure 4-6	AN06R01	3%	--	2%	--	--	--
			AN06R02	11%	--	6%	50%	--	--
			AN06R03	7%	--	3%	--	--	--
			AN06R04	72%	100%	86%	50%	--	--
			AN06R05	2%	--	1%	--	--	--
			AN06R06	1%	--	2%	--	--	--
			AN06R07	2%	--	2%	--	--	--
			AN06R08	--	--	--	--	100%	100%
	24L	Figure 4-7	AN24L01	--	--	7%	--	--	--
			AN24L02	5%	--	4%	--	--	--
			AN24L03	27%	--	26%	--	--	--
			AN24L04	55%	--	60%	--	--	--
			AN24L05	14%	--	4%	--	--	--
			AN24L06	--	--	--	--	100%	100%
	24R	Figure 4-8	AN24R01	--	--	32%	--	--	--
			AN24R02	--	--	16%	--	--	--
			AN24R03	43%	--	16%	--	--	--
			AN24R04	43%	--	32%	--	--	--
			AN24R05	14%	--	4%	--	--	--
Departures	6L	Figure 4-5	DN06L01	2%	--	2%	--	--	--
			DN06L02	16%	--	9%	--	--	--
			DN06L03	7%	--	3%	--	--	--
			DN06L04	74%	100%	45%	100%	--	--
			DN06L05	2%	--	42%	--	--	--
			DN06L06	--	--	--	--	69%	82%
			DN06L07	--	--	--	--	31%	18%
	6R	Figure 4-6	DN06R01	--	--	<1%	--	--	--
			DN06R02	--	--	<1%	--	--	--
			DN06R03	5%	50%	3%	2%	--	--
			DN06R04	7%	--	5%	2%	--	--
			DN06R05	20%	--	11%	3%	--	--
			DN06R06	64%	50%	53%	24%	--	--
			DN06R07	<1%	--	<1%	--	--	--
			DN06R08	4%	--	19%	55%	--	--
			DN06R09	--	--	8%	15%	--	--

Operation Type	Runway	Figure Number	Track Group	Air Taxi		General Aviation		General Aviation Skydive Local	
				Day	Night	Day	Night	Day	Night
			DN06R10	--	--	--	--	67%	88%
			DN06R11	--	--	--	--	33%	12%
	24L	Figure 4-7	DN24L01	11%	--	11%	33%	--	--
			DN24L02	11%	--	3%	--	--	--
			DN24L03	6%	--	9%	33%	--	--
			DN24L04	39%	--	25%	--	--	--
			DN24L05	33%	--	49%	33%	50%	67%
			DN24L06	--	--	3%	--	--	--
			DN24L07	--	--	--	--	50%	33%
	24R	Figure 4-8	DN24R01	89%	--	--	33%	--	--
			DN24R02	--	--	86%	33%	--	--
			DN24R03	11%	--	11%	33%	--	--
			DN24R04	--	--	3%	--	--	--

Note: Totals may not match exactly due to rounding.
Sources: FlightAware

Table 3-9 presents the flight track use for all civilian local circuits which were modeled in AEDT. The Japan Airlines circuit tracks are shown in **Figure 3-5** (Runway 6L) and **Figure 3-8** (Runway 24R). The remaining non-jet circuit tracks identified in **Table 3-9** are depicted in **Figure 3-5** through **Figure 3-8**.

Table 3-9. AEDT Modeled Local Fixed-Wing Model Flight Track Utilization

Operation Type	Runway	Figure Number	Track Group	Air Carrier Japan Airlines		General Aviation	
				Day	Night	Day	Night
Circuits	6L	Figure 4-5	CJ06L01	100%	--	--	--
			CN06L01	--	--	100%	100%
	6R	Figure 4-6	CN06R01	--	--	55%	85%
			CN06R02	--	--	45%	15%
	24L	Figure 4-7	CN24L01	--	--	35%	--
			CN24L02	--	--	43%	--
			CN24L03	--	--	22%	100%
	24R	Figure 4-8	CJ24R01	100%	--	--	--

Note: Totals may not match exactly due to rounding.
Sources: FlightAware

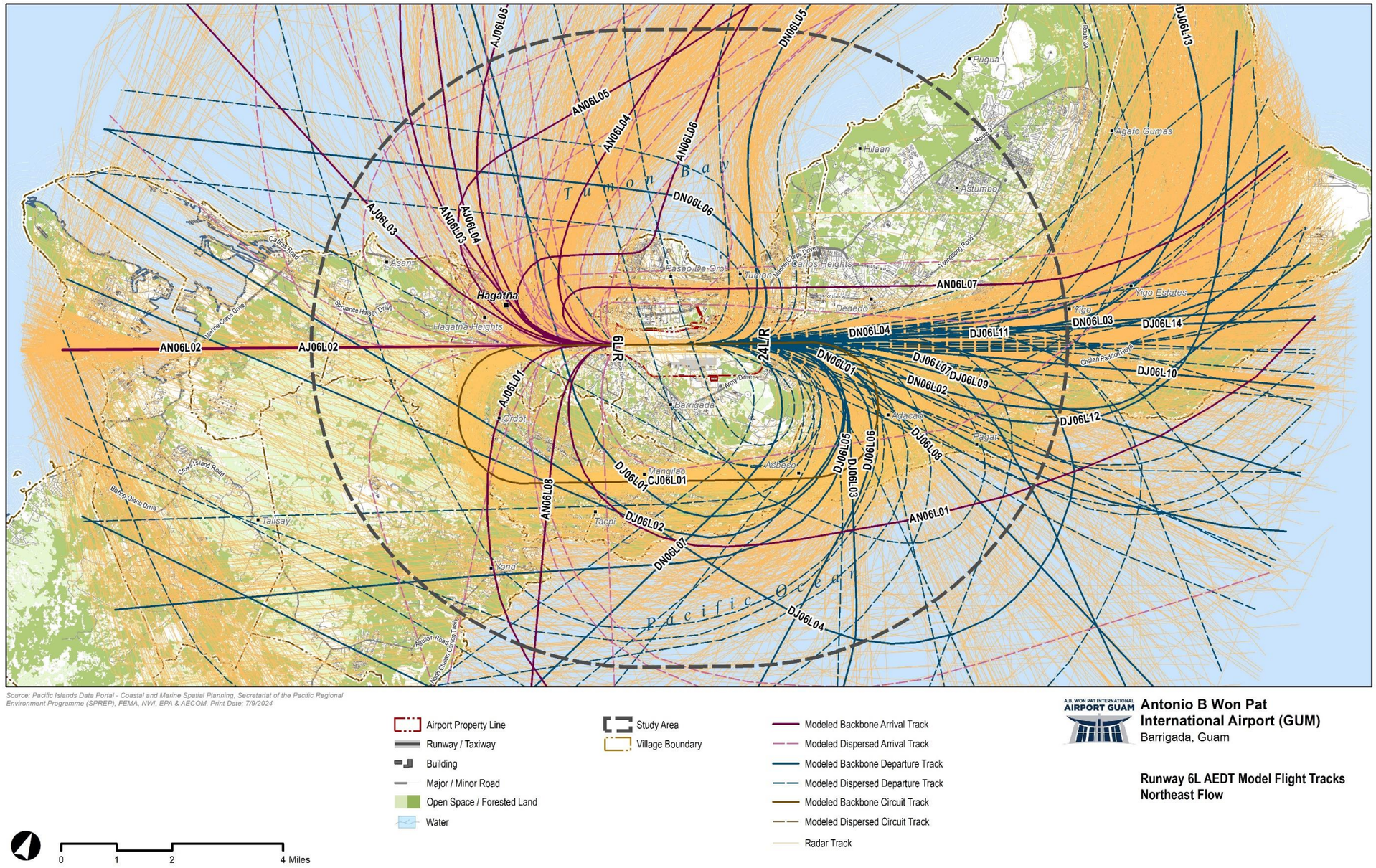
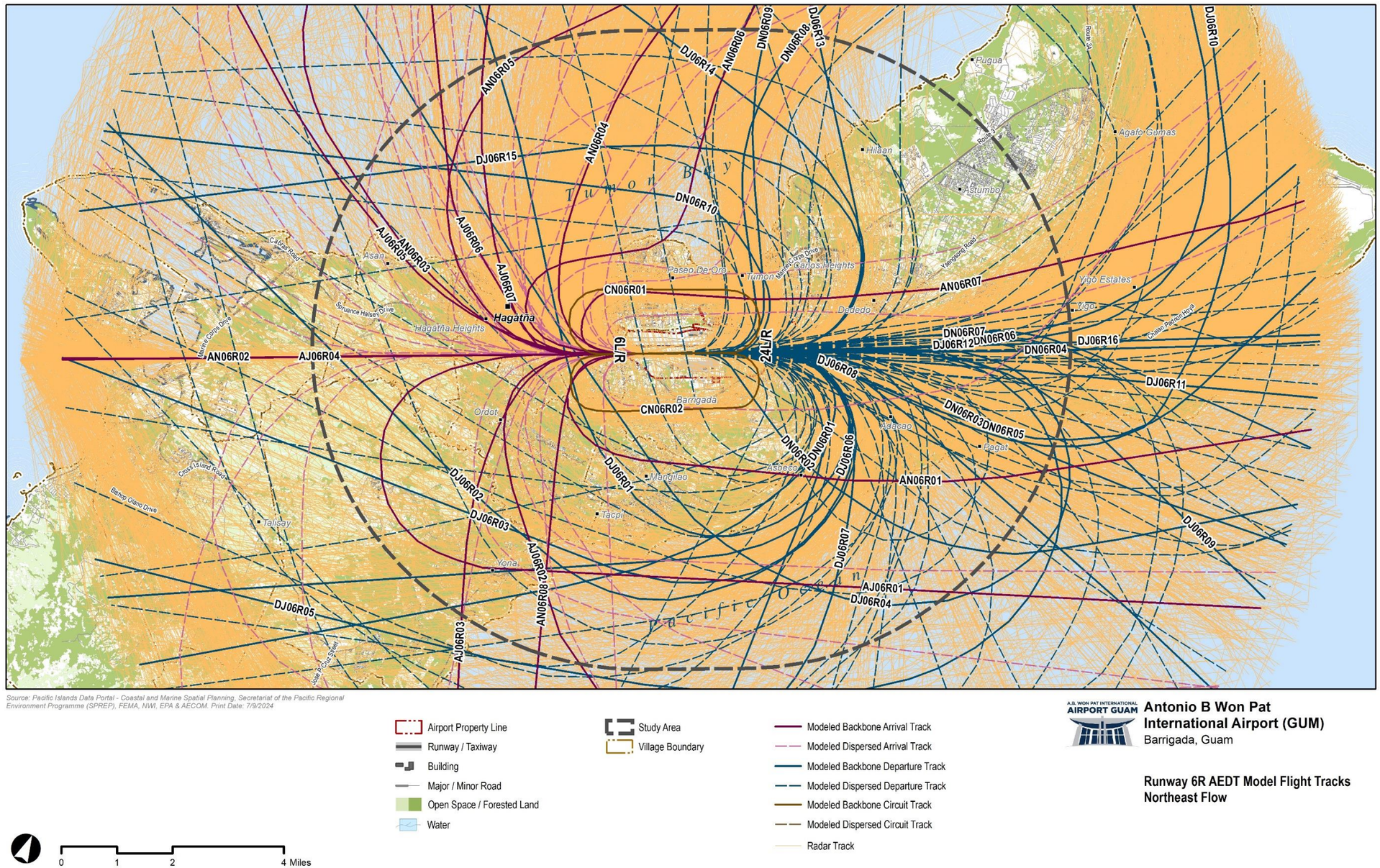


Figure 3-5. Runway 6L AEDT Model Flight Tracks – Northeast Flow

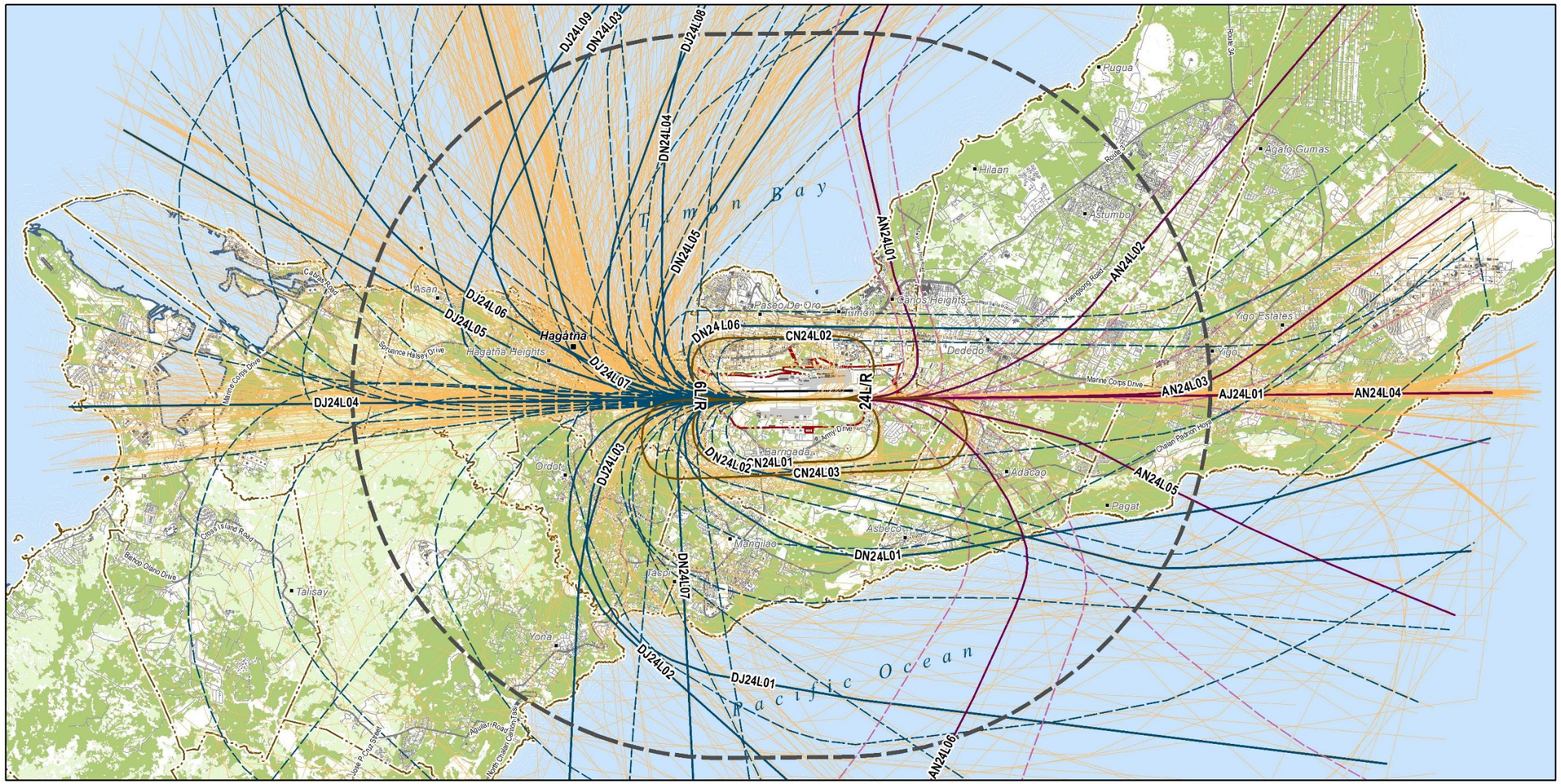


Source: Pacific Islands Data Portal - Coastal and Marine Spatial Planning, Secretariat of the Pacific Regional Environment Programme (SPREP), FEMA, NWI, EPA & AECOM. Print Date: 7/9/2024

Antonio B Won Pat International Airport (GUM)
Barrigada, Guam

Runway 6R AEDT Model Flight Tracks
Northeast Flow

Figure 3-6. Runway 6R AEDT Model Flight Tracks – Northeast Flow



Source: Pacific Islands Data Portal - Coastal and Marine Spatial Planning, Secretariat of the Pacific Regional Environment Programme (SPREP), FEMA, NWI, EPA & AECOM. Print Date: 7/9/2024

- Airport Property Line
- Runway / Taxiway
- Building
- Major / Minor Road
- Open Space / Forested Land
- Water
- Study Area
- Village Boundary
- Modeled Backbone Arrival Track
- Modeled Dispersed Arrival Track
- Modeled Backbone Departure Track
- Modeled Dispersed Departure Track
- Modeled Backbone Circuit Track
- Modeled Dispersed Circuit Track
- Radar Track

0 1 2 4 Miles

Antonio B Won Pat International Airport (GUM)
Barrigada, Guam

Runway 24L AEDT Model Flight Tracks Southwest Flow

Figure 3-7. Runway 24L AEDT Model Flight Tracks – Southwest Flow

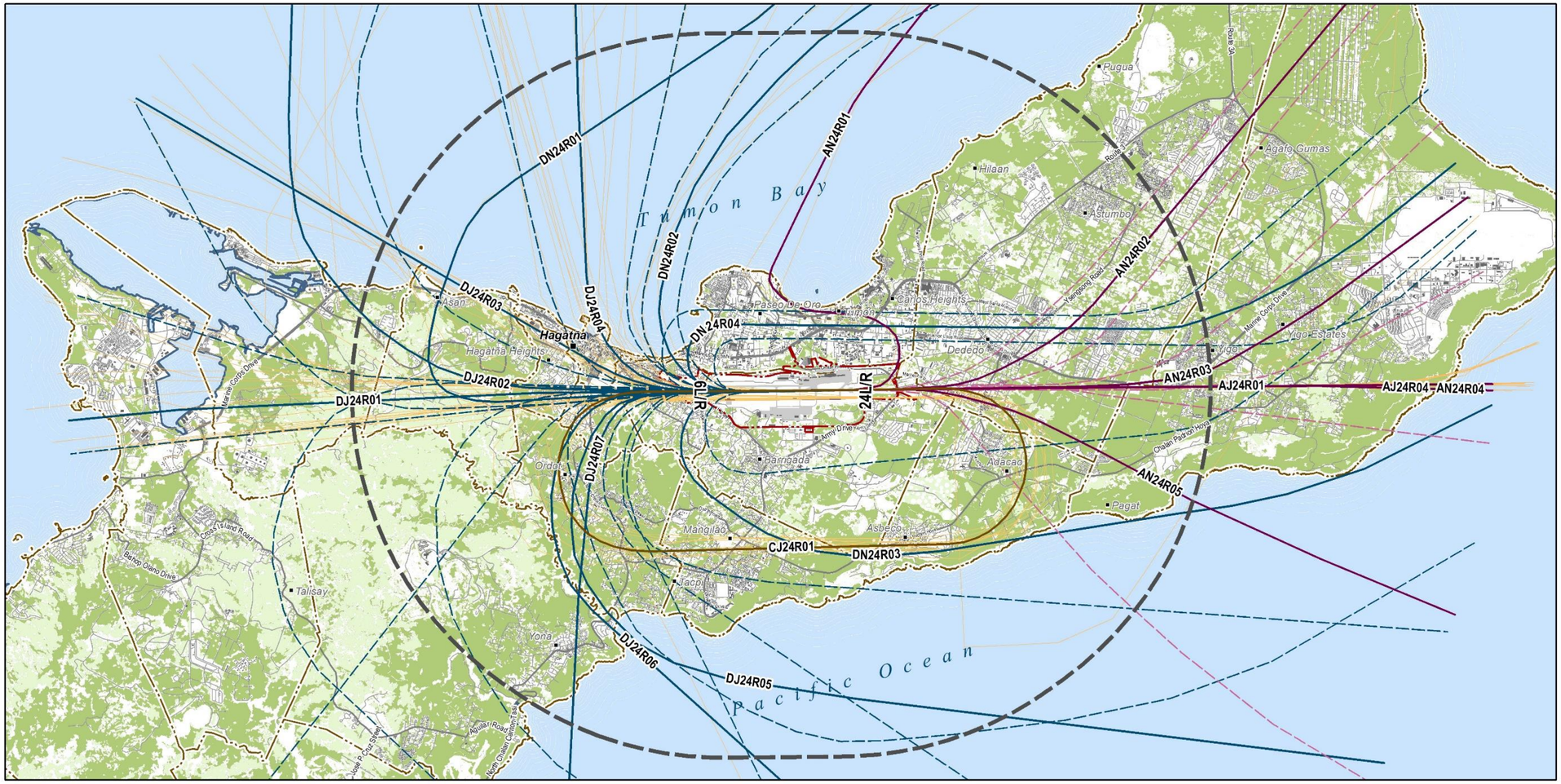


Figure 3-8. Runway 24R AEDT Model Flight Tracks – Southwest Flow

3.7 Meteorological Data

AEDT has several settings that affect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include 10-year average annual temperature, barometric pressure, and relative humidity at the Airport. AEDT holds the following default values for annual average weather conditions at the Airport, and these values were used for all noise modeling:

- Temperature: 81.83° F
- Sea-level Pressure: 1010.45 millibars
- Relative Humidity 81.32%
- Dew Point: 75.51° F
- Wind Speed: 8.95 Knots

3.8 Terrain Data

Terrain data describes the elevation of the ground surrounding the Airport and on Airport property. AEDT uses terrain data to adjust the ground level under the flight paths (aircraft-to-ground path length). The terrain data does not change the aircraft's performance or noise levels but alters the vertical distance between the aircraft and a "receiver" on the ground. This also affects assumptions about how noise propagates over ground. The Team obtained the terrain data from the United States Geological Survey (USGS) National Elevation Dataset with one-third arc second (approximately 33 feet) resolution. Terrain data was utilized in conjunction with the terrain features of the AEDT to generate noise contours for the existing and future conditions.

3.9 2024 and 2029 Noise Exposure Maps

This section presents the Airport aircraft noise exposure contours for 2024 (the existing condition) and 2029 (the 5-year forecast condition). The 2024 and 2029 Noise Exposure Maps represent and update to the Noise Exposure Maps previously approved in May 2003. The fundamental elements of a Noise Exposure Map are the noise exposure contours representing 5-decibel-increment contours using the DNL metric for existing and forecast conditions (2024 and 2029, respectively), presented on land use maps depicting the Airport layout, local land-use control jurisdictions, major land-use categories, discrete non-residential noise-sensitive sites, and other information required by Part 150.

Figure 3-9 and **Figure 3-10** represent the formal Noise Exposure Maps as submitted herein for FAA acceptance as compliant with Part 150 pursuant to §150.21.[13] As noted in item IV.D of Part 150, Noise Exposure Maps Checklist, Part 150 requires that Noise Exposure Maps depict the 65, 70, and 75 DNL noise contours. The scale on these figures is 1 inch to 2,000 feet, which is the minimum scale as required by §A150.103(b)(1) of Part 150. The two figures contain all graphical elements that Part 150 requires on the maps, with the exception of flight tracks, which Part 150 permits airports to submit in supplemental graphics.

GIAA has mitigated many of the noncompatible residential parcels in this area as part of the existing Noise Compatibility Program, making them compatible with FAA guidelines for aircraft noise. The Noise Exposure Maps indicate those parcels in which the structures have received treatment as part of the GIAA RSSP.

The existing and forecast conditions aircraft noise exposure contours are overlaid on base maps that show generalized land use based on Guam Department of Land Management zoning data. Based on the zoning data and visual map inspections, residential areas have been identified. As discussed in **Section 2.7**, Guam has a future land use plan that would result in a small area of Barrigada northeast of the Airport within the forecast condition (2029) DNL 65 dB contour to be changed to residential zoning and land use, but no timeline has been established; therefore, the forecast Noise Exposure Map (**Figure 3-10**) displays the existing land use. **Figure 3-11** shows both sets of aircraft noise exposure contours on the land use base map displaying the existing land use for easy comparison between the existing and forecast DNL contour sets.

[13] The Official Noise Exposure Maps at 1' to 2,000' scale can be found in Appendix F.

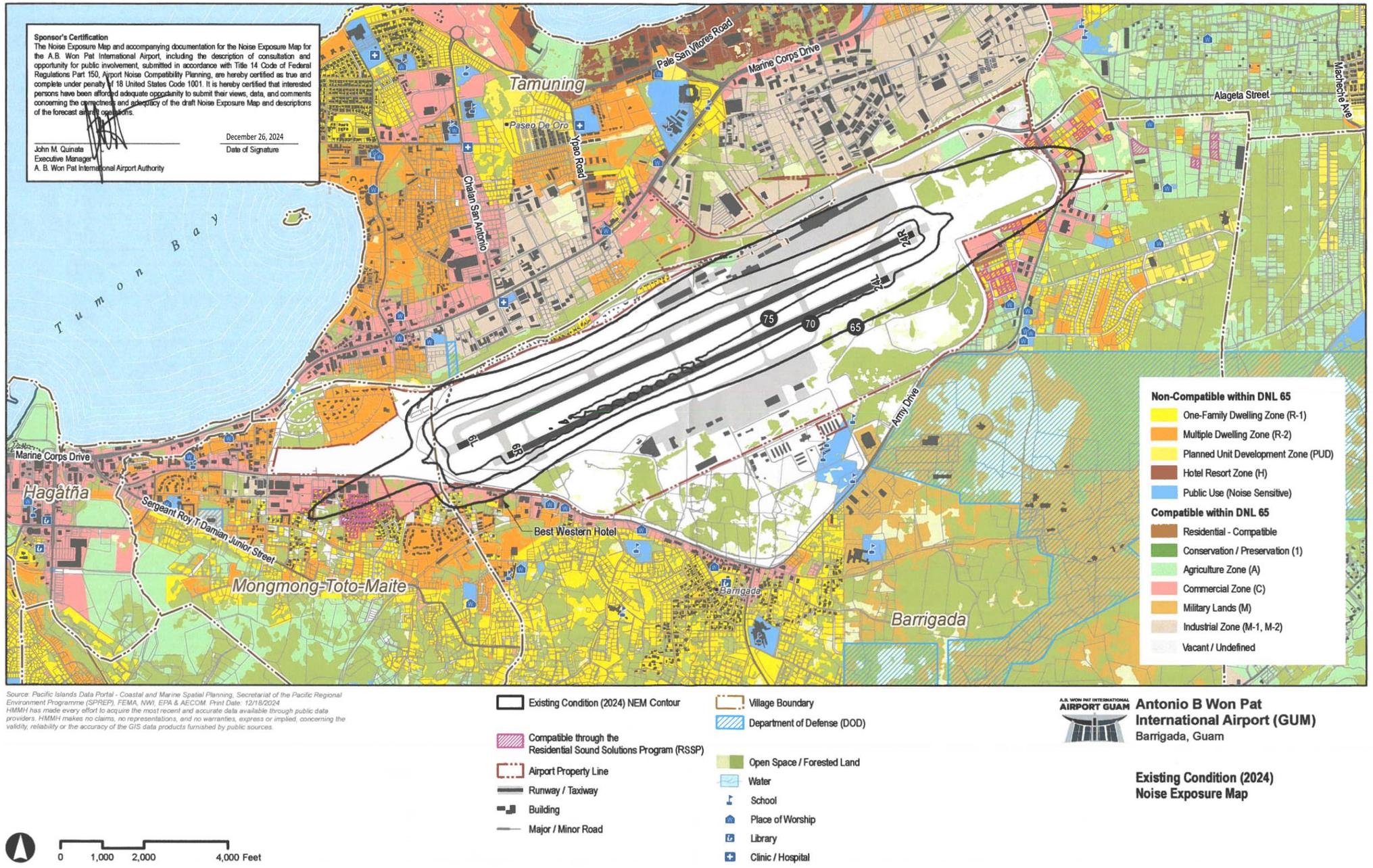


Figure 3-9. Existing Condition (2024) Noise Exposure Map

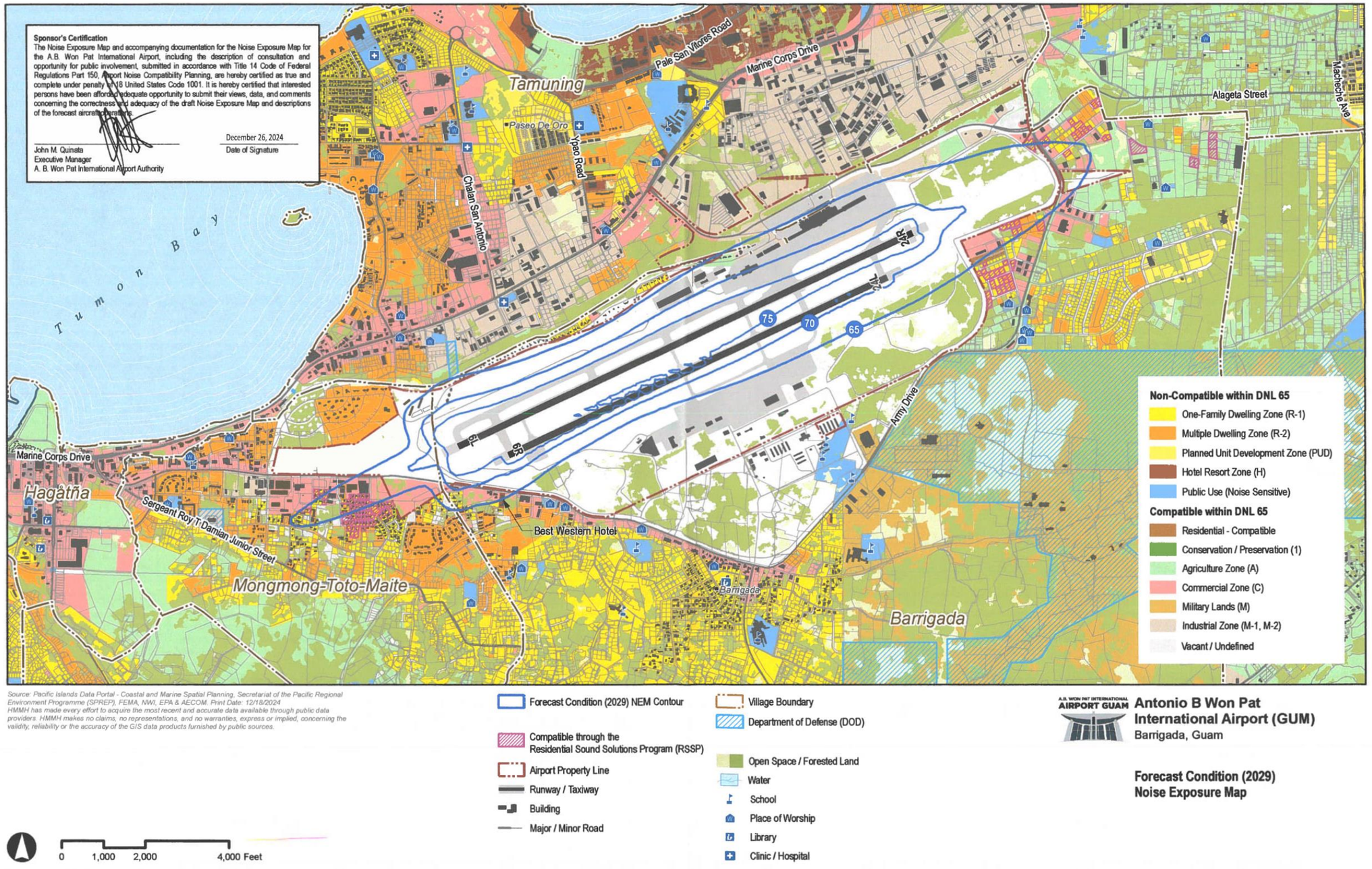


Figure 3-10. Future Condition (2029) Noise Exposure Map

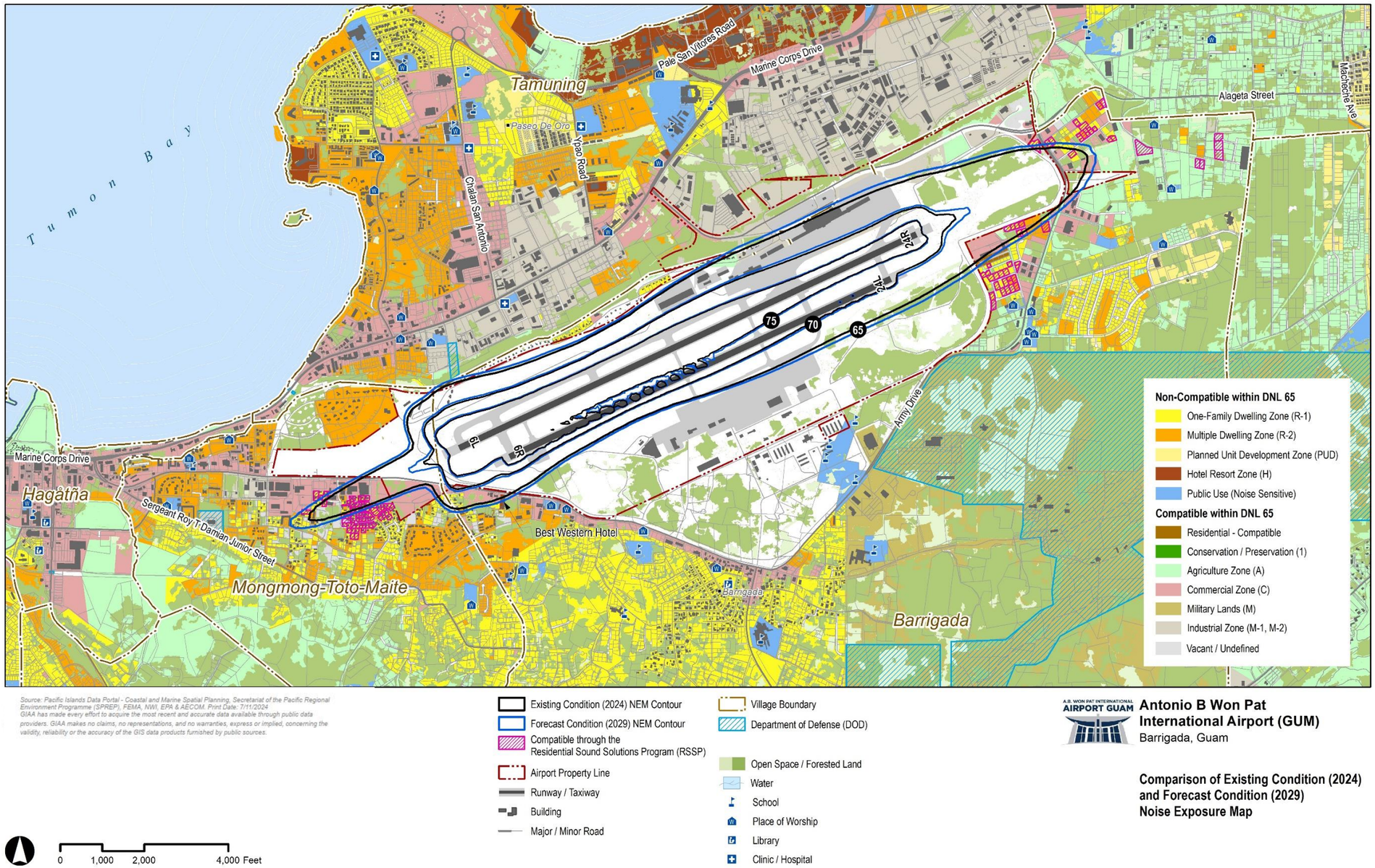


Figure 3-11. Comparison of Existing Condition (2024) and Future Condition (2029) Noise Exposure Map

4.
Noise Compatibility

4 Noise Compatibility

Part 150 requires the review of land uses located in the airport environs to understand the relationship between those land uses and the noise exposure associated with aircraft operations. This includes delineation of land uses within the 65 day-night average sound level (DNL) and higher aircraft noise exposure contours and identification of noise-sensitive uses. Identification of a noise-sensitive use within the DNL 65 decibel (dB) contour does not necessarily mean that the use is either considered noncompatible or that it is eligible for mitigation. Rather, identification merely indicates that the use may be considered noncompatible and requires further investigation.

The objective of airport noise compatibility planning is to promote compatible land use in communities surrounding airports. Part 150 requires the review of existing land uses surrounding an airport to determine land use compatibility associated with aircraft activity at Antonio B. Won Pat International Airport.

4.1 Land Use Guidelines

The land uses on Guam have been matched with the Part 150 guidelines land use categories. These are shown in Table 4-21. The Federal Aviation Administration (FAA) has published land use compatibility designations, as set forth in Part 150, Appendix A, Table 1 (reproduced here as Table 4-12). As Table 4-2 indicates, the FAA generally considers all land uses to be compatible with aircraft-related noise exposure in terms of DNL below 65 dB, including residential parcels, hotels, retirement homes, intermediate care facilities, hospitals, nursing homes, schools, preschools, and libraries. These categories will be referenced throughout the Part 150 process.

GIAA considers housing units as compatible with aircraft noise within the DNL 65 dB and greater contour if they were mitigated as part of the prior Residential Sound Solutions Program or if they were constructed after October 1, 1998. Per FAA policy, as of October 1, 1998, the FAA will approve, under Part 150, only remedial mitigation measures for existing noncompatible development and only preventive noise mitigation measures for new noncompatible development that may be eligible for Airport Improvement Program funding.

Table 4-1. Guam Land Uses compared to Part 150 Airport Noise / Land Use Compatibility Guidelines

Noise Exposure Map Land Uses	Part 150, Appendix A, Table 1	
	General Category	Description
Noncompatible within DNL 65		
One-Family Dwelling Zone (R-1)	Residential Use	Single Family Housing
Multiple Dwelling Zone (R-2)	Residential Use	Multi-Family Housing
Planned Unit Development (PUD)	Residential Use	Single or Multi Family Housing
Hotel Resort Zone (H)	Residential Use	Transient Lodging
Public Use (Noise Sensitive)	Public Use	Schools, Churches, Hospitals, Libraries, Nursing Homes
Compatible within DNL 65		
Residential - Compatible	Residential Use	Constructed after October 1, 1998
Conservation/Preservation (1)	Recreational	Open space, parks
Agriculture Zone (A)	Manufacturing & Production	Agriculture and Forestry
Commercial Zone (C)	Commercial Use	Offices, Retail, Warehouses
Military Lands (M)	Public Use	Government Services
Industrial Zone (M-1, M-2)	Manufacturing & Production	Manufacturing
Vacant / Undefined	Recreational	Open space / undefined

Table 4-2. Part 150 Airport Noise / Land Use Compatibility Guidelines

Land Use	Yearly Day-Night Average Sound Level (DNL) in Decibels					
	<65	65-70	70-75	75-80	80-85	>85
Residential Use						
Residential other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home park	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail--building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Key:

SLUCM: Standard Land Use Coding Manual
Y(Yes): Land use and related structures compatible without restrictions.
N(No): Land use and related structures are not compatible and should be prohibited.
NLR: Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35: Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 A-weighted decibels (dB) must be incorporated into design and construction of structure.

Notes:

The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

1) *Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often started as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.*
2) *Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.*

3) *Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.*
4) *Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.*
5) *Land use compatible provided special sound reinforcement systems are installed.*
6) *Residential buildings require an NLR of 25.*
7) *Residential buildings require an NLR of 30.*
8) *Residential buildings not permitted.*

Source: Part 150, Appendix A, Table 1, 2007

4.2 Growth Risk Analysis

As discussed in **Section 2.7**, the Guam Department of Land Management (DLM) indicated that there are numerous single-family residential properties within areas zoned as Agricultural (A), particularly northeast of the Antonio B. Won Pat International Airport (Airport). When an owner of an undeveloped property or a property with a single-family home that is zoned "A" wants to build new dwelling units or a small business establishment, then that owner needs to apply for change of zoning.

The 2009 Land Use Plan, when implemented, would convert much of the area northeast of the Airport currently designated as Agriculture to Residential. However, there is no timetable for implementation of this plan and the A.B. Won Pat International Airport Authority, Guam (GIAA) should continue to work with the Guam DLM to keep this area compatible land use.

4.3 Land Use and Population Changes

As required under Part 150, **Table 4-3** and **Table 4-4** provide the results of the land use compatibility analysis, including estimations of the population and housing units and identification of noise-sensitive sites exposed to DNL greater than 65 dB. The land use analysis shows that there are 155 residential units and one noise-sensitive site (transient lodging) within the Existing Condition 2024 DNL 65 dB contours and 303 residential units and the same one noise-sensitive site within the Forecast Condition 2029 DNL 65 dB contours. For the Existing Condition 2024 analysis, 118 of the 155 units and the one noise-sensitive site are potentially noncompatible with noise from Airport operations and for the Forecast Condition 2029 analysis, 251 of the 303 units and the one noise sensitive site are potentially noncompatible with noise from Airport operations. The FAA considers all land uses compatible that are exposed to DNL less than 65 dB.

The one noise-sensitive site within the DNL 65 dB contour, the Best Western Hotel is located just south of the Runway 6R end as shown in **Figure 4-2**.

The DNL 65 dB contour in both the existing and forecast conditions extends outside of Airport property controlled by GIAA to the northeast and southwest resulting in areas of compatible and noncompatible land use within the DNL 65 dB contour.

Table 4-3. Existing 2024 and Forecast 2029 Land Use Compatibility

Contour Interval	Area (Acres)		Population Census 2020				Housing Units			
			Total		Noncompatible		Total		Noncompatible	
	2024	2029	2024	2029	2024	2029	2024	2029	2024	2029
65-70 DNL	521.1	574.5	465	909	354	753	155	303	118	251
70-75 DNL	236.4	248.2	0	0	0	0	0	0	0	0
>75 DNL	262.3	281.9	0	0	0	0	0	0	0	0
Total > 65 DNL	1,019.8	1,104.5	465	909	354	753	155	303	118	251

Notes:

The number of buildings that participated in the RSSP was delineated based on research of available records maintained by GIAA. Land use and housing units within the DNL 65 dB contours were verified by windshield survey in May 2024.
The number of people is estimated based on a population factor (3.004 people per unit) developed from the 2020 U.S. Census block data within 1,000 feet of the 2029 DNL 65 dB contour.
The noncompatible number subtracts those units that have received sound insulation treatment and an avigation easement or were constructed after October 1, 1998.
Sources: U.S. 2020 Census data, GIAA 2024

Table 4-4. Existing 2024 and Forecast 2029 Noise-Sensitive Sites

Contour Interval	School		Place of Worship		Day Care		Transient Lodging	
	2024	2029	2024	2029	2024	2029	2024	2029
65-70 DNL	0	0	0	0	0	0	1	1
70-75 DNL	0	0	0	0	0	0	0	0
>75 DNL	0	0	0	0	0	0	0	0
Total > 65 DNL	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**

The breakdown of housing unit counts is based on aerial imagery and on-site verification of land uses and housing units within the DNL 65 dB contour completed in May 2024. **Figure 4-1** and **Figure 4-2** display these areas of residential land use within the existing and forecast noise contours.

Figure 4-1 displays the areas of existing and forecast noise exposure northeast of the Airport with small areas of residential properties (approximately 25 units in 2024 and 39 units in 2029, currently zoned agriculture and industrial) directly east of Runway 24R end and before Route 16. A second small area of residential properties under the extended centerline of Runway 24R (approximately 7 units in 2024 and 11 units in 2029, currently zoned agriculture) are located across Route 16.

Figure 4-2 displays the areas of existing and forecast noise exposure southwest of the Airport with a small area of the DNL 70 dB contour south of the Runway 6L end that crosses Route 8 over commercial property. The DNL 65 dB contour includes some areas of residential properties (approximately 112 units in 2024 and 201 units in 2029, currently zoned multi-dwelling and industrial) under the extended centerline to the Runway 6L end and up to Route 8. A second small area of residential properties is located south of the Runway 6L and 6R ends (approximately 11 units in 2024 and 52 units in 2029, currently zoned multi-dwelling and commercial) across Route 8.

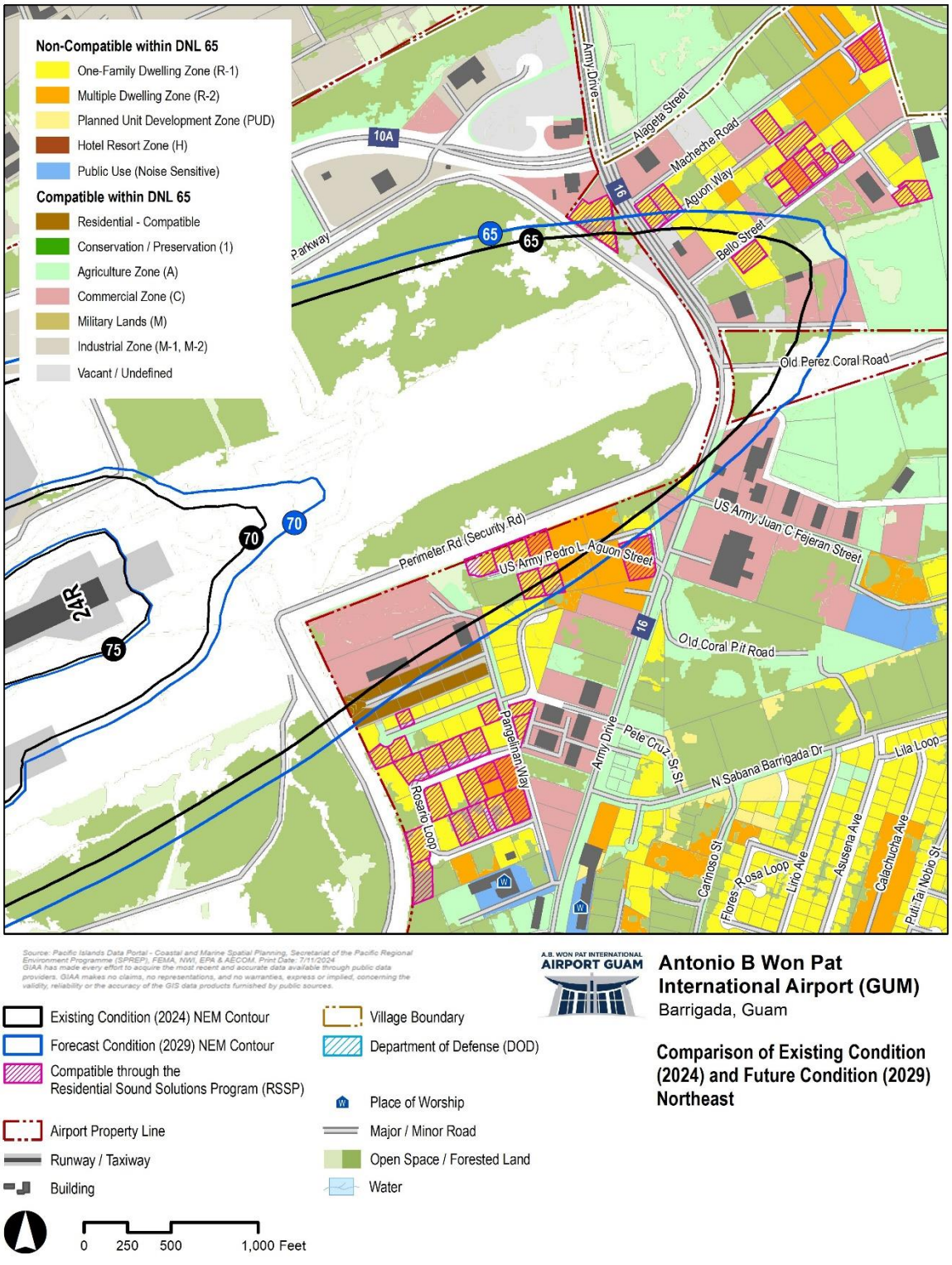


Figure 4-1. Comparison of Existing Condition (2024) and Future Condition (2029) – Northeast

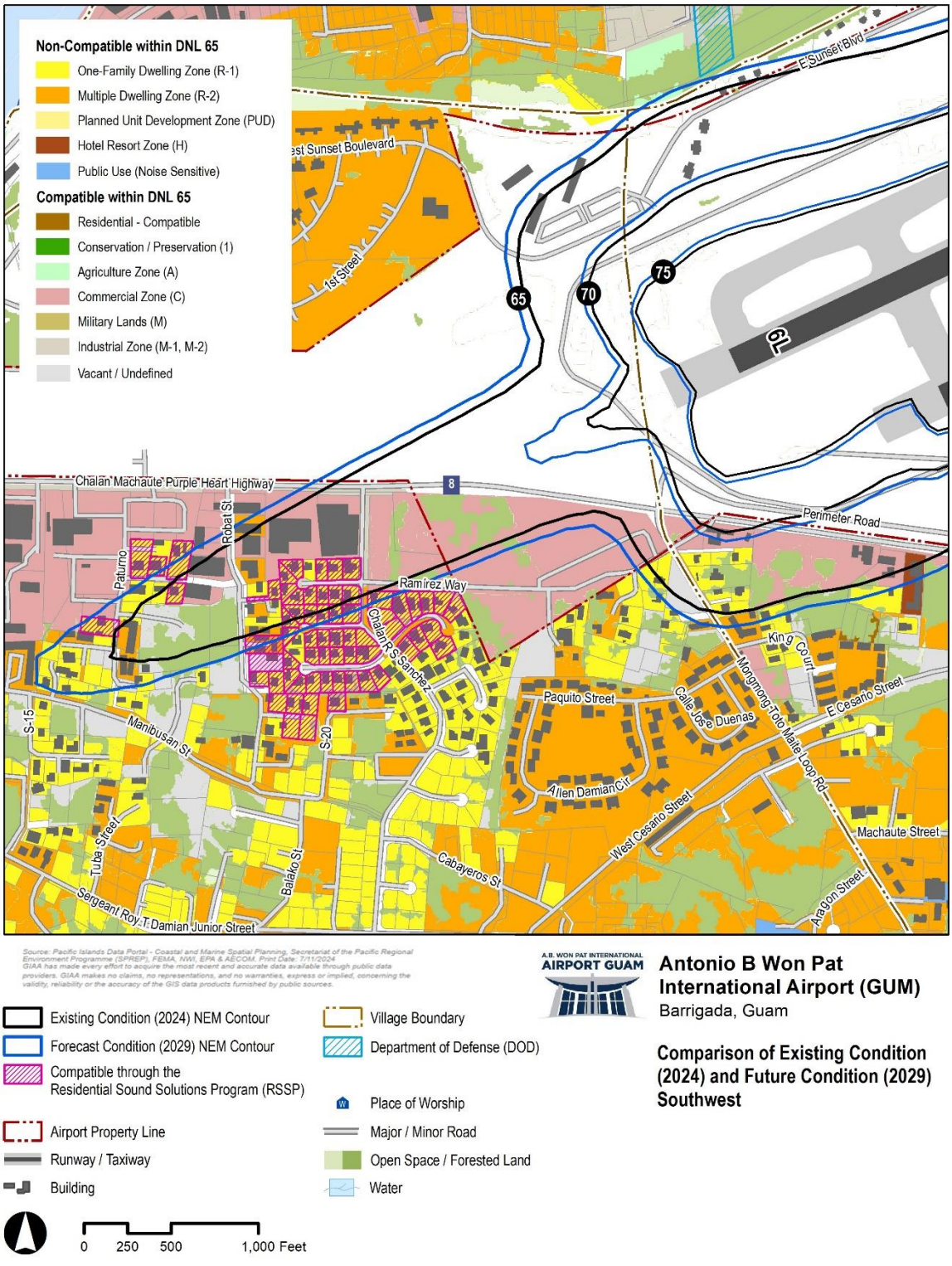


Figure 4-2. Comparison of Existing Condition (2024) and Future Condition (2029) – Southwest

5.
Stakeholder Engagement

5 Stakeholder Engagement

One of the opportunities afforded by an update to the Airport's Part 150, including the NEM, is stakeholder engagement. This chapter describes outreach efforts conducted throughout the development of the NEM to engage airport stakeholders. Stakeholders and those interested in airport noise compatibility planning were afforded an ongoing opportunity to learn about the Study and provide comments. This occurred through various mechanisms, including a PAC, a project initiation brochure, public draft documents, a public open house, and a 30-day public comment period. GIAA formed a PAC to ensure the key stakeholders remained engaged in the process and to efficiently keep them apprised of the progress and results.

5.1 Planning Advisory Committee

Table 5-1 provides the list of member organizations that were invited to participate on the PAC as consulting parties. The regulations governing the stakeholder consultation portions of the Part 150 process are found at 14 CFR 150.21(b) and 14 CFR 150.105(a). While a PAC is not specifically described in Part 150, GIAA created a PAC as part of this Part 150 Study in an effort to provide robust outreach and feedback related to all aspects of the Study. Not all member organizations invited to the PAC chose to send a representative, but a broad range of representatives took part, and all members were invited to each meeting whether or not they attended previous meetings. These representatives were provided multiple opportunities through the PAC to submit their views, data, and comments concerning the correctness and adequacy of the draft Noise Exposure Map and descriptions of forecast aircraft operations, as described in 14 CFR 150.21(b).

Table 5-1. Member Organizations on the Planning Advisory Committee

Public Agencies or Planning Agencies	FAA Officials	Regular Aeronautical Users of the Airport
• GIAA • Guam Chamber of Commerce • Guam Department of Land Management	• FAA ATCT • Western-Pacific Region, Airports Division • Honolulu Airports District Office (ADO)	• United Airlines • Japan Airlines • Federal Express • United Parcel Service • ACI • Andersen Air Force Base

GIAA scheduled PAC meetings for which the Study Team served as meeting facilitators, presented information, and engaged the members in appropriate discussions to assist in the validation of the collected information. Major topics discussed at each of the PAC meetings are presented in **Table 5-2**. Slides from PAC meeting presentations and the meeting summaries are provided in **Appendix D.1**.

Table 5-2. Meeting Topics of the Planning Advisory Committee

PAC Meeting #	Date	Topics Covered
1	11/8/2023	Overview of the Part 150 process, the PAC, initial data collection, operations forecast, and roles and responsibilities
2	5/22/2024	Final noise model inputs, preliminary draft Noise Exposure Maps, existing NCP review, public review process
3	11/14/2024	Review of the Noise Exposure Maps, Public Workshop and comment period. review of potential Noise Abatement measures and introduction of Land Use measures.

5.2 Public Open House

The Study Team members as well as GIAA staff served as facilitators at various stations at the public open house to discuss the project and answer questions from the public. The public open house was held at the start of the public comment period for this NEM document to present information on the noise model inputs, with a focus on the

resulting noise exposure contours and land use compatibility. The public open house was an in-person event at the Airport; the event is summarized in **Table 5-3**. All open house materials are provided in **Appendix D.2**.

GIAA provided the public open house information to PAC members and elected officials to share with their constituencies. Additionally, for the public open house, GIAA posted notices on the Airport website and issued two press releases. Copies are provided in **Appendix D.2**.

Table 5-3. Public Meeting

Meeting	Date	Topics Covered
Open House #1 (NEM Results)	11/14/2024	Public workshop to present the results of the Part 150 Update and the draft NEM Report prior to submittal to the FAA

Figure 5-1. GIAA Part 150 - Public Workshop

5.3 Public Review and Comment on the Draft NEM Report

GIAA provided the draft NEM document for public review and comment for a 30-day period. An electronic version of the full draft NEM document was posted on the Airport website for the public review period at (A.B. Won Pat International Airport Authority, Guam (guamairport.com) A hard copy (printed paper edition) of the draft NEM document is available for public review at the following locations during normal business hours:

- At the GIAA offices, 355 Chalan Pasaheru, Tamuning, 96913, Guam
- Public Libraries: Nieves M. Flores Memorial Library
  254 Martyr Street
  Hagåtña, Guam 96910

  Barrigada Branch Public Library
  177 San Roque Drive
  Barrigada, Guam 96913

Public comments were accepted in writing at the public information workshop, through the GIAA at any time throughout the project duration, or via email to giaapart150@aecom.com. The final NEM includes all public comments received prior to the close of the public comment period for the NEM document.

Figure 5-2. Guam Public Library Barrigada Branch - Draft NEM Display

Three public comments on the Draft NEM report were received during the comment period. The public comments received on the GIAA 2024 Draft NEM are included in **Appendix E**. The three comments primarily referenced the pause in the current RSSP program. Updating the NEM is required for the continued implementation of the RSSP; and GIAA will evaluate the need to continue the program given the results of the NEM.

5.4 Project Website

The GIAA Part 150 Study information is available at A.B. Won Pat International Airport Authority, Guam (guamairport.com) Study-related information and resources are posted on this site.

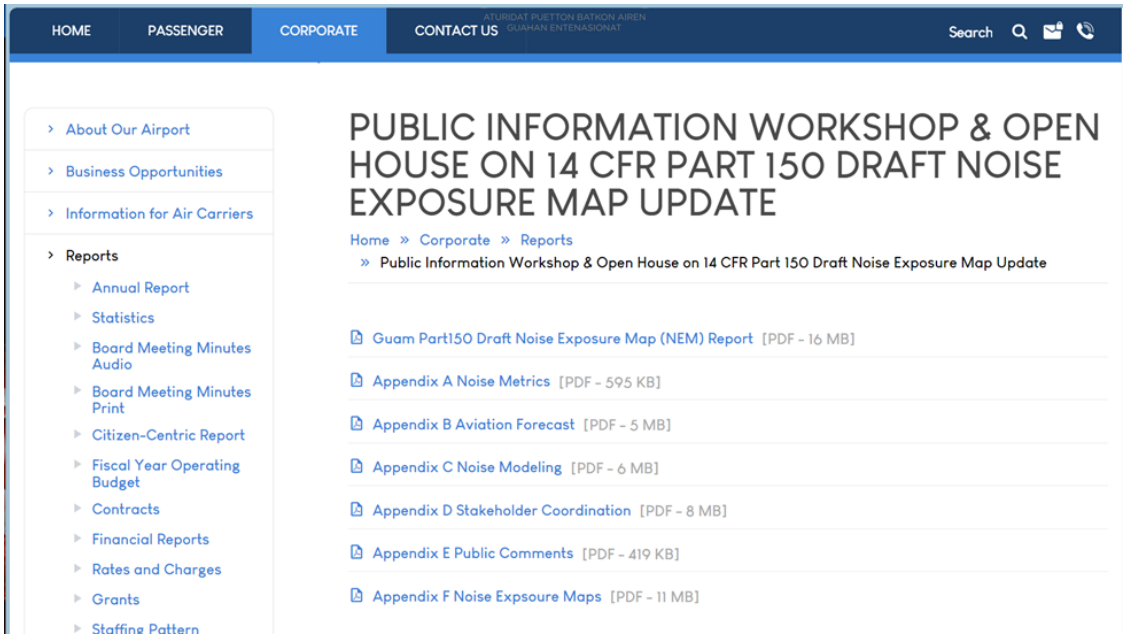


Figure 5-3. GIAA Part 150 Website page
Accessed 11/18/2024