# Summary of the NOISE EXPOSURE MAPS

AND SUPPORTING DOCUMENTATION

PREPARED FOR:

MONROE COUNTY BOARD OF COUNTY COMMISSIONERS

**OPERATOR OF:** 



PREPARED BY:

Deborah Murphy Lagos & Associates

IN CONJUNCTION WITH:



HD

**MARCH 1, 2023** 

#### **EXECUTIVE SUMMARY**

#### **KEY WEST INTERNATIONAL AIRPORT NEM UPDATE**

#### **ES.1 INTRODUCTION**

Key West International Airport (EYW) is owned and operated by Monroe County, Florida. It is located on the southeast corner of the island of Key West, within the city limits of Key West, Florida. In the Federal Aviation Administration's (FAA's) National Plan of Integrated Airports Systems (NPIAS), which defines the role of an airport, EYW is classified as a Small-Hub Primary Service airport enplaning more than 10,000 passengers per annum.

Monroe County has a long-established goal to provide aviation facilities to all residents and guests in a manner that maximizes safety, convenience, economic benefit, and environmental compatibility. As part of the plan to achieve its goal, Monroe County conducted a title 14 CFR part 150 (Part 150) Study in the mid to late 1990s to explore the impact of aircraft noise on the surrounding community. This Part 150 Study culminated with FAA approval of Noise Exposure Maps (NEMs) and a Noise Compatibility Program (NCP) on May 7, 1999.

#### ES.2 AIRCRAFT NOISE AND THE PART 150 PROCESS

The FAA Reauthorization Act of 2018 amended Section 47503(b) of title 49, United States Code. This revision requires airport operators that have submitted NEMs under §47503(a) to submit a revised map to the Secretary of Transportation "if, in an area surrounding an airport, a change in the operation of the airport would establish a substantial new noncompatible use, or would significantly reduce noise over existing noncompatible uses, that is not reflected in either the existing conditions map or forecast map currently on file with the FAA. Updated NEMs shall be required only if the relevant change in the operation of the airport occurs during:

- (A) the forecast period of the applicable noise exposure map submitted by an airport operator under subsection (a); or
- (B) the implementation period of the airport operator's noise compatibility program."

In addition to required updates to the NEM for the above reasons and in compliance with FAA Order 5100.38, the Airport Improvement Program Handbook, if a NEM is more than five years old and an airport sponsor desires to implement a noise compatibility project from their NCP that is funded by the FAA, the sponsor must provide written confirmation that the NEMs upon which the NCP-related project is based continue to be a reasonable representation of current and/or forecast conditions for the airport.

The FAA will not program (i.e., fund) noise compatibility projects using noise exposure maps that are more than five years old unless this process has been completed.

To remain in compliance with Part 150 and FAA Order 5100.38, Monroe County has prepared periodic updates to EYW's NEMs. Most recently, on December 19, 2013, the FAA determined that the NEMs submitted by the Monroe County Board of County Commissioners were in compliance with the applicable requirements. This current update is necessary due to changes in aircraft operational levels and the aircraft

fleet mix operating at the airport. This current update will document if these changes have an influence on the size and shape of the EYW noise contours and will also document if there are any new noncompatible land uses within the updated DNL 65+ dB contours.

Part 150 requires the submission of two maps, an existing condition map and a future condition map. The existing NEM must be based on current data as of the year of submission to the FAA or be representative of existing conditions. For this update, the existing condition noise contours are based on data for the average annual day during the 12-month period from October 1, 2020, through September 30, 2021 (Federal Fiscal Year 2021). The existing condition noise contours are identified and certified by the airport operator as the 2022 Existing Condition NEM. The airport operator has verified and certified that the 2022 Existing Condition NEM accurately represent the existing condition as of the date of submission of this report to the FAA.

In accordance with Part 150, the future condition NEM must be based on the aircraft operational levels and fleet mix that are forecast to occur at least 5 years after the year of submission. In addition to the operational levels and fleet, the future NEM must be based on reasonable assumptions concerning nighttime operations, flight patterns, airport layout (including any planned airport development), planned land use changes, and demographic changes in the areas surrounding the airport. The Future Condition NEM in this report utilizes the number of operations for the year 2028 in FAA's 2020 Terminal Area Forecast (TAF) for EYW. The fleet mix is based upon the fleet mix used for the Existing Condition with appropriate adjustments for changes in aircraft types known at this time. The future condition noise contours are identified and certified by the airport operator as the 2028 Future Condition NEM.

In summary, this Noise Exposure Maps and Supporting Documentation report documents the methods and data that were used to prepare the 2022 and 2028 NEMs and identifies the compatible and noncompatible land uses within the noise contours. The 2022 and 2028 NEMs are an update to the EYW NEMs that were accepted by the FAA on December 19, 2013.

The EYW NEM documentation is presented in six sections and seven appendices.

>	Section 1.0	Introduction
>	Section 2.0	Municipal Jurisdictions and Land Use
>	Section 3.0	Airport and Airspace Considerations
>	Section 4.0	Existing Condition: Year 2022 Noise Exposure
>	Section 5.0	Future Condition: Year 2028 Noise Exposure
>	Section 6.0	Consultation and Public Participation
>	Appendix A	History of the Noise Compatibility Program at EYW
>	Appendix B	Aircraft Noise
>	Appendix C	Summary of Consultation
>	Appendix D	Ad Hoc Committee Minutes and Proof of Publication for Meeting Ads
>	Appendix E	Public Comments and Responses

- Appendix F NEM Review and Acceptance Documentation
- Appendix G Large Scale Flight Track Maps and Noise Exposure Maps

# **ES.3** NOISE PREDICTION METHODOLOGY

The evaluation of the airport noise environment at EYW was completed using the methodologies and standards developed by the FAA and published in Part 150. The regulation requires that the cumulative noise energy exposure of individuals to noise resulting from aviation activities be established in terms of yearly day/night average sound level (DNL) as the FAA's primary metric. All detailed noise analyses must be performed using the most current version of the FAA's Aviation Environmental Design Tool (AEDT). For this NEM, the FAA's AEDT Version 3d was used to model aircraft noise exposure. User- defined information required to run the AEDT model includes:

- A physical description of the airport layout, including location, length and orientation of all runways, and airport elevation;
- The aircraft fleet mix for the average day;
- The number of daytime flight and run-up operations (7:00 a.m. to 9:59 p.m.);
- The number of nighttime flight and run-up operations (10:00 p.m. to 6:59 a.m.);
- · Aircraft departure stage lengths;
- · Runway utilization rates;
- Primary departure and arrival flight tracks; and
- Flight track utilization rates.

The noise analysis was conducted to reflect the existing (i.e., current) and future (i.e., forecast) conditions. This analysis includes maps depicting land uses within the DNL contours.

The following information is provided for each condition:

- The number of people living or residences within each noise contour above DNL 65 dB.
- The location and number of noise sensitive uses (e.g., schools, places of worship, hospitals, parks, recreation areas) exposed to DNL 65 dB or greater.
- Mitigation measures in effect or proposed and their relationship to the NEMs.

The information presented in the NEM document is a result of coordination with airport staff, the Airport Traffic Control Tower (ATCT) Manager, and local and regional FAA Airports Division Environmental Program Specialists. Previous studies conducted at EYW were considered and incorporated into the NEM documentation, as appropriate.

#### ES.4 EXISTING CONDITION AIRCRAFT OPERATIONAL CHARACTERISTICS

The noise modeling was performed for the existing average daily condition for October 1, 2020, through September 30, 2021, and the resulting contours are identified as the 2022 Existing Condition.

A total of 64,128 annual aircraft flight operations were modeled to develop the Existing Condition NEM. This equates to 176 average daily operations. **Table ES.1** provides a breakdown of these operations by aircraft category.

In addition to the 64,128 annual fixed-wing flight operations, 7,383 annual aircraft run-up operations (i.e., standing takeoff operations) were modeled to develop the Existing Condition NEM. This equates to 26 average daily run-up operations.

TABLE ES.1
SUMMARY OF 2021 FLIGHT OPERATIONS

CATEGORY	ANNUAL OPERATIONS	AVERAGE DAILY OPERATIONS		
AC/AT JET	21,563	59.08		
AC/AT PROP	6,593	18.06		
GA PROP ITINERANT	19,305	52.89		
GA PROP LOCAL	2,369	6.49		
GA JET	10,161	27.84		
GA HELO	3,698	10.13		
MIL ITINERANT	268	0.73		
MIL LOCAL	83	0.23		
MIL HELO	88	0.24		
TOTAL	64,128	175.69		

Note: Numbers may not add due to rounding.
Sources: FAA OPSNET, 2021, FlightRadar24, 2022.
Prepared by: Deborah Murphy Lagos & Associates

While the noise contours represent an average annual day, the number of aircraft operations per day varies during the 365-day period. Historically, the number of aircraft operations have been the highest during March and lowest during September. In addition, certain holidays and local events attract out-of-town visitors that often utilize general aviation aircraft (e.g., Fantasy Fest, New Year's Eve). The noise exposure may be higher during times when there are more aircraft operations, and lower during times when there are less aircraft operations. The yearly day-night average sound level takes these variations into account by using the average annual day.

## ES.5 EXISTING CONDITION NOISE CONTOURS AND NONCOMPATIBLE LAND USES

**Figure ES.1** (see page ES-10) presents the Existing Condition noise contours superimposed over the existing land use base map and is referred to as the Existing Condition NEM for Part 150 purposes. The lines of equal noise exposure are referred to as noise contours and are based on the DNL sound metric. The contours calculated for this study include the DNL 65-, 70-, and 75-dB contours.

**Figure ES.1** illustrates current compatible and noncompatible land uses surrounding EYW that are found within the DNL 65-, 70-, and 75-dB noise contours. Noncompatible land uses include single-family, multifamily, and transient lodging residential uses, as well as places of worship and community facilities (institutional land uses) and are indicated by a crosshatch pattern. Portions of Key West by the Sea Condominiums, Ocean Walk Apartments, and Las Salinas Condominiums are within the DNL 65 dB and

greater contour. Places of worship and community facilities (institutional land uses) within the DNL 65 dB contour include Grace Lutheran Church and School, and Catholic Charities St. Bede's Village. Transient lodging facilities within the DNL 65 dB contour include the Hyatt Residence Club Key West, Windward Pointe, and Hampton Inn Key West. Single- and multi-family land uses within the DNL 65 dB contour that are shown as compatible, which would normally be considered noncompatible, have been rendered compatible through participation in the Noise Insulation Program (NIP).

**Table ES.2** (see page ES-11) provides the number of housing units within the DNL 65-, 70-, and 75-dB contours. Single-family housing units that were split by a contour were counted in the higher-level contour. For multi-family residential and transient lodging facilities, the number of housing units was distributed amongst the various contours based on the proportion of the parcel's acreage that fell within each contour. The number of housing units was rounded to the nearest whole number. **Table ES.2** identifies the number of housing units that have participated in the NIP. These residences are now considered compatible land uses.

TABLE ES.2
EXISTING CONDITION NOISE EXPOSURE ESTIMATES - HOUSING UNITS AND POPULATION

EXISTING CONDITION NOISE EXPOSURE ESTIMATES - HOUSING UNITS AND POPULATION						
NUMBER OF HOUSING UNITS	DNL 65 TO 70 dBA	DNL 70 TO 75 dBA	DNL 75+ dBA	TOTAL OVER DNL 65 dBA		
Unmitigated (i.e., Noncompatible)						
Residential – Multi-Family	5	0	0	5		
Key West by the Sea Condominiums	12	0	0	12		
Ocean Walk Apartments	160	68	3	231		
Las Salinas Condominiums	18	0	0	18		
Residential – Single Family	41	2	0	43		
Transient Lodging (Occupancy Rate 84.175%)	146	8	0	154		
Total Unmitigated Housing Units	382	78	3	463		
Mitigated <sup>1</sup> (i.e., Compatible)						
Residential – Multi-Family	3	1	0	4		
Key West by the Sea Condominiums	88	0	0	88		
Residential – Single Family	87	60	7	154		
Total Mitigated Housing Units	178	61	7	246		

Notes: <sup>1</sup> Housing units are mitigated through participation in the NIP. Prepared by: Deborah Murphy Lagos & Associates and HD Mapping, 2022

## ES.6 FUTURE CONDITION AIRCRAFT OPERATIONAL CHARACTERISTICS

Most of the operational characteristics and assumptions used to develop the Existing Condition NEM were also used to generate the Future Condition NEM. Future operational characteristics including time of day, departure profiles and stage lengths, runway utilization, standing takeoff operations, flight tracks, and flight track utilization are not expected to vary significantly from current operational characteristics by 2028. The only operational characteristics that are expected to change are number of operations, air carrier / air taxi jet fleet mix, and back taxi operations. These assumptions were confirmed through consultation with airport staff and airport users.

The Terminal Area Forecast (TAF) is the official FAA forecast of aviation activity for U.S. airports. The TAF assumes a demand driven forecast for aviation services based upon local and national economic conditions as well as conditions within the aviation industry. In Federal Fiscal Year (FFY) 2020 there was a major decrease in passenger enplanements and commercial operations as a result of the COVID-19 pandemic. Total enplanements reported at FAA-towered airports and Federal contract-towered airports decreased 44.4 percent as a result of the COVID-19 pandemic. Total operations at these airports decreased 16.7 percent, commercial operations decreased 26.5 percent, and non-commercial operations decreased 9.1 percent. In FFY 2021 there was a modest recovery with these parameters increasing at above historical average growth rates. There is uncertainty associated with the forecasts because of the uncertainty regarding the pandemic and its economic impacts.

A total of 69,196 annual aircraft flight operations were modeled to develop the 2028 Future Condition NEM. This equates to 189.6 average daily operations. **Table ES.3** provides a breakdown of these operations by aircraft category.

In addition to the 69,196 annual flight operations,12,002 annual aircraft run-up operations (i.e., standing takeoff operations) were modeled to develop the 2028 Future Condition NEM. This equates to 56 average daily run-up operations.

TABLE ES.3
SUMMARY OF 2028 FLIGHT OPERATIONS

CATEGORY	ANNUAL OPERATIONS	AVERAGE DAILY OPERATIONS		
AC/AT JET	26,553	72.75		
AC/AT PROP	8,636	23.66		
GA PROP ITINERANT	18,038	49.42		
GA PROP LOCAL	2,435	6.67		
GA JET	9,599	26.30		
GA HELO	3,493	9.57		
MIL ITINERANT	262	0.72		
MIL LOCAL	92	0.25		
MIL HELO	88	0.24		
TOTAL	69,196	189.58		

Note: Numbers may not add due to rounding.

Sources: FAA TAF 2021

Prepared by: Deborah Murphy Lagos & Associates

## ES.5 FUTURE CONDITION NOISE CONTOURS AND NONCOMPATIBLE LAND USES

**Figure ES.2** presents the 2028 Future Condition noise contours superimposed over the existing land use base map and is referred to as the Future Condition NEM for Part 150 purposes. The lines of equal noise exposure are referred to as noise contours and are based on the DNL sound metric. The contours calculated for this study include the DNL 65-, 70-, and 75-dB contours.

**Figure ES.2** illustrates current compatible and noncompatible land uses surrounding EYW that are found within the DNL 65-, 70-, and 75-dB noise contours. Noncompatible land uses include single-family, multi-

family, and transient lodging residential uses, as well as places of worship and community facilities (institutional land uses) and are indicated by a crosshatch pattern. Portions of Key West by the Sea Condominiums, Ocean Walk Apartments, and Las Salinas Condominiums are within the DNL 65 dB and greater contour. Places of worship and community facilities (institutional land uses) within the DNL 65 dB contour include Grace Lutheran Church and School, Catholic Charities St. Bede's Village, Peace Covenant Presbyterian Church, and Key West High School. Transient lodging facilities within the DNL 65 dB contour include the Hyatt Residence Club Key West, Windward Pointe, and Hampton Inn Key West. Single- and multi-family land uses within the DNL 65 dB contour that are shown as compatible, which would normally be considered noncompatible, have been rendered compatible through participation in the Noise Insulation Program (NIP).

**Table ES.4** provides the number of housing units within the DNL 65-, 70-, and 75-dB contours. Single-family housing units that were split by a contour were counted in the higher-level contour. For multi-family residential and transient lodging facilities, the number of housing units was distributed amongst the various contours based on the proportion of the parcel's acreage that fell within each contour. The number of housing units was rounded to the nearest whole number. **Table ES.4** identifies the number of housing units that have participated in the NIP. These residences are now considered compatible land uses.

TABLE ES.4
FUTURE CONDITION NOISE EXPOSURE ESTIMATES – HOUSING UNITS AND POPULATION

NUMBER OF HOUSING UNITS	DNL 65 TO 70 dBA	DNL 70 TO 75 dBA	DNL 75+ dBA	TOTAL OVER DNL 65 dBA			
Unmitigated (i.e., Noncompatible)							
Residential – Single Family	45	5	0	50			
Residential – Multi-Family	5	0	0	5			
Key West by the Sea Condominiums	21	0	0	21			
Ocean Walk Apartments	159	77	6	242			
Las Salinas Condominiums	39	0	0	39			
Transient Lodging (Occupancy Rate 84.175%)	145	14	0	159			
Total Unmitigated Housing Units	414	96	6	516			
Mitigated¹ (i.e., Compatible)							
Residential – Single Family	96	63	8	167			
Residential – Multi-Family	3	1	0	4			
Key West by the Sea	183	0	0	183			
Total Mitigated Housing Units	282	64	8	354			
Total Housing Units	696	160	14	870			

Notes: <sup>1</sup> Housing units are mitigated through participation in the NIP. Prepared by: Deborah Murphy Lagos & Associates and HD Mapping, 2022

The area within the 2028 Future Condition NEM noise contours increased in size by 29.9 acres, or approximately 6.0 percent when compared to the 2022 Existing Condition NEM noise contours. This increase in size can be attributed to the increase in aircraft operations from 2021 to 2028. The contours also shifted to the west, which can be attributed to the relocation of Taxiway B to the end of the pavement. As a result, all aircraft departing on Runway 09 begin their takeoff roll at the end of the pavement. The 2028

Future Condition NEM encompasses 30 more acres of noncompatible land when compared to the 2022 Existing Condition NEM. The total housing units and population within the DNL 65 dB noise contour increases by approximately 23 percent.

#### **ES.6 PUBLIC PARTICIPATION**

Title 14 CFR part 150 §150.21(b) requires that each Noise Exposure Map (NEM) must be developed and prepared in consultation with FAA regional officials, the officials of the state and of any public agencies and planning agencies whose area, or any portion of whose area, of jurisdiction is within the DNL 65 dB contour depicted on the NEM, and other federal officials having local responsibility for land uses depicted on the map. This consultation must include regular aeronautical users of the airport, including air carriers and other aircraft operators.

Monroe County established the Ad Hoc Committee on Noise on May 16, 1995, by board motion. The members of the Ad Hoc Committee are appointed by the Monroe County Board of County Commissioners (BOCC) and represent the community and the aviation industry. Four members and one alternate represent airport neighbors, and four members and one alternate represent airport users. The committee chairperson is the BOCC representative from District 1, which includes the eastern portion of Key West, Stock Island, and Raccoon Key (aka Key Haven). The Committee has a collective and purposeful mission to not only represent the views of their immediate neighbors and/or aviation entity, but offer insights and comments related to noise issues affecting all Key West neighborhoods and aeronautical users.

The Ad Hoc Committee meetings served as the primary mechanism for receipt of public input for the NEM Update. Issues were raised, comments and suggestions were made, and all were discussed during the Ad Hoc Committee meetings. The Committee met nine times during the development of the NEM Update.

A Notice of Availability of the <u>Draft Noise Exposure Maps and Supporting Documentation</u> (the Draft NEM document) was published in *The Key West Citizen* as well as keysnews.com during the week of September 17, 2022. The Notice was also placed on the airport's website at <a href="https://eyw.com/public-notices">https://eyw.com/public-notices</a>. The Draft NEM document was made available electronically (in PDF format) for download on the airport's website at <a href="https://eyw.com/public-notices">https://eyw.com/public-notices</a>. All interested parties that are included on the Ad Hoc Committee and study email distribution lists were notified via email of the availability of the Draft NEM document. The Draft NEM document was available for public review at the Key West Public Library, EYW Administrative Office, and the office of Mayor Pro Tem Craig Cates. A printed copy of the Draft NEM document and a limited number of flash drives containing the Draft NEM document were available at each location. The comment period started on September 19, 2021, and ended on October 20, 2021, at 5:00 p.m.

A presentation on the <u>Draft the Noise Exposure Maps and Supporting Documentation</u> was made during the regular meeting of Monroe County's Ad Hoc Committee on Noise on October 4, 2022. The public was invited and encouraged to attend. There was an opportunity to ask questions, receive answers in real-time, and provide written comments.

The BOCC oversees the management and operation of all civilian airports within the County, including EYW. During their regular meeting on November 15, 2022, the BOCC voted to ratify and approve the Draft Noise Exposure Maps (NEMs) and Supporting Documentation for Key West International Airport.

Ratification included approval to transmit the document to the FAA for review and compliance determination.

### ES.7 FAA REVIEW AND ACCEPTANCE OF NEMS

Pursuant to § 150.21 (a), Monroe County (the airport operator) submitted to the FAA the specified number of copies of the noise exposure map with accompanying documentation which identifies each noncompatible land use in each area depicted on the map, as of the date of submission. The accompanying documentation included (1) the noise exposure based on forecast aircraft operations at the airport for a forecast period that is at least 5 years in the future, beginning after the date of submission (based on reasonable assumptions concerning future type and frequency of aircraft operations, number of nighttime operations, flight patterns, airport layout including any planned airport development, planned land use changes, and demographic changes in the surrounding areas); and (2) the nature and extent, if any, to which those forecast operations will affect the compatibility and land uses depicted on the map.

Pursuant to § 150.21 (c), the FAA will acknowledge receipt of the noise exposure maps and descriptions and will indicate whether they are in compliance with the applicable requirements. Following their determination that the NEMs submitted by EYW are in compliance with applicable requirements, the FAA will publish in the Federal Register a notice of compliance for each such noise exposure map and description, identifying the airport involved. Such notice will include information as to when and where the map and related documentation are available for public inspection.

As described in §47506(b)(1) of the *Aviation Safety and Noise Abatement Act of 1979*, a legal notice will be advertised in the local newspaper, *The Key West Citizen and* keysnews.com announcing the existence of the noise exposure maps. Pursuant to §47506(b), the legal notice will be published at least three times in a newspaper of general circulation in the county in which such property is located. The purpose of this notice is to provide constructive knowledge of the existence of the noise exposure maps.

Page ES-10 FIGURE ES.1

NOISE EXPOSURE MAP - ENLARGED



FIGURE ES.2 Page ES-11

2028 FUTURE CONDITION

NOISE EXPOSURE MAP - ENLARGED

