SAN DIEGO
INTERNATIONAL AIRPORT
LET'S GO.

Portable Noise Monitor Report

Prepared by: Aircraft Noise Office

For: Avoyer Place, La Mesa

October 20, 2022

Portable Noise Monitoring Summary

WHEN
WAS NOISE MEASURED

Monday, August 1, 2022, to
Thursday, August 11, 2022

11 Days

August 2022

S	M	T	W	T	F	S
	1	2	3	4	5	6
		measurements				
7	8	9	10	11	12	13
measurements						

Partial Measurement Days for Setup/Takedown

HOW MANY
AIRCRAFT NOISE EVENTS OCCURRED

91 SAN AIRCRAFT NOISE EVENTS / PER DAY

144 COMMUNITY NOISE EVENTS / PER DAY

39 NON-SAN AIRCRAFT NOISE EVENTS / PER DAY

MOST FREQUENT AIRCRAFT OVERFLIGHTS DURING THE MEASUREMENT PERIOD

Rank	Aircraft Type		Airport ID
1	Boeing 737-700		SAN
2	Embraer 170		SAN
3	Boeing 737-800		SAN
4	Cessna 172		MYF

CONCLUSION

During the nine, full (24-hour) day measurement period, the Community Noise Equivalent Level (CNEL) from aircraft noise* was 46 decibels (dB), while the CNEL from community noise was 52 dB.

The FAA and State of California's threshold for land use compatibility is an aircraft CNEL of 65 dB.

*Aircraft CNEL only includes operations from SAN.

Aircraft CNEL	Community CNEL	Total CNEL
46	52	53

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Introduction

Aircraft noise at the San Diego International Airport (SAN) has been monitored since the 1970s.

The Airport Noise and Operations Monitoring System (ANOMS) collects, analyzes, and processes data from several sources of information. The sources include noise events from 23 permanent Noise Monitoring Terminals (NMT's), Federal Aviation Administration (FAA) radar data, weather data, and noise complaints.

The purpose of the Portable Noise Monitoring program is to provide additional aircraft noise information beyond the Airport Authority's 23 NMT's. This information augments overall ANOMS data collection.

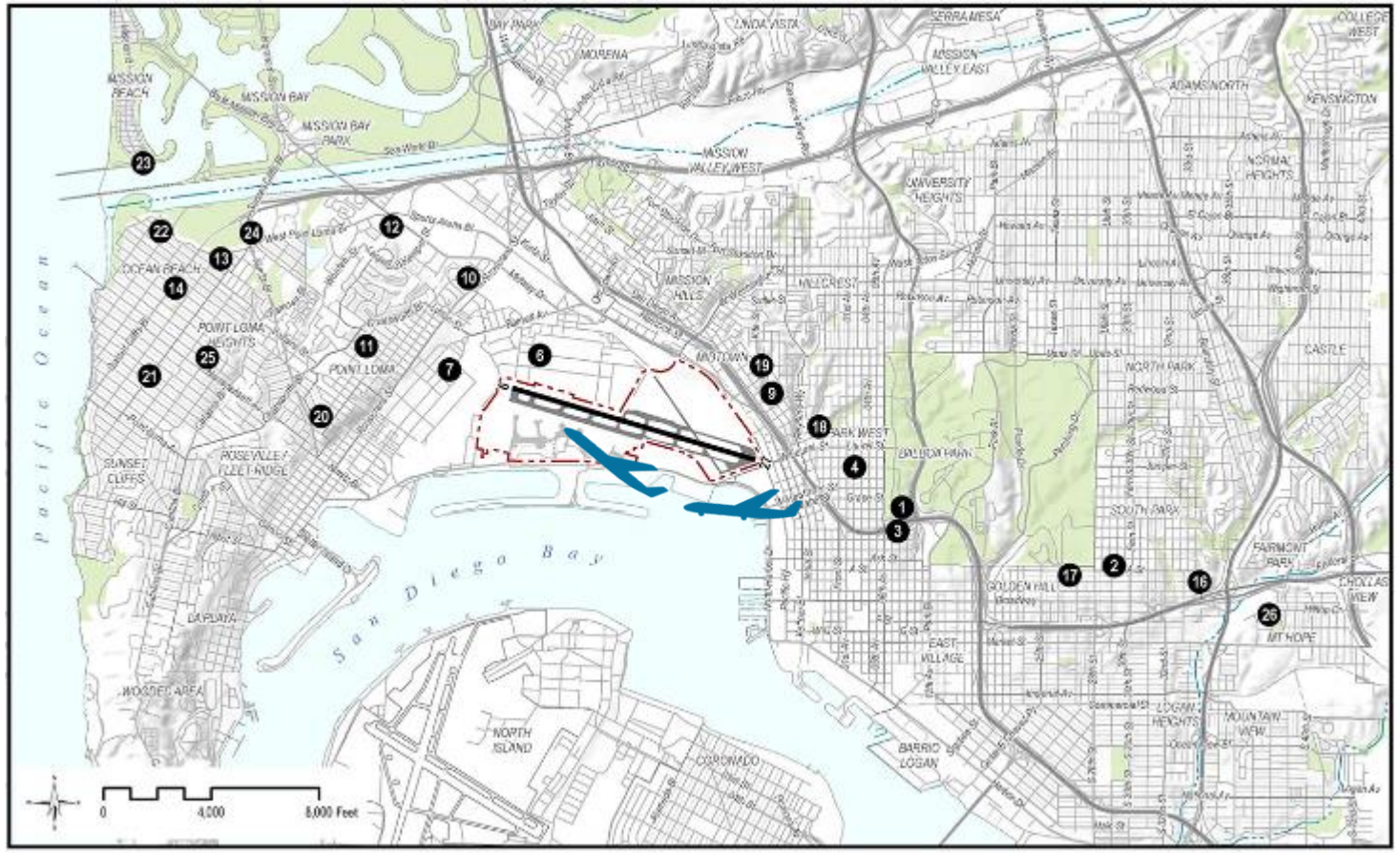


Figure 1. Map of the 23 permanent NMT locations at SAN. San Diego, CA.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Location

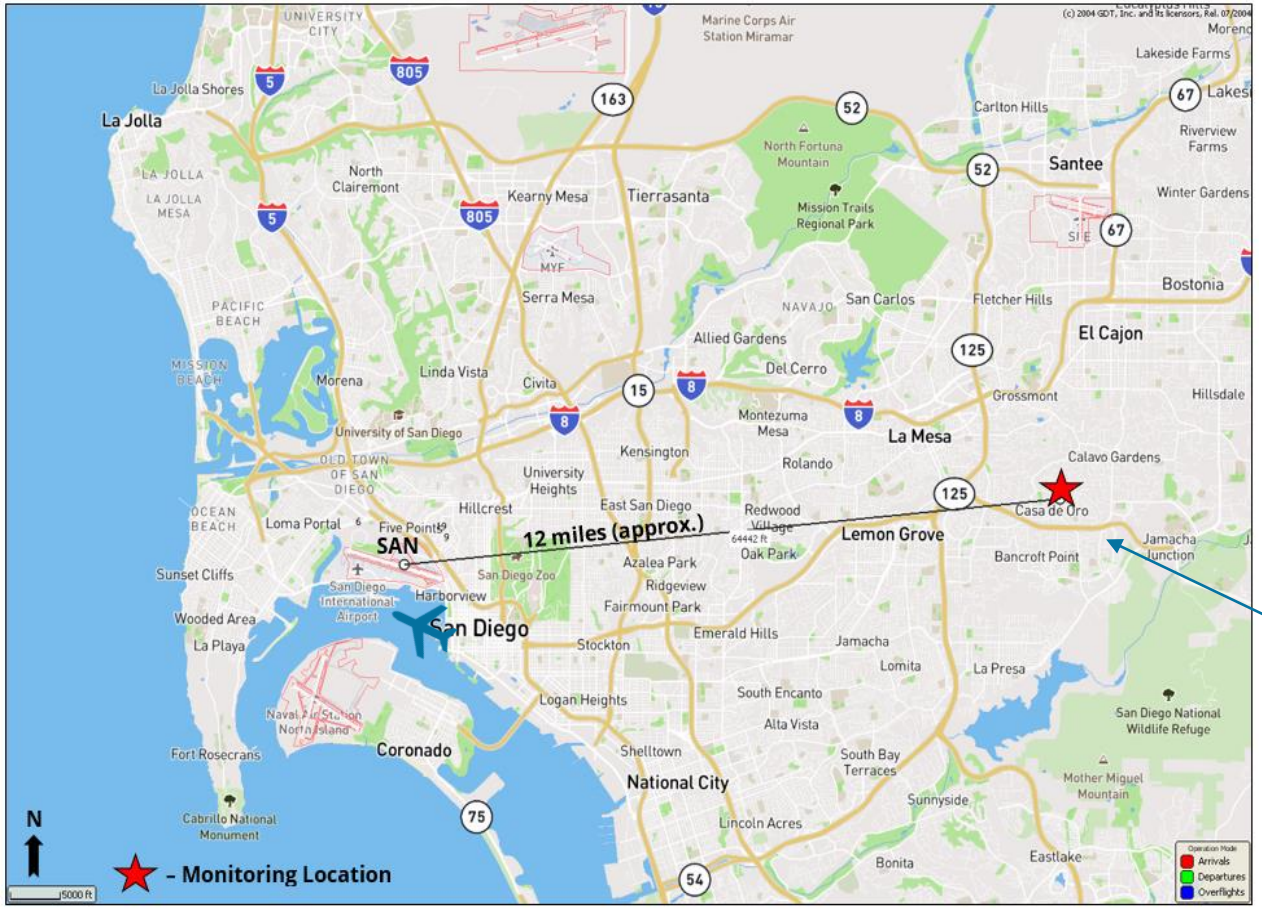


Figure 2. Map of the Portable Noise Monitoring location during August 1-11, 2022.

Location: Avoyer Pl., La Mesa, CA 92941.

Dates of Monitoring: August 1-11, 2022.

Proximity from SAN: The monitor was located approximately 12-miles east of the Airport.

On-Site Set Up: The noise monitor was placed in the back yard of a private and secure property. The monitor operated continuously during the entire 9–day measurement period. The microphone was positioned approximately six feet above the ground. The local terrain was sloping to the south, providing a wide and open area to conduct unobstructed sound measurements.

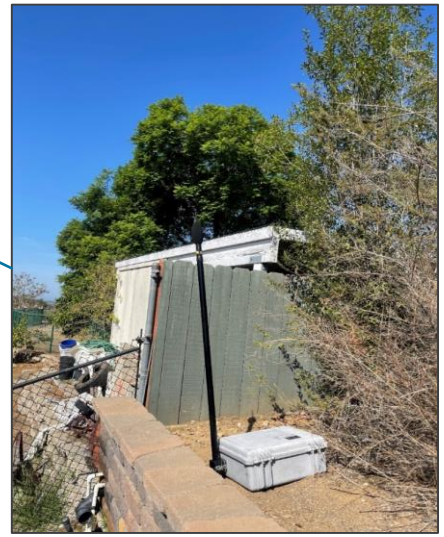


Figure 3. Portable Noise Monitor Set Up

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Methodology

Measurements were taken using a B&K Class I, 2250 Sound Level Meter.* The meter is a ‘precision’ grade analyzer, which was calibrated prior to the test.

In the absence of a nearby permanent NMT, a commonly used single baseline threshold of 50 dBA for the entire 24-hour period was established. For a sound event to trigger, the Equivalent Continuous Sound Level (LEQ) needed to exceed 50 dBA and last for over five seconds (minimum duration). The maximum duration was 60 seconds, and an event would be discarded beyond that time. For consistency, the portable monitor clock was synchronized to the same source used by ANOMS. The sound level meter recorded the following information about each noise event: date, time, duration, and noise levels.

Figure 4. B&K Class I, 2250 Sound Level Meter and associated field equipment.

* https://www.bksv.com/en/instruments/handheld/sound-level-meters/2250-series/type-2250-l, this meter meets Class I American National Institute Standards, Inc. (ANSI) S1.4:2014

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Noise Definitions

Noise by definition is unwanted sound. There are many ways to describe noise (metrics) however, the most commonly relied on metric is the **decibel (dB)**.

A-weighting (dBA) is used to adjust (filter) for frequency range of human hearing.

A number of factors affect sound, including, weather, ground effects, as well as human reaction to the noise source.

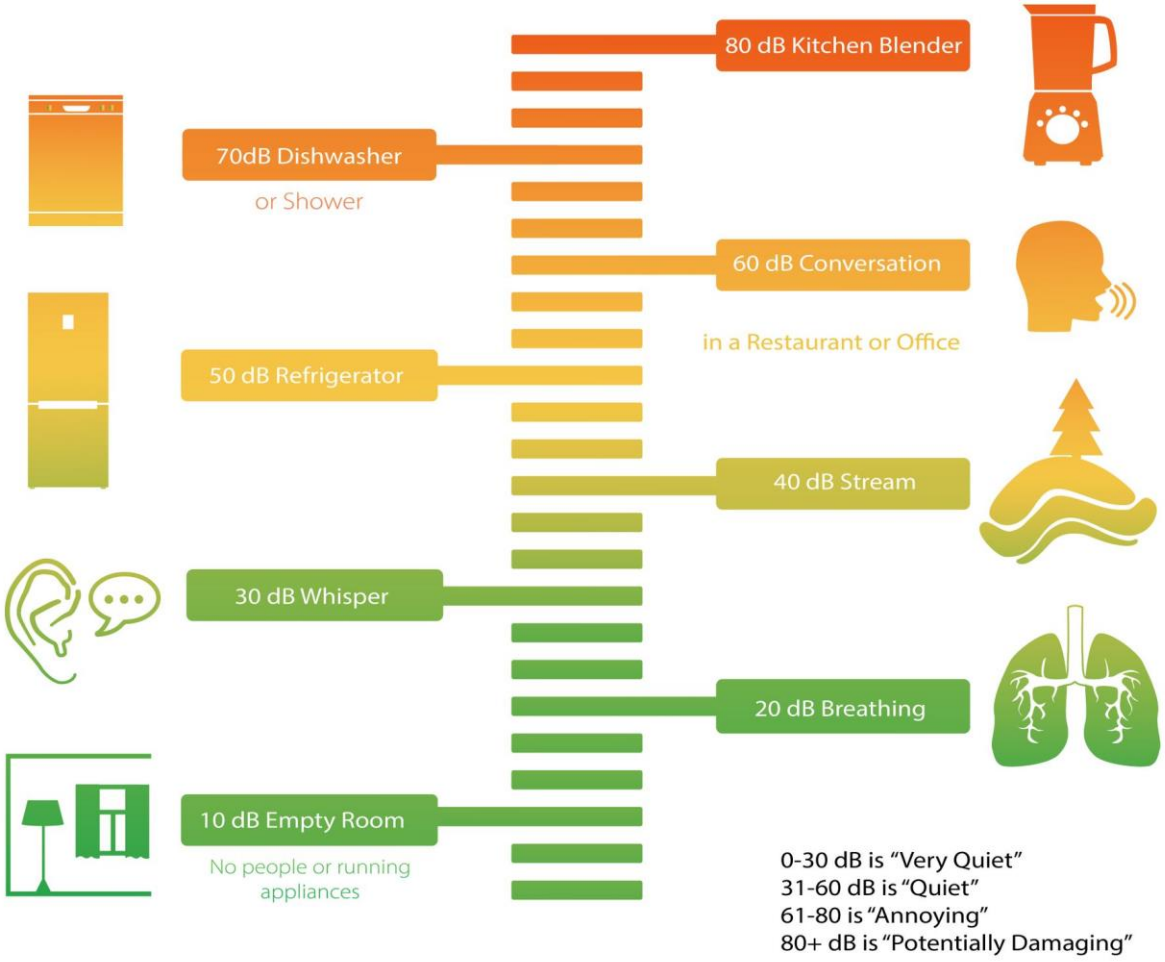


Figure 5. Common Sound Levels, Source: https://www.sylvane.com/blog/how-loud-is-a-decibel/.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Noise Definitions (cont.)

SEL – The most common measure of cumulative noise exposure for a single aircraft flyover is the Sound Exposure Level (SEL). Mathematically, it is the sum of the sound energy over the duration of a noise event – one can think of it as an equivalent noise event with a one-second duration.

Lmax – Maximum Sound Level is a measurement of the peak level of a sound event.

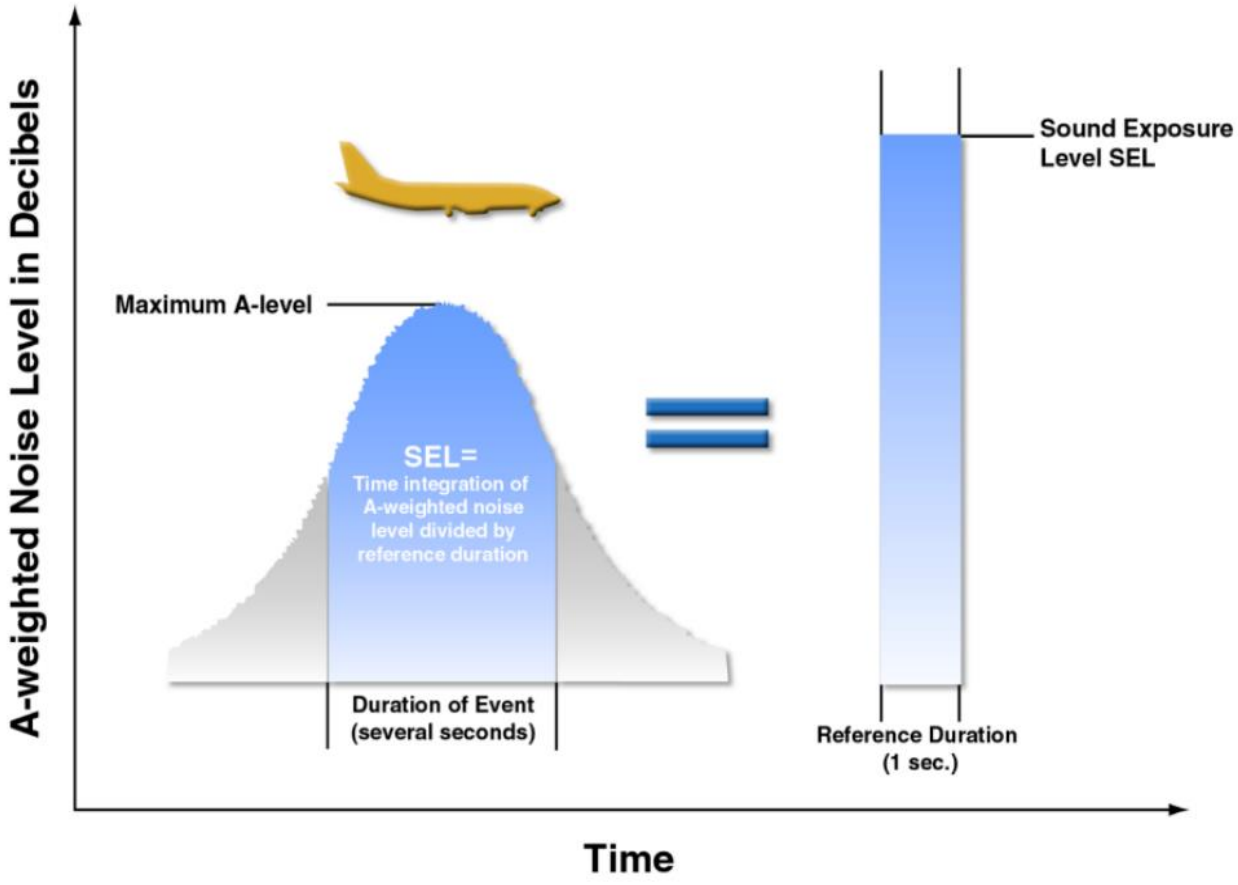


Figure 6. Sound Exposure Level and Maximum Sound Level, Source: Brown-Buntin Associates, Inc.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Metrics

The FAA and other federal agencies have established land use compatibility guidelines based on the Community Noise Equivalent Level (CNEL). CNEL is a weighted average of noise level over a 24–hour period. For CNEL calculation, a penalty of 5 dBA is added between 7 PM – 10 PM for evening hours, and a penalty of 10 dBA is added for the nighttime hours of 10 PM – 7 AM.

The logic behind these applied penalties is that residents are usually more sensitive to noise at night and during evening hours. CNEL is frequently used in regulations of airport noise impact on the surrounding community. A CNEL (for aircraft noise) exceeding 65 dBA is generally considered a threshold for land use compatibility.

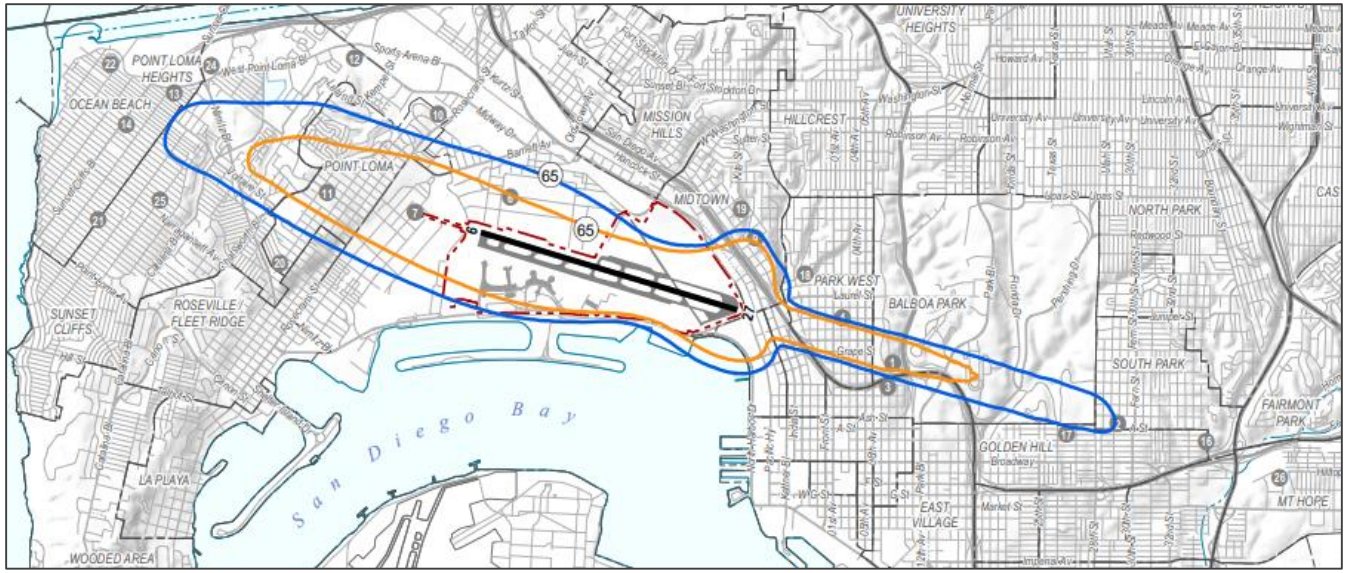


Figure 7. Example of CNEL contour, Source: 2nd Quarter 2022, State of California Quarterly Noise Report for SAN.

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Aircraft Operations

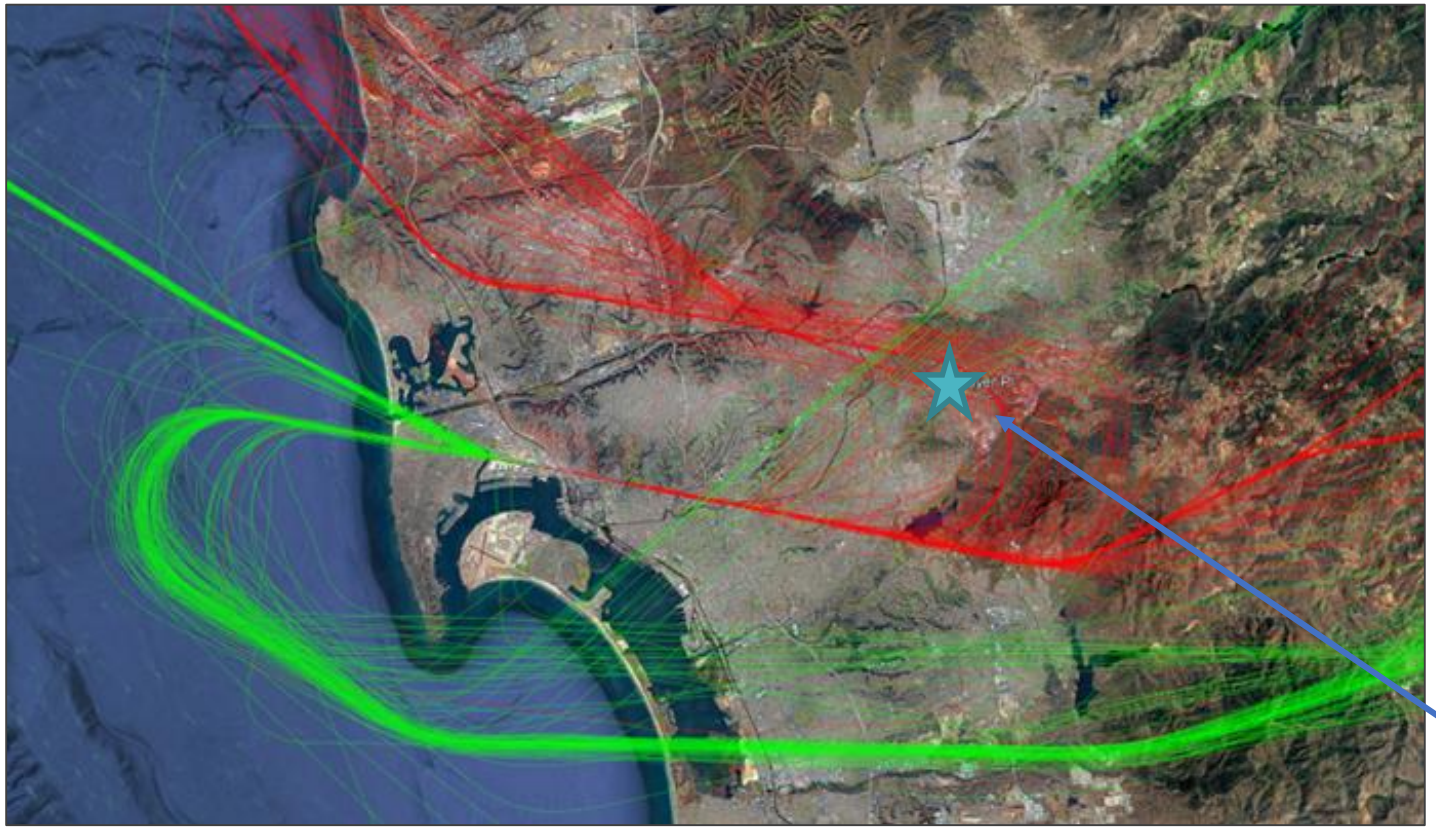


Figure 8: Flight Tracks during an average day in the testing period. Source: ANOMS

Aircraft at SAN typically operate in a "west flow" pattern where they arrive from the east and depart to the west. During inclement weather or high wind conditions they might operate in a reverse flow departing to the east and arriving to the west, however "east flow" is infrequent and represents approximately 1.7% of the total annual operations.

During the 9-day measurement period, there were 5,727 total operations: 2,866 Arrivals and 2,861 Departures. The average number of flights per day was 636.

The flight tracks in this figure are a sample of a "typical" day taken from July 21, 2022, and represent 702 flights.

Location: Avoyer Place, La Mesa

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Daily Noise Event Data

	SAN Aircraft			Non-SAN Aircraft			Community		
Date	# of Noise Events	AVG SEL	Avg LMAX	#of Noise Events	AVG SEL	Avg LMAX	# of Noise Events	AVG SEL	Avg LMAX
1-Aug	79	70	58	38	71	59	130	99	59
2-Aug	107	70	58	46	70	57	154	70	55
3-Aug	101	69	57	45	69	57	152	68	57
4-Aug	114	70	58	28	68	57	175	72	58
5-Aug	99	69	58	26	70	58	96	72	57
6-Aug	75	72	59	59	75	60	233	76	61
7-Aug	94	67	55	31	70	58	97	68	57
8-Aug	102	69	56	37	70	57	135	66	56
9-Aug	85	69	57	38	70	57	136	73	57
10-Aug	91	69	57	39	70	58	122	74	57
11-Aug	56	67	56	18	70	58	92	69	55

Figure 9: The table presents the daily noise event averages. Source: ANOMS

Location: Avoyer Place, La Mesa

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Loudest Aircraft Noise Events*

Aircraft	Airline	Event Date / Time	Airport	SEL (dB)	LMAX	Altitude (Ft. AGL)
Robinson Helicopter R44	N/A	8/6/2022 12:50	Montgomery-Gibbs Executive Airport	80	76.5	3,117
Van's Aircraft RV4	N/A	8/6/2022 15:21	Montgomery-Gibbs Executive Airport	79.6	70.3	2,073
Bell 407 Helicopter	N/A	8/2/2022 1:09	Gillespie Field Airport	79.4	67.3	1,588
Bell 407 Helicopter	N/A	8/9/2022 23:14	Gillespie Field Airport	79.3	64.7	1,506
Bell 407 Helicopter	N/A	8/5/2022 17:18	Gillespie Field Airport	78.7	69.5	1,709
Bell 407 Helicopter	N/A	8/7/2022 0:22	Gillespie Field Airport	78.5	65.8	1,598
Boeing 737-800	Southwest Airlines	8/3/2022 7:04	San Diego International Airport	78.5	75.3	5,046
Bell 407 Helicopter	N/A	8/1/2022 15:14	Gillespie Field Airport	78.4	68.9	1,401
Bell 407 Helicopter	N/A	8/6/2022 1:16	Gillespie Field Airport	78.4	66.4	1,499
Bell 407 Helicopter	N/A	8/2/2022 1:19	Gillespie Field Airport	78.1	65.1	1581

Figure 10: Loudest aircraft noise events August 1-11, 2022.

Location: Avoyer Place, La Mesa

*Note: The above graph denotes the 10 loudest aircraft noise events. While collecting data, the actual 10 loudest noise events were community noise events. Community noise can consist of construction, traffic, animals, etc...

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Noise Summary

In general, there are three sources of emitted energy, as it relates to sound measurements.
SAN Aircraft is sound solely attributed to aircraft operating at SAN.
Non-SAN Aircraft sound is measured for all “other” aircraft that do not operate in or out of SAN.
Community, also known as Ambient, sound are the sound events from all other sources such as vehicular traffic, landscaping activities, conversations, construction activities, kids playing, etc.

Noise Event Breakdown	
SAN Aircraft	823
Non-SAN Aircraft	349
Community	1,300

Figure 13. Total Noise Events for Avoyer Place, La Mesa, August 1-11

Date	Daily SAN Aircraft CNEL
8/2/2022	44
8/3/2022	44
8/4/2022	46
8/5/2022	44
8/6/2022	45
8/7/2022	43
8/8/2022	44
8/9/2022	42
8/10/2022	44

Figure 11. Daily Aircraft CNEL Levels for Avoyer Place, La Mesa

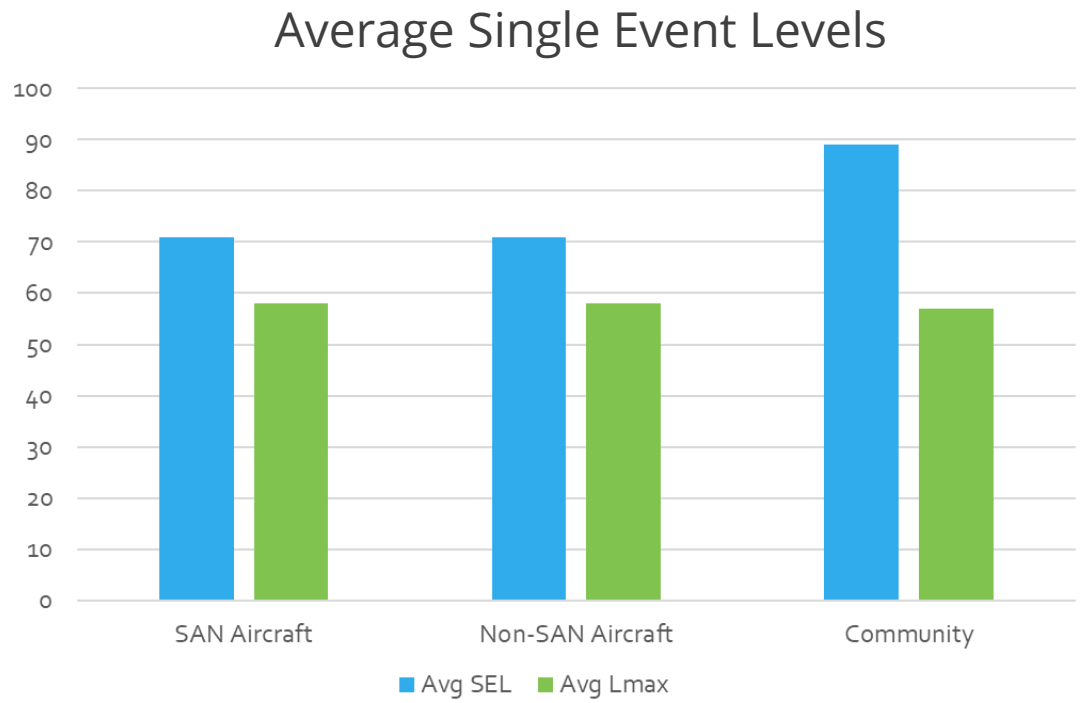
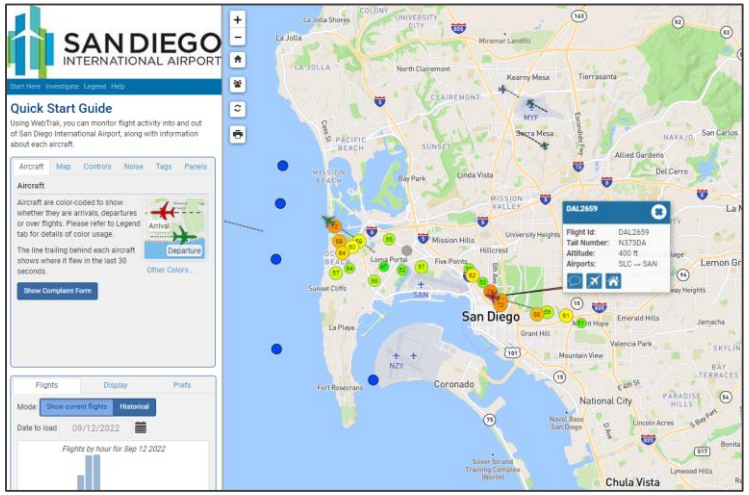


Figure 12. Average Single Event Levels for Avoyer Place, La Mesa

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.

Additional Resources

If you have any additional questions about the information in this report, or any other aircraft noise related concerns, please contact our **Aircraft Noise Office at 619-400-2660** and ask for a Noise Specialist. For additional information you can review aircraft flight tracks, file a noise complaint, or attend an Airport Noise Advisory Committee (ANAC) meeting.



If you want to research an aircraft, you can view the nearly real-time flight tracks on our website at:

https://webtrak.emsbk.com/san

Three ways to file a complaint:

1. On the web at https://webtrak.emsbk.com/san
2. Through the app, which can be found at https://viewpoint-app.emsbk.com/san4/login
3. By telephone at 619-400-2799

Learn more about what efforts have been done to reduce aircraft noise in the community or voice a concern about aircraft noise by attending a quarterly **Airport Noise Advisory Committee meeting.**

You can find out more information and location on our website here:

https://www.san.org/Aircraft-Noise/Initiatives

SAN DIEGO INTERNATIONAL AIRPORT
LET'S GO.