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INTERNATIONAL AIRPORT
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Portable Noise Monitor Report

Prepared by: Aircraft Noise Office

For: Tarento Drive, San Diego, CA

December 15, 2022

Portable Noise Monitoring Summary

WHEN
WAS NOISE MEASURED

November 14 – 28, 2022

15 Days

	S	M	T	W	T	F	S
November 2022		14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28					

Partial measurement (setup / takedown) days.

Full (24-hour) measurement days.

HOW MANY
NOISE EVENTS REGISTERED

8 SAN AIRCRAFT NOISE EVENTS TOTAL

780 COMMUNITY NOISE EVENTS TOTAL

34 NON-SAN AIRCRAFT NOISE EVENTS TOTAL

MOST FREQUENT AIRCRAFT FLIGHTS DURING THE MEASUREMENT PERIOD

Rank	Aircraft Type		Airport ID
1	Cessna 172		CRQ, MYF, NZY, VNY
2	C208		SAN
3	SR22		CRQ, MYF
4	B739		SAN

CONCLUSION

During the 13 full (24-hour) day measurement period, the Community Noise Equivalent Level (CNEL) from aircraft noise* was 32.8 decibels (dB), while the CNEL from community noise was 49.8 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
33	50	50

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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 Remote Monitoring Terminals (RMT'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 RMT's. This information augments overall ANOMS data collection.

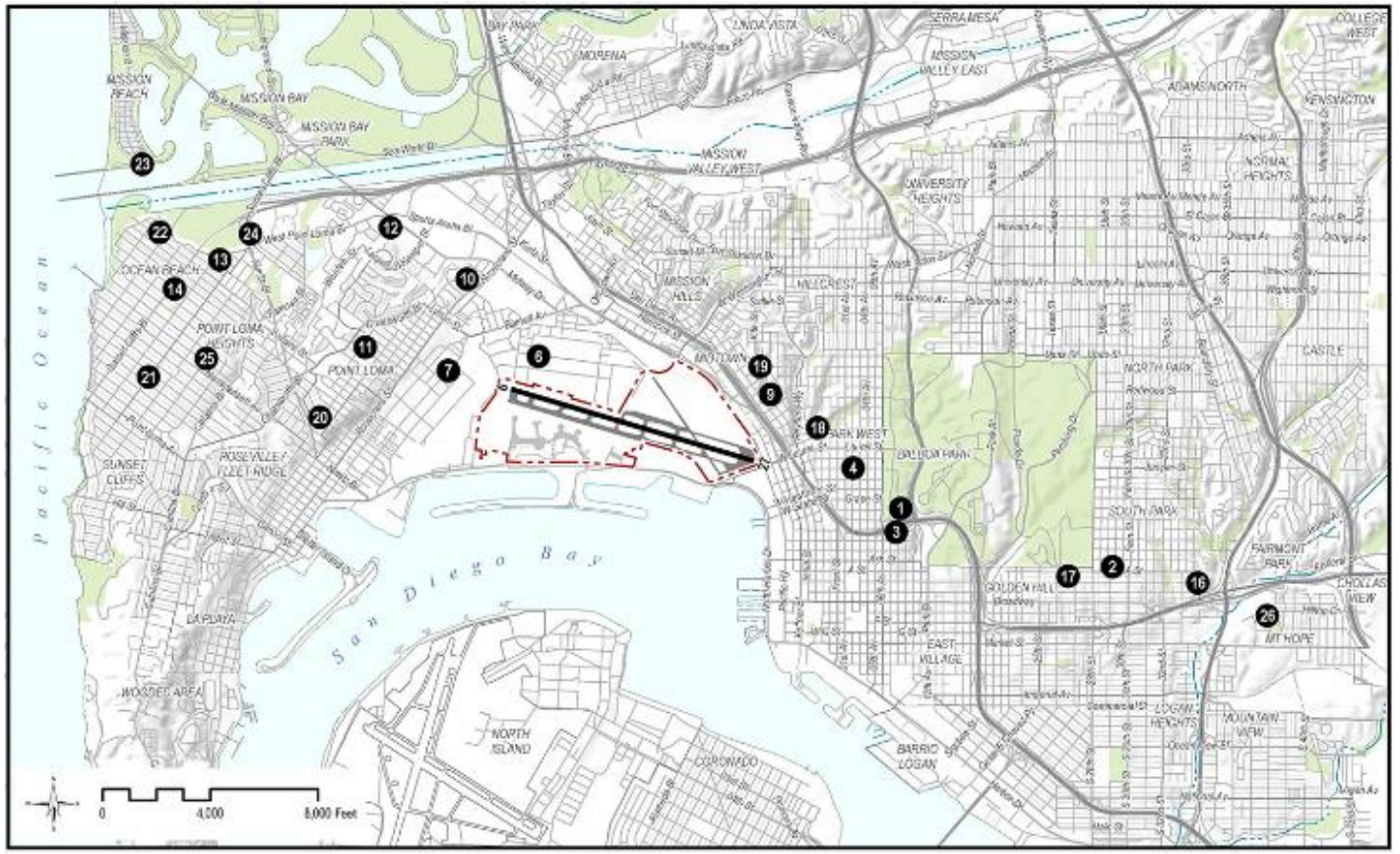

Figure 1. Map of the 23 permanent RMT locations at SAN, San Diego, CA.

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Location

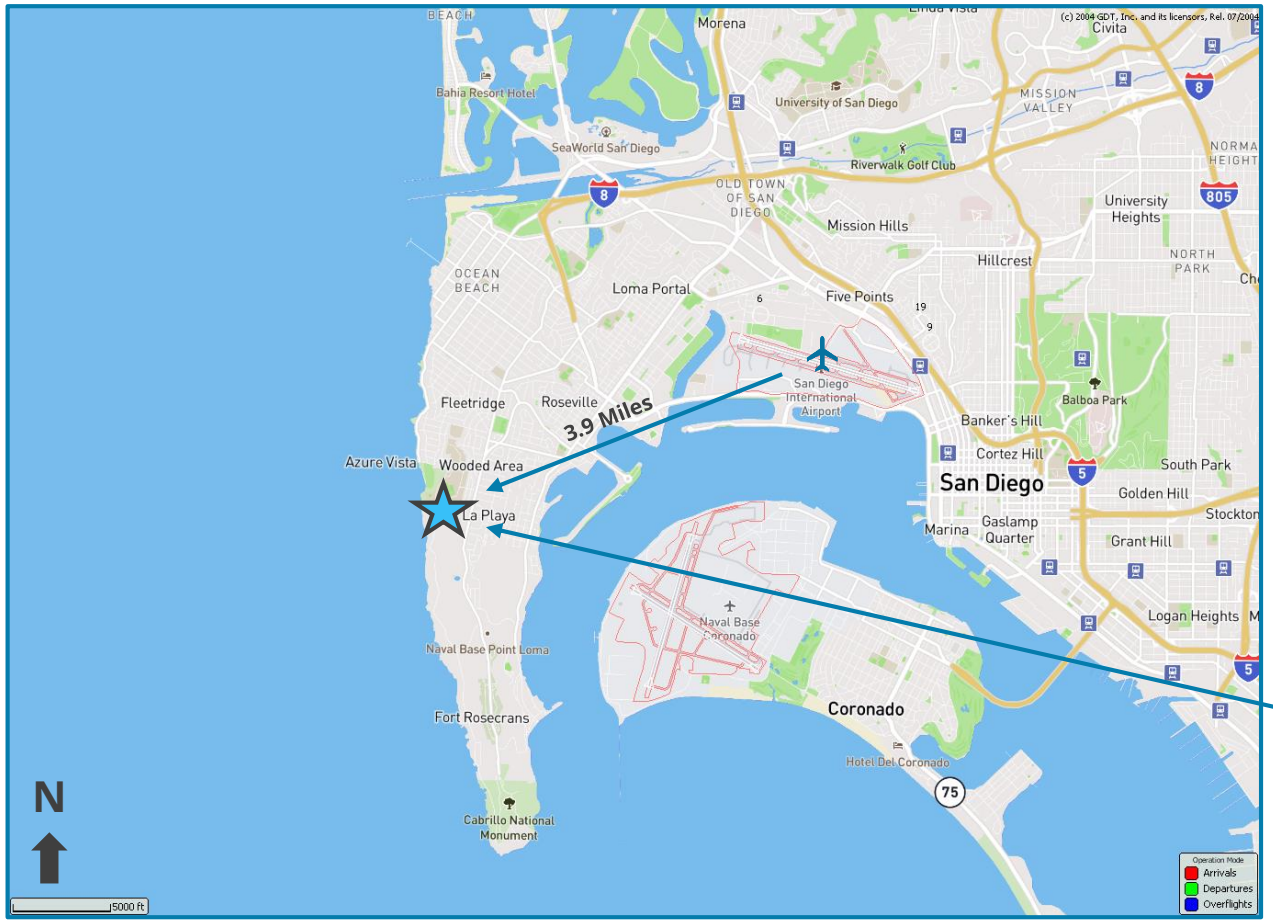

Figure 2. Map of the Portable Noise Monitoring location during November 14 – 28, 2022.

Location: Tarento Dr., San Diego, CA 92107.

Dates of Monitoring: November 14 – 28, 2022.

Distance from SAN: The monitor was located approximately 3.9 miles southwest from the center of the Airport.

On-Site Set Up: The noise monitor was placed in the backyard of a private and secure property. The monitor operated continuously during the entire 15–day measurement period. First and last days were partial measurement days, used for setup and takedown.
The microphone was placed approximately six feet above the ground.

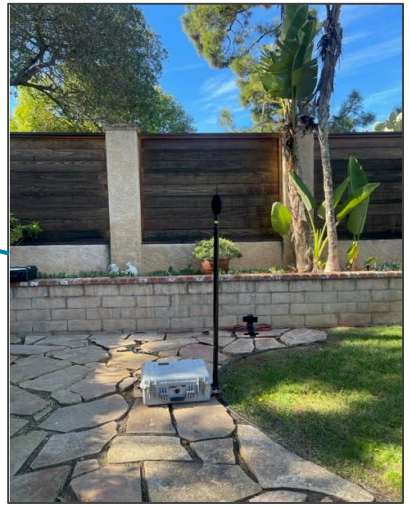

Figure 3. Portable Monitor at Location.

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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.

The following baseline thresholds were established: 60 dBA for Daytime (7:00 a.m. – 10:00 p.m.), 58 dBA for Evening (07:00 p.m. – 10:00 p.m.) and 55 dBA for nighttime (10:00 p.m. – 7:00 a.m.). The baseline threshold levels were established to match the nearest permanent RMT. After the first seven days, threshold was adjusted to a single 50 dBA level, because noise events were not being registered. 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 30 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.

Note: 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

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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.

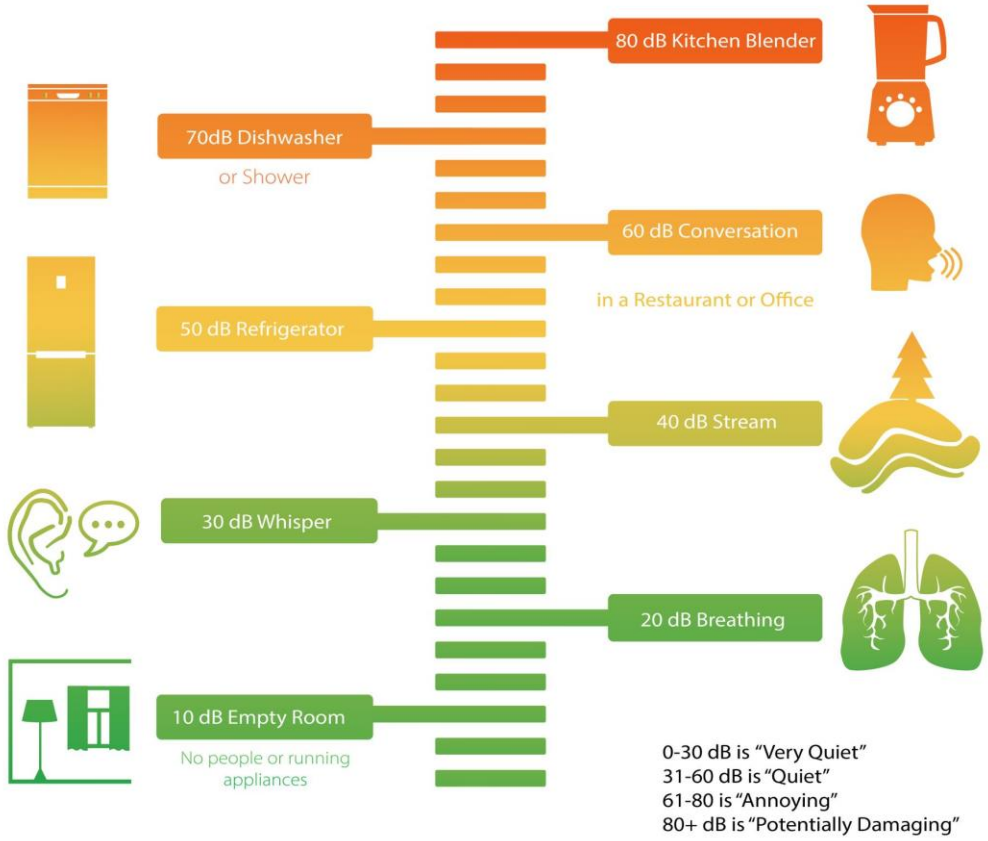

Figure 5. Common Sound Levels.
Source: https://www.sylvane.com/blog/how-loud-is-a-decibel/

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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.

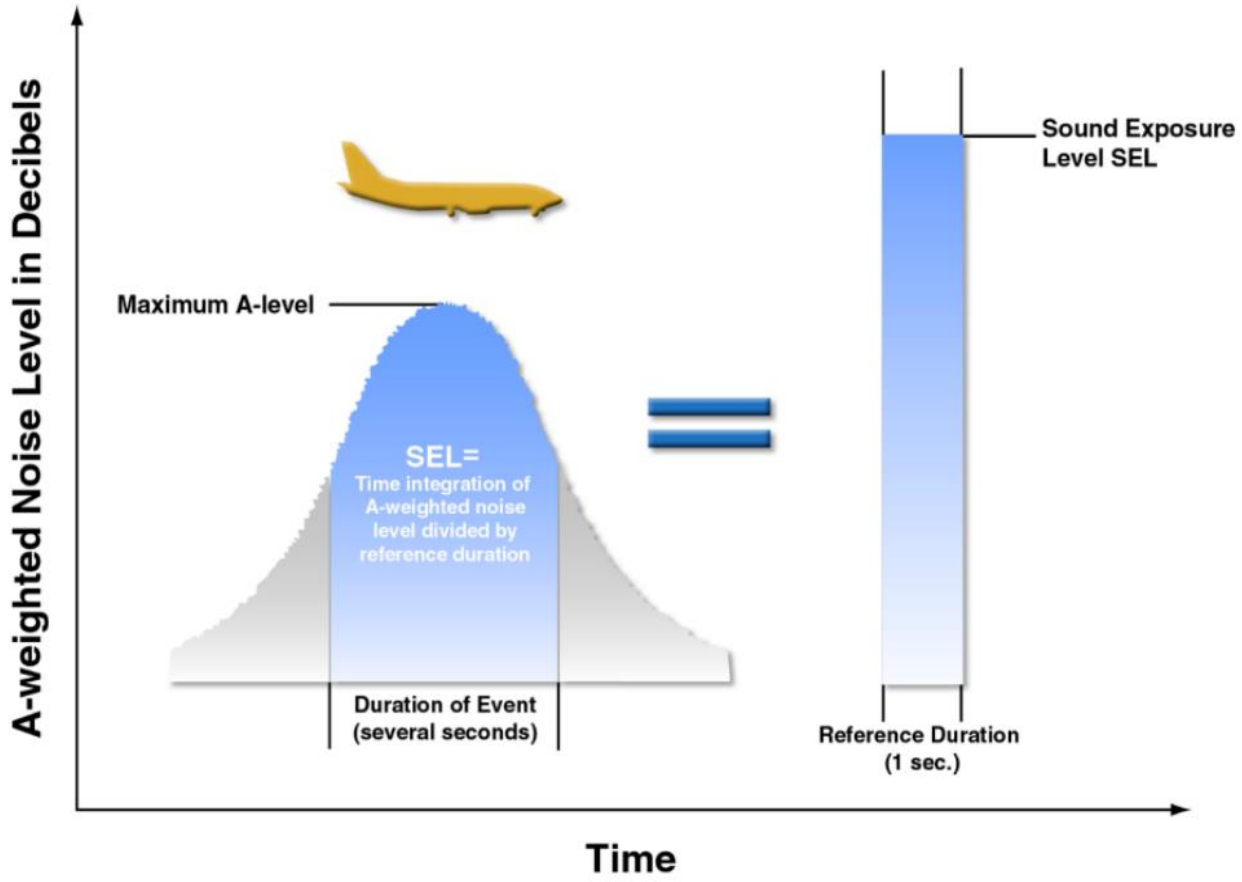

Figure 6. Sound Exposure Level and Maximum Sound Level.
Source: Brown-Buntin Associates, Inc.

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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 p.m. – 10 p.m. for evening hours, and a penalty of 10 dBA is added for the nighttime hours of 10 p.m. – 7 a.m.

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.

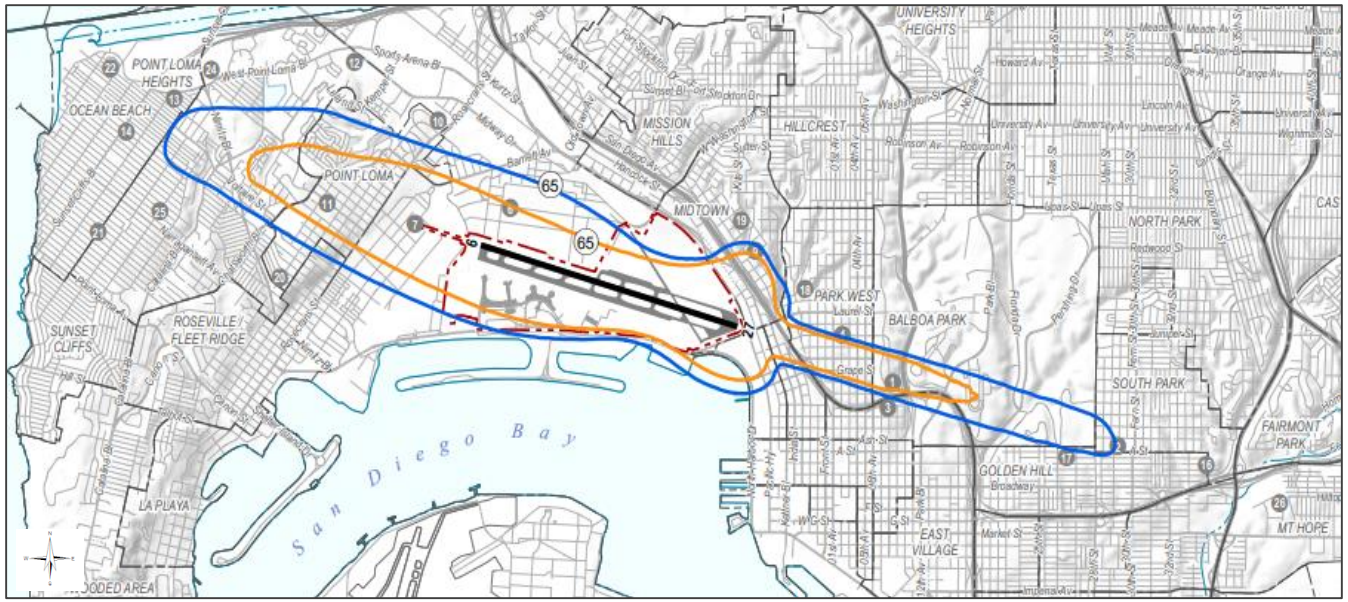

Figure 7. Example of CNEL contour, Source: 2nd Quarter 2022, State of California Quarterly Noise Report for SAN.

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Aircraft Operations

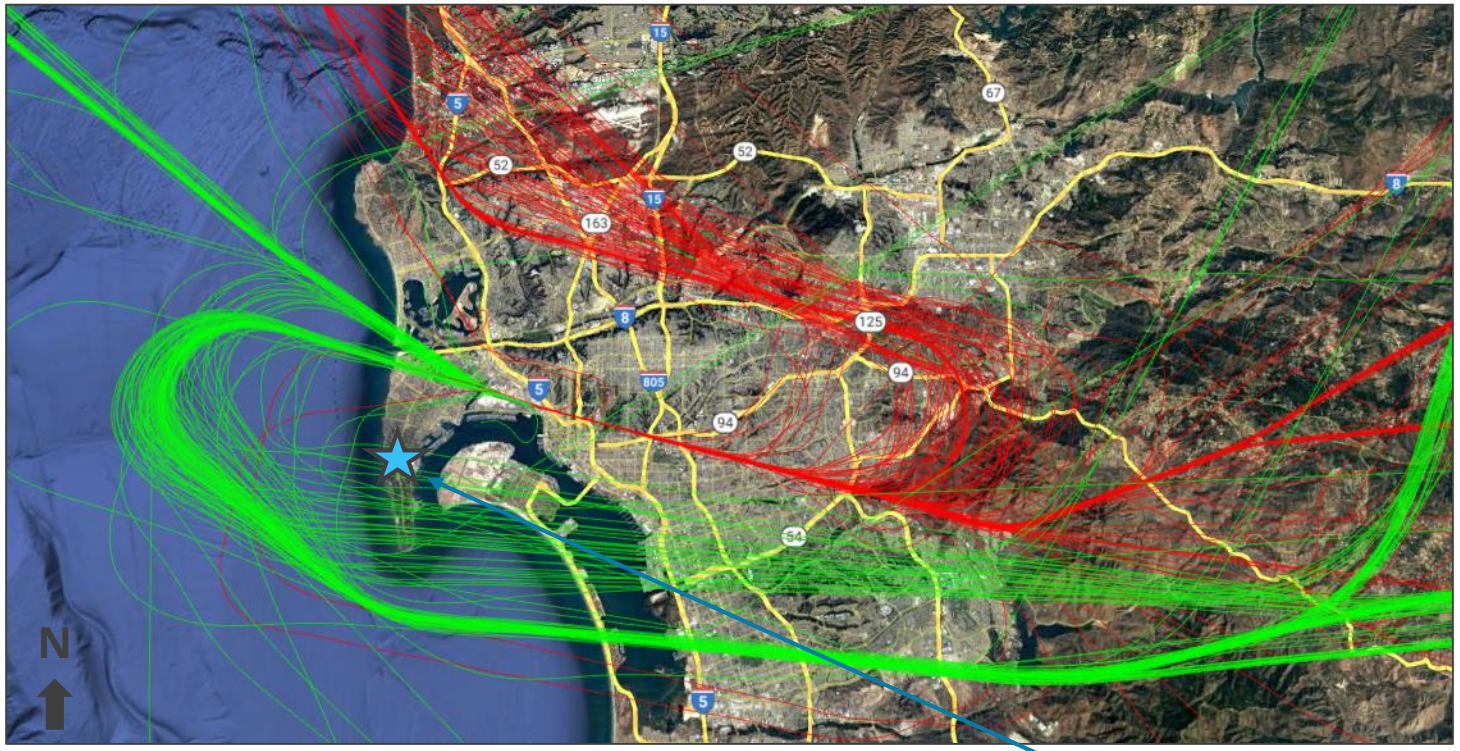

Figure 8. Flight Tracks during an average day in the testing period.
Source: ANOMS.

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, aircraft might operate in a reverse flow, departing to the east and arriving from the west, however this "east flow" pattern is infrequent and represents approximately 1.7% of the total annual operations.

During the 13 full-day measurement period, there were 7,825 total SAN operations: 3,915 Arrivals and 3,910 Departures. The average number of flights per day was 602.

Flight tracks in Figure 8 are a sample of a "typical" day taken from November 21, 2022, and represent 653 flights.

Location: Tarento Drive, San Diego, CA

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Daily Noise Event Data

	SAN Aircraft			Non-SAN Aircraft			Community		
Date	Noise Events (quantity)	Average SEL (dB)	Average Lmax (dB)	Noise Events (quantity)	Average SEL (dB)	Average Lmax (dB)	Noise Events (quantity)	Average SEL (dB)	Average Lmax (dB)
11/15/2022	0	0	0	1	73	70	0	0	0
11/16/2022	0	0	0	0	0	0	4	78	68
11/17/2022	0	0	0	0	0	0	5	78	67
11/18/2022	2	78	70	0	0	0	3	80	72
11/19/2022	0	0	0	0	0	0	0	0	0
11/20/2022	0	0	0	0	0	0	0	0	0
11/21/2022	0	0	0	0	0	0	2	80	72
11/22/2022	0	0	0	7	71	68	69	70	65
11/23/2022	3	76	67	14	77	67	108	85	75
11/24/2022	0	0	0	4	69	57	363	71	61
11/25/2022	1	65	56	1	67	56	25	69	61
11/26/2022	1	73	63	1	69	62	67	77	72
11/27/2022	1	67	55	6	64	58	134	68	60

Figure 9. Daily noise events averages.
Location: Tarento Drive, San Diego, CA.
Source: ANOMS.

Note: Full 24-hour days of measurements are displayed. Partial measurement (setup / takedown) days are not shown. Quantity "zero" noise events and average levels indicate that those were not registered by the Sound Level Meter.

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Loudest Aircraft Noise Events

Aircraft Type	Airline	Eevent Date / Time	Airport	SEL (dB)	Lmax (dB)	Height[1] at Lmax (Feet. MSL[2])
R22	N/A	11/23/22 3:10 PM	Brown Field Municipal Airport	85.4	76.3	157
B739	Alaska Airlines	11/23/22 10:53 PM	San Diego International Airport	80.5	71.2	2481
C172	N/A	11/23/22 2:37 PM	Gillespie Field Airport	79.1	65.1	169
C172	N/A	11/23/22 2:37 PM	Gillespie Field Airport	78.5	71	172
R22	N/A	11/23/22 3:10 PM	Brown Field Municipal Airport	78.5	64.9	146
R44	N/A	11/18/22 12:53 PM	San Diego International Airport	78.3	69.2	456
R44	N/A	11/18/22 12:53 PM	San Diego International Airport	78.2	70.2	481
C172	N/A	11/22/22 3:42 PM	Montgomery-Gibbs Executive Airport	77.9	75.9	163
C172	N/A	11/15/22 9:01 AM	Montgomery-Gibbs Executive Airport	76.4	70.3	187
C172	N/A	11/23/22 2:37 PM	Gillespie Field Airport	75.2	65.2	277

Figure 10. Loudest aircraft noise events November 15 - 27, 2022.
Location: Tarento Drive, San Diego, CA.
Height[1] – at which Lmax was registered.
MSL[2] – Mean Sea Level.
Source: ANOMS.

Note: This tables 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.

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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	8
Community	780
Non-SAN Aircraft	34

Figure 13. Registered Noise Events for Tarento Drive, San Diego, CA.
Source: ANOMS.

Date	Daily SAN Aircraft CNEL (dB)
11/15/2022	27
11/16/2022	0
11/17/2022	0
11/18/2022	32
11/19/2022	0
11/20/2022	0
11/21/2022	0
11/22/2022	30
11/23/2022	43
11/24/2022	27
11/25/2022	20
11/26/2022	25
11/27/2022	23

Figure 11. Daily Aircraft CNEL Levels for Tarento Drive, San Diego, CA.
Source: ANOMS.

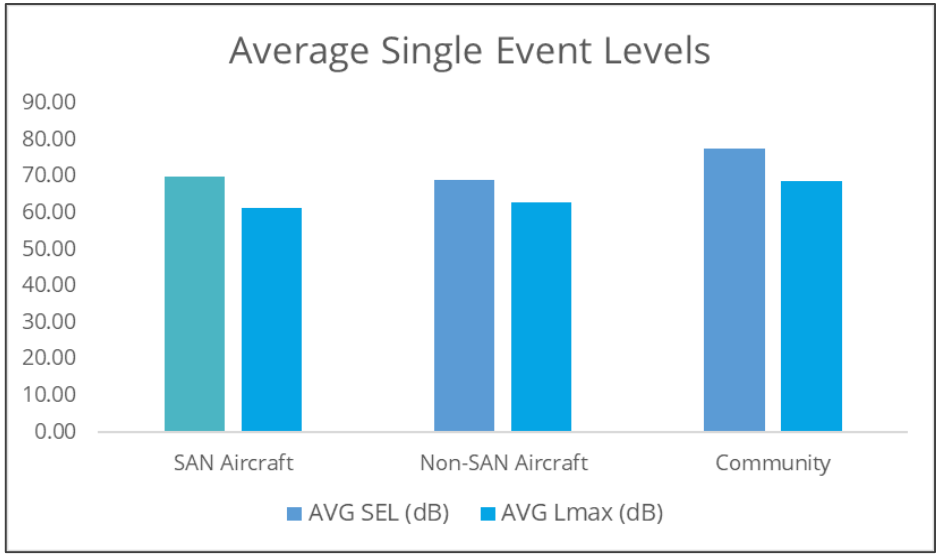

Figure 12. Average Single Event Levels for Tarento Drive, San Diego, CA.
Source: ANOMS.

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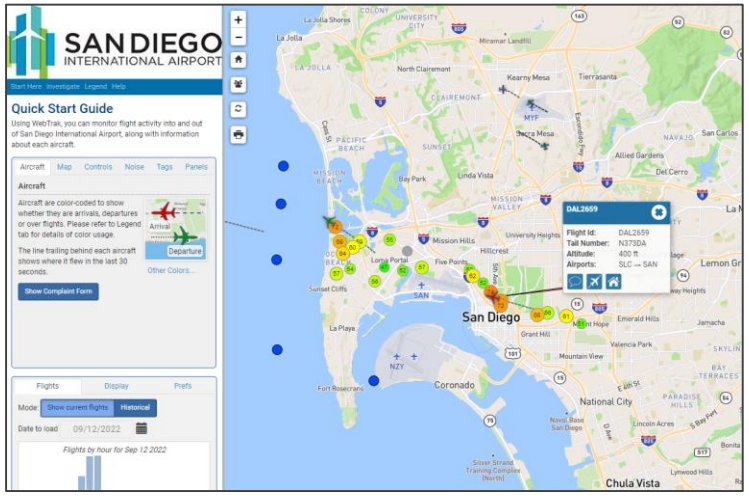
Note: Quantity "zero" CNEL levels indicate that those were not registered by the Sound Level Meter.

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

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