



December 1, 2021

Fly Quiet Report

FAA Fiscal Year 2021

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1.0 Summary of the 2021 Report

The Airport Noise Mitigation Office publishes an annual report that outlines the trends on how quietly each operator flies in and out of San Diego International Airport (SDIA). This is a summary of the Fly Quiet Report for 2021.

To better align with ANAC reporting periods, we have adjusted the program evaluation period to the FAA Fiscal Year which runs from October through the following September. This will allow for facilitation of the awards with ANAC approval in December, award coordination and Board presentation to the carriers in February of each year.

Observations for 2021:

- Stage 4 use has expanded significantly due to COVID through fleet attrition improving fleet quality scores.
- Exceedance measurements performed as expected to balance out the Fleet Quality component.
- Curfew Component impacts are still on the heavy side, but this will be augmented in 2022 with a Stage 4 component allowing recovery from penalized curfew violations.

This year's winners:

- Large Carrier – Southwest
- Small Carrier – Spirit Airlines
- Cargo Carrier – FedEx Express

2.0 Fly Quiet Program Description

The purpose of the SDIA Fly Quiet Program is to encourage individual Air Carriers to fly as quietly as possible in the San Diego area by acknowledging those Carriers that operate the quietest fleets and adhere to Authority Use Regulations (Curfew). By grading an Air Carrier's performance and making the scores available to the public, the program creates a participatory atmosphere for Carriers to actively reduce noise impacts.

The Fly Quiet Program offers a dynamic venue for reviewing noise abatement initiatives by praising and publicizing active participation rather than a system that admonishes violations from essentially voluntary procedures.

2.1 Reports

Fly Quiet reports communicate individual category results on a quarterly basis on a scale of 0-10 per element. These quantitative scores allow air carrier management and flight personnel to measure exactly how they stand compared to other carriers and how their proactive involvement can positively reduce noise in the San Diego area. Each year has a maximum value of 30 points.

2.2 Awards

At the end of the year, awards will be presented to the carriers in the following categories:

- Small Domestic Carrier (Less than 10% of passengers)
- Large Domestic Carrier (10% of passengers or more)
- International Carrier
- Air Cargo Carrier (All Cargo Carriers)

2.3 Elements

Currently the Fly Quiet Program scores Air Carriers on the following three elements that will be described in detail in the next section. Over time, changes can be made to adjust to new or modified metrics. The elements are:

- Fleet Quality
- Noise Exceedances
- Curfew Compliance

2.3.1 Fleet Quality

The Fleet Quality score evaluates the noise contribution of each operator's fleet mix as it actually operates at SDIA. Carriers generally own a variety of aircraft types and schedule them according to operational needs, passenger/cargo demand and other marketing considerations. The Fly Quiet Program assigns a higher rating to carriers flying quieter, newer aircraft and to those that adhere to the curfew.

Historically airports have rated Fleet Quality by the relative percentage of Stage 2 vs. Stage 3 operations¹. Since the completion of the phase out of Stage 2 aircraft mandated by the Airport Noise and Capacity Act (ANCA) of 1990, all aircraft in the U.S. over 75,000 pounds meet the more stringent Stage 3 noise standards. However, within the allowable Stage 3 criteria, there is a wide range of noise levels, and the Federal Aviation Administration (FAA) does not distinguish between these aircraft types.

There are now Stage 4 and Stage 5 aircraft types entering service. All *new design aircraft* over 12,500 pounds issued a type certificate after January 1, 2006 were required to meet Stage 4 standards. The new Stage 5 noise standard applies to any application for a new airplane type design that has a Maximum Certificated Takeoff Weight (MTOW) of 121,254 pounds or more on or after December 31, 2017; or that has a MTOW of less than 121,254 pounds on or after December 31, 2021.

The method used here bases an operator's Fleet Quality Rating on aircraft manufacturer noise certification data. For each aircraft type, 14 CFR Part 36 specifies allowable noise levels at three measurement locations: approach, departure, and sideline². Per 14 CFR Part 36 allowable noise limits increase with weight, so that larger aircraft, serving more passengers, are not penalized as compared to smaller types.

The rating method for the Fleet Quality totals the difference between each aircraft's certified noise levels at all three measuring points (takeoff, approach and sideline) and the Stage 3 standard for that aircraft type, weight and engine type.

Similar to and consistent with 14 CFR Part 36, the Fleet Quality Rating allows for higher noise levels for larger aircraft. It is important to credit larger aircraft serving more passengers, because they offer more air service in fewer flights and less total noise than multiple operations in smaller aircraft types.

¹ Stages 1-4 were established by a Federal Aviation Regulation called 14 CFR Part 36 which mandated the allowable noise levels for the manufacture of aircraft. Over time both Stage 1 and Stage 2 aircraft have been phased out of operation in the U.S. as a result of subsequent federal regulations.

² 14 CFR Part 36 standards are measured in terms of the single event metric Effective Perceived Noise Level (EPNdB), which accounts for different frequency characteristics of noise, such as low frequency.

Calculation of Rating:

The Fleet Quality rating calculation takes the takeoff, approach and sideline noise sum of the allowable Part 36 Stage 3 limit from the Part 36 certification level and then produces a total. Table 1 demonstrates this methodology for a B737-700 aircraft where the difference between the Stage 3 limit and certificated value is 4.1dB on takeoff, 3.8 dB on approach and 6.8 dB for sideline noise; for a cumulative sum of 14.7dB.

Table 1 – B737-700 Aircraft Example

B737-700 Aircraft	Takeoff (EPNdB)	Approach (EPNdB)	Sideline (EPNdB)	Total dB Below Stage 3 Limits
Part 36 Stage 3 Limit	91.2	99.7	96.6	-
Part 36 Certification Level	87.1	95.9	89.8	-
Difference	4.1	3.8	6.8	14.7

The Part 36 certification database for commercial aircraft is very extensive in listing many different noise values for variations on the same aircraft type depending on weight, flap settings, engine types, and other specifications. The Fleet Quality rating methodology looks at each operator at SDIA and their specific aircraft fleet. Certifications values for each aircraft type are averaged together per operator.

Table 2 provides an example for computing the Fleet Quality Sub Score. The example airline has four different aircraft types in their fleet that operate at SDIA. The number of operations is multiplied by the Cumulative Noise Level of the aircraft type to generate a cumulative noise level. The cumulative noise level is then divided by the sum of operations for the carrier to create a fleet average sub score.

Table 2 – Example for Computing the Fleet Quality Sub Score.

Aircraft Types	Cumulative Noise Level	Operations	Sum of Cumulative Noise
B737	14.3	80.0	1144.0
B737MAX	25.2	10.0	252.0
B738	13.1	50.0	655.0
B738MAX	25.3	10.0	253.0
Fleet Avg (sum of CNEL divided by Total Operations):			15.4

Table 3 demonstrates the impact to a particular Fleet Quality score as they incorporate quieter aircraft, like the 737Max or A320neo into their operation at the airport.

Table 3 – Example of Fleet Quality Improvement

Aircraft Types	Cumulative Noise Level	Operations	Sum of Cumulatives Noise
B737	14.3	70.0	1001.0
B737MAX	25.2	20.0	504.0
B738	13.1	40.0	524.0
B738MAX	25.3	20.0	506.0
Fleet Avg (sum of CNEL divided by Total Operations):			16.9

The Fleet Quality Score for each operator is determined based upon the sub score with a target cumulative noise level of 30dB. The sub score is divided by 30 then grossed up to 10-points to determine the Fleet Quality Score. As Stage 5 aircraft become significant enough to be measurable, the cumulative noise level target of 40 dB will be used.

In the example of Table 2, the sub score is 15.4 and therefore the operator's final Fleet Quality score would be 5.13 (15.4/30*10). In Table 3, that score increases to 5.63 through the utilization of newer aircraft (16.9/30*10).

2.3.2 Noise Exceedances

Eliminating loud aircraft noise events is a long-standing goal of the Airport, as a result, the Airport has established an element that identifies the loudest aircraft departing SDIA. The arrival and departure exceedances are captured at Daytime, Evening and Nighttime levels.

- The locations of the monitors where exceedances are captured are as follows:
 - RMT #2 – Approximately 3.5-nautical miles (6.5km) along the departure path to the east of the airport.
 - RMT #14 – Approximately 3.5-nautical miles (6.5km) along the departure path to the west of the airport for straight out departures.
 - RMT #24 – Approximately 3.5-nautical miles (6.5km) along the departure corridor to the northwest of the airport for right turn departures.

Calculation of Rating:

The Noise Exceedance Score for each operator is determined by adding the different categories of noise exceedances together and adjusting them to the number of operations to generate a score of up to ten (10) points. The current threshold settings are 90 dB for daytime departures (7:00 am to 7:00 pm), 85 dB in the shoulder hours (7:00 pm to 10:00 pm), and 80 dB during nighttime hours (10:00 pm to 7:00 am). Multiple exceedances for a single departure may be captured if they exceed the thresholds at both RMTs 14 and 24. As Stage 4 and 5 use increases, these threshold levels can be adjusted downward to reflect the noise improvements of the fleet and maintain measurement validity in fleet comparisons.

2.3.3 Curfew Compliance

SDIA has had a curfew in place since 1976. SDIA's curfew is governed as part of the Airport Use Regulations and may result in a monetary fine if an operator violates the curfew. All departures are restricted from 11:30 p.m. to 6:30 a.m. Aircraft may arrive at SDIA 24 hours a day.

The departure curfew is mandatory; however, there are exemptions for Emergency/Mercy flights. Compliance is at the discretion of the pilot or operator. Penalties may be waived in certain circumstances. Typical circumstances include local maintenance issues discovered near departure time, weather that significantly disrupts the SAN operation, or other operational issues such as FAA system outages that preclude an aircraft from an on time departure due to FAA implementation of ground delay programs. This component is designed to encourage a cancellation, even under these circumstances, rather than depart during the curfew window. Fee waivers are done through a review of the individual circumstances.

The curfew violations system includes administrative fines if \$2,000 for the first violation by a particular operator in a compliance period; \$6,000 for the second violation in a compliance period, and, \$10,000 for the third violation in a compliance period. Additionally, a multiplier is added to reflect the number of violations from the previous compliance period. The Fly Quiet Program formalizes the effort of working with the carriers to reduce the number of curfew violations.

Calculation of Rating:

An operator that does not log any curfew violations in a quarter will receive a score of ten (10) points. The ten (10) point score is adjusted based upon the following:

1. Curfew Violations:

If a carrier violates the curfew, they will be assessed a penalty of one (1) point.

2. Curfew Violations that are fined:

If the Airport's Curfew Violation Review Panel (CVRP) determines that a fine should be imposed on a curfew violation, they will be assessed an additional penalty of one (1) point.

It is possible that a carrier will receive a negative score in this category. If a carrier continues to violate the curfew, an excessive number of violations will become more punitive to the final overall score.

3.0 Score Sheets

The following pages show the scores for the carriers in each element for the evaluation period.

- The first three charts show the scoring in each element for a given carrier, there is no ranking associated with the individual elements. There is no preference to a given operator.
- The summary page shows the total points in each element and rankings by carrier group utilized for the awards to the best carrier in each operating category.
- The operating categories are:
 - Small Carrier
 - Large Carrier
 - International Carrier (Excluded this year due to COVID)
 - Air Cargo Carrier

Fleet Quality Report					
San Diego International Airport's Fly Quiet Program					
October 1, 2020 through September 30, 2021					
Airline		Operations	Percent of Operations	Sub Score	Fleet Quality Score
AAL		12,998	11.3%	21.00	7.00
AAY		697	0.6%	17.30	5.77
ASA		13,545	11.8%	14.00	4.67
BAW		0	0.0%	0.00	0.00
DAL		12,626	11.0%	12.00	4.00
DLH		0	0.0%	0.00	0.00
EDW		0	0.0%	0.00	0.00
FDX		3,425	3.0%	16.30	5.43
FFT		3,082	2.7%	20.70	6.90
HAL		1,216	1.1%	21.40	7.13
JAL		326	0.3%	27.70	9.23
JBU		2,633	2.3%	14.90	4.97
JZA		122	0.1%	13.80	4.60
NKS		1,436	1.3%	20.60	6.87
ROU		0	0.0%	0.00	0.00
SCX		442	0.4%	12.70	4.23
SKW		13,440	11.7%	14.70	4.90
SWA		35,434	30.9%	15.00	5.00
UAL		12,250	10.7%	14.90	4.97
UPS		852	0.7%	16.00	5.33
WJA		0	0.0%	0.00	0.00

Noise Exceedance Report
San Diego International Airport's Fly Quiet Program
October 1, 2020 through September 30, 2021

Airline		Operations	Daytime Exceedances (90+ dB)	Evening Exceedances (85+ dB)	Nighttime Exceedances (80+ dB)	Total Exceedances	Noise Exceedance Score
AAL		12,998	327	1,645	3,260	5,232	5.97
AAY		697	2	43	33	78	8.88
ASA		13,545	379	2,573	1,796	4,748	6.49
BAW		0	0	0	0	0	0.00
DAL		12,626	792	1,452	3,070	5,314	5.79
DLH		0	0	0	0	0	0.00
EDW		0	0	0	0	0	0.00
FDX		3,425	210	671	1,372	2,253	3.42
FFT		3,082	11	141	712	864	7.20
HAL		1,216	36	479	25	540	5.56
JAL		326	1	1	0	2	9.94
JBU		2,633	79	625	164	868	6.70
JZA		122	0	0	0	0	10.00
NKS		1,436	6	259	82	347	7.58
ROU		0	0	0	0	0	0.00
SCX		442	26	21	10	57	8.71
SKW		13,440	42	290	1,398	1,730	8.71
SWA		35,434	285	4,217	3,906	8,408	7.63
UAL		12,250	1,843	1,683	1,067	4,593	6.25
UPS		852	41	256	462	759	1.09
WJA		0	0	0	0	0	0.00

Curfew Violation Report						
San Diego International Airport's Fly Quiet Program						
October 1, 2020 through September 30, 2021						
Airline		Operations	Violations	Penalized Violations	Curfew Penalty Points	Curfew Violation Score
AAL		12,998	4	2	6	4.00
AAY		697	2	1	3	7.00
ASA		13,545	10	5	15	-5.00
BAW		0	0	0	0	0.00
DAL		12,626	4	2	6	4.00
DLH		0	0	0	0	0.00
EDW		0	0	0	0	0.00
FDX		3,425	0	0	0	10.00
FFT		3,082	0	0	0	10.00
HAL		1,216	0	0	0	10.00
JAL		326	0	0	0	10.00
JBU		2,633	5	5	10	0.00
JZA		122	0	0	0	10.00
NKS		1,436	0	0	0	10.00
ROU		0	0	0	0	0.00
SCX		442	0	0	0	10.00
SKW		13,440	0	0	0	10.00
SWA		35,434	1	0	1	9.00
UAL		12,250	1	1	2	8.00
UPS		852	0	0	0	10.00
WJA		0	0	0	0	0.00

Summary Report							
San Diego International Airport's Fly Quiet Program							
October 1, 2020 through September 30, 2021							
Airline Code		Number of Operations	Fleet Quality Score	Noise Exceedance Score	Curfew Violation Score	Total Fly Quiet Score	Category
AAL	 American Airlines	12,998	7.00	5.97	4.00	16.97	Large Carrier
AAY	 allegiant air	697	5.77	8.88	7.00	21.65	Small Carrier
ASA	 Alaska	13,545	4.67	6.49	-5.00	6.16	Large Carrier
BAW	 BRITISH AIRWAYS	0	0.00	0.00	0.00	0.00	International
DAL	 DELTA	12,626	4.00	5.79	4.00	13.79	Large Carrier
DLH	 Lufthansa	0	0.00	0.00	0.00	0.00	International
EDW	 edelweiss	0	0.00	0.00	0.00	0.00	International
FDX	 FedEx	3,425	5.43	3.42	10.00	18.86	Air Cargo
FFT	 FRONTIER	3,082	6.90	7.20	10.00	24.10	Small Carrier
HAL	 HAWAIIAN AIRLINES	1,216	7.13	5.56	10.00	22.69	Small Carrier
JAL	 JAPAN AIRLINES	326	9.23	9.94	10.00	29.17	International
JBU	 jetBlue AIRWAYS	2,633	4.97	6.70	0.00	11.67	Small Carrier
JZA	 Jazz	122	4.60	10.00	10.00	24.60	International
NKS	 spirit	1,436	6.87	7.58	10.00	24.45	Small Carrier
ROU	 rouge	0	0.00	0.00	0.00	0.00	International
SCX	 sun country airlines	442	4.23	8.71	10.00	22.94	Small Carrier
SKW	 SkyWest AIRLINES	13,440	4.90	8.71	10.00	23.61	Small Carrier
SWA	 Southwest	35,434	5.00	7.63	9.00	21.63	Large Carrier
UAL	 UNITED	12,250	4.97	6.25	8.00	19.22	Large Carrier
UPS	 ups	852	5.33	1.09	10.00	16.42	Air Cargo
WJA	 WESTJET	0	0.00	0.00	0.00	0.00	International

Summary Report
San Diego International Airport's Fly Quiet Program
October 1, 2020 through September 30, 2021

Airline Code		Number of Operations	Fleet Quality Score	Noise Exceedance Score	Curfew Violation Score	Total Fly Quiet Score	Category
FDX		3,425	5.43	3.42	10.00	18.86	Air Cargo
UPS		852	5.33	1.09	10.00	16.42	Air Cargo
JAL		326	9.23	9.94	10.00	29.17	International
JZA		122	4.60	10.00	10.00	24.60	International
BAW		0	0.00	0.00	0.00	0.00	International
DLH		0	0.00	0.00	0.00	0.00	International
EDW		0	0.00	0.00	0.00	0.00	International
ROU		0	0.00	0.00	0.00	0.00	International
WJA		0	0.00	0.00	0.00	0.00	International
SWA		35,434	5.00	7.63	9.00	21.63	Large Carrier
UAL		12,250	4.97	6.25	8.00	19.22	Large Carrier
AAL		12,998	7.00	5.97	4.00	16.97	Large Carrier
DAL		12,626	4.00	5.79	4.00	13.79	Large Carrier
ASA		13,545	4.67	6.49	-5.00	6.16	Large Carrier
NKS		1,436	6.87	7.58	10.00	24.45	Small Carrier
FFT		3,082	6.90	7.20	10.00	24.10	Small Carrier
SKW		13,440	4.90	8.71	10.00	23.61	Small Carrier
SCX		442	4.23	8.71	10.00	22.94	Small Carrier
HAL		1,216	7.13	5.56	10.00	22.69	Small Carrier
AAY		697	5.77	8.88	7.00	21.65	Small Carrier
JBU		2,633	4.97	6.70	0.00	11.67	Small Carrier

*International was excluded this year due to COVID.