

Summary of Measured Noise Levels in the Town of Superior, Colorado due to Rocky Mountain Metropolitan Airport Operations

August 2024



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Monthly Summary – August 2024 (Water Bladder Site)

The following summarizes the daytime noise levels measured at the Water Bladder measurement location located off S. Torreys Peak Dr. and aircraft operations detected over the Town of Superior for the month of August 2024. Additional information regarding the measurements follows.

- Over the entire month, a total of 14,158 aircraft operations¹ occurred within 1.25 miles of the measurement location (the distance within which aircraft are audible).
- Of these, 8,209 were touch and go (T&G) operations (58%).
- Over the entire month, aircraft operations were clearly noticeable (aircraft noise measured at approximately 5 dBA above the ambient sound level) for 8,539 minutes (142 hours).
- If T&G operations were not conducted at the airport, an analysis of the measurement data indicates that noticeable aircraft operations would decrease to 2,618 minutes (44 hours), which is a 69% reduction.
- The following summarizes the August 2024 noise survey results at the Water Bladder.

Table 1 - Summary of Daytime Measured Noise Levels and Aircraft Operations in August 2024 (Water Bladder)

Operations	Quantity	Audible aircraft operations	Aircraft noise above ambient (dBA)	Aircraft 5 dBA Above Ambient (minutes)	Aircraft 10 dBA Above Ambient (minutes)	Aircraft 20 dBA Above Ambient (minutes)
All	Total for month	14,158	---	8,539	5,537	877
	Daily average	457	17	294	191	30
Touch and Go Removed	Total for month	7,263	---	2,618	1,536	208
	Daily average	234	12	90	54	7

- Figure 1 shows the flight paths on August 22, a day with total operations close to the median for the month. Note the concentration of T&G operations over the Town of Superior and Boulder County.
- Figure 2 shows the measured noise levels and concurrent aircraft activity for this day. Maximum noise levels generated by individual aircraft operations exceeded the ambient sound level by at least the following levels for the durations noted:
 - 5 dBA (clearly noticeable), 329 minutes.
 - 10 dBA (significant increase), 224 minutes.
 - 20 dBA (much louder), 28 minutes.
- Table 2 shows the hourly average noise levels and operation counts for this day.
- Figure 3 shows an hour on this day, during which time the measured level rarely reached ambient conditions (37 dBA), meaning that aircraft noise was almost constantly present.
- Figure 4 shows the flight paths for the entire month of August 2024.

¹ This report counts each touch and go operation as a single operation. The Federal Aviation Administration counts each touch and go operation as two operations.

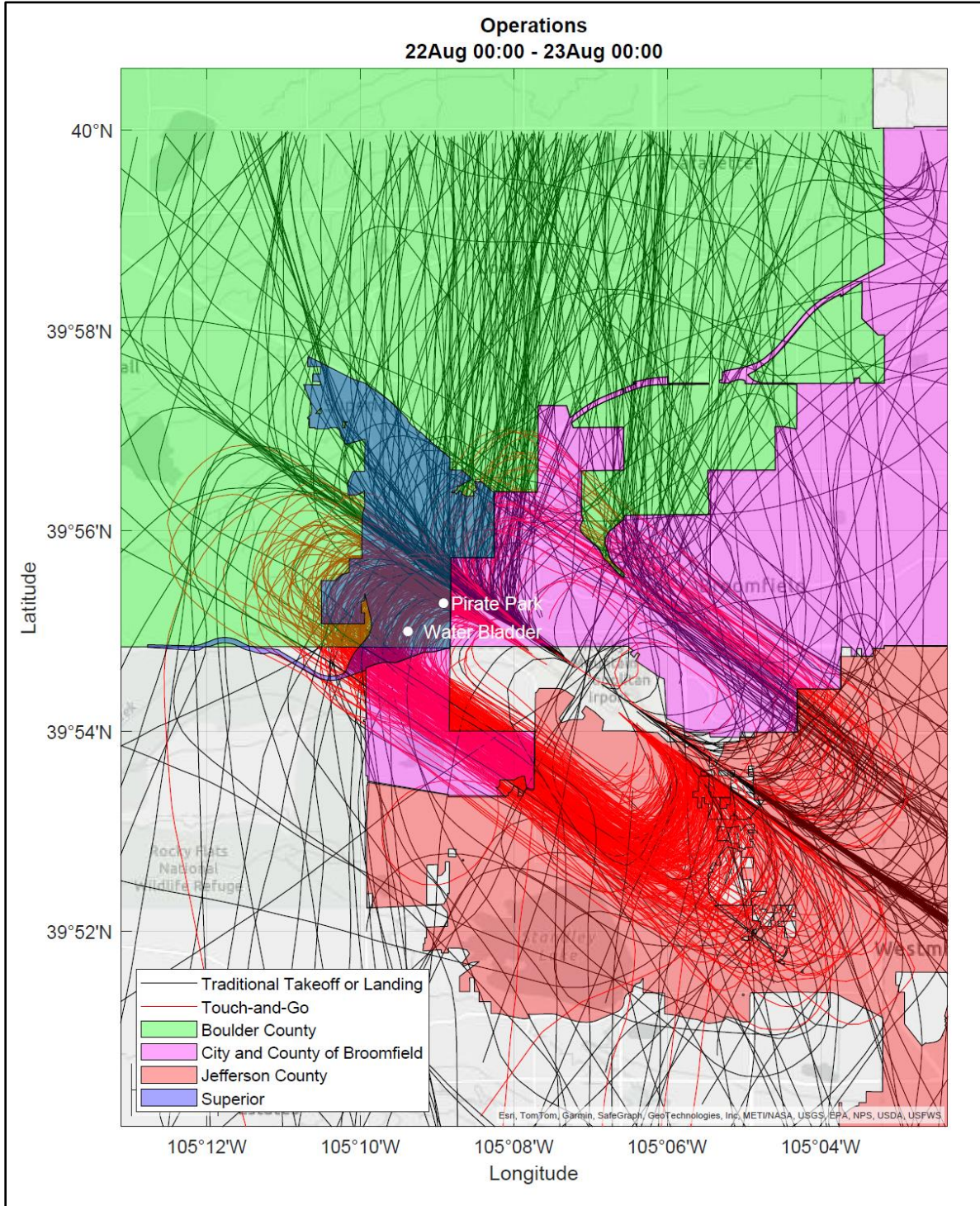


Figure 1 – Flight Paths on Median Day in August 2024 (708 Operations, 315 T&G)

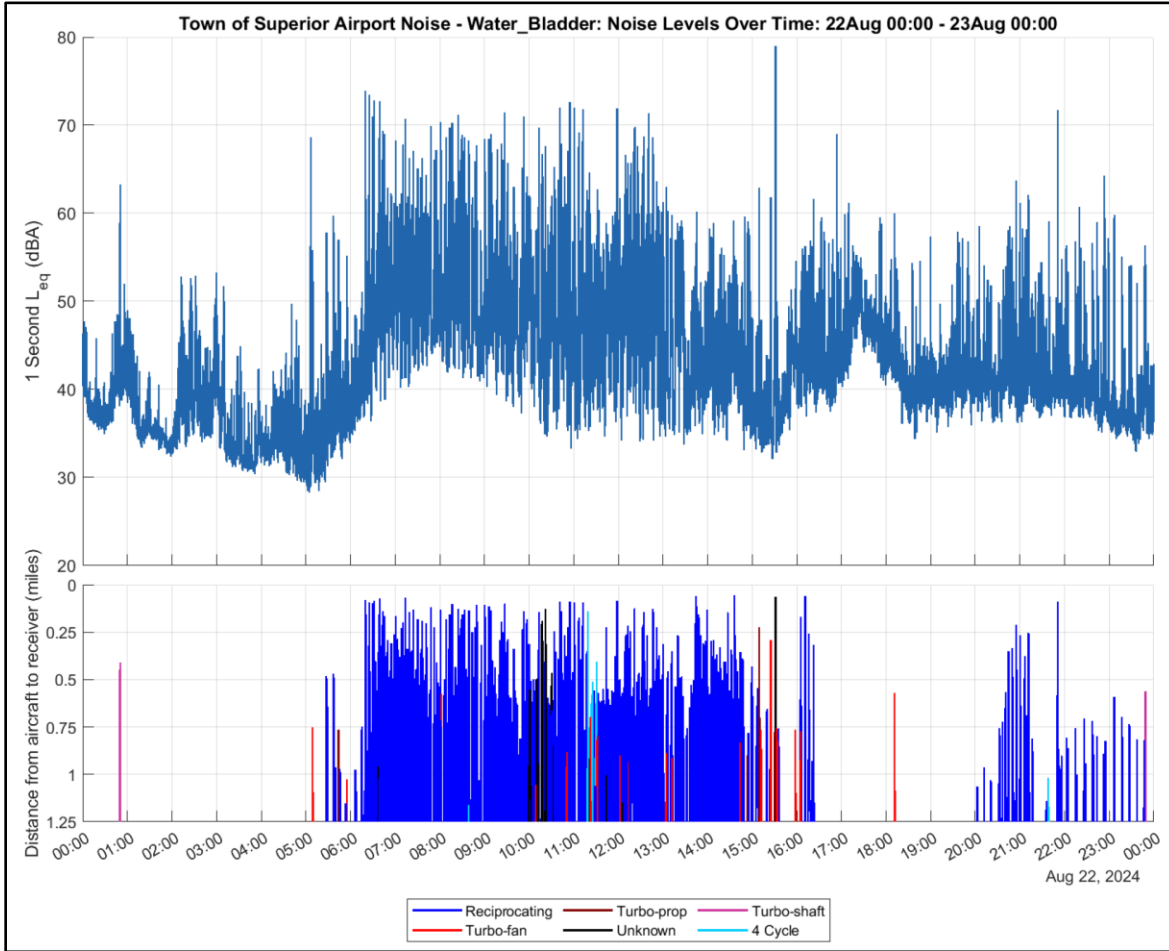


Figure 2 – Noise Levels and Aircraft Operations on Median Day (Water Bladder)

Table 2 – Hourly Noise Levels and Aircraft Operations on Median Day (Water Bladder)

Time	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm
Average Noise Level (dBA)	54	55	54	55	53	54	48	46	50	47	48	44	44	46	48
Number of Operations	48	67	65	98	79	61	62	63	60	15	15	7	4	0	18

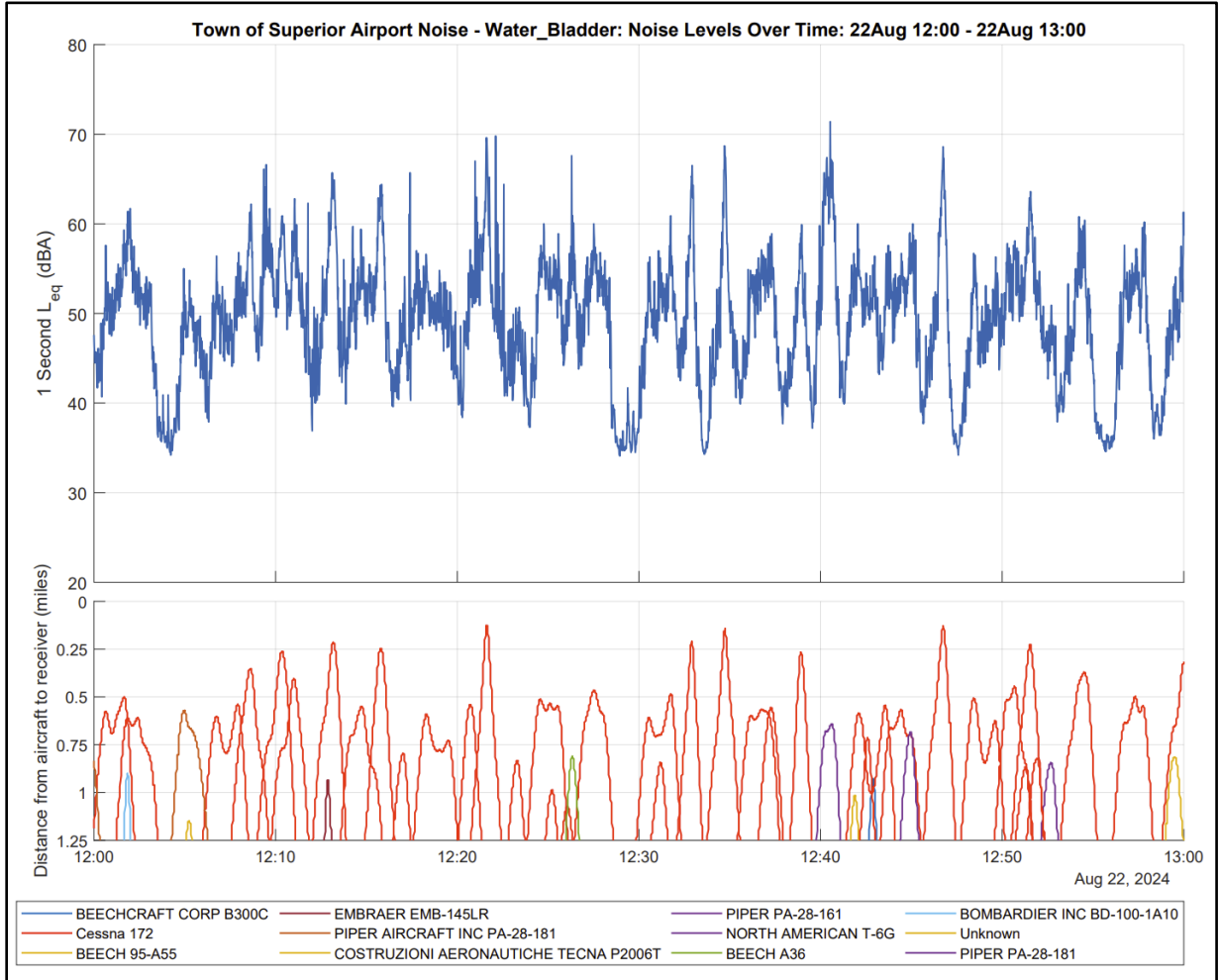


Figure 3 – Noise Levels and Aircraft Operations during an Example Hour on Median Day (Water Bladder)

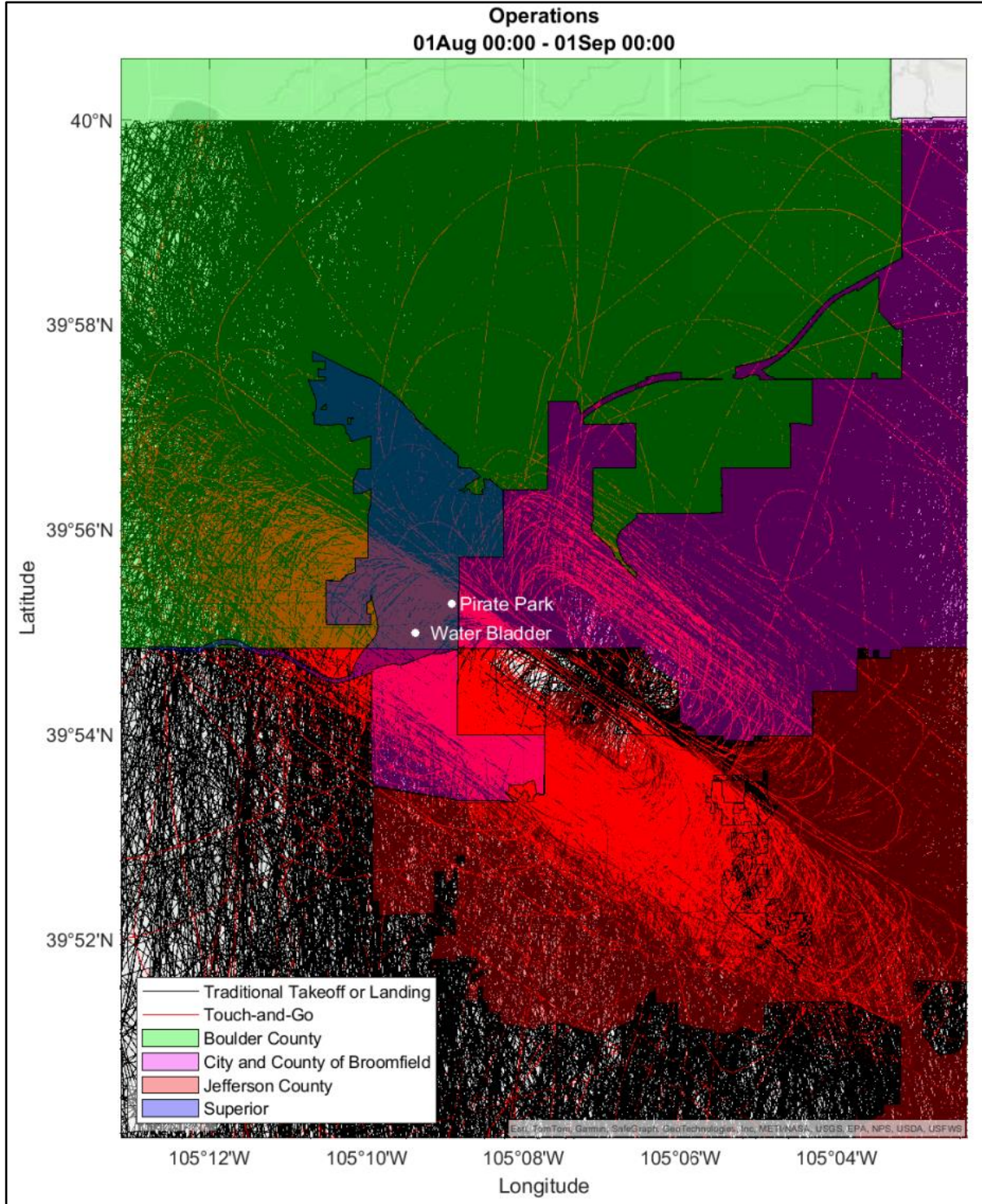


Figure 4 – All Flight Paths in August 2024 (20,823 Operations; 8,759 T&G)

Monthly Summary – August 2024 (Pirate Park Site)

The following summarizes the daytime noise levels measured at the Pirate Park measurement location located near Pirate Park off Yarrow Circle and aircraft operations detected over the Town of Superior for the month of August 2024. Additional information regarding the measurements follows.

- Over the entire month, a total of 14,712 aircraft operations² occurred within 1.25 miles of the measurement location (the distance within which aircraft are audible).
- Of these, 7,771 were touch and go (T&G) operations (53%).
- Over the entire month, aircraft operations were clearly noticeable (aircraft noise measured at approximately 5 dBA above the ambient sound level) for 7,016 minutes (117 hours).
- If T&G operations were not conducted at the airport, an analysis of the measurement data indicates that noticeable aircraft operations would decrease to 3,045 minutes (51 hours), which is a 57% reduction.
- Aircraft noise exceeds the ambient noise level by 20 dBA or more for a significant amount of time at this site (more than three-quarters of an hour per day).
- The following summarizes the August 2024 noise survey at Pirate Park. Note the minutes 20 dBA above ambient are much higher than at the Water Bladder due to the closer proximity to the runway and the lower, climbing, aircraft.

Table 3 - Summary of Daytime Measured Noise Levels and Aircraft Operations in August 2024 (Pirate Park)

Operations	Quantity	Audible aircraft operations	Aircraft noise above ambient (dBA)	Aircraft 5 dBA Above Ambient (minutes)	Aircraft 10 dBA Above Ambient (minutes)	Aircraft 20 dBA Above Ambient (minutes)
All	Total for month	14,712	---	7,016	4,633	1,342
	Daily average	475	19	251	165	48
Touch and Go Removed	Total for month	7,771	---	3,045	1,985	463
	Daily average	251	15	109	71	17

- Figure 5 shows the measured noise levels and concurrent aircraft activity for August 22, a day with total operations close to the median for the month. Maximum noise levels generated by individual aircraft operations exceeded the ambient sound level by at least the following levels for the durations noted:
 - 5 dBA (clearly noticeable), 294 minutes.
 - 10 dBA (significant increase), 200 minutes.
 - 20 dBA (much louder), 64 minutes.
- Table 4 shows the hourly average noise levels and operation counts for this day.
- Figure 6 shows an hour on this day, during which time the measured level rarely reached ambient conditions (39 dBA), meaning that aircraft noise was almost constantly present.

² This report counts each touch and go operation as a single operation. The Federal Aviation Administration counts each touch and go operation as two operations.

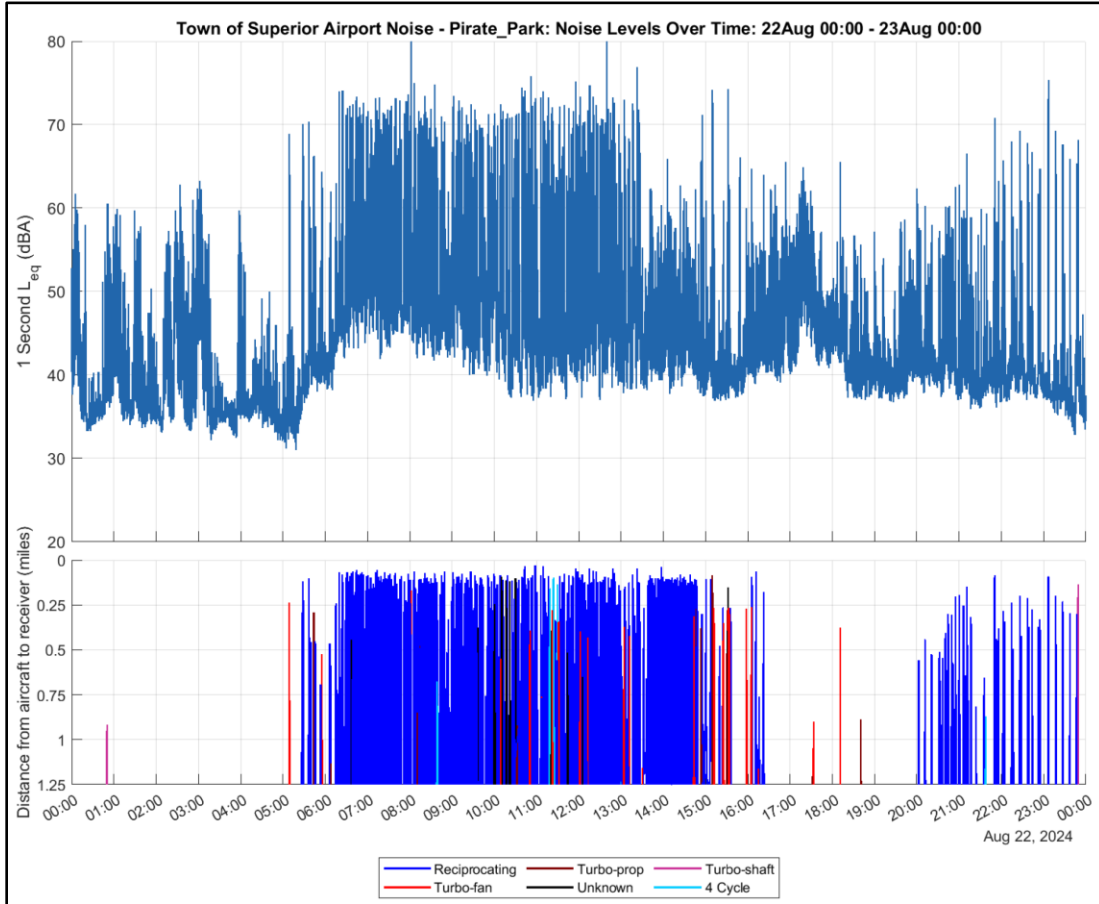


Figure 5 – Noise Levels and Aircraft Operations on Median Day (Pirate Park)

Table 4 – Hourly Noise Levels and Aircraft Operations on Median Day (Pirate Park)

Time	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm
Average Noise Level (dBA)	59	60	59	59	57	59	54	50	50	49	52	56	44	48	49
Number of Operations	48	67	65	98	79	61	62	63	60	15	15	7	4	0	18



Figure 6 – Noise Levels and Aircraft Operations during an Example Hour on Median Day (Pirate Park)

Detailed Results

1. Measurement Locations and Flight Paths

Noise level monitors were placed at the locations shown in Figure 1-1 and configured to continually measure noise levels. The meters were in service for the entirety of August 2024. The selection of measurement locations considered proximity of Town of Superior residences, aircraft flight paths, and availability of public land. The Water Bladder location was chosen as it is removed from busy roads and in the flight path of touch and go operations. The Community Center location was chosen as it is directly in the flight path of runway 12 L. The Pirate Park location was chosen as it is directly in the flight path of runway 12 R while still being nearby to residences.

Aircraft flight paths are limited due to Denver International Airport airspace to the east and mountains to the west. This, along with prevailing wind patterns, pushes a majority of operations over the Town of Superior, as shown in Figures 1 and 4 (above).

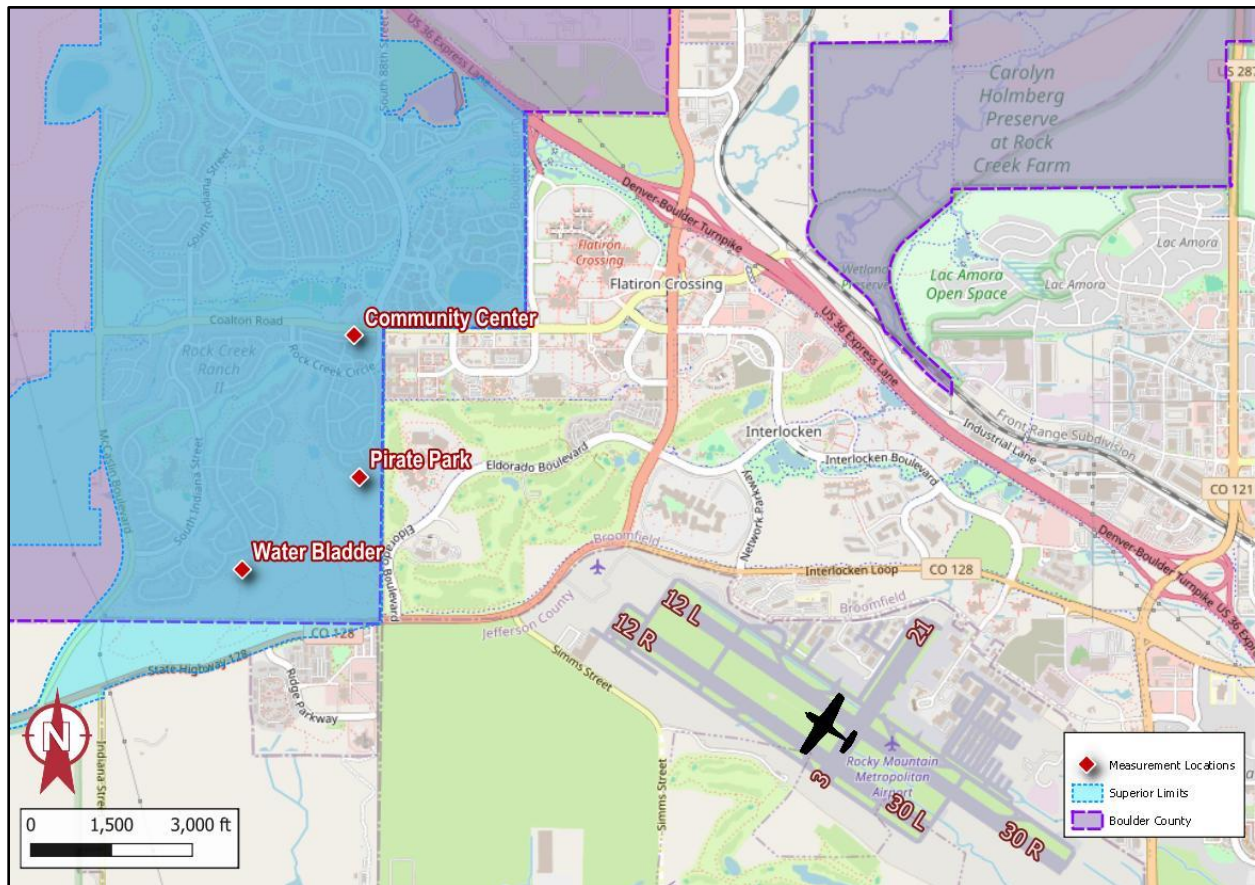


Figure 1-1. Measurement Locations and Airport

2. Noise and Aircraft Operations Measurement Procedures

Noise levels were measured in accordance with applicable acoustical standards as well as the author's experience in this specialized field. The following sections describe the acoustical standards followed, measurement equipment specifications and settings, measurement duration, ground wind measurement equipment, and aircraft operations data integration.

2.1 Applicable Noise Measurement and Analysis Standards

The measurements were executed in accordance with the relevant aspects of the following standards:

1. Noise measurement equipment meets the Type 1 specifications of American National Standards Institute (ANSI) standard S1.4-2014 (R2024) American National Standard Specification for Sound Level Meters.
2. ANSI S1.11-2004 (R2009), Electroacoustics - Octave-band and Fractional-octave-band Filters - Part 1: Specifications.
3. ANSI S1.40-2006 (R2016), American National Standard Specifications and Verification Procedures for Sound Calibrators.
4. The measurement and analysis procedures followed the applicable portions of ANSI S12.9-2013 Part 3 (R2018) Quantities and Procedures for Description and Measurement of Environmental Sound - Part 3: Short-Term Measurements with an Observer Present.
5. ANSI S12.18-1994 (R2019) Outdoor Measurement of Sound Pressure Level.
6. ANSI S1.13-2020 American National Standard Measurement of Sound Pressure Level in Air.

2.2 Noise Measurement Equipment

Noise levels were measured using Larson Davis Model 831 sound level meters with associated preamplifiers and ½ inch free-field precision microphones. All measurement and field calibration equipment were certified by a traceable laboratory within 18 months prior to the measurements. Field calibrations were conducted on August 5, 2024, and the drift in the measured noise level was well within tolerance (Water Bladder 0.28 dB, Pirate Park 0.12 dB, and Community Center - 0.07 dB). Calibration certificates and records are available upon request. The microphones were mounted on steel poles and positioned five feet above the ground (per ANSI S12.9). The microphones were covered with hydrophobically treated 7-inch diameter, 80-pores-per-inch density windscreens (ACO Pacific Model WS7-80T). Audio from each sound level meter was recorded using Tascam DR-05X digital recorders. The sound level meters were configured to continuously measure and record 1-second and 1-hour averages of the following metrics: overall L_{eq} , L_{10} , L_{50} , and L_{90} , as well as one-third octave band L_{eq} levels (6.3 Hz to 20 kHz).

2.3 Aircraft Position Measurement Equipment

Aircraft position data is being collected in the area with an Automatic Dependent Surveillance-Broadcast (ADS-B) monitoring system that receives real-time data from each aircraft in the area, including location, speed, and a unique identifier (hex code). Aircraft position data is being logged on 1-second intervals and is combined with the Federal Aviation Administration (FAA) aircraft registration database to get additional information for each aircraft, including make/model, engine type, and owner. Aircraft from flight schools were identified based on the owner and listed registration numbers from the flight school websites. Altitude data from the aircraft is based on barometric pressure on the aircraft and is not corrected for barometric pressure on the ground. During data processing, the altitude data is corrected based on barometric pressure from the airport. Aircraft above 11,000 feet are filtered out of the database to eliminate from the analysis aircraft that are merely passing overhead and not using Rocky Mountain Metropolitan Airport.

2.4 Meteorological Data

Wind speeds and direction are being measured continuously at each monitoring site using Vaisala WXT530 series sonic anemometers, mounted on steel poles approximately 6.5 feet above the ground (per ANSI S12.18) and placed within approximately 10 feet of the microphones. Barometric pressure data was obtained from the airport's weather station.

2.5 Resulting Measurement Database

This report presents the results of measurements conducted throughout the month of August 2024. A total of 744 hours of continuous noise, aircraft, and ground wind data were collected. All data was organized into a single database and time synchronized through the cellular network.

Figure 2-1 shows noise levels versus time (top graph) and distance to the nearest aircraft over time (bottom graph) for an example one-hour period at Pirate Park. This example shows a single aircraft doing touch and go exercises, which involves landing the airplane and immediately taking off again, and results in the airplane circling over the microphone every few minutes. Note the ambient sound level, the level occurring with no aircraft present, is approximately 38 dBA during this example hour. With aircraft present levels are as high as 73 dBA, which is a 35 dBA increase over the ambient sound level.

Figure 2-2 shows the measured noise levels and aircraft operations for a representative hour with frequent aircraft operations. During this hour the ambient sound level for this day of 39 dBA is rarely reached because there was very little time when aircraft noise was not audible.

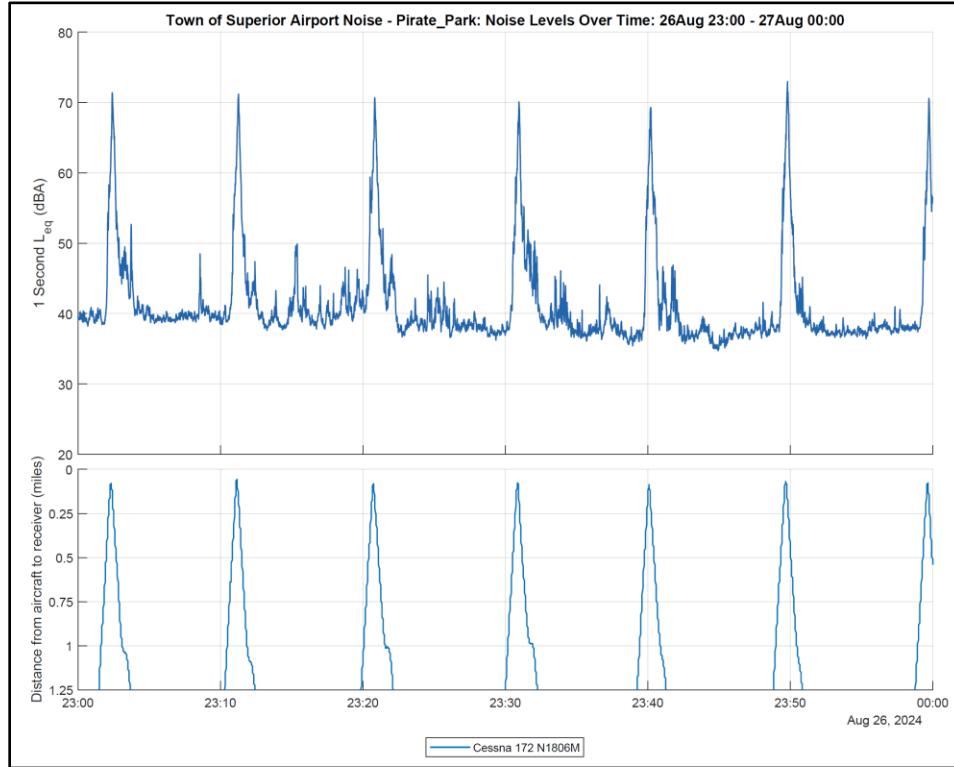


Figure 2-1. Example Time Plot of Measured Noise Levels - Touch and Go Operations

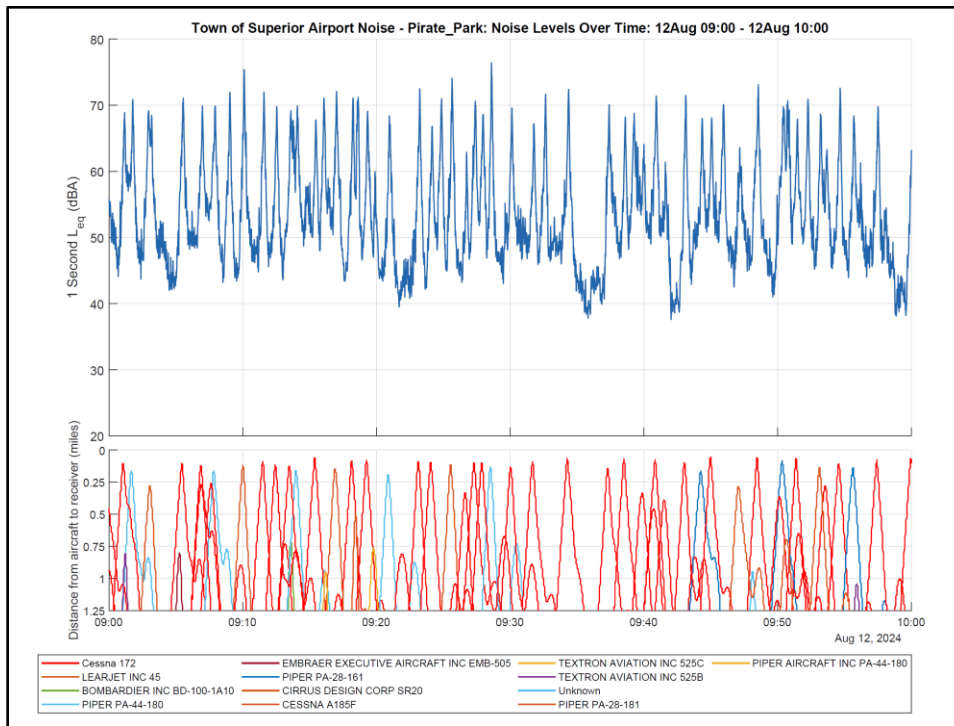


Figure 2-2. Example Time Plot During an Hour with Frequent Aircraft Operations

3. Data Analysis Procedures

The measured noise level and aircraft operations data was analyzed as follows.

3.1 Duration of Analysis Intervals

The measured data was recorded and analyzed in 1-second intervals. This interval was chosen because it provides sufficient resolution to capture changes in noise levels against aircraft proximity over time and follows the FAA's procedures. Results are summarized and presented herein in terms of daily averages of noise levels when aircraft are present versus ambient noise levels in the area (noise generated by non-aircraft sources, such as distant roadway traffic).

3.2 Aircraft Types and Operations

Each 1-second ADS-B sample was classified into one of five operational types: (1) on-the-ground, (2) flyover, (3) touch and go (T&G), (4) takeoff, and (5) landing. The number of operations per day for each operational type is shown in Table 3-1. Samples classified as on-the-ground were excluded from further analysis as planes would not be audible during these times, and samples for aircraft above 11,000 feet or classified as flyovers were excluded from further analysis as these operations were not generated by this airport.

Each aircraft detected in the month is analyzed separately. Each 1-second sample in which the individual aircraft's signal was detected is arranged into a table in chronological order. Each sample is labeled as on the ground (known from the positional information) or airborne. Airborne samples are then grouped into events, which include takeoff, landing, touch and go operation, and flyover. Starting with the first 1-second sample in time where the aircraft was detected as being airborne, the following logic is applied. This is also shown in the table below.

- If the previous sample was on the ground, and a sample within the next 20 minutes is on the ground, the entire window of samples when the aircraft was airborne is classified as touch and go.
- If the previous sample was on the ground, and no samples within the next 20 minutes are on the ground, the entire 20-minute window of samples is classified as takeoff.
- If the previous sample was not on the ground, and a sample within the next 20 minutes is on the ground, the entire window of samples when the aircraft was airborne is classified as landing.
- If the previous sample was not on the ground, and no samples within the next 20 minutes are on the ground, the entire 20-minute window of samples is classified as flyover.

	Is on the ground within the next 20 minutes	Is not on the ground within the next 20 minutes
Previous sample was on the ground	Touch and Go	Take-off
Previous sample was not on the ground	Landing	Flyover

Additionally, T&G operations were further classified as initial (the initial take off) or subsequent (subsequent touch and go landings and takeoffs) depending on whether or not the last operation of the aircraft was classified as a T&G operation. As described in more detail below, this was done to allow for the estimation of noise levels for a scenario where T&G operations occurred at another distant airfield.

Each ADS-B sample was also classified by aircraft engine type, as shown in Table 3-2. Aircraft engine type is identified from the aircraft registration “N Number” broadcast by the aircraft, and the FAA aircraft registration database, which provides details about each registered aircraft. Flight schools are identified based on the aircraft registered owner, a list of planes and N Numbers on each flight school’s website, and observations of aircraft at the airport. Most aircraft are identified as piston engine (reciprocating or 4-cycle) and the majority of them are registered to flight schools.

3.3 Ambient Sound Levels

For the purposes of this analysis, the ambient daytime noise levels for each day are defined as the L_{90} dBA noise level measured during daytime hours. This is calculated by ordering all 1-second L_{eq} dBA noise level samples measured between 7:00 AM and 10:00 PM and determining the 90th percentile, which is the noise level exceeded 90 percent of the time. Noise level contributions from aircraft operations are effectively removed with the L_{90} metric.

3.4 Aircraft Noise Levels

Aircraft noise levels represent the 1-second measurement samples when any aircraft operations were audible. Noise levels are plotted against the concurrently measured distance from each aircraft to quantify the relationship between these two variables. The data indicates that at distances of 1 to 1.25 miles, aircraft begin to have an effect on noise levels and, at distances of 1 mile or less from the measurement location aircraft have a significant influence on measured noise levels. For the purposes of this analysis operations were considered audible if the aircraft came within 1.25 miles of a measurement site at any time during the operation.

3.5 Aircraft Noise Levels without T&G Operations

Aircraft noise levels without T&G operations represent the average of all 1-second samples taken when aircraft operations were audible, but with noise level during all times when an aircraft operation was classified as a subsequent T&G set to the ambient sound level for that day. This simulates what the average noise level would be if T&G operations took place elsewhere, i.e., a distant airfield. Initial T&G operations were not removed from the analysis because an aircraft would need to take off and land at the airport even if T&G operations were located elsewhere. This initial T&G operation represents the takeoff and landing.

Table 3-1. Aircraft Operations³ by Type

Day	Operation Type			Total Operations	Percentage T&G	Total Number of Unique Aircraft
	T&G	Takeoff	Landing			
1-Aug-24	269	219	220	708	38%	169
2-Aug-24	348	228	208	784	44%	183
3-Aug-24	362	191	191	744	49%	152
4-Aug-24	220	132	141	493	45%	131
5-Aug-24	328	156	162	646	51%	138
6-Aug-24	361	201	193	755	48%	153
7-Aug-24	347	187	198	732	47%	156
8-Aug-24	4	93	86	183	2%	102
9-Aug-24	39	72	69	180	22%	80
10-Aug-24	114	86	89	289	39%	99
11-Aug-24	41	127	130	298	14%	130
12-Aug-24	453	218	223	894	51%	165
13-Aug-24	246	214	200	660	37%	182
14-Aug-24	258	220	220	698	37%	179
15-Aug-24	406	305	312	1,023	40%	185
16-Aug-24	299	249	239	787	38%	172
17-Aug-24	230	171	167	568	40%	135
18-Aug-24	187	148	167	502	37%	146
19-Aug-24	265	205	203	673	39%	172
20-Aug-24	397	260	253	910	44%	189
21-Aug-24	293	170	173	636	46%	154
22-Aug-24	315	190	203	708	44%	180
23-Aug-24	252	223	224	699	36%	182
24-Aug-24	335	183	167	685	49%	133
25-Aug-24	264	172	175	611	43%	137
26-Aug-24	424	237	229	890	48%	164
27-Aug-24	336	281	281	898	37%	167
28-Aug-24	414	250	247	911	45%	173
29-Aug-24	346	244	250	840	41%	195
30-Aug-24	293	247	236	776	38%	191
31-Aug-24	313	162	167	642	49%	127
Month Total	8,759	6,041	6,023	20,823	42%	-

³ This report counts each touch and go operation as a single operation. The Federal Aviation Administration counts each touch and go operation as two operations.

Table 3-2. Aircraft Operations⁴ by Aircraft Engine Type

Day	Engine Type					
	Piston	Turboprop	Turboshaft	Turbojet	Turbofan	Unknown
1-Aug-24	567	16	7	15	84	19
2-Aug-24	629	35	9	13	78	20
3-Aug-24	678	13	5	0	42	6
4-Aug-24	422	13	0	1	54	3
5-Aug-24	545	22	9	0	50	20
6-Aug-24	667	14	11	0	45	18
7-Aug-24	613	31	9	0	54	25
8-Aug-24	110	17	0	0	54	2
9-Aug-24	109	8	5	0	50	8
10-Aug-24	244	3	5	0	35	2
11-Aug-24	228	9	2	0	50	9
12-Aug-24	790	16	7	0	70	11
13-Aug-24	555	25	6	0	63	11
14-Aug-24	596	23	8	1	59	11
15-Aug-24	929	20	8	0	48	18
16-Aug-24	674	20	4	0	59	30
17-Aug-24	532	1	3	0	22	10
18-Aug-24	418	15	2	0	55	12
19-Aug-24	554	31	7	0	59	22
20-Aug-24	787	21	10	0	67	25
21-Aug-24	526	29	16	0	48	17
22-Aug-24	598	23	6	0	63	18
23-Aug-24	598	14	2	0	63	22
24-Aug-24	619	4	4	0	33	25
25-Aug-24	554	9	0	0	44	4
26-Aug-24	787	16	11	0	50	26
27-Aug-24	799	14	9	0	52	24
28-Aug-24	812	19	8	0	61	11
29-Aug-24	705	22	5	3	76	29
30-Aug-24	676	21	5	0	64	10
31-Aug-24	605	7	4	0	14	12
Month Total	17,926	531	187	33	1,666	480

⁴ This report counts each touch and go operation as a single operation. The Federal Aviation Administration counts each touch and go operation as two operations.

4. Noise Measurement and Analysis Results

Tables 4-1 through 4-3 provide a summary of the noise levels and aircraft operations measured during each day of August 2024 at each of the three measurement locations. The tables provide the following information:

- The daily measured ambient (background) sound level (L_{90}).
- The number of audible aircraft operations each day. For the purposes of this analysis operations were considered audible if aircraft came within 1.25 miles of a measurement site, based on an analysis of measured noise level and aircraft distance data. This will exclude any takeoffs and landings to and from runways 30 L and 30 R.
- The average measured noise level with aircraft from the airport present (within 1.25 miles).
- The number of decibels that aircraft noise is above the daily ambient sound level.
- The number of minutes each day that aircraft were present, and the noise level they generated that exceeded the ambient sound level by at least 5, 10, and 20 dBA, respectively.
- This information is then repeated with T&G operations excluded from the analysis.

Table 4-1. Summary of Measured Noise Levels⁵ and Aircraft Operations⁶ – Water Bladder

Date	Ambient Noise Level (dBA)	Daytime - All Operations						Daytime - T&G Operation Removed					
		Number of Audible Operations	Average Noise Level with Aircraft (dBA)	Aircraft Noise Level Increase Above Ambient (dBA)	Duration of Aircraft Noise Levels			Number of Audible Operations	Average Noise Level with Aircraft (dBA)	Aircraft Noise Level Increase Above Ambient (dBA)	Duration of Aircraft Noise Levels		
					> 5 dBA	> 10 dBA	> 20 dBA				> 5dBA	> 10 dBA	> 20 dBA
1-Aug-24	-	483	-	-	-	-	-	283	-	-	-	-	-
2-Aug-24	36	532	51	15	273	142	18	259	47	10	79	42	5
3-Aug-24	35	527	53	18	321	193	40	253	45	10	82	46	7
4-Aug-24	-	345	-	-	-	-	-	172	-	-	-	-	-
5-Aug-24	37	487	50	13	251	132	7	232	45	7	60	29	2
6-Aug-24	37	522	51	14	269	139	16	244	45	9	63	31	4
7-Aug-24	38	510	54	16	295	186	23	241	47	9	95	54	4
8-Aug-24	34	80	51	17	29	22	3	78	51	17	29	22	3
9-Aug-24	35	95	51	16	52	33	5	66	47	12	26	17	2
10-Aug-24	33	165	53	19	133	91	20	86	46	13	38	25	5
11-Aug-24	36	137	51	15	74	38	5	115	49	14	51	25	3
12-Aug-24	37	672	54	17	462	315	50	299	47	10	106	64	9
13-Aug-24	38	422	53	15	282	185	14	240	48	10	87	51	5
14-Aug-24	38	419	55	17	288	185	28	223	49	11	109	61	6
15-Aug-24	38	682	54	16	439	283	36	354	47	10	140	79	7
16-Aug-24	36	526	53	17	352	227	34	287	48	12	119	70	8
17-Aug-24	34	404	52	18	240	151	26	243	48	14	105	61	9
18-Aug-24	36	306	55	19	239	174	34	154	47	11	74	46	6
19-Aug-24	38	455	55	17	311	204	32	243	49	11	115	65	8
20-Aug-24	36	641	53	17	406	273	40	323	47	11	107	64	8
21-Aug-24	37	429	54	17	259	162	27	187	49	11	68	37	5
22-Aug-24	38	488	54	16	329	224	28	234	49	11	88	55	8
23-Aug-24	36	449	56	20	367	285	60	241	51	14	106	74	13
24-Aug-24	35	491	56	20	340	241	64	218	50	15	91	58	13
25-Aug-24	35	431	54	18	318	203	36	215	48	13	94	60	10
26-Aug-24	38	644	55	17	474	330	43	292	49	12	126	76	9
27-Aug-24	37	611	53	15	344	190	23	346	49	11	127	63	9
28-Aug-24	37	645	54	16	372	238	32	304	48	11	97	56	7
29-Aug-24	37	577	55	18	368	263	49	305	49	12	117	71	12
30-Aug-24	35	524	52	17	310	189	30	312	48	13	124	75	13
31-Aug-24	36	459	54	19	344	239	54	214	48	13	95	61	11
Monthly Average	36	457	53	17	294	191	30	234	48	12	90	53	7
Monthly Total	-	14,158	-	-	8,539	5,537	877	7,263	-	-	2,618	1,536	208

⁵ Noise data for August 1 and 4 was corrupted.

⁶ This report counts each touch and go operation as a single operation. The Federal Aviation Administration counts each touch-and-go operation as two operations.

Table 4-2. Summary of Measured Noise Levels⁷ and Aircraft Operations⁸ – Community Center

Date	Ambient Noise Level (dBA)	Daytime - All Operations						Daytime - T&G Operation Removed					
		Number of Audible Operations	Average Noise Level with Aircraft (dBA)	Aircraft Noise Level Increase Above Ambient (dBA)	Duration of Aircraft Noise Levels			Number of Audible Operations	Average Noise Level with Aircraft (dBA)	Aircraft Noise Level Increase Above Ambient (dBA)	Duration of Aircraft Noise Levels		
					> 5 dBA	> 10 dBA	> 20 dBA				> 5dBA	> 10 dBA	> 20 dBA
1-Aug-24	46	490	57	12	156	58	9	290	56	10	102	41	7
2-Aug-24	45	537	57	11	130	39	8	266	56	11	77	29	7
3-Aug-24	46	541	56	10	158	57	7	267	55	9	98	39	6
4-Aug-24	44	348	56	12	145	67	8	176	55	11	81	36	6
5-Aug-24	45	498	57	12	155	59	9	238	56	11	87	37	8
6-Aug-24	45	527	56	11	133	44	6	249	55	9	79	28	5
7-Aug-24	46	530	59	14	205	96	13	259	58	13	126	67	12
8-Aug-24	45	92	61	16	53	26	6	90	61	16	52	26	6
9-Aug-24	45	107	59	14	61	25	5	78	58	14	50	23	4
10-Aug-24	43	185	57	14	92	39	7	103	55	13	56	27	5
11-Aug-24	42	152	57	14	80	31	5	129	57	14	72	29	5
12-Aug-24	46	693	60	14	49	29	4	317	58	12	21	13	5
13-Aug-24	-	447	-	-	-	-	-	265	-	-	-	-	-
14-Aug-24	46	453	58	12	122	56	5	256	57	11	74	37	5
15-Aug-24	47	707	58	11	257	116	12	378	56	10	157	71	9
16-Aug-24	46	550	57	11	191	86	8	311	56	10	118	54	8
17-Aug-24	46	415	56	10	127	44	5	251	55	9	89	33	5
18-Aug-24	45	324	57	13	157	68	9	173	56	11	88	39	7
19-Aug-24	46	462	62	17	240	123	26	250	61	16	147	83	22
20-Aug-24	46	648	57	12	224	95	10	330	56	11	126	57	9
21-Aug-24	46	448	57	11	154	55	6	205	56	10	85	35	5
22-Aug-24	45	502	57	12	211	96	10	247	56	11	114	57	9
23-Aug-24	46	468	59	13	206	101	12	260	58	12	119	64	11
24-Aug-24	45	507	62	17	179	77	10	235	62	17	101	46	9
25-Aug-24	44	445	60	16	154	66	12	229	60	16	93	45	11
26-Aug-24	45	662	61	16	273	131	14	311	61	15	133	68	12
27-Aug-24	46	623	57	11	163	65	9	358	56	11	114	48	8
28-Aug-24	46	662	57	11	220	92	10	321	56	10	123	55	9
29-Aug-24	46	586	58	12	215	93	12	315	57	11	131	61	11
30-Aug-24	45	546	56	11	191	69	10	333	56	11	129	52	9
31-Aug-24	45	467	57	12	194	83	9	224	56	11	104	48	8
Monthly Average	45	472	58	13	163	69	9	249	57	12	98	45	8
Monthly Total	-	14,622	-	-	4,895	2,085	278	7,714	-	-	2,944	1,349	247

⁷ Noise meter malfunctioned August 13

⁸ This report counts each touch and go operation as a single operation. The Federal Aviation Administration counts each touch-and-go operation as two operations.

Table 4-3. Summary of Measured Noise Levels⁹ and Aircraft Operations¹⁰ – Pirate Park

Date	Ambient Noise Level (dBA)	Daytime - All Operations						Daytime - T&G Operation Removed					
		Number of Audible Operations	Average Noise Level with Aircraft (dBA)	Aircraft Noise Level Increase Above Ambient (dBA)	Duration of Aircraft Noise Levels			Number of Audible Operations	Average Noise Level with Aircraft (dBA)	Aircraft Noise Level Increase Above Ambient (dBA)	Duration of Aircraft Noise Levels		
					> 5 dBA	> 10 dBA	> 20 dBA				> 5dBA	> 10 dBA	> 20 dBA
1-Aug-24	39	497	57	18	209	120	32	296	53	14	108	63	15
2-Aug-24	-	543	-	-	-	-	-	270	-	-	-	-	-
3-Aug-24	-	542	-	-	-	-	-	267	-	-	-	-	-
4-Aug-24	-	351	-	-	-	-	-	177	-	-	-	-	-
5-Aug-24	40	499	52	13	106	52	5	239	50	10	47	23	4
6-Aug-24	39	528	55	16	198	101	16	249	50	11	75	37	5
7-Aug-24	40	532	60	20	265	178	51	260	54	14	118	78	16
8-Aug-24	37	92	58	21	51	36	11	90	58	21	50	35	11
9-Aug-24	38	106	56	18	65	42	9	77	55	17	43	30	7
10-Aug-24	36	187	55	19	136	94	21	104	50	15	55	40	9
11-Aug-24	38	156	56	18	89	56	13	133	54	16	67	39	8
12-Aug-24	39	694	59	20	366	253	80	318	52	13	119	78	18
13-Aug-24	40	448	59	19	248	163	48	264	54	15	119	79	16
14-Aug-24	40	461	60	20	274	198	62	263	55	15	133	95	23
15-Aug-24	40	719	58	19	381	248	68	387	53	13	171	107	21
16-Aug-24	38	556	57	19	296	192	56	316	53	14	135	85	20
17-Aug-24	38	420	56	18	201	123	32	255	52	15	112	69	17
18-Aug-24	39	329	58	19	215	149	43	175	52	13	87	60	12
19-Aug-24	39	463	59	20	294	205	62	251	55	15	136	96	22
20-Aug-24	39	652	58	19	327	207	63	332	52	13	122	77	19
21-Aug-24	39	452	58	19	250	169	50	206	52	13	84	54	13
22-Aug-24	39	505	59	20	294	200	64	248	55	16	111	78	20
23-Aug-24	39	475	60	21	332	244	83	267	54	16	139	101	27
24-Aug-24	38	511	59	22	299	212	72	237	55	17	111	77	19
25-Aug-24	37	444	59	21	268	189	58	228	55	18	108	79	24
26-Aug-24	39	662	60	20	392	270	85	311	55	15	141	94	22
27-Aug-24	39	625	57	18	285	162	35	360	53	13	147	85	15
28-Aug-24	39	661	58	19	338	226	62	320	53	14	126	82	20
29-Aug-24	39	588	59	20	302	200	64	316	54	15	130	85	21
30-Aug-24	38	541	56	18	250	149	34	328	53	15	138	83	18
31-Aug-24	39	473	59	19	285	197	63	227	53	14	112	77	20
Monthly Average	39	475	58	19	251	165	48	251	53	15	109	71	17
Monthly Total	-	14,712	-	-	7,016	4,633	1,342	7,771	-	-	3,045	1,985	463

⁹ Noise meter malfunctioned August 2 – August 4

¹⁰ This report counts each touch and go operation as a single operation. The Federal Aviation Administration counts each touch-and-go operation as two operations.