

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

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## September 2024



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## Monthly Summary – September 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 September 2024. Additional information regarding the measurements follows.

- Over the entire month, a total of 14,039 aircraft operations<sup>1</sup> occurred within 1.25 miles of the measurement location (the distance within which aircraft are audible).
- Of these, 7,562 were touch and go (T&G) operations (54%).
- Over the entire month, aircraft operations were clearly noticeable (aircraft noise measured at approximately 5 dBA above the ambient sound level) for 9,411 minutes (157 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 3,145 minutes (52 hours), which is a 67% reduction.
- The following summarizes the September 2024 noise survey results at the Water Bladder.

**Table 1 - Summary of Daytime Measured Noise Levels and Aircraft Operations in September 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	14,039	---	9,411	6,162	1,117
	Daily average	468	17	314	205	37
Touch and Go Removed	Total for month	7,707	---	3,145	1,860	278
	Daily average	257	12	105	62	9

- Figure 1 shows the flight paths on September 2, 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), 331 minutes.
  - 10 dBA (significant increase), 219 minutes.
  - 20 dBA (much louder), 48 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 (35 dBA), meaning that aircraft noise was almost constantly present.
- Figure 4 shows the flight paths for the entire month of September 2024.

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<sup>1</sup> 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.

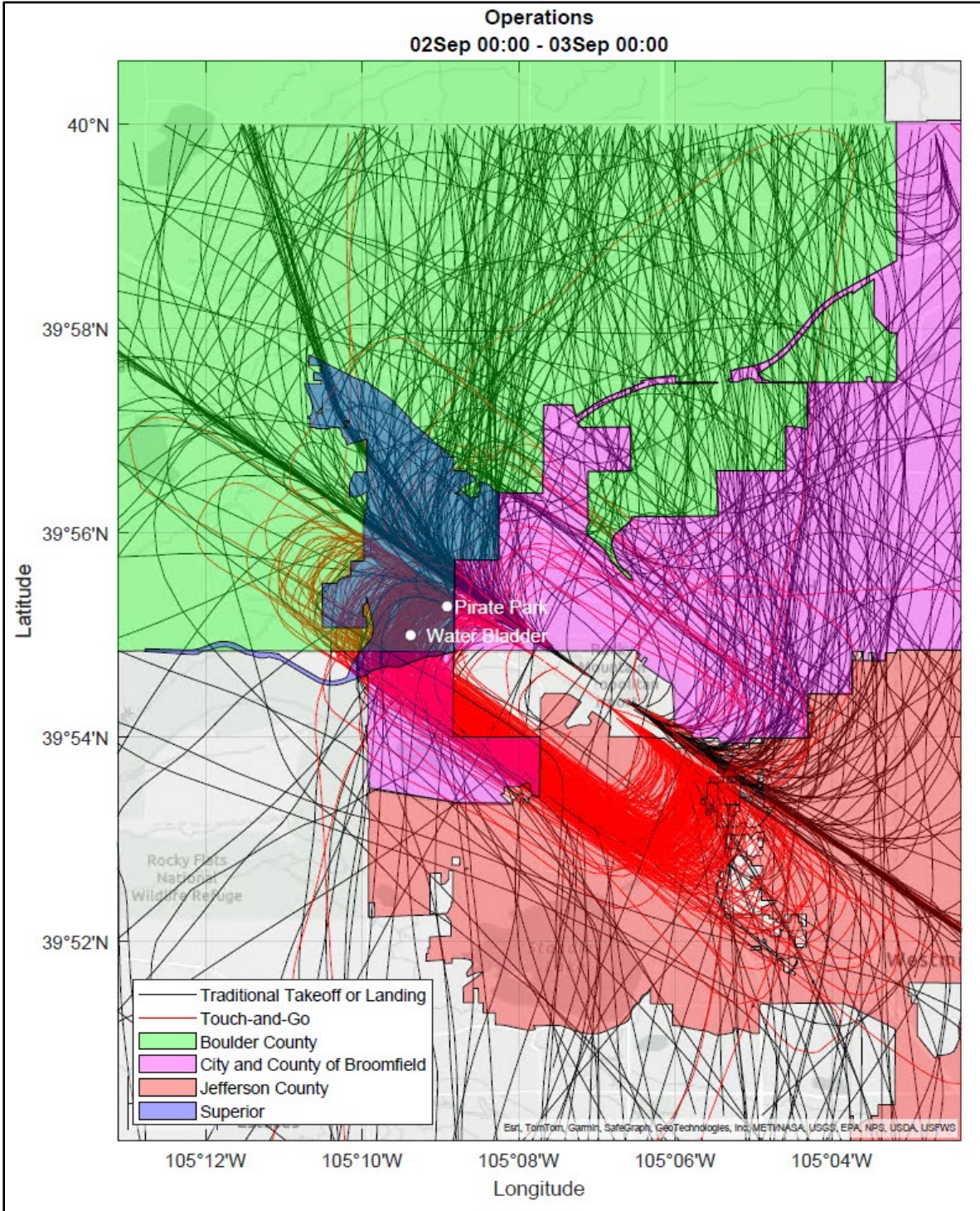


Figure 1 – Flight Paths on Median Day in September 2024 (700 Operations; 307 T&G)

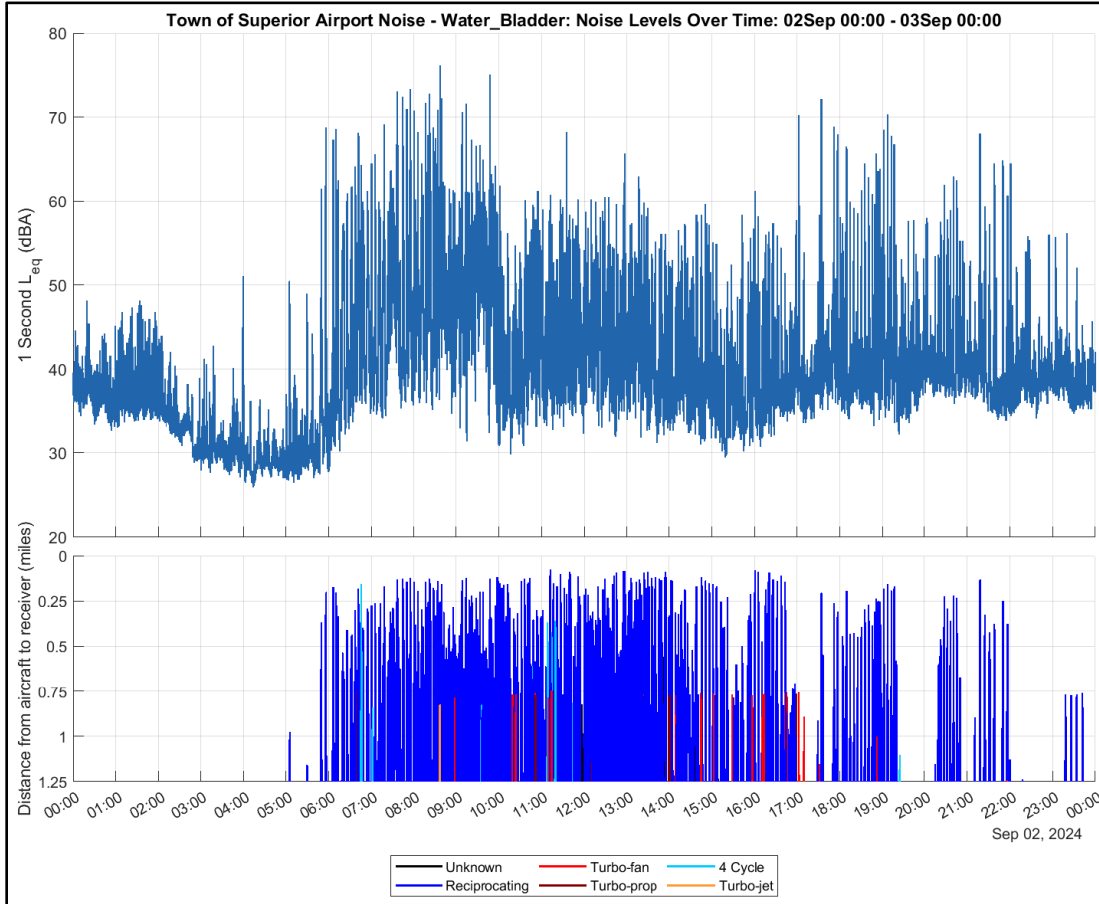


Figure 2 – Noise Levels and Aircraft Operations on Median Day (Water Bladder)

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	57	55	46	47	47	46	45	42	43	50	50	49	46	48
Number of Operations	41	58	77	59	68	77	59	50	37	33	17	23	14	21	17

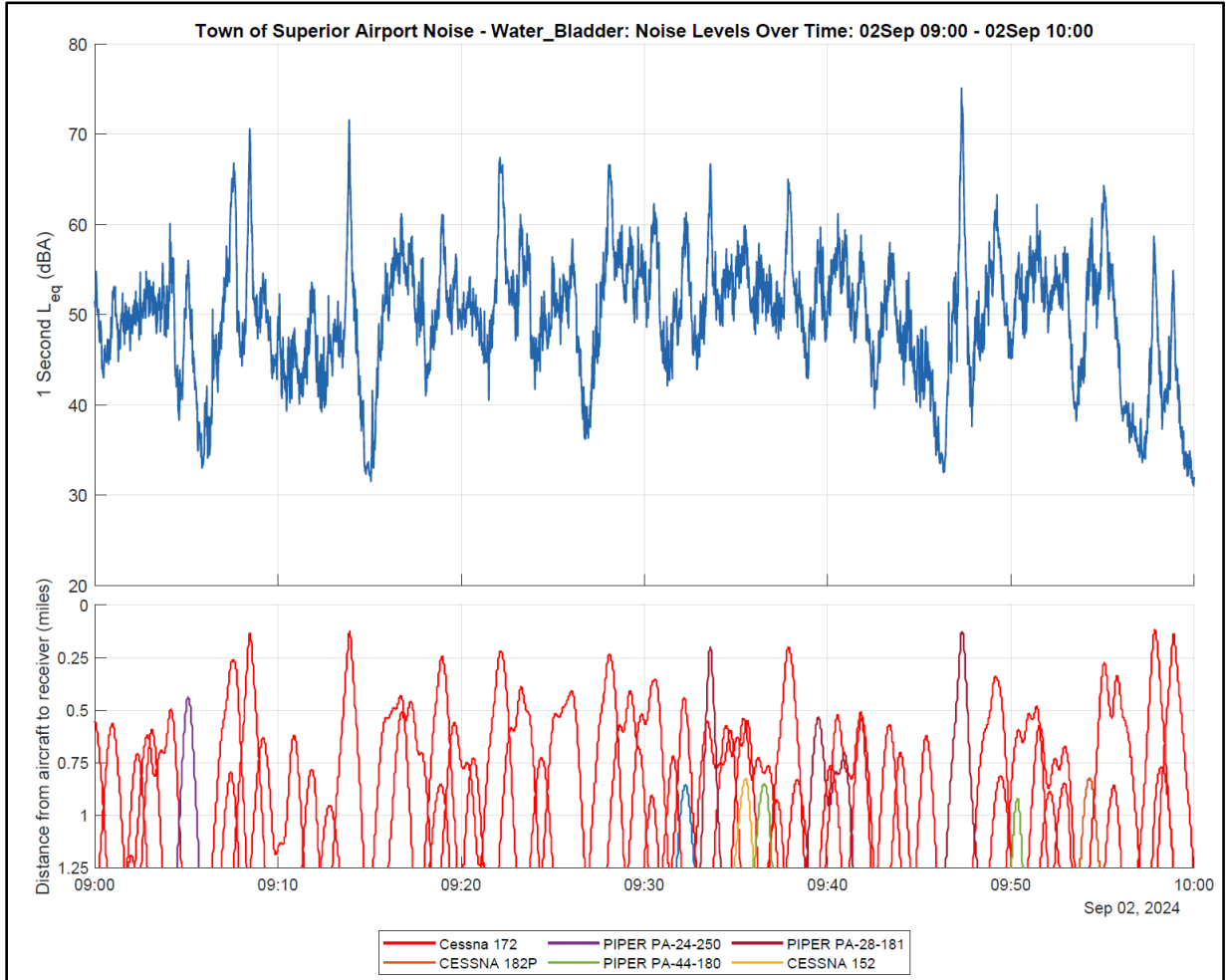


Figure 3 – Noise Levels and Aircraft Operations during an Example Hour on Median Day (Water Bladder)

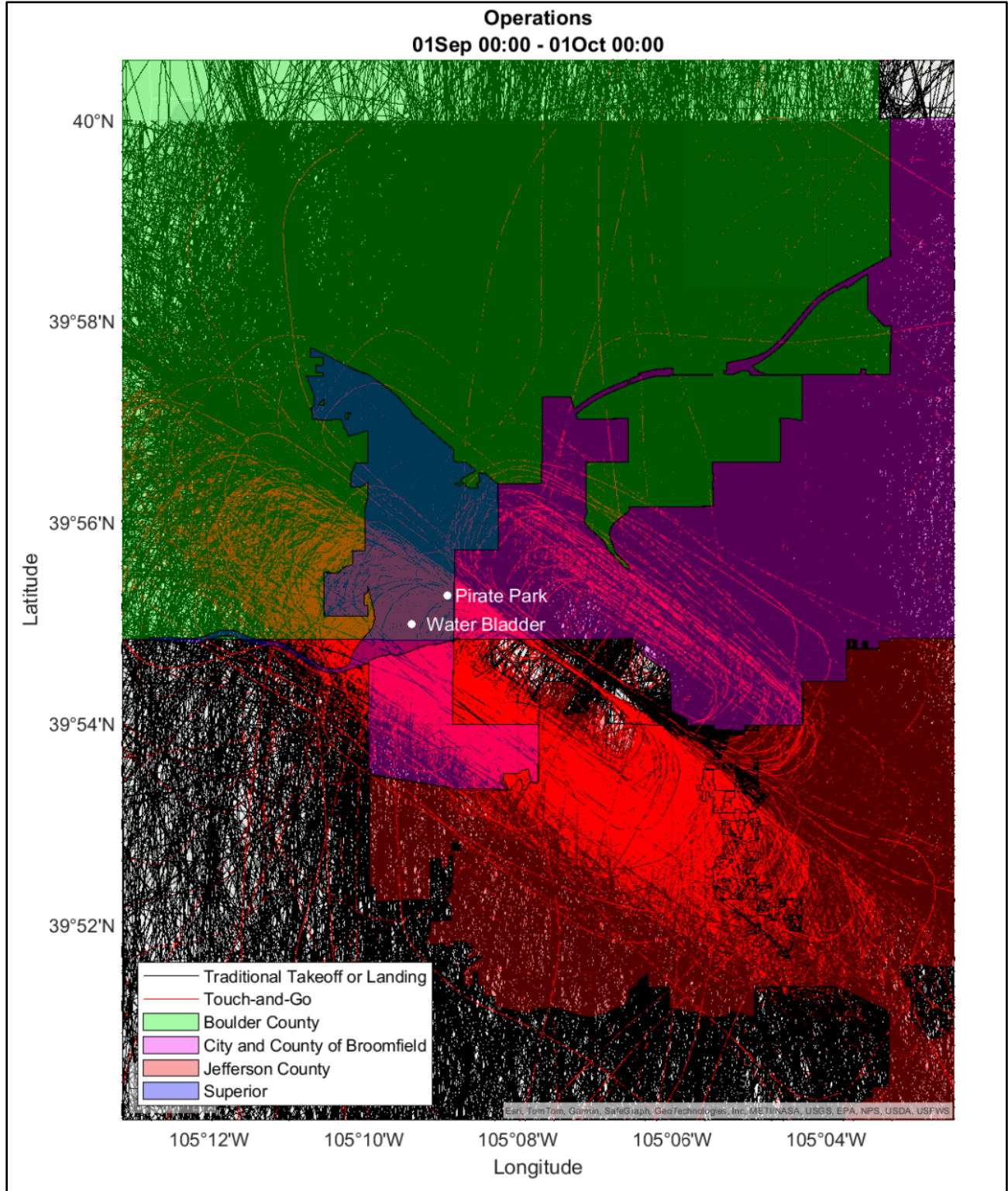


Figure 4 – All Flight Paths in September 2024 (20,978 Operations; 8,112 T&G)

## Monthly Summary – September 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 September 2024. Additional information regarding the measurements follows.

- Over the entire month, a total of 14,523 aircraft operations<sup>2</sup> occurred within 1.25 miles of the measurement location (the distance within which aircraft are audible).
- Of these, 7,635 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 7,644 minutes (127 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 3,527 minutes (59 hours), which is a 54% 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 September 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 September 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	14,523	---	7,644	5,072	1,490
	Daily average	484	20	273	181	53
Touch and Go Removed	Total for month	8,148	---	3,527	2,318	575
	Daily average	272	15	126	83	21

- Figure 5 shows the measured noise levels and concurrent aircraft activity for September 2, 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), 279 minutes.
  - 10 dBA (significant increase), 180 minutes.
  - 20 dBA (much louder), 48 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 (38 dBA), meaning that aircraft noise was almost constantly present.

<sup>2</sup> 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.

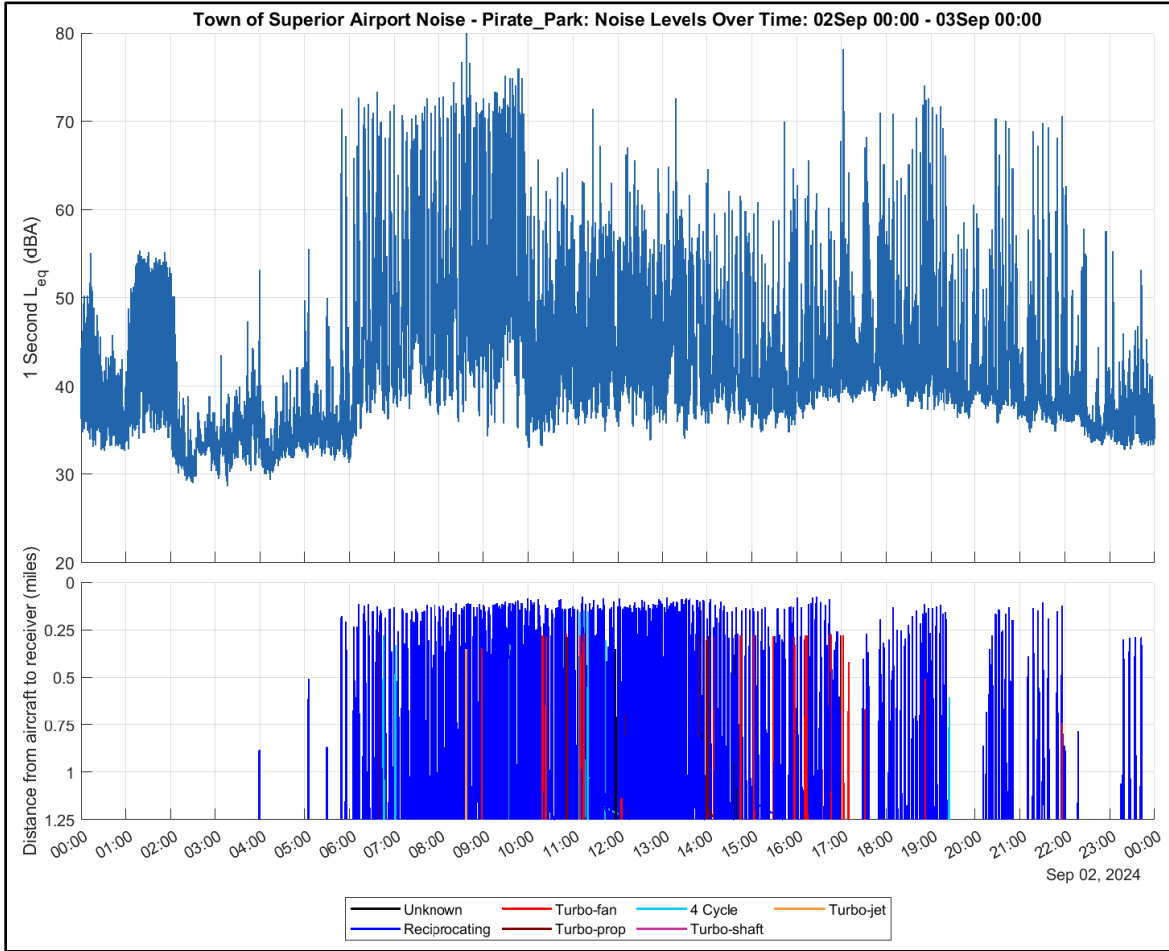


Figure 5 – Noise Levels and Aircraft Operations on Median Day (Pirate Park)

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)	57	61	60	49	50	49	51	47	48	48	53	55	52	50	51
Number of Operations	41	58	77	59	68	77	59	50	37	33	17	23	14	21	17



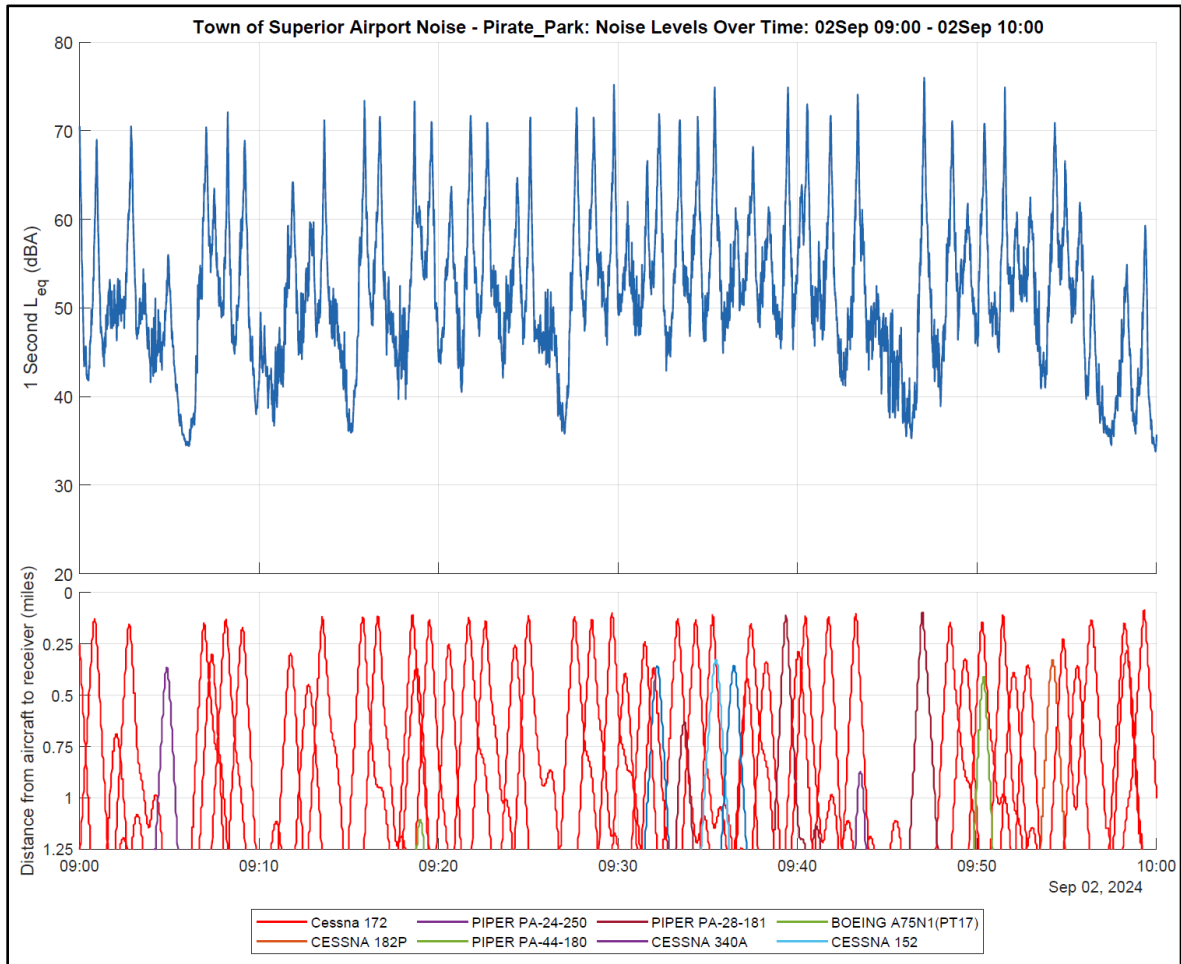


Figure 6 – Noise Levels and Aircraft Operations during an Example Hour on Median Day (Pirate Park)

# 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 September 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).

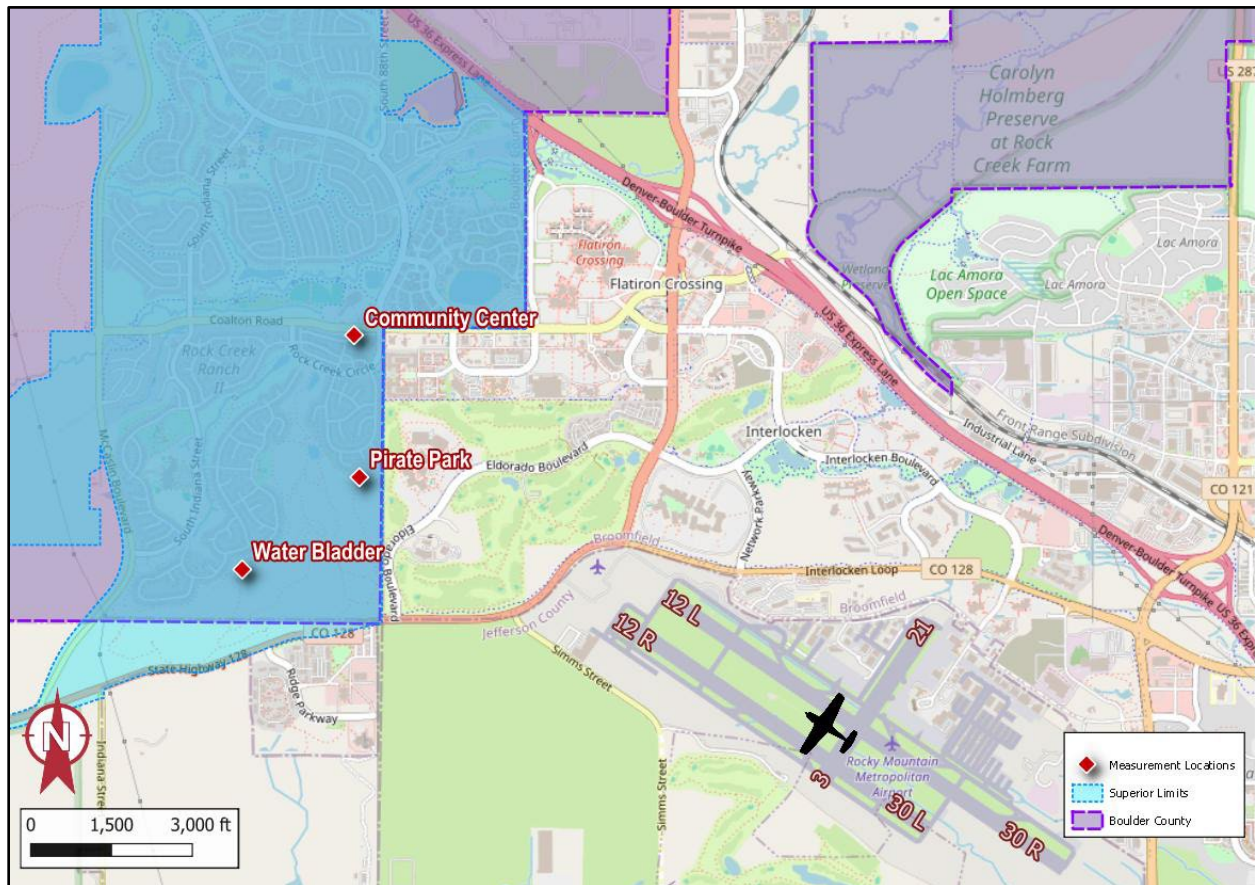


Figure 1-1. Measurement Locations and Airport

## **2. Noise and Aircraft Operations Measurement Procedures**

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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 September 9, 2024, and the drift in the measured noise level was well within tolerance (Water Bladder 0.29 dB, Pirate Park 0.18 dB, and Community Center - 0.08 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 September 2024. A total of 720 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 starting at 18:30, 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 75 dBA, which is a 37 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 38 dBA is never reached because there was very little time when aircraft noise was not audible.

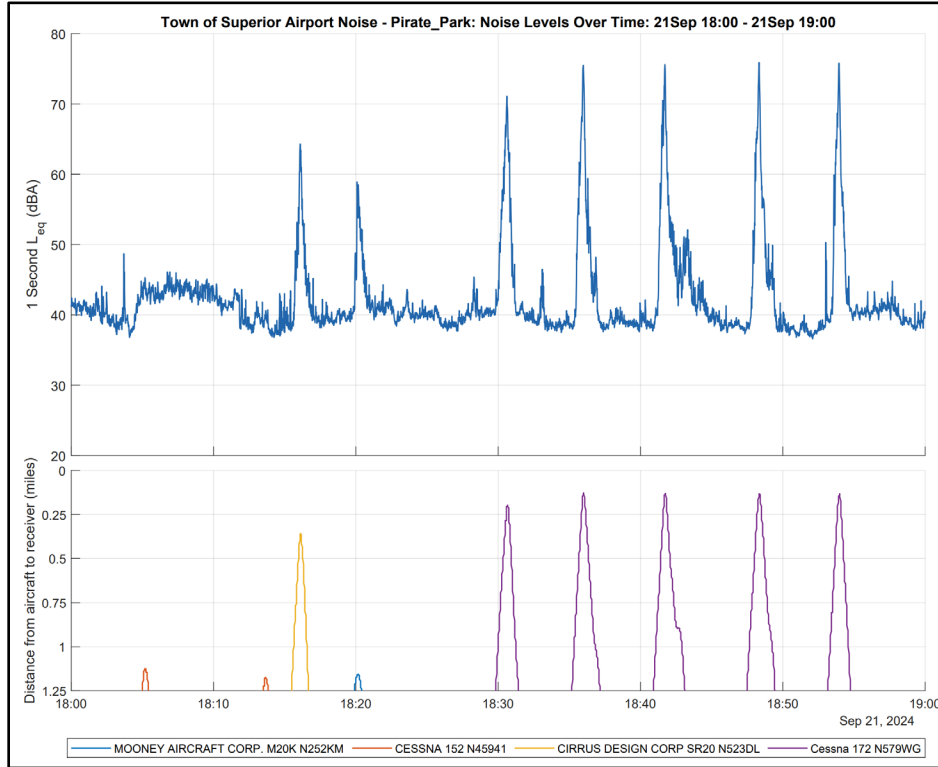


Figure 2-1. Example Time Plot of Measured Noise Levels - Touch and Go Operations

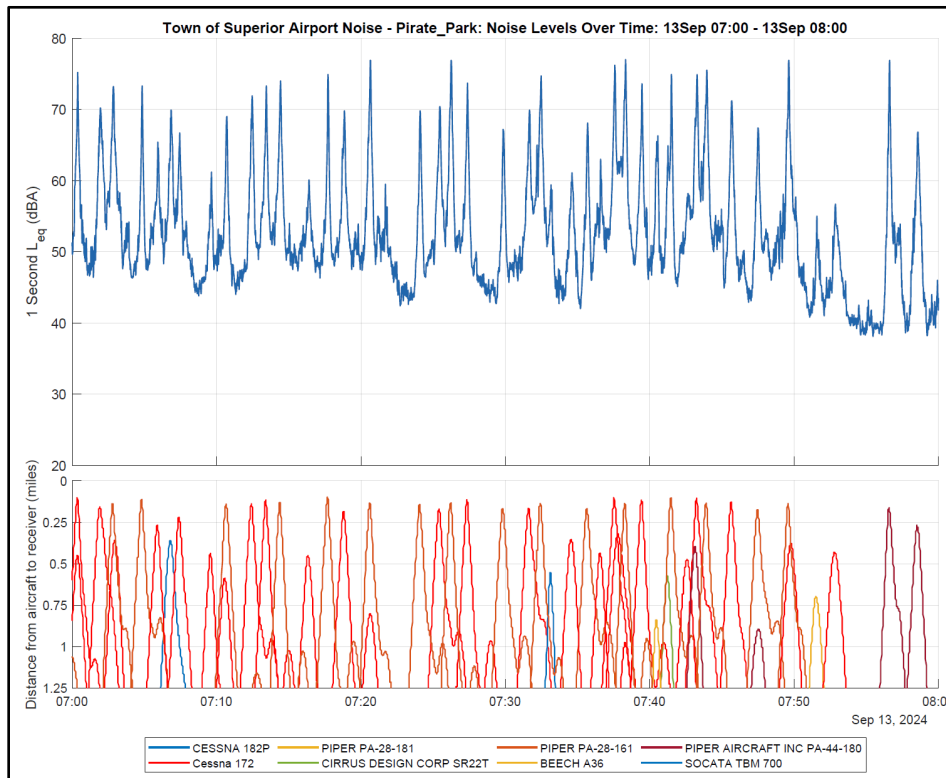


Figure 2-2. Example Time Plot During an Hour with Frequent Aircraft Operations

### 3. Data Analysis Procedures

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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 and is disregarded from further analysis.

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	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

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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 90<sup>th</sup> 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 have been 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 Operations<sup>3</sup> by Type**

Day	Operation Type			Total Operations	Percentage T&G	Total Number of Unique Aircraft
	T&G	Takeoff	Landing			
1-Sep-24	235	172	170	577	41%	138
2-Sep-24	307	196	197	700	44%	147
3-Sep-24	357	247	257	861	41%	164
4-Sep-24	274	167	165	606	45%	148
5-Sep-24	387	246	237	870	44%	159
6-Sep-24	326	263	282	871	37%	186
7-Sep-24	329	223	222	774	43%	167
8-Sep-24	278	172	177	627	44%	152
9-Sep-24	324	177	171	672	48%	147
10-Sep-24	309	233	243	785	39%	152
11-Sep-24	257	210	210	677	38%	168
12-Sep-24	137	183	199	519	26%	149
13-Sep-24	340	264	283	887	38%	198
14-Sep-24	233	208	193	634	37%	159
15-Sep-24	274	166	158	598	46%	156
16-Sep-24	266	225	196	687	39%	145
17-Sep-24	149	125	128	402	37%	73
18-Sep-24	379	246	244	869	44%	170
19-Sep-24	337	259	247	843	40%	179
20-Sep-24	221	255	283	759	29%	192
21-Sep-24	206	170	175	551	37%	141
22-Sep-24	165	105	95	365	45%	122
23-Sep-24	279	258	250	787	35%	161
24-Sep-24	341	256	257	854	40%	158
25-Sep-24	241	284	292	817	29%	199
26-Sep-24	332	255	247	834	40%	175
27-Sep-24	347	252	244	843	41%	184
28-Sep-24	115	216	210	541	21%	152
29-Sep-24	200	193	204	597	34%	160
30-Sep-24	167	199	205	571	29%	147
Month Total	8,112	6,425	6,441	20,978	39%	-

<sup>3</sup> 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 Operations<sup>4</sup> by Aircraft Engine Type**

Day	Engine Type					
	Piston	Turboprop	Turboshaft	Turbojet	Turbofan	Unknown
1-Sep-24	530	4	2	0	39	2
2-Sep-24	617	21	4	3	46	9
3-Sep-24	773	16	8	0	44	20
4-Sep-24	506	24	4	0	48	24
5-Sep-24	771	14	10	0	52	23
6-Sep-24	776	19	17	2	42	15
7-Sep-24	715	9	6	0	30	14
8-Sep-24	564	8	4	0	43	8
9-Sep-24	601	11	10	0	38	12
10-Sep-24	692	17	8	0	40	28
11-Sep-24	593	16	11	0	48	9
12-Sep-24	447	19	6	0	38	9
13-Sep-24	765	25	6	0	61	30
14-Sep-24	579	14	3	1	27	10
15-Sep-24	512	14	2	0	48	22
16-Sep-24	560	20	5	1	88	13
17-Sep-24	343	13	7	0	30	9
18-Sep-24	768	19	9	0	53	20
19-Sep-24	743	17	8	0	65	10
20-Sep-24	586	17	6	0	52	98
21-Sep-24	443	6	2	0	41	59
22-Sep-24	274	15	0	0	57	19
23-Sep-24	636	20	7	0	40	84
24-Sep-24	707	17	10	0	34	86
25-Sep-24	651	21	7	0	63	75
26-Sep-24	679	16	6	0	59	74
27-Sep-24	694	20	6	0	53	70
28-Sep-24	447	8	4	0	29	53
29-Sep-24	424	20	4	0	58	91
30-Sep-24	443	29	8	0	37	54
Month Total	17,839	489	190	7	1,403	1,050

<sup>4</sup> 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**

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Tables 4-1 through 4-3 provide a summary of the noise levels and aircraft operations measured during each day of September 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 Levels and Aircraft Operations<sup>5</sup> – 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-Sep-24	34	426	53	19	313	210	48	250	48	14	122	79	14
2-Sep-24	35	500	53	18	331	219	48	247	47	12	90	55	11
3-Sep-24	37	589	50	13	307	127	12	312	45	8	97	39	4
4-Sep-24	36	439	55	18	332	253	43	218	47	11	91	62	8
5-Sep-24	38	585	56	18	487	358	59	273	49	11	130	81	12
6-Sep-24	36	575	53	18	376	263	51	318	48	12	135	85	13
7-Sep-24	36	539	54	19	396	297	63	263	48	12	103	71	13
8-Sep-24	36	430	56	20	344	269	62	193	49	14	79	57	11
9-Sep-24	38	464	55	17	304	178	30	196	49	11	71	42	6
10-Sep-24	37	510	54	17	331	205	36	265	48	10	104	58	8
11-Sep-24	38	428	57	19	363	269	51	233	50	12	117	77	11
12-Sep-24	39	323	53	14	223	115	12	222	49	10	108	48	4
13-Sep-24	37	612	53	16	371	210	29	340	47	10	129	65	6
14-Sep-24	35	439	53	17	283	176	33	252	48	13	101	58	9
15-Sep-24	35	362	52	17	230	145	26	189	46	11	69	45	8
16-Sep-24	37	495	53	15	338	217	24	267	47	10	105	60	6
17-Sep-24	38	279	55	16	120	80	11	162	49	10	23	14	3
18-Sep-24	36	497	51	15	305	178	27	297	47	11	115	60	9
19-Sep-24	38	580	55	17	344	225	41	303	46	9	93	47	5
20-Sep-24	38	446	55	17	355	240	38	278	50	13	141	82	11
21-Sep-24	36	374	56	21	299	236	68	215	50	14	101	69	13
22-Sep-24	34	264	51	18	179	102	22	123	47	14	51	32	9
23-Sep-24	37	518	54	17	325	203	35	298	48	11	117	64	9
24-Sep-24	37	599	53	17	376	235	36	318	47	10	120	69	10
25-Sep-24	36	535	53	17	304	184	33	349	47	11	131	68	9
26-Sep-24	38	578	53	15	313	165	24	315	47	10	107	56	6
27-Sep-24	36	564	56	20	470	369	79	286	50	14	147	104	20
28-Sep-24	35	341	52	16	188	98	13	253	51	16	133	76	11
29-Sep-24	35	399	54	18	295	210	43	236	49	13	111	75	12
30-Sep-24	37	349	53	17	206	129	19	236	50	14	105	61	8
<b>Monthly Average</b>	<b>36</b>	<b>468</b>	<b>54</b>	<b>17</b>	<b>314</b>	<b>205</b>	<b>37</b>	<b>257</b>	<b>48</b>	<b>12</b>	<b>105</b>	<b>62</b>	<b>9</b>
<b>Monthly Total</b>	<b>-</b>	<b>14,039</b>	<b>-</b>	<b>-</b>	<b>9,411</b>	<b>6,162</b>	<b>1,117</b>	<b>7,707</b>	<b>-</b>	<b>-</b>	<b>3,145</b>	<b>1,860</b>	<b>278</b>

<sup>5</sup> 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 Levels<sup>6</sup> and Aircraft Operations<sup>7</sup> – 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-Sep-24	43	433	56	13	173	72	12	257	55	12	117	52	11
2-Sep-24	43	507	58	15	198	80	13	254	57	14	116	51	11
3-Sep-24	45	598	54	9	157	39	5	318	53	8	101	30	4
4-Sep-24	46	451	58	12	118	57	6	231	55	9	56	28	4
5-Sep-24	46	613	59	14	328	182	20	304	58	12	171	100	16
6-Sep-24	-	595	-	-	-	-	-	336	-	-	-	-	-
7-Sep-24	-	552	-	-	-	-	-	276	-	-	-	-	-
8-Sep-24	-	449	-	-	-	-	-	212	-	-	-	-	-
9-Sep-24	45	485	58	13	136	53	7	218	56	11	59	27	5
10-Sep-24	45	534	57	13	244	110	13	285	56	12	145	69	11
11-Sep-24	46	449	60	14	237	124	18	251	58	12	136	76	15
12-Sep-24	45	336	57	13	152	59	9	235	57	12	104	43	8
13-Sep-24	45	619	57	12	221	82	14	348	56	11	138	57	13
14-Sep-24	45	447	57	12	158	62	9	260	57	11	104	43	9
15-Sep-24	45	371	57	13	124	53	9	197	57	12	79	39	8
16-Sep-24	44	504	60	16	240	118	23	277	59	15	143	74	18
17-Sep-24	45	292	57	12	152	67	7	174	56	11	91	41	6
18-Sep-24	44	511	56	12	213	79	11	311	55	11	145	55	9
19-Sep-24	45	599	58	13	253	108	13	321	57	11	144	63	11
20-Sep-24	45	460	59	13	243	120	15	289	58	13	166	85	14
21-Sep-24	44	388	58	14	208	97	14	229	57	13	128	61	11
22-Sep-24	42	276	59	16	120	55	15	134	58	16	70	40	13
23-Sep-24	44	535	57	13	241	113	15	314	56	11	145	68	12
24-Sep-24	44	614	58	13	235	109	17	332	57	13	152	74	15
25-Sep-24	45	541	57	12	193	84	11	355	56	11	140	61	10
26-Sep-24	46	581	57	11	182	59	7	318	56	10	126	48	7
27-Sep-24	47	591	59	12	263	118	12	312	58	11	158	77	11
28-Sep-24	44	344	57	14	157	64	12	267	57	13	142	61	12
29-Sep-24	43	407	57	14	195	93	16	244	56	13	127	64	14
30-Sep-24	45	367	57	11	147	54	7	251	56	11	114	42	7
<b>Monthly Average</b>	<b>45</b>	<b>482</b>	<b>58</b>	<b>13</b>	<b>196</b>	<b>86</b>	<b>12</b>	<b>270</b>	<b>57</b>	<b>12</b>	<b>123</b>	<b>57</b>	<b>11</b>
<b>Monthly Total</b>	<b>-</b>	<b>14,449</b>	<b>-</b>	<b>-</b>	<b>5,288</b>	<b>2,313</b>	<b>333</b>	<b>8,110</b>	<b>-</b>	<b>-</b>	<b>3,317</b>	<b>1,528</b>	<b>287</b>

<sup>6</sup> Noise meter malfunctioned September 6 – September 8

<sup>7</sup> 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 Levels<sup>8</sup> and Aircraft Operations<sup>9</sup> – 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-Sep-24	36	433	57	20	258	175	48	257	52	16	131	86	20
2-Sep-24	38	509	58	20	279	180	48	256	53	15	109	70	17
3-Sep-24	39	598	52	13	256	113	14	318	48	10	113	48	6
4-Sep-24	41	451	60	19	142	98	30	230	53	12	43	28	5
5-Sep-24	39	622	61	22	449	345	130	307	56	16	165	127	40
6-Sep-24	39	596	58	20	309	208	68	336	53	15	151	100	26
7-Sep-24	39	553	59	20	337	231	74	276	53	14	131	87	22
8-Sep-24	39	447	61	23	304	226	81	210	55	16	107	80	21
9-Sep-24	39	490	59	20	160	108	35	222	53	14	54	38	9
10-Sep-24	38	538	57	19	156	107	33	287	53	14	70	48	14
11-Sep-24	39	453	61	22	342	253	87	254	55	16	144	105	31
12-Sep-24	40	337	58	17	236	156	27	236	54	14	139	93	12
13-Sep-24	38	619	57	19	340	215	49	347	52	14	161	103	22
14-Sep-24	38	449	57	19	250	157	39	261	52	14	119	76	16
15-Sep-24	38	372	57	19	190	120	33	198	52	14	86	55	15
16-Sep-24	38	509	58	20	318	219	64	280	53	15	140	96	25
17-Sep-24	-	290	-	-	-	-	-	172	-	-	-	-	-
18-Sep-24	-	515	-	-	-	-	-	314	-	-	-	-	-
19-Sep-24	39	604	56	17	197	109	24	324	52	13	94	52	9
20-Sep-24	40	471	59	20	327	221	63	298	55	16	173	117	25
21-Sep-24	37	390	60	23	301	222	81	229	54	17	136	95	28
22-Sep-24	34	277	57	23	193	126	42	135	55	20	78	56	23
23-Sep-24	38	537	58	20	328	226	69	316	53	15	152	99	24
24-Sep-24	39	616	58	19	319	202	56	333	54	15	149	96	24
25-Sep-24	38	542	57	19	292	179	46	356	53	15	166	99	23
26-Sep-24	40	585	57	17	281	154	34	322	53	13	132	74	14
27-Sep-24	39	591	60	21	416	287	97	312	56	16	176	124	36
28-Sep-24	37	359	56	19	199	122	29	271	55	19	157	100	26
29-Sep-24	37	404	58	21	267	189	58	241	53	16	131	91	26
30-Sep-24	39	366	57	18	197	123	31	250	55	15	121	72	15
<b>Monthly Average</b>	<b>38</b>	<b>484</b>	<b>58</b>	<b>20</b>	<b>273</b>	<b>181</b>	<b>53</b>	<b>272</b>	<b>53</b>	<b>15</b>	<b>126</b>	<b>83</b>	<b>21</b>
<b>Monthly Total</b>	<b>-</b>	<b>14,523</b>	<b>-</b>	<b>-</b>	<b>7,644</b>	<b>5,072</b>	<b>1,490</b>	<b>8,148</b>	<b>-</b>	<b>-</b>	<b>3,527</b>	<b>2,318</b>	<b>575</b>

<sup>8</sup> Noise meter malfunctioned September 17 – September 18

<sup>9</sup> 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.