

Runway Rotation Test Report

July 6, 2016 – December 25, 2016

Fly Quiet Program

Chicago O'Hare International Airport



Visit the O'Hare Noise Webpage on the Internet at
www.flychicago.com/ORDNoise

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SUMMARY

On September 18, 2015, the ONCC formed an ad hoc Fly Quiet Committee (Committee) to review, modify and make recommendations regarding nighttime noise abatement procedures at O'Hare International Airport (O'Hare). The Committee was formed as a result of the CDA's Noise Recommendations modifying the Fly Quiet Program. The Committee began a series of public meetings to address Fly Quiet modifications and set the following goals for a Runway Rotation Program:

1. **Provide Near-Term Relief** – Six-Month Test with Citizen Feedback
2. **Reduce Impacts to the Highest Impacted Communities** – Provide Relief to Significantly Impacted Communities
3. **Provide Predictability** – Publish a rotation schedule that allows citizens to predict periods of relief to the extent possible

The Committee set specific criteria for a runway rotation program and the ONCC formally recommended to the Chicago Department of Aviation (CDA) on May 6, 2016 that a Fly Quiet Runway Rotation Test (Test) be implemented.

The CDA established a Test that met the goals and specific criteria established by the ONCC and received approval by the Federal Aviation Administration (FAA) on July 1, 2016.



The CDA conducted the Test for a 25-week period in 2016 from the night of July 6, 2016 through the morning of December 25, 2017 (Test Period), as approved by the FAA. The purpose of the test is to evaluate a condition that could be in place until runway 15/33 is permanently closed. The Test occurred during the overnight hours and followed a 25-week schedule, beginning the evening of July 6, 2016 and ending the morning of December 25, 2016. The Test included ten (10) designated Fly Quiet Runway Configurations, along with runway rotations, intended to balance the overnight noise. Primary and Secondary Runway Configurations were designated for each week of the Test. Each new week began on Sunday evening at 10 p.m. or later, when demand allowed for one designated arrival runway and one designated departure runway. For additional background information, please refer to the Fly Quiet Rotation Test Submittal.

The results of the Test show that 67 percent of the aircraft operations (operations) that occurred during the overnight Fly Quiet Hours utilized the designated rotation runways. Each night there was an average of 97 operations; 65 of which operated on designated runways. Please refer to the following sections for additional details.

FLY QUIET MODE

The FAA considers nighttime hours as 10:00 p.m. - 07:00 a.m.¹ It is the CDA's goal for the Fly Quiet Program to occur during the entire nine-hour nighttime period of 10:00 p.m. to 7:00 a.m., however due to operational demand by the airlines and traveling public, Fly Quiet is typically limited to a period less than nine hours. Fly Quiet Mode, the period of time in Fly Quiet, starts each night on or after 10:00 p.m., once demand allows for two departure runways and one arrival runway and allows for the preferential flight tracks as outlined in the CDA's *Fly Quiet Manual*. Demand for the majority of the night allows for one arrival runway and one departure runway. Once demand increases in the morning where additional runways are needed and preferential flight tracks can no longer be utilized, Fly Quiet Mode stops.

For each week of the Test, the Start and Stop times of Fly Quiet was recorded and reported on the Test website: www.flychicago.com/flyquiettest.

¹ Airport Noise Compatibility Planning (14 CFR Part 150)

FIGURE 1
AVERAGE DAILY FLY QUIET START AND STOP TIMES

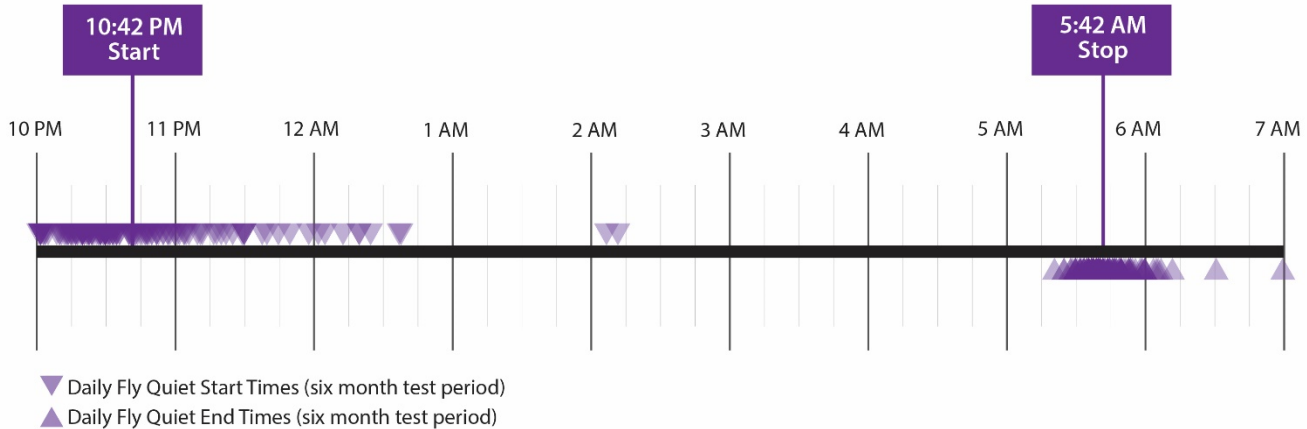
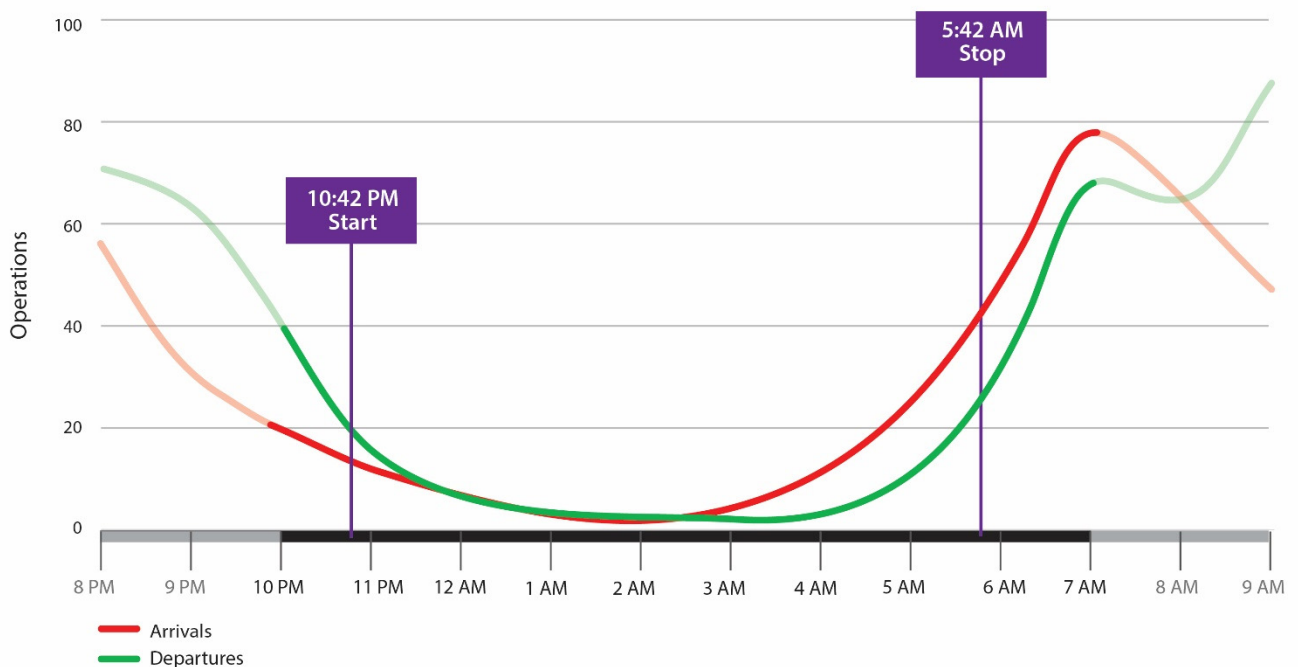


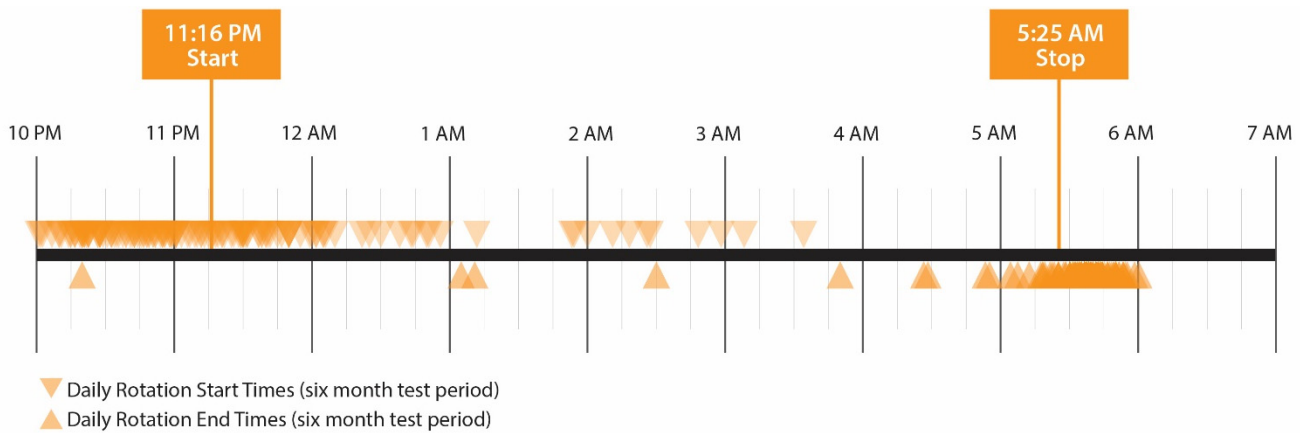
Figure 1 shows the daily Fly Quiet Start and Stop times for every night of the Test. The average daily Fly Quiet Start Time was 10:42 p.m. and the average daily Fly Quiet Stop Time was 5:42 a.m., for an average of seven (7) hours each night. The Fly Quiet Start and Stop times were based on runway demand. As shown in **Figure 2**, there is a departure bank before 10:42 p.m. that typically prevents Fly Quiet from beginning any earlier. If that departure bank is delayed for any reason, the start of Fly Quiet is also delayed. Similarly, there is a large arrival bank before 7 a.m. that causes Fly Quiet to typically end at 5:42 a.m. If this arrival bank is delayed, Fly Quiet can continue longer.

FIGURE 2
AVERAGE OPERATIONS BY HOUR FOR TEST PERIOD



ROTATION MODE

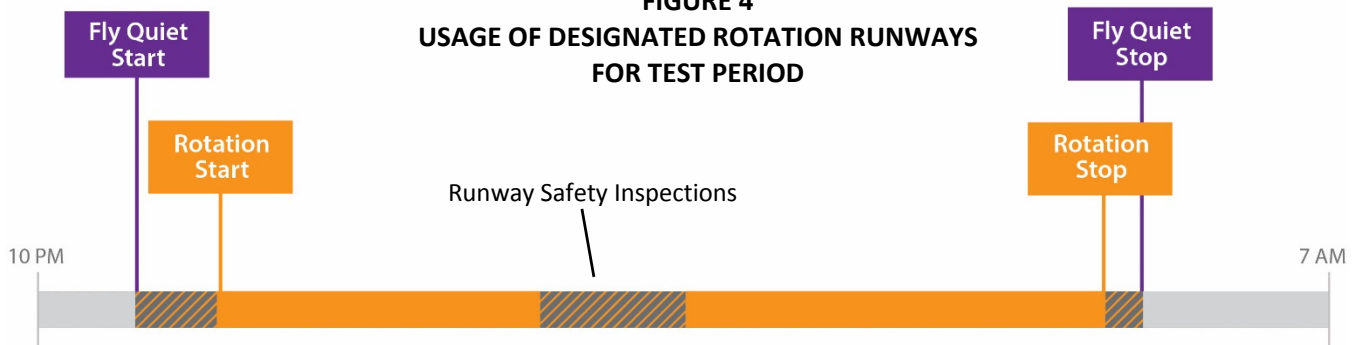
FIGURE 3
AVERAGE DAILY ROTATION MODE START AND STOP TIMES



For every week of the Test, one runway was designated for arrivals and one runway was designated for departures - which were defined as configurations. These configurations included some mixed-use runways. Each configuration also had a daily start and stop time, where both an arrival and departure runway were utilized. As shown in **Figure 3**, the daily Rotation Start and Stop times were tracked and reported for the Test. The average daily Rotation Start Time was 11:16 p.m. and the average daily Rotation Stop Time was 5:25 a.m.

Each runway at O'Hare is required to be closed throughout the night for approximately one hour in order to perform a proper runway safety inspection for FAR Part 139. During this time, a configuration will stop and typically resumes after the safety inspection is complete. In addition, there are typically periods of time immediately after Fly Quiet Mode starts and immediately before Fly Quiet Mode stops that the designated runways are not utilized or only partially utilized for many reasons.² The period of time when both the arrival and departure runways are utilized is Rotation Mode. Rotation Mode does not include periods of time when one of the designated runways is not being utilized. **Figure 4** depicts a typical night for Fly Quiet Start and Stop, Rotation Start and Stop and quantifies operations for periods.

FIGURE 4
USAGE OF DESIGNATED ROTATION RUNWAYS FOR TEST PERIOD



Average Number of Operations for Test Period

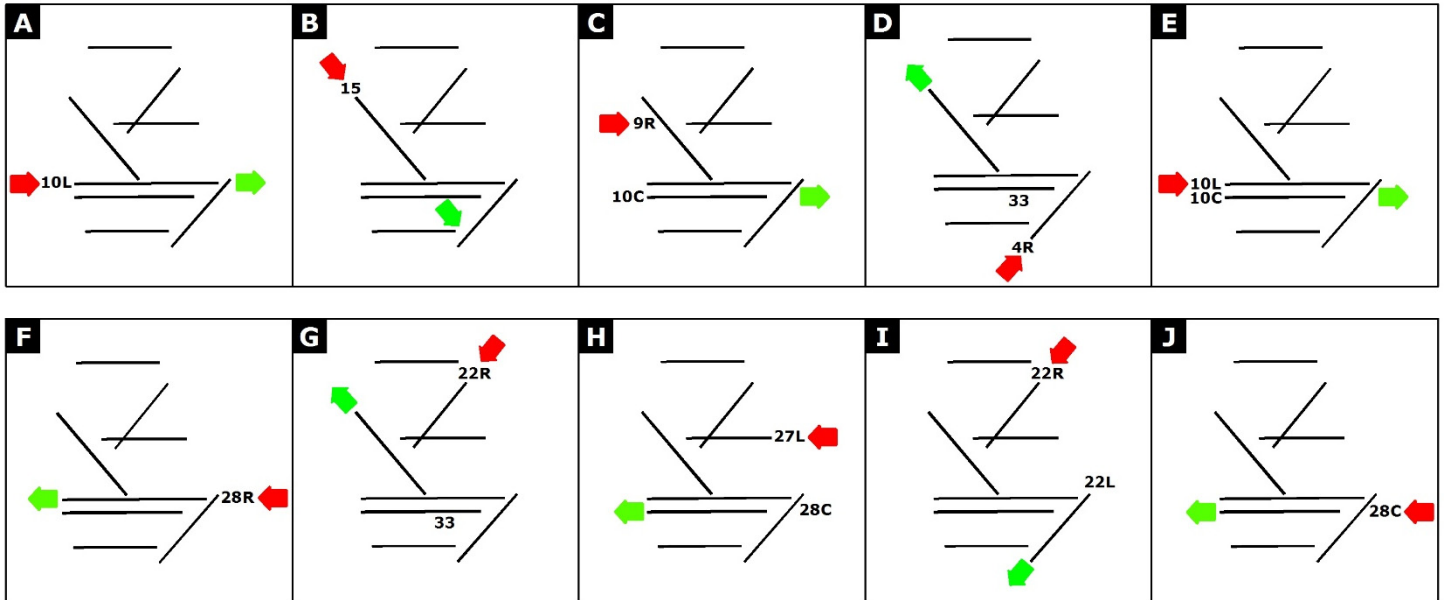
Runway Rotation Operations	= 65 Operations
Non-Runway Rotation Operations	= 32 Operations
Fly Quiet Operations	= 97 Operations

² On any given night, Test configurations may not have been allowed due to occurrences including, but not limited to, runway safety closures, thunderstorms, snow removal, FAA flight checks, construction, rubber removal, runway requests, and similar.

FLY QUIET TEST RUNWAY CONFIGURATIONS

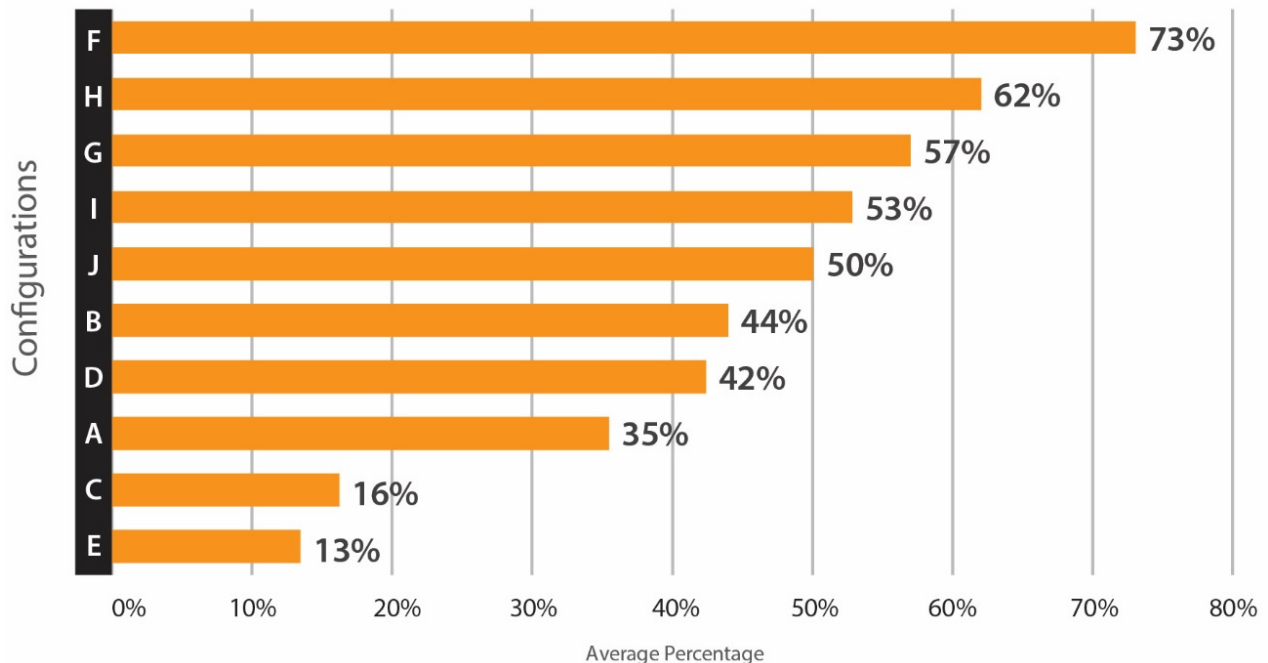
Ten (10) Fly Quiet Runway Configurations were developed and scheduled for a 25 week Test as show in **Figure 5**, below. As nighttime airfield construction affected the schedule, construction alternatives were utilized for those weeks while notifying the public in advance on the Test website: www.flychicago.com/flyquiettest .

FIGURE 5
FLY QUIET TEST CONFIGURATIONS



The results of the Test show that 67 percent of the operations that occurred during Fly Quiet utilized the designated runways. **Figure 6**, below, ranks the order of Fly Quiet Configuration usage, from highest to lowest.

FIGURE 6
AVERAGE RUNWAY CONFIGURATION USAGE



Note: Does not include Construction Alternatives during the Test.

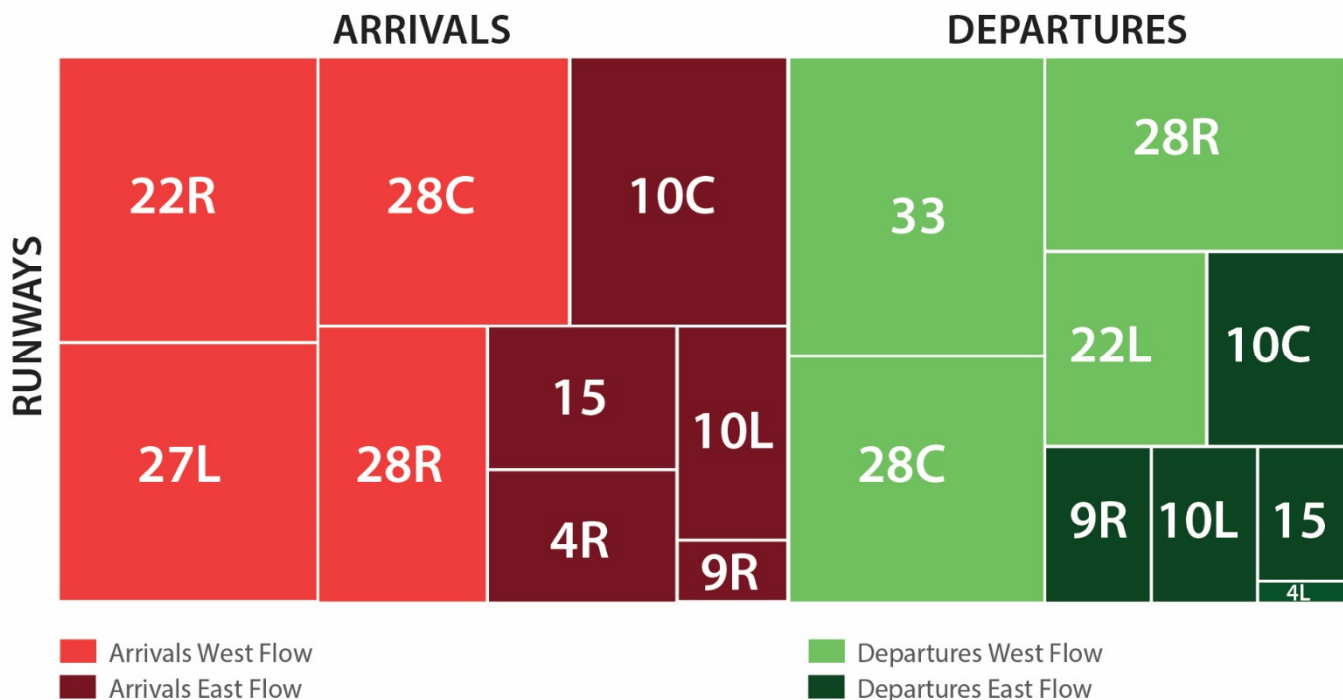
RUNWAY UTILIZATION FOR TEST PERIOD

The Test was designed to balance the runway utilization during Fly Quiet. The Test schedule included alternating weeks of utilizing parallel and diagonal runways and the Test included an equal number of East and West Flow weeks. Every week had a secondary configuration to accommodate opposite wind flow, but remained on parallel or diagonal runways similar to the primary configuration. The average operations for Fly Quiet Mode are broken out as follows:

Arrivals	55
Departures	42
Operations	97

Figure 7 is a TreeMap that displays proportional boxes in size for each runway operation, representative of the average throughout the Test. The lighter boxes represent West Flow operations and the darker boxes represent East Flow operations.

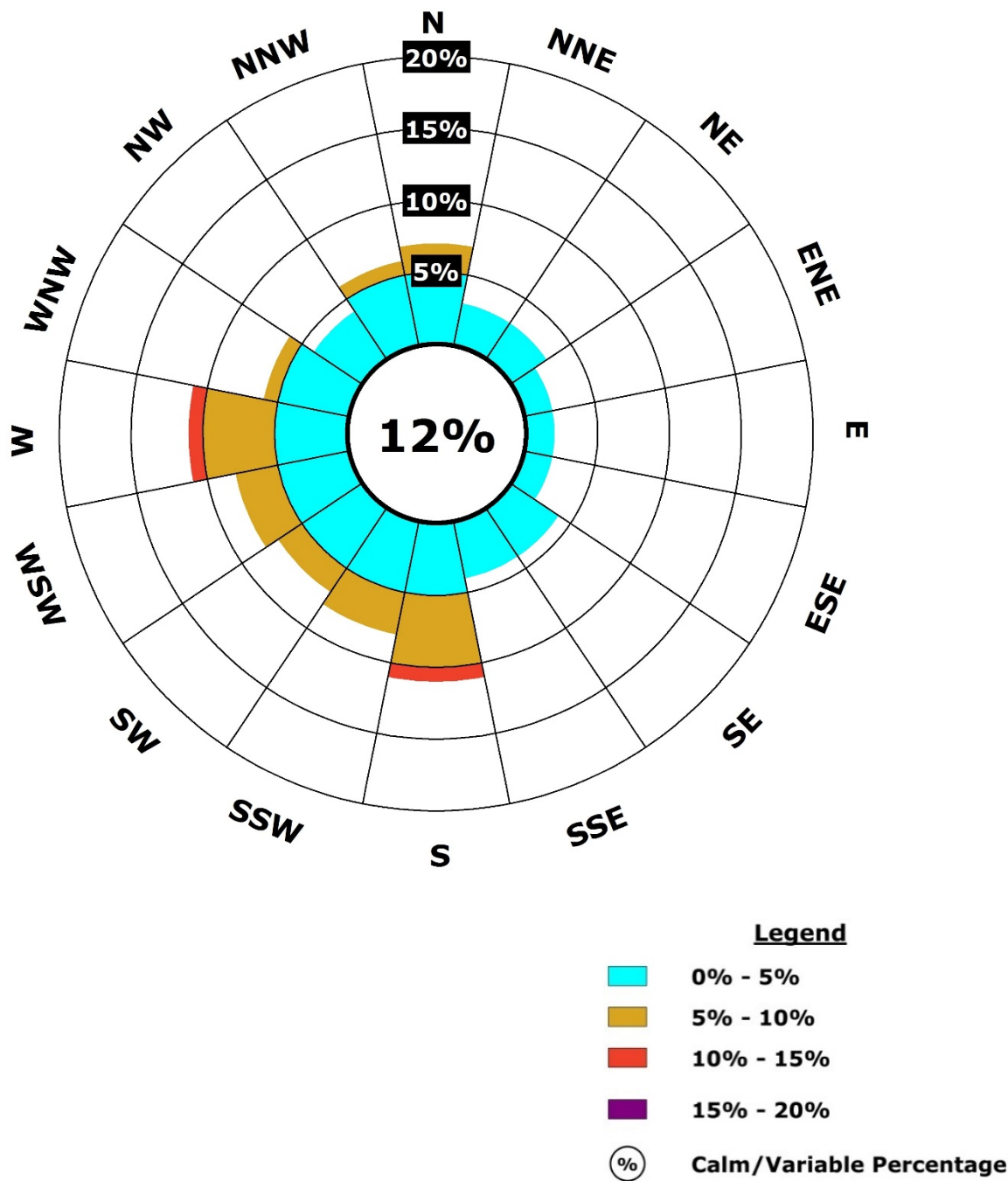
FIGURE 7
FLY QUIET MODE AVERAGE RUNWAY UTILIZATION FOR TEST PERIOD



WIND SUMMARY

Wind is a key factor influencing runway use and operation. Aircraft performance requirements make it necessary for aircraft to take off and land into the wind for safety purposes. Ideally, aircraft should take off and land into the wind as the increased airflow over the wings provides improved lift. **Figure 8** summarizes the percent of wind occurrences by direction based on hourly data from the KORD Automated Surface Observing System (ASOS), which is a joint effort of multiple government agencies.

FIGURE 8
PERCENT OF WIND OCCURRENCES DURING THE TEST

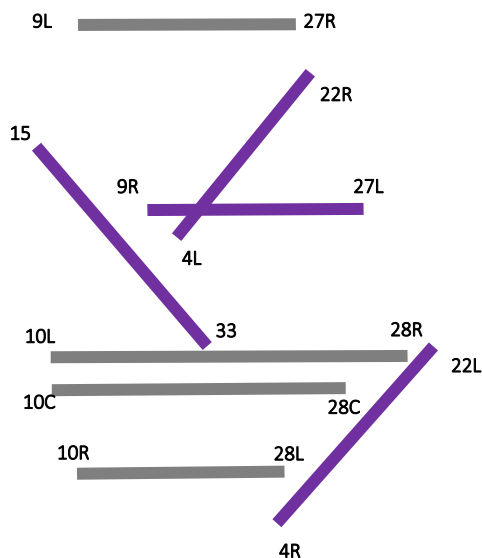


WIDE-BODY AIRCRAFT

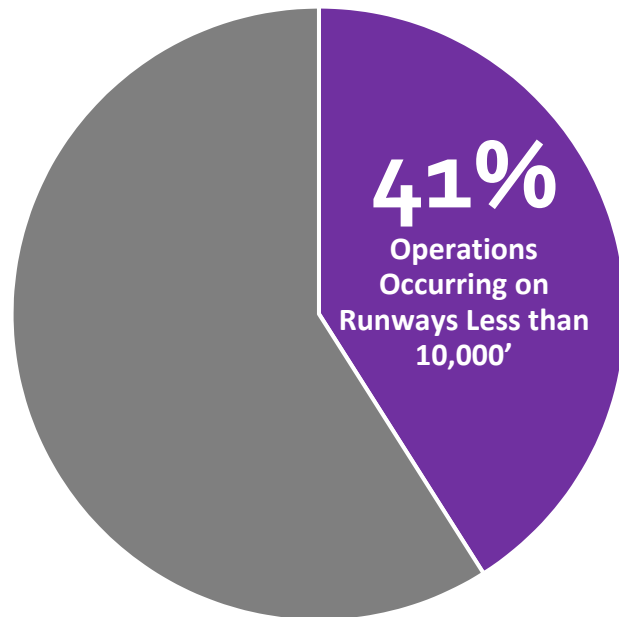
Most wide-body aircraft operating during the nighttime hours at O'Hare are cargo aircraft with large payloads. The typical wide-body aircraft that operate at O'Hare are the 767, 777, 747, and DC-10. These heavy aircraft typically climb at a slower rate and may cause significant noise complaints. Most heavy wide-body aircraft typically utilize the following two longest runways at O'Hare:

1. Runway 10L/28R 13,000 feet long
2. Runway 10C/28C 10,801 feet long

Wide-body operations on runway 10L/28R and 10C/28C heavily impacts the communities of Bensenville and Schiller Park. While the Test did not prevent these operations from occurring on these runways, it required airlines to request these runways during periods that these runways were not the designated runways. During the Test, the CDA required airlines to request specific runways two hours in advance if a specific runway was needed for operational considerations. All requests were granted during the Test unless that specific runway was closed for maintenance. Test results showed that 41% of wide-body operations (an average of 11 operations per night) were conducted on runways with lengths of less than 10,000 feet, which provided relief of nighttime noise to the communities impacted by runway 10L/28R and 10C/28C operations.



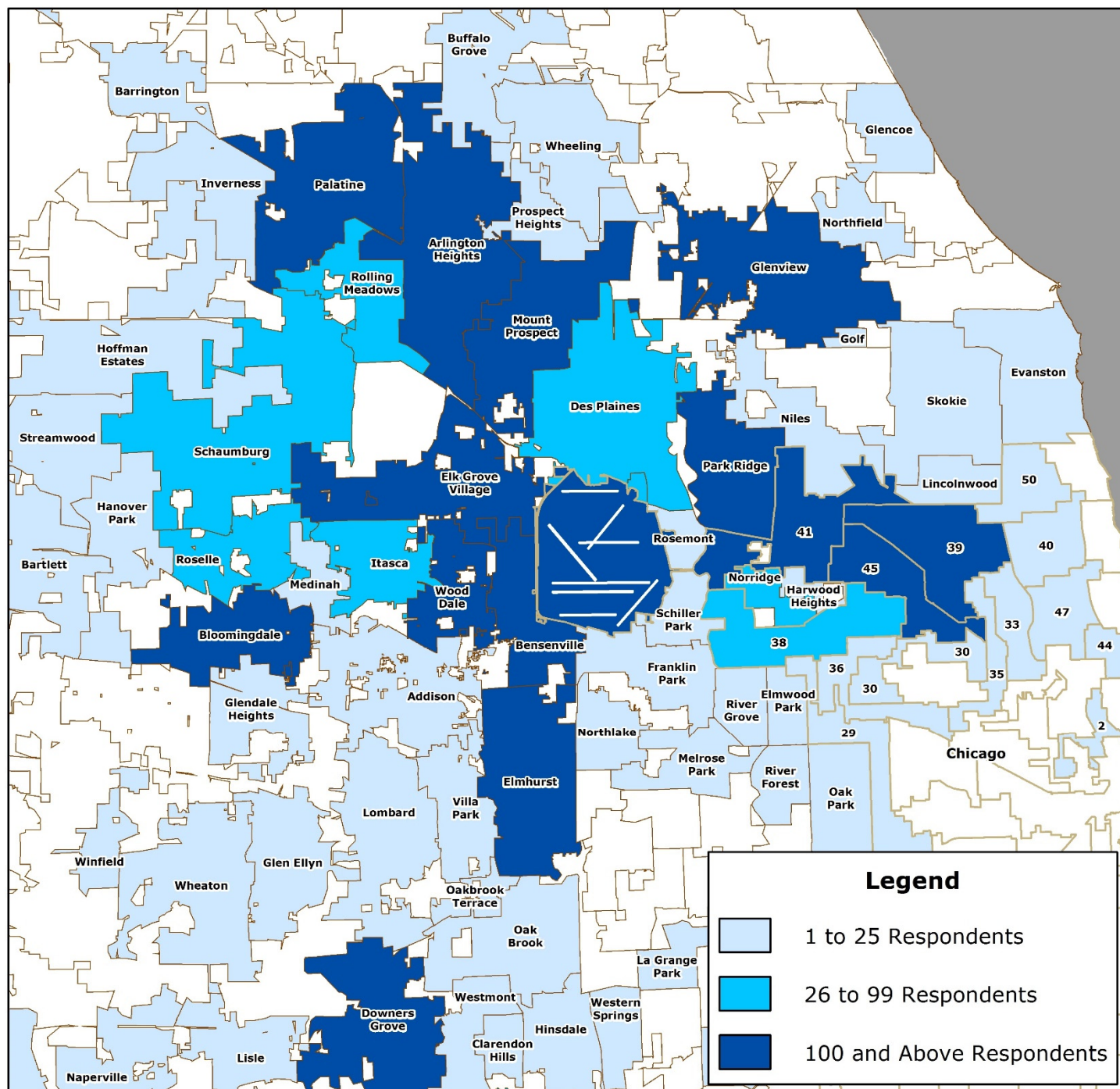
Note: Runways eligible for Fly Quiet and less than 10,000 feet in length are depicted in **purple**.



SURVEY FEEDBACK

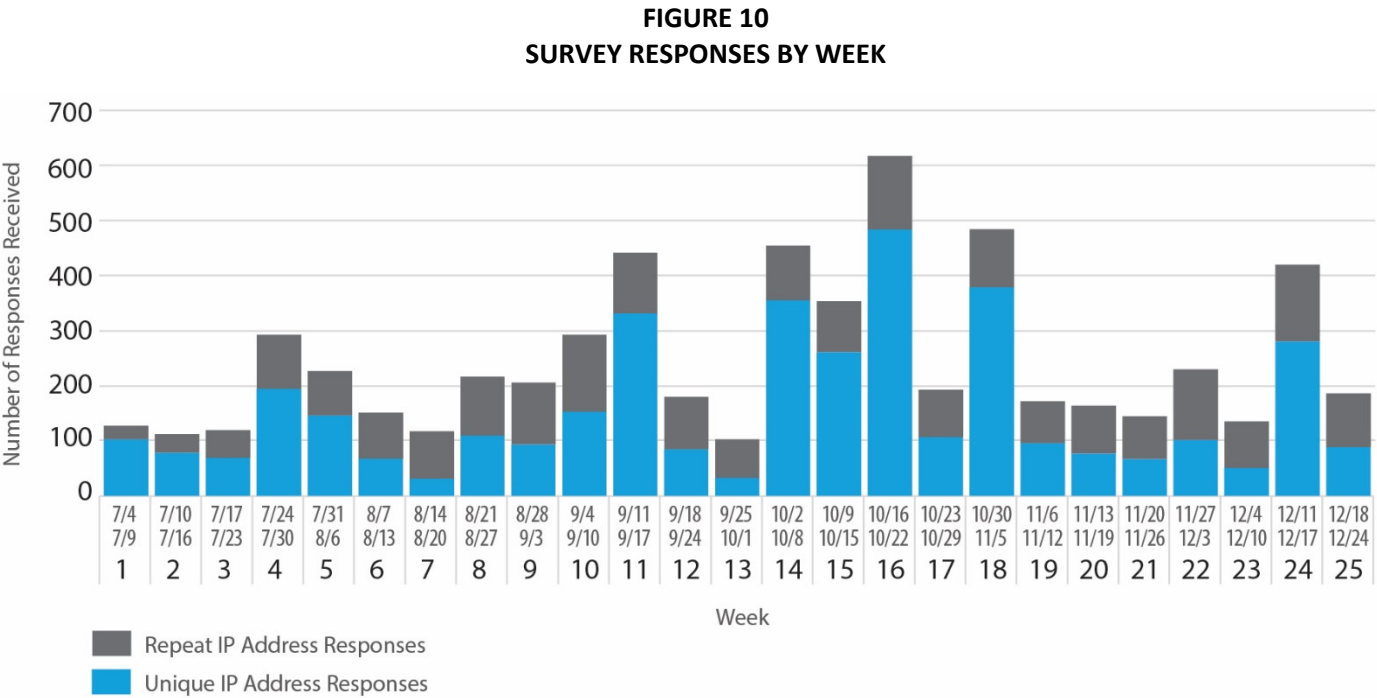
An online public survey was available during the Test in order for the CDA to receive feedback from residents of the communities surrounding O'Hare. There were 6,160 survey responses submitted, which originated from 3,837 unique IP addresses from 84 different communities in the Chicago region. The numbers of survey respondents by community are shown in **Figure 9**.

FIGURE 9
COMMUNITIES WITH SURVEY RESPONSES

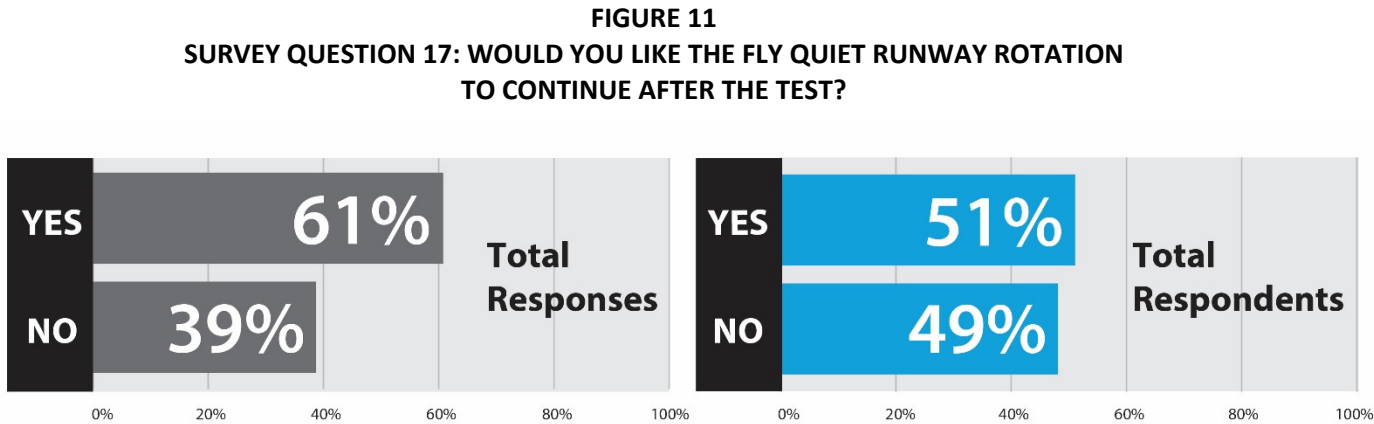


Note: Not all communities are depicted in Figure 9. The full list of survey responses is included in the Reports Section of this document.

The number of survey responses by week are shown in **Figure 10**.



As shown in **Figure 11**, 61% of the total survey responses indicate that the Test should continue. See the Reports Section of this document for detailed Survey results.



Would you like the Fly Quiet Runway Rotation to continue after the test?

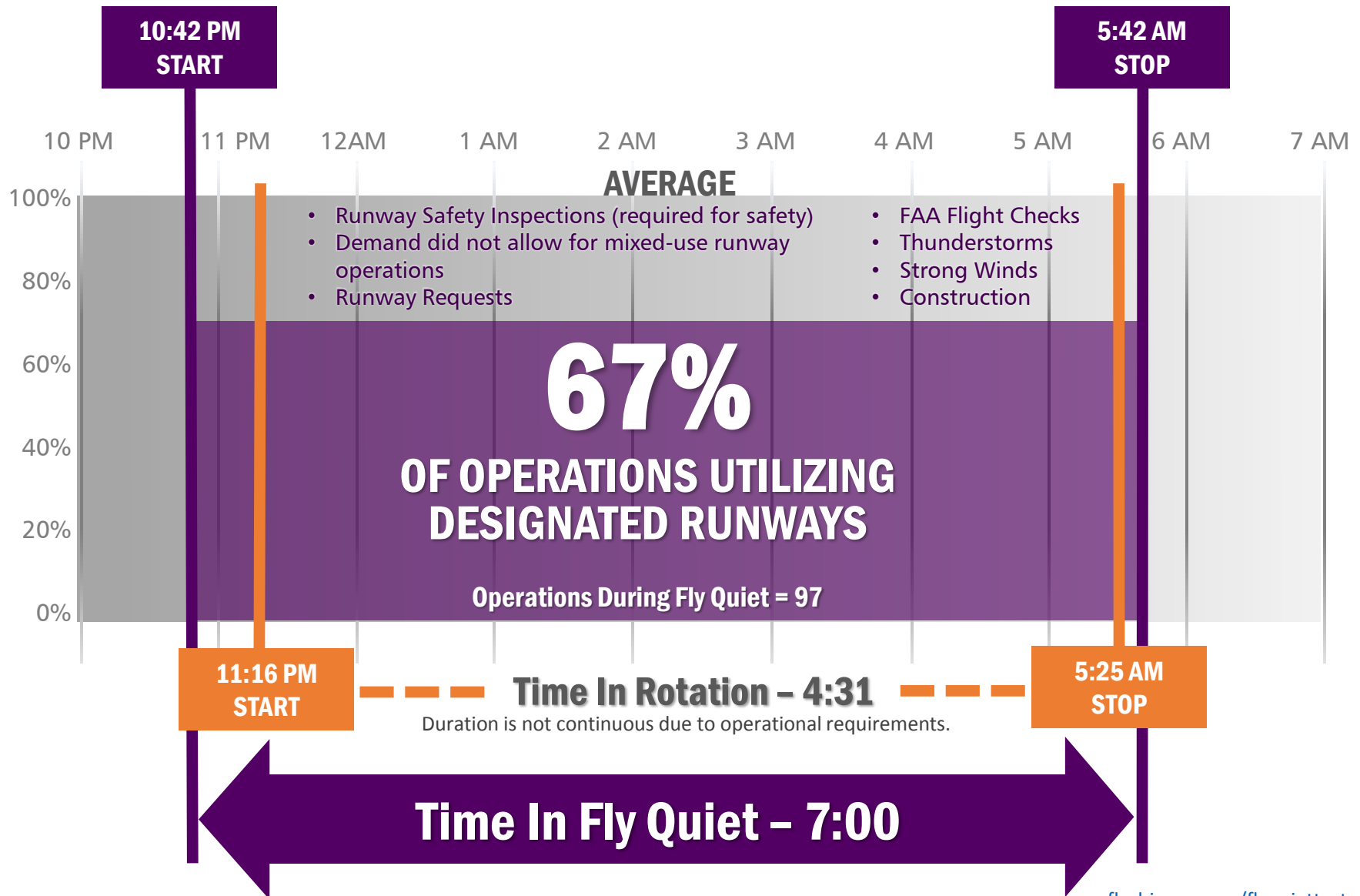
- A. YES
- B. NO

Note: Respondents represents unique IP addresses.

FLY QUIET SUMMARY

JULY 6 – DECEMBER 24, 2016

25 WEEK AVERAGE



RUNWAY ROTATION TEST
JULY 6, 2016 TO DECEMBER 25, 2016



July 6 - December 25

Overall Fly Quiet					Runway Rotation Test				
Start	Stop	Duration (hrs: mins)	Percentage of Nighttime ¹	Operations	Start	Stop	Duration ² (hrs: mins)	Primary ³	Secondary ³
7/6/16 - 10:30 PM	7/7/16 - 05:50 AM	7:20	81%	140	7/6/16 - 11:42 PM	7/7/16 - 05:31 AM	4:18	75%	0%
7/7/16 - 11:18 PM	7/8/16 - 05:44 AM	6:26	71%	90	7/7/16 - 11:50 PM	7/8/16 - 05:44 AM	3:05	83%	0%
7/8/16 - 10:47 PM	7/9/16 - 05:39 AM	6:52	76%	115	7/8/16 - 11:50 PM	7/9/16 - 05:42 AM	4:46	75%	3%
7/9/16 - 10:28 PM	7/10/16 - 05:43 AM	7:15	81%	93	7/9/16 - 10:28 PM	7/10/16 - 05:43 AM	6:29	99%	0%
7/10/16 - 11:00 PM	7/11/16 - 05:40 AM	6:40	74%	81	7/10/16 - 11:40 PM	7/11/16 - 05:40 AM	5:02	57%	0%
7/11/16 - 10:28 PM	7/12/16 - 05:32 AM	7:04	79%	110	7/12/16 - 12:56 AM	7/12/16 - 05:32 AM	3:54	27%	0%
7/12/16 - 11:02 PM	7/13/16 - 05:35 AM	6:33	73%	106	7/12/16 - 11:50 PM	7/13/16 - 05:32 AM	4:50	33%	38%
7/14/16 - 12:25 AM	7/14/16 - 05:30 AM	5:05	56%	69	7/14/16 - 12:38 AM	7/14/16 - 05:30 AM	3:57	0%	77%
7/14/16 - 10:46 PM	7/15/16 - 05:47 AM	7:01	78%	122	7/15/16 - 12:22 AM	7/15/16 - 05:35 AM	3:53	1%	66%
7/15/16 - 10:52 PM	7/16/16 - 05:48 AM	6:56	77%	106	7/15/16 - 11:50 PM	7/16/16 - 05:27 AM	4:34	46%	0%
7/16/16 - 10:02 PM	7/17/16 - 05:37 AM	7:35	84%	127	7/16/16 - 11:32 PM	7/17/16 - 05:37 AM	5:40	83%	0%
7/17/16 - 11:30 PM	7/18/16 - 06:07 AM	6:37	74%	109	7/17/16 - 11:30 PM	7/18/16 - 05:50 AM	4:29	77%	0%
7/18/16 - 11:12 PM	7/19/16 - 05:29 AM	6:17	70%	88	7/19/16 - 02:00 AM	7/19/16 - 05:04 AM	1:51	0%	43%
7/19/16 - 10:34 PM	7/20/16 - 05:38 AM	7:04	79%	112	7/20/16 - 02:27 AM	7/20/16 - 05:33 AM	1:31	17%	33%
7/20/16 - 10:30 PM	7/21/16 - 05:25 AM	6:55	77%	128	7/21/16 - 01:53 AM	7/21/16 - 05:25 AM	1:25	56%	0%
7/22/16 - 2:12 AM	7/22/16 - 05:59 AM	3:47	42%	92	7/22/16 - 03:08 AM	7/22/16 - 05:54 AM	2:46	58%	0%
7/22/16 - 10:58 PM	7/23/16 - 05:41 AM	6:43	75%	91	7/22/16 - 11:25 PM	7/23/16 - 05:41 AM	4:21	71%	0%
7/24/16 - 2:07 AM	7/24/16 - 05:53 AM	3:46	42%	46	7/24/16 - 02:48 AM	7/24/16 - 05:53 AM	1:15	70%	13%
7/25/16 - 12:05 AM	7/25/16 - 05:56 AM	5:51	65%	120	7/25/16 - 01:12 AM	7/25/16 - 05:38 AM	3:44	11%	40%
7/25/16 - 10:50 PM	7/26/16 - 05:38 AM	6:48	76%	127	7/25/16 - 11:21 PM	7/26/16 - 05:38 AM	5:56	80%	0%
7/26/16 - 11:01 PM	7/27/16 - 05:32 AM	6:31	72%	82	7/26/16 - 11:01 PM	7/27/16 - 05:25 AM	4:44	88%	0%
7/27/16 - 11:00 PM	7/28/16 - 05:40 AM	6:40	74%	103	7/27/16 - 11:00 PM	7/28/16 - 05:22 AM	4:43	71%	7%
7/29/16 - 12:20 AM	7/29/16 - 05:42 AM	5:22	60%	73	7/29/16 - 12:25 AM	7/29/16 - 05:42 AM	3:57	81%	0%
7/29/16 - 11:38 PM	7/30/16 - 06:00 AM	6:22	71%	98	7/29/16 - 11:38 PM	7/30/16 - 05:35 AM	4:35	69%	0%
7/30/16 - 10:28 PM	7/31/16 - 06:00 AM	7:32	84%	122	7/30/16 - 10:28 PM	7/31/16 - 04:55 AM	5:17	65%	0%
7/31/16 - 10:30 PM	8/1/16 - 05:39 AM	7:09	79%	143	7/31/16 - 10:58 PM	8/1/16 - 05:39 AM	5:26	74%	0%
8/1/16 - 11:10 PM	8/2/16 - 05:49 AM	6:39	74%	100	8/1/16 - 11:10 PM	8/2/16 - 05:49 AM	4:46	0%	95%
8/2/16 - 11:05 PM	8/3/16 - 05:41 AM	6:36	73%	83	8/2/16 - 11:30 PM	8/3/16 - 05:41 AM	4:58	55%	6%
8/3/16 - 10:35 PM	8/4/16 - 05:40 AM	7:05	79%	122	8/3/16 - 11:38 PM	8/4/16 - 05:40 AM	5:16	75%	0%
8/4/16 - 11:30 PM	8/5/16 - 05:38 AM	6:08	68%	78	8/4/16 - 11:30 PM	8/5/16 - 05:38 AM	5:18	95%	0%
8/5/16 - 10:32 PM	8/6/16 - 05:36 AM	7:04	79%	106	8/5/16 - 11:12 PM	8/6/16 - 05:36 AM	5:06	67%	2%
8/6/16 - 10:33 PM	8/7/16 - 05:45 AM	7:12	80%	86	8/6/16 - 10:48 PM	8/7/16 - 05:45 AM	5:55	90%	0%
8/7/16 - 10:40 PM	8/8/16 - 05:50 AM	7:10	80%	121	--	--	0:00	30%	1%
8/8/16 - 10:40 PM	8/9/16 - 05:37 AM	6:57	77%	103	8/8/16 - 10:47 PM	8/9/16 - 05:33 AM	6:38	91%	2%
8/9/16 - 10:44 PM	8/10/16 - 05:30 AM	6:46	75%	95	8/9/16 - 10:46 PM	8/10/16 - 05:30 AM	6:01	86%	1%
8/10/16 - 10:40 PM	8/11/16 - 05:38 AM	6:58	77%	125	8/10/16 - 11:41 PM	8/11/16 - 05:38 AM	5:22	56%	4%
8/11/16 - 10:57 PM	8/12/16 - 05:42 AM	6:45	75%	103	8/11/16 - 10:59 PM	8/12/16 - 05:07 AM	4:08	71%	0%
8/12/16 - 11:30 PM	8/13/16 - 05:42 AM	6:12	69%	83	8/12/16 - 11:40 PM	8/13/16 - 05:39 AM	5:11	72%	4%
8/13/16 - 10:02 PM	8/14/16 - 05:38 AM	7:36	84%	137	8/13/16 - 10:15 PM	8/14/16 - 05:38 AM	6:00	82%	0%
8/14/16 - 11:45 PM	8/15/16 - 05:50 AM	6:05	68%	73	8/15/16 - 12:00 AM	8/15/16 - 05:40 AM	4:28	75%	1%
8/15/16 - 10:48 PM	8/16/16 - 05:38 AM	6:50	76%	109	8/15/16 - 11:18 PM	8/16/16 - 05:38 AM	5:35	62%	24%
8/16/16 - 11:04 PM	8/17/16 - 05:36 AM	6:32	73%	95	8/16/16 - 11:29 PM	8/17/16 - 05:30 AM	5:19	79%	8%
8/17/16 - 10:55 PM	8/18/16 - 05:36 AM	6:41	74%	109	8/17/16 - 11:45 PM	8/18/16 - 05:36 AM	4:52	25%	48%
8/19/16 - 12:20 AM	8/19/16 - 05:42 AM	5:22	60%	55	8/19/16 - 12:30 AM	8/19/16 - 05:42 AM	4:25	0%	87%
8/19/16 - 11:30 PM	8/20/16 - 05:40 AM	6:10	69%	81	8/20/16 - 12:10 AM	8/20/16 - 05:39 AM	4:44	0%	80%
8/20/16 - 10:36 PM	8/21/16 - 05:55 AM	7:19	81%	112	8/20/16 - 10:59 PM	8/21/16 - 05:55 AM	6:32	0%	83%
8/21/16 - 10:30 PM	8/22/16 - 05:36 AM	7:06	79%	103	8/21/16 - 10:51 PM	8/22/16 - 05:36 AM	5:37	64%	0%
8/22/16 - 10:17 PM	8/23/16 - 05:39 AM	7:22	82%	133	8/22/16 - 10:17 PM	8/23/16 - 05:19 AM	6:02	83%	0%
8/23/16 - 10:20 PM	8/24/16 - 05:34 AM	7:14	80%	102	8/23/16 - 10:20 PM	8/24/16 - 05:34 AM	6:05	83%	0%
8/24/16 - 10:55 PM	8/25/16 - 05:39 AM	6:44	75%	91	8/24/16 - 10:55 PM	8/25/16 - 05:39 AM	5:41	77%	0%
8/25/16 - 10:30 PM	8/26/16 - 05:36 AM	7:06	79%	110	8/25/16 - 10:55 PM	8/26/16 - 05:36 AM	5:57	75%	1%
8/26/16 - 10:52 PM	8/27/16 - 05:44 AM	6:52	76%	92	8/26/16 - 11:37 PM	8/27/16 - 04:53 AM	5:11	3%	40%
8/27/16 - 10:18 PM	8/28/16 - 05:37 AM	7:19	81%	78	8/27/16 - 10:17 PM	8/28/16 - 05:37 AM	5:57	71%	15%
8/28/16 - 11:04 PM	8/29/16 - 05:50 AM	6:46	75%	79	--	--	0:00	8%	0%
8/30/16 - 12:02 AM	8/30/16 - 05:35 AM	5:33	62%	53	8/30/16 - 12:02 AM	8/30/16 - 05:35 AM	3:32	0%	83%
8/30/16 - 11:20 PM	8/31/16 - 05:47 AM	6:27	72%	67	8/31/16 - 12:50 AM	8/31/16 - 05:47 AM	3:08	22%	39%
8/31/16 - 10:35 PM	9/1/16 - 05:40 AM	7:05	79%	108	9/1/16 - 02:18 AM	9/1/16 - 05:33 AM	3:15	7%	42%
9/1/16 - 11:50 PM	9/2/16 - 05:40 AM	5:50	65%	63	9/1/16 - 11:50 PM	9/2/16 - 05:40 AM	3:54	86%	0%
9/2/16 - 10:28 PM	9/3/16 - 05:42 AM	7:14	80%	90	9/3/16 - 02:26 AM	9/3/16 - 02:30 AM	0:04	20%	0%
9/3/16 - 10:04 PM	9/4/16 - 06:00 AM	7:56	88%	72	9/3/16 - 10:47 PM	9/4/16 - 05:36 AM	5:34	56%	0%
9/4/16 - 10:26 PM	9/5/16 - 05:38 AM	7:12	80%	67	9/4/16 - 10:56 PM	9/5/16 - 05:38 AM	6:00	0%	73%

RUNWAY ROTATION TEST
JULY 6, 2016 TO DECEMBER 25, 2016



July 6 - December 25

Overall Fly Quiet					Runway Rotation Test				
Start	Stop	Duration (hrs: mins)	Percentage of Nighttime ¹	Operations	Start	Stop	Duration ² (hrs: mins)	Primary ³	Secondary ³
9/5/16 - 10:02 PM	9/6/16 - 05:43 AM	7:41	85%	112	9/5/16 - 11:37 PM	9/6/16 - 05:43 AM	5:11	0%	38%
9/6/16 - 10:24 PM	9/7/16 - 05:32 AM	7:08	79%	96	9/6/16 - 10:43 PM	9/7/16 - 05:32 AM	6:01	85%	5%
9/7/16 - 11:40 PM	9/8/16 - 05:36 AM	5:56	66%	80	9/7/16 - 11:59 PM	9/8/16 - 05:36 AM	5:37	78%	1%
9/8/16 - 10:17 PM	9/9/16 - 05:50 AM	7:33	84%	113	9/8/16 - 10:17 PM	9/9/16 - 05:50 AM	6:07	88%	5%
9/9/16 - 10:10 PM	9/10/16 - 05:49 AM	7:39	85%	111	9/9/16 - 10:10 PM	9/10/16 - 05:49 AM	6:44	79%	7%
9/10/16 - 10:02 PM	9/11/16 - 05:38 AM	7:36	84%	83	9/10/16 - 10:20 PM	9/11/16 - 05:38 AM	6:24	83%	2%
9/11/16 - 10:33 PM	9/12/16 - 05:41 AM	7:08	79%	86	9/11/16 - 10:55 PM	9/12/16 - 05:41 AM	5:56	88%	0%
9/12/16 - 10:31 PM	9/13/16 - 05:42 AM	7:11	80%	89	9/12/16 - 10:45 PM	9/13/16 - 05:42 AM	6:57	52%	40%
9/13/16 - 10:28 PM	9/14/16 - 05:41 AM	7:13	80%	83	9/13/16 - 10:28 PM	9/14/16 - 05:41 AM	7:13	88%	0%
9/14/16 - 10:23 PM	9/15/16 - 05:50 AM	7:27	83%	116	9/14/16 - 10:23 PM	9/15/16 - 05:50 AM	7:27	87%	0%
9/15/16 - 10:27 PM	9/16/16 - 05:50 AM	7:23	82%	99	9/15/16 - 10:34 PM	9/16/16 - 05:50 AM	7:16	85%	0%
9/16/16 - 10:20 PM	9/17/16 - 05:39 AM	7:19	81%	100	9/16/16 - 10:27 PM	9/17/16 - 05:39 AM	5:20	0%	71%
9/17/16 - 10:00 PM	9/18/16 - 05:42 AM	7:42	86%	82	9/17/16 - 11:31 PM	9/18/16 - 05:42 AM	5:09	1%	71%
9/18/16 - 10:14 PM	9/19/16 - 05:43 AM	7:29	83%	91	9/18/16 - 10:58 PM	9/19/16 - 05:43 AM	5:54	0%	70%
9/19/16 - 10:18 PM	9/20/16 - 05:48 AM	7:30	83%	118	9/19/16 - 10:52 PM	9/20/16 - 05:48 AM	5:23	88%	3%
9/20/16 - 10:27 PM	9/21/16 - 05:41 AM	7:14	80%	89	9/20/16 - 10:48 PM	9/21/16 - 05:41 AM	5:03	61%	24%
9/21/16 - 11:25 PM	9/22/16 - 05:32 AM	6:07	68%	93	9/21/16 - 11:47 PM	9/22/16 - 05:32 AM	5:45	84%	1%
9/22/16 - 10:30 PM	9/23/16 - 05:58 AM	7:28	83%	99	9/22/16 - 10:42 PM	9/23/16 - 05:58 AM	7:16	96%	0%
9/23/16 - 10:20 PM	9/24/16 - 05:54 AM	7:34	84%	99	--	--	0:00	0%	0%
9/24/16 - 10:00 PM	9/25/16 - 05:46 AM	7:46	86%	86	9/24/16 - 10:07 PM	9/25/16 - 05:36 AM	6:27	78%	1%
9/25/16 - 10:49 PM	9/26/16 - 05:45 AM	6:56	77%	91	9/25/16 - 10:49 PM	9/26/16 - 05:40 AM	6:51	89%	0%
9/26/16 - 10:00 PM	9/27/16 - 05:30 AM	7:30	83%	120	9/26/16 - 10:35 PM	9/27/16 - 05:30 AM	6:55	76%	0%
9/27/16 - 10:22 PM	9/28/16 - 05:25 AM	7:03	78%	87	9/27/16 - 11:17 PM	9/28/16 - 05:37 AM	5:29	51%	26%
9/28/16 - 10:50 PM	9/29/16 - 05:40 AM	6:50	76%	96	9/28/16 - 11:21 PM	9/29/16 - 05:40 AM	5:24	0%	75%
9/29/16 - 10:35 PM	9/30/16 - 05:37 AM	7:02	78%	102	9/29/16 - 11:03 PM	9/30/16 - 05:37 AM	5:43	0%	85%
9/30/16 - 10:29 PM	10/1/16 - 05:37 AM	7:08	79%	100	9/30/16 - 11:30 PM	10/1/16 - 05:46 AM	5:27	0%	73%
10/1/16 - 10:04 PM	10/2/16 - 05:39 AM	7:35	84%	80	10/1/16 - 10:19 PM	10/2/16 - 05:39 AM	7:20	89%	0%
10/2/16 - 10:20 PM	10/3/16 - 05:40 AM	7:20	81%	113	--	--	0:00	0%	35%
10/3/16 - 11:17 PM	10/4/16 - 05:50 AM	6:33	73%	62	10/3/16 - 11:17 PM	10/4/16 - 05:25 AM	6:08	92%	0%
10/4/16 - 10:33 PM	10/5/16 - 05:28 AM	6:55	77%	84	10/4/16 - 10:33 PM	10/5/16 - 05:28 AM	6:39	75%	0%
10/5/16 - 10:30 PM	10/6/16 - 05:53 AM	7:23	82%	111	10/5/16 - 11:01 PM	10/6/16 - 05:53 AM	6:52	78%	10%
10/6/16 - 10:30 PM	10/7/16 - 05:35 AM	7:05	79%	110	10/6/16 - 11:15 PM	10/7/16 - 05:35 AM	5:03	70%	0%
10/7/16 - 10:30 PM	10/8/16 - 05:33 AM	7:03	78%	85	--	--	0:00	0%	19%
10/8/16 - 10:05 PM	10/9/16 - 05:37 AM	7:32	84%	81	10/8/16 - 11:28 PM	10/9/16 - 05:37 AM	6:09	56%	16%
10/9/16 - 10:43 PM	10/10/16 - 05:45 AM	7:02	78%	97	10/9/16 - 10:43 PM	10/10/16 - 05:17 AM	5:45	76%	0%
10/10/16 - 10:25 PM	10/11/16 - 05:30 AM	7:05	79%	91	10/11/16 - 2:11 AM	10/11/16 - 05:30 AM	1:40	24%	19%
10/11/16 - 10:33 PM	10/12/16 - 05:28 AM	6:55	77%	79	10/11/16 - 10:33 PM	10/12/16 - 05:28 AM	6:10	85%	0%
10/12/16 - 10:19 PM	10/13/16 - 05:41 AM	7:22	82%	107	10/12/16 - 11:19 PM	10/13/16 - 05:41 AM	3:03	79%	0%
10/13/16 - 10:03 PM	10/14/16 - 05:46 AM	7:43	86%	130	10/13/16 - 10:03 PM	10/14/16 - 05:46 AM	5:58	93%	0%
10/14/16 - 10:22 PM	10/15/16 - 05:40 AM	7:18	81%	92	10/14/16 - 10:22 PM	10/15/16 - 05:18 AM	5:19	86%	0%
10/15/16 - 10:10 PM	10/16/16 - 05:44 AM	7:34	84%	56	10/15/16 - 10:10 PM	10/16/16 - 05:44 AM	6:05	77%	4%
10/16/16 - 10:48 PM	10/17/16 - 05:45 AM	6:57	77%	98	--	--	0:00	0%	0%
10/17/16 - 10:43 PM	10/18/16 - 05:31 AM	6:48	76%	88	10/17/16 - 10:43 PM	10/18/16 - 05:31 AM	5:36	0%	78%
10/18/16 - 10:41 PM	10/19/16 - 05:32 AM	6:51	76%	79	10/18/16 - 10:41 PM	10/19/16 - 05:32 AM	5:57	92%	3%
10/19/16 - 10:47 PM	10/20/16 - 05:39 AM	6:52	76%	100	10/19/16 - 11:29 PM	10/20/16 - 05:39 AM	4:23	73%	0%
10/20/16 - 10:17 PM	10/21/16 - 05:34 AM	7:17	81%	110	10/20/16 - 11:13 PM	10/21/16 - 05:34 AM	5:01	73%	0%
10/21/16 - 10:23 PM	10/22/16 - 05:30 AM	7:07	79%	97	10/21/16 - 10:23 PM	10/22/16 - 05:30 AM	6:12	0%	79%
10/22/16 - 10:02 PM	10/23/16 - 05:47 AM	7:45	86%	84	10/22/16 - 10:39 PM	10/23/16 - 05:39 AM	5:06	0%	51%
10/23/16 - 10:15 PM	10/24/16 - 05:41 AM	7:26	83%	90	10/23/16 - 10:51 PM	10/24/16 - 05:41 AM	5:58	47%	17%
10/24/16 - 10:16 PM	10/25/16 - 05:42 AM	7:26	83%	117	10/24/16 - 11:32 PM	10/25/16 - 05:42 AM	6:10	0%	76%
10/25/16 - 10:24 PM	10/26/16 - 05:32 AM	7:08	79%	102	10/25/16 - 10:54 PM	10/26/16 - 05:44 AM	6:50	0%	82%
10/26/16 - 10:53 PM	10/27/16 - 05:37 AM	6:44	75%	114	10/26/16 - 11:09 PM	10/27/16 - 05:51 AM	6:42	68%	18%
10/27/16 - 10:36 PM	10/28/16 - 05:39 AM	7:03	78%	105	10/27/16 - 10:56 PM	10/28/16 - 05:39 AM	6:43	82%	0%
10/28/16 - 11:22 PM	10/29/16 - 06:00 AM	6:38	74%	88	10/28/16 - 11:22 PM	10/29/16 - 06:00 AM	5:30	45%	0%
10/29/16 - 10:30 PM	10/30/16 - 05:51 AM	7:21	82%	78	10/29/16 - 10:39 PM	10/30/16 - 05:51 AM	7:12	0%	96%
10/30/16 - 10:24 PM	10/31/16 - 05:37 AM	7:13	80%	127	10/30/16 - 11:26 PM	10/31/16 - 05:37 AM	5:04	61%	0%
10/31/16 - 11:06 PM	11/1/16 - 05:21 AM	6:15	69%	50	10/31/16 - 11:06 PM	11/1/16 - 05:21 AM	6:15	0%	88%
11/1/16 - 10:31 PM	11/2/16 - 05:34 AM	7:03	78%	84	11/1/16 - 10:31 PM	11/2/16 - 05:34 AM	5:46	88%	4%
11/3/16 - 12:13 AM	11/3/16 - 06:04 AM	5:51	65%	117	11/3/16 - 12:44 AM	11/3/16 - 04:28 AM	2:15	46%	0%
11/3/16 - 10:41 PM	11/4/16 - 05:36 AM	6:55	77%	98	11/4/16 - 3:34 AM	11/4/16 - 05:36 AM	2:02	49%	0%
11/4/16 - 10:23 PM	11/5/16 - 05:42 AM	7:19	81%	99	--	--	0:00	46%	0%

RUNWAY ROTATION TEST
JULY 6, 2016 TO DECEMBER 25, 2016



July 6 - December 25

Overall Fly Quiet					Runway Rotation Test				
Start	Stop	Duration (hrs: mins)	Percentage of Nighttime ¹	Operations	Start	Stop	Duration ² (hrs: mins)	Primary ³	Secondary ³
11/5/16 - 10:03 PM	11/6/16 - 05:44 AM	7:41	85%	92	--	--	0:00	48%	0%
11/6/16 - 10:16 PM	11/7/16 - 05:35 AM	8:19	83%	94	11/6/16 - 10:21 PM	11/7/16 - 05:35 AM	5:09	1%	79%
11/7/16 - 10:21 PM	11/8/16 - 05:39 AM	7:18	81%	93	11/7/16 - 10:21 PM	11/8/16 - 05:39 AM	4:33	0%	78%
11/8/16 - 10:12 PM	11/9/16 - 05:36 AM	7:24	82%	87	11/8/16 - 10:44 PM	11/9/16 - 05:36 AM	3:54	6%	66%
11/9/16 - 10:02 PM	11/10/16 - 05:53 AM	7:51	87%	127	11/9/16 - 10:02 PM	11/10/16 - 05:53 AM	4:35	0%	83%
11/10/16 - 10:23 PM	11/11/16 - 05:38 AM	7:15	81%	103	11/10/16 - 10:23 PM	11/11/16 - 05:38 AM	5:06	10%	72%
11/11/16 - 10:20 PM	11/12/16 - 05:37 AM	7:17	81%	86	11/12/16 - 12:51 AM	11/12/16 - 05:37 AM	1:33	21%	17%
11/12/16 - 10:15 PM	11/13/16 - 05:39 AM	7:24	82%	73	11/12/16 - 10:15 PM	11/13/16 - 05:39 AM	6:28	0%	84%
11/13/16 - 10:35 PM	11/14/16 - 05:41 AM	7:06	79%	87	11/13/16 - 11:01 PM	11/14/16 - 05:41 AM	5:53	62%	5%
11/14/16 - 10:20 PM	11/15/16 - 05:36 AM	7:16	81%	82	11/14/16 - 10:20 PM	11/15/16 - 05:36 AM	5:59	71%	0%
11/15/16 - 10:20 PM	11/16/16 - 05:34 AM	7:14	80%	85	11/15/16 - 10:33 PM	11/16/16 - 05:34 AM	5:50	85%	0%
11/16/16 - 10:32 PM	11/17/16 - 05:36 AM	7:04	79%	88	--	--	0:00	0%	0%
11/17/16 - 10:00 PM	11/18/16 - 05:30 AM	7:30	83%	129	11/17/16 - 10:00 PM	11/18/16 - 05:30 AM	4:41	62%	0%
11/18/16 - 10:00 PM	11/19/16 - 05:36 AM	7:36	84%	127	--	--	0:00	1%	8%
11/19/16 - 10:00 PM	11/20/16 - 05:41 AM	7:41	85%	81	--	--	0:00	0%	35%
11/20/16 - 10:14 PM	11/21/16 - 05:44 AM	7:30	83%	92	11/20/16 - 10:14 PM	11/21/16 - 05:35 AM	4:39	0%	83%
11/21/16 - 10:13 PM	11/22/16 - 05:53 AM	7:40	85%	92	--	--	0:00	24%	0%
11/22/16 - 10:24 PM	11/23/16 - 05:48 AM	7:24	82%	102	--	--	0:00	15%	0%
11/23/16 - 10:21 PM	11/24/16 - 05:34 AM	7:13	80%	106	11/23/16 - 10:21 PM	11/24/16 - 05:34 AM	6:12	0%	81%
11/24/16 - 10:00 PM	11/25/16 - 07:00 AM	9:00	100%	102	11/24/16 - 10:00 PM	11/25/16 - 03:50 AM	4:53	0%	40%
11/25/16 - 10:11 PM	11/26/16 - 05:44 AM	7:33	84%	83	11/25/16 - 10:11 PM	11/26/16 - 05:44 AM	6:13	0%	81%
11/27/16 - 12:38 AM	11/27/16 - 05:36 AM	4:58	55%	49	11/27/16 - 02:58 AM	11/27/16 - 05:36 AM	2:38	0%	80%
11/27/16 - 10:57 PM	11/28/16 - 05:36 AM	6:39	74%	132	11/28/16 - 1:54 AM	11/28/16 - 05:36 AM	3:36	0%	27%
11/28/16 - 10:42 PM	11/29/16 - 05:40 AM	6:58	77%	92	--	--	0:00	40%	0%
11/29/16 - 10:28 PM	11/30/16 - 05:34 AM	7:06	79%	94	11/29/16 - 10:28 PM	11/30/16 - 05:23 AM	5:35	85%	1%
11/30/16 - 10:15 PM	12/1/16 - 05:45 AM	7:30	83%	105	11/30/16 - 10:49 PM	12/1/16 - 05:18 AM	5:52	63%	3%
12/1/16 - 10:14 PM	12/2/16 - 05:44 AM	7:30	83%	98	12/1/16 - 10:28 PM	12/2/16 - 05:31 AM	6:14	68%	4%
12/2/16 - 10:09 PM	12/3/16 - 05:47 AM	7:38	85%	103	--	--	0:00	34%	0%
12/3/16 - 10:20 PM	12/4/16 - 05:52 AM	7:32	84%	58	12/3/16 - 10:20 PM	12/4/16 - 05:43 AM	6:20	66%	10%
12/5/16 - 12:37 AM	12/5/16 - 06:12 AM	5:35	62%	95	12/5/16 - 12:43 AM	12/5/16 - 04:26 AM	3:43	0%	45%
12/5/16 - 10:48 PM	12/6/16 - 05:54 AM	7:06	79%	90	--	--	0:00	40%	0%
12/6/16 - 10:41 PM	12/7/16 - 05:39 AM	6:58	77%	81	--	--	0:00	0%	0%
12/7/16 - 10:31 PM	12/8/16 - 05:59 AM	7:28	83%	103	--	--	0:00	0%	1%
12/8/16 - 10:32 PM	12/9/16 - 05:46 AM	7:14	80%	89	12/8/16 - 10:36 PM	12/9/16 - 05:46 AM	7:10	0%	100%
12/9/16 - 10:13 PM	12/10/16 - 05:41 AM	7:28	83%	95	12/9/16 - 10:38 PM	12/10/16 - 05:41 AM	5:58	0%	72%
12/10/16 - 10:01 PM	12/11/16 - 06:31 AM	8:30	94%	86	12/10/16 - 10:01 PM	12/10/16 - 10:20 PM	0:19	58%	8%
12/11/16 - 11:29 PM	12/12/16 - 05:49 AM	6:20	70%	65	--	--	0:00	0%	0%
12/12/16 - 10:45 PM	12/13/16 - 05:50 AM	7:05	79%	78	12/12/16 - 11:01 PM	12/13/16 - 01:05 AM	2:04	0%	50%
12/13/16 - 10:23 PM	12/14/16 - 05:38 AM	7:15	81%	86	12/13/16 - 10:23 PM	12/14/16 - 05:38 AM	5:40	0%	77%
12/14/16 - 10:29 PM	12/15/16 - 05:42 AM	7:13	80%	98	12/14/16 - 10:29 PM	12/15/16 - 05:42 AM	5:38	0%	77%
12/15/16 - 10:52 PM	12/16/16 - 05:54 AM	7:02	78%	113	12/15/16 - 10:52 PM	12/16/16 - 05:12 AM	5:02	0%	70%
12/16/16 - 11:58 PM	12/17/16 - 06:05 AM	6:07	68%	87	--	--	0:00	2%	0%
12/17/16 - 10:00 PM	12/18/16 - 06:00 AM	8:00	89%	164	12/18/16 - 12:05 AM	12/18/16 - 01:11 AM	1:06	49%	0%
12/18/16 - 10:42 PM	12/19/16 - 05:44 AM	7:02	78%	152	12/19/16 - 12:02 AM	12/19/16 - 05:44 AM	5:42	80%	0%
12/19/16 - 10:02 PM	12/20/16 - 05:35 AM	7:33	84%	157	12/19/16 - 11:07 PM	12/20/16 - 05:35 AM	6:28	87%	0%
12/20/16 - 10:00 PM	12/21/16 - 05:46 AM	7:46	86%	151	12/20/16 - 11:12 PM	12/21/16 - 05:25 AM	5:17	52%	0%
12/21/16 - 10:17 PM	12/22/16 - 05:47 AM	7:30	83%	129	12/22/16 - 12:05 AM	12/22/16 - 05:37 AM	3:46	62%	0%
12/22/16 - 10:00 PM	12/23/16 - 05:38 AM	7:38	85%	143	12/22/16 - 11:55 PM	12/23/16 - 05:38 AM	4:49	66%	0%
12/23/16 - 11:11 PM	12/24/16 - 05:38 AM	6:27	72%	88	12/24/16 - 12:06 AM	12/24/16 - 05:38 AM	5:32	88%	0%
12/24/16 - 10:00 PM	12/25/16 - 06:06 AM	8:06	90%	93	12/24/16 - 10:27 PM	12/25/16 - 05:35 AM	7:08	1%	68%

Notes:

- 1: FAR Part 150 considers nighttime hours 10:00 PM - 07:00 AM.
- 2: Duration was not continuous because FAR Part 139 necessitates nightly runway closures for safety inspections.
- 3: Percentage of operations on designated runways for rotation within the overall Fly Quiet Time.

NIGHTTIME CONFIGURATION WIND SUMMARY

The below table depicts the percentage of time that each Fly Quiet Test Configuration was capable of being utilized based solely on actual wind measurements.

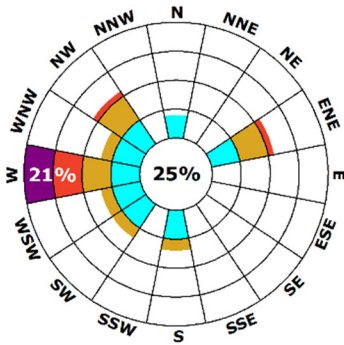
CONFIGURATION	July	August	September	October	November	December
A	83.5%	90.7%	85.9%	83.9%	74.5%	36.6%
C						
E						
B	88.5%	87.5%	84.4%	78.5%	80.1%	59.3%
D	75.6%	83.9%	68.5%	66.3%	60.9%	36.9%
F	94.6%	94.6%	86.7%	93.5%	95.6%	92.4%
H						
J						
G	80.6%	84.2%	67.4%	64.5%	75.3%	81.4%
I	92.5%	92.5%	80.0%	89.6%	93.7%	98.3%

Percentages are based on a tailwind limit of 5 knots and a crosswind limit of 25 knots; including wind gusts.

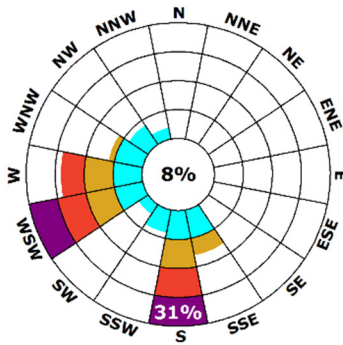
Source: National Climatic Data Center, 7/1/2016 - 12/31/2016, <http://www.ncdc.noaa.gov>

NIGHTTIME WEEKLY WIND SUMMARY WEEKS 1 - 12

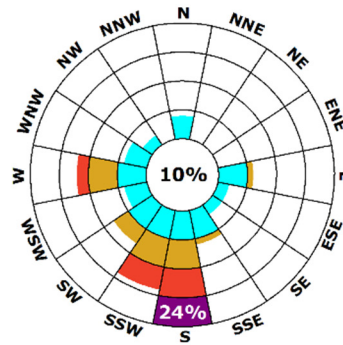
Week 1
7/6 - 7/9



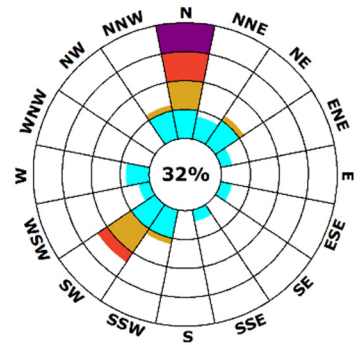
Week 2
7/10 - 7/16



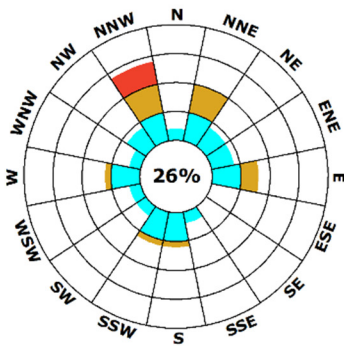
Week 3
7/17 - 7/23



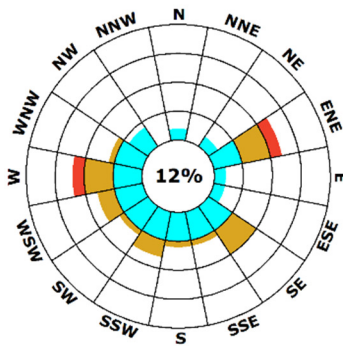
Week 4
7/24 - 7/30



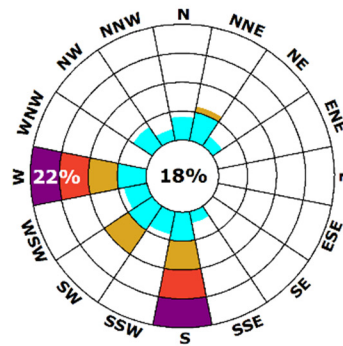
Week 5
7/31 - 8/6



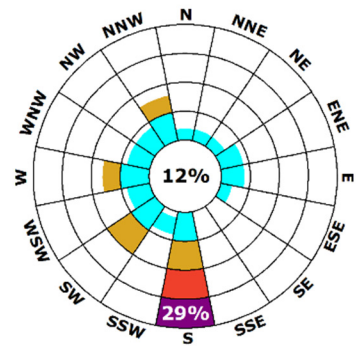
Week 6
8/7 - 8/13



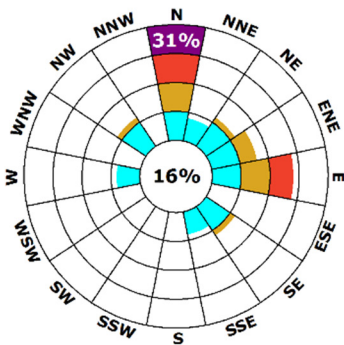
Week 7
8/14 - 8/20



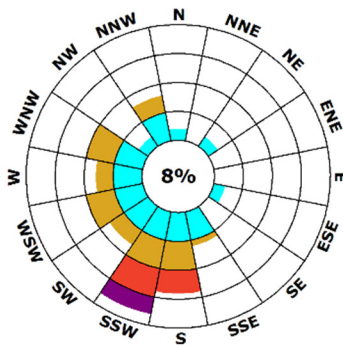
Week 8
8/20 - 8/27



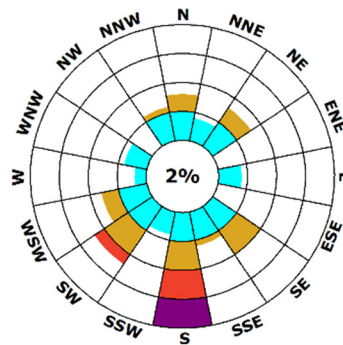
Week 9
8/28 - 9/3



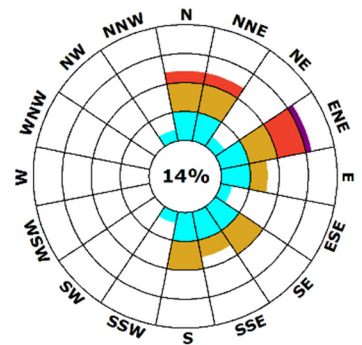
Week 10
9/4 - 9/10



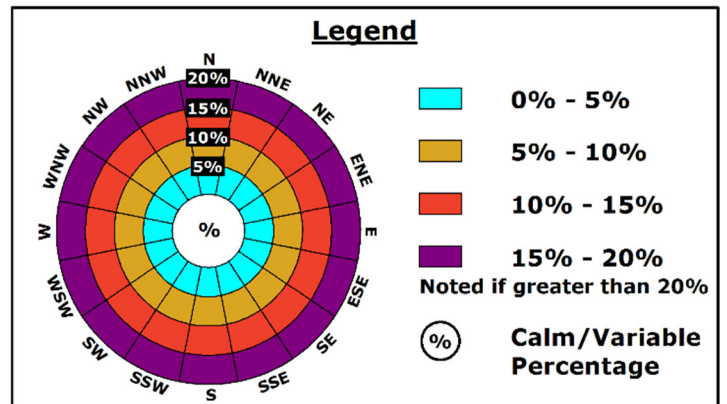
Week 11
9/11 - 9/17



Week 12
9/18 - 9/24

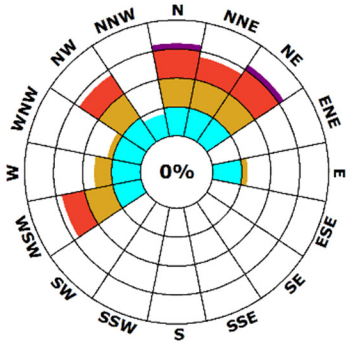


Source: National Climatic Data
Center, 7/6/2016 - 12/25/2016;
<http://www.ncdc.noaa.gov>

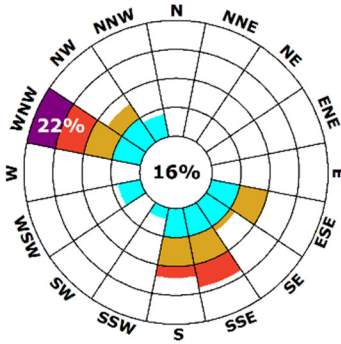


NIGHTTIME WEEKLY WIND SUMMARY WEEKS 13 - 25

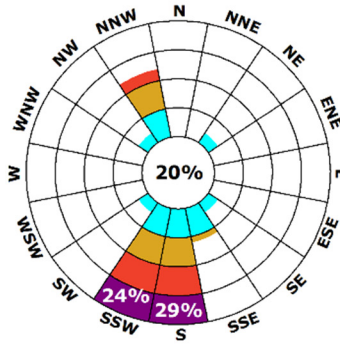
Week 13
9/25 - 10/1



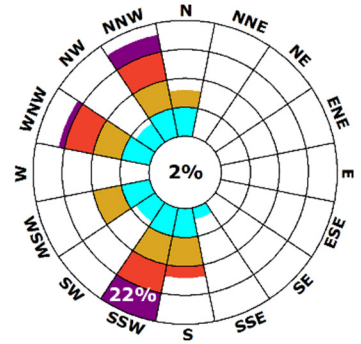
Week 14
10/2 - 10/8



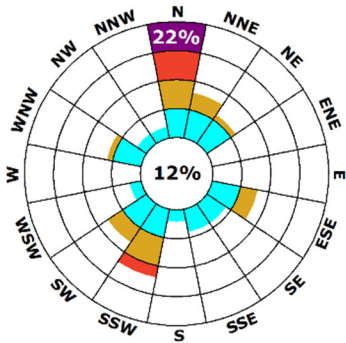
Week 15
10/9 - 10/15



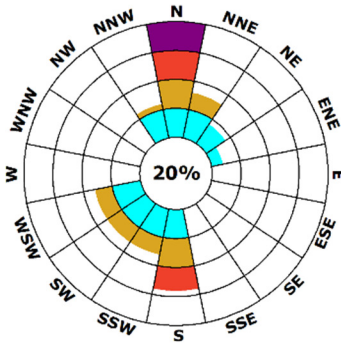
Week 16
10/16 - 10/22



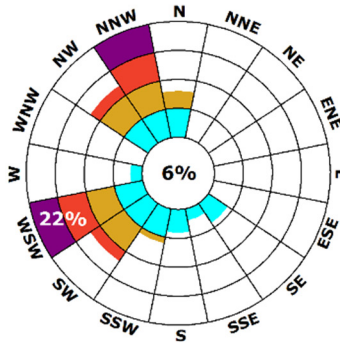
Week 17
10/23 - 10/29



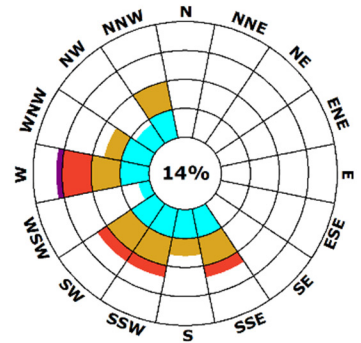
Week 18
10/30 - 11/5



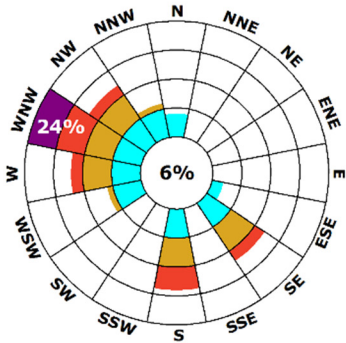
Week 19
11/6 - 11/12



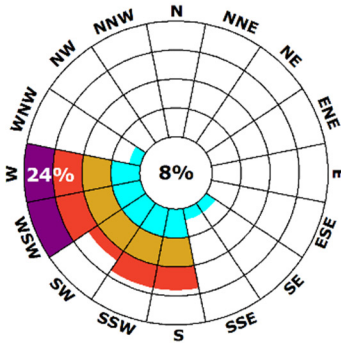
Week 20
11/13 - 11/19



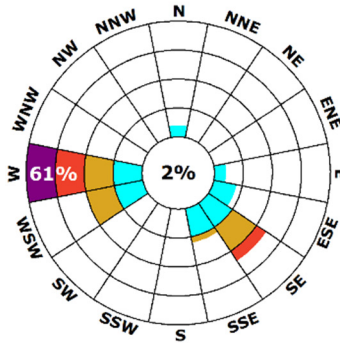
Week 21
11/20 - 11/26



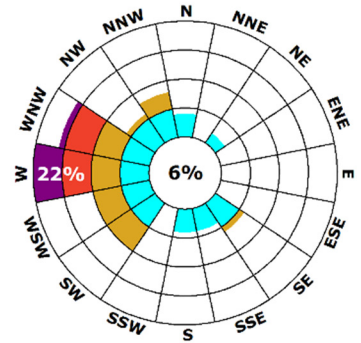
Week 22
11/27 - 12/3



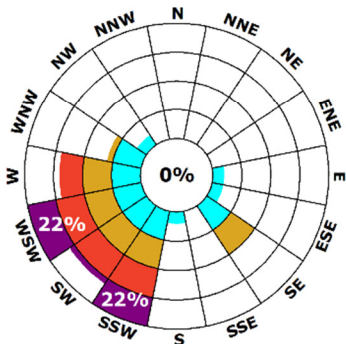
Week 23
12/4 - 12/10



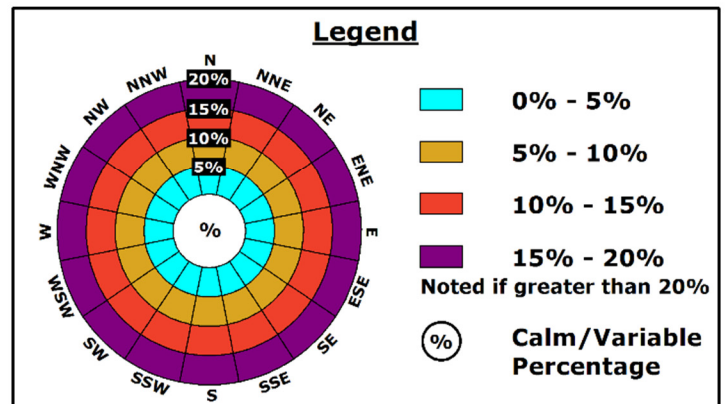
Week 24
12/11 - 12/17



Week 25
12/18 - 12/24



Source: National Climatic Data Center, 7/6/2016 - 12/25/2016;
<http://www.ncdc.noaa.gov>

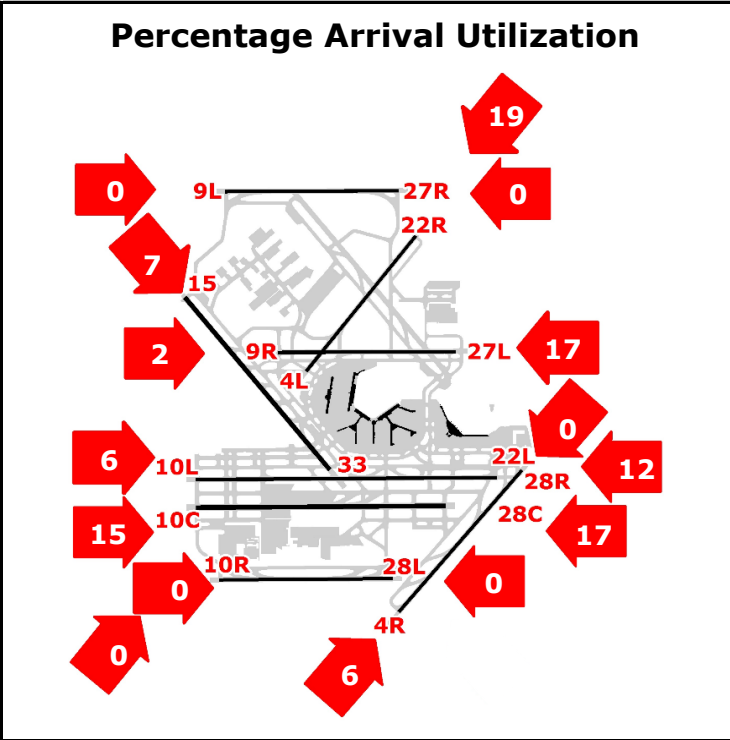
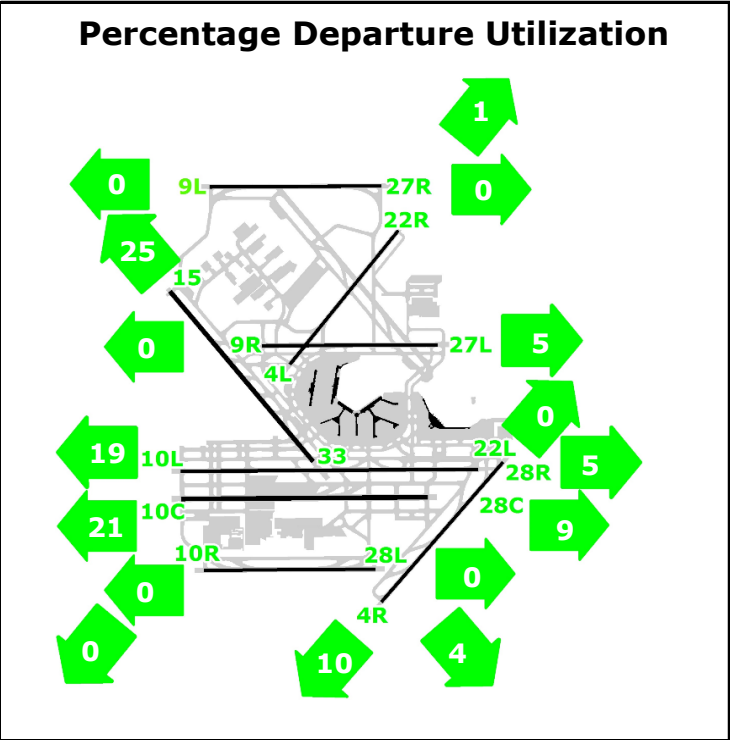
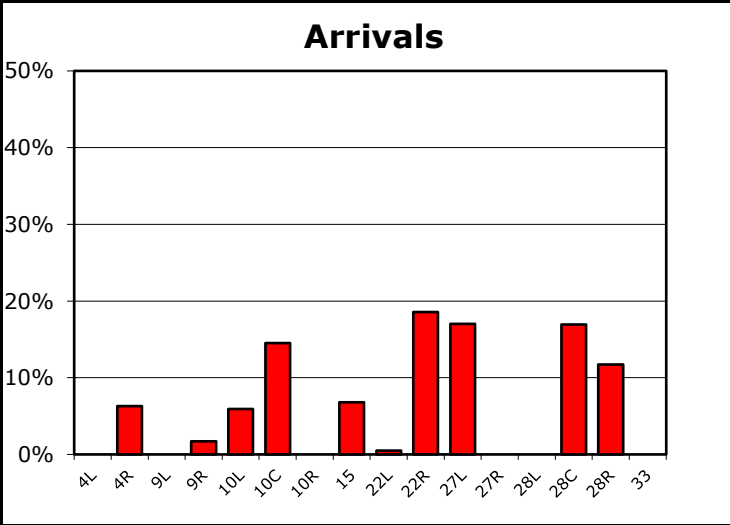
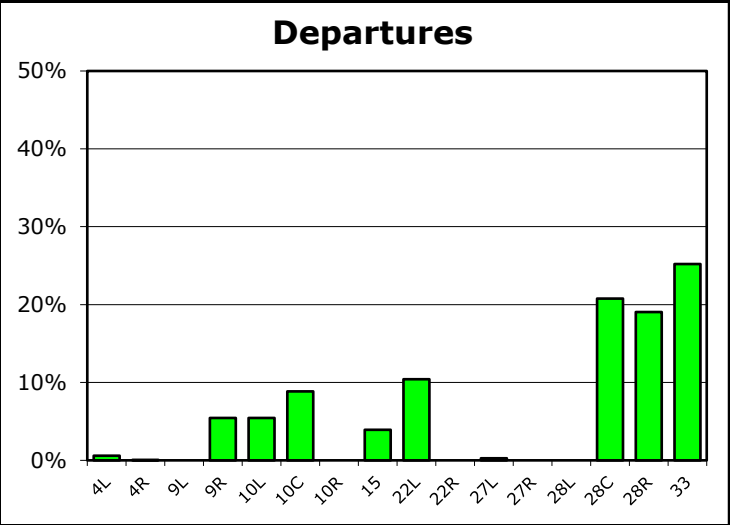


Runway Use Report

Chicago O'Hare International Airport
 Period: Night of July 6 through morning of December 25, 2016
 Fly Quiet Mode



		Runway Utilization															
		4L	4R	9L	9R	10L	10C	10R	15	22L	22R	27L	27R	28L	28C	28R	33
Average Daily Operations																	
Departures		0	0	0	2	2	4	0	2	4	0	0	0	0	9	8	11
Arrivals		0	3	0	1	3	8	0	4	0	10	9	0	0	9	6	n/a
Percentage Utilization																	
Departures		1%	0%	0%	5%	5%	9%	0%	4%	10%	0%	0%	0%	0%	21%	19%	25%
Arrivals		0%	6%	0%	2%	6%	15%	0%	7%	0%	19%	17%	0%	0%	17%	12%	n/a



Runway Use Report

Chicago O'Hare International Airport
 Period: Night of July 6 through morning of December 25, 2016
 Runway Rotation Mode



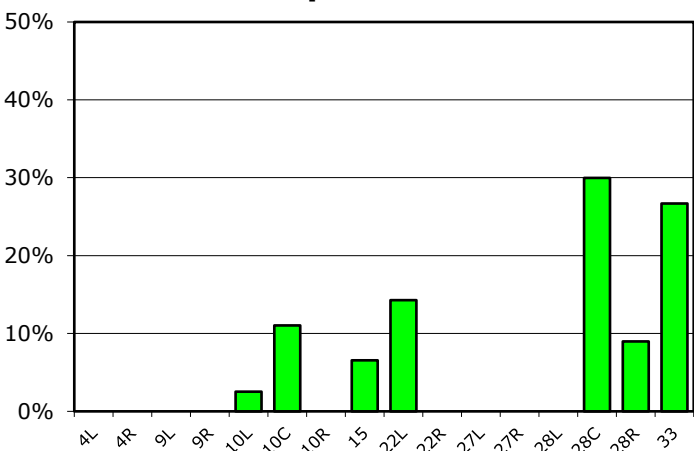
Runway Use

Source: Airport Noise Management System (ANMS)

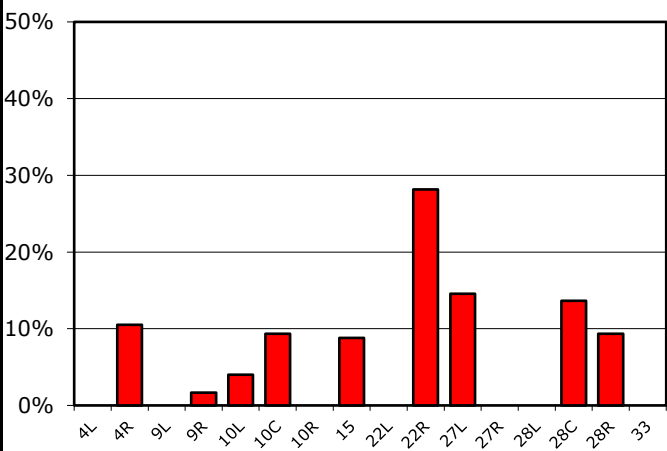
Runway Utilization

	4L	4R	9L	9R	10L	10C	10R	15	22L	22R	27L	27R	28L	28C	28R	33
Average Daily Operations																
Departures	0	0	0	0	1	2	0	1	3	0	0	0	0	6	2	6
Arrivals	0	3	0	1	1	3	0	3	0	9	5	0	0	4	3	n/a
Percentage Utilization																
Departures	0%	0%	0%	0%	3%	11%	0%	7%	14%	0%	0%	0%	0%	30%	9%	27%
Arrivals	0%	11%	0%	2%	4%	9%	0%	9%	0%	28%	15%	0%	0%	14%	9%	n/a

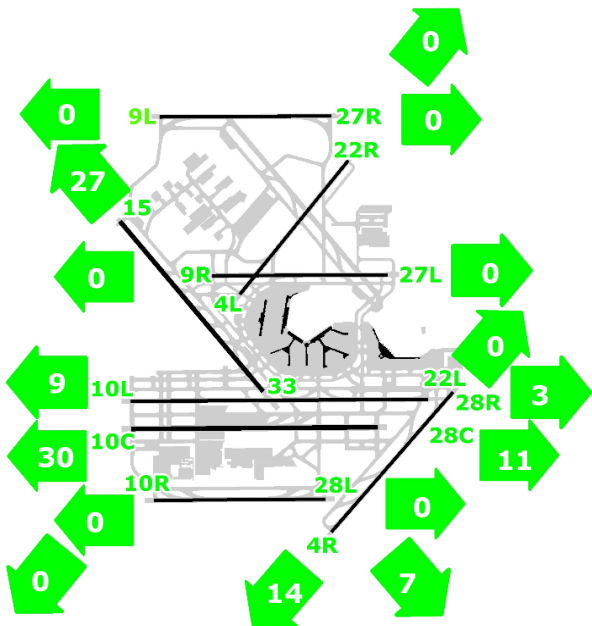
Departures



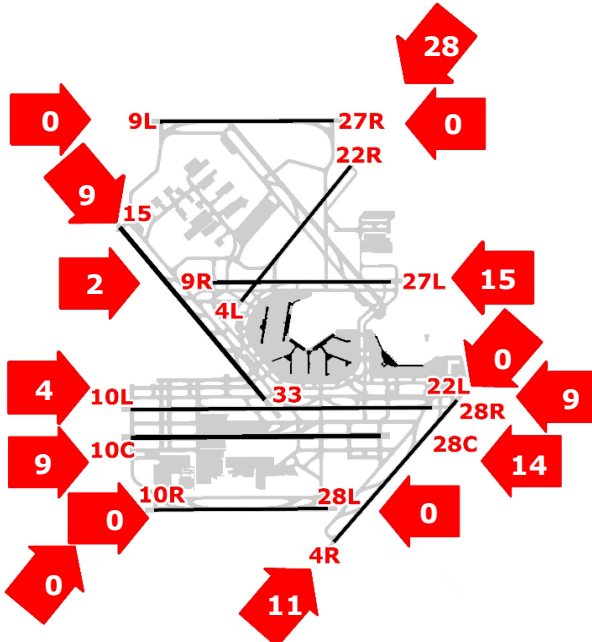
Arrivals



Percentage Departure Utilization



Percentage Arrival Utilization




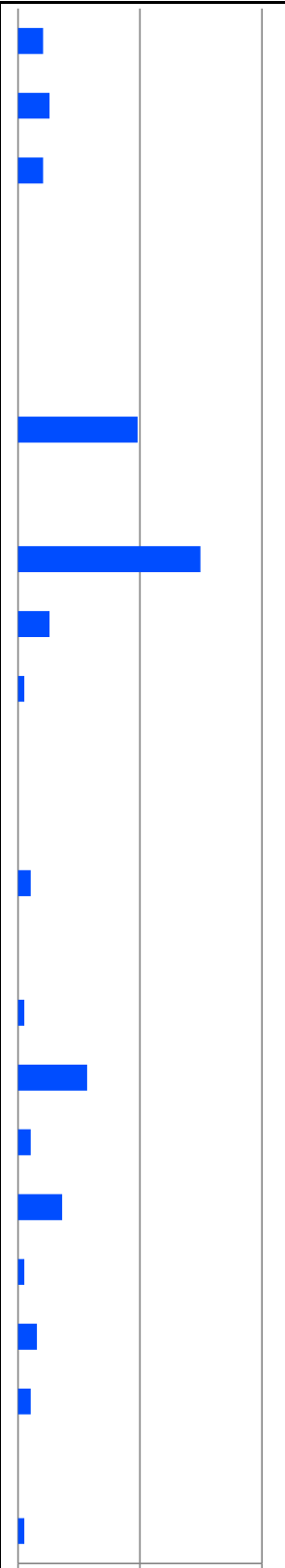





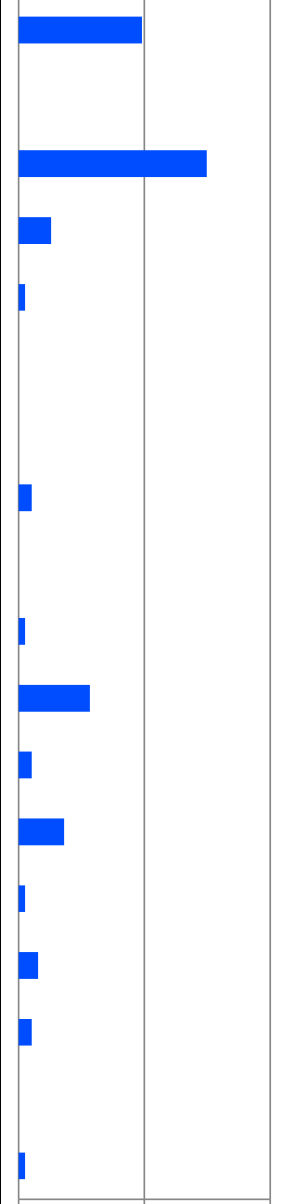






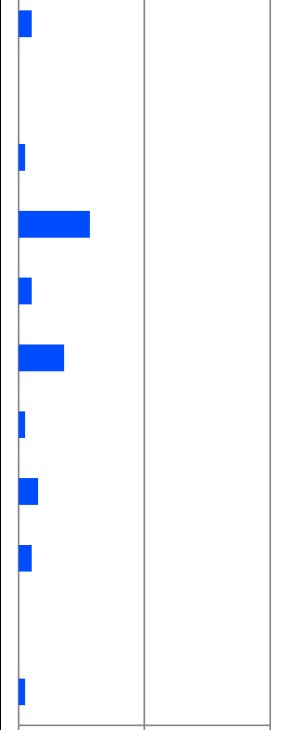







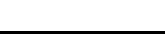
Aircraft Fleet Mix Report

Chicago O'Hare International Airport

Period: Night of July 6 through morning of December 25, 2016

Fly Quiet Mode



Aircraft	Average Operations per Day (Fly Quiet Mode)	Percentage of Total (Fly Quiet Mode)	Percentage of Total
Regional Aircraft			0% 20% 40%
 CRJ200/700/900	4	4.1%	
 E135/E145	5	5.2%	
 E170	4	4.1%	
 E190	0	0.0%	
 C208	0	0.0%	
Subtotal	13	13.4%	
Narrow-Body Aircraft			
 A319/320/321	19	19.6%	
 B717	0	0.0%	
 B737	29	29.9%	
 B757	5	5.2%	
 MD80	1	1.0%	
 MD90	0	0.0%	
Subtotal	54	55.7%	
Wide-Body Aircraft			
 A300	2	2.1%	
 A330	0	0.0%	
 A340	1	1.0%	
 B747	11	11.3%	
 B767	2	2.1%	
 B777	7	7.2%	
 B787	1	1.0%	
 DC10	3	3.1%	
 MD11	2	2.1%	
Subtotal	29	29.9%	
General Aviation	1	1.0%	
Total	97	100%	


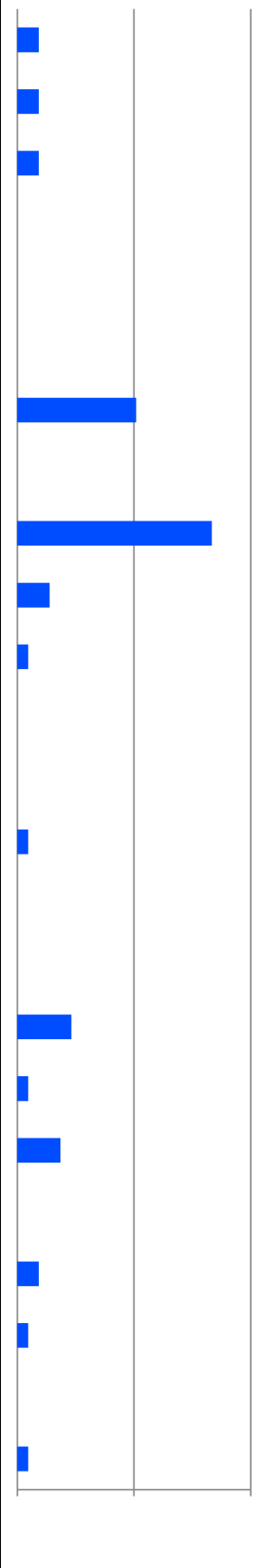





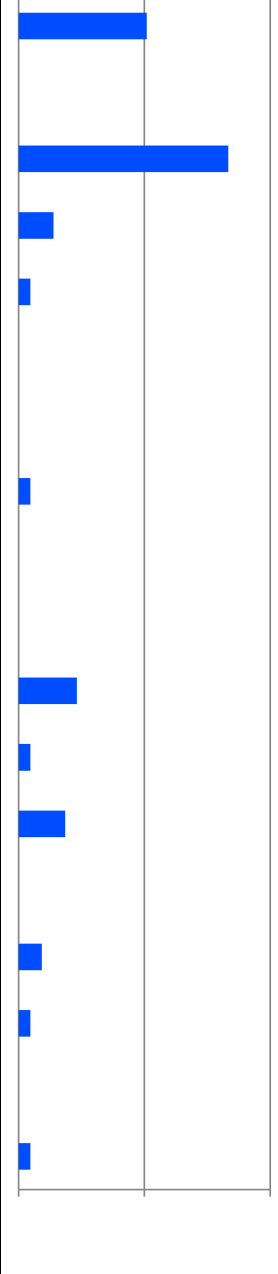






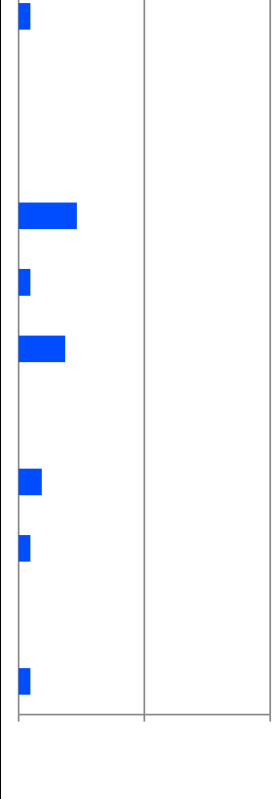








Aircraft Fleet Mix Report

Chicago O'Hare International Airport

Period: Night of July 6 through morning of December 25, 2016

Runway Rotation Mode



















































Aircraft	Average Operations per Day (Rotation Test)	Percentage of Total (Rotation Test)	Percentage of Total
Regional Aircraft			0% 20% 40%
 CRJ200/700/900	2	3.7%	
 E135/E145	2	3.7%	
 E170	2	3.7%	
 E190	0	0.0%	
 C208	0	0.0%	
Subtotal	6	11.1%	
Narrow-Body Aircraft			
 A319/320/321	11	20.4%	
 B717	0	0.0%	
 B737	18	33.3%	
 B757	3	5.6%	
 MD80	1	1.9%	
 MD90	0	0.0%	
Subtotal	33	61.1%	
Wide-Body Aircraft			
 A300	1	1.9%	
 A330	0	0.0%	
 A340	0	0.0%	
 B747	5	9.3%	
 B767	1	1.9%	
 B777	4	7.4%	
 B787	0	0.0%	
 DC10	2	3.7%	
 MD11	1	1.9%	
Subtotal	14	25.9%	
General Aviation	1	1.9%	
Total	54	100%	



























Airline Summary

Chicago O'Hare International Airport

Period: Night of July 6 through morning of December 25, 2016

Fly Quiet Mode

Airline	Arrivals	Departures	Total
United Airlines 	2,887	1,284	4,171
American Airlines 	1,512	892	2,404
FedEx 	497	436	933
Spirit Airlines 	637	266	903
AeroMexico 	404	330	734
American Eagle/Envoy 	199	459	658
UPS 	351	266	617
Frontier Airlines 	429	98	527
Sky West Aviation 	153	264	417
Asiana Airlines 	83	273	356
Republic Airlines 	102	235	337
United Express/ASA 	136	176	312
Korean Air Lines 	132	146	278
Delta Air Lines 	222	54	276
Cargolux Airlines 	133	124	257
Atlas Air 	79	159	238
Nippon Cargo Airlines 	31	185	216
AirBridge Cargo Airlines 	86	127	213
Alaska Airlines 	157	29	186
Virgin America 	162	5	167
General Aviation	141	106	247
Qatar Airways 	70	96	166
Air China Cargo 	66	91	157
United Express/Gojet 	46	111	157
United Express/Shuttle America 	64	91	155
Copa Airlines 	148	1	149
Emirates 	47	97	144
Cathay Pacific Airways 	31	108	139
United Express/Trans States 	72	65	137
Lufthansa 	2	88	90
JetBlue Airways 	75	11	86
Qantas Airways 	37	45	82
Interjet 	39	38	77
Lufthansa Cargo 	29	42	71
Scandinavian Airlines 	1	61	62
EVA Air 	9	46	55
Polar Air Cargo 	38	13	51
Kalitta Air 	25	22	47
Yangtze River Express Airlines 	11	33	44
Aerologic 	--	43	43
AeroUnion 	23	18	41
LOT 	3	34	37
American Eagle/PSA Airlines 	8	25	33
China Airlines 	23	5	28
Air France 	6	21	27
Finnair 	--	25	25
National Air Cargo 	6	15	21
Swift Air 	14	7	21
China Cargo Airlines 	7	12	19

Airline	Arrivals	Departures	Total
China Southern Airlines 	12	6	18
Sky Regional Airlines 	7	11	18
Air Canada 	14	3	17
Turkish Airlines 	--	17	17
Royal Jordanian 	3	9	12
Air India 	11	--	11
British Airways 	--	8	8
Delta Connection 	7	1	8
Air Choice One 	4	4	8
Volaris 	4	3	7
America West Airlines 	4	2	6
Delta Connection 	3	2	5
Kalitta Charters 	3	1	4
Allied Air 	--	3	3
All Nippon Airways 	1	2	3
Xtra Airways 	2	1	3
United Express/Mesa 	1	1	2
Singapore Airlines Cargo 	1	1	2
Miami Air International 	1	--	1
Hainan Airlines 	--	1	1
Aer Lingus 	--	1	1
Iberia Airlines 	--	1	1
Icelandair 	--	1	1
Royal Jet 	--	1	1
Swiss International Airlines 	--	1	1
WestJet Airlines 	--	1	1
Total 75	9,511	7,260	16,771













































Carrier Category	Percent of Total
United & American	39%
Other Domestic	26%
Other International	15%
Dedicated Cargo	18%
General Aviation	2%
Total	100%
























Airline Summary

Chicago O'Hare International Airport

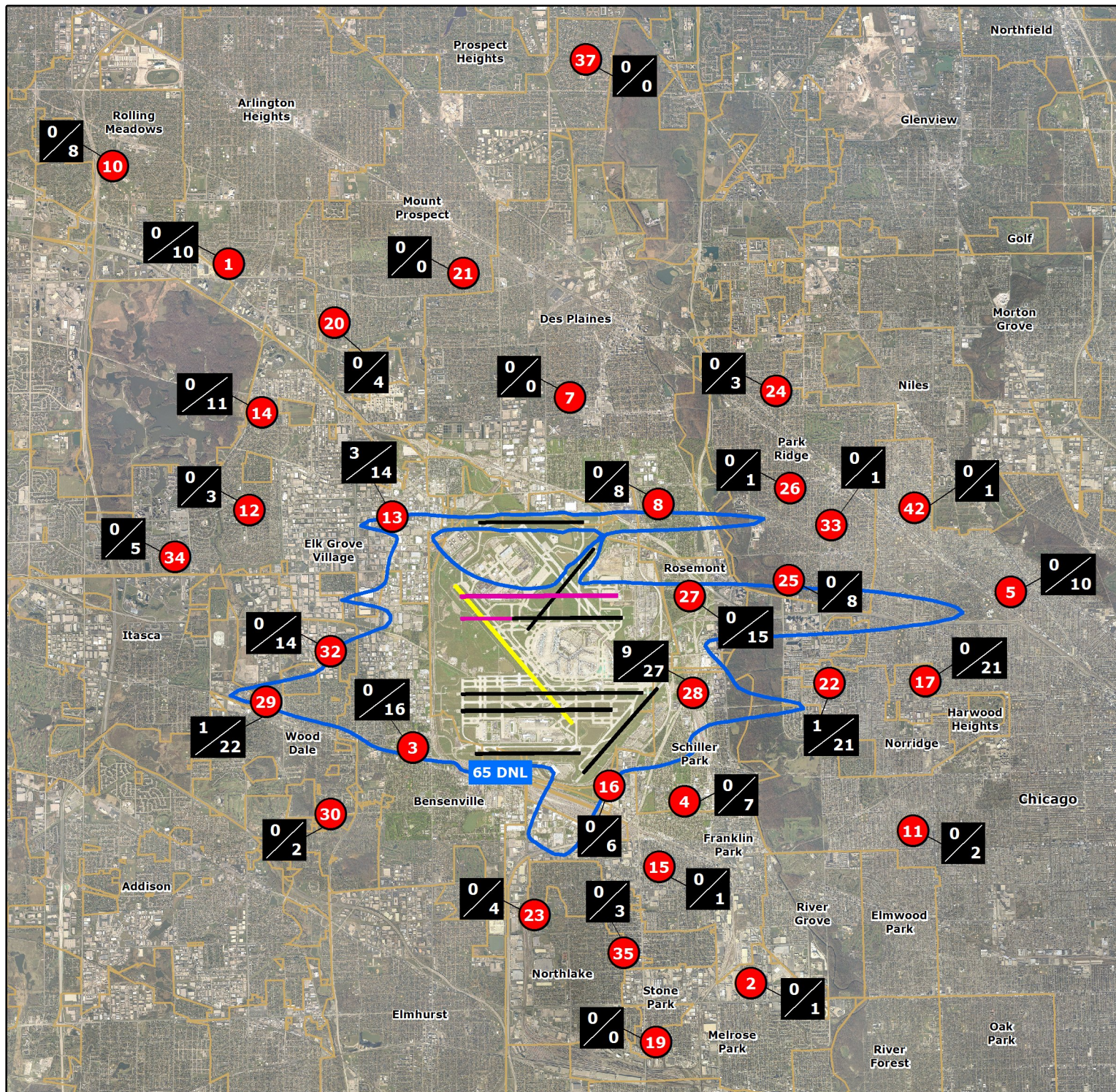
Period: Night of July 6 through morning of December 25, 2016

Runway Rotation Mode

Airline	Arrivals	Departures	Total
United Airlines 	1,962	647	2,609
American Airlines 	861	519	1,380
FedEx 	344	247	591
Spirit Airlines 	376	147	523
AeroMexico 	254	189	443
UPS 	230	116	346
Frontier Airlines 	301	43	344
American Eagle/Envoy 	83	143	226
Sky West Aviation 	60	99	159
Asiana Airlines 	20	133	153
Delta Air Lines 	122	20	142
United Express/ASA 	62	76	138
Atlas Air 	42	92	134
Republic Airlines 	50	83	133
Cargolux Airlines 	56	71	127
Nippon Cargo Airlines 	7	116	123
Korean Air Lines 	37	75	112
Alaska Airlines 	90	19	109
Copa Airlines 	101	--	101
AirBridge Cargo Airlines 	28	71	99
General Aviation	96	51	147
Virgin America 	86	1	87
Qatar Airways 	31	53	84
Emirates 	19	64	83
United Express/Shuttle America 	34	47	81
United Express/Gojet 	21	51	72
United Express/Trans States 	46	24	70
Air China Cargo 	20	48	68
Cathay Pacific Airways 	13	49	62
Qantas Airways 	15	27	42
JetBlue Airways 	34	4	38
Interjet 	22	9	31
Lufthansa Cargo 	9	20	29
Lufthansa 	--	28	28
AeroUnion 	12	15	27
Polar Air Cargo 	13	10	23
EVA Air 	7	15	22
Yangtze River Express Airlines 	2	19	21
Kalitta Air 	8	10	18
Scandinavian Airlines 	--	18	18
Air France 	4	13	17
China Airlines 	12	3	15
Aerologic 	--	13	13
LOT 	--	13	13
China Cargo Airlines 	2	9	11

Airline	Arrivals	Departures	Total
Sky Regional Airlines 	4	7	11
Swift Air 	8	3	11
Air Canada 	6	2	8
National Air Cargo 	1	7	8
Royal Jordanian 	1	6	7
Finnair 	--	8	8
Air Choice One 	3	3	6
China Southern Airlines 	4	1	5
American Eagle/PSA Airlines 	2	3	5
America West Airlines 	3	1	4
British Airways 	--	4	4
Volaris 	3	1	4
Delta Connection 	2	1	3
Kalitta Charters 	2	1	3
United Express/Mesa 	1	1	2
Xtra Airways 	2	--	2
Singapore Airlines Cargo 	1	1	2
Delta Connection 	1	--	1
Aer Lingus 	--	1	1
Allied Air 	1	--	1
Royal Jet 	--	1	1
Turkish Airlines 	--	1	1
WestJet Airlines 	--	1	1
Total	68	3,574	9,211

Carrier Category	Percent of Total
United & American	43%
Other Domestic	24%
Other International	14%
Dedicated Cargo	18%
General Aviation	1%
Total	100%



O'Hare International Airport

Average Fly Quiet Mode Aircraft Noise Events

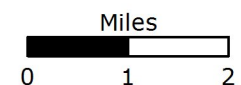
July 6, 2016 through December 25, 2016

City of Chicago
Rahm Emanuel, Mayor

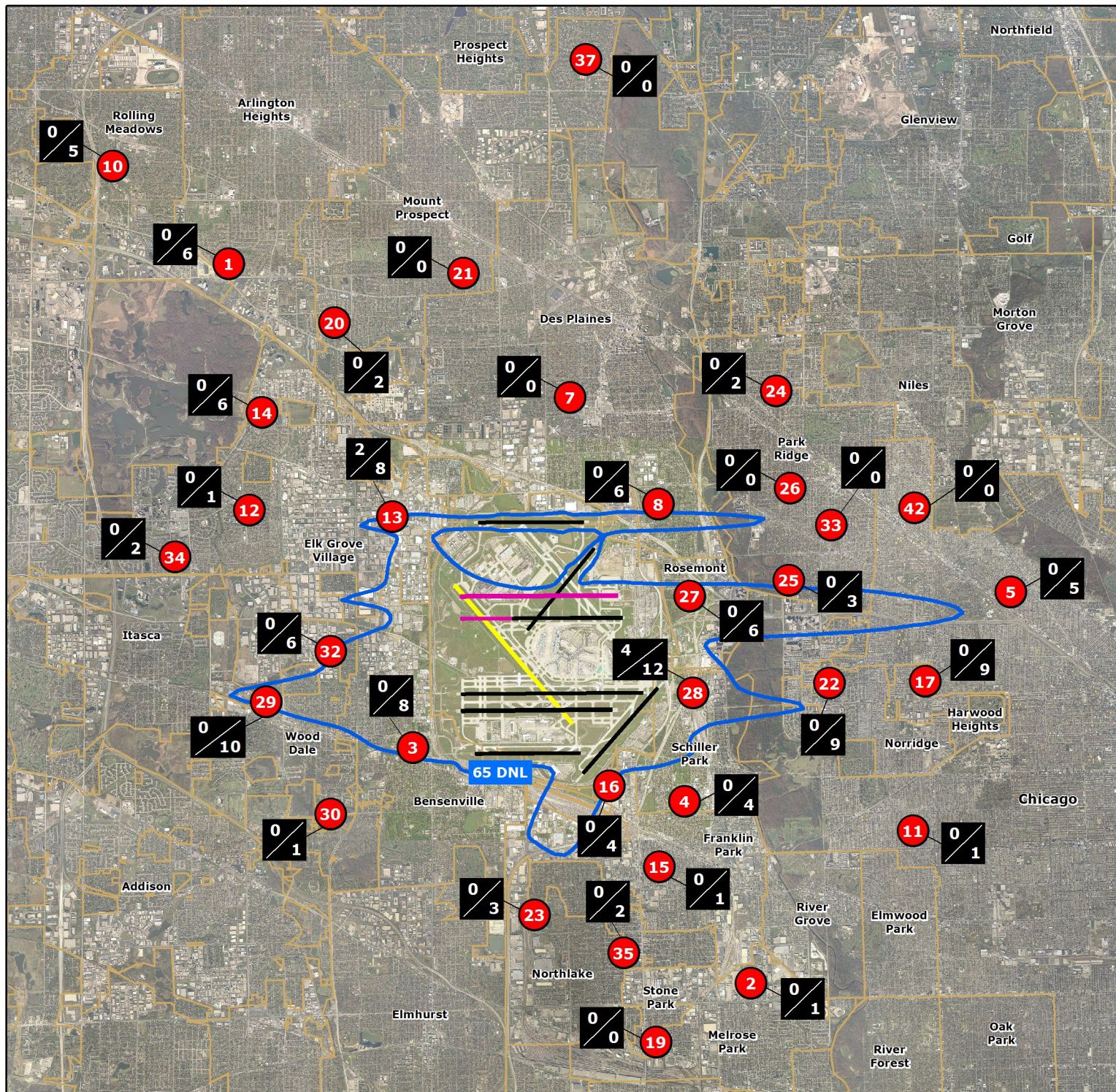
Department of Aviation
Ginger S. Evans, Commissioner

Legend

- Existing RMT Sites (33)
- Average Events 85dB and Greater
- Average Events 65dB and Greater
- Existing Runways
- Existing Runway to be Decommissioned
- Future Runways
- OMP Build Out Noise Contour (Measured in DNL - Day/Night Average Sound Level)
- Community Boundaries



Date: February 21, 2017
File: ORDFQ_ADANE_070616-122516.mxd



O'Hare International Airport


Average Rotation Mode Aircraft Noise Events

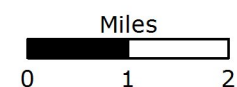
July 6, 2016 through December 25, 2016

City of Chicago
Rahm Emanuel, Mayor

Department of Aviation
Ginger S. Evans, Commissioner

Legend

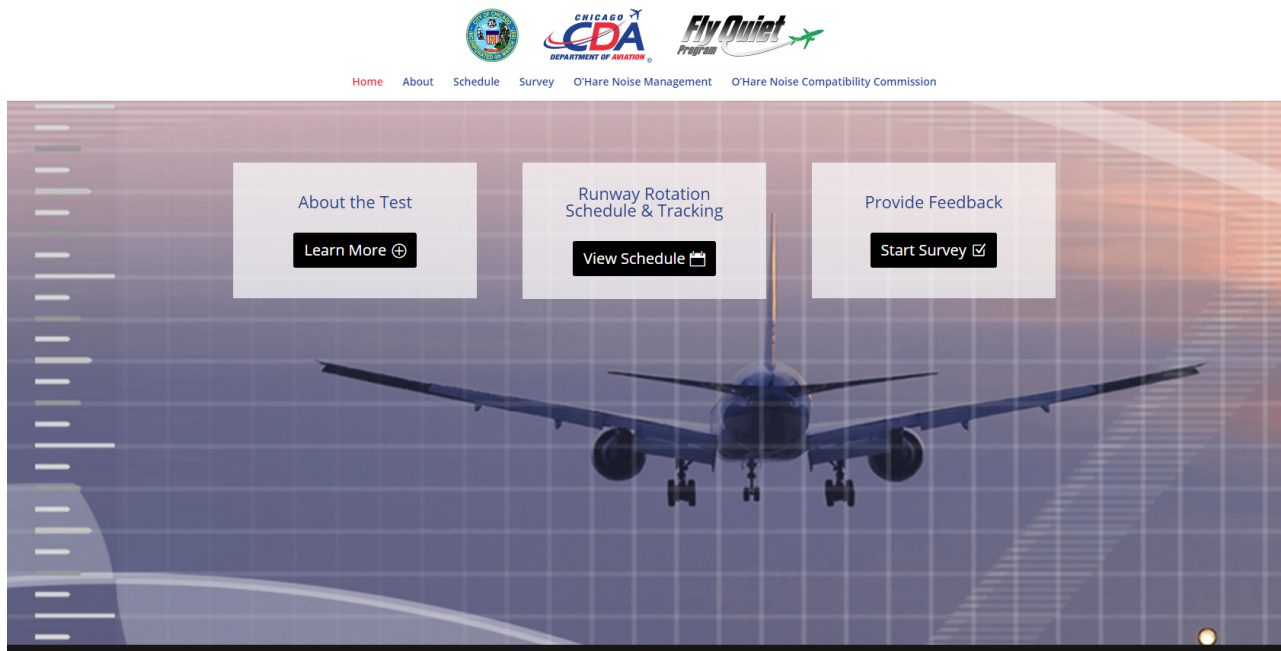
-  Existing RMT Sites (33)
-  Average Events 85dB and Greater
-  Average Events 65dB and Greater
-  Existing Runways
-  Existing Runway to be Decommissioned
-  Future Runways
-  OMP Build Out Noise Contour (Measured in DNL - Day/Night Average Sound Level)
-  Community Boundaries



SURVEY RESULTS: CITIZEN FEEDBACK

In order to capture citizen feedback regarding the Test, the CDA administered a public website that included the following:

- **Background Information** – Information on the Fly Quiet Program and the Test
- **Test Schedules** – Downloadable Test schedule in multiple formats
- **Weekly updates** – Adherence tracking of the Test
- **Survey** – Public survey, as approved by the ONCC



www.flychicago.org/flyquiettest

There were 6,160 survey responses submitted, which originated from 3,837 unique IP addresses. See Table 1 on the following page for the number of survey responses by community. For the purposes of this report, each unique IP address is considered to be one respondent. In some cases, repeat respondents provided inconsistent responses. Therefore, in such cases, the CDA made assumptions to summarize all survey responses.

Survey results show that 61% of the total survey responses believe that the Test should continue. Based on unique IP addresses received, 51% believe that the Test should continue.

The detailed results of the survey are included in this section of the document. The following pages include the public survey questions, as well as summarized responses to each survey question.

TABLE 1
SURVEY RESPONSES BY COMMUNITY

Community	Number of Survey Responses	Number of Unique IP Addresses
Bensenville	1,666	171
Chicago	746	646
Elmhurst	560	439
Glenview	511	380
Park Ridge	410	289
Palatine	289	248
Arlington Heights	284	260
Wood Dale	208	145
Downers Grove	188	171
Mount Prospect	187	165
Elk Grove Village	181	139
Bloomingtondale	138	119
Itasca	95	59
Des Plaines	70	62
Roselle	60	42
Norridge	59	54
Darien	49	45
Schaumburg	43	40
Woodridge	43	39
Rolling Meadows	30	26
Willowbrook	28	23
Harwood Heights	22	18
Schiller Park	19	17
Addison	17	16
Hinsdale	17	15
Niles	16	15
Villa Park	15	9
Western Springs	15	12
Prospect Heights	13	13
Wheeling	13	12
Buffalo Grove	11	11
Hanover Park	11	10
Bartlett	9	9
Golf	9	5
Westmont	9	8

TABLE 1, Continued
SURVEY RESPONSES BY COMMUNITY

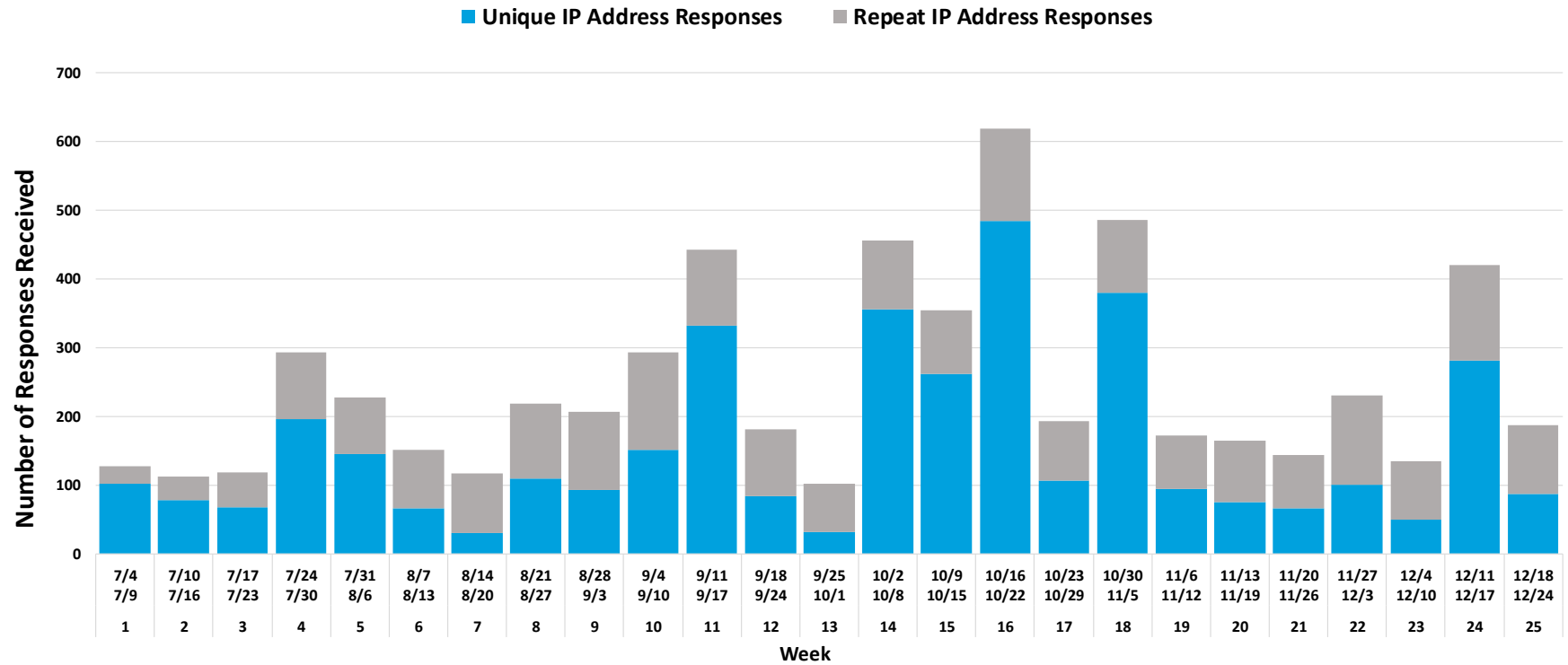
Community	Number of Survey Responses	Number of Unique IP Addresses
Lombard	8	6
Clarendon Hills	6	6
Wayne	6	5
Barrington	5	4
Franklin Park	5	5
Hoffman Estates	5	3
Inverness	5	5
Medinah	5	4
Bolingbrook	4	4
Northfield	4	4
Saint Charles	4	4
Elgin	3	3
Elmwood Park	3	3
Lincolnwood	3	3
Oak Park	3	3
River Forest	3	3
Rosemont	3	3
Skokie	3	3
Geneva	2	1
Glen Ellyn	2	2
Hampshire	2	1
La Grange Park	2	2
Northlake	2	2
Norwood Park	2	2
Oakbrook Terrace	2	1
River Grove	2	2
Sleepy Hollow	2	1
Winfield	2	2
Aurora	1	1
Batavia	1	1
Campton Hills	1	1
Evanston	1	1
Glencoe	1	1
Glendale Heights	1	1
Keeneyville	1	1

TABLE 1, Continued
SURVEY RESPONSES BY COMMUNITY

Community	Number of Survey Responses	Number of Unique IP Addresses
Lake Barrington	1	1
Libertyville	1	1
Lisle	1	1
Itasca*	1	0
McCook	1	1
Melrose Park	1	1
Morton Grove*	1	0
Naperville	1	1
Plainfield	1	1
Riverside*	1	0
South Elgin	1	1
Streamwood	1	1
Vernon Hills	1	1
Wheaton	1	1
TOTAL	6,160	3,837

* Note: There were multiple survey responses from the same IP address, representing more than one community.

The graph below shows the number of survey responses by week, broken-down by unique IP Addresses and repeat IP addresses.



Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
Repeat IP	25	34	51	98	82	84	86	109	114	142	111	97	70	100	93	134	88	106	78	89	78	130	85	139	100	2,323
Unique IP	102	78	68	196	146	67	31	109	93	152	332	84	32	356	262	485	106	380	95	76	66	101	50	282	88	3,837
Primary Secondary	CONFIGURATIONS																									
	F	B	H	D	J	G	A	I	C	G	E	D	F	B	H	D	J	G	A	I	C	G	E	D	F	
	A	G	C	I	E	B	F	D	H	B	J	I	A	G	C	I	E	B	F	D	H	B	J	I	A	

Construction Alternatives are highlighted in yellow.

FLY QUIET PROGRAM

RUNWAY ROTATION TEST

FINAL SURVEY QUESTIONS



Welcome to the Fly Quiet Runway Rotation Test Survey. The survey consists of 17 questions and should take less than five minutes to complete. All questions must be answered in order to complete the survey. Survey results will be compiled after the test has ended.

1. What is your address?
 - a. User input in address format (mandatory)
2. What is your age?
 - a. Under 20
 - b. 20 – 29
 - c. 30 – 39
 - d. 40 – 49
 - e. 50 – 59
 - f. 60 – 69
 - g. 70 and over
3. In what type of building do you live?
 - a. Single-family
 - b. Multi-family
 - c. Mixed-Use (residential and commercial)
4. What is the approximate age of the building in which you live?
 - a. Less than 10 years
 - b. 10 – 20 years
 - c. 20 – 30 years
 - d. 30 – 40 years
 - e. 40 – 50 years
 - f. Greater than 50 years
5. How long have you lived at this address?
 - a. Less than 1 year
 - b. 1-5 years
 - c. 5-10 years
 - d. 10-20 years
 - e. 20 or more years
6. How many people live in your home?
 - a. 1
 - b. 2
 - c. 3-5
 - d. 6-8
 - e. More than 8
7. Is this your primary residence?
 - a. Yes
 - b. No
8. Other than aircraft noise, would you say that your neighborhood is generally quiet or noisy at night?
 - a. Quiet
 - b. Noisy
9. What time do you typically go to sleep?
 - a. User input in time format
10. What time do you typically wake up in the morning?
 - a. User input in time format

11. What time of day do you typically work?
- a. Daytime
 - b. Nighttime
 - c. Both
 - d. Do not work
12. From 1 to 5 (5 being the highest), indicate the level of noise experienced **last** week during the Fly Quiet overnight period.
- a. 1
 - b. 2
 - c. 3
 - d. 4
 - e. 5
13. From 1 to 5 (5 being the highest), indicate the level of noise experienced **this** week during the Fly Quiet overnight period.
- a. 1
 - b. 2
 - c. 3
 - d. 4
 - e. 5
14. Do aircraft from O'Hare fly directly over your residence or further away?
- a. Directly Overhead
 - b. Further Away
15. On a scale of 1-5 (5 being the highest), how helpful was the information on this website regarding the runway rotation test?
- a. 1
 - b. 2
 - c. 3
 - d. 4
 - e. 5
16. Are the aircraft noise levels during the Fly Quiet overnight period (roughly 11 p.m. – 5:30 a.m.) better or worse than before the test period began on July 6?
- a. Better
 - b. Worse
17. Would you like the Fly Quiet Runway Rotation to continue after the test?
- a. Yes
 - b. No

Thank You for taking the survey. The results will be compiled and made available after the six-month test is complete. For more aircraft noise information, please use the below links:

[Noise Complaints](#)

[Sound Insulation](#)

[Flight Tracker](#)

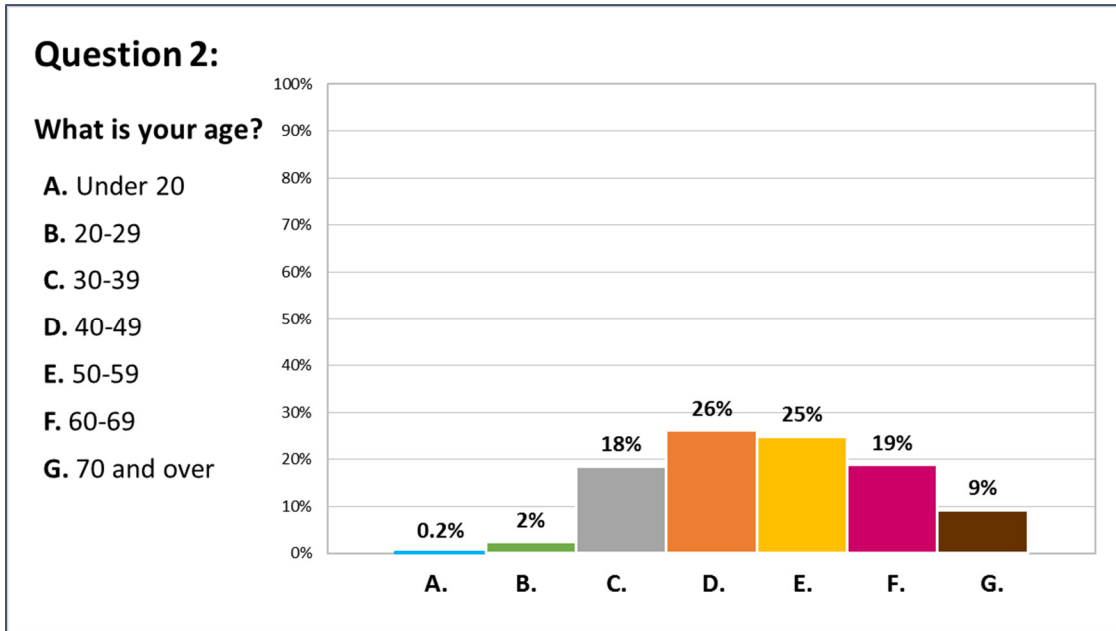
[Introduction to Noise](#)

[ONCC Meeting Dates](#)

SURVEY QUESTION 1
What is your address?

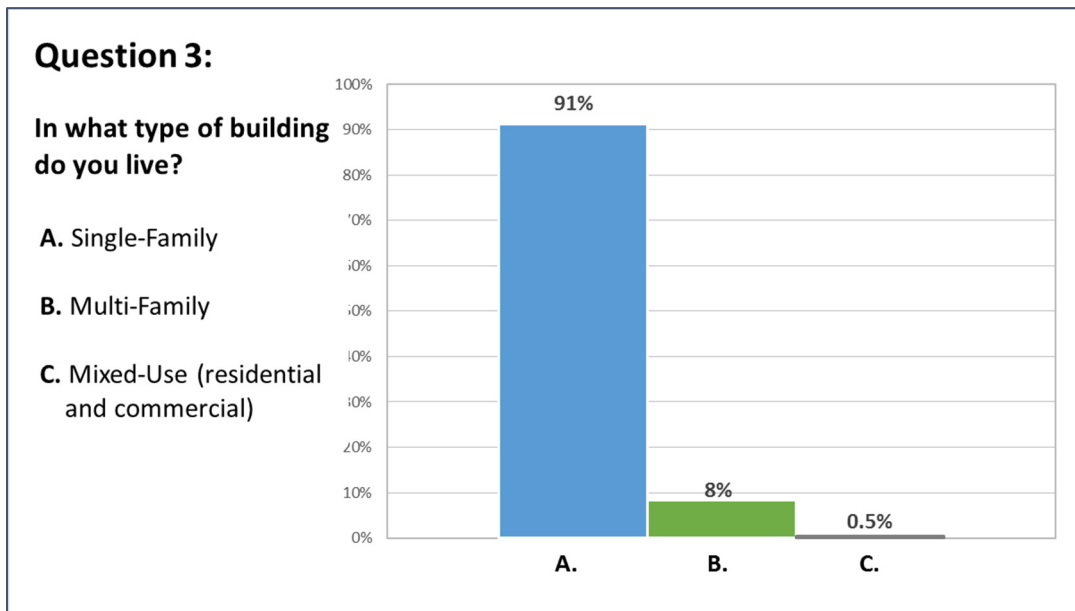
Based on total responses, 3,729 unique community addresses were entered.

SURVEY QUESTION 2
What is your age?



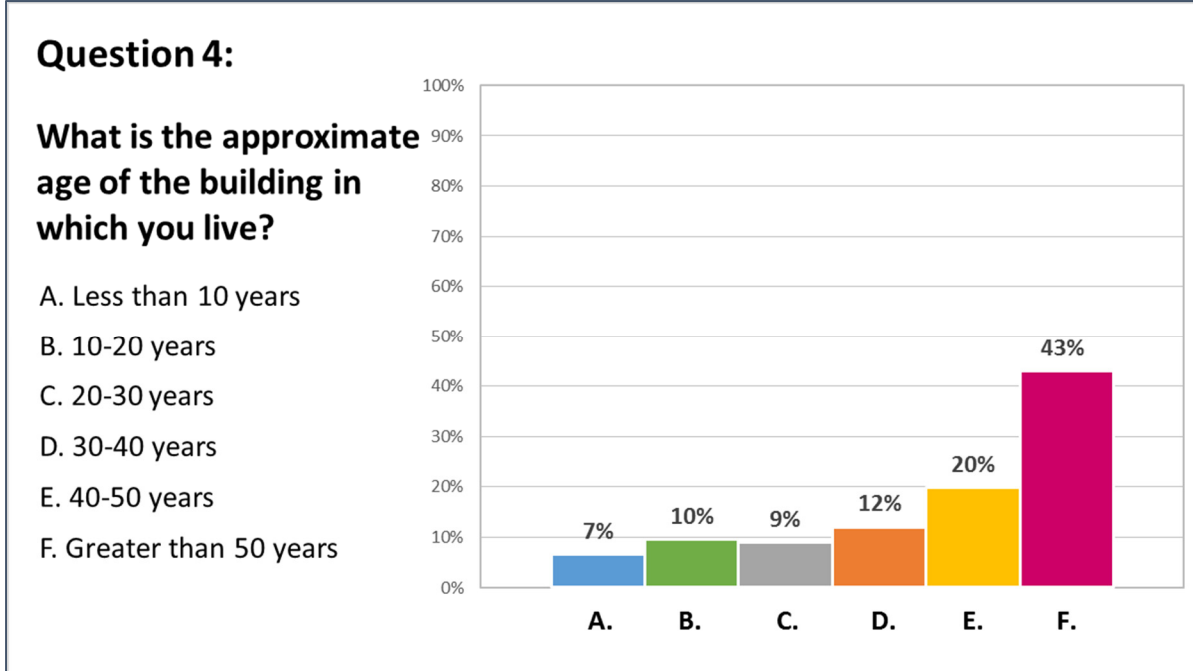
Based on total respondents.

SURVEY QUESTION 3
In what type of building do you live?



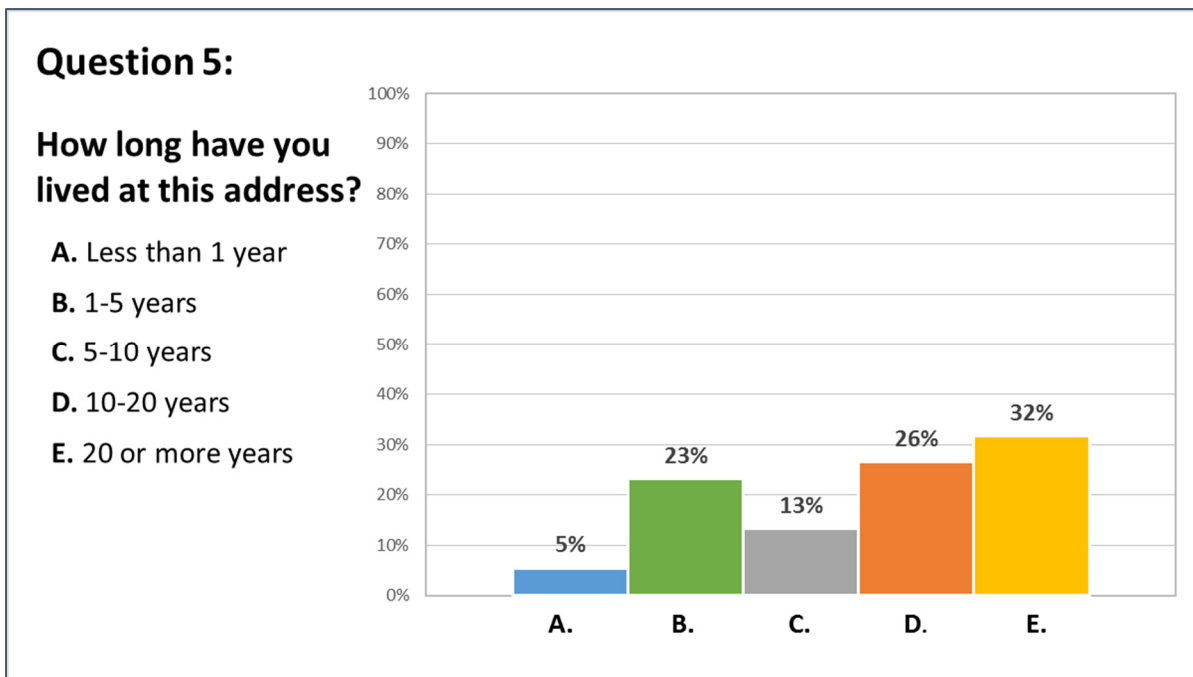
Based on total respondents.

SURVEY QUESTION 4
What is the approximate age of the building in which you live?



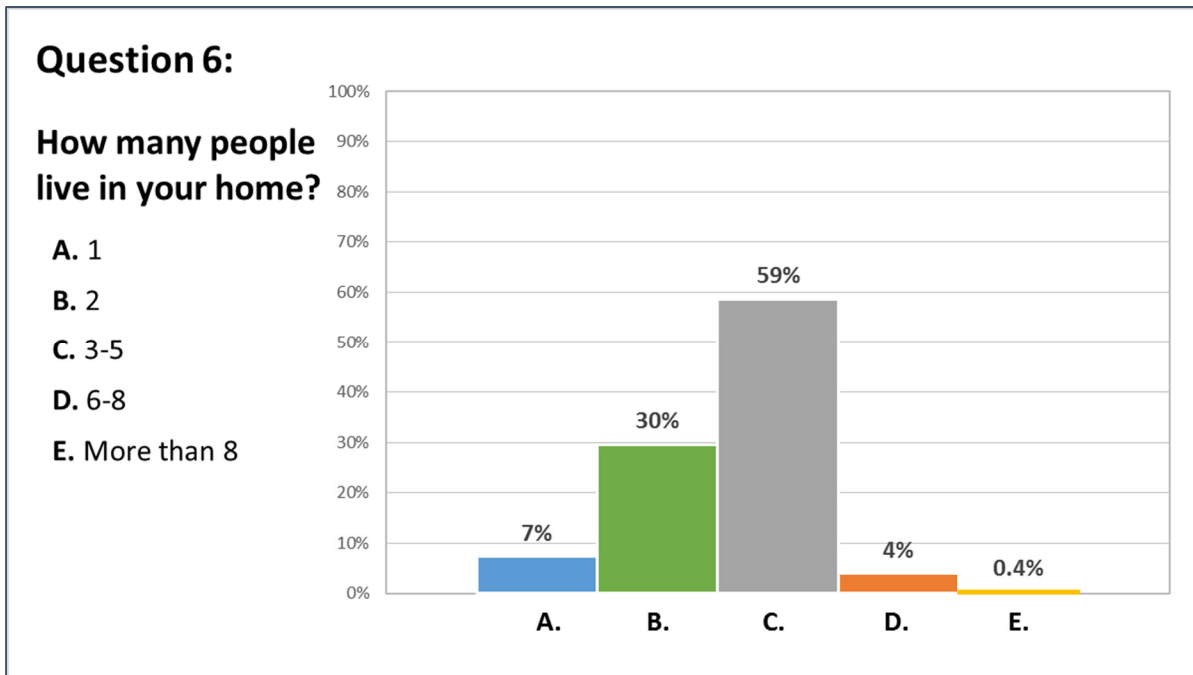
Based on total respondents.

SURVEY QUESTION 5
How long have you lived at this address?



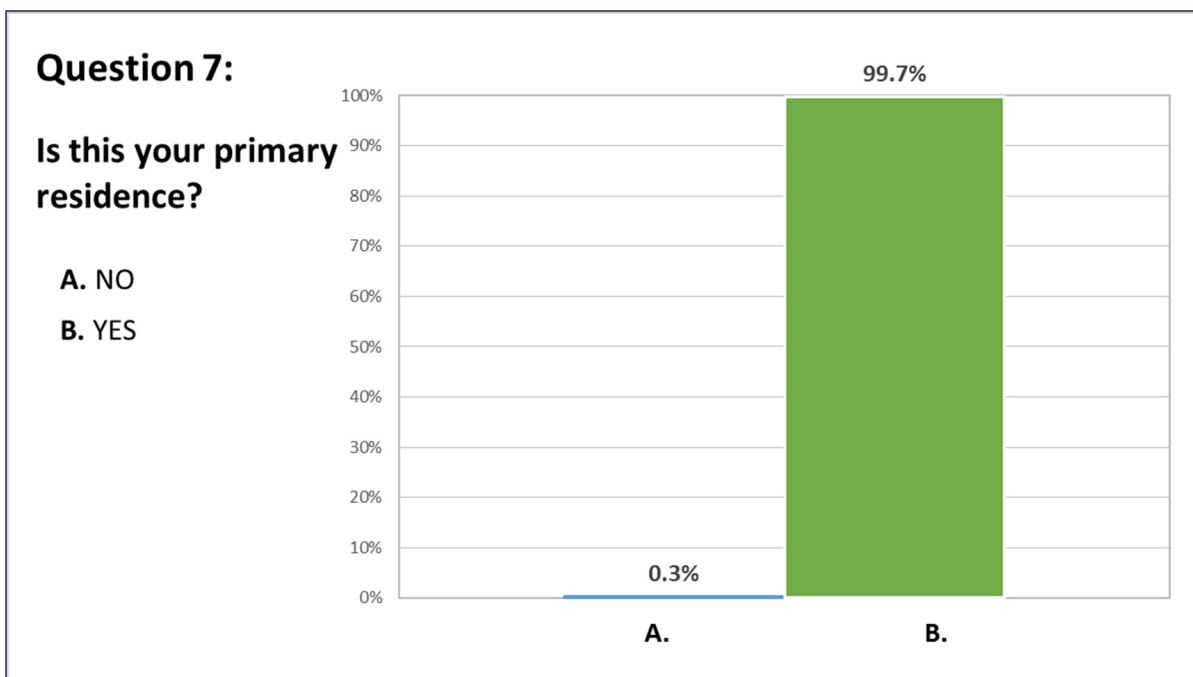
Based on total respondents.

SURVEY QUESTION 6
How many people live in your home?



Based on total respondents.

SURVEY QUESTION 7
Is this your primary residence?



Based on total respondents.

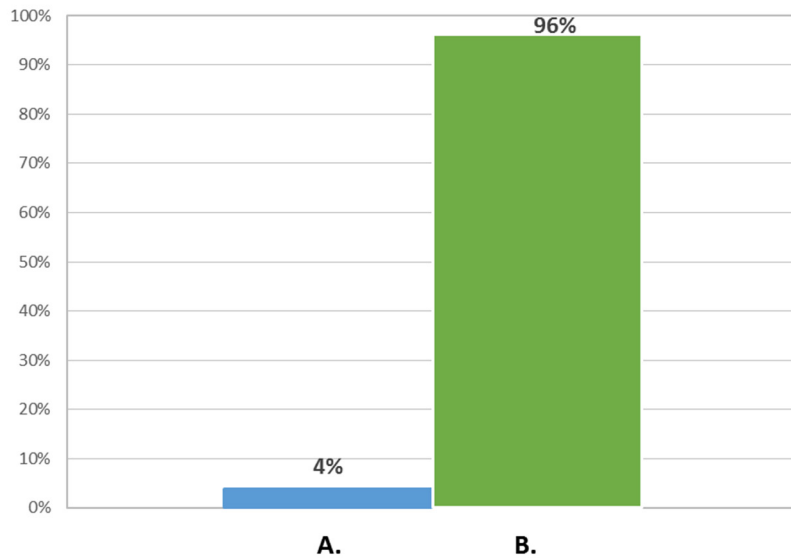
SURVEY QUESTION 8

Other than aircraft noise, would you say that your neighborhood is generally quiet or noisy at night?

Question 8:

Other than aircraft noise, would you say that your neighborhood is generally quiet or noisy at night?

- A. Noisy
- B. Quiet



Based on total respondents.

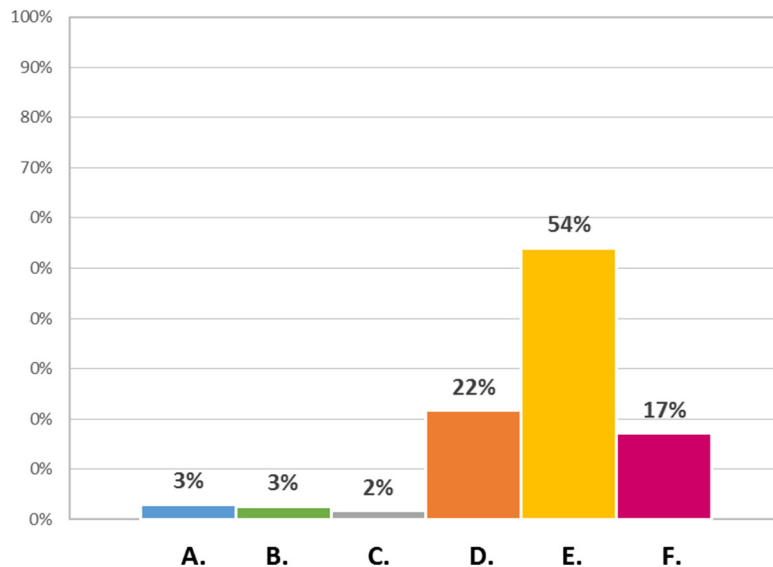
SURVEY QUESTION 9

What time do you typically go to sleep?

Question 9:

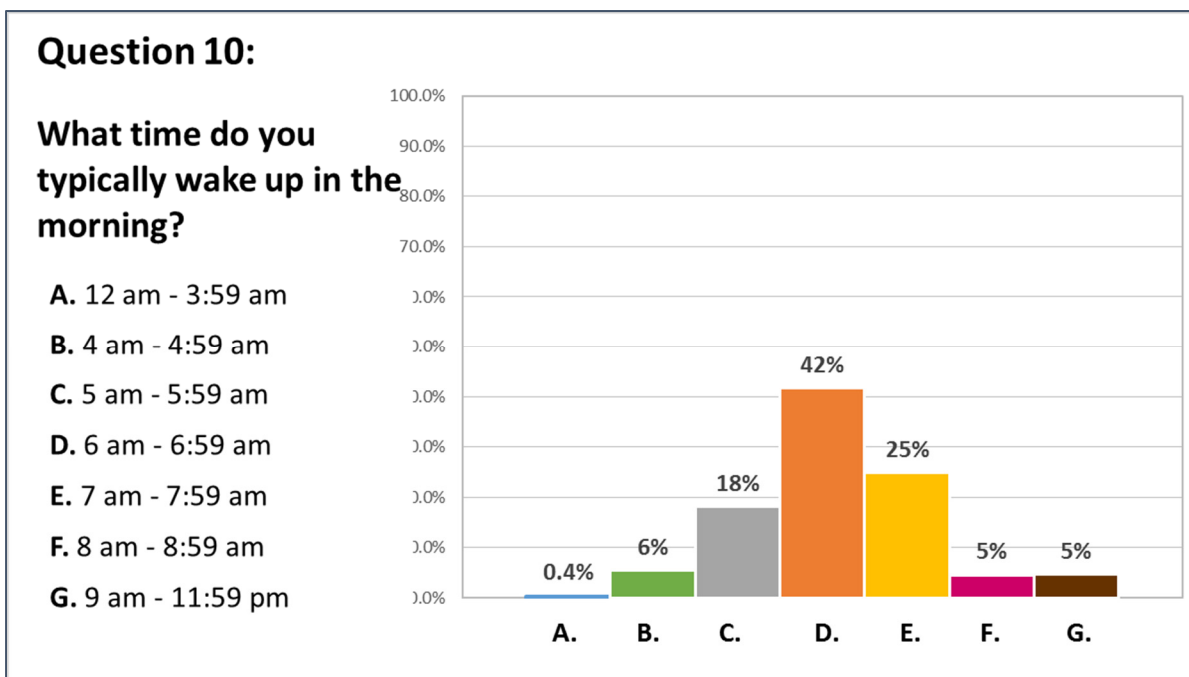
What time do you typically go to sleep in the evening?

- A. 12 am - 3:59 am
- B. 4 am - 7:59 pm
- C. 8 pm - 8:59 pm
- D. 9 pm - 9:59 pm
- E. 10 pm - 10:59 pm
- F. 11 pm - 11:59 pm



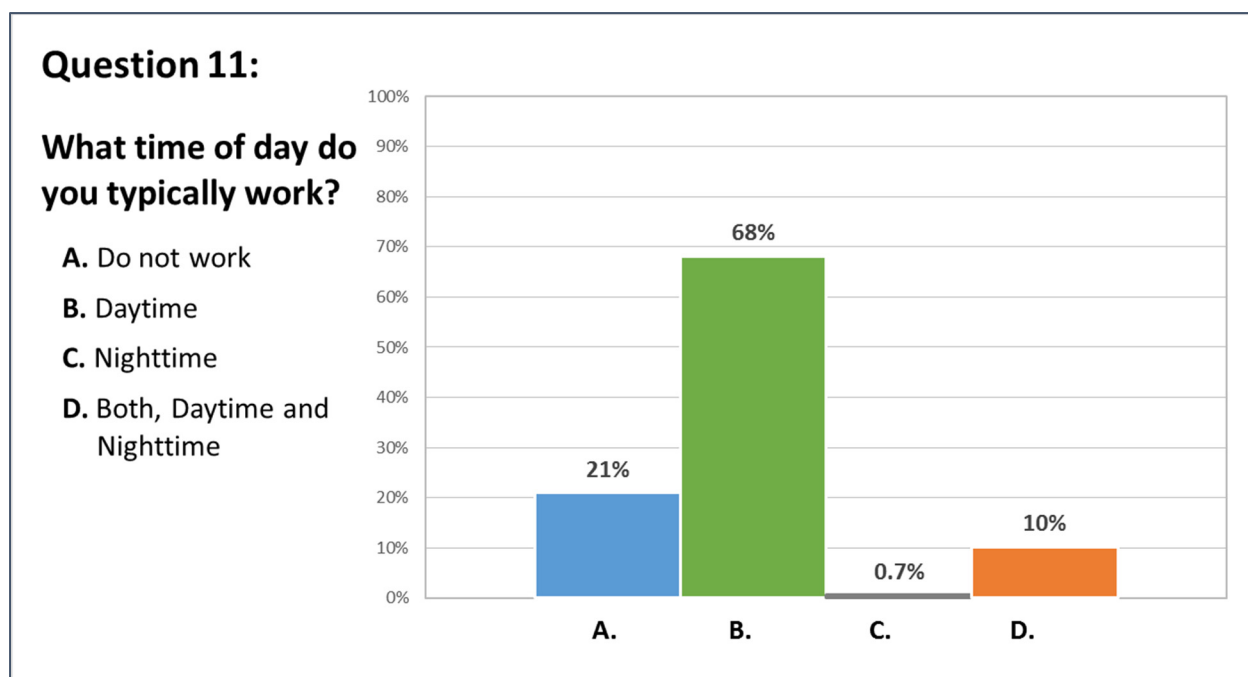
Based on total survey responses.

SURVEY QUESTION 10
What time do you typically wake up in the morning?



Based on total survey responses.

SURVEY QUESTION 11
What time of day do you typically work?



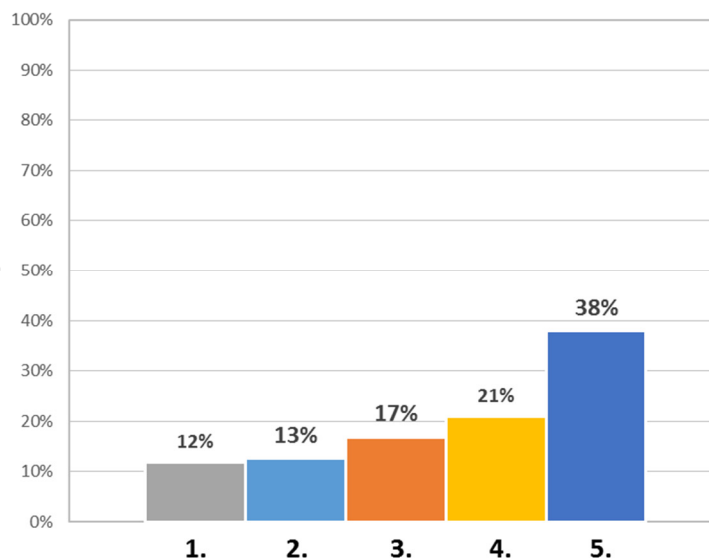
Based on total respondents.

SURVEY QUESTION 12

From 1 to 5 (5 being the highest), indicate the level of noise experienced last week during the Fly Quiet overnight period.

Question 12:

From 1 to 5 (5 being the highest), indicate the level of noise experienced last week during the Fly Quiet overnight period.



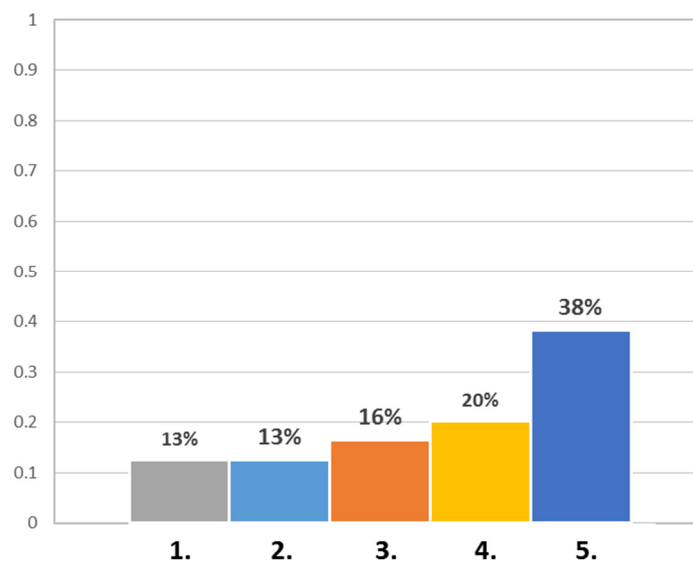
Based on total survey responses.

SURVEY QUESTION 13

From 1 to 5 (5 being the highest), indicate the level of noise experienced this week during the Fly Quiet overnight period.

Question 13:

From 1 to 5 (5 being the highest), indicate the level of noise experienced this week during the Fly Quiet overnight period.



Based on total survey responses.

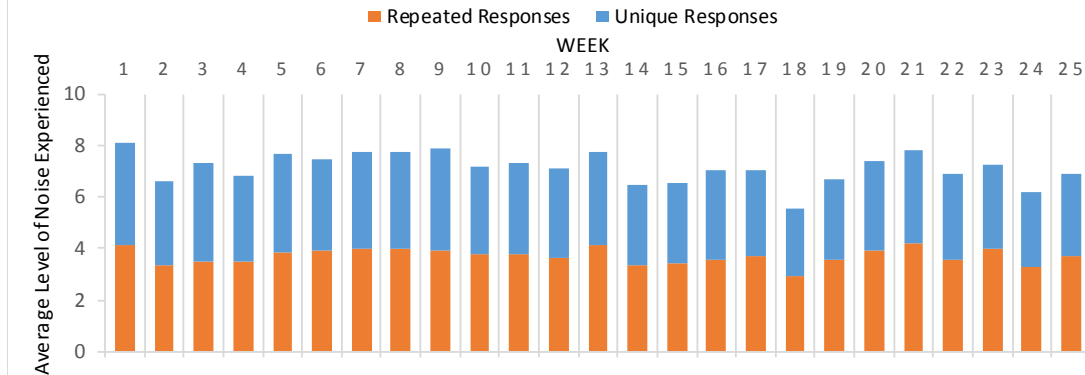
SURVEY QUESTION 12

From 1 to 5 (5 being the highest), indicate the level of noise experienced last week during the Fly Quiet overnight period.

Average - Level of Noise Experienced

Question 12:

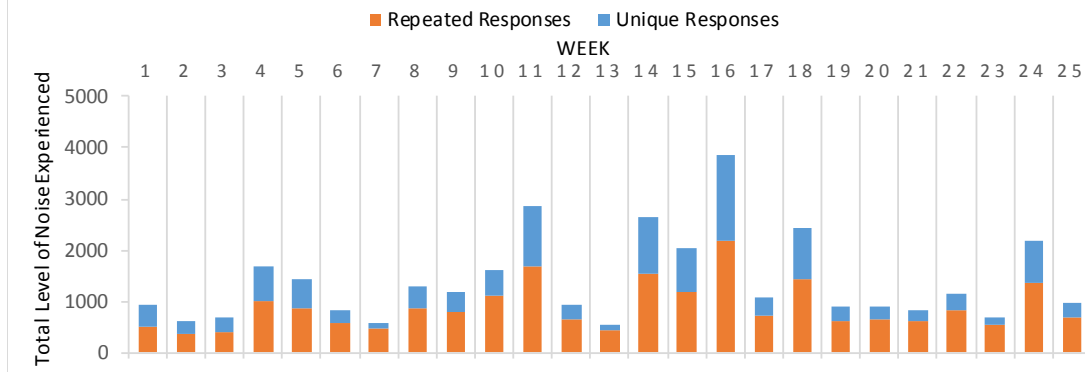
From 1 to 5 (5 being the highest), indicate the level of noise experienced last week during



Summed - Level of Noise Experienced

Question 12:

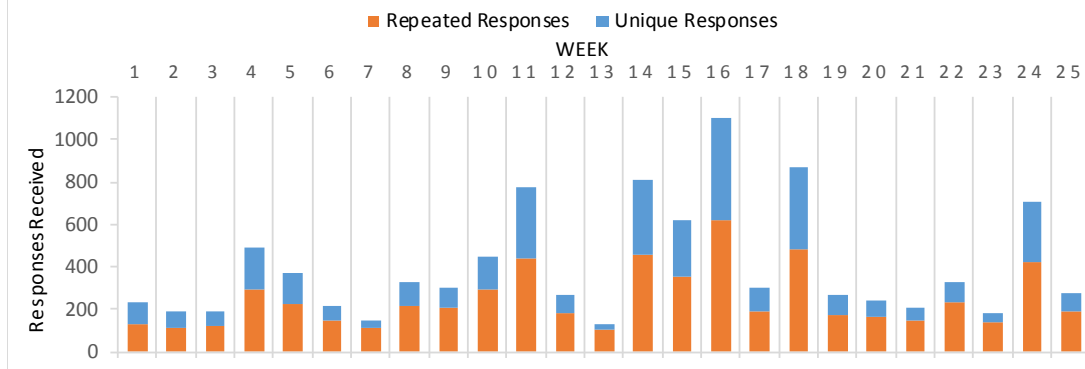
From 1 to 5 (5 being the highest), indicate the level of noise experienced last week during



Responses Received

Question 12:

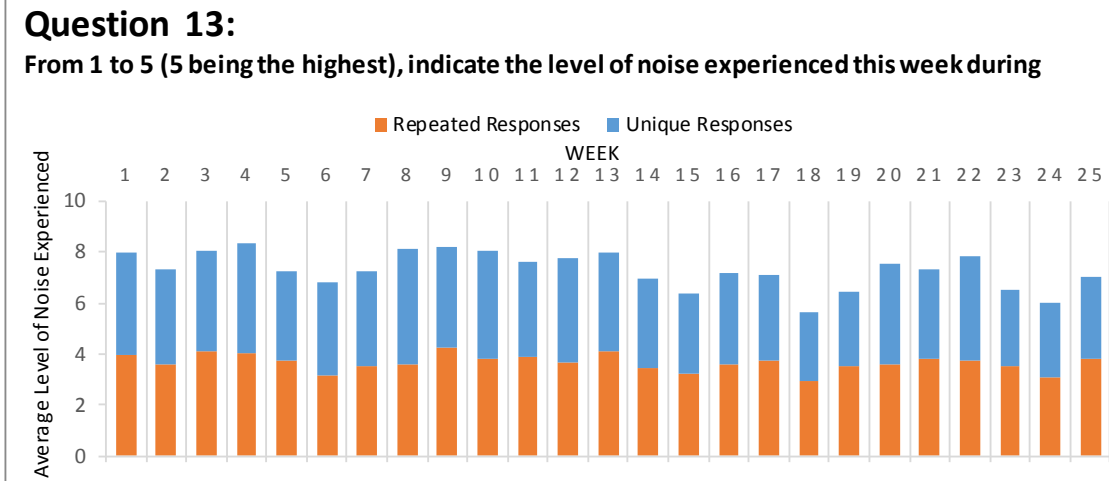
From 1 to 5 (5 being the highest), indicate the level of noise experienced last week during



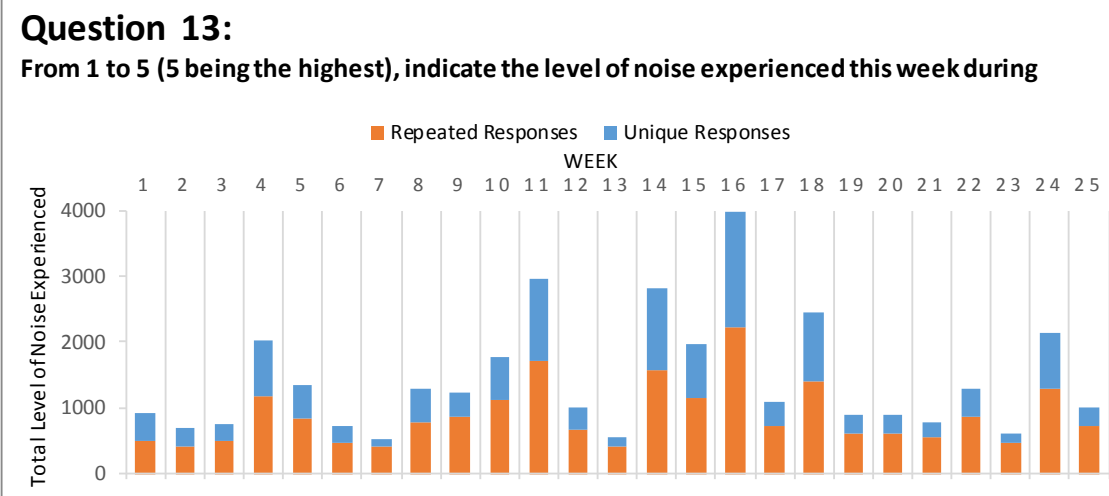
SURVEY QUESTION 13

From 1 to 5 (5 being the highest), indicate the level of noise experienced this week during the Fly Quiet overnight period.

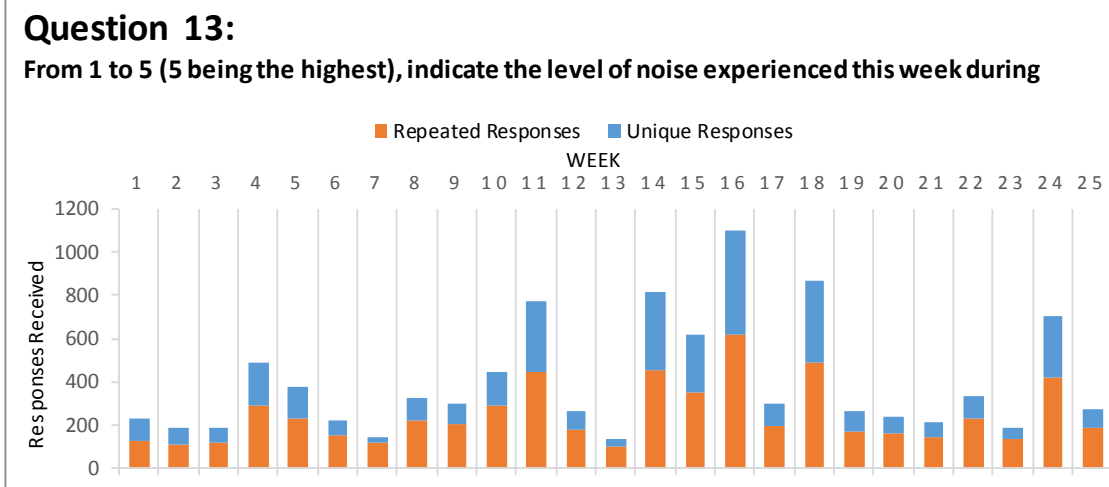
Average - Level of Noise Experienced



Sum - Level of Noise Experienced



Responses Received



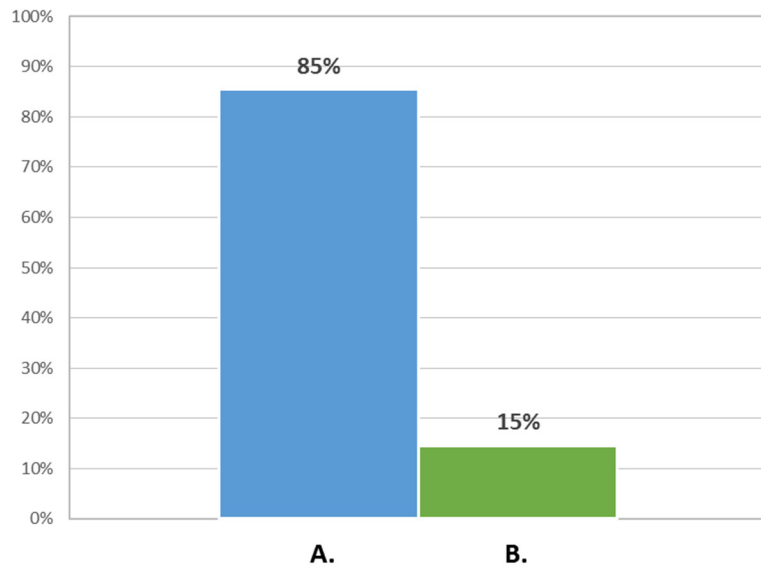
SURVEY QUESTION 14

Do aircraft from O'Hare fly directly over your residence or further away?

Question 14:

Do aircraft from O'Hare fly directly over your residence or further away?

- A. Directly Overhead
- B. Further Away



Based on total respondents.

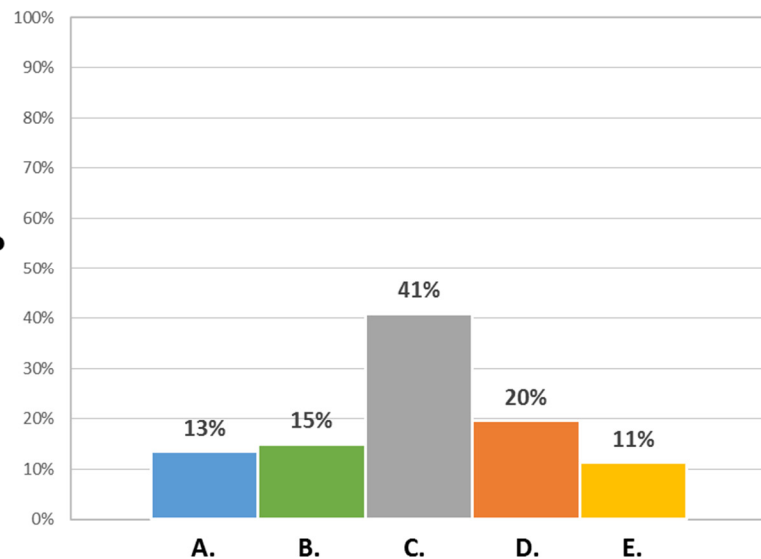
SURVEY QUESTION 15

On a scale of 1-5 (5 being the highest), how helpful was the information on this website regarding the runway rotation?

Question 15:

On a scale of 1-5 (5 being the highest), how helpful was the information on this website regarding the runway rotation test?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5



Based on total respondents.

SURVEY QUESTION 16

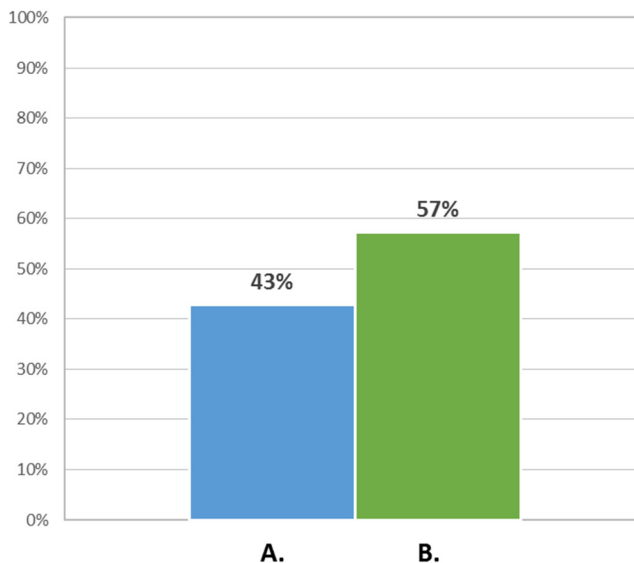
Are the aircraft noise levels during the Fly Quiet overnight period (roughly 11 pm – 5:30 am) better or worse than before the test period began on July 6?

Question 16:

Are the aircraft noise levels during the Fly Quiet overnight period (roughly 11 pm – 5:30 am) better or worse than before the test period began on July 6?

A. Better

B. Worse



Based on total respondents.

SURVEY QUESTION 17

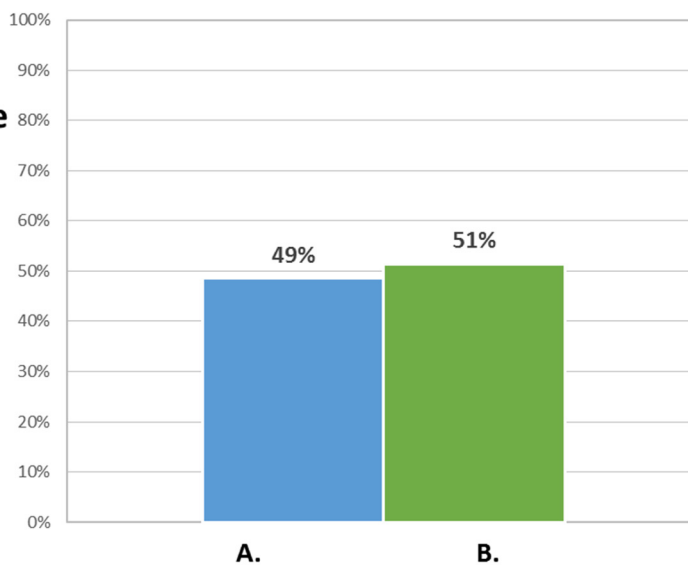
Would you like the Fly Quiet Runway Rotation to continue after the test?

Question 17:

Would you like the Fly Quiet Runway Rotation to continue after the test?

A. No

B. Yes



Based on total respondents.

