



Noise Compatibility

2nd Quarter, 2015

Oct. 5th, 2015

Disclaimer

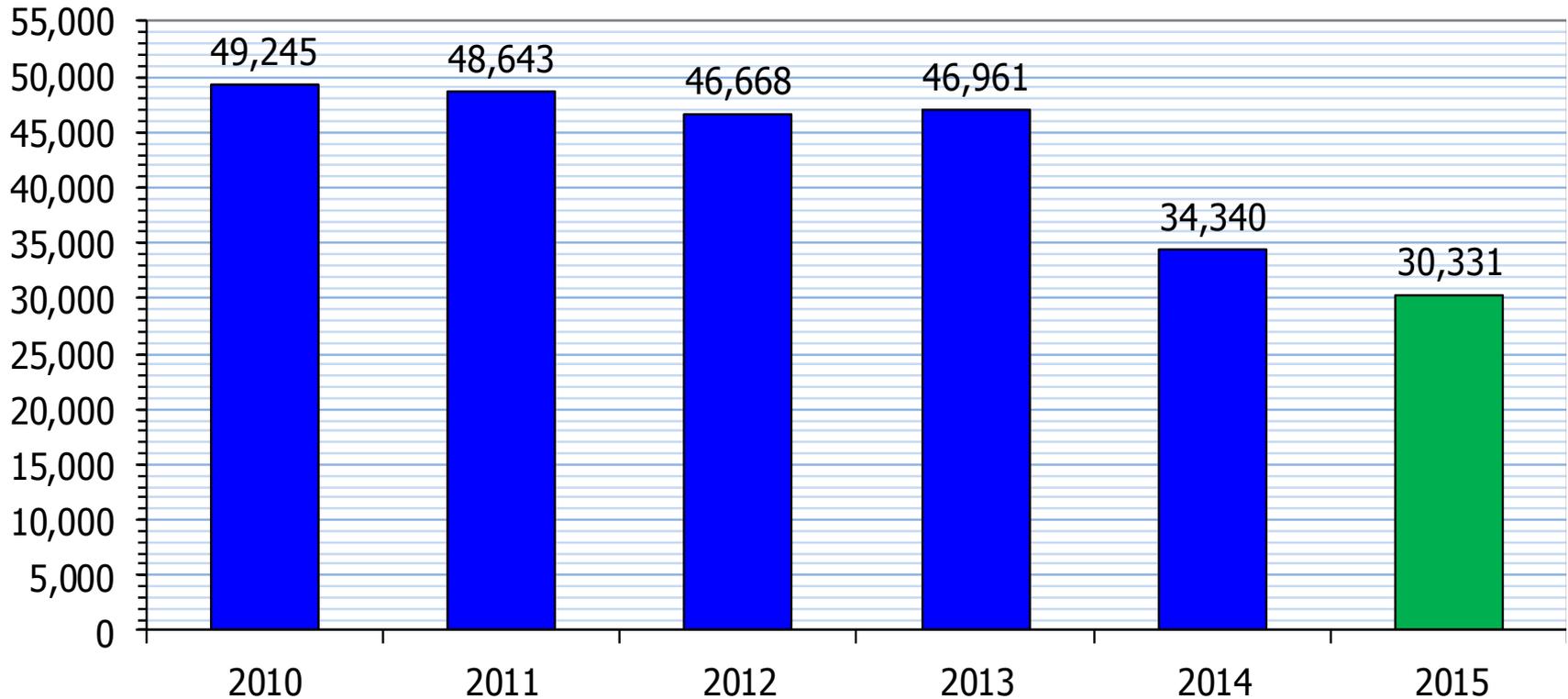


- Adherence to approved noise abatement measures is voluntary and subject to change based on weather, efficiency, and safety.
- The contents of this report are for informational purposes only. The information cannot be used for enforcement of any Noise Abatement Measure.

Aircraft Operations



Cleveland 2nd Quarter Operations 2010 - 2015



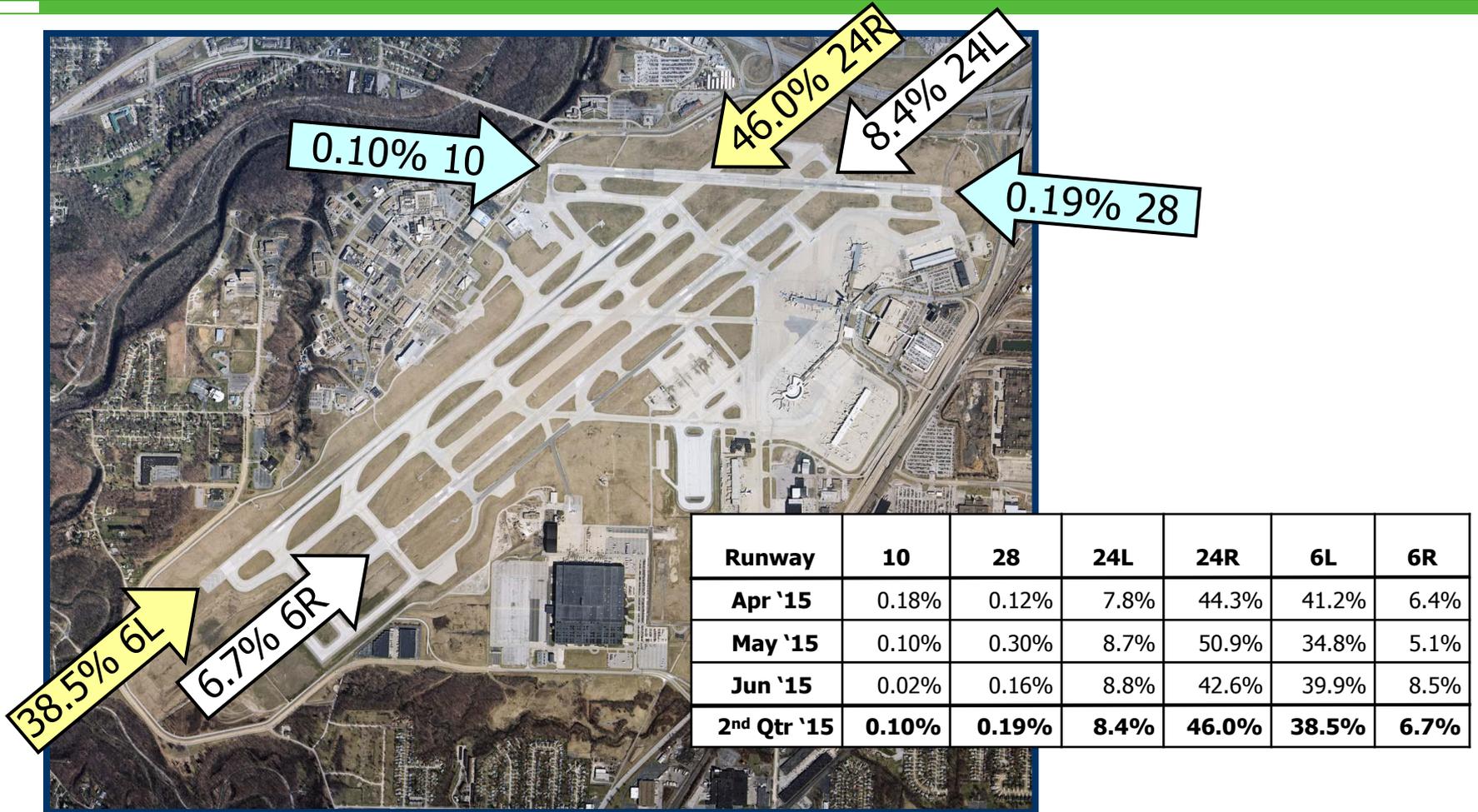
There were 30,331 landings and takeoffs in the 2nd Qtr. 2015; this is 11.67% below the 2nd Qtr. 2014.

Landings & Takeoffs

	2 nd Qtr., 2015		2 nd Qtr., 2014	
Commercial				
-Stage 2 with hush kit	23	0.08%	10	0.03%
-Heavy (incl. all B757s)	551	1.82%	570	1.66%
-MD80 series	1,051	3.46%	340	0.99%
-Other Stage 3	18,062	59.55%	13,885	40.43%
-Regional Jet	6,109	20.14%	10,696	31.15%
-Turboprop	1,199	3.95%	5,853	17.04%
Air Taxi	822	2.91%	644	1.88%
General Aviation	2,394	7.89%	2,282	6.65%
Military	60	0.20%	60	0.17%
Total	30,331	100.00%	34,340	100.00%

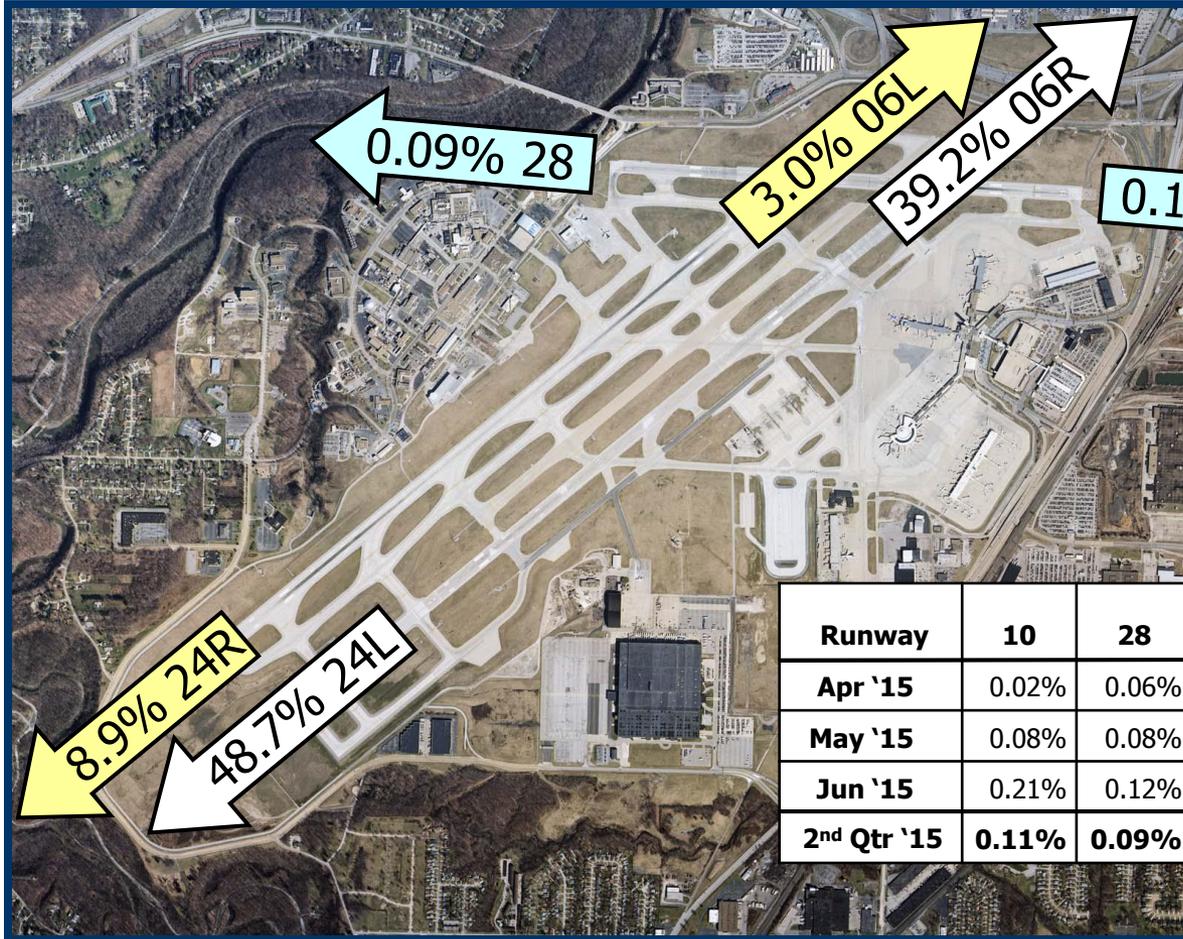
All aircraft above are Stage 3 certified with the exception of some Military and 0.08% of General Aviation (GA) aircraft. Stage 2 GA accordingly is 0.06% of the overall fleet. A hush kit reduces noise enough to meet Stage 3 levels, but well short of the noise level typical of aircraft originally manufactured as Stage 3.

Runway Use: 2nd Qtr, 2015 Arrivals



Totals may be less than 100%, as helicopter operations do not use runways.

Runway Use: 2nd Qtr, 2015 Departures



Runway	10	28	24L	24R	6L	6R
Apr '15	0.02%	0.06%	48.0%	8.4%	2.4%	41.0%
May '15	0.08%	0.08%	52.4%	10.2%	3.0%	34.1%
Jun '15	0.21%	0.12%	45.3%	8.1%	3.6%	42.6%
2nd Qtr '15	0.11%	0.09%	48.7%	8.9%	3.0%	39.2%

Totals may be less than 100%, as helicopter operations do not use runways.

Departure Headings, 2nd Qtr: Day-time

Jet Departures, 6:00 a.m. to 11:00 p.m. 2nd Qtr., 2015

A voluntary measure of the Noise Compatibility Program calls for jets departing between 6:00 a.m. and 11:00 p.m. from Runways 6L and 6R to take magnetic headings between 360° and 35° when turning left and between 65° and 95° when turning right until the jet is either 5 mi. away from the airport or has gained an altitude of 5,000 ft. above Mean Sea Level (MSL).

Another voluntary measure of the Noise Compatibility Program calls for jets departing between 6:00 a.m. and 11:00 p.m. from Runways 24L and 24R to take magnetic headings between 190° and 220° when turning left and between 250° and 280° when turning right until the jet is either 5 mi. away from the airport or has gained an altitude of 5,000 ft. MSL.

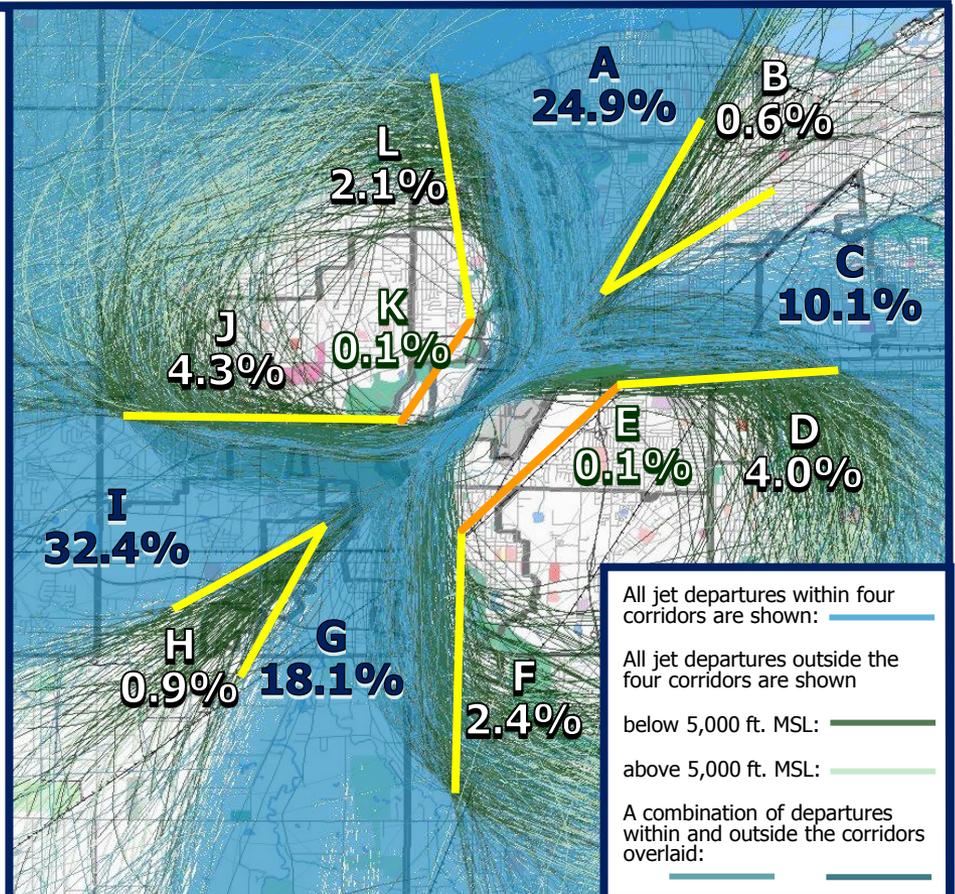
85.5% within corridors

- A. 24.9%:** north corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- C. 10.1%:** east corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- G. 18.1%:** south corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- I. 32.4%:** west corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL

14.5% outside corridors

- B. 0.6%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the north and east corridors
- D. 4.0%:** flights crossing the south boundary below 5,000 ft. MSL
- E. 0.1%:** flights turning south before entering the corridor
- F. 2.4%:** flights crossing the east boundary below 5,000 ft. MSL
- H. 0.9%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the west and south corridors
- J. 4.3%:** flights crossing the north boundary below 5,000 ft. MSL
- K. 0.1%:** flights turning north before entering the corridor
- L. 2.1%:** flights crossing the west boundary below 5,000 ft. MSL

(Percentages do not include Rwy 10/28 departures)



Departure Headings, 2nd Qtr: Night-time

Jet Departures, 11:00 p.m. to 6:00 a.m.

A voluntary measure of the Noise Compatibility Program calls for jets departing between 11:00 p.m. and 6:00 a.m. from Runways 6L and 6R to take headings of roughly 095° to 100° until reaching an altitude of 5,000 ft. MSL.

Another voluntary measure of the Noise Compatibility Program calls for jets departing between 11:00 p.m. and 6:00 a.m. from Runways 24L and 24R to take headings between 200° and 220° until reaching an altitude of 5,000 ft. MSL.

48.0 % within corridors

A. 27.2%: 095 corridor, including flights crossing the 095 corridor boundaries above 5,000 ft. MSL

F. 20.8%: 200 corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL

52.0 % outside corridors

B. 7.5%: flights crossing the south boundary below 5,000 ft. MSL

C. 0.4%: flights turning south before entering the 095 corridor

D. 1.8%: flights departing south without entering the 200 corridor

E. 15.4%: flights crossing the east boundary below 5,000 ft. MSL

G. 1.8%: flights crossing the west boundary below 5,000 ft. MSL

H. 7.5%: flights departing southwest without entering the corridor

I. 6.8%: flights departing west without entering the corridor

J. 8.6%: flights departing north, not east with the 095 corridor

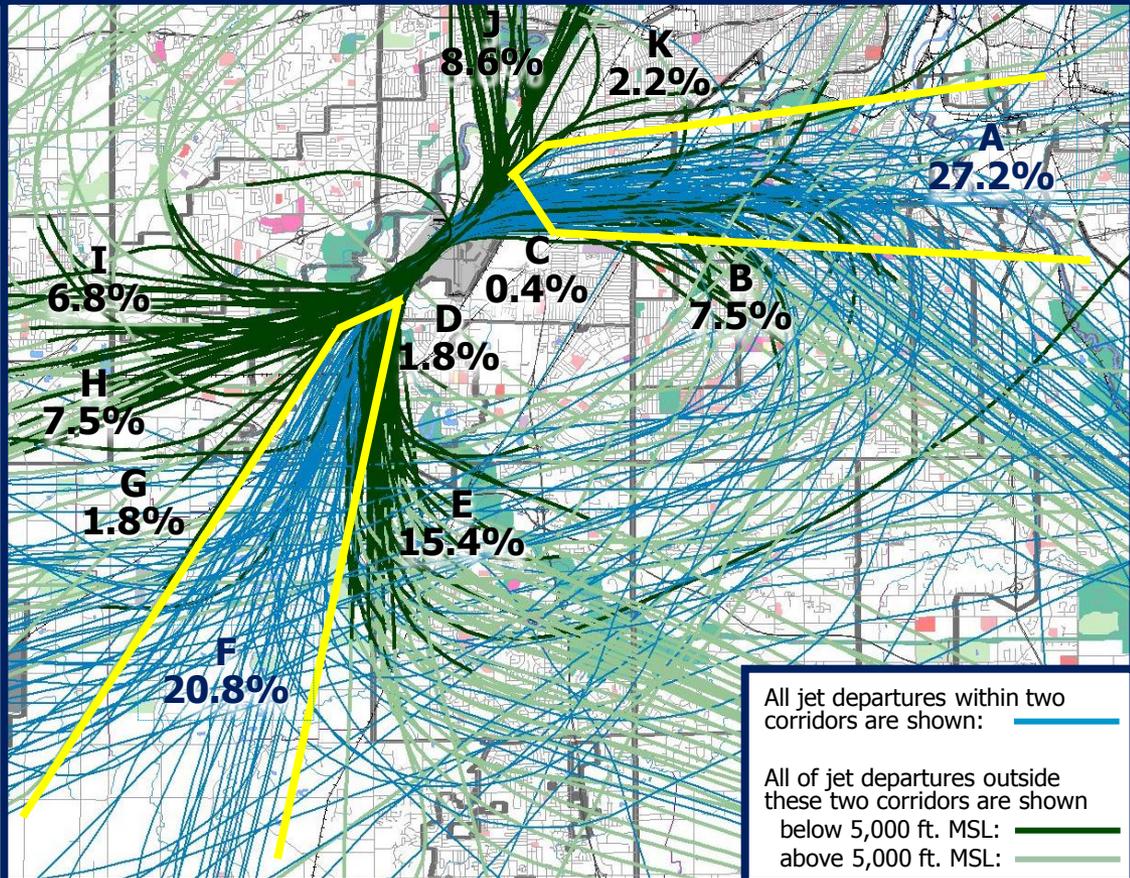
K. 2.2%: flights crossing the north boundary below 5,000 ft. MSL

(There were no Rwy 10 or Rwy 28 jet departures between 11:00 p.m. and 6:00 a.m. during the quarter.)

The percentage of departures on each runway from 11:00 p.m. to 6:00 a.m. during the quarter were as follows:

Runway	10	28	24L	24R	6L	6R
For jets:	0.0%	0.0%	50.0%	3.9%	5.4%	40.7%
For all aircraft:	0.0%	0.0%	47.6%	3.6%	5.8%	42.7%

88.4% of Jet Departures from Rwy 6L/6R are on the preferred Rwy, 6R.



All jet departures within two corridors are shown: ———

All of jet departures outside these two corridors are shown
below 5,000 ft. MSL: ———
above 5,000 ft. MSL: ———

Arrival Headings, 2nd Qtr: Night-time

Arrivals, 10:00 p.m. to 6:59 a.m.

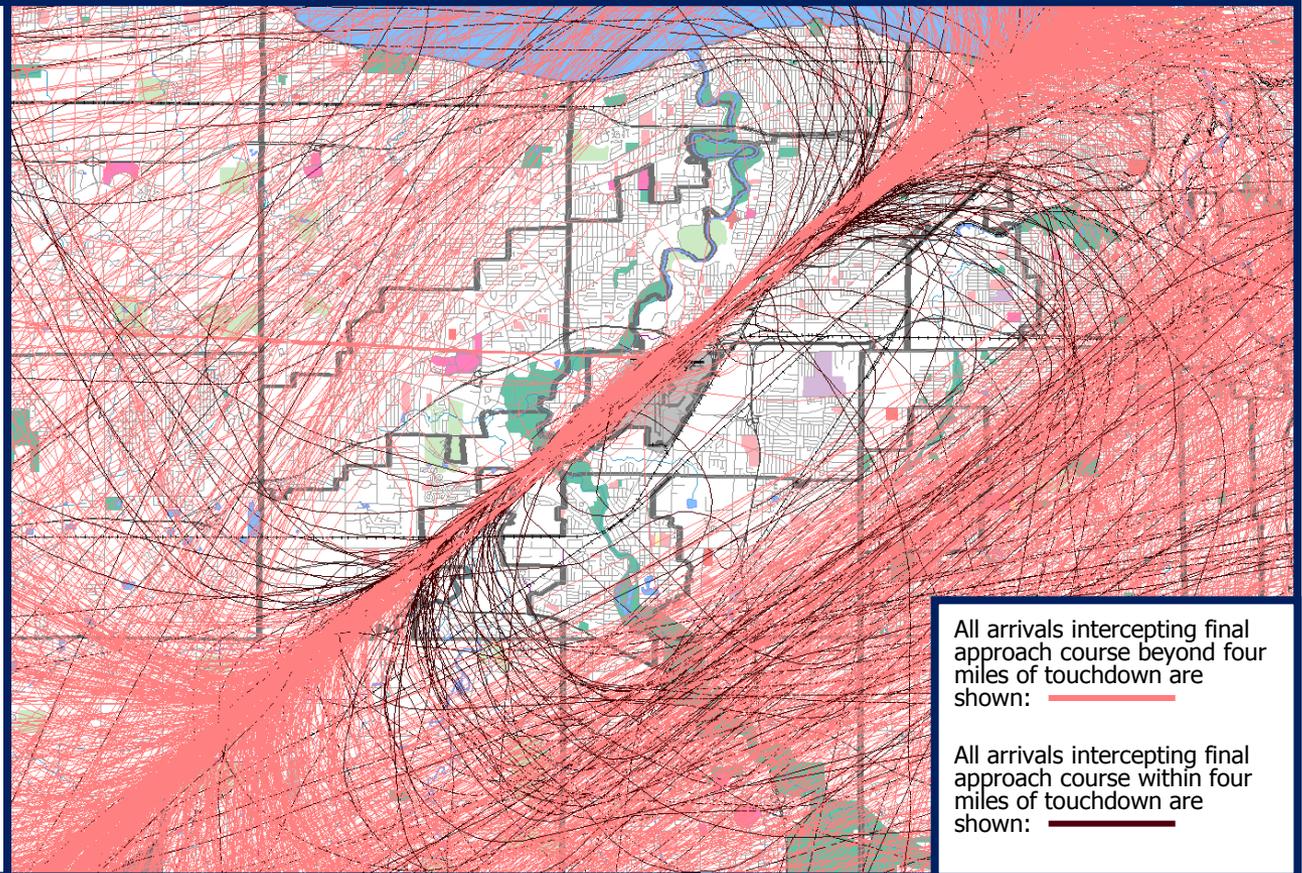
A voluntary measure of the Noise Compatibility Program calls for all aircraft arriving between 10:00 p.m. and 6:59 a.m., wind and weather permitting, to intercept final approach course no closer than four miles before touchdown.

**94.0% beyond four miles and
6.0% within four miles**

There is no comparable NCP measure regarding day-time arrivals.

Runway use by all arriving aircraft from 10:00 p.m. to 6:59 a.m. during the quarter was as follows:

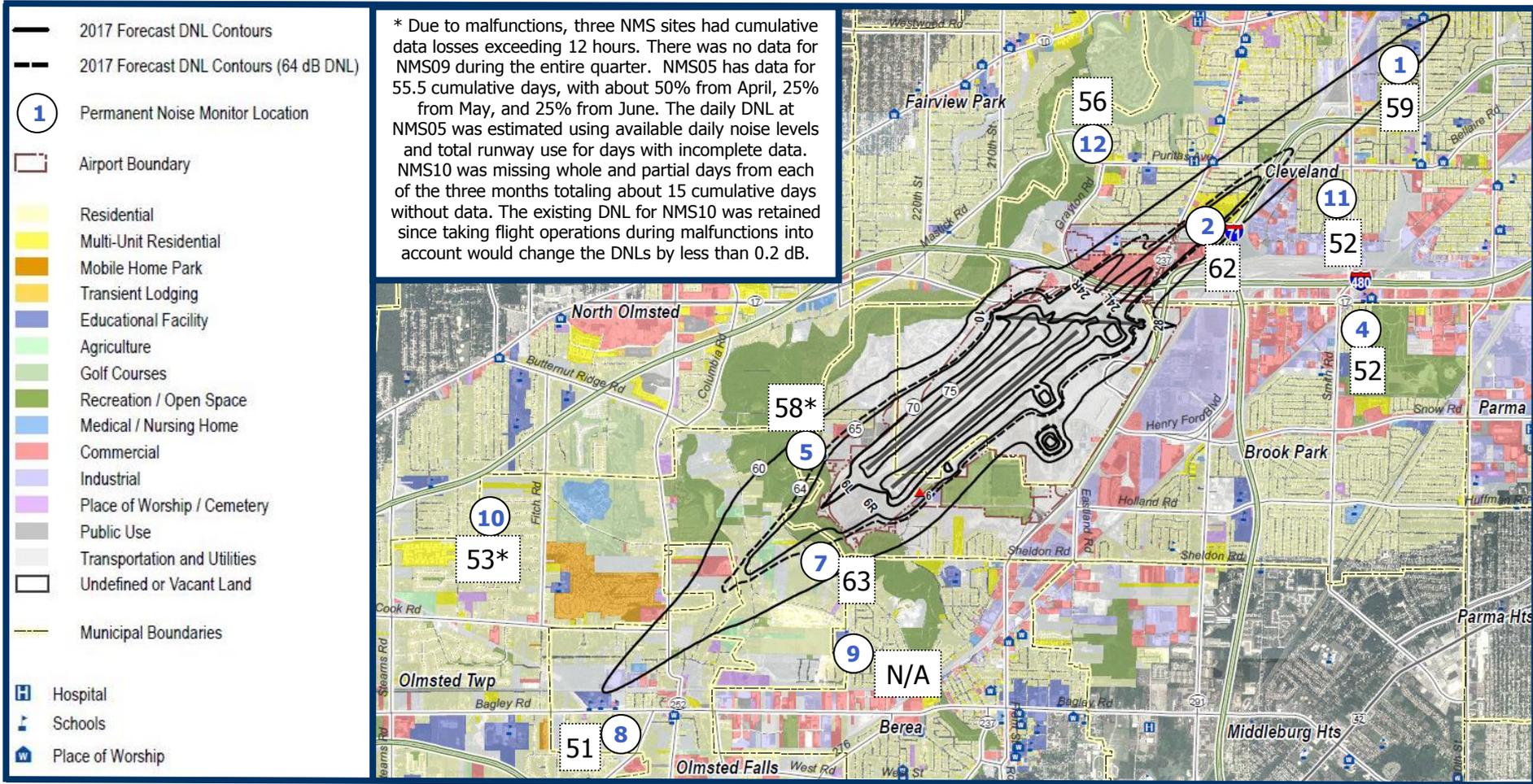
Rwy	Percentage of Arrivals	
	Jets	All Aircraft
10	0.3%	0.3%
28	0.0%	0.0%
24L	9.1%	9.5%
24R	37.7%	37.5%
6L	44.3%	44.1%
6R	8.6%	8.6%



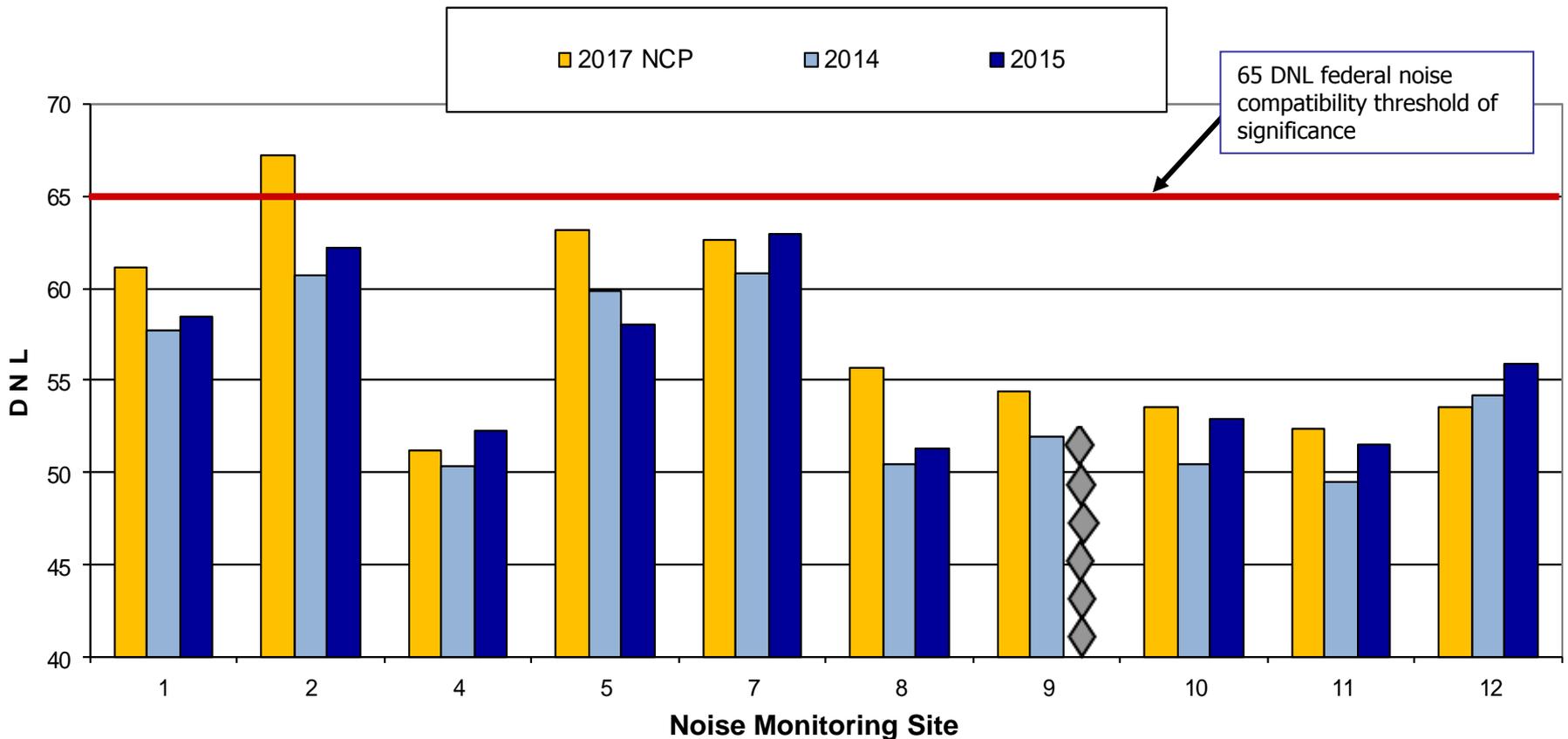
All arrivals intercepting final approach course beyond four miles of touchdown are shown: 

All arrivals intercepting final approach course within four miles of touchdown are shown: 

Aircraft Noise – DNL by Noise Monitoring Site

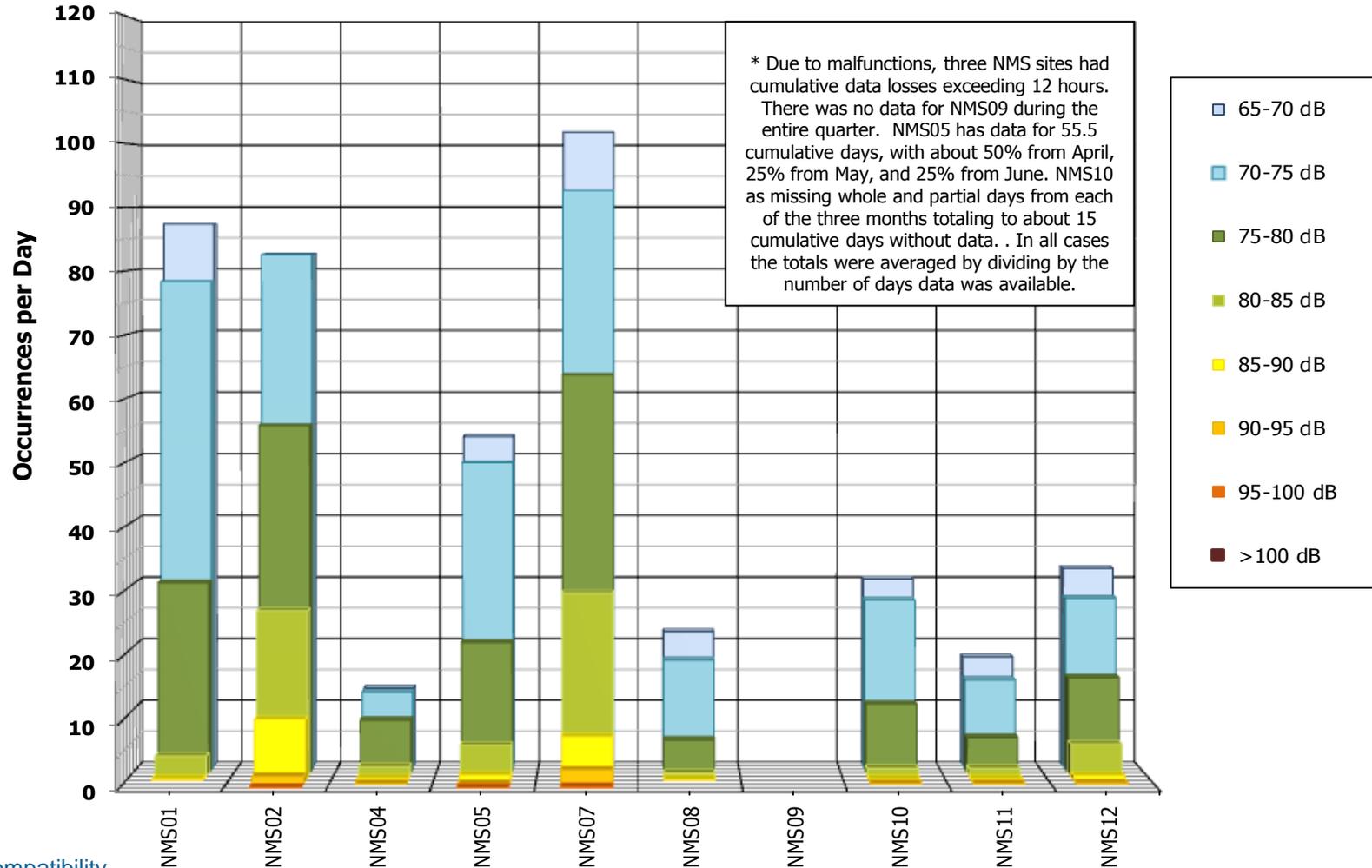


DNL: 2nd Qtr, 2015 vs. 2nd Qtr, 2014



* Due to malfunctions, three NMS sites had cumulative data losses exceeding 12 hours. There was no data for NMS09 during the entire quarter. NMS05 has data for 55.5 cumulative days, with about 50% from April, 25% from May, and 25% from June. The daily DNL at NMS05 was estimated using available daily noise levels and total runway use for days with incomplete data. NMS10 was missing partial days from each of the three months totaling to about 15 cumulative days without data. The existing DNL for NMS10 was retained since taking flight operations during malfunctions into account would change the DNLs by less than 0.2 dB.

Average Daily Number of Aircraft Noise Occurrences Above Each 5 dB Increment



Top 3 Lmaxs at each NMS, (1 of 2)

NMS	Lmax (dB)	Aircraft	Operation	Time and date	Sound Exposure Level (dB)¹	Duration (sec)
NMS01	88.9	MD-88	Arrival on Rwy 24R	4/23/15 9:08 PM	94.0	21.5
NMS01	87.9	MD-83	Arrival on Rwy 24R	4/13/15 5:44 PM	92.6	29.5
NMS01	87.1	Airbus A319	Arrival on Rwy 24R	4/5/15 1:04 PM	89.4	15.5
NMS02	96.0	MD-83	Departure off Rwy 6R	6/17/15 9:50 PM	101.0	20.0
NMS02	95.6	MD-82	Departure off Rwy 6R	5/21/15 6:48 PM	101.0	20.0
NMS02	95.6	MD-83	Departure off Rwy 6R	6/14/15 6:26 AM	100.9	22.0
NMS04	91.4	MD-88	Departure off Rwy 6R	5/20/15 7:21 AM	98.0	35.0
NMS04	89.2	MD-88	Departure off Rwy 6R	6/6/15 6:08 AM	95.9	25.0
NMS04	89.1	MD-88	Departure off Rwy 6R	4/28/15 5:22 PM	94.9	26.0
NMS05 ²	97.2	MD-88	Departure off Rwy 24R	6/9/15 12:44 PM	102.2	28.0
NMS05 ²	92.2	MD-88	Departure off Rwy 6R	4/9/15 7:11 AM	100.6	66.0
NMS05 ²	90.3	MD-11	Departure off Rwy 24L	4/9/15 10:30 PM	97.9	32.0
NMS07	96.7	MD-88	Departure off Rwy 24L	6/21/15 12:40 PM	102.2	28.5
NMS07	96.6	MD-82	Departure off Rwy 24R	5/27/15 7:19 PM	102.1	29.5
NMS07	96.5	MD-88	Departure off Rwy 24L	5/18/15 7:08 PM	102.2	27.5

¹ Sound Exposure Level is a measure that takes into account all noise over the entire duration of an event.

² Due to equipment malfunctions, data for NMS05 is available for a cumulative total of 55.5 days of the quarter.

Top 3 Lmaxs at each NMS, (2 of 2)

NMS	Lmax (dB)	Aircraft	Operation	Time and date	Sound Exposure Level (dB) ¹	Duration (sec)
NMS08	88.6	MD-83	Departure off Rwy 24L	5/12/15 3:36 PM	87.7	23.0
NMS08	88.0	MD-83	Departure off Rwy 24L	4/23/15 3:39 PM	93.9	29.5
NMS08 ²	87.8	MD-88	Departure off Rwy 24R	6/4/15 12:37 PM	93.9	21.5
NMS10 ³	90.6	MD-83	Departure off Rwy 24L	4/1/15 8:02 AM	97.3	32.5
NMS10 ³	89.8	MD-83	Departure off Rwy 24L	5/11/15 8:12 AM	95.5	26.5
NMS10 ³	89.3	MD-83	Departure off Rwy 24L	5/11/15 8:01 PM	96.0	27.0
NMS11	91.0	MD-88	Departure off Rwy 6R	6/16/15 12:46 PM	96.3	69.5
NMS11	90.9	MD-88	Departure off Rwy 6L	4/19/15 11:16 AM	96.6	35.5
NMS11	90.6	MD-88	Departure off Rwy 6R	4/25/15 7:15 AM	98.6	38.5
NMS12	93.8	MD-83	Departure off Rwy 6R	4/26/15 12:15 PM	99.6	30.0
NMS12	92.6	MD-83	Departure off Rwy 6R	6/25/15 7:48 PM	98.4	31.0
NMS12	92.2	MD-82	Departure off Rwy 6R	6/1/15 6:52 PM	97.8	38.0

¹ Sound Exposure Level is a measure that takes into account all noise over the entire duration of an event.

² Due to equipment malfunctions, data for NMS09 is unavailable for the entire quarter.

³ Due to equipment malfunctions, NMS10 was missing full and partial days from each of the three months totaling about 15 cumulative days of data.

Noise Complaints

City	Apr	May	Jun	2 nd Q '15 Calls	%	2 nd Q '14 Calls	%	2 nd Q '15 Callers	%	2 nd Q '14 Callers	%
Brook Park	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cleveland	0	3	2	5	29.4%	12	80.0%	4	28.6%	5	62.5%
Columbia Station	0	1	0	1	5.9%	0	0.0%	1	7.1%	0	0.0%
Fairview Park	0	2	1	3	17.6%	1	6.7%	3	21.4%	1	12.5%
North Olmsted	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Olmsted Falls	1	0	0	1	5.9%	0	0.0%	1	7.1%	0	0.0%
Olmsted Twp.	1	1	0	2	11.8%	2	13.3%	2	14.3%	2	25.0%
Parma	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Parma Heights	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Rocky River	0	0	5	5	29.4%	0	0.0%	3	21.4%	0	0.0%
Westlake	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Totals	2	7	8	17	100.0%	15	100.0%	14	100.0%	8	100.0%

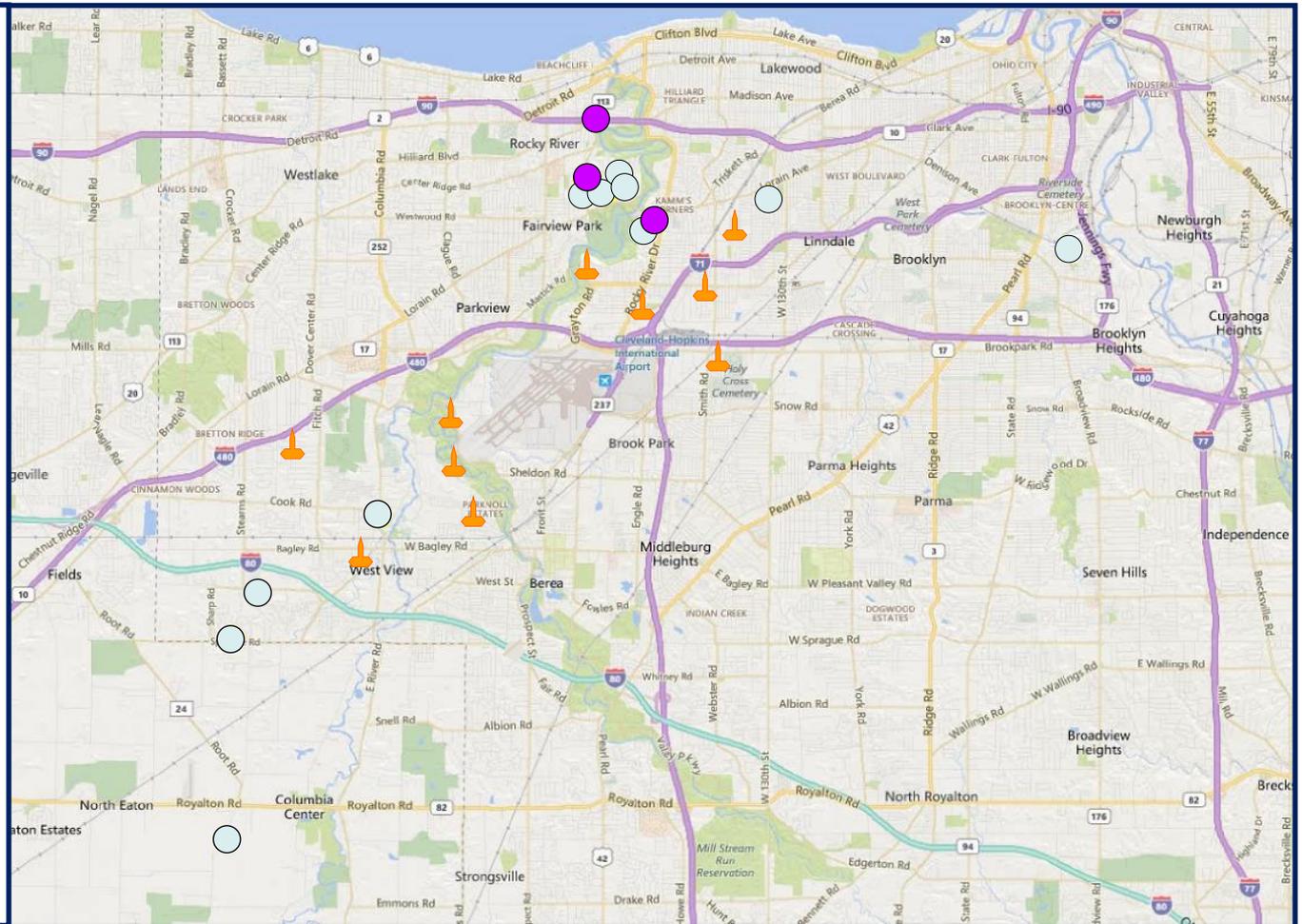
Noise Hotline – (216) 898-5220

2nd Quarter Complaint Map

LEGEND

Complaints per household

-  1 complaint
-  2 to 5 complaints
-  6 or more complaints
-  Noise Monitoring Station



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