



Noise Compatibility

3rd Quarter, 2013

Dec 13, 2013

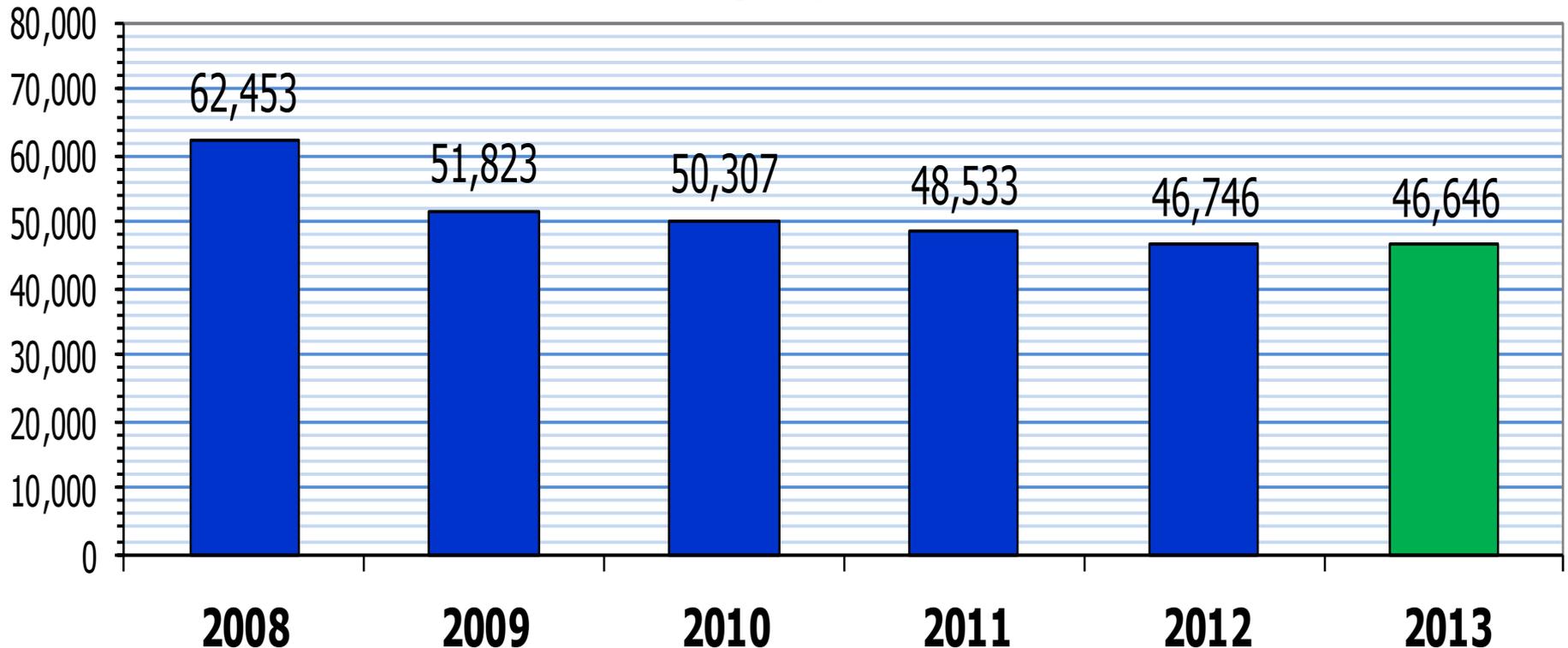
Disclaimer



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

Aircraft Operations

Cleveland 3rd Qtr. Operations 2008 - 2013



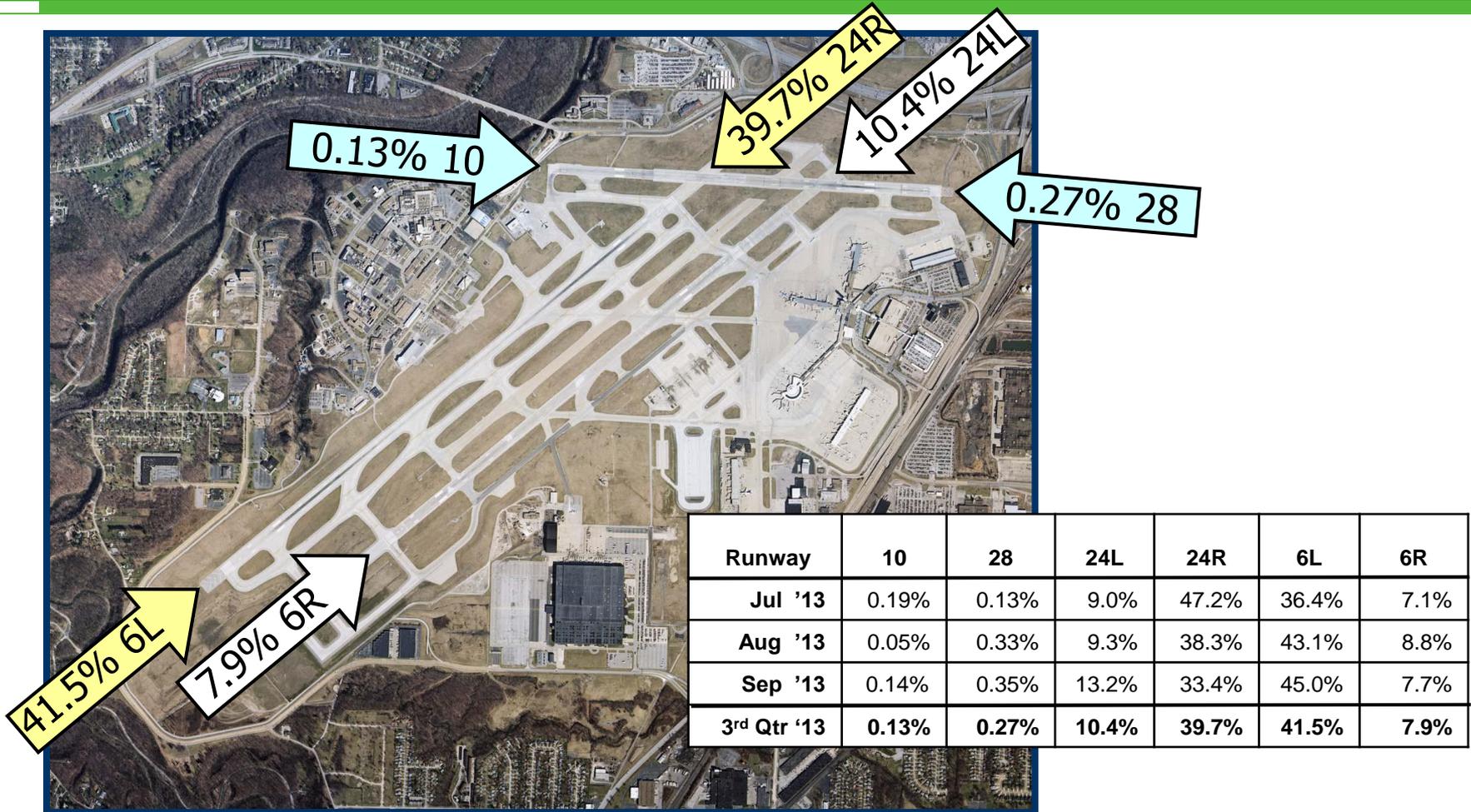
There were 46,646 landings and takeoffs in the 3rd Qtr. 2013; this is 0.21% less than 3rd Qtr. 2012.

Landings & Takeoffs

	3 rd Qtr, 2013		3 rd Qtr, 2012	
Commercial				
-Stage 2 with hush kit	232	0.50%	109	0.23%
-Heavy (incl. all B757s)	820	1.76%	832	1.78%
-MD80 series	1,002	2.15%	909	1.94%
-Other Stage 3	12,112	25.97%	12,398	26.52%
-Regional Jet	21,510	46.11%	21,919	46.89%
-Turboprop	8,412	18.03%	7,686	16.44%
Air Taxi	386	0.83%	583	1.25%
General Aviation	2,132	4.57%	2,252	4.82%
Military	40	0.09%	58	0.12%
Total	46,646	100.00%	46,746	100.00%

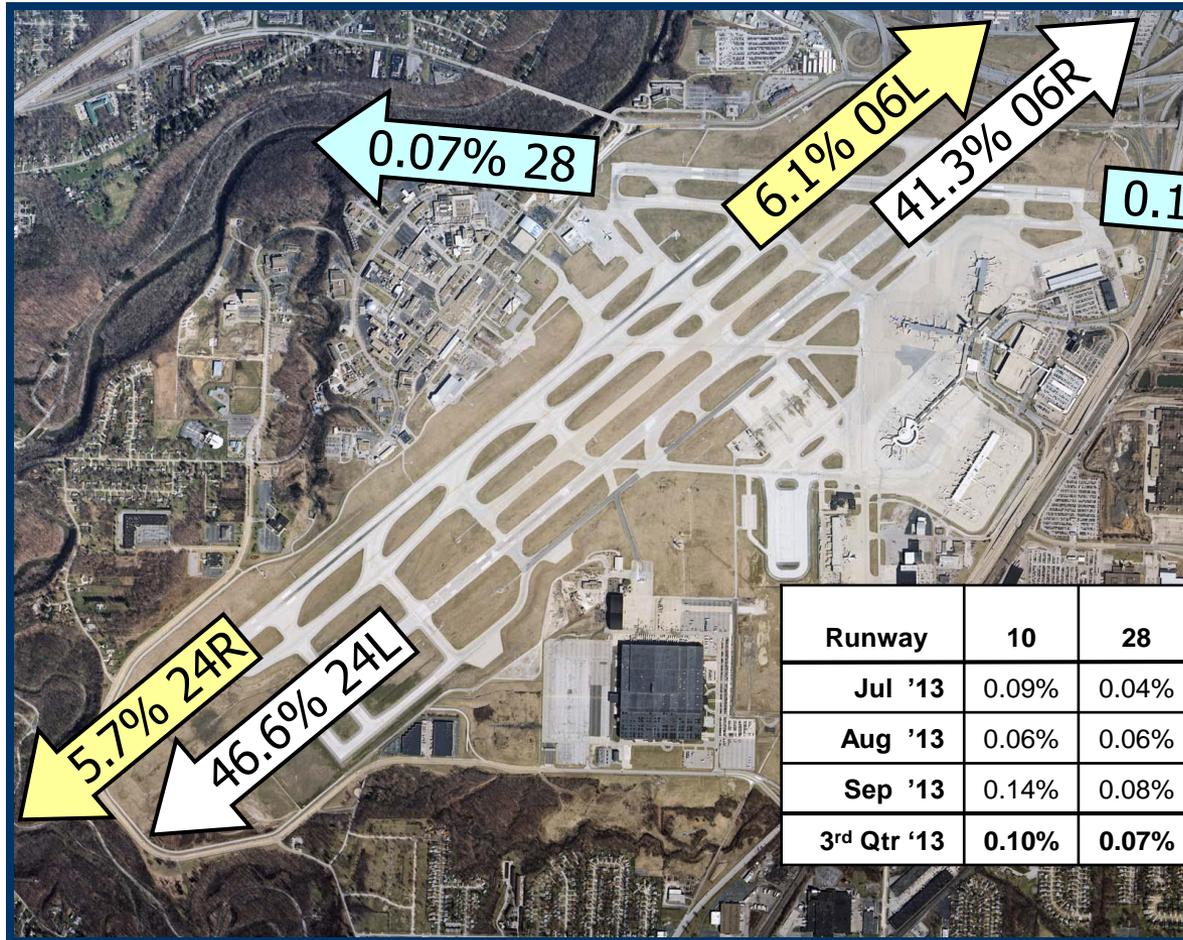
All aircraft above are Stage 3 certified with the exception of some Military and 1.4% of General Aviation (GA) aircraft, including helicopters. Stage 2 GA accordingly is 0.07% of the overall fleet. A hush kit reduces noise enough to meet Stage 3 levels, but well short of the noise level typical of aircraft originally manufactured as Stage 3.

Runway Use: 3rd Qtr, 2013 Arrivals



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

Runway Use: 3rd Qtr, 2013 Departures



Runway	10	28	24L	24R	6L	6R
Jul '13	0.09%	0.04%	53.8%	5.1%	5.1%	35.9%
Aug '13	0.06%	0.06%	45.4%	5.0%	4.7%	44.6%
Sep '13	0.14%	0.08%	40.3%	7.2%	8.6%	43.6%
3rd Qtr '13	0.10%	0.07%	46.6%	5.7%	6.1%	41.3%

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

Departure Headings – Day-time

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

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 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 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.

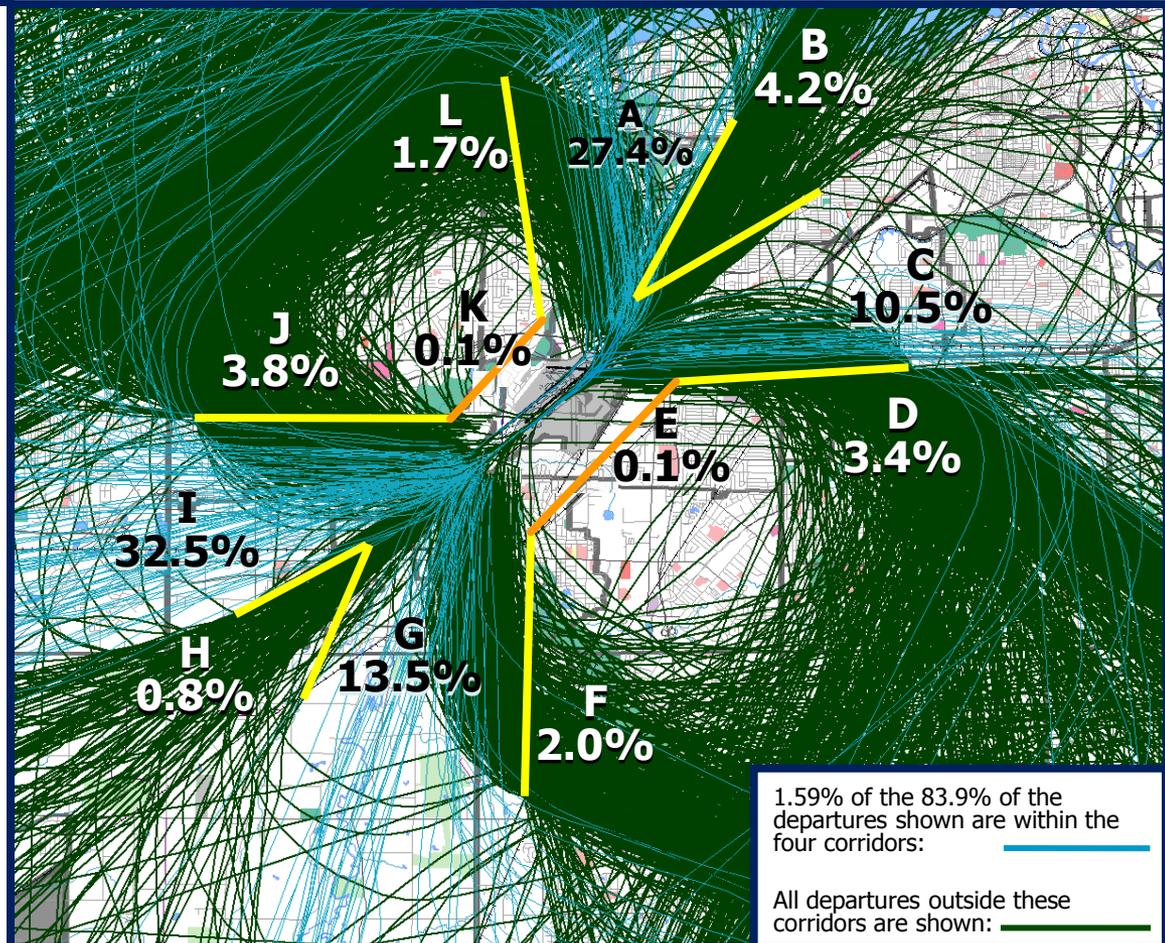
83.9% within corridors

- A. 27.4%:** north corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- C. 10.5%:** east corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- G. 13.5%:** south corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- I. 32.5%:** west corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL

16.1% outside corridors

- B. 4.2%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the north and south corridors
- D. 3.4%:** flights crossing the south boundary below 5,000 ft. MSL
- E. 0.1%:** flights turning south before entering the corridor
- F. 2.0%:** flights crossing the east boundary below 5,000 ft. MSL
- H. 0.8%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the west and south corridors
- J. 3.8%:** flights crossing the north boundary below 5,000 ft. MSL
- K. 0.1%:** flights turning north before entering the corridor
- L. 1.7%:** flights crossing the west boundary below 5,000 ft. MSL

(Percentages do not include Rwy 10/28 departures)



1.59% of the 83.9% of the departures shown are within the four corridors:

All departures outside these corridors are shown:

Departure Headings – 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.

61.7% within corridors

- A. 38.3%:** 095 corridor, including flights crossing the 095 corridor boundaries above 5,000 ft. MSL
- F. 23.4%:** 200 corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL

38.3% outside corridors

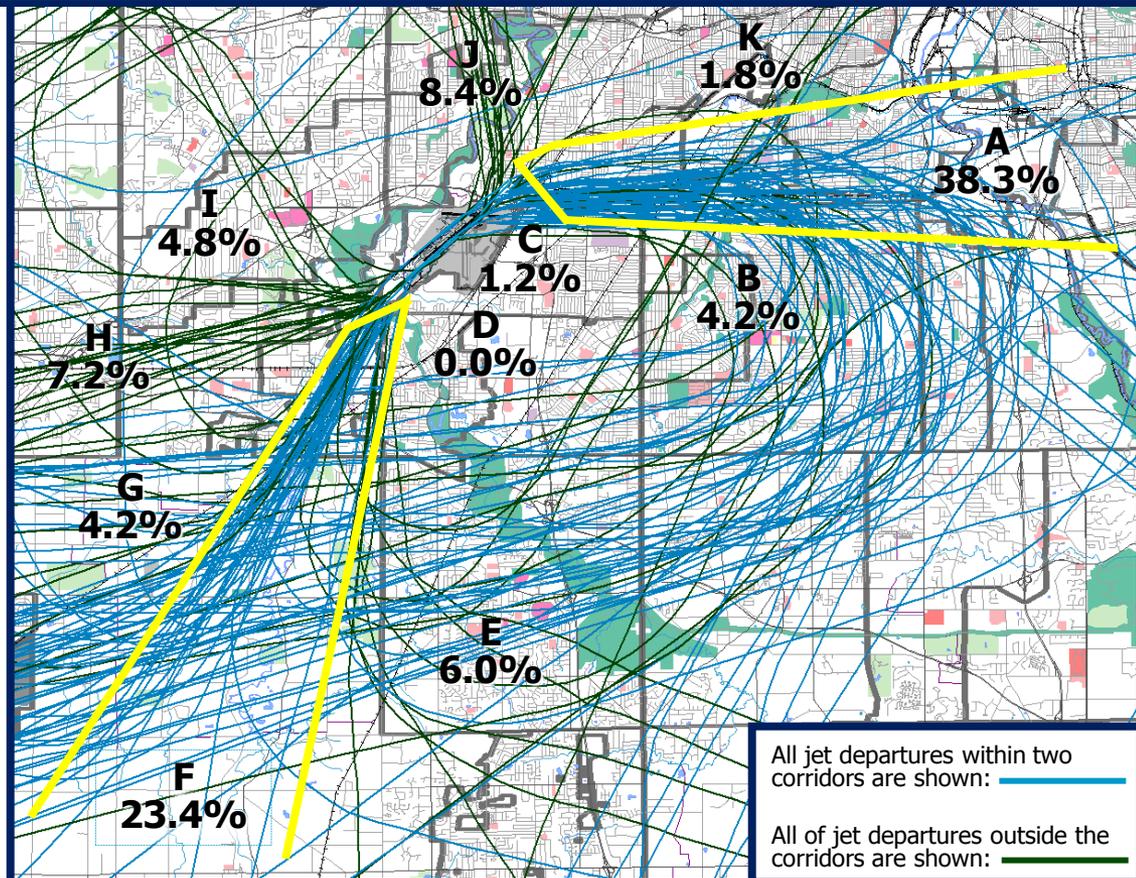
- B. 4.2%:** flights crossing the south boundary below 5,000 ft. MSL
- C. 1.2%:** flights turning south before entering the 095 corridor
- D. 0.0%:** flights departing south without entering the 200 corridor
- E. 6.0%:** flights crossing the east boundary below 5,000 ft. MSL
- G. 4.2%:** flights crossing the west boundary below 5,000 ft. MSL
- H. 7.2%:** flights departing southwest without entering the corridor
- I. 4.8%:** flights departing west without entering the corridor
- J. 8.4%:** flights departing north, not east with the 095 corridor
- K. 1.8%:** flights crossing the north boundary below 5,000 ft. MSL

(There were no Rwy 10 and one Rwy 28 jet departures between 11:00 p.m. and 6:00 a.m. during the 3rd Qtr. of 2013.)

The percentage of departures on each runway from 11:00 p.m. to 6:00 a.m. during the 3rd Qtr. of 2013 were as follows:

Rwy	10	28	24L	24R	6L	6R
For jets:	0.0%	0.0%	41.6%	4.2%	6.6%	47.6%
For all aircraft:	0.0%	0.4%	40.8%	6.3%	6.3%	46.2%

87.9% 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 the corridors are shown: ———

Arrival Headings – Night-time

Arrivals, 10:00 p.m. to 6:59 a.m., 3rd Qtr., 2013

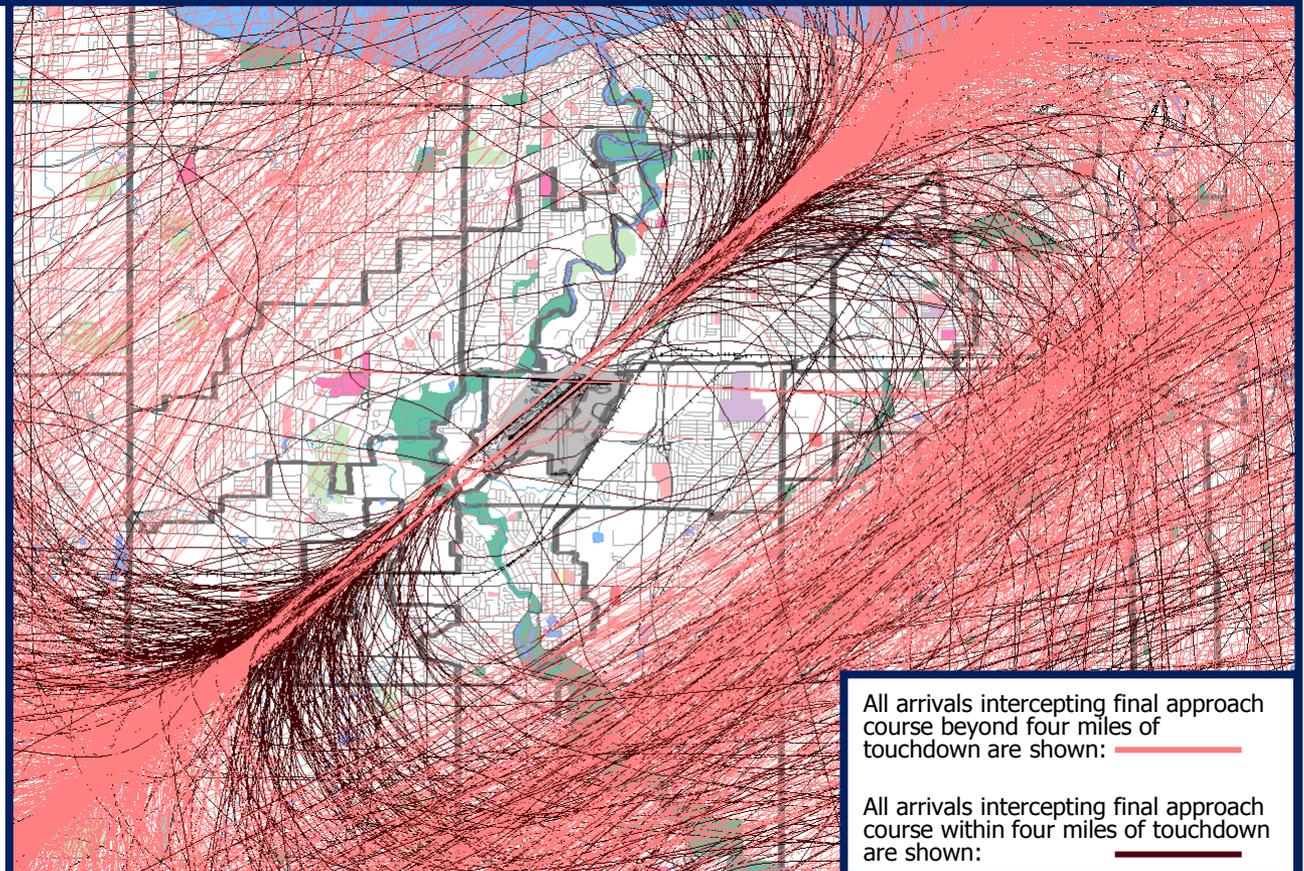
A voluntary measure of the Noise Compatibility Program calls for all aircraft arriving between 10:00 p.m. and 6:59 a.m., wind and weather permitting, to intercept final approach course no closer than four miles before touchdown.

85.9% beyond four miles and
14.1% 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 3rd Qtr., 2013 was as follows:

Rwy	Percentage of Arrivals	
	Jets	All Aircraft
10	0.1%	0.2%
28	0.0%	0.3%
24L	13.6%	13.8%
24R	29.5%	29.8%
6L	39.9%	39.5%
6R	16.9%	16.4%



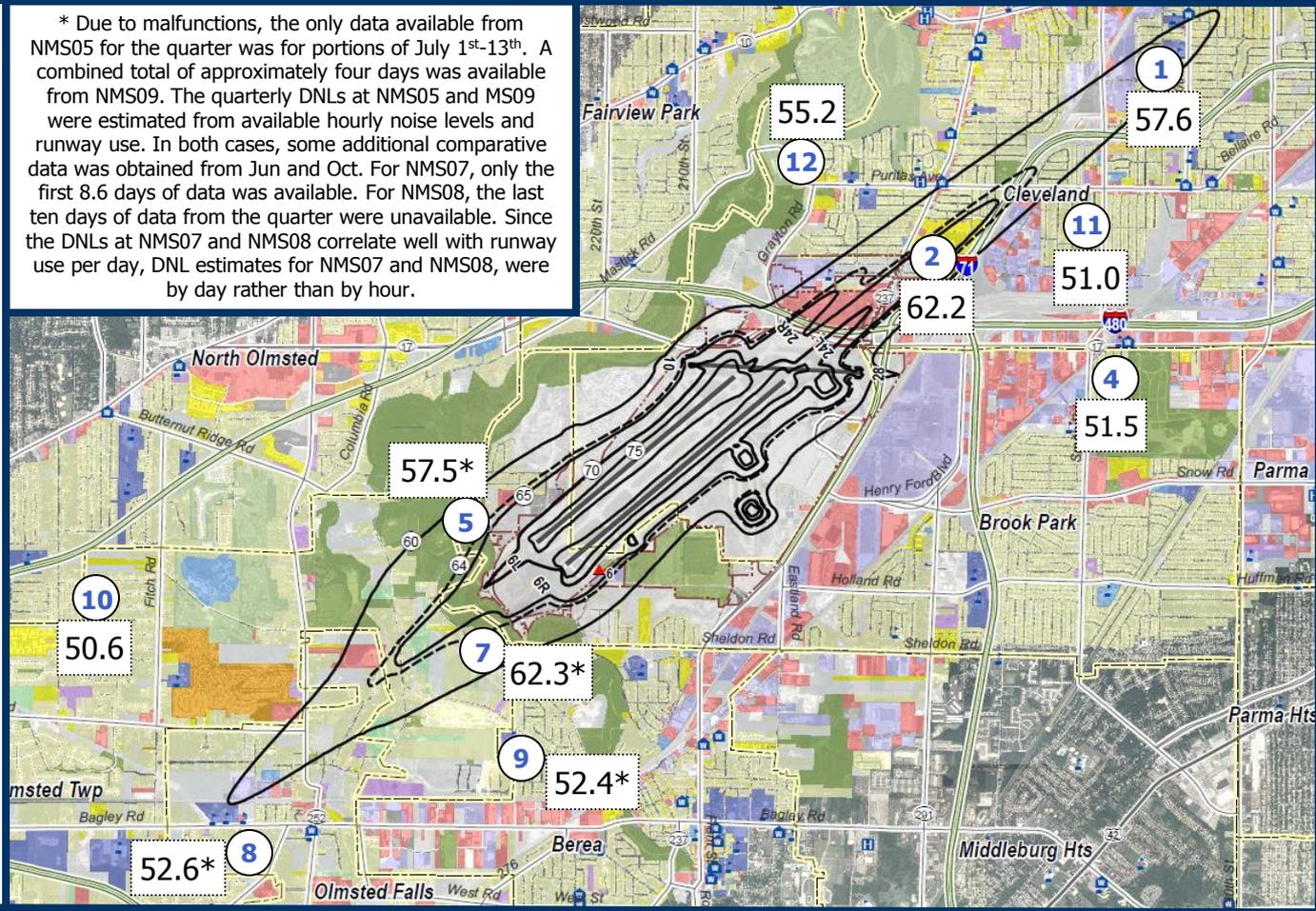
All arrivals intercepting final approach course beyond four miles of touchdown are shown: 

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

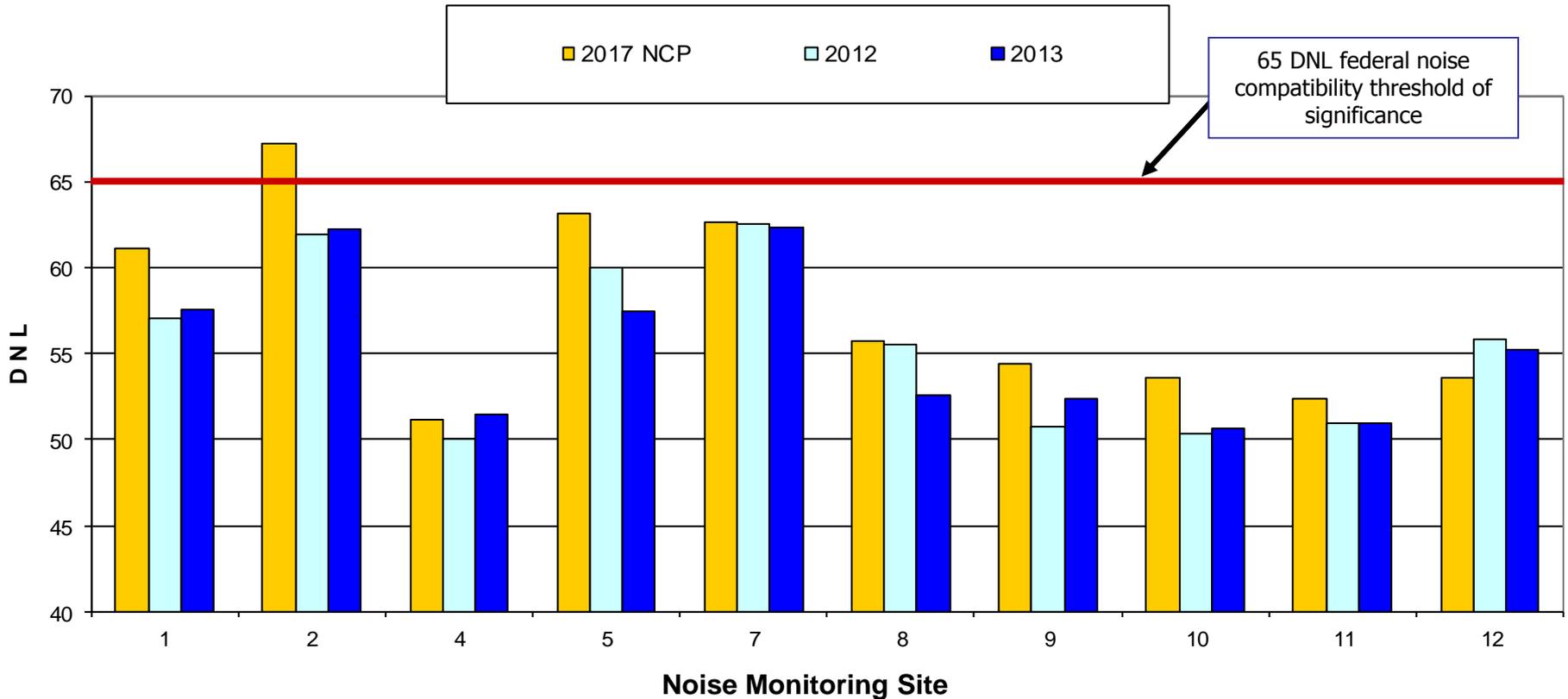
Aircraft Noise – DNL by Noise Monitoring Site



* Due to malfunctions, the only data available from NMS05 for the quarter was for portions of July 1st-13th. A combined total of approximately four days was available from NMS09. The quarterly DNLs at NMS05 and MS09 were estimated from available hourly noise levels and runway use. In both cases, some additional comparative data was obtained from Jun and Oct. For NMS07, only the first 8.6 days of data was available. For NMS08, the last ten days of data from the quarter were unavailable. Since the DNLs at NMS07 and NMS08 correlate well with runway use per day, DNL estimates for NMS07 and NMS08, were by day rather than by hour.

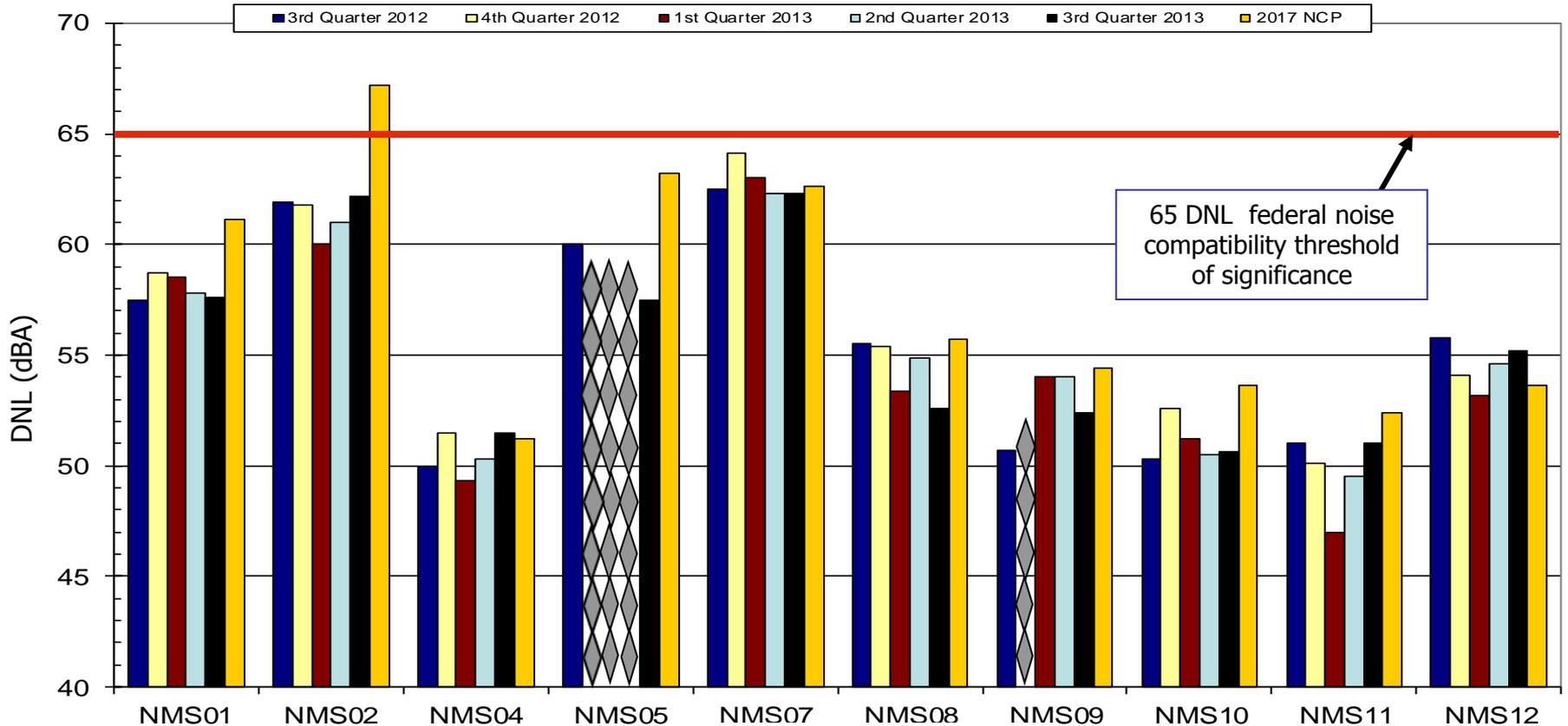


DNL: 3rd Qtr, 2013 vs. 3rd Qtr, 2012



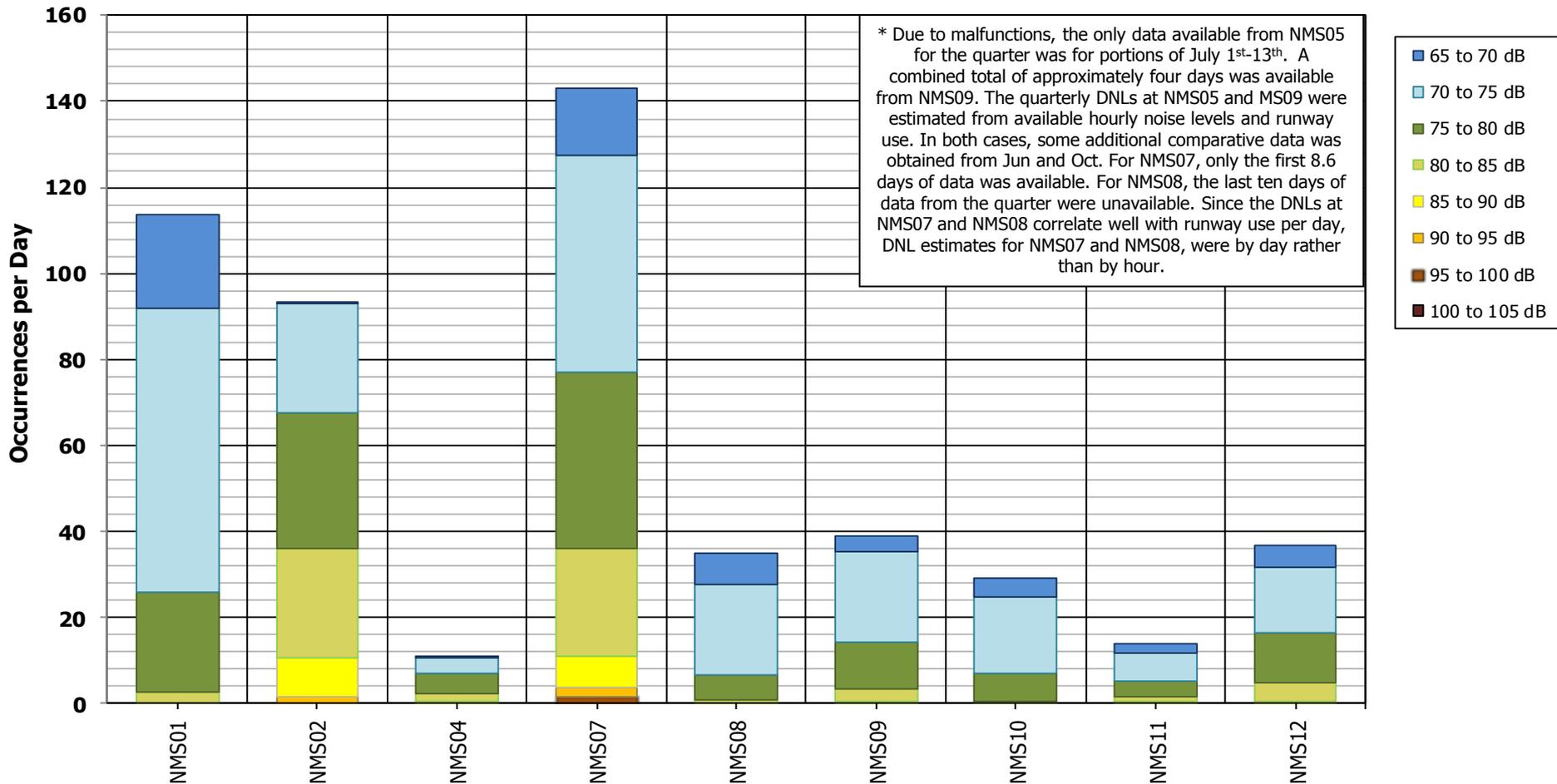
* Due to malfunctions, the only data available from NMS05 for the quarter was for portions of July 1st-13th. A combined total of approximately four days was available from NMS09. The quarterly DNLs at NMS05 and MS09 were estimated from available hourly noise levels and runway use. In both cases, some additional comparative data was obtained from Jun and Oct. For NMS07, only the first 8.6 days of data was available. For NMS08, the last ten days of data from the quarter were unavailable. Since the DNLs at NMS07 and NMS08 correlate well with runway use per day, DNL estimates for NMS07 and NMS08, were by day rather than by hour.

Five Qtr. DNL Comparison



* Due to malfunctions, the only data available from NMS05 for the quarter was for portions of July 1st-13th. A combined total of approximately four days was available from NMS09. The quarterly DNLs at NMS05 and MS09 were estimated from available hourly noise levels and runway use. In both cases, some additional comparative data was obtained from Jun and Oct. For NMS07, only the first 8.6 days of data was available. For NMS08, the last ten days of data from the quarter were unavailable. Since the DNLs at NMS07 and NMS08 correlate well with runway use per day, DNL estimates for NMS07 and NMS08, were by day rather than by hour.

Maximum Level per Noise Event, Occurrences Averaged by Day



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	89.9	MD-11	Arrival on Rwy 24L	9/10/13 5:53 AM	95.6	27.0
NMS01	88.0	MD-11	Arrival on Rwy 24L	9/11/13 5:47 AM	95.3	29.5
NMS01	88.0	DC9-50	Arrival on Rwy 24R	7/26/13 4:02 PM	94.5	25.0
NMS02	98.5	DC9-50	Departure off Rwy 6R	7/3/13 6:57 PM	105.2	30.0
NMS02	98.4	DC9-50	Departure off Rwy 6R	7/14/13 11:32 AM	104.6	39.5
NMS02	98.0	DC9-50	Departure off Rwy 6R	7/12/13 7:01 PM	104.0	28.5
NMS04	91.2	DC9-50	Departure off Rwy 6R	8/14/13 4:58 PM	99.2	31.5
NMS04	90.1	MD-88	Departure off Rwy 6R	9/13/13 1:05 PM	97.5	38.0
NMS04	90.0	DC9-50	Departure off Rwy 6L	9/24/13 4:41 PM	98.5	34.0
NMS05 ²	89.0	MD-11	Departure off Rwy 24R	7/8/13 10:36 PM	96.8	28.5
NMS05 ²	86.6	DC9-50	Departure off Rwy 6R	7/1/13 11:26 AM	93.9	40.5
NMS05 ²	86.2	A300	Departure off Rwy 24L	7/8/13 11:08 PM	94.0	28.5
NMS07 ³	98.2	DC9-50	Departure off Rwy 24L	7/8/13 11:35 AM	106.0	43.5
NMS07 ³	97.9	DC9-50	Departure off Rwy 24L	7/8/13 5:00 PM	105.6	42.5
NMS07 ³	97.4	B727-200	Departure off Rwy 24L	7/3/13 3:57 PM	102.7	29.5

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, the only data available from NMS05 during the quarter were portions of Jul 1st-13th.

³ Due to equipment malfunctions, only approximately the first 8.6 days of July were available from NMS07.

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	88.0	Unknown aircraft	Departure off Rwy 24R	7/30/13 10:40 AM	95.8	42.5
NMS08	87.9	MD-88	Departure off Rwy 24R	8/7/13 1:43 PM	93.7	30.5
NMS08	87.1	MD-88	Departure off Rwy 24L	7/6/13 12:56 PM	93.5	28.5
NMS09 ⁴	89.0	MD-88	Departure off Rwy 24L	8/26/13 8:35 AM	95.8	31.0
NMS09 ⁴	85.7	DC9-50	Departure off Rwy 24L	8/26/13 11:24 AM	94.7	27.5
NMS09 ⁴	85.1	MD-88	Departure off Rwy 24L	8/1/13 8:37 AM	92.2	27.5
NMS10	88.9	MD-83	Departure off Rwy 24L	7/23/13 12:30 PM	96.0	25.0
NMS10	88.2	MD-88	Departure off Rwy 24L	7/20/13 1:05 PM	93.1	28.0
NMS10	87.8	MD-82	Departure off Rwy 24L	7/29/13 6:28 PM	93.7	32.0
NMS11	94.8	DC9-50	Departure off Rwy 6R	8/9/13 11:33 AM	103.2	41.0
NMS11	93.9	DC9-50	Departure off Rwy 6R	7/14/13 11:32 AM	102.2	32.0
NMS11	93.8	DC9-50	Departure off Rwy 6R	7/3/13 6:57 PM	100.8	29.5
NMS12	91.1	MD-11	Departure off Rwy 6L	9/6/13 10:40 PM	97.5	32.0
NMS12	90.8	MD-83	Departure off Rwy 6R	9/13/13 6:34 PM	98.0	33.5
NMS12	90.5	MD-83	Departure off Rwy 6L	8/17/13 6:08 PM	96.5	29.5

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

⁴ Due to malfunctions, a combined total of only approximately 4 days between Jul 17 and Aug 25 were available from NMS09.

Noise Complaints



City	Jul	Aug	Sep	3 rd Q '13 Calls	%	3 rd Q '12 Calls	%	3 rd Q '13 Callers	%	3 rd Q '12 Callers	%
Berea	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Brook Park	0	0	0	0	0.0%	4	12.9%	0	0.0%	3	21.4%
Cleveland	22	8	7	37	47.4%	13	41.9%	12	48.0%	3	21.4%
Fairview Park	2	1	3	6	7.7%	5	16.1%	4	16.0%	3	21.4%
Lakewood	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Middleburg Hts.	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
North Olmsted	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Olmsted Falls	1	1	0	2	2.6%	1	3.2%	2	8.0%	1	7.2%
Olmsted Twp.	26	1	0	27	34.6%	2	6.5%	3	12.0%	1	7.2%
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	2	3	0	5	6.4%	6	19.4%	3	12.0%	3	21.4%
Westlake	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other	1	0	0	1	1.3%	0	0.0%	1	4.0%	0	0.0%
Totals	54	14	10	78	100.0%	31	100.0%	25	100.0%	14	100.0%

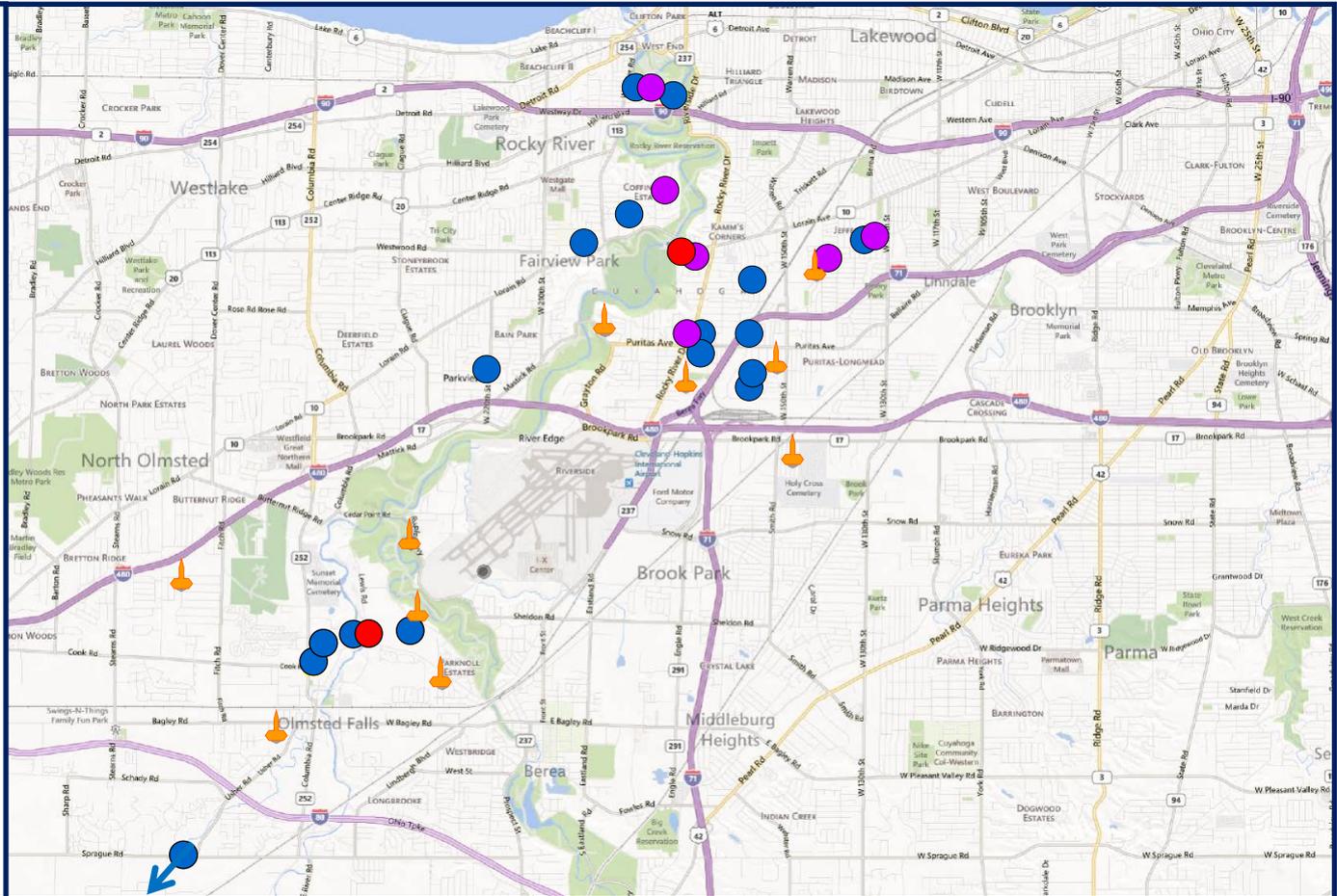
Noise Hotline – (216) 898-5220

Complaint Map

LEGEND

Complaints per household

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



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