



# ***Noise Compatibility***

**1<sup>st</sup> Quarter, 2013**

June 7, 2013

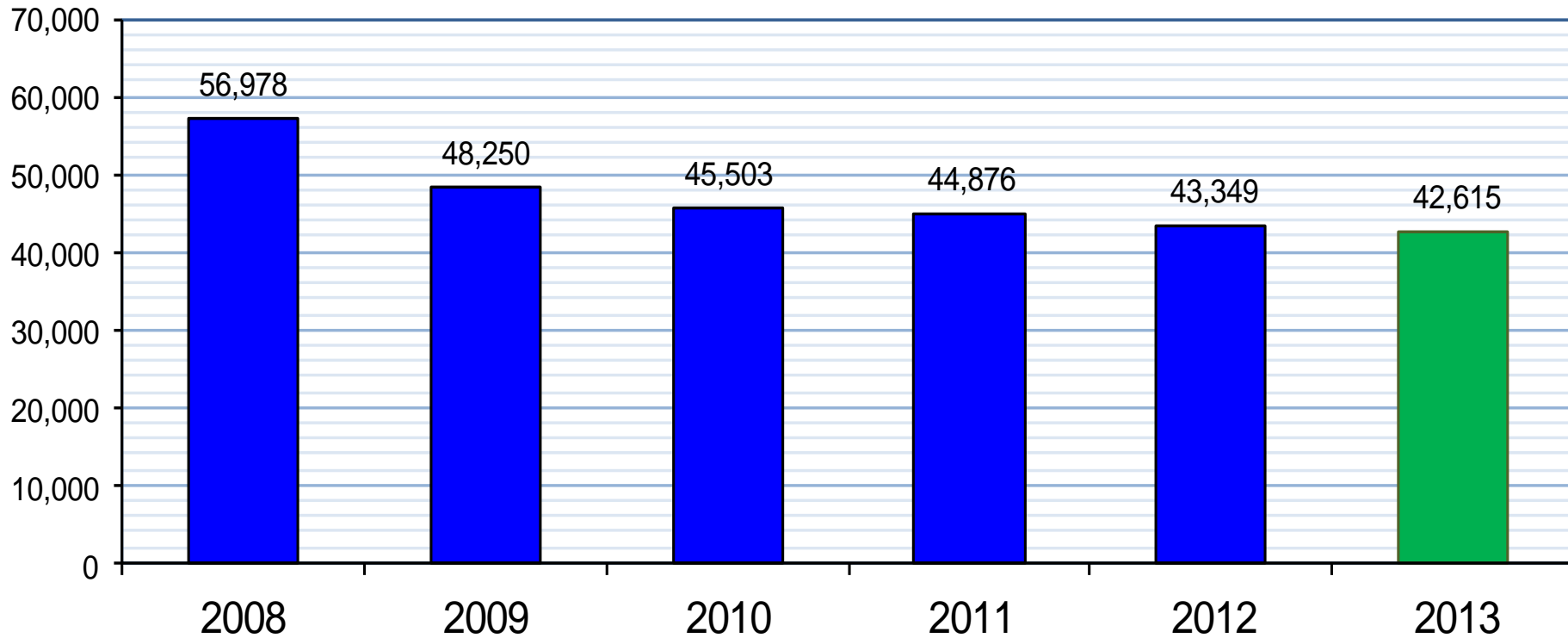
## *Disclaimer*



- 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 1<sup>st</sup> Quarter Operations 2008 - 2013



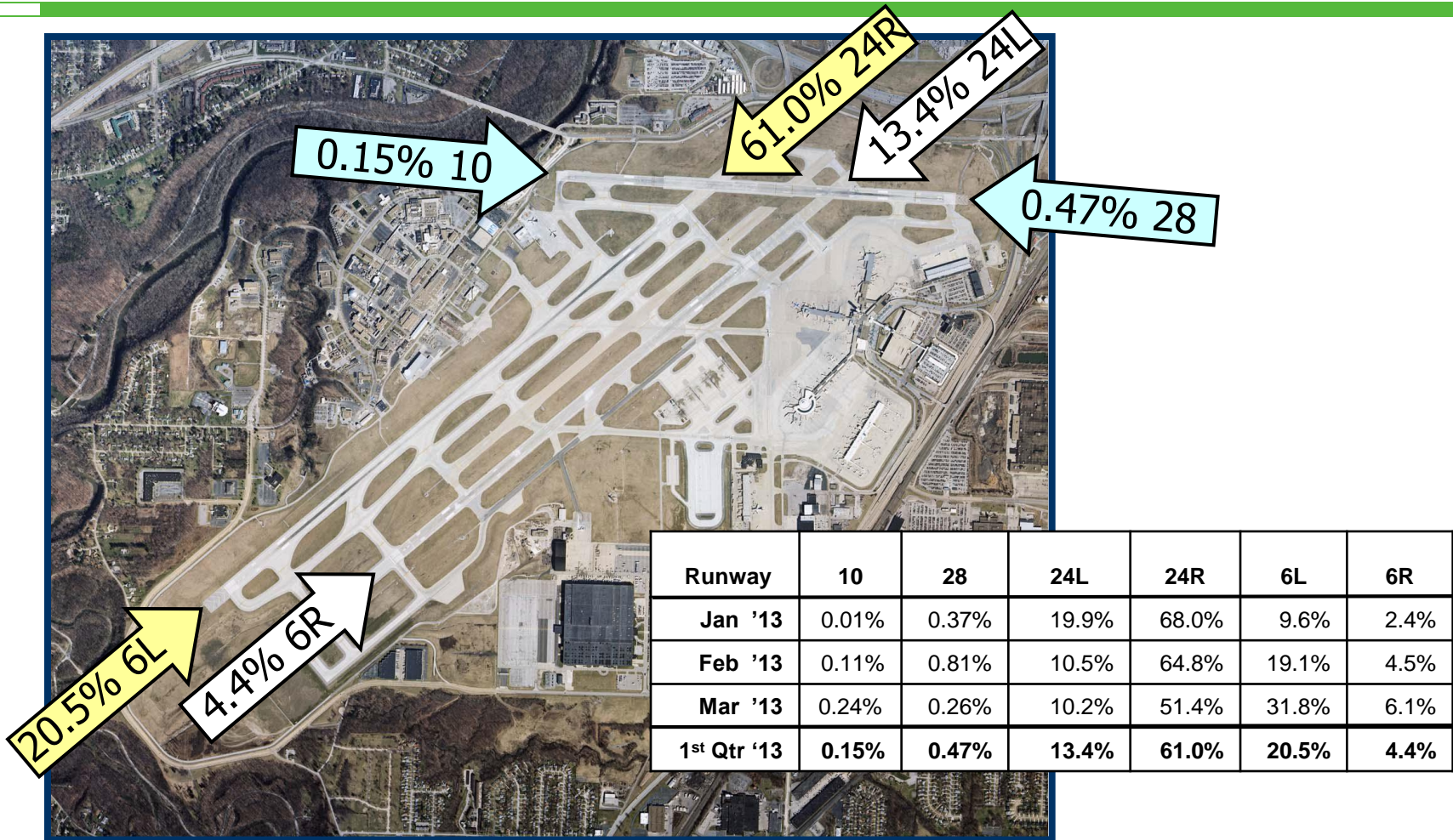
There were 42,615 landings and takeoffs in the 1<sup>st</sup> Qtr. 2013; this is 1.7% below the 1<sup>st</sup> Qtr. 2012.

## Landings & Takeoffs

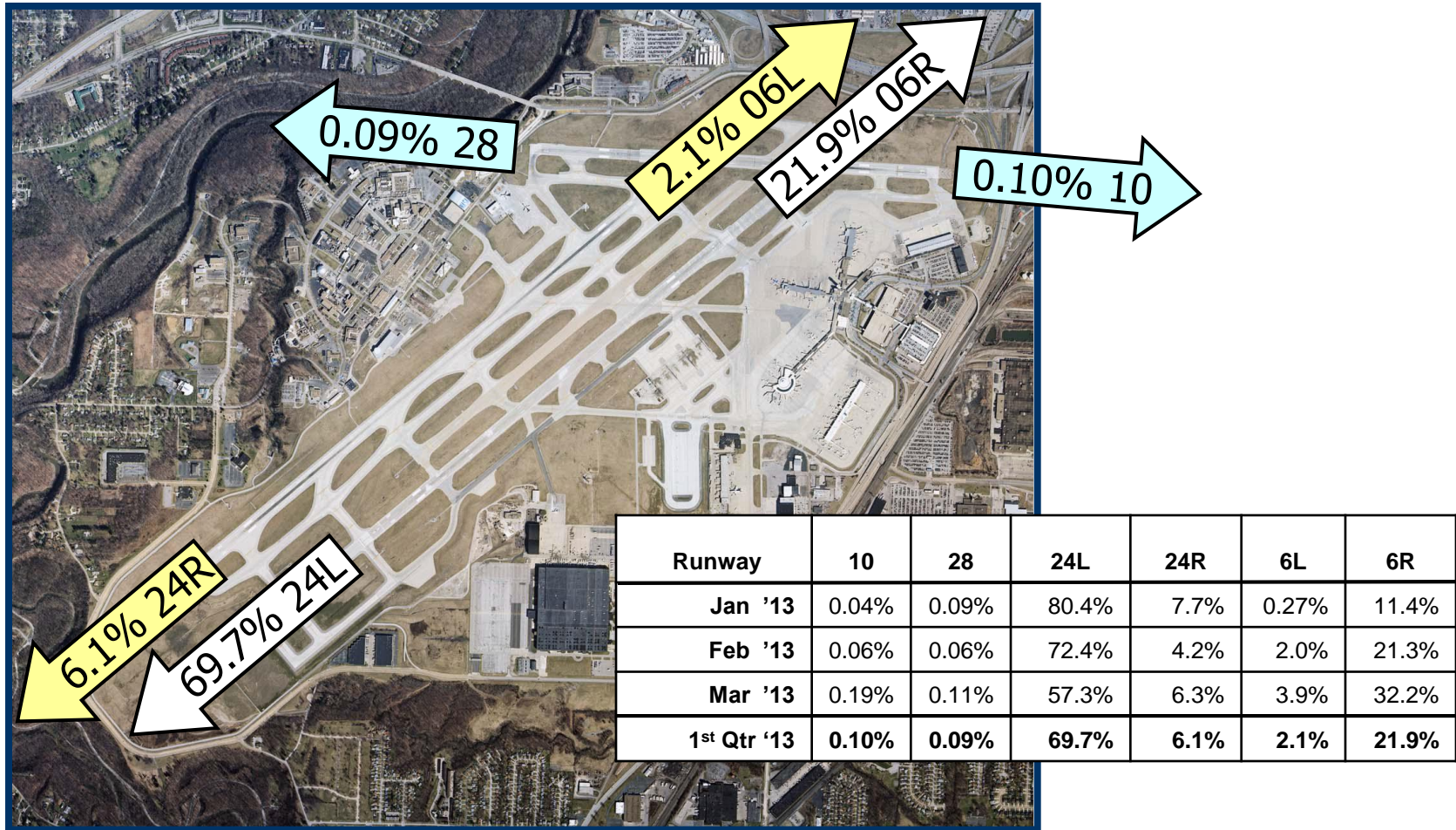
	1 <sup>st</sup> Qtr, 2013		1 <sup>st</sup> Qtr, 2012	
Commercial				
-Stage 2 with hush kit	179	0.42%	190	0.44%
-Heavy (incl. all B757s)	610	1.43%	798	1.84%
-MD80 series	757	1.78%	779	1.80%
-Other Stage 3	11,956	28.06%	10,645	24.56%
-Regional Jet	20,116	47.20%	20,326	46.89%
-Turboprop	6,424	15.07%	8,152	18.81%
Air Taxi	611	1.43%	335	0.77%
General Aviation	1,932	4.53%	2,076	4.79%
Military	30	0.07%	48	0.11%
<b>Total</b>	<b>42,615</b>	<b>100.00%</b>	<b>43,349</b>	<b>100.00%</b>

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 0.06% 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: Arrivals



# Runway Use: Departures



# 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.

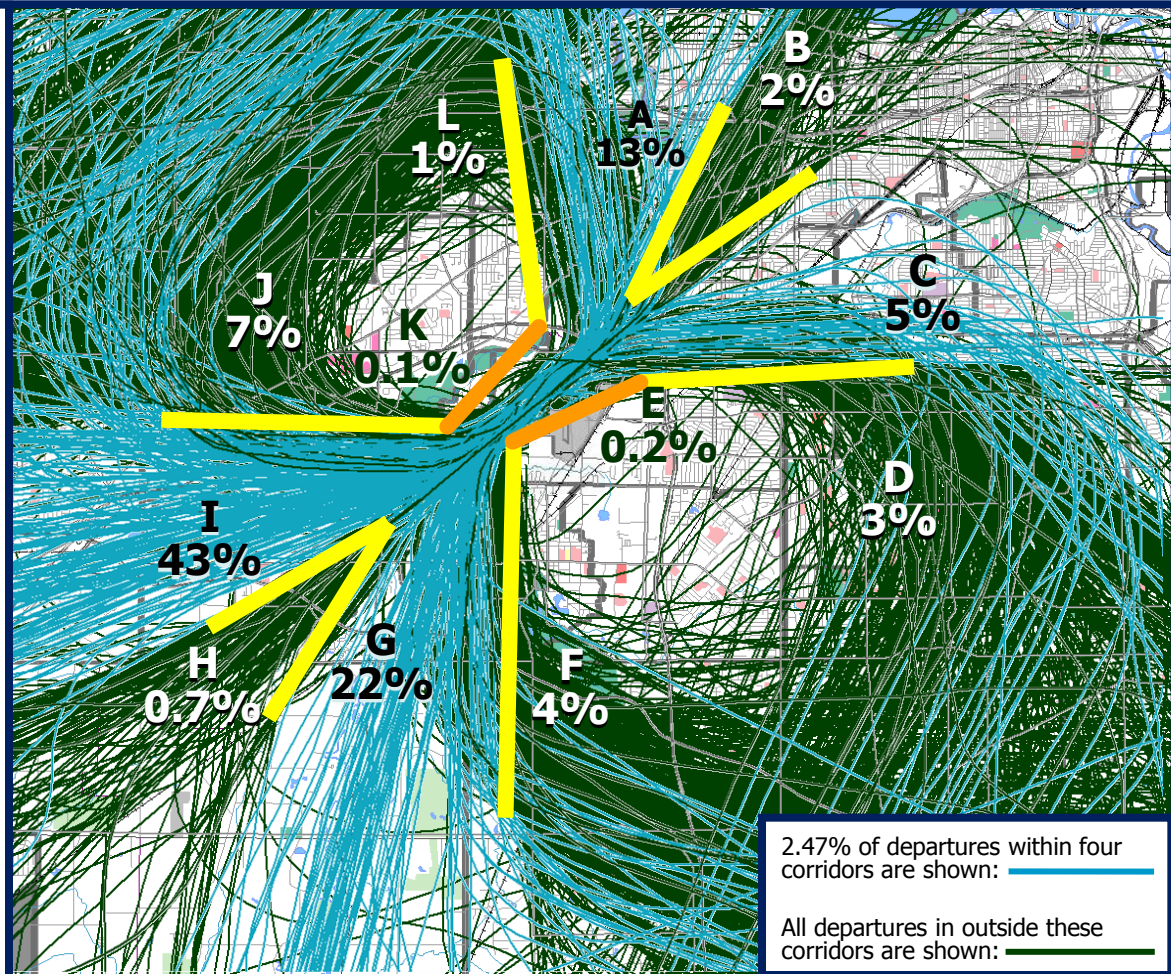
### **82.9% within corridors**

- A. 12.6%:** north corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- C. 5.4%:** east corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- G. 21.7%:** south corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- I. 43.1%:** west corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL

### **17.1% outside corridors**

- B. 2.0%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the north and south corridors
- D. 2.8%:** flights crossing the south boundary below 5,000 ft. MSL
- E. 0.2%:** flights turning south before entering the corridor
- F. 3.6%:** flights crossing the east boundary below 5,000 ft. MSL
- H. 0.7%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the west and south corridors
- J. 6.9%:** flights crossing the north boundary below 5,000 ft. MSL
- K. 0.1%:** flights turning north before entering the corridor
- L. 0.9%:** flights crossing the west boundary below 5,000 ft. MSL

(Percentages do not include Rwy 10/28 departures)



2.47% of departures within four corridors are shown: —————

All departures in 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.

### 63.7% within corridors

**A. 22.0%:** 095 corridor, including flights crossing the 095 corridor boundaries above 5,000 ft. MSL

**F. 41.8%:** 200 corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL

### 36.3% outside corridors

**B. 3.3%:** flights crossing the south boundary below 5,000 ft. MSL

**C. 0.0%:** flights turning south before entering the 095 corridor

**D. 0.5%:** flights departing south without entering the 200 corridor

**E. 5.5%:** flights crossing the east boundary below 5,000 ft. MSL

**G. 3.3%:** flights crossing the west boundary below 5,000 ft. MSL

**H. 12.1%:** flights departing southwest without entering the corridor

**I. 5.5%:** flights departing west without entering the corridor

**J. 4.4%:** flights departing north without entering the corridor

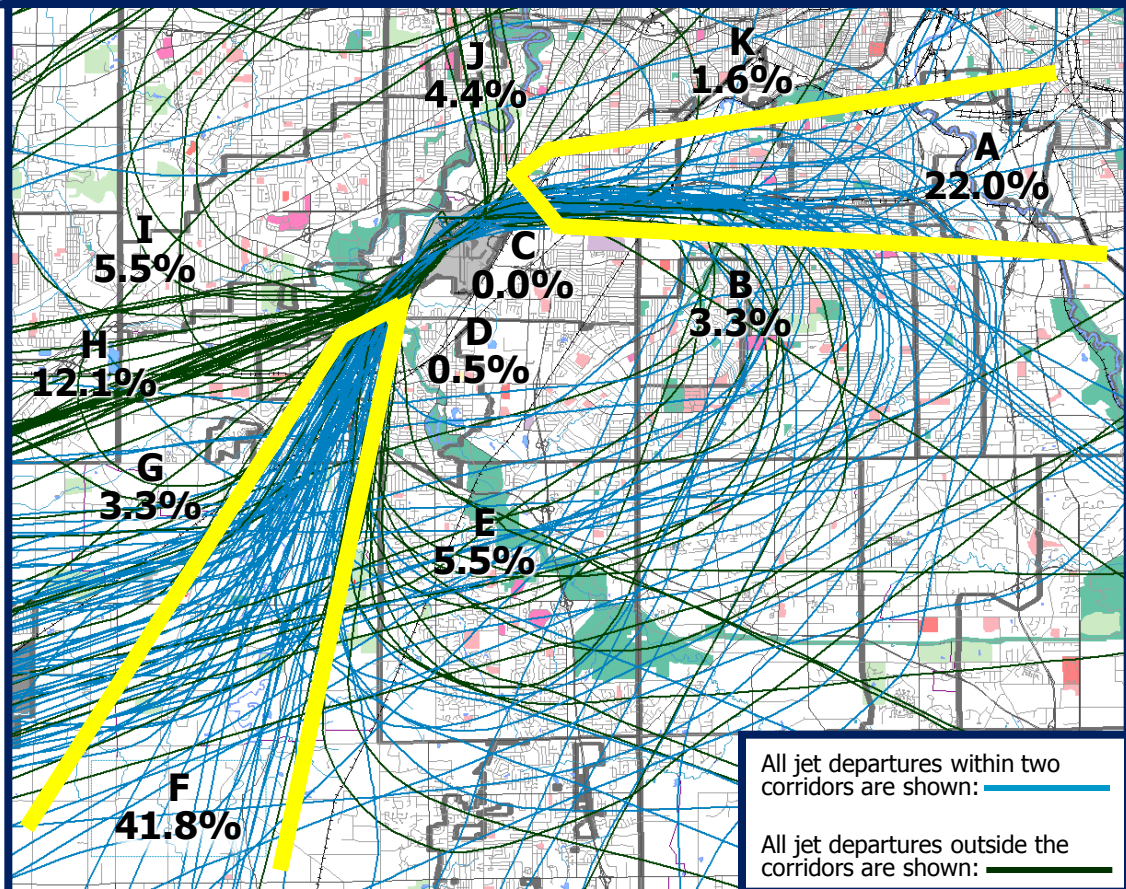
**K. 1.6%:** flights crossing the north boundary below 5,000 ft. MSL

(There was one Rwy 10 and no Rwy 28 jet departures between 11:00 p.m. and 6:00 a.m. during the 1<sup>st</sup> Qtr. of 2013.)

The percentage of departures on each runway from 11:00 p.m. to 6:00 a.m. during the 1<sup>st</sup> Qtr. of 2013 were as follows:

Rwy	10	28	24L	24R	6L	6R
For jets:	0.5%	0.0%	63.1%	3.7%	4.8%	27.8%
For all aircraft:	0.4%	0.0%	65.0%	4.0%	4.0%	26.5%

**85.2% of Jet Departures from Rwy 6L/6R are on the preferred Rwy, 6R.**



All jet departures within two corridors are shown: 

All jet departures outside the corridors are shown: 



# Arrival Headings – Night-time

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

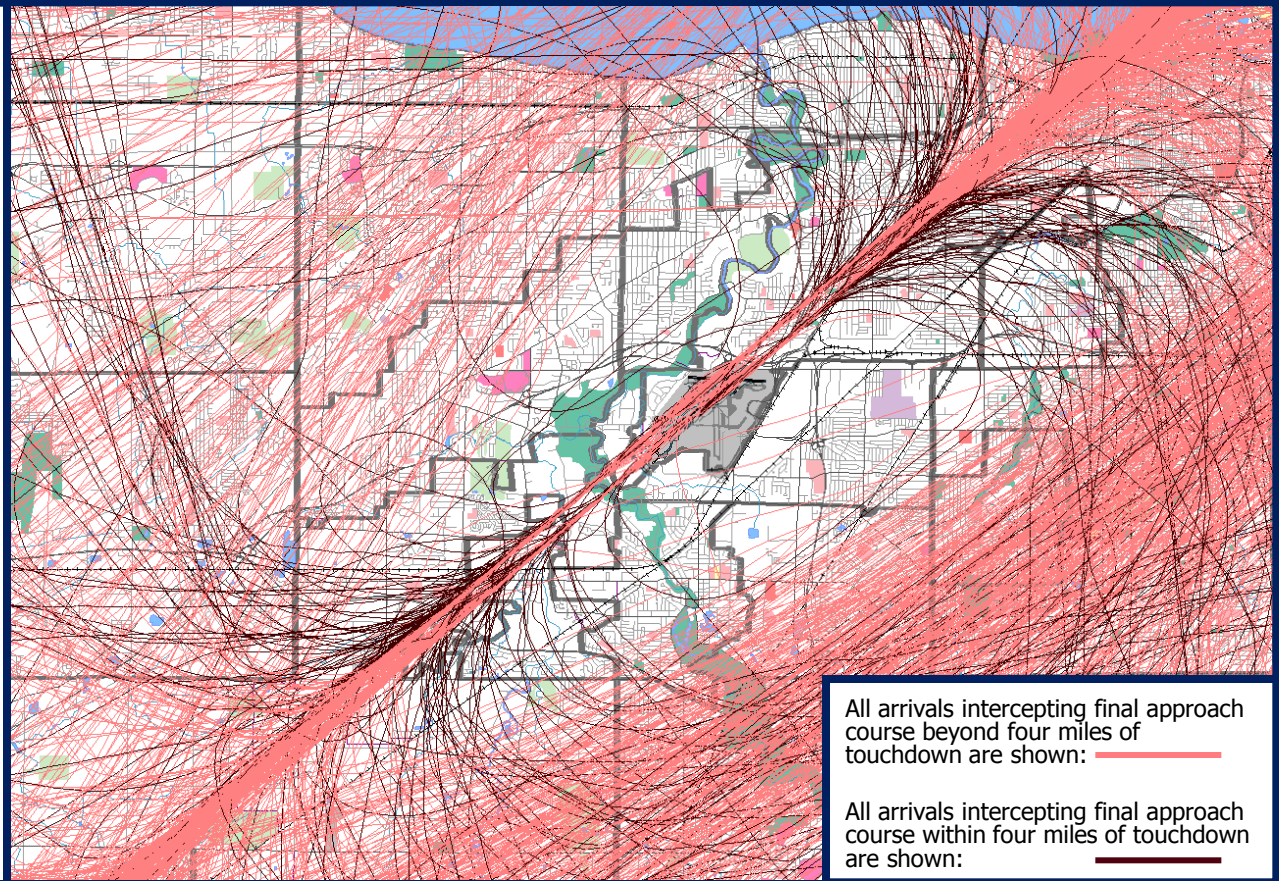
A voluntary measure of the Noise Compatibility Program calls for all aircraft arriving between 10:00 p.m. and 6:59 a.m., wind and weather permitting, to intercept final approach course no closer than four miles before touchdown.

**90.5% beyond four miles and  
9.5% within four miles**

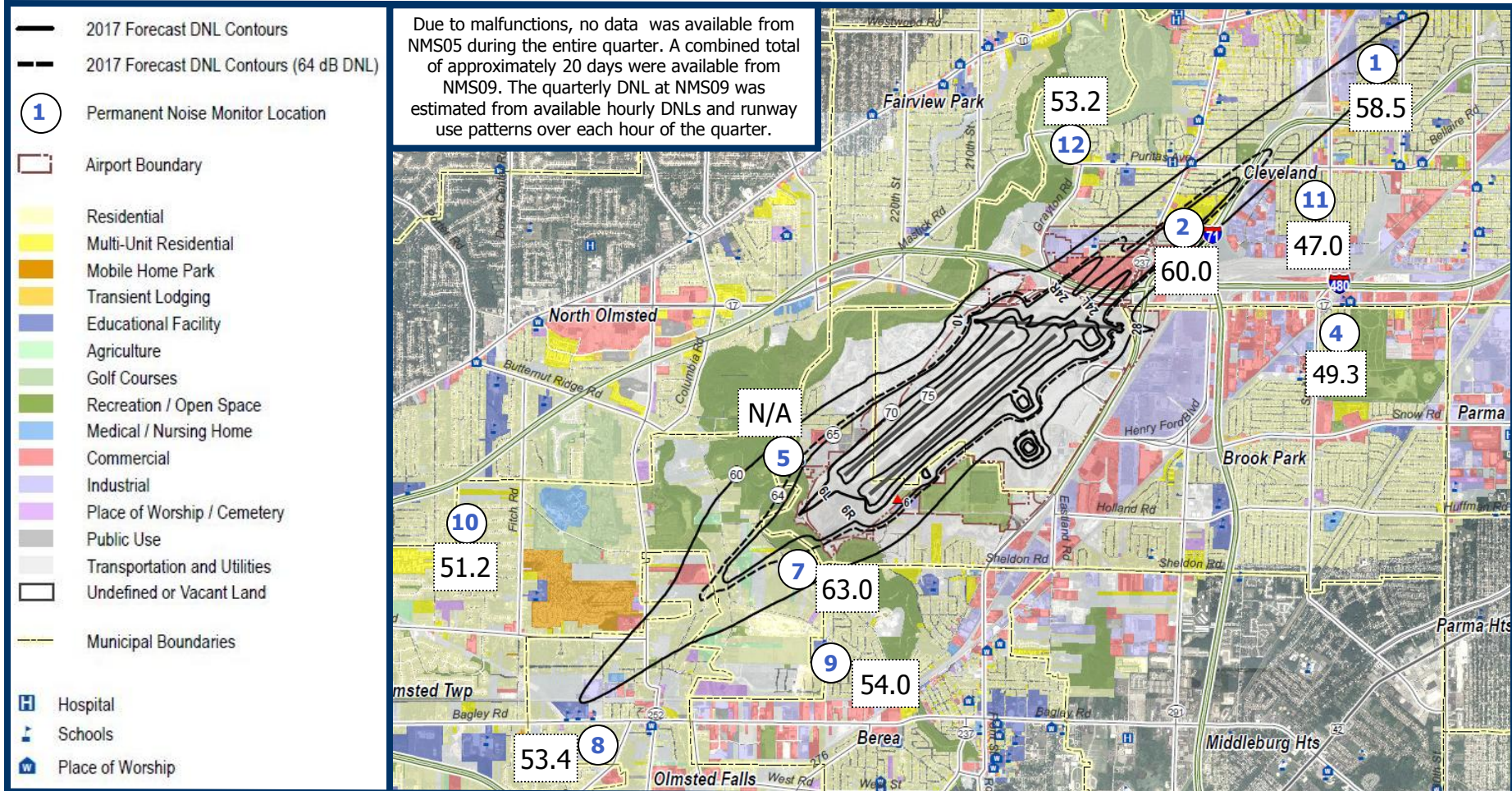
There is no comparable NCP measure regarding day-time arrivals.

Runway use by all arriving aircraft from 10:00 p.m. to 6:59 a.m. during the 1<sup>st</sup> Qtr., 2013 was as follows:

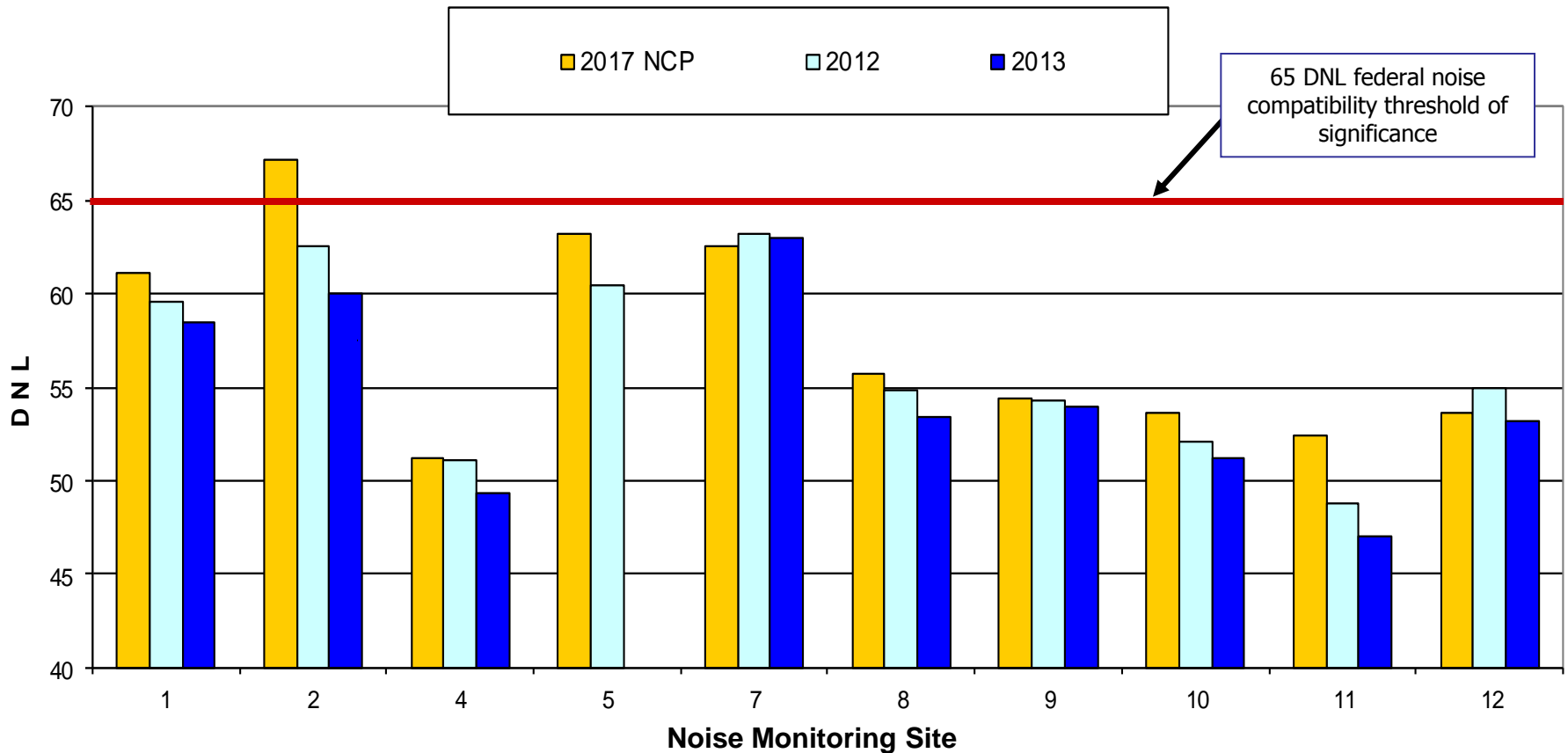
<b>Rwy</b>	<b>Percentage of Arrivals</b>	
	<b>Jets</b>	<b>All Aircraft</b>
<b>10</b>	0.1%	0.1%
<b>28</b>	0.1%	0.2%
<b>24L</b>	16.3%	17.8%
<b>24R</b>	51.3%	53.7%
<b>6L</b>	24.3%	20.1%
<b>6R</b>	7.9%	8.1%



# Aircraft Noise – DNL by Noise Monitoring Site

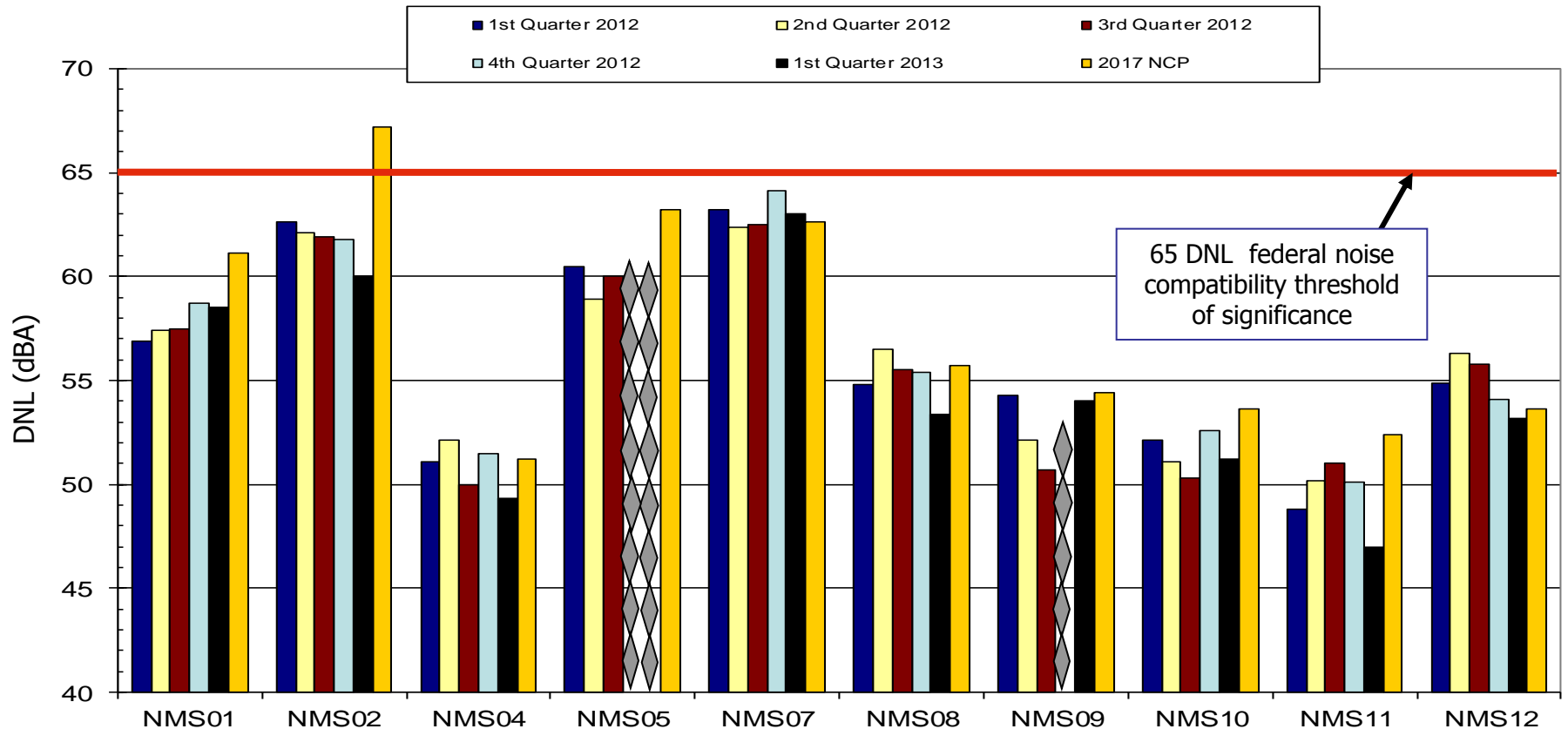


# DNL: 1<sup>st</sup> Qtr, 2013 vs. 1<sup>st</sup> Qtr, 2012



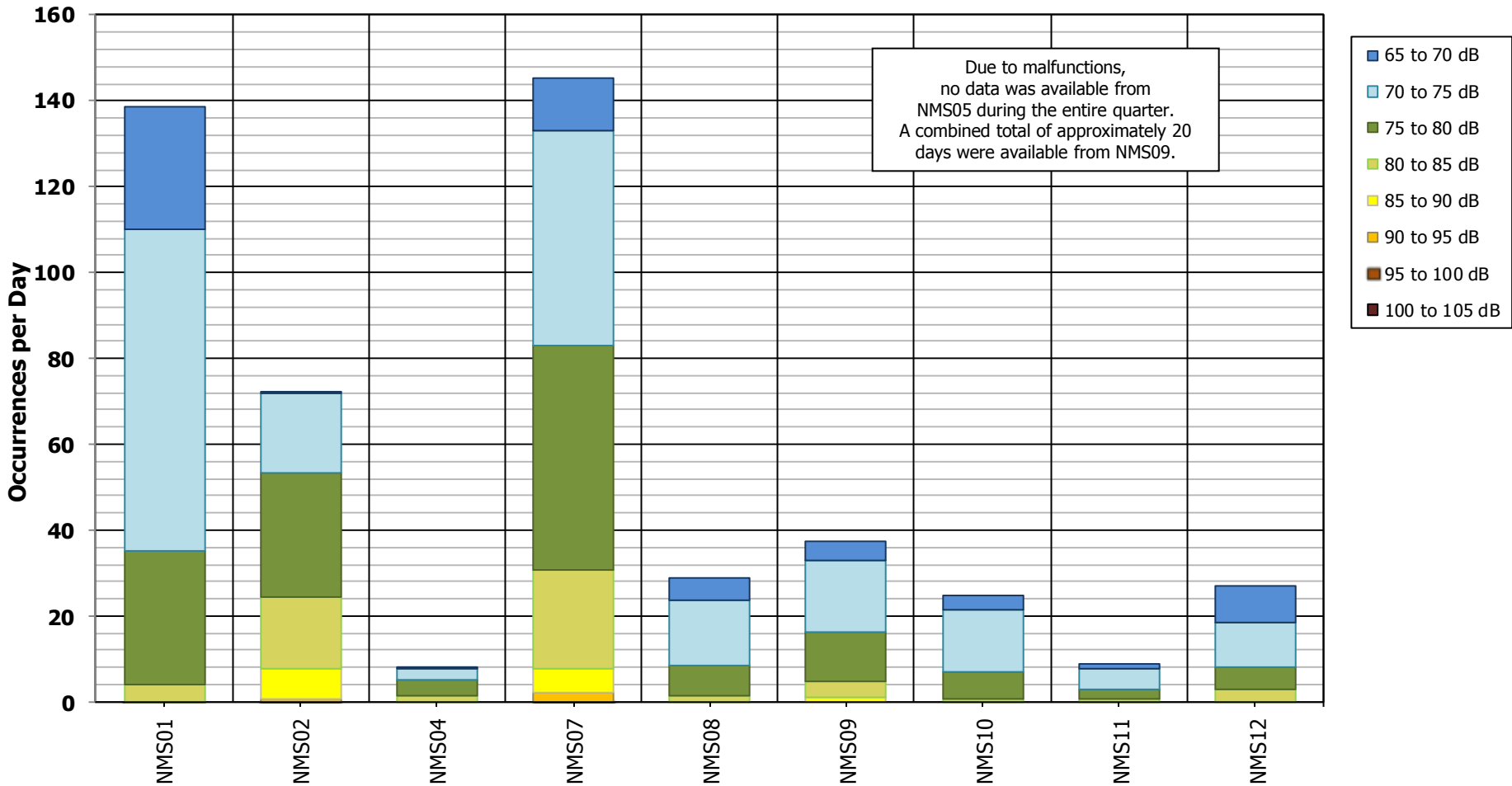
Due to malfunctions, no data was available from NMS05 during the entire quarter. A combined total of approximately 20 days were available from NMS09. The quarterly DNL at NMS09 was estimated from available hourly DNLs and runway use patterns over each hour of the quarter.

# Five Qtr. DNL Comparison



Due to malfunctions, no data was available from NMS05 during the entire quarter. A combined total of approximately 20 days were available from NMS09. The quarterly DNL at NMS09 was estimated from available hourly DNLs and runway use patterns over each hour of the quarter.

# 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)	Duration (sec)
NMS01	95.8	Military fighter jet	Arrival on Rwy 24R	1/25/13 10:55 AM	104.7	66.5
NMS01	90.5	Dash-8 series 300 turbo-prop	Arrival on Rwy 24L	3/14/13 11:17 AM	94.2	14.5
NMS01	89.1	DC9-50	Arrival on Rwy 24R	2/24/13 3:12 PM	97.0	30.0
NMS02	97.8	Military fighter jet	Arrival on Rwy 24R	1/25/13 10:56 AM	104.3	45.5
NMS02	96.3	DC9-50	Arrival on Rwy 24L	1/16/13 10:02 AM	99.1	13.0
NMS02	95.4	DC9-50	Arrival on Rwy 24L	2/27/13 10:33 AM	98.9	17.0
NMS04	90.2	DC9-50	Departure off Rwy 6R	3/1/13 11:56 AM	95.8	25.5
NMS04	88.7	MD-88	Departure off Rwy 6R	3/8/13 1:11 PM	96.1	25.5
NMS04	88.6	MD-88	Departure off Rwy 6R	3/2/13 1:30 PM	96.3	25.5
NMS05	<b>Not available</b>					
NMS07	101.0	DC9-50	Departure off Rwy 24L	2/8/13 11:41 AM	106.4	41.0
NMS07	100.1	DC9-50	Departure off Rwy 24R	2/22/13 11:56 AM	107.7	39.0
NMS07	99.8	DC9-50	Departure off Rwy 24L	2/15/13 11:28 AM	107.3	45.5

Due to equipment malfunctions, no data was available from NMS05 during the entire quarter.

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

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

<b>NMS</b>	<b>Lmax (dB)</b>	<b>Aircraft</b>	<b>Operation</b>	<b>Time and date</b>	<b>Sound Exposure Level (dB)*</b>	<b>Duration (sec)</b>
NMS08	94.6	Military fighter jet	Departure off Rwy 24L	1/25/13 2:06 PM	104.1	66.5
NMS08	90.3	MD-83	Departure off Rwy 24L	3/23/13 1:07 PM	96.8	38.0
NMS08	89.2	Unknown aircraft	Departure off Rwy 24R	3/27/13 9:33 AM	97.2	48.0
NMS09	89.9	DC9-50	Departure off Rwy 24L	2/1/13 11:16 AM	95.7	29.5
NMS09	89.9	MD-88	Departure off Rwy 24L	1/26/13 1:51 PM	94.9	29.5
NMS09	89.8	MD-88	Departure off Rwy 24R	3/22/13 8:37 AM	96.6	30.5
NMS10	90.1	Unknown aircraft	Departure off Rwy 24R	3/7/13 11:58 AM	96.7	44.0
NMS10	89.6	MD-82	Departure off Rwy 24L	1/16/13 1:10 PM	95.1	30.0
NMS10	88.2	Unknown aircraft	Departure off Rwy 24R	3/27/13 12:49 PM	94.9	45.5
NMS11	90.5	DC9-50	Departure off Rwy 6R	1/1/13 4:23 PM	99.1	33.5
NMS11	89.6	DC9-50	Departure off Rwy 6R	3/9/13 4:21 PM	97.7	31.5
NMS11	88.9	MD-88	Departure off Rwy 6R	2/13/13 1:39 PM	95.3	33.5
NMS12	92.7	MD-82	Departure off Rwy 6R	3/9/13 6:50 AM	98.8	31.5
NMS12	92.3	MD-82	Departure off Rwy 6R	3/5/13 6:57 AM	98.4	35.5
NMS12	91.7	MD-82	Departure off Rwy 6R	3/6/13 6:32 PM	97.4	38.0

\*Sound Exposure Level is a measure that takes into account all noise over the entire duration of an event. Due to malfunctions, a combined total of only approximately 20 days were available from NMS09. It is possible that some aircraft exceeded 90 dB at NMS09 without being represented here.

# Noise Complaints



City	Jan	Feb	Mar	1 <sup>st</sup> Q '13 Calls	%	1 <sup>st</sup> Q '12 Calls	%	1 <sup>st</sup> Q '13 Callers	%	1 <sup>st</sup> Q '12 Callers	%
Berea	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Brook Park	1	0	0	1	2.5%	0	0.0%	1	14.3%	0	0.0%
Cleveland	7	16	11	34	85.0%	19	54.3%	1	14.3%	4	30.8%
Fairview Park	0	3	0	3	7.5%	9	25.7%	0	42.9%	7	53.8%
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%	1	2.9%	0	0.0%	1	7.7%
Olmsted Falls	0	1	0	1	2.5%	0	0.0%	1	14.3%	0	0.0%
Olmsted Twp.	1	0	0	1	0.0%	6	17.1%	1	0.0%	1	7.7%
Parma	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Parma Heights	1	0	0	1	2.5%	0	0.0%	1	0.0%	0	0.0%
Rocky River	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Westlake	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other	0	0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%
<b>Totals</b>	<b>10</b>	<b>20</b>	<b>11</b>	<b>41</b>	<b>100.0%</b>	<b>35</b>	<b>100.0%</b>	<b>8</b>	<b>100.0%</b>	<b>13</b>	<b>100.0%</b>


Noise Hotline – (216) 898-5220

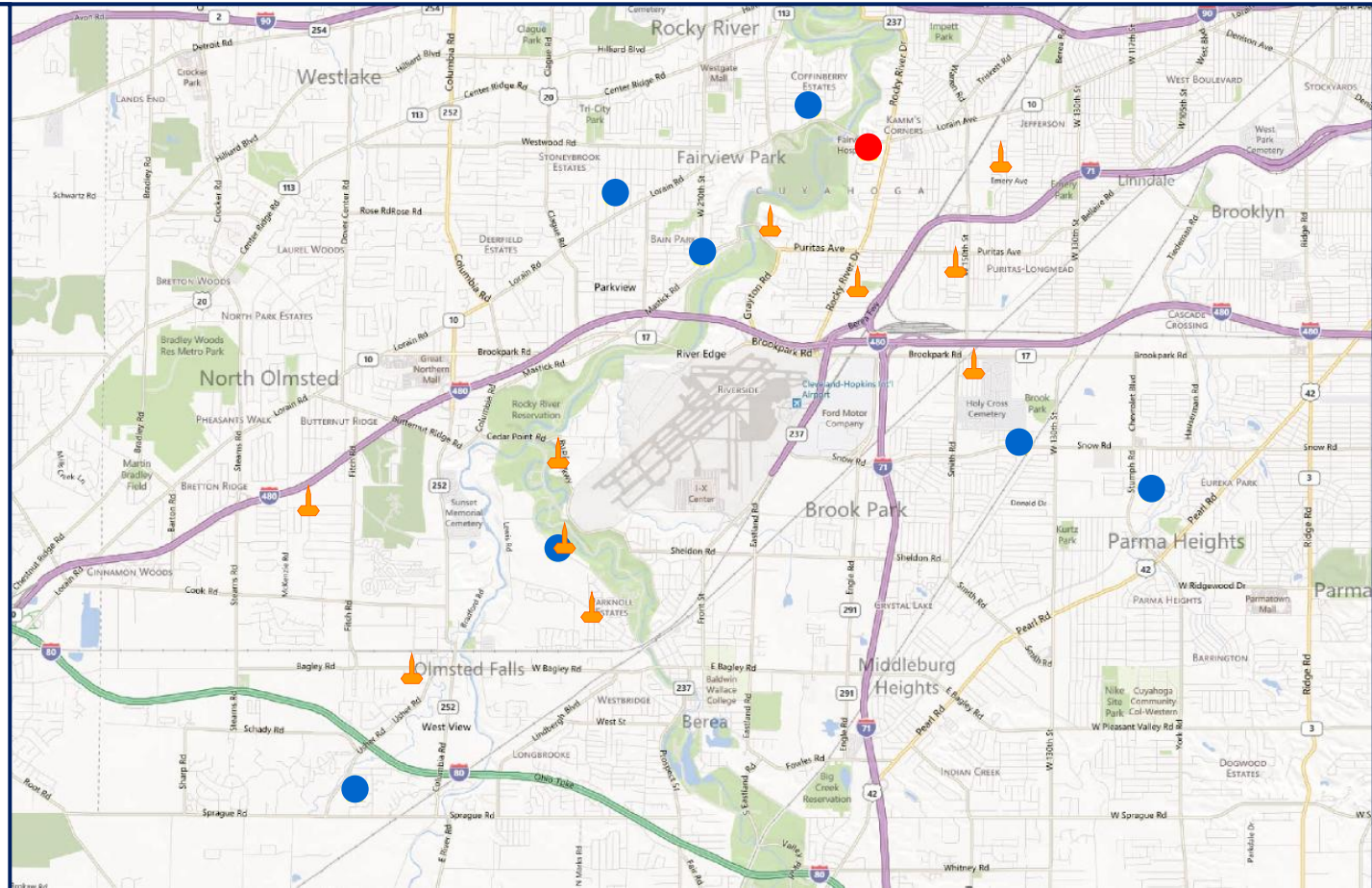


# Complaint Map

## LEGEND

Complaints per household

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



**CLE.**  
**Going places.™**

