



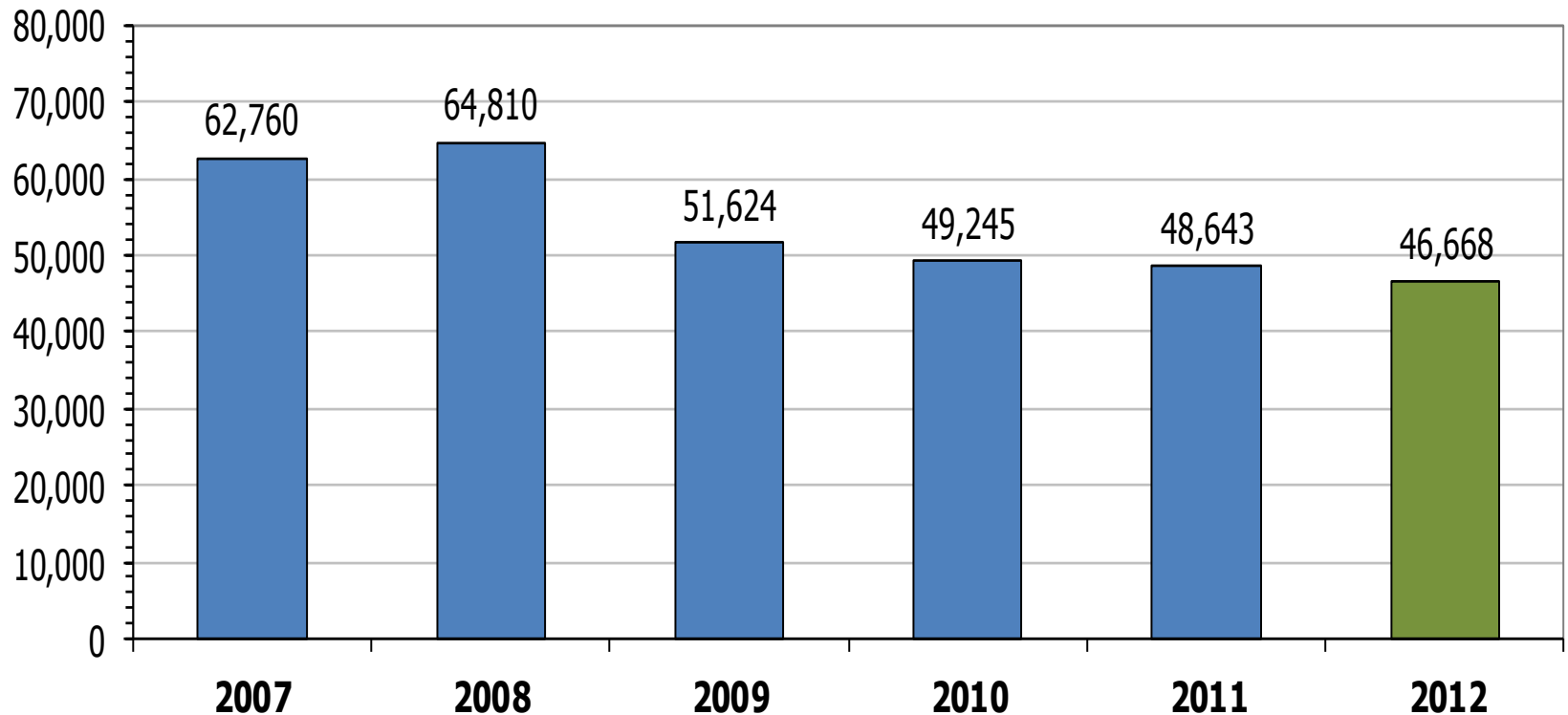
# ***Noise Compatibility***

**2<sup>nd</sup> Quarter 2012**

September 10, 2012

# Aircraft Operations

## Cleveland 2<sup>nd</sup> Qtr. Operations 2007 - 2012



**There were 46,668 landings and takeoffs in the 2nd qtr. of 2012; this is 4.06% below the 2nd qtr. 2011.**

Source: FAA Control Tower Traffic Count Reports

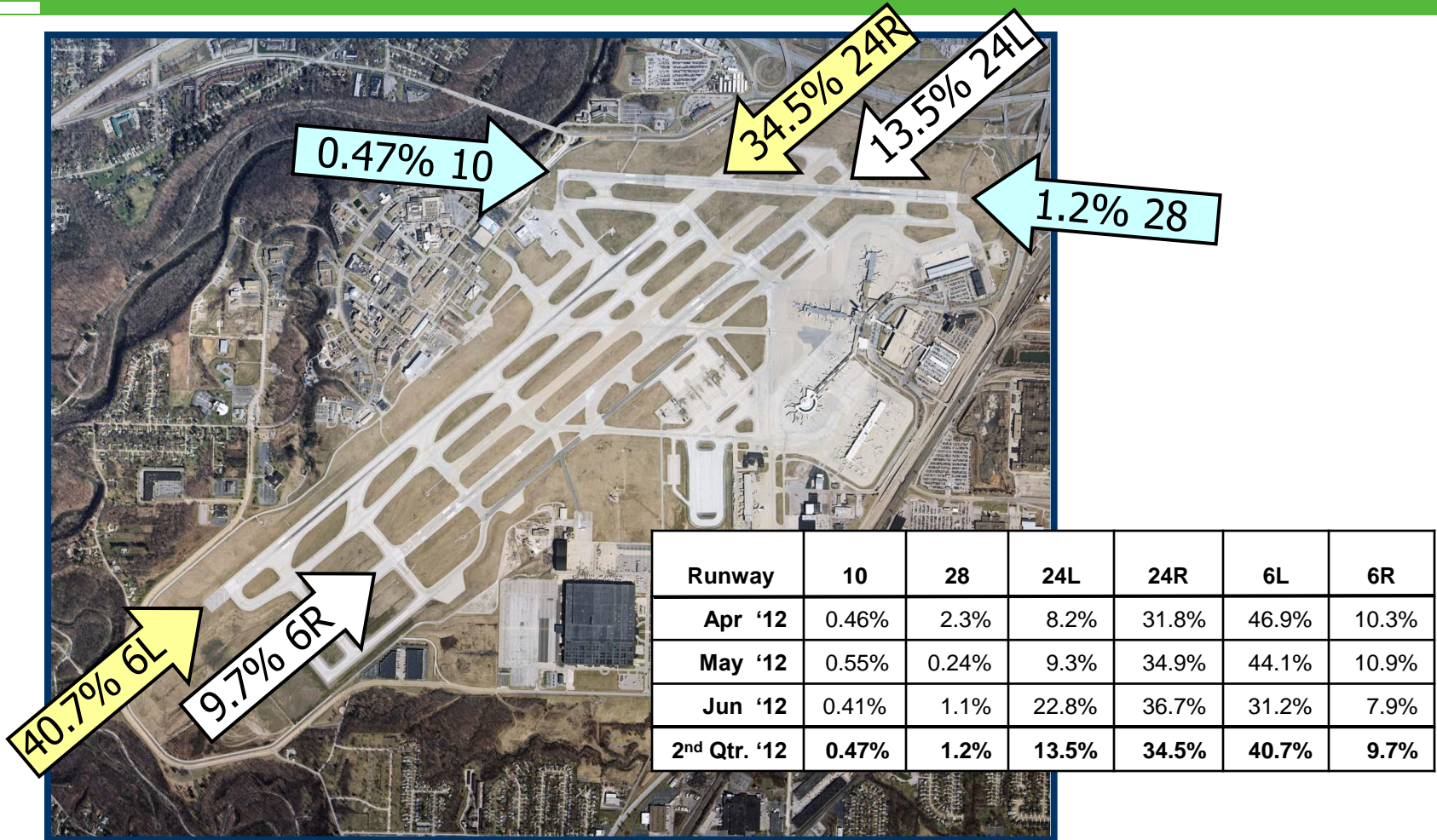
## 2<sup>nd</sup> Qtr. Fleet Mix : 2012 vs. 2011

### Landings & Takeoffs

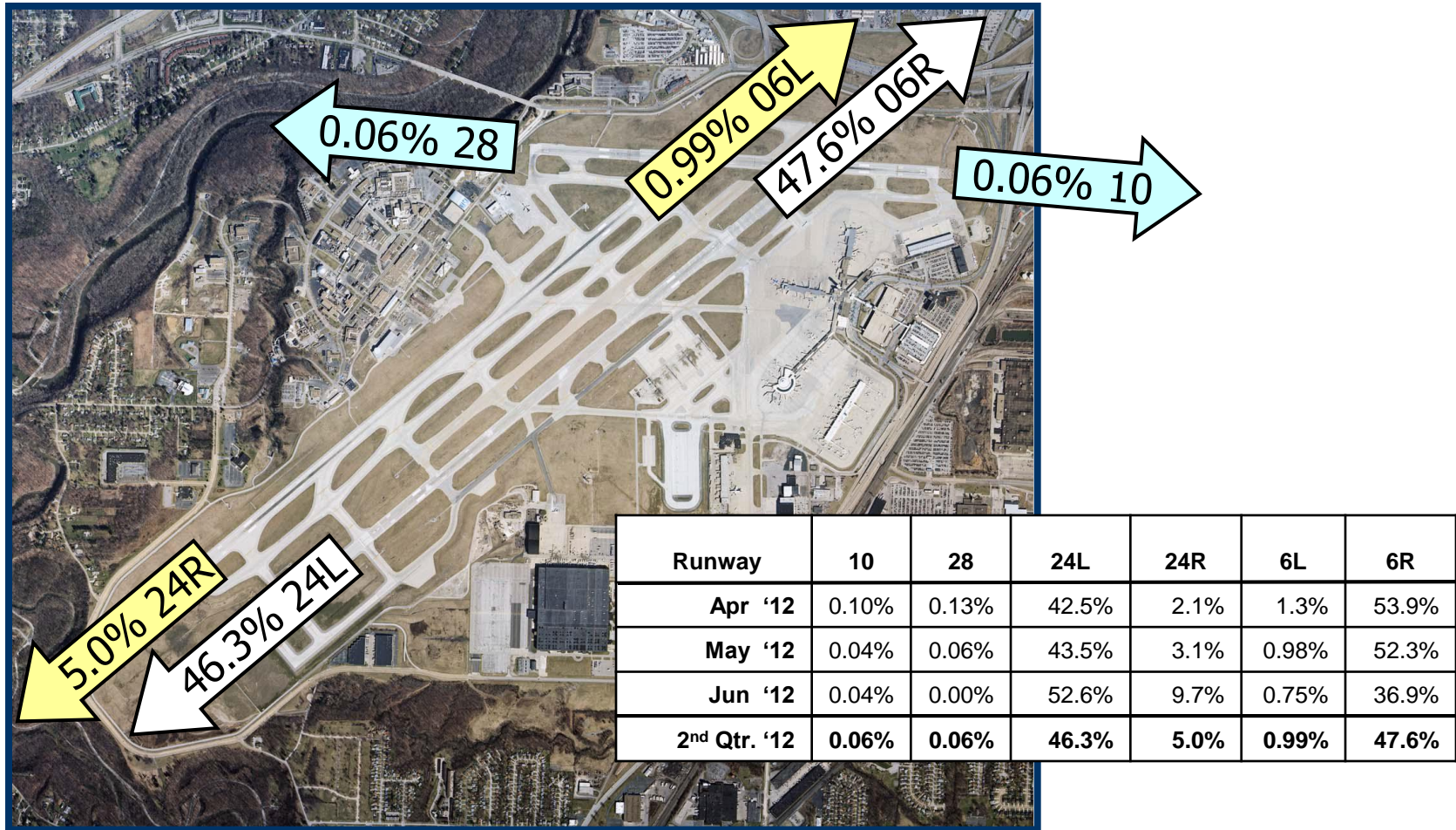
	2 <sup>nd</sup> Qtr. 2012		2 <sup>nd</sup> Qtr. 2011	
Commercial				
-Stage 2 with hush kit	179	0.38%	216	0.44%
-Heavy (Includes all B757s)	1,056	2.26%	941	1.93%
-MD80 Series	892	1.91%	565	1.16%
-Other Stage 3	11,410	24.45%	11,977	24.62%
-Regional Jet	21,626	46.34%	22,215	45.67%
-Turboprop	8,635	18.54%	9,687	19.91%
Air Taxi	652	1.40%	753	1.55%
General Aviation	2,141	4.59%	2,216	4.56%
Military	59	0.13%	73	0.15%
<b>Total</b>	<b>46,668</b>	<b>100.00%</b>	<b>48,643</b>	<b>100.00%</b>

All aircraft above are Stage 3 certified with the exception of some Military aircraft and about 2% of General Aviation aircraft. A hush kit reduces noise enough to meet Stage 3 levels, but well short of the noise level of typical aircraft originally manufactured as Stage 3.

# Runway Use: 2<sup>nd</sup> Qtr. 2012 Arrivals



# Runway Use: 2<sup>nd</sup> Qtr. 2012 Departures



# Departure Headings – Day-time

## Jet Departures, 6:00 a.m. to 11:00 p.m., 2<sup>nd</sup> Qtr., 2012

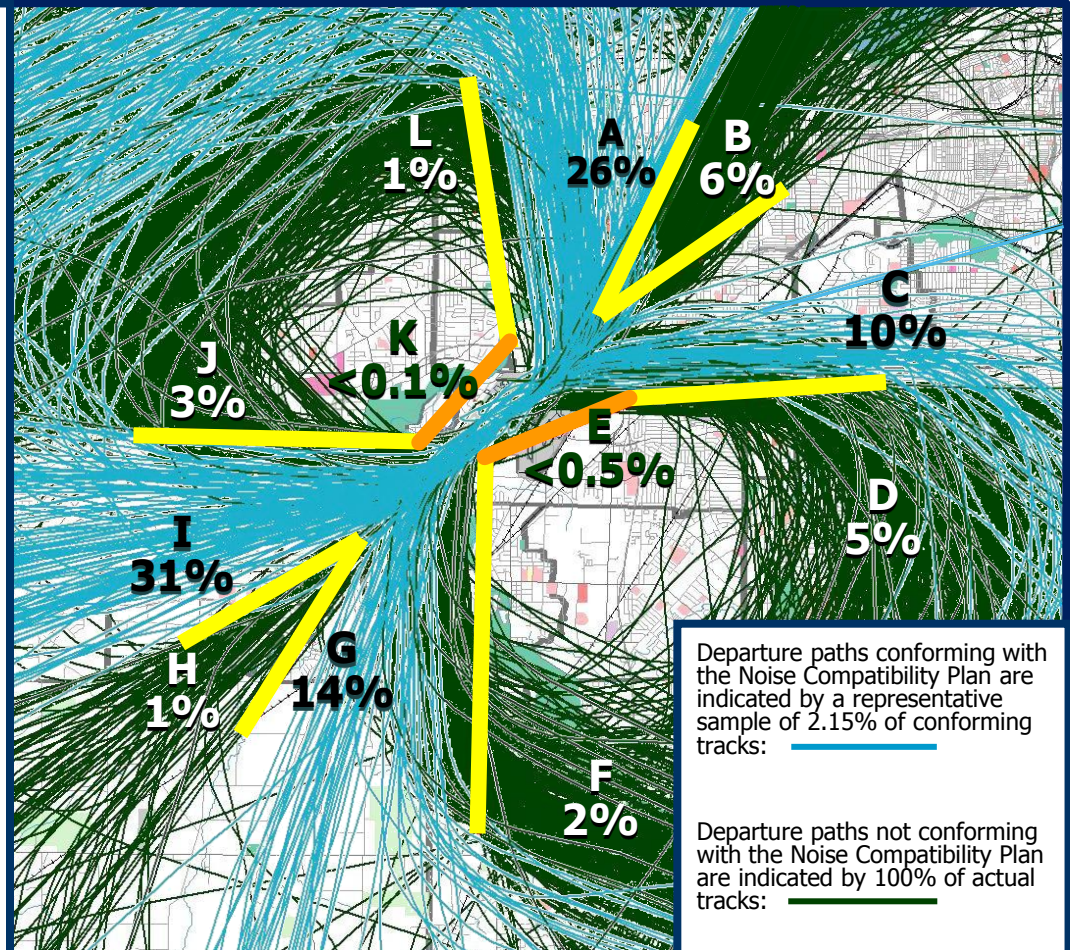
A voluntary measure of the Noise Compatibility Plan calls for jets departing between 6:00 a.m. and 11:00 p.m. from Runways 6L and 6R to take headings between 360° and 35° when turning left and between 65° and 95° when turning right until the jet is either 5 mi. away from the airport or has gained an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

Another voluntary measure of the Noise Compatibility Plan 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% conform and 18% do not conform**

- A. 26%:** north corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- B. 6%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the north and south corridors
- C. 10%:** east corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- D. 5%:** flights crossing the south boundary below 5,000 ft. MSL
- E. <0.5%:** flights turning south before entering the corridor
- F. 2%:** flights crossing the east boundary below 5,000 ft. MSL
- G. 14%:** south corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- H. 1%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the west and south corridors
- I. 31%:** west corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- J. 3%:** flights crossing the north boundary below 5,000 ft. MSL
- K. <0.1%:** flights turning north before entering the corridor
- L. 1%:** flights crossing the west boundary below 5,000 ft. MSL

(Percentages do not include Rwy 10/28 departures)



# Departure Headings – Night-time

## Jet Departures, 11:00 p.m. to 6:00 a.m., 2<sup>nd</sup> Qtr., 2012

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

Another voluntary measure of the Noise Compatibility Plan 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.

### 29.6% conform and 70.4% do not conform

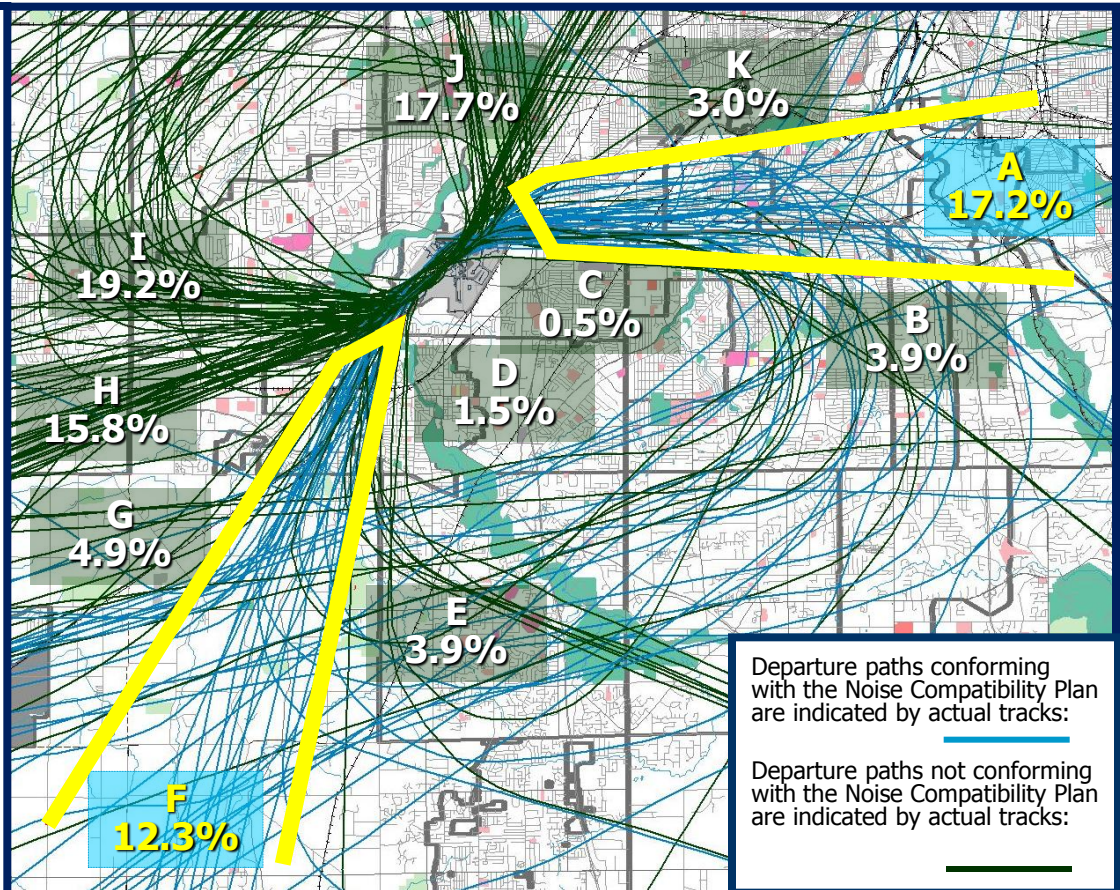
- A. 17.2%:** 095 corridor, including flights crossing the 095 corridor boundaries above 5,000 ft. MSL
- B. 3.9%:** flights crossing the south boundary below 5,000 ft. MSL
- C. 0.5%:** flights turning south before entering the 095 corridor
- D. 1.5%:** flights departing south without entering the 200 corridor
- E. 3.9%:** flights crossing the east boundary below 5,000 ft. MSL
- F. 12.3%:** 200 corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- G. 4.9%:** flights crossing the west boundary below 5,000 ft. MSL
- H. 15.8%:** flights departing southwest without entering the corridor
- I. 19.2%:** flights departing west without entering the corridor
- J. 17.7%:** flights departing north without entering the corridor
- K. 3.0%:** flights crossing the north boundary below 5,000 ft. MSL

(There was one Rwy 28 jet departure (not shown) and no Rwy 10 jet departures between 11:00 p.m. and 6:00 a.m.)

The percentage of departures on each runway from 11:00 p.m. to 6:00 a.m. during the 2<sup>nd</sup> Qtr. of 2012 were as follows:

Rwy	10	28	24L	24R	6L	6R
For jets:	0.0%	0.1%	49.8%	7.8%	3.4%	38.5%
For all aircraft:	0.0%	0.4%	8.7%	3.8%	1.8%	37.1%

**91.9% of Jet Departures from Rwy 6L/6R are on the preferred Rwy, 6R.**



Departure paths conforming with the Noise Compatibility Plan are indicated by actual tracks:

Departure paths not conforming with the Noise Compatibility Plan are indicated by actual tracks:

# Arrival Headings – Night-time

## Arrivals, 10:00 p.m. to 6:59 a.m., 2<sup>nd</sup> Qtr., 2012

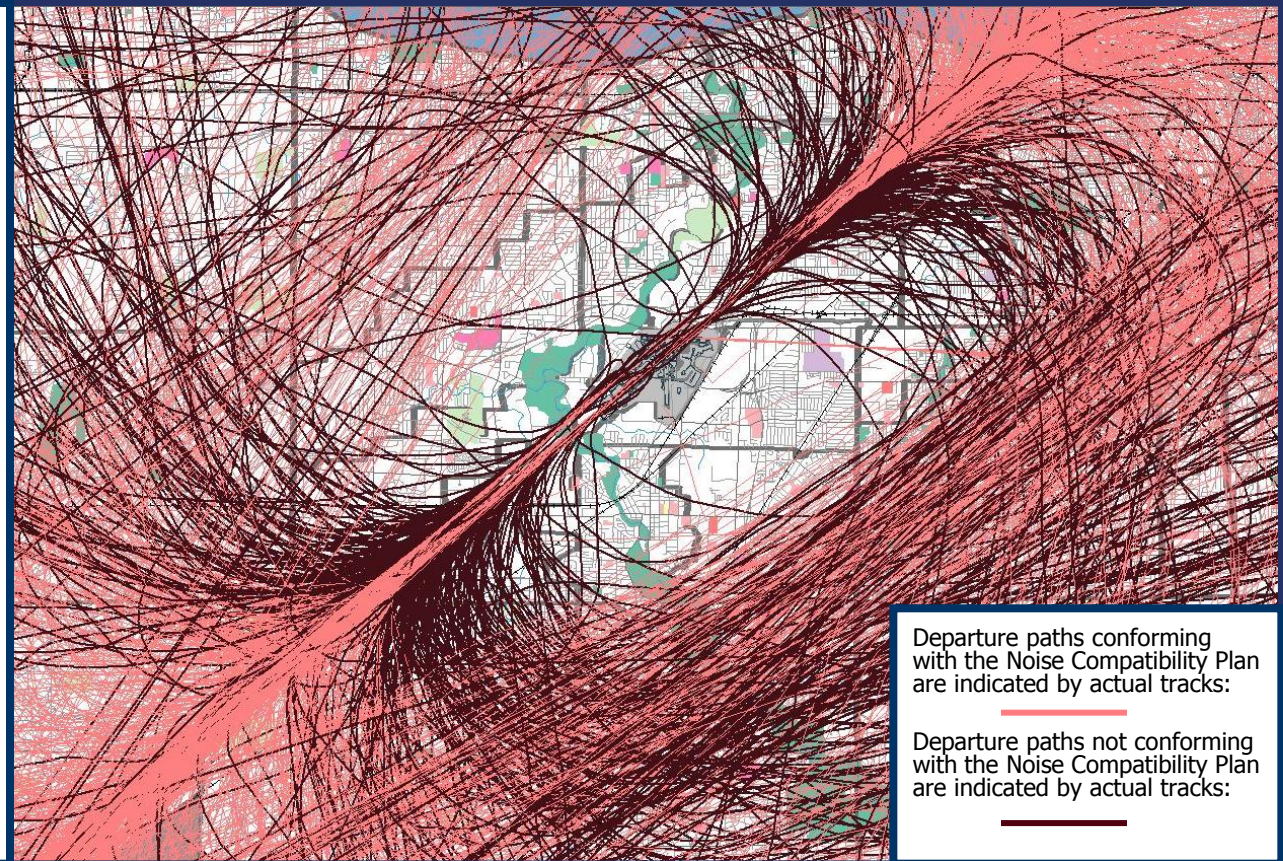
A voluntary measure of the Noise Compatibility Plan calls for all aircraft arriving between 10:00 p.m. and 6:59 a.m., wind and weather permitting, to intercept final approach course no closer than four miles before touchdown.

**82.2% conform and  
17.8% do not conform**

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 2<sup>nd</sup> Qtr., 2012 was as follows:

Rwy	Percentage of Arrivals	
	Jets	All Aircraft
<b>10</b>	0.0%	0.1%
<b>28</b>	0.6%	0.6%
<b>24L</b>	19.6%	19.8%
<b>24R</b>	21.8%	22.4%
<b>6L</b>	31.4%	31.5%
<b>6R</b>	26.6%	25.6%



Departure paths conforming with the Noise Compatibility Plan are indicated by actual tracks:

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Departure paths not conforming with the Noise Compatibility Plan are indicated by actual tracks:

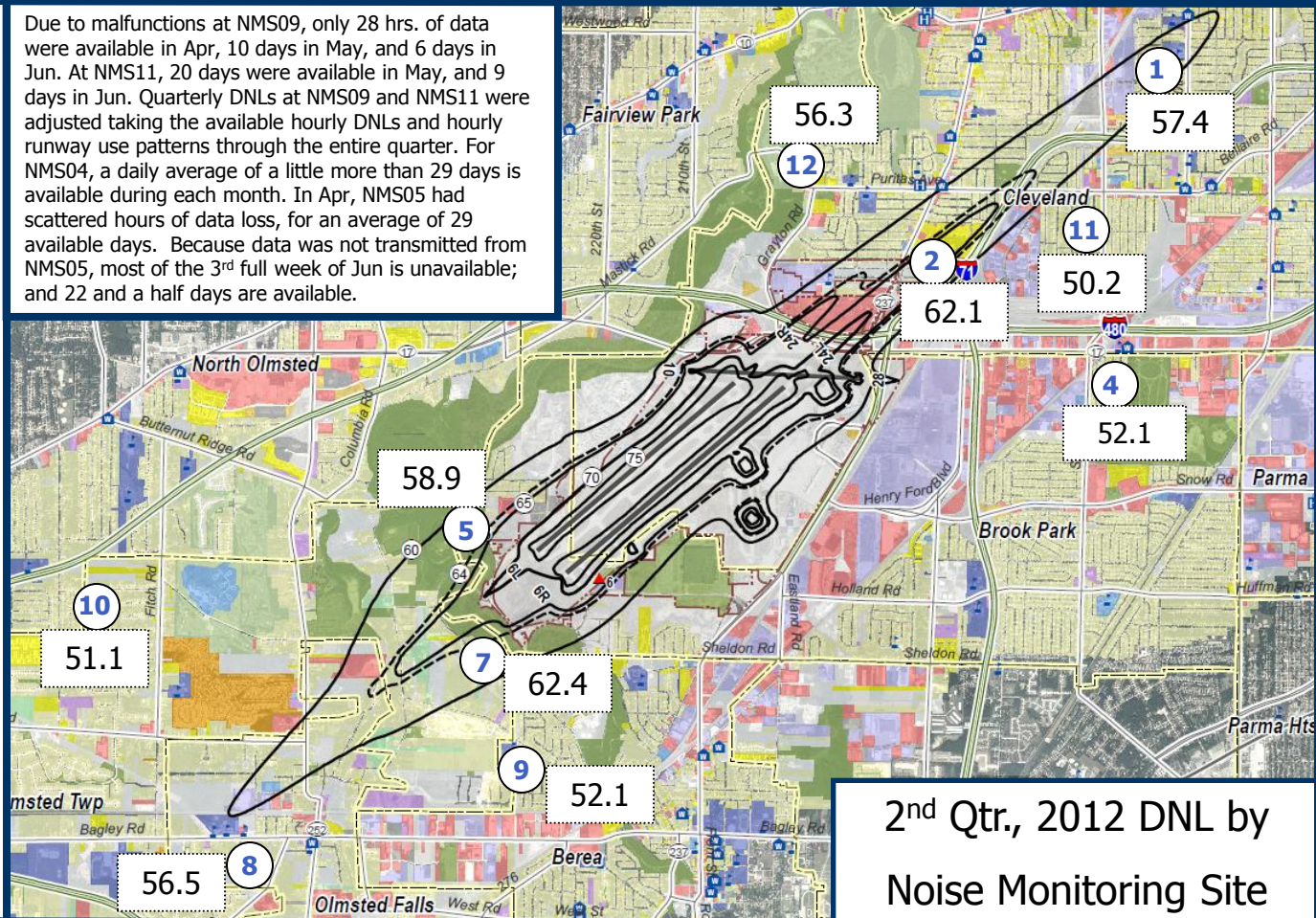
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# Aircraft Noise

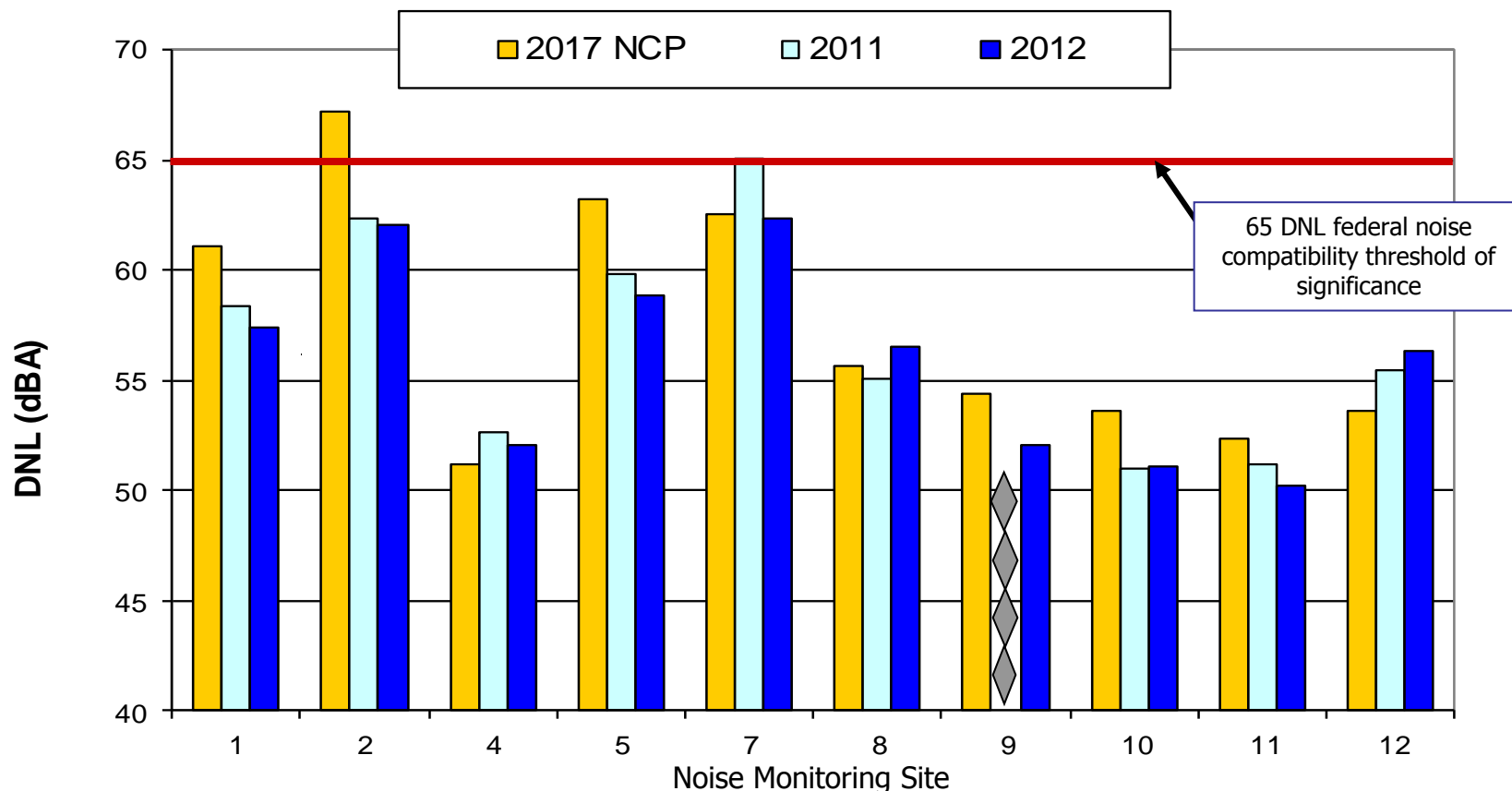


Due to malfunctions at NMS09, only 28 hrs. of data were available in Apr, 10 days in May, and 6 days in Jun. At NMS11, 20 days were available in May, and 9 days in Jun. Quarterly DNLs at NMS09 and NMS11 were adjusted taking the available hourly DNLs and hourly runway use patterns through the entire quarter. For NMS04, a daily average of a little more than 29 days is available during each month. In Apr, NMS05 had scattered hours of data loss, for an average of 29 available days. Because data was not transmitted from NMS05, most of the 3<sup>rd</sup> full week of Jun is unavailable; and 22 and a half days are available.



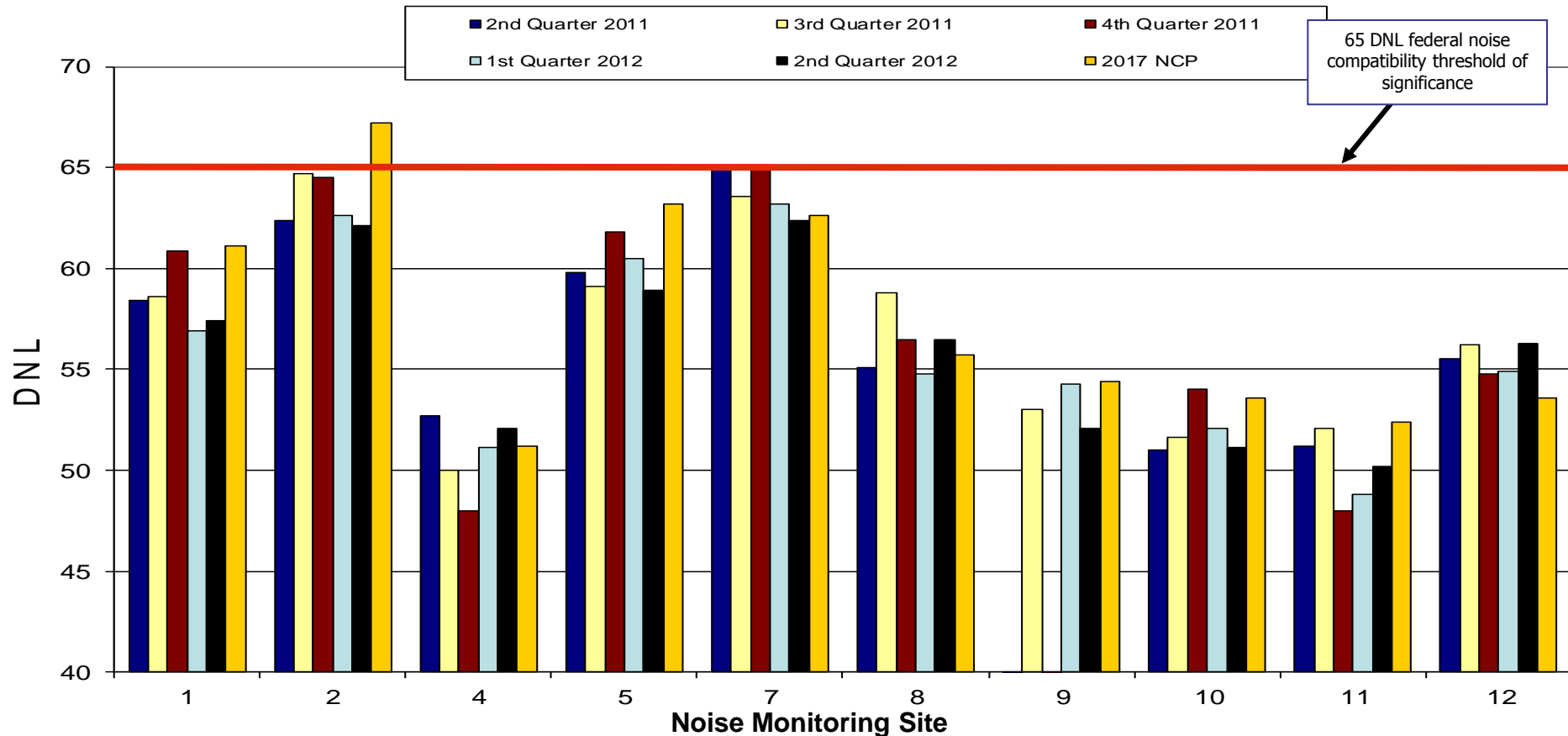
**2<sup>nd</sup> Qtr., 2012 DNL by  
Noise Monitoring Site**

# DNL: 2<sup>nd</sup> Qtr., 2012 vs. 2<sup>nd</sup> Qtr., 2011



Due to malfunctions at NMS09, only 28 hrs. of data were available in Apr, 10 days in May, and 6 days in Jun. At NMS11, 20 days were available in May, and 9 days in Jun. Quarterly DNLs at NMS09 and NMS11 were adjusted taking the available hourly DNLs and hourly runway use patterns through the entire quarter. For NMS04, a daily average of a little more than 29 days is available during each month. In Apr, NMS05 had scattered hours of data loss, for an average of 29 available days. Because data was not transmitted from NMS05, most of the 3<sup>rd</sup> full week of Jun is unavailable; and 22 and a half days are available.

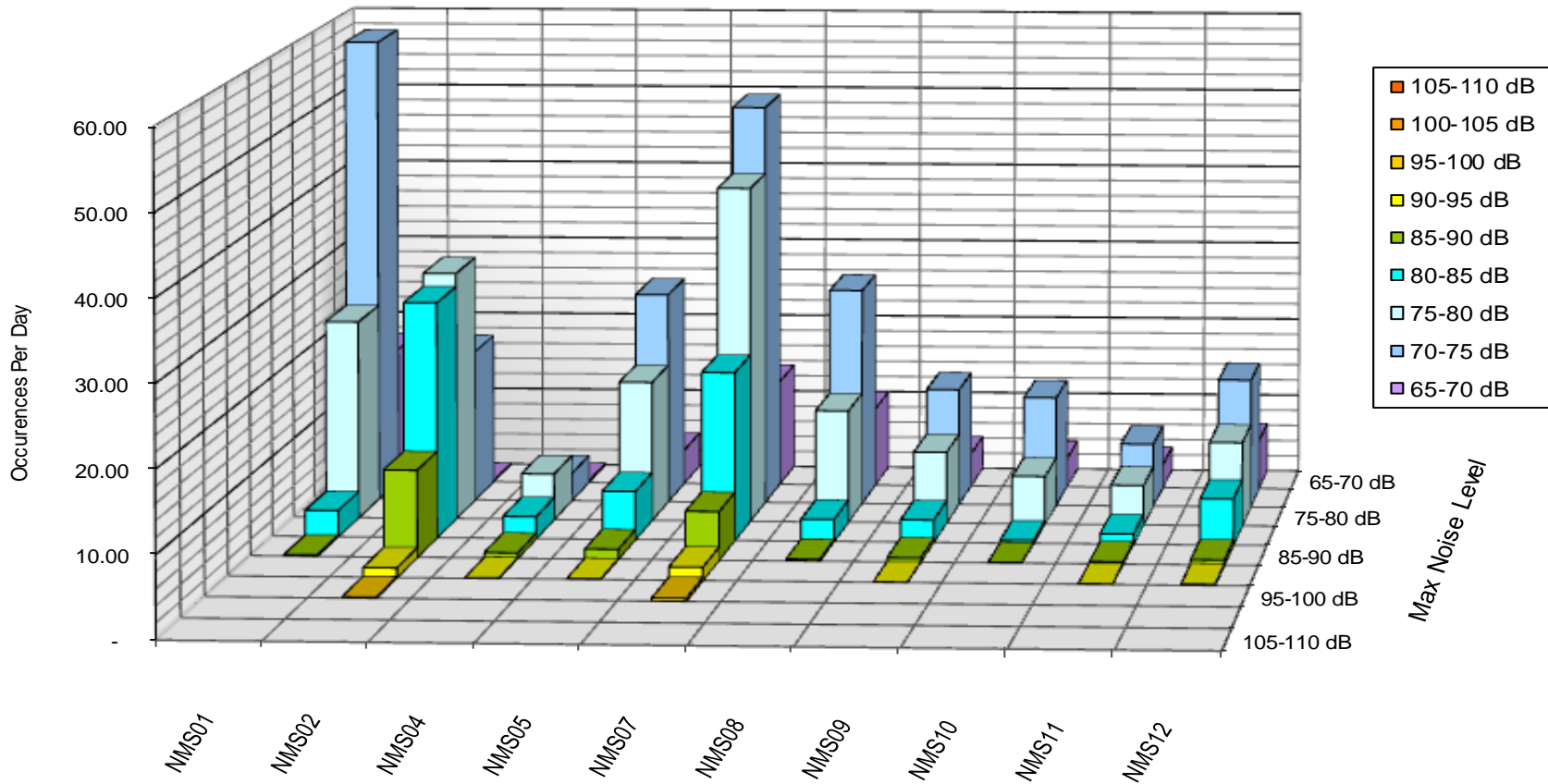
# Five Qtr. DNL Comparison



Due to malfunctions at NMS09, only 28 hrs. of data were available in Apr, 10 days in May, and 6 days in Jun. At NMS11, 20 days were available in May, and 9 days in Jun. Quarterly DNLs at NMS09 and NMS11 were adjusted taking the available hourly DNLs and hourly runway use patterns through the entire quarter. For NMS04, a daily average of a little more than 29 days is available during each month. In Apr, NMS05 had scattered hours of data loss, for an average of 29 available days. Because data was not transmitted from NMS05, most of the 3<sup>rd</sup> full week of Jun is unavailable; and 22 and a half days are available.

# Distribution of Noise Events

**Distribution of Lmax, Averaged by Day, 2<sup>nd</sup> Qtr., 2012**



## Top 3 Lmaxs at each NMS, 2<sup>nd</sup> Qtr., (1 of 2)

NMS	Lmax (dB)	Aircraft	Operation	Time and date	Sound Exposure Level (dB)	Duration (sec)
NMS01	88.7	DC9-50	Arrival on Rwy 24L	5/2/12 9:19 PM	94.2	25.0
NMS01	88.4	MD-83	Arrival on Rwy 24L	6/17/12 11:19 PM	92.7	24.0
NMS01	87.5	De Havilland Canada DHC-8-300 Dash 8	Arrival on Rwy 24R	4/11/12 6:45 AM	91.4	16.0
NMS02	99.9	Learjet 23	Arrival on Rwy 24L	6/24/12 11:53 AM	103.4	12.0
NMS02	97.2	Anoltov An-225	Departure off Rwy 6R	6/6/12 4:17 PM	99.9	12.0
NMS02	97.1	Boeing 767-300	Arrival on Rwy 24L	6/28/12 8:21 AM	99.4	18.0
NMS04	92.0	MD-88	Departure off Rwy 6R	4/1/12 4:16 PM	99.1	29.0
NMS04	91.6	DC9-50	Departure off Rwy 6R	5/17/12 12:22 PM	97.1	29.5
NMS04	91.2	MD-88	Departure off Rwy 6R	6/13/12 4:00 PM	96.0	30.5
NMS05	94.5	MD-82	Take-off Roll on Rwy 6R	5/18/12 6:56 AM	103.3	100.0
NMS05	92.4	DC9-50	Departure off Rwy 24R	5/15/12 12:23 PM	98.8	34.0
NMS05	91.7	DC9-50	Take-off Roll on Rwy 6R	5/18/12 8:00 AM	101.7	64.0
NMS07	99.5	DC9-50	Departure off Rwy 24L	6/1/12 1:03 PM	107.6	39.0
NMS07	97.9	DC9-50	Departure off Rwy 24L	5/11/12 12:20 PM	106.0	40.0
NMS07	97.9	DC9-50	Departure off Rwy 24L	5/29/12 12:21 PM	105.8	40.0

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<sup>nd</sup> Qtr., (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	90.0	MD-83	Departure off Rwy 24L	6/3/12 1:21 PM	94.6	32.5
NMS08	89.5	MD-88	Departure off Rwy 24L	4/19/12 12:33 PM	95.4	25.0
NMS08	88.5	MD-88	Departure off Rwy 24L	5/9/12 4:05 PM	95.6	33.5
NMS09	92.6	DC9-50	Departure off Rwy 24L	5/3/12 7:57 AM	99.8	30.5
NMS09	89.3	DC9-50	Departure off Rwy 24L	5/27/12 12:32 PM	97.4	30.5
NMS09	88.7	MD-88	Departure off Rwy 24L	5/2/12 4:03 PM	95.0	26.5
NMS10	89.8	MD-83	Departure off Rwy 24L	6/22/12 7:18 AM	96.1	28.5
NMS10	88.6	Boeing 727-200	Departure off Rwy 24R	5/10/12 10:51 PM	95.8	31.5
NMS10	87.7	Boeing 727-200	Departure off Rwy 24L	4/10/12 9:37 PM	94.3	42.0
NMS11	94.4	DC9-50	Departure off Rwy 6R	5/4/12 4:19 PM	101.6	33.5
NMS11	91.5	MD-88	Departure off Rwy 6R	5/7/12 12:25 PM	97.9	34.5
NMS11	91.2	MD-88	Departure off Rwy 6R	4/6/12 4:15 PM	96.2	26.5
NMS12	93.7	Boeing 727-200	Departure off Rwy 6R	4/18/12 7:43 AM	101.5	46.5
NMS12	92.7	Learjet 25	Departure off Rwy 6R	6/15/12 9:55 AM	101.3	46.0
NMS12	92.5	MD-83	Departure off Rwy 6R	6/25/12 6:25 PM	97.5	31.5

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

# Noise Hotline (216.898.5220)



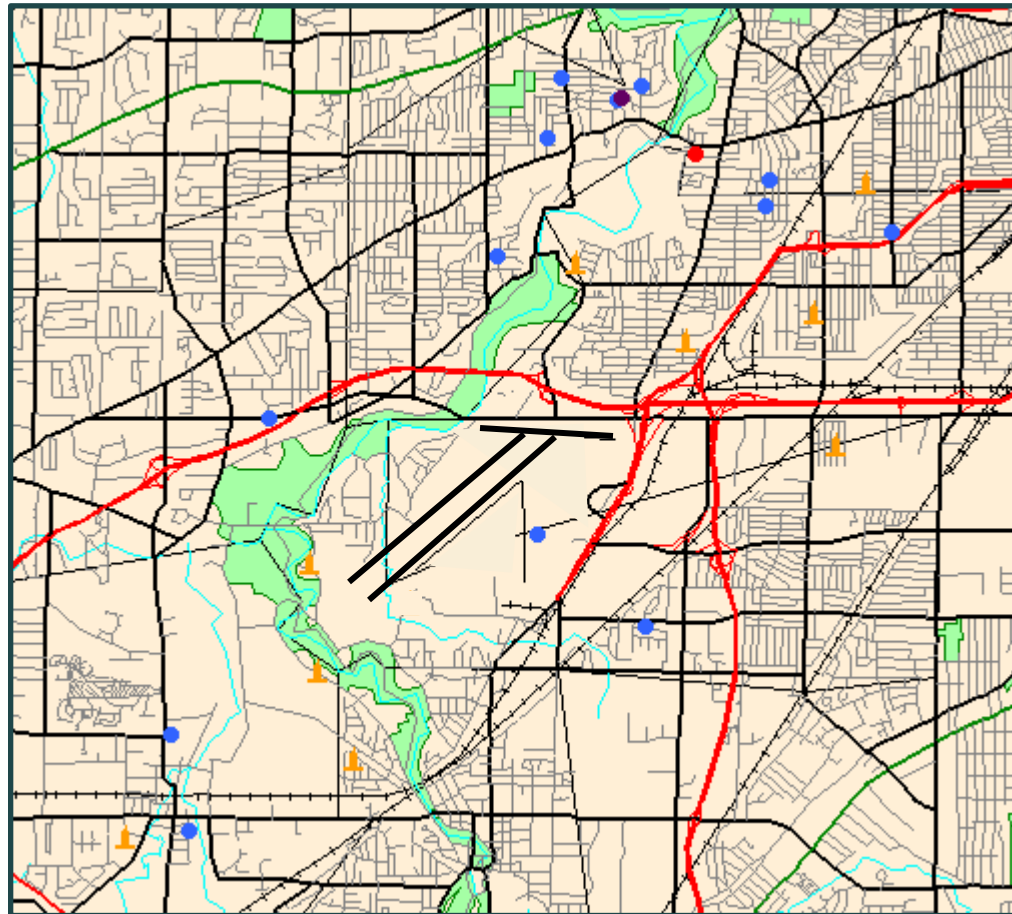
	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>2<sup>nd</sup> Qtr.</b>	<b>%</b>	<b>Callers</b>	<b>%</b>
Berea	0	0	0	0	0.00%	<b>0</b>	0.00%
Brook Park	1	0	0	1	2.86%	<b>1</b>	6.25%
Cleveland	11	8	5	23	65.71%	<b>5</b>	31.25%
Fairview Park	1	2	3	6	17.14%	<b>5</b>	31.25%
Lakewood	0	0	0	0	0.00%	<b>0</b>	0.00%
Middleburg Hts.	0	0	0	0	0.00%	<b>0</b>	0.00%
North Olmsted	0	1	0	1	2.86%	<b>1</b>	6.25%
Olmsted Falls	0	0	2	2	5.71%	<b>2</b>	12.50%
Olmsted Twp	0	0	0	0	0.00%	<b>0</b>	0.00%
Parma	0	0	0	0	0.00%	<b>0</b>	0.00%
Parma Heights	0	0	0	0	0.00%	<b>0</b>	0.00%
Rocky River	0	1	0	1	2.86%	<b>1</b>	6.25%
Westlake	0	0	0	0	0.00%	<b>0</b>	0.00%
Other	0	0	0	1	2.86%	<b>1</b>	6.25%
<b>Total (2012)</b>	<b>13</b>	<b>12</b>	<b>10</b>	<b>35</b>	<b>100.00%</b>	<b>16</b>	<b>100.00%</b>
<b>Total (2011)</b>	<b>33</b>	<b>17</b>	<b>11</b>	<b>61</b>	<b>100.00%</b>	<b>15</b>	<b>100.00%</b>

# Complaint Location Map: 2<sup>nd</sup> Qtr., 2012

## LEGEND

Complaints per household

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





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