



Noise Compatibility

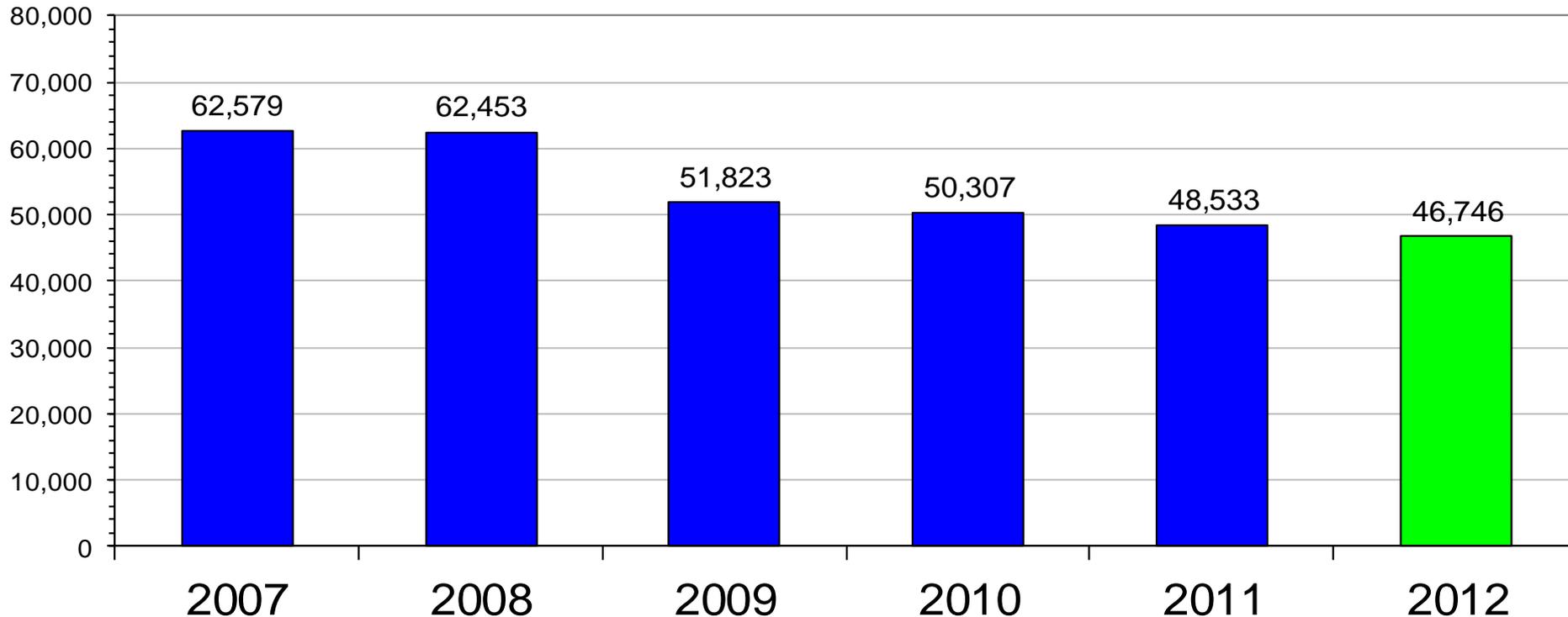
3rd Quarter, 2012

November 30, 2012

Aircraft Operations



Cleveland 3rd Qtr. Operations 2007 - 2012



There were 46,746 landings and takeoffs in the 3rd qtr. 2012; this is 3.7% below the 3rd qtr. 2011.

Source: FAA Control Tower Traffic Count Reports

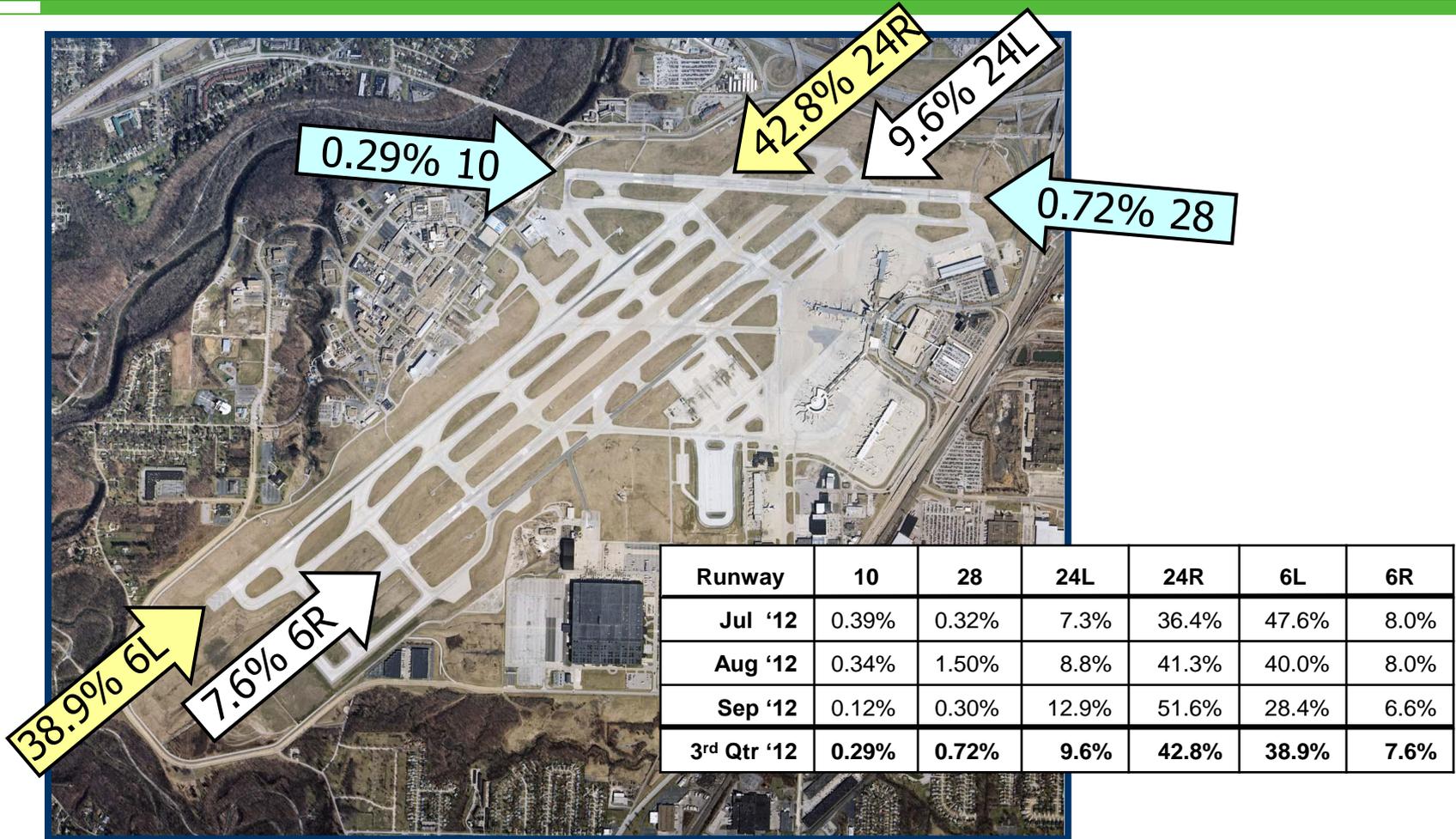
Fleet Mix: 3rd Qtr, 2012 vs. 3rd Qtr, 2011

Landings & Takeoffs

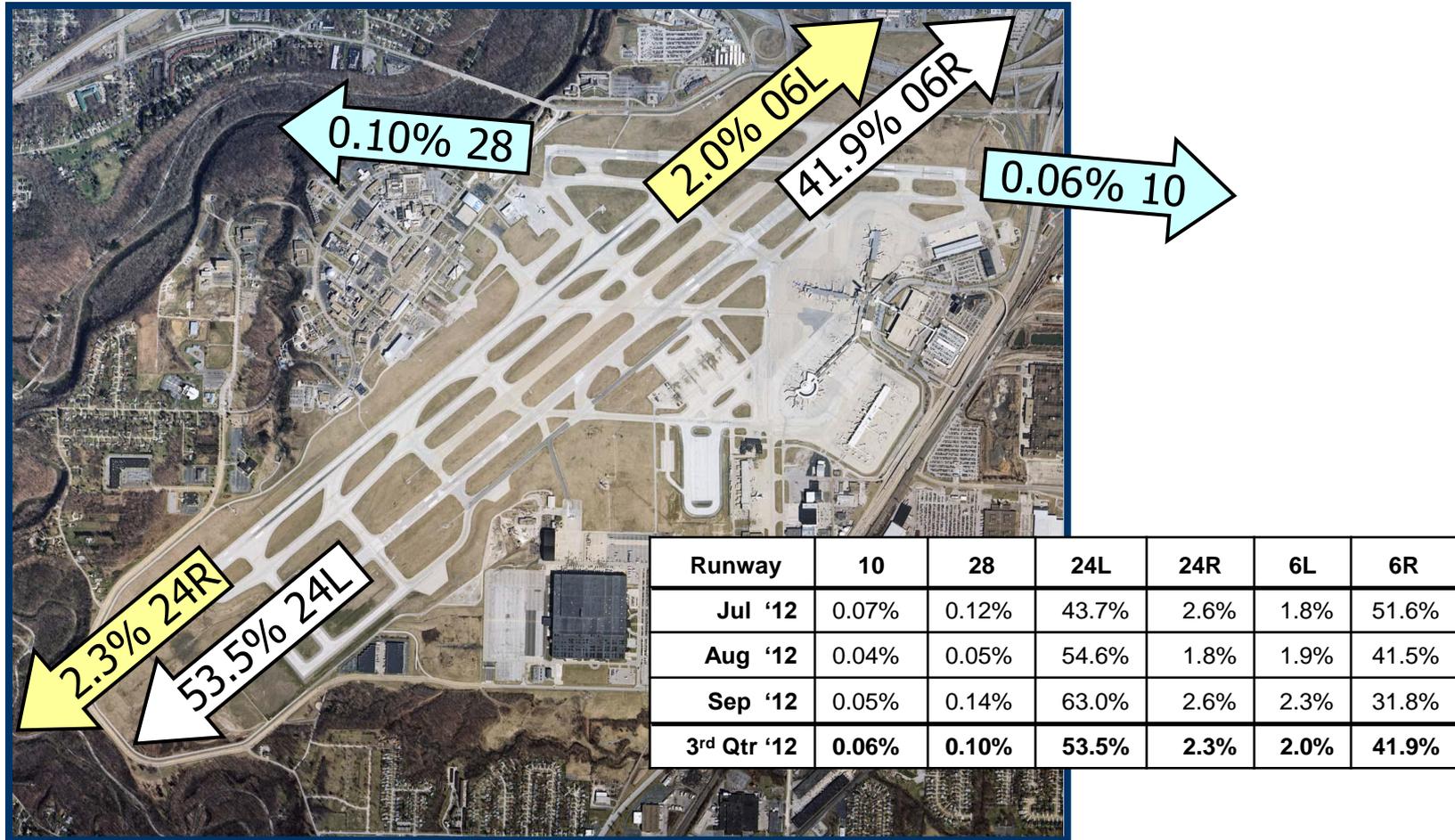
	3 rd Qtr, 2012		3 rd Qtr, 2011	
Commercial				
-Stage 2 with hush kit	109	0.23%	113	0.23%
-Heavy (incl. all B757s)	832	1.78%	1,057	2.18%
-MD80 series	909	1.94%	715	1.47%
-Other Stage 3	12,398	26.52%	11,447	23.59%
-Regional Jet	21,919	46.89%	22,222	45.79%
-Turboprop	7,686	16.44%	10,452	21.54%
Air Taxi	583	1.25%	316	0.65%
General Aviation	2,252	4.82%	2,113	4.35%
Military	58	0.12%	98	0.20%
Total	46,746	100.0%	48,533	100.0%

All aircraft above are Stage 3 certified with the exception of some Military aircraft and about 2% of General Aviation aircraft, counting helicopters. 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: 3rd Qtr. 2012 Arrivals



Runway Use: 3rd Qtr. 2012 Departures



Departure Headings – Day-time

Jet Departures, 6:00 a.m. to 11:00 p.m., 3rd Qtr., 2012

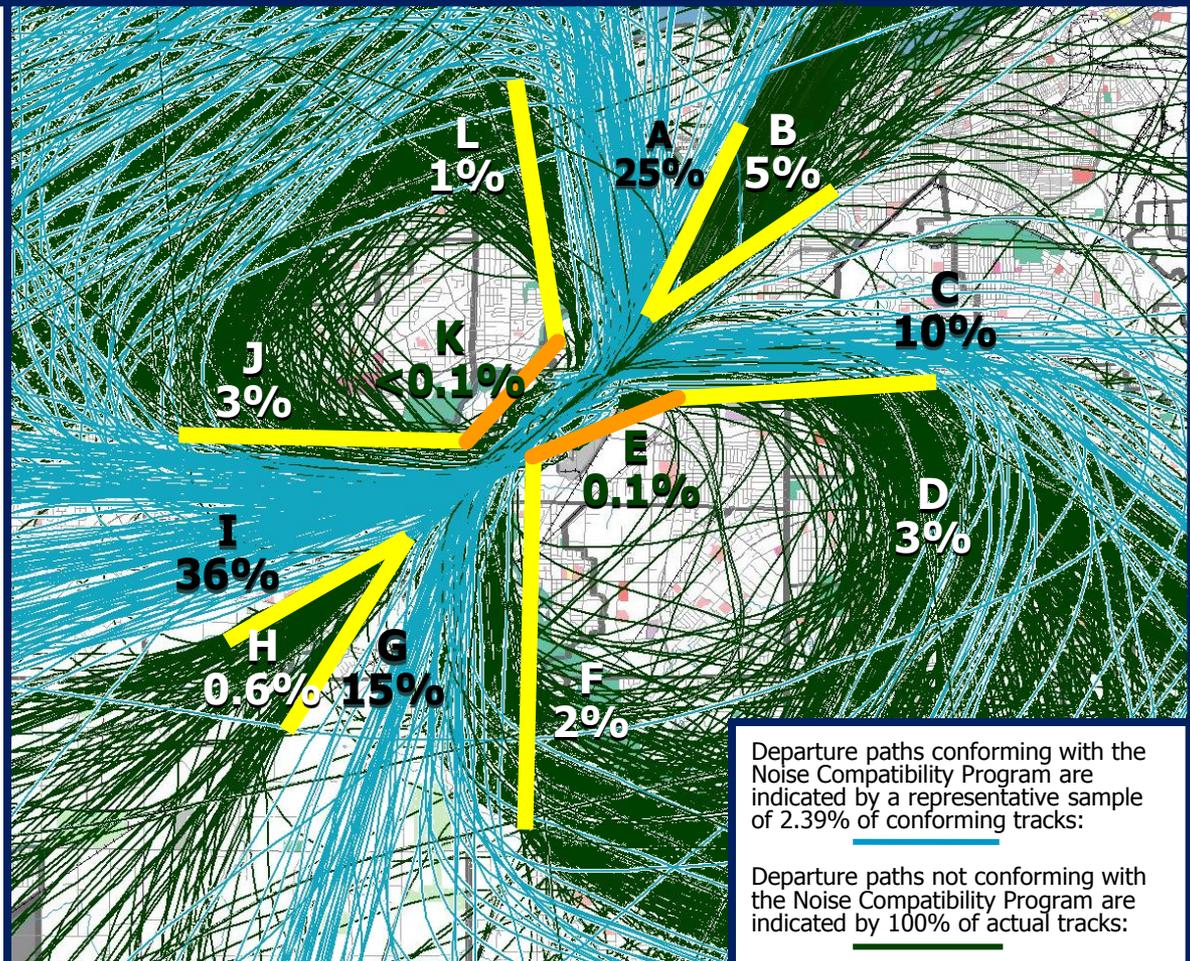
A voluntary measure of the Noise Compatibility Program calls for jets departing between 6:00 a.m. and 11:00 p.m. from Runways 6L and 6R to take headings between 360° and 35° when turning left and between 65° and 95° when turning right until the jet is either 5 mi. away from the airport or has gained 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.

85% conform and 15% do not conform

- A. 25%:** north corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- B. 5%:** 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. 3%:** flights crossing the south boundary below 5,000 ft. MSL
- E. 0.1%:** flights turning south before entering the corridor
- F. 2%:** flights crossing the east boundary below 5,000 ft. MSL
- G. 15%:** south corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- H. 0.6%:** flights crossing inner boundaries below 5,000 ft. MSL and then exiting between the west and south corridors
- I. 36%:** 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 paths conforming with the Noise Compatibility Program are indicated by a representative sample of 2.39% of conforming tracks:

Departure paths not conforming with the Noise Compatibility Program are indicated by 100% of actual tracks:

Departure Headings – Night-time

Jet Departures, 11:00 p.m. to 6:00 a.m., 3rd Qtr., 2012

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.

55.3% conform and 44.7% do not conform

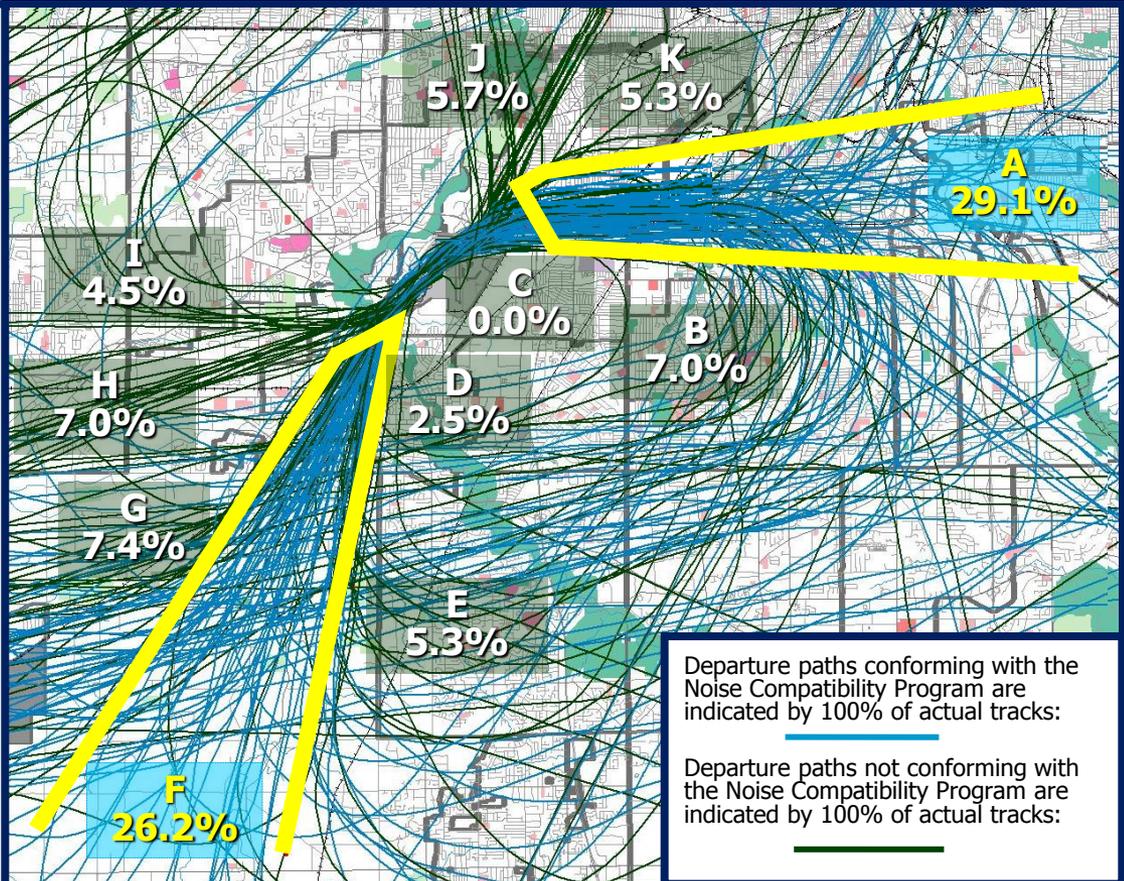
- A. 29.1%:** 095 corridor, including flights crossing the 095 corridor boundaries above 5,000 ft. MSL
- B. 7.0%:** flights crossing the south boundary below 5,000 ft. MSL
- C. 0.0%:** flights turning south before entering the 095 corridor
- D. 2.5%:** flights departing south without entering the 200 corridor
- E. 5.3%:** flights crossing the east boundary below 5,000 ft. MSL
- F. 26.2%:** 200 corridor, including flights crossing the corridor boundaries above 5,000 ft. MSL
- G. 7.4%:** flights crossing the west boundary below 5,000 ft. MSL
- H. 7.0%:** flights departing southwest without entering the corridor
- I. 4.5%:** flights departing west without entering the corridor
- J. 5.7%:** flights departing north without entering the corridor
- K. 5.3%:** flights crossing the north boundary below 5,000 ft. MSL

(There were no Rwy 10 nor 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 3rd Qtr. of 2012 were as follows:

Rwy	10	28	24L	24R	6L	6R
For jets:	0.0%	0.0%	41.4%	11.5%	17.2%	29.9%
For all aircraft:	0.3%	0.9%	40.2%	11.8%	15.9%	30.8%

63.5% of Jet Departures from Rwy 6L/6R are on the preferred Rwy, 6R.



Departure paths conforming with the Noise Compatibility Program are indicated by 100% of actual tracks:

Departure paths not conforming with the Noise Compatibility Program are indicated by 100% of actual tracks:

Arrival Headings – Night-time

Arrivals, 10:00 p.m. to 6:59 a.m., 3rd Qtr., 2012

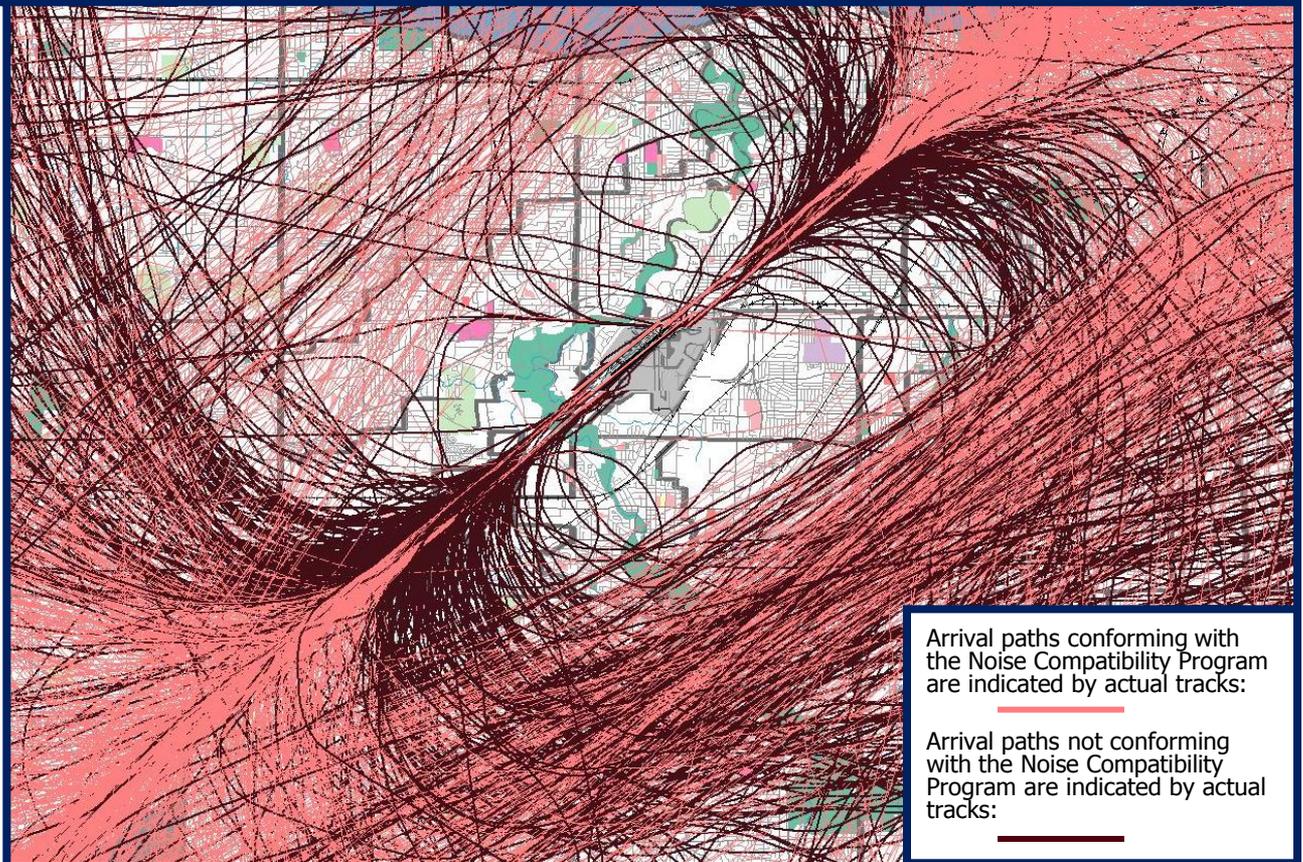
A voluntary measure of the Noise Compatibility Program calls for all aircraft arriving between 10:00 p.m. and 6:59 a.m., wind and weather permitting, to intercept final approach course no closer than four miles before touchdown.

81.6% conform and
18.4% 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 3rd Qtr., 2012 was as follows:

Rwy	Percentage of Arrivals	
	Jets	All Aircraft
10	0.2%	0.4%
28	0.0%	0.1%
24L	15.8%	16.0%
24R	26.8%	27.2%
6L	42.5%	41.5%
6R	14.9%	14.9%



Arrival paths conforming with the Noise Compatibility Program are indicated by actual tracks:

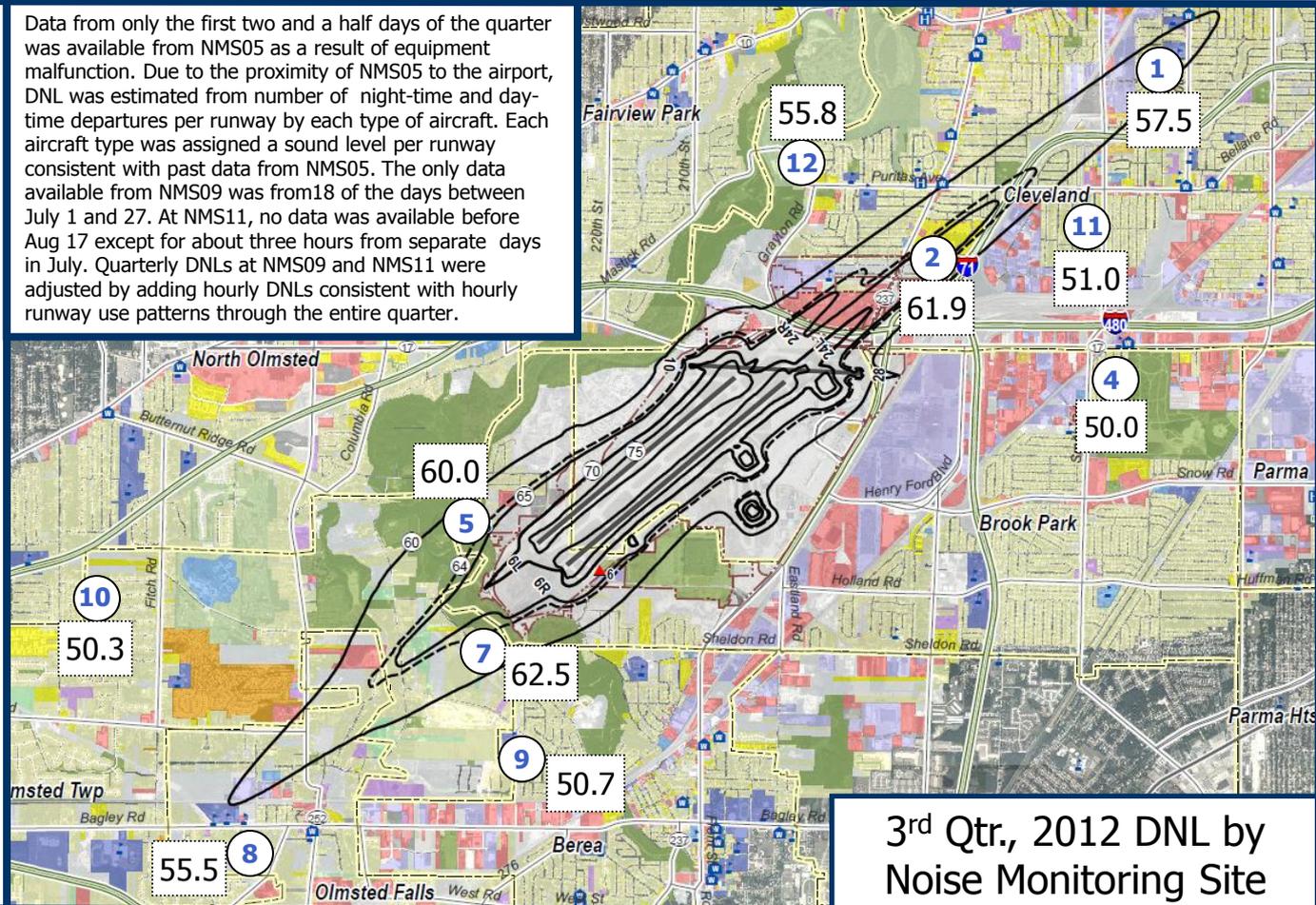
Arrival paths not conforming with the Noise Compatibility Program are indicated by actual tracks:

Aircraft Noise

-  2017 Forecast DNL Contours
-  2017 Forecast DNL Contours (64 dB DNL)
-  Permanent Noise Monitor Location
-  Airport Boundary
-  Residential
-  Multi-Unit Residential
-  Mobile Home Park
-  Transient Lodging
-  Educational Facility
-  Agriculture
-  Golf Courses
-  Recreation / Open Space
-  Medical / Nursing Home
-  Commercial
-  Industrial
-  Place of Worship / Cemetery
-  Public Use
-  Transportation and Utilities
-  Undefined or Vacant Land
-  Municipal Boundaries

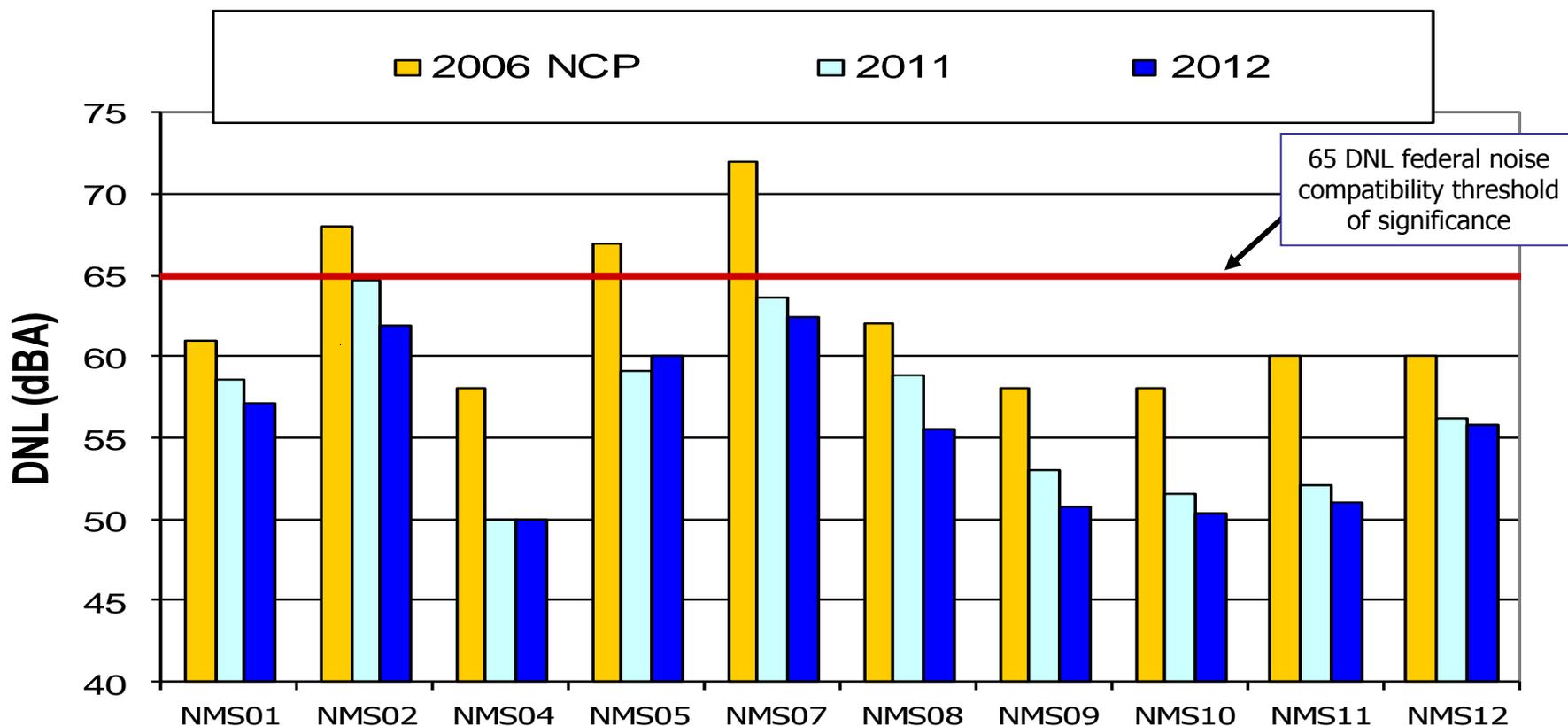
-  Hospital
-  Schools
-  Place of Worship

Data from only the first two and a half days of the quarter was available from NMS05 as a result of equipment malfunction. Due to the proximity of NMS05 to the airport, DNL was estimated from number of night-time and day-time departures per runway by each type of aircraft. Each aircraft type was assigned a sound level per runway consistent with past data from NMS05. The only data available from NMS09 was from 18 of the days between July 1 and 27. At NMS11, no data was available before Aug 17 except for about three hours from separate days in July. Quarterly DNLs at NMS09 and NMS11 were adjusted by adding hourly DNLs consistent with hourly runway use patterns through the entire quarter.



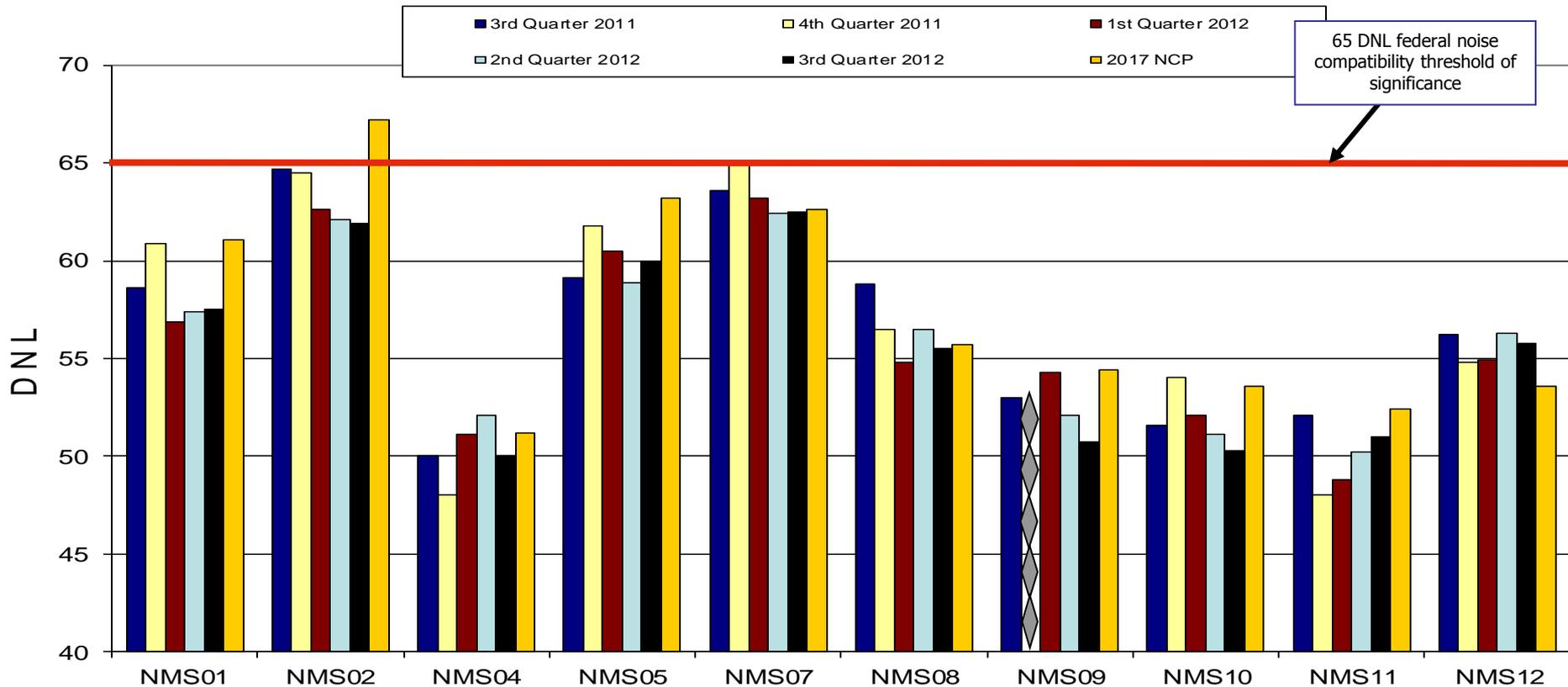
3rd Qtr., 2012 DNL by
Noise Monitoring Site

DNL: 3rd Qtr, 2012 vs. 3rd Qtr, 2011



Data from only the first two and a half days of the quarter was available from NMS05 as a result of equipment malfunction. Due to the proximity of NMS05 to the airport, DNL was estimated from number of night-time and day-time departures per runway by each type of aircraft. Each aircraft type was assigned a sound level per runway consistent with past data from NMS05. The only data available from NMS09 was from 18 of the days between July 1 and 27. At NMS11, no data was available before Aug 17 except for about three hours from separate days in July. Quarterly DNLs at NMS09 and NMS11 were adjusted by adding hourly DNLs consistent with hourly runway use patterns through the entire quarter.

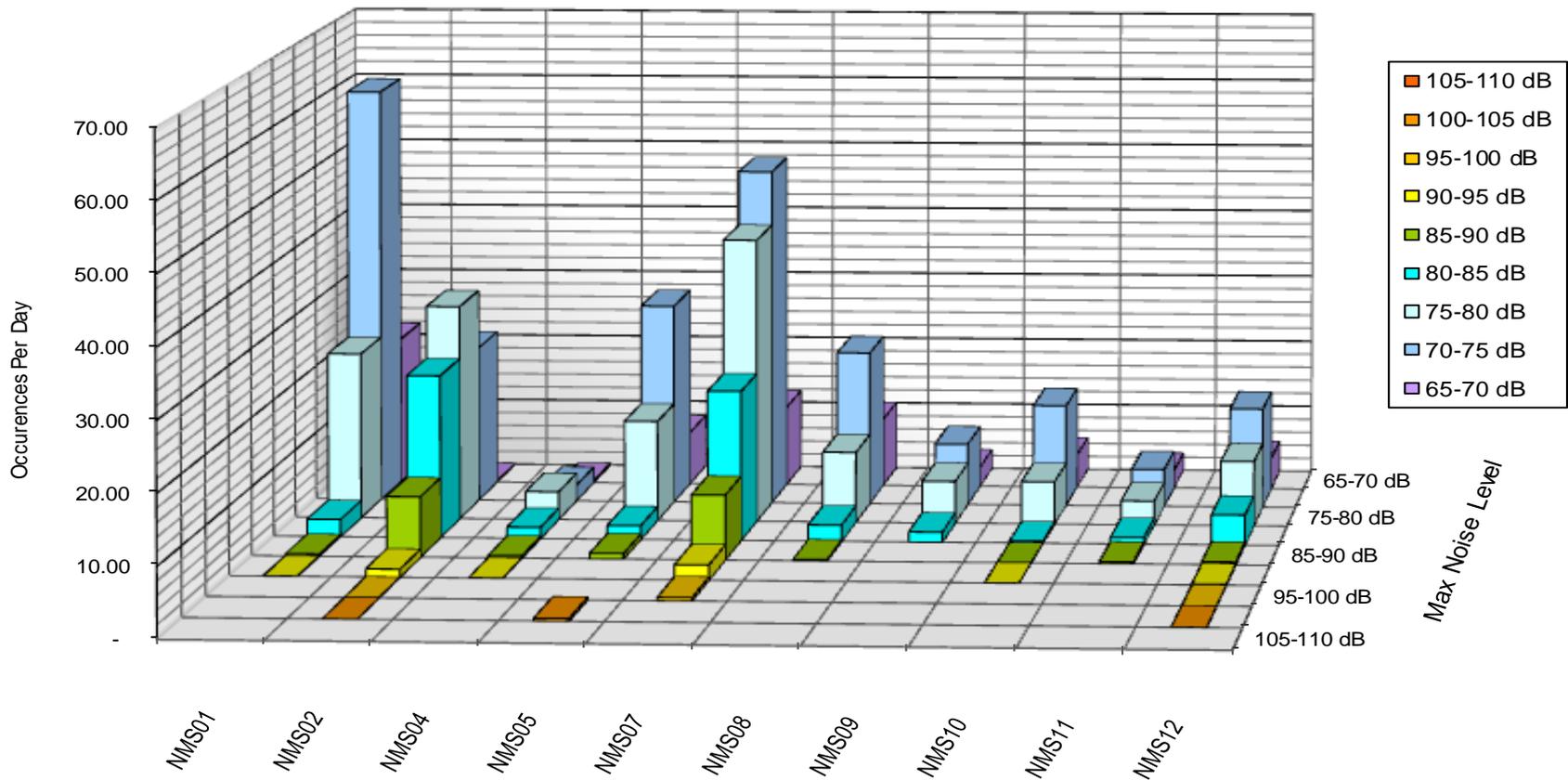
Five Qtr. DNL Comparison



Data from only the first two and a half days of the quarter was available from NMS05 as a result of equipment malfunction. Due to the proximity of NMS05 to the airport, DNL was estimated from number of night-time and day-time departures per runway by each type of aircraft. Each aircraft type was assigned a sound level per runway consistent with past data from NMS05. The only data available from NMS09 was from 18 of the days between July 1 and 27. At NMS11, no data was available before Aug 17 except for about three hours from separate days in July. Quarterly DNLs at NMS09 and NMS11 were adjusted by adding hourly DNLs consistent with hourly runway use patterns through the entire quarter.

Distribution of Noise Events

Distribution of Lmax, Averaged by Day, 3rd Qtr., 2012



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



NMS	Lmax (dB)	Aircraft	Operation	Time and date	Sound Exposure Level (dB)	Duration (sec)
NMS01	92.3	Military Jet	Arrival on Rwy 24R	8/30/12 2:28 PM	98.8	51.0
NMS01	91.3	Military Jet	Arrival on Rwy 24R	8/31/12 7:06 PM	99.0	33.5
NMS01	89.7	MD-88	Arrival on Rwy 24R	8/27/12 2:46 PM	96.2	39.0
NMS02	103.4	Military Jet	Arrival on Rwy 24R	8/30/12 2:29 PM	108.2	37.5
NMS02	96.1	MD-83	Departure off Rwy 6R	7/16/12 6:33 PM	100.9	22.5
NMS02	95.8	MD-88	Departure off Rwy 6R	7/27/12 4:00 PM	101.6	24.0
NMS04	92.7	MD-88	Arrival on Rwy 28	8/30/12 12:18 PM	96.3	13.0
NMS04	90.8	Military Jet	Departure off Rwy 6L	9/30/12 2:59 PM	99.3	44.5
NMS04	90.4	DC9-50	Departure off Rwy 6R	9/15/12 8:24 AM	98.6	30.0
NMS05	100.1	Lear Jet 25	Departure off Rwy 24R	7/ 3/12 9:04 AM	105.7	35.5
NMS05	89.1	MD-88	Departure off Rwy 24L	7/ 1/12 12:18 PM	90.8	17.0
NMS05	88.6	B737-900	Departure off Rwy 24L	7/ 3/12 8:31 AM	92.5	10.0
NMS07	99.0	DC9-50	Departure off Rwy 24L	9/ 8/12 7:08 AM	105.1	28.5
NMS07	99.0	MD-88	Departure off Rwy 24L	8/ 8/12 10:55 AM	101.6	28.0
NMS07	98.5	DC9-50	Departure off Rwy 24L	9/26/12 7:12 AM	106.2	45.0

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, 3rd Qtr, (2 of 2)

NMS	Lmax (dB)	Aircraft	Operation	Time and date	Sound Exposure Level (dB)	Duration (sec)
NMS08	89.2	MD-83	Departure off Rwy 24L	7/16/12 7:12 AM	95.8	25.5
NMS08	88.0	MD-83	Departure off Rwy 24L	7/ 7/12 6:23 PM	94.8	28.0
NMS08	87.9	MD-88	Departure off Rwy 24L	9/17/12 1:10 PM	95.3	32.0
NMS09	84.8	B737-300	Departure off Rwy 24L	7/24/12 6:12 AM	91.1	18.5
NMS09	83.8	B737-300	Departure off Rwy 24L	7/ 5/12 6:11 AM	89.7	20.0
NMS09	83.1	B737-700	Departure off Rwy 24L	7/22/12 1:51 PM	90.6	19.5
NMS10	90.5	Military Jet(s)	Departure off Rwy 24L or 24R	8/30/12 4:50 PM	99.0	32.0
NMS10	86.5	MD-82	Departure off Rwy 24L	7/23/12 2:05 PM	92.3	27.0
NMS10	85.2	Lear Jet 25	Departure off Rwy 24R	7/ 3/12 9:05 AM	96.2	49.0
NMS11	90.0	MD-88	Departure off Rwy 6R	8/24/12 4:39 PM	96.0	26.5
NMS11	89.0	MD-88	Departure off Rwy 6R	9/28/12 4:08 PM	95.9	30.0
NMS11	88.9	DC9-50	Departure off Rwy 6L	9/30/12 11:09 AM	98.1	38.5
NMS12	100.7	Military Jet(s)	Arrival on Rwy 24R	8/31/12 7:07 PM	106.1	78.0
NMS12	100.3	Military Jet(s)	Arrival on Rwy 24R	8/30/12 2:30 PM	106.9	69.0
NMS12	97.2	Military Jet(s)	Departure off Rwy 6R	9/ 1/12 12:48 PM	106.2	49.5

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

Noise Hotline (216.898.5220)



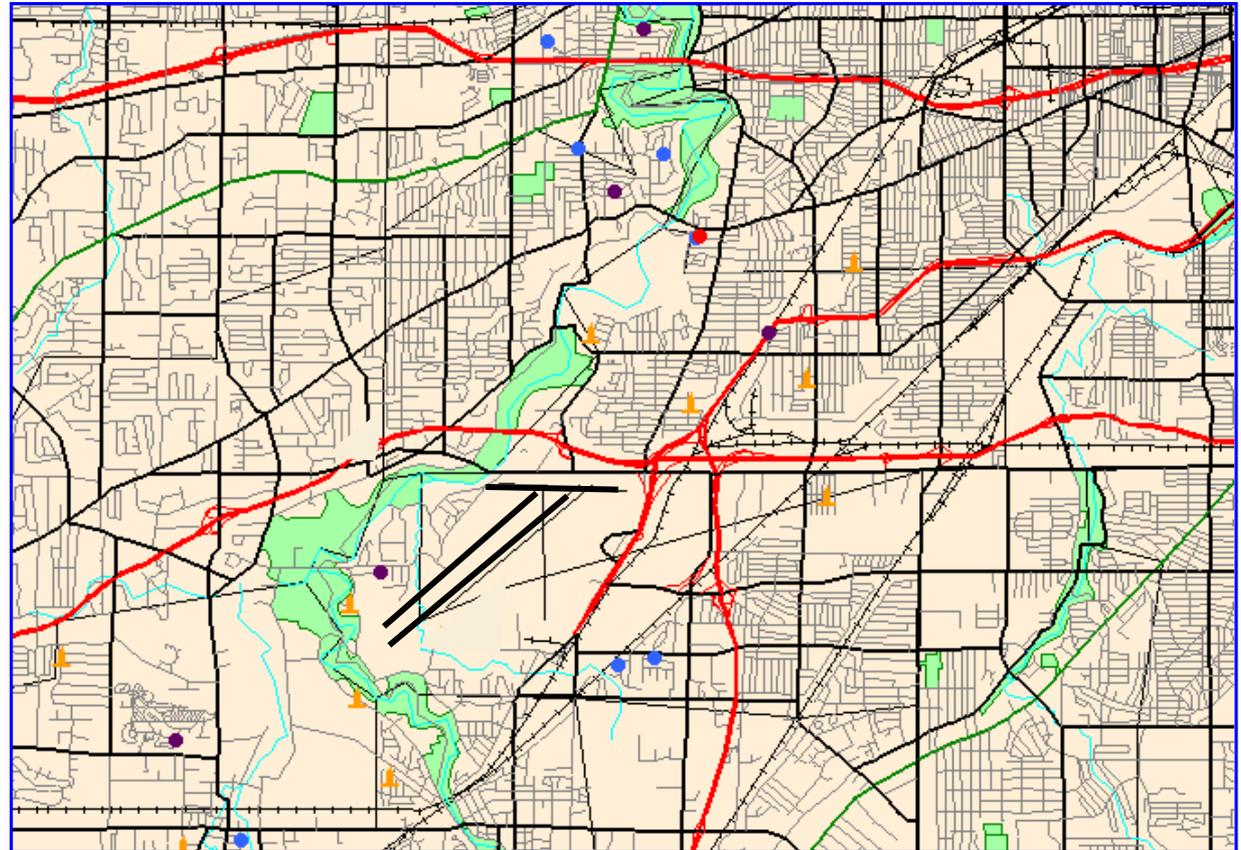
	Jul	Aug	Sep	3 rd Qtr Calls	%	Callers	%
Berea	0	0	0	0	0.00%	0	0.00%
Brook Park	0	3	1	4	12.90%	3	21.43%
Cleveland	6	3	4	13	41.94%	3	21.43%
Fairview Park	1	3	1	5	16.13%	3	21.43%
Lakewood	0	0	0	0	0.00%	0	0.00%
Middleburg Hts.	0	0	0	0	0.00%	0	0.00%
North Olmsted	0	0	0	0	0.00%	0	0.00%
Olmsted Falls	1	0	0	1	3.23%	1	7.14%
Olmsted Twp	0	0	2	2	6.45%	1	7.14%
Parma	0	0	0	0	0.00%	0	0.00%
Parma Heights	0	0	0	0	0.00%	0	0.00%
Rocky River	4	2	0	6	19.35%	3	21.43%
Westlake	0	0	0	0	0.00%	0	0.00%
Other	0	0	0	0	0.00%	0	0.00%
Total (2012)	12	11	8	31	100.00%	14	100.00%
Total (2011)	18	6	21	45	100.00%	22	100.00%

Complaint Location Map: 3rd Qtr, 2012

LEGEND

Complaints per household

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



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