

CALGARY
AIRPORT
AUTHORITY

YYC

Airport Community Consultative Committee

September 20, 2016



AGENDA

- 6:30 p.m. Welcome & Introductions
- 6:35 p.m. Noise Monitoring Update
- 7:05 p.m. Operational Procedures at YYC – Straight-out Departures
- 7:20 p.m. PublicVue Flight Tracking System
- 7:35 p.m. Q&A



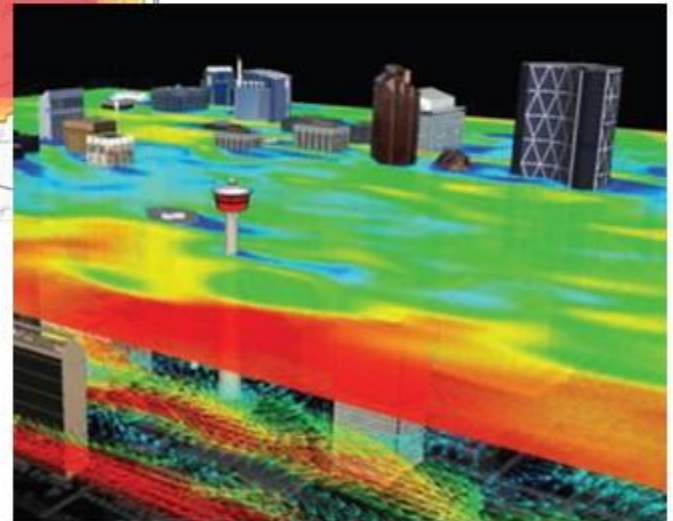
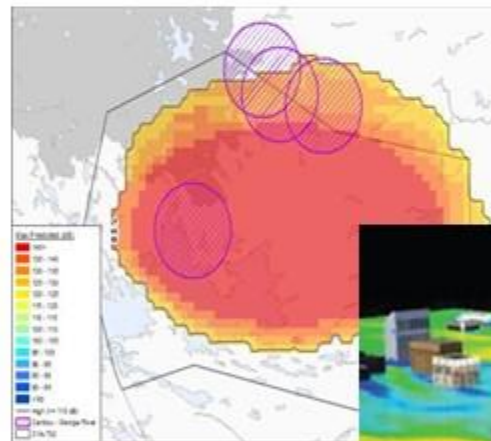
NOISE MONITORING UPDATE

Aircraft Noise Mobile Monitoring

Russ Lewis, M.Eng. P.Eng.
Acoustics and Noise Specialist
RWDI

- Russ Lewis
 - 25+ years experience in engineering
 - Calgary-based acoustics specialist
 - M.Eng. in Acoustics
 - Experience
 - Environmental noise measurement and analysis
 - Predictive noise modelling
 - Building acoustics and vibration
 - Communicating results
 - Working with stakeholders on environmental issues

- Engineers and scientists since 1972
 - Canadian company
 - Acoustics, Noise & Vibration
 - Noise measurement and predictive modelling
 - Wind engineering
 - Microclimate
 - Air quality



- Factors affecting noise levels at a location:
 - Loudness of the source
 - Distance from Source to Receiver
 - Atmospheric Conditions
 - Wind
 - Temperature gradient
 - Variable atmospheric conditions have a large impact on noise at on the ground

- Microphone on stand
- Stabilizing weight
- Weatherproof case
 - Sound Level Meter
 - Data Logger
 - Modem for communications
- Power
 - 120v access is best
 - Batteries
 - Solar panels



- Accuracy of data
 - Instruments used are the most accurate instruments available
 - A Type 1 B&K 2250 is shown during its calibration
 - Accurate over a very wide range of noise levels
- Calibration checked before and after all measurements
- Accurate reliable measurements require professional instruments used under known conditions



- A measurement in dBA is saved every second
- Aircraft events are identified
 - through correlation with aircraft movements
- The number of aircraft noise events exceeding given thresholds is calculated.
 - In consultation with the Calgary Airport Authority, these are typically done for a threshold of 70 dBA
Other thresholds can be used.

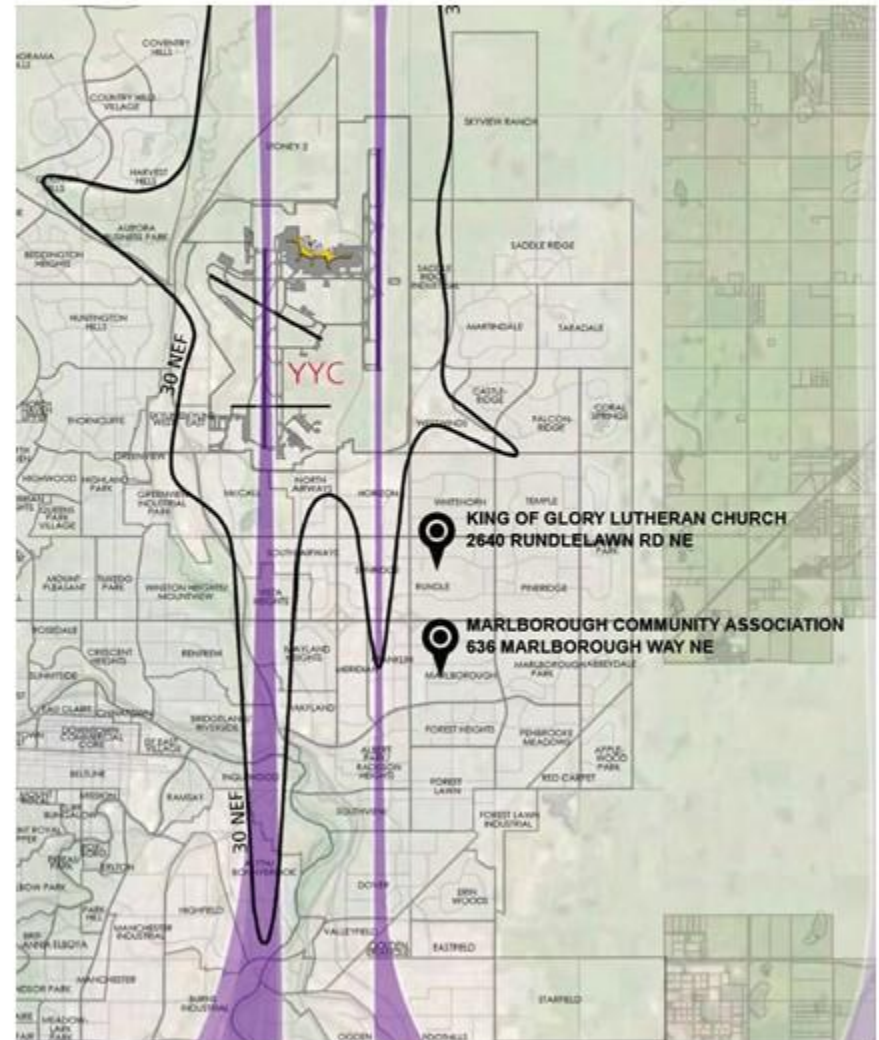


Goal:

- Benchmark noise levels for areas near Runway 17L/35R

Approach:

- Two mobile noise monitor stations (NMT)
- Continuous measurements (24x7)

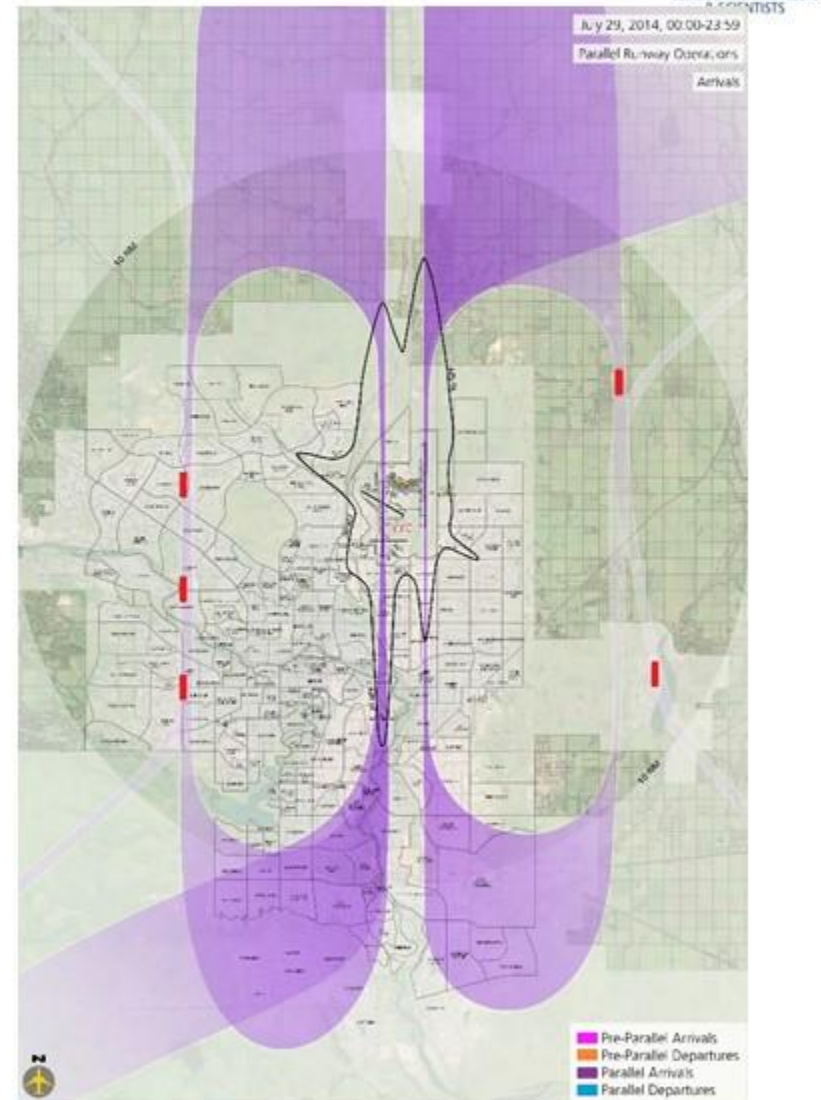


Goal:

- Benchmark noise levels in areas not typically monitored.

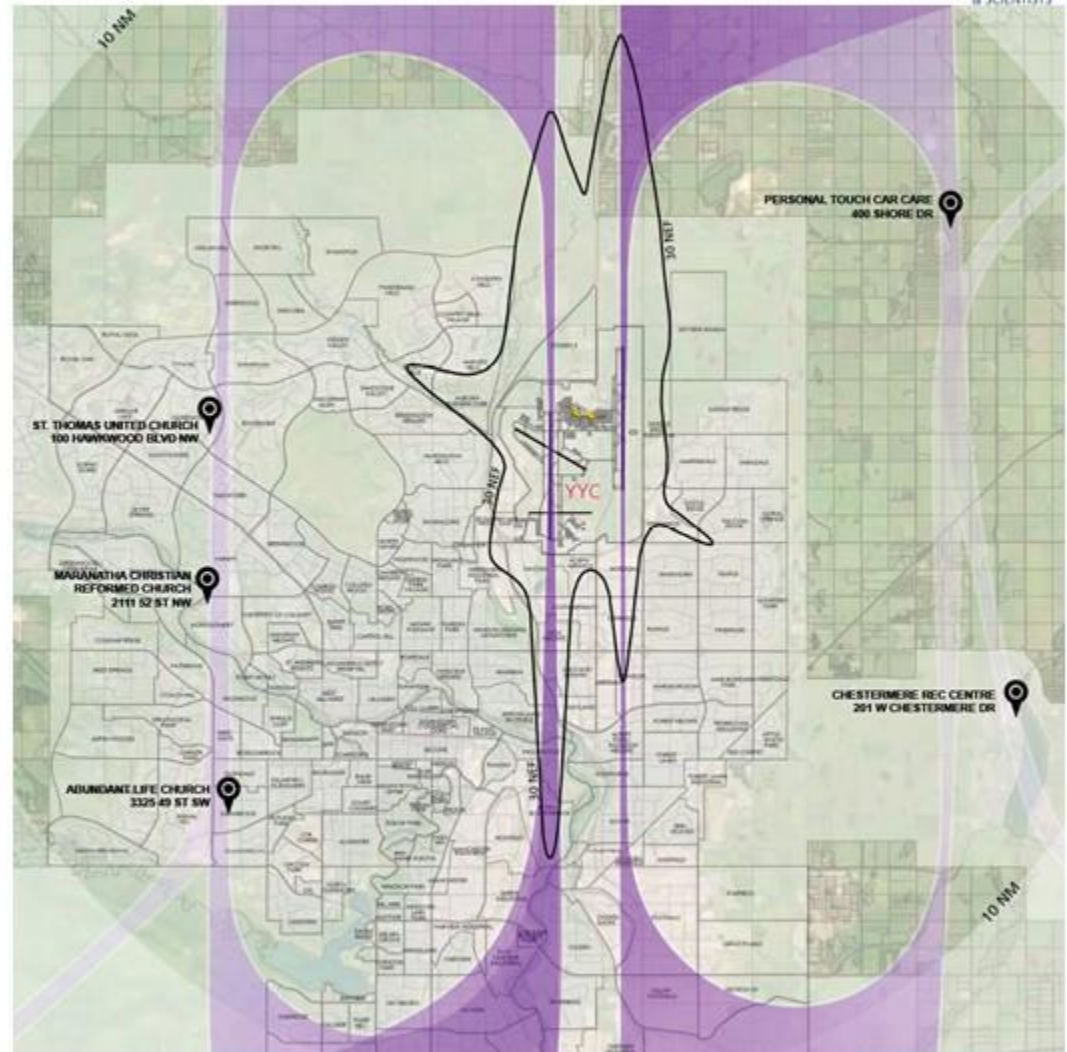
Approach:

- Five noise monitor stations (NMT)
- Period of one month
- Continuous measurements (24x7)



Adjustments:

- Worked with the Community Associations and Committee Members on NMT locations
- Extended the study for an additional month



1. Installation

- RWDI (acousticians) installs Downwind NMTs (July 8 - July 19)

2. Correlation

- RWDI reviews data and provides data to Harris (Flight Tracking System)
- Harris integrates NMT data and flight tracks in order to identify noise events and aircraft events

3. Analysis

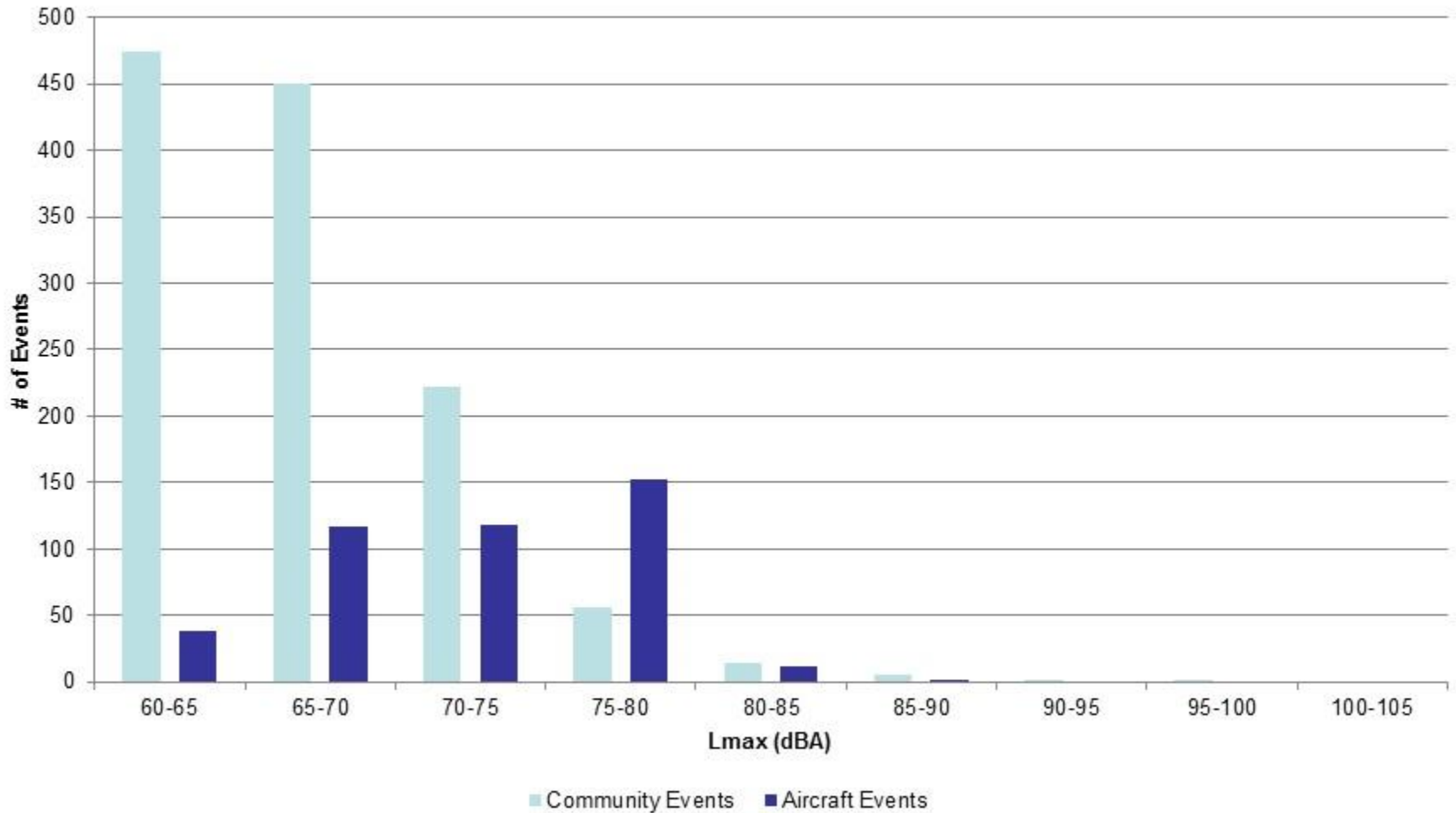
- Acousticians examine the results and provide summary for each location
- Summary is presented to ACCC to gather input

4. Reporting

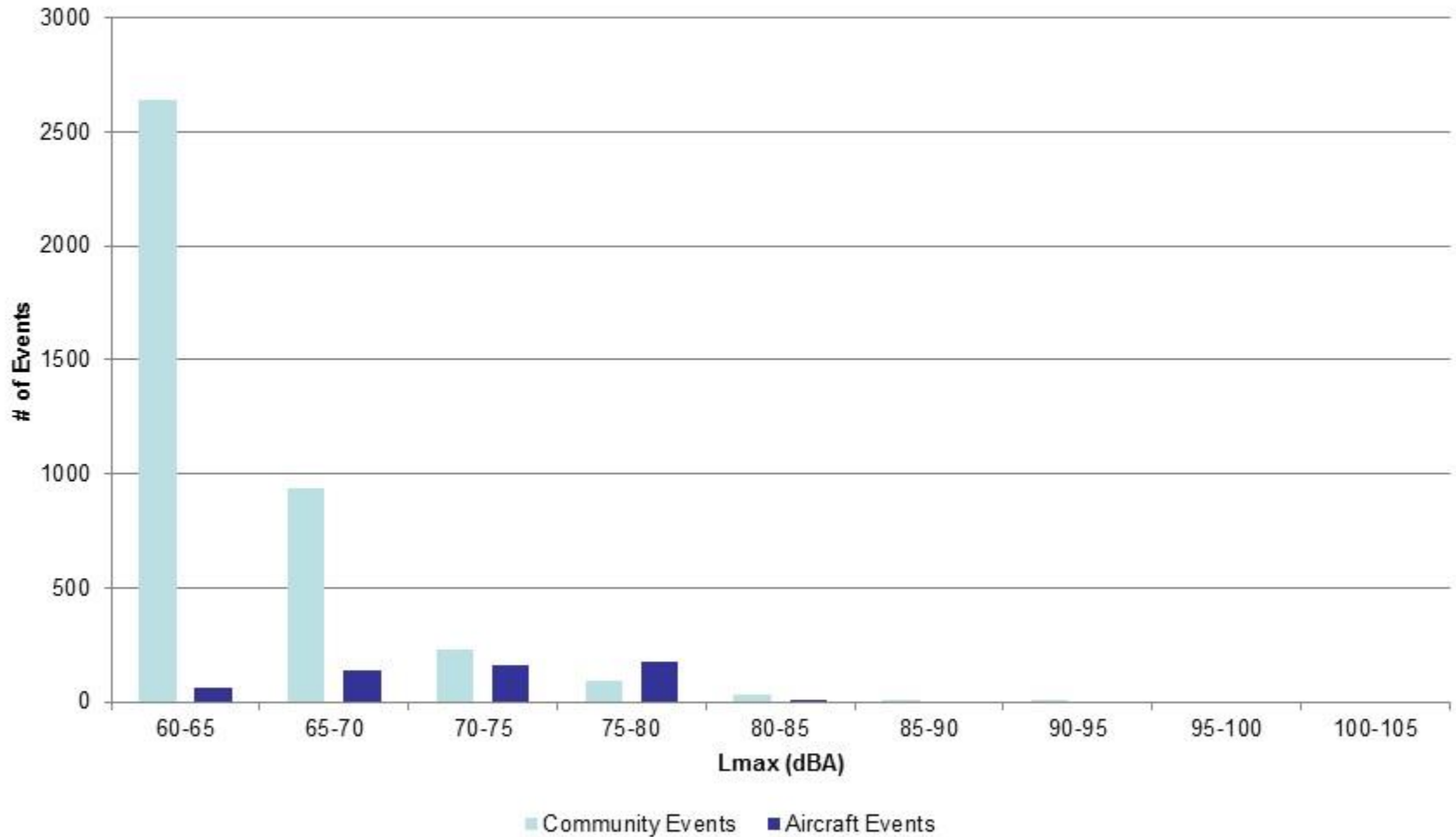
- The Calgary Airport Authority compiles all the results to report back to the community

- 'dBA' is a unit used to represent the overall loudness of a sound – accounting for the variation of sensitivity of the human ear
- An increase of 10 dBA is equivalent to a doubling of perceived noise level.
- Each of the example noise levels in the table are approximately twice as loud as you go up the scale

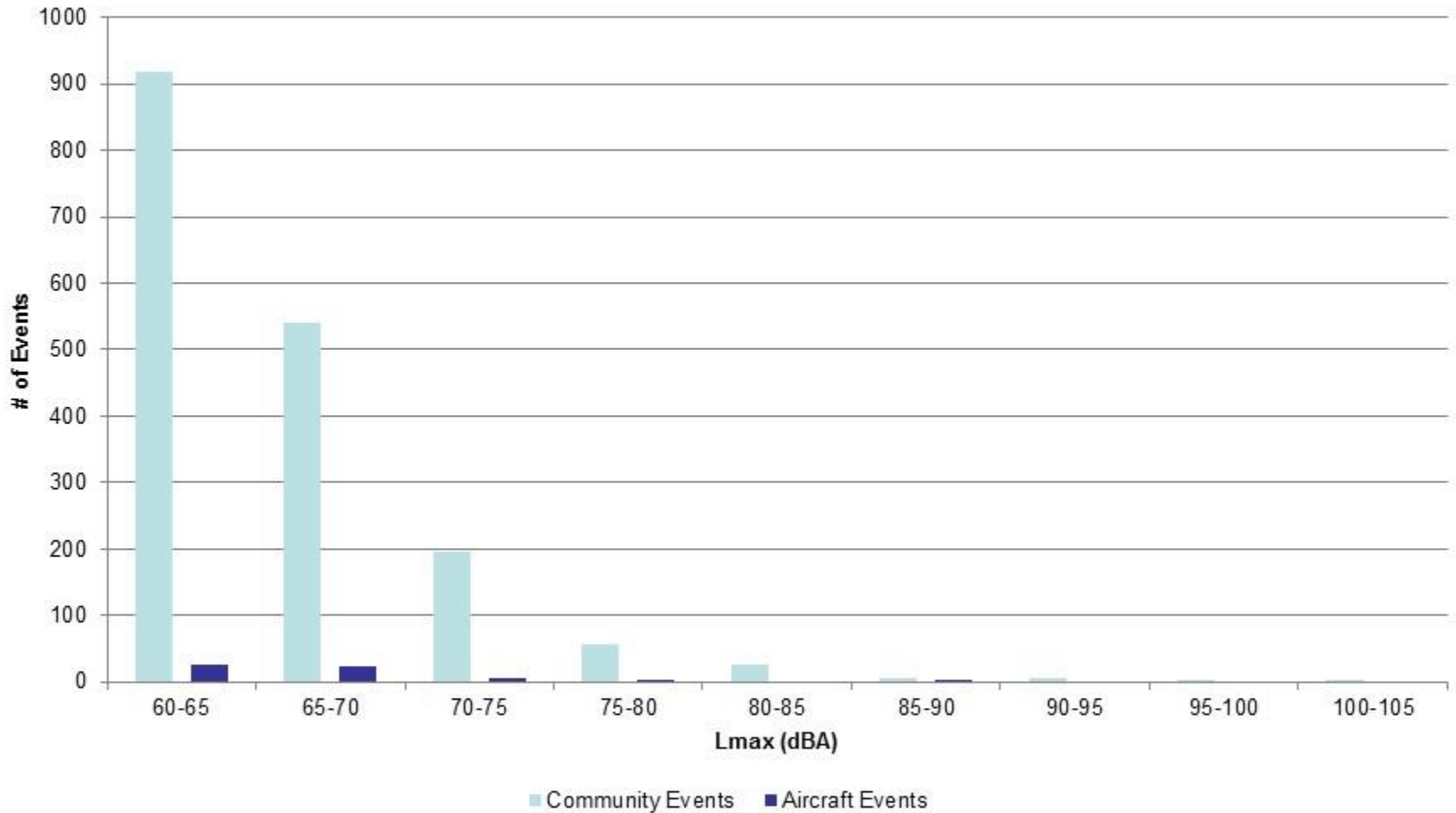
Sound Pressure Level dBA	Example Noise Sources
120	Threshold of pain
110	Loud Rock Band, nearby thunder
100	Dance Club, Car horn at 3m
90	Jack Hammer at 15m
80	Noisy cafeteria
70	Edge of highway
60	Conversational Speech
50	Office hubub
40	Soft music in the home
30	Very quiet home at night
20	Whisper



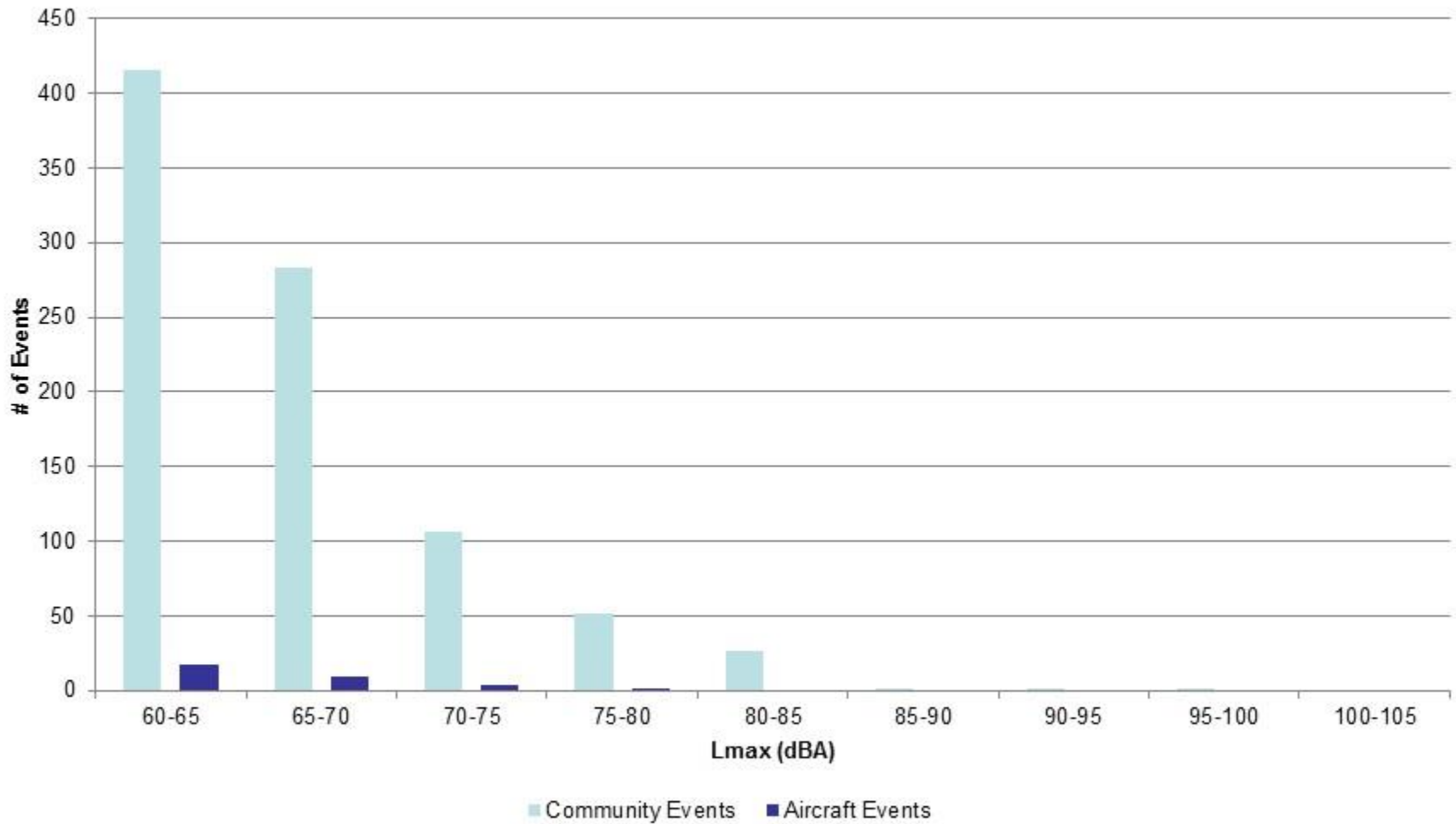
Metric	Per month (30 days)
Average daily community noise events (over 70 dBA)	11 events
Average daily aircraft noise events (over 70 dBA)	11 events
Average daily aircraft noise events at night (11pm-7am)	1 event
Average daily aircraft over noise monitor	14
Average altitude of aircraft noise event	1853 ft. AGL
Average dBA of aircraft noise event	72.2 dBA



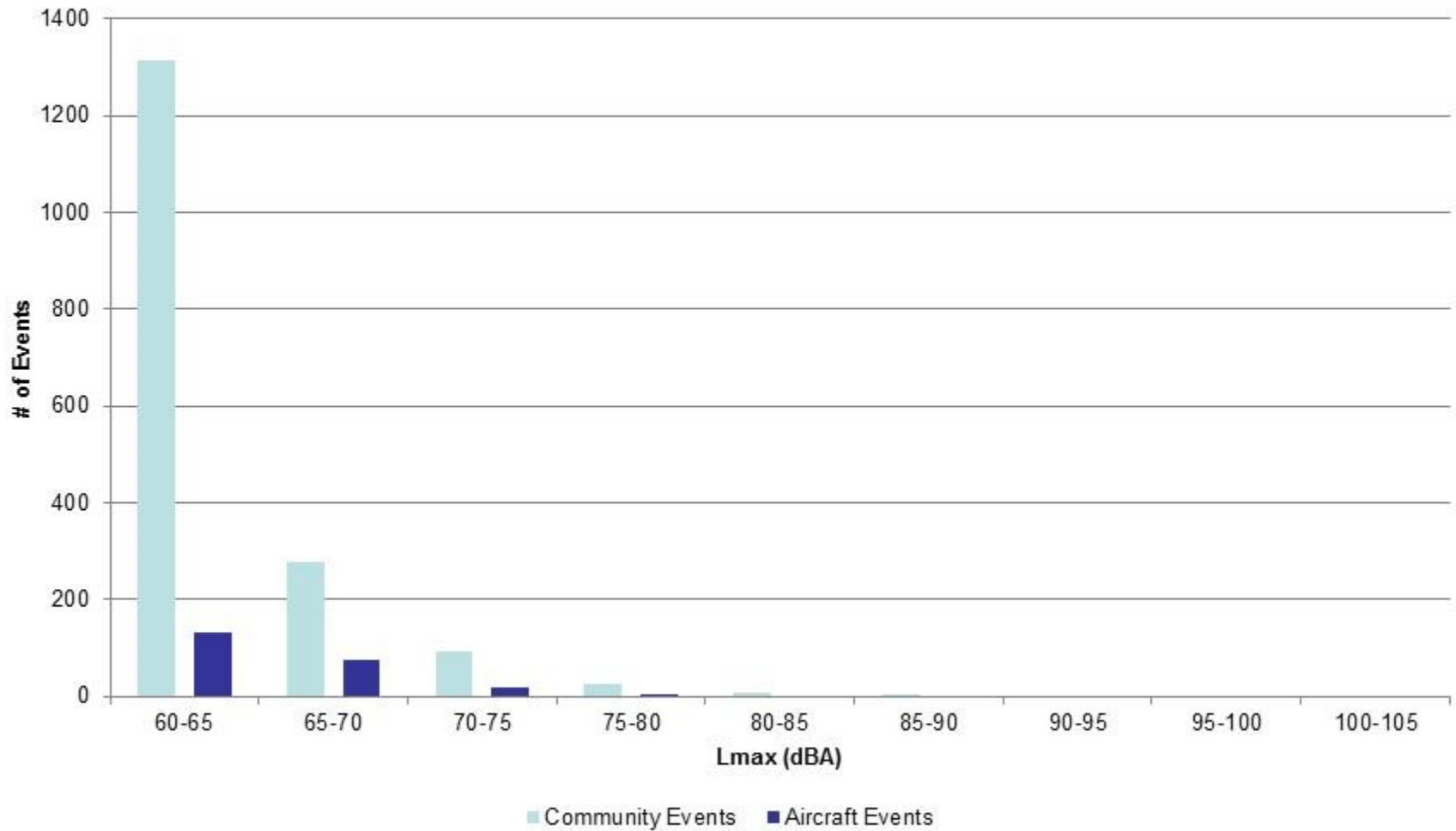
Metric	Per month (30 days)
Average daily community noise events (over 70 dBA)	13 events
Average daily aircraft noise events (over 70 dBA)	12 events
Average daily aircraft noise events at night (11pm-7am)	1 event
Average daily aircraft over noise monitor	19
Average altitude of aircraft noise event	2249 ft. AGL
Average level of aircraft noise event	71.6 dBA



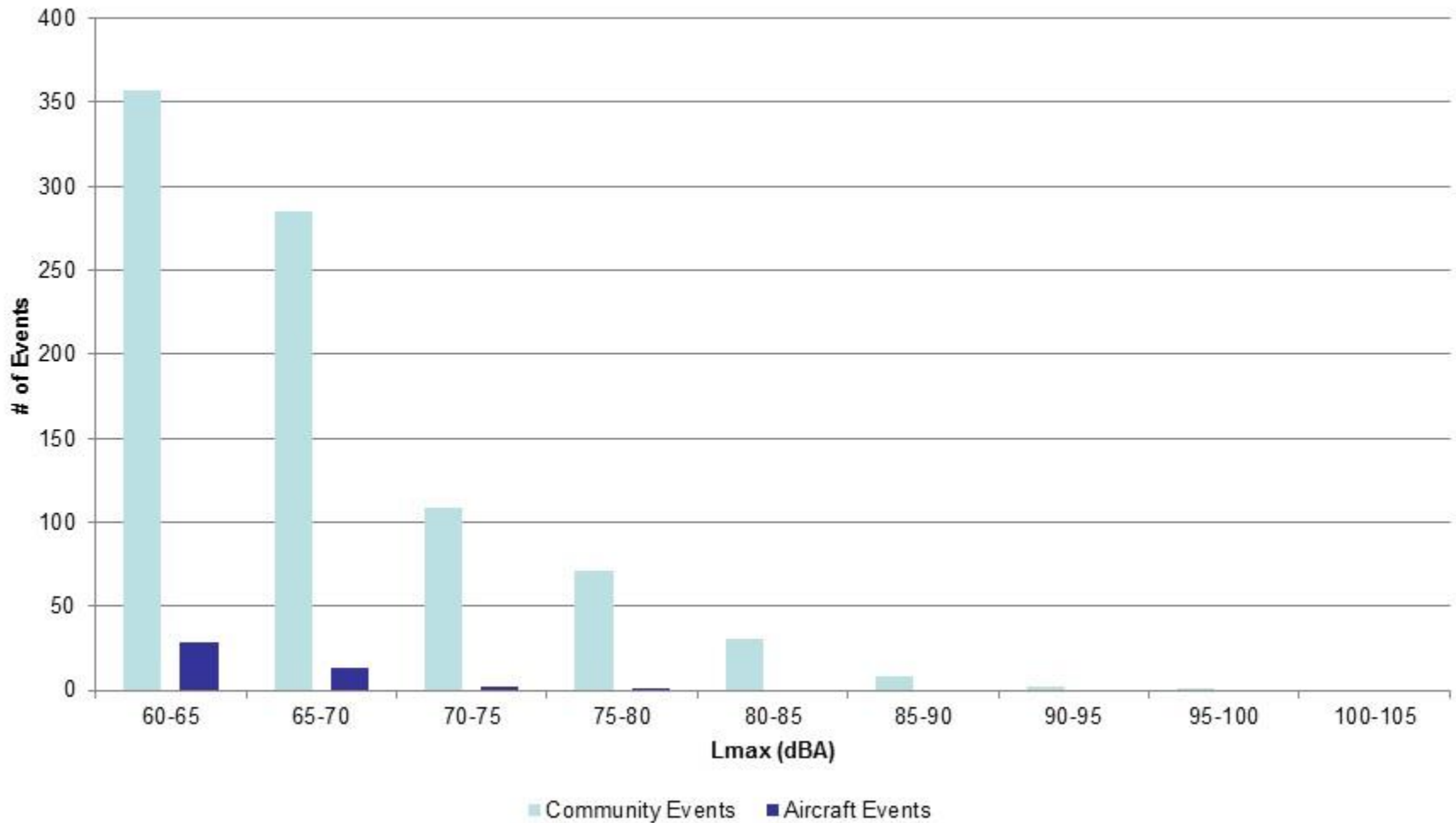
Metric	Per month (30 days)
Average daily community noise events (over 70 dBA)	10 events
Average daily aircraft noise events (over 70 dBA)	0 events
Average daily aircraft noise events at night (11pm-7am)	0 event
Average daily aircraft over noise monitor	45
Average altitude of aircraft noise event	3392 ft. AGL
Average dBA of aircraft noise event	66.3 dBA



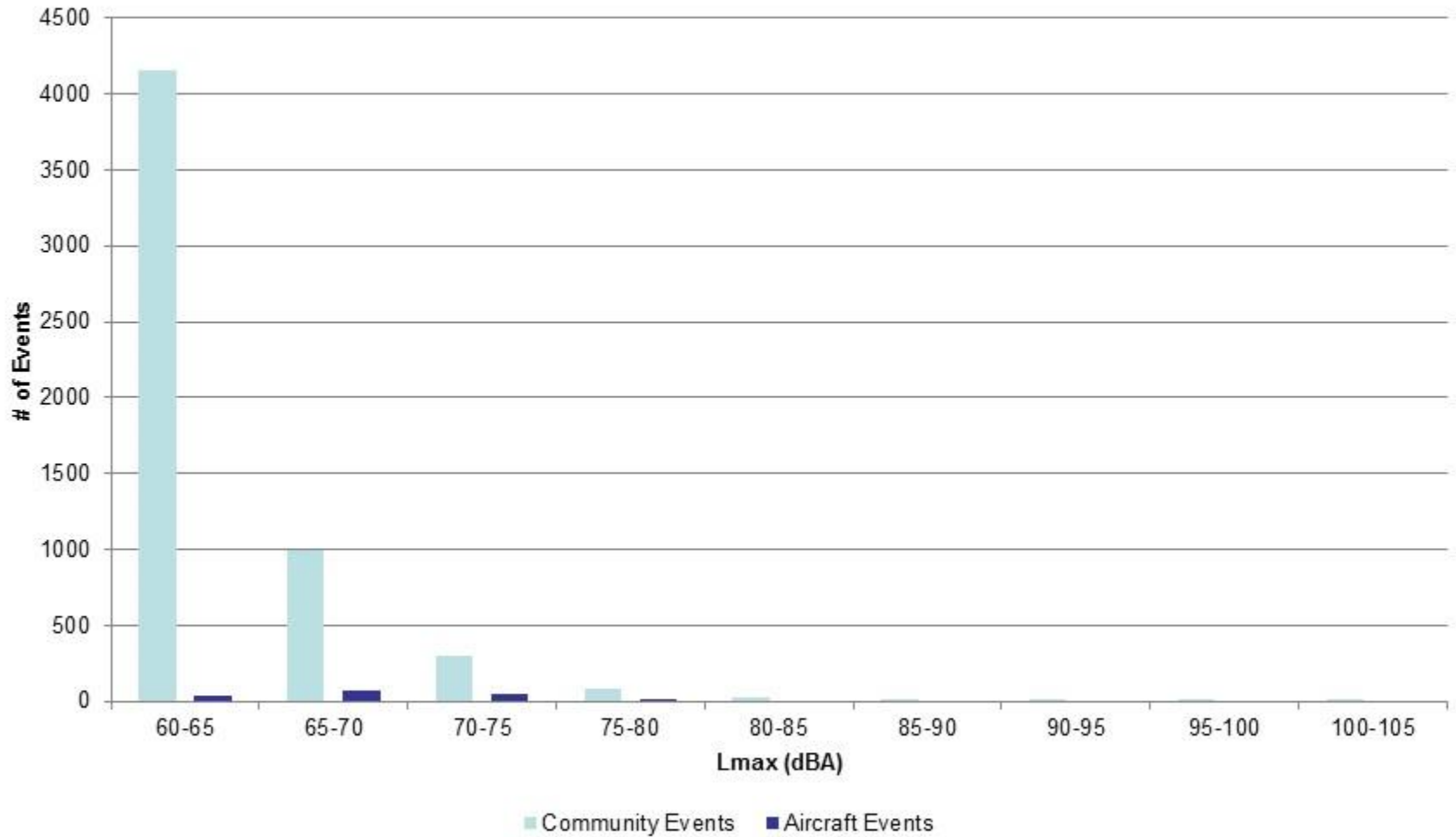
Metric	Per month (30 days)
Average daily community noise events (over 70 dBA)	7 events
Average daily aircraft noise events (over 70 dBA)	0 events
Average daily aircraft noise events at night (11pm-7am)	0 events
Average daily aircraft over noise monitor	46
Average altitude of aircraft noise event	2455 ft. AGL
Average dBA of aircraft noise event	66.1 dBA



Metric	Per month (30 days)
Average daily community noise events (over 70 dBA)	5 events
Average daily aircraft noise events (over 70 dBA)	1 events
Average daily aircraft noise events at night (11pm-7am)	0 event
Average daily aircraft over noise monitor	53
Average altitude of aircraft noise event	2752 ft. AGL
Average dBA of aircraft noise event	65.3 dB

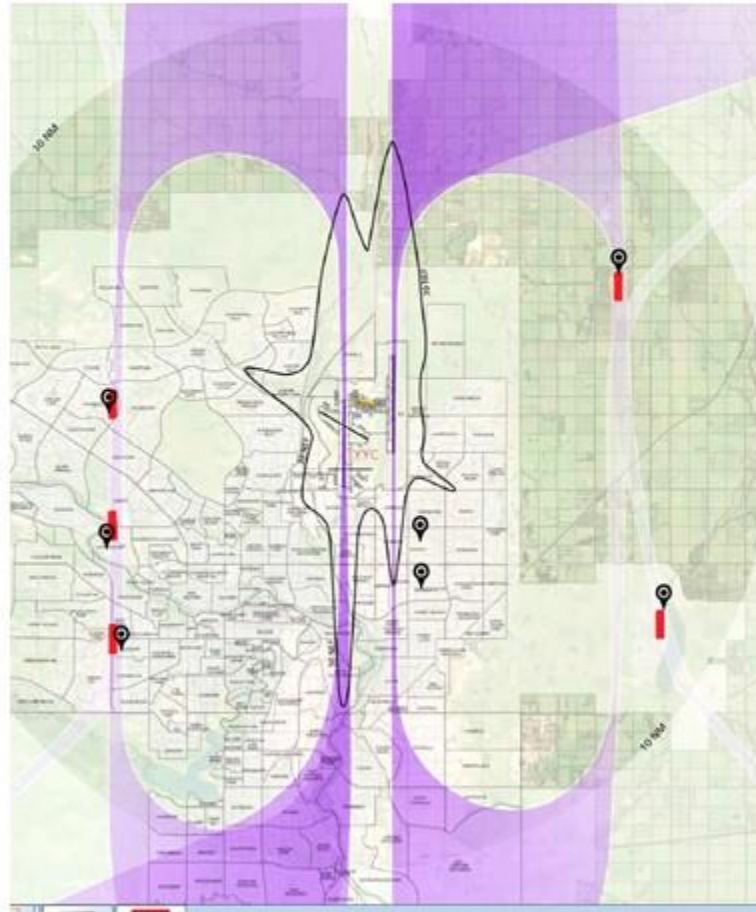


Metric	Per month (30 days)
Average daily community noise events (over 70 dBA)	9 events
Average daily aircraft noise events (over 70 dBA)	0 events
Average daily aircraft noise events at night (11pm-7am)	0 event
Average daily aircraft over noise monitor	23
Average altitude of aircraft noise event	3613 ft. AGL
Average dBA of aircraft noise event	64.8 dB



Metric	Per month (30 days)
Average daily community noise events (over 70 dBA)	14 events
Average daily aircraft noise events (over 70 dBA)	2 events
Average daily aircraft noise events at night (11pm-7am)	1 event
Average daily aircraft over noise monitor	21
Average altitude of aircraft noise event	2029 ft. AGL
Average dBA of aircraft noise event	67.9 dB

- **Questions?**



Next Steps

1. Finalize the NMT data analysis and prepare the report to the community (next ACCC meeting)
2. Continue to evaluate the use of virtual monitors
3. Identify sites for NMT relocation (based on aircraft operations)

NAVCANADA - 5° Letter

OPERATIONAL PROCEDURES AT YYC

Definitions

Heading

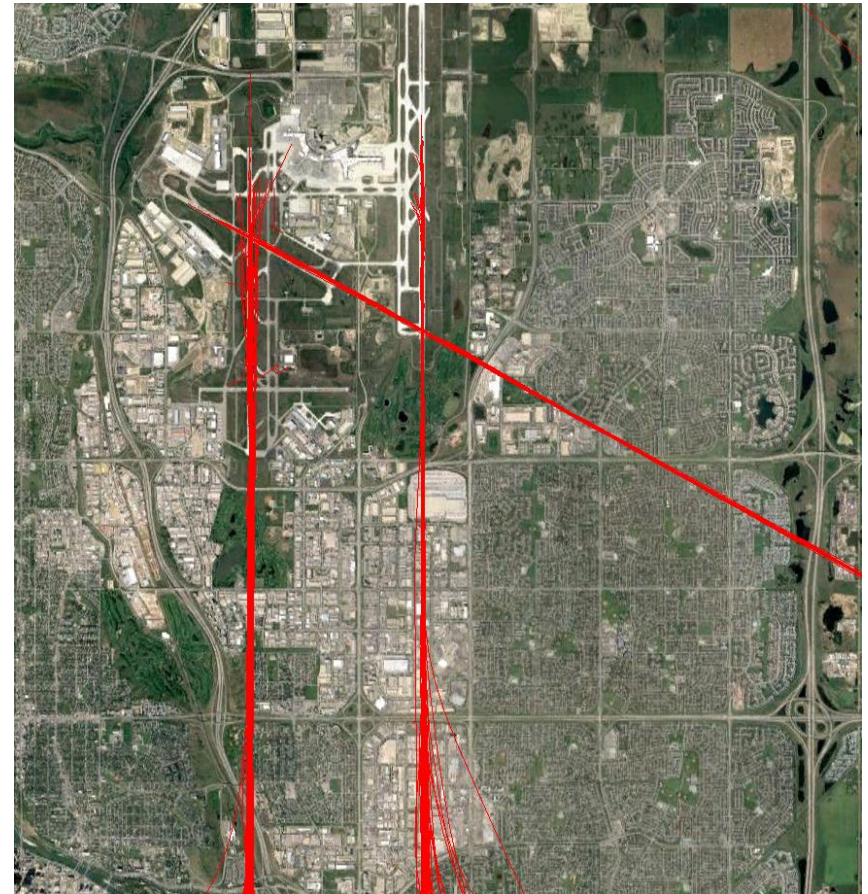
- Also referred to as Magnetic Heading (MH)
- Is the direction an aircraft is pointed with respect to magnetic north
- Subject to wind drift
- Runway Headings are Magnetic Headings

Tracking

- Is the course of an aircraft over the ground
- It uses instrumentation and GPS technology
- It is not impacted by wind drift

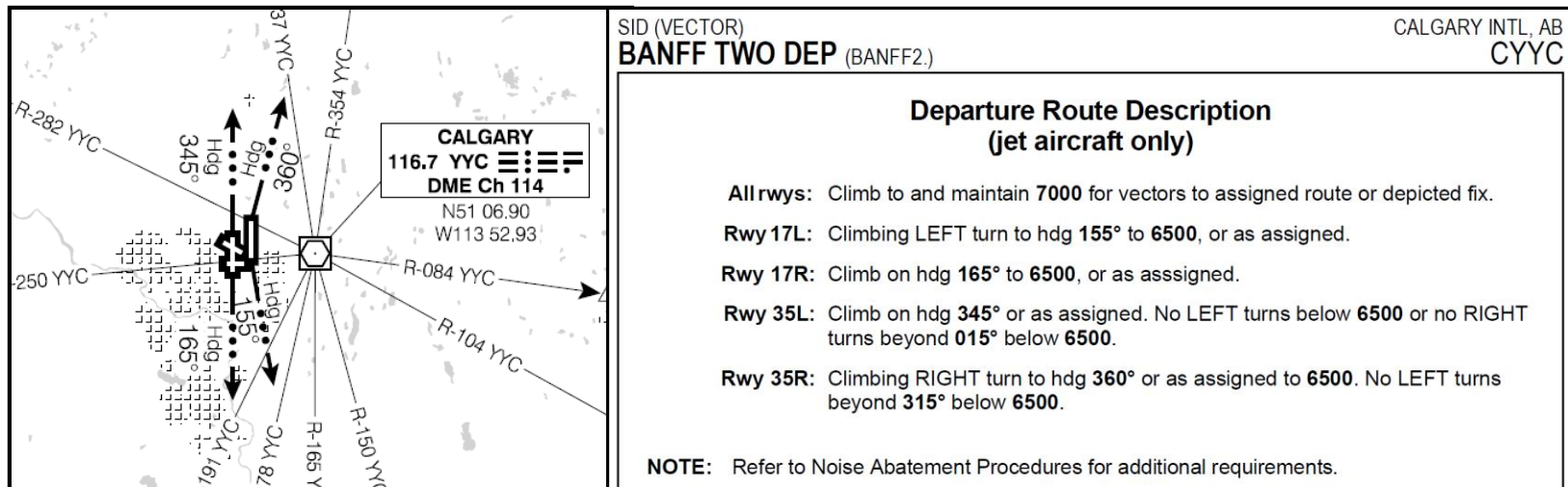
Straight-in Arrivals

- All arrivals into YYC are **straight-in** to align with the runways.
- Arrivals are aligned with the runways during final approach when aircraft are between 4-8 miles from the threshold.
- More than 95% of arriving aircraft at YYC use instrumentation available to them in the cockpit (IFR). They are not navigating by using any reference to what is on the ground (VFR).
- Straight in approaches will use either the Instrument Landing System (ILS), RNAV Required Navigation or RNP.

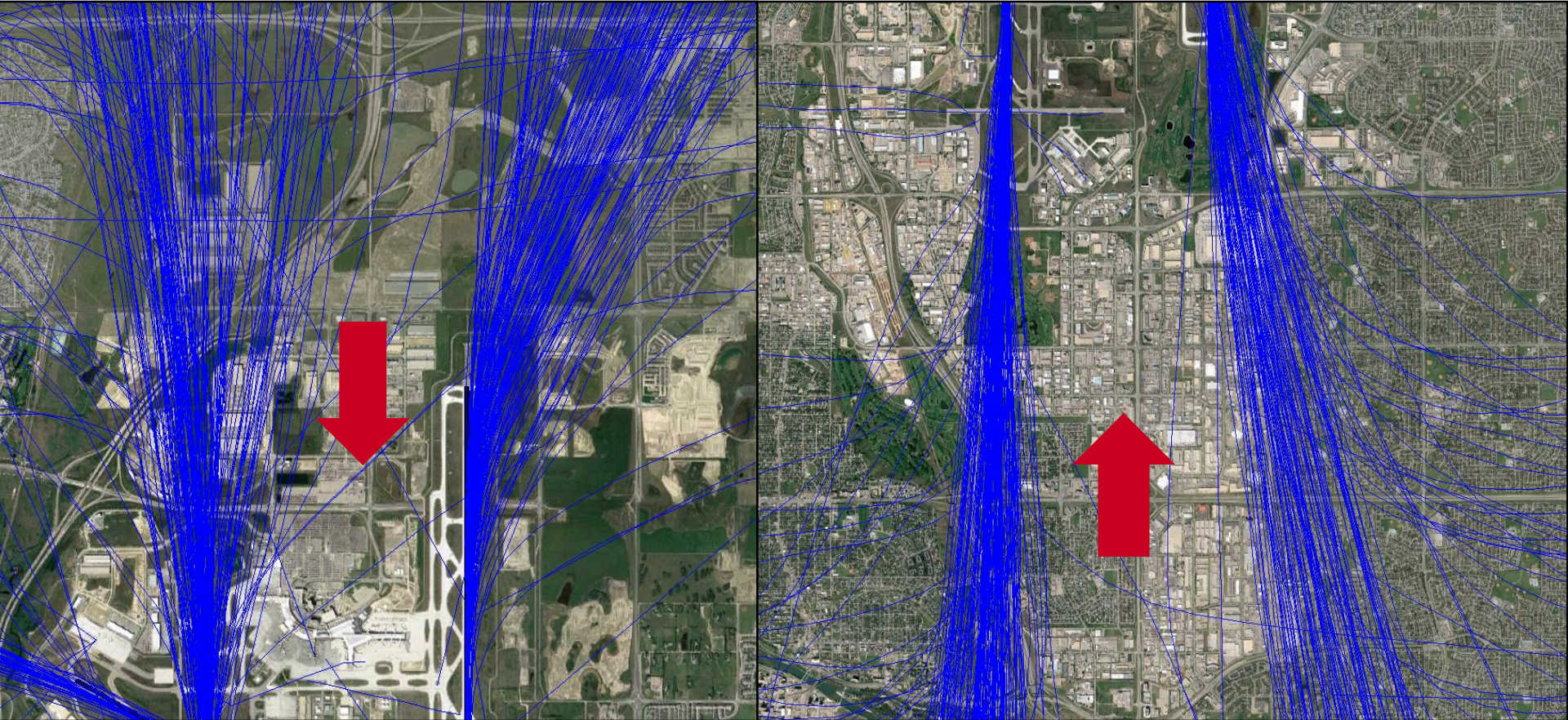


Straight-out Departures

- Straight-out departures at YYC mean aircraft follow runway headings.
- Departures are subject to wind drift. The Control Tower will apply drift correction if required.
- Departures follow established procedures. Procedures are assigned based on operations, runway, destination, time of day and aircraft type.



Straight-out Departures (24 hours)




Winds from the north

Winds from the south

PublicVue – FLIGHT TRACKING SYSTEM



**PublicVue Flight
Tracking System**

Learn more 

Additional Items

- Next ACCC meeting – Wednesday November 30, 2016

QUESTIONS & ANSWERS