# CONNECTING WITH THE COMMUNITY:

## ANNUAL NOISE REPORT - 2017

**YYC** CALGARY INTERNATIONAL AIRPORT

# DISCLAIMER

This report contains a summary of data collected over the specified period and is intended to convey the best information available at the time. The system databases are, to some extent, dependent upon external sources and errors may occur. All care is taken in the preparation of the report, but its complete accuracy cannot be guaranteed. The Calgary Airport Authority does not accept any legal liability for any losses arising from reliance upon data in this report which may be found to be inaccurate.

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# 1.0 INTRODUCTION

2017 was an exciting year as we welcomed a record 16.3 million passengers at YYC Calgary International Airport (YYC) and it was the first full year of operations in the new International Terminal Building. This demonstrates that, despite the current economic climate, YYC continues to be a strong economic driver in the Calgary region.

As both YYC and the City of Calgary continue to grow, the Calgary Airport Authority is mindful of airport operations and local communities. That is why we continue to work closely with NAV CANADA, airline partners, municipal governments and Transport Canada to investigate industry changes and innovations that look at addressing aircraft noise.

The Calgary Airport Authority maintains a Noise Management Program for YYC that consists of a Noise Monitoring Program, community engagement via consultative committee meetings, a noise concern investigation program, and lastly, publishing noise reports both quarterly and annually.

As part of YYC's Noise Management Program, the Authority has summarized the airport's operations and noise related initiatives undertaken in 2017 in this Annual Noise Report.

# 3.0 NOISE MANAGEMENT

Airports around the world share similar challenges when it comes to aircraft noise. The Calgary Airport Authority participates in industry working groups as a member of the Canada Airports Council to discuss innovations and industry-leading practices in aircraft noise management at airports.  At YYC, we actively review these industry leading practices as well as recommendations and suggestions from our consultative committees to determine if their implementation at YYC is feasible.  The review process involves both discussions with our airline partners and NAV CANADA, and are primarily focused on aviation safety. In some instances, a trial is proposed to evaluate the practice.

The Calgary Airport Authority listens to community concerns, and that is why we are continuously improving the Noise Management Program at YYC.  Refer to Section 4.0 for a summary of the 2017 noise program highlights and Section 10.0 for our proposed initiatives scheduled for 2018.

## 3.1 Industry Level Noise Management: Aviation Regulations, Policies & Guidelines

Regulations and policies dealing with noise management exist at various organizational levels from international standards set by the International Civil Aviation Organization (ICAO) to local Airport Authority policies.  Although noise management is an Airport Authority responsibility at airports across Canada, these Authorities have no regulatory enforcement powers for aeronautical regulations. Transport Canada is the organization responsible for administrating enforcement.

The ICAO working committees develop the international standards and operating procedures for aircraft certification and operations, which member countries reference in their legislation. In Canada, the *Aeronautics Act* (RSC 1985, c A-2) and the *Canadian Aviation Regulations* (CAR) (SOR/96-433) reference ICAO standards and procedures relating to noise certification and aircraft operations. Table 1 provides a brief synopsis of the regulations and guidelines governing aeronautical noise at YYC.

Table 1 - Tiers of regulations, policies and guidelines which govern aircraft noise at YYC

| INTERNATIONAL | |
|---|---|
| **The International Civil Aviation Organization  (ICAO)** | Canada is a member state of ICAO, which is a United Nations Specialized Agency. ICAO sets the standards and regulations necessary for aviation safety, security, efficiency and regularity, air navigation, and environmental protection. ICAO requires the Member States to adopt a 'balanced approach' to noise management. This balanced approach considers:<br>• Noise reduction at source;<br>• Land-use planning and management; and,<br>• Noise abatement operational procedures and operating restrictions. |
| **NATIONAL / FEDERAL** | |
| **Transport Canada (TC)** | TC is the Federal Government department responsible for the development and enforcement of aviation regulations, such as the *Aeronautics Act* and the *Canadian Aviation Regulations* (CAR).<br>TC's responsibilities with regard to noise include:<br>• Establishing noise and emissions standards;<br>• Setting the criteria that govern flight path design;<br>• Reviewing, approving, and publishing of new proposed noise control measures at airports;<br>• Reviewing and approving any new or proposed changes to Noise Abatement Procedures at an airport; and<br>• Conducting enforcement of suspected violations to published Noise Abatement Procedures. |
| **NAV CANADA** | NAV CANADA is responsible for the safe coordination and the efficient movement of aircraft, as well as planning and managing airspace. NAV CANADA assists in the implementation of the Noise Abatement procedures which specify:<br>• Departure and arrival altitude;<br>• Preferential runway use;<br>• Night-time operating restrictions; and<br>• Other restrictions designed to reduce noise disturbance from jet aircraft to surrounding neighbourhoods. |
| **PROVINCIAL / MUNICIPAL** | |
| **Alberta Municipal Affairs, the City of Calgary, and the City of Airdrie** | Provincial and municipal governments ensure that compatible development occurs around the airport through the development and exercise of land-use planning controls that include: the *Calgary International Airport Vicinity Protection Area* (AVPA) *Regulation* (Alta Reg 177/2009), the *Calgary Land Use Bylaw 1P2007* and the *Airdrie Land Use Bylaw B-01/2016*. |
| **YYC** | |
| **The Calgary Airport Authority** | The Authority manages and operates YYC Calgary International Airport in a safe, secure and efficient manner. Responsibilities with regards to noise include:<br>• Improving the efficiency of noise concern management;<br>• Maintaining and reviewing YYC's noise monitoring program; and<br>• Developing policies to reduce noise impacts associated with standard aircraft maintenance. |

# 4.0 2017 HIGHLIGHTS

As part of our noise management program, we conducted a number of studies and initiatives in 2017 that are summarized below.

## 4.1 Required Navigation Performance (RNP) Post-Implementation Review

From late 2016 into early 2017, NAV CANADA conducted a review of the implementation of the new Required Navigation Performance (RNP) approach procedures at YYC. The review included an analysis of the RNP approach procedure usage, community feedback as well as its environmental and noise-related effects over a six-month period (June 2016 to November 2016).

The review found that RNP utilization rates were lower than anticipated during the consultation stage. However, the environmental benefits from the procedure implementation were appreciable. Additionally, only a small number of noise complaints were correlated to RNP implementation. RNP approach procedures usage at YYC will continue to grow over time, but will not completely replace the conventional approach procedures as not all aircraft are equipped with the technology to use RNP.

NAV CANADA's full *Post-Implementation Community Impact Review* report can be accesed here.

## 4.2 Runway Usage Trial

In October, the Authority and NAV CANADA, collaboratively launched a six-month trial to look at improving the balance of aircraft departures on the southerly runways (17L and 17R) over the weekends. During the trial, the primary southerly departure runways were alternated on the weekends (Saturdays and Sundays) between 6:00 a.m. and 11:00 p.m. to balance the operations during non-peak days and hours while maintaining safe and efficient operations.

Alternation during the runway usage trial is undertaken as follows:
- The east runway (17L) is used as the primary departure runway on odd weekend days when south-flow operations are active
- The west runway (17R) is used as the primary departure runway on even weekend days when south-flow operations are active.

Alternating between runways is more complex than just switching between the parallel runways when capacity allows it. Safety is always the priority. In addition, runway assignment and flight direction must consider among other factors:

- Wind and other weather conditions
- Demand and capacity
- Construction and maintenance

This means that while departures during south-flow operations will alternate on the weekend, day-to-day variations should be expected:

- Aircraft may still depart from the other parallel runway
- Aircraft will continue to arrive on both runways
- Not all single runway departures will be straight out
- Aircraft will continue to fly over Calgary and the surrounding areas

Once the trial is complete, we will evaluate the performance results and community feedback to understand the benefits and long-term viability of this initiative. This trial represents another step in the evaluation of noise management tools and efforts aimed at reducing aircraft noise and addressing community concerns.

## 4.3 Runway 17L Departures Long-Term NMT Installation

As a result of the 2016 noise monitoring studies, we have included two new long-term locations to YYC's Noise Monitoring Terminal (NMT) network. These sites were added near Runway17L/35R to obtain objective data and assess aircraft noise levels in communities near 17L departures. The long-term NMTs replaced the temporary NMTs that were in the same locations since August 2017.

The two long-term NMT locations added in August 2017 were:

- Marlborough – Calgary Marlborough Community Association, and
- Rundle – King of Glory Lutheran Church

## 4.4 NMT Network Review

YYC's NMT network is used to collect data from individual aircraft events to provide noise-level information in specific communities, and to assist with the analysis of aircraft noise concerns. The existing NMT network was put in place when only the west runway (17R/35L) and the crosswind runway (11/29) were used as the mode of operation. With the addition of the east runway (17L/35R) to YYC, aircraft operations changed with the parallel runways becoming the prefered take-off and landing configuration.

# 2017 HIGHLIGHTS

For 2017, we focused our efforts on reviewing the NMT criteria and locations with respect to the current noise environment. With the change in runway operations, noise concerns related to crosswind operations declined, while the number associated to parallel runway departures and arrivals increased.

The review process consisted of:
- Calibration and servicing of all existing NMTs
- Review of NMT location criteria, using the results from our 2016 Noise Monitoring studies (i.e. proximity to community noise sources)
- Correlation of current NMT aircraft noise events with flight track information
- Identification of any areas with a higher percentage of aircraft movements currently not covered by NMT network
- Analysis of existing and potential NMT locations

We will expand the existing NMT network during a five-year span by:
- Upgrading monitors in sites that still reflect the current noise environment,
- Re-locating NMTs in areas where community noise sources are high, and flight-track correlation is low; and
- Removing NMTs from communities that do not accurately portray the existing noise environment and re-deploying them to new locations.

The focus in 2018 includes working with community associations to define NMT locations.

# 5.0 KEY INDICATORS

The Authority continuously monitors performance to balance airport operations with community concerns. Table 2 below compares a range of key operational and noise-related metrics for 2016 and 2017. These metrics are further explained in the following report sections.

Table 2 – 2016-2017 Key Indicator Comparison

| Parameter | | 2016 | 2017 |
|---|---|---|---|
| Total aircraft movements | ⬇ | 232,080 | 224,576 |
| Average daily movements (07:00 - 23:00) | ⬇ | 584 | 540 |
| Average daily movements (23:00-07:00) | ⬆ | 52 | 75 |
| Total passengers | ⬆ | 15.7 million | 16.3 million |
| North departures/arrivals (%) | ⬆ | 53% | 53.43% |
| South departures/arrivals (%) | ⬆ | 43% | 43.05% |
| West departures/arrivals (%) | ⬇ | 4% | 3.49% |
| East departures/arrivals (%) | ⬆ | 0% | 0.03% |
| Noise concerns | ⬇ | 6,458 | 5,736 |
| Households submitting concerns | ⬇ | 613 | 407 |

# 6.0 OPERATIONAL DATA

YYC experienced another year of strong growth with a 3.8 percent increase in passenger numbers and a 7.7 percent increase in cargo volumes as a result of the many enhancements to airline and freight services. 2017 saw the first full year of operations in the International Terminal bringing new technologies and innovations to enhance the guest experience. This new infrastructure brought added dimensions to the runway assignment and airport operations while keeping in mind a balanced approach to aircraft noise management.

## 6.1 Runway Use

YYC consists of two north/south parallel runways with two intersecting runways, as illustrated in Figure 1. The parallel runways are referred to as 17R-35L (the west runway) and 17L-35R (the east runway). The diagonal runway 11-29 is used as a 'crosswind runway', meaning it is used in extreme wind conditions that prohibit parallel runway use, and is also a preferential runway for night-time arrivals. The final runway, 08-26, is almost exclusively used by light aircraft and the general aviation sector.

YYC runs parallel runway operations, which maximizes operational efficiencies and provides the opportunity to arrive and depart aircraft simultaneously from both runways. Generally, aircraft coming from or going to the west use the west runway (17R-35L) and aircraft coming from or going to the east use the east runway (17L-35R).

There are a number of variables when determining runway use with the focus, first and foremost, on safe flight operations. Weather, regularly-scheduled maintenance, and the mix of aircraft arriving and departing all play a role in determining the routes aircraft take arriving or departing an airport. NAV CANADA, the organization responsible for the design and management of the airspace, considers factors such as overall air traffic volumes, meteorological conditions, runway availability, and noise abatement procedures.

Wind speed and direction is one of the criteria considered in runway selection and utilization. In general, during the winter months in Calgary, cold arctic air will move in from the north which means aircraft will primarily depart and arrive on our north facing runways (35R and 35L). Through summer, with warm winds from the south, aircraft will primarily take-off and land on our south facing runways (17R and 17L). Finally, when warm westerly Chinooks roll into the city, operations will typically switch to the crosswind runways (29, and for smaller aircraft runway 26).
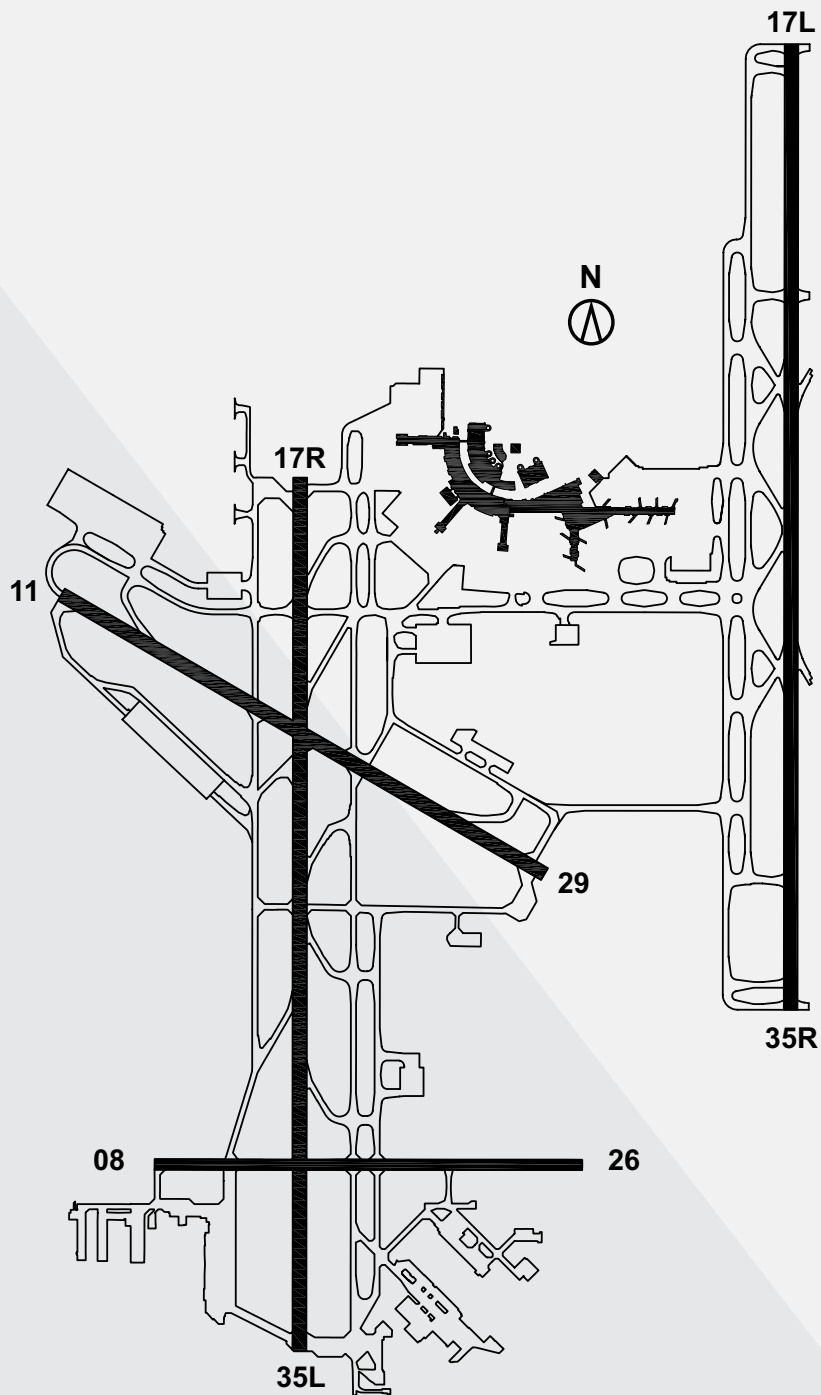
- Aircraft take-off and land facing into the wind
- South-facing arrivals or departures are 17L or 17R
- North-facing arrivals or departures are 35L or 35R
- The L and R always refer to the pilot's left and right
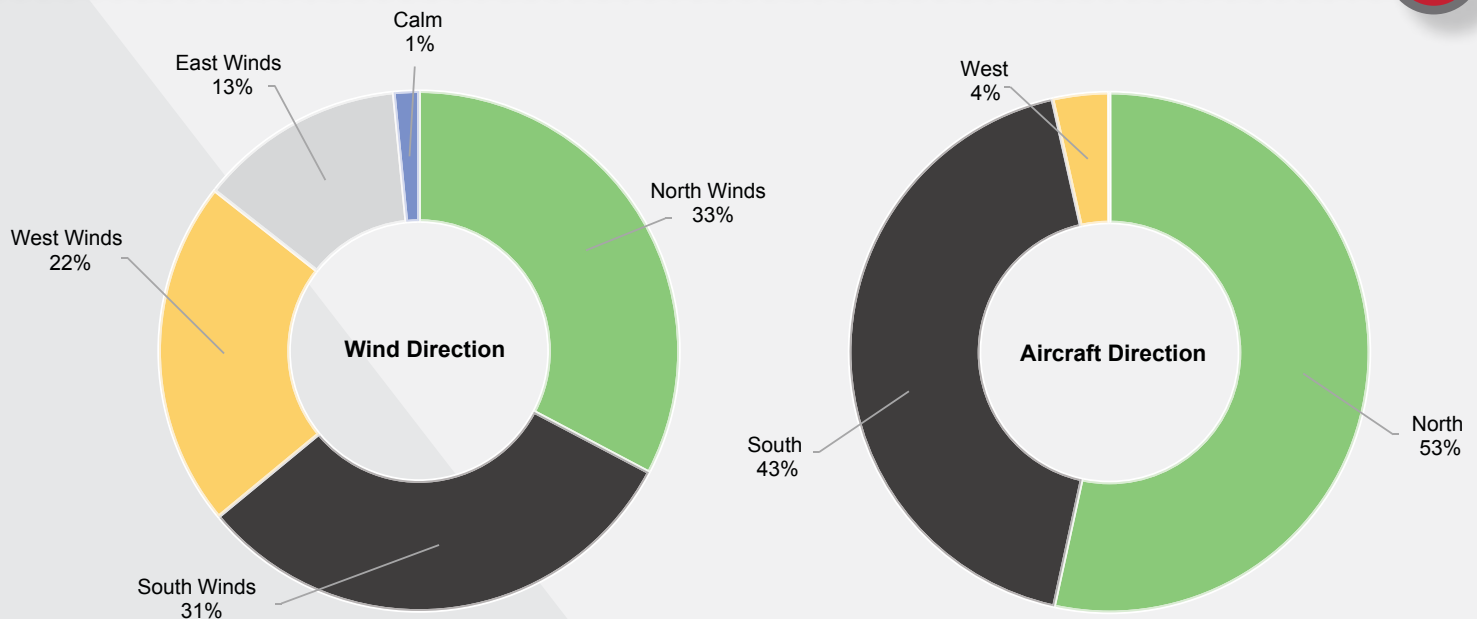
Figure 1 - Runway configuration and names

Figure 2 – Wind and Aircraft Directional Flow

In 2017, there was a high percentage of westerly and easterly winds in comparison with 2016 (12% and 9% more respectively). On days when wind speed is negligible on the ground, the upper winds can play a larger influence on the runway assignment decision. Overall, YYC saw slightly higher north-flow operations (see Figure 2), with a similar aircraft direction distribution to the previous year.

All aircraft perform differently, and there are a number of factors that influence its actual performance. During arrivals, inbound aircraft will align themselves with the runway centerline and, depending on the traffic, they will be sequenced in a straight-in approach anywhere between 5 and 20 miles from the airport (Figure 3). This is done so that the aircraft are in a stable decent and properly configured for landing. For departures, aircraft are assigned a heading to a certain altitude before proceeding on course.
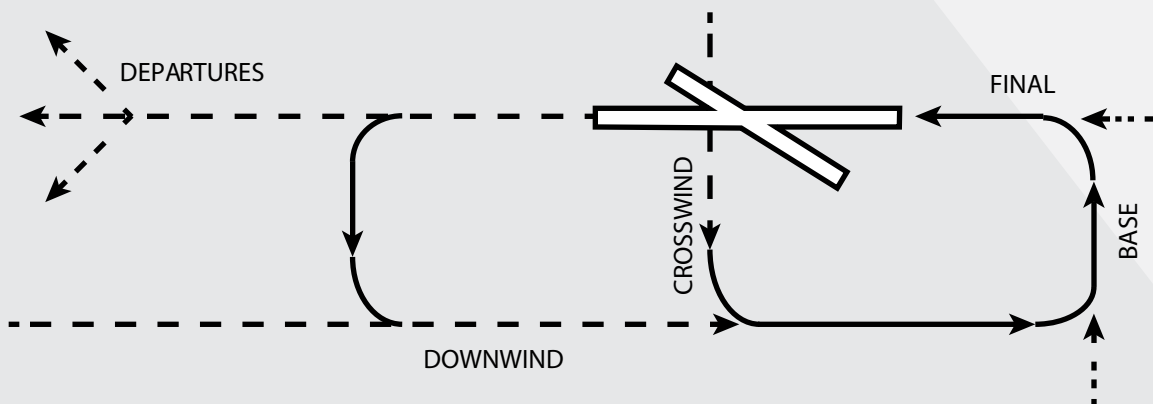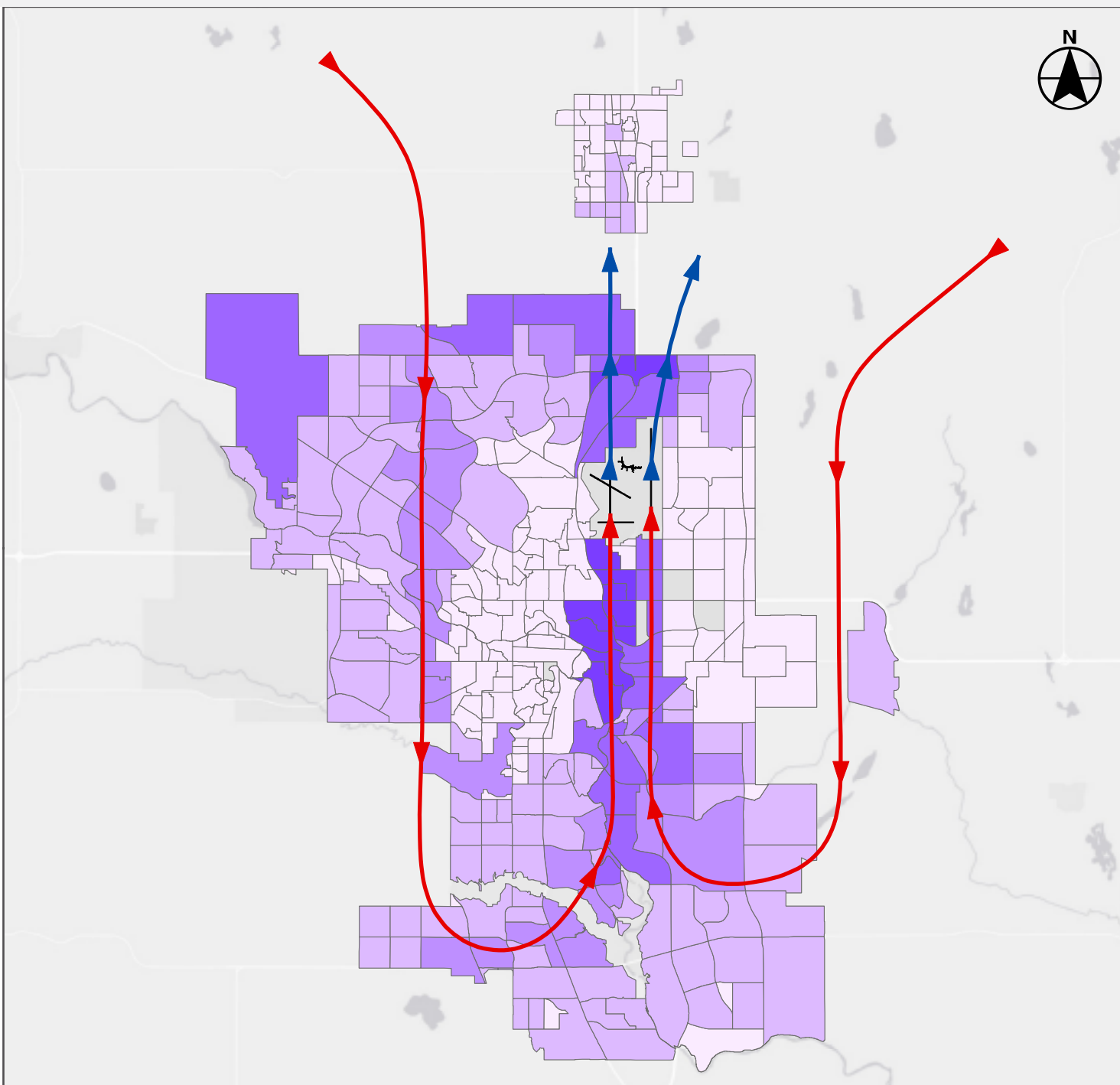


Figure 3 – Flight Path Basic Concept

# Overflight Frequency per Community during North Flow Operations

## Legend

〜 Generalized Departure Route

〜 Generalized Arrival Route

**Number of Flights**

| | |
|---|---|
| ▨ | 1 - 10 |
| ▨ | 11 - 50 |
| ▨ | 51 - 100 |
| ▨ | 101 - 200 |
| ▨ | >200 |
| ▨ | Communities |

**Figure 4**

Drawing No. yyc-noise-fltfrq-nth
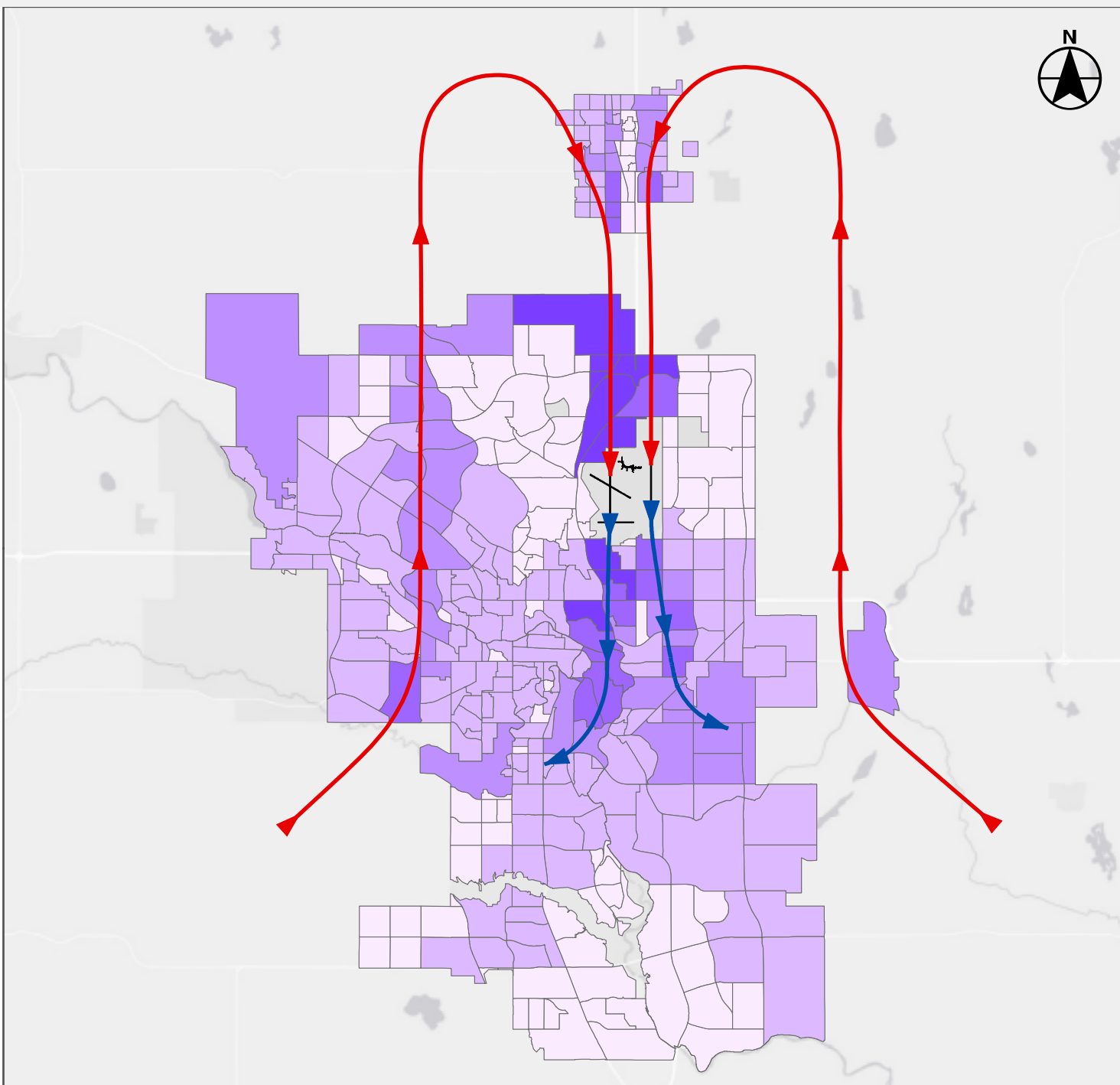
Flight information from:
June 22, 2017 (24 hours)

Coordinate System: NAD 1983 3TM 114
Projection: Transverse Mercator

Date Saved: 3/9/2018
Drawn by: kaylac

Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

**Alberta**

EDMONTON

CALGARY

N

Km
0   2.5   5   10

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## Overflight Frequency per Community during South Flow Operations

**Legend**

〰 Generalized Departure Route
〰 Generalized Arrival Route

**Number of Flights**

- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 200
- >200
- Communities

**Alberta**

EDMONTON
●

CALGARY
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**Figure 5**

Drawing No. yyc-noise-fltfrq-sth

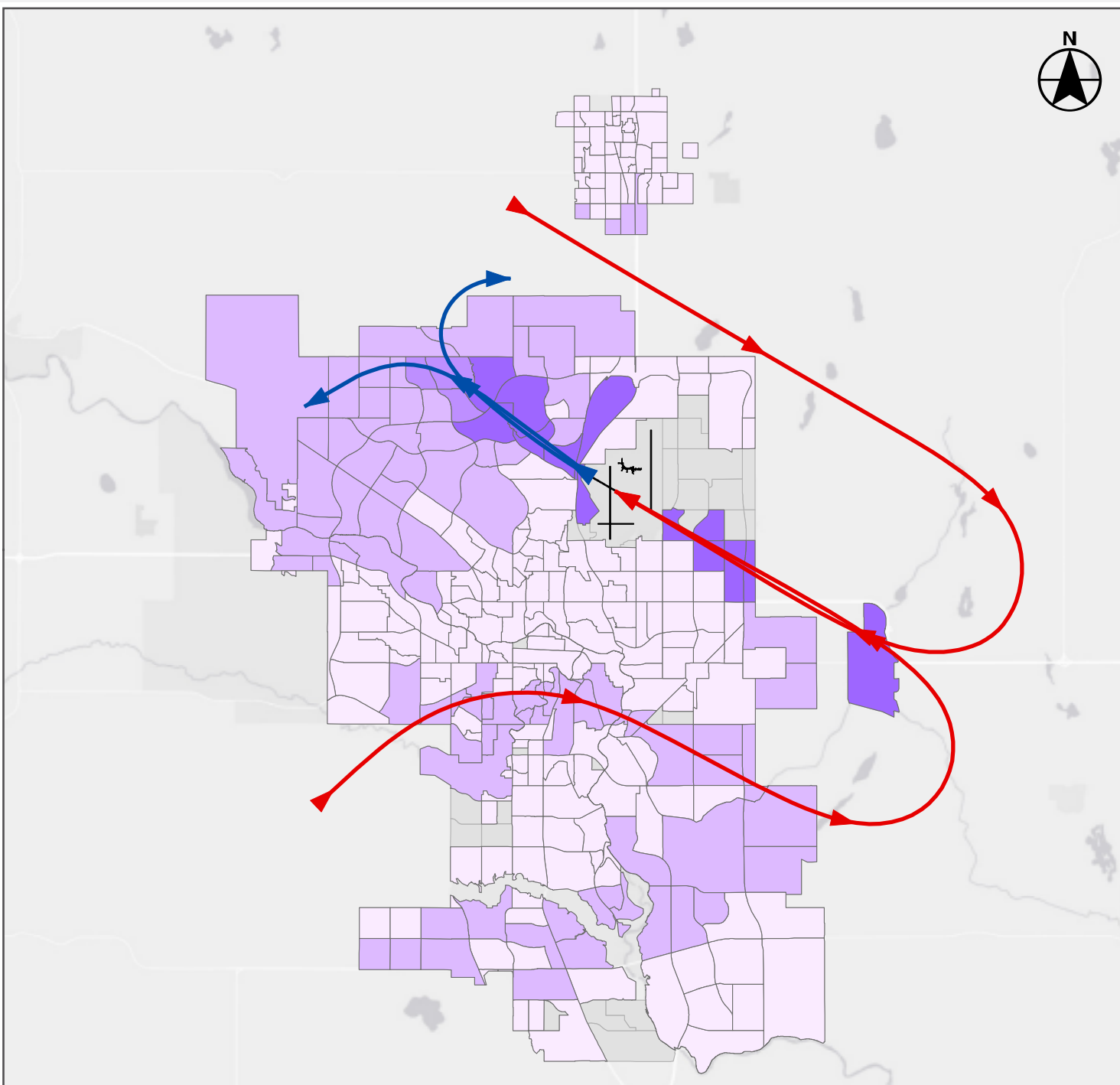Flight information from:
June 7, 2017 (24 hours)

Coordinate System: NAD 1983 3TM 114
Projection: Transverse Mercator

Date Saved: 3/9/2018
Drawn by: kaylac

Service Layer Credits: Esri, HERE, DeLorme,
MapmyIndia, © OpenStreetMap contributors, and the
GIS user community

Km
0    2.5    5         10

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**Overflight Frequency per Community during West Flow Operations**

**Legend**

〰 Generalized Departure Route

〰 Generalized Arrival Route

**Number of Flights**

■ 1 - 10
■ 11 - 50
■ 51 - 100
■ 101 - 200
■ >200
▨ Communities

**Alberta**

EDMONTON ●

CALGARY ★

**Figure 6**

Drawing No. yyc-noise-fltfrq-wst

Flight information from October 14, 2017
Only Runway 29 operations data illustrated
(approximately 70% of total flights in 24 hours)

Coordinate System: NAD 1983 3TM 114
Projection: Transverse Mercator

Date Saved: 3/9/2018
Drawn by: kaylac

Service Layer Credits: Esri, HERE, DeLorme,
MapmyIndia, © OpenStreetMap contributors, and the
GIS user community

Km
0   2.5   5      10

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Figures 4, 5 and 6 illustrate the frequency of aircraft movement over the airport surrounding area for a 24-hour period for north, south and west-flow operations respectively. These maps are an additional tool to show the arrival and departure corridors under specific aircraft operations. The lines and arrows shown in the map represent examples of generalized departure and arrival procedures into YYC.

During north (Figure 4) and south (Figure 5) flow we can observe that the higher overflight frequency is in line with the runways in use. Parallel to the runways, we see frequency related to the downwind leg portion of the arrival procedures. A "downwind leg" is a flight path parallel to the landing runway in the direction opposite to landing. Downwind legs are designed to be 5 to 6 miles from the runway centerline, which allows aircraft to smoothly transition to the final approach for landing (Figure 6). During west-flow conditions (Figure 6), which are typically a small percentage of our operations, we can observe a higher frequency in line with the crosswind runway (11/29).

Together with NAV CANADA, we strive to balance the use of parallel runways, but there may be variations on a daily or weekly basis like weather and maintenance that come into play. In 2017, annual maintenance and pavement repairs spanned approximately 14 weekends from May until October. Figure 7 illustrates the runway distribution percentages for departing and arriving aircraft in 2017.
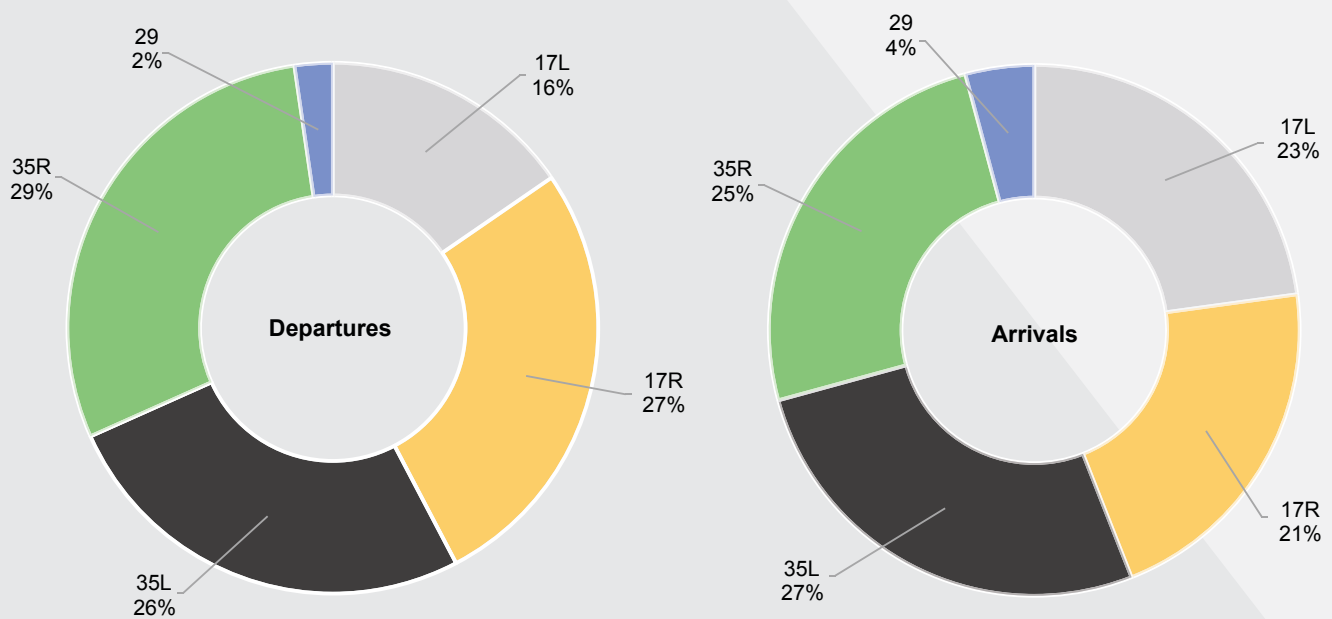


Figure 7 – Runway Use

Air transportation is not very different from other modes of transportation; there are peak morning and evening "rush hours" at YYC. Figure 8 illustrates YYC's average hourly departures and arrivals. Most often, the departure demand is higher in the morning and the arrival demand is greater in the evening. In 2017, the majority of aircraft operations (over 91%) at YYC occurred during the day-time hours from 07:00 to 23:00.  A number of flights, however, occurred in the 06:00 hour and midnight hour (00:00), which if included in the day-time totals, would account for 97% of daily operations.  In other words, only 3% of daily flights on average occurred between the hours of 01:00 and 04:00.
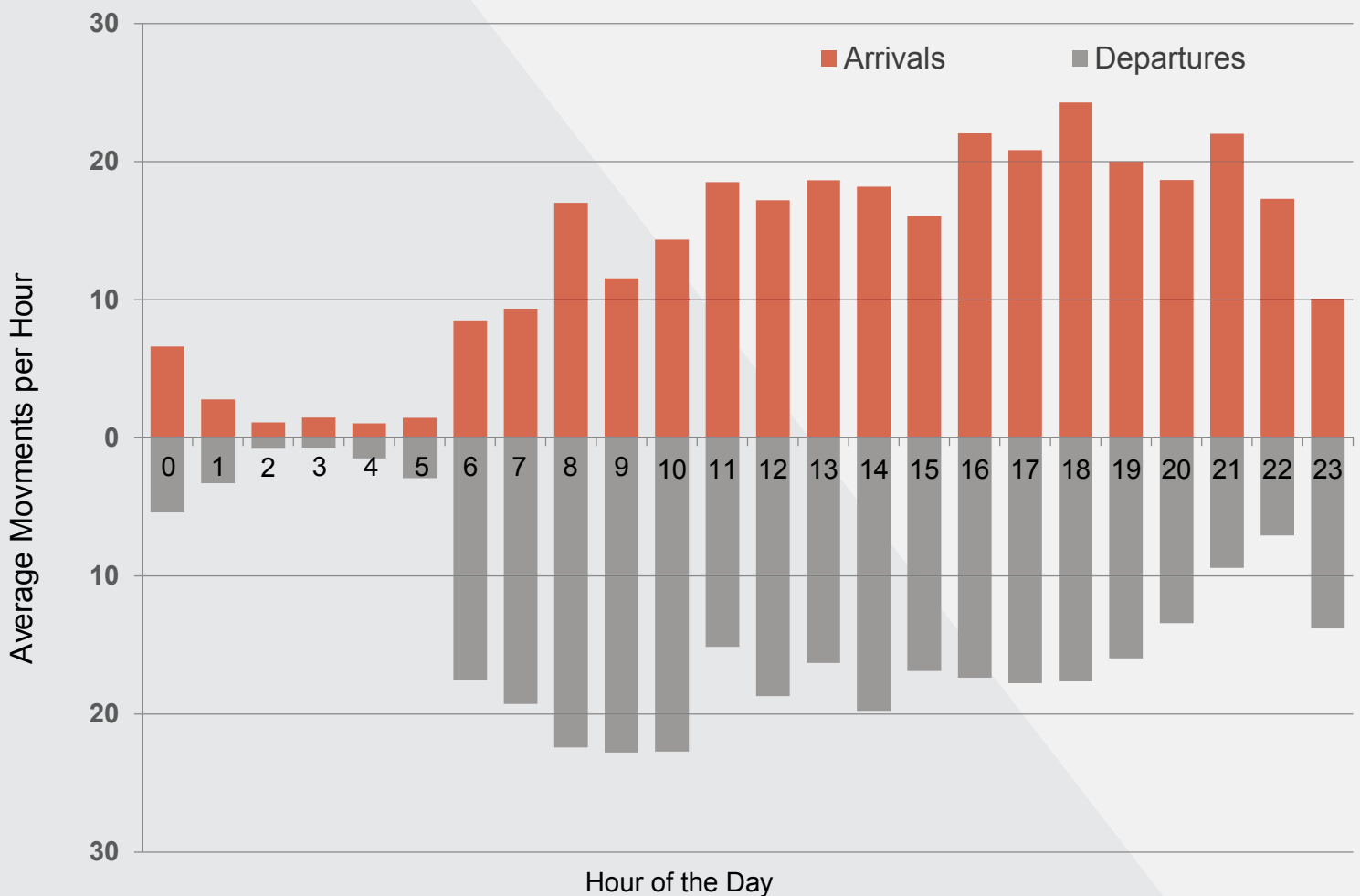
Figure 8 – Average Hourly Movements over 24 hrs

## 6.2 Fleet Mix

The mix of aircraft that operate at YYC continues to evolve as airlines introduce newer, quieter and more efficient airplanes. In 2017, the first Boeing 737 MAX 8 aircraft arrived at YYC, an aircraft that is more fuel-efficient and has a reduced operational noise footprint through quiet-engine technology. Figure 9 illustrates the aircraft mix that operated out of YYC in 2017.
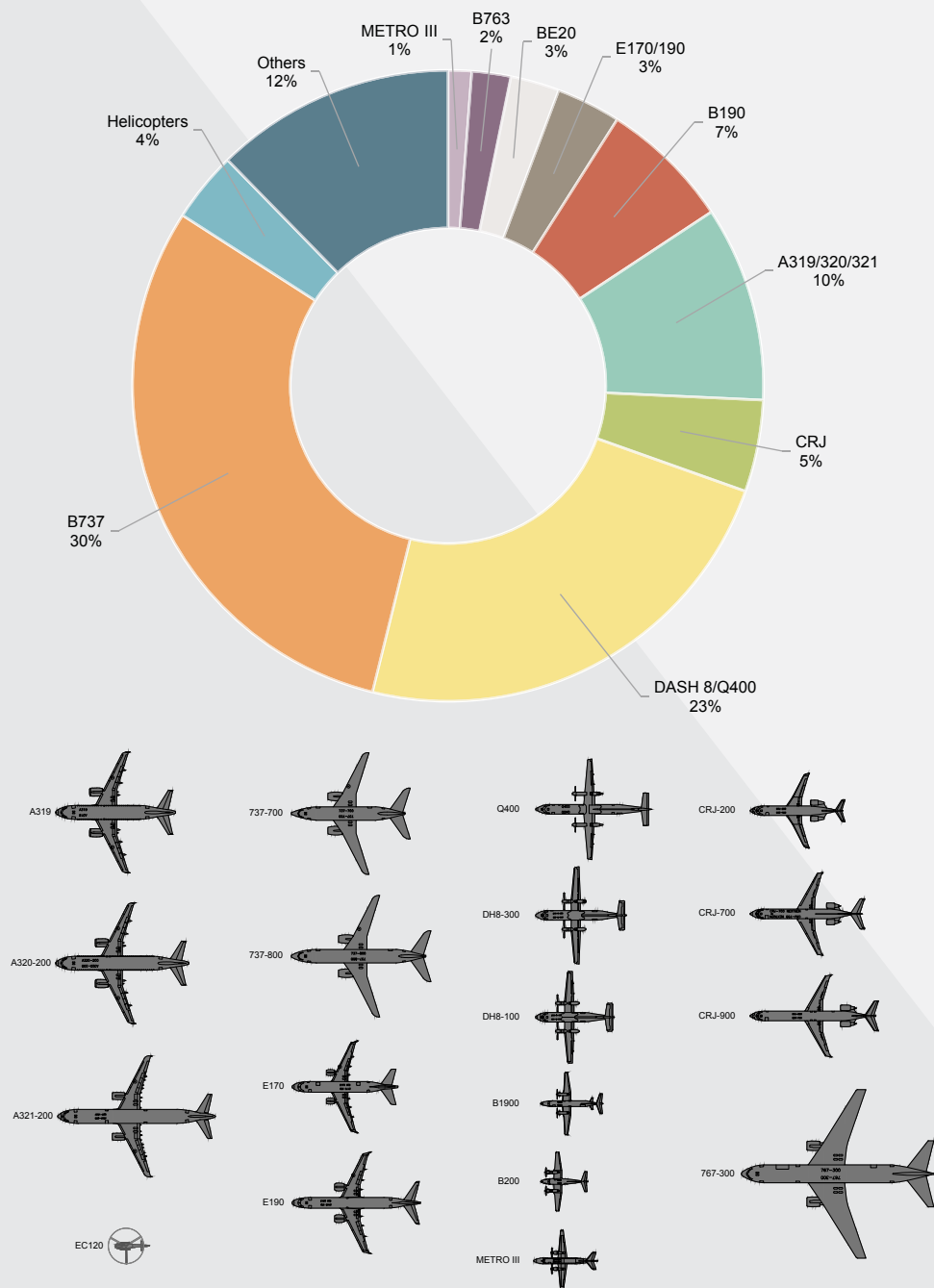


Figure 9 – Aircraft Mix

# 7.0 NOISE MONITORING

YYC actively monitors aircraft noise in the Calgary region using a network of Noise Monitoring Terminals (NMTs). Currently, there are 16 NMTs located in neighbouring communities that capture both aircraft and community noise data. Figure 11 (next page) illustrates the existing NMT locations in the region.

## 7.1 Noise Monitoring Terminal Data Analysis

### 7.1.1. How is noise from different sources measured and compared?

The amount of noise experienced at a given location varies over time and is the result of many sources, with aircraft being one. Because there are various sources of noise at the locations where YYC has its NMTs, several different measurements need to be considered when comparing aircraft to other community noises. These include decibels (dB), Equivalent Continuous Sound Level (LAeq), and A-weighted decibels (dBA), which are defined as follows:

- dB: The most basic noise measurement is a decibel (dB), which expresses the loudness of noise at any given instant.
- dBA: Is the unit of measure that based on the dB but is scaled to the human range of hearing. Figure 10 illustrates the range of human hearing in dBAs using examples of noise generated by various activities.
- LAeq: The average of the instantaneous noise measurement in dBA over a period of time. In order to compare how loudness for different sounds compare, it is necessary to also consider the duration of a given noise. For instance, aircraft noise may rise and fall from 60 dBA to 80 dBA and last 16 seconds, while a dog barking may be 80 dBA but will only last 2 seconds. In order to consider both the duration of a noise and its loudness, LAeq is used.
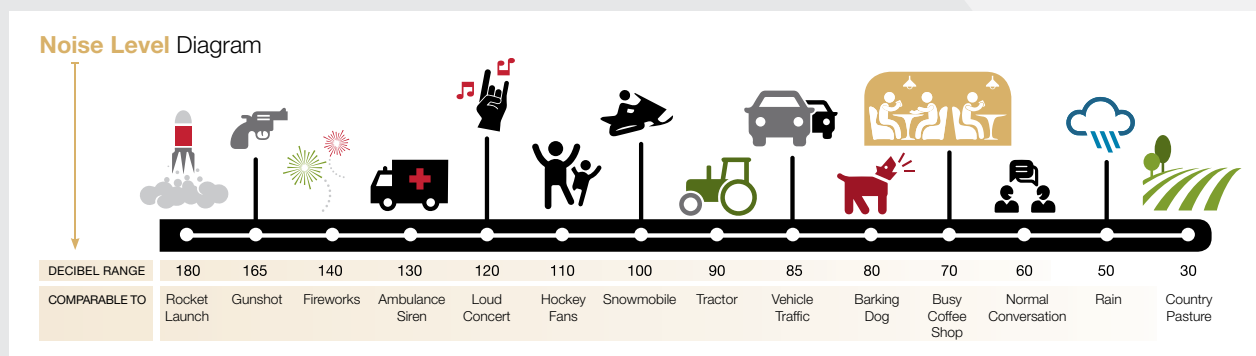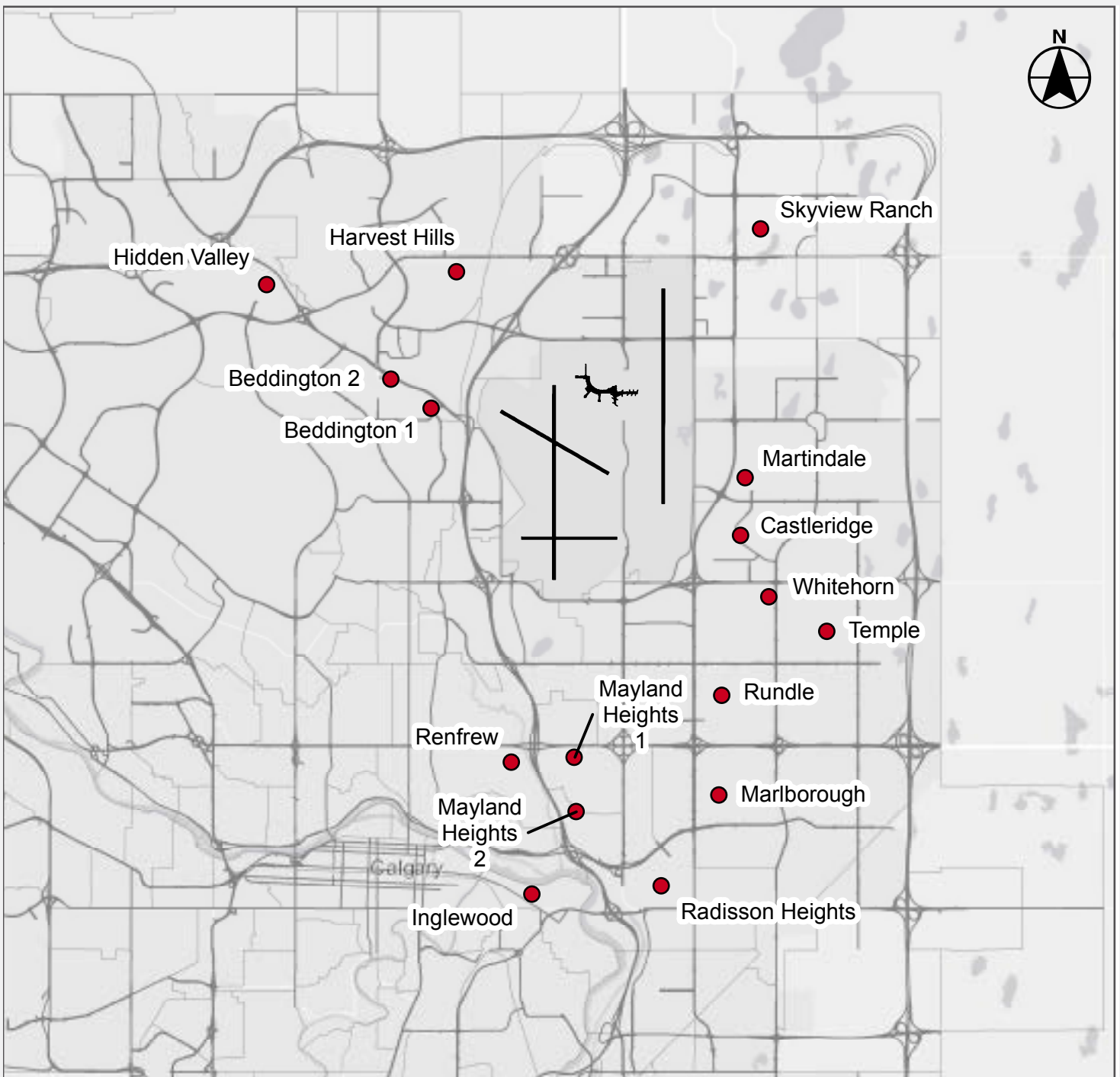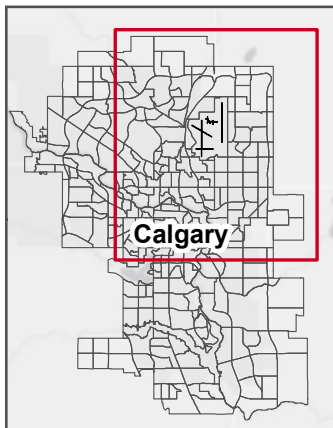


**Noise Level** Diagram

| DECIBEL RANGE | 180 | 165 | 140 | 130 | 120 | 110 | 100 | 90 | 85 | 80 | 70 | 60 | 50 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COMPARABLE TO | Rocket Launch | Gunshot | Fireworks | Ambulance Siren | Loud Concert | Hockey Fans | Snowmobile | Tractor | Vehicle Traffic | Barking Dog | Busy Coffee Shop | Normal Conversation | Rain | Country Pasture |

Figure 10 – Noise Level Diagram

**2017 Noise Monitoring Terminal Locations**

Skyview Ranch

Harvest Hills

Hidden Valley

Beddington 2

Beddington 1

Martindale

Castleridge

Whitehorn

Temple

Mayland Heights 1

Renfrew

Rundle

Marlborough

Mayland Heights 2

Calgary

Inglewood

Radisson Heights

N

**Legend**

● Noise Monitoring Terminal (NMT)

/\/ Road Network

Calgary Communities

**Calgary**

**Figure 11**

Drawing No. yyc-locn-nmt

Coordinate System: NAD 1983 3TM 114
Projection: Transverse Mercator

Date Saved: 7/25/2018
Drawn By: kaylac

Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Km
0   0.75  1.5        3

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When attempting to compare the amount of noise from various sources over a period of time, say a month, all the dBAs for a given type of noise in that timeframe are summed. Individual noise types are determined by selecting specific time periods when dBAs are above certain levels. These time periods are referred to as "noise events". Noise events occur when there is a sudden and sustained spike in the instantaneous noise level and are attributed to either community noise (e.g. vehicular traffic, construction, loud music, dog barking, etc.) or aircraft noise.

Each of YYC's NMTs has an assigned minimum level of dBAs, above which noise events are recorded. The noise level thresholds are determined based on the amount of background noise at a given NMT location. For YYC's NMTs, these levels are 60 to 70 dBA for 5 to 10 seconds.

## 7.1.2. How does aircraft noise compare to other sounds in the community?

The monthly average LAeq for aircraft noise is determined by averaging the LAeq from all of the aircraft noise events detected at an NMT over that period and comparing that with other noises in the community measured at that same NMT location for the same period. Appendix A compares this total with all other community noises and shows that on a monthly basis community noises other than aircraft contribute to more of the total noise experienced.

It is important to note that YYC's NMTs are not able to differentiate between noises other than aircraft, so all other community noises are added together. The reason aircraft noise is overall less than other noise sources is because the frequency of aircraft noise events is far less than other noise sources. While aircraft noise events tend to be longer than other sources, typically lasting about 15 seconds, noises events, such as, traffic, LRT, dogs barking, etc., occur more frequently. Therefore, over a month, the total LAeq for community noise exceeds aircraft because there are more community noise events. For example, if 50 aircraft each created 15 second noise events in a single day, that would amount to 12.5 minutes of LAeq data to be averaged. Conversely, the remainder of noise events during that 24-hour period would be attributed to community noise, and these exceeded the total number of aircraft noise events in 2017.

## 7.2 Noise Levels in Neighbouring Communities

LAeq at each NMT is summarized and illustrated in Appendix A. These graphs show the general trends in aircraft noise monitored in areas surrounding the airport.  Data differences between sites

are a result of the specific air traffic patterns over each location.

As mentioned in the 2017 Highlights sections, we calibrated all permanent NMTs as part of our network review process. In the graphs, a dashed line indicates the calibration date. After calibration, the NMTs located in Beddington 1, Renfrew, Mayland Heights 1, Castleridge, and Skyview Ranch showed significant changes in the data.

Overall, for the majority of NMTs, the community noise was between 50 to 60 dBA. This is consistent with typical suburban noise levels and similar to the noise level generated from air conditioners.  There were two NMTs where monthly averaged community noise was noticeably higher (Beddington 2 and Castleridge) this is attributed to their proximity to major roadways. Conversely, the quietest communities monitored by the NMTs were Harvest Hills and Temple. In general, there was minimal seasonal variation in the community noise levels at most sites. Castleridge, Temple, and Skyview Ranch showed some variation with both community noise and aircraft noise levels trending together; this suggests that improvements can be made in the aircraft noise event correlation at these sites.

Before the construction of the east runway (35R/17L), Runway 29 had a higher use.  Today, Runway 29 is used less frequently and mainly during strong westerly Chinook wind conditions. The aircraft noise detected at the Hidden Valley, Harvest Hills, Beddington 1 and 2 NMTs show an increase in average noise levels when Runway 29 is in use during Chinook winds (typically in fall, winter and spring). Similar trends were observed in the data from the NMTs located to the east and southeast of the airport along the approach to Runway 29.

Depending on the wind direction, the NMTs will detect aircraft departures or arrivals from the parallel runways (35R/17L and 35L/17R). It is worth noting that arriving aircraft are typically quieter than departing aircraft, so the aircraft noise detected by each NMT will be influenced by the runway assignment and day-to-day variation in airport operations.

For the majority of 2017, the Martindale NMT experienced technical issues which resulted in data loss. The plan is to include this location as part of the 2018 NMT network upgrade initiative. Also of note is the data gaps at both Marlborough and Rundle NMTs.  This was due to thedecommissioning of consultant-owned NMTs that were part of the 2016 departures study, and the commissioning of Calgary Airport Authority-owned NMTs that are part of the long-term noise monitoring network.

# 8.0 AIRCRAFT NOISE CONCERNS

The Authority offers several ways for individuals to register their questions or concerns regarding YYC operations:

• Dedicated e-mail - concerns@yyc.com
• Website Aircraft Concern submission form - yyc.com/aircraftconcerns
• Near real-time flight tracking system - PublicVue
• YYC aircraft concerns hotline - 403.735.1408

## 8.1 Noise Concerns

In 2017, we received 5,736 concerns from 407 individuals, a reduction of 11% from the number of total concerns received, and 33% decrease in number of individuals submitting concerns compared to 2016. Figure 12 provides a monthly breakdown of the total concerns received and total households represented.
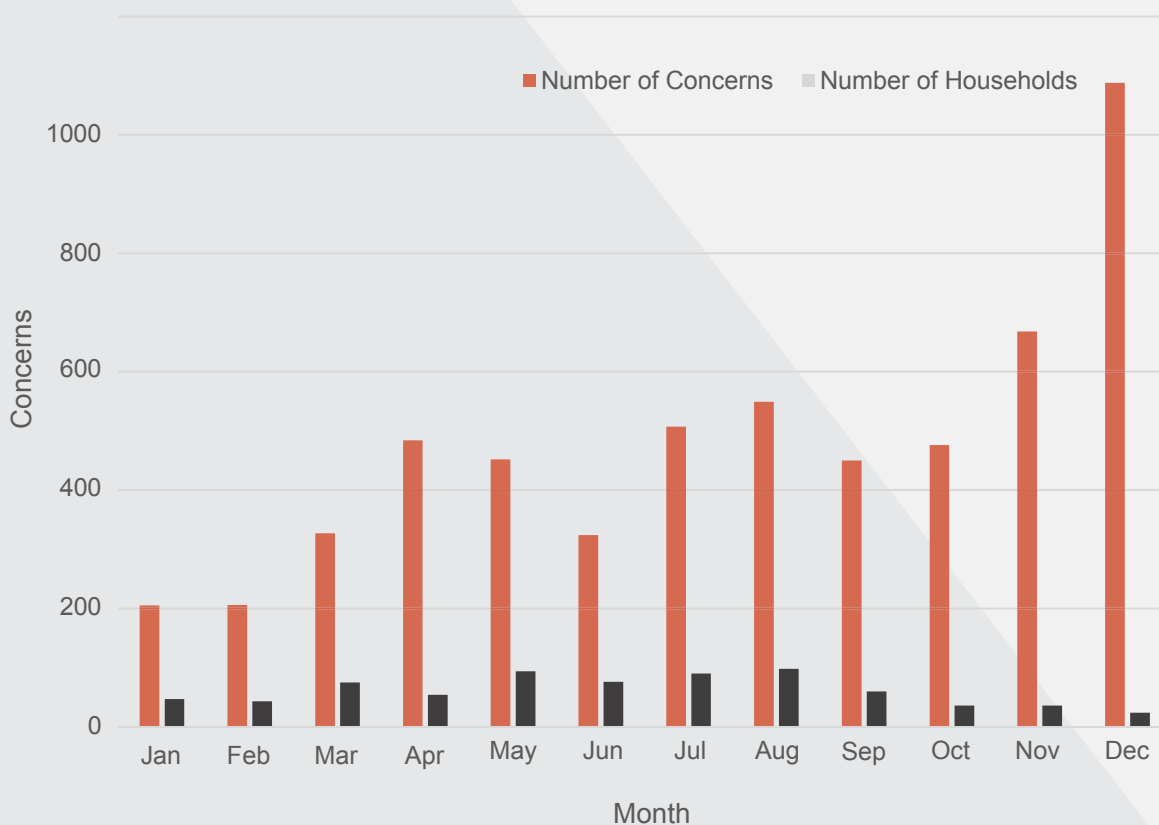


Figure 12 – Noise Concerns in 2017

When submitting concerns, individuals are asked to provide information about their residence. This helps us identify the type of operations occurring in the area at the time of the concern and, when needed, investigate the details of that operation for follow-up.

Figure 14 (page 26) shows the distribution of noise concerns by community. Airdrie and locations to the south of the airport show a higher density in the number of concerns. These communities might see lower altitudes from aircraft departing and arriving at YYC. Figure 15 (page 27) shows the frequency of concerns submitted by individuals or households for 2017. Aircraft noise concerns statistics can be challenging to interpret as concern submissions tend to be highly concentrated in a few dedicated individuals. This means communities highlighted in Figure 13 with a high concern volume, might show up in Figure 14 with a low number of households submitting concerns.

Similar to previous years, we continue to see a small group of people registering the majority of the concerns received during the year. In 2017, 48% of all concerns received (2,731) were submitted by two individuals. Five people made the majority (72%) of the total number of noise concerns received for the year (Figure 13).
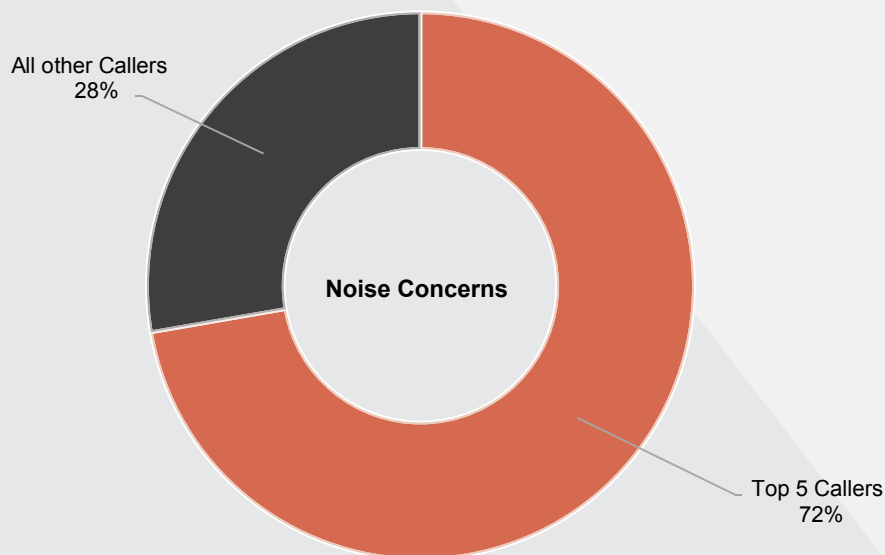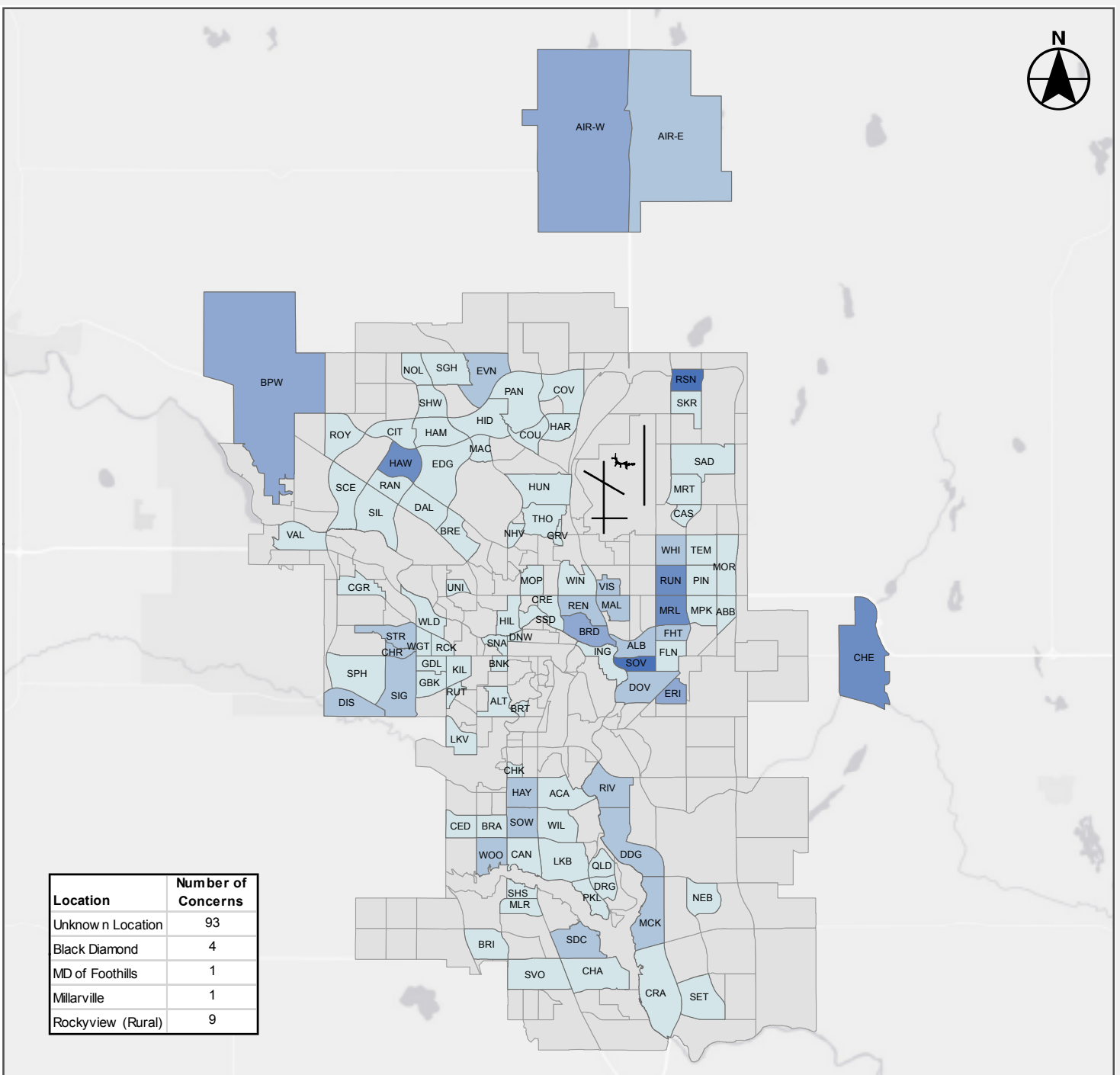


Figure 13 – 2017 Noise Concerns Volumes

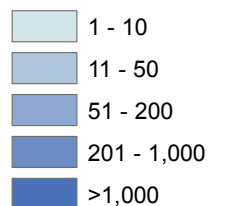**2017 Noise Concerns by Community**

| Location | Number of Concerns |
|---|---|
| Unknown Location | 93 |
| Black Diamond | 4 |
| MD of Foothills | 1 |
| Millarville | 1 |
| Rockyview (Rural) | 9 |

**Figure 14**

Drawing No. yyc-noise-concrns-cmnty

**Legend**

**2017 Noise Concerns**

- 1 - 10
- 11 - 50
- 51 - 200
- 201 - 1,000
- >1,000
- Communities

Coordinate System: NAD 1983 3TM 114
Projection: Transverse Mercator

Date Saved: 3/9/2018
Drawn by: kaylac

Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

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**2017 Number of Households Submitting Noise Concerns**

| Location | Number of Households |
|---|---|
| Unknown Location | 30 |
| Black Diamond | 2 |
| MD of Foothills | 1 |
| Millarville | 1 |
| Rockyview (Rural) | 4 |

**Figure 15**

Drawing No. yyc-noise-concrns-hsld

**Legend**

**Households**

- 1 - 2
- 3 - 5
- 6 - 15
- 16 - 25
- >25
- Communities

Coordinate System: NAD 1983 3TM 114
Projection: Transverse Mercator

Date Saved: 3/9/2018
Drawn by: kaylac

Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

**Alberta**

EDMONTON

CALGARY

YYC CALGARY AIRPORT AUTHORITY

### 8.1.1. Aircraft Concern Email/Phone Line Process

Here at YYC, we take all concerns received seriously and ensure that all calls and emails get logged in our database. Many of the concerns we receive are unspecified comments about aircraft noise; these get tracked in the database as a general concern. We follow up with inquiries about specific aircraft operations that require further information or investigation.

### 8.1.2. Investigation & Response of Noise Concerns

Investigation and response to concerns often involve verifying information with Air Traffic Controllers (NAV CANADA) and the aircraft operator. If the Authority suspects that any operational restrictions, including the Noise Abatement Procedures, have been infringed, the Authority immediately contacts the airline operator for information. Where it appears that the aircraft operation in question may not comply with aviation regulations, the Authority will contact Transport Canada, who will then undertake an investigation. If the investigation determines that a violation occurred, Transport Canada may impose a penalty on the aircraft operator.

# 9.0 COMMUNITY ENGAGEMENT

YYC is committed to staying connected with the communities in and around Calgary to keep the dialogue open about aircraft operations. In 2017, we began publishing quarterly updates that included detailed monthly aircraft operations. We also attended six community-led events to strengthen our communications with surrounding communities and provide space for stakeholders to ask questions directly to Authority staff.

## 9.1 Airport Community Consultative Committee

The primary objective of the Airport Community Consultative Committee (ACCC) is to provide a forum that enables dialogue and information exchanges between airport operators, community representatives and airport users. This community-based approach ensures that stakeholders are at the table to discuss current and future aircraft operations, keeping at the forefront any concerns from the surrounding communities. In 2017, the committee met three times (April, August and December) to discuss:

- NAV CANADA's update on the Required Navigation Performance (RNP) Procedures.
- Noise Monitoring updates.
- Construction dates for the spring and summer seasons.
- The new design for the Aircraft Noise Management Web page.
- The proposed NAV CANADA trial to improve the balance of departures of the 17L and 17R (south) runways over the weekends.
- Night-time operations explanation.
- The Committee membership confirmation process – for early 2018.

The meeting minutes and presentations are available at yyc.com under the ACCC section.

# 10.0 NEXT STEPS

The Authority will continue to work closely with community associations, government agencies and airlines to address noise concerns. Our focus for noise management will continue to be about bringing in knowledge, analyzing data from studies, looking at options when possible and keeping the community informed of any industry changes from a technical perspective.

Key initiatives identified for 2018, include:

- Begin the replacement and relocation of our permanent NMT network. 2018 is the first of a five-year plan to upgrade our systems with newer technology for better integration;
- Implement a roving mobile noise monitoring program. Focus will be on communities that do not have permanent noise monitoring coverage;
- Complete the Runway Usage Trial to improve the balance of south departures over the weekends; and
- Launch the improved Aircraft Noise Management Web page.

# APPENDIX A

## Bedington 1 NMT: Bedford Drive NE (_BED1)



Monthly Noise Levels
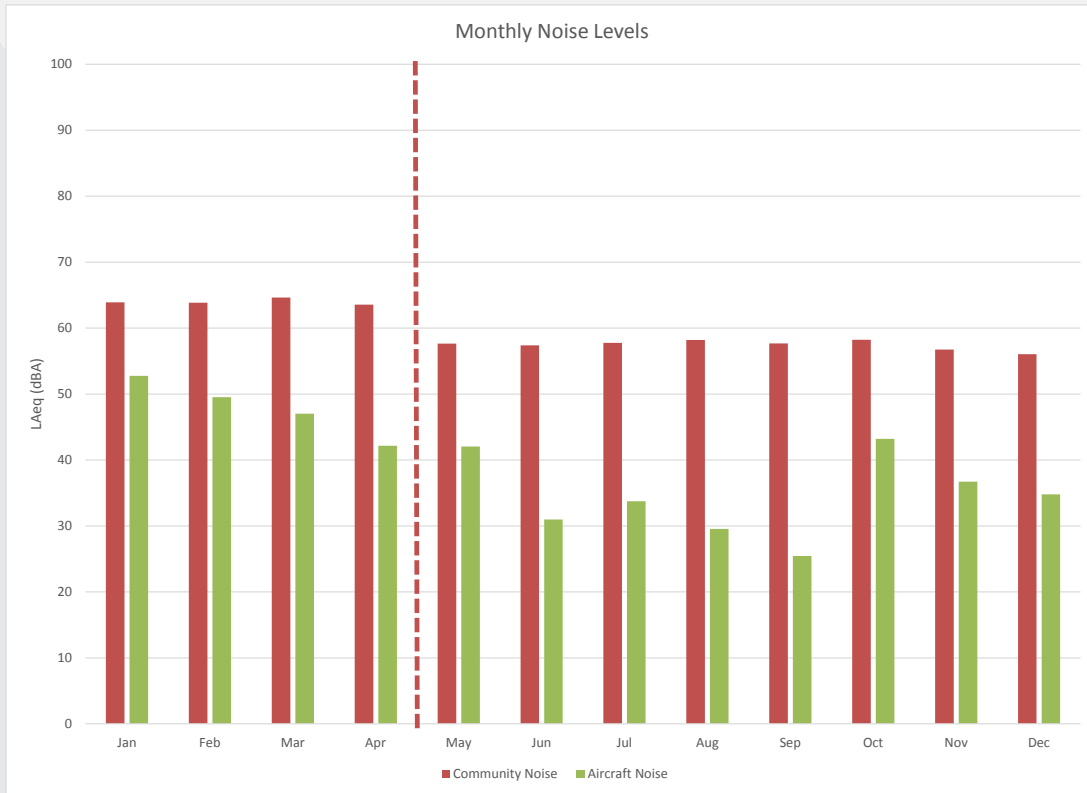
## Bedington 2 NMT: Beddington Circle (_BED2)



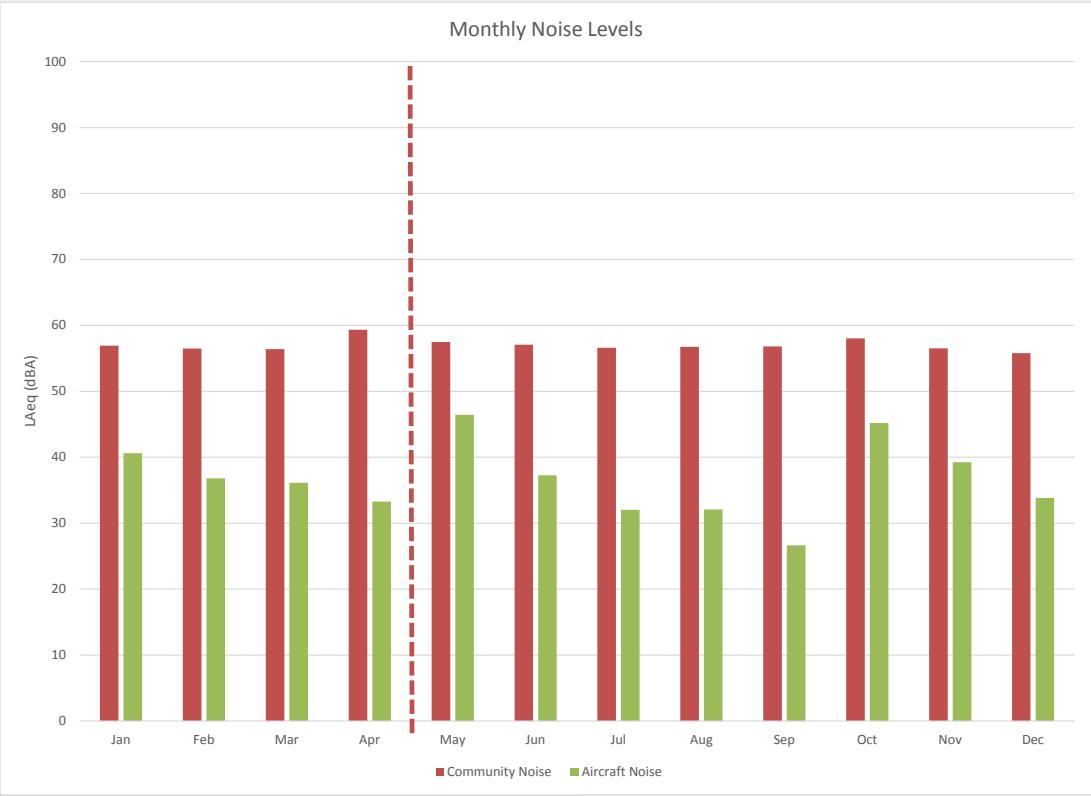Monthly Noise Levels
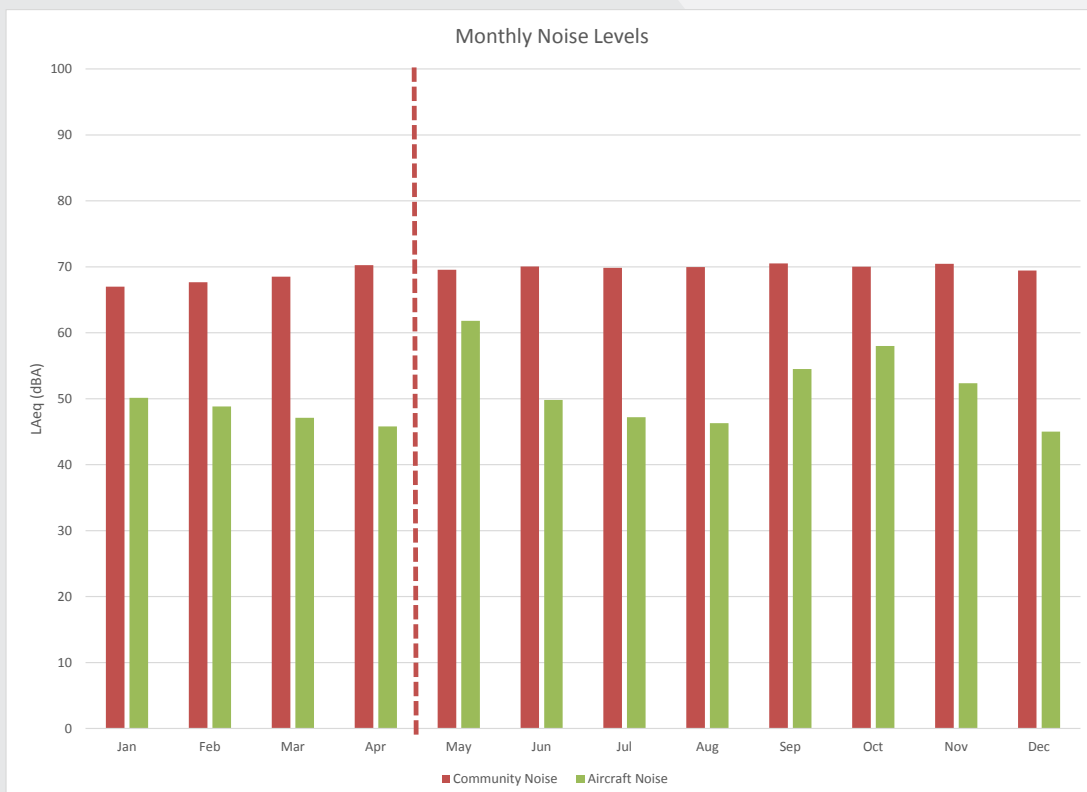
## Castleridge NMT: Castlebrook Road NE (_CAST)
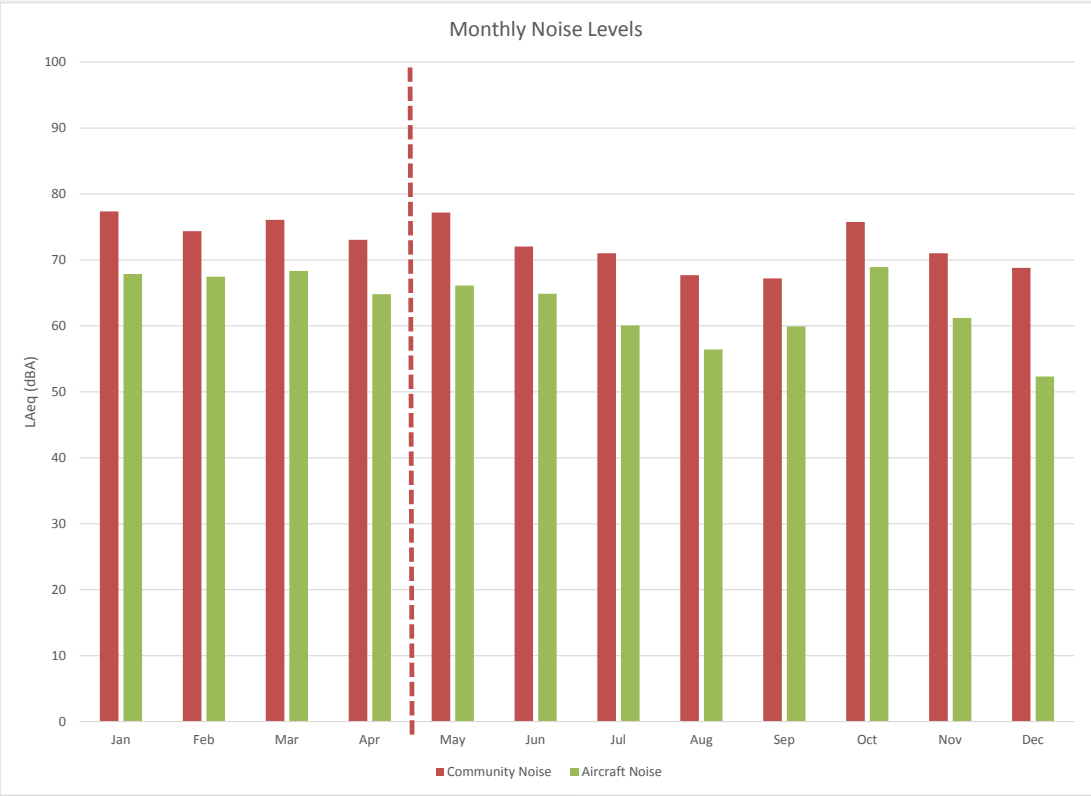


## Harvest Hills NMT: Harvest Hills Gate NE (_HARV)
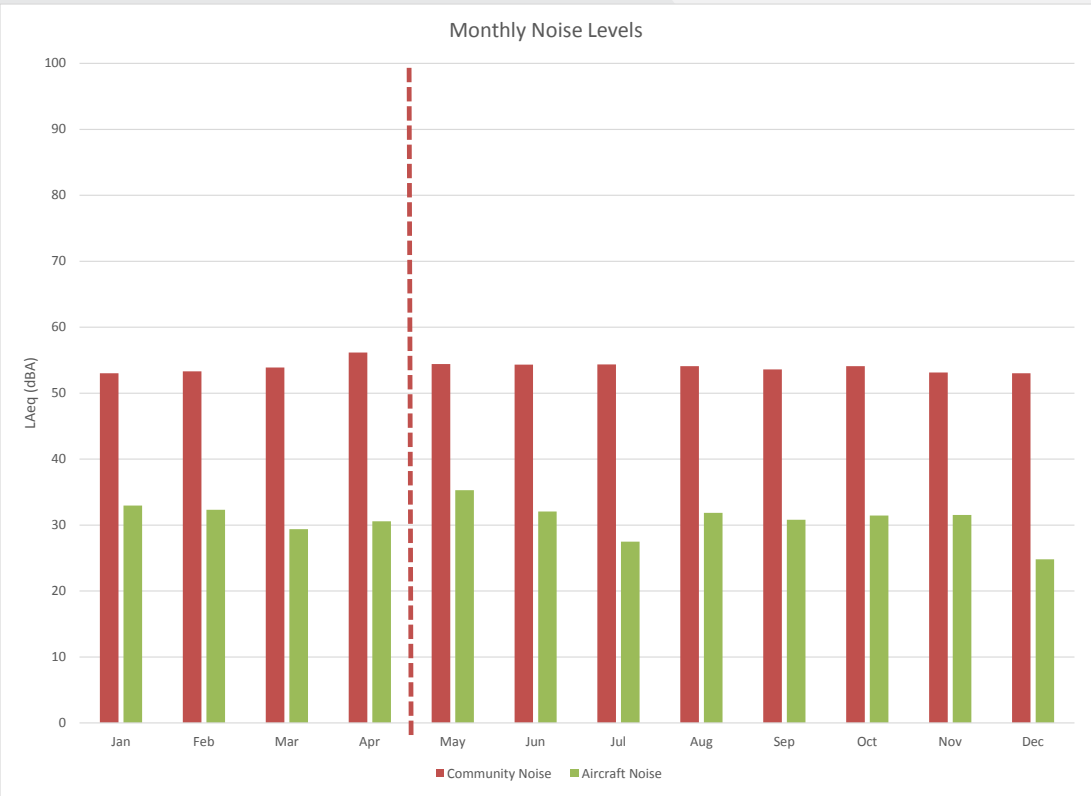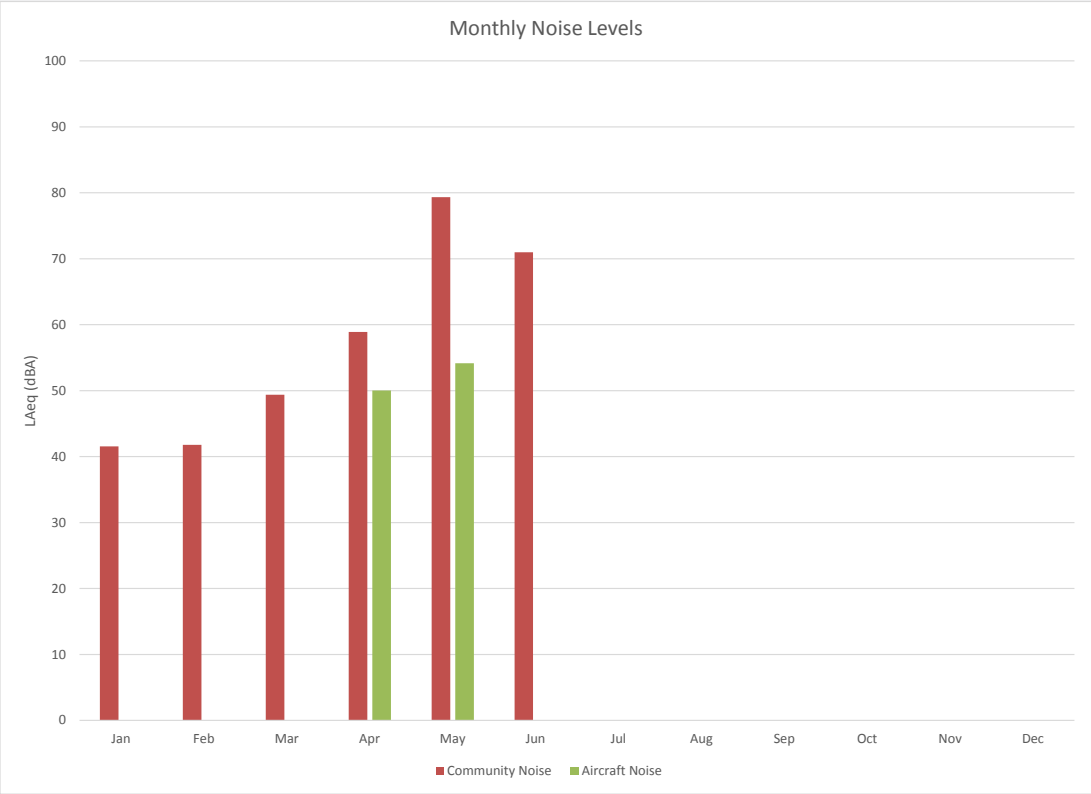
## Hidden Valley NMT: Hidden Valley Drive NW (_HIDD)



Monthly Noise Levels

## Inglewood NMT: 14 Street SE (_INGL)



Monthly Noise Levels
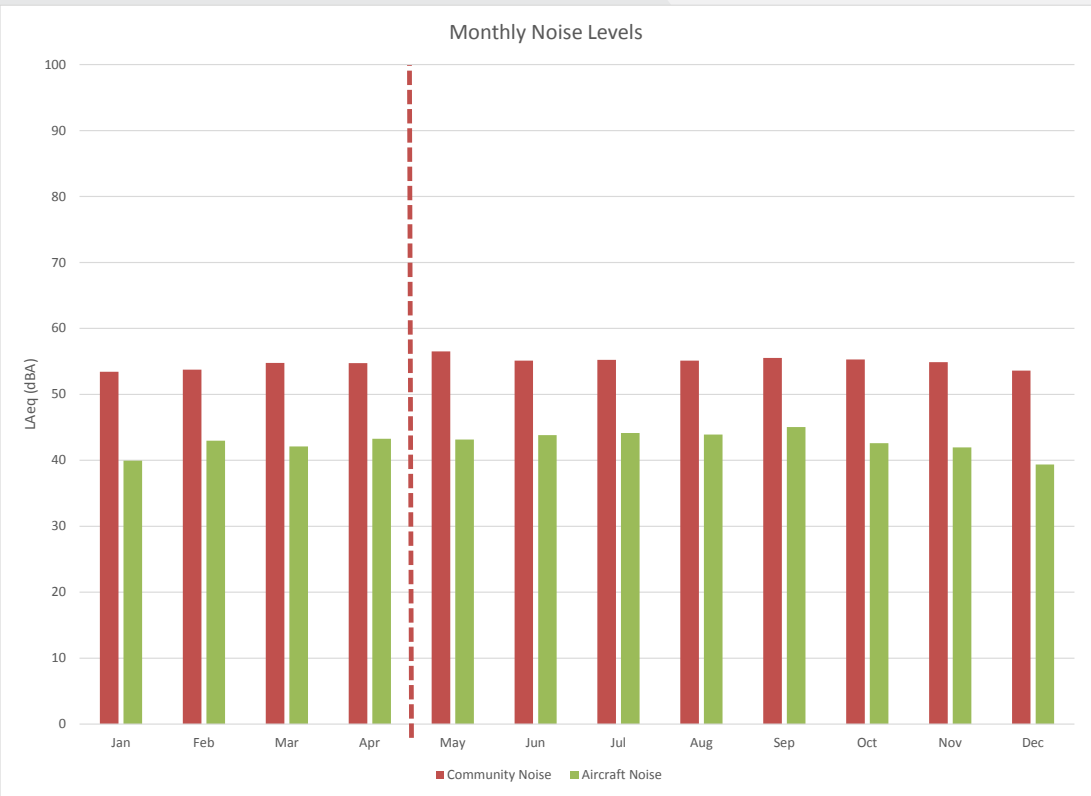
## Martindale NMT: Martindale Boulevard NE (_MART)



## Mayland Heights 2 NMT: Muskoka Drive NE (_MAY1)
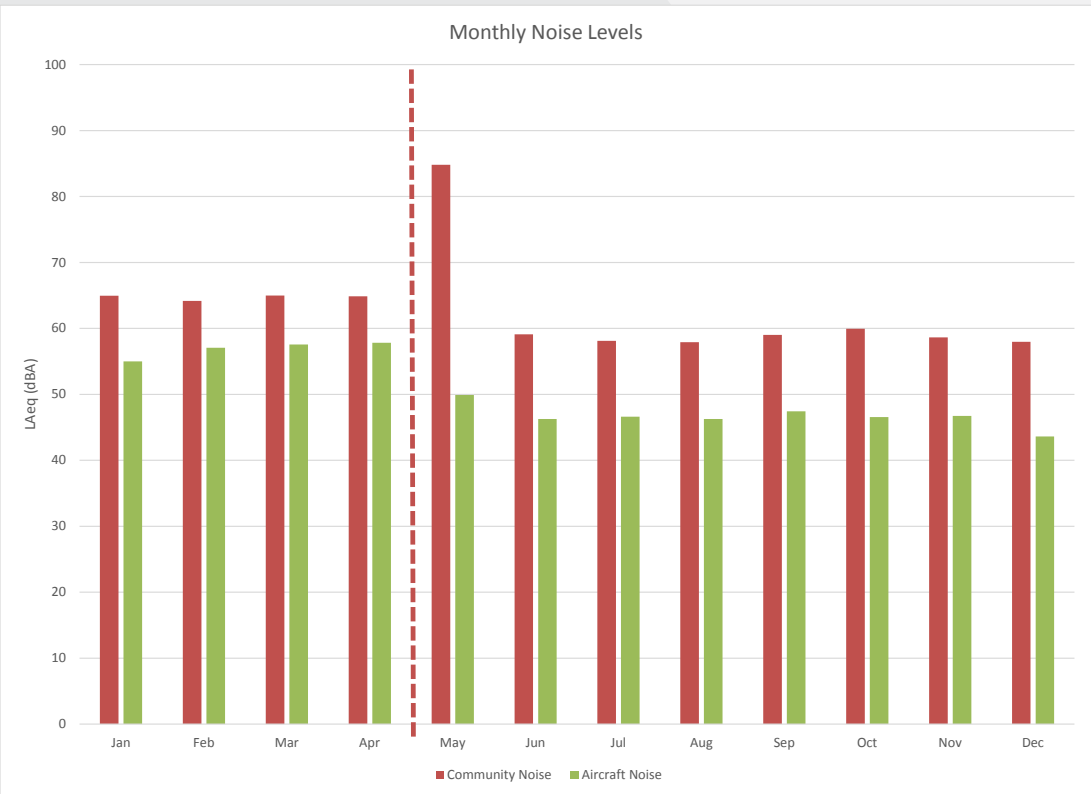
## Mayland Heights 1 NMT: 18A Street NE (_MAY2)

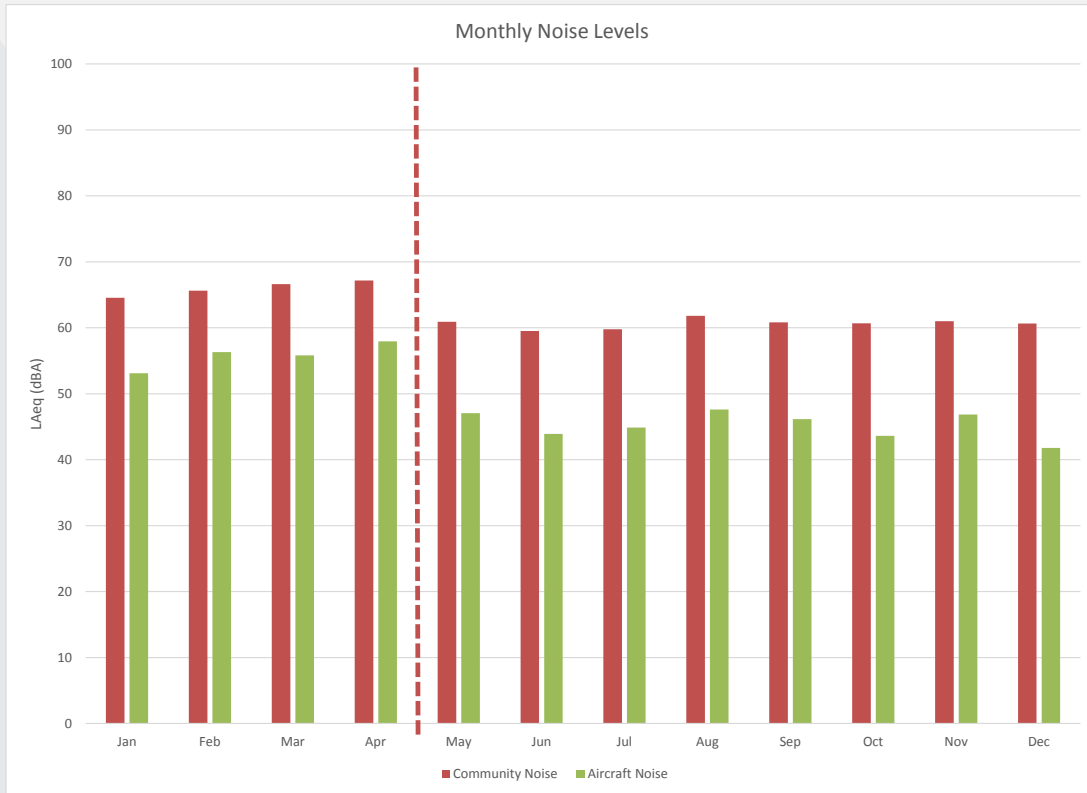

Monthly Noise Levels
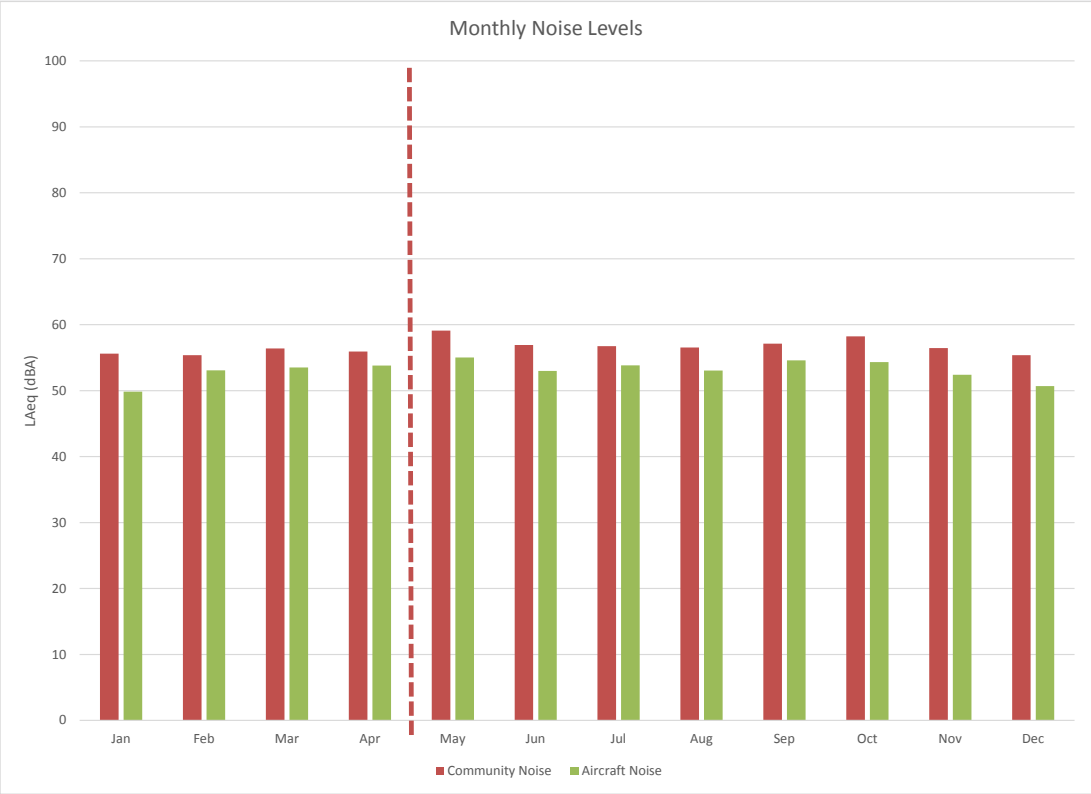
## Radisson Heights NMT: Robson Crescent SE (_RADI)



Monthly Noise Levels
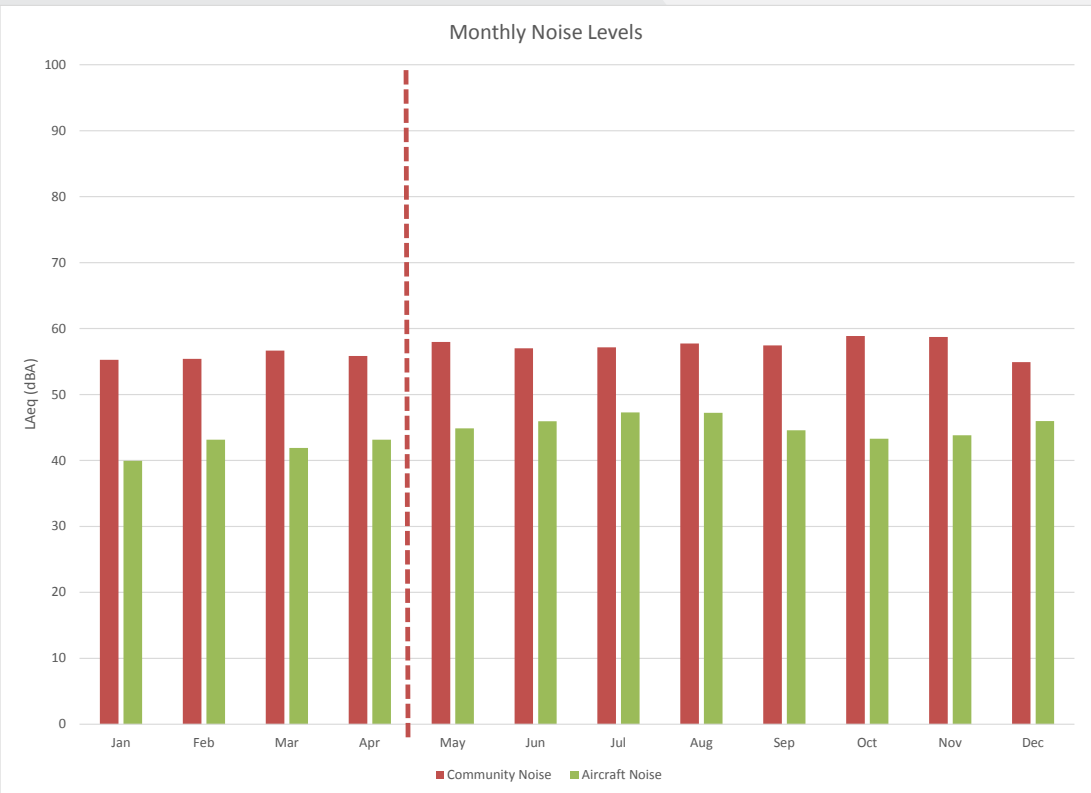
## Renfrew NMT: Russell Road NE (_RENF)



Monthly Noise Levels

## Skyview Ranch NMT: Skyview Ranch Drive NE (_SKYV)



Monthly Noise Levels
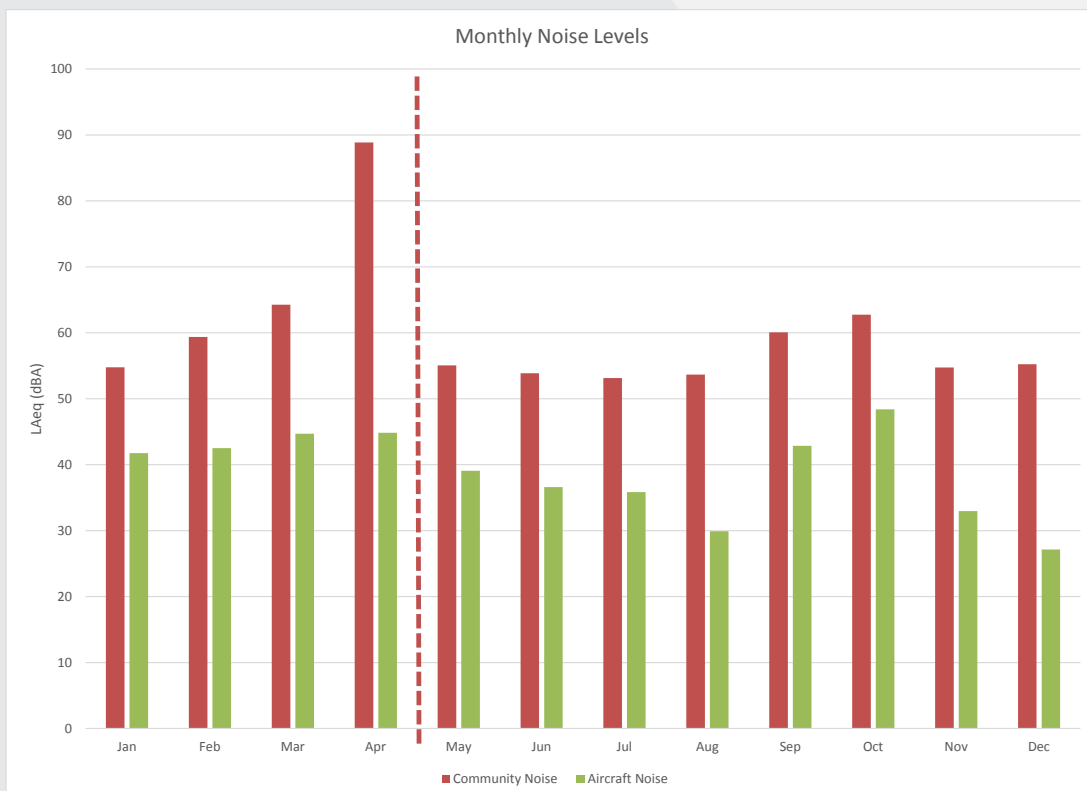
## Temple NMT: Templegreen Bay NE (_TMPL)



Monthly Noise Levels
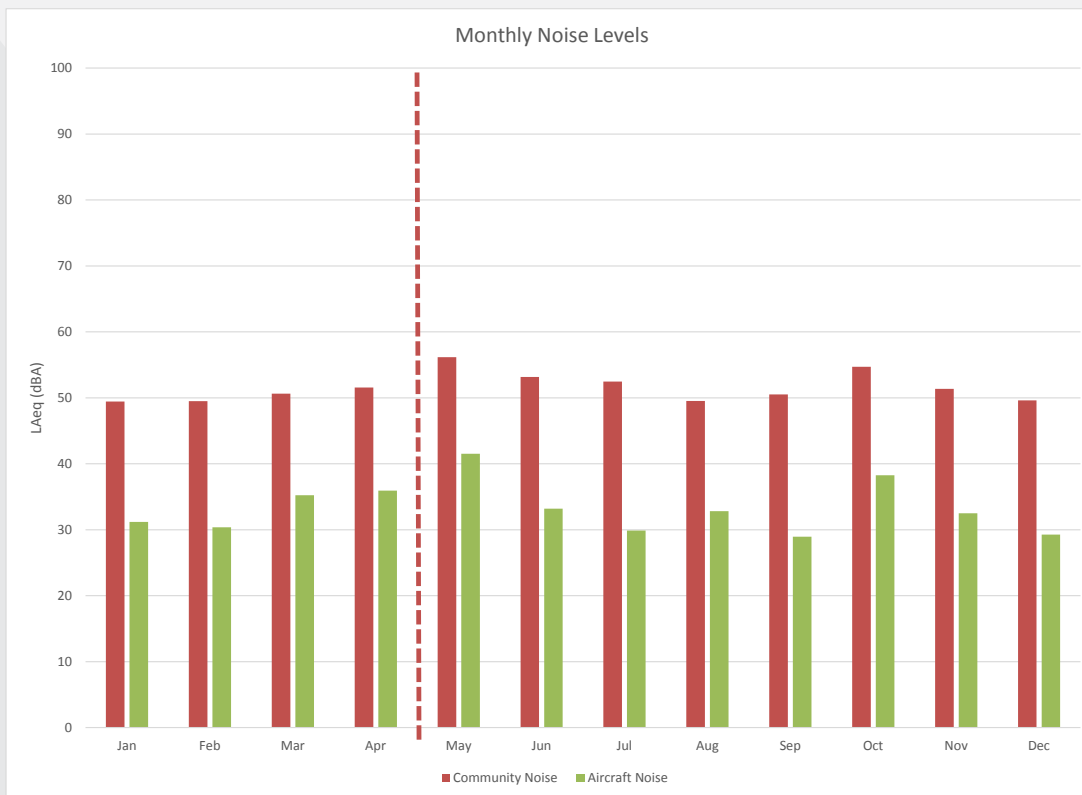
## Whitehorn NMT: Whiteland Drive NE (_WHIT)



Monthly Noise Levels

## Rundle NMT: Rundlelawn Road NE (_RUND)

**Monthly Noise Levels**



## Marlborough NMT: Marlborough Way NE (_MARL)

**Monthly Noise Levels**

**THE CALGARY AIRPORT AUTHORITY**

Community Engagement

2000 Airport Road NE, Calgary, AB, T2E 6W5

concerns@yyc.com

**CONNECT WITH US**

FlyYYC    FlyYYC    Fly_YYC

**YYC.COM**