2019 AERONAUTICAL NOISE MANAGEMENT REPORT

-VANCOUVER AIRPORT AUTHORITY-

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INTRODUCTION

Vancouver Airport Authority ("Airport Authority") is a community based and financially independent non-government organization, which oversees the daily operations of the Vancouver International Airport ("YVR") to ensure the airport runs safely and efficiently. The Airport Authority is committed to a positive long-term relationship with our surrounding communities and is dedicated to operating YVR in a manner that minimizes negative impacts on the environment, while providing 24-hour airport services.

The Airport Authority took over management of YVR from Transport Canada in 1992 under a long-term lease agreement. Managing noise from aircraft operations has been a priority for us since assuming responsibility of YVR.

As with all work undertaken by the Airport Authority, we approach noise management using a sustainability framework, which integrates the economic, environmental, social and governance aspects of our business. This framework is essential to our success and provides a responsible approach for our business objectives and our commitment to the local community.

The Airport Authority is committed to timely, transparent, and honest communication. The objective of this report is to share information about activities of the YVR Aeronautical Noise Management Program, and to facilitate informed dialogue between stakeholders involved in managing aircraft noise. Data and information compiled for this report also supports discussions with members of the YVR Aeronautical Noise Management Committee ("ANMC").

The ANMC is a consultative forum whose members are independently appointed by respective stakeholder groups that include citizen representatives, municipal staff, the Musqueam Indian Band, airlines, industry associations, NAV CANADA, and Transport Canada. The ANMC provides an opportunity for representatives to share information and provide advice and input on the development of noise management initiatives to the Airport Authority through a collaborative process. The ANMC is chaired by the Airport Authority and met three times in 2019. Minutes from these meetings are posted on the airport website (www.yvr.ca).

2019 HIGHLIGHTS

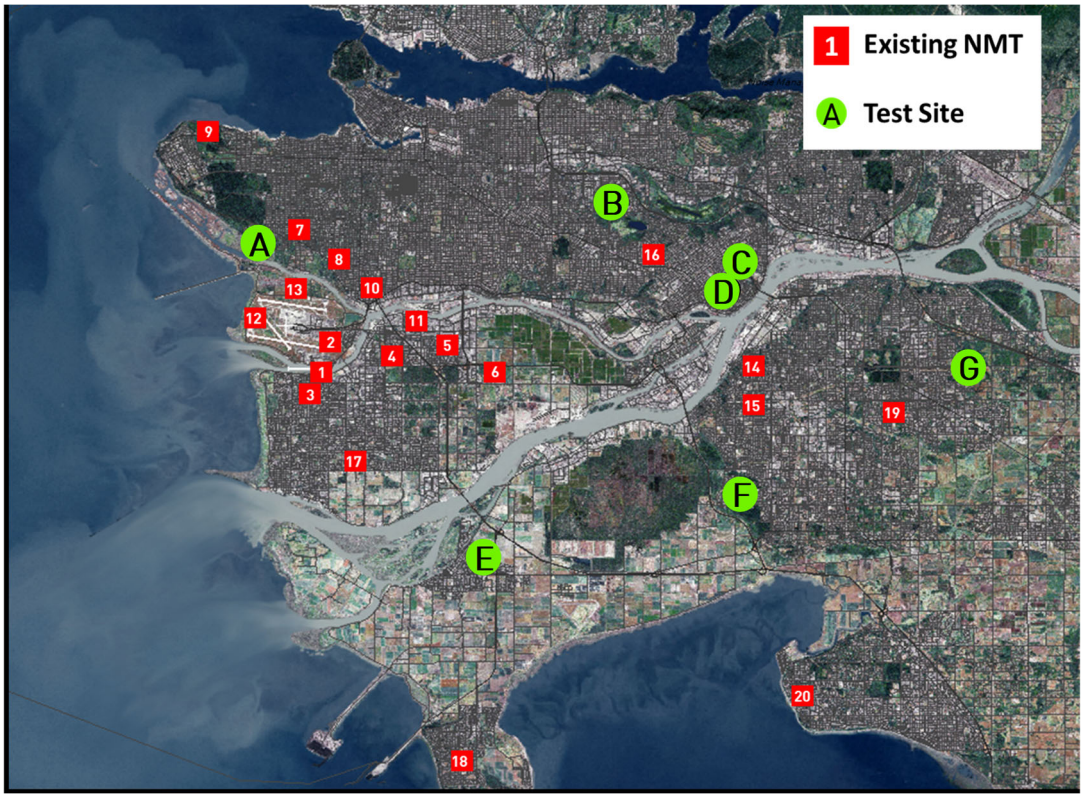
The Airport Authority has a comprehensive noise management program to manage noise from aircraft and airport operations while balancing the need of 24-hour airport access in the region. Annual work plans are guided by a broader set of initiatives contained in the YVR Noise Management Plan. This Plan is updated every five-years with input from the community and support from the ANMC, and the current Plan covers the years 2019-2023. Below is a summary of work highlights in 2019.

SITE ASSESSMENT FOR POTENTIAL NEW NOISE MONITORING TERMINALS

To accurately monitor and assess aircraft noise in the region, the Airport Authority maintains a network of Noise Monitoring Terminals ("NMTs") located throughout the surrounding area. In 2019, the Airport Authority retained the services of BKL, a local acoustical consulting company, to complete a study assessing the suitability of various locations in the Metro Vancouver area for siting new NMTs, to supplement the 20 fixed NMTs currently located in the community.

Seven test sites were identified for assessment. The location of the test sites is illustrated in Figure 1 and included: one site in Musqueam; one site in Burnaby, two sites in New Westminster, two sites in Delta; and one site in Surrey.

FIGURE 1: Test Sites for NMT Assessment



BKL collected sound level measurements at each site[1] and compared these against criteria in *ISO 20906:2009 Acoustics – Unattended monitoring of aircraft sound near airports*. In addition, the qualitative aspects of each site were considered including local obstructions or terrain features that could potentially shield the NMT from aircraft, and nearby noise sources that could adversely affect the ability to detect aircraft noise.

Based on their review, BKL determined that:

- Site A in Musqueam, Sites E and F in Delta, and Site G in Surrey were very favorable for consideration of a permanent NMT.
- Site B in Burnaby and Site D in New Westminster were determined to be moderately favorable for consideration of a permanent NMT.
- Site C in New Westminster was determined to be not suitable for consideration of a permanent NMT due to the high level of background noise from vehicle traffic.

Information from this study was then incorporated into multi-year project plan to expand the NMT network and upgrade the NMT hardware.

MULTI-YEAR SYSTEM PLAN FOR ANOMS FIELD HARDWARE

A multi-year project plan was prepared to support the replacement of hardware in the current NMTs and expand the current network of 20 fixed NMTs. Work will be done in stages over a five-year period, with a small number of NMTs completed each year. During the first stage of work, the Airport Authority is assessing the potential to install two new NMTs and take delivery of a new portable NMT unit.

DEPOLYED PORTABLE NMT IN MUSQUEAM

The Airport Authority continued with the deployment of a portable NMT unit in Musqueam. This unit was set up in at the Musqueam Indian Band Community Centre in September 2018, after discussions with the Musqueam Community, to monitor aircraft noise in the area in order to provide an understanding of aircraft noise exposure. Noise data measured at this and all sites are available online for the public to view through the YVR WebTrak tool[2] and a summary is also provided in this report.

[1] For the test site in Musqueam, BKL used sound level data collected by the Airport Authority's portable noise monitoring terminal that has been deployed at this location since September 2018.

[2] https://webtrak.emsbk.com/yvr5

NOISE MANAGEMENT INFORMATION VIDEOS

In an effort enhance information sharing with the community, the Airport Authority began creating short informative videos on various topics related to noise management and airport operations. A video explaining the general flight patterns used by aircraft serving YVR was created and posted on the airport website[3].

DISCUSSIONS WITH CANADIAN AIRPORTS

The Airport Authority continues to particpate in the Canadian Airports Council Noise Working Group, which includes members from many of the airports in Canada. This group provides a forum for the exchange of information and discussion of local and national noise issues, and several teleconferences and an in person meeting were hosted in 2019.

YVR FLY QUIET AWARDS

The 2018 YVR Fly Quiet Awards were presented at the annual YVR Chief Pilots Meeting. The goal of these awards is to suppoort best behaviors and raise awareness of noise issues within the aviation community.

The winners included: Jazz Aviation (propeller category); Air Canada (narrow-body jets); and All Nippon Airways (wide-body jets). Award winners for the past three years are presented in Table 1.

TABLE 1: YVR Fly Quiet Award Winners, 2016-2018

YEAR	Propeller	Narrow Body Jets	Wide Body Jets
2018	Jazz	AIR CANADA	ANA
2017	HORIZON AIR	American Airlines	ANA
2016	HORIZON AIR	Jazz	厦门航空 XIAMENAIR

[3] https://www.yvr.ca/en/about-yvr/noise-management/noise-faqs

YVR OPERATIONS IN REVIEW

In 2019, YVR experienced a decrease in the number aircraft movements and cargo tonnage, and the total number of passengers experienced an increase compared to 2018. Table 2 presents the annual operational statistics for 2019.

TABLE 2: Operational Statistics for YVR

Total Movements	331,441	2% Decrease from 2018
Total Cargo (Tonnes)	302,571	10.6% Decrease from 2018
Total Passengers	26,379,870	1.7% Increase from 2018

Figure 2 illustrates the historical trend of aircraft movements and passengers at YVR for the period of 1996-2019. The total number of aircraft movements remained well below the peak number of aircraft movements experienced in 1998. The passenger growth rate is higher than the growth rate of aircraft movements – meaning aircraft are carrying more passengers per operation, which has the benefit of reducing noise and emissions.

In 2019, approximately 97% of aircraft movements occurred during the day-time hours[4] and approximately 3% of aircraft movements during the night-time hours[5]. Figure 3 illustrates the average hourly runway movements by arrival and departure in 2019. As illustrated, aircraft movements begin to increase at 6:00AM and arrival or departure peaks are experienced throughout the day.

[4] For this report, day-time is defined as the period between 6:00AM and Midnight.
[5] For this report, night-time is defined as the period between Midnight and 6:00AM.

FIGURE 2: Annual Aircraft Movements & Passenger Statistics, 1996-2019 [6]

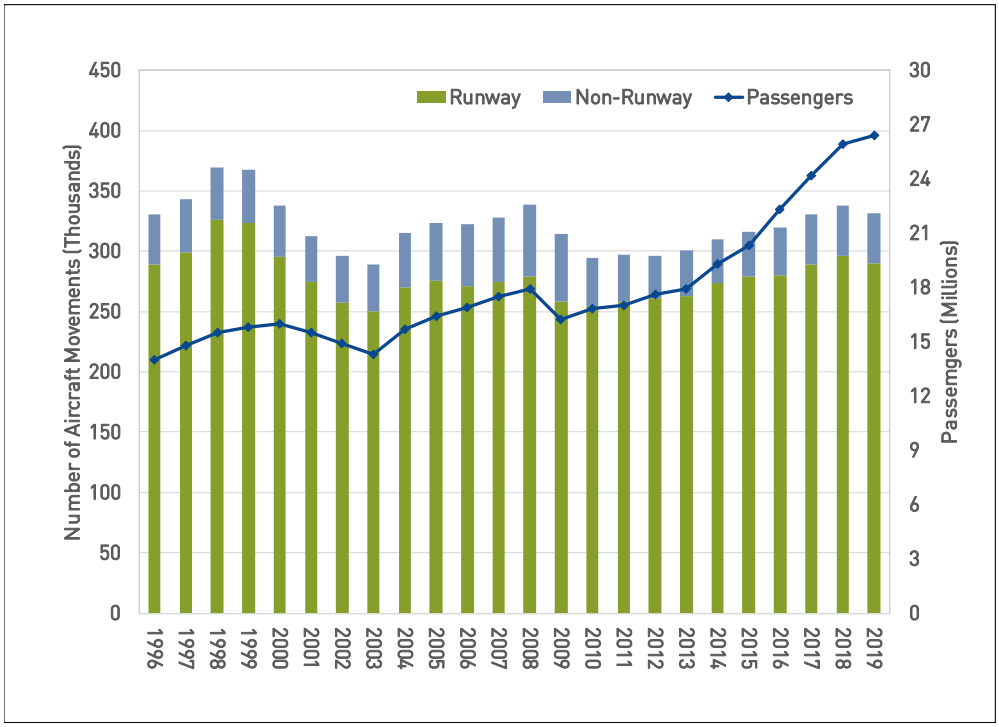
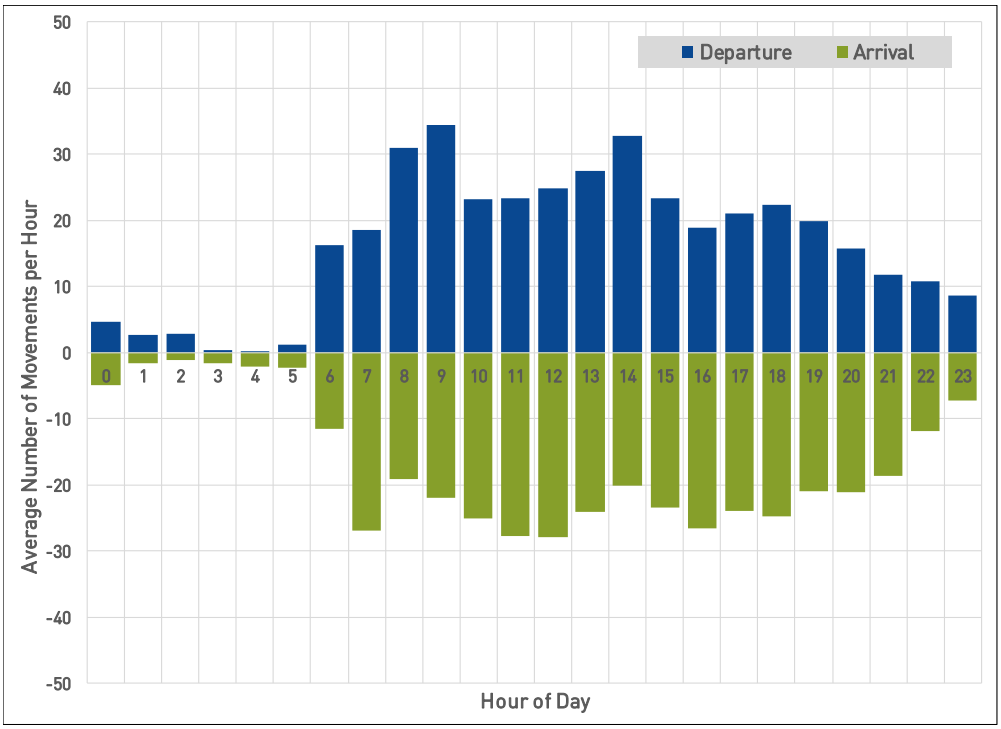


FIGURE 3: Average Hourly Runway Movements



[6] This chart includes both runway and non-runway movements. Non-runway movements include helicopter and float plane operations.

OPERATIONAL SNAPSHOT – NIGHT OPERATIONS

Like most international airports around the world and all international airports in Canada, YVR is open 24-hours a day to serve travel and business demands of the region. While movements at night are typically associated with cargo and courier services, there are several international flights using large wide body aircraft.

In 2019, there were approximately 9,385 runway movements during the night-time hours, representing a 4% decrease compared to 2018 (9,785). On average, this equates to approximately 26 movements per night between the hours of midnight and 6:00AM. Of these movements, approximately 52% were arrivals, which are generally quieter than departures. Table 3 summarizes the breakdown of the average nightly movements by aircraft type and operation.

TABLE 3: Average Movements at Night by Aircraft Type and Operation

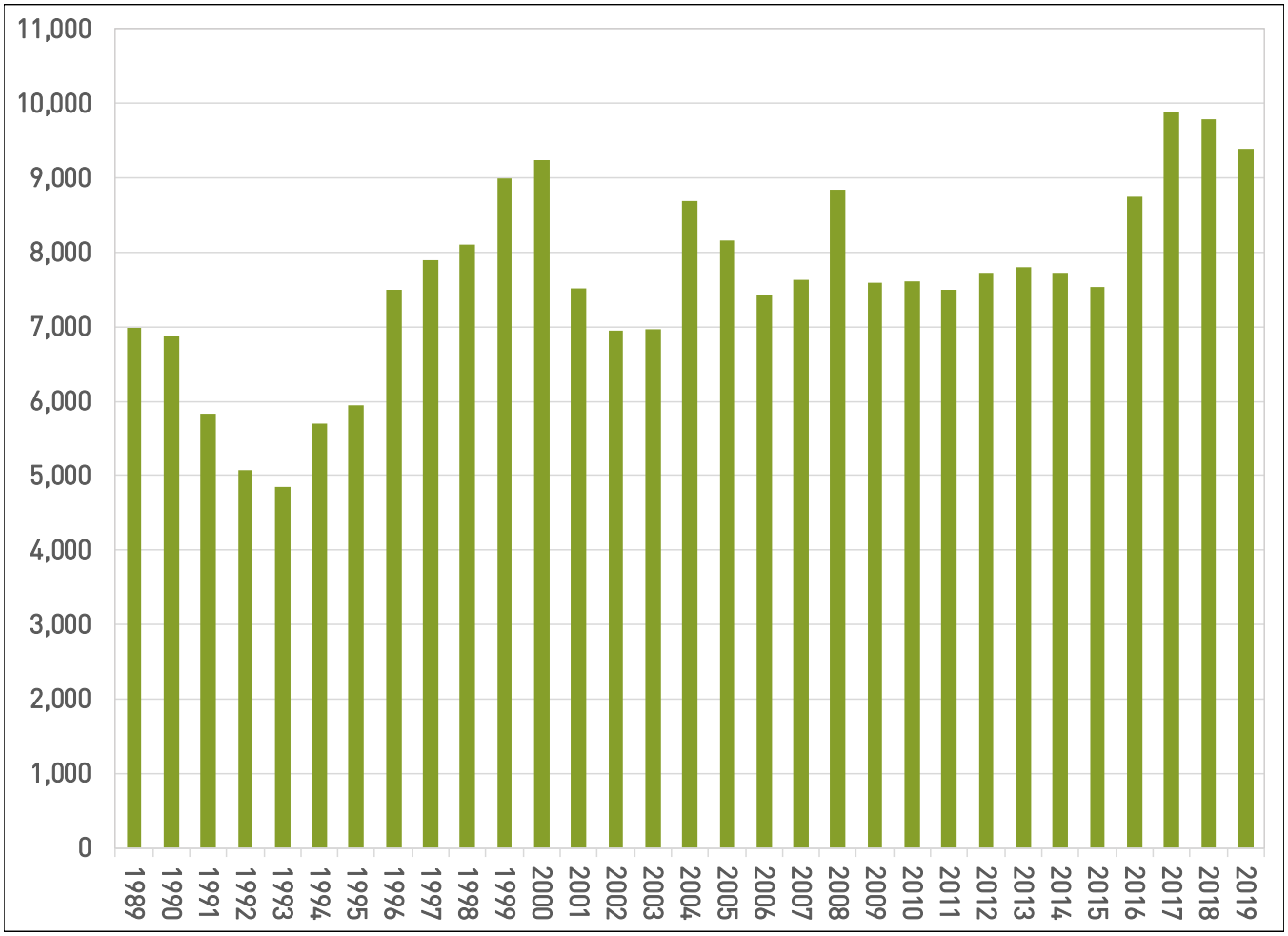
Aircraft Type	Operation	
	Arrival	Departure
Propeller (e.g. Dash-8, Navajo, Beech 1900, Saab 340)	2	1
Business Jet (e.g. Citation, Learjet)	1	1
Narrow Body Jet (e.g. A320, B737, CRJ, E190)	8	2
Wide Body Jet (e.g.B787, B777, A350, A330)	3	8

YVR has always been open 24-hours a day, including when the airport was managed by Transport Canada prior to the transfer to the Airport Authority in 1992. For comparative purposes, Figure 4 illustrates the annual night-time runway movements at YVR for the years 1989 to 2019

The published YVR Noise Abatement Procedures includes the following to minimize noise at night:

- A prior approval requirement for departures of jet aircraft rated over 34,000 kg (maximum take-off weight) between midnight and 6 AM.
- Use of preferential runways to keep arriving and departing aircraft over the Strait of Georgia (weather permitting).
- Early turn and vectoring procedures for aircraft on certain routes to minimize over-flights of populated areas.
- Closure of the north runway between the hours of 10 PM and 7 AM (except in the event of an emergency or maintenance).

FIGURE 4: Annual Night-time Movements at YVR, 1989-2019



OPERATIONAL SNAPSHOT – JET FLEET MIX BY NOISE CERTIFICATION

The International Civil Aviation Organization ("ICAO") is an agency of the United Nations and establishes principles and techniques for the planning and development of international air transportation to ensure safe and orderly growth. The ICAO Committee on Aviation Environmental Protection ("CAEP") prescribes standards for noise with the goal of promoting reduction at the source. These standards are contained in *Annex 16: Volume I Environmental Protection - Aircraft Noise* and categorize jet aircraft as either Chapter 2, Chapter 3 or Chapter 4 depending on three measured noise levels (take-off, landing, and sideline) obtained during prototype development[7].

[7] The Government of Canada legislated the phase-out of older noisier Chapter 2 jet aircraft over 34,000kg from operation in Canada by 2002. These aircraft are no longer permitted to operate in Canada and were either retired from operation or modified to meet Chapter 3 standards. A few exemptions were granted for aircraft operating from airfields in northern Canada.

The Chapter 14 noise standard was confirmed at the 9th meeting of CAEP in February 2013. This standard applies to new aircraft types over 55 tonnes (55,000kg) certified after 2017 and to new aircraft types less than 55 tonnes after 2020. To meet the Chapter 14 standard, aircraft must be at least 7 EPNdB (Effective Perceived Noise in Decibels) quieter than the current Chapter 4 standard. This reduction is cumulative over the three measurements points: take-off, landing, and sideline.

Table 4 below summarizes jet operations in 2019 according to their noise certification and Gross Take-off Weight ("GTOW") of the aircraft. In 2019, approximately 92% of all jet aircraft operating at YVR met Chapter 4 noise standards.

TABLE 4: ICAO Noise Certification of Jet Operations at YVR

ICAO Noise Certification	All Jet Aircraft	GTOW < 34,000kg (n~10,060)	GTOW ≥ 34,000kg	
			Narrow Body (n~122,360)	Wide Body (n~36,980)
Chapter 3	8%	22%	8%	2%
Chapter 4	92%	78%	92%	98%

In addition, approximately 92% of jet aircraft operating between the hours of midnight and 6:00 AM met Chapter 4 noise certification standards.

AIR TRAFFIC FLOW

YVR has two parallel runways and a crosswind runway. The parallel runways, which include the south runway (08R/26L) and the north runway (08L/26R), are aligned in an east-west direction with magnetic headings of 083° and 263°. The crosswind runway (13/31) is oriented in a northwest and southeast direction with magnetic headings of 125° and 305°.

The active runways are determined by wind conditions at the airport as aircraft must take-off and land into the wind for safety reasons. The predominant winds at YVR are typically in an easterly or westerly direction; therefore, the parallel runways are the primary runways in use. Based on historical observations, traffic flow in an easterly direction (Runway 08L and 08R) are more common during the fall and winter months, and traffic flow in a westerly direction (Runway 26L and 26R) are more common during the spring and summer months.

The published YVR Noise Abatement Procedures prescribes westerly flow of traffic as the preferred mode of operation whenever possible to reduce noise exposure on the community as this places departures, the noisiest type of operation, over the Strait of Georgia. In addition, NAV CANADA will attempt to accommodate two-way flow between the hours of 11:00PM and

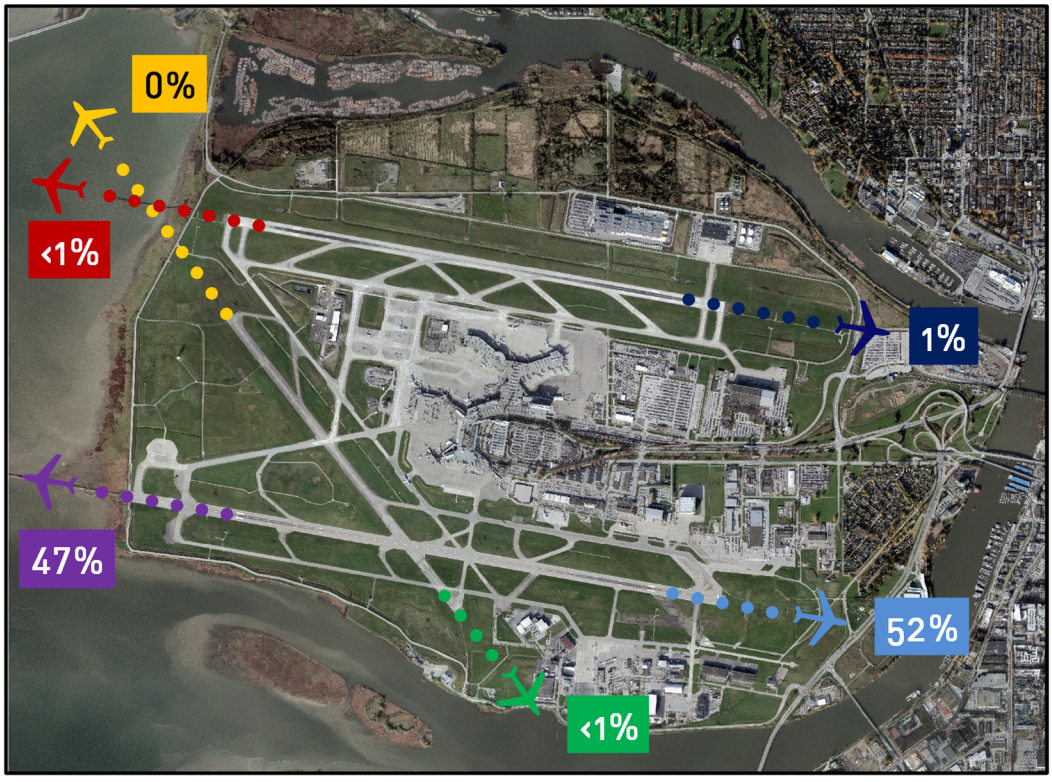
6:00AM to keep both arriving and departing aircraft over the Strait of Georgia to minimize over-flights and noise on the community. However, the use of two-way flow is dependent on traffic volume, airfield activities, and weather conditions and cannot be used all the time.

RUNWAY USE

At YVR, the south runway is the main 24-hour runway. The north runway is normally closed between the hours of 10:00 PM and 7:00 AM (except during emergencies and airfield maintenance) and is used primarily for landings between 7:00 AM and 10:00 PM. The crosswind runway is used infrequently and is generally reserved for periods of high crosswind conditions. Figure 5 and 6 illustrate the distribution of arrivals and departures on all runways in 2019.

FIGURE 5: Runway Arrival Distribution

FIGURE 6: Runway Departure Distribution



NOISE CONCERNS

One of the goals of the YVR Aeronautical Noise Management Program is to provide the community with up-to-date information on airport operations and noise management initiatives. The community can contact the Airport Authority with their questions and concerns through a variety of means, including:

- Dedicated e-mail (noise@yvr.ca)
- YVR Website (www.yvr.ca)
- Real-time flight and noise tracking system (WebTrak)
- 24-hour YVR Noise Information Line - (604) 207-7097

Information provided by residents and results of investigations are logged in a database, which is used to analyze and identify trends. The ANMC is provided a summary of concerns at each meeting to review and discuss.

NUMBER OF CONCERNS

In 2019, the Airport Authority received 2,546 noise concerns from 239 individuals across the Greater Vancouver area, which has a population of 2.4 million[8]. This represents a 278% increase in concerns but a 4% decrease in the number of individuals compared to 2018. Figure 7 presents a breakdown on the number of concerns and individuals for the past five years (2015-2019).

There are several individuals who register multiple concerns throughout the year, and in 2019 approximately 64% (1,638) of all concerns were received from three individuals.

Figure 8 provides a further breakdown of the number of concerns and individuals between 2015 and 2019, identifying the number of concerns associated with the three individuals registering the most concerns each year.

[8] 2016 Statistics Canada's Census (https://www12.statcan.gc.ca)

FIGURE 7: Number of Noise Concerns and Individuals, 2015 – 2019

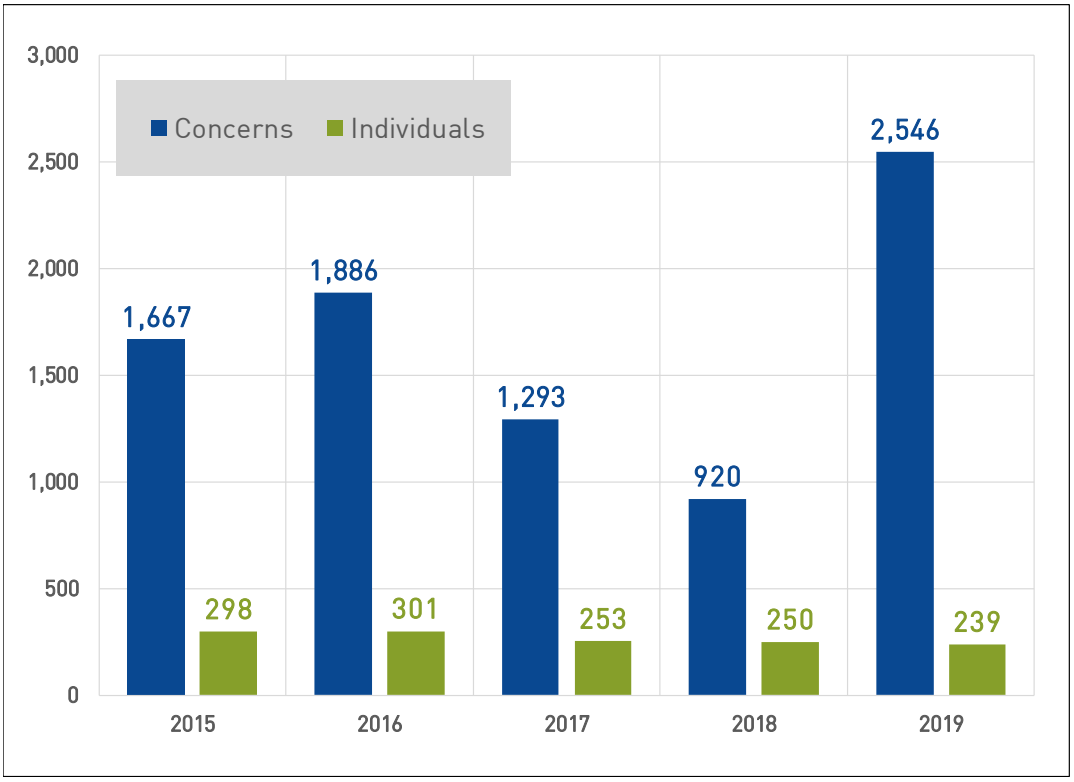
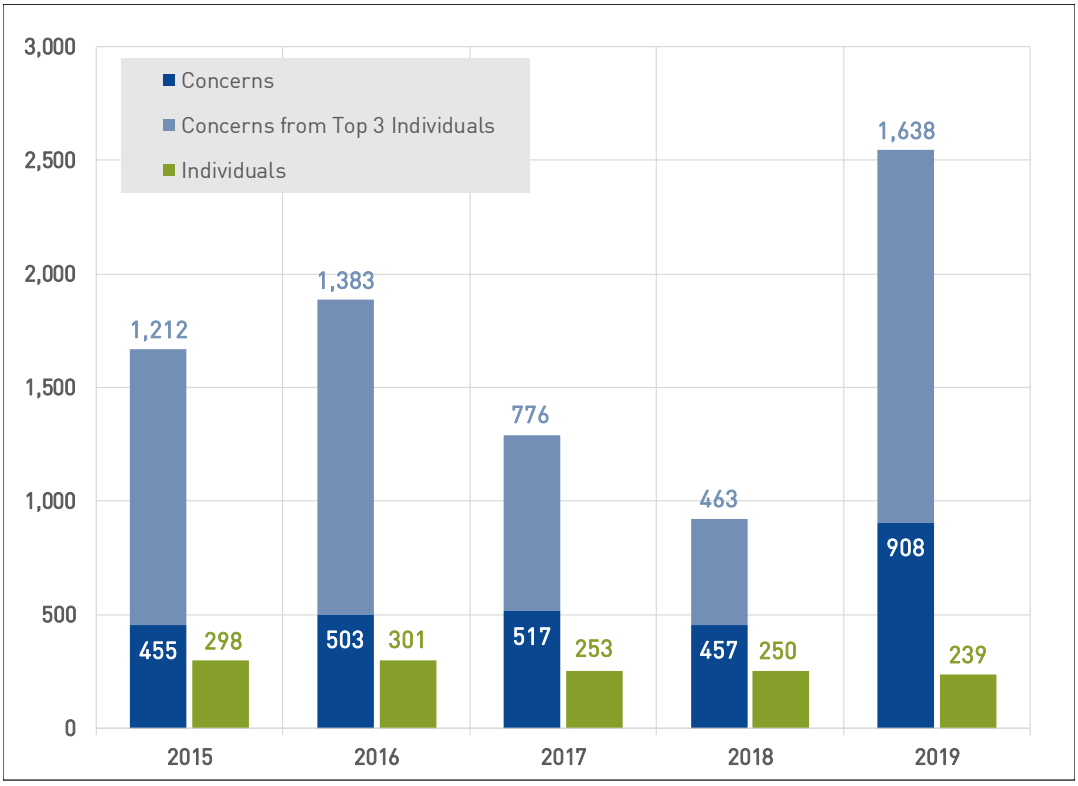


FIGURE 8: Number of Concerns and Individuals (Top 3 individuals each year), 2015 – 2019



Of the three individuals in 2019 registering the most concerns:

- Two reside in Richmond, within 7 km from the airport.
- One resides in Surrey, approximately 31 km from the airport.
- The concerns registered were mostly associated with jet aircraft departing on Runway 08R over the City.

NOISE CONCERNS BY LOCATION

Whenever possible, individuals are asked to provide information on the location of their residence to better understand the distribution of concerns across the region. Figure 9 illustrates the number of concerns and individuals for the various cities in the Greater Vancouver area.

FIGURE 9: Number of Concerns and Individuals by Location

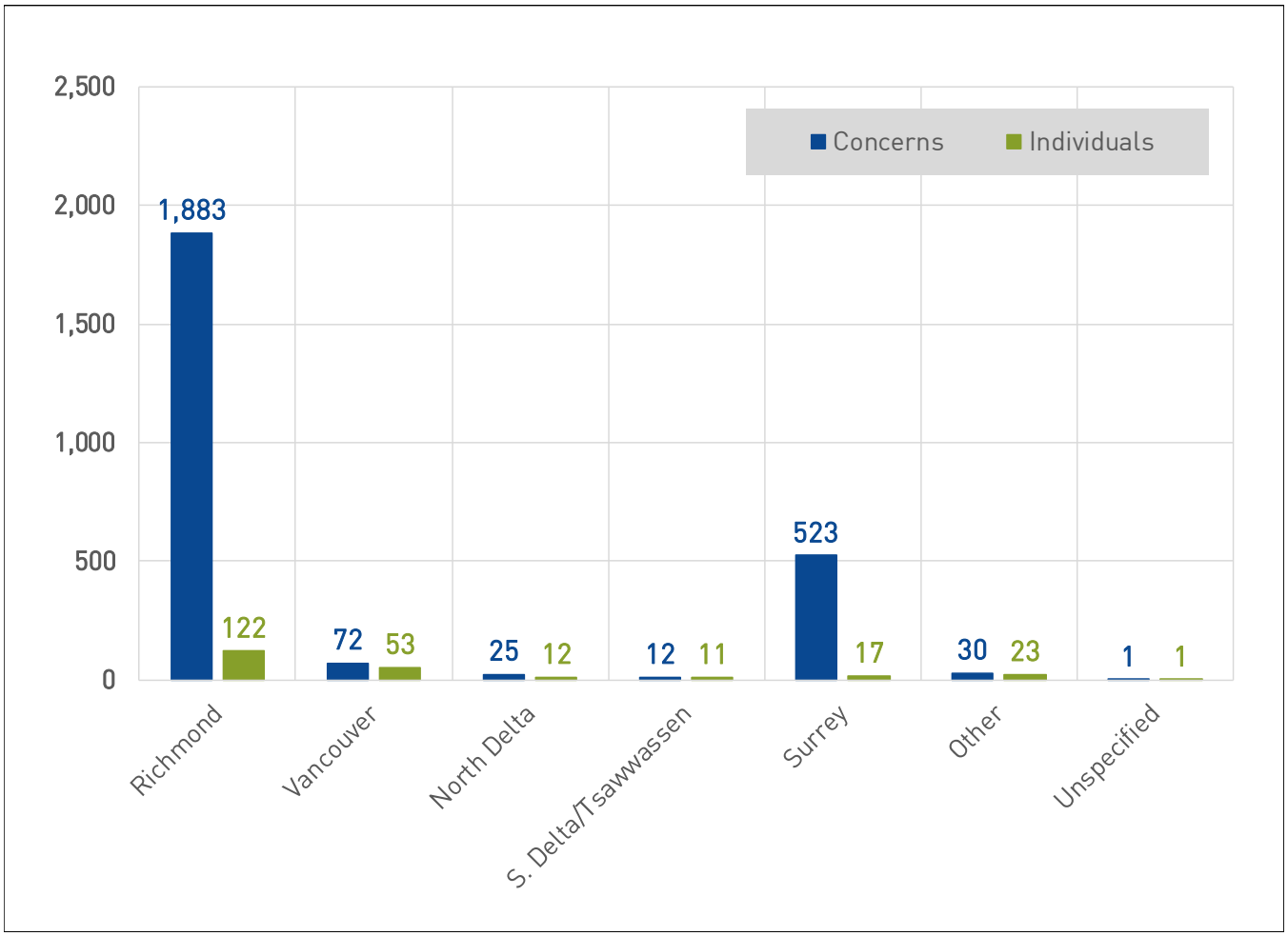


Figure 10 illustrates the geo-distribution of noise concerns across the Greater Vancouver area in 2019 based on address and postal code information. Locations closer to the airport generally exhibit a greater density of noise concerns due to the lower altitude of aircraft and regularity of aircraft activity.

Figure 11 illustrates the geo-distribution and the frequency of concerns in the Greater Vancouver area in 2019. The size of each dot represents the volume of concerns originating from that specific postal code. As illustrated, while most individuals registering frequent concerns were located close to the airport, some of these individuals are located more than 20 km from the airport. Aircraft noise concerns from these areas are generally related to the general routing and flight paths over populated areas.

FIGURE 10: Geo-distribution of Noise Concerns

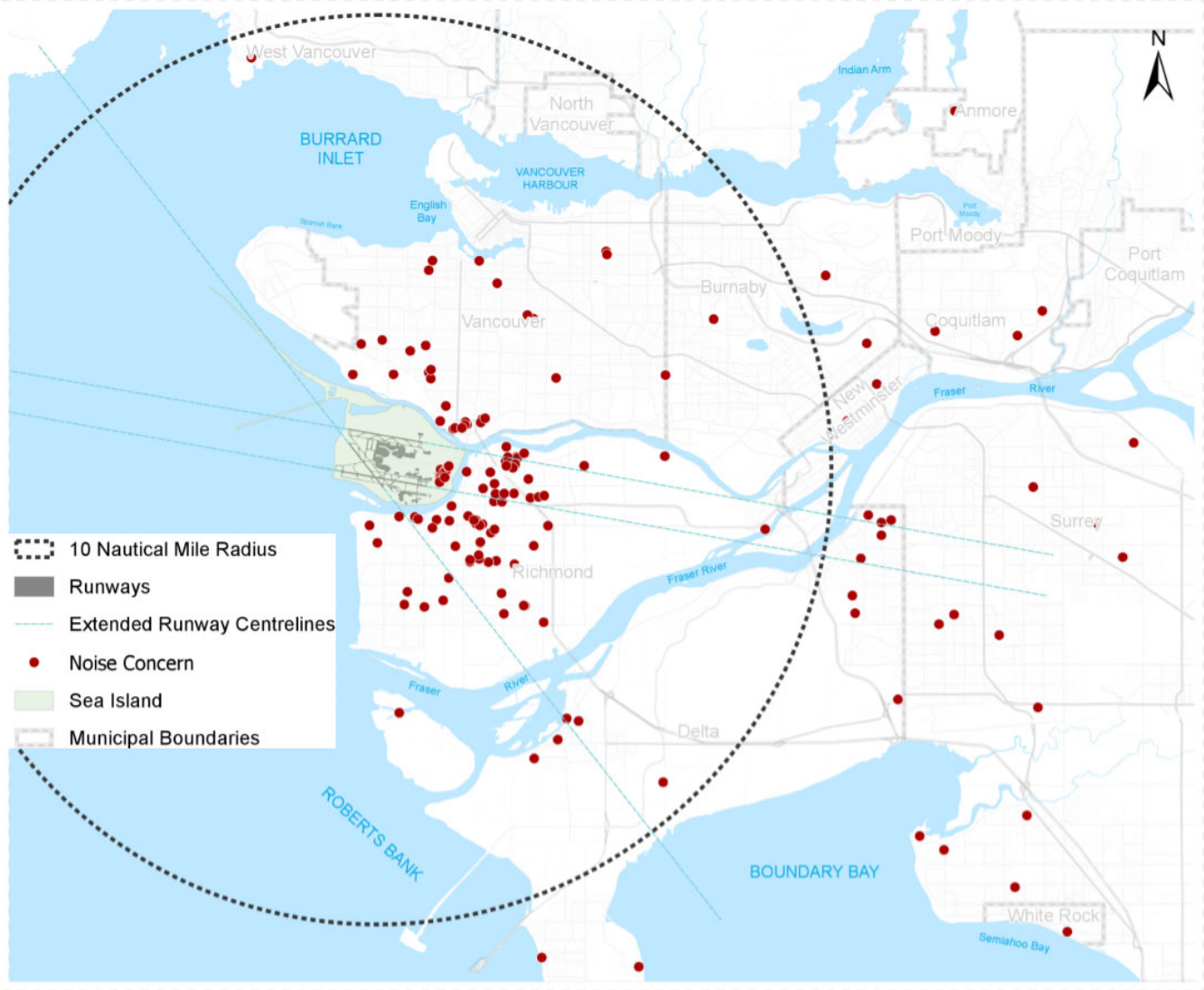
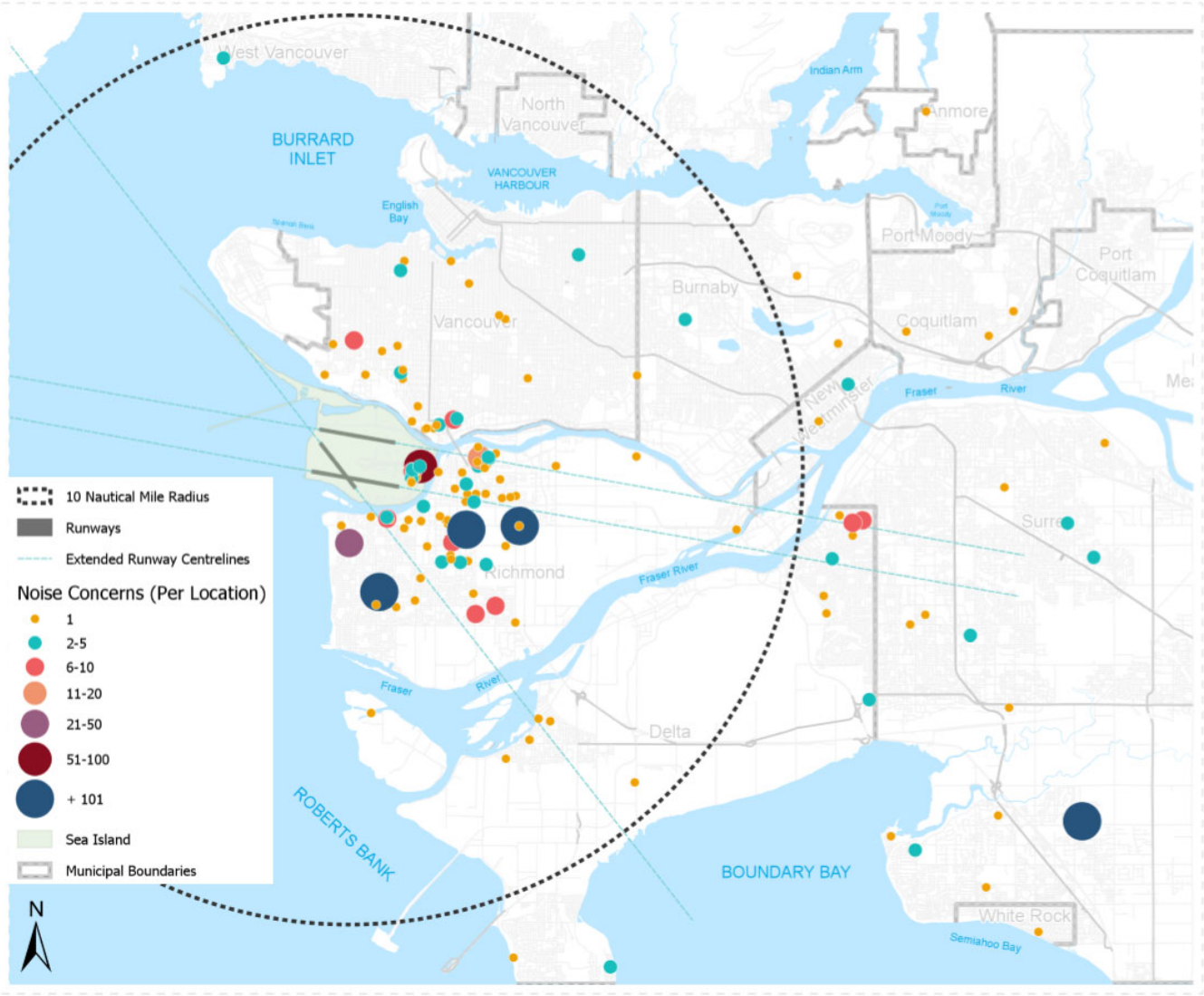


FIGURE 11: Frequency and Geo-distribution of Noise Concerns



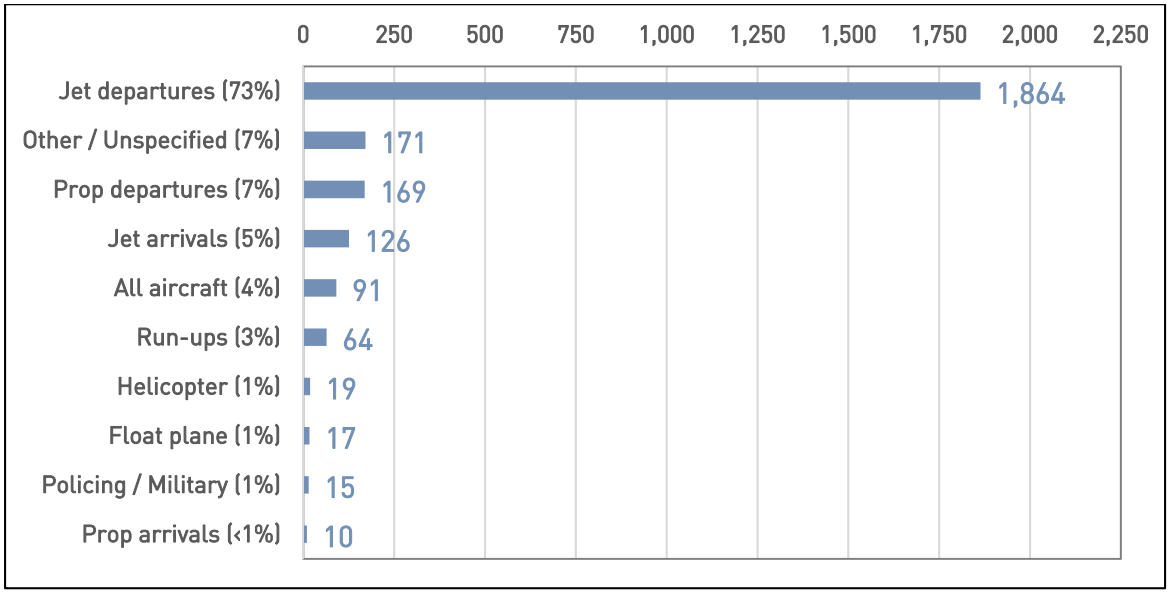
NOISE CONCERN BY OPERATION TYPE

When reporting noise concerns, individuals generally provide details of date, time, and location of the noise event. Based on the information provided, each concern is categorized into an operation type such as jet departure, jet arrival, helicopter and run-ups. In some cases, the information provided by the individual is general and not enough to categorize the concern to a specific operation. In these instances, Airport Authority staff will review flight tracks and procedures to best categorize the nature of the concern. General concerns that cannot be matched against a specific operation type are categorized as "All aircraft". General concerns that cannot be correlated to any aircraft activities at the time provided by the individuals are categorized as "Other/Unspecified".

While all areas of the region are exposed to some level of aircraft activity, the level of exposure will vary depending on the location of the area in relation to the airport and its proximity to flight paths. As such, the category of concerns will vary depending on where the individual is located as the distribution and nature of the operation over each area will be different. Figure 12 illustrates the breakdown of all noise concerns received in 2019 by operational category.

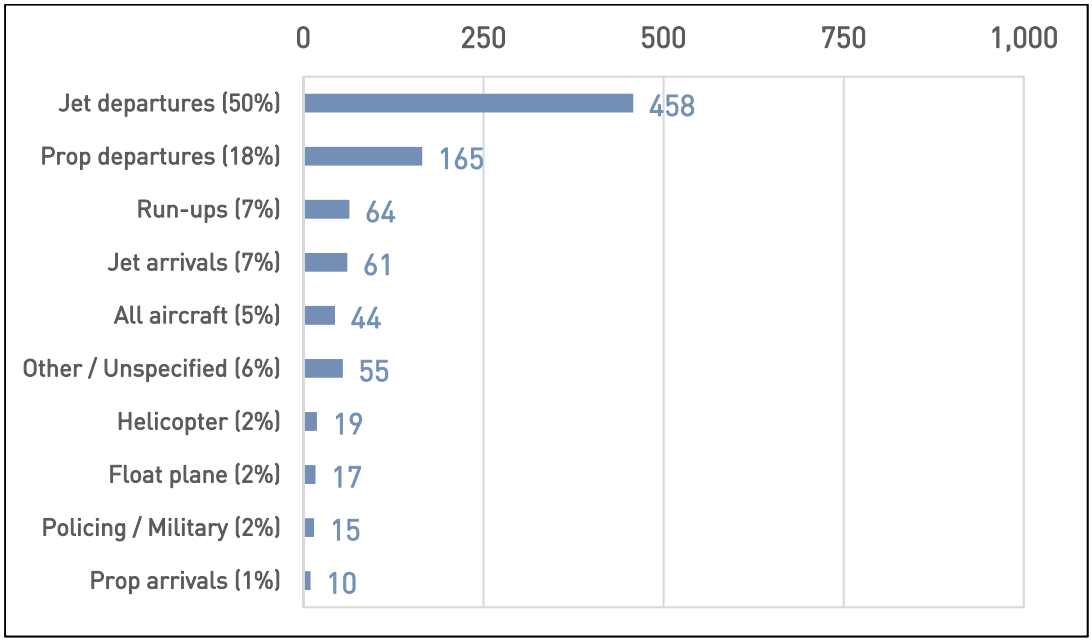
As illustrated, the three operational categories associated with the most concerns in 2019 are: jet departures, other/unspecified, and prop departures. Of the 1,864 concerns related to jet departures, 1,416 (76%) of these were associated with the three individuals submitting the most concerns in 2019.

FIGURE 12: Concerns by Operational Category, Total = 2,546



When a small number of individuals register multiple concerns, this can influence the statistics. Therefore, to better understand the nature and trends of concerns from the majority, further analysis was done with the dataset to exclude the 1,638 concerns from the three individuals with the most concerns. Figure 13 illustrates the remaining 908 concerns received from 236 individuals by operation type.

FIGURE 13: Concerns by Operational Category, Excluding Top 3 Individuals, Total = 908



Jet departures remained the top operational category, accounting for 50% of the concerns. Further analysis showed that:

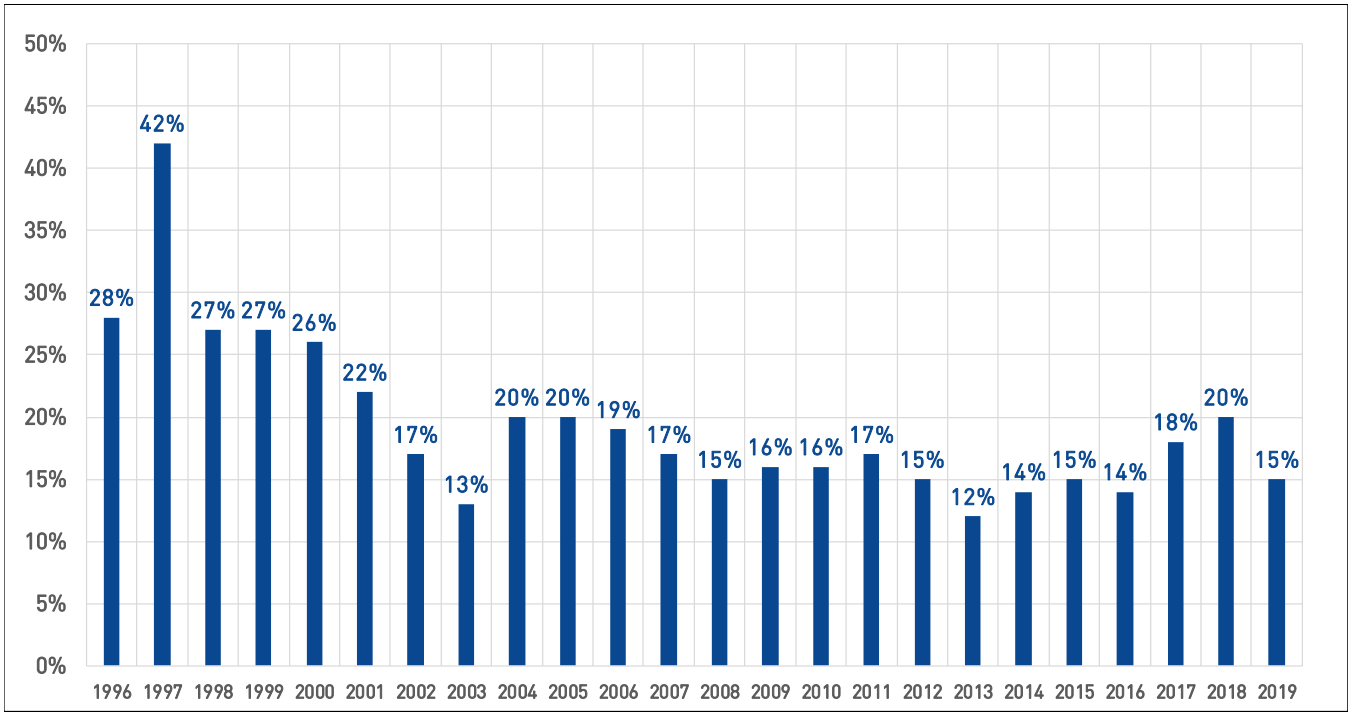
- 95% of concerns related to jet aircraft departures originated from communities located within 10 nautical miles of the airport. These are areas exposed to jet aircraft take-offs at lower altitudes.
- 18% of all concerns were associated with propeller aircraft departures. These concerns were received from residents living within 10 nautical miles of the airport.
- Approximately 7% of concerns were related to maintenance run-ups, with 95% of run-up concerns received from residents in Richmond. One individual in Richmond registered approximately 17% of all run-up concerns.

COMMUNITY SURVEY

Since the mid-1990s, the Airport Authority has commissioned a third-party survey to track public attitudes and opinions about YVR on several topics including aircraft noise. The community survey represents the opinions of approximately 1,000 residents selected at random from across communities in the Greater Vancouver area provides one gauge of aircraft noise annoyance.

When asked, "*While you have been at home during the past year, have you been annoyed by aircraft noise in your neighbourhood?*" approximately 15% of the survey respondents in 2019 stated that they were annoyed by aircraft noise, this is a decrease from 20% cited in 2018. Figure 14 illustrates the trend since 1996.

FIGURE 14: Community Survey - Respondents Annoyed by Aircraft Noise, 1996-2019



NOISE MONITORING DATA

The monitoring of noise levels and aircraft activity in communities around the airport is a major component of the YVR Aeronautical Noise Management Program. To achieve this, the Airport Authority uses the Aircraft Noise & Operations Monitoring System ("ANOMS") to provide an objective assessment of aircraft noise levels in the communities.

ANOMS combines noise data collected at NMTs and radar flight tracking data provided by NAV CANADA, which allows an understanding of the contribution of aircraft noise at each site. Figure 15 illustrates the NMT network and their relationship to runways at YVR. The network of NMT consists of 20 fixed NMTs with one portable unit that can be deployed as required. In 2018, the portable NMT was deployed for long term monitoring in Musqueam, and data collected at this site throughout 2019 is summarized in this report along with data from the other stations.

FIGURE 15: NMT Locations in the Greater Vancouver Area

ANNUAL AVERAGE NOISE LEVELS (LEQ)

One common metric for community noise assessment is the equivalent sound level, or average noise level ("Leq"), measured over a given period. Table 5 presents the annual average Leq, measured in units of A-weighted decibel or dBA, at each NMT location for the last five years. It is important to note that the average noise levels, presented below, include contributions from all sources in the community, including aircraft, motor vehicles, people, lawn mowers, barking dogs, etc.

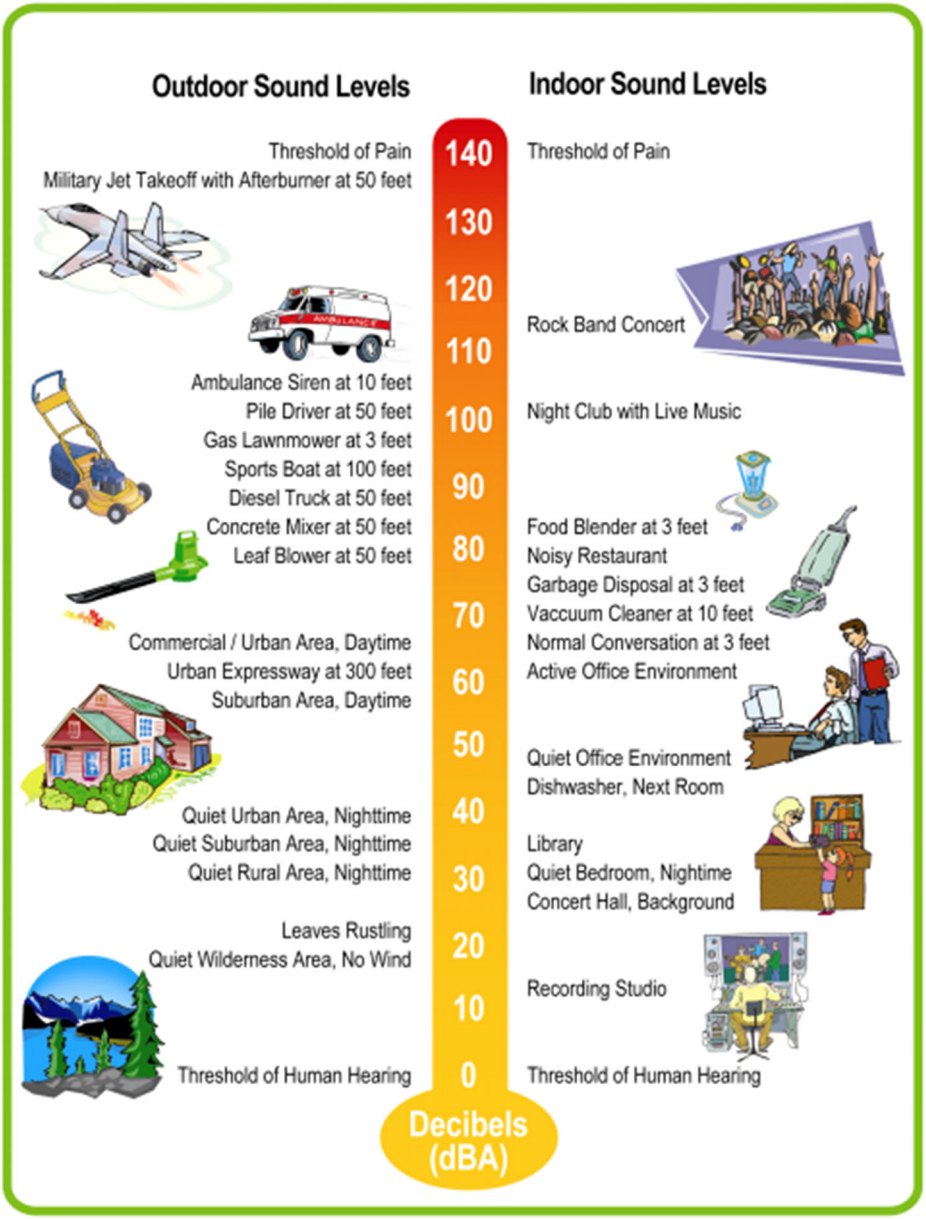
To provide context on sound exposure, Figure 16 illustrates example sounds levels ranging from 0 to 130 dBA associated with typical sources.

TABLE 5: Annual Average Noise Level (in dBA), 2015-2019

	Noise Monitoring Terminal									
YEAR	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
2015	61.4	65.1	52.7	60.3	58.4	61.7	58.4	52.0	50.1	54.3
2016	61.2	65.3	53.0	62.4	58.4	58.1	58.4	55.8	51.3	56.7
2017	61.0	64.9	54.1	59.9	58.5	57.1	57.5	51.4	50.1	55.1
2018	61.3	66.3	52.8	60.5	58.5	57.4	58.4	54.2	50.4	56.3
2019	**66.2**	**66.7**	**53.6**	**60.6**	**58.3**	**57.6**	**58.7**	**59.9**	**50.5**	**56.7**

YEAR	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	#21
2015	61.4	65.1	61.5	64.1	53.5	56.3	56.2	54.7	55.9	61.4	
2016	60.6	66.9	61.4	56.1	53.8	54.6	54.1	53.8	56.3	60.6	
2017	61.1	73.3	61.8	58.9	53.3	54.3	54.2	53.7	55.3	61.1	
2018	60.9	72.8	62.1	56.4	55.0	54.3	53.0	54.3	56.5	60.9	
2019	**61.3**	**71.9**	**62.3**	**60.2**	**53.9**	**54.4**	**53.9**	**53.9**	**60.5**	**53.2**	**52.5**

FIGURE 16: Example Sound Level and Associated Sources



Source: URS Corporation, 2008

NUMBER OF EVENTS - SINGLE EVENT NOISE LEVEL

Another metric used to assess noise is the single event noise level ("SEL"), measured in dBA. For an aircraft fly-over, either a landing or take-off, the SEL represents the total acoustic energy above a prescribed reference threshold and is typically 10 dBA greater than the maximum noise level experienced during the aircraft fly-over. The primary use of the SEL is to provide a comparison of noise events with different noise levels and durations.

While reference thresholds are set individually at each NMT according to the ambient noise levels in that area, thresholds are typically set between 65 and 70 dBA during the hours between 7:00AM and 10:00PM and between 55 and 60 dBA during the hours between 10:00 PM and 7:00 AM.

Noise events collected are categorized as either correlated or uncorrelated. Correlated events are those associated with aircraft and uncorrelated events are those associated with other sound sources in the community. For NMTs located close to flight paths, noise events are primarily associated with aircraft, whereas noise events at NMTs located farther away from the airport and flight path are primarily associated with non-aircraft sources.

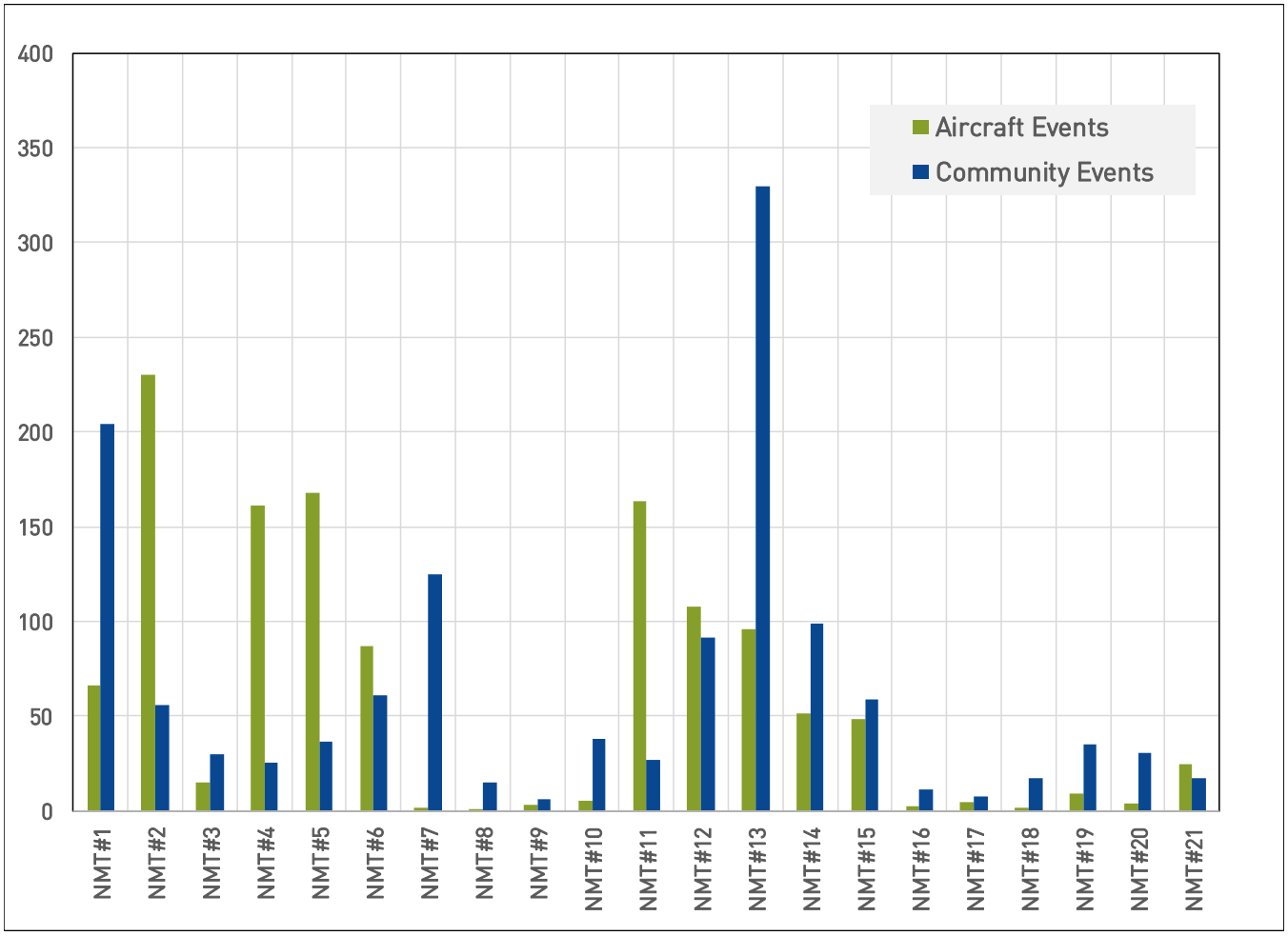
Table 6 presents the average number of aircraft and non-aircraft noise events registering a SEL above 70 dBA at each NMT location in 2019 and Figure 17 presents this information graphically.

TABLE 6: Average Daily Number of Noise Events above 70dBA at NMTs

NMT	Name	Location	Average number of DAILY Noise Events > 70 dBA		
			Aircraft	Community	Total
1	Richmond Olympic Oval	6111 River Rd., Richmond	66	204	270
2	Airside Burkeville	Templeton St., Richmond	231	56	287
3	Lynas Lane Park	Lynas Lane & Walton Rd., Richmond	15	30	45
4	Tomsett Elementary	Odlin Rd. and No. 4 Rd., Richmond	161	26	187
5	Bath Slough	Bath Rd. & Bath Slough, Richmond	168	36	204
6	Outer Marker	Westminster Hwy & No. 7 Rd., Richmond	87	61	148
7	Crofton School	W41st & Blenheim St., Vancouver	2	125	127
8	McKechnie School	W59th & Maple St., Vancouver	1	15	16
9	UBC	Northwest Marine Dr., Vancouver	3	6	9
10	Marpole	W67th & Cartier St., Vancouver	6	38	44
11	Bridgeport	No. 4 Rd. & Finlayson Dr., Richmond	163	27	190
12	West Sea Island	Airside YVR, Richmond	108	92	200
13	North Sea Island	Ferguson Rd., Richmond	96	329	425

14	Annieville-Delview Secondary	9111-116th St., Delta	51	99	150
15	Alex Fraser Bridge	North Delta Rec. Ctr. 11415-84th Ave., Delta	48	59	107
16	Burnaby - St. Francis	6610 Balmoral St., Burnaby	3	11	14
17	Maple Lane Elementary	Alouette Dr. & Tweedsmuir Ave., Richmond	5	8	12
18	South Delta - Tsawwassen	53rd Street & 8A Ave., Delta	2	17	19
19	North Surrey	82A Ave. & 146th St., Surrey	9	35	44
20	South Surrey	20th Ave. & Ocean Forest Dr., Surrey	4	31	35
21	Musqueam	Musqueam Community Centre. Musqueam	25	18	43

FIGURE 17: Average Daily Number of Noise Events at NMTs



ENVIRONMENT – YVR Noise Management

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For questions regarding this report, please contact us at the following:

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Note on Reported Figures and Data:

The Airport Authority receives aircraft operations data from NAV CANADA. This data includes daily aircraft arrivals and departures at YVR as well as aircraft transiting through the Vancouver Control Zone. Every effort is made to verify and correct anomalies in the dataset, and numbers stated in this report may vary slightly from those reported by others.

Version 1.00

- March 25, 2020 -