



# Proposed Noise Abatement Procedures Public Consultation Materials

## Oshawa Executive Airport

Final Report | September 27, 2021

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## List of Acronyms

Acronym	Definition
AC	Advisory Circular
AAE	Above Airport Elevation
AGL	Above Ground Level
ASL	Above Sea Level
CAR	Canadian Aviation Regulation
CFA	Canadian Flight Academy
CYOO	Oshawa Executive Airport
dB(A)	Decibels (A-Weighted)
DFC	Durham Flight Centre
ft.	Feet
FTU	Flight Training Unit
ICAO	International Civil Aviation Organization
km	Kilometre
kt	Knot (Nautical Mile per Hour)
m	Metre
NCAMS	NAV CANADA Aircraft Movement Statistics
µg	Microgram
VFR	Visual Flight Rules

# Data Notes

## Aircraft Movements

At various instances in this report, small variations occur in how annual aircraft movement data is reported. Historical activity from 1997 to 2020, as reported in Section 2.2, relies on Statistics Canada data (Statistics Canada Tables 23-10-0002-01 and 23-10-0018-01). Detailed analyses of aircraft movements and the Proposed Noise Abatement Procedures (Section 5) utilize NAV CANADA Aircraft Movement Statistics (NCAMS) datasets for 2019 and 2020 provided by the Airport Operator.

## Noise Complaints

January 2016 – July 2020 Data: Prior to July 2020, aircraft noise complaints were received via an online form, by telephone, or by email to the Airport Operator. Once received, noise complaints were manually logged in an electronic database. Information collected included the name, address, and contact information of the complainant and the month and year in which the complaint was logged. Data of this type is available from January 2016 to July 2020.

July 2020 – April 2021 Data: In July 2020, a change to the data collection process was implemented, with complaints being filed through Service Oshawa utilizing the City's Lagan Technologies record software (the "Lagan System"). The Airport Operator continues to be responsible for following up with complainants. The transition to using this system has allowed for increased granularity in the data collected, including the opportunity to include the date and time of the incident and to provide written comment.

For high-level analysis of trends over time, complaint data from January 1, 2016 to April 30, 2021 is used. For detailed quantitative analyses, this study utilizes the Lagan System noise complaint data collected between July 24, 2020 and April 30, 2021 – as noted above, this is the period during which complaints with additional detail and information are available. A total of 380 complaints were recorded in the Lagan System during that period. As not all fields are required be populated in the form, some inputs including date and time were not available for all complaints. Of the 380 complaints recorded in the Lagan System, 21 had no address, 67 did not include the date of the incident, and 190 did not include the time of the incident. Where complaints lacked required fields, they were omitted from specific analyses as applicable (e.g., a complaint without a time was not used to inform a time-of-day analysis). A detailed review of written comments appended to the complaint records resulted in the generation of 27 additional complaints within the database. These complaints were not individually defined in the Lagan System, as some complaints referenced more than one incident.

# 1 INTRODUCTION

Oshawa Executive Airport (the “Airport”) is owned by the City of Oshawa (the “City”) and operated by Total Aviation & Airport Solutions (the “Airport Operator”). The 2015-2019 Oshawa Executive Airport Business Plan included a commitment to ensure that the Airport is operated within the context of being a “Good Community Neighbour”. The 2015-2019 Business Plan also established the goal that the Airport shall be:

*“A leader in environmental stewardship including noise mitigation, wildlife management and energy conservation.”*

In recent years, the City has become increasingly aware of resident concerns regarding aircraft noise. Under the “Good Community Neighbour” direction and in acknowledgement of community concerns regarding aircraft noise, the City retained HM Aero Aviation Consulting (“HM Aero”) in 2021 to undertake the process specified by Transport Canada in Advisory Circular (AC) 302-002 – Implementation of New or Amended Noise Abatement Procedures. Specifically, HM Aero was retained to:

1. Conduct a qualitative and quantitative analysis of the noise concerns pertaining to the Airport, with the goal of defining the problem;
2. Review the existing Voluntary Noise Abatement Procedures to identify their effectiveness in addressing known noise concerns;
3. Develop new noise abatement procedures to further address the identified problem (the “Proposed Noise Abatement Procedures”);
4. Analyze the impacts of the Proposed Noise Abatement Procedures per the criteria of AC 302-002;
5. Lead a fulsome stakeholder consultation program that both meets and exceeds the requirements of AC 302-002; and
6. Where necessary, integrate stakeholder feedback in the Proposed Noise Abatement Procedures and prepare a submission to Transport Canada for review and approval.

This submission has been prepared for distribution to support the stakeholder consultation process mandated in AC 302-002. The intent is that the analysis and recommendations presented herein will be subject to widespread stakeholder consultation, and feedback will be integrated to further refine and improve the proposed solution where appropriate. Pending the receipt of stakeholder input, this report will be advanced further for submission to Transport Canada.

## 2 BACKGROUND

The development of noise abatement procedures for the Airport is contextualized by several background factors. These include the Airport's operations, historical activity levels, land use context, and the regulatory environment surrounding aircraft noise.

### 2.1 Airport Overview

Oshawa Executive Airport is maintained by the City's contracted Airport Operator as a Transport Canada-certified airport. The City of Oshawa has an operating and options agreement in place with the Government of Canada that requires that the City operates the Airport until 2047. However, the facility may be closed by the City prior to 2047 but no sooner than 2033 if a new airport is developed on the federally owned Pickering Lands, located approximately 20 km northwest of the Airport.

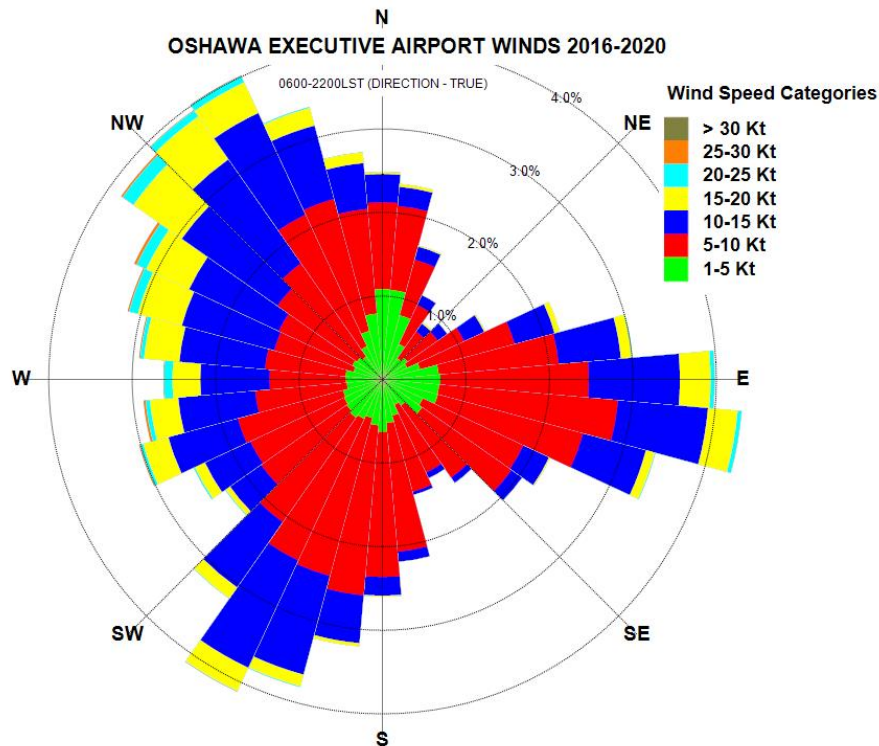
Aircraft operations are supported on the Airport's two runways, as shown in Figure 2.1: Runway 12-30 (4,250 ft. x 100 ft.) and Runway 05-23 (2,654 ft. x 100 ft.). Both runways have lighting to support nighttime operations and Instrument Flight Procedures to support aircraft activity in inclement weather conditions (Instrument Meteorological Conditions).

**Figure 2.1 - Oshawa Executive Airport Overview**



During most normal aircraft operations, arrivals and departures are conducted using the runway that is best aligned with the current wind conditions for improved aircraft performance. A windrose analysis was completed for the five-year period of 2016 to 2020 using data recorded at the Airport from 6:00 AM to 10:00 PM<sup>1</sup>. Using a crosswind limit of 15 kts for analysis purposes, Runway 12-30 is identified as the favoured runway based on historical prevailing winds for 99.4% of the year. For the 28,144 hours of data analyzed, only 158 hours were recorded whereby wind conditions would favour Runway 05-23 based on prevailing wind conditions using a 15 kt crosswind limit, or where this limit would be exceeded on all runways. The windrose analysis is visually depicted in Figure 2.2.

**Figure 2.2 - Oshawa Executive Airport Windrose**



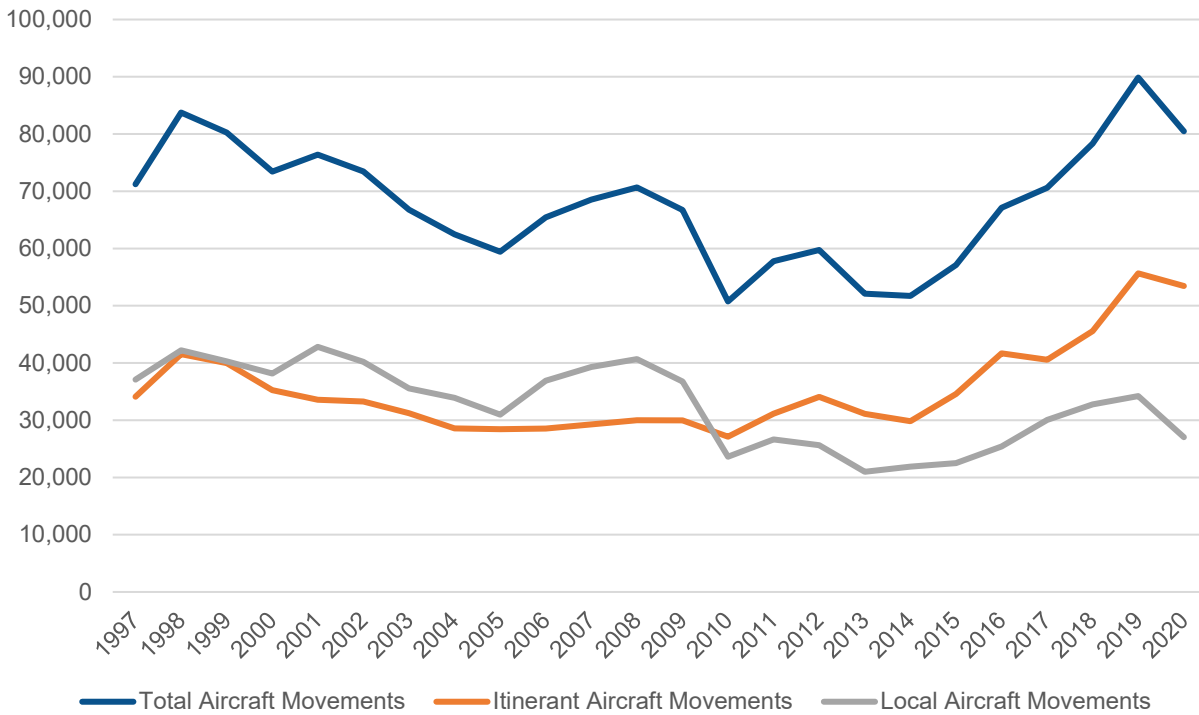
## 2.2 Historical Airport Activity Levels

An aircraft movement is a single landing, take-off, or touch-and-go<sup>2</sup>. Full-year historical aircraft movement data is available from Statistics Canada for the period of 1997 to 2020. As shown in Figure 2.3, variability is exhibited in the number of total aircraft movements that have occurred on an analysis basis during this period. Activity reached a maximum of approximately 84,000 total movements in 1998, before declining to between 50,000 and 60,000 movements between 2010 and 2015. Activity subsequently increased significantly from 57,000 movements in 2015 to a record high of approximately 90,000 movements in 2019, before activity decreased to approximately 80,000 movements in 2020 partially due to the restrictions implemented to address the COVID-19 pandemic. Between 2015 and 2019, activity increased by 57% or an average of 14% per year.

<sup>1</sup> An analysis of winds over a 24-hour basis was not completed given the existing and proposed overnight operational restrictions in place for the Airport.

<sup>2</sup> Within NAV CANADA's records, a touch-and-go is recorded as two local movements.

**Figure 2.3 - Oshawa Executive Airport Historical Aircraft Movements**



Data Source: Statistics Canada Tables 23-10-0002-01 and 23-10-0018-01

Aircraft movements can be further classified as:

- Local, where an aircraft remains in the airport traffic pattern; and
- Itinerant, where an aircraft proceeds to, or arrives from, another location (airport to airport), or an aircraft leaves the traffic pattern and returns without landing at another airport.

The number of annual local aircraft movements has ranged between approximately 20,000 and 45,000 across the data period. From 1997 to 2009, an annual average of roughly 38,000 local movements were recorded. In 2010, a significant decrease to around 24,000 movements was recorded, with a subsequent annual average of approximately 24,000 local movements between 2010 and 2016. For the period of 2017 to 2019, local movements increased to a maximum of roughly 34,000 in 2019 and an annual average of approximately 32,000. Local movements are commonly associated with initial flight training and recurrent pilot proficiency – such activity is further explored within the Problem Description.

Itinerant movements were historically eclipsed by local movements from 1997 until 2010. In 2010, a recorded low of approximately 27,000 itinerant movements was recorded at the Airport. Activity in this category subsequently increased to a record high of around 56,000 movements in 2019 before declining slightly in 2020. Between 2010 and 2019, 105% overall growth was experienced in this category, or an average of 12% per year.



## 2.3 Airport Land Use Context

The Airport is located within the municipal boundaries of the City of Oshawa and is defined by a primarily urban residential land use context, as shown in Figure 2.4. Extensive residential areas exist to the west, south, east, and northeast. The proximity of numerous residential neighbourhoods to the Airport, which has occurred as the result of several decades of development, is now associated with compatibility conflicts with aircraft operations as described in Section 3.

**Figure 2.4 - Oshawa Executive Airport Residential Land Use Context**



### Northern Context

The Airport is bounded by Taunton Road West along its northern edge; further to the north is the Northwood neighbourhood. Within Northwood, existing land uses include several areas of light industrial, commercial, residential, and institutional activity. A significant proportion of the lands to the north of the Airport are in an undeveloped, natural state and are designated “Open Space and Recreation” in the City of Oshawa’s Official Plan, including the Cedar Valley Conservation Area. Larger residential subdivisions are located between 500 m and 1,000 m to the northeast of the Airport, within the Samac neighbourhood, as well as Durham College and commercial uses.

## Eastern Context

The Airport abuts a significant wooded area and the Oshawa Creek ravine along the length of its eastern boundary, which is also part of Somerset Park. Further to the east, beyond the ravine, is the Centennial neighbourhood which is primarily defined by low-rise residential and institutional uses, as well as commercial developments along Simcoe Street North.

## Southern Context

Adjacent to the Airport exists a military museum, indoor athletics facility, park, and a woodlot. The area between the Airport and Rossland Road is defined by low-rise residential subdivisions, parks and open space, a secondary school, and a commercial plaza. The lands further to the south, across Rossland Road, exhibit similar land use characteristics and are primarily defined by low-rise residential neighbourhoods, as well as a large golf course.

## Western Context

Contiguous to the Airport, between its western boundary and Thornton Road North, is a golf course, a large area of open space, and several woodlots. The lands further to the west, across Thornton Road, are primarily defined by low-rise residential subdivisions, as well as the Thornton Cemetery and a golf course. While the land use context is largely similar, the City of Oshawa's municipal boundary ends at Garrard Road, after which point the lands are located within the Town of Whitby (approximately 700 m from the Airport).

## 2.4 Airport and Aircraft Noise Management

Aircraft noise is an externality of Airport operations that has the potential to cause significant ongoing disturbance to sensitive land uses in the vicinity of the Airport (e.g., residences, schools, retirement centres). The International Civil Aviation Organization (ICAO) adopted the Balanced Approach to Aircraft Noise Management that includes four principal elements:

1. **Reduction of Source Noise:** Limits on the noise of aircraft have been in place since the 1970s through Annex 16 to the Convention of International Civil Aviation. Transport Canada ensures compliance with applicable noise limits as part of the certification process for new aircraft.
2. **Land Use Planning:** Compatible land use planning involves appropriately separating noise-sensitive land uses, such as residential areas, from airports and associated aircraft noise. This involves delineating areas associated with current and anticipated future noise levels and enacting planning legislation that considers the sensitivity of each permitted use. In Canada, the Noise Exposure Forecast System is the primary means through which this planning is accomplished, supporting by municipal plans and bylaws.
3. **Noise Abatement Operational Procedures:** Changes that address the way aircraft are operated through the use of standardized and published procedures. Examples include noise preferential runways and avoiding overflights of noise-sensitive areas.
4. **Aircraft Type Operating Restrictions:** Prohibitions on the operation of select aircraft with high noise profiles.

The City of Oshawa has requested that noise abatement procedures be established for Oshawa Executive Airport, in alignment with the third pillar of the Balanced Approach to Aircraft Noise Management. Noise abatement procedures can be established in two ways:

1. **Voluntary procedures** can be established by an airport operator, distributed to airport tenants and aircraft operators, and / or published in the Canada Flight Supplement and Canada Air Pilot. Compliance is voluntary on the part of the pilot, and enforcement / penalties will not be implemented by Transport Canada; or
2. **Mandatory procedures** can be proposed by an airport operator to Transport Canada for adoption under the authority of Canadian Aviation Regulation (CAR) 602.105. Procedures will be published in the Canada Flight Supplement and Canada Air Pilot. Enforcement is the responsibility of Transport Canada, typically with support from the airport operator. Penalties for violating these procedures can be as high as \$5,000 for an individual and \$25,000 for a company. The process for the establishment of mandatory noise abatement procedures is outlined in AC 302-002.

The City of Oshawa has implemented Voluntary Noise Abatement Procedures for the Airport that are further described in Section 4.1. The City does not have the authority to unilaterally implement mandatory noise abatement procedures, as such authority is held by Transport Canada. Accordingly, at the February 8, 2021 meeting of the Oshawa Development Services Committee, it was resolved that City Staff be directed to undertake the AC 302-002 process for the establishment of mandatory noise abatement procedures for the Airport.

Separate from the foregoing discussion, it is also noted that earthen berms have been constructed at three locations at the Airport to mitigate aircraft noise:

- At the northeast edge of the Airport, to mitigate noise associated with aircraft ground operations in the hangar area;
- At the southeast edge of the Airport, to mitigate noise associated with aircraft ground operations to residences in the vicinity of Jane Street; and
- At the southern limit of the Airport to mitigate noise associated with aircraft ground operations to residences in the vicinity of Stevenson Road.

## 3 PROBLEM DESCRIPTION

Section 3 addresses Step 1.a. of the AC 302-002 process – Description of the Problem. The description of the problem includes the analysis of historical noise complaints submitted to the City of Oshawa, as well as qualitative findings arising from historical stakeholder engagement activities. Together, data from these sources is incorporated within the problem description.

### 3.1 Qualitative Analysis

In the preceding years prior to the commencement of the AC 302-002 process, the City of Oshawa consulted with the public on a variety of Airport-related matters. During these consultations, matters of Airport noise were frequently identified by attendees – therefore, consultation records are a valuable source of qualitative feedback on resident concerns surrounding the Airport. The project team reviewed the following three records of stakeholder input collected in 2018, 2019, and 2021 as a representative qualitative sample of resident inputs regarding Airport noise:

1. *Oshawa Executive Airport Community Liaison Committee Town Hall – June 13, 2018 – Meeting Summary.*

This document was prepared by Lura Consulting, the neutral, third-party facilitator for Oshawa Executive Airport. The document provides a summary of the Town Hall meeting that took place on June 13, 2018. This document is not a verbatim account of events, but rather an account of the key points made during the open house, presentation, and question and answer session. The June 2018 Town Hall was publicized through leaflets distributed to over 11,000 residences in the area of Oshawa Executive Airport and was attended by approximately 75 individuals.

2. *Oshawa Executive Airport Community Town Hall – September 24, 2019 – Meeting Summary.*

As with the previous report, this document was prepared by Lura Consulting and documented the key points of the September 24, 2019 Town Hall meeting. The meeting was publicized through leaflets to over 11,000 residences within 20 km of the Airport and was attended by 178 individuals.

3. *City of Oshawa Development Services Committee – May 5, 2021 Special Meeting.*

Representatives from HM Aero attended the above-noted meeting in an observatory role, to further understand community concerns regarding Airport noise. The intent of this meeting was for the City to review its Draft Proposed 2021-2022 Oshawa Executive Airport Action Plan. Airport noise was a recurring theme identified during the public comment period of the meeting. As this was a publicly viewable digital event, attendance numbers could not be recorded.

Through the review of the sources noted above, numerous key themes were identified regarding community noise concerns, including:

- A perception that aircraft movement levels are increasing, and the problem is worsening;
- A significant number of records that identify flight training and aircraft circuit activity as being their primary source of concern;
- The frequency and total volume of aircraft movements. A commonly reported metric was that an aircraft overflies every “X” minutes (e.g., 1.5 minutes) above a place of residence;
- The hours of the day during which aircraft operations occur, including the early morning and late evening;
- A perceived lack of enforcement for assumed noise violations; and
- A concern that select residential neighbourhoods are disproportionately impacted, especially on days where only one runway is in use.

Within the scope of this project, the focus is on identifying concerns related to aircraft noise. However, an important finding from the review of historical engagement materials is that community noise concerns are often intertwined with concerns regarding:

- Air quality, including aircraft emissions and lead;
- Vibrations from aircraft operations;
- Safety, with respondents believing that aircraft operate too low near the Airport; and
- Climate change, with select respondents seeing the Airport’s operations as being incompatible with environmental sustainability goals.

## 3.2 Quantitative Analysis

### 3.2.1 Noise Complaint Dataset

The City of Oshawa records aircraft noise complaints submitted by the public to identify root causes and inform mitigation and abatement strategies. Prior to July 2020, aircraft noise complaints were received via an online form, by telephone, or by email to the Airport Operator. Once received, noise complaints were manually logged in an electronic database. Information collected included the name, address, and contact information of the complainant and the month and year in which the complaint was logged. The Airport Operator was responsible for following up with individual complainants.

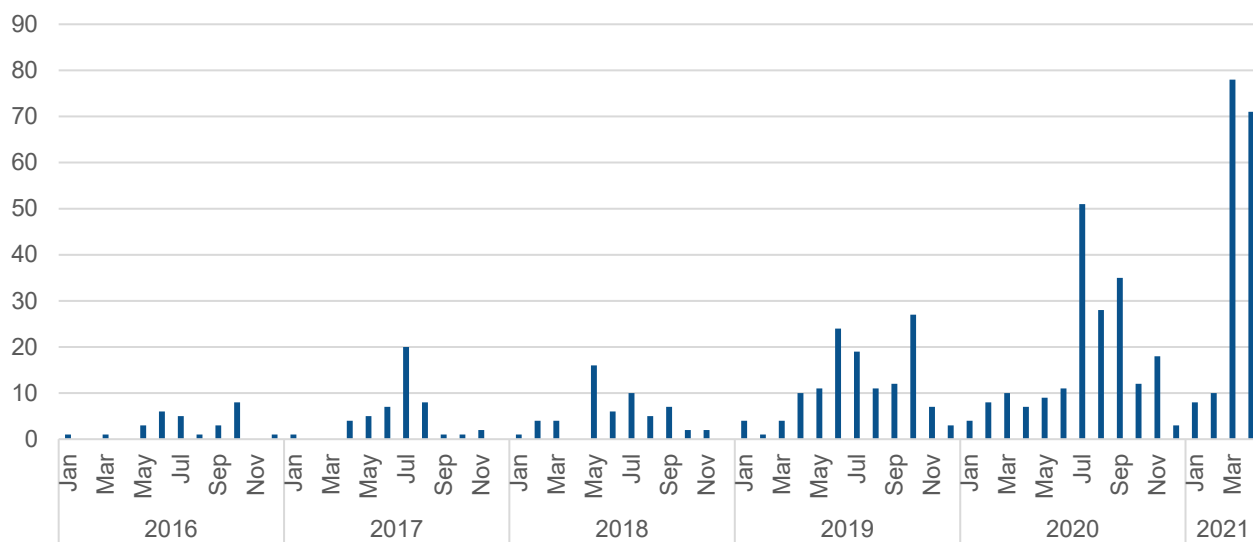
In July 2020, a change to the complaint collection process was implemented with complaints being filed through Service Oshawa utilizing the City’s Lagan Technologies record software (the “Lagan System”). The Airport Operator continues to be responsible for following up with complainants. The transition to using this system has allowed for increased granularity in the data collected, including the opportunity to include the date and time of the incident and to provide written comment.

For high-level analysis of trends over time, complaint data from January 2016 to April 2021 is used. For detailed quantitative analysis, this study utilizes the noise complaint data collected between July 24, 2020 and April 30, 2021 – as noted above, this is the period during which complaints with additional detail and information are available. A total of 380 complaints were recorded in the Lagan System during that period. As not all fields are required be populated in the form, some inputs including date and time were not available for all complaints. Of the 380 complaints recorded in the Lagan System, 21 had no address, 67 did not include the date of the incident, and 190 did not include the time of the incident. Where complaints lacked required fields, they were omitted from specific analyses as applicable (e.g., a complaint without a time was not used to inform a time-of-day analysis). A detailed review of written comments appended to the complaint records resulted in the generation of 27 additional complaints within the database. These complaints were not individually defined in the Lagan System, as some complaints referenced more than one incident.

### 3.2.2 Complaint Frequency and Distribution

A review of the past five years of records indicates that there has been a significant increase in complaints starting in 2019 and continuing through April 2021. As presented in Figure 3.1, the distribution of complaints throughout the year has remained relatively consistent, with most objections to aircraft noise recorded in the spring, summer, and fall. However, the number of complaints per month is generally increasing. For example, in March 2020, there were 10 complaints recorded compared to 78 in March 2021.

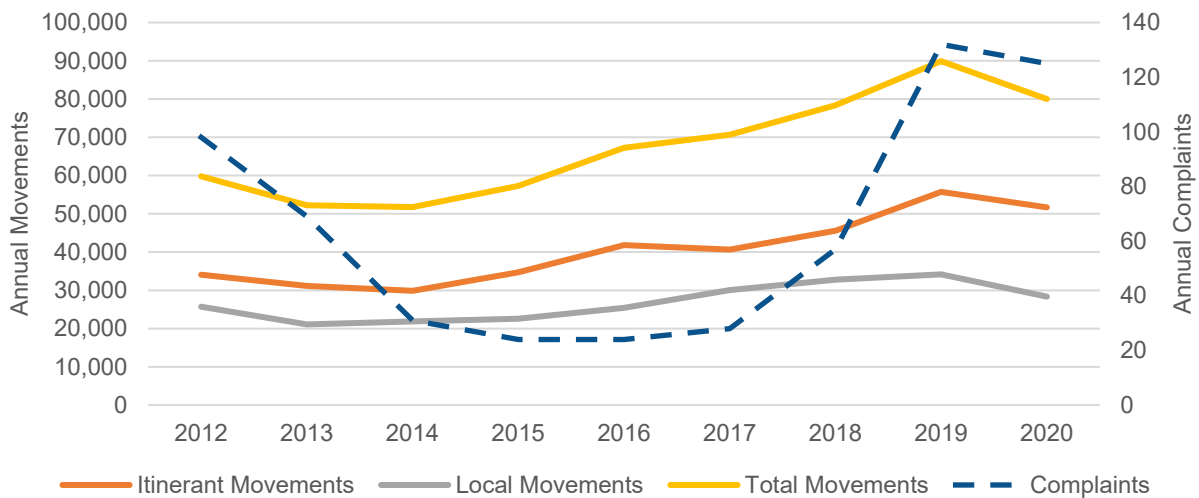
**Figure 3.1 - Complaint Count by Month (January 2016 – April 2021)**



Data Source: City of Oshawa Noise Complaint Records

When total annual complaints between 2012 and 2020 were compared to aircraft movements recorded at the Airport for the same period, the percent increase in complaints between 2017 and 2019 is observed to outpace the percent increase in movements (Figure 3.2). This suggests that the type of operations and the frequency and duration of flights influence the volume of complaints filed, in addition to annual aircraft movements.

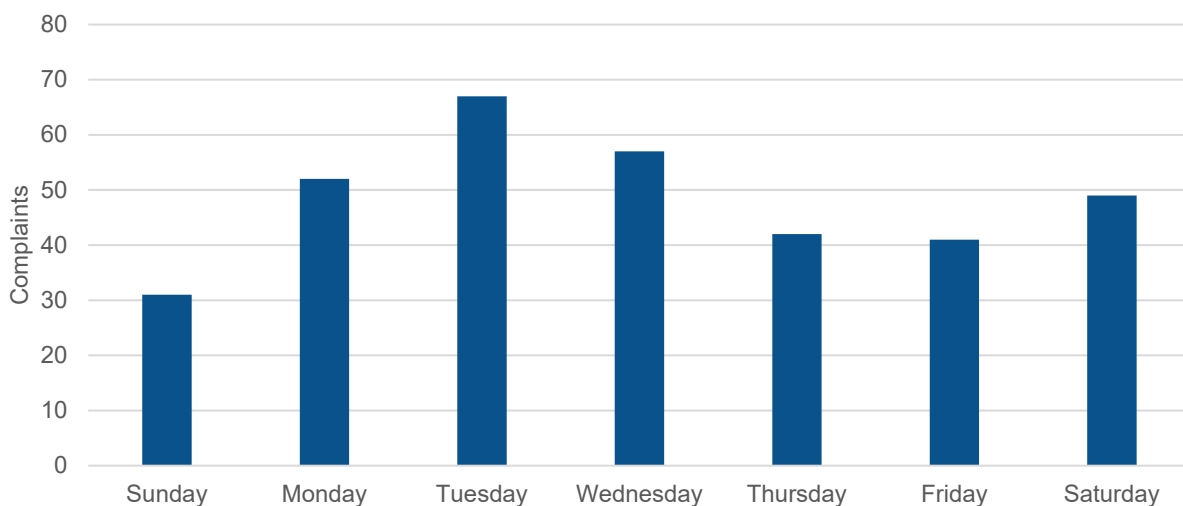
**Figure 3.2 - Complaints vs. Aircraft Movements (2012-2020)**



Data Source: City of Oshawa Noise Complaint Records, Statistics Canada Tables 23-10-0002-01 and 23-10-0018-01

A review of the comments recorded through the two town hall meetings (Section 3.1) as well as those included in the Lagan System data suggests that some residents believe that solutions targeting weekend operations will yield the greatest reprieve from aircraft noise. However, the data presented in Figure 3.3 for July 2020 through April 2021 indicates that complaint incidents occur most frequently on Mondays, Tuesdays, and Wednesdays, suggesting that abatement procedures that are only weekend-specific are unlikely to generate desired noise reduction results.

**Figure 3.3 - Complaint Count by Day of Week (July 2020 – April 2021)**

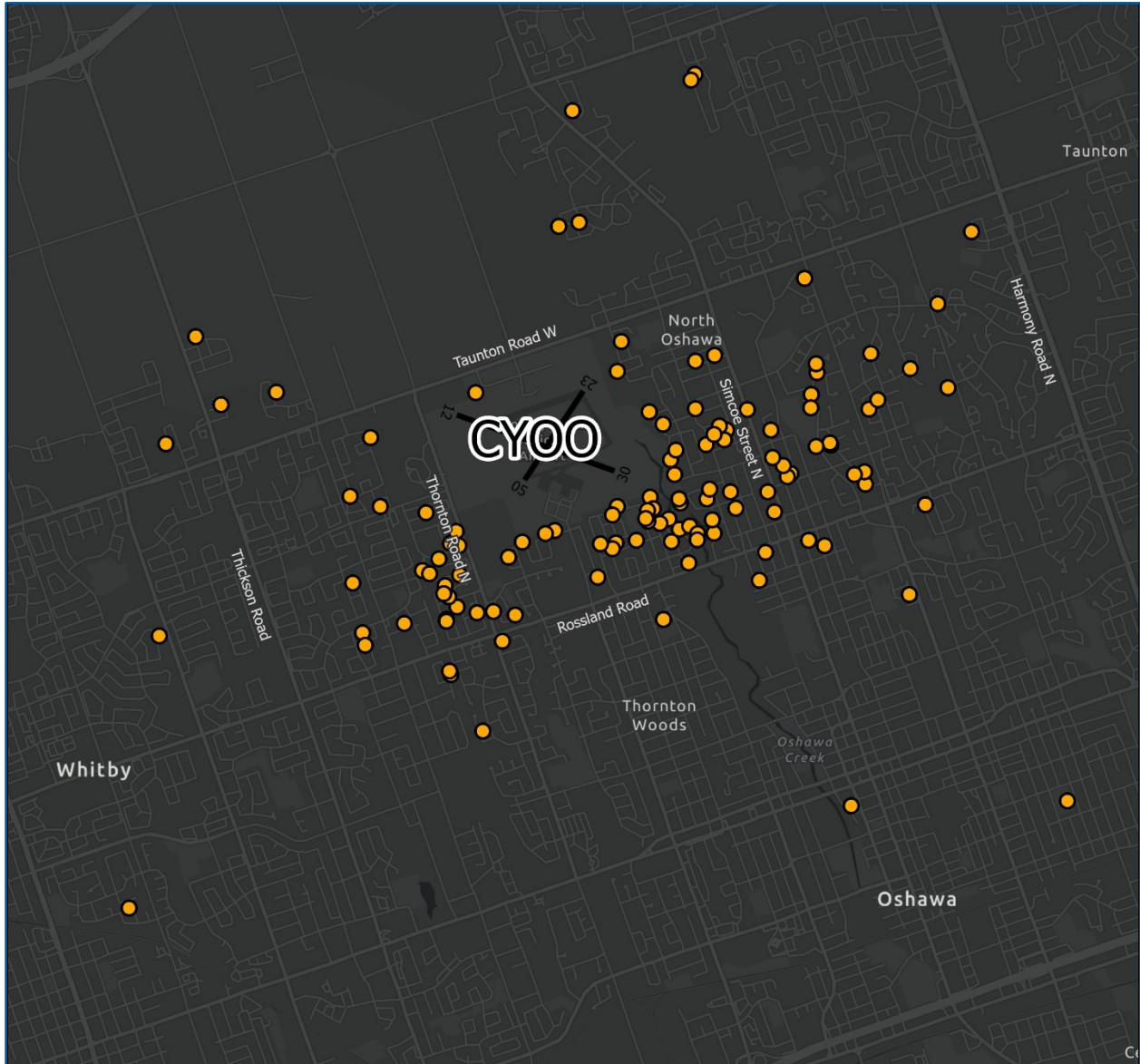


Data Source: City of Oshawa Noise Complaint Records

### 3.2.3 Complaint Locations and Concentrations

The project team geocoded the 2020-2021 complaint data from the Lagan System to better understand the proximity of complainants to the Airport as well as the distribution of complaints relative to the Airport's four runway thresholds (Runways 05, 23, 12, and 30)<sup>3</sup>. Addresses where one or more complaints have been filed are primarily north of Rossland Road, east of Thickson Road, and west of Harmony Road. Complaints were primarily associated with addresses in Oshawa and Whitby, with a small number from communities outside of those two municipalities (e.g., Ajax, Courtice, and Port Perry).

Figure 3.4 - Complaint Locations (July 2020 – April 2021)



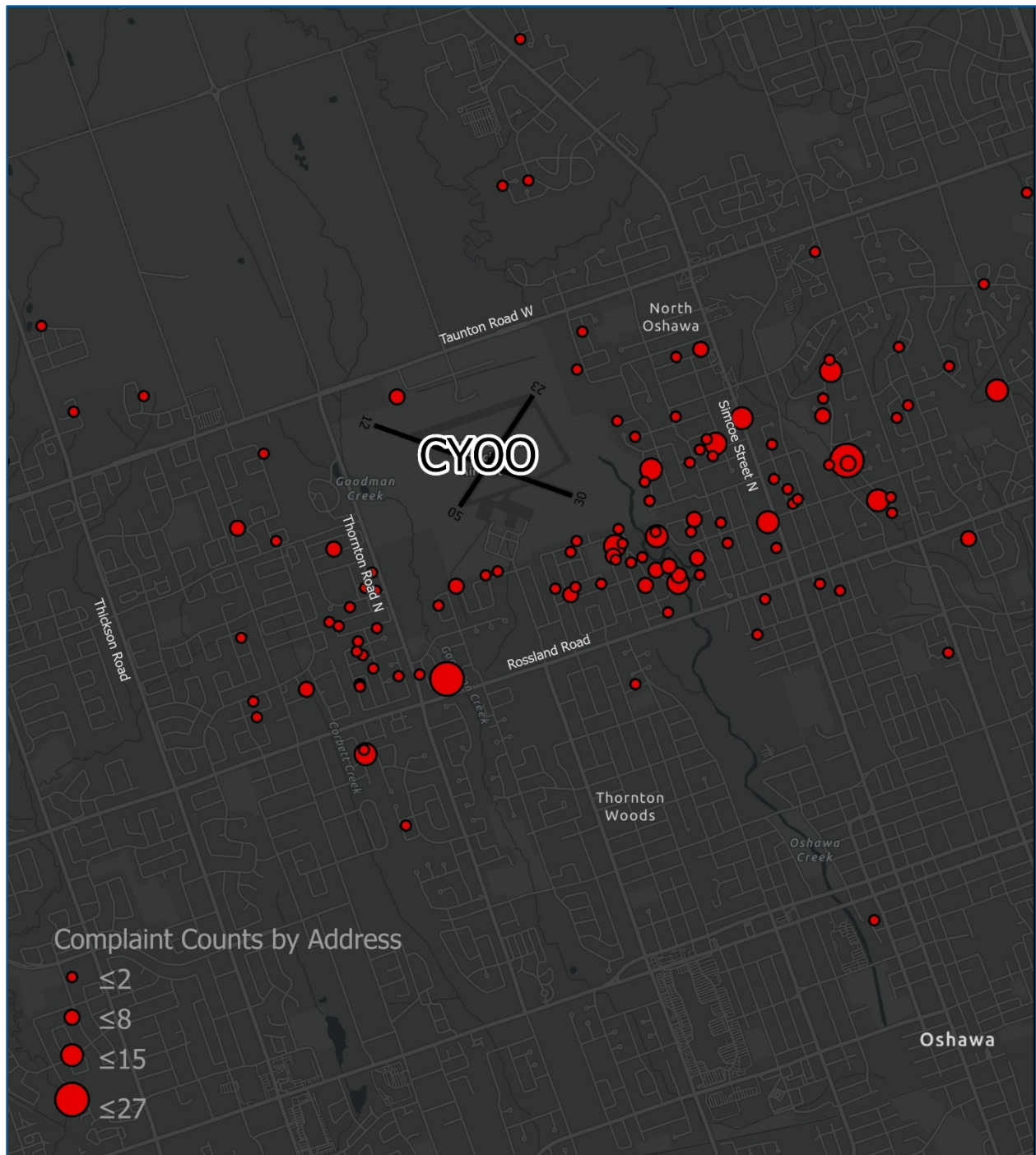
Data Source: City of Oshawa Noise Complaint Records

<sup>3</sup> Given the minimal information available for each complaint record in preceding years that is required to support subsequent analysis, such records were not geocoded.



Figure 3.5 presents the complaints using gradient symbols, with the smallest circles representing 1-2 complaints filed per address and the largest representing between 15 and 27 complaints filed per address. This map, when viewed with Figure 3.4, indicates a high concentration of complaints south and east of the Airport.

**Figure 3.5 - Complaint Count by Address (July 2020 – April 2021)**

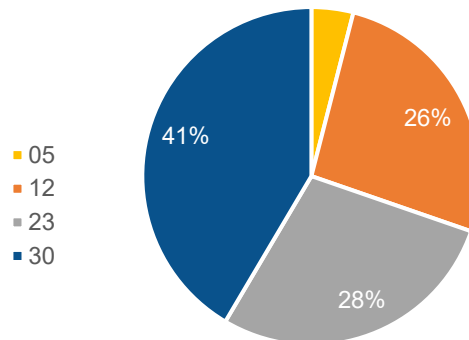


Data Source: City of Oshawa Noise Complaint Records

### 3.2.4 Complaints vs. Runway Utilization

Figure 3.6 presents the utilization of each of the four runways as a percentage of the total movements for 2020, sourced from NCAMS data. Runway 30 had the highest utilization (41% of total annual movements), with Runways 23 and 12 approximately equal in their utilization at 28% and 26%, respectively. Runway 05 is the least utilized runway, representing 4% of total annual movements in 2020.

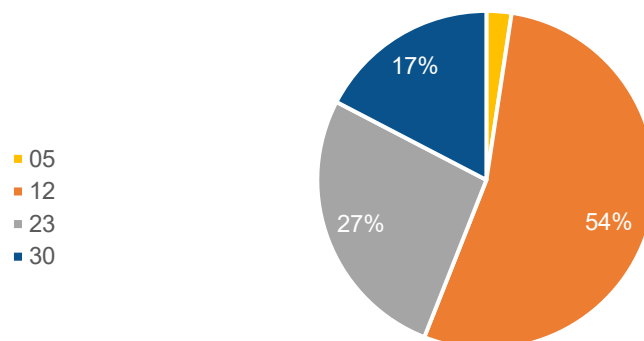
**Figure 3.6 - Proportional Runway Utilization (2020)**



Data Source: 2020 NAV CANADA Aircraft Movement Statistics

Because the time of each incident was not consistently included for many of the complaint records, the project team was unable to assign each movement reliably and consistently to one of the four runways. Instead, using NCAMS data, the project team determined which runway was most frequently used for each complaint day between July 2020 and April 2021. Figure 3.7 shows the proportion of total complaints associated with each runway in greatest use on the day of the complaint. For example, while Runway 12 was used for 26% of movements in 2020, it was associated with 54% of complaints in the reviewed period. Conversely, while Runway 30 was used for 41% of movements in 2020, it was associated with 17% of complaints in the reviewed period.

**Figure 3.7 - Percent of Complaints by Predominant Runway (July 2020 - April 2021)**

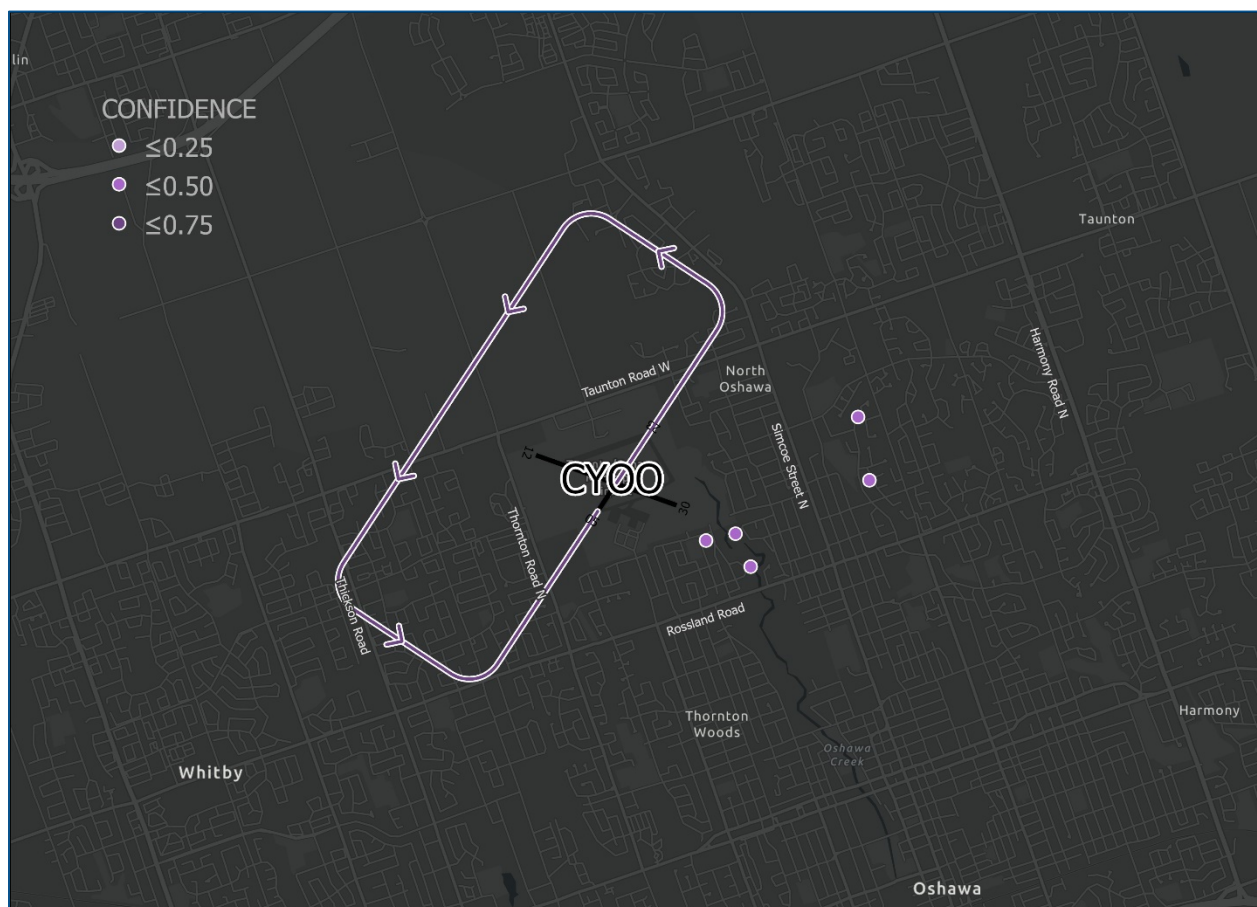


Data Source: 2020-2021 NAV CANADA Aircraft Movement Statistics, City of Oshawa Noise Complaint Records

In addition to identifying the predominant runway for each day, the project team also calculated the confidence that the predominant runway was the runway used on the day in question. For example, if Runway 05 was used for 45% of movements on a given day and none of the remaining runways were used more than 45%, then it assumed that Runway 05 was used for that day with 45% (0.45) confidence and is therefore associated with all complaints on that day.

Figure 3.8 shows the complaints associated with Runway 05 between July 2020 and April 2021, with the diagram overlaid with the Runway 05 left-hand traffic circuit pattern. The relatively few complaints attributed to Runway 05 corresponds with the low overall utilization of the runway relative the remaining three. The confidence that these complaints were linked to aircraft operating on Runway 05 are 50% or lower, indicating that other runways were used in addition to Runway 05 on the day in question. The complaint locations identified in Figure 3.8 are in proximity to the departure leg of the circuit where engine power settings are highest, and aircraft produce the most noise.

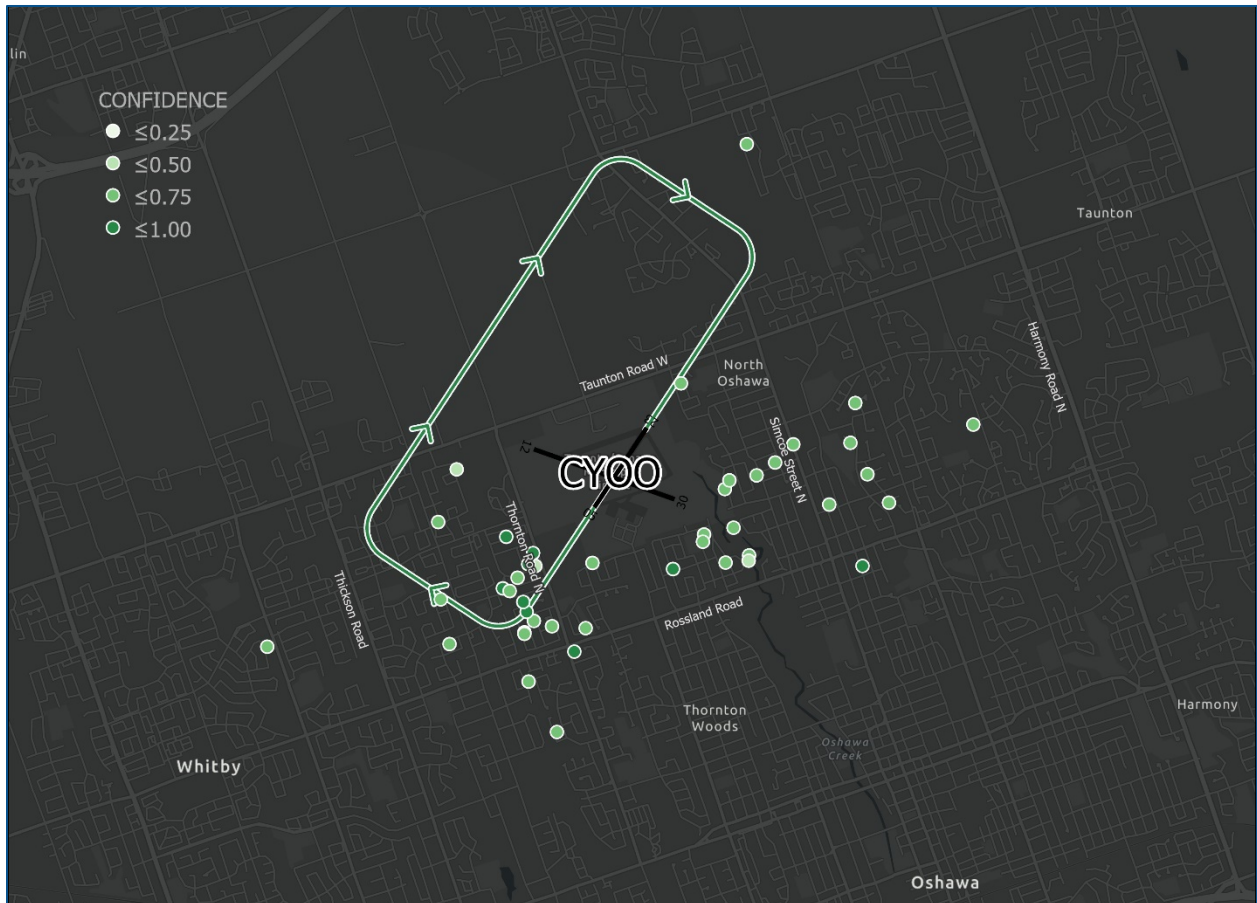
**Figure 3.8 - Complaints Associated with Runway 05 (July 2020 - April 2021)**



Data Source: 2020-2021 NAV CANADA Aircraft Movement Statistics, City of Oshawa Noise Complaint Records

For Runway 23, the highest concentration of complaints as well as the complaints with the highest runway utilization confidence are located below the departure and crosswind legs of the right-hand traffic circuit (Figure 3.9). Fewer complaints were registered near the downwind, base, and final legs of the circuit pattern where power settings are lower.

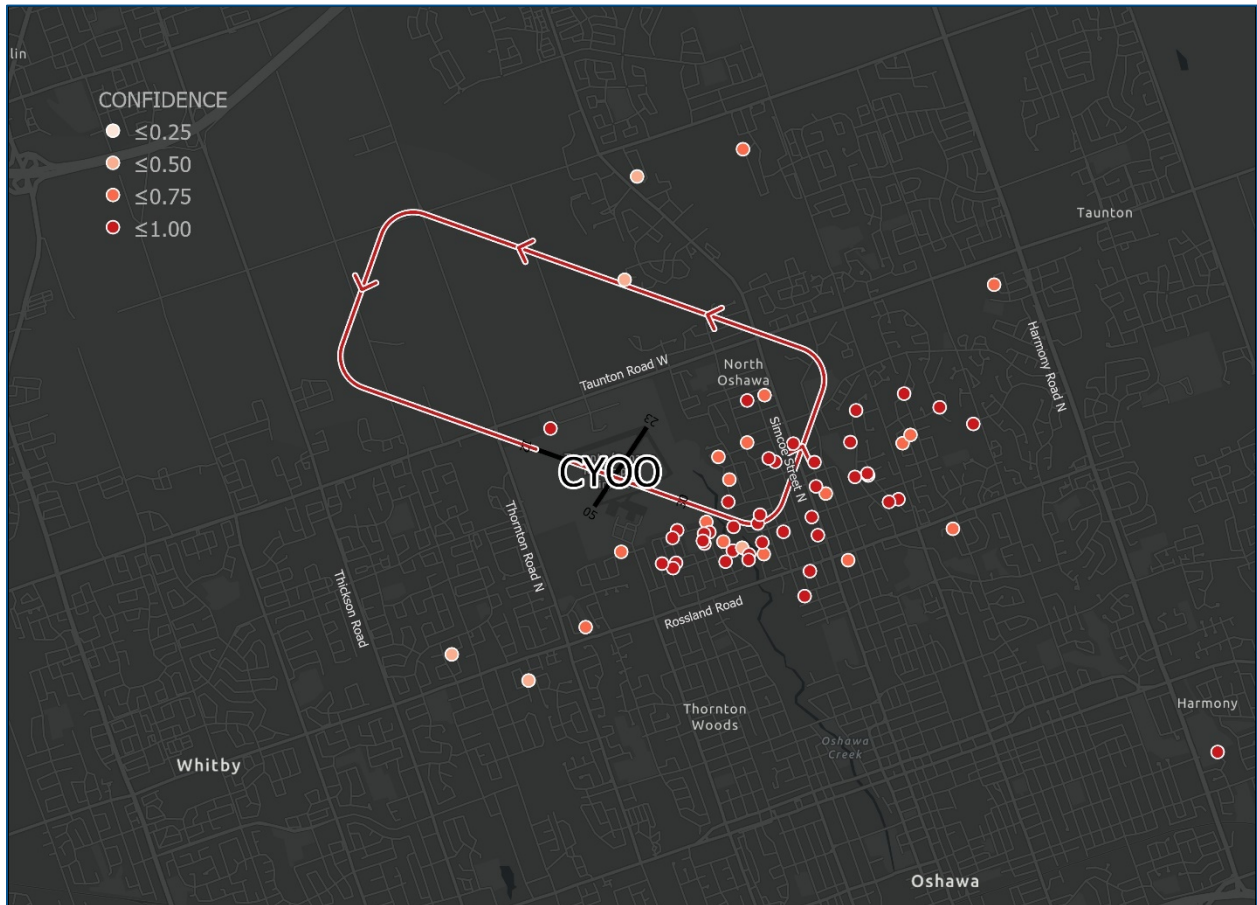
**Figure 3.9 - Complaints Associated with Runway 23 (July 2020 - April 2021)**



Data Source: 2020-2021 NAV CANADA Aircraft Movement Statistics, City of Oshawa Noise Complaint Records

Runway 12 supported 26% of total movements in 2020 but disproportionately accounts for 54% of recorded complaints. Figure 3.10 illustrates the concentration of complaints and runway utilization confidence – complaints are primarily located under the departure and crosswind legs of the Runway 12 traffic circuit. Fewer complaints outside of these areas may be attributed to lower engine power settings and lower population densities. The high confidence of association between noise complaints and runway usage shown in Figure 3.10 further supports findings as to the importance of Runway 12 operations in relation to community concerns.

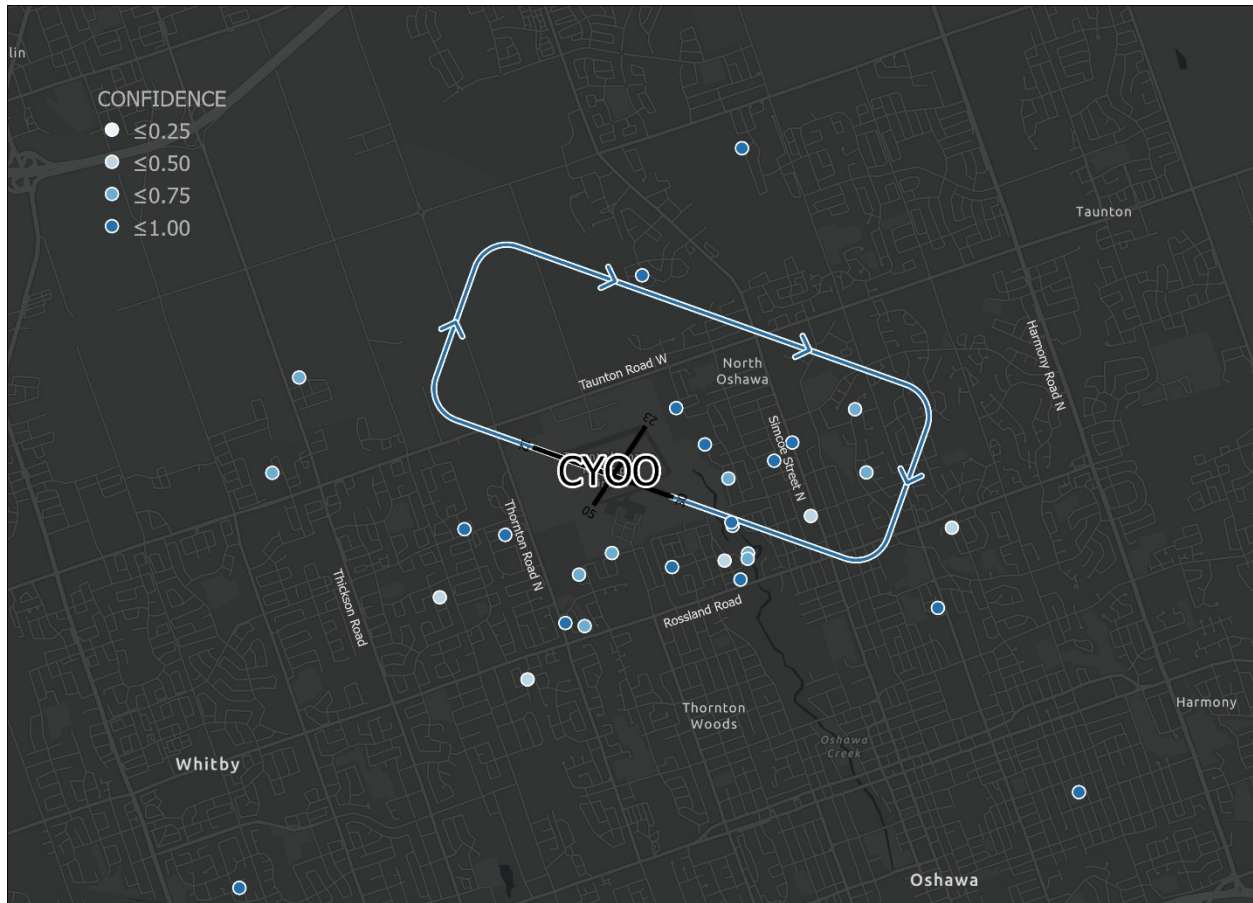
**Figure 3.10 - Complaints Associated with Runway 12 (July 2020 - April 2021)**



Data Source: 2020-2021 NAV CANADA Aircraft Movement Statistics, City of Oshawa Noise Complaint Records

Runway 30 has relatively few complaints under the departure and crosswind legs of the traffic circuit, as these areas have limited residential land uses. Also, the complaints with high runway utilization confidence are more dispersed when compared to Runway 12 and Runway 23. It has been noted that regardless of the runway in use, complaints are consistently submitted by addresses north of Rossland Road and near Oshawa Creek.

**Figure 3.11 - Complaints Associated with Runway 30 (July 2020 - April 2021)**



Data Source: 2020-2021 NAV CANADA Aircraft Movement Statistics, City of Oshawa Noise Complaint Records

### 3.2.5 Flight Training Operations

There are two Flight Training Units (FTUs) based at the Airport: Durham Flight Centre (DFC) and Canadian Flight Academy (CFA). A review conducted of the NCAMS data for 2019 and 2020, presented as Table 3.1, revealed that the two operators accounted for between 72% and 75% of all movements at the Airport over the two years. In addition to DFC and CFA, flight training is conducted using privately registered aircraft and by FTUs not based at Oshawa Executive Airport – however, records of such activity are not easily discernible in the NCAMS data, and subsequent analyses of flight training activity solely consider operations by DFC and CFA.

An analysis of local aircraft movements was also completed. As defined by Statistics Canada, local movements at airports with control towers or flight service stations are considered as movements in which the aircraft remains in the circuit. In 2019, DFC and CFA accounted for 80% of local movements and 73% in 2020.

**Table 3.1 - Airport-Based Flight Training Unit Total Movements (2019-2020)**

Year	2019		2020	
	Movements	Percent of Total	Movements	Percent of Total
Annual Based FTU Movements	64,643	75%	56,600	72%
Annual Non-FTU Movements	21,972	25%	22,247	28%
<b>Total</b>	<b>86,615</b>	<b>100%</b>	<b>78,847</b>	<b>100%</b>
<b>Date Source:</b> 2019-2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes				

**Table 3.2 - Airport-Based Flight Training Unit Local Movements (2019-2020)**

Year	2019		2020	
	Movements	Percent of Total	Movements	Percent of Total
Annual Based FTU Movements	24,467	80%	19,569	73%
Annual Non-FTU Movements	6,119	20%	7,389	27%
<b>Total</b>	<b>30,586</b>	<b>100%</b>	<b>26,958</b>	<b>100%</b>
<b>Date Source:</b> 2019-2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes				

### 3.3 Problem Description

The qualitative and quantitative analyses of historical data were critical in the identification of the problem. The following six points generally summarize the key elements of the community / aircraft noise problem at the Airport:

1. Complaints have increased substantially in recent years – A review of the previous 5 years of complaints identified a sharp increase in noise complaints recently. In 2018, 57 noise complaints were filed while 2019 and 2020 witnessed 132 and 273 complaints, respectively. The complaints recorded by the Lagan System total 380 between July 2020 to April 2021.
2. Aircraft movements are continuing to increase – Total aircraft movements at Oshawa Executive Airport have been increasing steadily from approximately 52,000 in 2014 to roughly 90,000 in 2019. The modest decline in movements observed in 2020 is attributed to the COVID-19 pandemic with aircraft movements anticipated to rebound and grow in 2021 and onward. While there is not a direct correlation, an increase in aircraft movements in the coming years is expected to result in an additional increase in noise complaints.
3. Complaints are not limited to specific days of the week – The data collected in the Lagan System between July 2020 and April 2021 shows that noise complaints are filed for incidents consistently throughout the week, with Monday, Tuesday, and Wednesday having the highest complaint counts. This suggests that procedures and restrictions proposed through this process must address the entire week, and not be limited to weekends and holidays.
4. Complaints by runway are disproportionate to runway use – runways closest to and aligned with dense residential areas experience a larger number of complaints than those aligned with unpopulated areas. For example, aircraft operations on Runway 12 were associated with 54% of complaints between July 2020 and April 2021, but this runway was utilized for only 26% of aircraft movements. Conversely, Runway 30 supported 41% of total aircraft movements, but was associated with 17% of complaints in the same period.
5. Flight training operations account for most aircraft movements at the Airport – in 2019 and 2020, the two Oshawa-based FTUs were responsible for between 72% and 75% of annual aircraft movements and between 73% and 79% of local (circuit) movements in the same period.
6. Residents have little reprieve from aircraft noise – under the current procedures and restrictions, individuals may be exposed to continuous aircraft noise during daylight hours with few prescribed pauses in activity that can be anticipated and relied upon.



## 4 PROPOSED NOISE ABATEMENT PROCEDURES

Section 4 addresses Step 1.b. – Proposed Solution and Step 1.c. – Alternatives of the AC 302-002 process. Provided herein is an overview of the existing Voluntary Noise Abatement Procedures, Proposed Noise Abatement Procedures, and the discarded Alternative Noise Abatement Procedures that were evaluated but were found to not be appropriate for implementation at the Airport.

### 4.1 Voluntary Noise Abatement Procedures

Voluntary Noise Abatement Procedures have been established for Oshawa Executive Airport separate from the AC 302-002 process. These procedures, summarized below, are published in the Canada Flight Supplement, Canada Air Pilot, and / or the Noise & Traffic Management Policy at CYOO (Revised January 2016). Adherence to the Voluntary Noise Abatement Procedures is the responsibility of aircraft operators; however, compliance cannot be formally enforced.

#### 1. Preferential Runways

- a. Controllers will designate runways to divert as many take-offs and landings as possible from flight over noise sensitive areas. When the Tower is closed, pilots are expected to select Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.
- b. Aircraft will use Runway 30 when the winds are blowing from a heading of 210° to 030° at up to 5 knots (9.26 km/h).

#### 2. Hours When Aircraft Operations are Prohibited or Restricted

- a. Flights are prohibited between 10:30 PM and 6:30 AM local unless approved by the Airport Manager. During this time, only police, medical and industrial emergency flights are permitted to land and take off. Airport tenants with aircraft based at the Oshawa Executive Airport are permitted to land between the hours above, but are not permitted to take off, independent from police, medical and industrial emergency flights.

#### 3. Arrival Procedures

- a. Arrival turns to final approach will be made at or above 1,000 ft. Above Sea Level (ASL) (540 ft. (AGL)).
- b. Approaches are to remain on or above an assumed 3° glide slope.
- c. If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).

#### 4. Departure Procedures

- a. On departure, no turns below 1,000 ft. ASL (540 ft. AGL).

## 5. Training Flights

- a. Training flights are prohibited at all times unless approved by the Airport Manager. Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.
- b. A maximum of 12 aircraft are permitted in the circuit for training purposes on Runway 05/23 at any given time.
- c. Flight training aircraft will not utilize a touch-and-go departure pattern on all runways after 4:00pm on any Saturday or Sunday.
- d. During the holiday long weekends, circuit training is not permitted on the Sunday or Monday on all runways.

## 6. Other

- a. Pilots are requested to maintain 2,000 ft. ASL (1,540 ft. AGL) or above over the Toronto Zoo.

In addition to the procedures described above, right-hand circuit procedures have been established for Runway 23 and Runway 30 pursuant to CAR 602.96. It is understood that the intent of these right-hand circuit procedures, when implemented, was to limit overflights of built-up areas and resulting noise problems despite being enacted pursuant to CAR 602.96 as opposed to CAR 602.105.

## 4.2 Proposed Noise Abatement Procedures

### 4.2.1 Development of Proposed Noise Abatement Procedures

Noise abatement procedures established through the AC 302-002 process must be made pursuant to the authority of CAR 602.105:

*“No person shall operate an aircraft at or in the vicinity of an aerodrome except in accordance with the applicable noise abatement procedures and noise control requirements specified by the Minister in the Canada Air Pilot or Canada Flight Supplement, including the procedures and requirements relating to*

- (a) preferential runways;*
- (b) minimum noise routes;*
- (c) hours when aircraft operations are prohibited or restricted;*
- (d) arrival procedures;*
- (e) departure procedures;*
- (f) duration of flights;*
- (g) the prohibition or restriction of training flights;*
- (h) VFR or visual approaches;*
- (i) simulated approach procedures; and*
- (j) the minimum altitude for the operation of aircraft in the vicinity of the aerodrome.”*

Items (a) to (j) of CAR 602.105 outline the permissible forms of noise abatement procedures that may be developed – proposals beyond the ten in-scope items described cannot be considered. The new Proposed Noise Abatement Procedures for Oshawa Executive Airport were developed as follows:

1. HM Aero reviewed the current Voluntary Noise Abatement Procedures to identify which procedures should be integrated in the AC 302-002 process, with or without revisions.
2. HM Aero undertook a review of voluntary and mandatory noise abatement procedures in place at Canadian airports, as published in the Canada Flight Supplement. In total, noise abatement procedures at 28 Canadian airports were reviewed, with each procedure categorized into the 10 classifications of CAR 602.105.
3. Supplementary research was completed to identify examples of noise abatement procedures that align with CAR 602.105, but that are not currently utilized at the above-noted reviewed airports.
4. Considering the Problem Description and existing procedures in place in Canada, HM Aero drafted preliminary noise abatement procedures for each of the 10 CAR 602.105 categories.
5. The preliminary noise abatement procedures were reviewed with representatives from the Airport Operator (Airport Manager, Airport Operations Manager) and the City of Oshawa (Chief Administrative Officer, Commissioner of Development Services, Director of Planning Services, and Principal Planner). The preliminary noise abatement procedures were refined based on the comments received from this staff-level review.

#### **4.2.2 Proposed Noise Abatement Procedures**

Based on the previously described methodology, 14 noise abatement procedures are proposed for consideration as documented in Table 4.1. Three types of noise abatement procedures are proposed:

1. Existing Voluntary Noise Abatement Procedures that are recommended to become mandatory pursuant to CAR 602.105 without any changes (7 procedures);
2. Existing Voluntary Noise Abatement Procedures that are recommended to become mandatory pursuant to CAR 602.105 with changes to better address the noise issues currently being experienced (5 procedures); and
3. New mandatory noise abatement procedures (2 procedures).

Table 4.1 documents each Proposed Noise Abatement Procedure, the CAR 602.105 authority through which the procedure is proposed to be made mandatory, and a brief overview of the procedure's intent.

**Table 4.1 - Proposed Noise Abatement Procedures**

No.	Proposed Noise Abatement Procedure	Existing / New	Notes / Rationale
<b>602.105(a) Preferential Runways</b>			
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	Existing Voluntary Procedure, Formalize Without Revisions	During hours when the NAV CANADA Tower is closed, routing arrivals from the northwest to Runway 12 and departures to northwest from Runway 30 will minimize overflights of built-up areas to the west, south, and east.
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	Existing Voluntary Procedure, Formalize With Revisions	Currently, Runway 30 is the preferential runway when the winds are blowing from a heading of 210° to 030° at up to 5 knots. The Proposed Noise Abatement Procedure will increase the utilization of Runway 30 by increasing the maximum 90° crosswind to 10 knots, and by introducing a maximum tailwind component of up to 5 knots.
<b>602.105(c) Hours When Aircraft Operations are Prohibited or Restricted</b>			
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above, but are not permitted to depart, independent from police, medical, and industrial emergency flights.	Existing Voluntary Procedure, Formalize With Revisions	Currently, the overnight operational restriction applies between 10:30 PM and 6:30 AM (8 overnight restricted hours). The Proposed Noise Abatement Procedure increases this window to 9:30 PM to 7:30 AM, for a total of 10 overnight restricted hours. This change will increase the number of 'quiet' overnight hours for residents. No changes are proposed to the existing exemptions for based aircraft, police, medical, and industrial emergency operations.
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	New Procedure	The intent of this procedure is to limit prolonged noise from overnight engine run-ups, except where an aircraft is conducting a runup as part of its pre-departure checklist.
<b>602.105(d) Arrival Procedures</b>			
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	Existing Voluntary Procedure, Formalize Without Revisions	This existing voluntary procedure is intended to limit low-level turns over built-up areas.
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	Existing Voluntary Procedure, Formalize Without Revisions	This existing voluntary procedure is intended to limit low-level final approaches over built-up areas.

No.	Proposed Noise Abatement Procedure	Existing / New	Notes / Rationale
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	Existing Voluntary Procedure, Formalize Without Revisions	This existing voluntary procedure is intended to limit low-level circling approach procedures over built-up areas.
<b>602.105(e) Departure Procedures</b>			
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	Existing Voluntary Procedure, Formalize Without Revisions	This existing voluntary procedure is intended to limit low-level turns over built-up areas.
<b>602.105(g) Prohibition or Restriction of Training Flights</b>			
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including private and commercial pilot recurrent training.	Existing Voluntary Procedure, Formalize Without Revisions	This existing voluntary procedure is intended to provide the opportunity for the Airport Manager to brief flight training aircraft on the various noise abatement procedures of the Airport, and to ensure that compliance can be achieved.
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	Existing Voluntary Procedure, Formalize With Revisions	Currently, flight training aircraft are not permitted to conduct touch-and-go procedures after 4:00 PM on any Saturday or Sunday. The original intent of this voluntary procedure was to decrease the frequency of aircraft overflights resulting from continuous touch-and-go's (i.e., high volume flight training). However, stop-and-go's and full-stop / taxi-back procedures continue to be permitted after 4:00 PM. The proposed procedure would prohibit all flight training from Friday to Monday year-round, with more restrictive hours in the summer months when residents typically are utilizing their outdoor amenity spaces. This restriction would apply to all flight training, including circuits, arrivals and departures to and from the practice area, and cross-country flights.
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	New Procedure	In the summer months (May through September), alternating Saturdays and Sundays would also be subject to flight training prohibitions. This restriction would apply to all flight training, including circuits, arrivals and departures to and from the practice area, and cross-country flights.
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	Existing Voluntary Procedure, Formalize With Revisions	Currently, circuit training is not permitted on the Sunday or Monday of holiday long weekends. The Proposed Noise Abatement Procedure would formally identify the federal statutory holidays on which flight training is prohibited. This restriction would apply to all flight training, including circuits, arrivals and departures to and from the practice area, and cross-country flights.

No.	Proposed Noise Abatement Procedure	Existing / New	Notes / Rationale
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	Existing Voluntary Procedure, Formalize With Revisions	Currently, a maximum of 12 aircraft are permitted in the circuit for training purposes on Runway 05-23. The Proposed Noise Abatement Procedure would apply to both Runway 05-23 and Runway 12-30 and create a cap of 4 aircraft in the circuit for training purposes. The intent of this change would be to limit the frequency of overflights resulting from high-volume flight training.
<b>602.105(j) Minimum Aerodrome Operation Altitudes</b>			
14	<b>Toronto Zoo:</b> Pilots are to maintain 2000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	Existing Voluntary Procedure, Formalize Without Revisions	This existing voluntary procedure is intended to limit low-level overflights of the Toronto Zoo, which can also cause distress to animals.

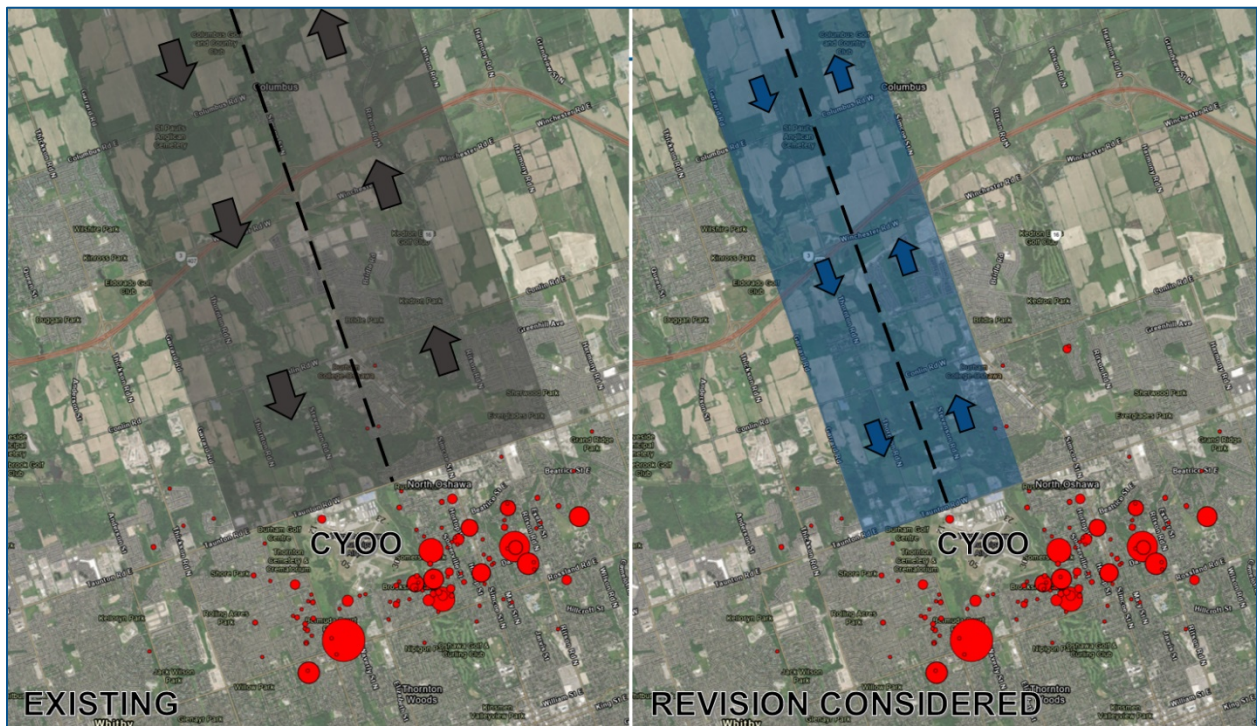
### 4.3 Alternative Noise Abatement Procedures

In addition to the Proposed Noise Abatement Procedures, four Alternative Noise Abatement Procedures were identified by the project team but were removed from further consideration following consultations with the Airport Operator, City Staff, and elected officials. These Alternative Noise Abatement Procedures are described as follows:

#### CAR 602.105 b) Minimum Noise Routes

- Procedure: Visual Flight Rules (VFR) departures to the north and arrivals from the north are to avoid noise sensitive areas by being routed between Durham College and Garrard Road.
- Rationale for Consideration: The lands north of Oshawa Executive Airport currently are in a primarily undeveloped state, with a sparsely populated corridor between Durham College / Samac to the east and Brooklin to the west. A procedure considered by HM Aero involved VFR departures and arrivals to and from the practice area being routed through this corridor, generally following Thornton Road N.
- Rationale for Removal: The primary flight training practice area is located approximately 18 km north of Oshawa Executive Airport in the vicinity of Port Perry and Lake Scugog. Simcoe Street N, which runs from the Airport to Port Perry, is currently used by NAV CANADA as a visual reference to separate outbound / northbound departures and inbound / southbound arrivals. Thornton Road N would not be as easily identifiable from the air as Simcoe Street N, creating navigation and separation challenges for student pilots. Further, the number of noise complaints in the Samac and Brooklin neighbourhoods are limited, suggesting that overflights in these areas do not currently pose a significant concern.

Figure 4.1 - Minimum Noise Route (Alternative Noise Abatement Procedure)



## CAR 602.105 d) Arrival Procedures

- **Procedure:** During the operational periods for NAV CANADA's Tower, Runway 12 and Runway 30 could be used for left-hand or right-hand circuits based on a predetermined alternating schedule (e.g., every other day).
- **Rationale for Consideration:** In 2020, Runway 12 was used for 26% of total movements, yet 54% of complaints were associated with days where Runway 12 was predominantly in use. Similarly, Runway 30 was used for 41% of movements and was associated with 17% of complaints. Consideration was given to alternating right-hand and left-hand circuits on separate days to provide a level of reprieve to residents to the west and east of the Airport during Runway 12 and Runway 30 circuit operations.
- **Rationale for Removal:** Alternating Runway 12 circuit directions would not significantly reduce the noise exposure realized by residents while aircraft are on their initial departure climb-out, prior to turning onto the crosswind leg. Similarly, Runway 30 operations would still consistently impact residents under the final approach leg. Introducing a left-hand circuit for Runway 30 and right-hand circuit for Runway 12 would also significantly increase overflights of neighbourhoods in Whitby to the west that are currently impacted by Runway 05-23 operations. Lastly, concern exists from an operational / implementation perspective, with increased potential for pilot and Air Traffic Controller error in keeping track of the circuit direction in use on a given day, and in following the cleared procedure.

**Figure 4.2 - Runway 30 Right-Hand and Left-Hand Circuits (Alternative Noise Abatement Procedure)**





### **CAR 602.105 g) Prohibition or Restriction of Training Flights**

- Procedure: An annual limit on the number of flight training movements that a FTU can perform at the Airport would be instituted (e.g., a total of 45,000 annual FTU movements).
- Rationale for Consideration: In 2019 and 2020, approximately 68,000 and 57,000 movements, respectively, were attributed to the operations of Durham Flight Centre and Canadian Flight Academy. In both years, approximately 70% of annual movements were attributed to these operators – as such, they jointly represent the largest source of activity at the Airport. Instituting a cap on the number of annual FTU aircraft movements was therefore considered to reduce overall Airport activity levels and accordingly aircraft noise.
- Rationale for Removal: Instituting an annual cap on FTU movements would present considerable implementation challenges for the City, the Airport Operator, and affected aircraft operators – both in the development and enforcement of a slot system. Further, limiting the number of annual FTU movements would fail to address the distribution of these movements throughout the year / week / day, and instances of high-volume flight training would continue to occur.

### **CAR 602.105 g) Prohibition or Restriction of Training Flights**

- Procedure: Turbofan, turbojet, and turboprop aircraft would be prohibited from circuit training at the Airport.
- Rationale for Consideration: While the disturbance generated by turbofan, turbojet, and turboprop aircraft varies considerably depending on the noise profile of each aircraft type, such aircraft are typically understood to have more significant noise impacts.
- Rationale for Removal: Consultations with the Airport Operator indicate that circuit training movements by the above-noted categories of aircraft occur on an infrequent basis, and complaints pertaining to such operations were not a significant contributor to the Problem Description. These aircraft also typically fly larger circuit patterns and therefore do not complete high-frequency overflights of dwellings in the vicinity of the Airport.

## 5 EVALUATION OF PROPOSED NOISE ABATEMENT PROCEDURES

Per Step 1 of the AC 302-002 process, a fulsome evaluation of the Proposed Noise Abatement Procedures must be completed that considers the following:

- The implications of not proceeding with the Proposed Noise Abatement Procedures, as documented in Section 5.1. For analysis purposes, it is assumed that the existing Voluntary Noise Abatement Procedures would continue to be in effect; and
- The implications of proceeding with the Proposed Noise Abatement Procedures, considering the nine criteria established in the AC 302-002 process: noise, costs, aircraft emissions, airport capacity, implementation, aviation system, air traffic management, safety, and fleet. These criteria are evaluated, respectively, in Sections 5.2 to 5.10.

The discussion provided herein is based on the independent analysis completed by HM Aero and may be refined based on inputs received through the stakeholder consultation process. Where applicable, data sources and assumptions have been documented. 2019 and 2020 NCAMS data was filtered where applicable to exclude 66, 70, 77, 88, 88A, 88B, and 99 movement codes, which generally include landings and takeoffs outside of the Airport boundary and aircraft operating in the control zone but not landing or taking off at the Airport.

## 5.1 Implications of Not Proceeding

As described previously, Voluntary Noise Abatement Procedures are currently in effect for the Airport that address preferential runway usage, hours where aircraft operations are restricted, arrival procedures, departure procedures, training flights, and overflights of the Toronto Zoo. Despite these procedures, a noise problem has been identified as described in Section 3. Failing to address the ongoing noise concerns at the Airport through the Proposed Noise Abatement Procedures may result in one or more of the following potential outcomes:

1. Noise complaints are unlikely to decline unless aircraft movements significantly decrease. With status quo or increased levels of aircraft movements, the number of noise complaints may reasonably be expected to increase over time. Prolonged and increasing exposure to aircraft noise may result in residences that have historically not recorded complaints doing so, and existing individuals that have submitted complaints doing so at an increasing rate. As noted previously in Section 3.1, the number of recorded noise complaints has increased significantly in recent years;
2. If new mandatory noise abatement procedures are not implemented, it may result in heightened public discontent, pressure to local decision-makers (i.e., Councillors and the Mayor) for change, and decreased local support for the Airport. Furthermore, resident perceptions of the City and Airport Operator's ability to enforce current procedures could also be negatively impacted to a higher degree.
3. If the current AC 302-002 process is completed without the implementation of the Proposed Noise Abatement Procedures, the City may decide in the future to initiate the AC 302-002 process again, with additional costs incurred in consulting fees and staff time;
4. The City's existing Voluntary Noise Abatement Procedures and Noise & Traffic Management Policy could be refined to include one or more of the abatement procedures recommended herein. However, the efficacy of such changes may be hindered by the reliance on voluntary compliance, as such procedures cannot be enforced by the City or Transport Canada unless enacted pursuant to CAR 602.105; and
5. Conversely, aircraft movement levels at the Airport may continue to increase with minimal restriction, representing a positive trend from an aviation activity and revenue generation perspective. However, such growth would be subject to the caveats described in 1. and 2. above.

In summary, continuing with the status quo whereby only the existing Voluntary Noise Abatement Procedures remain in effect is highly unlikely to address the noise issue documented previously. Increasing discontent among residents in the vicinity of the Airport may reasonably be expected if new mandatory noise abatement procedures are not enacted at the Airport.

## 5.2 Noise Implications

The Proposed Noise Abatement Procedures have been developed specifically for Oshawa Executive Airport to make incremental progress towards the problem identified in Section 3. Anticipated noise implications are summarized in Table 5.1, and are described in detail below. Background information on past noise monitoring studies prepared by the City of Oshawa is also provided to contextualize the following discussion.

**Table 5.1 - Proposed Noise Abatement Procedures, Noise Implications**

No.	Proposed Noise Abatement Procedure	Noise Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	Yes
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	Yes
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	Yes
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	Yes
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	Yes
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	Yes
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	Yes
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	Yes
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	Yes (Indirect)
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	Yes
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	Yes
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	Yes
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	Yes
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	Yes

## Background – Noise Monitoring Studies

The City of Oshawa commissioned a noise monitoring study in 2020, which was the first of two phases. The 2020 noise monitoring study<sup>4</sup> was completed using measuring units installed near each of the Airport's four runway thresholds. The 2020 study made several findings related to Airport noise:

- When comparing noise data from monitoring stations for an active (in use) and inactive runway, the difference was approximately 10 decibels (dBA), or an order of magnitude difference. This confirms resident concerns that aircraft operations significantly increase noise levels versus those associated with the ambient urban environment; and
- The differences between the takeoff end of the runway and the landing end of the runway were typically between 2 and 4 dBA, or approximately double the sound pressure level. This indicates that residents exposed to aircraft on takeoff experience a higher level of noise versus the level that would be experienced with a landing aircraft.

As of August 2021, the second phase of the 2020 noise monitoring study was in progress. In response to community input, five noise monitoring units have been installed in the following residential areas near the Airport: Barbados Street, Bessborough Drive, Juniper Street, Revelstoke Court, and Woodlea Crescent. By installing monitoring units in residential areas as opposed to at the Airport, the 2021 noise monitoring study is expected to result in more detailed findings regarding resident exposure to aircraft noise.

### Proposed Noise Abatement Procedure 1 – Tower Closed Preferential Runways

During overnight hours when the NAV CANADA Air Traffic Control Tower is closed, a Voluntary Noise Abatement Procedure currently exists whereby pilots are requested to utilize Runway 12 for arrivals and Runway 30 for departures, except where such operations would otherwise be precluded (e.g., due to winds that favour another runway). This procedure is intended to route arrivals and departures over less densely populated areas to the northwest, as shown in Figure 5.1.

A total of 33 movements were recorded in the 2019 and 2020 NCAMS datasets from 10:30 PM to 6:30 AM, although 8 were discarded from the analysis as the runway used was entered incorrectly and the actual runway used could not be verified. From 10:30 PM to 6:30 AM, 22% of arrivals used the recommended Runway 12, while 66% of departures utilized the recommended Runway 30 (Table 5.2). Implementing Proposed Noise Abatement Procedure 1 as a mandatory procedure is anticipated to improve overnight runway usage patterns, consistent with safety of operations and prevailing winds favouring the recommended runway.

It is noted that the Airport Operator also maintains a database of overnight aircraft movements, separate from the NCAMS datasets utilized by HM Aero. The Airport Operator's database does not include the runway used for each aircraft movement; accordingly, NCAMS data is used for this analysis.

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<sup>4</sup> RWDI Consulting Engineers and Scientists. (2020, October 28). Oshawa Executive Airport Noise Monitoring, Oshawa, Ontario – Noise Study (RWDI #1903663).

**Table 5.2 - Overnight Runway Utilization, 2019 and 2020 (10:30 PM to 6:30 AM)**

	Arrivals	Departures	Local
Runway 12	4*	-	4
Runway 30	9	2*	-
Runway 23	4	-	-
Runway 60**	1	1	-
<b>Total</b>	<b>18</b>	<b>3</b>	<b>4</b>

**Date Source:** 2019 and 2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes, as well as mislabelled runway movements

\* Denotes preferred arrival / departure runway

\*\* Runway 60 movements denote helicopters arriving at or departing from the Airport without using a runway

**Figure 5.1 - Overnight Preferential Runway Arrival and Departure Routes**



## Proposed Noise Abatement Procedure 2 – Tower Open Preferential Runways

By increasing the maximum 90° crosswind component for Runway 30 operations to 10 kts and by adding a maximum permitted tailwind component of up to 5 kts, the intent of this Proposed Noise Abatement Procedure is to increase the utilization of Runway 30 for aircraft arrivals and departures. Aircraft on the departure and crosswind legs operate at or near their highest power setting as they climb away from the Airport, thereby increasing noise exposure to residences in the area. The Runway 30 departure path and right-hand crosswind legs are established over non-residential and less densely populated residential areas of Oshawa and Whitby – accordingly, by increasing Runway 30 utilization, the goal is to redirect traffic so fewer residences are exposed to aircraft overflights when they operate at their highest power settings.

A windrose analysis was completed using data recorded at the Airport from 2016 to 2020 for the hours of 6:00 AM to 10:00 PM<sup>5</sup>. Under the current Voluntary Noise Abatement Procedure whereby Runway 30 is to be assigned up to a 5 kt 90° crosswind component and no tailwind component, Runway 30 was the preferred runway for 44% of the analyzed hours (Table 5.3). Runway 05 was favoured for 23% of the analyzed hours, Runway 23 for 22%, and Runway 12 for 11%. Based on the analyzed historical wind dataset, implementing the revised utilization criteria of the Proposed Noise Abatement Procedure would increase the time during which Runway 30 is wind-favoured by 1,597 hours per year, and would increase the preferred utilization of Runway 30 from 44% of operating hours to 70% of operating hours (Table 5.3). The preferred utilization of Runways 12, 05, and 23 would correspondingly decrease, reducing noise impacts on residences directly impacted by their arrival, departure, and circuit paths to varying degrees.

It is noted that dwellings to the south and east of the Airport that are impacted by the Runway 12 departure and left-hand crosswind legs will continue to be impacted by the Runway 30 right-hand base and final approach legs. However, increasing the utilization of Runway 30 will decrease the frequency at which these residences are overflown by aircraft operating at their highest power settings, and instead will result in an increased prevalence of overflights at reduced power as aircraft configure for landing.

**Table 5.3 - Runway Utilization Criteria Impacts (2016-2020 Wind Data)**

Runway	Existing Runway Utilization Criteria		Proposed Runway Utilization Criteria	
	Proportion of Analyzed Hours	Average Hours per Year	Proportion of Analyzed Hours	Average Hours per Year
Runway 30	44%	2,719	70%	4,316
Runway 12	11%	678	5%	296
Runway 05	23%	1,439	15%	948
Runway 23	22%	1,368	10%	645
<b>Total</b>	<b>100%</b>	<b>6,205</b>	<b>100%</b>	<b>6,205</b>
<b>Date Source:</b> 2016-2020 historical weather data				
<b>Note:</b> All analysis performed using wind data recorded at Oshawa Executive Airport from 2016 to 2020, from 6:00 AM to 10:00 PM local				

<sup>5</sup> As overnight operations are currently restricted, data from 10:00 PM to 6:00 AM was not integrated in the analysis.

The wind preferred runway that would have been assigned for each hour in 2019 and 2020 based on the Proposed Noise Abatement Procedure has been compared to the actual utilization of each runway using the 2019 and 2020 NCAMS data, as shown in Table 5.4 and Table 5.5. Assuming all runway assignment decisions were made based solely on prevailing winds, the Proposed Noise Abatement Procedure would have significantly increased the utilization of Runway 30 and decreased the use of Runway 12 in 2019 and 2020. Runway 30 would have been used for between 61% and 64% of movements in 2019 and 2020, versus the 41% to 42% of movements that actually occurred on Runway 30 in 2019 and 2020 (Table 5.5). The proportional use of Runway 12, which is associated with significant noise concerns, would decrease from between 26% and 35% in 2019 and 2020 to between 12% and 19% of aircraft movements in 2019 and 2020, with similar results anticipated in the future (Table 5.5).

**Table 5.4 - Runway Utilization Criteria Impacts, 2019 and 2020 Movements**

Runway	2019		2020	
	Movements (Historical)	Movements (With Proposed Runway Assignment Criteria)	Movements (Historical)	Movements (With Proposed Runway Assignment Criteria)
Runway 30	35,750	58,089	32,705	50,605
Runway 12	29,950	17,918	20,721	9,247
Runway 05	3,176	3,105	3,157	2,399
Runway 23	16,011	8,967	22,236	11,763

**Date Source:** 2016-2020 historical weather data, 2019 and 2020 NAV CANADA Aircraft Movement Statistics  
**Note:** Total aircraft movements may not sum to the levels reported elsewhere in this report due to the exclusion of records for which wind data was not available and datapoints for which a runway was improperly labelled.

**Table 5.5 - Runway Utilization Criteria Impacts, 2019 and 2020 Proportional Movements**

Runway	2019		2020	
	Proportion of Movements (Historical)	Proportion of Movements (With Proposed Runway Assignment Criteria)	Proportion of Movements (Historical)	Proportion of Movements (With Proposed Runway Assignment Criteria)
Runway 30	42%	61%	41%	64%
Runway 12	35%	19%	26%	12%
Runway 05	4%	3%	4%	3%
Runway 23	19%	9%	28%	15%

**Date Source:** 2016-2020 historical weather data, 2019 and 2020 NAV CANADA Aircraft Movement Statistics  
**Note:** Proportions for the movements under the proposed runway assignment criteria will not sum to 100%, as between 6% and 8% of movements did not have wind data available. Rounding will also influence the cumulative totals.



### Proposed Noise Abatement Procedure 3 – Overnight Restricted Hours

As noted previously, a Voluntary Noise Abatement Procedure is currently in effect whereby flights are prohibited between 10:30 PM and 6:30 AM, with the exception of police, medical, and industrial emergency flights that are permitted to arrive and depart, and aircraft based at the Airport that are permitted to arrive. In 2019, 14 movements were recorded between 10:30 PM and 6:30 AM, or 0.02% of the total of 86,615 movements in that year. In 2020, 19 movements were recorded in this period (0.02% of total annual movements).

The Proposed Noise Abatement Procedure would expand the restricted overnight period to 9:30 PM to 7:30 AM. Therefore, residents would experience an additional two hours per day with restricted aircraft operations, with the Airport’s daily hours of operation decreasing from 16 hours to 14 hours. On an annual basis, the Airport’s total non-restricted hours would decrease from 5,840 hours to 5,110 hours (a 12.5% decrease).

The expanded overnight restricted hours are expected to measurably reduce Airport activity during periods of heightened resident sensitivity to noise in the late evening and early morning. In 2019, 2,618 additional movements occurred during the two-hour expanded period of operational restrictions. Activity between 9:30 PM and 7:30 AM comprised 3.0% of the 86,615 movements recorded in 2019. Similarly, 1,266 additional movements were recorded during the two-hour expanded period of operational restrictions in 2020, or 1.6% of total annual movements. Of the movements that currently occur during the proposed expanded restricted period, there are three possible outcomes:

1. Movements of an exempted category continue (police, medical, industrial emergency, returning based aircraft);
2. Non-exempted movements are cancelled altogether (a movement is eliminated due to the Proposed Noise Abatement Procedure); or
3. Non-exempted movements shift to an unrestricted time of the day (a movement is not eliminated altogether but is shifted).

**Table 5.6 - Noise Implications, Modified Overnight Operational Restrictions**

	Existing: 10:30 PM to 6:30 AM		Proposed: 9:30 PM to 7:30 AM	
	2019	2020	2019	2020
Movements Outside of Restricted Hours	86,601	78,828	83,983	77,562
Movements Within Restricted Hours	14	19	2,632	1,285
<b>Total Annual Movements</b>	<b>86,615</b>	<b>78,847</b>	<b>86,615</b>	<b>78,847</b>
<b>Date Source:</b> 2019 and 2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes				

### Proposed Noise Abatement Procedure 4 – Overnight Engine Run-Ups

Data is not available on the number of overnight engine run-ups that historically occur that are associated with aircraft maintenance and testing. However, restricting overnight (9:30 PM to 7:30 AM) engine testing will limit future instances of prolonged noise exposure at high power settings.

## Proposed Noise Abatement Procedures 5, 6, and 7

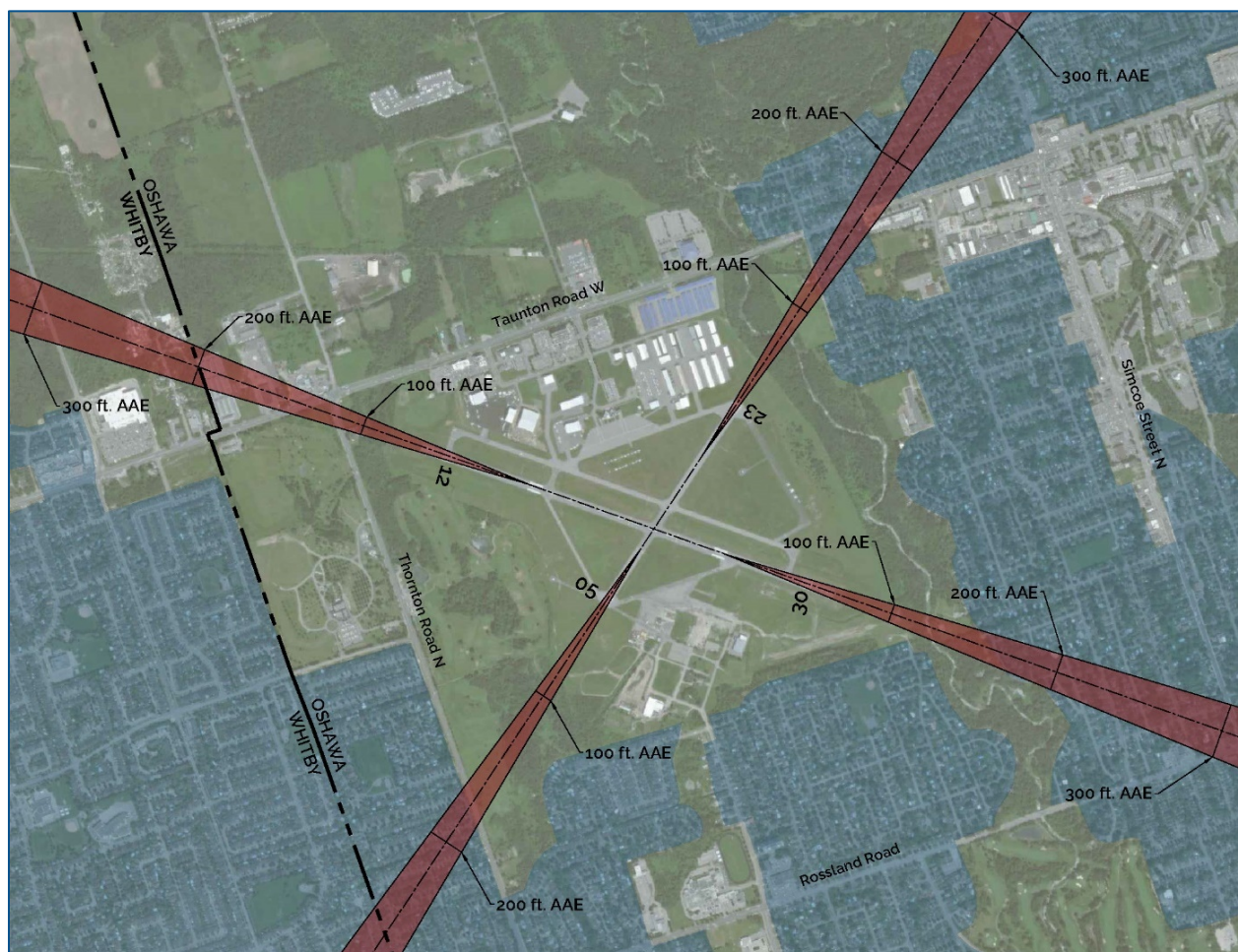
Proposed Noise Abatement Procedures 5, 6, and 7 involve the formalization of the following Voluntary Noise Abatement Procedures pertaining to arriving aircraft, without modification:

1. Arriving aircraft will remain at least 540 ft. AGL before making their turn for their final approach;
2. Approaches are to remain on or above an assumed 3° glide slope; and
3. Circling procedures are to be conducted at least 1,000 ft. AGL.

The intent of requiring final approaches to begin at or above 540 ft. AGL (also referred to as Above Aerodrome Elevation, or AAE) and following an assumed 3° glide slope is to limit instances of low approaches over residential dwellings, which increase noise exposure and result in resident concerns of safety and visual disturbance. Figure 5.2 shows hypothetical 3° final approach paths to each of the four runway thresholds. It should be noted that aircraft operating at a steeper glide slope angle (e.g., 3.5° or 4.0°) would have increased clearance from nearby residential dwellings and would be expected to have reduced levels of noise exposure.

Historical data is not available on the compliance of arriving aircraft with the voluntary approach procedures. However, making mandatory these existing procedures is expected to further reinforce good airmanship that will reduce noise exposure for dwellings impacted by arriving aircraft.

**Figure 5.2 - Representative 3° Glide Slope Approaches**



### **Proposed Noise Abatement Procedure 8 – Departure Turns**

Proposed Noise Abatement Procedure 8 involves the formalization of the existing Voluntary Noise Abatement Procedure, whereby aircraft are requested to climb to 1,000 ft. ASL (540 ft. AGL) before initiating their crosswind or departure turn. This procedure is intended to reduce low-level turns that expose residences to prolonged periods of high-power settings, as aircraft remain over a given point for a longer period.

### **Proposed Noise Abatement Procedure 9 – Prior Permission for Flight Training**

Proposed Noise Abatement Procedure 9 in and of itself will not have any direct noise implications. However, the intent of this Proposed Noise Abatement Procedure is to enable the implementation of other flight training-related Proposed Noise Abatement Procedures with direct noise implications – namely Proposed Noise Abatement Procedures 10, 11, 12, and 13.

As noted previously, all analyses of flight training implications are limited to the consideration of impacts to CFA and DFC – the two FTUs based at the Airport. While flight training occurs in privately owned aircraft and by other non-based FTUs that make use of the Airport, such activity is not easily discernible within the NCAMS datasets used by the project team.

### **Proposed Noise Abatement Procedure 10 – Time of Day Flight Training Restrictions**

The intent of this Proposed Noise Abatement Procedure is to limit flight training on Fridays, Saturdays, Sundays, and Mondays to the period of 8:00 AM to 4:00 PM from May 1 to September 30, and to the period of 8:00 AM to 8:00 PM from October 1 to April 30. Outside of these hours (before 8:00 AM year-round and after 4:00 PM / 8:00 PM as seasonally applicable), flight training would not be permitted. The intent of this procedure is to provide predictable periods of year-round reduced operations and reprieve from high frequency aircraft noise exposure for residents.

NCAMS data was analyzed for 2019 and 2020 to determine the scale of flight training operations during these periods. Operations by the two FTUs based at the Airport comprised an average of 61% of the movements that occurred during the October to April proposed restricted hours, and 71% of movements that occurred during the May to September proposed restricted hours. For flight training movements that currently occur during the proposed restricted periods, there are two possible outcomes:

1. Flight training movements are cancelled altogether, representing the elimination of a given movement's period of aircraft noise; or
2. The flight training activity is shifted to an unrestricted hour or day (i.e., noise is further concentrated during another time). FTU movements are subject to numerous factors that hinder the ability to predict or quantify the degree to which their shifting can occur. These factors include, but are not limited to, aircraft availability and maintenance downtime, instructor and student availability, and adequate meteorological conditions for the intended flight.

Restricting flight training before 8:00 AM and after 8:00 PM in the fall, winter, and spring months (October 1 to April 30) would have resulted in an estimated annual reduction or shifting of between 696 and 853 annual movements in 2019 and 2020, as demonstrated in Table 5.7. Implementing restrictions before 8:00 AM and after 4:00 PM from May 1 to September 30 would similarly have resulted in the shifting and / or reduction of between 4,924 and 6,902 movements in 2019 and 2020. While a degree of the activity identified in 2019 and 2020 that would be affected by these restrictions would be shifted to other days or hours, residents will benefit from predictable periods of reduced noise exposure in the mornings, late afternoons, and evenings on Fridays to Mondays throughout the year.

**Table 5.7 - Noise Implications, Seasonal Flight Training Time of Day Restrictions**

	October 1 to April 30, Before 8:00 AM, After 8:00 PM		May 1 to September 30, Before 8:00 AM, After 4:00 PM	
	2019	2020	2019	2020
Non-Flight Training Movements Within Restricted Hours	576	418	2,625	2,191
Flight Training Movements Within Restricted Hours	853	696	6,902	4,924
<b>Total Annual Movements Within Restricted Hours</b>	<b>1,429</b>	<b>1,114</b>	<b>9,527</b>	<b>7,115</b>
<b>Date Source:</b> 2019 and 2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes				

**Proposed Noise Abatement Procedure 11 – Alternating Seasonal Weekend Flight Training Restrictions**

Proposed Noise Abatement Procedure 11 would prohibit flight training on the first and third Sunday of each month and second and fourth Saturday of each month between May 1 and September 30. NCAMS data was used to analyze the number of flight training movements that would have been impacted by the 22 restricted weekend days per year in 2019 and 2020. Table 5.8 shows that in 2019, a total of 6,400 aircraft movements were recorded on 22 weekend days between May 1 and September 30, or an average of 291 aircraft movements per affected day. Of this total, 4,484 movements (70%) were operated by the two FTUs based at the Airport, or an average of 204 movements per weekend day. Similarly, 3,554 of the 5,670 movements that would have occurred on restricted weekends in 2020 were operated by the two FTUs, or 63% of total movements.

By implementing alternating seasonal weekend restrictions, activity on alternating Saturdays and Sundays would have been reduced by an average of 162 to 204 daily movements based on historical activity in 2019 and 2020 (Table 5.8). As noted previously, there are two possible outcomes:

1. Flight training movements on the affected days are cancelled altogether, thereby resulting in net decrease in aircraft noise; or
2. Training flights are rebooked on non-affected days, subject to the FTU capacity factors noted above in reference to Proposed Noise Abatement Procedure 10.

Regardless of whether activity is shifted to an alternate day or does not take place altogether, the implementation of alternating weekend flight training restrictions in the summer months would provide predictable and scheduled periods around which FTUs can plan their operations, and residents can plan their outdoor weekend activities with reprieve from high volumes of aircraft activity.

**Table 5.8 - Aircraft Movements on Alternating Restricted Weekend Days (2019 and 2020)**

	2019	2020
Movements Excluding Airport-Based Flight Training Units	1,916	2,116
Airport-Based Flight Training Unit Movements	4,484	3,554
<b>Total Movements on Restricted Weekend Days</b>	<b>6,400</b>	<b>5,670</b>
Average Daily Movements Not Operated by Airport-Based Flight Training Units	87	96
Average Daily Movements Operated by Airport-Based Flight Training Units	204	162
<b>Average Daily Movements on Restricted Weekend Days</b>	<b>291</b>	<b>258</b>
<b>Date Source:</b> 2019 and 2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes		

**Proposed Noise Abatement Procedure 12 – Statutory Holiday Flight Training Restrictions**

Operations by the two FTUs based at the Airport were analyzed for 2019 and 2020 to determine the total number of movements that occurred on the following proposed statutory holidays as indicated in the Canada Labour Code: New Year’s Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day. As shown in Table 5.9, a total of 925 and 596 aircraft movements were recorded on all statutory holidays in 2019 and 2020, respectively<sup>6</sup>. Of these movements, between 54% and 66% were operated by FTUs. While statutory holidays have historically been days with lower levels of Airport activity, limiting flight training is expected to further decrease aircraft movement levels and result in less noise exposure for residents by an average of 60 to 92 movements per statutory holiday (Table 5.9).

**Table 5.9 - Aircraft Movements on Statutory Holidays (2019 and 2020)**

	2019	2020
Movements Excluding Airport-Based Flight Training Units	312	275
Airport-Based Flight Training Unit Movements	613	321
<b>Total Movements on Statutory Holidays</b>	<b>925</b>	<b>596</b>
Average Daily Movements Not Operated by Airport-Based Flight Training Units	31	28
Average Daily Movements Operated by Airport-Based Flight Training Units	61	32
<b>Average Daily Movements on Statutory Holidays</b>	<b>92</b>	<b>60</b>
<b>Date Source:</b> 2019 and 2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes		

<sup>6</sup> The National Day for Truth and Reconciliation, which occurs on September 30<sup>th</sup>, began in 2021. Accordingly, aircraft movements on September 30 in 2019 and 2020 are higher than levels typically seen on other statutory holidays, on account of its previously unrestricted nature.

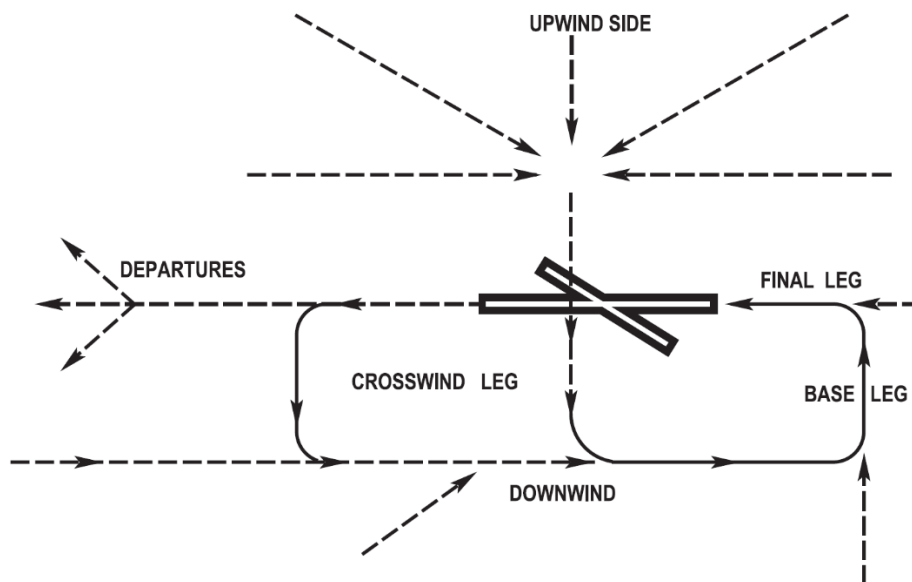
### Proposed Noise Abatement Procedure 13 – Circuit Flight Training Restrictions

A core element of flight training per Transport Canada’s required curriculum for various licenses and ratings is practicing take-offs, landings, and missed approaches. Training for these maneuvers typically occurs through the use of continuous circuits of the Airport, whereby aircraft take-off, fly a rectangular pattern (Figure 5.3), and land. After landing, aircraft may:

- Vacate the runway and complete the flight;
- Vacate the runway and taxi back for departure again;
- Stop on the runway and take-off again, without vacating (a stop-and-go); or
- Take-off again without stopping (a touch-and-go).

In a typical one-hour training flight, a given aircraft will complete numerous take-offs and landings, which can result in a high frequency of overflights for residents located under the traffic circuit. Currently, a voluntary procedure exists whereby a maximum of 12 aircraft are permitted in the circuit for training purposes on Runway 05-23; no such limitation is currently in effect for Runway 12-30.

**Figure 5.3 - Standard Left-Hand Traffic Circuit (Transport Canada)**



Proposed Noise Abatement Procedure 13 would introduce a limit of 4 aircraft operating in the circuit for training purposes for all runways with the goal of limiting the frequency of overflights that result from continuous circuit training. Noise impacts are estimated based on the number of overflights that a given residence directly under the circuit would experience based on varying numbers of aircraft in the circuit, as shown in Table 5.10 and summarized as follows:

- With 12 flight training aircraft conducting continuous circuits, a residence would experience an estimated 1.7 overflights per minute or 36 seconds between overflights. 12 aircraft is the current maximum established for Runway 05-23 in the Voluntary Noise Abatement Procedures;
- Typical operations have approximately 8 flight training aircraft conducting continuous circuits. In this instance, an estimated 1.4 overflights would occur per minute, or an overflight every 42 seconds; and
- The proposed limitation would be for 4 flight training aircraft conducting continuous circuits. The project team estimates that the frequency of overflights per minute would decrease to 0.7, and that an overflight would occur approximately every 1 minute 24 seconds.

A maximum of 4 aircraft using the circuit for flight training purposes is a marked decrease from the current limitation of 12 for Runway 05-23 and also a decrease from the common occurrence of 8 flight training aircraft within the traffic circuit. This restriction is anticipated to result in a decrease in the frequency of overflights experienced by residents living in the vicinity of the traffic circuit. It is noted that given the prevalence of circuit training in Transport Canada’s prescribed curricula, the reduction of the capacity of the traffic circuit will not change the need for FTUs to conduct student circuit training. Therefore, while peak activity in the traffic circuit would decrease with this Proposed Noise Abatement Procedure, the redistribution of circuit training activity throughout the day and week (subject to other restrictions applicable to FTUs) should be anticipated, as well as the redistribution of activity to other airports in the area (Section 5.7).

**Table 5.10 - Noise Implications, Flight Training Traffic Circuit Restrictions**

	Estimated Circuit Duration	Overflights Per Minute	Minutes Between Overflights	Overflights Per Hour
Current Restriction – 12 Aircraft in Circuit	7.2 min. (7 min. 12 sec.)	1.7	0.6 min. (36 sec.)	100
Typical Operations – 8 Aircraft in Circuit	5.8 min. (5 min. 48 sec.)	1.4	0.7 min. (42 sec.)	83
<b>Proposed Restriction – 4 Aircraft in Circuit</b>	<b>5.8 min. (5 min. 48 sec.)</b>	<b>0.7</b>	<b>1.4 min. (1 min. 24 sec.)</b>	<b>41</b>
<b>Notes:</b>				
<ul style="list-style-type: none"> <li>• Representative circuit duration values calculated based on the performance of a 1979 Cessna 172N. The size of the circuit is increased for the 12 aircraft calculation based on the additional distance required to maintain adequate spacing.</li> <li>• Calculations assume that all aircraft are uniformly spaced and do not vary in their performance.</li> <li>• Impacts of non-flight training aircraft in the circuit, including arrivals, are not modelled.</li> </ul>				

The cumulative impact of the flight training restrictions included in Proposed Noise Abatement Procedures 3, 10, 11, and 12 is that a total of 90 hours of flight training can be accommodated per typical week from October 1 to April 30, and 66 hours of flight training per typical week from May 1 to September 30. Based on these values and the assumptions documented in Table 5.11, it is estimated that 12,477 flight training lessons in the traffic circuit could take place in a typical year, or approximately 125,000 local movements annually (number of circuit training lessons multiplied by the number of local movements per lesson).

The data granularity in the 2019 and 2020 NCAMS files limits the ability to definitively identify the number of lessons that occur in the traffic circuit in a typical year. However, it is noted that 67,583 movements were attributed to the two FTUs based at the Airport in 2019, and that 56,600 movements occurred in 2020. Therefore, while several other factors will influence the degree to which this capacity can be utilized by the two FTUs (and other parties) including peak period demand, daytime vs. nighttime conditions, and instructor and student variability, the preliminary analysis detailed herein suggests that sufficient residual capacity likely exists to meet the traffic circuit flight training needs of the Airport with the Proposed Noise Abatement Procedure. Spreading peak demand for flight training in the traffic circuit throughout the day is the condition to this success being realized.

**Table 5.11 - Traffic Circuit Capacity Estimates**

	Proposed Restriction Period	
	October 1 to April 30	May 1 to September 30
Assumed Number of Circuit Training Lessons per Hour	4	
Maximum Circuit Training Hours Per Week	90	66
Estimated Number of Circuit Training Hours	68	56
Estimated Number of Circuit Training Lessons per Week	270	224
Total Weeks in Proposed Restricted Period	30	22
Estimated Number of Circuit Training Lessons per Period (Minus Statutory Holidays)	12,477	
Estimated Number of Local Movements per Circuit Training Lesson	10	
<b>Estimated Number of Circuit Training Local Movements per Year</b>	<b>124,768</b>	
<b>Notes:</b>		
<ul style="list-style-type: none"> <li>• Total annual local movements are adjusted to remove ten statutory holidays.</li> <li>• Flying hours are reduced by an assumed 25% between October 1 and April 30 and by 15% between May 1 and September 30 to account for days without Visual Meteorological Conditions and other weather-related Airport disruptions.</li> <li>• 10 local movements are assumed per 1 hour training flight in the circuit, based on the preceding assumption that a circuit can be completed approximately every 6 minutes and that each touch-and-go results in 2 local movements (i.e., a total of 5 touch-and-go's per 1 hour flight).</li> </ul>		

### Proposed Noise Abatement Procedure 14 – Toronto Zoo

Currently, a Voluntary Noise Abatement Procedure exists that requests that pilots do not overfly the Toronto Zoo at an altitude of less than 2,000 ft. ASL. This procedure, to be made mandatory, will limit disturbances to the animals that reside at the Toronto Zoo, as well as guests.

### Summarized Noise Implications

As shown in Table 5.12, Figure 5.4, and Figure 5.5, in a typical week in 2021, overnight operational restrictions are in effect for approximately 56 hours – under the Proposed Noise Abatement Procedures, this is recommended to increase to 70 hours year-round. Time of day flight training restrictions are also proposed to be introduced, which would further restrict such operations by 8 hours per week between October 1 and April 30, and by 32 hours per week between May 1 and September 30. Accordingly, normal (unrestricted) operations would comprise 54% of weekly hours between October and April, and 39% of weekly hours between May and September (Table 5.12).



**Table 5.12 - Summarized Noise Implications, Typical Weekly Restrictions**

	Status Quo (2021)		Proposed – October 1 to April 30		Proposed – May 1 – September 30	
	Typical Weekly Hours	% of Weekly Hours	Typical Weekly Hours	% of Weekly Hours	Typical Weekly Hours	% of Weekly Hours
Overnight Operational Restrictions	56	33%	70	42%	70	42%
Daytime Flight Training Restrictions	0	0%	8	5%	32	19%
Normal Operations	112	67%	90	54%	66	39%
<b>Total</b>	<b>168</b>	<b>100%</b>	<b>168</b>	<b>100%</b>	<b>168</b>	<b>100%</b>

**Figure 5.4 - Airport Noise Restrictions (October 1 - April 30)**

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1:00 AM	Overnight operational restrictions in effect Engine run-ups associated with aircraft maintenance not permitted						
2:00 AM							
3:00 AM							
4:00 AM							
5:00 AM							
6:00 AM							
7:00 AM	Flight training not permitted					Flight training not permitted	
8:00 AM							
9:00 AM							
10:00 AM							
11:00 AM							
12:00 PM							
1:00 PM							
2:00 PM							
3:00 PM							
4:00 PM							
5:00 PM							
6:00 PM							
7:00 PM							
8:00 PM	Flight training not permitted					Flight training not permitted	
9:00 PM	Overnight operational restrictions in effect Engine run-ups associated with aircraft maintenance not permitted						
10:00 PM							
11:00 PM							
12:00 AM							

**Notes:**

- Preferential runway criteria in effect at all times
- Arrival and departure procedures in effect at all times
- Maximum of 4 aircraft are permitted in the circuit for training purposes at all times
- Prior permission is required from the Airport Manager for all flight training
- Federal statutory holidays are also subject to flight training restrictions

**Figure 5.5 - Airport Noise Restrictions (May 1 – September 30)**

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1:00 AM	Overnight operational restrictions in effect until 7:30 AM Engine run-ups associated with aircraft maintenance not permitted						
2:00 AM							
3:00 AM							
4:00 AM							
5:00 AM							
6:00 AM							
7:00 AM	Flight training not permitted					Flight training not permitted	
8:00 AM	Flight training not permitted on alternating weekends						Flight training not permitted on alternating weekends
9:00 AM							
10:00 AM							
11:00 AM							
12:00 PM							
1:00 PM							
2:00 PM							
3:00 PM							
4:00 PM	Flight training not permitted	Flight training not permitted				Flight training not permitted	Flight training not permitted
5:00 PM							
6:00 PM							
7:00 PM							
8:00 PM							
9:00 PM							
10:00 PM	Overnight operational restrictions in effect after 9:30 PM Engine run-ups associated with aircraft maintenance not permitted						
11:00 PM							
12:00 AM							

**Notes:**

- Preferential runway criteria in effect at all times
- Arrival and departure procedures in effect at all times
- Maximum of 4 aircraft are permitted in the circuit for training purposes at all times
- Prior permission is required from the Airport Manager for all flight training
- Federal statutory holidays are also subject to flight training restrictions

Table 5.13 shows the total number of movements that would have been impacted in 2019 by the Proposed Noise Abatement Procedures 3, 10, 11, and 12, which have the most direct noise impacts in terms of the shifting or reduction of aircraft activity. In 2019, 15% of recorded aircraft movements would have been impacted by one of the above-noted Proposed Noise Abatement Procedures (as applicable given the operator type), or 12,924 of the 86,615 movements recorded in that year. Given the additional criteria established for flight training, 19% of annual movements in this category would have experienced one or more restrictions established through the Proposed Noise Abatement Procedures.

**Table 5.13 - Summarized Noise Implications, 2019 Aircraft Movements**

	Not Impacted by Hour or Day Restrictions		Impacted by Hour or Day Restrictions		Total Annual Movements
	Annual Movements	% of Annual Movements	Annual Movements	% of Annual Movements	
Non-Flight Training Movements	21,080	96%	892	4%	21,972
Flight Training Movements	52,611	81%	12,032	19%	64,643
<b>Total</b>	<b>73,691</b>	<b>85%</b>	<b>12,924</b>	<b>15%</b>	<b>86,615</b>
<p><b>Date Source:</b> 2019 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes</p> <p><b>Note:</b> Only movements impacted by the following Proposed Noise Abatement Procedures are counted:</p> <ul style="list-style-type: none"> <li>• 3 – Overnight Operational Restrictions</li> <li>• 10 – Friday-Monday Morning and Afternoon Flight Training Restrictions</li> <li>• 11 – Alternating Summer Seasonal Weekend Flight Restrictions</li> <li>• 12 – Statutory Holiday Flight Training Restrictions</li> </ul>					

Table 5.14 shows the total number of movements that would have been impacted in 2020 by Proposed Noise Abatement Procedures 3, 10, 11, and 12. 12% of recorded aircraft movements would have been impacted by one or more of the above-noted Proposed Noise Abatement Procedures as applicable, or 9,184 of the 78,847 movements recorded in that year. 15% of movements attributed to the two FTUs based at the Airport would be impacted by the noted procedures, or a total of 8,528 of the 56,600 movements that occurred in this category.

Of note, the aircraft movements not impacted by the four Proposed Noise Abatement Procedures that address the days and hours of operations would continue to be covered by the remaining 10 procedures, addressing matters such as arrivals and departures, runway utilization, and traffic circuit use.

**Table 5.14 - Summarized Noise Implications, 2020 Aircraft Movements**

	Not Impacted by Hour or Day Restrictions		Impacted by Hour or Day Restrictions		Total Annual Movements
	Annual Movements	% of Annual Movements	Annual Movements	% of Annual Movements	
Non-Flight Training Movements	21,591	97%	656	3%	22,247
Flight Training Movements	48,072	85%	8,528	15%	56,600
<b>Total</b>	<b>69,663</b>	<b>88%</b>	<b>9,184</b>	<b>12%</b>	<b>78,847</b>
<p><b>Date Source:</b> 2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes</p> <p><b>Note:</b> Only movements impacted by the following Proposed Noise Abatement Procedures are counted:</p> <ul style="list-style-type: none"> <li>• 3 – Overnight Operational Restrictions</li> <li>• 10 – Friday-Monday Morning and Afternoon Flight Training Restrictions</li> <li>• 11 – Alternating Summer Seasonal Weekend Flight Restrictions</li> <li>• 12 – Statutory Holiday Flight Training Restrictions</li> </ul>					

### 5.3 Cost Implications

As part of the proposal to implement new mandatory noise abatement procedures at the Airport, cost implications of the proposed procedures have been analyzed, specifically through potential revenue impacts to Airport users. Cost implications are summarized in Table 5.15. Increases in the level of effort of administering the Proposed Noise Abatement Procedures are expected to be borne by the Airport Operator and City, potentially with corresponding cost implications. While the magnitude of these increases cannot yet be quantified, the City is pursuing the development of Proposed Noise Abatement Procedures to address a known community issue, including the cost implications that will arise with potential solutions.

**Table 5.15 - Proposed Noise Abatement Procedures, Cost Implications**

No.	Proposed Noise Abatement Procedure	Cost Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	No
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	No
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	Yes
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	No
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	No
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	No
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	No
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	No
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	Yes (Indirect)
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	Yes
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	Yes
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year’s Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	Yes
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	Yes
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	No

## Proposed Noise Abatement Procedures 1, 2, 4, 5, 6, 7, 8, and 14

The above-noted Proposed Noise Abatement Procedures operationally address runway usage, aircraft arrivals and departures, and minimum altitudes. Significant cost implications are not expected to result from aircraft operators complying with these procedures.

### Proposed Noise Abatement Procedure 3 – Overnight Restricted Hours (Excluding Airport-Based Flight Training Units)

Proposed Noise Abatement Procedure 3 will expand the overnight period of restricted operations by two hours. As shown in Table 5.16, approximately 900 movements in 2019 and 700 movements in 2020 were performed by operators other than the two FTUs based at the Airport that would have been impacted by expanding the overnight restricted operations period to 9:30 PM – 7:30 AM. Arrivals of aircraft based at the Airport are permitted to continue during the proposed restricted period; therefore, cost implications are not anticipated within this category.

**Table 5.16 - Movements During Overnight Operating Restrictions (Excluding Airport-Based Flight Training Units)**

Movements Within Proposed Restricted Hours	2019	2020
Arrival Movements	241	231
Departure Movements	351	221
Local Movements	300	204
<b>Total</b>	<b>892</b>	<b>656</b>
<b>Date Source:</b> 2019-2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes		

Of the departures and local movements in 2019 and 2020 that would be affected by the proposed restricted hours, between 56% and 63% occurred within 30 minutes of the beginning or end of the proposed restricted period (i.e., between 7:00 AM and 7:30 AM, or between 9:30 PM and 10:00 PM). The remaining movements occurred within 60 minutes of the beginning or end of the proposed restricted period. It is anticipated that aircraft operators that must depart the Airport or conduct local movements will be able to shift their flight time accordingly to comply with the proposed restricted periods, with minimal cost impacts expected.

**Table 5.17 - Movements During Overnight Operating Restrictions, Time of Flight (Excluding Airport-Based Flight Training Units)**

Departures and Local Movements Within Proposed Restricted Hours	2019	2020
1h00m – 0h30m from End of Restrictions (6:30 AM – 7:00 AM)	70	56
< 0h30m from End of Restrictions (7:00 AM – 7:30 AM)	102	71
< 0h30m from Commencement of Restrictions (9:30 PM – 10:00 PM)	260	195
0h30m – 1h00m from Commencement of Restrictions (10:00 PM – 10:30 PM)	217	98
<b>Total</b>	<b>649</b>	<b>420</b>
<b>Date Source:</b> 2019-2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes		

### **Proposed Noise Abatement Procedures 9, 10, 11, and 12 (Airport-Based Flight Training Units)**

The aggregated impacts of the proposed time of day and day of week restrictions to the two FTUs based at the Airport (used to examine the impacts of flight training-related restrictions) were estimated in Section 5.2 to affect 12,032 movements in 2019 and 8,528 movements in 2020. These values represented 19% and 12% of recorded FTU movements in the two respective years for which data was available. As stated throughout this study, a movement affected by a time of day or day of week restriction that would stop it from occurring altogether can:

- Be cancelled / removed altogether on account of the given restriction(s), representing a loss in revenue for the FTU; or
- Be shifted to an alternative day or time within which there is capacity for the flight to be performed. In this instance, the revenue from the flight continues to be realized by the FTU.

The degree to which movements will be terminated or shifted cannot reliably be estimated, as there are a number of interrelated factors affecting how such decisions are made, including fleet availability and aircraft maintenance downtimes, airport capacity, instructor and student availability, and adequate meteorological conditions, among other factors.

An estimate has been prepared to consider the worst-case financial impacts to the two FTUs based at the Airport that would result if all movements affected by Proposed Noise Abatement Procedures 3, 10, 11, and 12 were cancelled altogether. This represents a worst-case scenario whereby no shifting of movements occurs – given the availability of residual Airport capacity in non-peak days and hours, it is expected that a degree of movement shifting will occur that will reduce these financial impacts.

As shown in Table 5.18, the two FTUs based at the Airport would have cumulatively lost approximately \$779,000 in revenue in 2019 if all movements that occurred during a restricted period identified in a Proposed Noise Abatement Procedure were cancelled altogether. In 2020, lost revenues are estimated at approximately \$595,000. This estimate is subject to the following factors, in addition to the assumptions documented within the table:

- Flight durations are assumed at 1h00m as NCAMS data cannot be used to reliably determine actual durations, due to data inconsistencies. Actual flight times that exceeded the assumed value would increase the revenue impacts to the given FTU;
- Relying on recorded arrivals to approximate the number of flights that would occur may underrepresent the total number of affected flights – an aircraft that departed during the morning restricted period but that arrived in a non-restricted time, for example, would not be recorded as an affected movement. However, recording both arrivals and departures may result in the double counting of affected movements, also skewing the data. Therefore, the approach taken is deemed sufficient for preliminary estimate purposes; and
- It is assumed that flight instructors are onboard or are supervising 50% of training flights, as actual instruction data is not available to the project team to support an alternative approach.

As noted above, the availability of residual capacity during non-restricted days and hours represents an opportunity for FTUs to redistribute (shift) their activities and continue operations, thereby reducing the worst-case financial impacts estimated in Table 5.18.

**Table 5.18 - Flight Training Units - Estimated Revenue Impacts**

Aircraft Fleet	Hourly Revenue	Recorded Number of Flights During Restricted Periods		Estimated Revenue During Restricted Periods	
		2019	2020	2019	2020
Cessna 150, Cessna 152	\$140.00	674	370	\$119,635	\$65,675
Cessna 172	\$170.00	3,041	2,433	\$631,008	\$504,848
Piper PA-28R	\$190.00	57	21	\$12,968	\$4,778
Piper PA-27, Piper PA-44	\$327.00	42	55	\$15,309	\$20,048
<b>Total</b>		<b>3,814</b>	<b>2,879</b>	<b>\$778,919</b>	<b>\$595,348</b>

**Date Source:** 2019-2020 NAV CANADA Aircraft Movement Statistics, excluding 66, 70, 77, 88, 88A, 88B, and 99 movement codes

**Notes:**

- Hourly instructor revenue for dual flight instruction is estimated at \$75.00, and is applied to an assumed 50% of all training flights
- All flights are assumed to have a duration of 1h00m
- Each NCAMS record is classified as an arrival, departure, local, or overhead movement. As all flights must have a recorded arrival, the number of arrivals is used to estimate the number of flights.
- Aircraft and instructor rental rates are average values based on publicly available data from the websites of the two FTUs based at the Airport, as of August 2021.

The revenue implications for the FTUs based at the Airport from Proposed Noise Abatement Procedures 9 through 13 can also be considered in terms of the reduction of potential revenue generating hours. In the status quo model with the existing Voluntary Noise Abatement Procedures in effect, FTUs based at the Airport have 112 hours in a typical week during which revenue-generating operations can occur. Under the Proposed Noise Abatement Procedures, the number of hours during which flight training can occur decreases to 90 (-20%) between October and April, and to 66 between May and September (-41%). As both the capacity of the airfield and the training capacity of the FTUs are neared within the permitted hours of normal operations as flight training activity increases, the expanded restricted periods represent limitations on potential growth.

As shown in Table 5.19 and Table 5.20, the potential revenue that could be realized by DFC and CFA in a given hour assuming full utilization of their respective fleets ranges between approximately \$2,100 and \$3,400 without flight instruction, and approximately \$3,000 and \$4,800 with flight instruction. While FTUs typically do not operate at near perfect levels of fleet utilization, these statistics are intended to demonstrate the tangible financial considerations associated with reducing the number of potential revenue-generating hours that a FTU can take advantage of to support its business.

**Table 5.19 - Maximum Potential Revenues per Hour, Durham Flight Centre**

Fleet	Hourly Revenue	Fleet Size	Potential Revenue, Without Flight Instruction	Potential Revenue, With Flight Instruction
Cessna 150/152	\$135	3	\$405	\$600
Cessna 172	\$155	6	\$930	\$1,320
Piper Arrow	\$190	1	\$190	\$255
Piper Aztec	\$324	2	\$648	\$778
Instructor	\$65	-	-	-
<b>Total Potential Revenue, One-Hour Period</b>			<b>\$2,173</b>	<b>\$2,953</b>

**Table 5.20 - Maximum Potential Revenues per Hour, Canadian Flight Academy**

Fleet	Hourly Revenue	Fleet Size	Potential Revenue, Without Flight Instruction	Potential Revenue, With Flight Instruction
Cessna 152	\$145	2	\$290	\$460
Cessna 172	\$185	13	\$2,405	\$3,510
Piper Seminole	\$330	2	\$660	\$830
Instructor	\$85	-	-	-
<b>Total Potential Revenue per Hour</b>			<b>\$3,355</b>	<b>\$4,800</b>

**Proposed Noise Abatement Procedure 13 – Circuit Flight Training Restrictions (Airport-Based Flight Training Units)**

The circuit training restriction of four aircraft at a given time will also influence the manner in which both FTUs based at the Airport conduct their operations. Based on the previously identified estimates in Section 5.2, approximately 12,500 circuit flight training lessons could be conducted annually, or approximately 125,000 local movements annually. Using FTU arrivals identified in the 2019 and 2020 NCAMS as a proxy for the total number of training flights, the two FTUs jointly completed approximately 20,000 training flights in 2019 and approximately 18,000 flights in 2020 – these totals also include training flights out of the traffic circuit in the practice area, cross-country flights between airports, and private rentals of FTU-registered aircraft that do not count as flight training.

Therefore, on the basis of annual movements, the traffic circuit capacity limit is not expected to result in revenue impacts to the two FTUs based at the Airport.

Notwithstanding the foregoing, it is recognized that demand for the traffic circuit can have peak periods during which the proposed capacity is reached. In these instances, flight training movements may either be cancelled, representing a revenue loss to the FTU; shifted to an alternative time with no revenue loss; or flown to another airport to complete the training with no revenue loss. In the third scenario, a cost will be borne by the student paying for the additional transit time to and from the alternative airport from Oshawa.



Using an example of a student and their instructor intending to complete a circuit training flight at the Airport but the circuit being full based on the Proposed Noise Abatement Procedure, Toronto / Buttonville Airport or Kawartha Lakes Airport could be used for such training, as further described in the Aviation System analysis. Using Buttonville or Kawartha Lakes would increase the cost incurred by the student by approximately \$100 to \$140, respectively. If students are repeatedly unable to complete their required training in a time and cost-effective manner at Oshawa Executive Airport, they may choose to seek out an FTU elsewhere in the region, thereby reducing revenues for the two FTUs based at the Airport.

**Table 5.21 - Hypothetical Flight Training Transit Time Costs**

	Oshawa	Buttonville	Kawartha Lakes
Lesson Time	60 min.	60 min.	60 min.
Transit Time	-	25 min.	35 min.
Total Billable Time	60 min.	85 min.	95 min.
<b>Total Lesson Cost</b>	<b>\$245</b>	<b>\$347</b>	<b>\$388</b>
Notes:			
<ul style="list-style-type: none"> <li>• Transit time includes the flight to and from Peterborough or Kawartha Lakes, assuming a 95 kt cruise speed</li> <li>• Lesson costs are calculated based on an assumed Cessna 172 hourly cost of \$170 and instructor hourly cost of \$75</li> </ul>			

## 5.4 Aircraft Emission Implications

The implications of the Proposed Noise Abatement Procedures with respect to aircraft emissions are summarized in Table 5.22 and reviewed below. Relevant background information on past air quality studies commissioned by the City of Oshawa is also provided to contextualize the analysis provided herein.

**Table 5.22 - Proposed Noise Abatement Procedures, Aircraft Emission Implications**

No.	Proposed Noise Abatement Procedure	Emission Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	Yes
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	Yes
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	Yes
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	No
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	No
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	No
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	No
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	No
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	Yes (Indirect)
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	Yes
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	Yes
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	Yes
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	Yes
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	No

## Background – Air Quality Studies

The City of Oshawa has completed air quality studies in 2015, 2019, and 2020 (first of two phases). The 2020 air quality study was reviewed by HM Aero<sup>7</sup>. Four high-volume air sampling monitoring units were installed near each runway threshold, with data collection occurring between July 4, 2019 and September 22, 2019. The report notes that the chosen locations were expected to have the greatest concentration of aircraft related pollutants. Key findings are as follows:

- The study did not identify any exceedances of the Ontario Ambient Air Quality Criteria, and the report notes that the monitoring showed very low levels of all pollutants. Significant differences between the four stations (i.e., four runways) were not identified, suggesting that the greatest impact on air quality was the ambient background levels / concentrations;
- With respect to Nitrogen Dioxide, the average of all measurements taken at the Airport (2.5 µg/m<sup>3</sup>) was less than the annual average recorded at Durham College (12.5 µg/m<sup>3</sup>);
- For Sulfur Dioxide, the average of all measurements taken at the Airport (2.0 µg/m<sup>3</sup>) was less than the provincial average (3.1 µg/m<sup>3</sup>);
- The average concentration of airborne lead (0.011 µg/m<sup>3</sup>) was noted to be less than the 2001 measurement by the Ministry of the Environment, Conservation and Parks, although more recent data was not noted to be available for comparison; and
- For concentrations of suspended particulates, average and maximum concentrations were compared to 2016 data from comparator sites in west Toronto and the Simcoe Experimental Farm. The 2019 average and maximum of all measurements taken at the Airport were noted to be less than those of the comparator sites.

At the time of this report's preparation in August 2021, the second phase of the 2020 air quality assessment was underway. Five air quality monitoring units have been installed in parks and residential areas near the Airport, namely at Bermuda Park, Deer Valley Park, Marigold Avenue, Somerville Street, and Woodlea Crescent. The 2021 air quality study is anticipated to result in more detailed findings of air quality in the community through the use of monitoring units in residential areas and parks, as opposed to on the Airport property.

### Proposed Noise Abatement Procedure 1 – Tower Closed Preferential Runways

The recommended use of Runway 12 for overnight arrivals and Runway 30 for overnight departures is not anticipated to change the number of aircraft movements that will occur at the Airport, and therefore not result in a net change in aircraft emissions. The flightpaths favoured in this Proposed Noise Abatement Procedure are primarily over areas with lower population densities and may result in a minor improvement in the level of potential aircraft emission exposure to residential dwellings situated to the south, west, and east of the Airport. However, given the infrequency of overnight operations because of the existing and proposed nighttime restricted periods, emission impacts are expected to be negligible.

### Proposed Noise Abatement Procedure 2 – Tower Open Preferential Runways

The utilization criteria identified in Proposed Noise Abatement Procedure 2 are anticipated to result in the increased use of Runway 30, with departures to the northwest, arrivals from the southeast, and the traffic circuit to the northeast of the Airport. The Runway 30 departure path and right-hand crosswind leg are located over less densely populated areas of Oshawa and Whitby – accordingly, the intention is to decrease the prevalence of aircraft operating at high power settings over extensive residential areas.

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<sup>7</sup> RWDI Consulting Engineers and Scientists. (2020, October 28). Oshawa Executive Airport Air Quality Monitoring, Oshawa, Ontario – Ambient Monitoring (RWDI #1903663).

Based on a windrose analysis, implementing the Proposed Noise Abatement Procedure would increase the hours during which Runway 30 can be designated as the preferred runway by 1,597, and would increase the proportional preferred utilization of Runway 30 from 44% to 70%. The utilization of Runways 12, 05, and 23 would also decrease, reducing emissions over residences affected by operations on these runways. This Proposed Noise Abatement Procedure would not change the number of aircraft movements that occur at the Airport nor their duration – therefore, while net emission levels would likely remain constant, the distribution of these emissions would be felt on an increased basis over sparsely populated areas northwest of the Airport.

### **Proposed Noise Abatement Procedure 3 – Overnight Restricted Hours**

As noted in Section 5.2, modifying the overnight hours at the Airport from 10:30 PM to 9:30 PM, and from 6:30 AM to 7:30 AM, will result in a two-hour increase in the overnight period of restricted operations. In 2019 and 2020, it was found that 2,618 and 1,266 annual aircraft movements, respectively, occurred during this two-hour period. Emission reductions will be realized where a flight that would have otherwise occurred during this period does not do so on account of the proposed restriction – however, it is anticipated that a proportion of movements may be shifted to non-restricted hours of the day. Accordingly, aircraft emission implications are expected to be limited.

### **Proposed Noise Abatement Procedures 9, 10, 11, 12, and 13**

The five Proposed Noise Abatement Procedures noted above address various controls on flight training activities at the Airport, including both the days and hours during which such training can occur. As described in Section 5.2, between 8,528 and 12,032 flight training movements would have been impacted in 2019 and 2020 by the implementation of overnight operational restrictions, time of day limits, summer seasonal weekend restrictions, and statutory holidays. Further impacts are anticipated as a result of a limit being instituted on the number of aircraft in the traffic circuit at a given time. The degree to which affected flight training movements will be removed, shifted to an unrestricted day or hour, or moved to another airport in the area cannot definitively be estimated; however, the potential reduction in flight training activity would result in lower aircraft emission levels in the region. As noted previously, air quality in the area is currently found to meet or exceed applicable standards and guidelines.

### **Proposed Noise Abatement Procedures 4, 5, 6, 7, 8, and 14**

Minimal reductions in aircraft emissions are anticipated with the proposed restriction of overnight engine maintenance run-ups. As maintenance run-ups are non-discretionary in nature, it is anticipated that this activity would shift to daytime hours. The arrival and departure procedures specified in Proposed Noise Abatement Procedures 5 through 8 are similarly anticipated to have negligible impacts on aircraft emissions. Similarly, the minimum overflight altitude of the Toronto Zoo is expected to have minimal aircraft emission implications.

## 5.5 Airport Capacity Implications

Airport capacity is the theoretical and / or practical number of aircraft movements that can occur during a specified timeframe – typically, capacity is analyzed on a peak hour, peak day, and annual basis. The capacity implications of the Proposed Noise Abatement Procedures are described herein.

**Table 5.23 - Proposed Noise Abatement Procedures, Airport Capacity Implications**

No.	Proposed Noise Abatement Procedure	Capacity Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	No
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	No
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	Yes
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	No
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	No
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	No
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	No
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	No
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	No
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	No
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	No
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	No
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	No
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	No

## Background – Airport Capacity

To understand the impacts of the proposed procedures and restrictions, the project team utilized the Prototype Airfield Capacity Model to estimate the capacity of the Airport’s runway system. The Prototype Airfield Capacity Model was developed by the U.S. Airport Cooperative Research Program and serves as a spreadsheet-based desktop modelling tool to assist in the preparation of high-level capacity estimates. Airfield capacity is the estimated number of aircraft movements that can be facilitated in a given period of time, based on an underlying set of assumptions such as fleet mix, separation minima, weather conditions and technological aides. As shown in Table 5.24, the hourly aircraft movement capacity of the Airport in Visual Meteorological Conditions is estimated at 57 movements, including touch-and-go’s.

**Table 5.24 - Hourly Airfield Capacity Estimate (Single Runway Operations, VMC)**

Capacity	Movements per Hour
Arrivals Capacity Including Touch-and-Go’s	27
Mixed Operations Departures Capacity Including Touch-and-Go’s	30
<b>Total Mixed Operations Capacity</b>	<b>57</b>

### Proposed Noise Abatement Procedures 1 and 2

The preferential use of Runway 12 for arrivals and Runway 30 for departures will impact the utilization of individual runways but is not expected to impact the total capacity of the airfield system.

### Proposed Noise Abatement Procedure 3 – Overnight Restricted Hours

Reducing the operating hours of the airport will reduce the overall capacity of the airfield system. As noted in Section 5.2, changing the overnight hours at the Airport from 10:30 PM to 9:30 PM, and from 6:30 AM to 7:30 PM, will result in a two-hour increase in the overnight period of restricted operations. Using the estimated mixed operations capacity of 57 movements per hour, this change would result in a daily decrease in capacity of 114 movements. Under the current restrictions, assuming 57 movements per hour, 16 hours of operations per day, and 365 operational days per year, the absolute (or maximum throughput) capacity of the airfield is approximately 333,000 annual movements. With the implementation of the proposed restrictions, the daily hours of operation would decrease to 14, resulting in the absolute capacity being reduced to approximately 291,000 annual movements. Practical capacity is the highest realistic throughput that an airport can maintain over the long-term, considering factors such as inclement weather and operational disruptions. When a practical capacity factor of 0.85 is applied, the resulting annual capacities are estimated at 283,000 movements and 248,000 movements respectively. For comparison, the Airport recorded 86,615 movements in 2019.

### Proposed Noise Abatement Procedures 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14

Proposed Noise Abatement Procedures 4 to 14 are not anticipated to result in changes to the absolute or practical annual airfield capacity of the Airport. It is noted that the impacts experienced in flight training operations as a result of Proposed Noise Abatement Procedures 10 to 13 may result in the net reduction of flight training movements at the Airport, thereby reducing the degree to which the Airport’s annual capacity is utilized. Conversely, the redistribution of flight training movements from restricted periods to non-restricted periods may result in increased instances where the hourly airfield capacity is approached or met, as traffic is concentrated in fewer hours of the day.

## 5.6 Implementation Implications

Each of the Proposed Noise Abatement Procedures will have implications in terms of their implementation and long-term monitoring and enforcement. The City has committed to operating the Airport as a “Good Community Neighbour” and recognizes that improvements are required in the balance between aircraft operations and resident concerns. The future endorsement of the Proposed Noise Abatement Procedures by City Council (with or without revisions) will underscore the City’s commitment to future implementation and enforcement. The preliminary implementation process is anticipated to include<sup>8</sup>:

1. Completion of stakeholder consultations pursuant to the AC 302-002 process;
3. Presentation of stakeholder findings and endorsement of the Proposed Noise Abatement Procedures by City Council;
4. Submission of the Proposed Noise Abatement Procedures to Transport Canada for review and, if deemed satisfactory, approval pursuant to CAR 602.105;
5. Distribution of advance notice to all Airport tenants and common aircraft operators;
6. Updating of all NAV CANADA aeronautical materials within the next 56-day publication cycle (i.e., Canada Air Pilot, Canada Flight Supplement), NAV CANADA air traffic control procedures (Section 5.8), and Airport manuals and procedures;
7. The development of internal (City and Airport Operator) procedures to support monitoring and the identification of potential noncompliance; and
8. Long-term monitoring by the Airport Operator and the City of the efficacy of the implemented noise abatement procedures, collection of noise complaints, and enforcement by the City, the Airport Operator, and Transport Canada.

Within the aviation community, compliance with the CARs and procedures enacted pursuant thereto is largely achieved on a voluntary and self-initiated basis. From consultations with the Airport Operator, adherence to the existing Voluntary Noise Abatement Procedures is understood to be widespread – in the future, it is anticipated that aircraft operators will achieve similar or greater levels of compliance to the Proposed Noise Abatement Procedures. In instances where voluntary compliance does not occur, enforcement action can be taken to ensure the desired outcomes of the given procedure are realized.

Compliance with the Proposed Noise Abatement Procedures, when implemented, will be enforceable pursuant to the authority of CAR 602.105. The City, through its contracted Airport Operator, will be responsible for monitoring and identifying instances of potential noncompliance. Alleged instances of noncompliance will be reported to Transport Canada for investigation and action pursuant to their aviation enforcement policy, which is noted by the agency to balance both fairness and firmness.

Penalties for violating noise abatement procedures enacted pursuant to CAR 602.105 can be as high as \$5,000 for an individual and \$25,000 for a company.

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<sup>8</sup> The implementation process may be revised by the City and the Airport Operator in the future based on feedback received from Transport Canada and NAV CANADA. The order of the steps described above may also be revised.

**Table 5.25 - Proposed Noise Abatement Procedures, Implementation Implications**

No.	Proposed Noise Abatement Procedure	Implementation Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	Yes
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	Yes
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	Yes
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	Yes
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	Yes
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	Yes
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	Yes
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	Yes
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	Yes
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	Yes
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	Yes
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	Yes
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	Yes
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	Yes



## 5.7 Aviation System Implications

The Proposed Noise Abatement Procedures were developed while considering potential implications for other airports that are part of the same aviation system as Oshawa Executive Airport. These facilities include, but are not limited to:

- **Toronto Pearson International Airport:** Toronto Pearson is located 65 km west of Oshawa and functions as the region's primary commercial passenger and cargo facility. General aviation and business aviation operations also occur at Toronto Pearson, although such users require prior approval to optimize the use of the facility's capacity. Noise abatement procedures have been enacted pursuant to CAR 602.105, including overnight restricted hours of between 12:30 AM and 6:30 AM.
- **Billy Bishop Toronto City Airport:** Toronto City Airport is located 50 km southwest supports regional commercial passenger services, general aviation, and business aviation. Operations by aircraft with more demanding takeoff and landing performance characteristics can be limited by the facility's comparatively short runways. Noise abatement procedures have been enacted pursuant to CAR 602.105, which include limiting arrivals and departures overnight and prohibiting all jet and certain propeller aircraft.
- **Toronto Buttonville Municipal Airport:** Toronto Buttonville is located 40 km west of the Airport and primarily supports flight training, general aviation, and business aviation. The facility is 100% privately owned by Cadillac Fairview and is operated by Torontair Ltd. Noise abatement procedures are in effect pursuant to CAR 602.105, and flights are prohibited after 12:00 AM unless approved by the airport manager. The long-term future of Toronto Buttonville is uncertain; in 2011, development plans were submitted for a mixed-use residential, commercial, and employment redevelopment project that was subsequently appealed, although these plans were withdrawn in 2020. As of early 2020, Cadillac Fairview indicated that Buttonville would continue to operate until at least the spring of 2023.
- **Peterborough Municipal Airport:** Peterborough Airport is located 55 km east of Oshawa and supports a mix of general aviation, business aviation, flight training, and aviation industrial users. While procedures have been enacted to minimize overflights of noise sensitive areas, overnight operations are not subject to curfews or restrictions.
- **Kawartha Lakes Municipal Airport:** Kawartha Lakes Airport is located 50 km north of Oshawa and primarily supports general aviation users and flight training. No restrictions are currently imposed on overnight operations.

Several other aerodromes with varying levels of infrastructure (e.g., paved and grass runways) and service levels are also located throughout the region, which form part of the aviation system for general aviation users. It is noted that the long-term future of Toronto Buttonville Airport is uncertain, with the potential closure and redevelopment of the facility reported in several sources at an indeterminate time in the future. The closure of Toronto Buttonville, in combination with the implementation of the Proposed Noise Abatement Procedures at Oshawa Executive Airport, may result in further impacts to the aviation system as general aviation, business aviation, and flight training activity is distributed throughout the region.

**Table 5.26 - Proposed Noise Abatement Procedures, Aviation System Implications**

No.	Proposed Noise Abatement Procedure	System Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	No
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	No
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	Yes
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	No
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	No
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	No
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	No
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	No
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	No
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	Yes
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	Yes
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	Yes
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	Yes
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	No

**Proposed Noise Abatement Procedures 1, 2, 4, 5, 6, 7, 8, 9, and 14**

The above-noted Proposed Noise Abatement Procedures primarily address the way aircraft operations occur at the Airport, including preferential runway usage, arrival procedures, departure procedures, and overflight altitudes. These procedures do not implement usage restrictions and accordingly are not expected to serve as significant forces that will displace aircraft operations from Oshawa Executive Airport to other facilities in the surrounding aviation system. While Proposed Noise Abatement Procedure 4 will restrict overnight engine run-ups associated with maintenance, this is not anticipated to be a significant factor that would shift aircraft maintenance operations to other airports.

### Proposed Noise Abatement Procedure 3 – Overnight Restricted Hours

As noted in Section 5.2, 2,618 aircraft movements occurred during the additional two-hour period of overnight operational restrictions in 2019. In 2020, 1,285 movements were recorded during these hours. It is recognized that a proportion of these movements may be flexible in their arrival or departure times and shift their schedules accordingly, while another proportion may choose not to operate their flight altogether – both possibilities result in no impacts to the aviation system. For aircraft operations during the proposed restricted period of 9:30 PM to 7:30 AM that cannot be rescheduled or cancelled, the following impacts to other airports in the aviation system may result:

1. Non-exempt aircraft that have a firm requirement to depart between 9:30 PM and 7:30 AM will need to originate their flight from an alternative airport. Depending on the aircraft type and the time of departure, these movements may originate from Toronto Pearson (subject to approval between 12:30 AM and 6:30 AM), Toronto City Airport (if before 11:00 PM), Toronto Buttonville (if before 12:00 AM), Peterborough (unrestricted), or Kawartha Lakes (unrestricted). Aircraft movements in this category may increase activity at other airports in the aviation system. It is noted that the fee environment of Toronto Pearson will likely limit the displacement of traffic to this facility to corporate and charter aircraft operators.
2. Non-exempt aircraft that are not based at the Airport that have a firm requirement to arrive between 9:30 PM and 7:30 AM may choose to use the same airports as noted above in 1., subject to the described restrictions, thereby increasing activity at other airports in the aviation system. Aircraft based at the Airport may continue to return during the restricted hours, negating impacts to the aviation system.
3. On days with no flight training restrictions (Tuesday – Thursday), the exemption for returning aircraft based at the Airport will enable pilots to depart Oshawa before 9:30 PM and train at other airports in the regional system, such as Peterborough and Kawartha Lakes before returning unrestricted. While the additional flight time to and from these airports (approximately 15 minutes each way) would increase aircraft rental and instructor costs, the use of other airports in the aviation system without overnight restrictions represents a partial solution to the business impacts that are expected to be experienced by FTUs as documented in Section 5.3.

Summarized, the expanded overnight restricted period may result in a modest increase in late evening / early morning activity at other airports in the surrounding aviation system.

**Table 5.27 - Aviation System Overnight Restrictions**

Airport	Overnight Restrictions	Exemptions
Oshawa Executive Airport	Existing: 10:30 PM – 6:30 AM Proposed: 9:30 PM – 7:30 AM	<ul style="list-style-type: none"> <li>• Police</li> <li>• Air ambulances</li> <li>• Industrial emergencies</li> <li>• Returning based aircraft</li> </ul>
Toronto Pearson International Airport	12:30 AM – 6:30 AM (dependent on aircraft noise certification)	<ul style="list-style-type: none"> <li>• Permission required to operate during overnight restricted hours</li> </ul>
Billy Bishop Toronto City Airport	11:00 PM – 6:45 AM	<ul style="list-style-type: none"> <li>• Air ambulances</li> <li>• Emergencies</li> </ul>
Toronto Buttonville Municipal Airport	After 12:00 AM	<ul style="list-style-type: none"> <li>• Approval required from Airport Manager</li> </ul>
Peterborough Municipal Airport	Unrestricted	
Kawartha Lakes Municipal Airport	Unrestricted	

## **Proposed Noise Abatement Procedures 10, 11, and 12**

Proposed Noise Abatement Procedures 10, 11, and 12 are intended to implement a series of time-of-day and day-of-year restrictions, during which no movements for the purposes of flight training will be accommodated. These procedures address local movements by FTUs, as well as arrivals and departures to other airports by flight training aircraft – in essence, all flight training activities would be restricted during the periods described by these three procedures.

Unlike Proposed Noise Abatement Procedure 2 that allows aircraft based at the Airport to return during overnight restricted hours, the three noted procedures institute hard limits on flight training activity and do not contemplate an exemption for returning aircraft. Accordingly, instances where flight training aircraft depart the Airport to train at another facility and return on the same day are not anticipated as a result of these procedures. The primary impact to the aviation system would be if FTUs based at the Airport choose to operate satellite facilities at other airports (e.g., Peterborough, Kawartha Lakes) to enable continued operations during evenings on Fridays to Mondays, the alternating summer weekend restricted days, and on statutory holidays. The capacities of the airports identified within the regional aviation system have not been reviewed for the degree to which they may be able to handle excess demand from Oshawa – however, past experience by HM Aero and consultations with the Airport Operator suggests that residual capacity may exist in Peterborough and Kawartha Lakes.

## **Proposed Noise Abatement Procedure 13 – Circuit Flight Training Restrictions**

Circuit training is an integral component of Transport Canada’s licensing and training requirements and is also an important part of maintaining pilot proficiency. The limit of four flight training aircraft in the circuit stipulated in Proposed Noise Abatement Procedure 13 will likely result in demand exceeding the stipulated maximum during peak periods. For demand for circuit training that is not reallocated to non-peak hours and days, it is anticipated that FTUs may direct their aircraft to fly to other suitable airports in the aviation system to complete their circuit requirements. Peterborough Municipal Airport may receive a proportion of this displaced capacity, although high-volume flight training currently occurs at this facility and noise abatement procedures have been enacted as a result of concerns from aircraft circuit noise. Based on its proximity to the Airport and the lower volumes of traffic at the site, Kawartha Lakes Municipal Airport may become a preferred location for the absorption of surplus circuit training activity from Oshawa.

## 5.8 Air Traffic Management Implications

NAV CANADA is the private not-for-profit corporation responsible for Canada's air navigation system. NAV CANADA operates an Air Traffic Control Tower 365 days per year from 6:30 AM to 10:30 PM; during unstaffed hours, the Airport is a Mandatory Frequency area. If approved by Transport Canada, the Proposed Noise Abatement Procedures will be published in the Canada Flight Supplement and Canada Air Pilot for review by aircraft operators. When adopted, NAV CANADA's Air Traffic Controllers will issue instructions and clearances in accordance with the Proposed Noise Abatement Procedures. However, NAV CANADA will not be responsible for enforcing compliance. NAV CANADA was consulted during the development of the Proposed Noise Abatement Procedures.

**Table 5.28 - Proposed Noise Abatement Procedures, Air Traffic Management Implications**

No.	Proposed Noise Abatement Procedure	Air Traffic Management Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	No
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	Yes
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	Yes
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	No
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	Yes
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	No
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	Yes
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	Yes
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	No
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	No
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	No
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	No
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	No

No.	Proposed Noise Abatement Procedure	Air Traffic Management Implications?
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	No

### Proposed Noise Abatement Procedure 2 – Tower Open Preferential Runways

The runway utilization criteria outlined in this Proposed Noise Abatement Procedure would require updates to NAV CANADA’s internal Standard Operating Procedures for air traffic control services specific to Oshawa Executive Airport. As identified in Sections 5.9 and 5.10, instances where aircraft cannot safely accept a clearance for Runway 30 may result in short-term air traffic management challenges as Air Traffic Controllers reaccommodate these aircraft on an alternate runway (Runway 12, 05, or 23).

### Proposed Noise Abatement Procedure 3 – Overnight Restricted Hours

As noted previously, the hours of operation for the NAV CANADA Air Traffic Control Tower currently align with the overnight restricted period (10:30 PM to 6:30 AM) described in the Voluntary Noise Abatement Procedures. Expanding the overnight restricted period to 9:30 PM to 7:30 AM will result in a significant decrease in Airport activity during these periods. This reduction in aircraft activity may result in NAV CANADA reducing the Oshawa Tower hours of operation to align with the overnight restricted period as proposed (9:30 PM to 7:30 AM). The hours of operation for other NAV CANADA services at the Airport, such as the Automatic Terminal Information Service and VHF Direction Finder services, would also be expected to be adjusted accordingly.

### Proposed Noise Abatement Procedures 5, 7, and 8

The above-noted Proposed Noise Abatement Procedures may require integration in the clearances and instructions given to aircraft operating at the Airport. Accordingly, changes to NAV CANADA’s Standard Operating Procedures at the Airport may be required.

### Proposed Noise Abatement Procedures 1, 4, 6, 9, 10, 11, 12, 13, and 14

The balance of the Proposed Noise Abatement Procedures are not expected to require changes to NAV CANADA’s air traffic management procedures at the Airport. Overnight preferential runways and maintenance engine runup restrictions (Proposed Noise Abatement Procedures 1 and 4) address periods during which the Air Traffic Control tower is unstaffed. Proposed Noise Abatement Procedure 6 addresses pilot technique and is not typically included in a clearance to land. The remaining five procedures addressing flight training operations are the responsibility of the Airport Operator to administer, although it is recognized that a degree of implementation planning and cooperation may be required between the Airport Operator and NAV CANADA, especially with the limit of four aircraft in the circuit for training purposes.

## 5.9 Safety Implications

Safety is of paramount importance and underscores all aspects of the Airport's operation. This includes safety for pilots and aircraft operators, individuals at the Airport, and the surrounding population. As a Transport Canada-certified facility, the Airport is required to maintain a Safety Management System, Emergency Response Plan, and various other procedures that address its safe operation. The Proposed Noise Abatement Procedures have been developed considering aviation safety, with implications described as follows – as noted by ICAO in its Balanced Approach to Aircraft Noise Management, procedures must give priority to safety considerations.

**Table 5.29 - Proposed Noise Abatement Procedures, Safety Implications**

No.	Proposed Noise Abatement Procedure	Safety Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	No
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	Yes
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	No
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	No
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	No
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	No
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	No
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	No
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	No
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	No
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	No
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	No
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	No
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	No

## **Proposed Noise Abatement Procedure 1 – Tower Closed Preferential Runways**

The overnight preferential usage of Runway 12 for arrivals and Runway 30 for departures described in Proposed Noise Abatement Procedure 1 is not anticipated to have a negative impact on aviation safety. Runway 12-30 is noted to be preferential from a runway length perspective (4,250 ft.) compared to Runway 05-23 (2,654 ft.). Further, despite the preferential assignment described in the Proposed Noise Abatement Procedure, pilots will continue to be able to select their arrival or departure runway based on their fulsome analysis of aviation safety considerations, including wind speed and direction, their overall pilot skill level, and meteorological conditions.

## **Proposed Noise Abatement Procedure 2 – Tower Open Preferential Runways**

Proposed Noise Abatement Procedure 2 will increase the maximum 90° crosswind from 5 kts to 10 kts for Runway 30 operations before a different (wind-aligned) runway would be assigned by NAV CANADA. Landings and take-offs in crosswind conditions require the use of different pilot techniques and control inputs compared to instances where the prevailing winds are aligned with the runway centreline and necessitate additional attention to minimize the effects of lateral drift. Maintaining alignment with the runway centreline in crosswind conditions can be further challenged when the runway surface is contaminated with water or snow, for example.

Training in crosswind conditions is a standard component of Transport Canada’s licensing requirements at all levels, including the Private Pilots License. Transport Canada’s TP 13723 Flight Test Guide - Private Pilot Licence - Aeroplane (6<sup>th</sup> Edition) includes several requirements for pilots to demonstrate their ability to handle crosswind landing conditions, including slipping, take-offs, and landings. Recurrent practice in crosswind conditions is also an important factor in maintaining pilot proficiency. While new pilots that are beginning their initial flight training will have the least experience with operating in crosswind conditions, training in such conditions will be conducted under the supervision of a Certified Flight Instructor, during which time proper techniques will be developed. Additionally, pilots that are unable to safely operate in 10 kt crosswind conditions may choose to decline a clearance for the use of Runway 30 in favour of an alternative runway. As noted in Section 5.10, the 10 kt 90° crosswind limit is also within the maximum demonstrated crosswind limit of general aviation aircraft that represent typical users of the facility.

Proposed Noise Abatement Procedure 2 also considers the implementation of a maximum tailwind component of 5 kts for Runway 30, to further increase its operational usage. Tailwind conditions can result in changes to aircraft performance and necessitate accompanying modifications to pilot technique – most notably through longer takeoff distances, higher groundspeeds at touchdown and longer landing distances, and the need to correct for wind conditions on the final approach leg. It is noted that the NAV CANADA Manual of Air Traffic Services enables the designation of a “calm wind runway” for noise abatement purposes in tailwinds of less than 5 kts including gusts, assuming dry runway conditions. While tailwinds up to a light breeze will result in variations in aircraft performance and accompanying pilot technique modifications:

- The 5 kt limit will include both prevailing winds and gust conditions per the NAV CANADA Manual of Air Traffic Services;
- The takeoff and landing distance available for Runway 30 (4,250 ft. from the threshold or 4,000 ft. from the intersection with Taxiway B) should be sufficient from an aircraft performance perspective for representative general aviation aircraft (Section 5.10);
- Tailwind operations will only be used during dry runway conditions, per the NAV CANADA Manual of Air Traffic Services, to limit other performance degrading factors; and
- Aircraft operators will continue to have the ability to decline a clearance for Runway 30 if the safety of their intended action cannot be assured.



Based on the foregoing, while the crosswind and tailwind limits of Proposed Noise Abatement Procedure 2 will impact aircraft performance and pilot technique and have associated safety implications, the risk posed is anticipated to be acceptable based on consultations with NAV CANADA, the Airport Operator, and the flying experience of the project team.

### **Proposed Noise Abatement Procedures 3, 4, 9, 10, 11, 12, and 13**

These seven noted Proposed Noise Abatement Procedures limit the Airport's hours of operations and / or activities that can occur at the facility (e.g., engine run-ups, flight training). These procedures do not change the manner in which flight operations will occur, and as such are not anticipated to result in direct aviation safety implications.

### **Proposed Noise Abatement Procedures 5, 6, 7, and 8**

The four Proposed Noise Abatement Procedures stipulate arrival and departure procedures and the manner in which flight operations occur. Procedure 5 requires arriving aircraft to remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach – while a standard altitude is not prescribed by Transport Canada for the base to final approach turn, the 540 ft. AGL height proposed is consistent with the descent profile of typical aircraft operations in a 1,000 ft. AGL traffic circuit. The proposed minimum height will also limit low-level turns near the Airport. Safety concerns with this existing procedure have not been reported by the Airport Operator, and no significant safety implications are anticipated.

The assumed 3° glide slope of Proposed Noise Abatement Procedure 6 is intended to ensure sufficient separation between aircraft and obstacles while on final approach and is typical of both standard Instrument Approach Procedures and the Instrument Approach Procedures of Oshawa Executive Airport. Safety concerns with this existing procedure have not been reported by the Airport Operator, and no significant safety implications are anticipated.

The proposed minimum altitude requirement for circling procedures (1,000 ft. AGL) is consistent with the altitude used by aircraft in the Airport's existing traffic circuits. Like the preceding procedures, existing safety concerns have not been identified by the Airport Operator, nor are significant safety implications anticipated.

Proposed Noise Abatement Procedure 7 stipulates that aircraft departing the Airport will maintain runway heading to an altitude of 540 ft. AGL before making their crosswind or departure turn. As with Proposed Noise Abatement Procedure 5, this is consistent with operations in a typical traffic circuit and will limit low-level turns. Accordingly, no significant safety implications are anticipated.

### **Proposed Noise Abatement Procedure 14 – Toronto Zoo**

Proposed Noise Abatement Procedure 14 is an existing voluntary procedure that stipulates a minimum overflight height for the Toronto Zoo. No aviation safety implications are anticipated, and this procedure is consistent with other requirements for obstacle clearances and overflights of built-up areas.

## 5.10 Fleet Implications

The Airport is currently used by a wide range of aircraft types; the predominant user group is currently single-engine and twin-engine flight training and general aviation aircraft. Based on 2020 NCAMS data, 90% of all movements were comprised of the following aircraft types: Cessna 150, 152, 172, 182, and 185; Piper PA-27 and PA-28; Cirrus SR-22; and Diamond DA-40. Other common aircraft fleets include small and medium business jets (e.g., Dassault Falcon 10, Cessna Citation), single and twin-engine turboprop aircraft (e.g., Pilatus PC-12, Beechcraft King Air), and larger users such as the Basler BT-67. The Proposed Noise Abatement Procedures must be assessed for implications to the aircraft fleets that use the Airport.

**Table 5.30 - Proposed Noise Abatement Procedures, Fleet Implications**

No.	Proposed Noise Abatement Procedure	Fleet Implications?
1	<b>Tower Closed Preferential Runways:</b> When the Air Traffic Control Tower is closed, pilots shall use Runway 12 for arrivals and Runway 30 for departures consistent with safety of operations.	No
2	<b>Tower Open Preferential Runways:</b> Aircraft will use Runway 30 when the winds are from a heading of 210° (incrementally) to 030° at up to 10 kts (18.52 km/h) or from a heading of 031° (incrementally) to 209° at up to 5 kts (9.26 km/h).	Yes
3	<b>Overnight Restricted Hours:</b> Between the hours of 9:30 PM and 7:30 AM, only police, medical and industrial emergency flights are permitted to arrive at and depart from the Airport. Airport tenants with aircraft based at the Airport are permitted to arrive between the hours described above between the hours above, but are not permitted to take off, independent from police, medical, and industrial emergency flights.	No
4	<b>Overnight Engine Run-Ups:</b> Engine run-ups associated with aircraft maintenance are prohibited from 9:30 PM to 7:30 AM.	No
5	<b>Arrival Turns:</b> Aircraft arriving at the Airport will remain at least 1,000 ft. ASL (540 ft. AGL) before making the turn for their final approach for landing.	No
6	<b>Approach Angle:</b> Approaches are to remain on or above an assumed 3° glide slope.	No
7	<b>Circling Procedures:</b> If weather conditions permit, circling procedures are to be conducted at 1,460 ft. ASL (1,000 ft. AGL).	No
8	<b>Departure Turns:</b> Aircraft departing the Airport will continue to fly on the runway heading until they reach 1,000 ft. ASL (540 ft. AGL) before making any turns.	No
9	<b>Prior Permission for Flight Training:</b> Prior permission by the Airport Manager is required for all flight training, including initial and recurrent training.	No
10	<b>Time of Day Flight Training Restrictions:</b> Flight training is not permitted Friday-Monday before 8:00 AM and after 4:00 PM May 1 – September 30; and Friday-Monday before 8:00 AM and after 8:00 PM October 1 – April 30.	No
11	<b>Alternating Seasonal Weekend Flight Training Restrictions:</b> Flight training is not permitted on the 1 <sup>st</sup> and 3 <sup>rd</sup> Sunday of the month and 2 <sup>nd</sup> and 4 <sup>th</sup> Saturday of the month from May 1 – September 30.	No
12	<b>Statutory Holiday Flight Training Restrictions:</b> Flight training is not permitted on the following federal statutory holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; National Day for Truth and Reconciliation; Thanksgiving Day; Remembrance Day; Christmas Day; and Boxing Day.	No
13	<b>Circuit Flight Training Restrictions:</b> A maximum of 4 aircraft are permitted in the circuit for training purposes for any runway at any given time.	No
14	<b>Toronto Zoo:</b> Pilots are to maintain 2,000 ASL or above over Toronto Zoo (N43 49 05 W79 11 15).	No

## Proposed Noise Abatement Procedure 2 – Tower Open Preferential Runways

Proposed Noise Abatement Procedure 2 will increase the maximum 90° crosswind from 5 kts to 10 kts for Runway 30 operations, before an alternate runway would be assigned by NAV CANADA. Aircraft are certified during flight testing to a maximum demonstrated crosswind component, which is generally lower for smaller flight training and general aviation aircraft. The Cessna 150 and Cessna 152, for example, comprised 12% of total movements in 2020 and have maximum demonstrated crosswind components of 12 kts to 13 kts, depending on the model and year of manufacturing<sup>9</sup>. The Cessna 172, which comprised 65% of movements in 2020, has a maximum demonstrated crosswind of 15 kts<sup>10</sup>. While the Proposed Noise Abatement Procedure would approach the maximum demonstrated crosswind component for select general aviation and flight training aircraft, the proposed 10 kt crosswind component associated with the preferred use of Runway 30 does not exceed the demonstrated limits. The Cessna 150 and the Cessna 172 aircraft fleets are commonly among the most restrictive fleet types from a crosswind perspective and this change is therefore not anticipated to have significant fleet implications.

Proposed Noise Abatement Procedure 2 also would introduce an allowable tailwind component for Runway 30 operations of up to 5 kts. As described in Section 5.9, tailwinds decrease aircraft takeoff and landing performance. Table 5.31 and Table 5.32 identify the takeoff and landing performance implications for three representative single-engine general aviation and flight training aircraft that commonly operate at the Airport: the Cessna 150, Cessna 172, and Cirrus SR-22. As shown below, takeoff distances increase by 25% in 5 kt tailwind conditions for each aircraft, with ground rolls increasing from 1,330 ft. to 1,663 ft. for the Cirrus SR-22, for example. The takeoff distance available for Runway 30 (4,000 ft. from the intersection with Taxiway D) continues to be sufficient in tailwind conditions for these representative aircraft. Similarly, the landing distance available for Runway 30 is sufficient based on the calculations and assumptions provided below.

Operations in tailwind conditions may represent an increased challenge for aircraft fleets with longer takeoff and landing distances, such as small and mid-size turboprop and turboprop aircraft commonly used by corporate operators at the Airport. Given the wide variety of aircraft types in this category that utilize Oshawa Executive Airport, representative performance calculations have not been completed. However, it is noted that select aircraft may be unable to accept a Runway 30 arrival or departure with a 5 kt tailwind – for these aircraft, the use of Runway 12 may be required. This point is supported by the 2011 Oshawa Executive Airport Runway Extension / Buttonville Airport Closure Impact Assessment (Genivar), which found that a significant number of small and mid-size corporate turboprop aircraft are restricted from operating at Oshawa Executive Airport on the basis of the length of Runway 12-30. Introducing a tailwind will represent a performance penalty that may further impact select aircraft types.

**Table 5.31 - General Aviation / Flight Training Takeoff Performance Estimates (5 kt Tailwind)**

	Takeoff Ground Roll		Takeoff Distance to Clear 50 ft. Obstacle	
	Zero Wind	5 kt Tailwind	Zero Wind	5 kt Tailwind
Takeoff Distance Available	Full-Length: 4,250 ft. / From Taxiway D: 4,000 ft.			
1977 Cessna 150M	900 ft.	1,125 ft.	1,690 ft.	2,113 ft.
1979 Cessna 172N	980 ft.	1,225 ft.	1,745 ft.	2,181 ft.
2016 Cirrus SR-22	1,330 ft.	1,663 ft.	2,267 ft.	2,834 ft.
<b>Assumptions:</b> Paved / dry runway, pressure altitude of 1,000 ft., temperature of 30° C				

<sup>9</sup> Limits are as noted in the 1977 Cessna 150M Pilot's Operating Handbook and the 1980 Cessna 152 Pilot's Operating Handbook.

<sup>10</sup> Per the 1979 Cessna 172N Pilot's Operating Handbook.

**Table 5.32 - General Aviation / Flight Training Landing Performance Estimates (5 kt Tailwind)**

	Landing Ground Roll		Landing Distance to Clear 50 ft. Obstacle	
	Zero Wind	5 kt Tailwind	Zero Wind	5 kt Tailwind
Landing Distance Available	4,250 ft.			
1977 Cessna 150M	485 ft.	606 ft.	1,135 ft.	1,419 ft.
1979 Cessna 172N	565 ft.	706 ft.	1,330 ft.	1,663 ft.
2016 Cirrus SR-22	1,285 ft.	1,606 ft.	2,693 ft.	3,366 ft.
<b>Assumptions:</b> Paved / dry runway, pressure altitude of 1,000 ft., temperature of 30° C				

**Proposed Noise Abatement Procedures 3, 4, 9, 10, 11, 12, and 13**

Proposed Noise Abatement Procedures 3, 4, 9, 10, 11, 12, and 13 are restrictions that limit the Airport’s hours and days of operations and the scale of flight training activity. These procedures will not impact the types of aircraft that make use of the Airport during these operational confines.

**Proposed Noise Abatement Procedures 1, 5, 6, 7, and 8**

Proposed Procedures 1, 5, 6, 7, and 8 are existing voluntary procedures that are proposed to be made mandatory without revisions. Consultations with the Airport Operator did not identify any fleet implications with these existing procedures, and performance requirements are not imposed with these procedures that would negatively impact the fleet types that commonly utilize the Airport.

**Proposed Noise Abatement Procedure 14 – Toronto Zoo**

Proposed Noise Abatement Procedure 14 is an existing voluntary procedure that stipulates a minimum overflight height for the Toronto Zoo. No aircraft fleet implications are anticipated.

## 6 NEXT STEPS

The finalization of this deliverable represents the completion of Step 1 of the AC 302-002 process. The next steps for the approval of the Proposed Noise Abatement Procedures are as follows:

1. **Stakeholder Consultations:** Consultations will be undertaken with respect to the Proposed Noise Abatement Procedures and their associated evaluation of effects. Per AC 302-002, this will include: the community at large, the Airport Operator, the Airport Community Liaison Committee, Transport Canada, NAV CANADA, Air Transport Association of Canada, Canadian Business Aviation Association, Canadian Owners and Pilots Association, scheduled operators, fixed-base operators, and other parties at the discretion of HM Aero and the City.
  - a. The stakeholder consultation process will include a combination of direct interviews, online surveys, and online public open houses. HM Aero will be responsible for fully and clearly explaining the impacts to all parties and documenting all consultations on behalf of the Airport Operator and the City.
  - b. If all consulted parties agree with the Proposed Noise Abatement Procedures, an updated version of this report will be prepared that documents the consultation process and includes signoffs indicating agreement of the participants
  - c. Where there is no consensus, the consultation process will be documented in the same manner as 1. b., including dissenting view(s) and accompanying rationale(s) for the positions taken.
2. **Transport Canada Submission:** HM Aero will prepare and submit to the City draft and final versions of its submission to Transport Canada, including the analysis contained herein with any updates as required from the stakeholder consultation process.
3. **Transport Canada Review:** The submission made by the City will be reviewed internally by Transport Canada, including the:
  - a. Regional Aerodrome and Air Navigation Division, which reviews the proposal to ensure the consultation process was followed and that the report is complete and accurate. A recommendation of concurrence or disagreement is provided.
  - b. Director, Civil Aviation Standards, which reviews the Regional Aerodrome and Air Navigation Division's recommendation, ensures the proposal meets applicable national policies and obtains Office of Technical Interest signoff.
4. **Transport Canada Decision:**
  - a. If the Director, Civil Aviation Standards concurs with the proposal in Step 3. b. and consensus exists, the proposal is issued for publication.
  - b. If there is no consensus, the Director, Civil Aviation Standards will prepare a briefing note and call a meeting of the Aircraft Noise and Emissions Committee to review the proposal. The Aircraft Noise and Emissions Committee may find that the proposal should be published, or dissents may be recorded.
  - c. If dissents are recorded at the Aircraft Noise and Emissions Committee, an issue paper will be submitted by the Director, Civil Aviation Standards to the Civil Aviation Regulatory Committee for review. The Civil Aviation Regulatory Committee will subsequently decide whether the Proposed Noise Abatement Procedures should be published.

6. **Implementation:** Assuming the Proposed Noise Abatement Procedures are approved at the federal level, publication changes will be made in the Canada Flight Supplement and Canada Air Pilot. The City and the Airport Operator may elect to conduct additional notification activities to Airport tenants and aircraft operators as part of the Safety Management System, and ongoing compliance and enforcement activities will occur.



#209-532 Montreal Road  
Ottawa, ON K1K 4R4  
[hmaero.ca](http://hmaero.ca)