

**Appendix A**  
**Meeting Agenda**  
**Billy Bishop Toronto City Airport**  
**Noise Sub Committee Meeting 16**

Thursday May 5, 2022  
7:00 PM to 8:30 PM  
Zoom Virtual Meeting

**AGENDA**

- 7:00 Welcome and Introductions
- 7:05 Agenda Review
- 7:10 NEF Presentation and Questions (Transport Canada)
- 8:15 Ground Noise Study Update (Michael David)
- 8:20 Permanent Noise Management Terminal Update (Michael MacWilliam)
- 8:25 Business Arising
- 8:30 Adjourn

**Appendix B**  
**Transport Canada Presentation**

# Aircraft Noise Exposure Forecast Tool – NEFCalc

BBTCA Noise Sub Committee Meeting 16  
05 May 2022



# Objectives

- Provide a high-level overview of TC roles and responsibilities for aircraft noise management.
- Discuss key components of the NEF Calculation Tool (NEFCalc), including history, attributes and use
- Describe inputs to the NEFCalc
- Respond to questions submitted by the BBTCA Noise Sub Committee
- Q&A

# TC Organizational Units

## **TC REGIONS**

- Ontario Region

## **TC POLICY GROUP**

- Airports and Air Navigation Services Policy

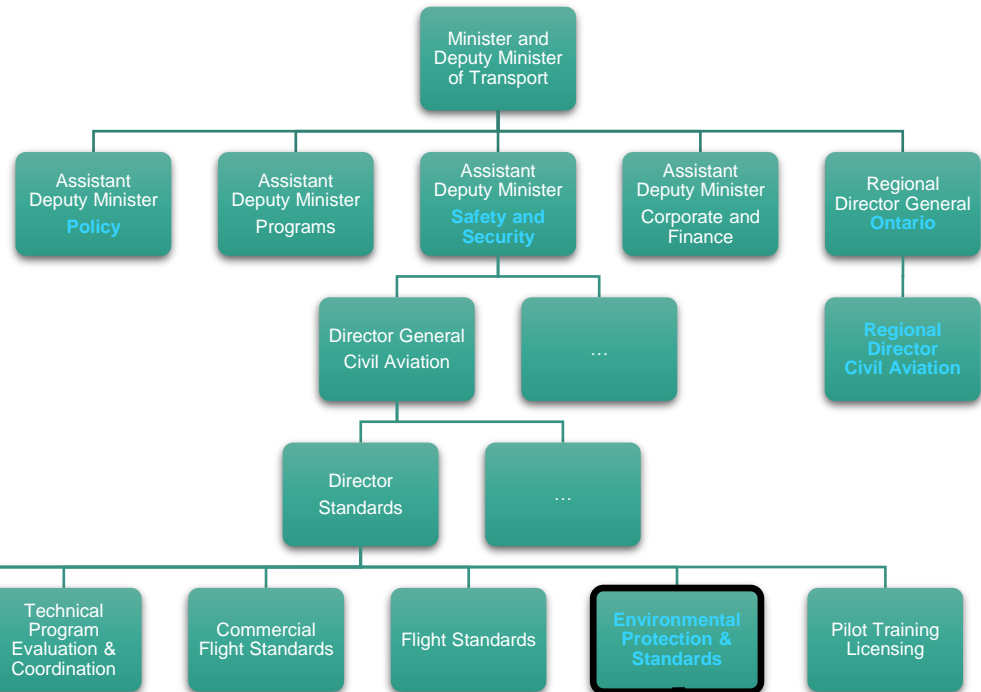
## **TC SAFETY & SECURITY GROUP**

- Civil Aviation, Standards Branch, Environmental Protection and Standards

# Transport Canada

## TC Aviation Environmental Protection Division:

- Technical Lead for Aircraft Noise and Emissions
- Canada Lead to ICAO for Environmental Protection
- Provides subject matter expertise related to aviation and the environment
  - Tools and metrics for noise exposure
  - Part IV of TP1247 (Aircraft Noise)
  - Support to TC Regional Offices



# NEF Context at BBTCA

- The NEF contour is the key limit that governs the number of take off and landings at BBTCA
- NEFCalc is the only tool that exists in the Tripartite Agreement. It is the only mechanism and provision in the agreement to govern the maximum allowable movements. It was agreed to by all parties with the creation of the agreement
- The BBTCA Master Plan utilized the same NEFCalc tool and methodology to complete all scenarios contained within the MP
- At the request of the City of Toronto, Transport Canada conducts annual noise exposure contours at BBTCA

# Noise Exposure Forecast (NEF) Tool and Metric

- In Canada we use the Noise Exposure Forecast (NEF) metric computed using the Transport Canada NEFCalc program
- The NEF is a cumulative 24 hour noise metric
- The intended use of NEFCalc is land-use planning
- Represents noise exposure of an average busy day
- Reflects fleet mix, runway use, day/night activity splits, average flight tracks
- Contour lines of 25, 28, 30 and 35 NEF are calculated
- Interpretation and land-use compatibility tables are included in TP1247 Land-use in the Vicinity of Aerodromes



# Submitted Questions

1. Incorrect interpretation of modelled flight number
2. Incorrect ground noise attenuation assumptions
3. Flyby noise energy omitted from NEF calculations
4. Terrain noise modelling not completed
5. NEF model scale not considered
6. Airport site ground noise resulting from NEF flight numbers not considered
7. NEF compliance studies not yet completed to confirm flight numbers

# Submitted Question - 1

## Q1 Incorrect interpretation of modelled flight number

- NEF Metric represents a cumulative 24 hours exposure to noise
- Modelling assumes only daytime (0700-2159) and a nighttime (2200-0659) periods for the traffic
- Daytime and Nighttime periods are independent from actual operating hours
- Peak Planning Day traffic levels used (average of the 7 busiest days of the 3 busiest months)

# Submitted Question - 2

Q2 Incorrect ground attenuation assumptions (and Q4 Terrain modelling not completed)

- The vicinity of each airport site is different
- Ground attenuation is a complex phenomenon
- The NEFCalc model and its ground attenuation algorithm was designed based on a horizontal flat ground surface
- The ground attenuation algorithm of the NEFCalc model has been assessed as conservative

***\*same answer as for Q4***

# Submitted Question - 3

## Q3 Flyby noise energy omitted from NEF calculations

- Sound is measured on a logarithmic scale
- Energy contributions below 10dB of the peak was considered negligible
- The reference to “total” noise exposure in TP1247 would appear to be more of a qualifier to “all aircraft on all runways” than to the particulars of the metric measurement.

# Submitted Question - 4

Q4 Terrain Modelling not completed (and Q2 Incorrect ground attenuation assumptions)

- The vicinity of each airport site is different.
- Ground attenuation is a complex phenomenon.
- The NEFCalc model and its ground attenuation algorithm was designed based on a horizontal flat ground surface.
- The ground attenuation algorithm of the NEFCalc model has been assessed as conservative.

***\*same answer as for Q2***

# Submitted Question - 5

Q5 NEF scale not considered

- The EPNdB is the unit used in the certification of aircraft.
- The data collected at the certification points is not used.
- The data collected during the certification process is used to prepared noise vs distance information used by the NEFCalc
- Noise vs distance information includes EPNL for 8 distances from 200 to 20000 feet.
- Scale of 1:50000 commonly used for mapping

# Submitted Question - 6

Q6 Airport site ground noise from NEF flight numbers not included

- The NEFCalc does not include noise from ground vehicles, maintenance engine runup, or reverse thrust
- NEF Contours and TP1247 are independent fit-for-purpose assessments not linked to local noise limitations

# Submitted Question - 7

Q7 NEF Compliance Studies not yet completed to confirm flight numbers

- Single event information can be an important tool in noise management.



# Questions

**Ted McDonald**

Senior Environmental  
Protection Specialist

**Gilles Bourgeois**

Aviation Noise Specialist

Environmental Protection and Standards (AARTG)  
Transport Canada, Civil Aviation  
Government of Canada

# **Appendix C**

## **Questions Submitted by Email**

### **Email Submission #1 – January 11, 2022 at 9:51 AM**

[Dear LURA and PortsToronto], the slots meeting is fast approaching.

There are a few noise engineering issues related to number of flights being calculated which were not documented in the 2019 Master Plan nor in any other studies for some reason. The flight numbers are being calculated solely based on NEF software output, so I focussed the following issues list on NEF modelling errors and omissions only. Please forward these issues to the noise engineers so they can speak to next steps and timing regarding their slot reduction calculations.

There have been systemic errors and omissions in applying the NEF noise engineering principles over the years, leading to excessive flight numbers having been calculated. It has not been helpful that the five noise engineering consultants retained separately by the City and Port Authority over the years since 2008, who presented noise capacity material to the public, confirmed they were not intimately familiar with the NEF noise energy calculation formula, nor underlying EPNL calculation methodology, when making their presentations. It is also not reasonable that any of the airport decision makers and policy makers should be assumed to have detailed working knowledge of NEF noise engineering calculations.

#### **1. Incorrect interpretation of modelled flight numbers**

The NEF calculation methodology calculates the theoretical total number of flights possible for a 24 hour operation, not the 16.25 operating hours available, resulting in excessive flight numbers being proposed during operating hours.

To recap noise calculation methodology, the NEF formula uses the decibel-seconds of noise energy of every modelled flyby (normalized over 10 seconds), and sums these decibels over 24 hours, to calculate an average decibel per hour ie. an NEF value (NEFdB) for the given location. The resulting NEF values are then plotted on the map, and contours of equal value are compared to the geographic location of the control contour noise envelop to confirm if the modelled flight scenario is within the noise envelop.

Airport decision makers have not documented that they have been informed by their noise engineers that the total modelled flights calculated using the NEF formula are for 24 hours of continuous airport activity. Per the NEF formula calculation methodology, the modelled total number of flights per day needs to be pro-rated (lowered) over the fewer number of hours the airport is actually approved for operation. For example regarding commercial flights, the 202 slots modelled over 24 hours multiplied by 16.25/24 equals 136 slots during airport operating hours. Furthermore, the NEF calculation methodology assumes the total EPNL noise energy from the total modelled flybys is equally distributed over each hour over the 24 hour period, not loaded up in specific hours. No specifics related to these flight calculations were appended to the Master Plan or otherwise to support flight numbers.

#### **2. Incorrect ground noise attenuation assumptions**

NEF software includes a ground noise attenuation algorithm which assumes modelled fly by noise is being absorbed by the lake surface, resulting in excess noise capacity assumptions and excessive flight volumes proposed.

The algorithm calculates an increasing volume of noise being absorbed by the ground surface during a flyby noise event when the plane is closer to the horizon or ground surface relative to a viewer

location. The modelled NEF values have been lowered accordingly. This assumed noise reduction due to ground surface attenuation does not apply to the water surfaces of Toronto waterfront. This issue is especially important at the Island Airport where planes are accelerating or decelerating from runway ends that are surrounded by Lake Ontario in front of residential towers. The lower noise values thus being modelled for each flyby (before being plotted on the noise map for comparison to the official noise control contour), results in additional noise capacity inside the control contour limit than is otherwise possible in real life. This leads to additional excessive flight numbers being proposed or assumed potentially possible.

Also related to this are the flight reductions that need to be calculated with respect to the anticipatable increased noise propagation (not attenuation) in the marine environment of the modelled NEF noise. The NEF software was designed to produce output for use on stereotypical suburban subdivisions on tableland, and explicitly does not consider reflective water surfaces or inversions. Airport decision makers have to date assumed the NEF noise maps for the Island Airport already include for Lake Ontario noise effects, and have not documented that they have been informed otherwise by their noise engineers.

### **3. Flyby noise energy omitted from NEF calculations**

The established NEF calculation procedure (more specifically the underlying EPNL) is excluding some of the fly by noise energy of louder planes (eg. Q400) from the NEF analysis, resulting in noise capacity exceedances of the 25 NEFdB zoning standard.

As detailed in the EPNL calculation procedure, the NEF noise maps only show that portion of modelled noise energy (decibel-seconds) which occurs within the duration of time in which the top 10 decibels of a given flyby are emitted. If there is any remaining fly by noise energy modelled to occur outside this defined window of time, it is automatically excluded from the NEF calculation. To illustrate this important issue (ignoring the typical PNdb to dBA conversion), the maximum fly by noise level of a Q400 aircraft in the harbourfront is sometimes 73dBA. Only the loudest portion of the noise energy that the Q400 emits during a fly by (occurring immediately before and after the maximum decibel), is included for in the NEF calculation (ie. the noise during the fly by from 63dBA to the 73dBA max, then back down to 63 dBA is included in NEF calculation). Whereas, the balance of the noise energy the same Q400 emits during the same fly by, before and after the flyby peak (between 63dBA to below the background sound level of roughly 50dBA), is not accounted for in the modelled results.

Airport decision makers to date have assumed the NEF contour maps account for the “total noise exposure”. This is also stated in Transport Canada’s TP1247 ‘Land Use in the Vicinity of Airports’ which is the document intended to guide them. Airport decision makers have not documented that they have been informed otherwise by their noise engineers.

Based on the EPNL calculation procedure, the NEF formula was envisioned for application where the maximum decibel in any modelled fly by would be within 10 decibels of the background sound level for a given location, in order for the calculated NEF values to contain the “total noise exposure”. When a flight mix contains louder aircraft exceeding this 10 dB limit, where it is therefore known that some of their modelled fly by noise energy will automatically being omitted through typical EPNL calculation, conditions exist for the NEF software output to produce a false or misleading 25 NEF contour compliance. In this instance, even though the NEF model output is plotted to show compliance with the 25 NEF noise envelop, the 25 NEFdB per hour fly by noise limit being relied upon by the previously zoned residential lands will be exceeded by the noise omitted from the calculations. The total noise energy for the hour in which the high decibel aircraft will be flying must be checked to ensure the flight mix and flight numbers proposed for that hour will still meet the overall 25 NEFdB per hour noise compliance

standard. Such careful assessment of the fly by noise energy that was omitted from the NEF analysis was not appended to the Master Plan to support the number of flights calculated in each hour. Airport decision makers have not documented that they have been informed by their noise engineers of this fundamental noise engineering check with respect to Q400 at Island Airport.

The NEF model output is supported by a logarithmic formula containing the terms:  $EPNL = PNL_{TM} + D$ . The Master Plan should have a tabulation of these terms for each of the modelled aircraft at the three ICAO reference locations (ie. lateral, takeoff and approach). From a community perspective, the key aircraft whose values need to be highlighted are those for the Q400 aircraft.

#### **4. Terrain noise modelling not completed**

The typical NEF modelling process was designed to model noise at ground surface elevations only, and not at the various elevations of 50 storey residential towers constructed 500m from the flightpath outside of the official noise envelop. Urban terrain modelling details have not been made available. Airport decision makers have not documented if they have been informed by their noise engineers that these matters need to be reviewed when calculating proposed flight numbers so that they address the 25 NEF noise standard re exterior walls of residential buildings.

#### **5. NEF model scale not considered**

There are important considerations when applying the typical NEF software process to the small Island Airport site. The NEF methodology (more specifically the underlying EPNL) was envisioned, designed, and tested empirically to model noise at ground surface elevations, and primarily for situations where the altitude of the observed aircraft is above 500' to 2,000' ie. not when the aircraft is at lower altitudes (below 350' or 35 storeys) or within a 10 second proximity of the end of runway. Also, given that NEF modelling typically generates 25 NEF contour lines for residential zoning that extend 3km or farther away from airports, the NEF software outputs are typically mapped at a larger 1:50,000 scale, exceeding the scale of the Island Airport. Similarly, the ICAO lateral certification point located 450m perpendicular to runway centerline is typically well inside the residential zoning contour line and not outside of it as at Island Airport. The Airport decision makers have not documented if they have been informed by their noise engineers of the above matters (affecting public health, safety, and well being), with respect to confirming the noise studies required to support the necessary flight number reductions.

#### **6. Airport site ground noise resulting from NEF flight numbers not considered**

The noise roar from the airport grounds due to the number of modelled flights exceeds site noise capacity.

Airport decision makers have to date assumed that stationary source noise (eg. the ground roar resulting from flight activities) is included for in the NEF noise contour mapping. This analysis requirement might sometimes be forgotten by technologists when modelling NEF scenarios, as the residential zoning limit is normally established much farther away from the airport, over which distance the ground roar from airport site may be otherwise assumed to have dissipated. Reductions to flight numbers need to be calculated to contain the on-site ground roar, so that the average hour noise levels meet the provincial stationary source noise limits. The entire waterfront tower corridor has been approved and constructed to meet those limits. The initial residential buildings in harbourfront were planned by a federal development agency to meet the stationary source noise limit requirements, and bedrooms were subsequently constructed facing the airport without noise protection nor central air conditioning as a result. Airport decision makers have not documented that they have been informed by their noise engineers that public health, safety, and well-being are affected in this regard when excessive flight numbers are not meeting the federal or provincial residential NEF standards.

## **7. NEF compliance studies not yet completed to confirm flight numbers**

Per 1996 NEF Validation Study, which confirmed the NEF process for Canada, the NEF software modelling work needs to be supplemented with single fly by event analyses to ensure the 25 NEF noise standard is met at small footprint airports like the Island Airport. The NEF modelling software was designed for a continuous noise environment such as when there are two or more descents and/or ascents taking place simultaneously. The Island Airport site is primarily dominated by single fly by noise events, which have never been studied to confirm 25 NEFdB average hour noise compliance at Island Airport. Airport decision makers have not documented that they have been informed by their noise engineers of this study requirement to confirm flight numbers.

### **Conclusion**

The above key issues list is not exhaustive. It is separate from matters related to outstanding certification requirements for a noise impact assessment study of the airport. In the absence of report sealed by a licensed professional noise engineer, public health, safety, and well-being have to date not yet been assured by any of the airport decision makers at Transport Canada, City of Toronto, and the Port Authority.

I added members of the airport noise sub-committee to email chain to keep in loop.

Regards,

[YQNA Representative]

## **Email Submission #2– March 17, 2022 at 11:23 PM**

[Attn LURA], further to below, here are other NEF related questions for your consideration, which are supplementary to my email of Jan 11, 2022.

Please distribute the final version of the question list ultimately forwarded to noise engineers.

Additional NEF questions not directly related to the Master Plan would include:

1. Transport Canada had inserted material into the 1983 Tripartite Agreement with respect to NEF modelling of historical flight activities. See Sections 1(i), 14(1)(f), 14(2), 14(4), 16, 27, and 34. The material is being referenced in the preparation of annual contour reports as requested by the City of Toronto per Section 28. What was the intention of this Transport Canada material? Firstly, the type of NEF value being calculated in the annual reports is not an average hour type decibel of the combined operating hours only, and would be anticipated to be lower than the typical NEF value calculated for a 24 hour operating period. Secondly and more problematically, it appears the City of Toronto has actually been relying on the Transport Canada annual reports as though a retrospective compliance check with respect to the overriding 25 NEFdB per hour residential zoning limit standard, even though the City ought to have known this was not actually covered by the annual reports based on their technical contents.
2. The Transport Canada annual report includes a map of plotted NEF value contours that were calculated in the report. The maps have been confusing airport decision makers and the public

for years, lowering confidence in Transport Canada. Why are there symmetrical NEF contour areas being plotted on irregular water and land surfaces without there being a note warning the reader that the plotted annual contours are solely based on generic modelling output and the plotted annual contours have not been enlarged to account for the acoustical properties of the marine environment? Also, why no similar warning note of the ascending /descending flight path elevations not discussed in annual report, being roughly 500m horizontal to mid-height of water fronting towers just outside the geographic location of the control contour noise envelope? Similarly, there is no warning note flagging that stationary source noise was not accounted for in the analysis, and its hourly magnitude may also extend far beyond the geographical location of the NEF control contour line at this location, as opposed to other airport locations.

3. The Transport Canada annual reports contain a disclaimer which appears to handcuff the engineers who prepared it, resulting in their inability to affix their professional seal to their own engineering reports, the highly abbreviated conclusion section, and no recommendations. For example, introductory page i of the 2018 contour report dated Dec 18, 2020 (issued 2 years after the fact) notes the report is for *“the exclusive use of Transport Canada (the Client), who has been a party to the development of the scope of work and understands its limitations. The methodology, findings, conclusions and recommendations in this report are based solely upon the scope of work and subject to the time and budgetary considerations described in the proposal and/or contract pursuant to which this report was issued. Any use, reliance on, or decision made by a third party based on this report is the sole responsibility of such third party.”* Both Transport Canada and the engineering consultant knew at the onset that their application of engineering principles in the annual report was going to be relied upon by a third party who requested the report be prepared, namely the City of Toronto who was directly copied in the report, and used for the purposes of protecting health, safety, and well being of the public. Please provide the RFP, proposal, and contract prepared by Transport Canada, laying out the scope of work for the annual contour reports. The amounts in the consultant fee proposal can be blacked out if necessary.
4. 25 years ago, the 1996 NEF Validation Study recommended that NEF process criteria be prepared for small contour footprint airports. Please present these criteria.
5. Will Transport Canada assist in an immediate half day training session involving two noise engineering staff from each of the Tripartite Agreement signatories assigned to the Island Airport file, to ensure the fundamental NEF and EPNL engineering principles and calculation methodologies are commonly understood, transparent, and accessible?

Additional NEF related questions directly related to the Master Plan would include:

6. Please provide clarification on need for a change in philosophical approach in deciding which NEF software version would be used to calculate ‘flight number capacity’ for the airport (ie. oldest software version still functioning versus then most current). An explanation was provided in the Jan 13, 2022 slots meeting that left an impression that business interests wish to mathematically increase the ‘flight number capacity’ inside the same 25 NEF ‘noise energy capacity’ established for the residential zoning limit. Can the rationales supporting the modelling decisions made back in 2009/10 be summarized, including what technical

considerations changed in the interim years to warrant a 2019 MP proposed revision to the 2010 approved engineering design operating scenario containing 202 slots?

7. Supplementary to this, the most current NEF software version includes a less restrictive algorithm with respect to the assumed noise attenuation of flyby noise by ground surfaces (referred to in industry literature as 'ground noise attenuation'), which has resulted in a mathematical increase in the modelled flight number capacity. Through the normal course of engineering business, the exact same 2009 design modelling scenario, but using the current software version, would have been prepared, for a flight number change comparison between the two software versions. Can this comparison of individual aircraft flight numbers be provided?
8. Per my Jan 11 Issue No. 3, could the requested data tables on file and referenced by the three Tripartite airport decision makers be forwarded?

Regards,

[YQNA Representative]

**Email Submission #3– May 5, 2022 at 10:12 AM**

Thanks so much [LURA]. Here are the 3 documents, attached as PDF. Questions are in document 1.

Cheers [BQNA Representative]

*Documents are included on the following pages.*

*Doc 1: Issues from Standing Committee on Transport March 2013*

*Doc 2: Distance from Kings Landing to Billy Bishop Airport airport East Runway*

*Doc 3: March 2019 Report on Air Transportation Noise Federal Government XC27-1-1-421-28-eng*



HOUSE OF COMMONS  
CHAMBRE DES COMMUNES  
CANADA

# **ASSESSING THE IMPACT OF AIRCRAFT NOISE IN THE VICINITY OF MAJOR CANADIAN AIRPORTS**

**Report of the Standing Committee on Transport,  
Infrastructure and Communities**

**Honourable Judy A. Sgro, Chair**

**MARCH 2019  
42<sup>nd</sup> PARLIAMENT, 1<sup>st</sup> SESSION**



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## **ASSESSING THE IMPACT OF AIRCRAFT NOISE IN THE VICINITY OF MAJOR CANADIAN AIRPORTS**

# **Report of the Standing Committee on Transport, Infrastructure and Communities**

**Hon. Judy A. Sgro Chair**

**MARCH 2019**

**42<sup>nd</sup> PARLIAMENT, 1<sup>st</sup> SESSION**

## **NOTICE TO READER**

### **Reports from committee presented to the House of Commons**

Presenting a report to the House is the way a committee makes public its findings and recommendations on a particular topic. Substantive reports on a subject-matter study usually contain a synopsis of the testimony heard, the recommendations made by the committee, as well as the reasons for those recommendations.

# **STANDING COMMITTEE ON TRANSPORT, INFRASTRUCTURE AND COMMUNITIES**

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**THE STANDING COMMITTEE ON  
TRANSPORT, INFRASTRUCTURE AND  
COMMUNITIES**

has the honour to present its

**TWENTY-EIGHTH REPORT**

Pursuant to its mandate under Standing Order 108(2), the Committee has studied the Impact of Aircraft Noise in the Vicinity of Major Canadian Airports and has agreed to report the following:



## TABLE OF CONTENTS

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SUMMARY .....	1
LIST OF RECOMMENDATIONS .....	3
ASSESSING THE IMPACT OF AIRCRAFT NOISE IN THE VICINITY OF MAJOR CANADIAN AIRPORTS.....	6
Introduction .....	6
Defining the Problem.....	8
Responsibility for Air Transportation in Canada .....	10
The Extent of the Aircraft Noise Problem at Major Canadian Airports .....	11
Issues in Noise Abatement and Management.....	13
Noise Management Committees.....	13
Noise Measurement .....	15
Public Access to Noise Data.....	17
Oversight of Canada’s Aviation Sector.....	19
Health Concerns .....	21
Night Flights .....	25
Reducing Noise “At The Source” Through Quieter Aircraft.....	26
APPENDIX A LIST OF WITNESSES .....	28
APPENDIX B LIST OF BRIEFS .....	32
REQUEST FOR GOVERNMENT RESPONSE.....	34

OF CANADA ..... 35





## SUMMARY

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In October 2018, the House of Commons Standing Committee on Transportation, Infrastructure and Communities decided to undertake a study on aircraft noise in areas surrounding major Canadian airports. The committee's study examined the impact aircraft noise has on residents living near major airports, how this noise is measured, monitored, and addressed by airports and other responsible entities, and actions the federal government can take to minimize the effects such noise has on communities while ensuring Canada's air transportation system remains safe and efficient.

Several key issues emerged during the committee's study, including a lack of available data on many aspects of Canadian airport operations, questions over the accuracy and possible outdatedness of the tools Canada currently uses for measuring and predicting the effect of aircraft noise on individuals, and a public perception of inadequate consultation, transparency, and oversight exercised by individual airport authorities and NAV CANADA.

Numerous citizens told the committee that living under flight paths has decreased their quality of life and led to concerns over short and long-term health effects due to noiserelated stress and interrupted sleep. Several witnesses also expressed frustration with the measures in place for receiving and addressing noise complaints at local airports, with some describing what they see as an absence of transparency and public accountability among the private entities responsible for dealing with noise issues. Several witnesses also expressed their opinion that airport authorities and NAV CANADA do not pursue meaningful public consultation before making operational decisions that expose communities to noise.

Several local airport authorities as well as NAV CANADA testified to the committee that they take noise complaints from the public seriously and are actively pursuing noisereducing measures designed to minimize the impact of airport operations on surrounding residential communities. Transport Canada explained that it felt Canada's privatized air transportation system operated well and that the federal government's current self-regulatory approach allows airports and NAV CANADA the flexibility necessary to respond to local noise concerns with limited oversight from Ottawa.

Several experts noted that a lack of Canadian data on many aspects of aircraft operations makes it difficult to formulate detailed, evidence-based recommendations on noise mitigation. Experts also told the committee that the main tool Canada uses to measure aircraft noise and predict its effect on individuals, the Noise Exposure Forecast, does not reflect the latest scientific evidence on how human beings perceive and tolerate noise. Witnesses cited several international best practices in aircraft noise management that have been implemented in Australia, the European Union and other industrialized

countries that serve to mitigate noise while ensuring a safe and vibrant air transportation sector.

## LIST OF RECOMMENDATIONS

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*As a result of their deliberations committees may make recommendations which they include in their reports for the consideration of the House of Commons or the Government. Recommendations related to this study are listed below.*

### **Recommendation 1 — Consideration of Noise Impacts**

**That Transport Canada recommend that NAV CANADA, airport authorities and airlines carefully consider noise impacts in their operational decisions, policies and equipment-purchasing decisions.**

### **Recommendation 2 — Noise Management Committees**

**That Transport Canada produce detailed guidelines for airport noise management committees to ensure greater transparency and enhanced public participation in, as well as notification of, airport authority decisions that may involve significant operational changes at major Canadian airports affecting flights paths or any other significant decisions that could increase noise pollution.**

### **Recommendation 3 – Rotation of Runways**

**That Transport Canada investigate the potential benefits of airports rotating the use of their runways in a more equitable way, where possible in order to better manage noise.**

### **Recommendation 4 – Continuous Descent Approaches**

**That Transport Canada use tools at its disposal to ensure that airlines use continuous descent approaches as much as possible in order to reduce aircraft noise.**

### **Recommendation 5 – Implementation of Helios Recommendations**

**That Transport Canada work with airport authorities and NAV CANADA to implement any outstanding recommendations stemming from the Helios study as soon as possible without compromising on safety; and that airport**

authorities and NAV CANADA be required to provide regular updates on their progress in implementation.

#### **Recommendation 6 – Calgary International Airport**

That Transport Canada and NAV CANADA study the implications of shifting the west side approach to Calgary International Airport and its new runway further west so that aircraft noise levels impact a smaller population outside the city's western boundary than the current route directly over the city.

#### **Recommendation 7 — Noise Exposure Forecast and Noise Measurement Review**

That Transport Canada support efforts to modernize outdated noise metrics. These efforts should include the review of Canada's Noise Exposure Forecast model to ensure that it is in keeping with the most recent scientific evidence and international norms on noise measurement and human perception of noise.

#### **Recommendation 8 — Data Transparency**

That Transport Canada recognize the importance of data transparency in building public acceptance for transportation infrastructure by collecting more data on noise in order to introduce evidence-based noise mitigation measures. Furthermore, that Transport Canada publicly release the data it has compiled including Noise Exposure Forecast contour maps and data on noise violations including sanctions imposed. This data should be made available to the public on its website.

#### **Recommendation 9 – World Health Organization Standards**

That Transport Canada assess how noise exposure forecasts are conducted and consider implementing and complying with the World Health Organization standard on noise around large Canadian airports.

#### **Recommendation 10 – Collaboration with Independent Advisory Bodies**

That Transport Canada direct NAV CANADA and airport authorities to collaborate on a regular basis with independent advisory bodies that include community representatives and to share information with such bodies in a transparent manner. The membership of such bodies should include representatives from Transport Canada, NAV CANADA, airport authorities, Health Canada and citizens.

#### **Recommendation 11 — Aircraft Noise Ombudsperson**

That the Government of Canada consider the creation of an independent ombudsperson modelled after those in other countries to review and

adjudicate aircraft noise complaints that are not able to be resolved in the existing airport noise management committee structure.

#### **Recommendation 12 — Cooperation with Municipal, Provincial and Territorial Health Authorities**

That the Government of Canada work in cooperation with municipal, provincial and territorial health authorities to:

- a. support research to better understand the impact of aircraft noise-related annoyance on human health, including location-specific epidemiological studies as well as examining mitigation measures for individuals who are sensitive to noise disturbances; and
- b. issue recommendations and guidelines, based on Canadian data and best practices in other jurisdictions, on effective models to manage and mitigate noise impacts on communities.

#### **Recommendation 13 — Foreign Aircraft Operations**

That NAV CANADA and Transport Canada collaborate with airport authorities and other stakeholders to clarify the oversight of international aircraft passing through Canadian airspace.

#### **Recommendation 14 — Night Flight Policy Review**

That Transport Canada review its policy on night flights at Canadian airports to ensure that its current practice offers the best balance between economic benefits and the wellbeing of residents.

#### **Recommendation 15 — Reducing noise at the source**

That Transport Canada recommend that Canadian airlines install noisereducing equipment as soon as possible as it becomes available, and that airlines provide regular updates on progress and timelines associated with the installation of such equipment. Furthermore, that Transport Canada, in continuing to monitor airlines' progress along these timelines, consider sanctions for those that continue to operate unmodified aircraft.

#### **Recommendation 16 — Land-use planning**

That Transport Canada encourage and work with airport authorities and municipalities to integrate long-term land use planning when developing local official plans and related zoning.



# ASSESSING THE IMPACT OF AIRCRAFT NOISE IN THE VICINITY OF MAJOR CANADIAN AIRPORTS

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## INTRODUCTION

Aviation is an important part of Canada's economy, with Canadian airports contributing an estimated 194,000 jobs and \$19 billion to the country's GDP in 2016.<sup>1</sup> Canadian air traffic has increased significantly over the past decade and industry observers forecast passenger and cargo numbers at Canadian airports to continue to increase. According to Statistics Canada, 123.9 million passengers enplaned and deplaned at Canadian airports in 2013; this figure rose to 149.6 million passengers in 2017, a 20% increase over the four-year period.<sup>2</sup> The Greater Toronto Airports Authority (GTAA), responsible for the management of Toronto Pearson International Airport, estimates that air passenger figures at Toronto Pearson will increase at a rate of 3.1% per year over the next two decades from 2017's record level of 47 million passengers to 85 million in 2037.<sup>3</sup>

Canadian airports provide the essential infrastructure for the aviation industry to operate. They also serve as important economic centres for their respective cities, providing employment, tourism dollars, and international trade connections for local businesses. Toronto Pearson International Airport, for example, directly employs nearly 50,000 people and the region surrounding the airport constitutes the second-largest employment zone in Canada.<sup>4</sup>

While airports are largely seen as economic assets for their host cities, concerned citizens and some observers have asked the federal government to pay increased attention to the environmental externalities of airport operations, including noise from aircraft flight paths near major airports. This noise is a source of annoyance and health

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<sup>1</sup> Canadian Airports Council, [Economic Impact: Canadian Airports in 2016](#).

<sup>2</sup> Statistics Canada, [Air passenger traffic at Canadian airports, annual](#).

<sup>3</sup> Greater Toronto Airports Authority (GTAA), [Toronto Pearson International Airport Master Plan 2017-2037](#), page 7.

<sup>4</sup> Standing Committee on Transport, Infrastructure and Communities, *Evidence*, 42<sup>nd</sup> Parliament, 1<sup>st</sup> Session (Evidence): [Hillary Marshall](#) (Vice-President, Stakeholder Relations and Communications, Greater Toronto Airports Authority).

concerns for those who live under flight paths, some of whom live in residential communities that existed prior to their local airport's establishment or expansion.





On 18 September 2018, the House of Commons Standing Committee on Transport, Infrastructure and Communities (the committee) [agreed](#) to study the impact of aircraft noise in the vicinity of major Canadian airports. Between 23 October 2018 and 28 February 2019, the committee held eleven meetings on this topic and heard from 43 witnesses, speaking on behalf of communities affected by aircraft noise, as well as representatives from government, industry, and academia.

## DEFINING THE PROBLEM

In 2001, the International Civil Aviation Organization (ICAO), a Montreal-based United Nations agency with a mandate to establish international standards for international air traffic, adopted the [Balanced Approach to Aircraft Noise Management](#), a set of model policies designed to help countries better manage aircraft noise while promoting the sustainable development of air transport. The four principal elements of this “Balanced Approach” are: 1) reduction of noise at the source through quieter aircraft; 2) land-use planning and management; 3) noise abatement operational procedures; and 4) operating restrictions. Transport Canada has adopted these principles in addressing noise around Canadian airports.<sup>5</sup>

In 2012, NAV CANADA, Canada’s civil aviation authority, made changes to its airspace and flight procedures to harmonize Canadian flight practices with those of the ICAO. These changes were part of a larger series of reforms adopted by ICAO member countries in 2010 that encouraged national aviation authorities to create more direct flight routes and more efficient arrival and departure procedures. The purpose was to improve airspace efficiency and safety, reduce greenhouse gas emissions, and, where possible, reduce exposure to aircraft noise in residential areas.<sup>6</sup>

A number of residents and observers noted, however, that the introduction of this new suite of recommended practices, referred to as Performance-Based Navigation (PBN), had the effect of exposing previously unaffected residential areas to air traffic. This led to complaints from some neighbourhoods that had not previously lived under flight paths and were unaccustomed to dealing with that noise.<sup>7</sup> Residents living under flight paths in major cities, including Toronto and Montreal, have organized community groups to represent their complaints and lobby elected officials for changes to airport practices.

ASSESSING THE IMPACT OF AIRCRAFT NOISE

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<sup>5</sup>See Transport Canada, [Managing noise from aircraft](#).

<sup>6</sup>See ICAO, [Performance-Based Navigation](#).

<sup>7</sup>TRAN, *Evidence*: [Jeff Knoll](#) (Town and Regional Councillor, Town of Oakville and Regional Municipality of Halton, Halton Region), [Sandra Best](#) (Chair, Toronto Aviation Noise Group), [Raymond Prince](#) (as an individual), [Dr. Colin Novak](#) (Associate Professor, University of Windsor).

These residents cite increased levels of annoyance and stress and an overall diminished quality of life because of their daily exposure to aircraft noise.<sup>8</sup>

**“Some might say that these residents should have considered this when choosing to live in a community under a flight path. In the case of north Oakville, it was not on a flight path until merely six years ago. The changes to the downwind leg, the incessant low and slow overflights, and the resulting noise and nuisance were imposed on these established neighbourhoods as a result of NAV CANADA's 2012 flight path changes—changes, I might add, that were made with no consultation and virtually no notice.”**

Mr. Knoll, Town and Regional Councillor, Town of Oakville

In response to public complaints about noise, airport authorities and airlines note that Canada's aviation sector has made considerable progress in reducing overall aircraft noise levels. The committee was told that as a result of more stringent international noise standards, as well as technological advances, commercial aircraft have become significantly quieter in recent years. Scott Wilson, the Vice-President of flight operations at WestJet Airlines Ltd, testified that the current generation of aircraft have a 90% smaller noise footprint compared to the first generation of Canadian jet aircraft from the 1960s. Murray Strom, the Vice-President of flight operations at Air Canada, similarly reported that its Boeing 787 Dreamliner is 60% quieter than similar aircraft models from previous years. Martin Massé, the Vice President of Public Affairs for Aéroports de Montréal and Hillary Marshall, the Vice President of Stakeholder Relations and Community Engagement for the Greater Toronto Airports Authority, also explain that while the number of air passengers has increased significantly, improvements in the size of aircraft have allowed this to happen without an accompanying increase in overall aircraft movements.

Despite these technological advancements, several experts testified to the committee that the general public's tolerance of noise from transportation appears to have

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<sup>8</sup> TRAN, *Evidence*: Johanne Domingue (President, Comité antipollution des avions de Longueuil), Paul-Yanic Laquerre (as an individual), Mr. Knoll (Town of Oakville).



decreased over time.<sup>9</sup> [Julia Jovanovic](#), a Ph.D. candidate at the University of Windsor who is working with the GTAA on a research project to measure aircraft noise annoyance, noted the importance such findings have in developing noise abatement strategies:

Trends are emerging in recent studies identifying that transportation noise annoyance is on the rise. More people are expressing high levels of annoyance at lower noise exposure levels than ever before. Among transportation sources, aircraft noise is perceived as the most annoying. With forecasts for continual capacity increases across major airports worldwide and a trend of increasing aircraft noise annoyance, it has never been more critical to study the issue at length in efforts to find solutions to mitigate and manage it.

Other countries, notably Australia, the United States, and member states of the European Union, have been studying the issue of aviation noise and its effect on their populations for decades. However, according to [Nick Boud](#), an aviation consultant with the United Kingdom-based firm Helios, Canada began to take an interest in this topic relatively late. Indeed, a recurring theme among many Canadian experts who testified before the committee, ranging from acoustics experts to a public health officer, is that there is a notable lack of Canadian research and data in this area for communities and other stakeholders to draw upon.<sup>10</sup> While Canada may have come late to the question of how to best manage aircraft noise, it is clear from the committee's study that it has a wealth of international experience and domestic expertise to draw upon in developing best practices for the abatement and management of aircraft noise.

## RESPONSIBILITY FOR AIR TRANSPORTATION IN CANADA

Responsibility for Canada's air transportation sector is shared among several different entities:

- **Transport Canada** establishes aviation safety and security standards under the provisions of the *Aeronautics Act* and the *Canadian Aviation Regulations* (CARs). Part V of the CARs sets out standards for Canadian aircraft, including noise compliance, while Part VI requires aircraft operating near a Canadian airport to comply with any noise abatement regulations that facility may have established. The department also

ASSESSING THE IMPACT OF AIRCRAFT NOISE  
IN THE VICINITY OF MAJOR CANADIAN AIRPORTS

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<sup>9</sup> TRAN, *Evidence*: [Julia Jovanovic](#) (Ph.D. Candidate, University of Windsor), [Nick Boud](#) (Principal Consultant, Helios).

<sup>10</sup> TRAN, *Evidence*: [Dr. Novak](#) (Associate Professor, University of Windsor), [Jovanovic](#) (University of Windsor), [Dr. Kaiser](#) (Montreal Public Health).

requires airport authorities to prepare noise exposure forecasts that predict noise resulting from aircraft operations using standardized software and measurements.

- **NAV CANADA** is a private, not-for-profit corporation that operates Canada's air traffic control and civil air navigation system under the auspices of the *Civil Air Navigation Services Commercialization Act*. NAV CANADA publishes Canada Air Pilot and Canadian Flight Supplement, two aviation reference publications that provide pilots with information on airport operations, including details on noise abatement procedures in effect at different facilities.
- **Local airport authorities** are not-for-profit corporations that manage and oversee 22 of the 26 airports that make up Canada's National Airports System. These authorities manage the environmental impact of airport infrastructure on surrounding communities, including monitoring noise levels and responding to community complaints about noise resulting from their operations.
- **Local governments**, in most Canadian provinces and territories, are responsible for land use planning and development. Such planning authorities may use Noise Exposure Forecasts (NEF), produced by airport authorities using Transport Canada software and metrics, to determine areas where residential development may not be suitable. While, in most cases, ultimate decision-making approval for land use rests with such authorities, some provinces have created provincial guidelines that place additional restrictions on development around airports, such as Alberta's Airport Vicinity Protection Areas<sup>11</sup>.

## THE EXTENT OF THE AIRCRAFT NOISE PROBLEM AT MAJOR CANADIAN AIRPORTS

Among other responsibilities, airport authorities are responsible for receiving and documenting noise complaints from residents. In their testimony to the committee, representatives of three major airport authorities (Calgary, Montreal, and Vancouver) cited a common trend<sup>12</sup>: a small but vocal group of concentrated individuals is responsible for most of the complaints. To that effect, Table 1 below provides the number of noise-related complaints registered at four major Canadian airports

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<sup>11</sup>TRAN, *Evidence*: [Bob Sartor](#) (President, Calgary Airport Authority).

<sup>12</sup> TRAN, *Evidence*: [Sartor](#) (Calgary Airport Authority), [Anne Murray](#) (Vice-President, Airline Business Development, Vancouver Airport Authority), [Anne Marcotte](#) (Director, Public Relations, Aéroports de Montréal).



(Vancouver, Calgary, Toronto Pearson, and Montreal Trudeau) in 2017 as well as information provided on the concentrated origin of these complaints.

[Colin Novak](#), a professor specializing in environmental noise and psychoacoustics at the University of Windsor, took note of this trend and reported to the committee that the number of people affected by annoyance is statistically small but nonetheless deserving of attention and study, describing the impacted population as “a very vocal group with a very valid concern.” On that topic, [Mr. Boud](#) argued in his testimony that while complaints can be an informative metric, they should not be the only metric used to determine the extent of the aviation noise problem in a given region. [Mr. Boud](#) advised the committee to consider complaint figures on their own with some caution:

Airports and community groups argue about whether the number of noise complaints recorded is an accurate indication of the scale of the problem. I counsel that you look at complaints as only one piece of the wider evaluation as to the scale of aviation noise as a problem. There are many factors that mean you cannot directly compare the number of complaints between airports. Identifying the percentage of new complaints each year can be an informative metric, but again, it should never be considered in isolation.



**Table 1 – Concentration of aircraft noise complaints at four Canadian international airports, 2017**

Airport	Period	Total number of complaints	Concentration
Vancouver 2017	1,293	Four individuals were responsible for 64% of the complaints, including two who lived 23 kilometres from the airport.	
Calgary International Airport	2017	5,700	Five callers made 72% of all calls; two individuals called over 2700 times (48%).
Toronto Pearson Airport	2017	168,876	29 callers were responsible for 66% of all complaints.
Montreal Trudeau Airport	2017	543	3 individuals were responsible for 27% of all complaints.

Source: **Vancouver Airport** – TRAN, *Evidence*: [Anne Murray](#) (Vice-President, Airline Business

Development and Public Affairs, Vancouver Airport Authority), **Calgary Airport** – TRAN, *Evidence: Bob Sartor* (President, Calgary Airport Authority), **Toronto Pearson Airport** – Greater Toronto Airports Authority, *Noise Statistics Update*, **Montreal Trudeau Airport** – Aéroports de Montréal, *Soundscape Advisory Committee – Summary of February 2, 2008 meeting*.

## ISSUES IN NOISE ABATEMENT AND MANAGEMENT

In the written briefs and oral testimony delivered to the committee, several key issues emerged as areas where residents and some experts feel the current regime for dealing with noise complaints can be improved.

### Noise Management Committees

As part of its *Noise Abatement Procedures and Restrictions Implementation Process*, Transport Canada requires airports to consult stakeholders, including community representatives, in making operational decisions that have noise implications, such as changes in runway use or flight approaches. At major airports, this consultation takes the form of a noise management committee, a permanent body intended to provide a forum for residents to voice their noise-related concerns and receive feedback from the airport authority. Transport Canada usually requires airport authorities to establish such committees as a condition of the long-term leases it signs.<sup>13</sup>

In her testimony to the committee, *Sara Wiebe*, the Director General of Air Policy at Transport Canada, notes that the department considers specific noise issues to be best handled by stakeholders at the local level. Airport authorities are accordingly granted autonomy in determining the composition and mandate of these noise committees.

Several residents that testified before the committee expressed dissatisfaction with the effectiveness of the noise management committee model, with several witnesses using the term “façade” to describe the current public consultation process.<sup>14</sup> *Sandra Best*, representing the Toronto Aviation Noise Group (TANG), a residents' group concerned over aircraft noise at Toronto Pearson Airport, expressed her view that the GTAA seemed to view meetings of its *Community Environment and Noise Advisory Committee* (CENAC)

as a formality for gaining acceptance for pre-determined plans rather than as opportunities for genuine consultation and public involvement. *Peter Bayrachny*, a representative of the Toronto-based Neighbours Against the Airplane Noise group, took issue with community representation, noting that the committee’s members included

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<sup>13</sup> Section 8.12.02 of GTAA’s current *60-year ground lease* with Transport Canada, for example, mandates the creation of a noise management committee composed of representatives from the GTAA, the aviation industry, and federal, provincial, and municipal levels of government.

<sup>14</sup> TRAN, *Evidence: Tom Driedger* (as an individual), *Peter Bayrachny* (Representative, Neighbours Against the Airplane Noise).



residents of Toronto's eastern suburbs, but none from the communities immediately surrounding the airport who are most affected by aviation noise. [Robyn Connelly](#), the GTAA's Director of Community Relations, explained that the inclusion of such members was appropriate as the committee sought a membership that reflected the airport's status as a regional hub.

[Ms. Connelly](#) noted in her testimony that the Authority accepted the conclusion of a report provided to it by the private consulting firm Helios that its noise committee lacked a "meaningful action plan or work program" and that it would soon unveil a "more ambitious" consultation model that implements recommendations made in a 2017 report it commissioned from Helios.<sup>15</sup> That report contains a number of best practices it found from investigating the mandate and activities of similar airport noise management committees, including the establishment of a tangible work plan focused on addressing community noise complaints, wider community involvement, including working with resident groups concerned with aircraft noise, and greater independence

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<sup>15</sup>The GTAA presented its new consultation model at its meeting of CENAC on 6 December 2018. A PowerPoint presentation and video of the meeting is available on the Toronto Pearson Airport [website](#).

from the airport management, including the possible appointment of an independent chairperson.<sup>16</sup>

**“Meaningful progress is only possible if all stakeholders are present at the table on a voluntary basis, work collaboratively, are prepared to give and take, make tough decisions and are committed to the objectives of delivering noise reduction and mitigation.”**

Mr. Boud, Helios

## Noise Measurement

Canada’s tool for measuring and predicting noise near major airports, the Noise Exposure Forecast (NEF), was created in 1967 by the United States Federal Aviation Administration (FAA). Primarily designed as a land-use planning tool, the NEF system calculates a given area’s expected noise exposure (represented as an “NEF level”) by measuring the average number of flights travelling over a given area or “contour” along with several other factors. According to Dr. Novak of the University of Windsor, however, the NEF is no longer widely used outside of Canada. As a 1996 paper commissioned by the National Research Council explains, many of the formulations used in the NEF measurement, including its weighing of the effect of night-time noise, were based on assumptions rather than surveys of resident responses or other scientific evidence.<sup>17</sup> Indeed, the paper notes that while Australia once used the NEF measurement system it has since changed its time-of-day weightings to better reflect responses of a survey of residents near major airports.<sup>18</sup>

Transport Canada notes that adverse community reaction tends to start at the 25 NEF level, with complaints expected to become more vigorous at 30 NEF, and concerted group and legal action expected at 40 NEF.<sup>19</sup> Transport Canada recommends that the

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<sup>16</sup> Helios (2017), 58-9.

<sup>17</sup> Bradley, J.S., NEF Validation Study (2): Review of Aircraft Noise and its Effects, Ottawa: Institute for Research in Construction, National Research Council, 1996, page 13.

<sup>18</sup> Ibid.

<sup>19</sup> Ibid., page 2.





construction of new residential developments not proceed in areas where sound levels exceed 30 NEF.<sup>20</sup>

Dr. Novak and Ms. Jovanovic both noted that Canada's metrics for measuring aircraft noise have not been updated since the 1970s and do not reflect current international best practice in acoustic measurement.<sup>21</sup> [Bob Sartor](#), the President of the Calgary Airport Authority, similarly indicated that Calgary airport's noise exposure forecast model has not "moved" since 1972, despite greater densification around the airport.

**"Canada is in need of a proper revision and verification of current noise exposure and noise annoyance metrics and thresholds, as these are not only severely outdated, but they have never been corroborated through Canadian annoyance survey results. This is a necessary step in order to ensure that existing noise abatement policy serves its purpose."**

[Julia Jovanovic](#), University of Windsor

Experts noted key developments that have emerged in the understanding of noise on the general population, specifically survey data showing that the public is more sensitive to lower levels of noise than previously indicated and an increased emphasis on understanding and measuring the annoyance created by noise rather than simply the noise itself.

For example, [Ms. Jovanovic](#), noted that this trend has been observed internationally, with recent studies identifying transport noise annoyance on the rise, with more people expressing high levels of annoyance at lower noise exposure levels than ever before. [Dr. David Kaiser](#), a public health officer in Montreal, echoed Ms. Jovanovic's comments that public tolerance for transport noise has likely declined since Transport Canada first developed its noise level recommendations. Dr. Kaiser cited survey data from the Montreal area showing that most aircraft noise complaints come from people living outside of the NEF 25-30 contours where Transport Canada anticipates noise complaints to be most likely to arise.

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<sup>20</sup> Transport Canada, [Noise Exposure Forecast and Related Programs](#).

<sup>21</sup> TRAN, Evidence: [Dr. Novak](#) (University of Windsor), [Jovanovic](#) (University of Windsor).

[Jeff Knoll](#), a councillor in the Town of Oakville, expressed his view that scientific measurements of noise in decibels or noise compression rates are not able to fully express the concentrated nature of aircraft noise experienced by some residents living under flight paths. [Ms. Jovanovic](#) expanded on this point, noting that, given how the human ear perceives noise and the subjectivity of noise sensitivity in individuals, there is an important difference between noise mitigation and annoyance mitigation that is not addressed in current models. As [Ms. Jovanovic](#) explained, acoustics experts are paying increased attention in their research to the annoyance caused by noise rather than simply measuring overall noise levels:

Given the critical importance of annoyance, it is essential that the issue be studied at length while keeping in mind a few very important considerations...[N]oise mitigation and noise annoyance mitigation are not one and the same. This is an important distinction, as there are examples of noise mitigation efforts that have not reaped the benefits of significantly reduced noise annoyance, most notably the Frankfurt nighttime ban....Annoyance is a complex psychological and sociological phenomenon that cannot be simply and precisely predicted nor regulated through [traditional methods of measuring noise].

## Public Access to Noise Data

[Raymond Prince](#) and [Sandra Best](#), residents of Montreal and Toronto respectively who testified to the committee about their experience with aircraft noise, pointed out that airport authorities are exempt from the *Access to Information Act*, making it difficult for residents and community groups to access data on aircraft noise. Two witnesses researching aircraft noise in Canada similarly noted that data on aircraft noise is not uniformly available from all airport authorities and lacks a coherent methodology.<sup>22</sup>

[Mark Kuess](#), the Director of the Community Alliance for Air Safety (CAAS), also noted that limited data about enforcement of penalties and rule violations is made available to the public.

International aviation stakeholders have recognised public communication and knowledge as crucial tools in building public acceptance of transportation infrastructure. Community acceptance of airports is strongly connected to communication, and research studies have shown that transparency and trust are important non-acoustic factors that influence the community response to noise.<sup>23</sup> To this end, many countries

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<sup>22</sup> TRAN, *Evidence*: [Kuess](#) (CAAS), [Jovanovic](#) (University of Windsor).

<sup>23</sup> Findell, Ian H. and Pieter Jan M. Stallen, [Non-acoustical factors in environmental noise](#), *Noise & Health* 1.3 (1999): 11-16.



require aviation acoustic data to be made available to the public. Some countries have also adopted legislation requiring the development and publication of noise maps or other data.<sup>24</sup>

While airport authorities develop NEF contour maps using software provided by Transport Canada, these maps are the property of the airport authorities, who may choose to share them with municipal government or other entities with land use planning authority. In fact, Transport Canada states on its website that such maps are not intended for public use.<sup>25</sup> In a written brief provided to the committee, Toronto-area resident [Antonio Natalizio](#) notes that while airports generally do not make noise contour information public, Health Canada advises residents to obtain such maps to determine whether their house is in a high NEF level area.

In a report prepared for the GTAA, the aviation consultancy firm Helios notes the importance of airports making information not only available, but also easily understandable to laypeople through the adoption of easily comprehensible measurements.<sup>26</sup> Some Canadian airports have taken measures to make user-friendly noise information available online. Vancouver International Airport, for example, allows the public to monitor incoming and outgoing flights online in near real-time with its [WebTrak software](#) portal. In addition to information on flight movements, this application displays recorded decibel levels at noise measurement stations throughout the Vancouver area and allows users to submit complaints about aircraft that may have exceeded maximum noise levels.

Dr. Novak and Ms. Jovanovic both identify Australia as an international leader in airport data transparency, noting that Australian airports enjoy a cooperative relationship with their surrounding communities, who frequently request and receive information on flight operations and noise from airport authorities.<sup>27</sup> Major Australian airports, like their Canadian counterparts, are run by private corporations that sign long-term leases with the Australian federal government.

In 2002, the European Union established a legally-binding [Environmental Directive on](#)

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<sup>24</sup> See, for example, the United States ([Noise Control Act](#) (1972)) and France ([Loi 85-696 du 11 juillet 1985 relative à l'urbanisme au voisinage des aéroports](#)).

<sup>25</sup> Transport Canada, [Noise Exposure Forecast and Related Programs](#).

<sup>26</sup> [Helios \(2017\)](#), page 69.

<sup>27</sup> TRAN, *Evidence*: [Dr. Novak](#) (University of Windsor), [Jovanovic](#) (University of Windsor).

[Noise](#), which sets decibel limits for noise in various transport sectors, including aircraft noise, and requires EU member countries to publish noise maps and action plans for major airports in their territory.

## Oversight of Canada's Aviation Sector

In 1992, Canada began privatising the management of its large commercial airports through long-term leases with private, not-for-profit organizations called airport authorities. Currently, such authorities manage all but four of the 26 airports that compose Canada's [National Airports System](#). Transport Canada currently operates on what one stakeholder witness refers to as a "self-regulation model"<sup>28</sup>, with the department explaining in its own testimony that it does not exercise day-to-day oversight over civil aviation operations or business decisions and expects airport authorities to monitor and enforce flight operations to ensure compliance with safety and security standards<sup>29</sup>.

In 1996, the government extended its privatisation of the aviation sector through the sale of the ownership and operation of Canada's Air Navigation System to [NAV CANADA](#), a private company that continues to provide air traffic control service and civil navigation oversight to Canadian aircraft. The federal government continues to exercise oversight over NAV CANADA, including the appointment of three members to its 16-member [board of directors](#) and the enforcement of legislation which, among other provisions, places limits on service fees it may charge air carriers.

In June 2015, NAV CANADA adopted a [voluntary communications and consultation protocol](#) to ensure greater public participation in its decision making processes, particularly regarding decisions that may expose communities to aircraft noise. [Ms. Best](#) noted that the organization's public outreach and responsiveness has notably improved since the adoption of this protocol, and called for its provisions to be legislated to ensure continued compliance and accountability. Conversely, [Mr. Prince](#) accused NAV CANADA of not following its voluntary commitment to consult the public on flight path changes.

Some citizen groups complained to the committee that the privatization of NAV CANADA and local airport authorities has made them largely unaccountable to their

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<sup>28</sup> TRAN, Evidence: [Kuess](#) (Director, Community Alliance for Air Safety).

<sup>29</sup> TRAN, Evidence: [Sara Wiebe](#) (Director General, Air Policy, Transport Canada).



surrounding communities and expressed scepticism over the ability of either entity to fairly consider and respond to public noise complaints given their financial relationship with airlines.<sup>3031</sup>

While many other Western countries have privatised their civil aviation sectors to some degree since the 1980s, all of them continue to exercise some degree of oversight. Some countries have established independent entities with statutory authority to investigate and arbitrate noise complaints.

These independent entities, sometimes dubbed noise ombudsmen, are charged with handling noise complaints or overseeing the noise complaint process. Examples of such bodies include Australia's [Aircraft Noise Ombudsman](#), a government-funded office that handles complaints about aircraft noise, monitors the presentation and distribution of aircraft noise-related information, and makes non-binding recommendations to Airservices Australia, the country's civil aviation authority. Several residents dealing with aircraft noise in their communities expressed a desire for such an independent oversight entity in Canada.<sup>32</sup> Helios' report on best practices in aircraft noise management notes that the creation of a Canadian aircraft noise ombudsperson would require discussion between airport authorities and Transport Canada as well as possible new legislation.<sup>33</sup>

Another potential gap in Canada's current aviation oversight regime mentioned during this study relates to the authority over noise produced by foreign aircraft. As [Neil Wilson](#), the President and CEO of NAV CANADA notes, Canada is at an international aviation crossroad, with many flight paths between Europe and the United States crossing Canadian airspace. [Mr. Wilson](#) notes that while NAV CANADA is responsible for making sure that foreign aircraft are safe while in Canadian airspace, it does not have a mandate to restrict their flight, including any noise they may produce. [Michael Robinson](#), the Director General of Civil Aviation at Transport Canada, similarly noted that while the department has requirements with regard to safety and security with

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<sup>30</sup> Airport authorities charge airlines fees to use their facilities (see, for example, Toronto Pearson Airport's [Terminal Charges and Landing Fees](#)), while NAV CANADA charges fees to airlines and other aircraft operators that use its services (see, NAV CANADA, [Service Charges](#)).

<sup>31</sup> TRAN, *Evidence*: [Driedger](#) (as an individual), [Bayrachny](#) (Neighbours Against the Airplane Noise), [Laquerre](#) (as an individual), [Best](#) (TANG), [Chris Isaac](#) (as an individual).

<sup>32</sup> TRAN, *Evidence*: [Antonio Natalizio](#) (as an individual), [Ilona Maziarczyk](#) (Markland Wood Homeowners Association), [Prince](#) (as an individual).

<sup>33</sup> [Helios \(2017\)](#), page 63.

aircraft landing at Canadian airports, these requirements do not specifically address noise.

Transport Canada notes the following on its website:

All aircraft operators must comply with the noise operating restrictions and noise abatement procedures, which are published by NAV CANADA in the Canada Air Pilot and the Canada Flight Supplement...Penalties for violating these procedures and restrictions can be as high as \$5,000 for an individual and \$25,000 for a company. NAV CANADA updates these publications every 56 days to ensure that flights comply with the latest operating standards.<sup>34</sup>

Elsewhere on its website, the department provides information on [corporate](#) and [noncorporate](#) offenders who have committee infractions under the *Canadian Aviation Regulations*, including violations of noise abatement procedures and noise control requirements listed in the *Canada Flight Supplement* or *Canada Air Pilot*.<sup>35</sup> The provided data, however, do not detail the specific infraction or where it occurred beyond a broad geographic region. Similarly, it is not clear if aircraft passing through Canadian airspace, rather than landing at a Canadian airport, would be subject to such enforcement measures.

## Health Concerns

A [2007 report](#) from the ICAO's Committee of Aviation and Environmental Protection's Noise Panel concluded that there is sufficient scientific evidence of a relationship between exposure to aircraft noise and five areas of human health and wellbeing:

- community annoyance;
- sleep disturbance/awakening;
- hypertension;
- cognitive and academic performance of children; and
- speech and communication interference.

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<sup>34</sup> Transport Canada, [Managing Noise from Aircraft](#).

<sup>35</sup> See, for example, the [October 2018](#) summary of enforcement actions, which includes a \$150,000 penalty issued to Philippines Airlines for not respecting noise controls on six occasions in the Ontario region.



The ICAO study also notes that full causality between aviation noise and health effects has not been established and that the above health effects can be influenced by several factors, including differences in noise sensitivity, variability in human hearing ability, the impact of other sources of noise, and socio-economic factors.

A 2010 [publication](#) from Health Canada, which provides advice to Transport Canada and other public authorities on the health effects of aircraft noise, appears to disagree with some of the ICAO's conclusions. Health Canada notes that while studies on possible links between noise and stress-related health concerns are ongoing, it does not consider there to be sufficient evidence in the existing scientific literature of a link between aircraft noise and either heart disease in adults or chronic stress in children.

Several witnesses living in areas with high levels of aircraft noise testified about health concerns, often citing scientific studies that claimed a connection between prolonged exposure to aircraft noise and a variety of poor health outcomes.<sup>36</sup> [Dr. Kaiser](#) cited evidence from the World Health Organization (WHO) concluding that there is “highquality” evidence of a link between aircraft noise and annoyance, which affects quality of life and is also a factor contributing to a wide variety of health outcomes.

Shortly before the committee began its study, the WHO released a publication on noise in the European region that set a guideline exposure level of 45 decibels (dB) using a balanced day-evening-night metric (Lden) for aircraft noise and a level of 40 dB using a night-weighted metric (Lnight) for aircraft noise at night, concluding that aircraft noise above these levels is associated with adverse health effects.<sup>37</sup> The study found that there is moderate-quality evidence of an association between exposure to aircraft noise at levels above 45 dB Lden and annoyance as well as poorer reading comprehension in children.<sup>38</sup> It also found moderate-quality evidence of an association between exposure to night-time aircraft noise at levels above 40 dB and negative effects on sleep.<sup>39</sup> In addition to these guidelines, the publication also reviewed evidence of possible measures taken to reduce aircraft noise exposure. Of the measures examined, the WHO

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<sup>36</sup> TRAN, *Evidence*: [Bayrachny](#) (Neighbours Against the Airplane Noise), [Domingue](#) (Comité antipollution des avions de Longueuil), [Saulius Brikis](#) (Director, Markland Wood Homeowners Association).

<sup>37</sup> World Health Organization Regional Office for Europe, [Environmental Noise Guidelines for the European Region](#), 2018, page 61.

<sup>38</sup> *Ibid.*, pages 61-2.

<sup>39</sup> *Ibid.*, page 62.

found moderate-quality evidence in scientific literature of changes to flight paths resulting in improved health outcomes.<sup>40</sup>

Two witnesses expressed concerns over the WHO's updated guidelines. [Dr. Novak](#) questioned the "strength and validity" of the organization's conclusions and recommendations, explaining that he felt the WHO guidelines do not place proper

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<sup>40</sup> Ibid., pages 71-3.



emphasis on annoyance as a cause of health problems.<sup>41</sup> [Mr. Boud](#) submitted an article from the *International Journal of Environmental Research and Public Health*<sup>42</sup> to the committee that criticizes the WHO's findings on annoyance at levels above 45 dB Lden. The article argues that the WHO included surveys in its aircraft noise dataset that should have been eliminated for not following standardized research methods. It concludes that eliminating these problematic studies would result in a guideline exposure level of 53 dB Lden. These differing conclusions on noise guidelines speak to the lack of international consensus on a specific measurement for aviation stakeholders to achieve in their operations. [Mr. Boud](#) noted that European airports use a standard of 55 decibels as a benchmark in measuring flight noise, but that this is not a strict limit to be achieved by the airports themselves.

**“In order to better understand what's going on and to inform people of potential impacts to their health, we need to have access to data. At the present time, we don't have access to information about where planes are in the air, how many there are, and what types they are. We don't have access to the noise measurements. Access to data is recommendation one.”**

[Dr. David Kaiser](#), Montreal Public Health Authority

As in other areas of this study, witnesses cited a significant lack of Canadian data on health effects and difficulty in obtaining the data necessary to make evidence-based recommendations.<sup>43</sup> [Dr. Kaiser](#) stressed the need for local health authorities to have more access to data on flight movements to properly assess the impact of flights on their communities and not rely on anecdotal evidence.

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<sup>41</sup>TRAN, Evidence: [Dr. Novak](#) (University of Windsor).

<sup>42</sup> Gjestland, Truls. [A Systematic Review of the Basis for WHO's New Recommendation for Limiting Aircraft Noise Annoyance](#), *International Journal of Environmental Research and Public Health* 15.12 (2018).

<sup>43</sup>Evidence: [Jovanovic](#) (University of Windsor), [Dr. Kaiser](#) (Montreal Public Health).  
TRAN,

## Night Flights

Canada's major international airports enforce location-specific noise abatement procedures for night-time flights that may set limits on the size of aircraft that may land or depart during certain hours or outline special landing patterns or other flight practices designed to minimize noise exposure levels in surrounding residential areas.<sup>44</sup> These restrictions are included in the *Canada Air Pilot* and the *Canada Flight Supplement*, published by NAV CANADA on a regular basis for aircraft operators working in Canadian airspace. Transport Canada allocates the country's busiest airport, Toronto Pearson, an annual "budget" of scheduled flights that may operate during this time based on a formula that considers overall passenger numbers at the airport.<sup>45</sup>

Several witnesses representing resident groups or testifying as individuals expressed concern over flights operating during night hours, with some expressing a desire to ban such flights completely to ensure that residents receive a pause from noise to allow for uninterrupted sleep.<sup>46</sup> A brief from the [Markland Woods Homeowners Association](#), a group of residents concerned with aircraft noise at Toronto Pearson Airport, notes that the airport's night hours were originally 22:00 to 07:00, before being reduced to eight hours and ultimately to the current six hour period. [Mr. Boud](#) and [Ms. Marshall](#) reported that most flights arriving during these hours are passenger flights, with cargo flights a distant second, indicating public demand for flights at night.

Those arguing for a total prohibition on night flights at major Canadian airports frequently point to Germany's Frankfurt International Airport as an example of a major international airport that has successfully implemented such a ban while continuing to serve as the busiest German airport and the fourth busiest in Europe.<sup>47</sup> In October 2011, the German state of Hesse issued a ban on all flights between 23:00 and 06:00., severely restricting operations at Frankfurt International.<sup>48</sup> Expert witnesses explained to the

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<sup>44</sup> See, inter alia, Vancouver Airport, [Night-time aircraft operations](#), Toronto Pearson Airport, [Night Flight Restriction Program \(NFRP\) Overview](#), Montreal Trudeau Airport, "Operating restrictions during certain hours" in [Noise Abatement](#).

<sup>45</sup> See [Backgrounder: Toronto Pearson Night Flight Budget – Understanding the 2013 Amendment](#).

<sup>46</sup> TRAN, *Evidence*: [Pierre Lachapelle](#) (Les Pollués de Montréal-Trudeau), [Raymond Prince](#) (as an individual).

<sup>47</sup> TRAN, *Evidence*: [Kuess](#) (CASS), [Driedger](#) (as an individual), [Natalizio](#) (as an individual), [Renee Jacoby](#) (Founding Chair, Toronto Aviation Noise Group).

<sup>48</sup> Deutsche Welle, [Dead of night flights banned at Frankfurt](#), 4 April 2012.

TRAN, *Evidence*:



committee, however, that this blanket night flight ban did not result in any change in overall annoyance levels among Frankfurt residents, rendering it largely ineffective as a noise abatement tool.<sup>49</sup>

[Ms. Marshall](#) expressed her view that further restrictions on night flights would have harmful economic consequences for the Toronto region and the Canadian economy. This message was echoed by [David Wojcik](#), the President and CEO of the Mississauga Board of Trade, who estimated that a night time ban would result in a \$6 billion loss in economic activity as well as job losses. The GTAA cited an increased desire for direct passenger flights to Canada's west coast as well as long-haul destinations in Asia as a key impetus for the increase in night flights in recent years.<sup>50</sup>

The 2017 Helios report notes, however, that Toronto Pearson's night hours are shorter than most of its counterparts at other airports.<sup>51</sup> While flights operating at Pearson between the hours of 00:30 and 06:00 are restricted, most international airports have a designated night period of at least eight hours. Many airports also take a noise-based approach to flight restrictions. London Heathrow Airport, for example, enforces a noise quota that places a limit on the overall noise made by aircraft landing or taking off between the hours of 23:00 and 07:00 and issues increased noise charges to aircraft landing during this period.<sup>52</sup>

## Reducing Noise “At The Source” Through Quieter Aircraft

Airlines play an important role in reducing airplane noise “at the source” through their acquisition of quieter aircraft and ensuring that flight crews follow noise-mitigating flight practices. As noted above, the current fleet of aircraft operating at major Canadian airports are, by any metric, considerably quieter than their predecessors. Some airports seek to encourage airlines to continually acquire and operate quieter aircraft using various incentives. Vancouver International Airport, for example, issues an annual [Fly Quiet](#) award to the airline that best adheres to the airport's noise abatement procedures and produces the lowest measured noise levels for aircraft in its category.

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<sup>49</sup>[Novak](#) (University of Windsor), [Jovanovic](#) (University of Windsor).

<sup>50</sup>TRAN, *Evidence*: [Marshall](#) (GTAA).

<sup>51</sup>[Helios \(2017\)](#), page 20.

<sup>52</sup> *Ibid.*, page 17-18.

TRAN, *Evidence*:

A notable example of the importance of noise reduction in aircraft is Air Canada's Airbus A320 fleet. [Ms. Marshall](#) identified this group of aircraft as producing an identifiable high-pitched "whine" related to air intake and noted that the GTAA had asked carriers operating at Toronto Pearson to take measures to correct it. Airbus has identified the noise as a defect caused by air flowing over vents in the aircraft's wings and has notified airlines that the issue can be remedied with the installation of a vortex generator, a small metal piece available from the manufacturer at minimal cost.<sup>53</sup> According to Helios, this retrofit can reduce the noise generated by the aircraft by 49 decibels.<sup>54</sup>

The GTAA has made the A320 repair part of its 2020 Noise Management Plan and has requested that Air Canada install vortex generators on its fleet by the end of 2020.<sup>55</sup> As he mentioned during his 27 November 2018 appearance before the committee, Marc Garneau, the Minister of Transport, has held conversations with Air Canada asking it to retrofit its fleet within the timeframe established by the GTAA.<sup>56</sup> [Mr. Strom](#) noted that the airline would only have 15% of its fleet retrofitted by the end of 2018 and only 80% by the 2020 deadline, citing the logistical difficulties faced in taking these aircraft out of service for maintenance as well as the lack of repair kits currently available from Airbus. [Mr. Strom](#) also sought to downplay the noise reduction that would result from such a retrofit, claiming that it would reduce the aircraft's overall noise by only three percent. A number of Air Canada's international peers, including Air France, British Airways, easyJet, and Lufthansa, are reported to have already made this change.<sup>57</sup> [Ms. Best](#), on behalf of the community group TANG, asked for the acceleration of this retrofit process, which [Mr. Knoll](#) described as occurring at a "molasses-like rate".

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<sup>53</sup> [Boud](#) (Helios).

<sup>54</sup> [Helios \(2017\)](#), page 13.

<sup>55</sup> TRAN, *Evidence*: [Marshall](#) (GTAA).

<sup>56</sup> TRAN, *Evidence*: [Hon. Marc Garneau](#) (Minister of Transport).

<sup>57</sup> [Marshall](#) (GTAA).

TRAN, *Evidence*:

## APPENDIX A LIST OF WITNESSES

The following table lists the witnesses who appeared before the Committee at its meetings related to this report. Transcripts of all public meetings related to this report are available on the Committee's [webpage for this study](#).

Organizations and Individuals	Date	Meeting
<b>As individuals</b>	2018/10/23	115
Chris Isaac		
Julia Jovanovic, Ph.D. Candidate University of Windsor		
Colin Novak, Associate Professor University of Windsor		
<b>Community Alliance for Air Safety</b>	2018/10/23	115
Al Kaminskis, Public Relations		
Mark Kuess, Director		
<b>Mississauga Board of Trade</b>	2018/10/23	115
David Wojcik, President and Chief Executive Officer		
<b>Terranova International Public Safety Canada (Terranova Aerospace)</b>	2018/10/23	115
James Castle, President		
Priscilla Tang, Senior Vice-President		
<b>As individuals</b>	2018/10/25	116
Richard Boehnke		
Tom Driedger		
<b>Neighbours Against the Airplane Noise</b>	2018/10/25	116
Peter Bayrachny, Representative		
<b>Aéroports de Montréal</b>	2018/10/30	117
Anne Marcotte, Director Public Relations		
Martin Massé, Vice-President Public Affairs		
Organizations and Individuals	Date	Meeting

<b>Calgary Airport Authority</b> Carmelle Hunka, General Counsel and Senior Director Risk & Compliance	2018/10/30	117
<b>Calgary Airport Authority</b> Bob Sartor, President	2018/10/30	117
<b>Department of Transport</b> Dave Dawson, Director Airports and Air Navigation Services Policy Clifford Frank, Associate Director Operations (West) Nicholas Robinson, Director General Civil Aviation Joseph Szwalek, Regional Director Civil Aviation – Ontario Sara Wiebe, Director General Air Policy	2018/10/30	117
<b>NAV CANADA</b> Jonathan Bagg, Senior Manager Public Affairs Blake Cushnie, National Manager Performance-based Operations Neil Wilson, President and Chief Executive Officer	2018/10/30	117
<b>Vancouver Airport Authority</b> Mark Cheng, Supervisor Noise & Air Quality Anne Murray, Vice-President Airline Business Development and Public Affairs	2018/10/30	117
<b>As individuals</b> Paul-Yanic Laquerre Raymond Prince	2018/11/08	120
<b>Comité antipollution des avions de Longueuil</b> Johanne Domingue, President	2018/11/08	120
<b>Markland Wood Homeowners Association</b> Saulius Brikiš, Director Ilona Maziarczyk, Director	2018/11/08	120
<b>Organizations and Individuals</b>	<b>Date</b>	<b>Meeting</b>

<b>Greater Toronto Airports Authority</b>	2018/11/27	122
Michael Belanger, Director Aviation Programs and Compliance		
Robyn Connelly, Director Community Relations		
Hillary Marshall, Vice-President Stakeholder Relations and Communications		
<b>Halton Region</b>	2018/11/27	122
Jeff Knoll, Town and Regional Councillor Town of Oakville and Regional Municipality of Halton		
<b>Toronto Aviation Noise Group</b>	2018/11/27	122
Sandra Best, Chair		
Renee Jacoby, Founding Chair		
<b>As an individual</b>	2018/11/29	123
Antonio Natalizio		
<b>Direction de santé publique de Montréal</b>	2018/11/29	123
David Kaiser, Medical Officer Urban Environment Service and Healthy Lifestyle		
<b>Les Pollués de Montréal-Trudeau</b>	2018/11/29	123
Pierre Lachapelle, President		
<b>Helios</b>	2018/12/06	125
Nick Boud, Principal Consultant		
<b>Air Canada</b>	2018/12/11	126
Samuel Elfassy, Vice-President Safety		
Murray Strom, Vice-President Flight Operations		
<b>WestJet Airlines Ltd.</b>	2018/12/11	126
Scott Wilson, Vice-President Flight Operations		





## APPENDIX B LIST OF BRIEFS

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The following is an alphabetical list of organizations and individuals who submitted briefs to the Committee related to this report. For more information, please consult the Committee's [webpage for this study](#).

**Baird, William**

**Better Flight Paths Group**

**Bezant, Toinette Burford,**

**Ken**

**Chin, Don**

**Comité antipollution des avions de Longueuil**

**Cue, Mary**

**Davanzo, Amanda**

**Direction de santé publique de Montréal**

**Driedger, Tom**

**Fehr, Pat**

**Fehr, Trish**

**Fisher, Ian**

**Gavan, Mary**

**Hillard, Jane**

**Kurak, Ed**

**Les Pollués de Montréal-Trudeau**

**Long Branch Neighborhood Association**

**Maj, Kasia**

**Mandel, Ezra**

**Markland Wood Homeowners Association**

**Mayes, Jan**

**Natalizio, Antonio**

**Perry, Lee**

**Singh, Perminder**

**Slatter, Richard**

**Smith, Shawn**

**Steele, Richard**

**Sutherland, Gary**

**Thackray, George**

**Toronto Aviation Noise Group**

**Watt, Patricia**

## REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the Committee requests that the government table a comprehensive response to this Report.

A copy of the relevant *Minutes of Proceedings* (Meetings Nos. 115 to 117, 120, 122, 123, 125, 126, 128, 132 and 133) is tabled.

Respectfully submitted,

Hon. Judy A. Sgro, P.C., M.P. Chair



### Supplementary Opinion by the NDP

The NDP supports the majority report of the study *Assessing the Impact of Aircraft Noise in the Vicinity of Major Canadian Airports*, even though it overlooks a number of crucial issues and essential evidence. In order to compensate for its failings, we wish to issue this supplementary opinion to the report.

The additional information provided by the NDP combines economic development and the public's well-being. It reflects the ideas and values defended by the New Democrats, and the expectations of Canadians, particularly with respect to the issues of cohabitation and public health.

First of all, we believe that the government must focus on the healthy cohabitation of the public and major airport administrations. A fair balance must be established between the wellbeing of Canadians and the economic activities of airports. To that end, people must be able to enjoy periods of time free from the stressful noise of planes.

**Recommendation 1: That the federal government, except in extraordinary circumstances, prohibit take-offs and landings in major Canadian airports at night, that is, between 11 pm and 7 am.**

*"People who live near airports often feel like second-class citizens. They cannot enjoy a normal evening like everyone else. Cargo aircraft begin flying over homes at 4 a.m. At about 5 a.m., 6 a.m. and 7 a.m., there are itinerant flights headed towards the regions. Between 8 a.m. and 11 p.m., there are local flights by small aircraft that transport packages. We are woken up starting at 4 a.m. and constantly bombarded by the noise."*

- Johanne Domingue, Comité antipollution des avions de Longueuil

Mrs. Domingue, appearing before the Committee, testified to the problems caused by constant flights near residential neighbourhoods. In light of the known health risks, measures must be taken to limit the negative externalities that Canadians face.

Then, even though there are a number of studies confirming the harmful effects that noise has on health, including disrupted sleep and cardiovascular health, a thorough Canadian study must be done of the situation, with a major focus on public health.

**Recommendation 2: That Health Canada undertake a thorough study of the effects of noise on public health around major Canadian airports.**

*"Of course we want to know more and better document the problem. Let me come back to what I said earlier: noise is harmful to health, and we have already gathered very good evidence on this subject."*

- David Kaiser, Direction de santé publique de Montréal

Dr. Kaiser emphasized the idea of creating our own Canadian noise management model rather than simply copying what is done elsewhere. To create that model, the proper stakeholders and various orders of government must be brought together around the same table. This must be a made-in-Canada model, which is why it is so important that Canada Health conduct a thorough public health study.

Finally, Canada must take inspiration from the various studies that do exist and establish a standard based on scientific data. That standard is the one established by the World Health Organization.

**Recommendation 3: That the federal government establish and respect the World Health Organization's noise standard around major Canadian airports.**

*"In terms of noise standards, there is already a very good starting point, which is the WHO guidelines. They were just renewed, and they are based on the best available evidence. We know what we should be aiming for; we have that information."* - David Kaiser, Direction de santé publique de Montréal

Once again, Dr. Kaiser has just highlighted the importance of policies based on the most recent data and the most rigorous studies on the subject. The World Health Organization's weighted index gives us a very good idea of what we should be aiming for in Canada.

Finally, several witnesses mentioned the difficulties of mediation and discussion between airport authorities and citizen groups.

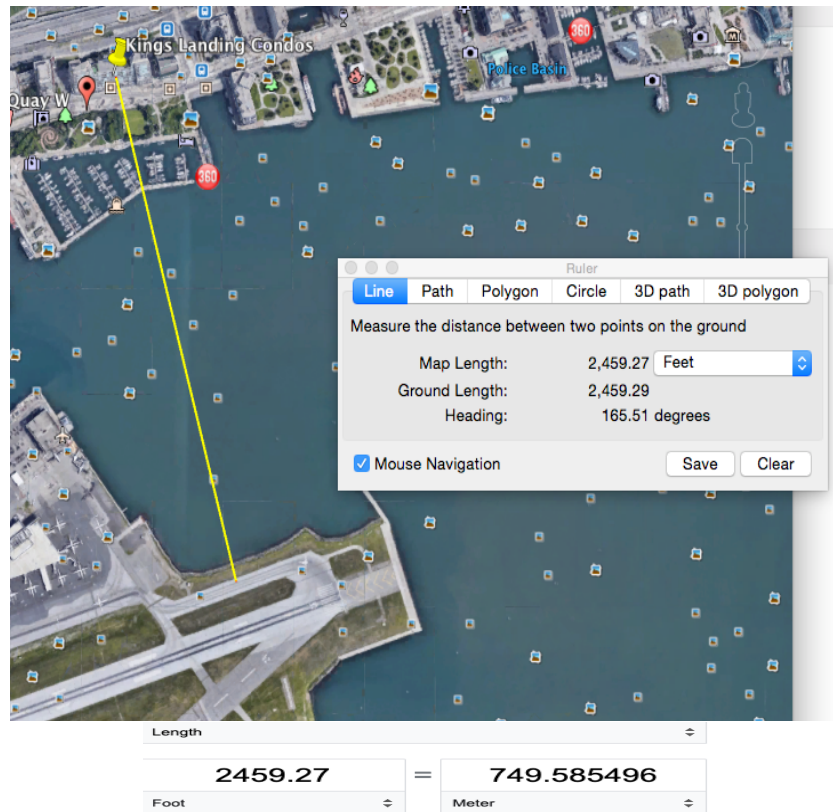
**Recommendation 4: That the federal government study the specific issues faced by major airports located outside major centers, such as Saint-Hubert, and take the necessary measures to ensure good relations between airport authorities and neighboring communities**

*"Given that this airport's runway is located in a densely populated area, the residents took action. We should not forget that small aircraft such as the Cessna 150 and Cessna 152, which are not equipped with noise suppressors, use this airport. There is a large number of local flights and more than 90,000 itinerant flights. The total number of flights is close to 199,000. For some years, this airport has held the Canadian record for the number of small aircraft flights and local flights. Residents swung into action in 2009. It is impossible and unthinkable for residents to tolerate this level of aircraft movement. It is truly abusive and excessive. We met with the elected officials of our town councils and held a public consultation in 2010, in which members of the community were very involved. We received 69 briefs, 200 solutions and 49 recommendations. One year later, despite all of this, the residents had to apply to the class action assistance fund in order to launch a class action suit as the matter was not resolved."* - Johanne Domingue, Comité antipollution des avions de Longueuil

For this reason, the situation at the Saint-Hubert airport is an example not to follow.



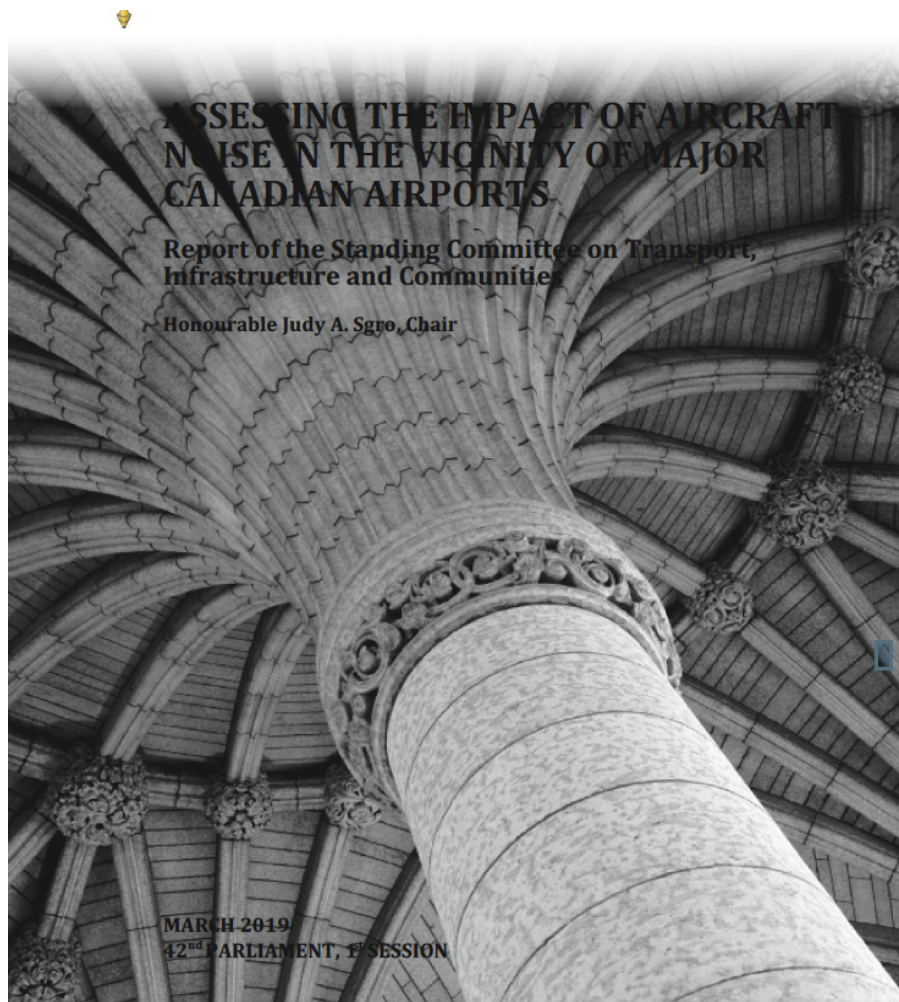
## Doc 1: Distance from KL to Billy Bishop Airport East Runway





### Questions: (Lesley Monette)

- How has Transport Canada addressed the concerns about the NEF measurement being out of date and not used around the world? See below from Report Doc 2 Full Report
- How has Transport Canada addressed the following recommendations from the following Committee Report since March 2019? (Listed the most important Recommendations first) See below from Doc 2 Full Report
- How does the NEF Standard accurately and adequately address Noise, and Health concerns of residents so close to airport runways when the airport is situated surrounded by water? See Doc 3



### NEF Standards

#### Noise Measurement

“Canada’s tool for measuring and predicting noise near major airports, the Noise Exposure Forecast (NEF), was created in 1967 by the United States Federal Aviation Administration (FAA). Primarily designed as a land-use planning tool, the NEF

system calculates a given area's expected noise exposure (represented as an "NEF level") by measuring the average number of flights travelling over a given area or "contour" along with several other factors.

According to Dr. Novak of the University of Windsor, however, the NEF is no longer widely used outside of Canada. As a 1996 paper commissioned by the National Research Council explains, many of the formulations used in the NEF measurement, including its weighing of the effect of night-time noise, were based on assumptions rather than surveys of resident responses or other scientific evidence.<sup>17</sup> Indeed, the paper notes that while Australia once used the NEF measurement system it has since changed its time-of-day weightings to better reflect responses of a survey of residents near major airports."<sup>18</sup>

## LIST OF RECOMMENDATIONS

*As a result of their deliberations committees may make recommendations which they include in their reports for the consideration of the House of Commons or the Government. Recommendations related to this study are listed below.*

### **Recommendation 7 — Noise Exposure Forecast and Noise Measurement Review**

***That Transport Canada support efforts to modernize outdated noise metrics. These efforts should include the review of Canada's Noise Exposure Forecast model to ensure that it is in keeping with the most recent scientific evidence and international norms on noise measurement and human perception of noise.***

### **Recommendation 9 – World Health Organization Standards**

***That Transport Canada assess how noise exposure forecasts are conducted and consider implementing and complying with the World Health Organization standard on noise around large Canadian airports.***

### **Recommendation 12 — Cooperation with Municipal, Provincial and Territorial Health Authorities**

***That the Government of Canada work in cooperation with municipal, provincial and territorial health authorities to:***

***.support research to better understand the impact of aircraft noise-related annoyance on human health, including location-specific epidemiological studies as well as examining mitigation measures for individuals who are sensitive to noise disturbances; and***

***.issue recommendations and guidelines, based on Canadian data and best practices in other jurisdictions, on effective models to manage and mitigate noise impacts on communities.***

### **Recommendation 15 — Reducing noise at the source**

***That Transport Canada recommend that Canadian airlines install noisereducing equipment as soon as possible as it becomes available, and that airlines provide regular updates on progress and timelines associated with the installation of such equipment. Furthermore, that Transport Canada, in continuing to monitor airlines' progress along these timelines, consider sanctions for those that continue to operate unmodified aircraft.***

### **List of all Recommendations from the Report**

#### **Recommendation 1 — Consideration of Noise Impacts**

***That Transport Canada recommend that NAV CANADA, airport authorities and airlines carefully consider noise impacts in their operational decisions, policies and equipment-purchasing decisions.***

## **Recommendation 2 — Noise Management Committees**

That Transport Canada produce detailed guidelines for airport noise management committees to ensure greater transparency and enhanced public participation in, as well as notification of, airport authority decisions that may involve significant operational changes at major Canadian airports affecting flights paths or any other significant decisions that could increase noise pollution.

## **Recommendation 3 – Rotation of Runways**

That Transport Canada investigate the potential benefits of airports rotating the use of their runways in a more equitable way, where possible in order to better manage noise.

## **Recommendation 4 – Continuous Descent Approaches**

That Transport Canada use tools at its disposal to ensure that airlines use continuous descent approaches as much as possible in order to reduce aircraft noise.

## **Recommendation 5 – Implementation of Helios Recommendations**

That Transport Canada work with airport authorities and NAV CANADA to implement any outstanding recommendations stemming from the Helios study as soon as possible without compromising on safety; and that airport authorities and NAV CANADA be required to provide regular updates on their progress in implementation.

## **Recommendation 6 – Calgary International Airport**

That Transport Canada and NAV CANADA study the implications of shifting the west side approach to Calgary International Airport and its new runway further west so that aircraft noise levels impact a smaller population outside the city's western boundary than the current route directly over the city.

## **Recommendation 7 — Noise Exposure Forecast and Noise Measurement Review**

*That Transport Canada support efforts to modernize outdated noise metrics. These efforts should include the review of Canada's Noise Exposure Forecast model to ensure that it is in keeping with the most recent scientific evidence and international norms on noise measurement and human perception of noise.*

## **Recommendation 8 — Data Transparency**

That Transport Canada recognize the importance of data transparency in building public acceptance for transportation infrastructure by collecting more data on noise in order to introduce evidence-based noise mitigation measures. Furthermore, that Transport Canada publicly release the data it has compiled including Noise Exposure Forecast contour maps and data on noise violations including sanctions imposed. This data should be made available to the public on its website.

## **Recommendation 9 – World Health Organization Standards**

*That Transport Canada assess how noise exposure forecasts are conducted and consider implementing and complying with the World Health Organization standard on noise around large Canadian airports.*

## **Recommendation 10 – Collaboration with Independent Advisory Bodies**

That Transport Canada direct NAV CANADA and airport authorities to collaborate on a regular basis with independent advisory bodies that include community representatives and to share information with such bodies in a transparent manner. The membership of such bodies should include representatives from Transport Canada, NAV CANADA, airport authorities, Health Canada and citizens.

### **Recommendation 11 — Aircraft Noise Ombudsperson**

That the Government of Canada consider the creation of an independent ombudsperson modelled after those in other countries to review and adjudicate aircraft noise complaints that are not able to be resolved in the existing airport noise management committee structure.

### **Recommendation 12 — Cooperation with Municipal, Provincial and Territorial Health Authorities**

*That the Government of Canada work in cooperation with municipal, provincial and territorial health authorities to:*

*.support research to better understand the impact of aircraft noise-related annoyance on human health, including location-specific epidemiological studies as well as examining mitigation measures for individuals who are sensitive to noise disturbances; and*

*.issue recommendations and guidelines, based on Canadian data and best practices in other jurisdictions, on effective models to manage and mitigate noise impacts on communities.*

### **Recommendation 13 — Foreign Aircraft Operations**

That NAV CANADA and Transport Canada collaborate with airport authorities and other stakeholders to clarify the oversight of international aircraft passing through Canadian airspace.

### **Recommendation 14 — Night Flight Policy Review**

*That Transport Canada review its policy on night flights at Canadian airports to ensure that its current practice offers the best balance between economic benefits and the wellbeing of residents.*

### **Recommendation 15 — Reducing noise at the source**

*That Transport Canada recommend that Canadian airlines install noisereducing equipment as soon as possible as it becomes available, and that airlines provide regular updates on progress and timelines associated with the installation of such equipment. Furthermore, that Transport Canada, in continuing to monitor airlines' progress along these timelines, consider sanctions for those that continue to operate unmodified aircraft.*

### **Recommendation 16 — Land-use planning**

That Transport Canada encourage and work with airport authorities and municipalities to integrate long-term land use planning when developing local official plans and related zoning.

## **Appendix D**

### **Additional Comments Submitted by Email**

*Additional comments were received following the meeting from the YQNA representative.*

**Email Submission – February 7, 2023 at 9:03 AM**

- Peak Planning Day considerations are important ones as the 1996 NEF Validation Study found that at Ottawa airport, there was a 40% discrepancy between the number of peak planning day movements and the 95th percentile day movements.
- Even though the NEF Validation Study was clearly not written by or for engineers and contains some typos, he would still recommend that NEF beginners read all 3 volumes of it.
- In the annual contour reports, the aircraft movements on the peak planning day are listed. Requested that the certified noise data (ie. EPNL, PNLTM, and D) for each of those aircraft, for each of the 3 ICAO noise measurement reference points, be added to the summary table for airport decision makers.