

# GTAA

## 2007 NOISE MANAGEMENT REPORT

Toronto Pearson International Airport

Toronto Pearson International Airport



# CONTENTS

Message from the Chair	1
Toronto Pearson International Airport and the GTAA	2
Noise Management at Toronto Pearson	4
Understanding Noise	4
Aircraft Noise Certification Levels	6
Noise Mitigation Measures	7
Land Use Planning	10
Community Environment and Noise Advisory Committee	12
Public Consultation and Education	14
Technical Noise Committee	14
GTAA Consultative Committee	15
Noise Management Office	15
Graphs	15-19
Glossary	20

# MESSAGE FROM THE CHAIR

**A**ccountability, transparency and commitment. As Chair of the GTAA's Community Environment and Noise Advisory Committee (CENAC), these are three of the top tier values offered up by the GTAA when dealing with the complex and often sensitive topic of noise management. This report aims to provide you with a comprehensive introduction about how we manage and mitigate the noise arising from airport operations.

The Greater Toronto Airports Authority (GTAA) operates in a manner that aims to be respectful of surrounding communities while meeting demand for air services in Southern Ontario.

We are proud of a robust noise management program that includes a variety of noise mitigation initiatives, many of which were developed through the formerly named Noise Management Committee (NMC), which was recently renamed CENAC. A significant 2007 accomplishment, this renaming is critical to focusing the committee not only on overseeing the noise management program, but also on the interdependencies between other programs related to noise and the environment.

It is inevitable, given the geography and demand placed on the facilities, that the airport will impact some members of the community. We offer opportunities for these residents to understand our operations and programs and seek their constructive ideas for improvement.

Today we are beginning to see a shift in environmental focus to the issue of climate change—a primary concern to most. To this end, the GTAA is being approached by operators to look at new ways of reducing the airport's greenhouse gas emissions. Some of these initiatives could potentially result in increased noise; however, the airport will always seek the most effective mitigation measures to ensure we minimize the impact on our neighbours.

I offer thanks to the members of the CENAC for their work to finding equitable solutions for all when it comes to noise management. By the very virtue of the existence of the airport, noise will always be a concern. Having residents and other stakeholders at the table to discuss opportunities for mitigation is a big step in the right direction for not only the airport, but also nearby communities.



Toby Lennox  
Chair, Community Environment and Noise Advisory Committee  
GTAA Vice President, Corporate Affairs and Communications



# TORONTO PEARSON INTERNATIONAL AIRPORT AND THE GTAA

Incorporated in 1993, the Greater Toronto Airports Authority (GTAA) holds the responsibility to operate, manage and develop Toronto Pearson, under terms set out in the December 1996 lease with the federal government. We are authorized to operate within the region on a commercial basis, to set fees, and to develop and improve facilities.

The GTAA has embarked on the next phase of our corporate development. As a result, a new vision for the organization was established; one that speaks directly to the challenges and opportunities ahead.

Our vision: to be “A leading airport company championing sustainable global access for the Greater Toronto Area.”

To achieve this vision, a new five year strategic plan was established, which focuses on global competitiveness, corporate sustainability and gateway traffic development.

The GTAA currently manages and operates Toronto Pearson International Airport. The responsibilities of the GTAA for the operation, management and development of Toronto Pearson are set out in the Ground Lease with the federal government, which was executed in December 1996. The Ground Lease has a term of 60 years, with one renewal term of 20 years. The GTAA's priorities are to operate a safe, secure and efficient

airport and to ensure that the facilities provide the necessary services, amenities, and capacity for current and future air travel requirements for the Greater Toronto Area (GTA).

The GTAA remains focused on providing quality aviation facilities at Toronto Pearson, recognizing that the region's current and future demand for air travel is expected to continue to grow. To meet this anticipated demand, the GTAA undertook and completed the Airport Development Program (ADP) over a span of ten years. Completion of the ADP was accomplished in January 2007.

Toronto Pearson remains Canada's busiest airport, handling more than 31 million passengers in 2007. The next busiest Canadian airport processed approximately half that number.

On most days, more than 1,100 arrivals and departures take place. Forecasted figures depict a Toronto Pearson that could be called upon to manage the movement of 50 million passengers each year by 2025, which translates into a year over year increase of approximately three per cent.

The airport currently has 76 passenger airlines operating from Terminals 1 and 3 and more than a dozen cargo airlines, connecting Toronto to 183 destinations around the world.

Toronto Pearson not only performs a gateway function, serving the needs of travellers, it also acts as an enabler for surrounding businesses and residents. In a recent economic study, it was deduced that the output related to direct, indirect and induced activity at Toronto Pearson is \$26.4 billion. Up to 185,000 total jobs are attributed to the three aforementioned sectors. Taxes paid to all levels of government, based on the same three areas, total \$4.5 billion.

The GTAA believes in maintaining good relations with neighbouring communities. We are committed to transparency and the engagement of area residents in our discussions on the topic of noise mitigation. The GTAA meets with the community on a regular basis through the Consultative Committee (CC) and the Community Environment and Noise Advisory Committee (CENAC). We have also committed ourselves to publishing this report to inform stakeholders of the ongoing progress of initiatives made in the consultative process with the community.

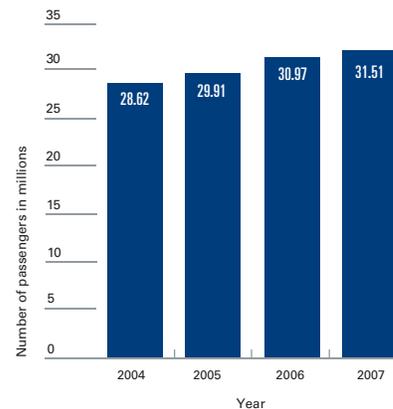
So dedicated is the GTAA to noise mitigation that we identified it as a significant aspect when the Authority began the certification process towards ISO 14001, the internationally recognized standard for environmental performance. All three of the core principles of ISO registration are applied towards noise mitigation; prevention of pollution, continual improvement, and compliance with relevant legislation. Each year, targets are set to ensure conformance to the three principles. In 2007, the target set was:

Review noise abatement procedures with respect to a balance between noise and air emissions.

With a due date of achieving this target in 2008, a working group has been formed between the GTAA and NAV CANADA to evaluate all reasonable options to reduce CO<sub>2</sub> emissions. Meetings are also ongoing with the Air Transport Association of Canada (ATAC) and NAV CANADA.

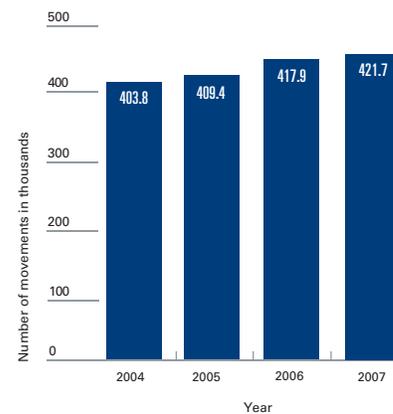
**Figure 1**

Passenger Volume



**Figure 2**

Aircraft Movements



# NOISE MANAGEMENT AT TORONTO PEARSON

Since assuming management of Toronto Pearson, the GTAA has taken responsibility, in accordance with its Ground Lease with the federal government, for the management and mitigation of aircraft noise for aircraft operating to and from Toronto Pearson within a ten nautical mile (18.5 km) radius of the airport.

The GTAA has a dedicated Noise Management Office that works toward noise mitigation by monitoring aircraft operations, investigating complaints, and identifying potential violations of operating restrictions and noise abatement procedures. The GTAA also works with the aviation community, neighbouring municipalities and local residents through the CENAC to consult with these parties on noise and environment issues, and to communicate its ongoing efforts to manage and mitigate aircraft noise at Toronto Pearson. In addition, the GTAA discusses noise mitigation strategies within the GTAA Technical Noise Committee and the GTAA Consultative Committee. Information about these committees is provided later in this document.

Ongoing initiatives aimed at mitigating aircraft noise at Toronto Pearson include:

- Restricting operating hours of all aircraft based on noise certification levels, such that quieter aircraft operate with fewer restrictions and noisier aircraft are more restricted during the night.
- Managing the total number of nighttime movements to meet Transport Canada allowances.
- Using departure and arrival procedures to minimize noise impacts in neighbouring communities by ensuring that pilots approach runways and depart runways on specified routes and operate their aircraft in ways to mitigate aircraft noise.
- Working with surrounding municipalities to ensure that areas impacted by aircraft noise are zoned appropriately and that sensitive land uses, such as residential, are not permitted in higher noise-impacted areas.
- Working with community representatives on the CENAC to maintain public dialogue about aircraft noise through regularly scheduled committee meetings, a series of noise forums and educational workshops, and ongoing communications from the GTAA available on GTAA.com, including this annual Noise Management Report.

## UNDERSTANDING NOISE

Sound is transmitted through the air in waves, like ripples that move outward across a pond when a stone splashes in its midst. When we perceive sound, we judge it to be desirable or undesirable. Sounds deemed undesirable are often referred to as noise.

The decibel is the universally accepted measurement of sound amplitude or volume: in our example, amplitude represents the height of the ripples on the pond. Because the sounds we experience vary in volume between 1 and 100,000 units, the logarithmic scale of the decibel (dB) is used to express this range because it reduces perceivable sound volumes within a manageable scale of 20–120 dB.

In addition, the human ear has greater sensitivity to a certain range of frequencies or pitches. Thus, sounds are usually measured in A-weighted decibels (dBA), which stresses the range of sounds that register most noticeably in the human ear.

Within the logarithmic A-weighted decibel scale, a three dBA decrease is barely perceptible to most people, while a five dBA decrease is clearly perceptible. Further, a decrease of ten dBA is perceived as being half as loud. For example, a library that generates 40 dBA of ambient noise is considered half as loud as a typical office that generates 50 dBA of ambient noise.

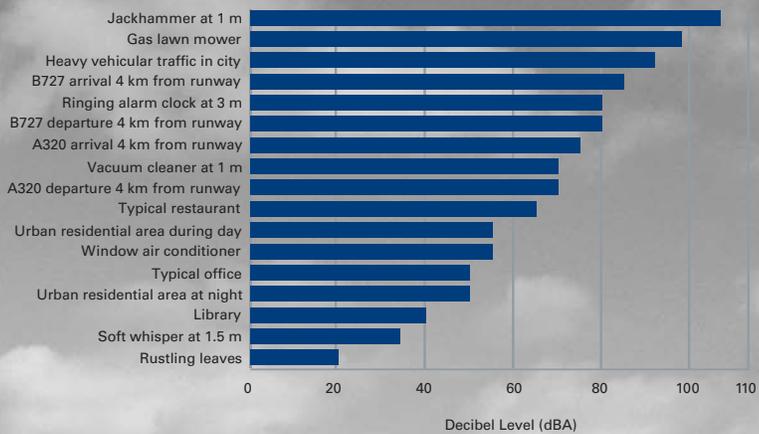
Yet, noise is often considered annoying even when it occurs at much lower volumes than desirable sounds. For example, an arriving Airbus A320 flying overhead four kilometres from the runway may generate the same 70 dBA level as a vacuum cleaner one metre away, but the aircraft may seem more annoying because people expect to hear the noise of the vacuum and, therefore, are willing to accept it. In addition, quieter noises that occur frequently may be considered as annoying as infrequent, louder noises.

It is also important to realize that sound volume can vary by up to five dBA depending on humidity, temperature and wind direction. Due to these factors, the sound of the same aircraft can appear to vary at the same location on different days.

For comparison, Figure 3 displays average sound levels of different events.



**Figure 3**  
Common Sound Levels



# AIRCRAFT NOISE CERTIFICATION LEVELS

Over the past 30 years, improvements in aircraft design and technology have resulted in significant reductions in the aircraft noise caused by engines and by the movement of air over the airframe of the aircraft. To date, noise reduction initiatives have focused primarily on reducing engine noise. However, new airframe designs appear capable of cutting aircraft noise further.

International Standards for Aircraft Noise Certification have been developed by the International Civil Aviation Organization (ICAO) and are prescribed in the *ICAO International Standards and Recommended Practices Annex 16 to the Convention on International Civil Aviation, Volume 1 - Aircraft Noise* for the global aviation industry.

As shown in Figure 4, in 2007, 99.7 per cent of all jet aircraft types operating at Toronto Pearson were manufactured under the Chapter 3 noise standards that required all subsonic jet aircraft types certificated after October 1977 to meet more stringent maximum noise levels. Aircraft types that conform to Chapter 3 noise emission standards include the Boeing 747-400, new generation B737, B757, B777 and Airbus 319, A320, A330 and A340, among others.

In June 2001, on the basis of recommendations made during the fifth session of the Committee on Aviation Environmental Protection (CAEP/5), the ICAO Council adopted a new Chapter 4 noise standard that is more stringent than standards contained in Chapter 3. This new standard requires a minimum of ten decibel cumulative reduction over Chapter 3, meaning that aircraft noise levels are reduced a total of ten

decibels when noise at the three takeoff flyover, takeoff sideline and approach measurement points are summed. Since January 2006, this latest standard applies to newly manufactured aircraft types and to Chapter 3 aircraft for which Chapter 4 certification is requested. Some examples of aircraft types that meet Chapter 4 are Airbus 319, A320 and A330 and Boeing 777. At Toronto Pearson, over 85 per cent of jet aircraft meet the Chapter 4 standard but may not have been formally re-certificated to Chapter 4.

Noisier, older jet aircraft originally certificated before 1977 are known as Chapter 2 and include Douglas DC-9, Boeing 727, older model B737, and older Learjet and Gulfstream business jets. Some of these jets were retrofitted or hushkitted to meet Chapter 3 standards. During 2007, less than two per cent of aircraft movements at Toronto Pearson involved these hushkitted Chapter 2 aircraft.

Jets that are non-noise certificated are the oldest and noisiest models. These include military aircraft that make fewer than 100 visits to Toronto Pearson each year. There are separate noise certification standards for small propeller aircraft and helicopters.

Since April 1, 2002, Chapter 3 aircraft (greater than 34,000 kg) are permitted to operate at Toronto Pearson. Although the GTAA and the CENAC have opposed the operation of Chapter 2 aircraft, Transport Canada retains the right to approve exemptions and permit some Chapter 2 aircraft to operate at Toronto Pearson.

**Figure 4**

Toronto Pearson Chapter 3  
Percentage (all jet operations)

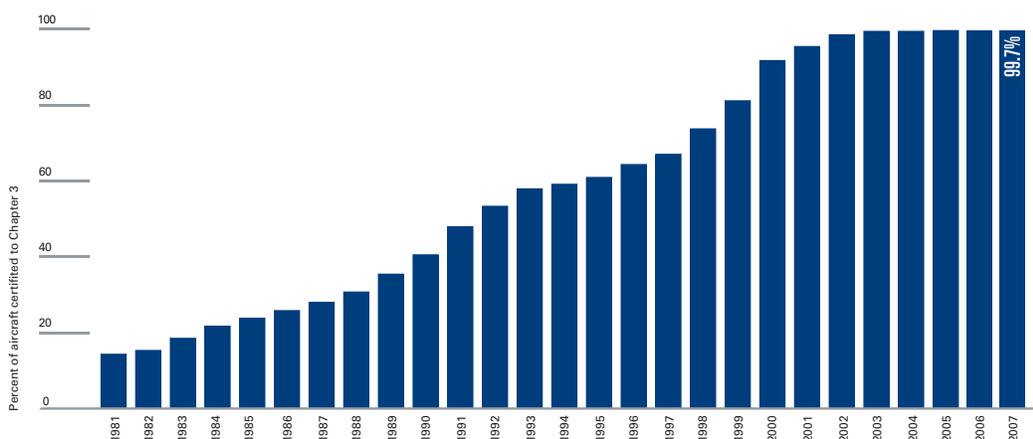
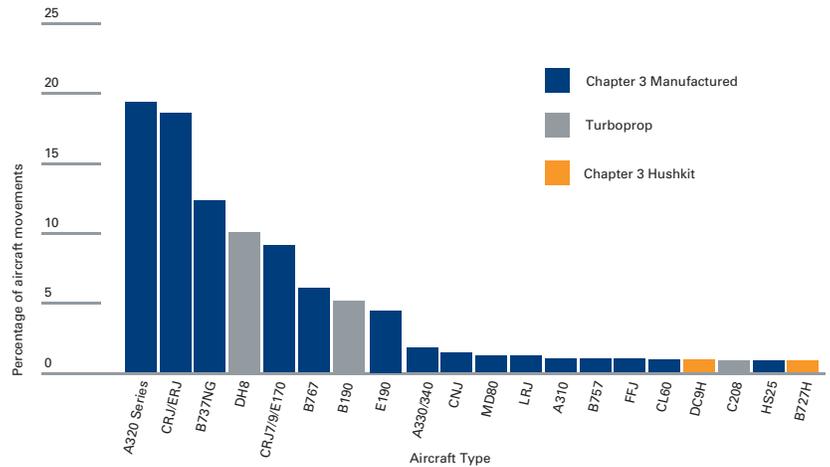


Figure 5 shows the annual percentage of movements by aircraft type that operated at Toronto Pearson in 2007. Operations by the Airbus A320 series, the Boeing 737 new generation (NG), Canadair Regional Jet (CRJ) and Embraer Regional Jet (ERJ) totalled over 50 per cent of all aircraft movements. These aircraft were all manufactured to meet Chapter 3 requirements and are among the quietest aircraft that operate at the airport.

Non-jet aircraft operations accounted for 16 per cent of total aircraft movements in 2007. The most common turboprop aircraft operating at Toronto Pearson was the twin engine De Havilland Dash 8, representing ten per cent of all movements at the airport.

**Figure 5**

Annual Percentage of Specific Movements by Aircraft Type



# NOISE MITIGATION MEASURES

## Regulations and Policies

Regulations and policies pertaining to noise management originate from various organizations, including those standards set by the ICAO, Transport Canada and the GTAA.

The federal Aeronautics Act and the Canadian Aviation Regulations (CARs) support the ICAO standards and set Canadian procedures relating to aircraft noise certification and operations. It is important to note that aviation is federally regulated, and therefore municipal bylaws, such as noise bylaws, are not applicable to aviation activity.

Specific sections governing operations of the airport include:

**Aeronautics Act - Section 4.9(f)** The federal government may make regulations respecting aeronautics and noise emanating from airports and aircraft.

**Canadian Aviation Regulations -** No person shall operate an aircraft at or near an airport except in accordance with the applicable noise abatement procedures and noise control requirements specified by the Minister in the Canada Air Pilot or Canada Flight Supplement.

These documents issued by the federal government describe the rules that pilots must follow to abide by the airport's noise management program, including the procedures and requirements relating to the following:

- Preferential runways
- Minimum noise routes
- Hours when aircraft operations are prohibited or restricted
- Arrival procedures
- Departure procedures
- Duration of flights
- The prohibition or restriction of training flights
- Visual flight rules or visual approaches
- Simulated approach procedures
- The minimum altitude for the operation of aircraft near the airport

## Noise Operating Restrictions

### Time of Day Restrictions

The GTAA is required to develop and maintain a comprehensive aircraft Noise Management Program that includes a plan for managing the number of flights during restricted hours, between 12:30 a.m. and 6:30 a.m. To ensure

that flights during the restricted period remain proportionate to overall traffic levels, Transport Canada has imposed annual limits on the total number of restricted period flights at Toronto Pearson, calculated annually between November and October. Operating the only airport in Canada with these restrictions, the GTAA carefully manages these flights to ensure that the limit is not exceeded.

Effective June 10, 2004, Toronto Pearson's night flight restrictions were amended to apply to all aircraft. The noisiest and older non-noise certified jet aircraft are prohibited from operating between 8 p.m. and 8 a.m., while Chapter 2 and equivalent aircraft are prohibited from operating between midnight and 7 a.m. The quieter Chapter 3 and equivalent aircraft may be scheduled between 6:30 a.m. and 12:30 a.m. A limited number of Chapter 3 or equivalent aircraft operate as exemptions that are scheduled within the restricted hours (12:30 a.m. to 6:30 a.m.). Their approval is conditional upon the GTAA's ability to remain within the annual limit for restricted period flights.

The GTAA may grant operating extensions on the day of operation for flights delayed by weather, emergencies, security, air traffic control issues or mechanical difficulties. Chapter 3 aircraft greater than 34,000 kg Gross Take Off Weight (GTOW) may operate until 3 a.m., depending upon existing circumstances and runway availability.

Daily requests for Chapter 3 jet aircraft less than 34,000 kg GTOW and equivalent propeller aircraft may be approved to

operate in the restricted hours up to a daily limit. Noisier Chapter 2 aircraft, non-noise certified aircraft and equivalent operations are not granted operating extensions.

### Preferential Runway Assignment

Runways are labelled by the first two digits of their compass bearings. For example, a pilot approaching Toronto Pearson from the southwest and cleared to land on Runway 05 would follow compass heading 057.

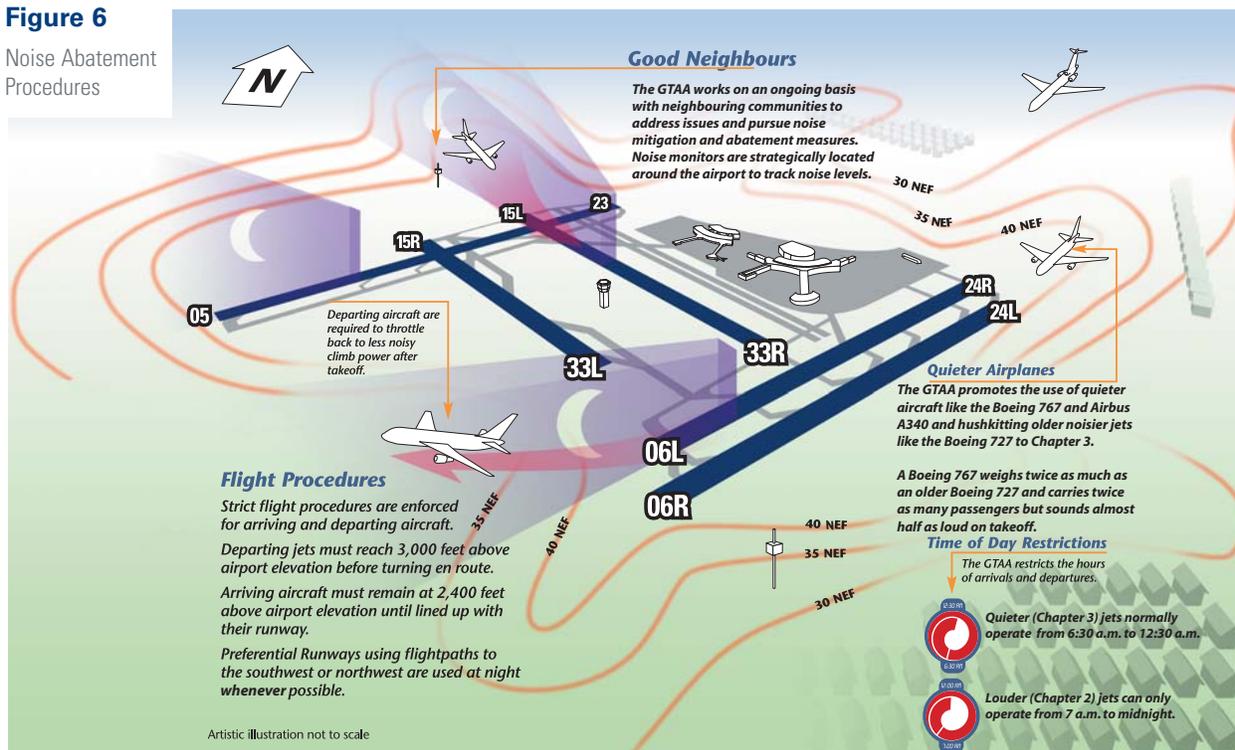
Toronto Pearson has five runways: 05-23, 06R-24L, 06L-24R, 15R-33L, and 15L-33R. Each runway has two designators as each runway can be used in either direction. The right (R) and left (L) designators identify which of a pair of runways a pilot is cleared to use.

Aircraft using these runways take off and land into the wind for safety reasons; therefore, runway use is dependent on the direction and speed of the wind. In addition, weather, runway conditions, and approach aid availability may affect NAV CANADA's determination of which runways will be used at any time. To minimize noise, the GTAA works with NAV CANADA to maintain strict flight procedures for arriving and departing aircraft.

Subject to existing conditions, preferential runways have been allocated for use between midnight and 6:30 a.m. The following runways are preferred for aircraft departures in the following order of priority: Runways 23, 33R and 24R.

**Figure 6**

Noise Abatement Procedures



The following runways are preferred for aircraft arrivals in the following order of priority: Runways 05, 15L and 06L. Operations on other runways are limited as much as possible during this time period.

Preferential runway assignments have been in practice for many years to ensure that the fewest number of people in the surrounding communities are impacted by aircraft operating at night.

### Engine Run-ups

Occasionally, airline maintenance staff are required to perform engine run-ups after engine repairs have been completed. At all times, these run-ups must be approved by the GTAA in advance and conducted at designated times and locations that have been determined to minimize their impact on the surrounding communities.

Between midnight and 7 a.m., engine run-ups are approved only for aircraft scheduled to depart that morning at locations farthest from residential areas. Engine run-ups are prohibited for all noisier Chapter 2 aircraft between 2 a.m. and 5 a.m.

### Noise Abatement Procedures

Noise abatement procedures governing flights operating at Toronto Pearson are approved by Transport Canada and are legally binding on aircraft operators.

While the airport and airlines act to minimize noise during departures and arrivals, sometimes they may have to deviate from noise abatement procedures when unusual conditions, such as thunderstorms, dictate.

#### *Departures*

Pilots of jet aircraft are required to throttle back from take-off power to less noisy climb power shortly after take-off and must follow specified headings or ground tracks to 3,000 feet (914 m) above airport elevation before making en-route turns. Pilots of propeller aircraft must comply with jet procedures between 11 p.m. and 7 a.m. During the day, these pilots may turn as low as 500 feet (152 m) above airport elevation to accommodate increased hourly operations.

A procedure for smaller, quieter Chapter 3 jet aircraft was established in 2000 and formalized in 2005 after five years of trials and analysis. Using this early turn procedure, pilots of these aircraft are permitted to turn to assigned headings at 500 feet (152 m) above airport elevation between 7 a.m. and 11 p.m. when departing on Runways 05, 06R, 06L, 23, 24R and 24L.

#### *Arrivals*

Pilots of arriving jet aircraft must remain at 2,400 feet (732 m) above airport elevation until they line up with their runways, generally seven to ten nautical miles (13 to 18.5 km) from the airport. They must then maintain a three-degree glide slope approach until touchdown, and minimize noisy reverse thrust after touchdown. Pilots of propeller aircraft must comply with jet arrival procedures between 11 p.m. and 7 a.m.



# LAND USE PLANNING

To ensure that compatible land uses are planned and developed near the airport, the GTAA works closely with surrounding municipalities to ensure that areas impacted by aircraft noise are zoned appropriately and that sensitive land uses, such as residential, are restricted in higher noise-impacted areas.

## Noise Exposure Forecast

Transport Canada has developed a Noise Exposure Forecast (NEF) model to calculate long-term aircraft noise exposure based on actual and forecasted flights, and the assessed level of noise annoyance in those areas. Contour lines are drawn on a map (Figure 7) connecting points of equal noise impact representing 25, 30, 35 and 40 NEF. It is important to remember that the NEF contour does not measure decibel levels for individual flights, but is a cumulative noise value of overall actual and forecasted flights, and noise annoyance.

Figure 7 is also available on [www.GTAA.com](http://www.GTAA.com) under the Noise Management section.

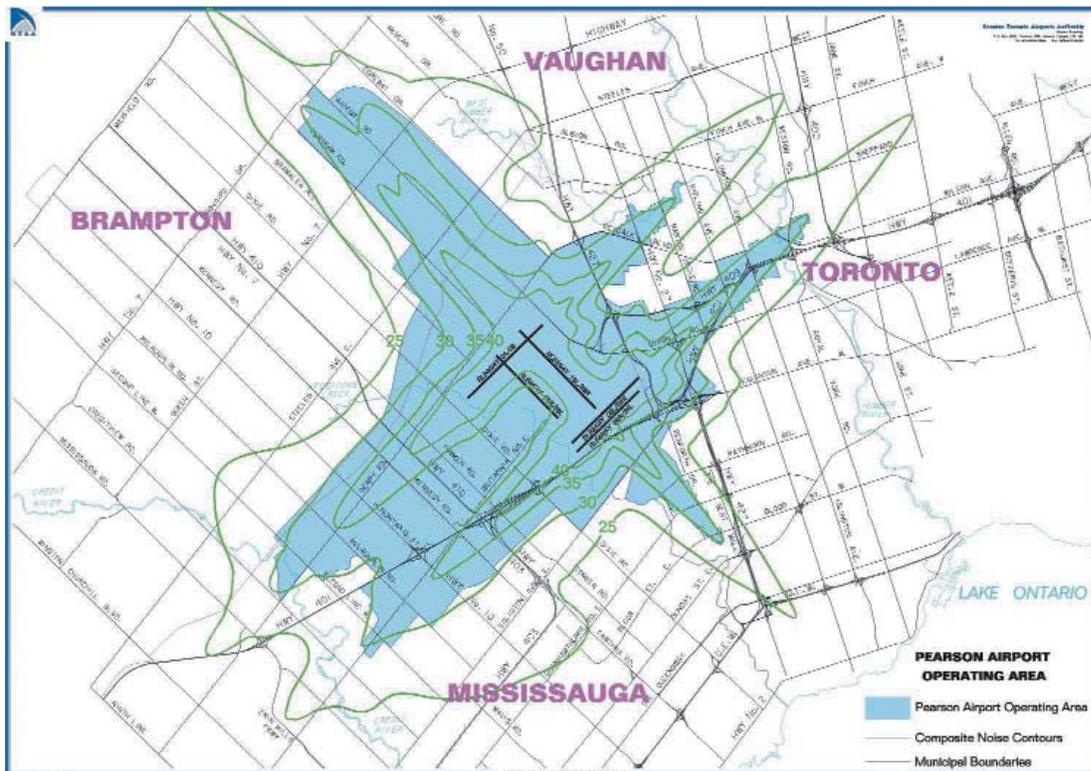
Transport Canada has taken the position that areas with an NEF as low as 25 may be affected by aircraft noise. Areas of 30 NEF or greater are considered incompatible for sensitive land uses, such as residential development.

## Airport Operating Area

The GTAA has established the Toronto Pearson Airport Operating Area (AOA), which uses well-defined natural and human-made boundaries to approximate the 30 NEF contour on the ground. Surrounding municipalities have included this operating area in their official plans and have approved associated policies that limit incompatible land uses within these areas.

**Figure 7**

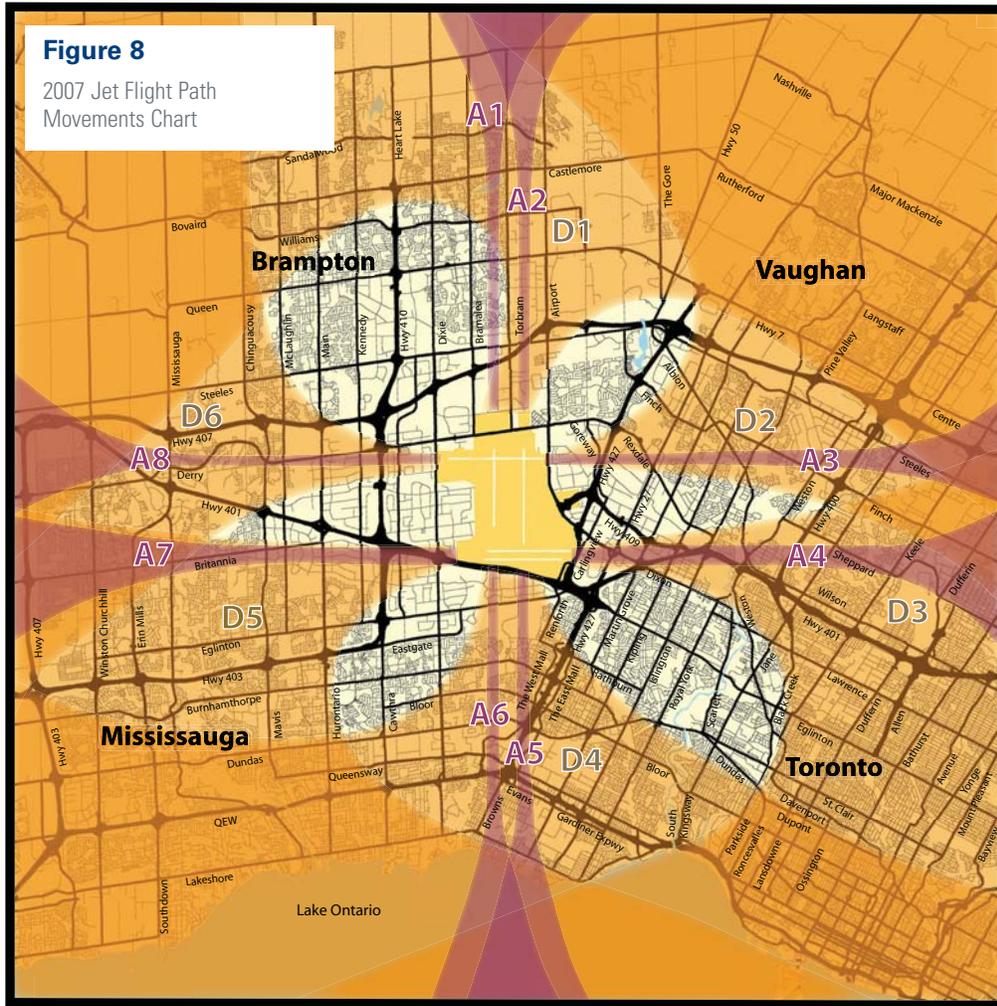
Airport Operating Area



### Jet Flight Path Movements Chart

In an effort to better communicate with local residents and provide new tools that describe aircraft activity near Toronto Pearson, the GTAA has developed a Jet Flight Path Movements Chart to illustrate the general flight patterns of the majority of Toronto Pearson's jet aircraft operations.

While this chart does not indicate the level of noise generated by aircraft activity in an area nor the level of community annoyance, it does provide valuable information when used in conjunction with other traditional aircraft noise maps and resources. This chart is based on a program successfully employed at Sydney Airport in Australia and on input from the CENAC.



**Figure 8**  
2007 Jet Flight Path Movements Chart

- Legend**
- Pearson International Airport
  - Arrival Flight Zone
  - Departure Flight Zone
  - Body of Water
  - Areas with Less Frequent Jet Over Flights
  - Overlapping Arrival Flight Zones
  - Overlapping Departure Flight Zones

Flight Zone Names	Daily Average Movements	Percentage of All Movements	Daily Range of Movements	Days With No Movements	Associated Runway(s)
<b>A1</b>	2	0.2%	0-103	347	15R
<b>A2</b>	8	0.8%	0-184	187	15L
<b>A3</b>	111	11.6%	0-290	76	23
<b>A4</b>	159	16.5%	0-382	74	24L & 24R
<b>A5</b>	2	0.2%	0-41	286	33R
<b>A6</b>	23	2.4%	0-423	285	33L
<b>A7</b>	80	8.3%	0-334	135	06L & 06R
<b>A8</b>	95	9.9%	0-356	112	05
<b>D1</b>	43	4.4%	0-476	83	33L & 33R
<b>D2</b>	51	5.2%	0-259	143	05
<b>D3</b>	113	11.7%	0-381	147	06L & 06R
<b>D4</b>	2	0.2%	0-158	282	15L & 15R
<b>D5</b>	125	13.0%	0-316	80	24L & 24R
<b>D6</b>	149	15.4%	0-387	54	23
Arrivals (A1-A8)	481	50.0%			
Departures (D1-D6)	482	50.0%			
<b>Total Jet Movements</b>	<b>963</b>	<b>100.0%</b>			

- Notes:**
- 1) The flight zones illustrated are intended to reflect the general flight path patterns of the majority of Pearson's jet aircraft operations. Some jet operations do occur outside these zones.
  - 2) The information presented excludes non-jet aircraft (piston and turboprop) using Pearson, and any over flights unrelated to Pearson (en route aircraft flying through the area) to maximize the clarity of the presentation and to focus on the types of operations with the most significant noise impact.
  - 3) The arrival flight zones reflect primarily the final approach phase of the arrival, excluding any earlier phases that may pass through the airport vicinity prior to joining the final approach path.
  - 4) The departure flight zones do not reflect the flight paths of the smaller, quieter jet aircraft that are permitted to conduct early departure turns (similar to non-jet aircraft), although these operations are included in the table.
  - 5) Although the yellow map areas, 'Areas with Less Frequent Jet Over Flights' are not within arrival or departure flight zones, they are not completely free of over flights. These areas may be over flown by jet aircraft operating outside of the general jet flight zones (see Note 1), non-jet and over flights not associated with Pearson (see Note 2), arrivals prior to joining the final approach path (see Note 3), and early turn jet departures (see Note 4).
  - 6) The information reflects traffic levels and flight zones for the year 2007 only. It does not project future airport operations. Overall traffic volumes can be expected to increase as demand for air travel services increases in the future.
  - 7) This map only presents the general location and number of jet aircraft operations at Pearson and is provided for general information purposes only. It does not quantify the noise impacts associated with those operations. The noise associated with operations within any of the flight zones may be heard outside of the zone itself. This information does not replace the Noise Exposure Forecast system used for land use planning purposes.

# COMMUNITY ENVIRONMENT AND NOISE ADVISORY COMMITTEE

The Community Environment and Noise Advisory Committee (CENAC), formerly known as the Noise Management Committee (NMC), provides a consultative/communication forum for community stakeholders to meet with GTAA Management and other aviation community representatives. The committee discusses issues relating to the mitigation of aircraft noise in the community and the operation of Toronto Pearson International Airport in an environmentally responsible manner.

The CENAC is an advisory body for the GTAA. The committee will include representatives of the three surrounding municipalities and allow for the GTAA to hear concerns expressed in a public forum and to take action as considered appropriate.

## Committee Responsibilities

### Mandate

The CENAC mandate is set out in the Ground Lease (section 8.12.02) as follows:

*“The Tenant shall ensure that mitigation of noise emanating from aircraft in the takeoff, ascent, descent, approach and terminal phases of flight is a part of the mandate of a noise management committee which the Tenant shall establish and which shall include at a minimum, the Tenant, the Minister or his designate, aviation industry representatives and appropriate provincial and municipal government representatives.”*

The CENAC examines environmental issues related to the ongoing operation of Toronto Pearson International Airport.

### Communication and Dissemination / Education of Stakeholders

The CENAC acts in an advisory capacity to the GTAA on all issues relating to Toronto Pearson’s Noise Management and Environment Policies with a view to improving the GTAA’s noise mitigation and environment programs, and promote the objectives of the Authority respecting all aspects of noise and environment management.

The CENAC will provide a forum for the discussion of noise and environment related matters and will decide on the best methods of distributing information to stakeholders and to stakeholder groups on an issue by issue basis. The CENAC will issue a report on an annual basis summarizing the GTAA’s ongoing noise mitigation initiatives and the work of the CENAC.

### Linkages

The CENAC members that represent community stakeholders actively seek the opinions of their constituents regarding noise related matters and to represent these concerns in the committee forum. Similarly, committee members will disseminate the results of committee discussions to their constituent bodies.

Linkage to the GTAA Consultative Committee (CC), Toronto Pearson’s main consultative communication forum, will be provided through common membership. The GTAA will continue to perform this liaison through the committee chair.

The CENAC will also have linkage to the Technical Noise Committee (TNC) to provide a two-way communication regarding the operational aspects of noise monitoring, enforcement, and mitigation. This linkage will be provided through the GTAA GM, Airside Operations.

The CENAC will provide the communication liaison between the community and the GTAA Board of Directors through GTAA management.

### Scope

The CENAC will advise on matters related but not limited to the following:

- Aircraft Operation procedures impacting aircraft noise in Toronto Pearson’s Operating Area
- The examination of alternatives for noise mitigation
- The enforcement of aircraft noise violations
- Municipal land use within the GTAA operating area
- The review of the GTAA’s environmental programs and adherence to ISO targets

- The examination of potential environmentally sensitive measures at Toronto Pearson

The CENAC will report and make recommendations to the GTAA. The GTAA may refer recommendations to the appropriate committee of the GTAA Board of Directors, to the GTAA CC, to the Technical Noise Committee or other bodies as appropriate for consideration.

Members will have the opportunity to vote on recommendations and minutes will show conclusion and resolution. Minutes will be published in a timely fashion. The Committee will be given feedback regarding these recommendations.

The CENAC may appoint ad hoc sub-committees to deal with specific issues as they arise.

Terms of Reference will be reviewed and updated as required to ensure that the GTAA CENAC mandate and membership remain current and appropriate.

### **Membership**

#### **CHAIR:** (Voting)

- The GTAA President and CEO or his designate (one): Committee Chair

#### **COMMUNITY MEMBERS:** (Voting)

- City of Brampton (three): one elected representative, one resident, and one additional to be appointed at Council discretion
- City of Mississauga (five): two elected representatives, two residents, and one additional to be appointed at Council discretion
- City of Toronto (three): one elected representative, one resident, and one additional to be appointed at Council discretion

Municipalities will be permitted to designate alternates when a member is unable to attend a meeting. Councillors, residents, or councillors' staff representatives are permitted to stand-in as an alternate for an elected representative who is unable to attend a meeting. Designated alternates are encouraged to attend meetings regularly and can vote in absence of the regular member.

Each nominating body will set the term of membership with a suggested minimum of two years.

#### **RESOURCE MEMBERS:** (Non-Voting)

- Transport Canada regional staff representative
- NAV CANADA representative
- ATAC representative
- One staff representative from each of the Cities of Brampton, Mississauga, and Toronto
- Province of Ontario Staff representative

Resource Members will support the CENAC and will be appointed to the committee by their constituent group.

#### **GTAA MEMBERS:** (Non-Voting)

- As required

### **Procedures/Operation**

By the last meeting of the calendar year, the committee will approve a meeting schedule for the following year. Meetings will be held at least on a quarterly basis in the Administrative Offices of the GTAA. Meetings can be rescheduled at the discretion of the committee at least two weeks in advance of the scheduled meeting date. The meeting schedule, and any subsequent changes, shall be made publicly available.

There will be a published agenda, which will be delivered one week in advance of published meeting dates. Items for discussion should be submitted to the Committee Chair prior to meeting.

Quorum shall consist of six voting members, including the chair. In the event quorum is not attained, meetings will proceed on an informal basis. Regular attendance is expected of members. If a member, and/or their alternate, misses more than two consecutive regularly scheduled meetings, then the appointing community will be advised.

For most CENAC business, a consensus approach will be followed. For those issues where a vote is requested, only "community" members and the committee chair will have voting rights. Items requiring a vote will be outlined on the agenda and, where possible, material will be provided to members in advance of meetings.

Meetings will be open to the public and to the media.

Minutes of the meetings will be circulated to CENAC members as early as possible after each meeting. Further distribution of the minutes will be decided by the CENAC.

The GTAA Corporate Affairs and Communications Department will provide secretariat services. The GTAA will provide a budget for the administrative support of this Committee.

# PUBLIC CONSULTATION AND EDUCATION

## 2007 Schedule

CENAC Meeting - Wednesday, February 7, 2007

CENAC Meeting - Wednesday, April 11, 2007

CENAC Meeting - Wednesday, June 13, 2007

CENAC Meeting - Wednesday, September 12, 2007

Public Workshop - Wednesday, November 7, 2007

CENAC Meeting - Wednesday, December 12, 2007

## Working with the Community

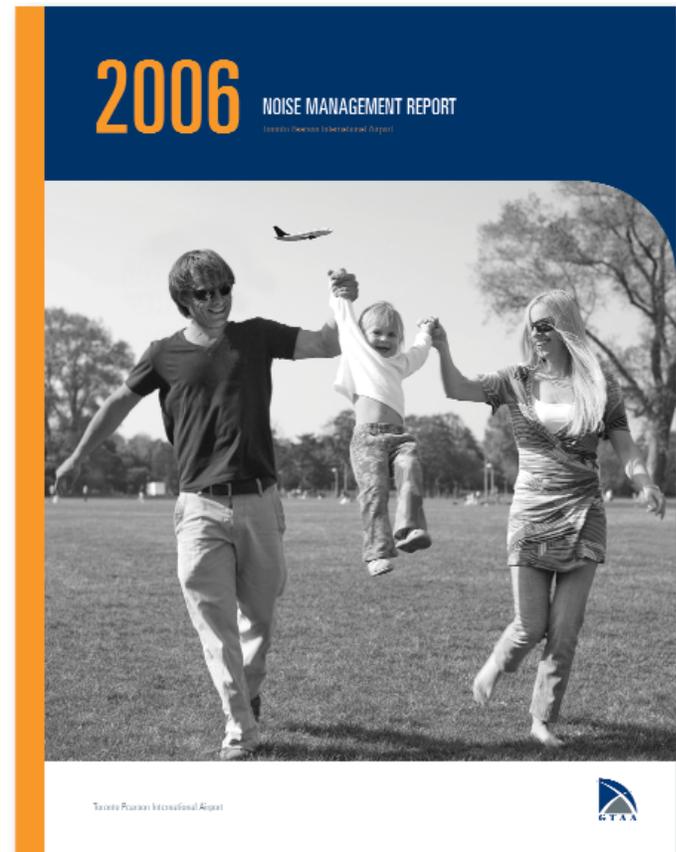
In an effort to educate and consult with local residents, the GTAA hosted a public workshop in 2007. Such sessions, in addition to the regularly scheduled CENAC meetings, allow the GTAA and area residents to exchange information related to the Noise and Environment Management Program.

On November 7, 2007 at 7 p.m., the GTAA hosted a workshop about the GTAA's Environmental Management Program. The workshop covered stormwater management, air quality monitoring and other environmental initiatives including the ISO 14001 program. The workshop provided an opportunity for members of our CENAC committee and members of the neighbouring communities to become more familiar with the environmental program at Toronto Pearson.

The GTAA is committed to public consultation and looks forward to continuing to work with neighbouring residents to improve the Noise and Environment Management Program at Toronto Pearson.

## Annual Noise Management Report

This annual Noise Management Report summarizes the aircraft noise mitigation efforts of the GTAA and the CENAC. This report continues to be an effective tool to educate and communicate with the surrounding communities. The report is available online at [www.gtaa.com](http://www.gtaa.com) and is distributed to interested residents and all local elected officials.



## Technical Noise Committee

Another important component of the Noise Management Program at Toronto Pearson is the Technical Noise Committee (TNC). The TNC meets on a regular basis to assess the effectiveness of existing noise abatement procedures and to discuss the technical merits of proposed noise mitigation initiatives that are generated by individual members, the CENAC and public input from workshops or forums.

The committee consists of many airport and aviation stakeholders, including representatives from the GTAA, Transport Canada, NAV CANADA, and the airlines. The TNC is a valuable round-table forum where industry specialists consider new technologies and proposals that could be used to augment the airport's noise mitigation program. Specific discussion topics include aircraft and airport operating procedures, Toronto Pearson's night flight restriction program, aircraft noise monitoring systems, and noise mitigation enforcement processes.

On an ongoing basis, the TNC investigates and debates proposed initiatives and reports findings to the GTAA and, through the Chair, to the CENAC.

### GTAA Consultative Committee

The GTAA also holds regularly scheduled Consultative Committee meetings that provide an important forum for airport stakeholders to discuss issues affecting Toronto Pearson and its surrounding communities and businesses. Aircraft noise issues and noise mitigation initiatives may be discussed by this committee, which is given regular updates regarding the work of the CENAC.

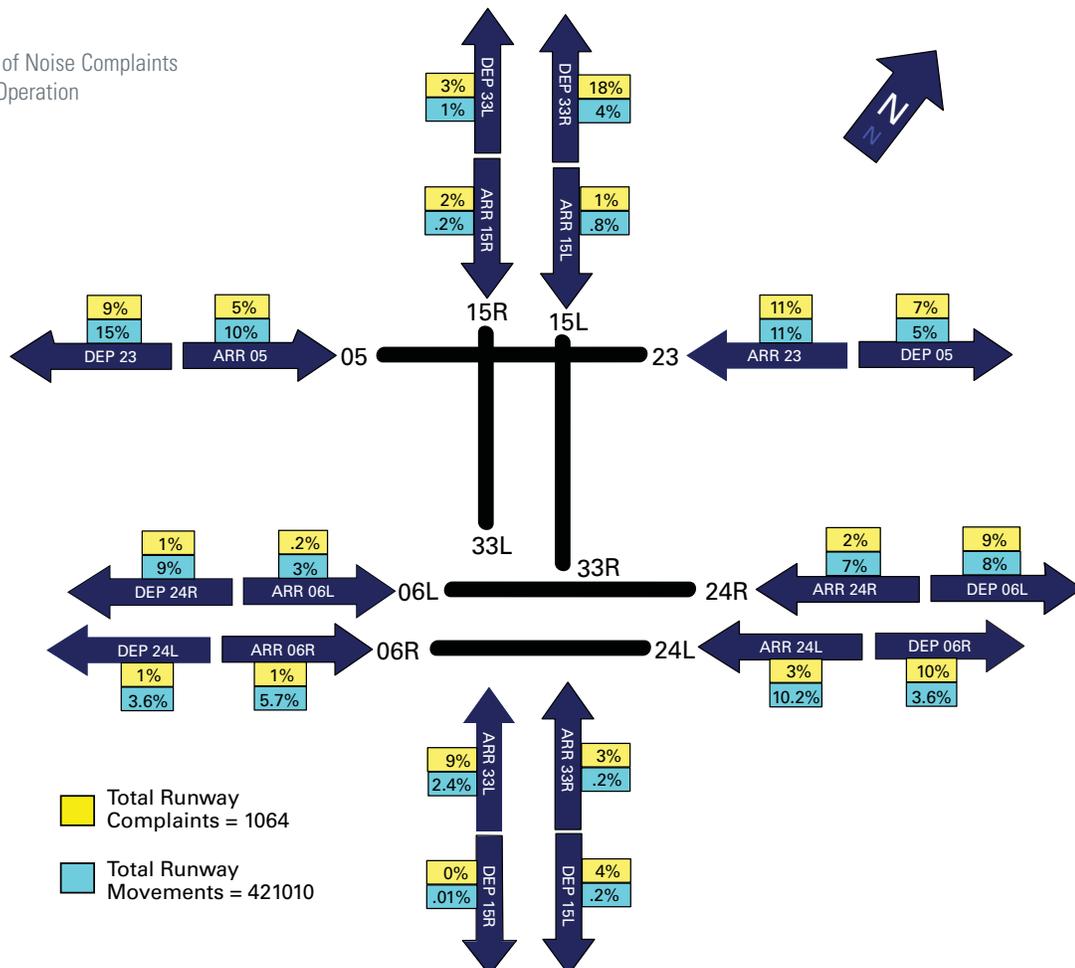
Membership on this committee consists of city councillors, regional staff, board of trade representatives, and local residents. Resource members from the GTAA, the airline industry, Transport Canada, NAV CANADA, and city staff also attend meetings.

# NOISE MANAGEMENT OFFICE

The GTAA Noise Management Office (NMO) monitors airport operations in relation to the Noise Management Program using the Airport Noise Monitoring and Flight Tracking System and its community-based Noise Monitoring Terminals. In addition, NMO staff register aircraft noise complaints using a database system that categorizes noise complaints and automatically correlates these complaints with flight tracking data and complainant data. Staff then investigate complaints, report their findings, and respond to complainants.

Staff of the NMO also respond to CENAC inquiries, provide information and analysis as required, research noise mitigation initiatives, and provide technical expertise for committee meetings and committee members. This ongoing collaboration between the NMO and the CENAC is a key element of the Noise Management Program at Toronto Pearson.

**Figure 9**  
Comparison of Noise Complaints by Runway Operation



**Figure 10**

Comparison of Aircraft Movements and Complaints by Runway Operation

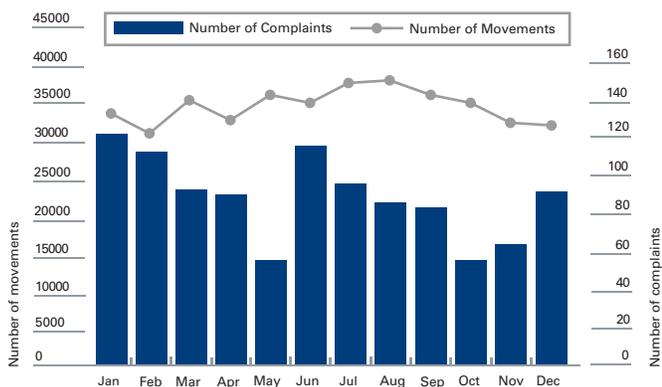
ARRIVALS			DEPARTURES		
Runway	Movements	Complaints	Runway	Movements	Complaints
Arrive 23	46742	113	Depart 05	22051	71
Arrive 24R	29083	17	Depart 06L	33600	99
Arrive 24L	42794	31	Depart 06R	15297	109
Arrive 33R	1007	30	Depart 15L	908	38
Arrive 33L	10125	98	Depart 15R	37	0
Arrive 06R	24200	14	Depart 24L	14986	13
Arrive 06L	10887	2	Depart 24R	38947	12
Arrive 05	41509	55	Depart 23	64972	99
Arrive 15R	768	25	Depart 33L	4185	32
Arrive 15L	3176	14	Depart 33R	15736	192
<b>Total Arr</b>	<b>210291</b>	<b>399</b>	<b>Total Dep</b>	<b>210719</b>	<b>665</b>
<b>Total All Runways</b>				<b>421010</b>	<b>1064</b>
<b>Non Runway Complaints*</b>					<b>28</b>
<b>Total Complaints</b>					<b>1092</b>

1,064 complaints were registered against a particular runway operation.

\*The remaining 28 complaints were registered against missed approaches, ILS inspections, maintenance run-ups, helicopter operations and unknown sources.

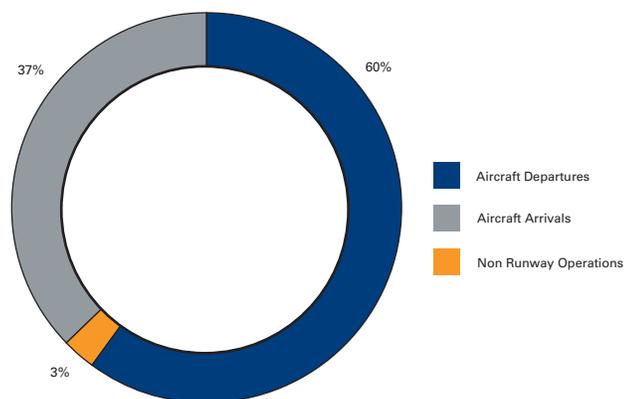
**Figure 11**

Monthly Comparison of Runway Movements and Noise Complaints



**Figure 12**

Noise Complaints by Operation

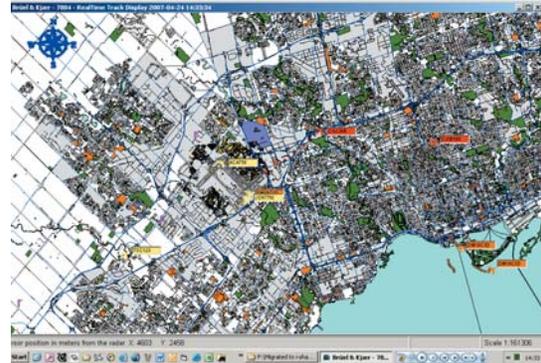


Non Runway Operations include ILS inspections, maintenance run-ups, helicopter operations and unknown sources.

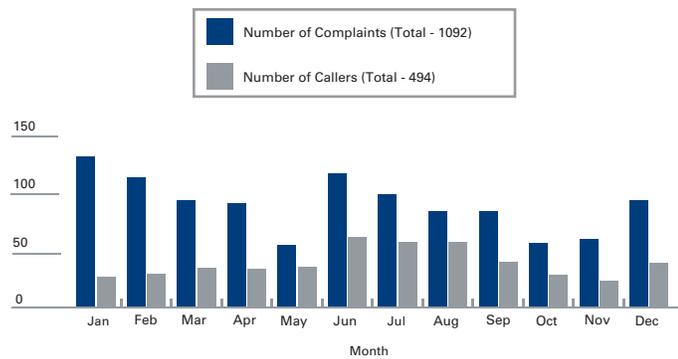
### Airport Noise Monitoring and Flight Tracking

The GTAA uses a sophisticated Airport Noise Monitoring and Flight Tracking System that combines radar flight tracking data from NAV CANADA with mapping data from a Geographic Information System (GIS). This data is then correlated with noise readings collected at the Noise Monitoring Terminals (NMTs) in the surrounding communities. Figure 13 is a screen shot of the system's real-time display mode that provides the GTAA with the following information respectively in descending order: aircraft identification; current altitude above sea level; aircraft type; ground speed; transponder code; origin; and destination. Aircraft arriving at Toronto Pearson are shown in yellow, while departing aircraft are shown in red.

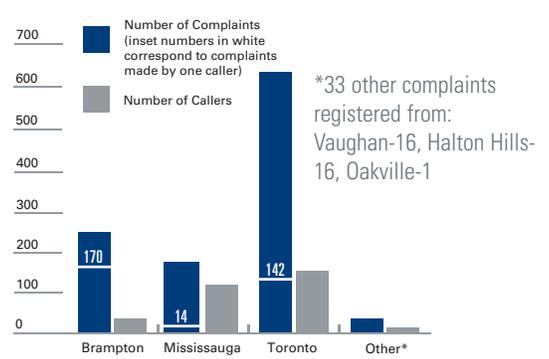
**Figure 13**  
Realtime Noise Monitoring Display



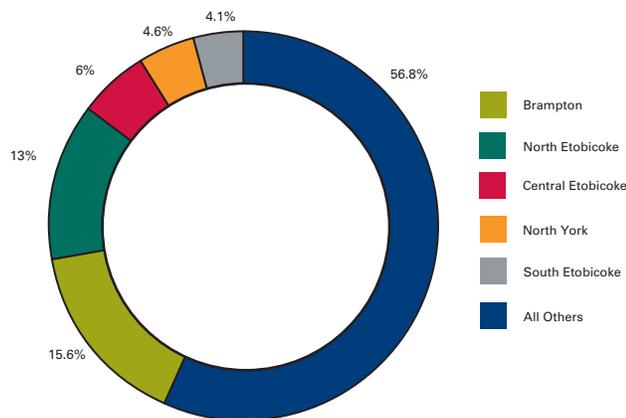
**Figure 14**  
Monthly Comparison of Noise Complaints and Callers



**Figure 15**  
Comparison of Noise Complaints by Municipality



**Figure 16**  
Top Five Callers vs. All Other Callers

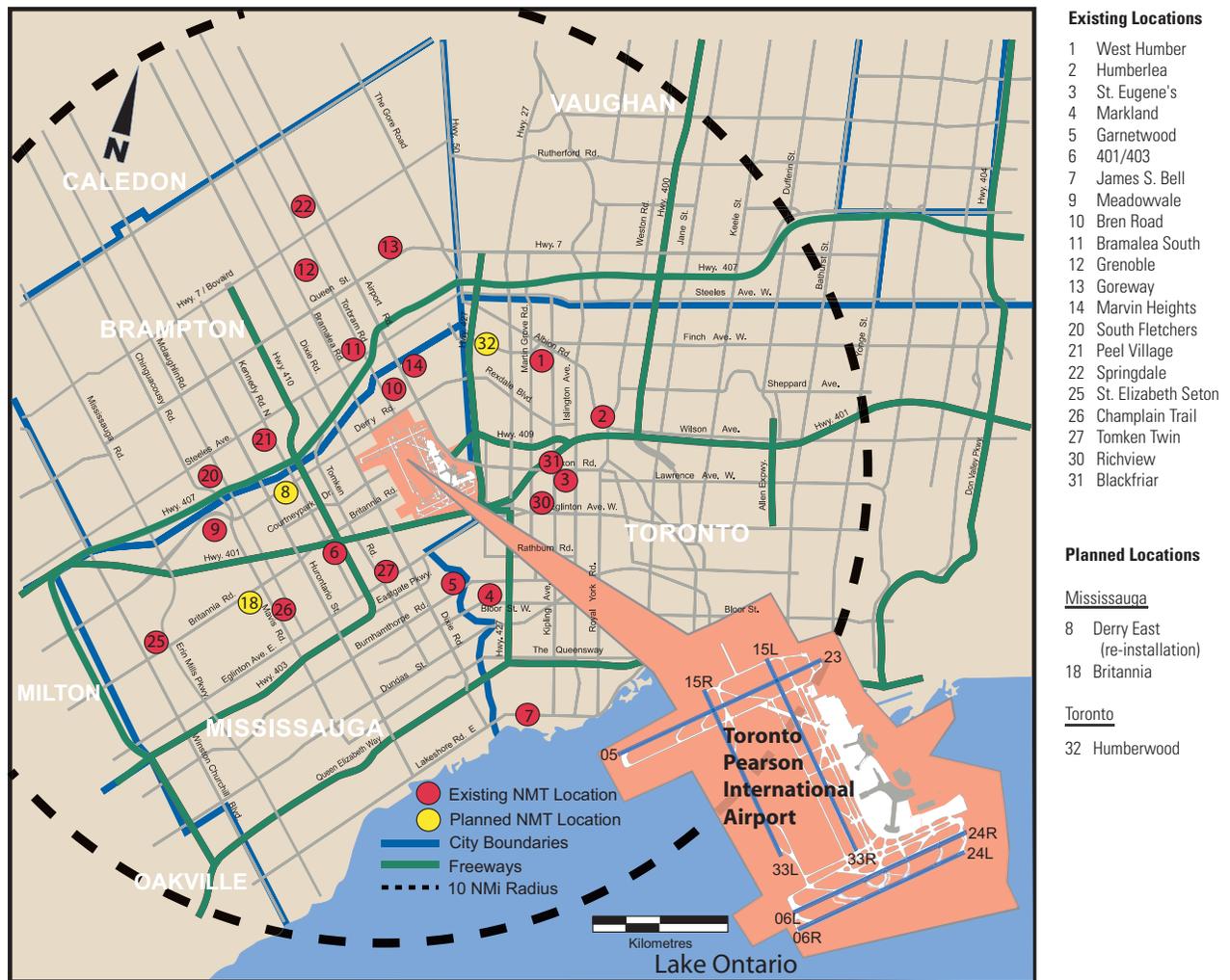


### Community Noise Monitoring Terminals

The GTAA uses NMTs within the Noise Management Program to quantify aircraft noise throughout the Airport Operating Area. Using specialized software, NMO staff collect and analyze noise levels generated by aircraft operating at Toronto Pearson. A total of 21 NMTs are currently in operation. The NMT data is used by NMO staff when investigating resident complaints.

The GTAA has committed to the CENAC that it will strategically place NMTs in each of the surrounding municipalities to improve the monitoring of aircraft noise and increase the effectiveness of aircraft noise analysis. The most recently added NMT locations were recommended by the NMC and the location of every NMT was selected to establish a comprehensive NMT footprint across the communities surrounding Toronto Pearson. Over the years, the number of NMTs in neighbourhoods around Toronto Pearson has continued to increase.

**Figure 17**  
NMT Location Map



**Figure 18**

NMT LEQ Data

**Noise Monitoring Terminal Monthly LEQ (dBA): 2007**

NMT	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Toronto</b>													
1	West Humber	59.4	-	59.8	60.0	-	61.1	60.9	60.6	-	-	59.0	57.9
2	Humberlea	59.0	57.8	59.2	59.0	57.6	66.1	56.6	57.3	58.4	59.5	59.1	57.8
3	St. Eugene's	55.2	58.6	58.6	58.8	55.9	55.5	55.4	57.4	56.2	55.6	56.5	56.8
4	Markland	-	54.8	57.0	-	-	56.1	64.5	56.9	54.7	55.2	58.4	55.2
7	James S. Bell	54.5	54.7	55.2	56.3	56.1	58.2	56.3	53.7	55.4	55.2	55.6	55.3
30	Richview	-	-	-	-	-	-	-	-	-	-	58.9	57.9
31	Blackfriar	64.8	-	65.0	65.5	65.0	-	-	64.8	64.4	64.0	66.8	64.2
<b>Mississauga</b>													
5	Garnetwood	55.8	56.2	56.8	58.2	55.5	55.7	66.2	53.9	55.5	54.9	56.7	55.7
6	Hwy 401 & Hwy 403	61.1	60.2	64.3	65.8	64.9	68.5	68.7	61.3	-	63.7	61.7	61.2
9	Meadowvale	57.1	55.8	57.6	57.7	58.9	59.2	59.0	59.5	58.5	58.7	58.5	57.2
10	Bren Road	62.8	62.9	63.5	65.3	63.9	64.0	68.6	64.1	64.8	63.9	62.3	-
14	Marvin Heights	-	-	-	-	-	-	-	-	-	-	57.8	57.0
25	St. Elizabeth Seton	-	-	-	-	-	-	-	-	-	58.8	-	58.8
26	Champlain Trail	59.0	57.9	58.5	59.3	57.8	57.5	56.2	55.7	-	-	-	-
27	Tomken Twin	59.4	62.1	60.8	60.2	59.0	58.1	60.3	58.0	69.1	59.3	64.7	71.8
<b>Brampton</b>													
11	Bramalea South	55.1	55.6	58.1	57.6	56.2	-	63.7	56.2	56.4	56.2	56.2	54.7
12	Grenoble	53.4	56.0	55.5	56.9	52.7	52.7	51.6	52.6	53.7	53.8	54.4	55.3
13	Goreway	57.8	55.4	55.0	-	-	-	-	54.1	55.2	55.3	54.7	53.7
20	South Fletchers	63.0	62.2	62.5	62.7	61.9	61.6	61.7	61.8	61.9	62.5	63.1	62.4
21	Peel Village	53.4	55.3	55.1	57.0	54.9	54.0	54.0	58.0	-	-	54.6	53.4

- Noise level data provided for NMTs that were active over 75% of the time.
- NMT #8 out of service due to new building on the property. To be re-installed in 2008.
- NMT #25 re-installed in September 2007.
- NMT #26 removed in September 2007 due to construction on the school building.
- NMT #30 re-installed in October 2007.

Figure 18 shows the measured monthly average noise levels at each Noise Monitoring Terminal. Noise data presented includes the contribution of all noise sources, and not simply aircraft generated. The varying locations of the NMTs in the community contribute to the variation in noise levels, where some NMTs may be closer than others to regular arrival and departure flight paths (see Fig. 17).

**Registering Complaints**

To register an aircraft noise complaint within ten nautical miles (18.5 km) of Toronto Pearson, contact the NMO at (416) 247-7682. Noise complaints can also be registered through the GTAA website at [www.GTAA.com](http://www.GTAA.com).

For complaints concerning en route aircraft or those beyond ten nautical miles (18.5 km) of the airport, call Transport Canada at (416) 952-0335.

support of the CENAC, Transport Canada publishes the names of corporations violating the Aeronautics Act and the Canadian Aviation Regulations, including noise violations, on its website:

<http://www.tc.gc.ca/civilaviation/standards/enforcement/publications/corporate/summary.htm>

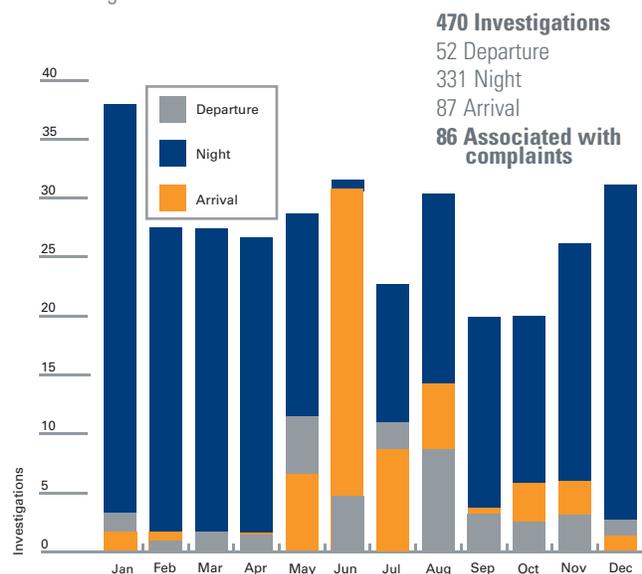
**Investigations and Enforcement**

The GTAA investigates potential violations of noise abatement procedures, restricted hours operations and maintenance engine run-ups. Investigations conducted by the GTAA result from both registered public complaints and ongoing tracking and monitoring carried out by the GTAA.

If GTAA staff believes that a violation has occurred, the details of the case are forwarded to Transport Canada for final disposition, as it has the sole authority for determining financial penalties. For any violation, Transport Canada may assess a maximum fine of \$25,000 against a company and \$5,000 against a pilot. In addition, at the urging and in

**Figure 19**

Monthly Enforcement Investigations



# GLOSSARY

**Airport elevation** 569 feet above sea level

**ATAC** Air Transport Association of Canada

**CAEP** Committee on Aviation Environmental Protection

**CARs** Canadian Aviation Regulations

**CENAC** Community Environment and Noise Advisory Committee

**Chapter 2** Noise certification class for jet aircraft built before 1977 with noisier low-bypass and early high-bypass turbofan engines

**Chapter 3** Noise certification class for jet aircraft built after 1977 with newer, quieter high-bypass turbofan engines; required standard for jet aircraft operating in Canada since April 1, 2002

**Chapter 4** Noise certification class for jet aircraft built after January 1, 2006, with latest, quietest engine technology

**CRJ** Canadair Regional Jet

**dBa** A-weighted decibel scale that defines sound volume within the range perceptible by the human ear

**Glide slope** Radio navigation aid that provides vertical guidance during final approach

**GTA** Greater Toronto Area

**GTAA** Greater Toronto Airports Authority

**GTOW** Gross Take-Off Weight

**Hushkit** Engine modification to reduce Chapter 2 certificated jet aircraft noise to Chapter 3 standards

**ICAO** International Civil Aviation Organization

**ILS** Instrument Landing System

**Leq** Continuous equivalent sound level (average noise level)

**Movement** Aircraft arrival or departure

**NEF** Noise Exposure Forecast

**Nmi** Nautical mile (1.152 statute mile or 1.853 kilometres)

**NMO** Noise Management Office

**NMT** Noise Monitoring Terminal

**Non-noise certificated** Noise certification class for jet aircraft, such as military and historical aircraft, that use the noisiest and often the oldest engine technology

**Rwy** Runway

**Runway 05/23** 11,120-foot east-west runway (heading 057 degrees and 237 degrees magnetic)

**Runway 06R/24L** 9,000-foot east-west runway (heading 057 degrees and 237 degrees magnetic)

**Runway 06L/24R** 9,697-foot east-west runway (heading 057 degrees and 237 degrees magnetic)

**Runway 15R/33L** 9,088-foot north-south runway (heading 147 degrees and 327 degrees magnetic)

**Runway 15L/33R** 11,050-foot north-south runway (heading 147 degrees and 327 degrees magnetic)

**Subsonic** Relating to speeds less than the speed of sound

**Threshold** First usable portion of a runway for landing

**TNC** Technical Noise Committee

**Transponder** Radio receiver/transmitter that provides aircraft identification to radar systems



**Greater Toronto Airports Authority**

P.O. Box 6031, 3111 Convair Drive  
Toronto AMF, Ontario  
Canada L5P 1B2

[www.GTAA.com](http://www.GTAA.com)

President and Chief Executive Officer  
Lloyd McCoomb