



# 2004 Noise Management Report

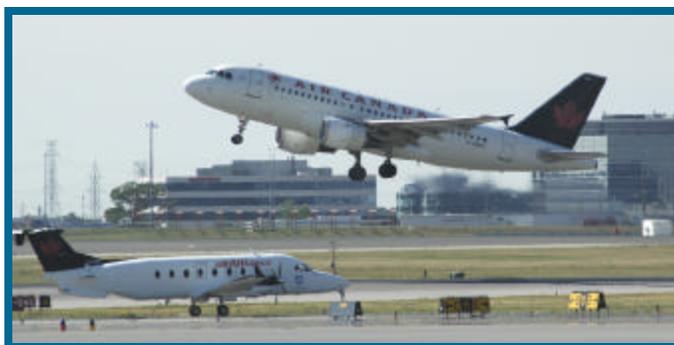


# Contents

<b>1</b>	Noise Management - Glossary
<b>2</b>	Message from the Chair
<b>4</b>	NMC Terms of Reference
<b>8</b>	Education and Consultation
<b>9</b>	Understanding Noise
<b>10</b>	Regulations and Policies
<b>11</b>	Noise Operating Restrictions
<b>12</b>	Noise Abatement Procedures
<b>13</b>	Noise Aircraft Certification
<b>14</b>	Airport Operating Area and Noise Exposure Forecast
<b>15</b>	Noise Management Office
<b>16</b>	NMT Locations
<b>17</b>	Airport Noise Monitoring and Flight Tracking
<b>18</b>	Annual Statistics

# Noise Management - Glossary

**Aerodrome** Airport  
**Airport elevation** 569 feet above sea level  
**ATAC** Air Transport Association of Canada  
**CAEP** Committee on Aviation Environmental Protection  
**CAR** Canadian Aviation Regulations  
**Chapter 2** Noise certification class for jet aircraft-noisier and older technology  
**Chapter 3** Noise certification class for jet aircraft-quieter and newer technology  
**Chapter 4** Noise certification class for jet aircraft-quietest and latest technology  
**CRJ** Canadair Regional Jet



**dBa** A-weighted decibel  
**FAR** Federal Aviation Regulations (U.S.)  
**Glideslope** Descent profile during final approach  
**GTA** Greater Toronto Area  
**GTAA** Greater Toronto Airports Authority  
**GTAA CC** Greater Toronto Airports Authority Consultative Committee  
**GTOW** Gross Take-off Weight  
**Hushkit** Engine modification to reduce noise  
**ICAO** International Civil Aviation Organization  
**ILS** Instrument Landing System  
**Kg** Kilogram  
**Leq** Continuous equivalent sound level (average noise level)  
**Movement** Aircraft arrival or departure  
**NEF** Noise Exposure Forecast  
**NMC** Noise Management Committee  
**Nmi** Nautical mile (1.152 statute mile or 1.853 kilometres)  
**NMT** Noise Monitoring Terminal  
**Non-noise certificated** Noise certification class for jet aircraft - noisiest and oldest technology  
**Power plant** Propeller, turboprop, turbojet, or turbofan engine  
**Rwy** Runway  
**Runway 05/23** 11,120ft east-west runway (heading 057 degrees & 237 degrees magnetic)  
**Runway 06L/24R** 9,697ft east-west runway (heading 057 degrees & 237 degrees magnetic)  
**Runway 06R/24L** 9,000ft east-west runway (heading 057 degrees & 237 degrees magnetic)  
**Runway 15L/33R** 11,050ft north-south runway (heading 147 degrees & 327 degrees magnetic)  
**Runway 15R/33L** 9,080ft north-south runway (heading 147 degrees & 327 degrees magnetic)  
**Subsonic** Relating to speeds less than that of sound  
**Threshold** Beginning portion of runway usable for landing  
**TNC** Technical Noise Committee  
**Toronto Pearson** Toronto Pearson International Airport  
**Transponder** Radio receiver/transmitter

# Message from the Chair



On behalf of the Greater Toronto Airports Authority's Noise Management Committee (NMC), I am pleased to present the 2004 edition of the annual noise report. This report is intended to provide airport stakeholders with information on the activity at Toronto Pearson International Airport as well as report on the 2004 activities of the NMC.

Since assuming management of Toronto Pearson, the Greater Toronto Airports Authority (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 10 nautical mile radius of the airport.

While the GTAA maintains and promotes Toronto Pearson as an economic asset for the Greater Toronto Area (GTA), it remains sensitive to the issue of aircraft noise and its effects on surrounding communities. Part of this commitment to the community has involved the establishment of the NMC, a community-based committee that functions as a forum where members of the community and the Authority can openly discuss noise and environment related issues. Acting in an advisory capacity to the GTAA, the committee meets at least five times a year and members of the public are invited to attend and provide comments directly to committee members.

The NMC continues to be a constructive forum for noise mitigation issues to be brought forward and discussed. NMC members continue to be effective advocates for the communities they represent and 2004 saw the committee continue to build on their many notable achievements. The operators of the Canadair Regional Jet have maintained a departure procedure for the CRJ that has proven beneficial both from an environmental standpoint as well as an operational perspective. The GTAA awaits approval from Transport Canada to formalize the permanent implementation of this procedure.

The NMC also actively brought forward and discussed environmental issues. The scope of the committee has been increased to include any environmental impacts, including, but not limited to noise, that the airport has on the surrounding communities. A key element to this focus on environmental issues in 2004 was the continuing work of the NMC's Air Quality Study sub-committee.



NOISE  
MANAGEMENT  
COMMITTEE

The committee meets at least five times a year and members of the public are invited to attend and provide comments directly to committee members.

With the support of the NMC, the GTAA continued to increase the number of community Noise Monitoring Terminals (NMT) in surrounding municipalities. A total of 19 NMTs are operating to provide accurate data concerning aircraft operating into and out of Toronto Pearson. In cooperation with the community, the GTAA plans to increase the number of existing NMTs during the next several years.

The NMC continues to be an effective forum for education and the dissemination of information. The committee is an important community forum which directly helps to improve the GTAA's noise management program. We look forward to building on the successes of 2004 as we continue to strive to be a good neighbour.

Lastly, I would like to extend my thanks to the members of the NMC for their dedication to working collaboratively with all airport stakeholders and for their commitment to their communities.

Sincerely,

Steve Shaw  
Chair, Noise Management Committee  
GTAA Vice President, Corporate Affairs

## Noise Management Committee Members - 2004

**Brampton** - Councillor John Sprovieri, Mr. Jim Medeiros, Mr. Brad Green

**Mississauga** - Councillor Maja Prentice, Councillor Pat Saito, Mr. Gordon Stewart, Ms. Tina Rizzuto-Willan

**Toronto** - Councillor Rob Ford, Councillor Suzan Hall, Mr. Ross Vaughan

**Technical Members** - NAV CANADA- Mr. Dave Mastel, Transport Canada- Mr. Dave Bayliss,

Pilot-Captain Brian Harkness, ATAC- Mr. Andy Vasarins, Province of Ontario- Mr. Paul Steckham,

City of Brampton- Mr. David Waters, City of Mississauga- Mr. John Calvert

# NMC Terms of Reference

## **PURPOSE**

The Noise Management Committee (NMC) will provide a consultative / communication forum for community stakeholders to meet with Greater Toronto Airports Authority (GTAA) Management and other aviation community representatives to discuss issues relating to the mitigation of aircraft noise in the community. The NMC will be an advisory body for the GTAA President and Chief Executive Officer.

It 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 NMC 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."

### **COMMUNICATION AND DISSEMINATION / EDUCATION OF STAKEHOLDERS**

The NMC will act in an advisory capacity to the GTAA on all issues relating to Toronto Pearson's Noise Management Policy with a view to improving the GTAA's noise mitigation program, and promote the objectives of the Authority respecting all aspects of noise management.

The NMC will provide a forum for the discussion of noise related matters and will decide on the best methods of distributing information to stakeholders and to stakeholder groups on an issue by issue basis.

### **LINKAGES**

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

The NMC will provide a forum for the discussion of noise related matters and will decide on the best methods of distributing information to stakeholders and to stakeholder groups on an issue by issue basis.

Linkage to the GTAA Consultative Committee (GTAA CC), Toronto Pearson's main consultative communication forum, will be provided through common membership. One member from the GTAA and one member from the Community will serve on both committees and will act as a liaison between both committees. The GTAA will continue to perform this liaison through the committee chair.

The NMC will also have linkage to the Technical Noise Management Committee (TNC) to provide a two-way communication on the operational aspects of noise monitoring, enforcement, and mitigation. This linkage will be provided through the GTAA Vice President, Operations and Chief Engineer.

#### **SCOPE**

The NMC 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 NMC will report and make recommendations to the GTAA President and Chief Executive Officer. The President and CEO may refer recommendations to the appropriate committee of the GTAA Board of Directors, to the GTAA CC, to the Technical Noise Management 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 on these recommendations.



**MEMBERSHIP**

**CHAIRPERSON:** GTAA President and Chief Executive Officer or designate.

<b>COMMUNITY MEMBERS:</b>	<b>VOTING</b>
City of Brampton (3)	1 elected representative, 1 resident, and 1 additional to be appointed at Council discretion.
City of Toronto (3)	1 elected representative, 1 resident, and 1 additional to be appointed at Council discretion.
City of Mississauga (5)	2 elected representatives, 2 residents, and 1 additional to be appointed at Council discretion.

Municipalities will be permitted to appoint alternate councillors or residents, who are encouraged to attend meetings regularly. Alternates can vote in absence of the regular member.

<b>COMMUNITY MEMBERS:</b>	<b>NON -VOTING</b>
	1 staff representative from each of Brampton, Toronto and Mississauga Consultative Committee representative Province of Ontario Staff representative

<b>TECHNICAL MEMBERS:</b>	<b>NON-VOTING</b>
	Transport Canada regional staff representative Nav Canada and ATAC representatives Technical members, Nav Canada and ATAC, will support (NMC).

<b>GTAA MEMBERS:</b>	<b>NON-VOTING</b>
	As Required

**ATTENDANCE**

Regular attendance is expected of members. If a member misses more than two consecutive regularly scheduled meetings, then the appointing community will be advised.

**PROCEDURES / OPERATION**

Meetings will be held on a bi-monthly basis in the Administrative Offices of the GTAA. The Committee will meet the second Wednesday of alternating months at 4:00 p.m.

Should there be a need to re-schedule the meeting will take place on the following Wednesday.

There will be a published agenda, which will be delivered one week in advance of published meetings dates. Items for discussion should be submitted to the Committee Chairperson two weeks 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.

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

#### **SECRETARIAT SERVICES**

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



# Noise Management: Education and Consultation



## **Community Education and Consultation**

In an effort to educate and consult with local residents, the GTAA hosted several Public Forums and Workshops in 2004. Meetings were held in each of Toronto Pearson's adjacent municipalities in order to provide a forum for community members to express comments and concerns to representatives of the GTAA, NAV CANADA, Transport Canada and the airline industry.

These opportunities for consultation and education were in addition to the regularly scheduled NMC meetings and allowed the GTAA and residents to exchange information regarding airport operations as they relate to the Noise Management Program.

Over the course of the year Public Forums were held in Toronto on April 28, in Brampton on May 26, and in Mississauga on October 27.

The GTAA also hosted a December 1st public workshop on Noise Abatement Procedures and Enforcement. This workshop served to educate interested residents on the GTAA and Transport Canada's noise abatement and enforcement programs and initiatives at Toronto Pearson. Input from participants at the workshop was forwarded to the NMC for its review and analyzed by the GTAA in order to improve the effectiveness of the GTAA's Noise Management Program.

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

## **Community Noise Monitoring Terminals**

The GTAA has committed to increasing the number of Noise Monitoring Terminals (NMTs) in each of the surrounding municipalities to improve the monitoring of aircraft noise and increase the effectiveness of aircraft noise analysis. By year end, the number of NMTs installed in communities around Toronto Pearson has increased from 14 to 19 installations. The location of each NMT was based on recommendations from the NMC in conjunction with their respective municipalities. It is expected that the number of NMTs will total 23 by the end of 2005.

## **Ongoing collaboration between the NMC and the GTAA Noise Management Office**

The GTAA's Noise Management Office monitors airport operations in relation to the Noise Management Program and registers and responds to noise complaints. While they regularly investigate and respond to noise complaints, the Noise Management Office also works with the committee to respond to their inquiries, provide information and analysis, research noise mitigation initiatives, and provide technical expertise for committee meetings and committee members.

### 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 mitigation procedures and to discuss the technical merits of any proposed noise mitigation initiatives.

The committee is made up 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 where industry specialists consider new technologies and proposals that could be used to augment the airport's noise mitigation program. Specific topics for discussion 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 Noise Management Committee and the GTAA.

## Understanding Noise

The universally accepted measurement of sound is the decibel, which uses a logarithmic scale due to the large range of noise levels that can be heard. Because the human ear has greater sensitivity to certain frequencies or pitches, aircraft noise and most other community sounds are usually measured in "A-weighted decibel (dBA)". To the average human, a 3 dBA increase is barely perceptible while a 5 dBA increase is clearly perceptible. An increase in 10 dBA is perceived as being twice as loud. As an example, general office noise at 50 dBA is considered twice as loud as a 40 dBA library.

Unwanted or unexpected sounds can be considered noise even when their loudness and pitch are the

same as familiar sounds. While an Airbus A320 flying overhead may generate the same 70 dBA level as a vacuum cleaner one metre away, the aircraft may seem more annoying to a person because one expects to hear the vacuum's noise and is therefore willing to accept it.

Sound waves propagated through the air can change with humidity, temperature and wind direction. Due to these factors, sound can vary by up to five or more decibels from the same aircraft operating at the same location on different days.

### Common Sound Levels

Noise Source	Sound Level
Urban residential nighttime	50 dBA
Urban residential daytime	55 dBA
Office environment	60 dBA
Vacuum at 10 feet	70 dBA
A320 arrival 2 nmi from runway	75 dBA
B727 arrival 2 nmi from runway	85 dBA
A320 departure 2 nmi from runway	70 dBA
B727 departure 2 nmi from runway	80 dBA
Leafs overtime win versus Ottawa	100 dBA

# Regulations and Policies

Regulations and policies pertaining to noise management originate from various regulatory bodies, including those standards set by the International Civil Aviation Organization (ICAO), Transport Canada and the GTAA.

The Aeronautics Act and the Canadian Aviation Regulations (CARs) support the ICAO standards and set Canadian procedures relating to noise certification and aircraft operations.

Specific sections governing operations of an aerodrome include:

The Aeronautics Act - Section 4.9(f)

The Governor in Council may make regulations respecting aeronautics and, without restricting the generality of the foregoing, may make regulations respecting noise emanating from aerodromes and aircraft.

The Aeronautics Act also states that other standards, procedures or specifications can be incorporated by reference.

The Canadian Aviation Regulations (CARs)

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

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

# Noise Operating Restrictions

## **Time of Day Restrictions**

The GTAA is required to develop and maintain a comprehensive aircraft noise mitigation program while at the same time manage the number of flights during the night restricted hours. To ensure that the number of flights during the restricted hours remains proportionate to overall traffic levels, limits have been placed on the total number of flights that may occur between 12:30 a.m. and 6:30 a.m., in any year. The GTAA carefully manages the number of flights within the restricted period to ensure that the established limit is not exceeded.

Effective June 10, 2004, Toronto Pearson's restrictions were amended to apply to all aircraft. The noisiest and older non-noise certified jet aircraft are prohibited between 8 p.m. and 8 a.m., while Chapter 2 and equivalent aircraft are restricted 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. There are a limited number of arrivals of Chapter 3 aircraft scheduled during the evening and morning shoulder periods (12:30 a.m. and 1 a.m. and again between 6 a.m. and 6:30 a.m.).

The GTAA Duty Manager may grant operating extensions on the day of operation for flights delayed by weather, emergencies, air traffic control issues or mechanical difficulties. Chapter 3 over 34,000 kg GTOW aircraft may be approved up until 3 a.m. depending upon the circumstances and runway availability. Daily requests for Chapter 3 jet aircraft under 34,000 kg GTOW and equivalent propeller aircraft may be approved to operate in the restricted hours up to a daily limit. A limited number of exemptions for Chapter 3 aircraft are approved conditional on the GTAA's ability to remain within the total number of flights associated with Transport Canada's imposed annual limit (November-October). Non-noise certified aircraft and Chapter 2 and equivalent operations will not be granted operating extensions.

## **Preferential Runway Assignment**

To minimize noise, the GTAA works with air traffic control (NAV CANADA) to maintain strict flight procedures for arriving and departing aircraft. Subject to operational safety (wind, weather, runway conditions, and approach aid availability), preferential runways have been allocated for use between midnight and 6:30 a.m. Preferred departures are in the following order of priority: Runways 23, 33R and 24R. Preferred arrivals are in the following order of priority: Runways 05, 15L and 06L. Operations on other runways are limited as much as possible during this time.

## **Engine Run-ups**

Occasionally, airline maintenance staff are required to perform engine run-ups after the engine repairs have been completed. At all times, these run-ups must be approved by the GTAA Duty Manager and conducted at designated times and locations where impact on the surrounding community is minimized. Between midnight and 7 a.m., these ground operations are only approved at locations furthest from residential areas and for those aircraft scheduled to depart the next morning. All Chapter 2 aircraft are prohibited from performing aircraft maintenance run-ups between 2 a.m. and 5 a.m.

# Noise Abatement Procedures

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

## Departures:

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 above airport elevation before making enroute turns. Propeller aircraft must comply with jet procedures between 11 p.m. and 7 a.m., except regarding climb procedures. During the day they may turn as low as 500 feet above airport elevation to accommodate increased hourly operations.

## Arrivals:

Arriving jet aircraft must remain at 2,400 feet above airport elevation until they line up with their runway, generally seven to ten nautical miles from the airport. They must then maintain a three-degree glide slope approach until touchdown, and minimize noisy reverse thrust after touchdown. Propeller aircraft must comply with jet arrival procedures between 11 p.m. and 7 a.m.

While the airport and airlines act to minimize noise during departures and arrivals, sometimes they may have to deviate from noise procedures if there is any question of safety.

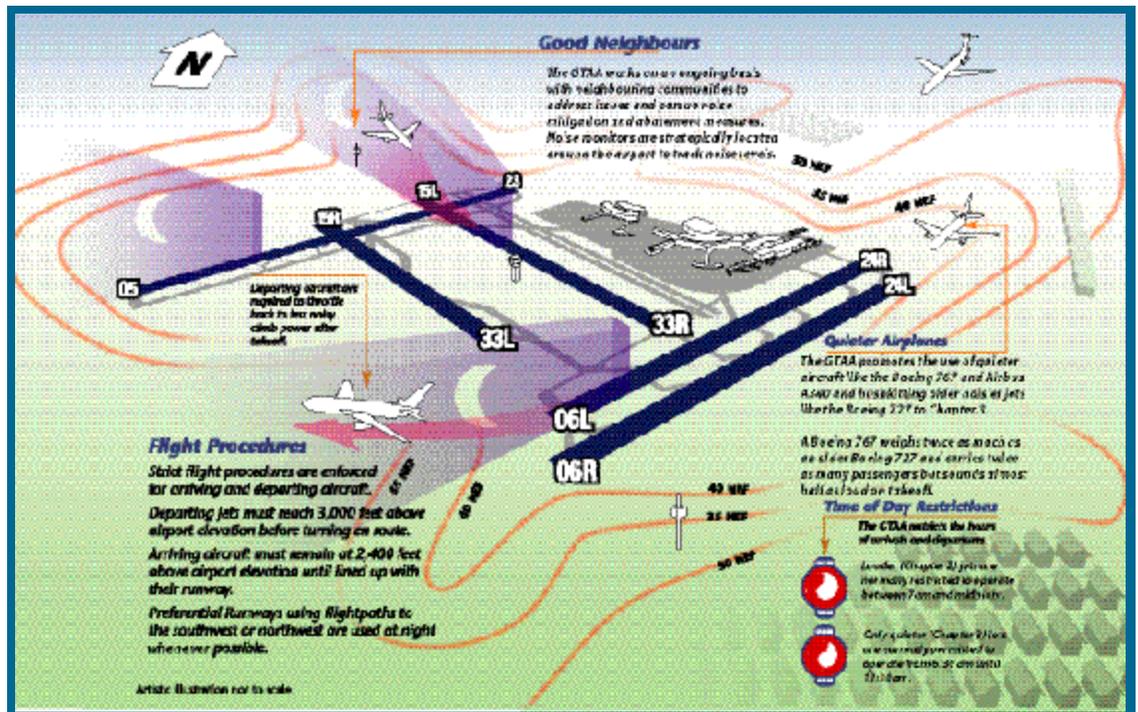


Figure 1: Noise Abatement Procedures

# Noise Aircraft Certification

The GTAA follows the guidelines of managing noise as prescribed by the International Civil Aviation Organization (ICAO) Annex 16 Volume I, Chapter 3, created to develop standards that would be uniform for the global aviation industry. Chapter 3 noise standards of ICAO require that all subsonic jet aircraft types certificated after October 1977 meet more stringent maximum noise levels. In the United States, aircraft that meet similar noise standards under FAR Part 36 are referred to as Stage 3. Aircraft that conform to those noise emission standards include the Boeing 747-400, new generation 737, 757, and Airbus 319, 320, 330 and 340, among others. Noisier, older aircraft, known as Chapter 2 or Stage 2, include Douglas DC-9, Boeing 727, older model 737, and older Learjets and Gulfstream business jets. Some of these jets can be hushkitted to meet Chapter 3 standards. Jets that are non-noise certificated are the oldest, noisiest models. These include military aircraft that make fewer than 100 visits to Toronto Pearson each year.

Transport Canada has adopted timetables for conversion of large air carrier jet fleets to the quieter Chapter 3 standards. Since April 1, 2002, only the quietest Chapter 3 aircraft (greater than 34,000 kg) are permitted to operate at Toronto Pearson. Although the GTAA and the NMC have opposed Chapter 2 exemptions, Transport Canada retains the right to approve exemptions and permit some Chapter 2 aircraft to operate at Toronto Pearson.

## What's Next?

In June 2001, on the basis of recommendations made by the Committee on Aviation Environmental Protection (CAEP/5), the ICAO Council adopted a new Chapter 4 noise standard which is even more stringent than that contained in Chapter 3. Commencing in January 2006, the new standard will apply to newly manufactured aircraft and to Chapter 3 aircraft for which re-certification to Chapter 4 is requested.

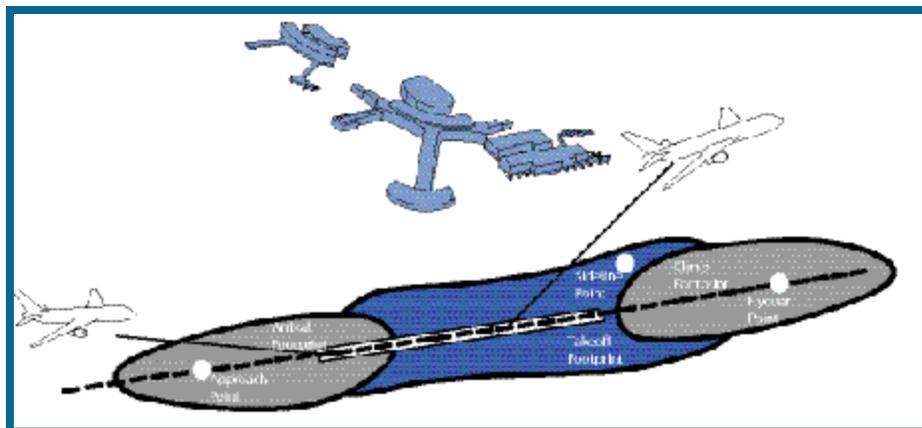


Figure 2: Aircraft Noise Certification

# Airport Operating Area and Noise Exposure Forecast

## NOISE EXPOSURE FORECAST

An NEF is a cumulative noise value of overall actual or forecasted flights.

Transport Canada has developed a “Noise Exposure Forecast” (NEF) model to calculate long term aircraft noise exposure based on actual or forecasted flights. Contour lines are drawn on a map (Figure 3) 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 or forecasted flights.

Transport Canada has taken the position that areas as low as 25 NEF may be affected by aircraft noise. Areas of 30 NEF or greater are considered incompatible for new residential development. The GTAA has established the Toronto Pearson Airport Operating Area which uses well-defined natural or manmade boundaries to approximate the 30 NEF Contour on the ground. This operating area and associated policies that limit incompatible sensitive land uses are included in the Official Plans of the municipalities that surround the airport.

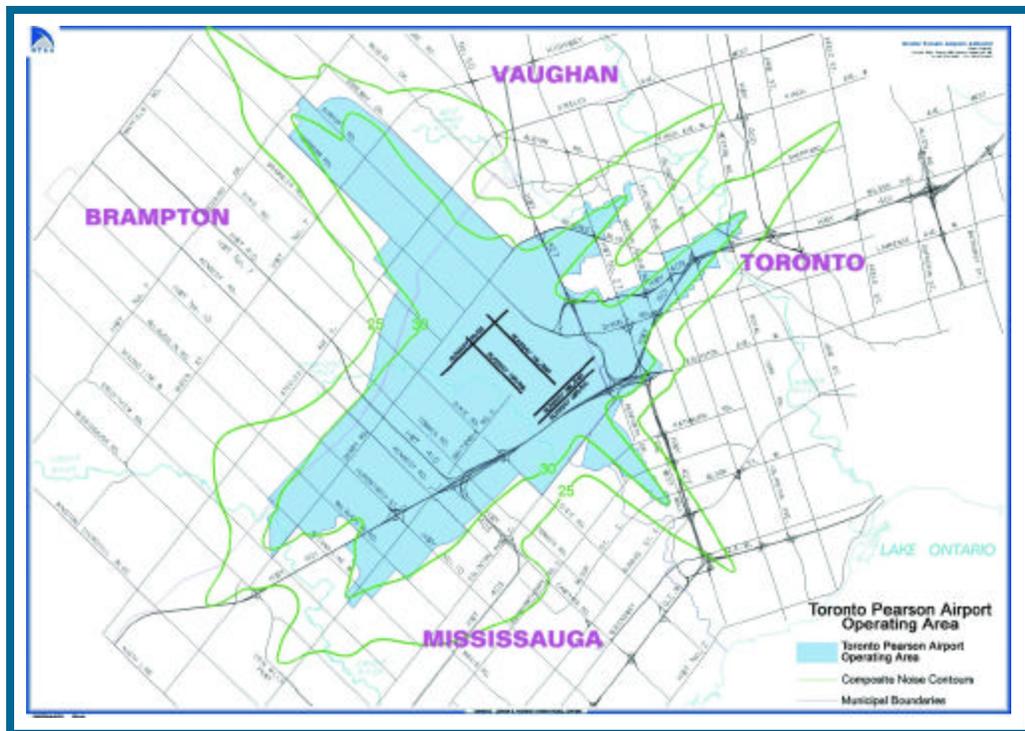


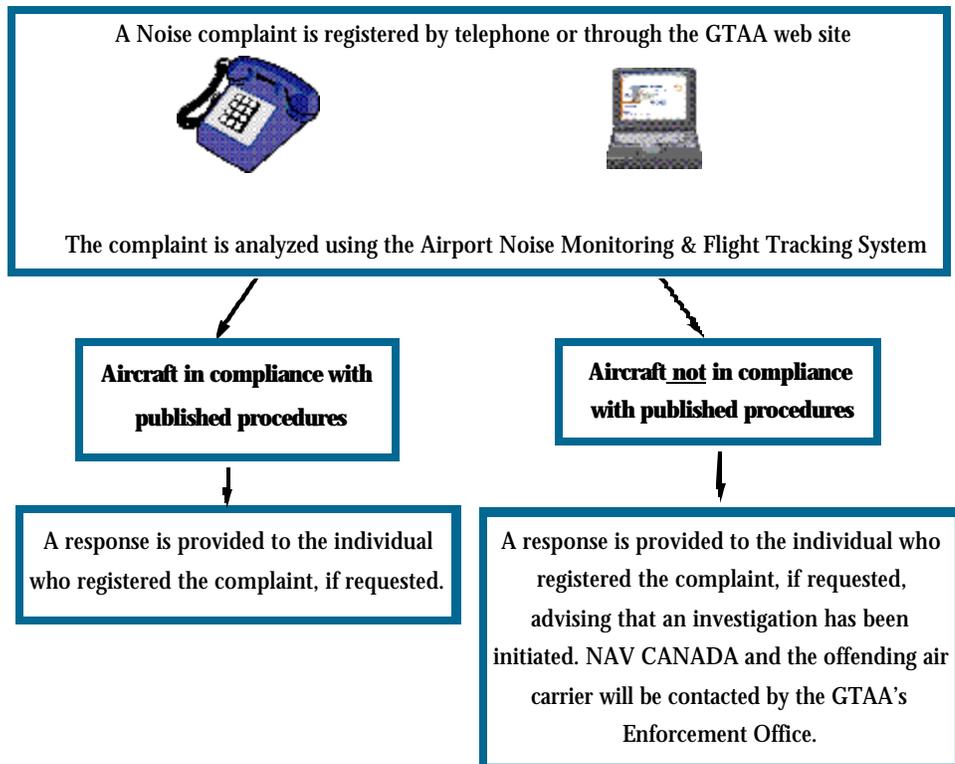
Figure 3: Airport Operating Area

# Noise Management Office



The GTAA maintains a Noise Management Office to monitor airport operations in relation to the Noise Management Program. The primary responsibility of the Noise Management Office is to register and respond to noise complaints. To register a noise complaint concerning arriving or departing aircraft within 10 nautical miles of Toronto Pearson, contact the GTAA at (416) 247-7682. Noise complaints can also be registered through the GTAA web site at [www.gtaa.com](http://www.gtaa.com). For complaints concerning en route aircraft or those beyond 10 nautical miles from the airport, call Transport Canada at (416) 952-0335.

## How a noise complaint is handled



## Enforcement

Only Transport Canada has the authority to issue fines to aircraft operators found to be in contravention. Transport Canada publishes the names of corporations violating the Aeronautics Act and the Canadian Aviation Regulations (CARs), including noise violations. Corporate offenders along with a summary of the offence and the resulting sanctions are published on the Transport Canada web site at:

[www.tc.gc.ca/civilaviation/regserv/enforcement/publications/corporate/summary.htm](http://www.tc.gc.ca/civilaviation/regserv/enforcement/publications/corporate/summary.htm)

# NMT Locations

The GTAA uses Noise Monitoring Terminals as a part of the overall Noise Management Program. Together with specialized software, the Noise Management Office has the ability to collect data related to aircraft noise. A total of 20 NMTs are operating to provide accurate data concerning aircraft operating into and out of Toronto Pearson. The data collected is utilized by the GTAA Noise Management Office in the course of investigating potential noise infractions or responding to resident complaints.



Figure 4: NMT Location Map

# Airport Noise Monitoring and Flight Tracking

The GTAA utilizes a sophisticated Airport Noise Monitoring and Flight Tracking System that combines radar flight track data from NAV CANADA with spatial data from a Geographic Information System (GIS). Flight track data is then correlated with realtime noise data collected at the community Noise Monitoring Terminals. The figure below is a screen shot of the system's realtime display mode. It provides GTAA Noise Office staff the following information : aircraft identification; altitude above sea level; aircraft type; ground speed; transponder code; origin and destination respectively in descending order. Aircraft arriving at Toronto Pearson are shown in yellow while departing aircraft are shown in red.

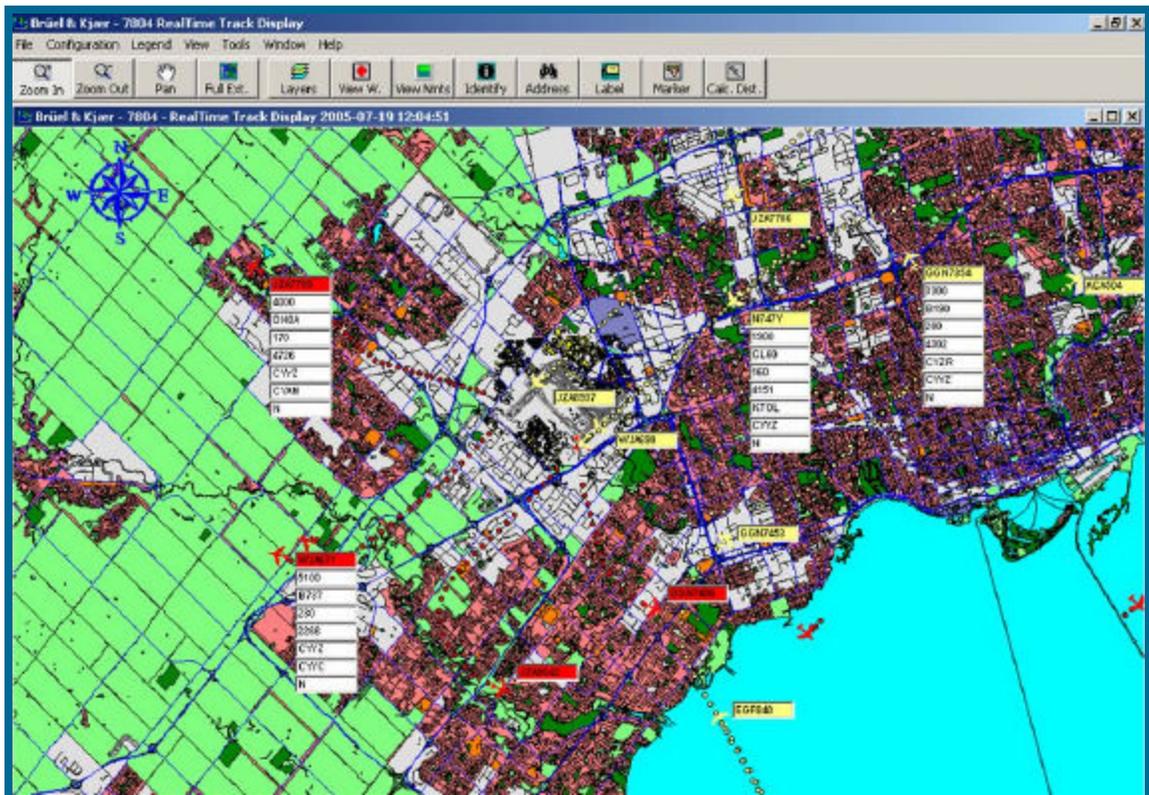
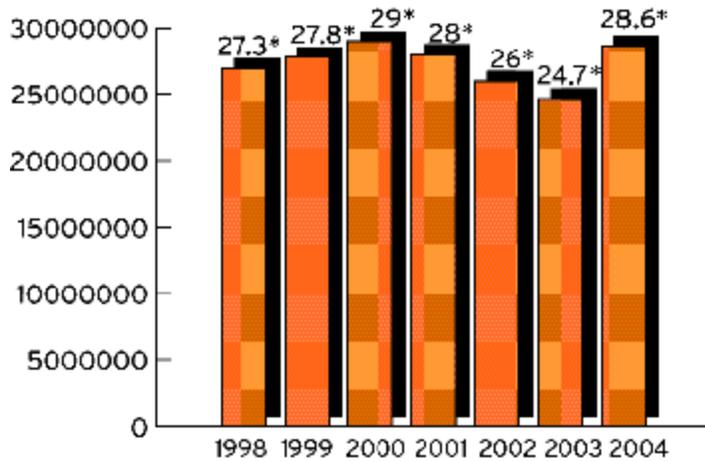


Figure 5: Realtime Noise Monitoring Display



Figures 6 and 7 illustrate passenger and aircraft movement trends for the years 1998 through 2004. Passenger traffic increased between 1994 and 2000. The decline in passenger traffic between 2001 and 2003 can be attributed to a number of factors, such as the events of September 11, 2001, SARS and world events which affected the entire airline industry. In 2004, passenger traffic rebounded to 2000 levels.

Figure 6: Passenger Volumes for 1998 through 2004

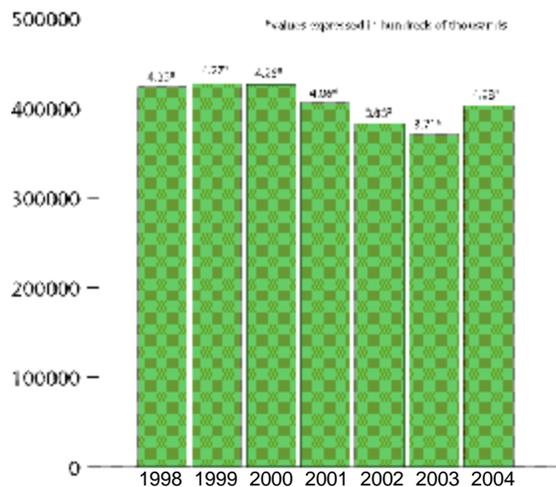


Figure 7: Aircraft Movements for 1998 through 2004

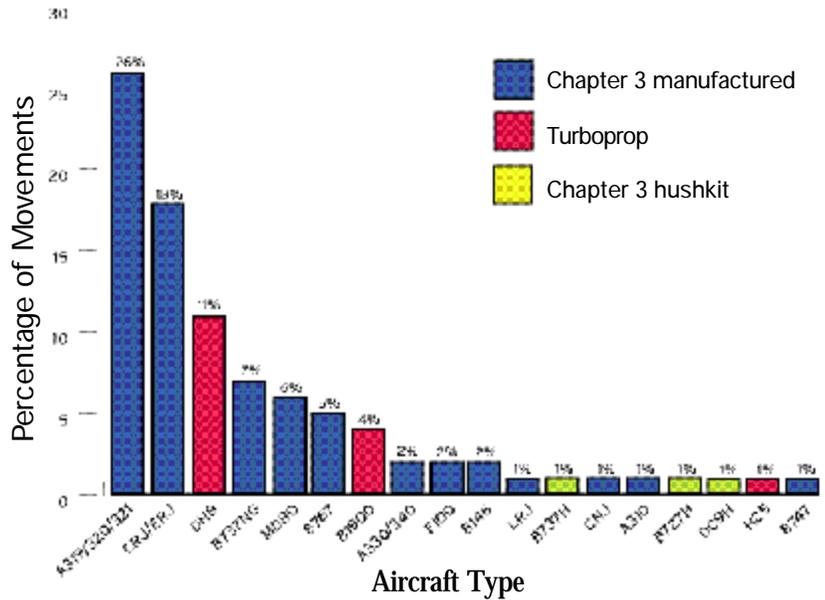


Figure 8: Annual percentage of specific movements by aircraft type

Figure 8 shows the annual percentage of specific movements by aircraft type that operate at Toronto Pearson. In 2004, 96 per cent of all jet aircraft operations were the manufactured, quietest Chapter 3 aircraft. Hushkitted, or retrofitted, aircraft accounted for approximately 4 per cent of all jet aircraft operations.

Accounting for just greater than half of all flights in 2004 were the Airbus A319, A320 & A321, the new generation Boeing 737, in addition to the Canadair Regional Jet (CRJ) and the Embraer Regional Jet (ERJ). These aircraft were all manufactured to meet Chapter 3 requirements and are among the quietest aircraft that operate at the airport.

Jet aircraft that have been hushkitted to conform to Chapter 3 regulations, such as the Boeing 727, 737-200 and McDonnell Douglas DC-9 accounted for 3 per cent of total operations at Toronto Pearson.

The most popular turboprop aircraft operating at Toronto Pearson in 2004 were the twin engine Dash-8 and the twin engine Beech 1900 representing 15 per cent of all flights at the airport.

ARRIVALS			DEPARTURES		
Runway	Movements	Complaints	Runway	Movements	Complaints
Arrive 23	33084	25	Depart 05	13993	18
Arrive 24R	59521	50	Depart 06L	44706	99
Arrive 24L	10586	10	Depart 06R	2747	12
Arrive 33R	915	3.5	Depart 15L	790	99
Arrive 33L	8209	249	Depart 15R	7	2
Arrive 06R	6123	6	Depart 24L	1314	10
Arrive 06L	29686	55	Depart 24R	41142	256
Arrive 05	38785	44	Depart 23	63895	154
Arrive 15R	1224	76	Depart 33L	16555	111
Arrive 15L	11655	62	Depart 33R	15886	141
<b>Total Arr</b>	<b>199788</b>	<b>612</b>	<b>Total Dep</b>	<b>201035</b>	<b>902</b>
		<b>Total All Runways</b>		<b>400823</b>	<b>1514</b>
		<b>Non Runway Complaints*</b>			<b>34</b>
		<b>Total Complaints</b>			<b>1548</b>

**Notes:**

Other operations relate to missed approaches, ILS inspections, maintenance runups and helicopter operations

Figure 9: Comparison of Aircraft Movements and Complaints by Runway Operation

Figures 9 & 10 illustrates a comparison of aircraft movements by runway to the number of complaints. In 2004 there were a total of 400,823 aircraft movements (arrivals and departures) at Toronto Pearson, while 1,548 complaints were registered with the GTAA's Noise Management Office.

1,514 of these complaints were registered against a particular runway operation.

The remaining 34 complaints were registered against: missed approaches; ILS inspections; maintenance runups and helicopter operations.

Complaints in the table relate to source of operation, not by geographic location (e.g., depart 33R rollback complaints are from south of the airport).

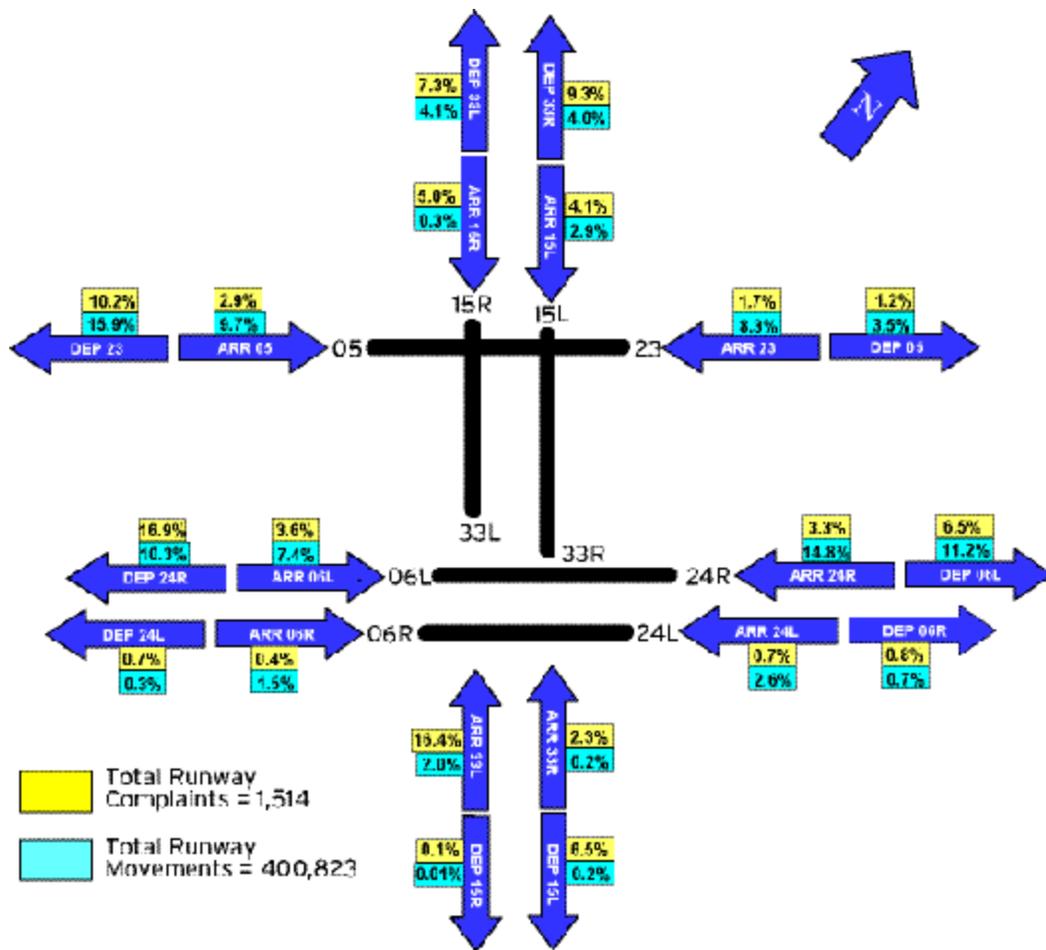
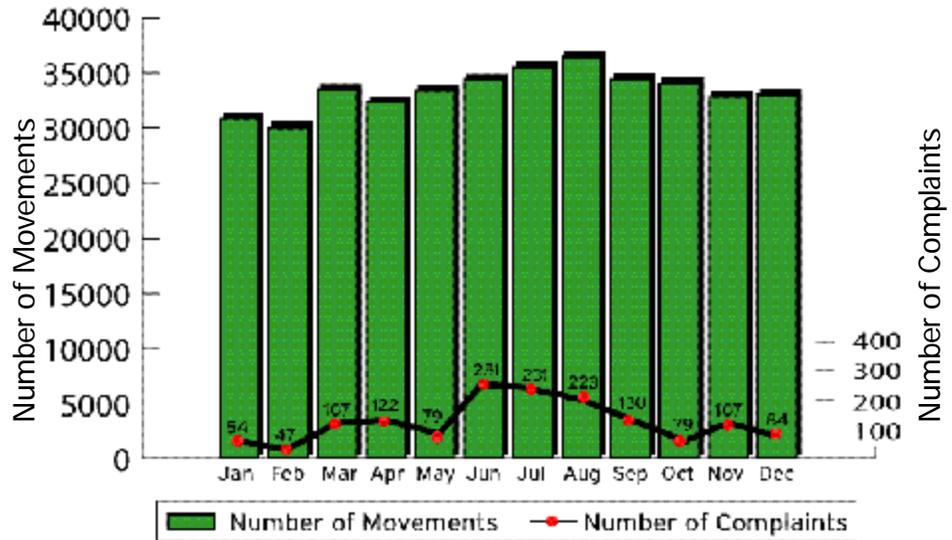


Figure 10: Comparison of Noise Complaints by Runway Operation

**ENFORCEMENT**

The GTAA manages aircraft noise by strictly enforcing the type of aircraft using Toronto Pearson International Airport as set out under applicable federal regulations and by enforcing noise abatement procedures.

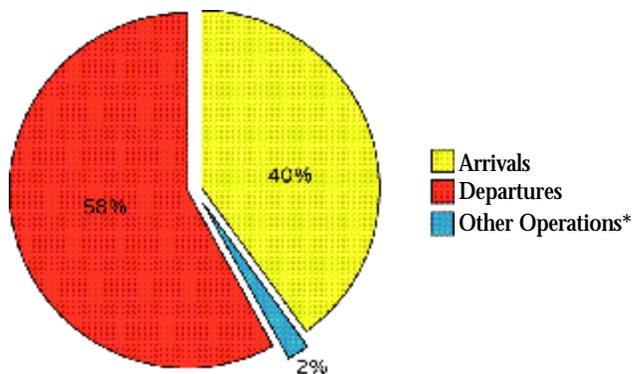


**Figure 11: Monthly Comparison of Runway Movements and Noise Complaints**

As in the past, the number of complaints varies throughout the year however the top three months of complaints registered occurs during the summer months for two main reasons.

The first coincides with the fact that during the warm summer months, the exposure to noise by the surrounding community is greatest given the greater use of outdoor space. The second reason has to do with Phase 1 of the Airport Development Program which saw the closure of Toronto Pearson's busiest runway, 05/23, during the summer months. With this closure, a significant portion of the operations were moved to other runways and therefore a higher frequency of arrivals and departures were seen on other flightpaths.

With the 3-year phasing of the 05/23 project, it is expected that this trend in complaints may continue over the next few summers.

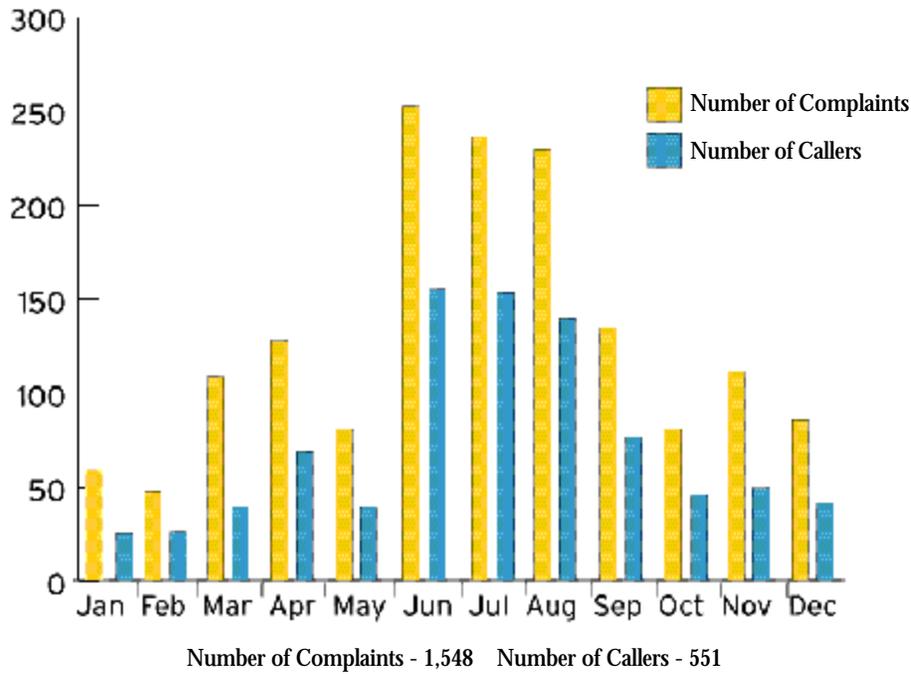


**Figure 12: Noise Complaints by Operation**

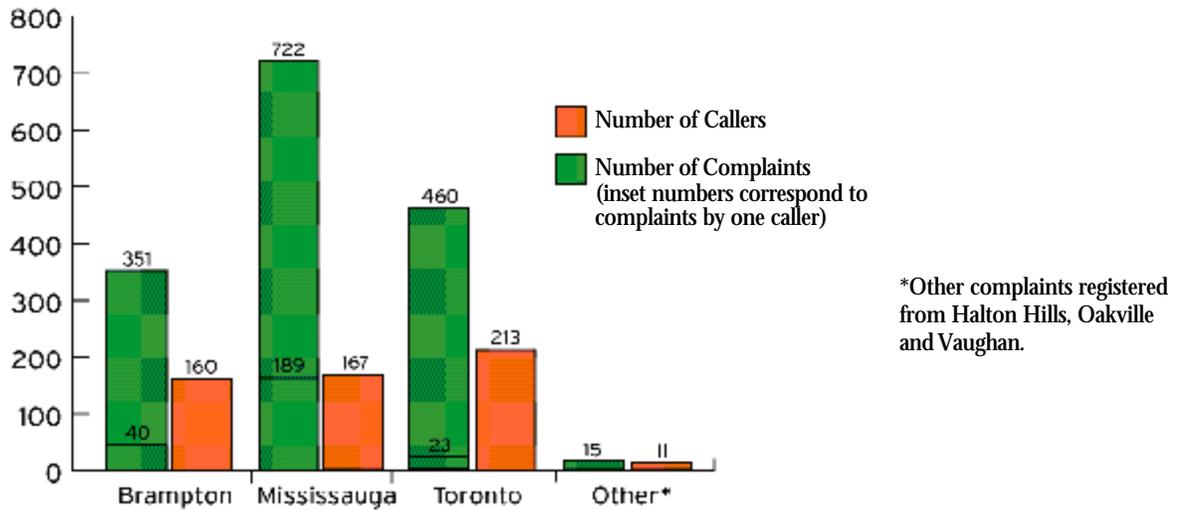
In 2004, the majority of complaints by operation were associated with aircraft departures.

This can be attributed to the fact that departures are generally noisier than arrivals and thus impact a greater number of residential areas due to its larger noise footprint.

\*Other Operations relate to missed approaches, ILS inspection, maintenance runups and helicopter operations.



**Figure 13: Monthly Comparison of Noise Complaints and Callers**



**Figure 14: Comparison of Noise Complaints by Municipality**

Figure 14 illustrates the total number of noise complaints and callers by municipality. In this case, Brampton had 160 complainants who registered 351 individual complaints. In 2004, one Brampton resident accounted for 11 per cent (40) of the total complaints registered. In Mississauga there were 167 complainants registering 722 individual complaints, with 26 per cent (189) complaints registered from one Mississauga resident, while in Toronto there were 213 complainants accounting for 460 complaints. 23 (5 per cent) individual complaints were registered from one resident in Toronto.

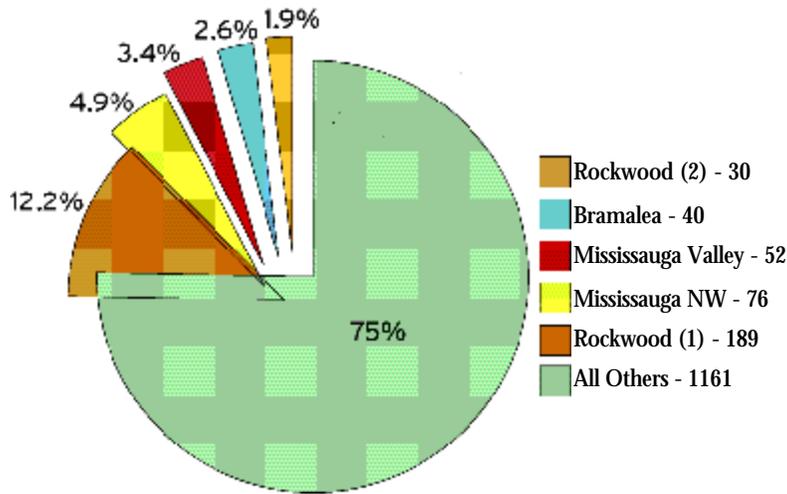
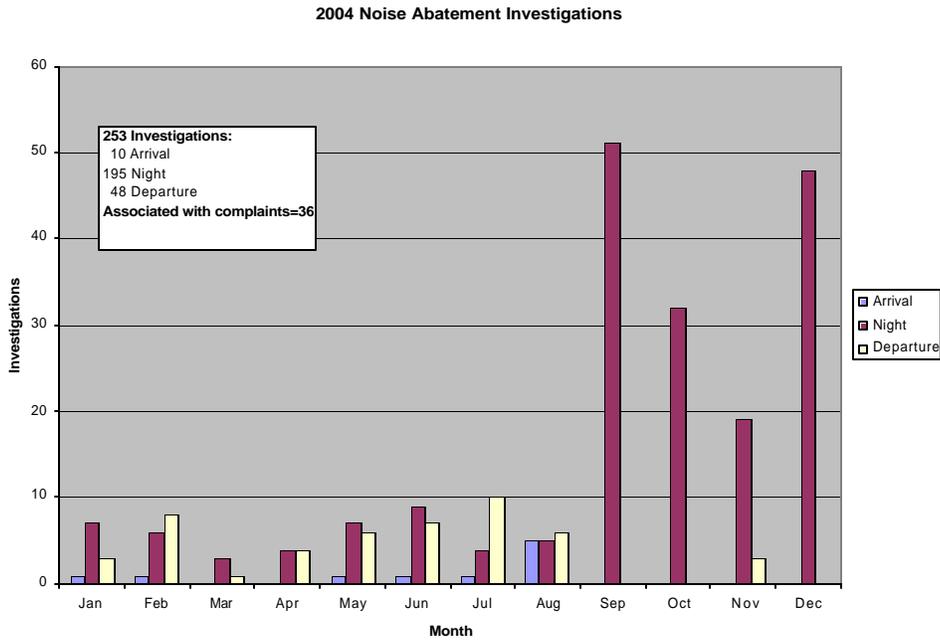


Figure 15: Top 5 Callers vs. All Other Callers

NMT	Location	J	F	M	A	M	J	J	A	S	O	N	D
NMT	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
<b>Toronto</b>													
1	West Humber	58.0	58.3	60.6	60.2	-	-	-	-	59.4	60.0	60.0	60.0
2	Humberlea	57.6	57.9	60.2	-	-	-	-	-	59.5	59.2	-	-
3	St. Eugene's	57.6	56.4	57.6	57.8	-	-	-	-	56.5	56.2	58.0	58.0
4	Markland	54.8	54.6	56.0	56.0	-	-	-	-	59.6	55.3	56.0	56.0
7	James S. Bell	55.4	55.2	-	55.7	-	-	-	-	54.7	55.7	56.0	56.0
30	Richview	-	-	-	-	-	-	-	-	-	-	-	-
31	Blackfriar	-	-	-	-	-	-	-	-	-	64.5	64.5	64.5
<b>Mississauga</b>													
5	Garnetwood	54.3	53.3	55.8	55.2	-	-	-	-	59.6	55.7	57.0	57.0
6	Hwy 401 & Hwy 403	60.0	60.3	64.0	64.1	-	-	-	-	63.7	60.6	60.0	60.0
8	Derry East	-	-	-	-	-	-	-	-	-	-	-	-
9	Meadowvale	56.7	56.4	59.3	59.7	-	-	-	-	59.1	59.5	57.0	57.0
10	Bren Road	58.1	58.5	60.0	59.3	-	-	-	-	60.6	57.4	56.0	56.0

- Notes: 1. NMT #8 out of service due to building construction on the property.  
 2. NMT #21 - New location installed March 2004.  
 3. NMT #25 - New location installed March 2004.  
 4. NMT #26 - New location installed March 2004.  
 5. NMT #27 - New location installed March 2004.  
 6. NMT #30 - New location installed November 2004.  
 7. NMT #31 - New location installed May 2004  
 8. Noise level data provided for NMTs that were active over 75% of the time. Software problems with new NMTs (#21, 25, 26, 27, 30 & 31) resulted in limited data for some months.

Figure 16: Noise Monitoring Terminal Monthly Leq (dBA)



**Figure 17: Noise Abatement Investigations**

Figure 17 depicts the breakdown of the 253 investigations conducted by the GTAA in 2004 concerning potential noise abatement violations. Of these, there were 10 investigations resulting from arrival procedures, 195 investigations that resulted from night flight operations and 48 investigations concerning potential departure violations. Of the 253 investigations conducted by the GTAA in 2004, 14 per cent were associated with public complaints registered with the GTAA's Noise Management Office.

Of note is the significant increase in night flight investigations between September and December. This increase can be attributed to the implementation of the new "Under 34,000-kg Nighttime Restriction", which was published in the Canada Air Pilot in the summer of 2004. It is anticipated that once the new restriction becomes better understood by operators, investigations and potential violations will reduce.

If GTAA enforcement staff believe that a violation has occurred, the case is forwarded to Transport Canada for final disposition as it has the sole authority for determining financial penalties. Transport Canada publishes the names of corporate offenders on its web site:

<http://www.tc.gc.ca/civilaviation/RegServ/Enforcement/Publications/Corporate/summary.htm>

**Contact Information:**

GTAA Noise Complaints/Information: (416) 247-7682  
 GTAA Web Site: [www.gtaa.com](http://www.gtaa.com)  
 Transport Canada Noise Complaints: (416) 952-0335