

# INTRODUCTION

Aéroports de Montréal (ADM) is responsible for the management, operation and development of Montréal-Pierre Elliott Trudeau International Airport since 1992. Under its lease with Transport Canada, ADM committed to, among other things, developing a soundscape management plan, forming a consultative committee on soundscape management and addressing complaints from citizens related to noise generated by air traffic in the vicinity of the airport. In addition, ADM constantly monitors aircraft noise and flight paths using an Airport Noise and Operations Management System (ANOMS).

Soundscape management around airports is governed in Canada by the *Aeronautics Act* and the *Canadian Aviation Regulations*. Noise operating restrictions and noise abatement procedures specific to each airport, and approved by the federal government, are published in the *Canada Air Pilot (CAP)* and the *Canada Flight Supplement*.

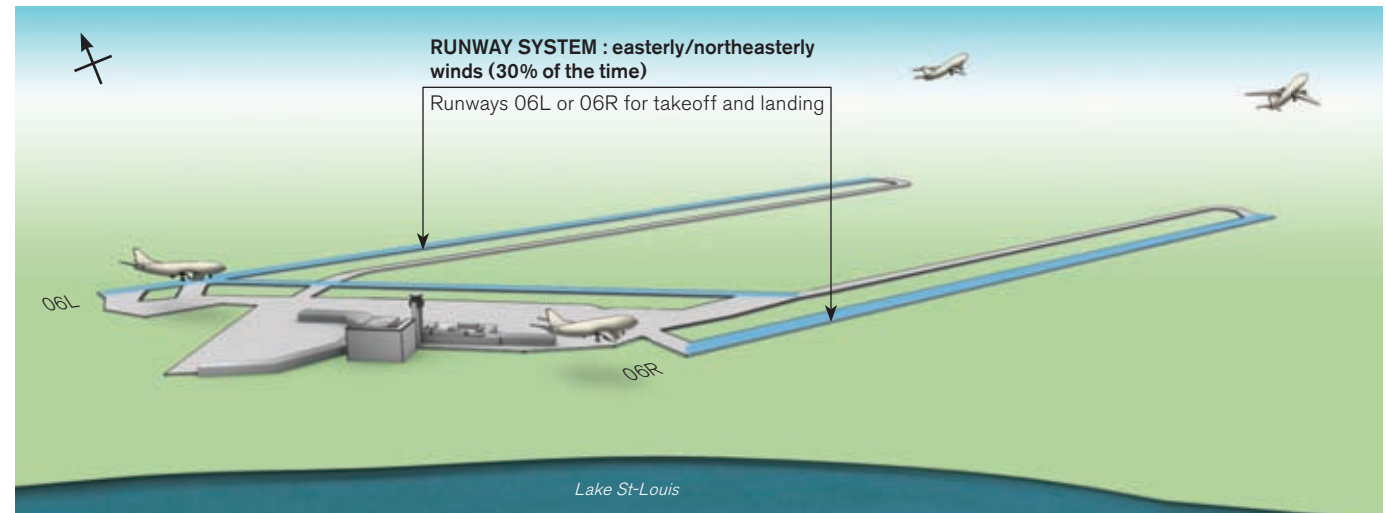
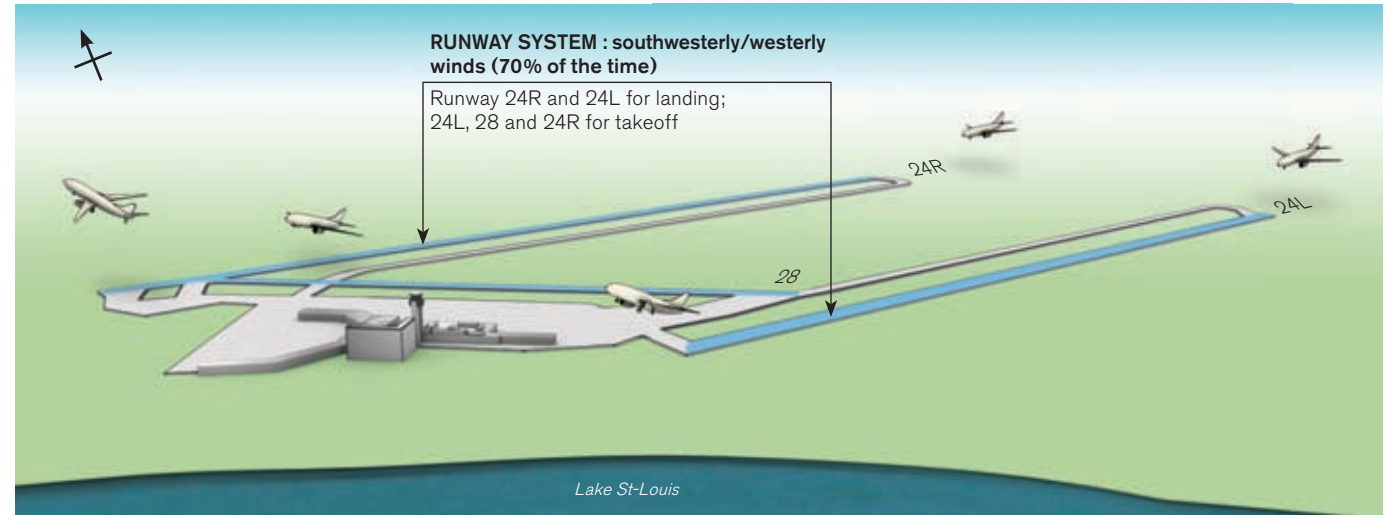
Transport Canada is the regulatory body responsible for enforcing air traffic noise control and abatement regulations, and is empowered to sanction both pilots and carriers who violate them. Each time an apparent irregularity is noted, ADM informs Transport Canada, which then determines the appropriate actions to be taken.

# TAKEOFF AND LANDING PROCEDURES AT MONTRÉAL-TRUDEAU

IN ADDITION TO SPECIFIC PROCEDURES DURING RESTRICTED AIRPORT OPERATING HOURS, PILOTS MUST FOLLOW CERTAIN PROCEDURES AT ALL TIMES.

**AFTER TAKEOFF**, jets rise along a straight-line trajectory to a minimum altitude of 3,000 feet before making a turn toward their destination (Note: Since type of aircraft, load and weather conditions can affect the rate of climb, aircraft do not reach 3,000 feet at the same point in their flight). On the other hand, turboprop and piston (propeller) aircraft initiate a turn immediately after takeoff.

**ON FINAL APPROACH WHEN LANDING**, pilots generally follow a standard procedure, which is to align the aircraft with the runway at a minimum altitude of 3,000 feet and make the final approach with an angle of descent of 3 degrees.



## SOUNDSCAPE CONSULTATIVE COMMITTEE

The Soundscape Consultative Committee brings together representatives of the cities of Dorval, Pointe Claire and Montréal, the Borough of Saint-Laurent, Transport Canada, NAV Canada, the Government of Québec and the airlines, as well as members of ADM management. This committee is a forum for exchanging information as well as for discussing and consulting on all soundscape-related issues, especially on any proposal for changing noise operating criteria and noise abatement procedures.

In conjunction with the Airport Soundscape Advisory Committee, the carriers, NAV Canada and Transport Canada, ADM continues to make sustained efforts to improve the soundscape around the airport.



### LISTENING TO CITIZENS

ADM HAS ESTABLISHED A NUMBER OF INFORMATION TOOLS TO ANSWER QUESTIONS FROM NEIGHBOURING RESIDENTS ABOUT THE SOUNDSCAPE.

In May 2009, ADM launched its *Soundscape Management Newsletter*. The newsletter, distributed by e-mail, informs residents about any events that could affect the soundscape around the airport. To subscribe, please send your email address to: [yulclientele@admtl.com](mailto:yulclientele@admtl.com)

Similarly, the "Frequently asked questions" section on our website at [admtl.com](http://admtl.com) has been developed based on the questions we most often receive.

Citizens can also contact us by phone at 514.633.3351 or by e-mail at [yulclientele@admtl.com](mailto:yulclientele@admtl.com)

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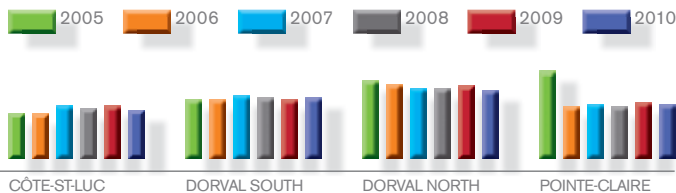
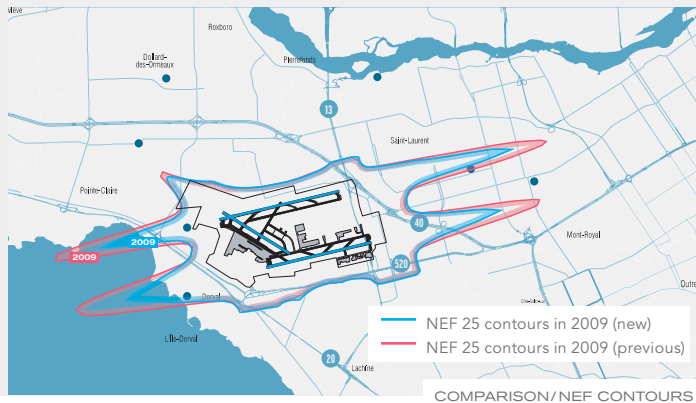


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Regardless of the method used, the 2009 NEF25 noise contour compares advantageously to that of the 1995 reference year (81.9 km<sup>2</sup> and 107,333 people). The improved soundscape stems mainly from the modernization of the air fleet and the phasing out of noisier, Chapter 2 aircraft.

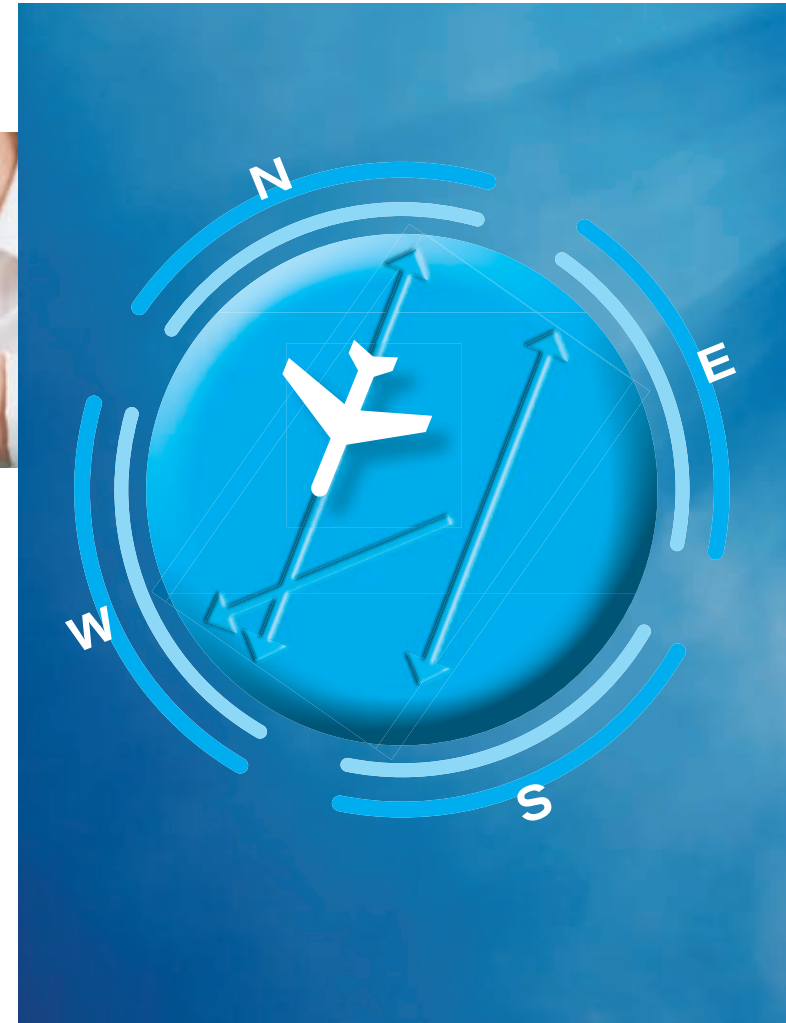
For 2009, ADM prepared the NEF25 contours using both methodologies. The surface area of the noise footprint is 27.2 km<sup>2</sup> using the new methodology versus 30.1 km<sup>2</sup> using the former method. A more significant variance is observed regarding the population living within the footprint which drops to 9,903 versus 17,917 using the former method. These variances essentially reflect the updated database being used by Transport Canada.

The NEF system measures the total amount of noise created by all types of aircraft operated at an airport, on all the runways and for a whole year of operation at all times of day or night. The higher the NEF level, the greater the noise disturbance. Transport Canada recommends against undertaking new residential construction in sectors where the NEF level surpasses 30.



Une version française de ce document est disponible.

## SOUNDSCAPE MANAGEMENT AT MONTRÉAL-TRUDEAU

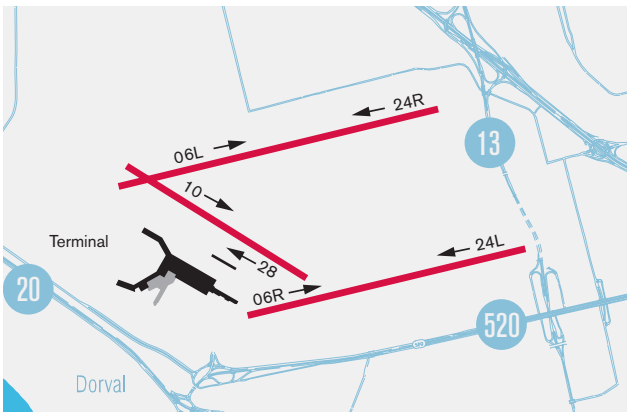


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# MONTRÉAL-TRUDEAU AIRPORT

Covering an area of 13.2 km<sup>2</sup>, Montréal-Trudeau airport began operation in 1941. Initially built for military purposes, the airport subsequently contributed to the phenomenal growth of the civil aviation industry from the 1950s to 1970s. It was Canada's largest airport until 1975.

The airport has three runways: two parallel and a third intersecting them. This runway configuration has remained unchanged since 1958.



THE AIRPORT IS AN ESSENTIAL INFRASTRUCTURE SERVING THE GREATER MONTRÉAL COMMUNITY AS WELL AS QUÉBEC AS A WHOLE. EACH YEAR, IT SERVES SOME 13 MILLION PASSENGERS AND ABOUT 28,000 PEOPLE WORK ON THE AIRPORT TERRITORY.

When it was founded, the airport was located in a sector that was primarily agricultural. Over the years, entire residential neighbourhoods have mushroomed in adjacent municipalities. Even today, new residential developments, some high class, are being built next to the airport and under runway flight paths.

A section of Transport Canada's website addresses the use of land near airports (TP 1247).

<http://www.tc.gc.ca/eng/civilaviation/publications/tp1247-part4-table3-1500.htm>

In addition, information on the selection of construction materials for residential buildings based on NEF levels is found in the *New Housing and Airport Handbook* (NHA 5185 81/05) published by the Canada Mortgage and Housing Corporation.



## NOISE FUNDAMENTALS

Aircraft noise comes mainly from engines and the flow of air around an aircraft in flight. Engine noise is predominant when a plane takes off and is using maximum thrust.

Generally speaking, bigger planes make more noise than smaller ones. But size isn't everything. With improvements in engine technology in recent years, some older, smaller aircraft can be as noisy as some of the latest-generation widebody jets.

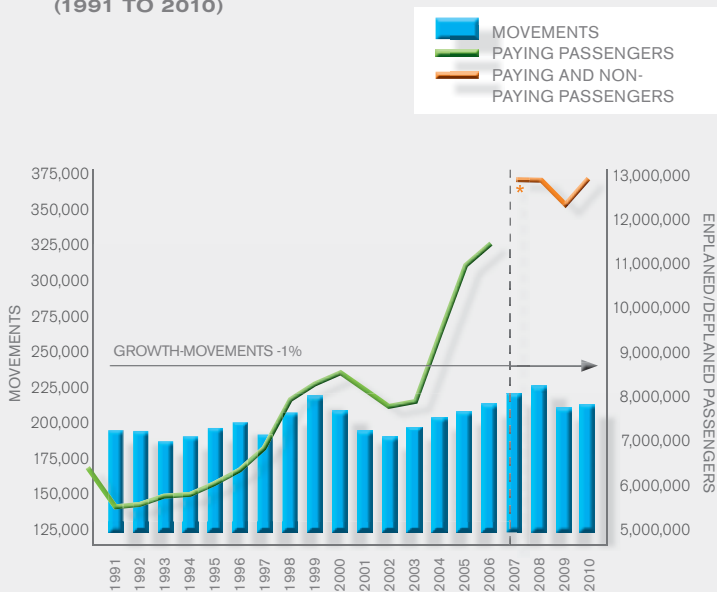
The noise from an airplane flying overhead will be heard for a few seconds or several minutes depending on its altitude, speed over the point of observation, and ambient noise levels. Weather conditions (strength and direction of winds, temperature, humidity level, atmospheric pressure, cloud ceiling) also influence noise propagation.

# AIR TRAFFIC CHARACTERISTICS AT MONTRÉAL-TRUDEAU

Air traffic is determined mainly by the number of movements (takeoffs and landings) per year, by their distribution during the day, as well as by the type of aircraft used. As shown in the chart below, air traffic at Montréal-Trudeau can be described as average for an international airport.

Despite an increase in the number of passengers at Montréal-Trudeau between 1991 and 2010, the number of aircraft movements has remained relatively stable during the same period. This is due mainly to the increased proportion of international traffic, which uses larger aircraft that carry more passengers per movement, as well as by higher load factors.

## TRAFFIC EVOLUTION/20 YEARS\* (1991 TO 2010)



# NOISE ABATEMENT MEASURES

## OPERATING HOURS AND NIGHT FLIGHT RESTRICTIONS

Montréal-Trudeau airport has operated 24 hours a day since it opened in 1941. Aircraft weighing less than 45,000 kg may operate 24 hours a day. However, certain restrictions apply to aircraft weighing more than 45,000 kg.

**AIRCRAFT WEIGHING MORE THAN 45,000 KG:  
AUTHORIZED TAKEOFFS BETWEEN 7 A.M. AND MIDNIGHT  
AUTHORIZED LANDINGS BETWEEN 7 A.M. AND 1 A.M.**

Aéroports de Montréal may grant exemptions for certain flights that meet strict criteria established in an internal policy, such as:

- ▶ **MEDICAL EMERGENCIES**
- ▶ **DELAYS OUTSIDE THE AIRLINE'S CONTROL**
- ▶ **ADVERSE WEATHER CONDITIONS, ETC.**
- ▶ **AND FOR CERTAIN SCHEDULED FLIGHTS:**
  - ▶ **EXEMPTIONS FOR MORNING DEPARTURES BETWEEN 6 A.M. AND 7 A.M.**
  - ▶ **EXEMPTIONS FOR LATE ARRIVALS**

A strict internal policy applies in such cases. Exemptions for scheduled flights represent a very small percentage of total flights and they must be supported by sound operational reasons. Moreover, the exemptions are conditional on adherence to applicable noise abatement measures. ADM rigorously monitors justifications for exemption requests.

## **USE OF PREFERENTIAL RUNWAYS AND RUNWAY SYSTEM FOR NIGHT OPERATIONS**

Runways are assigned by NAV Canada, the organization that manages and controls air traffic in Canada, and aircraft safety is always the primary consideration in all decisions. The rules of aerodynamics require that airplanes take off and land into the wind. This means the assignment of runways may be changed in a given day depending on changes in wind direction and strength.

In Montréal, the prevailing winds are from the Southwest, so aircraft usually take off and land toward Lake St-Louis (Runways 24).

At night, wind permitting, Runway 24L is favoured for takeoffs because the strip of land between the airport and Lake St-Louis is the narrowest and least densely populated, Runway 24R is favoured for landings. On the other hand, winds from the Northeast require the use of Runways 06.

It is also important to note that runways may be closed for varying periods of time for several reasons such as snow removal and repairs to the runways or the taxiways serving them. The closing of a runway therefore occasionally requires a change in normal flight paths.

## **RESTRICTIONS ON ENGINE TESTING**

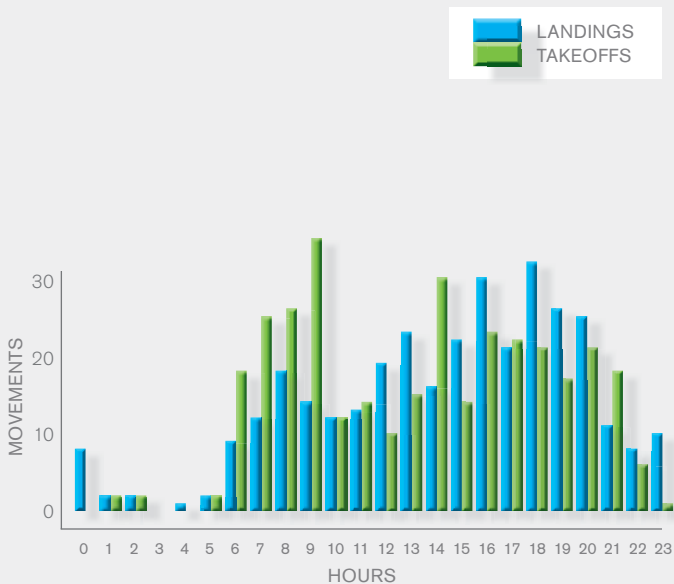
In order to minimize the noise impacts of aircraft, there are rules governing engine testing. Engine testing at high RPMs for inspection or maintenance purposes is forbidden between 11 p.m. and 7 a.m. Permission may be granted in some cases, especially for aircraft that must constantly be ready to respond to emergencies in remote regions. The duration of the engine tests is limited to 20 minutes. Locations for high power engine testing are selected to minimize noise disturbances for nearby residences.



The vast majority of aircraft movements over Montréal take place during the day. Night flights (between midnight and 7 a.m.) represent 6.7% of airport operations. These mostly involve aircraft weighing less than 45,000 kg, which are allowed to operate 24 hours a day.

## ARRIVALS AND DEPARTURES PER HOUR

(TYPICAL DAY OF 2010)



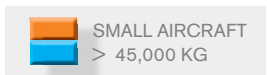
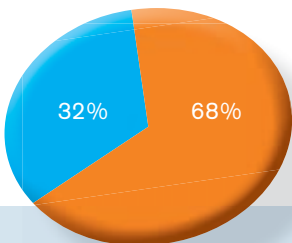


The aircraft most commonly used at Montréal-Trudeau are from the Boeing and Airbus families, regional jets such as Bombardier CRJs, and Dash8 turboprops. About 67% of air traffic is composed of aircraft weighing less than 45,000 kg, which are generally quieter.



AIRCRAFT	LESS THAN 45,000 KG	MORE THAN 45,000 KG	AIRCRAFT	LESS THAN 45,000 KG	MORE THAN 45,000 KG
Airbus 310		•	Challenger	•	
Airbus 320		•	Convair	•	
Airbus 330		•	CRJ 100-200	•	
Airbus 340		•	CRJ 700-900	•	
Airbus 380		•	Dash 8	•	
ATR	•		Embraer 135-145	•	
Beech 1900	•		Embraer 170	•	
Beech 100 King Air	•		Embraer 190		•
Boeing 737		•	Global Express	•	
Boeing 747		•	Gulfstream	•	
Boeing 757		•	Hawker HS125	•	
Boeing 767		•	Learjet	•	
Boeing 777		•	MD11		•
Cessna	•		Piper PA-31 Navajo	•	

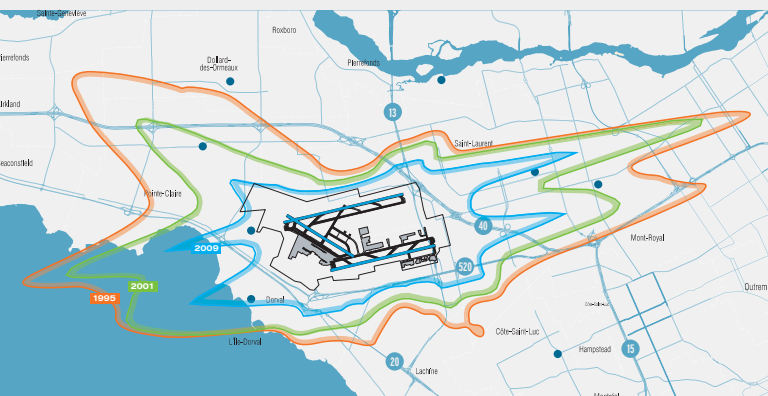
### BREAKDOWN OF AIRCRAFT TYPES BY WEIGHT IN 2009



# CHANGES IN THE SOUNDSCAPE

Perceived noise in the surrounding airport area is measured using the NEF (Noise Exposure Forecast) model developed by Transport Canada (TC), which presents results as contours.

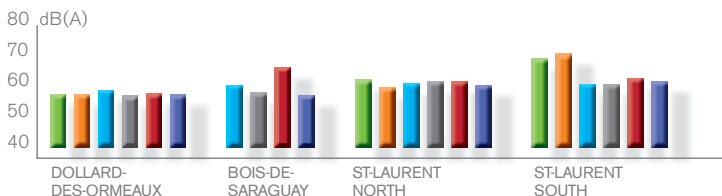
It is important to note that, in collaboration with the National Research Council of Canada, Transport Canada recently updated the methodology it uses to calculate NEF noise contours in Canada, both from an IT standpoint and with respect to aircraft noise data. Specifically, Transport Canada now uses the same Federal Aviation Administration (FAA) database, which contains up-to-date information on about 350 types of aircraft. The new software factors in the characteristics of more modern airplanes, their improved performance, new noise certification standards, and the greater diversity of airplane models and engine systems. Application of the new methodology has created variances from the former method.



## ANNUAL AVERAGE NOISE LEVEL AT EACH NOISE MONITORING STATION

The noise indicator called total LEQ, expressed in decibels dB(A), is based on actual noise data collected by noise-monitoring stations located in nearby neighbourhoods.

Total Leq considers all sources of noise captured at the monitoring station, not only aircraft noise (train, road traffic).



Note: Noise levels measured at Dollard-des-Ormeaux from August 12 to September 23, 2007 have been excluded from the total Leq calculation because of construction work near the noise monitoring station.