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## ***Aircraft Noise Management in Canada***

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**Allison Padova**

Industry, Infrastructure and Resources Division  
Parliamentary Information and Research Service

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**(In Brief)**

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# AIRCRAFT NOISE MANAGEMENT IN CANADA

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## 1 INTRODUCTION

Aviation infrastructure of any size is generally considered to be an asset for a region. Communities with air transport services can benefit from just-in-time logistics and convenient personal and business travel, as well as more tourism, recreational flying and flight training opportunities. Having a local airport can also help develop and diversify the regional economy. Some businesses, such as those in the “knowledge” or high-value manufacturing industries, consider the availability of air transportation services to be very important when making decisions about new locations.

On the other hand, for people living in close proximity to places where aircraft land and take off, the noise can be a nuisance, to say the least. Aircraft noise can affect communities of all sizes, from large cities with busy international airports to rural settings where private airstrips are sometimes found.

Although larger aircraft can carry more people at once and new engines are much quieter than they used to be, Canadians will likely experience even more aircraft noise in the future. Because the global economy is growing – and with it, the demand for air transportation – air traffic is expected to increase over time.<sup>1</sup> Furthermore, since municipalities can approve residential development in the vicinity of airports when it does not present an obstacle for air traffic, it is possible that the number of people who live near airports will grow.

In 2001, the International Civil Aviation Organization (ICAO) developed policies for member states to help manage the impact of aircraft noise on affected populations without unduly inhibiting air traffic growth.<sup>2</sup> The ICAO assembly endorsed an approach to reducing the impact of aircraft noise that focuses primarily on the reduction of noise at source (i.e., quieter aircraft), better land-use planning and management, noise-abatement operating procedures, and – as a last resort – operating restrictions. ICAO has also developed policies regarding charges to be levied on aircraft operators who fly noisier types of aircraft.

This paper outlines how aircraft noise is managed in Canada by the federal transport department (Transport Canada) and other industry stakeholders, such as the civil air navigation services provider (NAV CANADA) and the operators of Canada’s major airports. The paper also describes some additional measures taken in other jurisdictions to reduce the impact of aircraft noise on affected residents.

## 2 TRANSPORT CANADA’S ROLE

Aviation is under federal jurisdiction in Canada. The aviation industry is governed by the *Aeronautics Act* and the related *Canadian Aviation Regulations (CARs)*, which contain noise-related measures.<sup>3</sup> Transport Canada regulates aviation activities, enforces regulations pertaining to aircraft noise, investigates reports of infractions and issues monetary penalties in cases of proven infractions.<sup>4</sup>

One way in which the CARs limit aircraft noise is through provisions in the *Airworthiness Manual* (CARs, Part V) that set out design standards for aircraft.<sup>5</sup> CAR 507.20 states that only aircraft meeting the noise emission levels specified in Chapter 516 of the *Airworthiness Manual* can receive a Certificate of Noise Compliance and be allowed to operate in Canada. The *Airworthiness Manual* incorporates by reference the international noise emission standards published by ICAO in Volume I of Annex 16 (Environmental Protection) to the *International Convention on Civil Aviation*. If an aircraft no longer meets the required noise emission levels, the Minister of Transport has the authority to suspend its Certificate of Noise Compliance (CAR 507.22).

Part VI of the CARs, “General Operating and Flight Rules,” also helps manage aircraft noise.<sup>6</sup> CAR 602.105 (Noise Operating Criteria) requires that aircraft operating at or in the vicinity of Canadian aerodromes must comply with airport-specific noise abatement procedures and control requirements published in the *Canada Air Pilot*, a navigation publication for pilots. Noise abatement procedures and controls at Canadian airports may include:

- aircraft departure and arrival procedures designed to minimize the noise impact on surrounding communities; and
- restrictions on engine run-up procedures at the airport as well as on ground service equipment.

The noise abatement procedures and controls at the international airports in Vancouver, Ottawa, Toronto and Montréal contain additional operational restrictions on flights during nighttime hours. Generally, these include:

- a ban on arrivals and departures by the noisiest aircraft, as well as flight training aircraft; and
- a ban on arrivals and departures by jet aircraft other than those mentioned above, with some exceptions, such as in the case of an emergency or unforeseen delay, or with prior permission from the airport authority.

CAR 602.106 (Noise-Restricted Runways) prohibits take-offs by certified aircraft exempted from the applicable noise emissions standards on certain runways at nine Canadian airports. Only a few aircraft in Canada are exempted from applicable noise emissions standards and these include military aircraft and some aircraft used on unpaved runways in the North.

In addition to enforcing these regulations, Transport Canada uses other tools to help mitigate the impact of aircraft noise on communities. The department has created an airport noise exposure forecast model to inform the planning process for lands adjacent to airports. This model, based on actual and forecasted noise emissions, helps to ensure that no noise-sensitive developments are built in those areas.<sup>7</sup> Transport Canada has also developed a process by which stakeholders, such as airports and community groups, may request changes to the established noise abatement controls and procedures at airports. Proposals to change established procedures and controls must be made in consultation with stakeholders and NAV CANADA and must be approved by the Minister of Transport.<sup>8</sup>

Although section 4.9(e) of the *Aeronautics Act* permits regulations respecting the location of aerodromes, there currently are no regulations applicable to non-certified facilities. Non-certified aerodromes include those outside built-up areas of a city or town, those that do not have scheduled passenger air transport services and those for which certification of compliance with the CARs has not been deemed to be in the public interest by the Minister of Transport.<sup>9</sup> As a result, occasionally a small private airstrip or water landing area comes into existence, creating a new and unexpected noise nuisance for neighbours. In cases where aircraft noise is generated by an unregistered aerodrome on land or water and a dispute arises, Transport Canada's regional officers can be asked to facilitate a consultative process between the aerodrome operator and the neighbouring residents.

### 3 AIRPORT OPERATORS' ROLE

Nearly 30 of the busiest airports in Canada are managed and operated by not-for-profit, local corporations called airport authorities.<sup>10</sup> These authorities lease the federal airport infrastructure from Transport Canada, operating and managing according to the terms of long-term (i.e., 60 years) lease agreements. Among other things, the airport authorities are responsible for managing the environmental impact (including noise) of their facilities on the surrounding communities.

Transport Canada generally requires airport authorities to monitor aircraft noise, to maintain a noise management committee with community representation and to receive noise complaints from neighbouring residents. Some airport authorities are also required to develop a noise management plan, which requires approval from the Minister of Transport, and to report on noise management issues. Through noise monitoring and receiving complaints, airport authorities can detect violations of established noise abatement procedures and controls and report them to Transport Canada.

At airports with nighttime operating restrictions (described in section 2 of this paper), airport authorities may offer an exemption to an air carrier if the airport authority determines that the economic benefits of a flight outweigh the negative impact on residents. This evaluation is not subject to ministerial approval. Among the airports with nighttime restrictions, Toronto Pearson International Airport is unique in that the number of nighttime flight exemptions it may approve on an annual basis is subject to a limit, which is computed according to a formula in its lease. There is no limit on the number of nighttime flight exemptions that airport authorities can award in Vancouver, Ottawa or Montréal (the other airports with nighttime operating restrictions). On a one-time basis, an airport authority may also allow aircraft to land outside the curfew hours in unforeseen circumstances such as air traffic control delays, mechanical problems and weather delays.

## 4 NAV CANADA'S ROLE

Since 1997, NAV CANADA has owned and operated the civil air navigation system (air traffic control) in Canada. NAV CANADA does not have a mandate to manage aircraft noise, but its responsibilities for air navigation support the efforts of Transport Canada and airport authorities to manage noise emissions.

Among NAV CANADA's responsibilities is the regular updating of any noise abatement procedures and controls in place at registered aerodromes and the publishing of those updates in the *Canada Air Pilot*, which pilots use for reference. NAV CANADA's air traffic controllers direct aircraft at each airport in accordance with these published procedures and controls.

Under the *Civil Air Navigation Services Commercialization Act*, NAV CANADA is also permitted to make changes on its own initiative to aircraft routings in order to improve airspace efficiency.<sup>11</sup> Changes to an airport's arrival and departure routings can have an impact on a community's exposure to aircraft noise since the changes may result in lower or higher levels of aircraft noise in a given area. As long as routing changes have no impact on air navigation service levels and respect the established airport noise procedures and controls, NAV CANADA can implement them without the approval of the minister and without consulting the public.<sup>12</sup> NAV CANADA's new navigation procedures that allow for more efficient en route operations and constant descent from higher altitudes also reduce overall route kilometres and engine thrust at low altitudes. As a result of these efficiency-enhancing initiatives, there is less overall noise from aircraft operations and less aircraft noise near the ground.<sup>13</sup>

## 5 NOISE MANAGEMENT PRACTICES IN OTHER JURISDICTIONS

Local governments can help minimize the size of the population affected by aircraft noise by introducing more restrictive land-use zoning around airports. For example, the City of Hamburg in Germany prohibits the construction of new homes in areas that are exposed to high levels of airport noise, and the governments of a number of American states, as well as those in the regions surrounding the Paris–Charles de Gaulle Airport in France, have implemented some form of noise disclosure requirement in real estate transactions.<sup>14</sup>

Airport managers can also encourage aircraft operators to take additional steps to reduce noise emissions, over and above the established noise abatement measures, through incentives and penalties. Some airports, such as Seatac Airport in Seattle and Vancouver International Airport, provide a reward and/or publicity to the airline that operates the quietest fleet mix and complies with noise abatement procedures.<sup>15</sup> Many airport managers in European countries, such as France, Germany, Spain, Italy and the United Kingdom, take the opposite approach and penalize airlines that operate noisier aircraft by charging higher fees for them to use the airport.<sup>16</sup> Some airport managers whose facilities generate extreme noise for the surrounding

populations, including airports in Paris, Frankfurt, Narita and Chicago, have invested in residential and public building insulation programs to reduce residents' noise exposure. The owners of a number of major urban airports, including some in the United Kingdom and Germany, have even implemented home purchase or relocation programs for neighbouring residents exposed to excessive levels of aircraft noise.<sup>17</sup>

## 6 CONCLUSION

Transport Canada and airport managers are responsible for managing aircraft noise in Canada. Their efforts are supported by NAV CANADA, the air navigation services provider. Transport Canada makes and enforces regulations under the *Aeronautics Act* that control which aircraft may be certified for use in Canada and how they may be operated to minimize noise near airports. Managers of larger airports are responsible for monitoring aircraft noise, receiving noise complaints from neighbouring residents and maintaining a noise committee with stakeholder participation. NAV CANADA publishes the established noise abatement procedures and controls for use by pilots, and its air traffic controllers follow them. NAV CANADA's efforts to design more precise routings for aircraft operators around airports in Canada can affect the locations where aircraft noise is detected in a community. In general, the new routings produce less overall noise and less noise at lower altitudes.

Canada's approach to dealing with aircraft noise is broadly consistent with ICAO's suggested approach to aircraft noise management, which endorses the use of quieter aircraft, better land-use planning and management, noise abatement operating procedures and operating restrictions at airports. Other measures that are consistent with ICAO's recommendations, but not yet widely used in Canada, include initiatives to restrict noise-sensitive developments around airports or requirements to disclose airport noise in real estate transactions. In jurisdictions outside Canada, some airports have introduced higher airport charges for the noisiest types of certified aircraft to both discourage their use and to fund additional noise mitigation measures.

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## NOTES

1. Organizations such as the International Civil Aviation Organization and Boeing are forecasting in the order of 5% annual growth in air traffic. See International Civil Aviation Organization [ICAO], "[Medium-Term Passenger Traffic Forecasts](#)," *Forecasts of Scheduled Passenger Traffic*; and Boeing, "[Current Market Outlook 2012–2031](#)," *Long-Term Market*.
2. ICAO, "[Aircraft Noise](#)," *Environment Branch*.
3. [Aeronautics Act](#), R.S., 1985, c. A-2.
4. Transport Canada, "[Aircraft Noise Management](#)," *Air Transportation*.
5. Transport Canada, "[Part V – Airworthiness](#)," *Canadian Aviation Regulations (CARs) 2012-1*.

6. Transport Canada, "[Part VI – General Operating and Flight Rules](#)," *Canadian Aviation Regulations (CARs) 2012-1*.
7. Transport Canada, "[Noise Exposure Forecast and Related Programs](#)."
8. The process to follow is described in Transport Canada, [Advisory Circular \(AC\) No. 302-002, Implementation of New or Amended Noise Abatement Procedures](#).
9. Transport Canada, "[Aerodromes and Air Navigation](#)."
10. For more about the history of airport commercialization in Canada, see Allison Padova, [Airport Governance Reform in Canada and Abroad](#), Publication no. 07-12-E, Parliamentary Information and Research Service, Library of Parliament, Ottawa, 5 September 2007.
11. [Civil Air Navigation Services Commercialization Act](#), S.C. 1996, c. 20, s. 13.
12. While it is not obliged to do so, NAV CANADA usually invites comments from the public on proposed airspace changes, as was the case in its recent Toronto–Ottawa–Montreal Airspace Review Exercise that resulted in new Standard Terminal Arrival Routes at these airports. For more information, see NAV CANADA, "[Frequently Asked Questions](#)," *Toronto-Ottawa-Montreal Airspace Review*.
13. NAV CANADA, [Collaborative Initiatives For Emissions Reductions: Status Update 2012](#).
14. Boeing, "[Airports with Noise and Emissions Restrictions](#)," *Commercial Airplanes: Airport Noise and Emissions Regulations*. See, for example, Charles de Gaulle, Orlando International and Raleigh-Durham International airports.
15. Ruud Vader, [Noise Annoyance Mitigation at Airports by Non-Acoustic Measures: Inventory and Initial Analysis](#), Vader Management, Report prepared for Air Traffic Control the Netherlands, Amsterdam, 2007, p. 51.
16. Boeing, "Airports with Noise and Emissions Restrictions." See the "NOISE Chrgs" column for airports with noise surcharges.
17. Vader (2007), p. 55.