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**From:** Greffe-Registry
**Subject:** Avis d"enquête en vertu de l"article 32 / Notice of intention to investigate under section 32 - 5825-03705
**Date:** 2025-12-22 9:23:08 AM

(English Follows)

# Avis d'enquête en vertu de l'article 32

**Institution :** Santé Canada
**Date :** 2025/12/22
**Numéro de dossier du Commissariat :** 5825-03705
**Numéro de la demande d'accès :** A-2025-000298

Le 2025/11/28, une plainte en vertu de la Loi sur l'accès à l'information a été déposée auprès du Commissariat à l'information contenant les allégations suivantes contre Santé Canada :

L'institution n'a pas répondu à la demande ou aux demandes d'accès susmentionnée(s) dans le délai de 30 jours ou dans le délai prorogé, comme l'exige l'article 7. L'allégation s'inscrit dans le cadre de l'alinéa 30(1)a).

La Commissaire à l'information du Canada avise Santé Canada, en vertu de l'article 32 de la Loi, qu'elle a l'intention de faire enquête sur cette ou ces allégation(s). Santé Canada doit donc conserver tous les documents relatifs à celle(s)-ci jusqu'à ce que l'enquête et tout recours judiciaire subséquent soient terminés.

**Pour en savoir plus** : Voir « Processus de traitement des plaintes et d'enquête au Commissariat à l'information » (dans le menu « Plaintes ») sur le site Web du Commissariat (https://www.oic-ci.gc.ca/fr).

# Notice of intention to investigate under section 32

**Institution:** Health Canada
**Date:** 2025/12/22
**OIC file number:** 5825-03705
**Access request number:** A-2025-000298

On 2025/11/28, a complaint under the Access to Information Act was submitted to the Office of the Information Commissioner (OIC) alleging the following against Health Canada:

It did not respond to the above-noted access request(s) within the 30-day or extended period, as required by section 7. This allegation falls under paragraph 30(1)(a).

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The Information Commissioner of Canada gives notice to Health Canada under section 32 that she intends to investigate this or these allegation(s). Consequently, Health Canada must keep all records relating to the allegation(s) until the investigation and any subsequent legal proceedings are complete.

**More information:** See "How the OIC processes and investigates complaints" (under the "Complaints" menu) on the OIC website (https://www.oic-ci.gc.ca/en).

ATIA - 19(1)

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**From:** Fabio Ovettini
**To:** Minister of Transport / Ministre des Transports (TC); hcminister.ministresc; hcminister.ministresc; Prime Minister | Premier Ministre; [redacted]
**Cc:** [redacted] judy.sgro@parl.gc.ca; PublicHealth@toronto.ca; publichealth@toronto.ca; councillor_perruzza@toronto.ca; petitions@oag-bvg.gc.ca; [redacted] info.com@chrc-ccdp.gc.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; mayor_chow@toronto.ca; tc.ministerofitransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc; [redacted] trakocevic-co@ndp.on.ca; doug.fordco@pc.ola.org; [redacted] plac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; plac.ward01@tdsb.on.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_ainslie@toronto.ca; [redacted] humberleacommunitygroup@gmail.com; [redacted] ws@city.ca; [redacted] judy.sgro.a1@parl.gc.ca; [redacted] ZZG-Community Engagement
**Subject:** GTAA Network Outage Confirms Longstanding Community Concerns — Time for Federal Takeover of Pearson Airport
**Date:** 2025-06-28 8:56:13 PM

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**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** GTAA Network Outage Confirms Longstanding Community Concerns — Time for Federal Takeover of Pearson Airport

**To:** Ms. Freeland, Minister of Transport

Dear Minister Freeland,

I am writing to you not just in response to the June 26 network outage at Toronto Pearson Airport, but to reiterate a message our community has been sounding for months—one that your office and GTAA executives have consistently ignored: the operation of Pearson Airport is suffering from a dangerous lack of accountability, transparency, and competence.

This latest outage confirms what our community has long been documenting: the GTAA is unfit to manage this critical infrastructure. It is time for the federal government to assume direct control of Toronto Pearson International Airport. The GTAA has breached the terms of its lease with Transport Canada—repeatedly, over many years—and by any reasonable standard, the lease is no longer valid. We are calling for federal takeover **without compensation**, based on clear and sustained non-compliance.

This outage, which disrupted check-in, baggage handling, and flight schedules at both Terminal 1 and Terminal 3, is not an isolated incident. It is a symptom of a deeper rot in airport governance—enabled by federal inaction and a leadership culture at GTAA that continues to deny, deflect, and downplay.

Our community's complaints have not been vague or emotional. They have been detailed, consistent, and grounded in clear failures:

- Chronic IT failures and outages;
- Broken or disabled noise monitoring terminals;
- Lost complaint data and altered noise reports;
- A complaint system deliberately made less accessible;
- Health-impairing night flights with no justification;
- Repeated disregard for public feedback and legal obligations.

Now, with this latest failure, the broader public gets to experience firsthand what we have endured for years: mismanagement disguised as modernization.

We remind you that under the lease agreement between Transport Canada and GTAA, the operator is obligated to ensure safe, reliable, and efficient operations in the public interest. It is now beyond dispute that those obligations are not being met.

---

We therefore call for the following immediate actions:

1. A full, public report into the June 26 network outage, including root causes, timelines, and identification of accountable personnel;
2. An independent audit of the GTAA's operational, IT, and complaint-handling systems—spanning at least the last five years, with results made public;
3. A formal investigation into whether the Greater Toronto Airports Authority is in violation of its lease agreement with Transport Canada;
4. Federal takeover of Toronto Pearson International Airport:
   There is now overwhelming and sustained evidence that GTAA has failed to meet its obligations under the lease. These failures are not isolated incidents but systemic, persistent, and damaging to the public interest. As such, we are calling on the federal government to terminate the lease on the basis of chronic non-compliance and assume direct control of the airport—without compensation, as would be the consequence for any lessee that has materially breached a federal contract.

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This is no longer just about noise. It is about governance failure at one of the country's most critical pieces of infrastructure.

Canada deserves better. Our communities deserve better. And frankly, so do the millions of travellers who now get a small taste of the chaos we've been documenting—week after week, complaint after complaint.

We await your response.

Sincerely,
Fabio Ovettini

ATIA - 19(1)

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**From:** Fabio Ovettini
**To:** [redacted] judy.sgro@parl.gc.ca; [redacted] tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc; hcminister.ministresc@canada.ca; pm@pm.gc.ca; ministre-minister@ec.gc.ca
**Cc:** [redacted] humberleacommunitygroup@gmail.com; [redacted] trakocevic-co@ndp.on.ca; [redacted] w5@ctv.ca; [redacted] piac.ward04@tdsb.on.ca; office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] mark.carney@parl.gc.ca; petitions@oag-bvg.gc.ca; info.com@chrc-ccdp.gc.ca; hcinfo.infosc@canada.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; [redacted]
**Subject:** Accountability Regarding Outdated Pearson NEF — City Submission Attached
**Date:** 2025-09-11 9:10:09 AM
**Attachments:** City_NEF_Accountability_with_Exhibits.pdf

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**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Accountability Regarding Outdated Pearson NEF — City Submission Attached

**To:**

- The Honourable Chrystia Freeland, Minister of Transport
- The Honourable Marjorie Michel, Minister of Health
- The Honourable Julie Dabrusin, Minister of Environment and Climate Change
- The Right Honourable Mark Carney, Prime Minister of Canada
- [redacted]
- [redacted]
- The Honourable Judy Sgro, M.P.

Minister Freeland, Minister Michel, Minister Dabrusin, Prime Minister Carney, [redacted] and MP Sgro,

I am providing you with the attached disclosure, which has been submitted to City of Toronto leadership regarding GTAA's lease obligations and the outdated Noise Exposure Forecast (NEF) for Toronto Pearson.

You are included here for **accountability**. This step is consistent with the **good faith our community has demonstrated** throughout our engagement with GTAA and Transport Canada — in stark contrast to the **bad faith repeatedly displayed by your institutions**, including:

- ongoing manipulation and retroactive alteration of complaint reports,
- disabling of community noise monitors, and
- most recently, the **refusal to share the list of attendees at the September 4 public meeting**, which fostered an adversarial – not collaborative – environment.

The attached document lays out:

- the **lease provisions** requiring current noise forecasting and transparent reporting;
- how the **NEF has not been updated for ~25 years**, forcing City Planning, Toronto Public Health, and the Board of Health to operate without accurate contours; and
- the resulting **health and economic harms** to Toronto residents and to the City, as well as the **actions requested** of the City (including commissioning an independent damages study and pursuing compensation).

Toronto residents deserve transparency, compliance with binding obligations, and prompt corrective action. We expect a substantive response addressing the issues and remedies outlined.

Sincerely,
Fabio Ovettini

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# Outdated Noise Exposure Forecast (NEF) – Urgent Action, Accountability, and Compensation

From:
Fabio Ovettini
34 Jodphur Avenue
Toronto, Ontario, M9M 2J4
September 11, 2025

To:
- Mayor of Toronto
- Toronto City Councillors
- Toronto Public Health
- Toronto City Planning
- Toronto Board of Health

## 1. Introductory Note

This submission is directed to Toronto's municipal leadership and institutions responsible for health, planning, and governance. It highlights the fact that the Noise Exposure Forecast (NEF) used for Toronto Pearson International Airport has not been updated since approximately the year 2000.

For nearly 25 years, City Planning, Toronto Public Health, and the Board of Health have had to operate without current NEF contours, relying on obsolete data that does not reflect growth in operations, intensification of night flights, or the expansion of noise-impacted communities.

This prolonged omission has led to faulty land-use planning, underestimation of public health risks, and massive, preventable costs to both the City and its residents.

## 2. Statement of Concern

Toronto's municipal responsibilities have been undermined by the absence of updated NEF contours:

- City Planning has approved housing, schools, and healthcare facilities based on outdated assumptions of noise exposure.
- Toronto Public Health has issued assessments that necessarily understate sleep disturbance and cardiovascular risks from aircraft noise.
- The Board of Health has been forced to make policy recommendations without accurate baseline data.

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The consequences are profound: residents have suffered preventable health harms, while the City has incurred significant economic and social costs (lost productivity, increased healthcare utilization, and misallocated infrastructure investments).

## 3. Findings

### a) Outdated NEF (not updated since ~2000)

The NEF for Pearson remains substantially outdated, despite major increases in aircraft movements and residential growth under flight paths.

### b) Lease Obligations Breached (see Exhibit A)

The Pearson Ground Lease contains binding obligations on the tenant (GTAA) to comply with applicable environmental laws, promptly report contraventions, rectify non-compliance, and maintain accurate records and reporting. It also contains noise management obligations, including maintaining up-to-date forecasts to inform land-use compatibility and public planning.

### c) Impact on the City

- Planning decisions proceeded under a false premise of limited exposure; sensitive land uses have been sited in high-exposure zones.
- Public Health impacts (sleep disturbance, cardiovascular and mental health outcomes) were underestimated.
- Residents bore preventable health burdens, with cumulative costs likely in the billions over time.

## 4. Requested Action

Given the magnitude of the failure and the municipal consequences, the City of Toronto should:

1. Acknowledge that planning and health policy have been compromised by reliance on an outdated NEF.
2. Commission an independent study quantifying health and economic damages to Toronto residents attributable to aircraft noise and prolonged NEF stasis.
3. Seek compensation through legal action against both the Greater Toronto Airports Authority (GTAA) and the Government of Canada for failing to update and enforce NEF-related obligations under the Ground Lease.
4. Demand immediate NEF updates and transparent, periodic reporting going forward, with the City's technical participation and public release of contours.

## 5. Conclusion

The failure to update the NEF is a systemic breakdown that misled Toronto's institutions, harmed residents, and drained public resources. By taking decisive action — including

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litigation to obtain compensation — Toronto can protect its citizens, recover damages, and restore accountability.

Respectfully submitted,
Fabio Ovettini

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## Exhibit A — Pearson Ground Lease: Pertinent Excerpts (for City Planning & Health)

Purpose of this Exhibit:
To provide the specific lease clauses that establish binding obligations relevant to NEF maintenance, environmental compliance, reporting, and the protection of the public interest.

### A1) Section 8.06 – Observance of Law (p.141)

Tenant must observe and comply with all applicable laws, including environmental statutes and regulations, at its own cost. This includes ensuring compliance by all Occupants and Transferees.

### A2) Section 37.08 – Compliance with Laws (p.238)

Tenant shall comply with all Applicable Environmental Laws and provide notice of any contraventions or non-compliance, and must take corrective measures at its own expense.

### A3) Article 37 – Environment

Establishes comprehensive environmental duties, including reporting, audits, and management plans. Requires operation of a Noise Management Program (s.8.11, p.146) and maintenance of an Airport Master Plan (s.7.01, p.134). Both instruments depend on up-to-date NEF contours.

### A4) Section 7.01 – Airport Master Plan (p.132)

Tenant must prepare and keep current a 20-year plan addressing long-term development. Subsection 7.01.01(ix) requires inclusion of noise envelopes including forecasts (i.e., NEFs).

### A5) Sections 8.11–8.13 – Noise Management (pp.144–145)

Require the Tenant to adopt noise abatement/mitigation procedures, operate a noise management committee, handle complaints, monitor aircraft noise within 10 nautical miles, and consult on land-use planning in affected areas. Explicitly obligate Tenant to update NEFs and use them for land-use compatibility.

### A6) Section 9.02 – Performance Review (p.149) & Section 9.04 – Community Consultative Committee (p.151)

Tenant must provide information for performance review and maintain consultation with communities. NEF updates are central to this obligation.

### A7) NEF Software Provision (Article 8)

Specifies that the Minister of Transport shall provide the Tenant with the NEF software at no charge, confirming Transport Canada's recognition of NEFs as mandatory and standardized.

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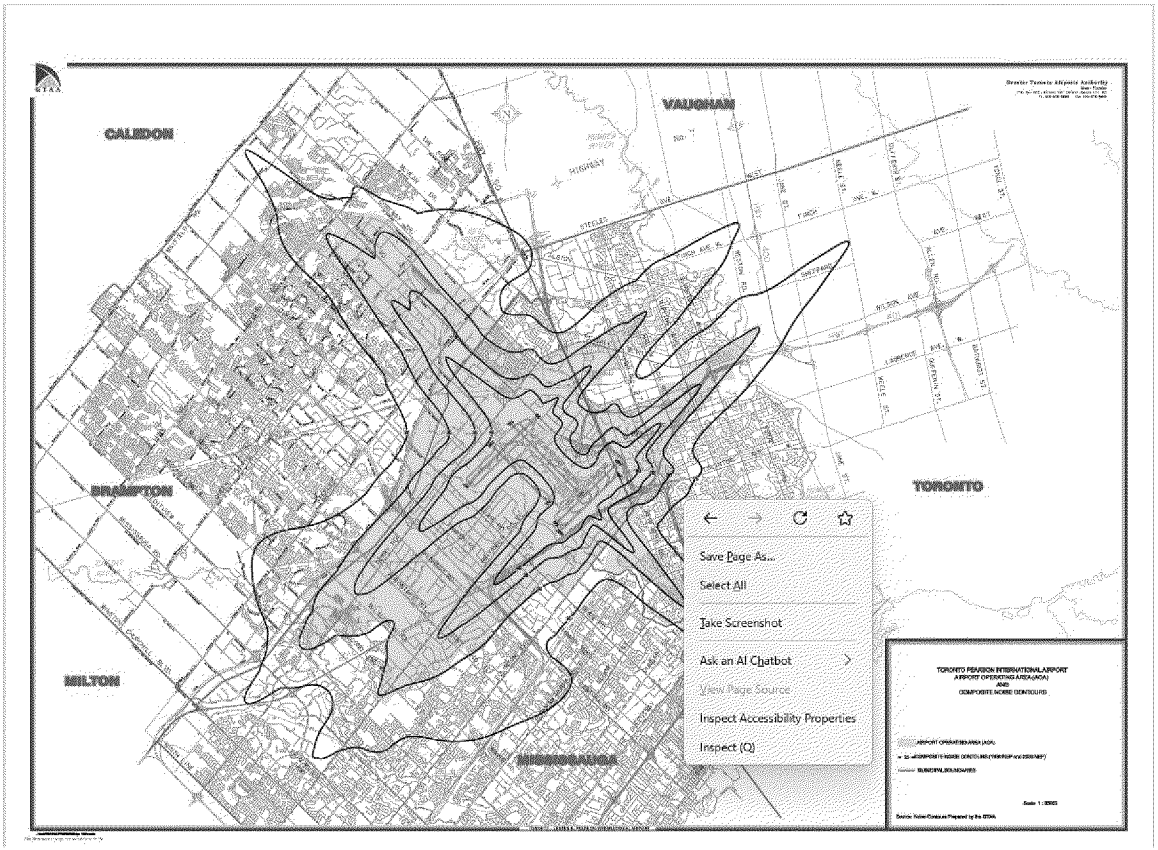
## Exhibit B — Evidence of Outdated NEF

This exhibit documents that the Noise Exposure Forecast (NEF) for Toronto Pearson has not been updated since 2000, contrary to lease obligations and federal policy. The images below demonstrate the last officially published contours and highlight the 25-year gap in updates.



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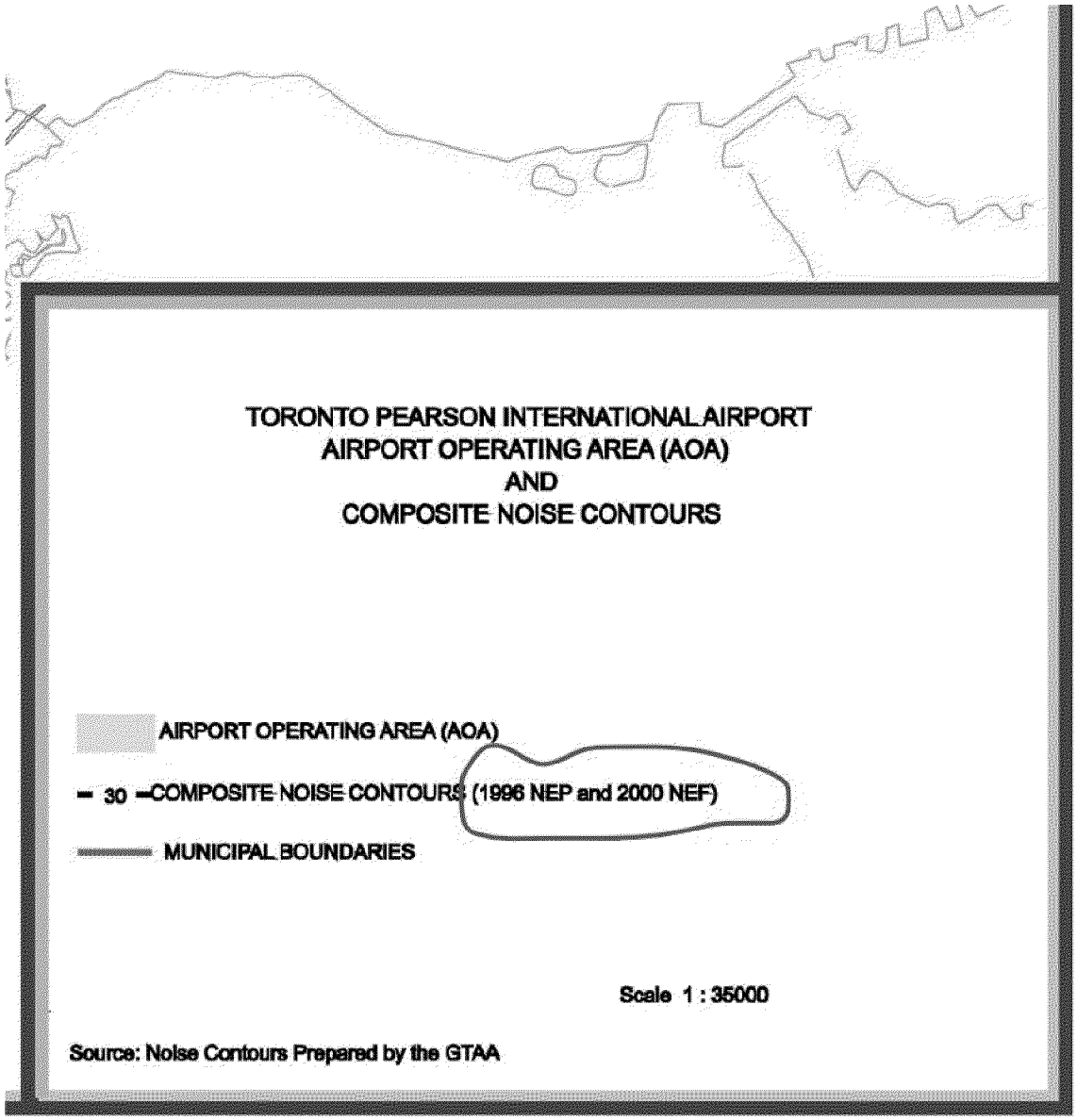


https://cdn.torontopearson.com/-/media/project/pearson/content/community/noise-management/pdfs/aoa-composite-noise-contours.pdf?modified=20190227221209&rev=2dde7fa516364f40b0282f97f07dd21a&hash=FFAB3B0C1C882E0D779C43D17060AF09

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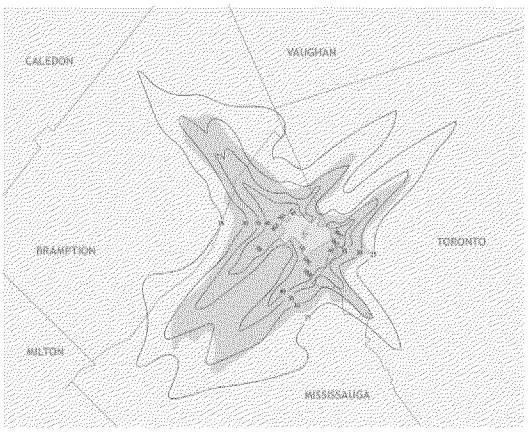


Airport Operating Area (AOA)

Composite Noise Contours (1996 NEP and 2000 NEF)

Municipal Boundaries

Discounts and offers for you

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**From:** Buckley, Kathleen (HC/SC)
**To:** Cox-Leigh, Ian (HC/SC)
**Subject:** FW: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action
**Date:** 2025-06-05 11:45:00 AM

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**From:** Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Sent:** 2025-06-04 2:21 PM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Subject:** RE: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

Unclassified / Non classifié

Ok tks.

Céline Henrie

Executive Director
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada, Government of Canada
celine.henrie@hc-sc.gc.ca / Cel: 613-371-5066

Directrice exécutive
Direction des services de l'accès à l'information et de la protection des renseignements personnels
Direction générale des services de gestion
Santé Canada, Gouvernement du Canada
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**From:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Sent:** 2025-06-04 2:20 PM
**To:** Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Subject:** RE: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

Unclassified / Non classifié

No need to be sorry at all.

We do have an access request (A-2025-000298 ) but it's looking like it will be a NIL. And we were also copied on the requester's email to the Min, DM and a whole slew of other people.

**From:** Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Sent:** 2025-06-04 2:19 PM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Subject:** RE: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

Unclassified / Non classifié

Tks Kate. Is this an access request or simply a letter to the Minister that we have been copied on?

Sorry, reading quickly between sessions.

Céline Henrie

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**From:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Sent:** 2025-06-04 11:57 AM
**To:** Béral, Prosper (HC/SC) <prosper.beral@hc-sc.gc.ca>; Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Cc:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>

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**Subject:** FW: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

Unclassified / Non classifié

Good morning, Prosper,

In Céline's absence, I'm looping you into this email in case you get questions from above.

Our Intake team received a message below from one of our requesters (A-2025-000298 – already tasked to CSB, HPN(NIL) and HECSB).

He has emailed our Minister, DM, Associate DM along with several others.

For your situational awareness only – no action required at this time.

Thanks
Kate

**From:** Payant, Talia (HC/SC) <talia.payant@hc-sc.gc.ca> **On Behalf Of** atip / aiprp (HC/SC)
**Sent:** 2025-06-04 11:49 AM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Subject:** FW: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

Unclassified / Non classifié

Hello!

FYI: A-2025-000298.

Thank you / Merci,

*Talia Payant*

(she | her | elle)

Access to Information and Privacy Services Directorate
Health Canada and Public Health Agency of Canada / Government of Canada
Talia.payant@hc-sc.gc.ca / **NEW -** Tel: 343-576-6101

Direction des services d'accès à l'Information et Protection des Renseignements Personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Talia.payant@hc-sc.gc.ca / **NOUVEAU -** Télé: 343-576-6101

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-06-04 11:29 AM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>; hcminister.ministresc <hcminister.ministresc@hc-sc.gc.ca>; MHA Minister / Ministre SMD (HC/SC) <mhaminister.ministresmd@hc-sc.gc.ca>; Prime Minister | Premier Ministre <pm@pm.gc.ca>
**Cc:** [redacted] aara.saks@parl.gc.ca; [redacted] mark.holland@parl.gc.ca; vaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC) <Eric.Costen@hc-sc.gc.ca>; Orencsak, Greg (he, him | il, lui) (HC/SC) <Greg.Orencsak@hc-sc.gc.ca>; pierre.poilievre@parl.gc.ca; Jagmeet - M.P. <jagmeet.singh@parl.gc.ca>; Francesco Sorbara <francesco.sorbara@parl.gc.ca>; [redacted] humberleacommunitygroup@gmail.com [redacted] Mayor Chow <mayor_chow@toronto.ca>; Councillor Perruzza <councillor_perruzza@toronto.ca>; [redacted] Tom Rakocevic <trakocevic-co@ndp.on.ca>; [redacted] W5 Viewer Mail <w5@ctv.ca>; [redacted] doug.fordco@pc.ola.org; [redacted] hcminister.ministresc <hcminister.ministresc@hc-sc.gc.ca>; [redacted] ; judy.sgro.a1@parl.gc.ca; [redacted] judy.sgro@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca;

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councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_mckelvie@toronto.ca; [redacted] councillor_ainslie@toronto.ca; [redacted]

**Subject:** Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

Dear Honourable Marjorie Michel,

Congratulations on your recent appointment as Canada's Minister of Health. I write to you with both sincere hope and an urgent appeal.

For too long, successive Ministers of Health have remained silent while thousands of Canadians living under major flight paths — especially around Toronto Pearson — have endured what can only be described as chronic, imposed harm: **continuous aircraft noise and air pollution throughout the day and night**.

These are not one-off events. They are persistent, government-permitted intrusions on our most basic human need — **sleep** — and they occur at volumes regularly measured between **70 and 80+ decibels**, far above what any health authority would deem acceptable at night. The Noise Monitoring Terminal (NMT) at Acacia Park captures this reality in stark terms, showing nightly patterns of sound events that destroy any chance of deep, sustained rest. Attached you will find data captured by the Noise Monitoring Terminal located at Acacia Park, clearly illustrating the severity and frequency of this noise exposure.

In addition to sleep loss, **daytime overflights also interfere with children's ability to learn**. Numerous studies — including work referenced by the World Health Organization and European Environment Agency — have shown that chronic exposure to aircraft noise near schools is linked to **delays in reading comprehension, reduced attention spans, and impaired memory**. The noise doesn't just disturb the classroom — it disrupts the development of the mind itself.

This is not just a nuisance — it is a violation of public health.

According to **Health Canada**, the recommended amount of sleep for Canadians is:

- **Adults (18–64 years):** 7 to 9 hours
- **Older adults (65+):** 7 to 8 hours
- **Teenagers (14–17 years):** 8 to 10 hours
- **Children (5–13 years):** 9 to 11 hours
- **Preschoolers (3–5 years):** 10 to 13 hours
- **Infants (4–11 months):** 12 to 15 hours

Yet for those of us living beneath these flight paths, achieving even the minimum of these sleep targets is impossible. **Aircraft fly low over our homes all night long, without pause** — from shortly after midnight until well past 6:00 AM. This is not the occasional disruption; it is an unrelenting pattern. Every few minutes, a jet passes overhead, waking someone — a child, an elder, a parent — who then struggles to fall back asleep. And by the time sleep might return, another plane arrives. This cycle continues until morning.

**This is how illness is manufactured.** Not by accident, but through years of policy inaction.

The contradiction is glaring. **Transport Canada** requires **commercial drivers** to have **at least 8 consecutive hours of quality sleep** before driving — a standard designed to protect life and safety. And yet, under the current air traffic system, a resident under the flight path cannot possibly meet that requirement, let alone meet the broader recommendations set by your own department for overall health.

So I ask:

**Will you be the first Minister of Health to act?**

I respectfully request that you:

1. **Acknowledge** the severe and long-term health risks posed by nighttime aircraft operations over residential areas;
2. **Direct Health Canada** to take an active role in responding to this crisis, including public comment and interdepartmental advocacy;
3. **Write to the Minister of Transport** to demand that their department align flight policies with Health Canada's sleep recommendations, and recognize the current system as both unsustainable and unacceptable.

To make matters worse, when we have raised these concerns with the **Greater Toronto Airports Authority (GTAA)**, we have been told — quite plainly — that **expansion will continue and there is nothing we can do about it**. This statement reflects a troubling disregard for public health and democratic accountability. It sends a clear message to residents: that our suffering is acceptable collateral for continued growth. We refuse to accept that.

This is not a Toronto problem. It is a **national health issue** affecting people in every region with a major airport. People under these flight paths have the right to the same rest, safety, and health protection as every other Canadian.

We are not asking for favours — only for fairness.

I hope you will be the Minister who finally brings health back into this conversation.

Sincerely,
Fabio Ovettini
34 Jodphur Avenue,
Toronto, ON. M9M 2J4
fabio217@yahoo.com

ATIA - 19(1)

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**From:** Fabio Ovettini
**To:** [redacted] Chrystia - M.P. Freeland; Minister of Transport / Ministre des Transports (TC)
**Cc:** ZZG-Community Engagement; anita.anand@parl.gc.ca; [redacted] aara.saks@parl.gc.ca; [redacted] mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); pierre.poilievre@parl.gc.ca; Jagmeet - M.P.; Francesco Sorbara; [redacted] Mayor Chow; Councillor Perruzza; [redacted] W5 Viewer Mail; [redacted] newstips@thestar.ca; [redacted] doug.ford@pc.ola.org [redacted] hcminister.ministres@c; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; [redacted] piac.ward01@tdsb.on.ca; [redacted] judy.sgro.a1@parl.gc.ca; Meneses Albert (Sgro Judy A. - MP); Calderan Amy (Sgro Judy A. - MP); [redacted] judy.sgro@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_mckelvie@toronto.ca; [redacted] councillor_ainslie@toronto.ca; [redacted] MHA Minister / Ministre SMD (HC/SC)
**Subject:** Additional Monitoring Failure – Oriole Park NMT #37 Offline
**Date:** 2025-05-19 11:41:39 AM

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**Warning:** This message is from an EXTERNAL SENDER - be CAUTIOUS, particularly with links and attachments.
**Attention:** Ce message provient d'un EXPÉDITEUR EXTERNE - soyez PRUDENT, en particulier avec les liens et les pièces jointes.

[redacted] Ms. Freeland,

Yet another noise monitoring failure—this time at Oriole Park NMT #37, which has now been offline for over a week.

Once again, there is no notice, no explanation, and no timeline for repair. There has been no communication with the public. The community is left without any indication that this issue is even on your radar.

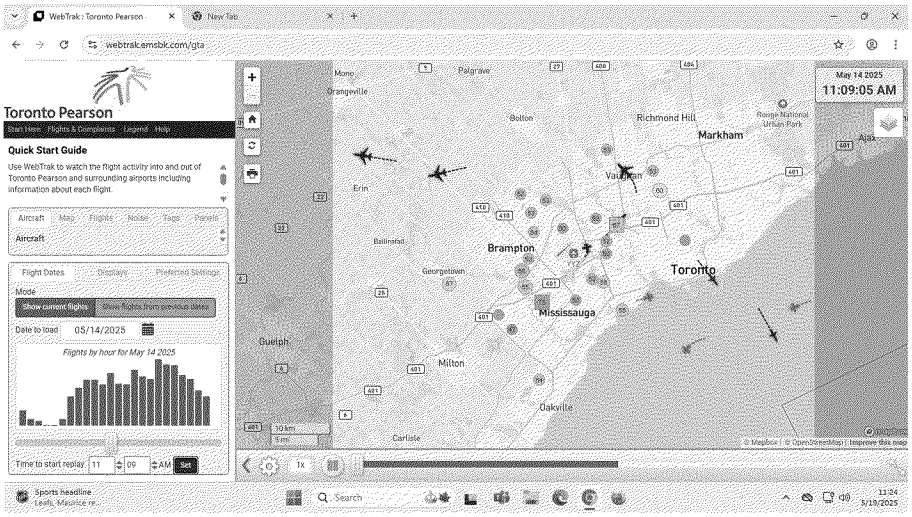
This is not an isolated incident. It's part of a larger pattern of neglect and mismanagement that continues to erode trust in the agencies and operators responsible for safeguarding public health and upholding federal infrastructure obligations.

And yet, Transport Canada continues to look the other way—refusing to enforce the very standards and responsibilities it is mandated to uphold. The silence from all parties involved is deafening.

How many monitoring terminals have to go dark before this is treated as the systemic failure it clearly is?

Toronto Pearson is being run as if accountability is optional.

Sincerely,
Fabio Ovettini



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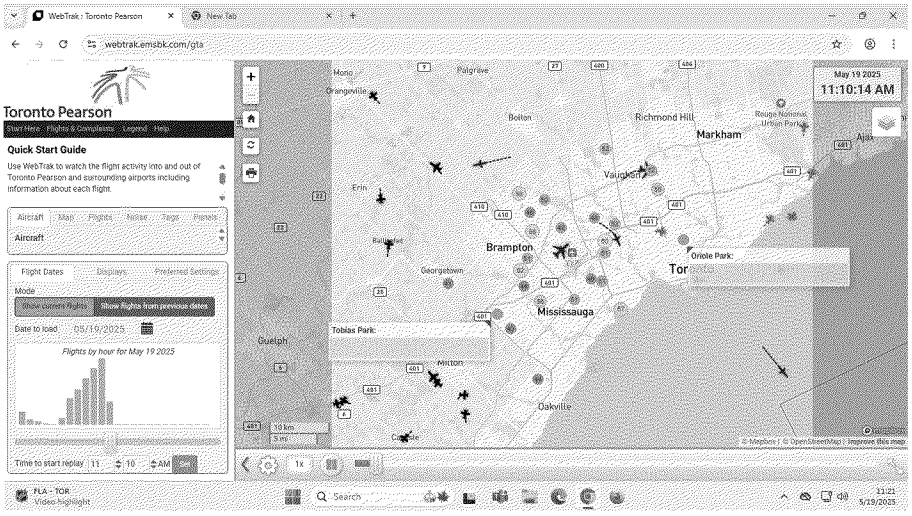

ATIA - 19(1)

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**From:** Fabio Ovettinj
**To:** judy.sgro@parl.gc.ca; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc; hcminister.ministresc@canada.ca; [redacted]; pm@pm.gc.ca; ministre-minister@ec.gc.ca
**Cc:** [redacted] Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; [redacted] humberleacommunitygroup@gmail.com [redacted] mayor_chow@toronto.ca; councillor_perruzza@toronto.ca; [redacted] trakocevic-co@ndp.on.ca; [redacted] tv5@ctv.ca; [redacted] doug.fordco@pc.ola.org; [redacted] piac.ward04@tdsb.on.ca; [redacted] piac.ward01@tdsb.on.ca; [redacted] judy.sgro.a1@parl.gc.ca; [redacted] judy.sgro@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; [redacted] mark.carney@parl.gc.ca; chrystia.freeland@parl.gc.ca; marjorie.michel@parl.gc.ca; amy.calderan.521@parl.gc.ca; councillor_ainslie@toronto.ca; communityengagement@gtaa.com; petitions@oag-bvg.gc.ca; info.com@chrc-ccdp.gc.ca; pm@pm.gc.ca; hcinfo.infosc@canada.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; hcminister.ministresc@canada.ca; [redacted]
**Subject:** Addressing the Elevated Crash Risk from Acute Sleep Deprivation Linked to Nighttime Aircraft Noise
**Date:** 2025-08-28 8:16:28 AM

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**Subject:** Addressing the Elevated Crash Risk from Acute Sleep Deprivation Linked to Nighttime Aircraft Noise

**Ministers Michel, Freeland, Dabrusin**

[redacted]

I hope this message finds you well.

I am writing to draw your attention to compelling research from the AAA Foundation for Traffic Safety and AAA Newsroom demonstrating the significantly increased crash risk associated with acute sleep deprivation and drowsy driving.

This issue is not abstract. Communities near Toronto Pearson Airport face chronic nighttime noise from departing and arriving aircraft—well documented through rising complaint volumes and public health studies—creating conditions of sleep deprivation that extend beyond annoyance into measurable safety, health, and economic costs.

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## Key Findings at a Glance

Crash risk increases dramatically with shorter sleep in the past 24 hours (against the baseline of ≥7 hours):

- 6–7 hours → 1.3× the crash risk
- 5–6 hours → 1.9× the crash risk
- 4–5 hours → 4.3× the crash risk
- < 4 hours → 11.5× the crash risk

Chronically short sleepers (usually < 5 hours per night) face a crash risk 5.4× higher than those who routinely achieve 7+ hours.

The AAA Newsroom further notes that even one hour less than the recommended 7 hours substantially impairs driving, with 4+ hours of lost sleep producing impairment equivalent to being over the legal alcohol limit.

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## Why This Matters for Toronto Pearson

- Nighttime aircraft operations at Toronto Pearson routinely disrupt sleep across large swaths of the GTA, with recent quarterly reports showing complaint volumes rising dramatically year over year.
- Sleep deprivation from airport noise doesn't only affect health—it raises the risk of motor vehicle collisions, workplace accidents, and costly productivity losses, all of which carry significant economic consequences.
- Studies in North America, Europe, and Australia have attached multi-billion-dollar costs to noise-related sleep disturbance, cardiovascular disease, and accident risk—costs that should be deducted from the airport's reported economic "benefits" to the region.

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## Proposal for Action

**1. Multi-Ministry Awareness Campaign**
Launch a coordinated public awareness initiative on the dangers of sleep deprivation, tying together drowsy driving and nighttime aircraft noise impacts.

**2. Policy & Operational Measures**

- Reassess night flight restrictions at Toronto Pearson, considering curfews or limits on overnight operations.
- Encourage employers and transportation agencies to adopt fatigue risk management systems for both drivers and shift workers impacted by chronic noise exposure.

**3. Research & Monitoring**

- Collect local data on health outcomes, traffic accidents, and workplace injuries in noise-affected areas.
- Publish annual triple-bottom-line assessments (economic, environmental, health) for Toronto Pearson operations to provide a true cost–benefit picture.

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**4. Cross-Sector Collaboration**
Bring together Health, Transport, Environment, GTAA, municipal leaders, and public health experts to design integrated responses balancing economic interests with public safety and well-being.

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In summary, the evidence shows that even modest sleep loss increases crash risk—and nighttime aircraft noise at Toronto Pearson is creating precisely these conditions. Factoring the resulting health, safety, and economic costs into airport decision-making is long overdue.

## References

1. AAA Foundation for Traffic Safety – *Acute Sleep Deprivation and Risk of Motor Vehicle Crash Involvement*
https://aaafoundation.org/acute-sleep-deprivation-risk-motor-vehicle-crash-involvement/

2. AAA Newsroom – *The Quiet Killer Stalking Our Roads: Drowsy Driving*
https://newsroom.aaa.com/2024/03/the-quiet-killer-stalking-our-roads-drowsy-driving/

Sincerely,
Fabio Ovettini

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**From:** Bradley, Kevin (HC/SC) on behalf of atip / aiprp (HC/SC)
**To:** Hogan, Erin (HC/SC)
**Cc:** atip / aiprp (HC/SC)
**Subject:** FW: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver
**Date:** 2025-11-25 1:10:00 PM

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Hello Erin,

Please see the status update request below for file A-2025-000298.

Thank you / Merci,

Kevin Bradley
Senior ATIP Officer
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Kevin.bradley@hc-sc.gc.ca / Tel: 343-993-2619
Agent principal de l'AIPRP
Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-993-2619

**From:** Fabio Ovettini
**Sent:** 2025-11-25 1:00 PM
**To:** atip / aiprp (HC/SC) ; Bradley, Kevin (HC/SC)
**Subject:** Re: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Status Update Request – Access to Information Request re GTAA / Toronto Pearson International Airport

Dear Mr. Bradley and Access to Information and Privacy Services,

I am writing to request a status update on my Access to Information request regarding records held by Health Canada that relate to the Greater Toronto Airports Authority (GTAA) and Toronto Pearson International Airport.

On June 3, 2025, your office advised that my original request (initially submitted on May 21, 2025) would be opened for processing and that the $5.00 application fee would be waived. As requested, I re-attached and re-sent the full text of my original request that same morning (see email chain below).

To date, I have not received an acknowledgement letter, file number, notice of any time extension under section 9 of the Access to Information Act, or any responsive records.

Could you please:

- Confirm that my request has been formally registered and provide the assigned file number;
- Indicate the date on which the statutory time limit began;
- Advise whether any extension has been taken under section 9 of the Act, and if so, its duration and rationale; and
- Provide an update on the current stage of processing and an expected timeframe for release of records.

Given the public health importance of the subject matter, I would be grateful for any steps your office can take to expedite this file.

Thank you for your attention. I look forward to your response.

Sincerely,
Fabio Ovettini
34 Jodphur Avenue
Toronto, Ontario M9M 2J4
fabio217@yahoo.com

On Tuesday, June 3, 2025 at 10:55:05 a.m. EDT, Fabio Ovettini <fabio217@yahoo.com> wrote:
Morning,
Attached you will find the original request.
Sincerely,
Fabio Ovettini
On Tuesday, June 3, 2025 at 10:45:30 a.m. EDT, atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca> wrote:

Unclassified / Non classifié

Good morning Fabio,

Our apologies, however, we are unable to locate any record of your original request within our system or generic inbox. There is a possibility that our Security email system prevented us from receiving your email on May 21, 2025, as it shows below. Could you kindly attach the original email so that we may attempt to resolve any issues that may have blocked your email.

We will accept the $5.00 application fees to be waived and open your request this morning and assign for processing.

If you have any other questions, please do not hesitate to ask.

Thank you / Merci,

Kevin Bradley (He / Him / Il)

Sr Project Officer

Access to Information and Privacy Services Directorate

Corporate Services Branch

Health Canada and Public Health Agency of Canada

Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371

Agent principal de projet

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Direction des services d'accès à l'information et de la protection des renseignements personnels

Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada

Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

---

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-06-03 10:14 AM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>; hcminister.ministresc <hcminister.ministresc@hc-sc.gc.ca>; MHA Minister / Ministre SMD (HC/SC) <mhaminister.ministresmd@hc-sc.gc.ca>; Prime Minister | Premier Ministre <pm@pm.gc.ca>
**Subject:** Re: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Follow-up on Access to Information Request Submitted

Dear Access to Information and Privacy Coordinator,

I am writing to follow up on an Access to Information request I submitted to your office regarding records held by Health Canada that relate to the Greater Toronto Airports Authority (GTAA) and Toronto Pearson International Airport.

The original request was sent on Wednesday, May 21, 2025 at 08:36:31 p.m. EDT, and to date, I have not received an acknowledgement or response. I would appreciate confirmation that the request was received and is being processed. If any additional information or clarification is required on my part, please do not hesitate to contact me at fabio217@yahoo.com.

Given the public health significance of the subject matter, I kindly ask that this request be treated with priority, and I reiterate my request for a waiver of fees under section 11(6) of the Access to Information Act, in the public interest.

Thank you for your attention to this matter. I look forward to your reply.

Sincerely,
**Fabio Ovettini**
34 Jodphur Avenue
Toronto, Ontario M9M 2J4
fabio217@yahoo.com

On Wednesday, May 21, 2025 at 08:36:31 p.m. EDT, Fabio Ovettini <fabio217@yahoo.com> wrote:

Access to Information Request

**To:**
Access to Information and Privacy Coordinator
Health Canada
Holland Cross - Tower B
1600 Scott Street, 7th Floor, Suite 700
Postal Locator: 3107A
Ottawa, Ontario K1A 0K9
E-mail: atip-aiprp@hc-sc.gc.ca
Telephone: 613-954-9165

**From:**
Fabio Ovettini
34 Jodphur Avenue,
Toronto, Ontario M9M 2J4
E-mail: fabio217@yahoo.com

Dear Access to Information and Privacy Coordinator,

I am submitting this request under the Access to Information Act.

Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:

1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:

- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;

- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;

- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.

2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:

- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;

- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;

- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.

3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:

- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;

- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.

4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:

- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;

- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.

5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such

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requests.

This request applies to all records from all time periods, unless otherwise limited by law.

Please include:
- Records held at headquarters and regional offices;
- Archived or legacy systems;
- Databases, emails, notes, drafts, attachments, audio recordings, and presentations;
- Records in any language or format, whether digital or physical, classified or unclassified.

Request for Fee Waiver:

I respectfully request a waiver of any applicable fees, including the $5 application fee, under section 11(6) of the Access to Information Act. The subject matter of this request pertains to public health, environmental exposure, and government accountability, and disclosure is clearly in the public interest. The information sought will help inform affected communities and advance public understanding of aviation-related health risks.

Please contact me at fabio217@yahoo.com should clarification be required. I am happy to work with your office to narrow or prioritize portions of the request for efficient processing.

Sincerely,

Fabio Ovettini

34 Jodphur Avenue,

Toronto, Ontario M9M 2J4

E-mail: fabio217@yahoo.com

ATIA - 19(1)

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**From:** Fabio Ovettini
**To:** Minister of Transport / Ministre des Transports (TC); hcminister.ministresc; Prime Minister | Premier Ministre
**Cc:** publichealth@toronto.ca; councillor_perruzza@toronto.ca; petitions@pag-bvg.gc.ca; [redacted] info.com@chrc-ccdp.gc.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; mark.holland@parl.gc.ca; [redacted] hcminister.ministresc; hcinfo.infosc@canada.ca; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; judy.sgro@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; mayor_chow@toronto.ca; [redacted] trakocevic-co@ndp.on.ca; doug.fordco@pc.ola.org; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_ainslie@toronto.ca; [redacted] humberleacommunitygroup@gmail.com; [redacted] w5@ctv.ca; [redacted] judy.sgro.a1@parl.gc.ca; [redacted] communityengagement@gtaa.com; [redacted]
**Subject:** Azure Outage or Incompetence Admission? Time to Revoke GTAA's Approvals
**Date:** 2025-07-11 7:38:30 AM

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**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Azure Outage or Incompetence Admission? Time to Revoke GTAA's Approvals

Minister Freeland,
Minister Michel,
Prime Minister Carney,

Yesterday, [redacted] attempted to frame Microsoft's Azure outage as an act of "transparency." In truth, it was an accidental confession: an admission that the GTAA's reporting systems are poorly architected, fragile, and mismanaged.

This is not transparency. It's incompetence masquerading as communication.

The failures at GTAA are not isolated—they are systemic. The entire structure is cracked, and [redacted] leadership has become a liability. Her decision to install a gum-chewing, eye-rolling distraction artist to oversee community engagement is nothing short of insulting. **This is who [redacted] chose to represent GTAA to the community—not to listen, not to serve, but to deflect, dismiss, and perform.**

He does not speak for the residents who suffer daily under the noise and pollution of Pearson; he speaks *at* them, with contempt. He has all the qualifications of someone working in a low-budget travelling circus, not a major international airport. **But then again, maybe that's the point—because under [redacted] direction, GTAA *is* a circus: chaotic, unserious, and grotesquely out of touch with the damage it causes.**

Why was he chosen? Because [redacted] has no compass—moral or operational. She is lost. Flailing. *Manotazos de ahogado.* The job is beyond her, and the cracks are showing in every corner of GTAA's operations.

You have received falsified, manipulated, or missing reports. You've seen obstruction of public data, community neglect, broken monitors, fabricated numbers, near-collisions, and now a global outage used as cover.

So I ask you directly:

**When will you start referring these individuals for criminal investigation?**
**When will you revoke every approval granted to GTAA in the last 20 years?**
**When will this government stop enabling incompetence?**

Because the public is no longer confused. We are furious. And we are waiting for action—not more excuses.

Sincerely,
Fabio Ovettini

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**From:** Payant, Talia (HC/SC) on behalf of atip / aiprp (HC/SC)
**To:** Buckley, Kathleen (HC/SC)
**Cc:** Burrows, Andrea (HC/SC); Hogan, Erin (HC/SC); Henrie, Celine (HC/SC)
**Subject:** FW: Demande initiale de documents et de renseignements / Initial request for documents and information - 5825-03705
**Date:** 2025-12-22 9:35:00 AM
**Attachments:** Avis d"enquête en vertu de l"article 32 Notice of intention to investigate under section 32 - 5825-03705.msg

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Hello,

Please find attached the Notice of intention to investigate under section 32.

A new complaint was received from the OIC. Please find the summary of complaint below.

Reason of Complaint: Deemed refusal

The OIC is seeking the following documents:

•Original access request
•Response letter, if any
•Notice of any extension of time taken
•Activity screen report on the access request from the institution's case management system (e.g. ATIP Express, APCM)

Kindly provide the requested documentation to the OIC by email no later than 2026-01-15.

Please cc the ATIP generic account with your response.

Thank you / Merci,

*Talia Payant*

(she | her | elle)
Junior ATIP Officer
Access to Information and Privacy Services Directorate
Health Canada and Public Health Agency of Canada / Government of Canada
Talia.payant@hc-sc.gc.ca / Tel: 343-993-6394

Agente subaltern de l'AIPRP
Direction des services d'accès à l'Information et Protection des Renseignements Personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Talia.payant@hc-sc.gc.ca / Télé: 343-993-6394

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**From:** _Greffe-Documents-Registry <Greffe-Documents-Registry@oic-ci.gc.ca>
**Sent:** 2025-12-22 9:23 AM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>
**Cc:** Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Subject:** Demande initiale de documents et de renseignements / Initial request for documents and information - 5825-03705

{English Follows}

## Demande initiale de documents et de renseignements

**Institution :** Santé Canada
**Date :** 2025/12/22
**Numéro de dossier du Commissariat :** 5825-03705
**Numéro de la demande d'accès :** A-2025-000298

Pour faire suite à l'avis d'enquête en vertu de l'article 32 daté du 2025/12/22 , le Commissariat à l'information a besoin de copies des documents et des renseignements suivants **dans les 15 jours ouvrables** après la réception de la présente demande, afin de commencer à enquêter sur la ou les plainte(s) susmentionnée(s) :

•Demande d'accès originale
•Lettre de réponse, le cas échéant
•Avis de prorogation de délai, le cas échéant
•Rapport de l'écran des activités sur la demande d'accès du système de gestion des cas de l'institution (p. ex. ATIP Express, APCM)

L'enquêteur pourrait demander d'avantage de renseignements et de documents au cours de l'enquête.

### Exigences relatives au format des documents

Les institutions doivent envoyer les documents en format PDF (interrogeable, si possible). Sauvegardez toutes les pièces jointes aux courriels et joignez-les au document PDF correspondant (au moyen de la fonction « Modifier le fichier PDF » d'Acrobat, par exemple). Si ce n'est pas possible, le Commissariat accepte également les documents en formats Microsoft Word, Excel et PowerPoint ainsi que les images et les vidéos.

Choisissez un nom de fichier clair pour chaque document ou groupe de documents.
**Par exemple** :
• Lettre de réponse.pdf
• Copie de travail des documents.pdf

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

• Imprimé de l'écran des activités.pdf
• Documents sur l'attribution des tâches.pdf
• Correspondance_demandeur.pdf
• Documents de consultation.pdf

Veuillez envoyer tous les documents et les renseignements **désignés « Protégé B » ou moins** par courriel chiffré ou postel au Greffe du Commissariat.

Le Commissariat accepte les documents classifiés **« Secret »** et **« Très secret »** en format papier et/ou PDF sur des CD-ROM ou clés USB clairement identifiés, suivant les instructions et la façon de nommer les fichiers ci-dessus. Ces documents doivent être livrés au Commissariat en personne ou par messagerie (signature requise).

Veuillez communiquer avec le Greffe du Commissariat pour obtenir de plus amples renseignements. (Voir aussi le guide de la GRC sur le transport et la transmission de renseignements protégés ou classifiés.)

Si vous avez des questions, veuillez communiquer avec le Greffe du Commissariat.

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## Initial request for documents and information

**Institution:** Health Canada
**Date:** 2025/12/22
**OIC file number:** 5825-03705
**Access request number:** A-2025-000298

Further to the Notice of intention to investigate under section 32 dated 2025/12/22 , the Office of the Information Commissioner (OIC) requires copies of the following documents and information **within 15 business days** after receiving this request in order to begin investigating the above-noted complaint(s).

•Original access request
•Response letter, if any
•Notice of any extension of time taken
•Activity screen report on the access request from the institution's case management system (e.g. ATIP Express, APCM)

The investigator may ask for more documents and records over the course of the investigation.

**Document format requirements**

Institutions should save the documents as PDFs (searchable, if possible). Be sure to save all attachments to emails and attach them to the corresponding PDF (using the Edit PDF function in Acrobat, for example). If it is not possible to send documents as

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

PDFs, the OIC also accepts documents in Microsoft Word, Excel and PowerPoint formats, as well as images and videos.

Choose a clear file name for each document or group of documents. **Examples:**
• Response letter.pdf
• Working copy of records.pdf
• Activity Screen Printout.pdf
• Tasking documents.pdf
• Requester correspondence.pdf
• Consultation documents.pdf

Send all documents and information **designated Protected B or lower** by encrypted email or ePost to the OIC Registry.

The OIC accepts documents classified **Secret** and **Top Secret** as hard copies and/or as PDFs on clearly labelled CD-ROMs or USB keys, following the guidelines and naming conventions given above. These records are only to be delivered to the OIC in person or by courier (with a required signature). Contact the OIC Registry for more information. (See also the RCMP guidelines for transmitting protected and classified documents.)

If you have any questions, please contact the OIC Registry.

_Greffe-Registry Greffe-Documents-Registry@oic-ci.gc.ca
30, rue Victoria, 7ième étage / 30 Victoria Street, 7th Floor
Gatineau QC K1A 1H3

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**From:** Henrie, Celine (HC/SC)
**To:** CSB ATIP ACTION REQUEST / DGSG AIPRP (HC/SC)
**Cc:** ATIPSD EDO / AIPRP BDE (HC/SC)
**Subject:** FW: FYA: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2
**Date:** 2025-06-04 7:27:00 PM
**Attachments:** image001.png
A-2025-000298 CSB Retrieval form.pdf

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Allo Melissa,

We do not have any relevant records. Please find signed retrieval form attached.

Céline Henrie

Executive Director
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada, Government of Canada
celine.henrie@hc-sc.gc.ca / Cel: 613-371-5066

Directrice exécutive
Direction des services de l'accès à l'information et de la protection des renseignements personnels
Direction générale des services de gestion
Santé Canada, Gouvernement du Canada
celine.henrie@hc-sc.gc.ca / Tél.cell.: 613-371-5066

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**From:** Wilde, Stephanie (HC/SC) <stephanie.wilde@hc-sc.gc.ca>
**Sent:** 2025-06-04 9:33 AM
**To:** Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Cc:** ATIPSD EDO / AIPRP BDE (HC/SC) <csbatipsdedo-dgsgdsaiprpbde@hc-sc.gc.ca>
**Subject:** RE: FYA: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Good morning Céline,

ATIP Ops does not have any records to provide. The completed retrieval form is attached for your signature.

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

Stephanie
*Stephanie Wilde*
A/Policy Manager, Access to Information and Privacy
Corporate Services Branch
Health Canada / Government of Canada
stephanie.wilde@hc-sc.gc.ca / Tel: 613-408-4583
Chat with me here / Parle avec moi ici
Gestionnaire de politique p.i., Accès à l'information et protection des renseignements personnels
Direction générale des services de gestion
Santé Canada / Gouvernement du Canada
stephanie.wilde@hc-sc.gc.ca / Tél: 613-408-4583

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**From:** Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Sent:** 2025-06-04 9:01 AM
**To:** Wilde, Stephanie (HC/SC) <stephanie.wilde@hc-sc.gc.ca>
**Cc:** ATIPSD EDO / AIPRP BDE (HC/SC) <csbatipsdedo-dgsgdsaiprpbde@hc-sc.gc.ca>
**Subject:** Fwd: FYA: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Hello Stephanie,

Could your team search Ricoh for relevant documents and prepare the response?
Sent from my iPhone

Begin forwarded message:

> **From:** "CSB ATIP ACTION REQUEST / DGSG AIPRP (HC/SC)" <csbatipactionrequest-dgsgaiprp@hc-sc.gc.ca>
> **Date:** June 4, 2025 at 8:42:25 AM EDT
> **To:** "Henrie, Celine (HC/SC)" <celine.henrie@hc-sc.gc.ca>
> **Cc:** "ATIPSD EDO / AIPRP BDE (HC/SC)" <csbatipsdedo-dgsgdsaiprpbde@hc-sc.gc.ca>, "CSB ATIP ACTION REQUEST / DGSG AIPRP (HC/SC)" <csbatipactionrequest-dgsgaiprp@hc-sc.gc.ca>
> **Subject: FYA: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2**

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Good Morning,

Please see retrieval request below for file A-2025-000298, for your action. Please return your DG signed OPI ATI Retrieval Form along with the records back to the Single Window, no later than COB June 12, 2025.

Please let me know if another Directorate should be tasked.

Thank you,

**Mélissa Tessier**
(she) | (elle)

ATIP Single Window,
Access to Information and Privacy Services Directorate
Corporate Services Branch,
Health Canada and the Public Health Agency of Canada
melissa.tessier@hc-sc.gc.ca | Tel : (343) 574-5144

Guichet unique des AIPRP,
Direction des services d'accès à l'information et de la protection des renseignements personnels
Direction générale des services de gestion,
Santé Canada et l'Agence de la Santé Publique du Canada
melissa.tessier@hc-sc.gc.ca | Tél: (343) 574-5144

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-04 7:53 AM
**To:** CSB ATIP ACTION REQUEST / DGSG AIPRP (HC/SC) <csbatipactionrequest-dgsgaiprp@hc-sc.gc.ca>
**Subject:** ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

*...le Français suit...*

Health Canada has received an access to information request for:
**Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

**This request applies to all records from all time periods, unless otherwise limited by law.**

**Please include: - Records held at headquarters and regional offices; - Archived or legacy systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;**

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**- Records in any language or format, whether digital or physical, classified or unclassified.**

The Branch(es) tasked for this request is(are) **[CSB, HPB]**

**In the first 48 hours...**

**Incorrect or Incomplete Tasking**
If additional branches should be tasked (aside from those noted above) or if your branch was tasked in error, please respond as soon as possible.

**Nil Responses**
If you do not have records relevant to the request please complete the ATI Retrieval Form, including Director General-level approval and include an explanation (Example: this information is only held at the provincial level. Our institution does not receive copies.)

*Note: If another branch is the lead but your branch still holds records, it is not a nil.*

**Clarification, Complexities and Voluminous Requests**
If you are seeking clarification, require more time because of a particularly voluminous request, or would like an opportunity to assist the requester in refining the scope of their request, please respond to this tasking to provide additional information. Key Steps and Considerations are available on mySource. The Record Retrieval due date may be adjusted depending on the length of time required to respond to your concerns.

**To complete the Record Retrieval...**

**Collection of Records**
Please conduct a search for records under the control of you/your program (i.e. that the program has access to) and provide copies of unaltered versions in either PDF or standard Microsoft format. Emails must include any attachments/embedded documents and password protection/encryption should be removed prior to submission.
*Note: When searching emails, please ensure the Treasury Board Secretariat Guideline on searching encrypted e-mails in response to information requests is followed.*

**Program Recommendations**
Please complete the ATI Retrieval Form and enclose it with your

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Record Retrieval. Recommendations should include any sensitivities within the record set that may qualify for exemption, and a detailed description of why it is sensitive and what the harm of release would be.

**Approval and Submission**
All record retrievals and recommendations must receive Director General-level approval. Record Retrievals and completed forms are due to ATIP Operations on **June 13, 2025**.

Further information about the ATIP process can be found on the ATIP intranet site under Responding to an ATIP Request and ATIP Frequently Asked Questions.

If you have any questions, please contact **Julien Beauchamp** at **julien.beauchamp@hc-sc.gc.ca** or at **343-542-3278**.

Regards,
Julien

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Santé Canada a reçu une demande d'accès à l'information pour:
**Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities**

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**caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

**This request applies to all records from all time periods, unless otherwise limited by law.**

**Please include: - Records held at headquarters and regional offices; - Archived or legacy systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;**
**- Records in any language or format, whether digital or physical, classified or unclassified.**

La (Les) direction générale(s) chargée(s) de cette demande est(sont) la(les) suivante(s), **[DGSG, DGPS]**.

**Au cours des 48 premières heures...**

> **Attribution des tâches inexacte ou incomplète**
> Si d'autres directions générales doivent être chargées (en plus de celles mentionnées ci-dessus) ou si votre direction générale a été chargée par erreur, veuillez répondre le plus rapidement possible.

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**Réponse aucun document pertinent**
Si vous ne disposez pas de documents pertinents à la demande, veuillez remplir le formulaire de récupération de la demande d'accès à l'information, approuvé au niveau directeur général, et inclure une explication (exemple : cette information n'est détenue qu'au niveau provincial. Notre institution ne reçoit pas de copies).

Remarque : si une autre direction générale est responsable mais votre direction générale détient toujours des documents, il ne s'agit pas d'une réponse aucun document pertinent.

**Clarification, complexité et demandes volumineuses**
Si vous souhaitez obtenir des clarifications, si vous avez besoin de plus de temps en raison d'une demande particulièrement volumineuse, ou si vous souhaitez avoir la possibilité d'aider le demandeur à réduire la portée de sa demande, veuillez répondre à cette attribution de tâche afin de fournir des informations complémentaires. Les principales étapes et considérations sont disponibles sur maSource. La date limite de récupération des documents peut être ajustée en fonction du temps nécessaire pour répondre à vos préoccupations.

**Pour compléter la récupération de documents...**

**Collecte de documents**
Veuillez rechercher les documents sous le contrôle du programme (c'est-à-dire auxquels le programme a accès) et fournir les versions non modifiées en format PDF ou en format Microsoft standard. Les courriels doivent inclure toutes les pièces jointes ou tous les documents intégrés et la protection par mot de passe ou le chiffrement doivent être désactivés avant la remise des documents.
Remarque : lors de la recherche de courriels, veuillez vous assurer que la *Ligne directrice sur la recherche de courriels chiffrés en réponse à des demandes de renseignements* du Secrétariat du Conseil du Trésor est suivie.

**Recommandations du programme**
Veuillez remplir le formulaire de récupération demande d'accès à l'AI et le joindre à votre Récupération des documents. Les recommandations doivent inclure les aspects sensibles du dossier qui peuvent faire l'objet d'une exception, ainsi qu'une description détaillée des raisons pour lesquelles le dossier est sensible et des conséquences négatives de sa divulgation.

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**Approbation et soumission**
Toutes les demandes de récupération de documents et les recommandations doivent être approuvées au niveau du directeur général. Les récupération de documents et les formulaires dûment remplis doivent être envoyés au service des opérations de l'AIPRP avant le **13 juin 2025**.

De plus amples informations sont disponibles sur le site intranet de l'AIPRP, sous la rubrique Modèles et outils et Foire aux questions de l'AIPRP.

Si vous avez des questions, veuillez communiquer avec **Julien Beauchamp** à **julien.beauchamp@hc-sc.gc.ca** ou à **343-542-3278**.

Merci,
Julien

**Julien Beauchamp**
(he/il)

Team Leader, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe, Accès à l'information et protection des renseignements personnels
Direction de la Politique, planifications et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

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# ATIP Access Request Record Retrieval: Branch Recommendations

Reset Form

## Part 1: Administrative information

ATIP File Number: A-2025-000298

Date: 2025-06-04

Request Text: Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:

| Department/Agency | Branch | Directorate/Division | Branch ATIP Single Window |
|---|---|---|---|
| HC | CSB | ATIPSD | Mélissa Tessier |

## Part 2: Retrieval Results and Recommendation

☐ **Records Provided**

☑ **No Records Found**

A thorough search has been conducted and no relevant records could be located. **Details are included in the rationale below**

**Please note any details of the search that was conducted and/or provide a rationale as to why your team/program does not have any records.**

No Records Exist.

A word search was completed in EDIMS to identify previous ATI requests regarding GTAA or Toronto Pearson and there were no relevant results.

Jump to Approval

2502E

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# ATIP Access Request Record Retrieval: Branch Recommendations

## Part 4: Approval

**I hereby attest that**

- ✔ A thorough search has been conducted
- ✔ A thorough search of encrypted emails has been conducted in accordance with the TBS Guideline on searching encrypted e-mails in response to information requests
- ✔ All relevant records have been provided. Non-relevant records and duplicates have been removed
- ✔ Passwords have been removed from records
- ✔ All sensitivities relating to this file have been identified and the context of the sensitivities has been explained in the above rationale

**Director General or equivalent**

Title/Team

Executive Director, ATIPSD

*Mandatory

eSignature

Henrie, Celine

Digitally signed by Henrie, Celine
DN: C=CA, O=GC, OU=HC-SC, CN="Henrie, Celine"
Reason: I am approving this document
Location:
Date: 2025.06.04 19:26:12-04'00'
Foxit PDF Editor Version: 12.1.7

**ADM/VP** (if applicable)

Title/Branch

eSignature

2502E

ATIA - 19(1)

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**From:** Fabio Ovettini
**To:** [redacted]; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca
**Cc:** ZZG-Community Engagement; Anand, Anita - M.P.; [redacted] aara.saks@parl.gc.ca; rminichiello@verityintl.com; [redacted] mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); pierre.poilievre@parl.gc.ca; jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; [redacted] humberleacommunitygroup@gmail.com; [redacted] Mayor Chow; "Councillor Perruzza"; [redacted] Tom Rakocevic; [redacted] WS Viewer Mail; [redacted] newstips@thestar.ca; [redacted] doug.fordco@pc.ola.org; [redacted] hcminister.ministresc; MHA Minister / Ministre SMD (HC/SC); [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; [redacted] piac.ward01@tdsb.on.ca; [redacted] judy.sgro.a1@parl.gc.ca; Meneses, Albert (Sgro, Judy A. - MP); Calderan Amy (Sgro Judy A. - MP); [redacted] judy.sgro@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_mckelvie@toronto.ca; [redacted] Councillor Ainslie; [redacted]
**Subject:** Complaint System Failure on May 4, 2025 – Another 504 Gateway Timeout
**Date:** 2025-05-04 9:51:04 PM
**Attachments:** image.png

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**Warning:** This message is from an EXTERNAL SENDER - be CAUTIOUS, particularly with links and attachments.
**Attention:** Ce message provient d'un EXPÉDITEUR EXTERNE - soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Open Letter to [redacted] and the GTAA Leadership**
**Complaint System Failure on May 4, 2025 – Another 504 Gateway Timeout**

To [redacted] GTAA Executive Team, and Board of Directors:

Once again, your systems have failed. While community members were actively filing noise complaints—a basic exercise in civic participation—your public-facing complaint portal went down. The error? *504 Gateway Timeout*. This is not a rare event. This is not a surprise. This is a recurring pattern of collapse, and it demands accountability.

Your system failed **exactly when it was needed most**. Residents were mobilized. We were engaged. We were taking time out of our lives—already disrupted and diminished by constant aircraft noise—to demand recognition, to be counted, to speak. Instead, our time and effort were erased by your inability to maintain even the most rudimentary digital infrastructure. Let that sink in: you are running Canada's largest airport, and you cannot keep a complaint form online.

This isn't about a server. This is about contempt—contempt for public input, contempt for transparency, contempt for the very communities your operations harm.

Let's stop pretending this is a one-off error. The failure is systemic. The rot is structural. You continue to rely on the same people, same managers, same vendors, same excuses. When exactly do you intend to learn that institutional loyalty is not a substitute for competence? That continuity in failure is not resilience—it's negligence?

Einstein said something about the definition of insanity: doing the same thing over and over and expecting different results. Your leadership seems to have taken that as a business model.

You cannot run a major international airport on duct tape and denial. You cannot posture as a public-facing institution when your interface with the public is broken, again and again. And you absolutely cannot claim to be listening to us when your listening tool doesn't work.

We are not asking for miracles. We are demanding basic functionality, professional stewardship, and visible accountability. And we are watching.

Fix your systems. Fix your management. Or step aside for people who can.

Sincerely,

Fabio Ovettini

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**504 Gateway Time-out**

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**From:** Beauchamp, Julien (HC/SC)
**To:** Hogan, Erin (HC/SC)
**Subject:** FW: Request under the Access to Information Act - Health Canada - A-2025-000298
**Date:** 2025-12-09 7:15:00 AM

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Good morning Erin,

Please see email below from requester re: A-2025-000298.

Thanks,

Julien

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-12-08 7:39 PM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** Re: Request under the Access to Information Act - Health Canada - A-2025-000298

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** ATIP A-2025-000298 – Status and request for prioritized processing

Dear ATIP Coordinator,

I am writing regarding access request **A-2025-000298**. I acknowledge the OIC's decision concerning the admissibility of my delay complaint. As the OIC noted, this does not affect Health Canada's ongoing obligation to respond to my request.

I would also like to share **new information** that I have not previously raised with your office. I have been dealing with significant health issues that predate my surgery. I attended emergency on **August 30, 2025**, and underwent surgery on **October 31, 2025**. Given the prolonged delay already incurred, I respectfully request that this file be prioritized.

Please provide:

1. The current status of **A-2025-000298**;
2. Confirmation that the request remains active;
3. The name/contact of the assigned officer (if available); and
4. A firm expected date for partial or full release of records.

If Health Canada intends to rely on any extension under section 9 of the Act, please provide the relevant written notice and justification. If no extension was issued, I request that the file proceed to immediate processing and release without further delay.

Sincerely,
Fabio Ovettini

On Thursday, June 19, 2025 at 08:47:10 a.m. EDT, Fabio Ovettini <fabio217@yahoo.com> wrote:

**Subject:** Confirmation to Proceed with Modified ATI Request

Good morning, and thank you for your message and for consulting with your subject matter experts.

I appreciate the clarification and understand the considerations regarding the archival/legacy information. However, I would like to proceed with the request **as it currently stands**, including the transition period from Transport Canada to GTAA in 1996. I also confirm that the modifications you've made to the request text are acceptable.

Please move ahead with processing the request.

Thank you again for your support and guidance throughout this process.

Best regards,
Fabio Ovettini

On Thursday, June 19, 2025 at 08:08:35 a.m. EDT, Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca> wrote:

Unclassified / Non classifié

Good morning,

Thank you for your response and providing the additional information. I have reached out to our subject matter experts and it does appear like the additional clarification helped. However, there are still one detail to confirm with you.

Our experts have recommended that you exclude the archival/legacy information portion of the request. With the new time frame of 1990 to present, it would include the transition from TC to GTAA and the creation of the GTAA (1996). While HC may records on this portion, they would require significant time for archival mining and could take a while. As a possible solution, they have mentioned that it may be worth seeking those records directly from Transport Canada, since they are lead

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and could have the historical records more readily accessible and available.

I have modified the request text a bit to reflect the latest clarification. Could you please confirm that this is ok with you, or let me know if additional modifications should be made to the text.

**Pursuant to the Access to Information Act, I am requesting access to any and all records (from January 1, 1990 to June 3, 2025) held by Health Canada, that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport. Records include final versions and/or latest version available. Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**

**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**

**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal**

**governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**

**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**

**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**

**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**

**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:**

**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or**

**Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**

**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**

**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**

**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

Thanks,

Julien

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**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-06-12 8:59 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** Re: Request under the Access to Information Act - Health Canada - A-2025-000298

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Clarification and Refinement of ATI Request – GTAA and Toronto Pearson Airport

Good morning Beauchamp,

Thank you for your detailed response and for your efforts to facilitate the retrieval of records.

I would like to revise and narrow my Access to Information request as follows:

1. Timeframe

Please limit the request to records created between January 1, 1990, and the present.

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2. Type of Documents

I am willing to receive only final versions or the latest available drafts of documents. If a particular document raises further interest, I may submit a follow-up request for its draft versions.

3. Level of Recipients

Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health.

4. Focus of Retrieval

I ask that you focus on records concerning:

- Air pollution related to operations at Toronto Pearson International Airport or the Greater Toronto Airports Authority (GTAA);
- Aircraft noise, vibration, and their impact on public health;
- Community health risks associated with aviation-related pollutants (e.g., ultrafine particles, NOx, $SO_2$, PM2.5, etc.);
- Issues involving noise exposure thresholds, including effects on sleep and mental health;
- Any discussion or analysis of the GTAA Night Flight Budget, including night operations between 10:00 p.m. and 7:00 a.m.

5. Priority Records
Where possible, I ask that priority be given to:

- Health Canada's own assessments, internal memos, and interdepartmental briefings;
- Complaints or inquiries from the public, professionals, advocacy groups, or municipal officials;
- Records involving interdepartmental communication with Transport Canada and Environment and Climate Change Canada.

I hope these refinements allow you to proceed more efficiently. Please let me know if further adjustments are needed. Thank you again for your time and support.

Sincerely,
**Fabio Ovettini**
Toronto, Ontario
fabio217@yahoo.com

On Thursday, June 12, 2025 at 07:12:58 a.m. EDT, Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca> wrote:

Unclassified / Non classifié

Good morning Fabio Ovettini,

I am writing to you in regards to your access to information request for the following information:

**"Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**

**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**

**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal**

**governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**

**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**

**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**

**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**

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- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.

3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:

- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or

Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;

- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.

4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:

- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;

- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.

5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.

This request applies to all records from all time periods, unless otherwise limited by law.

Please include: - Records held at headquarters and regional offices; - Archived or legacy systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;

- Records in any language or format, whether digital or physical, classified or unclassified."

I am currently corresponding with our subject matter experts, who have identified a few key points that may facilitate the retrieval of the information you are seeking. As currently worded, your request would result in over 20,000 pages of records. This type of volume represents a very long processing time, and I would imagine you would not be able to receive the records until a few years (would also most likely include records you are not interested in). Hoping to reduce the volume of relevant records and get you records as quickly and efficiently as possible, I am wondering if you would be able to provide additional information on the following points:

1. **Timeframe:** You currently have your requested worded as "all records from all time periods". Is there a more specific timeframe we could use to perform our retrieval of records ? Keeping in mind that more recent dates will provide data and information that more accurately represents the current activity and residential impacts. In order to proceed with the request, we would need specific dates (ex: years 2020 to present).
2. **Type of documents:** Would you be open to receive only final (or latest drafts) of documents? This would remove all the different versions of each document, allowing us to reduce the total volume of records. If you come across a document that you have particular interest in once you receive the records, it would be possible for you to request all the draft versions of the document.
3. **Recipients of the information:** Could we reduce the scope to only include correspondence at a DG level and above ? Retrieving information from all staff in a division is time consuming and will take a significant amount of time to process, resulting in a lot of information you may not be interested in.
4. **Focus of retrieval:** Our subject matter experts suggest focusing the retrieval on topics we have interpreted as your area of focus. Specifically, would you be able to add a line to your request to indicate that the focus of our retrieval should be on "air pollution", "noise and vibration", "public health impacts", and "risks for communities in proximity of aviation pollutants" ?

Any other additional information you can provide that would allow us to focus our retrieval on what you are seeking would be appreciated. Please note that your request will be placed on hold until we received clarification. If we have not received a response from you by July 2nd 2025, we will assume you are no longer interested in the information and close your request. If you have any questions or wish to discuss, please do not hesitate to contact me.

Thank you,

**Julien Beauchamp**

(he/il)

Team Leader, Access to Information and Privacy Division

Corporate Policy & Planning Services Directorate

Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe, Accès à l'information et protection des renseignements personnels

Direction de la Politique, planifications et services corporatifs

Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

ATIA - 19(1)

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**From:** Fabio Ovettini
**To:** [redacted] mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); judy.sgro@parl.gc.ca; pierre.poilievre@parl.gc.ca; Jagmeet - M.P.; Francesco Sorbara; [redacted] humberleacommunitygroup@gmail.com; [redacted] Mayor Chow; Councillor Perruzza; [redacted] Tom Rakocevic; [redacted] W5 Viewer Mail; [redacted] Minister of Transport / Ministre des Transports (TC); [redacted] newstips@thestar.ca; [redacted] ZZG-Community Engagement; doug.fordco@pc.ola.org; [redacted] hcminister.ministresc; MHA Minister / Ministre SMD (HC/SC) [redacted] office@timothycs.com; [redacted] piac.ward01@tdsb.on.ca; [redacted] Anita.Anand@parl.gc.ca; anita.anand@parl.gc.ca; fabio.ovettini; judy.sgro.a1@parl.gc.ca; Meneses Albert (Sgro Judy A. - MP); Calderan Amy (Sgro Judy A. - MP)
**Subject:** Concerns Regarding Noise Narrative at Pearson Airport.
**Date:** 2024-10-31 8:14:12 PM

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**Attention:** Ce message provient d'un EXPÉDITEUR EXTERNE - soyez PRUDENT, en particulier avec les liens et les pièces jointes.

GTAA's charlatans,

I am reaching out to address a narrative repeatedly presented by Nav Canada and Pearson Airport concerning runway usage. It is often stated that east-west runways are selected primarily due to wind conditions, yet evidence suggests otherwise. Aircraft are equipped to safely operate in winds up to 30 knots or more, and newer planes can handle even higher wind thresholds. At Pearson, we rarely experience such high winds, which suggests that capacity, rather than wind, is a decisive factor for east-west operations.

The consistent focus on wind conditions seems to overlook the profound impact of noise on surrounding communities. Many residents suffer from disrupted sleep, decreased quality of life, and long-term health issues. The lack of transparency in decision-making fuels distrust, as it feels that operational efficiency is prioritized over community well-being.

I urge you to consider and address the real impact of noise pollution and to communicate transparently with the public. Clarity on runway selection criteria would be a significant step toward rebuilding trust with the community.

Since it's Halloween, here's my parting message: I've decided to become the monster in *your* nightmares.

https://nbaa.org/aircraft-operations/international/north-america/toronto-airport-amends-crosswind-runway-selection-criteria/

Sincerely,
Fabio Ovettini

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**From:** Bradley, Kevin (HC/SC)
**To:** Beauchamp, Julien (HC/SC)
**Cc:** atip / aiprp (HC/SC)
**Subject:** New Request: A-2025-000298
**Date:** 2025-06-03 11:27:00 AM

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Hello,

Note: Located news article involving requester concerning GTAA Airport complaints.
http://toronto.citynews.ca/2024/06/26/toronto-pearson-airport-noise-complaints-process/
Note: Applicant stated request was originally sent on May 21, 2025 however there is no records of receiving it.

Request: **Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or**

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**organization — including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

**This request applies to all records from all time periods, unless otherwise limited by law.**

**Please include: - Records held at headquarters and regional offices; - Archived or legacy systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;**
**- Records in any language or format, whether digital or physical, classified or unclassified.**

Thank you / Merci,

Kevin Bradley (He / Him / Il)

Sr Project Officer
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371

Agent principal de projet

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Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**From:** Meraw, Keilee (HC/SC)
**To:** Beauchamp, Julien (HC/SC); HECSB ATI / AI DGSESC (HC/SC)
**Cc:** Olivas-Bosquet, Helena (HC/SC); Houde, Alexandre (HC/SC) (he, him | il, lui); Lepine, Leigh Anne (HC/SC)
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2
**Date:** 2025-06-23 1:55:54 PM

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Unclassified / Non classifié

I was thinking that electronic files would be easier to retrieve and redact – and could be considered separate from the paper files.... But if that approach is not typically done, an extension would definitely be needed given breadth and scope of this request.
Keilee

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**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-23 1:54 PM
**To:** Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Hi Keilee,

In a majority of cases, we work with electronic records, which can simply be imported in our redaction system and be sent to the requester in electronic format as well. The challenge with paper records, is that they have to be scanned in our system before we can apply our redactions.

I want to make sure I didn't misunderstand your question... Are you thinking that in this case, paper records would be faster to provide ? We can always work together and collaborate to find the easiest way to obtain the records, depending on the situation.

Julien

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**From:** Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>
**Sent:** 2025-06-23 1:43 PM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>

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**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Thanks for this Julien – I do think we may wish to consider electronic vs. paper options – as the requester could get documents sooner. Has that ever been considered for other requests?

Keilee

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**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-23 1:39 PM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Alexandre,

I would propose that we leave the request as is and keep all the records in that same request. Now, I understand that this request represents a significant volume of information and retrieval complexity and also that the directorate has some concerns about meeting the retrieval due date. Since there is a large volume of records, we can certainly look at providing an extension, in order to give you sufficient time to retrieve the information.

I think we can touch base again once I have obtained responses to the latest clarification request. Once we have those details, we can look at how much volume we are looking at and how long it will take to retrieve. This info will allow us to make a decision on the extension of the request.

Hope this helps. I will let you know as soon as I hear back from the requester.

Thanks,
Julien

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**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-06-23 1:26 PM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>; Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Bonjour Julien,

Out of curiosity, my manager asked if it would be possible to ask the requestor if he would be wiling to break down the request in 3-4-5 parts?

I just want to know if it's possible for now as I haven't yet spoken with the directorate to determine the exact time frame, they could split it by.

In example, we could provide the last 5 years of electronics records at the due date and then work on providing the archives for 15 years in a second batch and the last 15 years in a third batch or something like that.

What do you think, and do you have something to propose?

Merci beaucoup!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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*Sent from the traditional unceded territory of the Algonquin Anishnaabeg People, the traditional guardians of this unceded land.*

Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-06-23 10:03 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Bonjour Julien,

Je viens de recevoir les demandes d'éclaircissements de la part de notre direction en charge de la récupération.

J'ai de la difficulté à leur faire comprendre qu'il n'y a pas, pour l'instant, de base solide pour une extension en vertu de la loi.

Merci!

Below are some points for which the programs are requesting clarifications before proceeding with the retrieval process. Kindly note that they are awaiting these clarifications from the analyst as soon as possible. As a result, a change in the deadline may be requested:

**a.** It was assumed that travel documents referencing Toronto Pearson International Airport are not within scope, as SED interprets these as not aligning with the spirit or intent of the request (i.e., seeking information on the potential environmental and health impacts of the airport). Could you

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please confirm this assumption?

**b.** SED flags a potential need to engage MAMD, should the following types of records be deemed in scope. In response to the Request for Standing Offer Process (Provision of Scientific Expertise to Support Human Health Risk Assessment conducted by SED starting on December 5, 2023), several proposals submitted by companies included references to Toronto Pearson International Airport. If these proposals are considered in scope and MAMD is the original recipient, could you kindly confirm whether MAMD will handle the retrieval and whether SED should not include these records to avoid duplication in the consolidated retrieval package?

**c.** To assist in refining the portion of the request text quoted below (bullet 1), could the requester confirm if they are only interested in records related to air pollution, noise pollution, and/or human health? As written, the request would result in retrieving many travel-related records that mention Toronto Pearson International Airport. If these records are in scope, could you kindly confirm if the revised instruction below is to be followed:
*"Records include final versions and/or latest versions available. Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health."*
Should this instruction guide the retrieval efforts at the DG level and above (depending on the final level of approval)?

> **1.** All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:
> – Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;
> – Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations.

**d.** Based on the amended scope previously shared, SED had hoped there would be confirmation of a focus on:
*"records that mention topics of particular interest to the requester, notably air pollution, noise, public health impacts, and risks for communities in proximity to aviation pollutants, etc."*
This approach would exclude travel documents, procurement records, and notifications where the airport is simply listed as the point of entry.
Could you confirm this understanding?

Kind regards,

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Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-23 7:31 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Alexandre,

Thanks for the additional information and recommendations to task DMO and MBU. Unfortunately, at this point we cannot legally place the request on hold. The request text has all the elements for it to be a valid ATI request (it has a date scope, clear record types and subject matter). We were under the impression that following the last clarification, the request was clear enough to proceed (though still quite voluminous...). We can certainly still go back to the requester with additional questions, but from what I can tell, the requester will probably wish not to reduce the scope of the request any more.

I will wait for the addition clarification questions and we can go from there ?

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Thanks again,

**Julien Beauchamp**
(he/il)

ATIP Team Leader, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe de l'AIPRP, Accès à l'information et protection des renseignements personnels
Direction de la Politique, planifications et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

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**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-06-20 1:48 PM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Julien,

D'autres questions sont à prévoir et nous recommandons que MBU et DMO soit aussi inclus dans la récupération:

Our programs are reaching out with several additional clarification questions related to this amended request. We are currently compiling these questions and refinement requests and plan to send them to you next week.
Would it be possible to pause this retrieval request again until these clarification and refinement matters are resolved? Currently, the bureaus are unable to proceed with the retrieval work prior to receiving the responses to their questions. SED is recommending that MBU and DMO also be tasked for this file, given that the scope includes "communications to or from the Office of the Minister of Health

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Kind regards,

Bonne journée!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

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**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-20 8:21 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Alexandre,

Given the complexity and volume on this one, I can provide an extension up until July 7th, 2025. I will make the change in our system.

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Bonne journee!
Julien

---

**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-20 8:17 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Hello Julien,

Is it possible to have until July 3 to complete the tasking?

Thank you much!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

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---

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**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-20 7:50 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

*...le Français suit...*

Health Canada has received an access to information request for:
**Pursuant to the Access to Information Act, I am requesting access to any and all records (from January 1, 1990 to June 3, 2025) held by Health Canada, that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport. Records include final versions and/or latest version available. Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization - including but not limited to:**

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**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities - that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

The Branch(es) tasked for this request is(are) **[HECSB, CSB (For portion 5 of the request)]**

**In the first 48 hours...**

**Incorrect or Incomplete Tasking**
If additional branches should be tasked (aside from those noted above) or if your branch was tasked in error, please respond as soon as possible.

**Nil Responses**
If you do not have records relevant to the request please complete the ATI Retrieval Form, including Director General-level approval and include an explanation (Example: this information is only held at the provincial level. Our institution does not receive copies.)

*Note: If another branch is the lead but your branch still holds records, it is not a nil.*

**Clarification, Complexities and Voluminous Requests**
If you are seeking clarification, require more time because of a particularly voluminous request, or would like an opportunity to assist the requester in refining the scope of their request, please respond to this tasking to provide additional information. Key Steps and Considerations are available on mySource. The Record Retrieval due date may be adjusted depending on the length of time required to respond to your concerns.

**To complete the Record Retrieval...**

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**Collection of Records**

Please conduct a search for records under the control of you/your program (i.e. that the program has access to) and provide copies of unaltered versions in either PDF or standard Microsoft format. Emails must include any attachments/embedded documents and password protection/encryption should be removed prior to submission.

*Note: When searching emails, please ensure the Treasury Board Secretariat Guideline on searching encrypted e-mails in response to information requests is followed.*

**Program Recommendations**

Please complete the ATI Retrieval Form and enclose it with your Record Retrieval. Recommendations should include any sensitivities within the record set that may qualify for exemption, and a detailed description of why it is sensitive and what the harm of release would be.

**Approval and Submission**

All record retrievals and recommendations must receive Director General-level approval. Record Retrievals and completed forms are due to ATIP Operations on **July 02, 2025**.

Further information about the ATIP process can be found on the ATIP intranet site under Responding to an ATIP Request and ATIP Frequently Asked Questions.

If you have any questions, please contact **Julien Beauchamp** at **julien.beauchamp@hc-sc.gc.ca** or at **343-542-3278**.

Regards,
Julien

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Santé Canada a reçu une demande d'accès à l'information pour:

**Pursuant to the Access to Information Act, I am requesting access to any and all records (from January 1, 1990 to June 3, 2025) held by Health Canada, that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport. Records include final versions and/or latest version available. Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**

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**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization - including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities - that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

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**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

La (Les) direction générale(s) chargée(s) de cette demande est(sont) la(les) suivante(s), **[DGSESC]**.

**Au cours des 48 premières heures...**

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**Attribution des tâches inexacte ou incomplète**
Si d'autres directions générales doivent être chargées (en plus de celles mentionnées ci-dessus) ou si votre direction générale a été chargée par erreur, veuillez répondre le plus rapidement possible.

**Réponse aucun document pertinent**
Si vous ne disposez pas de documents pertinents à la demande, veuillez remplir le formulaire de récupération de la demande d'accès à l'information, approuvé au niveau directeur général, et inclure une explication (exemple : cette information n'est détenue qu'au niveau provincial. Notre institution ne reçoit pas de copies).

Remarque : si une autre direction générale est responsable mais votre direction générale détient toujours des documents, il ne s'agit pas d'une réponse aucun document pertinent.

**Clarification, complexité et demandes volumineuses**
Si vous souhaitez obtenir des clarifications, si vous avez besoin de plus de temps en raison d'une demande particulièrement volumineuse, ou si vous souhaitez avoir la possibilité d'aider le demandeur à réduire la portée de sa demande, veuillez répondre à cette attribution de tâche afin de fournir des informations complémentaires. Les principales étapes et considérations sont disponibles sur maSource. La date limite de récupération des documents peut être ajustée en fonction du temps nécessaire pour répondre à vos préoccupations.

**Pour compléter la récupération de documents...**

## Collecte de documents

Veuillez rechercher les documents sous le contrôle du programme (c'est-à-dire auxquels le programme a accès) et fournir les versions non modifiées en format PDF ou en format Microsoft standard. Les courriels doivent inclure toutes les pièces jointes ou tous les documents intégrés et la protection par mot de passe ou le chiffrement doivent être désactivés avant la remise des documents.
Remarque : lors de la recherche de courriels, veuillez vous assurer que la *Ligne directrice sur la recherche de courriels chiffrés en réponse à des demandes de renseignements* du Secrétariat du Conseil du Trésor est suivie.

**Recommandations du programme**
Veuillez remplir le formulaire de récupération demande d'accès à l'AI et le joindre à votre Récupération des documents. Les recommandations doivent inclure les aspects sensibles du dossier qui peuvent faire l'objet d'une exception, ainsi qu'une description détaillée des raisons pour lesquelles le dossier est sensible et des conséquences négatives de sa divulgation.

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**Approbation et soumission**
Toutes les demandes de récupération de documents et les recommandations doivent être approuvées au niveau du directeur général. Les récupération de documents et les formulaires dûment remplis doivent être envoyés au service des opérations de l'AIPRP avant le **2 juillet 2025**.

De plus amples informations sont disponibles sur le site intranet de l'AIPRP, sous la rubrique Modèles et outils et Foire aux questions de l'AIPRP.

Si vous avez des questions, veuillez communiquer avec **Julien Beauchamp** à **julien.beauchamp@hc-sc.gc.ca** ou à **343-542-3278**.

Merci,
Julien

**Julien Beauchamp**
(he/il)

ATIP Team Leader, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe de l'AIPRP, Accès à l'information et protection des renseignements personnels
Direction de la Politique, planifications et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

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**From:** Beauchamp, Julien (HC/SC)
**To:** HECSB ATI / AI DGSESC (HC/SC)
**Cc:** Olivas-Bosquet, Helena (HC/SC); Houde, Alexandre (HC/SC) (he, him | il, lui)
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2
**Date:** 2025-06-19 8:52:00 AM

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Salut Alex,

I have just heard back from the requester. They would like to proceed with the 1990 to present timeframe, including the archived documents.
With regards to point #2, it is correct to assume the focus should be on GTAA.

I have modified the request to include the clarifications and will be sending out a new tasking at some point today. Thanks to everyone for all the work/time put into this clarification.

Julien

---

**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-18 9:30 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

## Hello Julien,

## Further clarification have been provided to me:

Sorry for the delay, I was out yesterday. I think we are definitely getting there with the below new scope and clarifications and just have a few comments/questions.

1. Timeframe: 1990 would include the transition from TC to the GTAA for airport control and the creation of the GTAA (1996). Although I can't confirm, I assume HC archives may have some records that may be in scope and we'd have to build in the significant time to do that archival mining. We would need to contract this out and could take a long while. What I would suggest to the requestor, if this type of information is of interest to them, they could approach TC for records of those types in that period. As TC would have been lead, it's more likely that they would have those historical records more readily accessible and available. HC would have more recent related records which I propose

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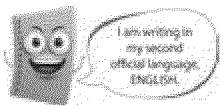
would be of greater interest to the requestor if they are interested in human health information. I suggest for HC to exclude archival/legacy information and focus search on the latest science/data/information available. This would not only make the retrieval more manageable, but would provide for records in a much more timely fashion. But please be advised that we would likely still have significant volume.

2. Formated scope clarity: It may be a cut/paste issue but wanted to confirm. The first set of bullets should all be related to that first bullet, correct? (i.e. GTAA context) Is it just the first and fifth bullets related to the GTAA and the rest are for anywhere, or do we focus specifically on GTAA concerns? Note that if we go broader there will obviously be more challenges. My sense from the rest of the wording is that we should focus on the GTAA but would like to confirm please.

Thanks!

Thank you!

Alexandre




ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-17 9:44 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

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Good morning,

I have heard back from the requester following possible clarifications. Before I go ahead and send a new retrieval tasking, I wanted to verify with HECSB if the new information allows you to proceed with the retrieval, or if additional clarifications are required.

**Time frame:** The requester has identified the time period of "January 1, 1990 to present"
**Document versions:** The requester agrees to receive only final versions/latest available draft versions of documents.
**Level of correspondence:** The requester agrees to restrict the scope of the request to DG-level and above.
**Focus of retrieval:** The focus should be on the following –

- Air pollution related to operations at Toronto Pearson International Airport or the Greater Toronto Airports Authority (GTAA);
- Aircraft noise, vibration, and their impact on public health;
- Community health risks associated with aviation-related pollutants (e.g., ultrafine particles, NOx, $SO_2$, PM2.5, etc.);
- Issues involving noise exposure thresholds, including effects on sleep and mental health;
- Any discussion or analysis of the GTAA Night Flight Budget, including night operations between 10:00 p.m. and 7:00 a.m.

Additional context provided by the requester:

I ask that priority be given to:

- Health Canada's own assessments, internal memos, and interdepartmental briefings;
- Complaints or inquiries from the public, professionals, advocacy groups, or municipal officials;
- Records involving interdepartmental communication with Transport Canada and Environment and Climate Change Canada.

Please let me know if these clarifications are sufficient, or if you have additional questions regarding the new information.

Thanks in advance,

Julien

**Julien Beauchamp**
(he/il)

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Team Leader, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe, Accès à l'information et protection des renseignements personnels
Direction de la Politique, planifications et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

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**From:** Buckley, Kathleen (HC/SC)
**Sent:** 2025-06-11 10:03 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Boy oh boy, this is a doozy.

I think we can legally put the file on hold based on the lack of a date-range itself, and in turn we can also put a pause on HECSB's tasking as well.

Leave it with Julien and me and we'll get back to you with further instruction.

You have a great day as well!

Kate

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**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-11 9:53 AM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC)

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<julien.beauchamp@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Hello Kathleen!

Thank you for the feedback, it's greatly appreciated. Find attached the file you are seeking.

Do have a great day!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

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**From:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Sent:** 2025-06-11 9:49 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

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Hi Alexandre,

Thanks for reaching out on this one. Julien is away today, so I'll respond with what I can.

I will start off by saying that I very much doubt that the requester will agree to scoping too much out (if anything) and I will go out on a limb to say that they will most certainly make a complaint to the Information Commissioner on the delay. That said, I do think that we should push for a date-range, but it may not affect the outcome unfortunately.

Also, would you mind sharing the attachment that you mention below? The one where you say that "both branches agree with the attached document and have added their own clarifications. What approach would you propose?"

Thanks
Kate

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**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-10 1:58 PM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

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Hello Kathleen,

We are trying to get clarification for the program to refine the search. Deadline is June 13, and we've asked for clarification on June 5, 2025. Can this request be put on hold for now as we have no answers yet. I had shared our OPI name to Julien and Julien's name to our Analyst to try to resolve this quickly. This email is the second follow up after clarification were sought.

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Could you please advise?

Thank you!

Alexandre

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Tél : (343)542-6065

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---

**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-09 1:02 PM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

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Bonjour Julien,

As-tu des éclaircissements pour cette demande?

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Merci!

Alexandre

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Tél : (343)542-6065

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**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-05 2:22 PM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

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Bonjour Julien,

Les directions consultées soulèvent des clarifications et ont des commentaires à propos de cette demande d'AI. Tu trouveras les clarifications et les précisions d'ordre Générale dans le document qui est joint.

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Les deux directions sont d'accord avec le document en pièce jointes et ajoute ses précisions. Que proposes-tu comme approche?

Les deux noms que je peux te partager si tu as des questions, considérant la complexité de cette demande, sont Boti Manuel kimbuila ainsi de Daren Kelland dans la direction de la sûreté des milieux. Cette direction est clairement plus touchée que l'autre, devenant ainsi le lead du dossier pour la DGSESC.

Hi,
SED requires some clarifications and have suggested tweaks to scope to focus retrieval on the aspects related to the GTAA that appear to be of interest to the requestor while avoiding the bulk of records inadvertently that would otherwise be scope in. It's not possible to know volume of everything in our archives and otherwise in our possession that mentions the GTAA, but we do know what even if refinements suggested we are already looking at over 20k records and still have not heard from everyone yet.

Also wanted to flag that even with the refinements suggested to focus scope, we would need an extension of at least 3 months to address such volumes. We would need significantly more time than this if the scope is not refined and stays as is (likely a year).

Please see attached and we would be happy to chat to explain further.

Regards,

ERHSD:

Hello all,

We are in support of SED's request for clarification and extension request.

>>>>>>>>>>>>>>>>>>>>>>>
CCRPB is good with the proposed clarifications that SED has provided.

Since CCRPB's records only pertain to noise exposure, we have interpreted the request as follows

> All records that mention GTAA and/or Toronto Pearson with regards to health or environmental issues. This would include all emails, enquiries, complaints, and any communications between HC and any other groups related to GTAA and/or Pearson on the topic of health or environmental issues.

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CCRPB only has a role in providing expertise on health effects on noise upon the request of Transport Canada, we have limited records that fall in scope of this request.

**>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>**

Merci beaucoup et bonne journée!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Tél : (343)542-6065

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**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-04 9:47 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

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*...le Français suit...*

Health Canada has received an access to information request for:
**Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater**

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**Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

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**This request applies to all records from all time periods, unless otherwise limited by law.**

**Please include: - Records held at headquarters and regional offices; - Archived or legacy systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;**
**- Records in any language or format, whether digital or physical, classified or unclassified.**

The Branch(es) tasked for this request is(are) **[HECSB, HPB, CSB]**

**In the first 48 hours...**

**Incorrect or Incomplete Tasking**
If additional branches should be tasked (aside from those noted above) or if your branch was tasked in error, please respond as soon as possible.

**Nil Responses**
If you do not have records relevant to the request please complete the ATI Retrieval Form, including Director General-level approval and include an explanation (Example: this information is only held at the provincial level. Our institution does not receive copies.)

*Note: If another branch is the lead but your branch still holds records, it is not a nil.*

**Clarification, Complexities and Voluminous Requests**
If you are seeking clarification, require more time because of a particularly voluminous request, or would like an opportunity to assist the requester in refining the scope of their request, please respond to this tasking to provide additional information. Key Steps and Considerations are available on mySource. The Record Retrieval due date may be adjusted depending on the length of time required to respond to your concerns.

**To complete the Record Retrieval...**

**Collection of Records**
Please conduct a search for records under the control of you/your program (i.e. that the program has access to) and provide copies of unaltered versions in either PDF or standard Microsoft format. Emails must include any attachments/embedded documents and password protection/encryption should be removed prior to submission.
*Note: When searching emails, please ensure the Treasury Board Secretariat Guideline on searching encrypted e-mails in response to information requests is followed.*

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**Program Recommendations**
Please complete the ATI Retrieval Form and enclose it with your Record Retrieval. Recommendations should include any sensitivities within the record set that may qualify for exemption, and a detailed description of why it is sensitive and what the harm of release would be.

**Approval and Submission**
All record retrievals and recommendations must receive Director General-level approval. Record Retrievals and completed forms are due to ATIP Operations on **June 13, 2025**.

Further information about the ATIP process can be found on the ATIP intranet site under Responding to an ATIP Request and ATIP Frequently Asked Questions.

If you have any questions, please contact **Julien Beauchamp** at **julien.beauchamp@hc-sc.gc.ca** or at **343-542-3278**.

Regards,
Julien

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Santé Canada a reçu une demande d'accès à l'information pour:
**Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with**

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**GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

**This request applies to all records from all time periods, unless otherwise limited by law.**

**Please include: - Records held at headquarters and regional offices; - Archived or legacy systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;**
**- Records in any language or format, whether digital or physical, classified or unclassified.**

La (Les) direction générale(s) chargée(s) de cette demande est(sont) la(les) suivante(s), **[DGSESC, DGPS, DGSG]**.

**Au cours des 48 premières heures...**

> **Attribution des tâches inexacte ou incomplète**
> Si d'autres directions générales doivent être chargées (en plus de celles mentionnées ci-dessus) ou si votre direction générale a été chargée par erreur, veuillez répondre le plus rapidement possible.

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**Réponse aucun document pertinent**
Si vous ne disposez pas de documents pertinents à la demande, veuillez remplir le formulaire de récupération de la demande d'accès à l'information, approuvé au niveau directeur général, et inclure une explication (exemple : cette information n'est détenue qu'au niveau provincial. Notre institution ne reçoit pas de copies).

Remarque : si une autre direction générale est responsable mais votre direction générale détient toujours des documents, il ne s'agit pas d'une réponse aucun document pertinent.

**Clarification, complexité et demandes volumineuses**
Si vous souhaitez obtenir des clarifications, si vous avez besoin de plus de temps en raison d'une demande particulièrement volumineuse, ou si vous souhaitez avoir la possibilité d'aider le demandeur à réduire la portée de sa demande, veuillez répondre à cette attribution de tâche afin de fournir des informations complémentaires. Les principales étapes et considérations sont disponibles sur maSource. La date limite de récupération des documents peut être ajustée en fonction du temps nécessaire pour répondre à vos préoccupations.

**Pour compléter la récupération de documents...**

## Collecte de documents

Veuillez rechercher les documents sous le contrôle du programme (c'est-à-dire auxquels le programme a accès) et fournir les versions non modifiées en format PDF ou en format Microsoft standard. Les courriels doivent inclure toutes les pièces jointes ou tous les documents intégrés et la protection par mot de passe ou le chiffrement doivent être désactivés avant la remise des documents.
Remarque : lors de la recherche de courriels, veuillez vous assurer que la *Ligne directrice sur la recherche de courriels chiffrés en réponse à des demandes de renseignements* du Secrétariat du Conseil du Trésor est suivie.

**Recommandations du programme**
Veuillez remplir le formulaire de récupération demande d'accès à l'AI et le joindre à votre Récupération des documents. Les recommandations doivent inclure les aspects sensibles du dossier qui peuvent faire l'objet d'une exception, ainsi qu'une description détaillée des raisons pour lesquelles le dossier est sensible et des conséquences négatives de sa divulgation.

**Approbation et soumission**
Toutes les demandes de récupération de documents et les recommandations doivent être approuvées au niveau du directeur général. Les récupération de documents et les formulaires dûment remplis doivent être envoyés au service des opérations de l'AIPRP avant le **13 juin 2025**.

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De plus amples informations sont disponibles sur le site intranet de l'AIPRP, sous la rubrique Modèles et outils et Foire aux questions de l'AIPRP.

Si vous avez des questions, veuillez communiquer avec **Julien Beauchamp** à **julien.beauchamp@hc-sc.gc.ca** ou à **343-542-3278**.

Merci,
Julien

**Julien Beauchamp**
(he/il)

Team Leader, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe, Accès à l'information et protection des renseignements personnels
Direction de la Politique, planifications et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

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**From:** Beauchamp, Julien (HC/SC)
**To:** HECSB ATI / AI DGSESC (HC/SC)
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2
**Date:** 2025-06-12 6:45:00 AM

---

Merci Alexandre. Je regarde ça aujourd'hui et je vous laisse savoir dès que j'aurai des nouvelles du demandeur.

Bonne journée !

Julien

---

**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-11 10:10 AM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

I hear you.

Thank you much and we will await further instruction before continuing digging.

Have a great day!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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*Sent from the traditional unceded territory of the Algonquin Anishnaabeg People, the traditional guardians of this unceded land.*

Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Sent:** 2025-06-11 10:03 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Boy oh boy, this is a doozy.

I think we can legally put the file on hold based on the lack of a date-range itself, and in turn we can also put a pause on HECSB's tasking as well.

Leave it with Julien and me and we'll get back to you with further instruction.

You have a great day as well!

Kate

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**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-11 9:53 AM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE

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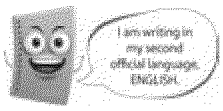
Hello Kathleen!

Thank you for the feedback, it's greatly appreciated. Find attached the file you are seeking.

Do have a great day!

Alexandre




ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

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**From:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Sent:** 2025-06-11 9:49 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

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Hi Alexandre,

Thanks for reaching out on this one. Julien is away today, so I'll respond with what I can.

I will start off by saying that I very much doubt that the requester will agree to scoping too much out (if anything) and I will go out on a limb to say that they will most certainly make a complaint to the Information Commissioner on the delay. That said, I do think that we should push for a date-range, but it may not affect the outcome unfortunately.

Also, would you mind sharing the attachment that you mention below? The one where you say that "both branches agree with the attached document and have added their own clarifications. What approach would you propose?"

Thanks
Kate

---

**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-10 1:58 PM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Hello Kathleen,

We are trying to get clarification for the program to refine the search. Deadline is June 13, and we've asked for clarification on June 5, 2025. Can this request be put on hold for now as we have no answers yet. I had shared our OPI name to Julien and Julien's name to our Analyst to try to resolve this quickly. This email is the second follow up after clarification were sought.

Could you please advise?

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Thank you!

Alexandre

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Health Canada/Governement of Canada
Tel : (343) 542-6065

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Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-09 1:02 PM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Bonjour Julien,

As-tu des éclaircissements pour cette demande?

Merci!

Alexandre

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Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

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**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-05 2:22 PM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Bonjour Julien,

Les directions consultées soulèvent des clarifications et ont des commentaires à propos de cette demande d'AI. Tu trouveras les clarifications et les précisions d'ordre Générale dans le document qui est joint.

Les deux directions sont d'accord avec le document en pièce jointes et ajoute ses précisions. Que proposes-tu comme approche?

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Les deux noms que je peux te partager si tu as des questions, considérant la complexité de cette demande, sont Boti Manuel kimbuila ainsi de Daren Kelland dans la direction de la sûreté des milieux. Cette direction est clairement plus touchée que l'autre, devenant ainsi le lead du dossier pour la DGSESC.

Hi,
SED requires some clarifications and have suggested tweaks to scope to focus retrieval on the aspects related to the GTAA that appear to be of interest to the requestor while avoiding the bulk of records inadvertently that would otherwise be scope in. It's not possible to know volume of everything in our archives and otherwise in our possession that mentions the GTAA, but we do know what even if refinements suggested we are already looking at over 20k records and still have not heard from everyone yet.

Also wanted to flag that even with the refinements suggested to focus scope, we would need an extension of at least 3 months to address such volumes. We would need significantly more time than this if the scope is not refined and stays as is (likely a year).

Please see attached and we would be happy to chat to explain further.

Regards,

ERHSD:

Hello all,

We are in support of SED's request for clarification and extension request.

>>>>>>>>>>>>>>>>>>>>>>>
CCRPB is good with the proposed clarifications that SED has provided.

Since CCRPB's records only pertain to noise exposure, we have interpreted the request as follows

> All records that mention GTAA and/or Toronto Pearson with regards to health or environmental issues. This would include all emails, enquiries, complaints, and any communications between HC and any other groups related to GTAA and/or Pearson on the topic of health or environmental issues.

CCRPB only has a role in providing expertise on health effects on noise upon the request of Transport Canada, we have limited records that fall in scope of this request.

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>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

Merci beaucoup et bonne journée!

Alexandre

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Tel : (343) 542-6065

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Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-04 9:47 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

*...le Français suit...*

Health Canada has received an access to information request for:
**Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:**

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**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

**This request applies to all records from all time periods, unless otherwise limited by law.**

**Please include: - Records held at headquarters and regional offices; - Archived or legacy**

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**systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;**
**- Records in any language or format, whether digital or physical, classified or unclassified.**

The Branch(es) tasked for this request is(are) **[HECSB, HPB, CSB]**

**In the first 48 hours...**

**Incorrect or Incomplete Tasking**
If additional branches should be tasked (aside from those noted above) or if your branch was tasked in error, please respond as soon as possible.

**Nil Responses**
If you do not have records relevant to the request please complete the ATI Retrieval Form, including Director General-level approval and include an explanation (Example: this information is only held at the provincial level. Our institution does not receive copies.)

*Note: If another branch is the lead but your branch still holds records, it is not a nil.*

**Clarification, Complexities and Voluminous Requests**
If you are seeking clarification, require more time because of a particularly voluminous request, or would like an opportunity to assist the requester in refining the scope of their request, please respond to this tasking to provide additional information. Key Steps and Considerations are available on mySource. The Record Retrieval due date may be adjusted depending on the length of time required to respond to your concerns.

**To complete the Record Retrieval...**

**Collection of Records**
Please conduct a search for records under the control of you/your program (i.e. that the program has access to) and provide copies of unaltered versions in either PDF or standard Microsoft format. Emails must include any attachments/embedded documents and password protection/encryption should be removed prior to submission.
*Note: When searching emails, please ensure the Treasury Board Secretariat Guideline on searching encrypted e-mails in response to information requests is followed.*

**Program Recommendations**
Please complete the ATI Retrieval Form and enclose it with your Record Retrieval. Recommendations should include any sensitivities within the record set that may

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qualify for exemption, and a detailed description of why it is sensitive and what the harm of release would be.

**Approval and Submission**
All record retrievals and recommendations must receive Director General-level approval. Record Retrievals and completed forms are due to ATIP Operations on **June 13, 2025**.

Further information about the ATIP process can be found on the ATIP intranet site under Responding to an ATIP Request and ATIP Frequently Asked Questions.

If you have any questions, please contact **Julien Beauchamp** at **julien.beauchamp@hc-sc.gc.ca** or at **343-542-3278**.

Regards,
Julien

---

Santé Canada a reçu une demande d'accès à l'information pour:
**Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**

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**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

**This request applies to all records from all time periods, unless otherwise limited by law.**

**Please include: - Records held at headquarters and regional offices; - Archived or legacy systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;**
**- Records in any language or format, whether digital or physical, classified or unclassified.**

La (Les) direction générale(s) chargée(s) de cette demande est(sont) la(les) suivante(s), **[DGSESC, DGPS, DGSG]**.

**Au cours des 48 premières heures...**

**Attribution des tâches inexacte ou incomplète**
Si d'autres directions générales doivent être chargées (en plus de celles mentionnées ci-dessus) ou si votre direction générale a été chargée par erreur, veuillez répondre le plus rapidement possible.

**Réponse aucun document pertinent**
Si vous ne disposez pas de documents pertinents à la demande, veuillez remplir le formulaire de récupération de la demande d'accès à l'information, approuvé au niveau

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directeur général, et inclure une explication (exemple : cette information n'est détenue qu'au niveau provincial. Notre institution ne reçoit pas de copies).

Remarque : si une autre direction générale est responsable mais votre direction générale détient toujours des documents, il ne s'agit pas d'une réponse aucun document pertinent.

**Clarification, complexité et demandes volumineuses**
Si vous souhaitez obtenir des clarifications, si vous avez besoin de plus de temps en raison d'une demande particulièrement volumineuse, ou si vous souhaitez avoir la possibilité d'aider le demandeur à réduire la portée de sa demande, veuillez répondre à cette attribution de tâche afin de fournir des informations complémentaires. Les principales étapes et considérations sont disponibles sur maSource. La date limite de récupération des documents peut être ajustée en fonction du temps nécessaire pour répondre à vos préoccupations.

**Pour compléter la récupération de documents...**

**Collecte de documents**
Veuillez rechercher les documents sous le contrôle du programme (c'est-à-dire auxquels le programme a accès) et fournir les versions non modifiées en format PDF ou en format Microsoft standard. Les courriels doivent inclure toutes les pièces jointes ou tous les documents intégrés et la protection par mot de passe ou le chiffrement doivent être désactivés avant la remise des documents.
Remarque : lors de la recherche de courriels, veuillez vous assurer que la *Ligne directrice sur la recherche de courriels chiffrés en réponse à des demandes de renseignements* du Secrétariat du Conseil du Trésor est suivie.

**Recommandations du programme**
Veuillez remplir le formulaire de récupération demande d'accès à l'AI et le joindre à votre Récupération des documents. Les recommandations doivent inclure les aspects sensibles du dossier qui peuvent faire l'objet d'une exception, ainsi qu'une description détaillée des raisons pour lesquelles le dossier est sensible et des conséquences négatives de sa divulgation.

**Approbation et soumission**
Toutes les demandes de récupération de documents et les recommandations doivent être approuvées au niveau du directeur général. Les récupération de documents et les formulaires dûment remplis doivent être envoyés au service des opérations de l'AIPRP avant le **13 juin 2025**.

De plus amples informations sont disponibles sur le site intranet de l'AIPRP, sous la rubrique Modèles et outils et Foire aux questions de l'AIPRP.

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Si vous avez des questions, veuillez communiquer avec **Julien Beauchamp** à **julien.beauchamp@hc-sc.gc.ca** ou à **343-542-3278**.

Merci,
Julien

**Julien Beauchamp**
(he/il)

Team Leader, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe, Accès à l'information et protection des renseignements personnels
Direction de la Politique, planifications et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

ATIA - 19(1)

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**From:** Fabio Ovettini
**To:** [redacted]
**Cc:** [redacted] aara.saks@parl.gc.ca; [redacted] mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him / il, lui) (HC/SC); Orencsak, Greg (he, him / il, lui) (HC/SC); pierre.poilievre@parl.gc.ca; [redacted] humberleacommunitygroup@gmail.com; [redacted] newstips@thestar.ca; [redacted] doug.fordco@pc.ola.org; [redacted] hcminister.ministresc; MHA Minister / Ministre SMD (HC/SC); [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; [redacted] piac.ward01@tdsb.on.ca; [redacted] Anita.Anand@parl.gc.ca; judy.sgro.a1@parl.gc.ca; [redacted] judy.sgro@parl.gc.ca; [redacted] Councillor_Crisanti@toronto.ca; councillor_holyday@toronto.ca; Councillor_Morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; Councillor_Malik@toronto.ca; Councillor_Saxe@toronto.ca; councillor_matlow@toronto.ca; Councillor_Moise@toronto.ca; councillor_fletcher@toronto.ca; Councillor_ChernosLin@toronto.ca; Councillor_Burnside@toronto.ca; councillor_carroll@toronto.ca; Councillor_Cheng@toronto.ca; councillor_bradford@toronto.ca; Councillor_Kandavel@toronto.ca; councillor_thompson@toronto.ca; Councillor_Mantas@toronto.ca; Councillor_Myers@toronto.ca; councillor_mckelvie@toronto.ca; [redacted] councillor_ainslie@toronto.ca; [redacted] jagmeet.singh@parl.gc.ca; [redacted] Councillor Perruzza; Tom Rakocevic; [redacted] ZZG-Community Engagement; [redacted] Francesco Sorbara; [redacted] amy.calderan.521@parl.gc.ca; w5@ctv.ca; [redacted] mayor_chow@toronto.ca; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; [redacted] albert.meneses.521@parl.gc.ca; [redacted]
**Subject:** Critical Malfunction of Pearson's Portal
**Date:** 2025-03-05 1:04:46 PM

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**Warning:** This message is from an EXTERNAL SENDER - be CAUTIOUS, particularly with links and attachments.
**Attention:** Ce message provient d'un EXPÉDITEUR EXTERNE - soyez PRUDENT, en particulier avec les liens et les pièces jointes.

[redacted]

I am reaching out to bring to your immediate attention a critical malfunction in Pearson's portal. For the past few days, the page that displays quarterly reports has been down, which is causing significant disruption.

I would also like to remind you that corruption and incompetence are not merely administrative failures—they have real consequences. Attempting to cover up such issues only perpetuates further corruption and incompetence, leading to systemic failure. I urge you to take immediate action to resolve this issue before the situation escalates further.

Please check the attached screenshots displaying the issue below.

Please confirm receipt of this email and provide an update on when we can expect the issue to be resolved.

Sincerely,
Fabio Ovettini

404 ERROR

The page you are looking for was moved, removed, renamed or might never existed.

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# 404 ERROR

The page you are looking for was moved, removed, renamed or might never existed.

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**From:** HECSB ATI / AI DGSESC (HC/SC)
**To:** Beauchamp, Julien (HC/SC)
**Cc:** Meraw, Keilee (HC/SC); Olivas-Bosquet, Helena (HC/SC); Houde, Alexandre (HC/SC) (he, him | il, lui); Lepine, Leigh Anne (HC/SC); HECSB ATI / AI DGSESC (HC/SC)
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2
**Date:** 2025-07-10 3:10:42 PM

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Unclassified / Non classifié

Hello Julien,

HECSB has uploaded the responsive records in the proper folder of the Y drive.

ERHSD has one folder they are not sure if there aren't any duplicates.

The folder is 928MB. Using an approximate 2KB per page, it's equivalent of 464 000 pages. (there are .pdf, .docs and .xls) in the total count.

Have a great day!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

*Sent from the traditional unceded territory of the Algonquin Anishnaabeg People, the traditional guardians of this unceded land.*

Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

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**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-07-07 10:19 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Alexandre,

The best we could do on this one would be July 10$^{tt}$ . Our legislative is on July 11$^{th}$, so we need to provide a response to the requester by then. If you are able to provide a copy of the records by the 10$^{th}$ , we can take a legal extension and grant you a couple more days to work on recommendations (that's one option...). But if we don't have records by then, we can't legally take an extension.

Julien

---

**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-07-07 8:35 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2
**Importance:** High

Unclassified / Non classifié

Bonjour Julien!

Est-ce possible d'avoir confirmation que l'extension est approuvée jusqu'au 11 juillet pour cette demande? Pour l'instant la date butoir est pour aujourd'hui.

Merci!

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Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-07-04 11:21 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>; Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Bonjour Julien,

HECSB estime pouvoir compléter la requête de récupération pour le 11 juillet, 2025.

Compte tenu du volume élevé de documents à récupérer (environ 4,000 pages), est-ce qu'une prolongation de la date butoir jusqu'à cette date est possible,?

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Merci beaucoup et bonne journée!

Alexandre

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Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-07-03 7:36 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Good morning,

Apologies for not responding earlier. We currently have a due date for the tasking of July 7, 2025. Does the program have an idea of how long they expect it could take to retrieve the records ?

Thanks,
Julien

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**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-07-02 10:31 AM

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Hello Julien,

Based on the estimate of 4,000 pages, could ATIO look at extensions on the request and/or on the retrieval tasking, as discussed on the June 24, 2025, email below?

Thank you much!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-26 10:05 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>

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**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut !

Thanks for the update. It is absolutely ok to place all the documents requiring a section 19 exemption into one folder. We do not require OPIs to identify the personal information in the records, as we have the expertise to identity and redact on our side.

Let me know if we can help with anything else,
Thanks!
Julien

---

**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-06-26 9:51 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Julien!

HECSB estimates this request count of pages to about 4,000 pages.

Also, here are some recommendations from one of our OPI:

Also, now that the scope has been narrowed, I wanted to enquire again about redactions. Majority of records searched and retrieved are all MECS documents and should be redacted under Exemption #19 (personal information). We would like to request placing these records in a folder for a **blanket** redaction review of Exemption #19, due to time and volume. **Is this feasible? I think this is doable, no? Please confirm.**

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Upon review of MECS this afternoon, the following **additional** MECS were located. These were not tasked down to ERHSD DGO/CCRPB. **Recommendation that DMO lead the review of these redactions for inclusion.**

Trail ended with ADMO. 24-003901-409 (Ministerial correspondence)
Trail ended with DMO 24-005794-374 (Ministerial correspondence) This is redacted and should be included.
Trail ended with DMO 25-075323-185 (DM correspondence)
Trail ended with DMO 25-075201-431 (DM correspondence)

(Previously flagged by SED that ERHSD reviewed) **Recommendation that DMO lead the review of these redactions for inclusion.**
25-075254 – 514 - **Instructions to file an airplane noise compliant with Pearson Airport
25-075135 – 792 - **Concerns regarding the Greater Toronto Airports Authority
24-075509 – 961 - **Addressed to MoH, MHA, DM + AsDM / Urgent Call for Action on Noise Pollution and Health Impacts in Communities around Pearson Airport.

Thank you

Please, advise on next steps and if an extension can be provided.

Merci beaucoup et bonne journée Julien!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

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**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-06-24 11:34 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; Meraw, Keilee (HC/SC) <keilee.meraw@hc-sc.gc.ca>; Lepine, Leigh Anne (HC/SC) <leigh.anne.lepine@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Merci Julien!

Je te reviens avec un compte estimé de pages.

Bonne journée!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

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Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

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**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-24 11:32 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC)

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(he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Alexandre,

Please see my answers in red below. Hopefully this helps guide the retrieval and we are able to have a better picture of what the retrieval looks like. Once we know what the approx.. page count looks like, we can look at extensions on the request and/or on the retrieval tasking.

Thanks !
Julien

---

**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-06-23 10:03 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Bonjour Julien,

Je viens de recevoir les demandes d'éclaircissements de la part de notre direction en charge de la récupération.

J'ai de la difficulté à leur faire comprendre qu'il n'y a pas, pour l'instant, de base solide pour une extension en vertu de la loi.

Merci!

Below are some points for which the programs are requesting clarifications before proceeding with the retrieval process. Kindly note that they are awaiting these clarifications from the analyst as soon as possible. As a result, a change in the deadline may be requested:

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**a.** It was assumed that travel documents referencing Toronto Pearson International Airport are not within scope, as SED interprets these as not aligning with the spirit or intent of the request (i.e., seeking information on the potential environmental and health impacts of the airport). Could you please confirm this assumption? I can confirm this assumption – focus of the records should be on the following:

- Air pollution related to operations at Toronto Pearson International Airport or the Greater Toronto Airports Authority (GTAA);
- Aircraft noise, vibration, and their impact on public health;
- Community health risks associated with aviation-related pollutants (e.g., ultrafine particles, NOx, $SO_2$, PM2.5, etc.);
- Issues involving noise exposure thresholds, including effects on sleep and mental health;
- Any discussion or analysis of the GTAA Night Flight Budget, including night operations between 10:00 p.m. and 7:00 a.m.

**b.** SED flags a potential need to engage MAMD, should the following types of records be deemed in scope. In response to the Request for Standing Offer Process (Provision of Scientific Expertise to Support Human Health Risk Assessment conducted by SED starting on December 5, 2023), several proposals submitted by companies included references to Toronto Pearson International Airport. If these proposals are considered in scope and MAMD is the original recipient, could you kindly confirm whether MAMD will handle the retrieval and whether SED should not include these records to avoid duplication in the consolidated retrieval package? Based on the above focus of the retrieval above, I don't believe these records fall within the scope of what the requester is looking for.

**c.** To assist in refining the portion of the request text quoted below (bullet 1), could the requester confirm if they are only interested in records related to air pollution, noise pollution, and/or human health? As written, the request would result in retrieving many travel-related records that mention Toronto Pearson International Airport. If these records are in scope, could you kindly confirm if the revised instruction below is to be followed:
*"Records include final versions and/or latest versions available. Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health."*
Should this instruction guide the retrieval efforts at the DG level and above (depending on the final level of approval)?

> **1.** All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:
> – Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;

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– Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations.

Yes, retrieval efforts should be done at DG level and above. Focus should be on subjects mentioned above.

**d.** Based on the amended scope previously shared, SED had hoped there would be confirmation of a focus on:
*"records that mention topics of particular interest to the requester, notably air pollution, noise, public health impacts, and risks for communities in proximity to aviation pollutants, etc."*
This approach would exclude travel documents, procurement records, and notifications where the airport is simply listed as the point of entry.
Could you confirm this understanding? I can confirm this understanding.

Kind regards,

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

*Sent from the traditional unceded territory of the Algonquin Anishnaabeg People, the traditional guardians of this unceded land.*

Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-23 7:31 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>

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**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Alexandre,

Thanks for the additional information and recommendations to task DMO and MBU. Unfortunately, at this point we cannot legally place the request on hold. The request text has all the elements for it to be a valid ATI request (it has a date scope, clear record types and subject matter). We were under the impression that following the last clarification, the request was clear enough to proceed (though still quite voluminous...). We can certainly still go back to the requester with additional questions, but from what I can tell, the requester will probably wish not to reduce the scope of the request any more.

I will wait for the addition clarification questions and we can go from there ?

Thanks again,

**Julien Beauchamp**
(he/il)

ATIP Team Leader, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe de l'AIPRP, Accès à l'information et protection des renseignements personnels
Direction de la Politique, planifications et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

---

**From:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Sent:** 2025-06-20 1:48 PM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Julien,

D'autres questions sont à prévoir et nous recommandons que MBU et DMO soit aussi inclus dans la récupération:

Our programs are reaching out with several additional clarification questions related to this amended request. We are currently compiling these questions and refinement requests and plan to send them to you next week.
Would it be possible to pause this retrieval request again until these clarification and refinement matters are resolved? Currently, the bureaus are unable to proceed with the retrieval work prior to receiving the responses to their questions. SED is recommending that MBU and DMO also be tasked for this file, given that the scope includes "communications to or from the Office of the Minister of Health

Kind regards,

Bonne journée!

Alexandre

ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

*Sent from the traditional unceded territory of the Algonquin Anishnaabeg People, the traditional guardians of this unceded land.*

Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

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*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-20 8:21 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Salut Alexandre,

Given the complexity and volume on this one, I can provide an extension up until July 7th, 2025. I will make the change in our system.

Bonne journee!
Julien

---

**From:** Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca> **On Behalf Of** HECSB ATI / AI DGSESC (HC/SC)
**Sent:** 2025-06-20 8:17 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>; HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** RE: ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

Hello Julien,

Is it possible to have until July 3 to complete the tasking?

Thank you much!

Alexandre

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ATIP Single Window Branch Coordinator Back-up / Healthy Environments and Consumer Safety Branch (HECSB)
Health Canada/Governement of Canada
Tel : (343) 542-6065

*Sent from the traditional unceded territory of the Algonquin Anishnaabeg People, the traditional guardians of this unceded land.*

Coordonnateur suppléant du guichet unique de l'AIPRP/Direction générale de la santé environnementale et de la sécurité des consommateurs (DGSESC)
Santé Canada/Gouvernement du Canada
Tél : (343)542-6065

*En provenance du territoire traditionnel non cédé du peuple algonquin Anishnaabeg, les gardiens traditionnels de cette terre non cédée.*

---

**From:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Sent:** 2025-06-20 7:50 AM
**To:** HECSB ATI / AI DGSESC (HC/SC) <hecsb.ati-ai.dgsesc@hc-sc.gc.ca>
**Cc:** Olivas-Bosquet, Helena (HC/SC) <helena.olivas-bosquet@hc-sc.gc.ca>; Houde, Alexandre (HC/SC) (he, him | il, lui) <alexandre.houde@hc-sc.gc.ca>
**Subject:** ATIP RECORD RETRIEVAL FOR A-2025-000298 / JB2 / RÉCUPÉRATION DE LA DEMANDE POUR L'AIPRP : A-2025-000298 / JB2

Unclassified / Non classifié

*...le Français suit...*

Health Canada has received an access to information request for:
**Pursuant to the Access to Information Act, I am requesting access to any and all records (from January 1, 1990 to June 3, 2025) held by Health Canada, that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport. Records include final versions and/or latest version available. Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant**

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**messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization - including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities - that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

The Branch(es) tasked for this request is(are) **[HECSB, CSB (For portion 5 of the request)]**

**In the first 48 hours...**

**Incorrect or Incomplete Tasking**

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If additional branches should be tasked (aside from those noted above) or if your branch was tasked in error, please respond as soon as possible.

**Nil Responses**

If you do not have records relevant to the request please complete the ATI Retrieval Form, including Director General-level approval and include an explanation (Example: this information is only held at the provincial level. Our institution does not receive copies.)

*Note: If another branch is the lead but your branch still holds records, it is not a nil.*

**Clarification, Complexities and Voluminous Requests**

If you are seeking clarification, require more time because of a particularly voluminous request, or would like an opportunity to assist the requester in refining the scope of their request, please respond to this tasking to provide additional information. Key Steps and Considerations are available on mySource. The Record Retrieval due date may be adjusted depending on the length of time required to respond to your concerns.

**To complete the Record Retrieval...**

**Collection of Records**

Please conduct a search for records under the control of you/your program (i.e. that the program has access to) and provide copies of unaltered versions in either PDF or standard Microsoft format. Emails must include any attachments/embedded documents and password protection/encryption should be removed prior to submission.

*Note: When searching emails, please ensure the Treasury Board Secretariat Guideline on searching encrypted e-mails in response to information requests is followed.*

**Program Recommendations**

Please complete the ATI Retrieval Form and enclose it with your Record Retrieval. Recommendations should include any sensitivities within the record set that may qualify for exemption, and a detailed description of why it is sensitive and what the harm of release would be.

**Approval and Submission**

All record retrievals and recommendations must receive Director General-level approval. Record Retrievals and completed forms are due to ATIP Operations on **July 02, 2025**.

Further information about the ATIP process can be found on the ATIP intranet site under Responding to an ATIP Request and ATIP Frequently Asked Questions.

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If you have any questions, please contact **Julien Beauchamp** at julien.beauchamp@hc-sc.gc.ca or at **343-542-3278**.

Regards,
Julien

---

Santé Canada a reçu une demande d'accès à l'information pour:
**Pursuant to the Access to Information Act, I am requesting access to any and all records (from January 1, 1990 to June 3, 2025) held by Health Canada, that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport. Records include final versions and/or latest version available. Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**
**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**
**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**
**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**
**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**
**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**
**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

**3. All records of inquiries, complaints, or submissions from any individual or organization - including but not limited to:**
**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities - that relate to GTAA, Pearson Airport, or aircraft noise and its**

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**impact;**
**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**
**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**
**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

La (Les) direction générale(s) chargée(s) de cette demande est(sont) la(les) suivante(s), **[DGSESC]**.

**Au cours des 48 premières heures...**

**Attribution des tâches inexacte ou incomplète**
Si d'autres directions générales doivent être chargées (en plus de celles mentionnées ci-dessus) ou si votre direction générale a été chargée par erreur, veuillez répondre le plus rapidement possible.

**Réponse aucun document pertinent**
Si vous ne disposez pas de documents pertinents à la demande, veuillez remplir le formulaire de récupération de la demande d'accès à l'information, approuvé au niveau directeur général, et inclure une explication (exemple : cette information n'est détenue qu'au niveau provincial. Notre institution ne reçoit pas de copies).

Remarque : si une autre direction générale est responsable mais votre direction générale détient toujours des documents, il ne s'agit pas d'une réponse aucun document pertinent.

**Clarification, complexité et demandes volumineuses**
Si vous souhaitez obtenir des clarifications, si vous avez besoin de plus de temps en raison d'une demande particulièrement volumineuse, ou si vous souhaitez avoir la possibilité d'aider le demandeur à réduire la portée de sa demande, veuillez répondre à cette attribution de tâche afin de fournir des informations complémentaires. Les principales étapes et considérations sont disponibles sur maSource. La date limite de récupération des documents peut être ajustée en fonction du temps nécessaire pour répondre à vos préoccupations.

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**Pour compléter la récupération de documents...**

### Collecte de documents

Veuillez rechercher les documents sous le contrôle du programme (c'est-à-dire auxquels le programme a accès) et fournir les versions non modifiées en format PDF ou en format Microsoft standard. Les courriels doivent inclure toutes les pièces jointes ou tous les documents intégrés et la protection par mot de passe ou le chiffrement doivent être désactivés avant la remise des documents.
Remarque : lors de la recherche de courriels, veuillez vous assurer que la *Ligne directrice sur la recherche de courriels chiffrés en réponse à des demandes de renseignements* du Secrétariat du Conseil du Trésor est suivie.

**Recommandations du programme**

Veuillez remplir le formulaire de récupération demande d'accès à l'AI et le joindre à votre Récupération des documents. Les recommandations doivent inclure les aspects sensibles du dossier qui peuvent faire l'objet d'une exception, ainsi qu'une description détaillée des raisons pour lesquelles le dossier est sensible et des conséquences négatives de sa divulgation.

**Approbation et soumission**

Toutes les demandes de récupération de documents et les recommandations doivent être approuvées au niveau du directeur général. Les récupération de documents et les formulaires dûment remplis doivent être envoyés au service des opérations de l'AIPRP avant le **2 juillet 2025**.

De plus amples informations sont disponibles sur le site intranet de l'AIPRP, sous la rubrique Modèles et outils et Foire aux questions de l'AIPRP.

Si vous avez des questions, veuillez communiquer avec **Julien Beauchamp** à **julien.beauchamp@hc-sc.gc.ca** ou à **343-542-3278**.

Merci,
Julien

**Julien Beauchamp**
(he/il)

ATIP Team Leader, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

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Chef d'équipe de l'AIPRP, Accès à l'information et protection des renseignements personnels
Direction de la Politique, planifications et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

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**From:** Bradley, Kevin (HC/SC) on behalf of atip / aiprp (HC/SC)
**To:** Fabio Ovettini; atip / aiprp (HC/SC)
**Subject:** RE: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver
**Date:** 2025-06-03 1:16:00 PM

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Hello Fabio,

This is to inform you that your request has been assigned for processing. For your reference the file number is A-2025-000298. The analyst responsible may reach out if any clarification is required.

Thank you / Merci,

Kevin Bradley (He / Him / Il)

Sr Project Officer

Access to Information and Privacy Services Directorate

Corporate Services Branch

Health Canada and Public Health Agency of Canada

Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371

Agent principal de projet

Direction des services d'accès à l'information et de la protection des renseignements personnels

Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada

Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

**From:** Fabio Ovettini
**Sent:** 2025-06-03 10:55 AM
**To:** atip / aiprp (HC/SC)
**Subject:** Re: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

Morning,
Attached you will find the original request.
Sincerely,
Fabio Ovettini

On Tuesday, June 3, 2025 at 10:45:30 a.m. EDT, atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca> wrote:

Unclassified / Non classifié

Good morning Fabio,

Our apologies, however, we are unable to locate any record of your original request within our system or generic inbox. There is a possibility that our Security email system prevented us from receiving your email on May 21, 2025, as it shows below. Could you kindly attach the original email so that we may attempt to resolve any issues that may have blocked your email.

We will accept the $5.00 application fees to be waived and open your request this morning and assign for processing.

If you have any other questions, please do not hesitate to ask.

Thank you / Merci,

Kevin Bradley (He / Him / Il)

Sr Project Officer

Access to Information and Privacy Services Directorate

Corporate Services Branch

Health Canada and Public Health Agency of Canada

Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371

Agent principal de projet

Direction des services d'accès à l'information et de la protection des renseignements personnels

Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada

Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

---

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-06-03 10:14 AM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>; hcminister.ministresc <hcminister.ministresc@hc-sc.gc.ca>; MHA Minister / Ministre SMD (HC/SC) <mhaminister.ministresmd@hc-sc.gc.ca>; Prime Minister | Premier Ministre <pm@pm.gc.ca>
**Subject:** Re: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Follow-up on Access to Information Request Submitted

Dear Access to Information and Privacy Coordinator,

I am writing to follow up on an Access to Information request I submitted to your office regarding records held by Health Canada that relate to the Greater Toronto Airports Authority (GTAA) and Toronto Pearson International Airport.

The original request was sent on Wednesday, May 21, 2025 at 08:36:31 p.m. EDT, and to date, I have not received an acknowledgement or response. I would appreciate confirmation that the request was received and is being processed. If any additional information or clarification is required on my part, please do not hesitate to contact me at fabio217@yahoo.com.

Given the public health significance of the subject matter, I kindly ask that this request be treated with priority, and I reiterate my request for a waiver of fees under section 11(6) of the Access to Information Act, in the public interest.

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

Thank you for your attention to this matter. I look forward to your reply.

Sincerely,
**Fabio Ovettini**
34 Jodphur Avenue
Toronto, Ontario M9M 2J4
fabio217@yahoo.com

On Wednesday, May 21, 2025 at 08:36:31 p.m. EDT, Fabio Ovettini <fabio217@yahoo.com> wrote:

Access to Information Request

**To:**
Access to Information and Privacy Coordinator
Health Canada
Holland Cross - Tower B
1600 Scott Street, 7th Floor, Suite 700
Postal Locator: 3107A
Ottawa, Ontario K1A 0K9
E-mail: atip-aiprp@hc-sc.gc.ca
Telephone: 613-954-9165

**From:**
Fabio Ovettini
34 Jodphur Avenue,
Toronto, Ontario M9M 2J4
E-mail: fabio217@yahoo.com

Dear Access to Information and Privacy Coordinator,

I am submitting this request under the Access to Information Act.

Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:

1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:

- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;

- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;

- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.

2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:

- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;

- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;

- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.

3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:

- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;

- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.

4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:

- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;

- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.

5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.

This request applies to all records from all time periods, unless otherwise limited by law.

Please include:
- Records held at headquarters and regional offices;
- Archived or legacy systems;
- Databases, emails, notes, drafts, attachments, audio recordings, and presentations;
- Records in any language or format, whether digital or physical, classified or unclassified.

Request for Fee Waiver:

I respectfully request a waiver of any applicable fees, including the $5 application fee, under section 11(6) of the Access to Information Act. The subject matter of this request pertains to public health, environmental exposure, and government accountability, and disclosure is clearly in the public interest. The information sought will help inform affected communities and advance public understanding of aviation-related health risks.

Please contact me at fabio217@yahoo.com should clarification be required. I am happy to work with your office to narrow or prioritize portions of the request for efficient processing.

Sincerely,

Fabio Ovettini

34 Jodphur Avenue,

Toronto, Ontario M9M 2J4

E-mail: fabio217@yahoo.com

ATIA - 19(1)

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**From:** Fabio Ovettini
**To:** ministre-minister@ec.gc.ca; judy.sgro@parl.gc.ca; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc; hcminister.ministresc@canada.ca; pm@pm.gc.ca
**Cc:** [redacted], communityengagement@gtaa.com; councillor_perruzza@toronto.ca; petitions@oag-bvg.gc.ca; [redacted], info.com@chrc-ccdp.gc.ca; hcinfo.infosc@canada.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; mayor_chow@toronto.ca; [redacted] trakocevic-co@ndp.on.ca; doug.fordco@pc.ola.org; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_ainslie@toronto.ca; [redacted] humberleacommunitygroup@gmail.com; [redacted] w5@cty.ca; [redacted] judy.sgro.a1@parl.gc.ca; [redacted]
**Subject:** Environmental Oversight Responsibilities Under Pearson Airport Ground Lease
**Date:** 2025-08-11 7:45:25 AM

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**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

Subject: Environmental Oversight Responsibilities Under Pearson Airport Ground Lease

Honourable Julie Dabrusin
Minister of Environment and Climate Change

Dear Minister Dabrusin,

I am following up on correspondence I received on March 13, 2025, from your department (ref. MIN 321607), in which Lisa St-Amour, Manager of the Departmental Correspondence Unit, stated that my concerns about Greater Toronto Airports Authority (GTAA) operations "fall under the purview of Transport Canada."

Respectfully, that response is incomplete and does not reflect the obligations that exist under the Pearson Airport Ground Lease and Canadian law.

The Ground Lease between Transport Canada and the GTAA explicitly requires the tenant to comply with all "Applicable Environmental Law," and defines that term to include all relevant federal and provincial environmental laws, not just those in aviation legislation. This obligation is not a formality — it is a binding contractual term that is enforceable by the Government of Canada.

Furthermore, nothing in the lease exempts the GTAA from direct enforcement of federal environmental statutes, including the Canadian Environmental Protection Act, the Fisheries Act, and other legislation under your department's authority. These laws apply to all federal lands and undertakings, regardless of who holds the lease.

In plain terms:

Transport Canada enforces lease compliance as landlord;

Environment and Climate Change Canada enforces environmental laws as regulator;

Both ministries have responsibilities that are concurrent, not exclusive.

To suggest otherwise leaves a gap in enforcement and accountability — one that the GTAA has repeatedly exploited.

I am therefore asking you, as the current Minister of Environment and Climate Change, to confirm:

That your department acknowledges its authority to investigate and enforce compliance with environmental laws on federal lands operated by the GTAA;

What enforcement, inspection, or compliance actions your department has taken at Pearson Airport in the past five years;

Whether your office will commit to participating actively in the environmental oversight functions mandated under the Ground Lease.

The communities surrounding Pearson live with the environmental consequences of GTAA operations every day. They deserve more than a jurisdictional hand-off — they deserve a government that enforces the law.

I look forward to your direct response.

Sincerely,
Fabio Ovettini
Toronto, Ontario
Annex A – Environmental Compliance Obligations under Pearson Airport Ground Lease

Source: Ground Lease between Her Majesty the Queen in Right of Canada (as represented by the Minister of Transport) and the Greater Toronto Airports Authority (GTAA), executed December 2, 1996.
37.01 – Environmental Baseline Study Report

The Tenant shall not allow any Hazardous Substance to be present on the Premises except in compliance with Applicable Environmental Law.

37.02 – Definitions

"Applicable Environmental Law" means:

"Any law, regulation, ordinance, rule, order, code, permit, guideline or policy of any federal, provincial or municipal governmental authority now or hereafter in force relating in any way to the environment, environmental protection, contamination, pollution, health, safety, hazardous substances, waste disposal or the use, handling, treatment, removal, storage, transportation or disposal of hazardous substances."

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37.08 – Compliance with Laws

“The Tenant shall at all times and in all respects comply with Applicable Environmental Law and Applicable Airport Law relating to the Premises, the Airport, or the Tenant’s operations.”

Implications

GTAA is bound to comply with all federal and provincial environmental laws, not just aviation-specific regulations.

Enforcement of these laws falls within the jurisdiction of Environment and Climate Change Canada (ECCC) where federal statutes are concerned, regardless of Transport Canada’s role as landlord.

This creates concurrent responsibility:

Transport Canada – enforces compliance as part of the lease terms.

ECCC – enforces environmental statutes directly.

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**From:** Bradley, Kevin (HC/SC)
**To:** "Fabio Ovettini"
**Cc:** atip / aiprp (HC/SC)
**Subject:** RE: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver
**Date:** 2025-11-25 1:11:00 PM

---

Hello Fabio,

Thank you for your email below. For your reference the file number is A-2025-000298 and your email has been forwarded to the analyst responsible to provide a status update as requested.

Thank you / Merci,

Kevin Bradley

Senior ATIP Officer
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Kevin.bradley@hc-sc.gc.ca / Tel: 343-993-2619

Agent principal de l'AIPRP
Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-993-2619

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-11-25 1:00 PM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>; Bradley, Kevin (HC/SC) <kevin.bradley@hc-sc.gc.ca>
**Subject:** Re: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Status Update Request – Access to Information Request re GTAA / Toronto Pearson International Airport

Dear Mr. Bradley and Access to Information and Privacy Services,

I am writing to request a status update on my Access to Information request regarding records held by Health Canada that relate to the Greater Toronto Airports Authority (GTAA) and Toronto Pearson International Airport.

On June 3, 2025, your office advised that my original request (initially submitted on May 21, 2025) would be opened for processing and that the $5.00 application fee would be waived. As requested, I re-attached and re-sent the full text of my original request that same morning (see email chain below).

To date, I have not received an acknowledgement letter, file number, notice of any time extension under section 9 of the Access to Information Act, or any responsive records.

Could you please:

- Confirm that my request has been formally registered and provide the assigned file number;
- Indicate the date on which the statutory time limit began;
- Advise whether any extension has been taken under section 9 of the Act, and if so, its duration and rationale; and
- Provide an update on the current stage of processing and an expected timeframe for release of records.

Given the public health importance of the subject matter, I would be grateful for any steps your office can take to expedite this file.

Thank you for your attention. I look forward to your response.

Sincerely,
Fabio Ovettini
34 Jodphur Avenue
Toronto, Ontario M9M 2J4
fabio217@yahoo.com

On Tuesday, June 3, 2025 at 10:55:05 a.m. EDT, Fabio Ovettini <fabio217@yahoo.com> wrote:

Morning,

Attached you will find the original request.

Sincerely,
Fabio Ovettini

On Tuesday, June 3, 2025 at 10:45:30 a.m. EDT, atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca> wrote:

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

Good morning Fabio,

Our apologies, however, we are unable to locate any record of your original request within our system or generic inbox. There is a possibility that our Security email system prevented us from receiving your email on May 21, 2025, as it shows below. Could you kindly attach the original email so that we may attempt to resolve any issues that may have blocked your email.

We will accept the $5.00 application fees to be waived and open your request this morning and assign for processing.

If you have any other questions, please do not hesitate to ask.

Thank you / Merci,

Kevin Bradley (He / Him / Il)

Sr Project Officer

Access to Information and Privacy Services Directorate

Corporate Services Branch

Health Canada and Public Health Agency of Canada

Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371

Agent principal de projet

Direction des services d'accès à l'information et de la protection des renseignements personnels

Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada

Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

---

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-06-03 10:14 AM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>; hcminister.ministresc <hcminister.ministresc@hc-sc.gc.ca>; MHA Minister / Ministre SMD (HC/SC) <mhaminister.ministresmd@hc-sc.gc.ca>; Prime Minister | Premier Ministre <pm@pm.gc.ca>
**Subject:** Re: Access to Information Request – All Records Related to Greater Toronto Airports Authority (GTAA) / Toronto Pearson International Airport – Request for Fee Waiver

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
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**Subject:** Follow-up on Access to Information Request Submitted

Dear Access to Information and Privacy Coordinator,

I am writing to follow up on an Access to Information request I submitted to your office regarding records held by Health Canada that relate to the Greater Toronto Airports Authority (GTAA) and Toronto Pearson International Airport.

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Given the public health significance of the subject matter, I kindly ask that this request be treated with priority, and I reiterate my request for a waiver of fees under section 11(6) of the Access to Information Act, in the public interest.

Thank you for your attention to this matter. I look forward to your reply.

Sincerely,
**Fabio Ovettini**
34 Jodphur Avenue
Toronto, Ontario M9M 2J4
fabio217@yahoo.com

On Wednesday, May 21, 2025 at 08:36:31 p.m. EDT, Fabio Ovettini <fabio217@yahoo.com> wrote:

Access to Information Request

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**To:**
Access to Information and Privacy Coordinator
Health Canada
Holland Cross - Tower B
1600 Scott Street, 7th Floor, Suite 700
Postal Locator: 3107A
Ottawa, Ontario K1A 0K9
E-mail: atip-aiprp@hc-sc.gc.ca
Telephone: 613-954-9165

**From:**
Fabio Ovettini
34 Jodphur Avenue,
Toronto, Ontario M9M 2J4
E-mail: fabio217@yahoo.com

Dear Access to Information and Privacy Coordinator,

I am submitting this request under the Access to Information Act.

Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:

1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:

- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;

- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;

- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.

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- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;

- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.

3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:

- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;

- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.

4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:

- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;

- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.

5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.

This request applies to all records from all time periods, unless otherwise limited by law.

Please include:
- Records held at headquarters and regional offices;
- Archived or legacy systems;
- Databases, emails, notes, drafts, attachments, audio recordings, and presentations;
- Records in any language or format, whether digital or physical, classified or unclassified.

Request for Fee Waiver:

I respectfully request a waiver of any applicable fees, including the $5 application fee, under section 11(6) of the Access to Information Act. The subject matter of this request pertains to public health, environmental exposure, and government accountability, and disclosure is clearly in the public interest. The information sought will help inform affected communities and advance public understanding of aviation-related health risks.

Please contact me at fabio217@yahoo.com should clarification be required. I am happy to work with your office to narrow or prioritize portions of the request for efficient processing.

Sincerely,

Fabio Ovettini

34 Jodphur Avenue,

Toronto, Ontario M9M 2J4

E-mail: fabio217@yahoo.com

ATIA - 19(1)

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**From:** Fabio Ovettini
**To:** Minister of Transport / Ministre des Transports (TC); Prime Minister | Premier Ministre
**Cc:** [redacted] mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); Jagmeet - M.P.; Francesco Sorbara; [redacted] humberleacommunitygroup@gmail.com; [redacted] Mayor Chow; Councillor Perruzza; [redacted] Tom Rakocevic; [redacted] W5 Viewer Mail; [redacted] doug.fordco@pc.ola.org [redacted] hcminister.ministresc; [redacted] piac.ward04@tdsb.on.ca; [redacted] ; office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] judy.sgro.a1@parl.gc.ca; [redacted] judy.sgro@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_mckelvie@toronto.ca; [redacted] councillor_ainslie@toronto.ca; [redacted]
**Subject:** Escalation: Alleged Document Tampering and Data Manipulation by GTAA Requires Federal Oversight and Possible Criminal Investigation
**Date:** 2025-06-10 6:15:10 PM

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**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Escalation: Alleged Document Tampering and Data Manipulation by GTAA Requires Federal Oversight and Possible Criminal Investigation

Dear Minister Freeland,

I am writing to follow up on a formal complaint I submitted to Transport Canada regarding serious allegations of data manipulation and internal misconduct at the Greater Toronto Airports Authority (GTAA), which operates Toronto Pearson International Airport under a lease with the federal government.

This matter involves credible evidence that GTAA has tampered with operational and noise-related public records — including the **alteration of reports and identifying numbers overnight** — potentially to misrepresent airport impacts. These actions may violate multiple provisions of the **Criminal Code of Canada**, including sections related to **forgery (s.366), fraud (s.380), obstruction of justice (s.139), and fabricating evidence (s.137)**. Given that these documents may be used in regulatory processes or federal reporting, such tampering is not only unethical but may constitute a **criminal offence**.

Additionally, the sudden departures of Robyn Connelly (former Director of Sustainability + Social Impact) and a manager known as Cynthia Woods, Manager Noise Management Office from the complaints department appear connected to these internal irregularities. These leadership changes raise concerns about possible retaliation or cover-up within the organization.

Because GTAA functions under a federally delegated authority, Transport Canada **has a legal and ethical duty to investigate**. However, if these allegations are substantiated, then Transport Canada should also:

- Refer the matter to the **RCMP or federal prosecutors** for criminal investigation;
- Consider **civil proceedings** if the government or public interest has suffered damages;
- Demand a **third-party forensic audit** of the relevant data systems and records;
- Examine whether GTAA remains in compliance with the terms of its federal lease.

I am escalating this matter to your office because of its broader implications for **federal oversight, public trust, and the integrity of national infrastructure governance**. If private airport authorities under federal jurisdiction are allowed to falsify data without consequence, it undermines Canada's regulatory credibility and the rights of the communities affected by their operations.

We have documentation that supports these claims and are prepared to share it with your office or any independent investigator you authorize.

I urge you to take this matter seriously and to consider advocating for an immediate and transparent federal response.

Sincerely,

Fabio Ovettini

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

**From:** Bradley, Kevin (HC/SC) on behalf of atip / aiprp (HC/SC)
**To:** Hogan, Erin (HC/SC)
**Cc:** atip / aiprp (HC/SC)
**Subject:** RE: For Import: A-2025-000298
**Date:** 2025-08-28 11:20:55 AM

Unclassified / Non classifié

To close the loop,
The import is now complete except for the 1 Excel file mentioned below. For some reason LF will not import the document properly and my assumption is because of the page count when converted to PDF which is currently at 15,628 pages.
The total number of imported pages as it stands in the Working copy folder is 17,449 pages.
If you have any questions please let me know.
Thank you / Merci,
Kevin Bradley
Senior ATIP Officer
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371
Agent principal de l'AIPRP
Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

---

**From:** Bradley, Kevin (HC/SC) **On Behalf Of** atip / aiprp (HC/SC)
**Sent:** 2025-08-28 10:19 AM
**To:** Hogan, Erin (HC/SC)
**Cc:** atip / aiprp (HC/SC)
**Subject:** RE: For Import: A-2025-000298

Unclassified / Non classifié

Morning Erin,
Despite my efforts the file is not importing into LF. I am trying one last time.
For your reference since the Excel document is too large to attach to email.
File path: \\Ncr-1\vol5\IRBV2\ATIP SHARE\HC\HECSB\A-2025\A-2025-000298\WAQB
File Name: 064_2025-05-29_sas_df
Thank you / Merci,
Kevin Bradley
Senior ATIP Officer

Document Released Under the Access to Information Act by Health Canada / Document divulgué en vertu de la Loi sur l'accès à l'information par Santé Canada

Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371
Agent principal de l'AIPRP
Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

---

**From:** Bradley, Kevin (HC/SC) <kevin.bradley@hc-sc.gc.ca> **On Behalf Of** atip / aiprp (HC/SC)
**Sent:** 2025-08-27 11:59 AM
**To:** Hogan, Erin (HC/SC) <erin.hogan@hc-sc.gc.ca>; atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>
**Subject:** RE: For Import: A-2025-000298

Unclassified / Non classifié

Nicely is not the issue, it is just bugging out when importing to LF.
I will get it.
Thank you / Merci,
Kevin Bradley

Senior ATIP Officer
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371
Agent principal de l'AIPRP
Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

---

**From:** Hogan, Erin (HC/SC) <erin.hogan@hc-sc.gc.ca>
**Sent:** 2025-08-27 11:57 AM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>
**Subject:** RE: For Import: A-2025-000298

Unclassified / Non classifié

Thanks Kevin. If it can't be imported "nicely" let me know and I'll process it outside of LF

---

**From:** Bradley, Kevin (HC/SC) <kevin.bradley@hc-sc.gc.ca> **On Behalf Of** atip / aiprp (HC/SC)
**Sent:** 2025-08-27 11:56 AM
**To:** Hogan, Erin (HC/SC) <erin.hogan@hc-sc.gc.ca>; atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>

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**Subject:** RE: For Import: A-2025-000298

Unclassified / Non classifié

Hello Erin,
I am just having a little difficulty importing 1 Excel file into Laserfiche. All but this one file are in the working copy and good to go. I will keep working on getting this Excel file. Once it is complete I will close the import action and notify you.

Thank you / Merci,
Kevin Bradley
Senior ATIP Officer
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371
Agent principal de l'AIPRP
Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

---

**From:** Hogan, Erin (HC/SC) <erin.hogan@hc-sc.gc.ca>
**Sent:** 2025-08-25 9:03 AM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>
**Subject:** For Import: A-2025-000298

Unclassified / Non classifié

Hi Intake,
Can you please import his HECSB retrieval for A-2025-000298?
There's a lot of nesting folders. Can you please name the original "HECSB – folder name" and include all folder names you needed to click on to get to the records. Eg: HECSB – ERHSD - CCRPB – Consult TC
WAQB Folder:
These powerpoint decks have notes that will need to be captured
013_2021-04-23_AHSD_Aviation23042021
019_2022-1-7_CASAP slides for January presentation
021_2022-05-18_MMACNEILL- NAPS Presentation - May 18th 2022
030_2023-06-07_CASAP_NAPSMM_07062023_final_ (this one also has comments)
038_2024-05-08_CASAP YYZ presentation_
058_2025-05-15_CASAP_TC_Meeting_15052025_
067_2025-06-12_UFP workshop presentation
Thanks,
Erin

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Erin Hogan
(she | her | elle)

Senior ATIP Analyst, Access to Information and Privacy Division
Corporate Policy & Planning Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Erin.Hogan@canada.ca / Tel: 343-998-2441 / TTY: 1-800-465-7735

Analyste Principale de l'AIPRP, Accès à l'information et protection des renseignements personnels
Direction de la politique, planification et services corporatifs
Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada
Erin.Hogan@canada.ca / Tél: 343-998-2441 / ATS: 1-800-465-7735

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**From:** Buckley, Kathleen (HC/SC)
**To:** Bradley, Kevin (HC/SC); Beauchamp, Julien (HC/SC)
**Cc:** atip / aiprp (HC/SC); Granieri, Emily (HC/SC)
**Subject:** RE: New Request received: A-2025-001153
**Date:** 2025-12-09 10:41:00 AM

---

Hi Kevin.
Ya, he wants the processing file essentially. All good to process and you can assign to Emily. You can let the requester know that A-2025-000298 isn't completed yet, so he/she will only get what we have to date.

Thanks
Kate

---

**From:** Bradley, Kevin (HC/SC) <kevin.bradley@hc-sc.gc.ca>
**Sent:** 2025-12-09 10:05 AM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>; Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Cc:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>
**Subject:** New Request received: A-2025-001153

Unclassified / Non classifié

Good morning,

We are in receipt of a new request that also pertains to a previous request submitted to HC that is being processed by your team.

Before we respond to the applicant with any clarifications, I would like to get your opinions on how to proceed.

The full request text can be found in EDIMS as well as in SACR.

Thank you / Merci,

Kevin Bradley

Senior ATIP Officer
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada

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Kevin.bradley@hc-sc.gc.ca / Tel: 343-993-2619

Agent principal de l'AIPRP
Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-993-2619

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**From:** Fabio Ovettini
**To:** Prime Minister | Premier Ministre; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc; hcminister.ministresc@canada.ca; ministre-minister@ec.gc.ca
**Cc:** envi@parl.gc.ca; hesa@parl.gc.ca; OGGO@parl.gc.ca; ETHI@parl.gc.ca; TRAN@parl.gc.ca; speaker@parl.gc.ca; judy.sgro@parl.gc.ca; contact-questions@psic-ispc.gc.ca; speaker.president@parl.gc.ca; petitions@oag-bvg.gc.ca
**Subject:** False and Misleading Data in GTAA Q2 2025 Complaint Report – Request for Ministerial Action and Committee Distribution
**Date:** 2025-10-16 3:32:45 PM
**Attachments:** GTAA_Q2_2025_False_Data_Submission_Final.pdf

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

# False and Misleading Data in GTAA Q2 2025 Complaint Report

To:
The Honourable Steven MacKinnon, Minister of Transport
The Honourable Julie Dabrusin, Minister of Environment and Climate Change
The Honourable Marjorie Michel, Minister of Health
The Right Honourable Mark Carney, Prime Minister of Canada

**Cc:** Clerks of the Standing Committees on Transport, Infrastructure and Communities (TRAN); Environment and Sustainable Development (ENVI); Health (HESA); Government Operations and Estimates (OGGO); and Access to Information, Privacy and Ethics (ETHI); the Clerk of the House of Commons; the Speaker of the House of Commons; the Commissioner of the Environment and Sustainable Development (CESD); the Office of the Public Sector Integrity Commissioner of Canada (PSIC); and Judy Sgro, Member of Parliament for Humber River—Black Creek..

**Subject: False and Misleading Data in GTAA Q2 2025 Complaint Report – Request for Ministerial Action and Committee Distribution**

Dear Ministers, Prime Minister Carney, and Committee Clerks,

The Toronto Pearson Q2 2025 Noise Complaint Report has just been released — and before even getting into the numbers, the problems are immediately visible.

As shown in the attached screenshots, the report is mislabelled and structurally inconsistent:

• "Preferential Hours (12:00 a.m.–6:29 a.m.)" and "Restricted Hours (12:30 a.m.–6:29 a.m.)" cover almost the same nighttime window, leaving approximately 18 hours of the day unaccounted for.
• The summary table is mathematically incorrect — "Restricted + Preferential" hours should equal "All Hours," yet they do not.
• The totals for arrivals and departures also fail to reconcile with the stated all-hours figure.

Once one digs deeper into the internal tables, the numbers begin to appear internally consistent — but there is no verifiable data source to confirm them. In practice, the summary presentation is misleading and would easily deceive any casual reader or policymaker.

These reports are used to brief Transport Canada, Health Canada, and Environment and Climate Change Canada, and they are also referenced in public communications and lobbying activities. In past quarters, GTAA quietly replaced erroneous reports after being notified — but without issuing any public correction or erratum. No original version remains accessible, effectively erasing the historical record.

Given that these issues persist despite repeated alerts to federal authorities, it raises a troubling question:
Are these errors being tolerated — or overlooked — because correcting them would expose systemic inconsistencies in GTAA's data reporting?

Attached is a full evidentiary submission entitled "False and Misleading Data in GTAA Q2 2025 Complaint Report," including annexed screenshots and cross-reconciled data tables.

Thank you for your attention to this serious matter.

Respectfully,
Fabio Ovettini

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# False and Misleading Data in GTAA Q2 2025 Complaint Report

Submission to: The Honourable Steven MacKinnon (Minister of Transport), The Honourable Julie Dabrusin (Minister of Environment and Climate Change), The Honourable Marjorie Michel (Minister of Health), and The Right Honourable Mark Carney (Prime Minister of Canada).

## 1. Summary of Evidence

This submission presents clear evidence that the Greater Toronto Airports Authority (GTAA) has published false, incomplete, and misleading data in its official Q2 2025 'Quarterly & Annual Complaints Report.' The report's 'Complaints against Operations' panel — the default public summary — is arithmetically impossible, structurally incomplete, and semantically deceptive.

## 2. Description of the False Chart (Exhibit A)

Extracted from GTAA's Q2 2025 report:

Complaints against Operations
All Hours: 251,445
  Arrivals: 173,000
  Departures: 78,587

Preferential Hours: 28,477
  Arrivals: 22,000
  Departures: 6,379

Restricted Hours: 20,668
  Arrivals: 17,000
  Departures: 3,769

## 3. Analysis

• Mathematical contradiction: 'Preferential + Restricted' totals only 49,145, representing 19.5% of 'All Hours' (251,445). Missing: ~202,300 complaints (≈ 80.5%) — corresponding to unreported daytime operations (06:30–23:59).

• Rounding error revealing manipulation: Arrivals (173 K) + Departures (78,587) = 251,587, which exceeds the stated total (251,445). This mismatch suggests manual editing or aggregation from inconsistent datasets.

• Time-period falsification: GTAA's charts define 'Preferential Hours' = 00:00–06:29 and 'Restricted Hours' = 00:30–06:29. Both describe the same six-hour nighttime window, leaving no representation for 18 hours of the operational day.

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• Regulatory implications: Violates obligations under the Pearson Ground Lease (Articles 7.01, 8.11, 37), the Aeronautics Act, ICAO Annex 16, the Canadian Environmental Protection Act (1999), and the Values and Ethics Code for the Public Sector (2012).

### Summary of Findings

Even before analyzing the data, the charts are structurally invalid. The GTAA labels "Preferential Hours (12:00 a.m.–6:29 a.m.)" and "Restricted Hours (12:30 a.m.–6:29 a.m.)" as distinct periods, yet both describe only the nighttime window. As a result, no data is shown for the remaining 18 hours of daily operations (06:30 a.m.–11:59 p.m.), leaving the report mathematically incomplete and misleading by omission.

- Day (Normal Operations): 06:30–00:29

- Night (Restricted Hours): 00:30–06:29

The charts therefore fail as valid representations of operations under ICAO and WHO frameworks.

### 4. Findings

• The 'All Hours' figure cannot be reconstructed from the sub-categories presented.
• Daytime complaint volumes are omitted entirely from public view.
• The Minister of Transport, as landlord under the Ground Lease, has a duty to audit the GTAA's reporting methodology.

### 5. Requested Actions

• Immediate Transport Canada audit of GTAA complaint and noise-monitor data handling.

• Direction to Health Canada to assess public-health implications of the suppressed daytime data.

• Referral to Environment and Climate Change Canada under CEPA s.64 for potential data falsification.

• Distribution of this evidence through the Clerk of the House of Commons for inclusion in the parliamentary record.

## 6. Annexes

Annex A – Screenshot of "Complaints against Operations" panel (GTAA Q2 2025 Report)

Annex B – Cross-reconciled complaint totals (Arrivals + Departures, Q2 2024–2025)

Annex C – Comparative analysis of mislabeled "Preferential" and "Restricted" hours

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Prepared by:
Fabio Ovettini
fabio217@yahoo.com

34 Jodphur Avenue, Toronto, Ontario. M9M 2J4

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## Annex A – Screenshot of "Complaints against Operations" panel (GTAA Q2 2025 Report)

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**Complaints against Operations**

| | | |
|---|---|---|
| All Hours | 251,4... | Arrivals 173K / Departures 78,587 |
| Preferential Hours | 28,477 | Arrivals 22K / Departures 6,379 |
| Restricted Hours | 20,668 | Arrivals 17K / Departures 3,769 |

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## Annex B – Cross-Reconciled Complaint Totals (Arrivals + Departures, Q2 2024–2025)

Purpose

To demonstrate that GTAA's published "All Hours," "Preferential Hours," and "Restricted Hours" totals are internally inconsistent and fail to reconcile to the true sum of arrivals + departures across the same period.

| Category | 2024 Complaints | 2025 Complaints | % Change | Observed Discrepancy |
|---|---|---|---|---|
| Arrivals (All Hours) | 43,465 | 172,858 | +298 % | Matches site claim of +297.6 % |
| Departures (All Hours) | 28,037 | 78,587 | +180 % | Matches site claim of +180.2 % |
| Combined Total | 71,502 | 251,445 | +251 % | ✔Reproduces summary panel total |
| Preferential Hours (00:00–06:29) | 4,026 | 28,477 | +607 % | Omitted ≈ 202 k daytime records |
| Restricted Hours (00:30–06:29) | 2,706 | 20,668 | +664 % | Duplicate subset of same window |

Key Finding: "Preferential + Restricted" = 49,145, only 19.5 % of the "All Hours" total (251,445). Thus ≈ 80 % of complaints (≈ 202 k) are unreported in any defined time segment — proof of structural data omission.

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## Annex C – Comparative Analysis of Mislabeled "Preferential" and "Restricted" Hours

Overview

GTAA's charts define overlapping intervals:
- Preferential Hours: 12:00 a.m.–6:29 a.m.
- Restricted Hours: 12:30 a.m.–6:29 a.m.

This overlap eliminates daytime representation (06:30 a.m.–11:59 p.m.), misleading readers into believing nighttime data covers the entire 24 hours.

| Label | Published Time Range | Actual Period Represented | Logical Outcome |
|---|---|---|---|
| Preferential | 00:00–06:29 | Nighttime operations | Duplicates Restricted window |
| Restricted | 00:30–06:29 | Nighttime subset | Excludes first 30 min of day |
| Daytime (Omitted) | 06:30–23:59 | Main operational window | Completely absent from chart |

Conclusion: The labelling scheme creates an 18-hour blind spot (06:30–23:59) and invalidates the Q2 2025 dataset for policy or health assessment purposes.

ATIA - 19(1)

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**From:** Fabio Ovettini
**To:** judy.sgro@parl.gc.ca; pierre.poilievre@parl.gc.ca; Jagmeet - M.P.; Francesco Sorbara; [redacted] humberleacommunitygroup@gmail.com; [redacted] Mayor Chow; [redacted] Councillor Perruzza; [redacted] Tom Rakocevic; [redacted] WS Viewer Mail; [redacted] Minister of Transport / Ministre des Transports (TC); [redacted] newstips@thestar.ca; [redacted] ZZG-Community Engagement; [redacted] hcminister.ministresc; [redacted] doug.ford.co@pc.ola.org; [redacted] MHA Minister / Ministre SMD (HC/SC); [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; [redacted] piac.ward04@tdsb.on.ca; [redacted] Fabio Ovettini
**Subject:** Federal Minister of Transportation Resigns Amid Growing Public Pressure
**Date:** 2024-09-20 8:47:44 AM

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**Warning:** This message is from an EXTERNAL SENDER - be CAUTIOUS, particularly with links and attachments.
**Attention:** Ce message provient d'un EXPÉDITEUR EXTERNE - soyez PRUDENT, en particulier avec les liens et les pièces jointes.

The resignation comes at a critical juncture for the transportation portfolio, as the ministry has been dealing with significant challenges, including the ongoing public outcry over noise pollution near major airports, concerns over national infrastructure, and the growing demand for more sustainable transportation policies.

Pablo Rodriguez resigns from cabinet, dealing another blow to Trudeau Liberals

**Pablo Rodriguez resigns from cabinet, dealing another blow to Trudeau Li...**

John Marchesan

The Quebec Liberals have been without a leader since Dominique Anglade resigned following her defeat in the 2022...

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**From:** Buckley, Kathleen (HC/SC)
**To:** Béral, Prosper (HC/SC); Henrie, Celine (HC/SC)
**Cc:** Beauchamp, Julien (HC/SC)
**Subject:** RE: Nighttime Aircraft Noise and Public Health – A Cali for Urgent Federal Action
**Date:** 2025-06-04 1:19:00 PM

---

Oh ok. I don't expect that anything will come of it as there is no link to his ATIP request in the individual's email, but it may come to light in future emails if there is any back and forth correspondence with him.

He's quite upset and it's looking like we will respond with a NIL return, which may escalate his anger.

Enjoy APEX.

Kate

**From:** Béral, Prosper (HC/SC) <prosper.beral@hc-sc.gc.ca>
**Sent:** 2025-06-04 1:00 PM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>; Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Cc:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** Re: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

Unclassified / Non classifié

Thanks, Kathleen,

I am out of the office as well and here at APEX with Céline, although I haven't yet seen her.

Get Outlook for iOS

---

**From:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Sent:** Wednesday, June 4, 2025 11:56:55 AM
**To:** Béral, Prosper (HC/SC) <prosper.beral@hc-sc.gc.ca>; Henrie, Celine (HC/SC) <celine.henrie@hc-sc.gc.ca>
**Cc:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** FW: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

Unclassified / Non classifié

Good morning, Prosper,

In Céline's absence, I'm looping you into this email in case you get questions from above.

Our Intake team received a message below from one of our requesters (A-2025-000298 – already tasked to CSB, HPN(NIL) and HECSB).

He has emailed our Minister, DM, Associate DM along with several others.

For your situational awareness only – no action required at this time.

Thanks
Kate

**From:** Payant, Talia (HC/SC) <talia.payant@hc-sc.gc.ca> **On Behalf Of** atip / aiprp (HC/SC)
**Sent:** 2025-06-04 11:49 AM
**To:** Buckley, Kathleen (HC/SC) <kathleen.buckley@hc-sc.gc.ca>
**Subject:** FW: Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

Unclassified / Non classifié

Hello!

FYI: A-2025-000298.

Thank you / Merci,

*Talia Payant*

(she | her | elle)

Access to Information and Privacy Services Directorate
Health Canada and Public Health Agency of Canada / Government of Canada
Talia.payant@hc-sc.gc.ca / **NEW -** Tel: 343-576-6101

Direction des services d'accès à l'Information et Protection des Renseignements Personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada

ATIA - 19(1)

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Talia.payant@hc-sc.gc.ca / **NOUVEAU -** Télé: 343-576-6101

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-06-04 11:29 AM
**To:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>; hcminister.ministresc <hcminister.ministresc@hc-sc.gc.ca>; MHA Minister / Ministre SMD (HC/SC) <mhaminister.ministresmd@hc-sc.gc.ca>; Prime Minister | Premier Ministre <pm@pm.gc.ca>
**Co**[redacted]aara.saks@parl.gc.ca; [redacted]mark.holland@parl.gc.ca; vaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC) <Eric.Costen@hc-sc.gc.ca>; Orencsak, Greg (he, him | il, lui) (HC/SC) <Greg.Orencsak@hc-sc.gc.ca>; pierre.poilievre@parl.gc.ca; Jagmeet - M.P. <jagmeet.singh@parl.gc.ca>; Francesco Sorbara <francesco.sorbara@parl.gc.ca>[redacted] Mayor Chow <mayor_chow@toronto.ca>; Councillor Perruzza <councillor_perruzza@toronto.ca>; [redacted] Tom Rakocevic <trakocevic-co@ndp.on.ca>; [redacted]W5 Viewer Mail <w5@ctv.ca>[redacted]doug.fordco@pc.ola.org; [redacted] hcminister.ministresc <hcminister.ministresc@hc-sc.gc.ca>; [redacted]piac.ward04@tdsb.on.ca; [redacted]office@timothycs.com; [redacted]piac.ward01@tdsb.on.ca; [redacted]judy.sgro.a1@parl.gc.ca; [redacted]judy.sgro@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_mckelvie@toronto.ca; [redacted] councillor_ainslie@toronto.ca; [redacted]
**Subject:** Nighttime Aircraft Noise and Public Health – A Call for Urgent Federal Action

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

Dear Honourable Marjorie Michel,

Congratulations on your recent appointment as Canada's Minister of Health. I write to you with both sincere hope and an urgent appeal.

For too long, successive Ministers of Health have remained silent while thousands of Canadians living under major flight paths — especially around Toronto Pearson — have endured what can only be described as chronic, imposed harm: **continuous aircraft noise and air pollution throughout the day and night**.

These are not one-off events. They are persistent, government-permitted intrusions on our most basic human need — **sleep** — and they occur at volumes regularly measured between **70 and 80+ decibels**, far above what any health authority would deem acceptable at night. The Noise Monitoring Terminal (NMT) at Acacia Park captures this reality in stark terms, showing nightly patterns of sound events that destroy any chance of deep, sustained rest. Attached you will find data captured by the Noise Monitoring Terminal located at Acacia Park, clearly illustrating the severity and frequency of this noise exposure.

In addition to sleep loss, **daytime overflights also interfere with children's ability to learn**. Numerous studies — including work referenced by the World Health Organization and European Environment Agency — have shown that chronic exposure to aircraft noise near schools is linked to **delays in reading comprehension, reduced attention spans, and impaired memory**. The noise doesn't just disturb the classroom — it disrupts the development of the mind itself.

This is not just a nuisance — it is a violation of public health.

According to **Health Canada**, the recommended amount of sleep for Canadians is:

- **Adults (18–64 years):** 7 to 9 hours
- **Older adults (65+):** 7 to 8 hours
- **Teenagers (14–17 years):** 8 to 10 hours
- **Children (5–13 years):** 9 to 11 hours
- **Preschoolers (3–5 years):** 10 to 13 hours
- **Infants (4–11 months):** 12 to 15 hours

Yet for those of us living beneath these flight paths, achieving even the minimum of these sleep targets is impossible. **Aircraft fly low over our homes all night long, without pause** — from shortly after midnight until well past 6:00 AM. This is not the occasional disruption; it is an unrelenting pattern. Every few minutes, a jet passes overhead, waking someone — a child, an elder, a parent — who then struggles to fall back asleep. And by the time sleep might return, another plane arrives. This cycle continues until morning.

**This is how illness is manufactured.** Not by accident, but through years of policy inaction.

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The contradiction is glaring. **Transport Canada** requires **commercial drivers** to have **at least 8 consecutive hours of quality sleep** before driving — a standard designed to protect life and safety. And yet, under the current air traffic system, a resident under the flight path cannot possibly meet that requirement, let alone meet the broader recommendations set by your own department for overall health.

So I ask:

**Will you be the first Minister of Health to act?**

I respectfully request that you:

1. **Acknowledge** the severe and long-term health risks posed by nighttime aircraft operations over residential areas;
2. **Direct Health Canada** to take an active role in responding to this crisis, including public comment and interdepartmental advocacy;
3. **Write to the Minister of Transport** to demand that their department align flight policies with Health Canada's sleep recommendations, and recognize the current system as both unsustainable and unacceptable.

To make matters worse, when we have raised these concerns with the **Greater Toronto Airports Authority (GTAA)**, we have been told — quite plainly — that **expansion will continue and there is nothing we can do about it**. This statement reflects a troubling disregard for public health and democratic accountability. It sends a clear message to residents: that our suffering is acceptable collateral for continued growth. We refuse to accept that.

This is not a Toronto problem. It is a **national health issue** affecting people in every region with a major airport. People under these flight paths have the right to the same rest, safety, and health protection as every other Canadian.

We are not asking for favours — only for fairness.

I hope you will be the Minister who finally brings health back into this conversation.

Sincerely,
Fabio Ovettini
34 Jodphur Avenue,
Toronto, ON. M9M 2J4
fabio217@yahoo.com

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**From:** Fabio Ovettini
**To:** Prime Minister | Premier Ministre
**Cc:** TC.MinisterofTransport-MinistredesTransports.TC@tc.gc.ca; hcminister.ministresc
**Subject:** Formal Offer to Resolve Escalating Public Health, Legal, and Criminal Exposure Linked to Pearson Airport Operations
**Date:** 2025-07-08 8:09:57 AM

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Formal Offer to Resolve Escalating Public Health, Legal, and Criminal Exposure Linked to Pearson Airport Operations

**To:** The Right Honourable Mark Carney, Prime Minister of Canada
**Cc:** The Honourable Chrystia Freeland, Minister of Transport
The Honourable Marjorie Michel, Minister of Health

---

Dear Prime Minister Carney,

We write to you today with a final offer — not of surrender, but of resolution.

For years, residents of Toronto and surrounding communities have endured the unrelenting harm caused by aircraft noise and pollution stemming from operations at Toronto Pearson Airport. We have submitted thousands of complaints, compiled evidence from federally installed noise monitors, gathered scientific and medical documentation, and filed numerous information requests. We have reached out in good faith to a succession of Transport Ministers — Omar Alghabra, Pablo Rodriguez, Anita Anand, and now Chrystia Freeland. None have taken meaningful action. The result is a deepening public health crisis, growing legal exposure, and now — the real possibility of **criminal liability**.

Just a day ago, a near-collision occurred at Pearson Airport. A landing aircraft was forced to abort its landing at the last possible moment to avoid hitting another aircraft that had not cleared the runway. The event was captured in real-time and can be viewed at the following link:
https://drive.google.com/file/d/1ww3ArpIkRrtW_bPXGriCpJK4S8ij2vW1/view?usp=sharing

This incident underscores what residents have been warning for years: this is not just about noise — it is about **negligence, institutional decay, and life-threatening mismanagement**. If lives are lost, no official will be able to claim they were not warned.

We believe the evidence now meets the threshold not only for **civil litigation** — including for violations of **Sections 7 and 15 of the Charter** — but also for potential **Criminal Code offences**, including:

- Criminal negligence causing bodily harm (s. 219–221),
- Breach of public trust (s. 122),
- Failure to perform a duty imposed by law (s. 180),
- And reckless endangerment of the public.

And still — we offer your government one last opportunity to come to the table.

We are prepared to enter into **immediate, good-faith negotiations** to discuss:

- Acknowledgement of the harm inflicted on affected communities;
- Enforceable mitigation of air traffic over residential zones;
- A fair compensation program for impacted residents;
- Independent oversight of GTAA operations, complaint systems, and compliance with the federal lease.

If we do not receive a response within **14 calendar days**, this letter will be made public and shared with affected communities, media outlets, international human rights organizations, and legal counsel. We will proceed with the release of evidence, the mobilization of public support, and the initiation of legal action — including potential criminal referrals where warranted.

Prime Minister, you now face a decision: to correct a deepening injustice — or to preside over its collapse into scandal.

We are prepared to meet. The only question is whether your government is prepared to listen.

Sincerely,
Fabio Ovettini

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**From:** Payant, Talia (HC/SC) on behalf of atip / aiprp (HC/SC)
**To:** Bradley, Kevin (HC/SC)
**Cc:** atip / aiprp (HC/SC)
**Subject:** RE: QC: A-2025-000298 - QC COMPLETED GOOD TO GO!
**Date:** 2025-06-03 11:19:00 AM

---

Thank you / Merci,

*Talia Payant*

(she | her | elle)

Access to Information and Privacy Services Directorate
Health Canada and Public Health Agency of Canada / Government of Canada
Talia.payant@hc-sc.gc.ca / **NEW -** Tel: 343-576-6101

Direction des services d'accès à l'Information et Protection des Renseignements Personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Talia.payant@hc-sc.gc.ca / **NOUVEAU -** Télé: 343-576-6101

---

**From:** Bradley, Kevin (HC/SC) <kevin.bradley@hc-sc.gc.ca>
**Sent:** 2025-06-03 11:12 AM
**To:** Payant, Talia (HC/SC) <talia.payant@hc-sc.gc.ca>
**Cc:** atip / aiprp (HC/SC) <atip-aiprp@hc-sc.gc.ca>
**Subject:** QC: A-2025-000298

Unclassified / Non classifié

Thank you / Merci,

Kevin Bradley (He / Him / Il)

Sr Project Officer
Access to Information and Privacy Services Directorate
Corporate Services Branch
Health Canada and Public Health Agency of Canada
Kevin.bradley@hc-sc.gc.ca / Tel: 343-999-3371

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Agent principal de projet
Direction des services d'accès à l'information et de la protection des renseignements personnels
Santé Canada et Agence de la Santé Publique du Canada / Gouvernement du Canada
Kevin.bradley@hc-sc.gc.ca – Télé: 343-999-3371

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**From:** Beauchamp, Julien (HC/SC)
**To:** Fabio Ovettini
**Subject:** RE: Request under the Access to Information Act - Health Canada - A-2025-000298
**Date:** 2025-06-19 8:49:00 AM

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That sounds good. I will go ahead and send the new tasking and we will process your request.
Have a good day,

Julien

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-06-19 8:47 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** Re: Request under the Access to Information Act - Health Canada - A-2025-000298

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Confirmation to Proceed with Modified ATI Request

Good morning, and thank you for your message and for consulting with your subject matter experts.

I appreciate the clarification and understand the considerations regarding the archival/legacy information. However, I would like to proceed with the request **as it currently stands**, including the transition period from Transport Canada to GTAA in 1996. I also confirm that the modifications you've made to the request text are acceptable.

Please move ahead with processing the request.

Thank you again for your support and guidance throughout this process.

Best regards,
Fabio Ovettini

On Thursday, June 19, 2025 at 08:08:35 a.m. EDT, Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca> wrote:

Unclassified / Non classifié

Good morning,

Thank you for your response and providing the additional information. I have reached out to our subject matter experts and it does appear like the additional clarification helped. However, there are still one detail to confirm with you.

Our experts have recommended that you exclude the archival/legacy information portion of the request. With the new time frame of 1990 to present, it would include the transition from TC to GTAA and the creation of the GTAA (1996). While HC may records on this portion, they would require significant time for archival mining and could take a while. As a possible solution, they have mentioned that it may be worth seeking those records directly from Transport Canada, since they are lead and could have the historical records more readily accessible and available.

I have modified the request text a bit to reflect the latest clarification. Could you please confirm that this is ok with you, or let me know if additional modifications should be made to the text.

**Pursuant to the Access to Information Act, I am requesting access to any and all records (from January 1, 1990 to June 3, 2025) held by Health Canada, that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport. Records include final versions and/or latest version available. Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health:**

**1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:**

**- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;**

**- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal**

**governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;**

**- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.**

**2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:**

**- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;**

**- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;**

**- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.**

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**3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:**

**- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or**

**Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;**

**- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.**

**4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:**

**- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;**

**- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.**

**5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.**

Thanks,

Julien

---

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** 2025-06-12 8:59 AM
**To:** Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca>
**Subject:** Re: Request under the Access to Information Act - Health Canada - A-2025-000298

**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** Clarification and Refinement of ATI Request – GTAA and Toronto Pearson Airport

Good morning Beauchamp,

Thank you for your detailed response and for your efforts to facilitate the retrieval of records.

I would like to revise and narrow my Access to Information request as follows:

1. Timeframe

Please limit the request to records created between January 1, 1990, and the present.

2. Type of Documents

I am willing to receive only final versions or the latest available drafts of documents. If a particular document raises further interest, I may submit a follow-up request for its draft versions.

3. Level of Recipients

Please restrict the scope of correspondence to individuals at the Director General (DG) level and above, including any communications to or from the Office of the Minister of Health.

4. Focus of Retrieval

I ask that you focus on records concerning:

- Air pollution related to operations at Toronto Pearson International Airport or the Greater Toronto Airports Authority (GTAA);
- Aircraft noise, vibration, and their impact on public health;
- Community health risks associated with aviation-related pollutants (e.g., ultrafine particles, NOx, $SO_2$, PM2.5, etc.);
- Issues involving noise exposure thresholds, including effects on sleep and mental health;
- Any discussion or analysis of the GTAA Night Flight Budget, including night operations between 10:00 p.m. and 7:00 a.m.

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5. Priority Records
Where possible, I ask that priority be given to:

- Health Canada's own assessments, internal memos, and interdepartmental briefings;
- Complaints or inquiries from the public, professionals, advocacy groups, or municipal officials;
- Records involving interdepartmental communication with Transport Canada and Environment and Climate Change Canada.

I hope these refinements allow you to proceed more efficiently. Please let me know if further adjustments are needed. Thank you again for your time and support.

Sincerely,
**Fabio Ovettini**
Toronto, Ontario
fabio217@yahoo.com

On Thursday, June 12, 2025 at 07:12:58 a.m. EDT, Beauchamp, Julien (HC/SC) <julien.beauchamp@hc-sc.gc.ca> wrote:

Unclassified / Non classifié

Good morning Fabio Ovettini,

I am writing to you in regards to your access to information request for the following information:

"Pursuant to the Access to Information Act, I am requesting access to any and all records held by Health Canada, in any format that relate to, refer to, or mention the Greater Toronto Airports Authority (GTAA) or Toronto Pearson International Airport, including but not limited to:

1. All correspondence and communications (internal or external), regardless of origin or destination, including but not limited to:

- Emails, letters, phone logs, meeting invitations, memos, briefing notes, instant messages, or text messages;

- Communications involving other federal departments (e.g., Transport Canada, Environment and Climate Change Canada), provincial or municipal

governments, the GTAA, airport staff, elected officials, advocacy groups, private citizens, foreign governments, or international organizations;

- Communications from politicians or political offices (federal, provincial, or municipal) or their staff referencing GTAA, Pearson Airport, or related health or environmental issues.

2. All records of assessments, reports, data, or studies, whether completed, ongoing, or commissioned by Health Canada, related to:

- Aircraft noise, air pollution, vibration, or environmental contamination associated with GTAA or Pearson Airport;

- Public health effects or potential risks to adjacent or nearby communities caused by airport operations or aircraft traffic;

- Exposure to aviation-related pollutants (e.g., ultrafine particles, NOx, SO2, particulate matter, etc.) in the surrounding regions.

3. All records of inquiries, complaints, or submissions from any individual or organization — including but not limited to:

- Members of the public, healthcare professionals, researchers, military personnel, government officials, advocacy groups, municipalities, or

Indigenous communities — that relate to GTAA, Pearson Airport, or aircraft noise and its impact;

- Records related to responses provided or actions taken by Health Canada in relation to such inquiries or concerns.

4. All internal policy discussions, risk assessments, and interdepartmental briefings involving GTAA or Pearson Airport, particularly with reference to:

- Community health impacts, epidemiological data, public health planning, or noise exposure thresholds;

- Health Canada's role in regulating, monitoring, or advising on GTAA-related issues.

5. All Access to Information requests submitted by third parties regarding GTAA or Pearson Airport, and any responsive records Health Canada compiled or reviewed in relation to such requests.

This request applies to all records from all time periods, unless otherwise limited by law.

Please include: - Records held at headquarters and regional offices; - Archived or legacy systems; - Databases, emails, notes, drafts, attachments, audio recordings, and presentations;

- Records in any language or format, whether digital or physical, classified or unclassified."

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I am currently corresponding with our subject matter experts, who have identified a few key points that may facilitate the retrieval of the information you are seeking. As currently worded, your request would result in over 20,000 pages of records. This type of volume represents a very long processing time, and I would imagine you would not be able to receive the records until a few years (would also most likely include records you are not interested in). Hoping to reduce the volume of relevant records and get you records as quickly and efficiently as possible, I am wondering if you would be able to provide additional information on the following points:

1. **Timeframe:** You currently have your requested worded as "all records from all time periods". Is there a more specific timeframe we could use to perform our retrieval of records ? Keeping in mind that more recent dates will provide data and information that more accurately represents the current activity and residential impacts. In order to proceed with the request, we would need specific dates (ex: years 2020 to present).
2. **Type of documents:** Would you be open to receive only final (or latest drafts) of documents? This would remove all the different versions of each document, allowing us to reduce the total volume of records. If you come across a document that you have particular interest in once you receive the records, it would be possible for you to request all the draft versions of the document.
3. **Recipients of the information:** Could we reduce the scope to only include correspondence at a DG level and above ? Retrieving information from all staff in a division is time consuming and will take a significant amount of time to process, resulting in a lot of information you may not be interested in.
4. **Focus of retrieval:** Our subject matter experts suggest focusing the retrieval on topics we have interpreted as your area of focus. Specifically, would you be able to add a line to your request to indicate that the focus of our retrieval should be on "air pollution", "noise and vibration", "public health impacts", and "risks for communities in proximity of aviation pollutants" ?

Any other additional information you can provide that would allow us to focus our retrieval on what you are seeking would be appreciated. Please note that your request will be placed on hold until we received clarification. If we have not received a response from you by July 2nd 2025, we will assume you are no longer interested in the information and close your request. If you have any questions or wish to discuss, please do not hesitate to contact me.

Thank you,

**Julien Beauchamp**

(he/il)

Team Leader, Access to Information and Privacy Division

Corporate Policy & Planning Services Directorate

Corporate Services Branch
Health Canada and Public Health Agency of Canada / Government of Canada
julien.beauchamp@hc-sc.gc.ca / Tel: 343-542-3278

Chef d'équipe, Accès à l'information et protection des renseignements personnels

Direction de la Politique, planifications et services corporatifs

Direction générale des services de gestion
Santé Canada et Agence de la santé publique du Canada / Gouvernement du Canada
julien.beauchamp@hc-sc.gc.ca / Tél : 343-542-3278

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**From:** Fabio Ovettini
**To:** [redacted] hcminister.ministresc; [redacted] mark.carney@parl.gc.ca; crystia.freeland@parl.gc.ca; judy.sgro.a1@parl.gc.ca; jagmeet.singh@parl.gc.ca; kamal.khera@parl.gc.ca; [redacted] francesco.sorbara@parl.gc.ca; judy.sgro@parl.gc.ca
**Subject:** Fw: Level of Concern for Airplane Noise Is A Joke
**Date:** 2025-04-08 8:20:04 AM
**Attachments:** Appendix 1---EPA-HQ-OAR-2010-0687-0002_content-1.pdf
Appendix 2---Primer_Jan2015.pdf
Appendix 3---https-pubmed.ncbi.nlm.nih.gov-26231366.pdf
Appendix 6---Noise-Events-March-2025.pdf
Motion to Address Health Impacts of Airplane Noise on Toronto Residents.pdf
Noise-Events-Jan-2025-.pdf
Noise-Events-Feb-2025-.pdf

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Morning,

I'm resending the proposed motion and supporting materials regarding the health impacts of persistent airplane noise on Toronto residents. The original message was returned due to a server size limit, so I have reduced the attachment sizes accordingly.

Sincerely,
Fabio Ovettini

----- Forwarded Message -----
**From:** Fabio Ovettini
**To:** [redacted]
**Cc:** [redacted] judy.sgro@parl.gc.ca ; Tom Rakocevic ; [redacted] ; Minister of Transport / Ministre des Transports (TC) ; ZZG-Community Engagement ; Anand, Anita - M.P. ; [redacted] ; aara.saks@parl.gc.ca ; [redacted] mark.holland@parl.gc.ca ; yaara.saks@parl.gc.ca ; eric.costen@hc-sc.gc.ca ; greg.orencsak@hc-sc.gc.ca ; pierre.poilievre@parl.gc.ca ; Singh, Jagmeet - M.P. ; [redacted] humberleacommunitygroup@gmail.com ; [redacted] ; Mayor Chow [redacted] W5@ctv.ca ; [redacted] newstips@thestar.ca ; [redacted] ; hcminister.ministresc ; mhaminister.ministresmd@hc-sc.gc.ca ; [redacted] piac.ward04@tdsb.on.ca ; [redacted] office@timothycs.com ; [redacted] piac.ward01@tdsb.on.ca ; [redacted] ; judy.sgro.a1@parl.gc.ca ; Meneses, Albert (Sgro, Judy A. - MP) ; Calderan, Amy (Sgro, Judy A. - MP) ; [redacted] ; Councillor Crisanti ; Councillor Holyday ; Councillor Morley ; Councillor Perks ; Councillor Nunziata ; Councillor Pasternak ; Councillor Colle8 ; Councillor Malik ; Councillor Saxe ; Councillor Matlow ; Councillor Moise ; Councillor Fletcher ; Councillor Chernos Lin ; Councillor Burnside ; Councillor Carroll ; Councillor Cheng ; Councillor Bradford ; Councillor Kandavel ; Councillor Thompson ; Councillor Mantas ; Councillor Myers ; Councillor McKelvie ; [redacted] Councillor Ainslie ; [redacted] ; Mark.Carney@parl.gc.ca ; Crystia.Freeland@parl.gc.ca ; Kamal.Khera@parl.gc.ca ; [redacted] fabio ovettini
**Sent:** Monday, April 7, 2025 at 11:10:29 p.m. EDT
**Subject:** Re: Level of Concern for Airplane Noise Is A Joke

Councillor [redacted]

Attached you will find the proposed motion titled **"Motion to Address Health Impacts of Airplane Noise on Toronto Residents"**, along with **Appendices 1 through 6**, which provide supporting data and documentation for your review.

The motion outlines the urgent health and environmental concerns associated with sustained aircraft noise and pollution in our city. It includes proposed actions for the City of Toronto to take in collaboration with provincial and federal stakeholders, and calls for accountability from those responsible.

If you find the motion reasonable, I hope you will consider presenting it at the next Board of Health meeting.

If you ultimately decide not to bring the motion forward, we would appreciate knowing as early as possible before the meeting so we can explore alternative avenues for advancing this issue.

Thank you for your time and your commitment to the health and well-being of our community.

Sincerely,
Fabio Ovettini

On Thursday, April 3, 2025 at 03:24:58 p.m. EDT, Daryl Henderson wrote:

Hello Councillor Perruzza,

Thank you for taking the time to speak with Fabio and me today about the airplane noise issue.

It is incredibly frustrating that every level of government has essentially told us there is nothing they can do to address the issue. MP Judy Sgro is well aware that the Federal Liberal Ministry of Transportation and the Ministry of Health have done nothing to assist us. Robyn Connelly of the GTAA in a strong proud voice told me that the airport traffic is going to get busier, that there was nothing I can be do about it, and that is the way it was going to be. The GTAA operates

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Pearson Airport as they see fit, and the different levels of government seem indifferent to the thousands of average-income families affected by the noise, siding with economic growth over our quality of life.

You mentioned that if Fabio and I put in the hard work and more of our time to draft a motion, you would review it and, if you believe it has any merit, you would present it. You do not believe the motion will fly right now. Well you at least gave us an option that we did not have before our conversation today, and we appreciate this from you.

I strongly believe that the GTAA and Pearson Airport should take more responsibility and manage air traffic in a way that makes life more livable for residents affected by the airplane noise. The situation worsens each year and many people speak up about it but we are continuously told that nothing can be done. MP Judy Sgro and her office initially told us they had no power to help us out, yet we were able to twist Judy's arm to do more for us. Life is nit great with the airplane noise in my and outside of my house.

I wish I owned a Lake Shore mansion in Toronto and could call Michael Finklstein from the Toronto Health Committee when I had issues with airplane noise from the planes using Billy Bishop Airport and he could do something for me because it would be under his jurisdiction. Pearson Airport is under the jurisdiction of Peel Region and we need to call them not Michael Finklstein. Pierre Poilievre said if he is elected Prime Minister of Canada the Big Jets would be allowed to use Billy Bishop airport and there would be less traffic on the highways in Toronto because of this decision - less planes at Pearson Airport.

Thanks again for listening to us today!

Take care,

[redacted]

---

**From:** [redacted]
**Sent:** April 3, 2025 10:44 AM
**To:** [redacted]
**Cc:** [redacted] udy.sgro@parl.gc.ca ; Tom Rakocevic ; [redacted] Minister of Transport / Ministre des Transports (TC) ; ZZG-Community Engagement ; Anand, Anita - M.P. ; [redacted] aara.saks@parl.gc.ca [redacted] ; [redacted] mark.holland@parl.gc.ca ; yaara.saks@parl.gc.ca ; eric.costen@hc-sc.gc.ca ; greg.orencsak@hc-sc.gc.ca ; pierre.poilievre@parl.gc.ca ; Singh, Jagmeet - M.P. ; [redacted] ; humberleacommunitygroup@gmail.com ; [redacted] W5@ctv.ca ; [redacted] ; newstips@thestar.ca ; [redacted] hcminister.ministresc ; mhaminister.ministresmd@hc-sc.gc.ca ; [redacted] piac.ward04@tdsb.on.ca ; [redacted] office@timothycs.com ; [redacted] piac.ward01@tdsb.on.ca ; [redacted] ; judy.sgro.a1@parl.gc.ca ; Meneses, Albert (Sgro, Judy A. - MP) ; Calderan, Amy (Sgro, Judy A. - MP) ; [redacted] ; Councillor Crisanti ; Councillor Holyday ; Councillor Morley ; Councillor Perks ; Councillor Nunziata ; Councillor Pasternak ; Councillor Colle8 ; Councillor Malik ; Councillor Saxe ; Councillor Matlow ; Councillor Moise ; Councillor Fletcher ; Councillor Chernos Lin ; Councillor Burnside ; Councillor Carroll ; Councillor Cheng ; Councillor Bradford ; Councillor Kandavel ; Councillor Thompson ; Councillor Mantas ; Councillor Myers ; Councillor McKelvie ; [redacted] Councillor Ainslie ; [redacted] ; [redacted] ; Mark.Carney@parl.gc.ca ; Crystia.Freeland@parl.gc.ca ; Kamal.Khera@parl.gc.ca ; Fabio Ovettini
**Subject:** Re: Level of Concern for Airplane Noise Is A Joke

**Hello** [redacted]

A call from [redacted] today at 12:30 would be fantastic. I told Fabio tha[redacted]s making himself available to speak with me today and asked if he had anything he wanted me to ask. Fabio mentioned a few things.

If it's okay, can Fabio join me in speaking to [redacted] this afternoon?

Thank you!

Take care,

[redacted]

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**From:** [redacted]

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**Sent:** Thursday, April 3, 2025 10:16:51 a.m.
**To:**
**Cc:** judy.sgro@parl.gc.ca ; Tom Rakocevic ; ; Minister of Transport / Ministre des Transports (TC) ; ZZG-Community Engagement ; Anand, Anita - M.P. ; Anand, Anita - M.P. ; aara.saks@parl.gc.ca ; ; mark.holland@parl.gc.ca ; yaara.saks@parl.gc.ca ; eric.costen@hc-sc.gc.ca ; greg.orencsak@hc-sc.gc.ca ; pierre.poilievre@parl.gc.ca ; Singh, Jagmeet - M.P. ; Francesco Sorbara ; ; humberleacommunitygroup@gmail.com ; ; ; Mayor Chow ; W5@ctv.ca ; ; ; newstips@thestar.ca ; doug.fordco@pc.ola.org ; hcminister.ministresc ; mhaminister.ministresmd@hc-sc.gc.ca ; piac.ward04@tdsb.on.ca ; office@timothycs.com ; piac.ward01@tdsb.on.ca judy.sgro.a1@parl.gc.ca ; Meneses, Albert (Sgro, Judy A. - MP) ; Calderan, Amy (Sgro, Judy A. - MP) ; ; judy.sgro@parl.gc.ca ; Councillor Crisanti ; Councillor Holyday ; Councillor Morley ; Councillor Perks ; Councillor Nunziata ; Councillor Pasternak ; Councillor Colle8 ; Councillor Malik ; Councillor Saxe ; Councillor Matlow ; Councillor Moise ; Councillor Fletcher ; Councillor Chernos Lin ; Councillor Burnside ; Councillor Carroll ; Councillor Cheng ; Councillor Bradford ; Councillor Kandavel ; Councillor Thompson ; Councillor Mantas ; Councillor Myers ; Councillor McKelvie ; ; Councillor Ainslie ; Mark.Carney@parl.gc.ca ; Crystia.Freeland@parl.gc.ca ; Kamal.Khera@parl.gc.ca ; Fabio Ovettini
**Subject:** RE: Level of Concern for Airplane Noise Is A Joke

Hi
Thank you for communication with our office.
Please advise if you are available to speak with today. If so he is available to give you a call between 12:30 and 12:45pm. Please confirm as soon as possible and I will schedule this for him.
Best Regards,

**From:**
**Sent:** April 2, 2025 6:52 PM
**To:**
**Cc:** judy.sgro@parl.gc.ca; Tom Rakocevic Minister of Transport / Ministre des Transports (TC) ; ZZG-Community Engagement ; Anand, Anita - M.P. ; Anand, Anita - M.P. ; ; aara.saks@parl.gc.ca; mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; eric.costen@hc-sc.gc.ca; greg.orencsak@hc-sc.gc.ca; pierre.poilievre@parl.gc.ca; Singh, Jagmeet - M.P. ; Francesco Sorbara ; humberleacommunitygroup@gmail.com; Mayor Chow ; Councillor Perruzza ; W5@ctv.ca; newstips@thestar.ca; doug.fordco@pc.ola.org; hcminister.ministresc ; mhaminister.ministresmd@hc-sc.gc.ca; piac.ward04@tdsb.on.ca; office@timothycs.com; piac.ward01@tdsb.on.ca; judy.sgro.a1@parl.gc.ca; Meneses, Albert (Sgro, Judy A. - MP) ; Calderan, Amy (Sgro, Judy A. - MP) ; judy.sgro@parl.gc.ca; Councillor Crisanti ; Councillor Holyday ; Councillor Morley ; Councillor Perks ; Councillor Nunziata ; Councillor Pasternak ; Councillor Colle8 ; Councillor Malik ; Councillor Saxe ; Councillor Matlow ; Councillor Moise ; Councillor Fletcher ; Councillor Chernos Lin ; Councillor Burnside ; Councillor Carroll ; Councillor Cheng ; Councillor Bradford ; Councillor Kandavel ; Councillor Thompson ; Councillor Mantas ; Councillor Myers ; Councillor McKelvie ; Councillor Ainslie ; Mark.Carney@parl.gc.ca; Crystia.Freeland@parl.gc.ca; Kamal.Khera@parl.gc.ca; Fabio Ovettini
**Subject:** [External Sender] Level of Concern for Airplane Noise Is A Joke
https://www.youtube.com/live/qcCA3kb0QkY

Board of Health - April 1, 2025 - YouTube

Board of Health, meeting 23, April 1, 2025Agenda and background materials:https://secure.toronto.ca/council/#/committees/2564/25805

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www.youtube.com

Hello [redacted]

I sent you an email yesterday after the Minister of Health meeting, asking if you could plan a meeting to discuss airplane noise. I received a quick email reply from your office stating no and indicating that it is a federal matter. I called your office after receiving the email but was unable to speak to anyone, so I left a message requesting a callback. An hour later, I called again and managed to speak with someone. I asked if I could talk to Jessica, who sent the email, but I was told she was at City Hall and unavailable. I requested that someone please call me back to discuss the matter, but I did not receive a reply from you or your office today.

I have dealt with Liberal MP Judy Sgro for Humber River - Black Creek regarding airplane noise for the past few years, with little success in reducing the airplane traffic in my community. From our first meeting, MP Judy Sgro informed us that she lived in the city many years ago and learned to live with the plane noise, expecting us to do the same. She never suggested actions we could take at that meeting, such as creating a petition for her to present in the House of Commons. Given her long tenure as an MP, she should have been aware that we could have initiated a petition at that time. A couple of years later, a petition was created to save the Marian Shrine of Gratitude, we asked MP Judy Sgro if those affected by airplane noise in Humber River - Black Creek could create a petition for the airplane noise. It wasn't easy for our community to organize this petition due to misunderstandings between her office and us, which caused months of delay. I am not sure how this petition is progressing now because no one updates us on it.

I informed MP Judy Sgro that many residents were unaware of how to file a noise complaint with Pearson Airport, but her level of concern was low. She ignored my requests to help distribute instructions to the community for many months. I asked Robyn Connelly of the GTAA and Pearson Airport if they could mail letters with instructions on instructions on how to file noise complaints, but each time, she declined. MP Judy Sgro was aware of these discussions. Fabio Ovettini and I took it upon ourselves to make people aware of how to file complaints in the community , leading to an increase noise complaints filed with Pearson Airport. After complaints rose significantly, MP Judy Sgro finally decided to inform the community about how to file noise complaints, and now she seems to take credit for the increase in the complaint numbers. Federal Liberal MP Judy Sgro has not spoken to me in months now regarding the airplane noise, and it is disappointing to have her as my MP for Humber River - Black Creek. A staff member of hers once advised me that I should be nicer to MP Judy Sgro if I want her to do anything for me. Yes, I will bow down and kiss her feet. I no longer wish to deal with Liberal MP Judy Sgro, as it is clear that neither she nor her office views airplane noise as a problem.

Previous Federal Liberal Ministers of Transport, including Omar Alghabra, Pablo Rodriguez, and most recently Anita Anand, have completely dismissed the airplane noise issue. Omar Alghabra ignored a letter from MP Judy Sgro regarding airplane noise in her riding, and she did not demand a response from him. Pablo Rodriguez had someone from his office inform us that he was busy with other matters and suggested we seek help from other levels of government. I informed you and Tom of this in a conversation we had. Most recently, Anita Anand claimed that the federal government had nothing to do with air traffic and that we needed to deal with the GTAA and Toronto Pearson Airport directly. Fabio explained to her that the federal government is responsible, but she did not respond to him. Chrystia Freeland is now the new Federal Liberal Minister of Transport, and while she has received several emails regarding this issue, she has not replied to any of us I do not believe.

The meeting at City Hall yesterday highlighted the frustrations of many residents in Toronto regarding various types of noise. Fabio Ovettini spoke up about airplane noise, which likely would not have been discussed otherwise. I was unaware of this meeting until the day before, and it would have been helpful if you had informed us, given your position on the Health Committee and your knowledge of what we are living with here. I do apologize if you did send me information about this meeting. Do you remember the day you visited St. Simons School and expressed alarm upon hearing the noise from large jets overhead? In yesterday's meeting, you acknowledged the plane noise as a problem but stated there was nothing you could do about it "zilch." Many times, planes fly every 45 seconds, making it difficult to have conversations with neighbours in the summer, invite friends over to sit outside, or sleep at night. Your level of concern about airplane noise seems low, and it appears you believe it is not an issue for you to address because you have no authority over it. We have seen your office take some action here, and I am sure you can do more if we twist your arm, but it seems you choose not to. Just look at the children at St. Simons who cannot talk to one another during recess due to the noise from the planes. They can not open the windows in class because of the noise from the planes...thank God for air conditioning.

Ida Li Preti asked Michael Finkelstein, a board of health member, what residents affected by airplane noise should do, and he stated it was a federal issue, then suggested we contact Peel Region, saying it was out of his jurisdiction, but the plane noise is here. It seems to me that no one wants to deal with this issue because the GTAA is powerful, and no one wants to upset this organization because they have lots of money.

As a city councillor, why don't you work on fixing the city bylaws to address noise problems? To identified the problem of City bylaws yesterday. I am sure you can arrange a meeting to discuss the airplane noise and have Judy and Tom there as well. You understand that some nights, residents in your riding cannot sleep, yet you seem okay with it because you have convinced yourself that there is nothing you can do to help us out. I have a medical condition that you are aware of that makes my life difficult for me if I do not get a proper night sleep, as there is a very real possibility of having an epileptic seizure if I don't. I know this to be true now. The noise from planes affects my sleep on many nights. My life changed significantly after I had my first seizure at work at 32 years old. I went to school and had a good job and was well paid and had been promoted a couple of times where I was a supervisor, but my employer considered me a health risk after my seizures and ultimately found a way to terminate me. I lose my drivers license for six months after each seizure I have. Try not driving your car for six months and see if your life becomes more difficult. It is crucial now for me to sleep at night and I am more aware of this now that I am older, and the noise from the planes is no joke - how you made sound effects of a plane; planes at night make it difficult for me and others to sleep properly and it is no joke!

The federal government has given the GTAA and Pearson Airport the authority to operate as they please. Deborah Flint, the GTAA's CEO, was hired with the agenda to increase air traffic to Pearson Airport. The GTAA and Pearson Airport seem unconcerned about those who struggle to sleep at night or enjoy their lives in their own homes. Our highways are continually congested now because of the increase air traffic. Pierre Poilievre spoke up about it and said it was a concern that we should take seriously. Maybe Michael Finkelstein can speak about the pollution created from continual congested highways because it falls under his jurisdiction and not Peel Region.

I have lived in my house my entire life, and the airplane noise has never been this bad in recent years. I truly believe that the GTAA and Pearson Airport need to take more responsibility for addressing the airplane noise issue. Robyn Connelly of the GTAA told me that the planes will get busier and that there is nothing I or others can do about it—that is just the way it is going to be.

I understand the frustration of the man from yesterday's meeting who spoke about his noise issue. He said he has been doing everything possible, yet no one is doing anything to fix the problem. There are delays and more delays. It is terrible!

Listening to you speak yesterday and not receiving a callback today reminded me a lot of how Mammoliti handled the Fiera Foods noise issue in our neighbourhood. I really do not understand why we have different levels of government if none of them take any responsibility to help out.

Sincerely,

[redacted]

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**From:** [redacted]
**Sent:** April 1, 2025 2:24 PM
**To:** [redacted]
**Subject:** RE: Airplane Noise

Hi [redacted]

As this issue is regulated Federally our office is unable to host a meeting to discuss this in depth at this time. Given the Federal nature of this issue, if we were to call a meeting our Municipal staff do not have the jurisdiction to speak to the matter.

[redacted] will continue to advocate for effected Ward 7 residents such as yourself when given the opportunities on the Municipal level as he sympathizes strongly with you all and is hopeful that the Federal government will properly address this issue.

We will continue to work with you all through this. My colleague [redacted] has adopted the file from [redacted] and is keen on pursuing a resolution.

Best Regards,

[redacted]

**From:** [redacted]
**Sent:** April 1, 2025 1:59 PM
**To:** [redacted]
**Cc:** [redacted] Fabio Ovettini ; humberleacommunitygroup@gmail.com; [redacted]
**Subject:** [External Sender] Airplane Noise

Hello [redacted]

Would it be possible to arrange a meeting with residents of Humber River - Black Creek who are affected by airplane noise to discuss this issue of concern?

It was a good meeting today and thank you for speaking up about the noise that this neighbourhood receives.

Take care,

[redacted]

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ERG No.: 0245.03.408.001
Contract No.: EP-D-07-097

# Historical Assessment of Aircraft Landing and Take-off Emissions (1986 - 2008)

Prepared by:

Eastern Research Group
1600 Perimeter Park Drive
Morrisville, North Carolina 27560

Under Contract to:

E.H. Pechan & Associates, Inc.
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For Submittal to:

U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Assessment and Standards Division
2000 Traverwood Drive
Ann Arbor, MI 48105

May 2011

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# EXECUTIVE SUMMARY

## Background

Historically, the U.S. Environmental Protection Agency (EPA) has worked with the Federal Aviation Administration (FAA) and the International Civil Aviation Organization (ICAO) in developing emission provisions for aircraft operating in U.S. air space. Under this approach, ICAO has proposed international provisions, and subsequently EPA has initiated Clean Air Act rulemakings to establish domestic standards that are at least as stringent as ICAO's provisions. In 1981, ICAO adopted provisions for emission of oxides of nitrogen ($NO_x$), hydrocarbons (HC), carbon monoxide (CO), and smoke; these standards went into effect in 1986.[1] ICAO developed more stringent $NO_x$ provisions in 1992, 1998, and 2004, which went into effect in 1996, 2004, and 2008, respectively. The EPA promulgated similar emission standards in 1982 for HC, and in 1997 for $NO_x$ and CO. In 2005, EPA promulgated additional $NO_x$ emission limits. Currently, the EPA is conducting a rulemaking to adopt standards equivalent to the latest ICAO $NO_x$ provisions. Note that these standards are designed to address emissions during landing and take–off (LTO) cycles.

## Purpose of this Study

The EPA is assessing the impact these past standards have had on reducing emissions from commercial aircraft. In order to evaluate the long term impact of these standards, the EPA is evaluating aircraft engine emissions associated with LTO cycles for the period from 1986 through 2008. An LTO cycle includes: the approach below 3,000 feet, the landing, taxi to and from the terminal, take-off and climb-out to 3,000 feet. The EPA commissioned this project to compile appropriate activity and aircraft characteristics data and to develop the emission inventories for each year of the study period. Pollutants included in this assessment are: $NO_x$, Volatile Organic Compounds (VOC), CO, particulate matter (PM) and fine particulate matter ($PM_{2.5}$), oxides of sulfur (as $SO_2$), carbon dioxide ($CO_2$), and hazardous air pollutants (HAP) emissions as defined in Section 112(b)1 of the Clean Air Act.

## Scope of this Study

This study provides a comprehensive look at changes in annual $NO_x$ inventories for aircraft operations in the United States for subsonic aircraft using engines covered by the provisions of ICAO's Committee on Aviation Environmental Protection (CAEP). Engines covered by the ICAO gaseous emissions provisions, specifically include jet engines with outputs (or thrust) greater than 26.7 kN.

This study covers the period 1986-2008 and includes domestic and foreign flagged carriers. Emissions were calculated at both the national level and for 42 non-attainment areas that had significant commercial air traffic. There were 201 airports in these non-attainment areas; Appendix H includes a complete list of nonattainement areas and airports included in this

[1] The first ICAO emission standards went into effect in 1986, and thus, the first year of this analysis is 1986. Smoke standards apply to engines independent of engine size. It should be noted that smoke is outside the scope of this study.



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assessment. Emissions were also normalized by LTO level (kgs of pollutant/LTO), to assess how the fleet is performing from year-to-year, independent of changes in activity. The developed emission trends were evaluated relative to the years when the ICAO provisions were implemented to try to discern associated changes in emissions (total kgs) or emission rates (kg/LTO). Fleet-wide averages were also developed for each year to assess relative changes in engine pressure ratios and thrust output to evaluate changes in fleet engine performance over time. This was done because the provisions and level of emissions depends on these parameters (or is a function of these parameters) in some cases.

Additional studies were included in this project to more accurately estimate emissions for 2008, such as: an inventory of emission estimates for auxiliary power units (APUs), emission estimates for aircraft not included in the T-100 data such as non-air carrier operations for air taxis and general aviation, and an assessment of non-commercial (non-air carrier) activities that use aircraft equipped with engines covered by the ICAO gaseous emissions provisions, but not reported in the T-100 dataset.

**Results**

As shown in Figure E-1, total U.S. LTOs for aircraft with engines covered by the ICAO provisions for gaseous emissions[2] increased approximately 50 percent between 1986 and 2008, and the LTO $NO_x$ emissions inventory increased approximately 28 percent during that same timeframe. And the $NO_x$ emissions per LTO decreased by 11 percent. This analysis indicates that when operations activity, aircraft fleet population, accessions, retirements, and fleet mix changes are accounted for, growth in the level of $NO_x$ emission was less than that of LTOs. However, even with technology improvements and more stringent provisions for $NO_x$ emissions, this analysis also shows that there has been no net reduction in the LTO $NO_x$ inventory over this period of time.

[2] Engines covered by the ICAO standards have rated output (or thrust) greater than 26.7 kN.



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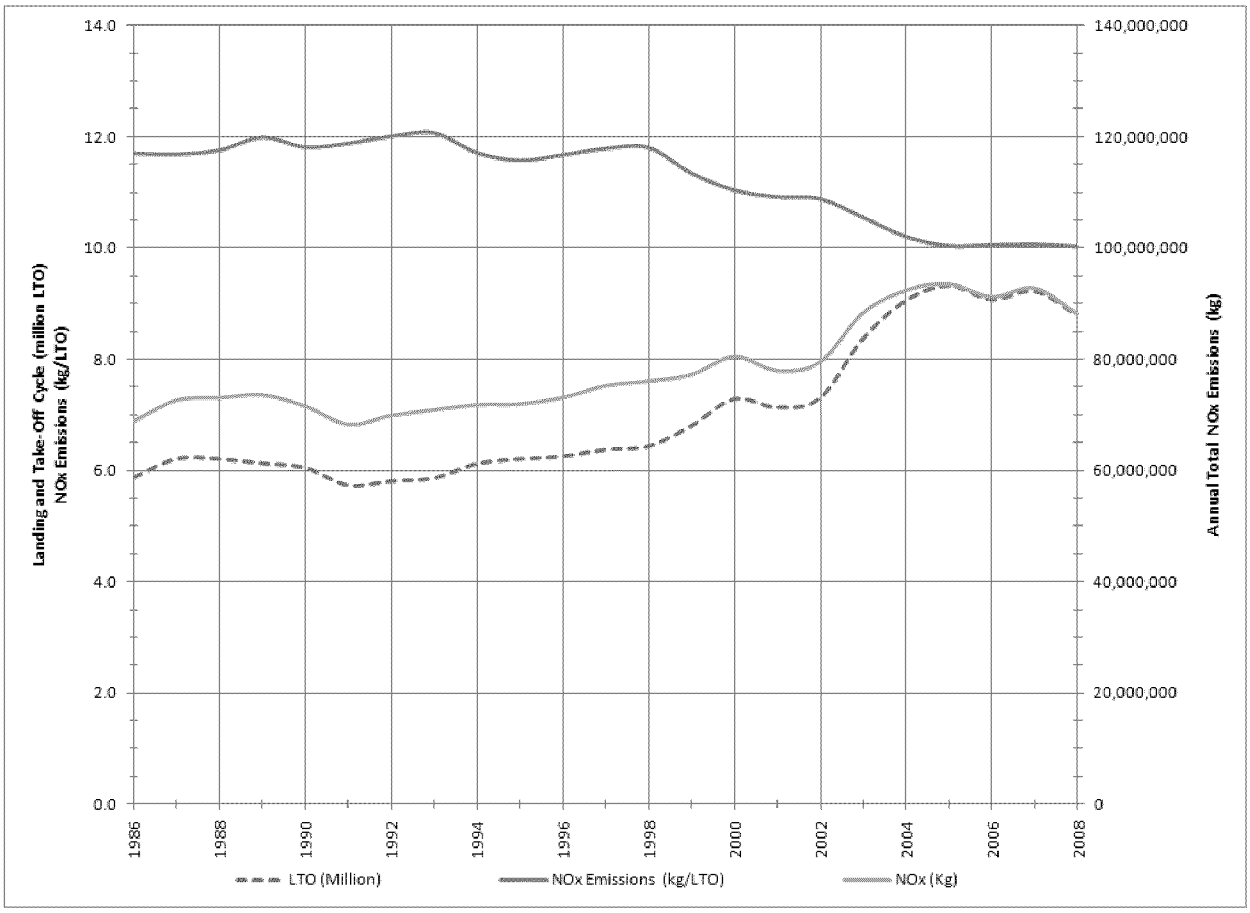


**Figure E-1. National LTOs (million) and $NO_x$ Emissions (kg/LTO and kg) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Total Fleet**

Changes in the fleet (for aircraft with engines covered by the ICAO provisions for gaseous emissions) were also evaluated for different aircraft types. Figure E-2 shows that the increase in LTOs was caused almost exclusively by a dramatic increase in regional jet activity. Since 1986, LTOs from regional jets increased from 500,000 per year to over 3 million per year in 2008, while those from the traditional wide- and narrow-body aircraft were relatively unchanged. For the purpose of this study, regional aircraft are defined as aircraft with a seat count less than 100 passenger seats.



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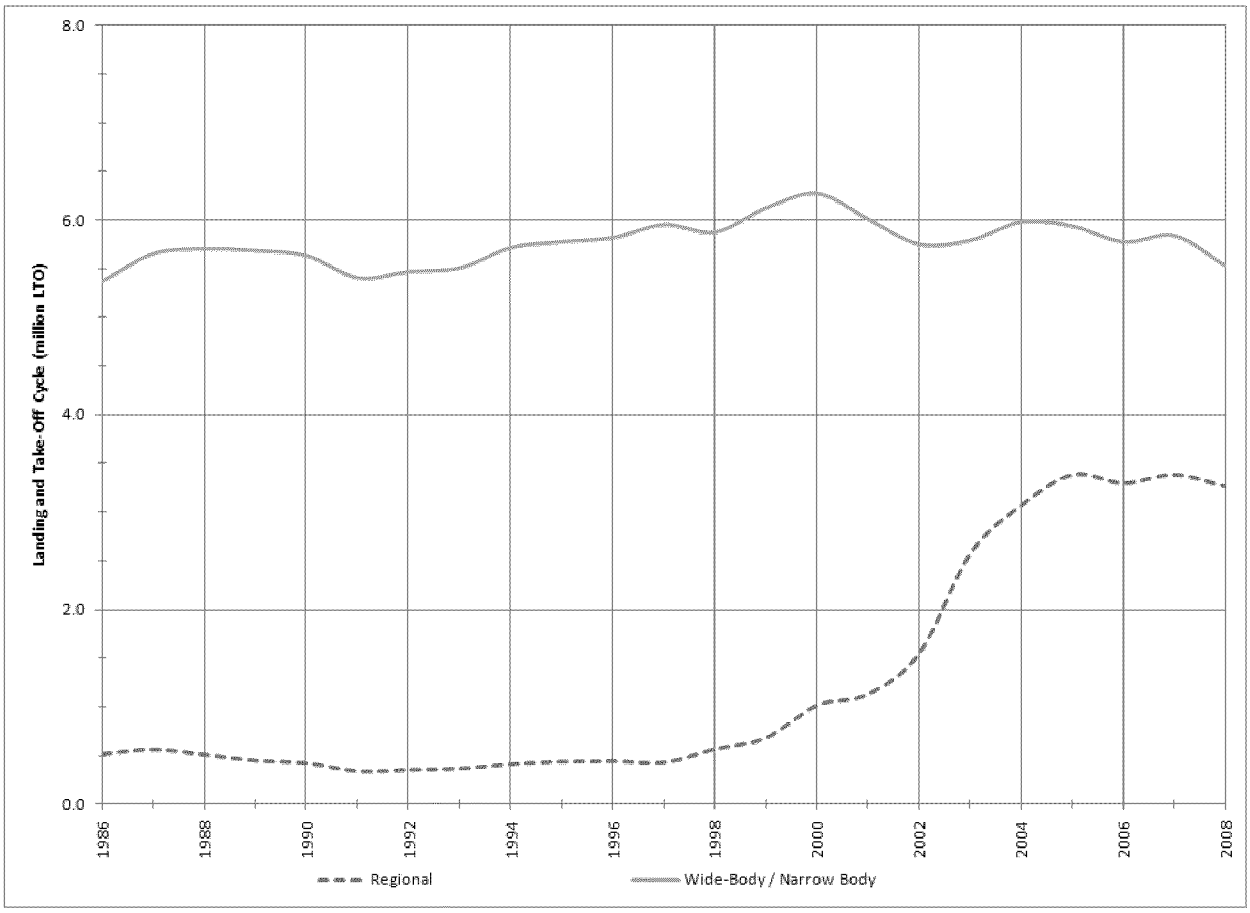


**Figure E-2. National LTOs (million) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type**

The information shown in Figure E-2 may suggest that this increase in the LTO $NO_x$ inventory is caused primarily by regional jet activity, since $NO_x$ emissions from wide-/narrow-body aircraft have presumably decreased as a result of the technology response to the ICAO provisions. This also might be anticipated because wide-/narrow-body LTOs were nearly unchanged over the study period. However, Figure E-3 shows the opposite to be true for $NO_x$ emission. Over the study period, the LTO $NO_x$ emissions inventory for traditional wide-/narrow-body aircraft increased by 13 percent.

Also, on a kg $NO_x$/LTO basis, Figure E-4 shows that traditional wide-/narrow-body aircraft emissions increased by 9 percent, while emissions from regional jets decreased by 32 percent. The cause of this increase is not obvious.



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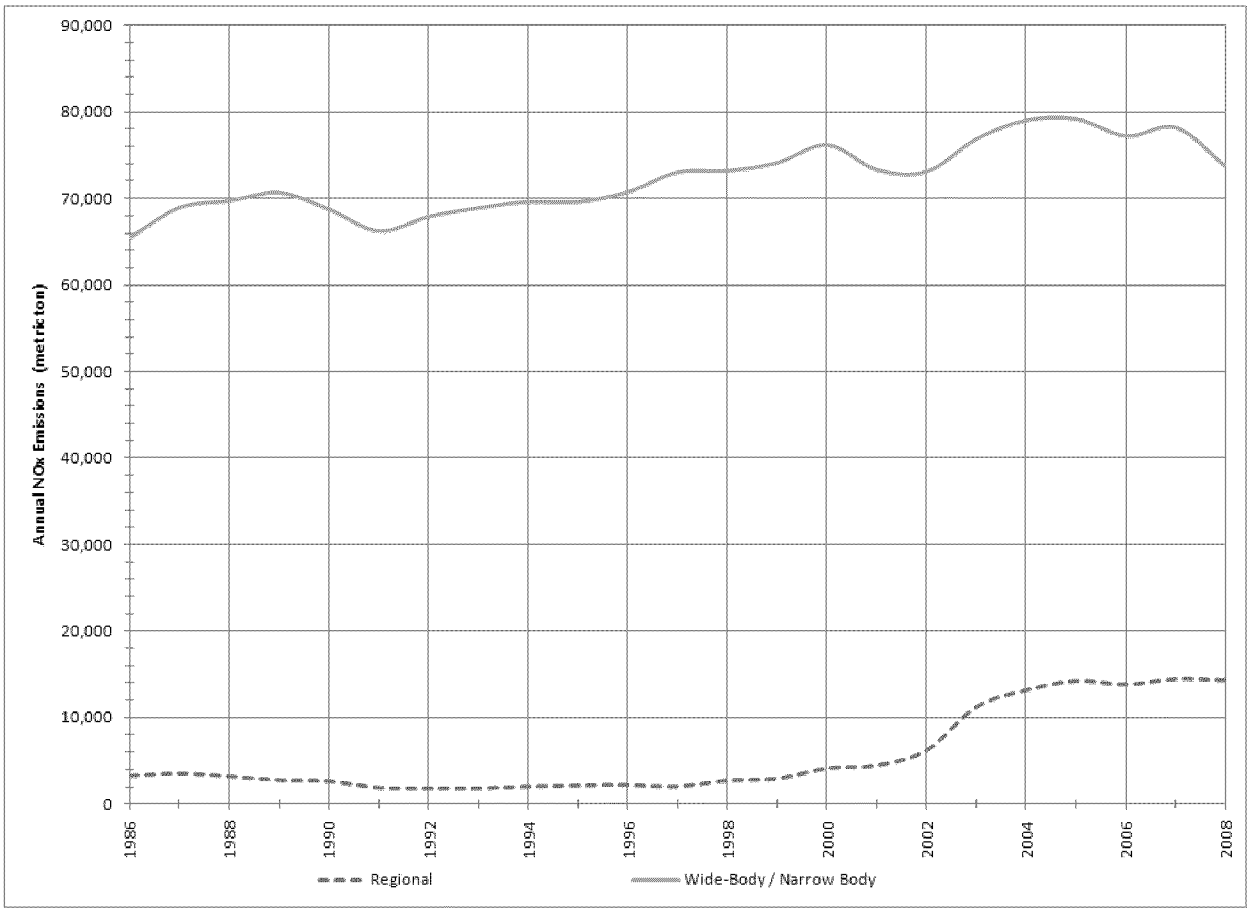


**Figure E-3. National $NO_x$ Emissions (metric ton) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type**



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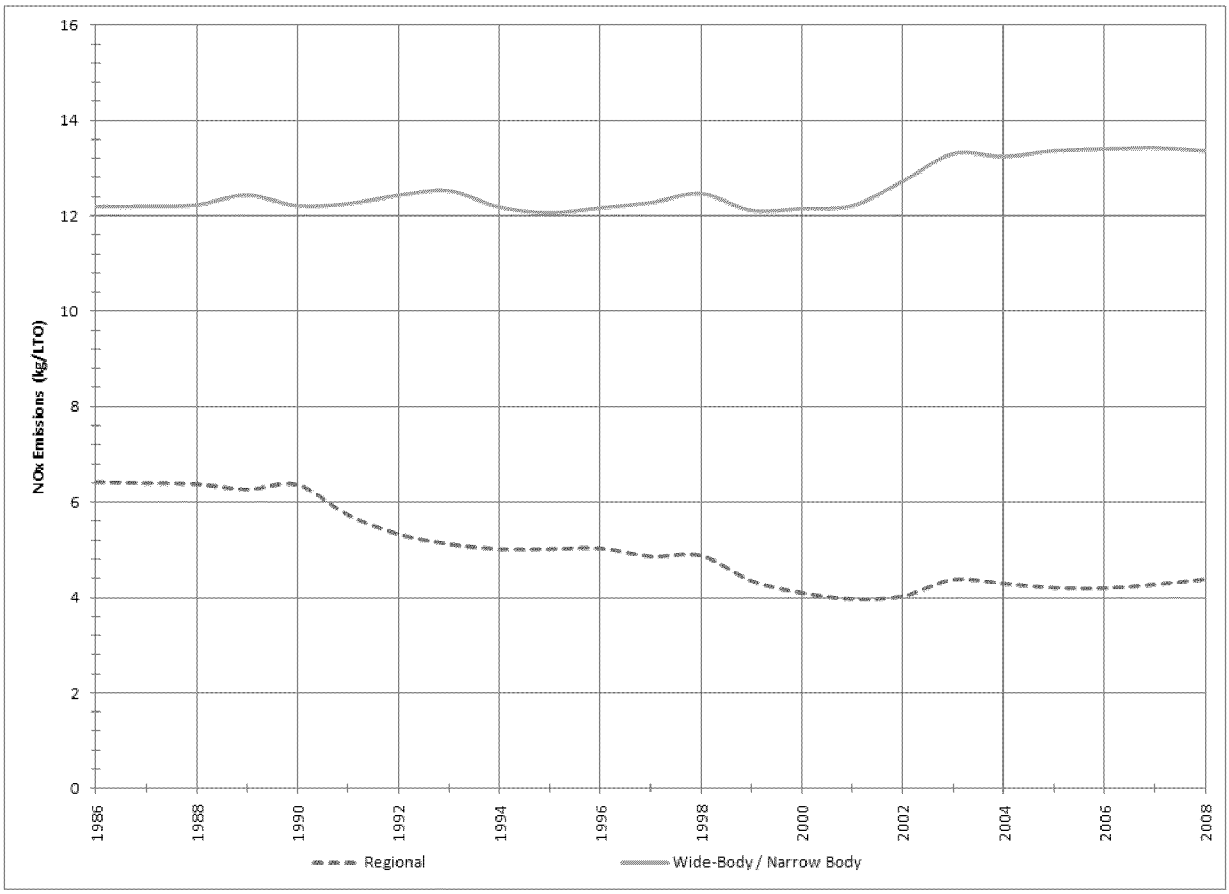


**Figure E-4. National Average $NO_x$ Emissions (kg/LTO) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type**

Efforts to improve the fuel efficiency of engines that power the wide- and narrow-body aircraft fleet seem to result in some degradation in $NO_x$ emissions reduction performance, which may not have been fully anticipated and appreciated years ago when the $NO_x$ standards were set. This degradation (or $NO_x$ increase) is consistent with the increase in engine compressor pressure ratios over time. Higher pressures increase the air temperature entering the combustion chamber, increasing combustion temperatures with a concomitant rise in $NO_x$ emissions.

The relaxed slope of the Pressure Ratio (PR) versus Dp/Foo[3] line for PRs over 30 have made new $NO_x$ standards less challenging and the use of derivatives have allowed throttle push versions of certified engine models to continue production under previous standards. Furthermore, the less stringent requirement for engines under 89kN thrust, and the lack of production cut-off could have all, to varying degrees, contributed to the loss in effectiveness of the provisions for $NO_x$ emissions in reducing LTO $NO_x$ emission inventories in the U.S.

To put into perspective the emissions associated with aircraft equipped with engines covered by ICAO gaseous emissions provisions, it was necessary to develop a complete inventory of aircraft emissions that included smaller aircraft in the air taxi and general aviation categories, equipped with turbofan engines that have a thrust less than or equal to 26.7 kilonewtons. The T-100 data were therefore supplemented with operations data obtained

[3] The mass, in grams (Dp), of $NO_x$ emitted during the LTO cycle, divided by the rated output (Foo) of the engine.



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from the FAA's Terminal Area Forecast (TAF) [4] and airport master plan (5010) data[5] obtained from the 2008 aircraft portion of the National Emission Inventory, which was split into piston and jet powered aircraft using data from the FAA's 2008 General Aviation and Air Taxi Activity (GAATA) Survey[6]. The TAF and 5010 data were also adjusted to account for duplicates in the T-100 data, mostly for the air taxi category, but air carrier data were also evaluated. This was done by summing the T-100 data by aircraft type (i.e., air carriers and air taxis) as defined by the FAA and included in the aircraft crosswalk table developed for this project (see Appendix G). The aggregated T-100 data were compared with the TAF and 5010 data for individual airports. Where the LTOs in TAF and 5010 were equal to or less than those reported in the T-100 data, only the T-100 data were used. Where the LTOs in the TAF and 5010 data were greater than the T-100 values, the T-100 LTOs were subtracted from the TAF and 5010 values to avoid double counting.

The TAF and 5010 operations data are not provided by aircraft make and model, but are summarized in terms of aircraft types. In order to estimate emissions for these general aircraft types, generic criteria and HAP emission factors used in the EPA's National Emission Inventory[7] were applied to the adjusted TAF and 5010 LTO data to estimate airport specific emissions.

It is noted that some of the aircraft included in the TAF and 5010 data are equipped with engines covered by ICAO gaseous emissions provisions, but are not included in the T-100 dataset because they are not involved directly in commercial air carrier activities. In this study, these are referred to as non-air carrier aircraft equipped with engines covered by ICAO provisions. As noted above, the TAF and 5010 data do not differentiate aircraft make/model and engine configuration, therefore it was necessary to quantify the makeup of the fleet of non-air carrier aircraft covered by ICAO provisions using FAA aircraft registration data. Aircraft that could be identified as being part of the commercial air carrier fleet, charter fleet or licensed to a broker were identified and removed from the registry dataset. Based on the registration data, if the aircraft was equipped with an engine that had a thrust rating greater than 27.6 kN, then it was retained in the non-air carrier aircraft covered by ICAO provisions dataset. Since the FAA aircraft registry data does not quantify annual operations, these aircraft were assumed to have a level of activity similar to other aircraft involved in general aviation based on the 2008 GAATA survey. This LTO activity level was assigned to each aircraft included in the dataset of non-air carrier aircraft equipped with engines covered by ICAO provisions and applied to Emissions and Dispersion Modeling System (EDMS)[8] to estimate national 2008 emissions. Note that using the aircraft registration data it is not possible to identify where these non-air carrier aircraft operate. Therefore, only national estimates could be developed.

To avoid double counting of the aircraft in the dataset of non-air carrier aircraft equipped with engines covered by ICAO provisions with the TAF and 5010 data, it was necessary to exclude these aircraft LTOs from the TAF and 5010 data and those remaining LTOs represent

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[4] The Terminal Area Forecast (TAF) system is the official forecast of aviation activity at FAA facilities. http://aspm.faa.gov/main/taf.asp

[5] FAA's Office of Air Traffic provides a complete listing of operational airport facilities in the National Airspace System Resources (NASR) database. An electronic report can be generated from the NASR database and is available for download from the internet at the following web site: http:// www.faa.gov/airports_airtraffic/airports/airport_safety/airportdata_5010/. This database is updated every 56 days.

[6] http://www.faa.gov/data_research/aviation_data_statistics/general_aviation/CY2008/

[7] http://www.epa.gov/ttn/chief/net/nei08_alm_popup.html

[8] http://www.faa.gov/about/office_org/headquarters_offices/apl/research/models/edms_model/



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activity levels for aircraft that are not equipped with engines covered by ICAO gaseous emissions provisions. Table E-1 summarizes results for aircraft relative to the ICAO status (i.e., ICAO or Non-ICAO) of the engines associated with the aircraft, also noting the data source (i.e., T-100, TAF/5010, or aircraft registration data).

**Table E-1. Summary of 2008 National Aircraft Activity and Emissions Data for Turbofan and Turboprop Aircraft by ICAO Provision**

| Source | Operational Type | Regulated | LTO | $NO_X$ (kg) | VOC (kg) | CO (kg) | $PM_{10}$ (kg) | $PM_{2.5}$ (kg) | $SO_2$ |
|---|---|---|---|---|---|---|---|---|---|
| T100 | AC | ICAO | 6,354,778 | 77,756,251 | 9,019,675 | 52,370,174 | 1,032,172 | 1,032,172 | 7,784,761 |
| T100 | AT | ICAO | 2,431,408 | 10,315,077 | 2,063,428 | 10,419,912 | 228,701 | 228,701 | 1,247,253 |
| Aircraft Registry [(b)] | GA | ICAO | 563,472 | 5,110,719 | 3,484,480 | 7,038,627 | 197,625 | 197,625 | 563,924 |
| T100 | AT | non ICAO | 1,231,925 | 732,963 | 988,339.48 | 5,800,159 | (a) | (a) | 155,297 |
| 5010/TAF | AT | non ICAO | 2,641,969 | 929,174 | 1,205,643 | 4,327,450 | 723,017 | 705,520 | 194,720 |
| 5010/TAF | GA | non ICAO | 11,242,286 | 1,650,911 | 2,785,050 | 48,837,110 | 1,207,032 | 1,177,822 | 374,667 |
| T100 | APU | non ICAO | 8,892,776 | 2,577,545 | 284,544 | 3,693,825 | 414,601 | 414,601 | 401,838 |
| | | **Total** | | **99,072,640** | **19,831,158** | **132,487,258** | **3,803,160** | **2,124,018** | **10,722,461** |

(a) Although EDMS has a method to estimate PM emissions from ICAO certified engines, coverage for non-ICAO certified engines was too incomplete to provide an emission estimate at this time.
(b) Emissions for Non-air carrier Aircraft Covered by ICAO Provisions were calculated from the FAA's Aircraft Registry. This information is presented in Appendix I.
(c) AC = air carrier, AT = air taxi, GA = general aviation, and APU = auxiliary power unit

In conclusion, this study shows that at the national level air carrier aircraft and air taxis equipped with engines that are subject to the ICAO provisions as reported in the T-100 dataset accounted for 89 percent of aircraft $NO_x$ emissions. When non-commercial air carriers equipped with engines that are covered by the ICAO provisions are also considered, 94 percent of $NO_x$ emissions are accounted for. Much of the remaining aircraft $NO_x$ emissions (2.6 percent) are attributed to auxiliary power units (APUs), which are not affected by ICAO provisions. This study also indicates that improvements in emission rates were mostly driven by changes in fleet operations that utilized more regional jets.

Emissions by nonattainment areas generally followed the national trends, but some locations varied significantly reflecting changes in local fleet operations, such as the opening or expansion of new freight handling facilities or the realignment of air carrier service hubs.



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# 1.0 INTRODUCTION

Historically, the U.S. EPA has worked with the FAA and the ICAO in developing emission standards for aircraft with FAA type certificates, operating in U.S. air space. Under this approach international provisions have first been adopted by ICAO, and subsequently EPA has initiated Clean Air Act (CAA) rulemakings to establish domestic standards that are at least as stringent as ICAO's provisions.

In 1981, ICAO adopted emission provisions for $NO_x$, HC, CO, and smoke; these provisions went into effect in 1986. ICAO developed more stringent $NO_x$ provisions in 1992, 1998, and 2004, which went into effect in 1996, 2004, and 2008, respectively. The EPA promulgated similar emission standards in 1982 for HC, and in 1997 for $NO_x$ and CO. In 2005, EPA promulgated additional $NO_x$ emission limits. Currently, the EPA is conducting a rulemaking to adopt the last two rounds of ICAO $NO_x$ provisions. [9]

For this project, the EPA is assessing the impact these past EPA standards have had on reducing emissions from commercial aircraft. In order to evaluate the long term impact of these standards, the EPA is evaluating aircraft engine emissions associated with LTO cycles for the period from 1986 through 2008. An LTO cycle includes the approach below 3,000 feet altitude, the landing, taxi to and from the terminal, take-off and climb-out to 3,000 feet.

The EPA commissioned this project to compile appropriate activity and aircraft characteristics data and to develop the emission inventories for each year of the study period. Pollutants included in this assessment are: $NO_x$, VOC, CO, particulate matter (PM) and fine particulate matter ($PM_{2.5}$), oxides of sulfur (as $SO_2$), carbon dioxide ($CO_2$), and hazardous air pollutants (HAP) emissions. Note the HAPs included in this study are limited to those noted in Section 112(b)1 of the Clean Air Act. It should also be noted that aircraft do not emit all 188 HAPs noted in the act. The fuel sulfur content used in this study was 0.068 percent (680 ppm,1.292 g/Kg of fuel) to be consistent with the FAA agreed upon First Order Approximation (FOA) 3a methodology used for PM emissions modeling.

This assessment includes domestic and foreign flagged carriers. Emissions were calculated at both the national level and for 42 non-attainment areas that had significant commercial air traffic. Emissions were also normalized by LTO level (kgs of pollutant/LTO), to assess how the fleet is performing from year-to-year, independent of changes in activity. The developed emission trends were evaluated relative to the years when the ICAO provisions were implemented to try to discern associated changes in emissions (total kgs) or emission rates (kg/LTO). Fleet-wide averages were also developed for each year to assess relative changes in engine pressure ratios and thrust output to evaluate changes in fleet engine performance over time. This was done because the provisions and level of emissions depends on these parameters (or is a function of these parameters) in some cases.

Section 2 of this report summarizes the methodologies used to develop input files for the FAA's EDMS. Note that EDMS version 5.1.1 was used for the national assessment and EDMS

[9] ICAO's Committee on Aviation Environmental Protection adopted the last two rounds of $NO_x$ standards at their 6th meeting in 2004 and 8th meeting in 2010.



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version 5.1.2 was used for the non-attainment assessment. FAA staff indicated that the upgrade to version 5.1.2 did not affect engine or fleet emission calculation methodologies and only improved reporting output files for the FAA's Voluntary Airport Low Emissions Program (VALE). Section 2 also discusses how non-T-100 data were used to estimate emissions for remainder of the fleet not represented in the T-100 data in order to have a complete estimate of aircraft emissions.

Section 3 of this report presents and discusses output of the EDMS model for the national assessment and the non-attainment area assessment. Output from the model was processed to allow easy comparison between years and aircraft types (i.e., regional, narrow-body, and wide-body), engine types (i.e., turbofan and turboprop), engine configurations (i.e., two-, three-, and four- engine aircraft), and ICAO certification status (i.e., certified or non-certified for ICAO gaseous emissions provisions). This study focuses on aircraft equipped with engines covered by ICAO gaseous emissions provisions and where the T-100 data document activity of aircraft equipped with non-ICAO engines (e.g. turbo props or jets with output (or thrust) less than 26.7 kN), these aircraft were identified in this study and their data handled separately. EDMS output included in Section 3 includes emissions from both propulsion engines and auxiliary power units (APUs). Section 3 also includes emission estimates for aircraft activities not included in the T-100 data set such as estimates derived from the FAA's Terminal Area Forecast (TAF) and 5010 Master Plan data. The TAF and 5010 Master Plan data would include aircraft equipped with engines covered by ICAO gaseous emissions provisions as well as those not covered by ICAO provisions.



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# 2.0 METHODOLOGY

In order for the EPA to accurately assess the impact of the ICAO engine provisions, ERG developed a dataset of aircraft activity for the entire country and for selected non-attainment areas for each inventory year using the Department of Transportation (DOT) Bureau of Transportation Statistics (BTS) Air Carrier Statistics database, also known as the T-100 [10] data provided to the project by Database Products. This BTS dataset contains data on domestic market, domestic segment, international market, international segment, combined domestic and international market, and combined domestic and international segment data by certificated U.S. air carriers. Pursuant to 14 CFR Part 217 and Part 241, data are collected by the Office of Airline Information (OAI) within the BTS on the Form 41, Schedule T-100—U.S. Air Carrier Traffic and Capacity Data By Nonstop Segment and On-flight Market and Form 41, Schedule T-100(f)—Foreign Air Carrier Traffic and Capacity Data by Nonstop Segment and On-flight Market. Large, certificated air carriers, small certificated air carriers, and commuter air carriers are required to complete Form 41. The Form 41 requirements are tiered based on the carriers' annual operating revenue. The reporting groups are as follows:

- Group III - over $1 billion in annual operating revenues
- Group II - from $100,000,001 to $1 billion in annual operating revenues
- Group I Over - from $20,000,001 to $100,000,000 in annual operating revenues
- Group I Under - $20,000,000 or less in annual operating revenues

All carriers submit monthly segment and market traffic data and quarterly enplanement and operations statistics. Aircraft that do not generate operating revenue do not trigger the above reporting requirements and are therefore excluded from the T-100 data.

Because the T-100 data extend back to only 1990, the EPA provided comparable aircraft activity data by airport for the years 1986 through 1989 for domestic traffic.[11] Activity data for foreign flagged carriers were unavailable prior to 1990. To account for foreign flagged activity from 1986 through 1989, LTOs were backcast using the average LTOs growth factors derived from the period 1990-1993, for which foreign flagged data were available. The data used for backcasting are provided in Appendix A.

## 2.1 National-level Approach for Aircraft Equipped with Engines Covered by ICAO Provisions and Included in the T-100 Dataset

The T-100 data provide LTO counts associated with specific aircraft based on the manufacturer and airframe model. The T-100 data for the study period includes a total of 242 aircraft models. Each aircraft model reported in the T-100 dataset has a unique identification code (A/C code). For this project ERG used the FAA's EDMS [12] model to calculate emissions. The EDMS data files include 539 aircraft models, each with its own unique identification code

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[10] www.bts.gov/programs/statistical_policy_and_research/source_and_accuracy_compendium/form41_schedule.html

[11] EPA obtained the 1986 through 1989 T-100 data from Database Products.

[12] http://www.faa.gov/about/office_org/headquarters_offices/aep/models/edms_model/



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(ACCODE). To link the T-100 activity data to the aircraft models in EDMS, ERG created a crosswalk based on information obtained from aircraft manufacturers, airlines, Jane's *Aircraft Recognition Guide*, Aviation Week *Source Book*, and on-line data sources. The crosswalk is provided in Appendix G of this report. The T-100 data does not include engine type.

### 2.1.1 *Engine Assignment*

To calculate emissions using EDMS, both the airframe model and engine must be identified and matched to data in EDMS. To help match aircraft to their associated engines, the EPA provided ERG with Ascend fleet inventories for each year of the study period. The Ascend Online Fleets Database[13] is a privately owned database that contains details on individual aircraft in the global fleet including information such as aircraft serial number and engine make and model. Because many aircraft can be equipped with different engine models, the Ascend data were used to assign engines used on a specific aircraft model for each inventory year.

For example, the U.S. fleet includes Boeing 737-300 series aircraft, which can be equipped with three different CFM International engine models: the CFM56-3-B1 and CFM56-3-B2, which were originally introduced in 1986, and CFM56-3-C1, which was introduced in 1997 (as shown in Table 2-1). These respective CFM engines have different fuel consumption rates, emission rates, pressure ratios, and thrust derived from data obtained from individual engine datasheets, contained in ICAO databank,[14] as noted in Table 2-2. As illustrated in Table 2-2, variance in the emission rates between the different engines associated with a given aircraft make and model can be significant.

[13] www.ascendworldwide.com
[14] http://www.caa.co.uk/default.aspx?catid=702

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**Table 2-1. Distribution of Engine Models for the Ascend Database– Boeing 737-300**

| Year | Number of Planes in Service | CFM 56-3-B1 (UID: 2CM004) | CFM 56-3-B2 (UID: ICM005) | CFM 56-3-C1 (UID: 1CM007) |
|---|---|---|---|---|
| 1986 | 130 | 76% | 24% | |
| 1987 | 291 | 76% | 24% | |
| 1988 | 291 | 76% | 24% | |
| 1989 | 336 | 69% | 31% | |
| 1990 | 376 | 62% | 38% | |
| 1991 | 378 | 61% | 39% | |
| 1992 | 385 | 62% | 38% | |
| 1993 | 416 | 65% | 35% | |
| 1994 | 437 | 67% | 33% | |
| 1995 | 470 | 69% | 31% | |
| 1996 | 496 | 69% | 31% | |
| 1997 | 515 | 69% | 30% | 1% |
| 1998 | 527 | 67% | 31% | 2% |
| 1999 | 534 | 66% | 15% | 19% |
| 2000 | 539 | 63% | 16% | 21% |
| 2001 | 524 | 63% | 16% | 21% |
| 2002 | 504 | 63% | 15% | 22% |
| 2003 | 49 | 63% | 17% | 20% |
| 2004 | 481 | 64% | 16% | 20% |
| 2005 | 409 | 69% | 14% | 18% |
| 2006 | 378 | 66% | 14% | 20% |

**Table 2-2. ICAO Aircraft Engine Emissions Data Bank**

| Engine Make/Model | Rated Output (kN) | $NO_x$ Emissions During LTO Cycle (g) | Fuel Usage During LTO Cycle (kg) | $NO_x$ Emissions Per Unit Output (g/kN) | Pressure Ratio |
|---|---|---|---|---|---|
| CFM 56-3-B1 | 89 | 3,595 | 392 | 40.2 | 22.6 |
| CFM 56-3-B2 | 98 | 4,213 | 421 | 42.9 | 24.3 |
| CFM 56-3-C1 | 105 | 4,810 | 448 | 46.0 | 25.2 |

As aircraft models and engines changed over time, the engine assignment for an aircraft model was reassigned when another engine became the dominant engine. The engine assignment and modeling had some limitations. First, the Ascend data do not include either the airframe identification codes used by either T-100 data or the EDMS model. Second, EDMS does not include all combinations of airframe model and engine. If EDMS did not include the most popular engines, then the next most popular engine was used and so on until a match was made with the engines in EDMS. If none of the engines matched the engines reported in the Ascend database and comparable engines could not be identified, then an engine in EDMS with similar thrust characteristics was used. However, this default engine matching was a rare event.

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The limitations discussed above resulted in a small percentage of airframe model and engine combinations that could not be matched in EDMS. Approximately 97 percent of aircraft LTOs were matched, the exact percentage varied from year-to-year as noted in Appendix B. The remaining aircraft that could not be matched tended to be smaller or older aircraft associated with a relatively small number of LTOs. The emission inventory impact of these missing aircraft were accounted for in the national estimates by applying the aggregated LTO emission factors reported in Appendix C to the total amount of LTOs not matched for each inventory year.

### 2.1.2 *Improved Accuracy for High Activity Aircraft*

In initial EDMS modeling runs, Ascend data were used to quantify the most popular engines for each inventory year. As aircraft models and engines changed over time, it was determined that the accuracy of EDMS emissions estimates (and pressure ratio and thrust characterizations) could be improved by using the Ascend engine distribution for a given aircraft model. However, the level of resources required to quantify all engine options for all 242 aircraft models for each year of the study period was not warranted because the variance between the engine options was not always significant. Thus, this data improvement effort was targeted at high-activity aircraft.

In developing the improved Ascend engine distribution in the fleet, this project focused on the top 10 high-activity aircraft for each year, including domestic and foreign operations. The high-activity aircraft were identified based on total annual LTOs for each year. The top 10 high-activity aircraft varied over the period of the study and as a result, 47 aircraft were identified as high-activity for domestic and foreign operations. These 47 aircraft, listed in Appendix D, represent approximately 80 percent of the fleet activity, in terms of LTO cycles each year.

LTOs cycles were distributed across existing EDMS engines in a manner consistent with the Ascend engine distribution producing weighted emissions. However, not all high-activity aircraft received this LTO distribution, only those that met the following criteria:

1. The aircraft model must account for greater than four percent of the total annual LTOs.
2. The variance of the $NO_x$ emission factor associated with the different aircraft engine options must be greater than 10 percent in any year.
3. The aircraft must be equipped with an engine covered by ICAO provisions.

These criteria were evaluated for each year and for domestic and international operations separately. Of the 40 high-activity aircraft, 27 met the criteria, accounting for approximately 75 percent of annual fleet activity in terms of LTO cycles. Aircraft that did not meet these criteria, or that were not considered to be high activity aircraft, used the approach described in Section 2.1.1 to make airframe engine assignments. Table 2.3 presents the 27 high-activity aircraft selected for accuracy improvement with the maximum $NO_x$ variance between engines modeled in domestic and international use.



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**Table 2-3. Compiled High-Activity Aircraft**

| 27 High-Activity Aircraft[a] | | | | | |
|---|---|---|---|---|---|
| Airframe | Max. $NO_x$ Variance | | Airframe | Max. $NO_x$ Variance | |
| | Domestic | Int'l | | Domestic | Int'l |
| Airbus Industrie A319 | 87% | 87% | Boeing 747-200/300 | | 94% |
| Airbus Industrie A320-100/200 | 209% | 129% | Boeing 747-400 | | 133% |
| Airbus Industrie A330-200 | | 43% | Boeing 757-200 | 82% | |
| Airbus Industrie A340-200 | | 39% | Boeing 767-200/ER/EM | | 74% |
| Boeing 727-100/C/Qc | 112% | | Boeing 767-300/300ER | | 193% |
| Boeing 727-200/231A | 71% | 86% | Boeing 777-200/200LR/233LR | | 80% |
| Boeing 737-100/200 | 39% | 39% | Embraer-145 | 26% | |
| Boeing 737-300 | 34% | | McDonnell Douglas DC-9-10 | 48% | |
| Boeing 737-400 | 14% | | McDonnell Douglas DC-9-30 | 39% | 39% |
| Boeing 737-5/600LR | 34% | | McDonnell Douglas DC-9-50 | 16% | |
| Boeing 737-700/700LR | 74% | 106% | McDonnell Douglas DC-10-30 | | 13% |
| Boeing 737-800 | 41% | | McDonnell Douglas DC-9 Super 80/MD81/2/3/7/8 | 20% | 45% |
| Boeing 747-100 | | 80% | McDonnell Douglas MD-11 | | 25% |
| Boeing 747F | | 69% | | | |

[a] Each of these high-activity aircraft met the following criteria in at least one year of the study period: 1) the aircraft model accounted for more than 4% of the total annual LTOs. 2) the variance of the NOx emission factor, associated with the different aircraft engine options, was greater than 10%, and 3) the aircraft was equipped with an engine covered by ICAO provisions.

The weighted emissions approach assumes that all aircraft of the same model and series have similar types of operations and utilization rates. Summary data used to develop the weighted emission factors are presented in Appendix E. Although this approach is a refinement over using a single engine to estimate aircraft model emissions, it may not be representative of the fleet profile at an individual airport. Additionally, this approach does not specifically account for high-emitter aircraft that have low LTOs. Such aircraft are not considered a high-activity aircraft, but may have a significant impact on air quality because they are equipped with older engines that may emit more pollutants.



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To evaluate this approach's degree of improvement upon emission estimates, the weighted $NO_x$ emission factors were compared to the $NO_x$ emission factor associated with the most popular engine; these data are presented in Appendix C. The $NO_x$ difference ranged from zero to 33 percent, with the largest differences noted for the domestic Airbus 320-100/200 (209 percent in 2000). In 2000, according to Ascend, six of the 233 operational Airbus 320 aircraft were equipped with a United Technologies PW4168A, whose $NO_x$ emission rate 13.9 kg/LTO is much higher than dominate engine used at the time (i.e., 5.4 kg/LTO International Aero Engine V2527-A5). See Appendix D for details on engine $NO_x$ emission variance.

The first set of input files created for the EDMS run were developed to provide national emission estimates that did not differentiate between airports. For this analysis, all annual activity was aggregated by aircraft make and model and processed at a hypothetical airport based on FAA default values. This approach allowed the mixing height, temperature, and the taxi time-in-modes to be held constant (taxi in and out times for each aircraft were set at 7 and 9 minutes respectively (16 minutes total, which was the default value used in the EPA's National Emission Inventory)). Note that all EDMS modeling used the performance mode, which varies aircraft approach and take-off and climb-out modes according to an individual aircraft design and engine characteristics.

Emissions were developed for both aircraft equipped with and without engines covered by ICAO gaseous emissions provisions. ICAO provisions do not cover gaseous emissions from aircraft with turbofan engines less than or equal to 26.7 kilonewtons of thrust or turboprop and piston-engines.[15]

This study is an investigation into annual $NO_x$ inventories for commercial aircraft covered by the provisions of ICAO, therefore the aircraft equipped engines not covered by ICAO were removed from the dataset and handled separately. Emissions associated with engines not covered by ICAO gaseous emissions provisions were developed using the EDMS model and embedded assumptions such as mixing height and individual aircraft-engine modes as described above.

Output from EDMS was grouped into appropriate aircraft categories for further evaluation. These aircraft categories roughly match general industry groupings. Initially aircraft were split into narrow- and wide-body categories. Narrow-body aircraft were assumed to have single aisle configuration in the passenger compartment (e.g., Airbus A319 and Boeing 737-300), while wide-body aircraft were assumed to have a dual aisle configuration (e.g., Boeing 767-300 and McDonnell Douglas DC-10-30). Aircraft were further grouped into those equipped with two, three, and four engines. Given the growth in regional aircraft activities, a separate group was developed of regional jet aircraft equipped with two engines and having less than 100 passenger seats (e.g., Canadair RJ-700 and Embraer-145). All categories were further disaggregated into aircraft equipped with engines covered by and not covered by ICAO provisions. Also aircraft equipped with turbo props were separated from aircraft equipped with turbofan engines. The T-100 data did not include any piston driven aircraft. Piston engines are

[15] As stated earlier, emissions were calculated for engines found on aircraft in the T-100 database which did not include aircraft equipped with piston engines.

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common to small general aviation aircraft. General aviation does not generate revenue from their activities and are therefore excluded from T-100; their activities are captured by TAF and 5010 data. Emissions from aircraft equipped with piston engines are discussed in Section 2.4.

Note that use of a single (hypothetical) airport approach will provide a useful estimate of national emissions, which was considered appropriate to evaluate the performance that the ICAO provisions have had over the study period. Actual aircraft and emissions at individual airports may not follow national trends and may be significantly different than the national average. To investigate trends on a smaller scale, historical emissions for airports in a select number of non-attainment areas were also developed and are discussed in the next section.

## 2.2 Non-attainment Area Approach for Aircraft Equipped with Engines Covered by ICAO Provisions and Included in the T-100 Dataset

Commercial service aircraft emissions inventories were analyzed for criteria pollutant non-attainment areas (NAA) where airports had either: 1) high commercial service, 2) large human population nearby, or 3) high percent aircraft emission relative to the total inventory, leading to a list of 42 NAA, as listed in Table 2-4. Collectively these 42 NAAs include 201 airports that account for 73 percent of commercial air traffic as reported in the T-100 data set and are included in the project data files associated with this project. A list of airports in each identified NAA are provided in Appendix H.

**Table 2-4. List of Non-attainment Areas Included[a]**

| State | Non-attainment Area Name |
|---|---|
| AK | Anchorage |
| AZ | Phoenix-Mesa |
| CA | Lake Tahoe South Shore |
| CA | Los Angeles South Coast Air Basin |
| CA | Riverside Co. |
| CA | Sacramento Metro |
| CA | San Diego |
| CA | San Francisco-Oakland-San Jose |
| CA | San Joaquin Valley |
| CO | Aspen |
| CO | Denver-Boulder-Greeley-Ft Collins-Love |
| CT | Greater Connecticut; Hartford-New Britain-Middletown |
| DC-MD-VA | Washington |
| GA | Atlanta |
| IL-IN | Chicago-Gary-Lake County |



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**Table 2-4. List of Non-attainment Areas Included[a] (Cont.)**

| State | Non-attainment Area Name |
|---|---|
| IN | Indianapolis |
| KY-IN | Louisville |
| MD | Baltimore |
| MA | Boston-Lawrence-Worcester |
| MI | Detroit-Ann Arbor |
| MN | Minneapolis-St. Paul |
| MO-IL | St. Louis |
| NC-SC | Charlotte-Gastonia-Rock Hill |
| NC | Raleigh-Durham-Chapel Hill |
| NH | Boston-Manchester-Portsmouth; Manchester |
| NM | Albuquerque |
| NV | Las Vegas; Clark County |
| NV | Reno; Washoe County |
| NY-NJ-CT | New York City |
| NY | Syracuse |
| OH-KY-IN | Cincinnati-Hamilton |
| OH | Cleveland-Akron-Lorain |
| PA-NY-MD-DE | Philadelphia-Wilmington-Atlantic City |
| PA | Pittsburgh-Beaver Valley |
| RI | Providence (All RI) |
| TN-AR | Memphis |
| TX | Dallas-Fort Worth |
| TX | El Paso |
| TX | Houston-Galveston-Brazoria |
| UT | Salt Lake City |
| WA | Seattle-Tacoma |
| WI | Milwaukee-Racine |

[a] Please note that the non-attainment status of areas changes over time. This list represents a 2010 snapshot only for purposes of this report.

To estimate emissions for airports located in the 42 identified areas, input files were compiled and applied to the EDMS using the 2008 T-100 data. The approach used for the NAA portion of this study is slightly different from the national approach because taxi times collected for the Bureau of Transportation Statistics (BTS) online database TranStats[16] were used for each airport included in the selected NAAs. Departure and arrival performance data are available by airport from 1995 forward. For years prior to 1995, a national average of taxi times was used. The data show that taxi times were often higher than 16-minutes and varied year-to-year and airport-to-airport. As an example of the significant difference in taxi times, data for two airports is provided in Appendix F.

Except for the taxi time adjustment, the emission estimating procedures for each airport included in the non-attainment area were the same as that described for the national emission estimates.

[16] http://www.transtats.bts.gov/



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## 2.3 Assessment of Non-Commercial Aircraft in the TAF/5010 Dataset Equipped with Engines Covered by ICAO Provisions

Some of the aircraft equipped with engines covered by ICAO gaseous emissions provisions are included in the TAF and 5010 data and are not in the T-100 data since they are not directly involved in commercial air carrier activities. In this study, these aircraft are referred to as non-air carrier aircraft equipped with engines covered by ICAO provisions.

The TAF and 5010 data do not differentiate aircraft make/model and engine configuration, therefore it was necessary to quantify the makeup of the fleet of non-air carrier aircraft covered by ICAO provisions using 2008 FAA aircraft registration data. Aircraft that could be identified in the registration data as being part of the commercial air carrier fleet, charter fleet or licensed to a broker were removed from the dataset. Based on the registration data, if the aircraft was equipped with an engine that had a thrust rating greater than 27.6 kN, then it was retained in the non-air carrier aircraft covered by ICAO provisions dataset. Since the FAA aircraft registry data does not quantify annual operations, these aircraft were assumed to have a level of activity similar to other aircraft involved in general aviation based on the 2008 GAATA survey. This LTO activity level was assigned to each aircraft included in the dataset of non-air carrier aircraft equipped with engines covered by ICAO provisions and applied to EDMS to estimate national 2008 emissions. Note that using the aircraft registration data it is not possible to identify where these non-air carrier aircraft operate. Therefore, only national estimates could be developed.

To avoid double counting of the aircraft in the dataset of non-air carrier aircraft equipped with engines covered by ICAO provisions with the TAF and 5010 data, it was necessary to exclude these aircraft LTOs from the TAF and 5010 data and those remaining LTOs represent activity levels for aircraft that are not equipped with engines covered by ICAO gaseous emissions provisions.

The estimated census of these aircraft, their activity, fuel consumption and emissions are discussed in greater detail in Appendix I. This assessment quantified that emissions from these non-air carrier aircraft equipped with engines covered by ICAO provisions accounted for only two to four percent of total aircraft emissions (depending upon pollutant). These results are summarized in Table 3-20.

## 2.4 Aircraft Not Equipped with Engines Covered by ICAO Provisions (TAF/5010 Aircraft Activity

In order to develop a complete picture of aircraft activities and to put in perspective the emissions associated with aircraft equipped with engines that meet the ICAO gaseous emissions provisions, it was necessary to evaluate emissions of aircraft not equipped with engines covered by ICAO gaseous emissions provisions. To account for these aircraft, aviation traffic associated with smaller aircraft with turbofan engines that have a thrust less than or equal to 26.7 kilonewtons were evaluated. These aircraft are used in air taxi and general aviation applications and may not be included in the T-100 data. To account for these smaller jet powered aircraft, 2008 air taxi and general aviation LTOs were obtained from the 2008 aircraft component of the National Emission Inventory. That information was derived from the FAA's

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Terminal Area Forecast (TAF) and Airport Master Plan (5010) data and split into piston and jet powered aircraft using data from the FAA's GAATA.

The TAF and 5010 data for air carrier and air taxi operations were compared to the T-100 dataset to account for duplicates. This was done by summing the T-100 data by aircraft type as defined by the FAA and included in the aircraft crosswalk table developed for this project (see Appendix G) and comparing them with the TAF and 5010 data for individual airports. Where the LTOs in TAF and 5010 were equal to or less than those reported in the T-100 data, then the T-100 data were used. Where the LTOs in the TAF and 5010 data were greater than the T-100 values, the T-100 LTOs were subtracted from the TAF and 5010 values to avoid double counting.

The TAF and 5010 data are not provided by aircraft make and model, instead they are presented as activity in generic terms of aircraft types (e.g., air taxis and general aviation). In order to estimate emissions for these general categories, the generic emission factors for VOC, CO, $NO_x$, $PM_{10}$, $PM_{2.5}$ and $SO_x$ (as $SO_2$) were taken from the EPA's National Emission Inventory report [17]and applied to the adjusted TAF and 5010 LTO dataset described above.

## 2.5 Auxiliary Power Unit (APU)

APUs are small turbine engines that tend to be located in the back of the aircraft. APUs provide power for engine start up, but also generate energy for the cabin, ventilation, hydraulics and pre-flight system checks during periods when the main engines are not operating.

In EDMS each aircraft is matched with the appropriate APU. EDMS calculates APU emission estimates based on aircraft LTOs activities. These emission estimates were compiled from the EDMS output for the 2008 runs and are summarized at the national level in Table 3-16 and by non-attainment area in Table 3-17. In general, APU emissions account for roughly three percent of total aircraft emissions. This relatively small value is considered reasonable given the low power of the engines and the short period of time they operate. Note that a growing number of airports are reducing APU operations by providing gate power and ventilation to aircraft while docked at the terminals, this allows the APUs to be shut off during passenger boarding and departure of aircraft. This evaluation did not take into consideration these emission reduction measures, so actual emissions may be less.

[17] http://www.epa.gov/ttn/chief/net/nei08_alm_popup.html

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# 3.0 RESULTS

## 3.1 National-level Assessment Aircraft Equipped with ICAO Certified Engines Included in the T-100 Dataset

Over the study period, aircraft traffic varied from year-to-year, but there was a general increase in LTO activity of approximately 50 percent as shown in Table 3-1 and Figure 3-1. Over the study period, LTO fuel consumption increased by only 37%. At the national level, only $NO_x$ emissions increased significantly; increases in $NO_x$ emissions were not proportional to increases in LTOs for the study period: LTOs increased by 50 percent, while $NO_x$ emissions increased by 28 percent. Other pollutants decreased during the study period. The significant reductions in VOC, THC, and total organic gases (TOG) can likely be attributed to more complete combustion as engine efficiency improves.

**Table 3-1. National Activity (LTOs), Fuel Consumption, and Emissions for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset (metric ton)**

| Year | LTO | Fuel | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{2.5}$ [a] |
|---|---|---|---|---|---|---|---|---|---|
| 1986 | 5,874,316 | 6,816,452 | 74,353 | 29,613 | 34,061 | 34,240 | 68,754 | 8,807 | 2,504 |
| 1987 | 6,206,370 | 7,112,409 | 75,225 | 29,548 | 33,986 | 34,165 | 72,540 | 9,189 | 2,257 |
| 1988 | 6,202,985 | 7,054,137 | 74,057 | 28,311 | 32,563 | 32,734 | 72,967 | 9,114 | 2,222 |
| 1989 | 6,125,675 | 6,970,700 | 75,224 | 29,523 | 33,958 | 34,136 | 73,482 | 9,006 | 2,346 |
| 1990 | 6,045,322 | 6,673,942 | 67,379 | 23,835 | 27,415 | 27,559 | 71,438 | 8,623 | 1,961 |
| 1991 | 5,733,914 | 6,259,928 | 60,743 | 19,919 | 22,911 | 23,031 | 68,156 | 8,088 | 1,793 |
| 1992 | 5,808,380 | 6,328,411 | 61,655 | 20,202 | 23,236 | 23,358 | 69,777 | 8,176 | 1,823 |
| 1993 | 5,861,193 | 6,300,469 | 54,743 | 14,254 | 16,395 | 16,481 | 70,788 | 8,140 | 1,631 |
| 1994 | 6,119,188 | 6,461,585 | 61,664 | 18,272 | 21,016 | 21,127 | 71,700 | 8,348 | 1,770 |
| 1995 | 6,203,165 | 6,486,013 | 61,177 | 17,832 | 20,511 | 20,618 | 71,829 | 8,380 | 1,733 |
| 1996 | 6,251,732 | 6,528,713 | 61,870 | 17,480 | 20,106 | 20,212 | 73,000 | 8,435 | 1,727 |
| 1997 | 6,372,166 | 6,658,898 | 60,982 | 15,902 | 18,290 | 18,386 | 75,136 | 8,603 | 1,716 |
| 1998 | 6,432,611 | 6,654,759 | 60,404 | 14,819 | 17,044 | 17,134 | 75,968 | 8,598 | 1,669 |
| 1999 | 6,796,307 | 6,866,667 | 64,243 | 13,249 | 15,239 | 15,319 | 77,130 | 8,872 | 1,456 |
| 2000 | 7,281,089 | 7,087,654 | 63,062 | 10,335 | 11,888 | 11,950 | 80,401 | 9,157 | 1,324 |
| 2001 | 7,129,475 | 6,718,712 | 59,725 | 9,712 | 11,171 | 11,230 | 77,845 | 8,681 | 1,236 |
| 2002 | 7,294,559 | 6,587,966 | 58,166 | 8,721 | 10,031 | 10,084 | 79,401 | 8,512 | 1,173 |
| 2003 | 8,360,221 | 7,169,167 | 64,382 | 10,287 | 11,832 | 11,894 | 88,221 | 9,263 | 1,338 |
| 2004 | 9,045,669 | 7,463,913 | 65,632 | 10,153 | 11,678 | 11,739 | 92,290 | 9,643 | 1,354 |
| 2005 | 9,314,957 | 7,543,544 | 65,631 | 9,821 | 11,296 | 11,356 | 93,475 | 9,746 | 1,289 |
| 2006 | 9,067,032 | 7,303,603 | 62,877 | 9,207 | 10,590 | 10,646 | 91,120 | 9,436 | 1,214 |
| 2007 | 9,215,727 | 7,352,405 | 64,669 | 9,427 | 10,843 | 10,900 | 92,727 | 9,499 | 1,245 |
| 2008 | 8,786,186 | 6,990,724 | 62,790 | 9,636 | 11,083 | 11,141 | 88,071 | 9,032 | 1,261 |
| Change Over Period (%) | 50% | 3% | -16% | -67% | -67% | -67% | 28% | 3% | -50% |

Where LTO = landing and take-off, CO = carbon monoxide, THC = total hydrocarbon, VOC = volatile organic compounds, TOG = total organic gases, $NO_x$ = nitrogen oxide, $SO_x$ = sulfur dioxide, PM = particulate matter.
[a] EDMS calculates both $PM_{2.5}$ and $PM_{10}$, because these values are identical only $PM_{2.5}$ is shown.



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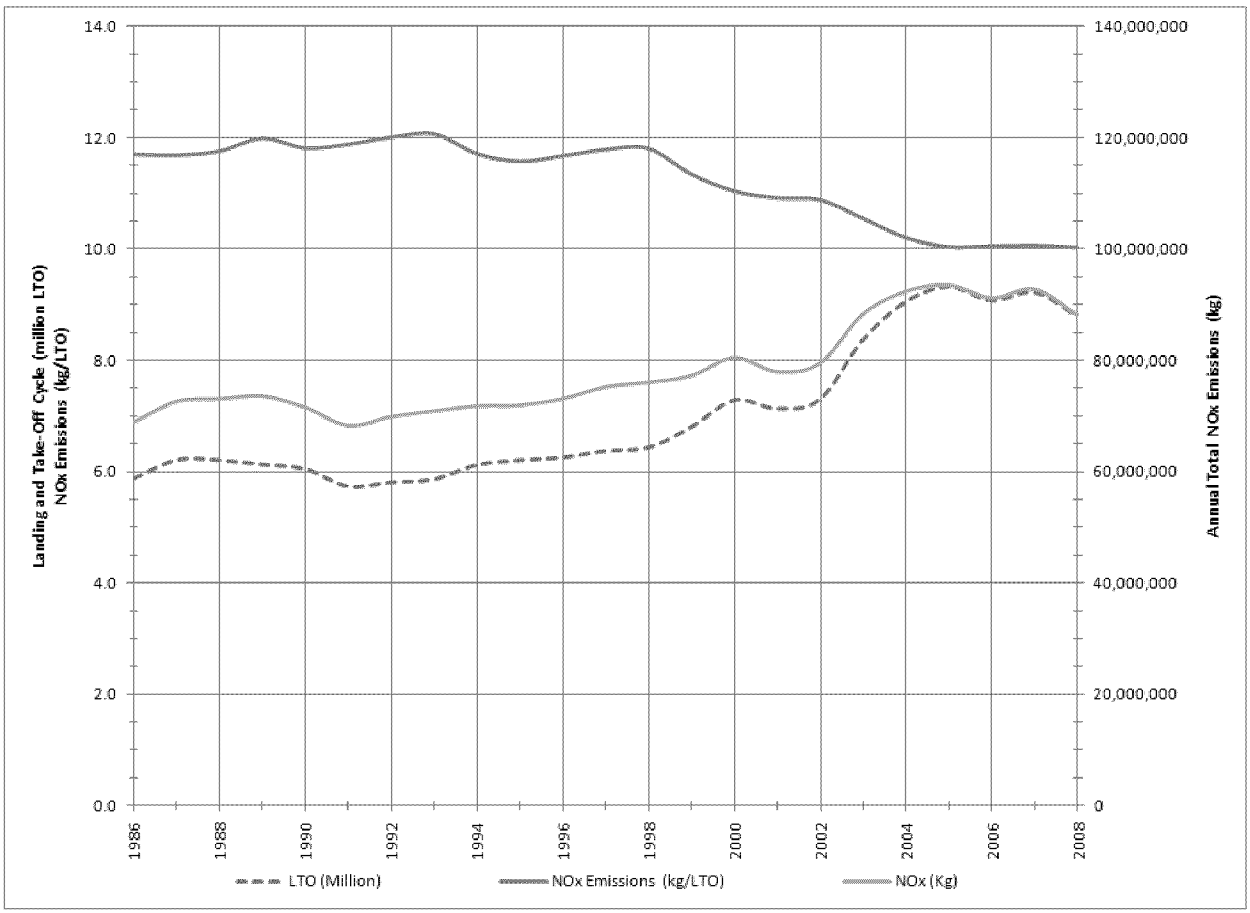


**Figure 3-1. National LTOs (million) and $NO_x$ Emissions (kg/LTO and kg) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Total Fleet**

## 3.2 Normalized Emissions and Fuel Consumption Data for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions Included in the T-100 Dataset

EDMS output was normalized in terms of LTOs and fuel consumption to assess aircraft emission changes—independent of changes in aircraft activity. Results show that in aggregate, normalized fuel consumption rates for LTOs have declined 31 percent over time for engines covered by ICAO gaseous emissions provisions (see Table 3-2 and Figure 3-2). All pollutant emission rates (per LTO) varied from year-to-year, generally declining over the study period, as shown in Table 3-2. For example, normalized $NO_x$ emissions remained relatively stable from 1986 to 1998 at around 12 kg per LTO as shown in Figure 3-1, which was followed by a gradual decline until 2005 when it held at 10 kg per LTO.



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**Table 3-2. National Average Fuel Consumption and Average Emissions Normalized with Respect to Activity (kg/LTO) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset**

| Year | Fuel | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{25}$ |
|---|---|---|---|---|---|---|---|---|
| 1986 | 1,160 | 12.7 | 5.04 | 5.80 | 5.83 | 11.70 | 1.50 | 0.43 |
| 1987 | 1,146 | 12.1 | 4.76 | 5.48 | 5.50 | 11.69 | 1.48 | 0.36 |
| 1988 | 1,137 | 11.9 | 4.56 | 5.25 | 5.28 | 11.76 | 1.47 | 0.36 |
| 1989 | 1,138 | 12.3 | 4.82 | 5.54 | 5.57 | 12.00 | 1.47 | 0.38 |
| 1990 | 1,104 | 11.1 | 3.94 | 4.53 | 4.56 | 11.82 | 1.43 | 0.32 |
| 1991 | 1,092 | 10.59 | 3.47 | 4.00 | 4.02 | 11.89 | 1.41 | 0.31 |
| 1992 | 1,090 | 10.61 | 3.48 | 4.00 | 4.02 | 12.01 | 1.41 | 0.31 |
| 1993 | 1,075 | 9.34 | 2.43 | 2.80 | 2.81 | 12.08 | 1.39 | 0.28 |
| 1994 | 1,056 | 10.08 | 2.99 | 3.43 | 3.45 | 11.72 | 1.36 | 0.29 |
| 1995 | 1,046 | 9.86 | 2.87 | 3.31 | 3.32 | 11.58 | 1.35 | 0.28 |
| 1996 | 1,044 | 9.90 | 2.80 | 3.22 | 3.23 | 11.68 | 1.35 | 0.28 |
| 1997 | 1,045 | 9.57 | 2.50 | 2.87 | 2.89 | 11.79 | 1.35 | 0.27 |
| 1998 | 1,035 | 9.39 | 2.30 | 2.65 | 2.66 | 11.81 | 1.34 | 0.26 |
| 1999 | 1,010 | 9.45 | 1.95 | 2.24 | 2.25 | 11.35 | 1.31 | 0.21 |
| 2000 | 973 | 8.66 | 1.42 | 1.63 | 1.64 | 11.04 | 1.26 | 0.18 |
| 2001 | 942 | 8.38 | 1.36 | 1.57 | 1.58 | 10.92 | 1.22 | 0.17 |
| 2002 | 903 | 7.97 | 1.20 | 1.38 | 1.38 | 10.88 | 1.17 | 0.16 |
| 2003 | 858 | 7.70 | 1.23 | 1.42 | 1.42 | 10.55 | 1.11 | 0.16 |
| 2004 | 825 | 7.26 | 1.12 | 1.29 | 1.30 | 10.20 | 1.07 | 0.15 |
| 2005 | 810 | 7.05 | 1.05 | 1.21 | 1.22 | 10.03 | 1.05 | 0.14 |
| 2006 | 806 | 6.93 | 1.02 | 1.17 | 1.17 | 10.05 | 1.04 | 0.13 |
| 2007 | 798 | 7.02 | 1.02 | 1.18 | 1.18 | 10.06 | 1.03 | 0.14 |
| 2008 | 796 | 7.15 | 1.10 | 1.26 | 1.27 | 10.02 | 1.03 | 0.14 |
| Change Over Period (%) | -31% | -44% | -78% | -78% | -78% | -14% | -31% | -66% |

EDMS calculates both $PM_{2.5}$ and $PM_{10}$, because these values are identical only $PM_{2.5}$ is shown.



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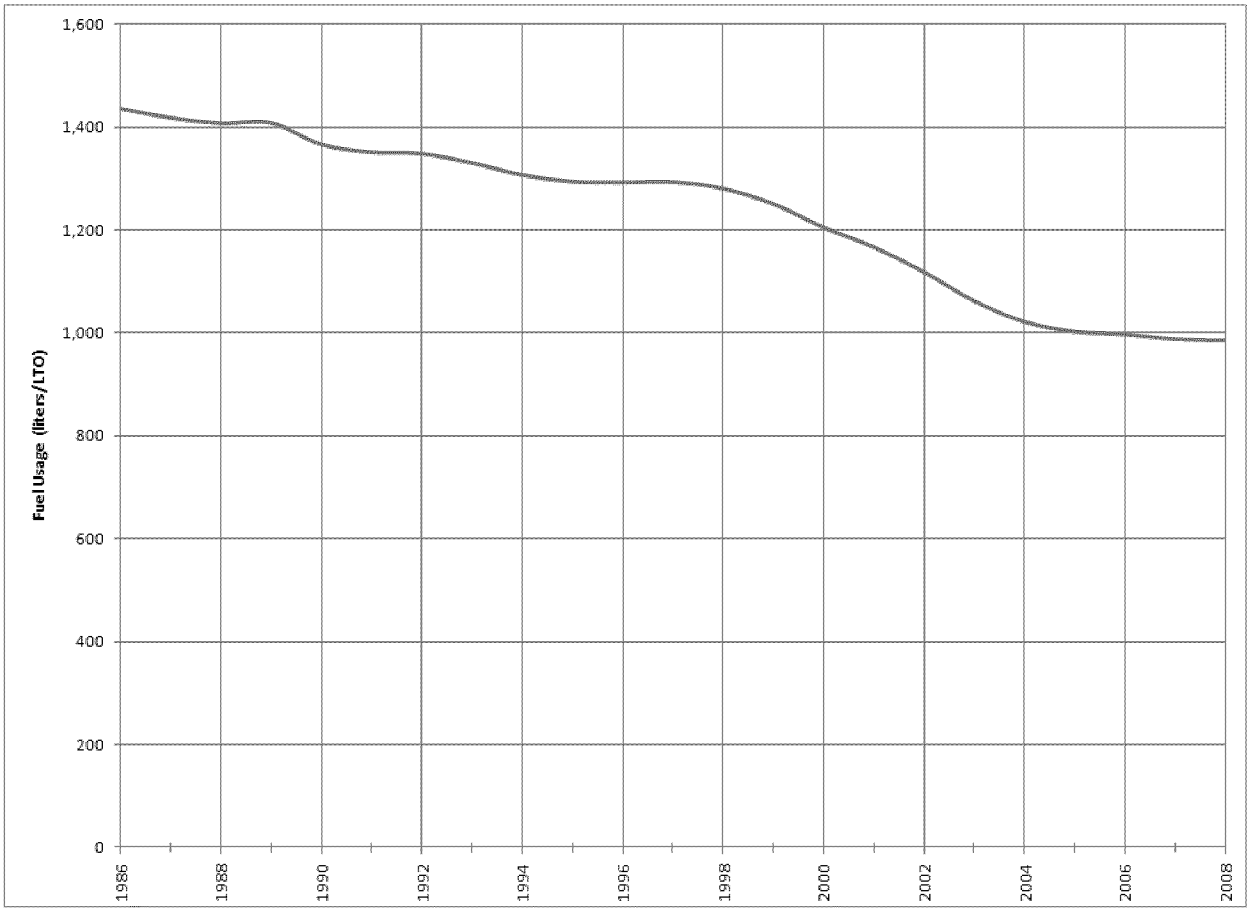


**Figure 3-2. National Average Fuel Consumption Normalized with Respect to Activity (liters/LTO) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Total Fleet**



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### 3.2.1 *Emissions and Fuel Consumption by Aircraft Categories for Commercial Aircraft Equipped with Engines Covered by the ICAO Provisions Included in the T-100 Dataset*

Total U.S. LTOs for aircraft with engines covered by the ICAO gaseous emissions provisions increased approximately 50 percent since 1986, while $NO_x$ emissions increased approximately 28 percent during that same timeframe (see Table 3-2 for other pollutant trends on a normalized basis). Figure 3-3 below shows the study period historical trends in annual $NO_x$ emissions, LTOs, and $NO_x$ emissions per LTO for commercial aircraft operations.

**LTO Activity, By Aircraft Group**

The impact of changes in the U.S. fleet on historical annual $NO_x$ emissions for commercial aircraft operations was further investigated. Because the emission estimates were developed for individual aircraft models, it was possible to assess whether the normalized emission trends noted in Table 3-2 occurred equally across all aircraft categories. In order to evaluate this question, LTO trends over time were evaluated for each aircraft category. As indicated in Figures 3-3 (high activity (greater than 1 million LTOs) commercial aircraft groups) and 3-4 (low activity (less than 1 million LTOs) commercial aircraft groups), activity between the different aircraft categories varied significantly over time.

Regional aircraft equipped with turbofan engines covered by ICAO gaseous emissions provisions increased from eight percent of annual LTOs in 1986 to 31 percent in 2008 as shown in Table 3-4. A significant increase in activity in 2001/2002 may be due to the fleet restructuring that occurred when air travel declined after September 2001. Regional aircraft equipped with turboprop engines (i.e., not covered by ICAO gaseous emissions provisions) had a relatively constant growth from 1986 to 1996 when they peaked at 19 percent of the LTOs. Figure 3-5 shows that LTOs associated with regional jets increased while those from the traditional wide- and narrow-body aircraft had modest increases over time.

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**Figure 3-3. National LTOs (million) for High Activity Commercial Aircraft, Included in the T-100 Dataset (Narrow-Body 2 Engine, Narrow-Body 3 Engine, Regional 2 Engine Turboprop, Regional 2 Engine Turbojet) [Refers to Table 3-3]**



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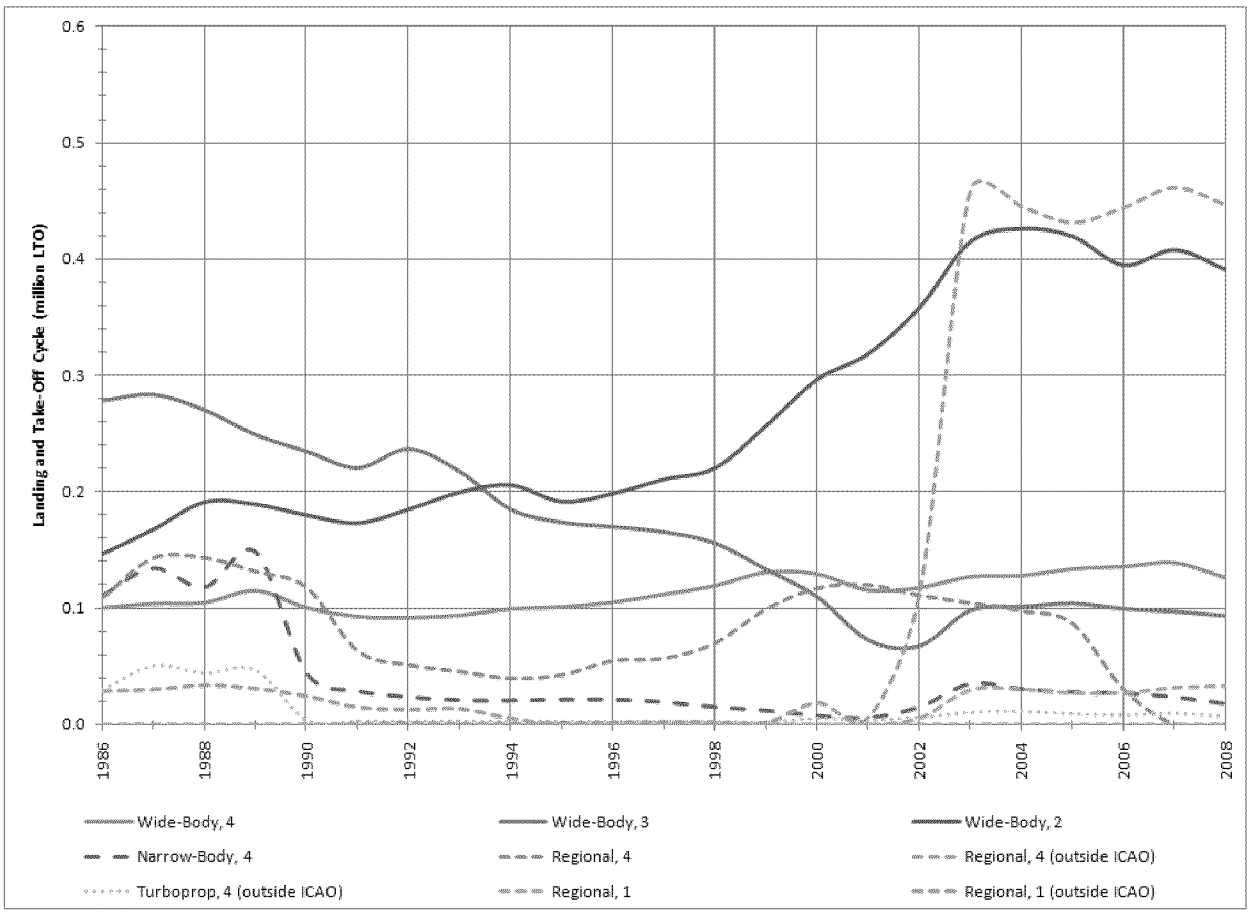


**Figure 3-4. National LTOs (million) for Low Activity Commercial Aircraft Included in the T-100 Dataset (Wide-Body 2, 3, and 4 Engine, Narrow-Body 4 Engine, Regional 4 Engine Turbojet, Regional 4 Engine Turboprop, 4 Engine Turboprop, Regional 1 Engine Turbojet, Regional 1 Engine Turboprop) [Refers to Table 3-3]**



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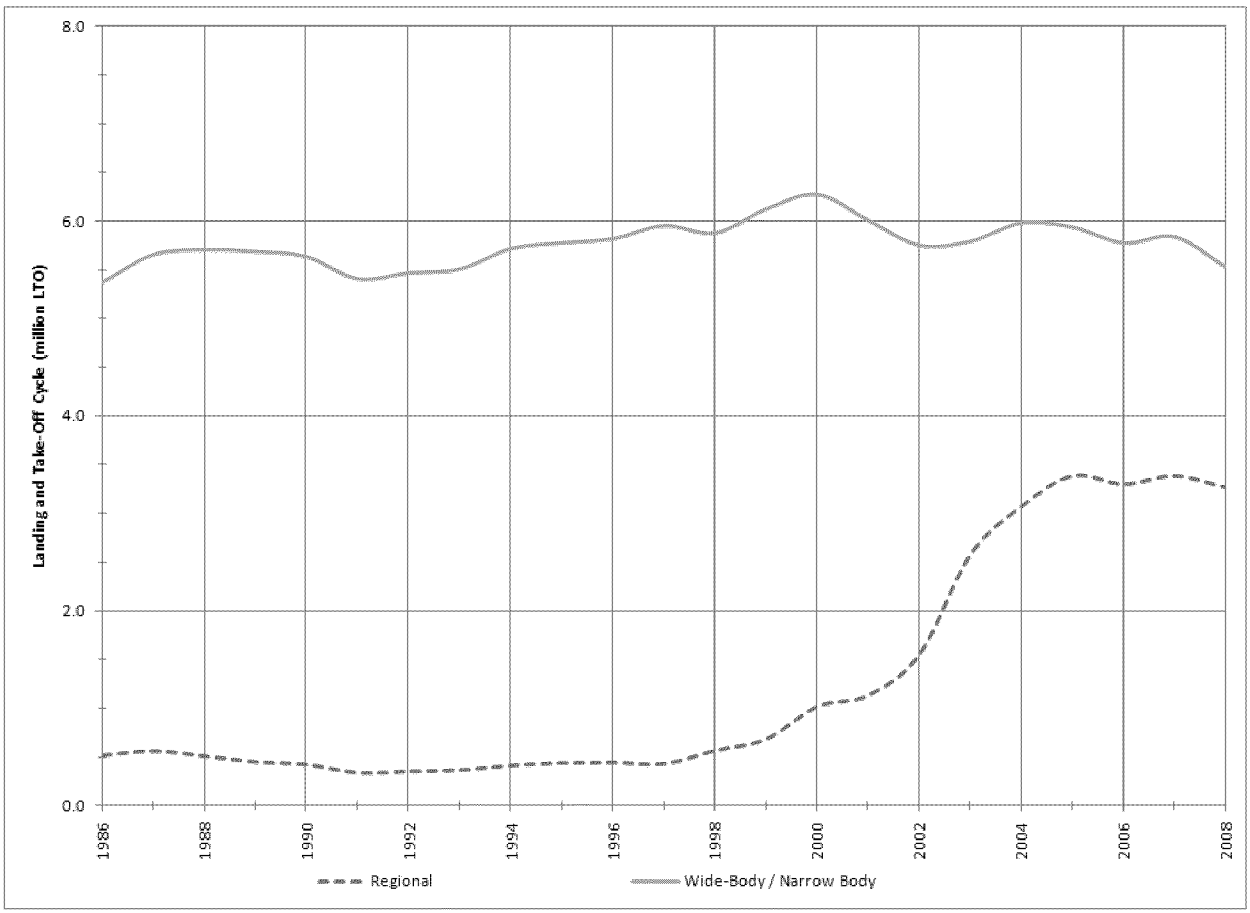


**Figure 3-5. National LTOs (million) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type [Refers to Table 3-4]**



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## Table 3-3. National LTOs (million) for Commercial Aircraft, Included in the T-100 Dataset

| Group/Engine[a] | Regulated | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Narrow-Body 2 | ICAO | 2.79 | 3.09 | 3.25 | 3.41 | 3.69 | 3.73 | 3.89 | 4.08 | 4.45 | 4.58 | 4.66 | 4.79 | 4.73 | 5.02 | 5.25 | 5.17 | 5.06 | 4.97 | 5.16 | 5.14 | 5.01 | 5.09 | 4.84 |
| Narrow-Body 3 | ICAO | 1.94 | 1.87 | 1.77 | 1.58 | 1.38 | 1.16 | 1.03 | 0.89 | 0.76 | 0.70 | 0.66 | 0.65 | 0.63 | 0.57 | 0.48 | 0.33 | 0.13 | 0.15 | 0.13 | 0.11 | 0.10 | 0.08 | 0.06 |
| Narrow-Body 4 | ICAO | 0.11 | 0.13 | 0.12 | 0.15 | 0.04 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | <0.01 | <0.01 | 0.01 | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 | 0.02 |
| Regional 1 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| Regional 2 | ICAO | 0.40 | 0.41 | 0.36 | 0.31 | 0.30 | 0.27 | 0.29 | 0.31 | 0.37 | 0.39 | 0.38 | 0.37 | 0.49 | 0.58 | 0.89 | 1.01 | 1.43 | 2.44 | 2.94 | 3.27 | 3.24 | 3.35 | 3.23 |
| Regional 4 | ICAO | 0.11 | 0.14 | 0.14 | 0.13 | 0.12 | 0.06 | 0.05 | 0.05 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.10 | 0.12 | 0.12 | 0.11 | 0.10 | 0.10 | 0.09 | 0.03 | - | - |
| Wide-Body 2 | ICAO | 0.15 | 0.17 | 0.19 | 0.19 | 0.18 | 0.17 | 0.19 | 0.20 | 0.21 | 0.19 | 0.20 | 0.21 | 0.22 | 0.26 | 0.30 | 0.32 | 0.36 | 0.42 | 0.43 | 0.42 | 0.39 | 0.41 | 0.39 |
| Wide-Body 3 | ICAO | 0.28 | 0.28 | 0.27 | 0.25 | 0.23 | 0.22 | 0.24 | 0.22 | 0.18 | 0.17 | 0.17 | 0.17 | 0.16 | 0.13 | 0.11 | 0.07 | 0.07 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.09 |
| Wide-Body 4 | ICAO | 0.10 | 0.10 | 0.10 | 0.11 | 0.10 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 | 0.11 | 0.12 | 0.13 | 0.13 | 0.12 | 0.12 | 0.13 | 0.13 | 0.13 | 0.14 | 0.14 | 0.13 |
| Wide-Body 6 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | <0.01 | <0.01 | - | <0.01 | <0.01 | - |
| Regional 1 | non-ICAO | - | - | - | - | - | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.02 | <0.01 | 0.11 | 0.46 | 0.45 | 0.43 | 0.44 | 0.46 | 0.45 |
| Regional 2 | non-ICAO | 0.45 | 0.39 | 0.43 | 0.49 | 0.42 | 0.61 | 0.74 | 0.84 | 0.86 | 1.32 | 1.43 | 1.27 | 1.32 | 1.27 | 1.36 | 1.03 | 1.15 | 1.94 | 1.78 | 1.59 | 1.51 | 1.48 | 1.35 |
| Regional 3 | non-ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Regional 4 | non-ICAO | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 | 0.01 | 0.01 | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | - | - | - | - | - | - | - |
| Turboprop 4 | non-ICAO | 0.03 | 0.05 | 0.04 | 0.05 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.01 | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| ALL | - | 6.38 | 6.68 | 6.71 | 6.69 | 6.49 | 6.35 | 6.56 | 6.71 | 6.98 | 7.52 | 7.69 | 7.65 | 7.75 | 8.06 | 8.66 | 8.15 | 8.55 | 10.77 | 11.28 | 11.34 | 11.03 | 11.16 | 10.58 |
| ALL Regulated | - | 5.87 | 6.21 | 6.20 | 6.13 | 6.05 | 5.73 | 5.81 | 5.86 | 6.12 | 6.20 | 6.25 | 6.37 | 6.43 | 6.80 | 7.27 | 7.12 | 7.29 | 8.36 | 9.05 | 9.31 | 9.07 | 9.22 | 8.79 |

[a] Engines are turbofan unless otherwise noted.

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.

Narrow-body 4 engine aircraft include the Boeing 707 and McDonnell Douglas DC-8. For additional details on aircraft models and category assignments see Appendix G.

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## Table 3-4. National LTOs (Percent of Total) for Commercial Aircraft, Included in the T-100 Dataset

| Group/Engine[a] | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Narrow-Body 2 (ICAO) | 44% | 46% | 48% | 51% | 57% | 59% | 59% | 61% | 64% | 61% | 61% | 63% | 61% | 62% | 61% | 63% | 59% | 46% | 46% | 45% | 45% | 46% | 46% |
| Narrow-Body 3 (ICAO) | 30% | 28% | 26% | 24% | 21% | 18% | 16% | 13% | 11% | 9% | 9% | 9% | 8% | 7% | 5% | 4% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |
| Narrow-Body 4 (ICAO) | 2% | 2% | 2% | 2% | 1% | 0.4% | 0.4% | 0.3% | 0.3% | 0.3% | 0.3% | 0.2% | 0.2% | 0.1% | <0.1% | <0.1% | 0.2% | 0.3% | 0.3% | 0.2% | 0.2% | 0.2% | 0.2% |
| Regional 1 (ICAO) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.1% | 0.3% | 0.3% | 0.2% | 0.3% | 0.3% | 0.3% |
| Regional 2 (ICAO) | 6% | 6% | 5% | 5% | 5% | 4% | 4% | 5% | 5% | 5% | 5% | 5% | 6% | 7% | 10% | 12% | 17% | 23% | 26% | 29% | 29% | 30% | 31% |
| Regional 4 (ICAO) | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0.3% | - | - |
| Wide-Body 2 (ICAO) | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% |
| Wide-Body 3 (ICAO) | 4% | 4% | 4% | 4% | 4% | 3% | 4% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Wide-Body 4 (ICAO) | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Wide-Body 6 (ICAO) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.1% | <0.1% | <0.1% | - | <0.1% | <0.1% | - |
| Regional 1 (non-ICAO) | - | - | - | - | - | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | 0.2% | <0.1% | 1% | 4% | 4% | 4% | 4% | 4% | 4% |
| Regional 2 (non-ICAO) | 7% | 6% | 6% | 7% | 7% | 10% | 11% | 12% | 12% | 18% | 19% | 17% | 17% | 16% | 16% | 13% | 13% | 18% | 16% | 14% | 14% | 13% | 13% |
| Regional 3 (non-ICAO) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% |
| Regional 4 (non-ICAO) | 0.5% | 0.4% | 0.5% | 0.5% | 0.4% | 0.2% | 0.2% | 0.2% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | - | - | - | - | - | - | - |
| Turboprop 4 (non-ICAO) | 0.5% | 1% | 1% | 1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | 0.1% | 0.1% | <0.1% | <0.1% | <0.1% | <0.1% |
| ALL | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| ALL Regulated | 92% | 93% | 92% | 92% | 93% | 90% | 89% | 87% | 88% | 82% | 81% | 83% | 83% | 84% | 84% | 87% | 85% | 78% | 80% | 82% | 82% | 83% | 83% |

[a] Engines are turbofan unless otherwise noted.

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.

Narrow-body 4 engine aircraft include the Boeing 707 and McDonnell Douglas DC-8. For additional details on aircraft models and category assignments see Appendix G.

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Narrow-body two-engine aircraft represented approximately 44 percent of LTOs in 1986, reaching a peak in the later 1990s and 2001 of 63 percent and then declined around 2005 to 46 percent of LTOs, which was maintained through 2008. Collectively, regional turbofan aircraft and narrow-body two-engine aircraft represent around 77 percent of LTO activities, compared to 1986, when these two aircraft categories collectively accounted for approximately 52 percent of LTO activities.

Conversely, narrow-body aircraft equipped with three engines have consistently declined in activity, accounting for 30 percent of LTO activities in 1986, declining to around one percent from 2003 to 2008. Also the larger wide-body aircraft (three and four engines) show a historical decline in LTO activities from six percent in 1986 to two percent in 2008; except for the two-engine wide-body aircraft, which remains around two to four percent of LTOs throughout the study period.

**$NO_x$ Emissions Inventory, By Aircraft Group**

By disaggregating the normalized emissions into aircraft categories, $NO_x$ emissions trends between aircraft types can be discerned as shown in Tables 3-5 and 3-6 and Figure 3-6; note that emissions were normalized relative to LTOs. $NO_x$ emissions for narrow-body aircraft equipped with two engines dominate all historical years (Tables 3-4 and 3-5). Note that their $NO_x$ contributions (Table 3-6) were less than their share of the LTOs (Table 3-4) during the period from 1986 to 1994. From 2000 to 2008 the $NO_x$ contributions associated with narrow-body two engined aircraft were larger than their share of the LTOs. Note also that after 2002, narrow-body two-engine aircraft's share of the LTOs declined to less than 50 percent, but accounted for approximately 55 percent of the $NO_x$ emissions. Aggregating the kg $NO_x$/LTO data into regional versus non-regional aircraft, Figure E-4 shows that traditional wide-/narrow-body aircraft emissions increased by 9 percent, while emissions from regional jets decreased by 32 percent.

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## Table 3-5. National Emission (metric ton) for Commercial Aircraft Included in the T-100 Dataset

| Group/Engine[a] | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Narrow-Body 2 (ICAO) | 26,049 | 29,224 | 30,910 | 32,574 | 35,727 | 36,178 | 38,322 | 40,604 | 44,161 | 45,346 | 46,410 | 47,941 | 47,504 | 48,140 | 51,041 | 50,788 | 50,950 | 50,432 | 52,532 | 52,621 | 51,556 | 51,944 | 49,335 |
| Narrow-Body 3 (ICAO) | 14,761 | 14,240 | 13,477 | 12,024 | 10,683 | 9,008 | 8,089 | 7,072 | 6,063 | 5,667 | 5,316 | 5,261 | 5,086 | 4,627 | 3,856 | 2,632 | 1,044 | 1,155 | 1,044 | 888 | 797 | 656 | 497 |
| Narrow-Body 4 (ICAO) | 2,136 | 2,533 | 2,249 | 2,784 | 880 | 527 | 403 | 387 | 366 | 372 | 357 | 331 | 278 | 236 | 158 | 92 | 285 | 652 | 550 | 508 | 510 | 458 | 349 |
| Regional 1 (ICAO) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 338 | 1,772 | 1,803 | 1,619 | 1,623 | 1,888 | 1,973 |
| Regional 2 (ICAO) | 2,652 | 2,739 | 2,395 | 2,027 | 1,974 | 1,537 | 1,545 | 1,572 | 1,808 | 1,919 | 1,887 | 1,730 | 2,324 | 2,372 | 3,473 | 3,790 | 5,265 | 8,897 | 10,823 | 12,114 | 12,049 | 12,576 | 12,350 |
| Regional 4 (ICAO) | 615 | 807 | 808 | 741 | 671 | 363 | 295 | 263 | 231 | 247 | 316 | 328 | 404 | 571 | 673 | 689 | 637 | 598 | 560 | 497 | 171 | 0 | 0 |
| Wide-Body 2 (ICAO) | 3,801 | 3,843 | 4,293 | 4,246 | 4,079 | 3,934 | 4,530 | 4,680 | 4,899 | 4,529 | 4,880 | 5,349 | 5,837 | 6,873 | 8,032 | 9,139 | 9,986 | 11,277 | 11,553 | 11,169 | 10,535 | 11,261 | 10,964 |
| Wide-Body 3 (ICAO) | 10,906 | 11,247 | 11,018 | 10,252 | 9,686 | 9,388 | 9,797 | 9,337 | 7,084 | 6,574 | 6,441 | 6,395 | 6,241 | 5,360 | 4,616 | 3,246 | 3,335 | 5,078 | 5,281 | 5,476 | 5,191 | 5,039 | 4,897 |
| Wide-Body 4 (ICAO) | 7,834 | 7,907 | 7,817 | 8,833 | 7,739 | 7,222 | 6,795 | 6,874 | 7,088 | 7,175 | 7,393 | 7,801 | 8,295 | 8,952 | 8,552 | 7,470 | 7,560 | 8,357 | 8,142 | 8,583 | 8,688 | 8,904 | 7,705 |
| Wide-Body 6 (ICAO) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 |
| Regional 1 (non-ICAO) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 17 | 74 | 77 | 74 | 80 | 86 | 89 |
| Regional 2 (non-ICAO) | 201 | 173 | 183 | 233 | 244 | 378 | 499 | 563 | 659 | 981 | 1,047 | 980 | 1,045 | 967 | 978 | 848 | 865 | 1,252 | 1,120 | 979 | 1,077 | 1,237 | 1,410 |
| Regional 3 (non-ICAO) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Regional 4 (non-ICAO) | 27 | 28 | 32 | 29 | 23 | 14 | 12 | 13 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Turboprop 4 (non-ICAO) | 77 | 158 | 140 | 149 | 5 | 4 | 6 | 7 | 9 | 10 | 10 | 10 | 10 | 8 | 8 | 2 | 9 | 12 | 11 | 9 | 9 | 17 | 9 |
| ALL | 69,060 | 72,899 | 73,321 | 73,893 | 71,710 | 68,553 | 70,295 | 71,371 | 72,373 | 72,820 | 74,057 | 76,127 | 77,023 | 78,105 | 81,388 | 78,696 | 80,291 | 89,559 | 93,498 | 94,536 | 92,286 | 94,067 | 89,580 |
| ALL Regulated | 68,754 | 72,540 | 72,967 | 73,482 | 71,438 | 68,156 | 69,777 | 70,788 | 71,700 | 71,829 | 73,000 | 75,136 | 75,968 | 77,130 | 80,401 | 77,845 | 79,401 | 88,221 | 92,290 | 93,475 | 91,120 | 92,727 | 88,071 |

[a] Engines are turbofan unless otherwise noted.

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.

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## Table 3-6. National Emission (Percent of Total) for Commercial Aircraft Included in the T-100 Dataset

| Group/Engine[a] | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Narrow-Body 2 (ICAO) | 38% | 40% | 42% | 44% | 50% | 53% | 55% | 57% | 61% | 62% | 63% | 63% | 62% | 62% | 63% | 65% | 63% | 56% | 56% | 56% | 56% | 55% | 55% |
| Narrow-Body 3 (ICAO) | 21% | 20% | 18% | 16% | 15% | 13% | 12% | 10% | 8% | 8% | 7% | 7% | 7% | 6% | 5% | 3% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Narrow-Body 4 (ICAO) | 3% | 3% | 3% | 4% | 1% | 1% | 1% | 1% | 1% | 1% | 0.5% | 0.4% | 0.4% | 0.3% | 0.2% | 0.1% | 0.4% | 1% | 1% | 1% | 1% | 0.5% | 0.4% |
| Regional 1 (ICAO) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.4% | 2% | 2% | 2% | 2% | 2% | 2% |
| Regional 2 (ICAO) | 4% | 4% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 3% | 3% | 2% | 3% | 3% | 4% | 5% | 7% | 10% | 12% | 13% | 13% | 13% | 14% |
| Regional 4 (ICAO) | 1% | 1% | 1% | 1% | 1% | 1% | 0.4% | 0.4% | 0.3% | 0.3% | 0.4% | 0.4% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0.2% | - | - |
| Wide-Body 2 (ICAO) | 6% | 5% | 6% | 6% | 6% | 6% | 6% | 7% | 7% | 6% | 7% | 7% | 8% | 9% | 10% | 12% | 12% | 13% | 12% | 12% | 11% | 12% | 12% |
| Wide-Body 3 (ICAO) | 16% | 15% | 15% | 14% | 14% | 14% | 14% | 13% | 10% | 9% | 9% | 8% | 8% | 7% | 6% | 4% | 4% | 6% | 6% | 6% | 6% | 5% | 5% |
| Wide-Body 4 (ICAO) | 11% | 11% | 11% | 12% | 11% | 11% | 10% | 10% | 10% | 10% | 10% | 10% | 11% | 11% | 11% | 9% | 9% | 9% | 9% | 9% | 9% | 9% | 9% |
| Wide-Body 6 (ICAO) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.1% | <0.1% | <0.1% | - | <0.1% | <0.1% | - |
| Regional 1 (non-ICAO) | - | - | - | - | - | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% |
| Regional 2 (non-ICAO) | 0.3% | 0.2% | 0.2% | 0.3% | 0.3% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% |
| Regional 3 (non-ICAO) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% |
| Regional 4 (non-ICAO) | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | - | - | - | - | - | - | - |
| Turboprop 4 (non-ICAO) | 0% | 0% | 0% | 0% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% | <0.1% |
| ALL | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| ALL Regulated | 100% | 100% | 100% | 99% | 100% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 99% | 98% |

[a] Engines are turbofan unless otherwise noted.

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.

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Narrow-body aircraft equipped with three engines generally had proportionally lower emissions relative to their share of the LTOs from 1986 to about 2001, after which time they contributed about the same percentage of total $NO_x$ emissions relative to their share of the LTOs.

Wide-body aircraft generally had the highest $NO_x$ emissions relative to their share of LTOs. For example, in 1986, wide-body three-engine aircraft accounted for 16 percent of the $NO_x$, but only four percent of the LTOs (Table 3-4). This situation remained until around 1995 when their share of the LTOs declined to two percent, but accounted for nine percent of the $NO_x$ emissions. Similarly wide-body two-engine aircraft consistently accounted for 11 to 13 percent of $NO_x$ from 2001 to 2008, while representing only four percent of the LTOs. Note that although the wide-body four-engine aircraft have the highest emission rates, they had an 22 percent decline in the emission rate over the study period, as shown in Table 3-7 and Figure 3-6. Note, the intent of this study is to evaluate engine emission performance for the duration of the study period, therefore impacts relative to the volume of passengers or freight carried were not considered in this assessment.

Regional aircraft consistently have a disproportionately lower $NO_x$ contribution relative their share of the LTOs. The growth in activity of these lower emitting aircraft appears to be compensating for the higher emission trends of the larger aircraft. These aircraft, along with two engine jets and turboprops not covered by ICAO gaseous emissions provisions tend to have the lowest emissions in terms of LTOs.

Table 3-7 and Figures 3-6 and 3-7 show the $NO_x$ emission rate (kg/LTO) trends over the study period. Three aircraft groups' emission rates decreased over time: regional two engine aircraft, wide-body four engine, and aircraft equipped with four turboprops. In 2008, these aircraft groups had 31, 1 and less than one percent of the fleet activity respectively. The dramatic increase in regional jet activity is discussed earlier in this section. While activity for these aircraft have increased, they are associated with significantly lower $NO_x$ emission rates relative other non-regional jets noted in Figure E-4. Although regional jet emission rates decreased, the total contribution of $NO_x$ emissions (metric ton) from regional aircraft has increased. Figure 3-8 shows the total emissions for regional jets compared to wide- and narrow-body aircraft. Regional jet $NO_x$ emissions increased by 433 percent over the study period, and wide-/narrow-body $NO_x$ emissions inventory increased by 13 percent.

**Emission Benefits from Last Round of the ICAO $NO_x$ Standards (from 2014 to 2030)**

In addition to assessing the effect that past ICAO $NO_x$ standards have had on reducing LTO $NO_x$ emissions (from 1986 to 2008) from commercial aircraft, the EPA is evaluating the LTO $NO_x$ emission reductions in the U.S. from the last round of the ICAO $NO_x$ standards. CAEP adopted these additional $NO_x$ standards at their 8$^{th}$ meeting in February 2010 (CAEP/8 meeting), and as described earlier, currently the EPA is conducting a rulemaking to adopt standards equivalent to the CAEP/8 $NO_x$ standards. CAEP's assessments indicated that the CAEP/8 $NO_x$ standards would provide global $NO_x$ reductions, which would translate to emission reductions in

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the U.S. The global LTO $NO_x$ reductions were estimated to be about 5.5 percent in 2026 and 7 percent in 2036 relative to the baseline.[18]

For comparable percent $NO_x$ reductions in the U.S., we estimated the percent and absolute LTO $NO_x$ inventory reductions in the U.S. for the years 2020 and 2030. To evaluate these reductions, we first projected the 2008 national emissions for aircraft equipped with engines covered by ICAO provisions included in the T-100 dataset (see Table 3-1 for the 2008 LTO $NO_x$ emissions for these aircraft, which is 88,071 metric tons) to 2020 and 2030 by utilizing the forecast of operations (or LTOs) from the December 2009 TAF -- for air carrier and air taxi categories of aircraft. From years 2008 to 2020, LTO $NO_x$ emissions were projected to increase by about 17 percent to 102,621 metric tons, and from years 2008 to 2030, LTO $NO_x$ emissions were forecast to grow by 46 percent to 128,792 metric tons. Second, for the CAEP global percent $NO_x$ reductions described above for years 2026 and 2036, we estimated the percent and subsequent absolute reductions of the U.S. LTO $NO_x$ for 2020 and 2030 by linear interpolation. This estimation would translate to LTO $NO_x$ reductions in the U.S. of about 4.5 percent or 5,200 tons in 2020 and about 6 percent or 8,700 tons in 2030. The cumulative LTO $NO_x$ reductions from 2014 to 2030 (2014 is the implementation date of the CAEP/8 $NO_x$ standards) were projected to be about 100,000 $NO_x$ tons.

[18] CAEP Rapporteurs of Modeling Task Force and Forecasting and Economic Analysis Support Group, *Environmental and Economic Assessment of the $NO_x$ Stringency Scenarios*, CAEP/8-WP/15, December 2, 2009.



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## Table 3-7. National Average $NO_x$ Emissions (kg/LTO) for Commercial Aircraft, Included in the T-100 Dataset

| Group/Engine[a] | Regulated | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Narrow-Body 2 | ICAO | 9.3 | 9.5 | 9.5 | 9.6 | 9.7 | 9.7 | 9.8 | 10.0 | 9.9 | 9.9 | 10.0 | 10.0 | 10.0 | 9.6 | 9.7 | 9.8 | 10.1 | 10.2 | 10.2 | 10.2 | 10.3 | 10.2 | 10.2 |
| Narrow-Body 3 | ICAO | 7.6 | 7.6 | 7.6 | 7.6 | 7.7 | 7.8 | 7.8 | 7.9 | 8.0 | 8.0 | 8.0 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 | 7.9 | 8.0 | 8.0 | 7.9 | 8.2 | 8.3 |
| Narrow-Body 4 | ICAO | 19.3 | 18.9 | 19.2 | 18.8 | 20.2 | 18.7 | 17.5 | 19.0 | 18.2 | 18.0 | 17.1 | 17.7 | 19.2 | 20.6 | 22.6 | 17.7 | 19.8 | 19.0 | 18.3 | 18.6 | 19.3 | 19.9 | 20.3 |
| Regional 1 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 58.8 | 58.8 | 58.8 | 58.8 | 58.8 | 58.8 | 58.8 |
| Regional 2 | ICAO | 6.6 | 6.7 | 6.7 | 6.5 | 6.6 | 5.7 | 5.3 | 5.0 | 4.9 | 4.9 | 4.9 | 4.7 | 4.8 | 4.1 | 3.9 | 3.8 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.8 | 3.8 |
| Regional 4 | ICAO | 5.6 | 5.6 | 5.6 | 5.6 | 5.7 | 5.7 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | 5.7 | - | - |
| Wide-Body 2 | ICAO | 25.9 | 22.9 | 22.4 | 22.4 | 22.6 | 22.7 | 24.4 | 23.4 | 23.8 | 23.6 | 24.5 | 25.3 | 26.4 | 26.7 | 27.1 | 28.7 | 27.9 | 27.2 | 27.1 | 26.6 | 26.7 | 27.6 | 28.0 |
| Wide-Body 3 | ICAO | 39.3 | 39.8 | 40.9 | 41.2 | 41.3 | 42.6 | 41.4 | 43.0 | 38.4 | 37.9 | 37.9 | 38.7 | 40.1 | 40.2 | 42.1 | 44.6 | 49.2 | 51.7 | 52.1 | 52.5 | 52.1 | 51.8 | 52.3 |
| Wide-Body 4 | ICAO | 78.1 | 76.1 | 74.6 | 76.8 | 77.1 | 77.7 | 73.8 | 73.1 | 71.2 | 71.0 | 70.3 | 69.7 | 69.5 | 68.5 | 66.2 | 64.7 | 64.3 | 65.9 | 63.7 | 64.2 | 64.1 | 64.2 | 61.1 |
| Wide-Body 6 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 168 | 168 | 168 | - | 168 | 168 | - |
| Regional 1 | non-ICAO | - | - | - | - | - | 0.04 | 0.1 | 0.3 | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Regional 2 | non-ICAO | 0.4 | 0.4 | 0.4 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 0.8 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.7 | 0.8 | 0.8 | 0.6 | 0.6 | 0.6 | 0.7 | 0.8 | 1.0 |
| Regional 3 | non-ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| Regional 4 | non-ICAO | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | - | - | - | - | - | - | - |
| Turboprop 4 | non-ICAO | 2.6 | 3.2 | 3.2 | 3.2 | 1.4 | 1.7 | 2.1 | 2.7 | 3.1 | 3.7 | 4.0 | 4.0 | 4.2 | 4.2 | 1.5 | 0.4 | 1.4 | 1.1 | 1.0 | 1.0 | 1.1 | 1.8 | 1.4 |
| ALL | - | 10.8 | 10.9 | 10.9 | 11.0 | 11.0 | 10.8 | 10.7 | 10.6 | 10.4 | 9.7 | 9.6 | 9.9 | 9.9 | 9.7 | 9.4 | 9.6 | 9.4 | 8.3 | 8.3 | 8.3 | 8.4 | 8.4 | 8.5 |
| ALL Regulated | - | 11.7 | 11.7 | 11.8 | 12.0 | 11.8 | 11.9 | 12.0 | 12.1 | 11.7 | 11.6 | 11.7 | 11.8 | 11.8 | 11.3 | 11.0 | 10.9 | 10.9 | 10.6 | 10.2 | 10.0 | 10.0 | 10.1 | 10.0 |

[a] Engines are turbofan unless otherwise noted.

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.

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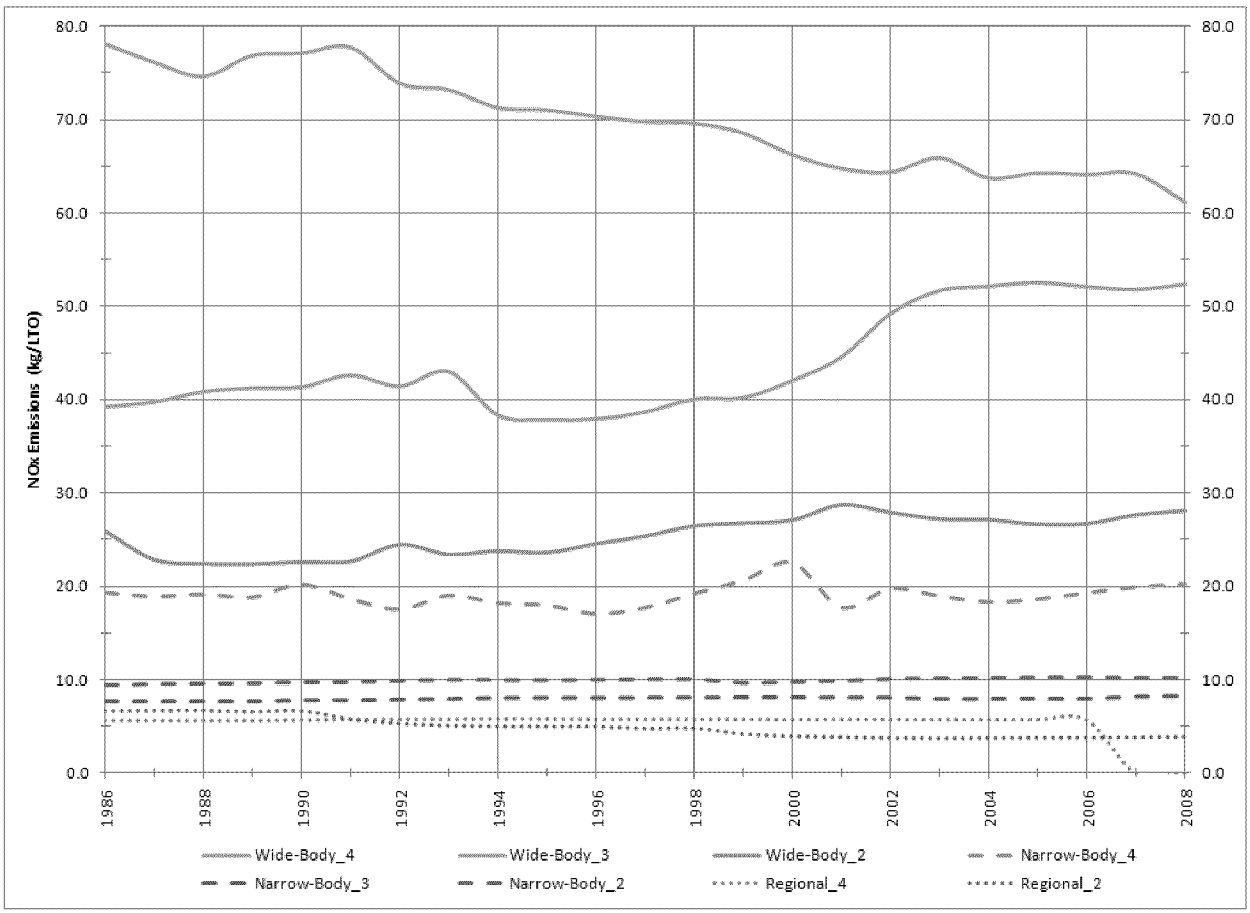


**Figure 3-6. National Average $NO_x$ Emission (kg/LTO) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type [Refers to Table 3-7]**

*Note: The number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines. These emission values are comparable to those in Table 3-7.

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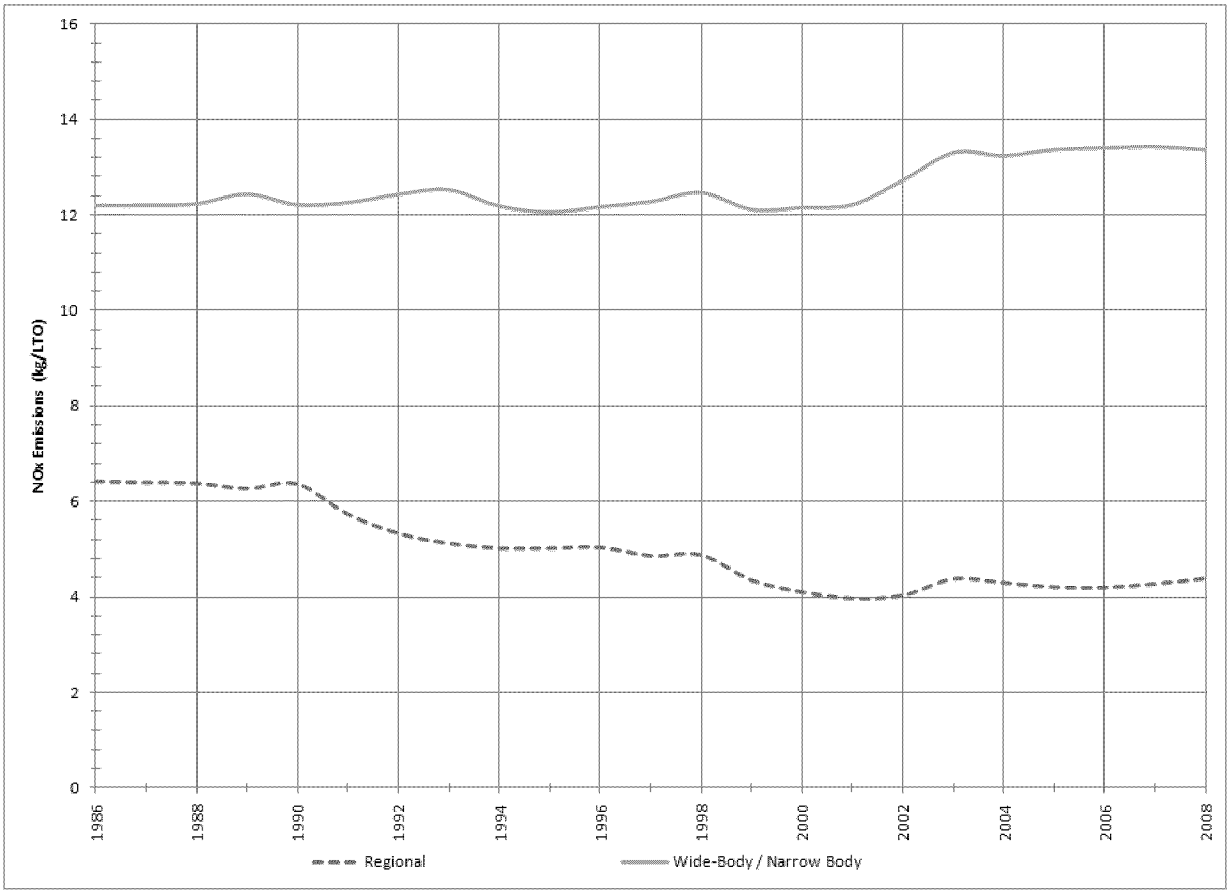


**Figure 3-7. National Average $NO_x$ Emissions (kg/LTO) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type**



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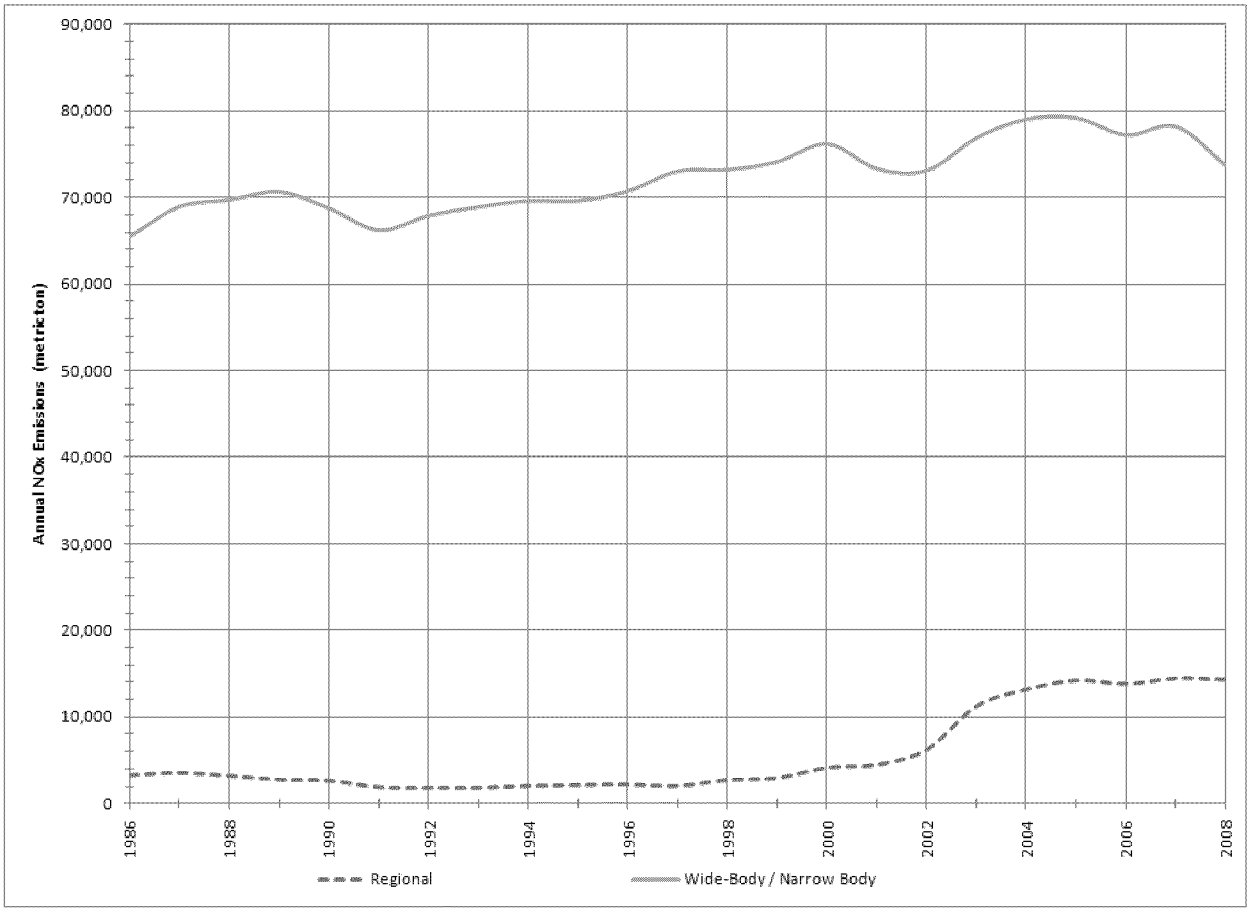


**Figure 3-8. National $NO_x$ Emissions (metric ton) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type [Refers to Table 3-5]**



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### 3.2.2 *Engine Design/Operation vs. $NO_x$ Emissions for Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset*

The ICAO databank[19] contains information on engine exhaust emissions and normal operating conditions. There are two important terms that define the databanks' reference conditions:

- **Thrust** is the maximum thrust available for take-off under normal operating conditions at International Standard Atmosphere (ISA) sea level static conditions without the use of water injection.

- **Pressure ratio** is the ratio of the mean total pressure at the last compressor discharge plane of the compressor to the mean total pressure at the compressor entry plane when the engine is developing take-off thrust rating in ISA sea level static conditions.

To study changes in engine designs, engine technologies, and $NO_x$ emissions, data were evaluated relative to the terms and units of the ICAO provisions (i.e., grams of $NO_x$ per kilonewton per engine). Normalized fleet thrust profiles were generated relative to LTO activity and were aggregated into aircraft categories as shown in Table 3-8 and Figure 3-9. Thrust profiles vary from year to year, but generally increased for all aircraft types, except regional aircraft, for which thrust declined 19 percent for the study period.

[19] http://www.caa.co.uk/default.aspx?catid=702



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**Table 3-8. National Average Engine Thrust Normalized with Respect to Activity (kN/LTO) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset (turboprop aircraft excluded)**

| Group/Engine[a] | Regulated | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Narrow-Body 2 | ICAO | 75.4 | 78.1 | 80.6 | 83.1 | 85.1 | 87.8 | 91.1 | 93.7 | 93.5 | 93.6 | 94.1 | 95.2 | 96.6 | 98.0 | 100 | 102 | 105 | 106 | 106 | 107 | 107 | 106 | 108 |
| Narrow-Body 3 | ICAO | 66.9 | 66.9 | 67.0 | 67.0 | 67.4 | 67.5 | 67.7 | 68.0 | 68.4 | 68.5 | 68.5 | 68.5 | 68.7 | 68.8 | 68.9 | 68.9 | 69.2 | 68.9 | 69.0 | 69.1 | 69.0 | 69.7 | 69.7 |
| Narrow-Body 4 | ICAO | 94.5 | 93.5 | 92.5 | 89.6 | 95.1 | 91.2 | 87.6 | 90.7 | 90.3 | 90.2 | 92.8 | 90.1 | 93.1 | 95.4 | 98.5 | 92.8 | 96.3 | 95.4 | 94.5 | 95.1 | 96.1 | 97.0 | 97.5 |
| Regional 1 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 |
| Regional 2 | ICAO | 53.4 | 53.5 | 53.2 | 55.2 | 55.0 | 59.5 | 61.0 | 61.8 | 62.0 | 61.5 | 62.1 | 62.1 | 57.8 | 51.5 | 46.5 | 44.3 | 40.9 | 39.8 | 39.8 | 40.6 | 41.2 | 41.7 | 43.0 |
| Regional 4 | ICAO | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | - | - |
| Wide-Body 2 | ICAO | 223 | 220 | 230 | 231 | 223 | 237 | 238 | 241 | 244 | 247 | 249 | 256 | 264 | 241 | 268 | 278 | 281 | 276 | 260 | 278 | 280 | 275 | 280 |
| Wide-Body 3 | ICAO | 191 | 190 | 190 | 191 | 189 | 190 | 192 | 207 | 200 | 202 | 205 | 209 | 211 | 216 | 229 | 234 | 235 | 224 | 222 | 219 | 221 | 222 | 221 |
| Wide-Body 4 | ICAO | 216 | 217 | 221 | 218 | 222 | 225 | 225 | 224 | 224 | 224 | 224 | 226 | 226 | 227 | 228 | 228 | 225 | 223 | 226 | 227 | 228 | 227 | 229 |
| Wide-Body 6 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 191 | 191 | 191 | - | 191 | 191 | - |
| ALL Regulated | | 75.6 | 77.7 | 79.5 | 80.6 | 82.8 | 83.4 | 84.8 | 86.3 | 86.3 | 81.0 | 80.4 | 83.7 | 83.8 | 84.9 | 85.4 | 89.5 | 87.4 | 74.7 | 74.7 | 76.2 | 76.8 | 76.5 | 78.1 |

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.



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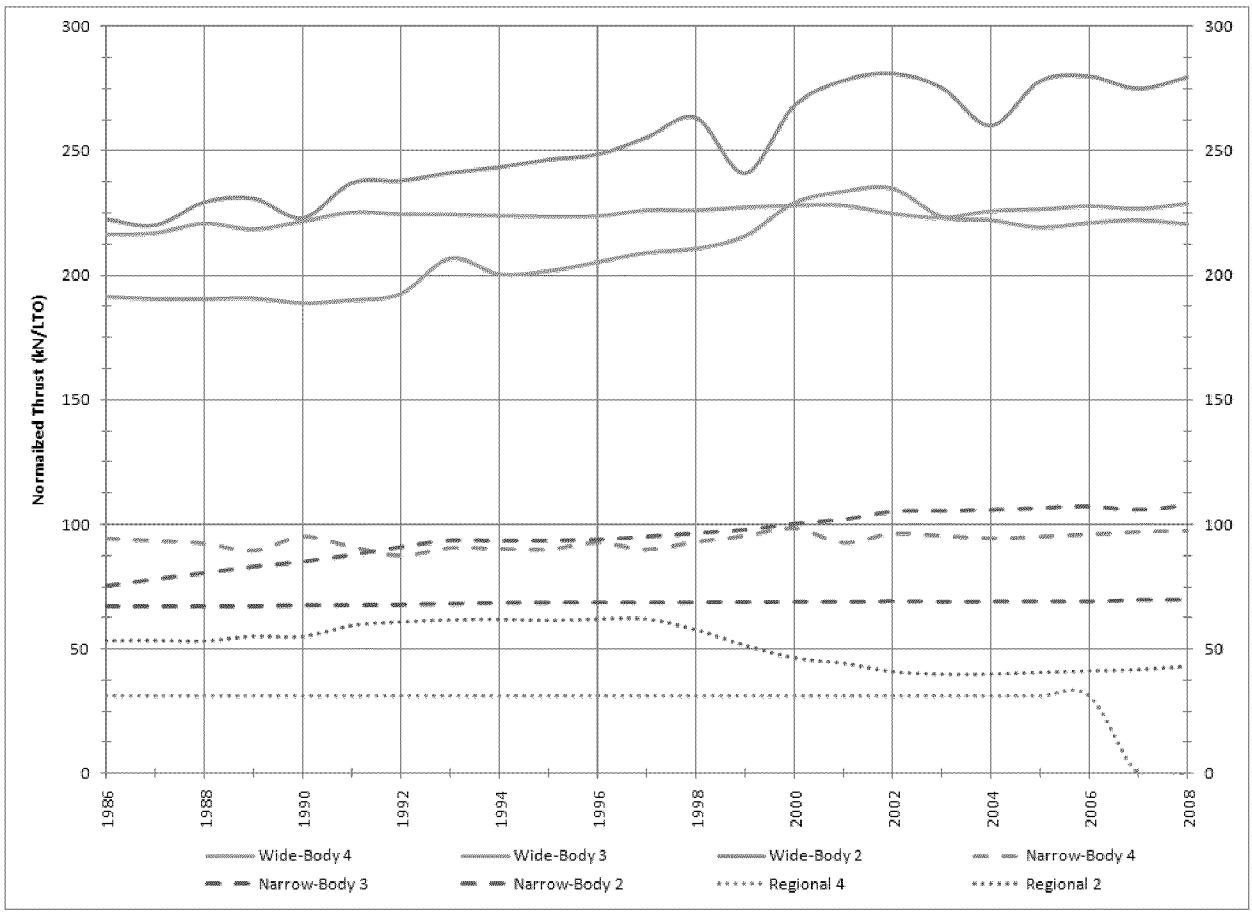


**Figure 3-9. National Average Engine Thrust Normalized with Respect to Activity (kN/LTO)) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type [Refers to Table 3-8]**

*Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.

Next, Figure 3-10 presents $NO_x$ emissions per LTO cycle by thrust groupings; note that $NO_x$ emissions increase as engine thrust increases. Figure 3-10 presents $NO_x$ emissions per LTO cycle for three aircraft types and engine thrust groupings: regional aircraft equipped with engines with thrust ratings less than 89 kN, non-regional aircraft with ratings less than 89 kN, and non-regional aircraft with thrust ratings greater than 89 kN. Figure 3-10 shows that $NO_x$ emissions (kg/LTO) from non-regional aircraft with ratings greater than 89 kN declined by 25 percent ( the data in these tables have not been weighted relative to activity), so larger aircraft equipped with higher thrust is not adjusted to account for the relatively small number of LTOs associated with these aircraft. For smaller aircraft, $NO_x$ emissions from non-regional aircraft with ratings less than 89 kN increased moderately, while $NO_x$ emissions from regional aircraft decreased over time.



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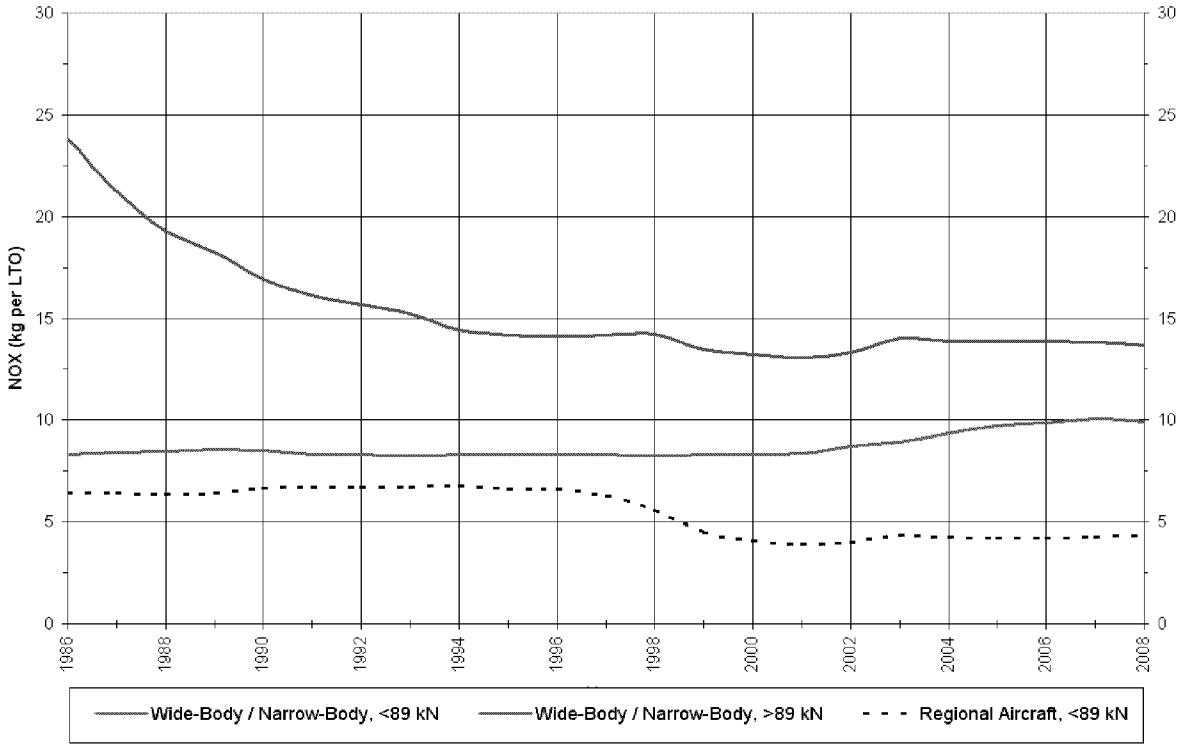


**Figure 3-10. National Average $NO_x$ Emission (kg/LTO) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type and Thrust**

Table 3-9 presents the weighted grams of $NO_x$ per LTO per kilonewton per engine for each aircraft type. Over the study period, two engine regional aircraft had a 28 percent decline in $NO_x$ emissions (grams per LTO) per kilonewton per engine, narrow-body two engine aircraft had a 24 percent decline, and wide body two-engine aircraft had a 16 percent decline. These three aircraft types account for approximately 80 percent of the air traffic in 2008. Narrow body three-engine and four-engine aircraft along with wide body three-engine aircraft showed an increase in $NO_x$ emissions per kilonewton per engine, but they collectively accounted for approximately two percent of the 2008 LTOs.

Looking at engine design trends, normalized engine pressure ratios for all aircraft categories increased during the study period, as noted in Table 3-10 and Figure 3-11. Pressure ratios for regional aircraft equipped with two engines covered by ICAO gaseous emissions provisions increased by 19 percent during the study period and narrow-body aircraft equipped with two engines covered by ICAO gaseous emissions provisions increased by 36 percent, indicating that aircraft are being equipped with engines with increasingly larger pressure ratios.



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**Table 3-9. National Average $NO_x$ Emissions per LTO Cycle/Engine-Thrust (g per LTO/kN) for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset (turboprop aircraft excluded)**

| Group/Engine | Regulated | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Narrow-Body 2 | ICAO | 124 | 121 | 118 | 115 | 114 | 111 | 108 | 106 | 106 | 106 | 106 | 105 | 104 | 97.9 | 96.8 | 96.3 | 95.7 | 96.2 | 96.1 | 96.0 | 95.8 | 96.3 | 94.7 |
| Narrow-Body 3 | ICAO | 114 | 114 | 114 | 114 | 115 | 115 | 116 | 117 | 117 | 117 | 117 | 117 | 118 | 118 | 118 | 117 | 117 | 115 | 115 | 115 | 115 | 117 | 118 |
| Narrow-Body 4 | ICAO | 205 | 202 | 207 | 210 | 212 | 205 | 200 | 210 | 202 | 199 | 184 | 197 | 206 | 216 | 229 | 191 | 205 | 199 | 194 | 196 | 201 | 205 | 208 |
| Regional 1 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 826 | 826 | 826 | 826 | 826 | 826 | 826 |
| Regional 2 | ICAO | 124 | 124 | 126 | 119 | 121 | 96.5 | 86.2 | 81.4 | 79.6 | 80.2 | 79.4 | 76.1 | 82.3 | 79.9 | 83.7 | 85.1 | 90.1 | 91.7 | 92.5 | 91.4 | 90.3 | 90.1 | 88.9 |
| Regional 4 | ICAO | 182 | 181 | 181 | 181 | 183 | 185 | 186 | 186 | 187 | 187 | 186 | 186 | 186 | 185 | 185 | 185 | 185 | 185 | 185 | 184 | 183 | - | - |
| Wide-Body 2 | ICAO | 116 | 104 | 97.7 | 96.9 | 101 | 95.6 | 103 | 97.0 | 97.6 | 95.7 | 98.7 | 99.1 | 100 | 111 | 101 | 103 | 99.0 | 98.6 | 104 | 95.7 | 95.2 | 100 | 100 |
| Wide-Body 3 | ICAO | 205 | 209 | 215 | 216 | 219 | 225 | 215 | 208 | 191 | 188 | 185 | 185 | 190 | 186 | 184 | 191 | 209 | 231 | 235 | 240 | 236 | 233 | 237 |
| Wide-Body 4 | ICAO | 361 | 351 | 338 | 352 | 348 | 345 | 329 | 326 | 318 | 317 | 314 | 308 | 307 | 301 | 290 | 284 | 286 | 295 | 282 | 283 | 281 | 283 | 267 |
| Wide-Body 6 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 880 | 880 | 880 | - | 880 | 880 | - |

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.

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**Table 3-10. National Average Engine Pressure Ratios for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset (turboprop aircraft excluded)**

| Group/Engine[a] | Regulated | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Narrow-Body 2 | ICAO | 17.6 | 18.1 | 18.6 | 19.0 | 19.3 | 19.8 | 20.3 | 20.7 | 20.7 | 20.8 | 20.8 | 21.0 | 21.3 | 21.5 | 22.0 | 22.5 | 23.1 | 23.2 | 23.3 | 23.6 | 23.7 | 23.5 | 23.9 |
| Narrow-Body 3 | ICAO | 16.4 | 16.4 | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | 16.6 | 16.7 | 16.7 | 16.7 | 16.7 | 16.7 | 16.7 | 16.7 | 16.7 | 16.8 | 16.7 | 16.7 | 16.8 | 16.7 | 16.9 | 16.9 |
| Narrow-Body 4 | ICAO | 20.9 | 20.4 | 19.8 | 18.3 | 19.9 | 17.5 | 14.7 | 15.3 | 15.5 | 15.6 | 16.4 | 15.7 | 16.6 | 17.2 | 18.9 | 19.5 | 20.2 | 21.2 | 21.2 | 21.6 | 22.3 | 22.9 | 23.3 |
| Regional 1 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 |
| Regional 2 | ICAO | 16.5 | 16.3 | 16.2 | 16.0 | 15.7 | 15.9 | 16.0 | 16.1 | 16.1 | 16.2 | 16.1 | 16.2 | 16.6 | 17.2 | 17.7 | 17.9 | 18.5 | 18.8 | 19.1 | 19.2 | 19.4 | 19.5 | 19.7 |
| Regional 4 | ICAO | 12.3 | 12.2 | 12.1 | 12.1 | 12.1 | 12.0 | 12.0 | 12.0 | 12.1 | 12.1 | 12.0 | 12.0 | 12.1 | 12.5 | 12.6 | 12.6 | 12.6 | 12.7 | 12.6 | 12.7 | 12.9 | - | - |
| Wide-Body 2 | ICAO | 26.6 | 28.6 | 29.6 | 29.7 | 29.4 | 30.0 | 27.8 | 30.5 | 30.7 | 30.8 | 31.1 | 31.6 | 32.1 | 30.7 | 31.6 | 32.9 | 33.2 | 32.6 | 32.2 | 32.7 | 32.9 | 32.4 | 33.0 |
| Wide-Body 3 | ICAO | 25.4 | 25.4 | 25.5 | 25.4 | 25.2 | 25.3 | 25.6 | 26.8 | 26.1 | 26.2 | 26.5 | 26.7 | 26.9 | 27.1 | 28.0 | 28.1 | 28.7 | 28.2 | 28.1 | 27.9 | 28.2 | 28.2 | 28.4 |
| Wide-Body 4 | ICAO | 23.8 | 23.1 | 23.7 | 23.5 | 24.2 | 25.2 | 24.9 | 25.2 | 25.5 | 26.0 | 26.0 | 26.5 | 26.8 | 27.1 | 27.7 | 27.9 | 27.3 | 26.9 | 28.2 | 28.2 | 28.4 | 28.5 | 28.4 |
| Wide-Body 6 | ICAO | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8.0 | 8.0 | 8.0 | - | 8.0 | 8.0 | - |
| ALL Regulated | | 16.8 | 17.3 | 17.6 | 17.7 | 18.3 | 18.5 | 18.8 | 19.2 | 19.4 | 19.0 | 18.9 | 19.3 | 19.7 | 20.0 | 20.3 | 21.0 | 21.0 | 18.9 | 19.6 | 19.9 | 20.0 | 20.1 | 20.4 |

[a] Engines are turbofan unless otherwise noted.

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.

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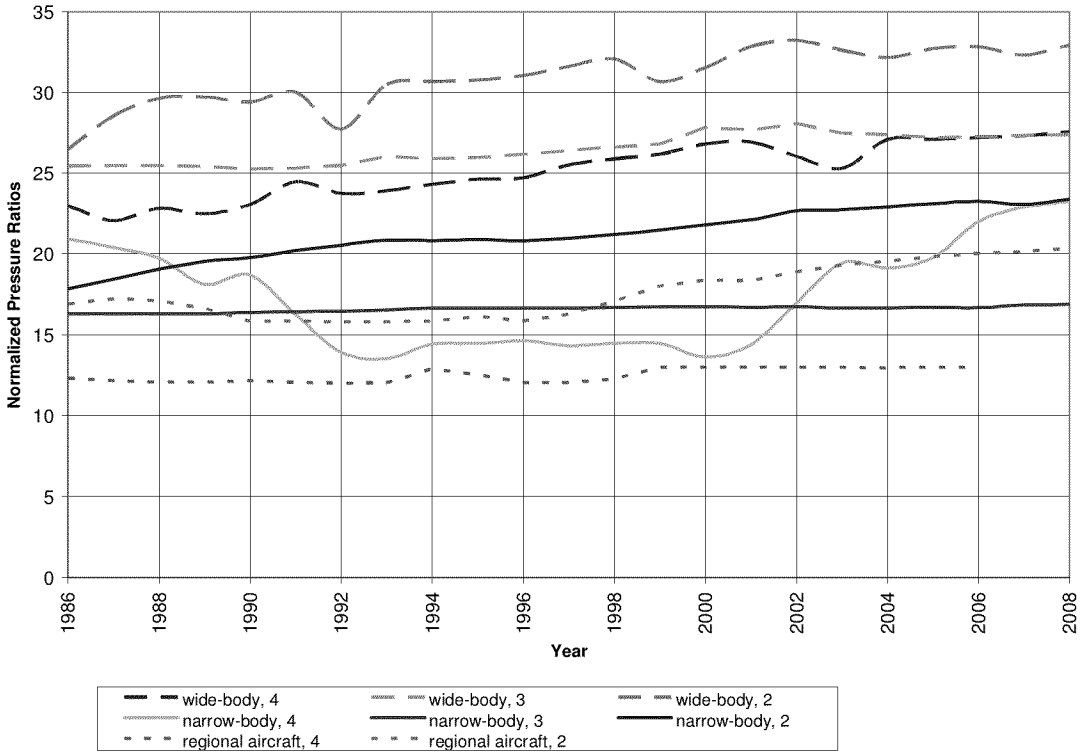


**Figure 3-11. National Average Engine Pressure Ratios for Commercial Aircraft Equipped with Engines Covered by ICAO Provisions, Included in the T-100 Dataset, Organized by Aircraft Type [Refers to Table 3-10]**

*Note: The number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.



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## 3.3 Non-attainment Area (NAA) Assessment

This study assessed whether the 42 selected NAAs followed the national LTO and $NO_x$ emissions trends. As shown in Figure 3-1, for national commercial aircraft over the study period, annual $NO_x$ emissions increased 28 percent, LTOs increased approximately 50 percent, and $NO_x$ emissions per LTO decreased 11 percent. As will be discussed below, not all 42 NAA locations considered in this study followed this national trend.[20] Collectively these non-attainment areas include 201 airports and account approximately 70 percent of commercial air traffic as reported in the T-100 data. Each NAA was grouped according to the total number of annual LTOs. Most NAA include more than one airport. It is likely that LTO activities at small airports are under-reported because they may primarily consist of general aviation operations that do not generate revenue and therefore do not trigger reporting requirements and would not be included in the T-100 data.

In general, the emissions data for airports in the selected non-attainment areas can vary significantly from each other over time as fleet operations change from passenger to cargo operations or from large aircraft to smaller regional aircraft and air taxis or for broader economic reasons. In order to evaluate the impact aviation is having on local air quality, it is necessary to assess the changes in aircraft activities over time for the specific airports in the local area of interest, rather than extrapolate from national air traffic or emission patterns.

Three pairs of figures and tables show results for the 42 selected NAAs. Figure 3-12 and Table 3-11 show annual LTOs for commercial aircraft included in the T-100 dataset; Figure 3-13 and Table 3-12 show annual $NO_x$ emissions for commercial aircraft included in the T-100 dataset; and Figure 3-14 and Table 3-13 show $NO_x$ emission rates for commercial aircraft included in the T-100 dataset.

[20] Annual $NO_x$ emissions increased by 28 percent, LTOs increased by 50 percent, and $NO_x$ emissions per LTO decreased by 11 percent.



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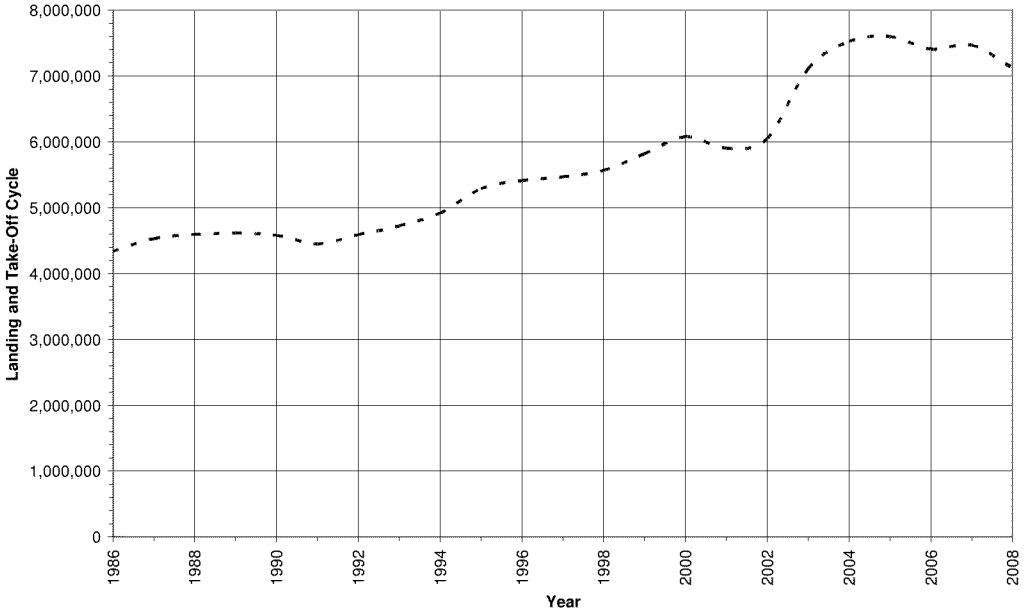


**Figure 3-12. Selected Non-attainment Areas LTOs for Commercial Aircraft, Included in the T-100 Dataset, Total Fleet [Refers to Total from Table 3-11]**

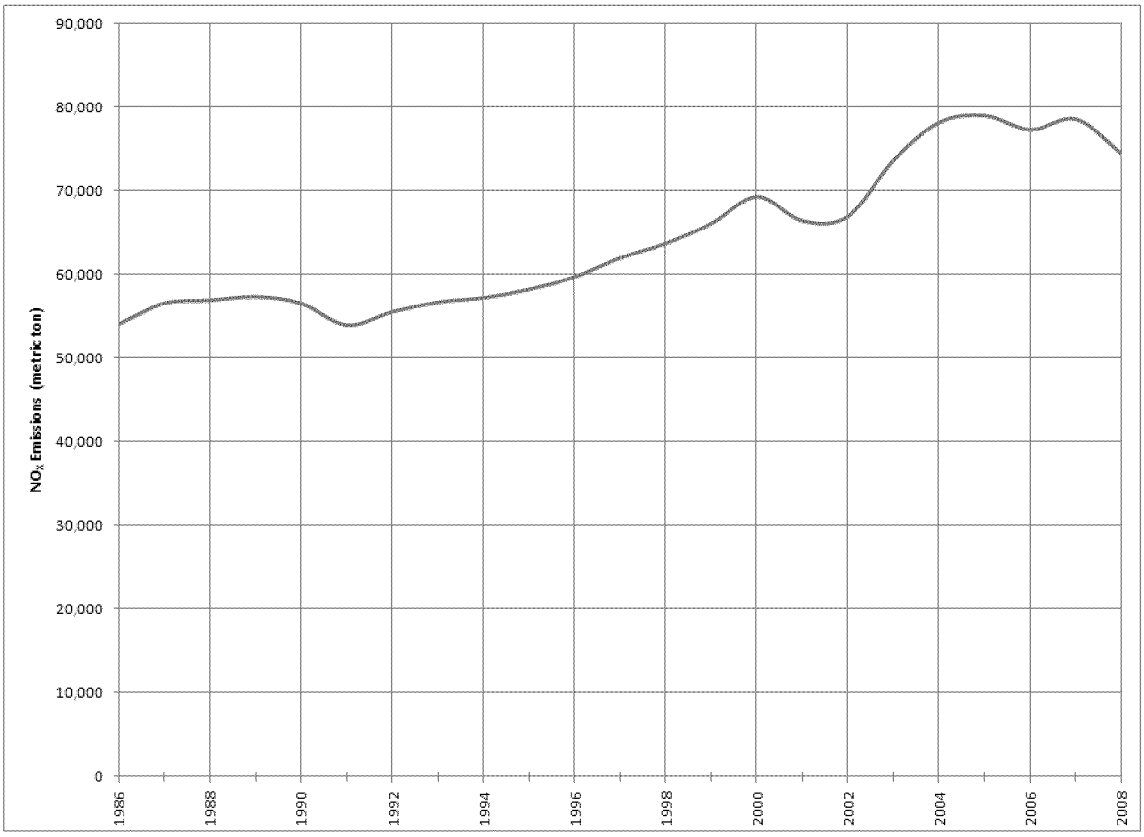


**Figure 3-13. Selected Non-attainment Areas $NO_x$ Emissions (kg) for Commercial Aircraft, Included in the T-100 Dataset, Total Fleet [Refers to Total from Table 3-12]**

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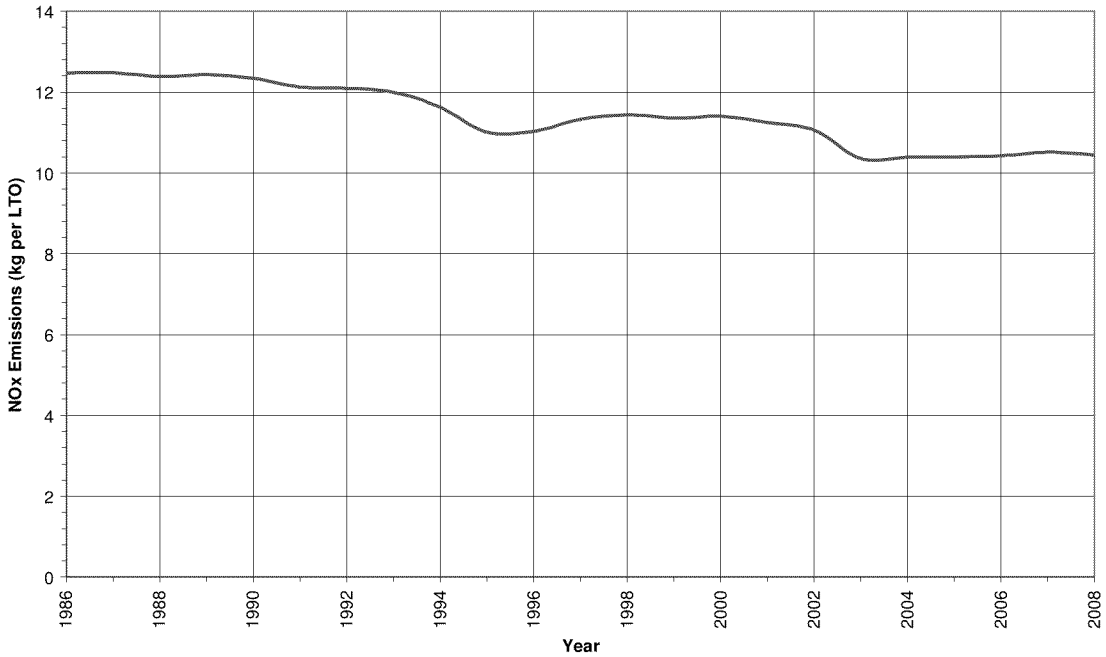


**Figure 3-14. Selected Non-attainment Areas $NO_x$ Emissions (kg/LTO) for Commercial Aircraft, Included in the T-100 Dataset**



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**Table 3-11. Selected Non-attainment Areas LTOs (× 10,000) for Commercial Aircraft, Included in the T-100 Dataset**

| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Albuquerque, NM | 3.61 | 3.49 | 3.45 | 3.45 | 3.30 | 3.13 | 3.28 | 3.55 | 3.77 | 4.41 | 5.13 | 4.55 | 3.77 | 3.88 | 3.75 | 3.75 | 4.17 | 5.09 | 4.92 | 4.69 | 4.68 | 5.06 | 4.84 |
| Anchorage, AK | 3.43 | 3.51 | 3.61 | 3.99 | 3.50 | 3.35 | 3.60 | 3.38 | 3.42 | 3.28 | 3.69 | 3.83 | 4.18 | 4.30 | 4.37 | 4.44 | 5.70 | 8.68 | 9.35 | 9.91 | 10.3 | 10.3 | 9.5 |
| Aspen | 0.34 | 0.34 | 0.34 | 0.36 | 0.31 | 0.28 | 0.33 | 0.33 | 0.34 | 0.34 | 0.34 | 0.34 | 0.37 | 0.35 | 0.36 | 0.33 | 0.34 | 0.38 | 0.39 | 0.40 | 0.47 | 0.48 | 0.58 |
| Atlanta, GA | 28.8 | 28.7 | 28.1 | 24.4 | 28.5 | 20.5 | 21.7 | 26.5 | 31.5 | 34.2 | 34.2 | 35.6 | 37.8 | 41.2 | 41.9 | 41.5 | 41.7 | 43.8 | 46.9 | 47.4 | 47.3 | 48.2 | 47.6 |
| Baltimore, MD | 6.49 | 6.84 | 7.59 | 7.80 | 7.37 | 6.75 | 5.77 | 5.96 | 7.77 | 7.40 | 7.13 | 7.22 | 7.82 | 9.00 | 9.90 | 10.8 | 10.8 | 11.8 | 12.4 | 12.4 | 12.3 | 12.2 | 11.6 |
| Boston-Lawrence-Worcester (eastern MA), MA | 12.0 | 12.8 | 12.7 | 12.5 | 12.0 | 11.4 | 15.2 | 16.4 | 16.3 | 17.7 | 14.5 | 13.3 | 12.9 | 13.6 | 15.6 | 16.3 | 17.0 | 23.7 | 25.0 | 25.1 | 25.2 | 24.7 | 22.5 |
| Boston-Manchester-Portsmouth (southeast NH), NH | 0.28 | 0.26 | 0.33 | 0.63 | 0.46 | 0.53 | 0.77 | 1.40 | 1.24 | 1.37 | 0.78 | 0.71 | 1.09 | 1.41 | 1.89 | 1.87 | 2.10 | 2.91 | 3.41 | 3.39 | 2.97 | 3.03 | 2.72 |
| Charlotte-Gastonia-Rock Hill, NC-SC | 9.50 | 9.45 | 10.7 | 11.6 | 11.9 | 12.7 | 12.7 | 12.1 | 13.3 | 13.3 | 13.2 | 13.1 | 12.6 | 12.1 | 13.6 | 13.5 | 14.2 | 18.9 | 19.9 | 22.7 | 22.2 | 23.0 | 23.7 |
| Chicago-Gary-Lake County, IL-IN | 38.3 | 38.8 | 39.3 | 39.4 | 39.1 | 38.8 | 41.5 | 42.7 | 44.5 | 44.5 | 43.8 | 45.2 | 46.6 | 47.7 | 48.6 | 49.1 | 51.2 | 56.2 | 60.2 | 56.6 | 56.5 | 56.0 | 52.5 |
| Cincinnati-Hamilton, OH-KY-IN | 3.96 | 6.30 | 6.56 | 6.89 | 6.57 | 6.99 | 7.32 | 7.30 | 7.32 | 8.14 | 9.23 | 9.23 | 9.13 | 8.93 | 15.7 | 14.6 | 20.9 | 25.3 | 26.2 | 25.6 | 19.0 | 18.2 | 15.4 |
| Cleveland-Akron-Lorain, OH | 6.21 | 6.66 | 7.56 | 7.74 | 8.08 | 6.84 | 6.68 | 6.37 | 7.53 | 9.43 | 11.3 | 12.1 | 12.4 | 13.0 | 13.7 | 12.0 | 11.1 | 12.5 | 13.1 | 13.2 | 12.8 | 12.4 | 11.7 |
| Dallas-Fort Worth, TX | 26.4 | 27.3 | 28.4 | 29.8 | 30.6 | 30.8 | 32.3 | 39.2 | 41.0 | 41.8 | 40.8 | 40.4 | 42.1 | 43.1 | 43.5 | 41.0 | 39.8 | 42.0 | 43.9 | 39.3 | 39.4 | 39.1 | 37.5 |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | 20.1 | 20.4 | 19.0 | 16.7 | 15.0 | 14.7 | 15.6 | 17.3 | 16.3 | 17.1 | 19.0 | 18.3 | 16.9 | 18.8 | 19.6 | 18.5 | 19.8 | 23.7 | 26.8 | 26.8 | 28.6 | 29.7 | 29.9 |
| Detroit-Ann Arbor, MI | 14.4 | 13.9 | 13.7 | 14.9 | 14.1 | 13.5 | 13.9 | 14.4 | 15.1 | 15.9 | 16.6 | 18.9 | 20.8 | 22.9 | 22.9 | 22.0 | 21.6 | 23.5 | 25.0 | 25.1 | 23.1 | 22.7 | 22.4 |
| El Paso, TX | 2.22 | 2.59 | 2.62 | 2.79 | 2.80 | 2.75 | 2.69 | 2.84 | 2.93 | 2.97 | 2.75 | 2.61 | 2.61 | 2.61 | 2.55 | 2.32 | 2.52 | 2.57 | 2.63 | 2.66 | 2.55 | 2.59 | 2.42 |
| Greater Connecticut, CT | 3.92 | 3.25 | 3.38 | 3.24 | 3.11 | 2.95 | 3.48 | 3.29 | 3.24 | 3.67 | 3.67 | 3.46 | 3.29 | 3.84 | 4.32 | 3.96 | 3.91 | 4.35 | 4.73 | 5.29 | 4.90 | 4.75 | 4.29 |
| Houston-Galveston-Brazoria, TX | 15.2 | 16.6 | 16.4 | 16.6 | 16.9 | 16.3 | 17.0 | 17.7 | 18.2 | 23.4 | 24.4 | 25.2 | 26.8 | 27.5 | 28.7 | 27.9 | 27.1 | 28.2 | 30.4 | 32.4 | 34.4 | 34.7 | 32.8 |
| Indianapolis, IN | 4.74 | 4.45 | 4.58 | 4.98 | 4.55 | 4.50 | 4.59 | 4.05 | 4.31 | 4.26 | 4.20 | 4.41 | 4.34 | 4.54 | 4.85 | 5.08 | 5.48 | 7.41 | 7.83 | 8.46 | 8.11 | 8.03 | 7.98 |
| Lake Tahoe South Shore, CA | 0.09 | 0.10 | 0.09 | 0.09 | 0.08 | 0.02 | 0.00 | 0.03 | <0.01 | 0.03 | (a) | (a) | (a) | 0.03 | 0.01 | (a) | (a) | (a) | <0.01 | (a) | (a) | (a) | (a) |
| Las Vegas, NV | 7.31 | 9.61 | 8.72 | 9.31 | 9.15 | 9.63 | 9.05 | 9.67 | 10.9 | 12.4 | 13.3 | 13.4 | 13.5 | 14.1 | 15.5 | 15.3 | 15.3 | 16.9 | 19.4 | 21.0 | 21.5 | 21.5 | 19.6 |
| Los Angeles South Coast Air Basin, CA | 30.2 | 33.3 | 33.2 | 34.5 | 35.4 | 33.7 | 32.1 | 31.6 | 32.7 | 36.8 | 38.4 | 36.9 | 37.8 | 39.9 | 40.8 | 39.2 | 37.6 | 43.1 | 45.2 | 45.3 | 45.6 | 47.7 | 43.4 |
| Louisville, KY-IN | 3.48 | 4.03 | 3.63 | 4.13 | 2.07 | 2.01 | 1.94 | 2.04 | 2.56 | 2.74 | 2.76 | 2.91 | 2.81 | 2.77 | 2.95 | 2.98 | 3.93 | 6.49 | 6.39 | 6.77 | 6.60 | 6.97 | 6.47 |
| Memphis, TN-AR | 10.6 | 10.9 | 10.5 | 9.95 | 6.54 | 5.88 | 5.46 | 5.36 | 5.54 | 5.76 | 5.55 | 5.70 | 5.60 | 6.52 | 7.37 | 7.51 | 9.98 | 17.3 | 16.4 | 16.8 | 16.7 | 16.3 | 16.2 |
| Milwaukee-Racine, WI | 3.19 | 2.92 | 3.64 | 3.77 | 3.82 | 3.59 | 3.85 | 3.73 | 3.93 | 3.92 | 4.13 | 4.31 | 4.38 | 4.51 | 4.76 | 4.60 | 5.39 | 7.85 | 8.24 | 8.67 | 7.98 | 7.99 | 7.42 |
| Minneapolis-St Paul, MN | 12.1 | 11.4 | 11.3 | 11.7 | 11.2 | 11.3 | 12.2 | 12.9 | 13.3 | 14.1 | 14.7 | 17.1 | 18.9 | 20.9 | 21.9 | 20.7 | 20.8 | 22.9 | 24.6 | 24.2 | 21.5 | 20.7 | 20.5 |
| New York-N. New Jersey-Long Island, NY-NJ-CT | 41.1 | 38.7 | 39.8 | 38.3 | 37.7 | 36.6 | 39.6 | 40.3 | 41.3 | 44.6 | 44.7 | 45.0 | 46.8 | 48.1 | 51.1 | 50.2 | 48.7 | 55.3 | 60.2 | 61.7 | 63.4 | 67.1 | 65.8 |

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**Table 3-11. Selected Non-attainment Areas LTOs (× 10,000) for Commercial Aircraft, Included in the T-100 Dataset (Cont.)**

| Area Name | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Philadelphia-Wilmington-Atlantic City, PA-NY-MD-DE | 8.82 | 10.4 | 10.2 | 9.30 | 10.8 | 9.23 | 10.5 | 11.2 | 10.9 | 12.1 | 13.3 | 13.8 | 13.6 | 13.9 | 14.7 | 14.1 | 15.1 | 20.1 | 22.0 | 24.7 | 23.9 | 23.3 | 23.0 |
| Phoenix-Mesa, AZ | 11.4 | 13.0 | 13.5 | 14.4 | 14.6 | 14.3 | 14.2 | 14.1 | 15.0 | 17.0 | 19.2 | 18.5 | 17.6 | 18.3 | 19.3 | 18.9 | 19.5 | 22.8 | 22.9 | 23.7 | 23.6 | 23.1 | 21.9 |
| Pittsburgh-Beaver Valley, PA | 11.6 | 12.1 | 12.8 | 12.3 | 12.4 | 12.3 | 13.8 | 12.7 | 13.6 | 14.4 | 15.1 | 13.7 | 12.1 | 11.2 | 11.9 | 12.5 | 12.6 | 16.3 | 14.7 | 11.4 | 10.1 | 8.98 | 6.92 |
| Providence (entire State), RI | 1.42 | 1.35 | 1.41 | 1.40 | 1.66 | 1.60 | 2.20 | 2.15 | 1.92 | 1.94 | 1.78 | 2.25 | 2.49 | 2.62 | 3.04 | 3.22 | 3.34 | 4.19 | 4.48 | 4.44 | 4.44 | 4.42 | 4.03 |
| Raleigh-Durham-Chapel Hill, NC | 2.94 | 4.72 | 6.41 | 6.41 | 6.46 | 6.19 | 5.97 | 5.81 | 5.06 | 4.23 | 4.27 | 4.30 | 5.17 | 6.52 | 7.48 | 7.02 | 6.31 | 7.00 | 8.14 | 8.36 | 7.82 | 8.30 | 7.48 |
| Reno, NV | 2.53 | 2.83 | 2.25 | 2.24 | 2.15 | 2.40 | 2.47 | 2.89 | 2.92 | 3.12 | 3.82 | 4.15 | 3.89 | 3.61 | 3.09 | 2.58 | 2.59 | 3.01 | 3.31 | 3.25 | 3.06 | 3.19 | 2.92 |
| Riverside County (Coachella Valley), CA | 0.59 | 0.61 | 0.61 | 0.71 | 0.94 | 0.97 | 0.83 | 0.48 | 0.46 | 0.62 | 0.74 | 0.62 | 0.73 | 0.80 | 0.77 | 0.76 | 0.80 | 1.46 | 1.39 | 1.32 | 1.39 | 1.45 | 1.33 |
| Sacramento Metro, CA | 2.57 | 2.94 | 3.50 | 3.65 | 3.83 | 3.78 | 3.84 | 3.42 | 3.16 | 3.86 | 3.95 | 4.00 | 3.97 | 4.02 | 4.04 | 4.17 | 4.66 | 5.51 | 5.73 | 5.89 | 6.12 | 6.72 | 6.21 |
| Salt Lake City, UT | 6.84 | 7.56 | 7.66 | 7.84 | 7.41 | 7.25 | 7.29 | 8.03 | 8.40 | 8.75 | 9.28 | 9.03 | 8.70 | 8.28 | 8.09 | 7.69 | 8.97 | 14.0 | 15.1 | 17.4 | 15.7 | 15.9 | 14.6 |
| San Diego, CA | 5.82 | 6.44 | 6.91 | 7.08 | 7.01 | 6.99 | 7.00 | 6.75 | 7.13 | 7.47 | 7.62 | 7.97 | 8.43 | 8.67 | 8.37 | 8.23 | 8.20 | 9.11 | 9.44 | 9.98 | 10.1 | 10.6 | 10.2 |
| San Francisco Bay Area, CA | 23.5 | 25.0 | 25.5 | 26.5 | 27.2 | 26.7 | 26.1 | 24.7 | 24.2 | 26.9 | 28.2 | 28.4 | 28.3 | 28.6 | 28.5 | 28.3 | 27.1 | 29.9 | 31.3 | 30.9 | 31.4 | 32.7 | 31.4 |
| San Joaquin Valley, CA | 1.22 | 1.40 | 2.13 | 2.66 | 3.31 | 2.82 | 2.27 | 1.25 | 0.61 | 0.84 | 1.08 | 0.72 | 0.88 | 1.08 | 0.67 | 0.64 | 1.04 | 2.63 | 2.64 | 2.81 | 2.83 | 3.02 | 2.61 |
| Seattle-Tacoma, WA | 9.69 | 11.3 | 11.4 | 12.1 | 12.4 | 14.1 | 14.3 | 13.7 | 13.7 | 15.0 | 15.8 | 15.8 | 15.9 | 17.1 | 17.3 | 16.2 | 16.5 | 18.6 | 19.0 | 18.2 | 18.3 | 18.3 | 18.4 |
| St. Louis, MO-IL | 16.1 | 14.0 | 14.2 | 14.8 | 13.3 | 15.8 | 17.5 | 18.3 | 20.4 | 22.1 | 22.4 | 22.8 | 22.2 | 22.1 | 20.6 | 19.4 | 17.8 | 17.7 | 12.7 | 13.1 | 12.5 | 11.6 | 11.0 |
| Syracuse, NY | 3.64 | 3.89 | 3.87 | 3.45 | 2.71 | 2.61 | 2.58 | 2.32 | 2.11 | 2.01 | 1.63 | 1.46 | 1.59 | 1.53 | 1.69 | 1.55 | 1.75 | 2.67 | 2.96 | 2.94 | 2.58 | 2.65 | 2.49 |
| Washington, DC-MD-VA | 16.8 | 18.9 | 17.9 | 17.1 | 17.9 | 18.4 | 15.7 | 14.2 | 14.2 | 14.9 | 15.0 | 15.5 | 16.0 | 17.8 | 17.9 | 15.7 | 17.6 | 25.2 | 33.0 | 35.3 | 29.0 | 29.1 | 28.4 |

[a] Lake Tahoe periods when commercial airline service (that are required to report T-100 data) was temporarily discontinued to the area.

Note: the number associated with the aircraft type indicate the number of engines; for example, wide-body 4 is a wide-body aircraft equipped with four engines.



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**Table 3-12. Selected Non-attainment Areas $NO_x$ Emission (kg/LTO) for Commercial Aircraft, Included in the T-100 Dataset**

| Area Name | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Albuquerque, NM | 7.64 | 7.74 | 7.68 | 7.88 | 7.90 | 7.94 | 8.14 | 8.17 | 8.11 | 7.16 | 6.53 | 7.17 | 8.14 | 7.89 | 7.87 | 7.89 | 7.61 | 6.70 | 6.98 | 7.15 | 6.96 | 6.92 | 7.17 |
| Anchorage, AK | 21.0 | 20.6 | 19.6 | 21.6 | 28.4 | 26.6 | 24.5 | 24.3 | 27.6 | 29.5 | 30.4 | 33.9 | 36.4 | 37.9 | 38.1 | 38.3 | 34.5 | 26.5 | 27.4 | 28.6 | 28.4 | 28.3 | 24.4 |
| Aspen | 1.59 | 1.80 | 2.12 | 2.59 | 3.17 | 3.89 | 3.95 | 3.95 | 3.95 | 3.95 | 3.97 | 4.00 | 4.04 | 4.11 | 4.14 | 4.10 | 3.97 | 3.54 | 3.06 | 3.01 | 2.95 | 3.46 | 2.97 |
| Atlanta, GA | 12.1 | 12.3 | 12.5 | 12.6 | 12.7 | 12.9 | 13.0 | 12.1 | 10.8 | 10.7 | 11.2 | 11.4 | 11.6 | 11.6 | 12.2 | 12.0 | 12.6 | 13.7 | 13.6 | 13.8 | 11.9 | 11.1 | 11.1 |
| Baltimore, MD | 10.6 | 9.91 | 9.72 | 9.32 | 9.17 | 9.26 | 9.34 | 9.63 | 9.40 | 9.51 | 9.63 | 9.53 | 9.67 | 9.67 | 9.56 | 9.36 | 9.76 | 9.45 | 9.53 | 9.23 | 9.12 | 9.36 | 9.04 |
| Boston-Lawrence-Worcester (eastern MA), MA | 15.7 | 14.7 | 14.7 | 15.8 | 15.4 | 15.3 | 11.9 | 11.1 | 10.9 | 9.41 | 11.1 | 12.7 | 13.7 | 13.5 | 12.6 | 11.2 | 9.89 | 7.15 | 7.62 | 7.41 | 7.24 | 7.40 | 7.70 |
| Boston-Manchester-Portsmouth (southeast NH), NH | 4.28 | 8.40 | 8.09 | 8.39 | 8.45 | 8.45 | 5.45 | 2.72 | 3.23 | 3.03 | 4.49 | 6.18 | 6.90 | 7.80 | 7.58 | 8.25 | 8.54 | 7.52 | 8.02 | 8.05 | 7.46 | 7.37 | 7.48 |
| Charlotte-Gastonia-Rock Hill, NC-SC | 8.40 | 8.37 | 8.50 | 8.32 | 8.57 | 8.22 | 8.46 | 8.31 | 8.59 | 8.91 | 9.00 | 8.95 | 8.86 | 8.62 | 9.16 | 9.30 | 9.38 | 7.26 | 7.30 | 7.55 | 7.54 | 7.83 | 7.79 |
| Chicago-Gary-Lake County, IL-IN | 13.6 | 14.0 | 13.8 | 13.6 | 13.2 | 13.1 | 12.3 | 12.6 | 11.3 | 11.0 | 11.2 | 11.1 | 11.6 | 11.8 | 11.9 | 11.1 | 10.9 | 10.5 | 10.6 | 10.7 | 10.6 | 10.8 | 10.4 |
| Cincinnati-Hamilton, OH-KY-IN | 9.46 | 9.40 | 9.64 | 10.9 | 10.0 | 10.2 | 10.7 | 10.9 | 10.8 | 10.5 | 11.2 | 11.7 | 11.9 | 11.9 | 8.53 | 8.42 | 7.51 | 7.72 | 7.95 | 7.82 | 7.24 | 7.22 | 7.59 |
| Cleveland-Akron-Lorain, OH | 9.14 | 9.45 | 9.34 | 9.33 | 9.46 | 9.46 | 9.57 | 9.15 | 9.00 | 6.99 | 6.10 | 5.75 | 5.68 | 5.13 | 5.23 | 5.58 | 5.96 | 5.58 | 5.71 | 5.64 | 5.41 | 5.50 | 5.51 |
| Dallas-Fort Worth, TX | 12.7 | 13.1 | 13.7 | 13.7 | 13.9 | 13.5 | 13.5 | 11.0 | 9.55 | 9.26 | 9.08 | 9.32 | 8.70 | 8.37 | 8.73 | 8.83 | 9.04 | 9.14 | 9.58 | 9.72 | 9.61 | 9.66 | 9.43 |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | 10.6 | 10.6 | 10.7 | 10.7 | 11.0 | 11.5 | 11.4 | 11.3 | 11.1 | 10.2 | 9.81 | 10.6 | 11.8 | 11.0 | 10.5 | 10.4 | 10.1 | 8.61 | 8.25 | 8.23 | 8.19 | 8.32 | 8.13 |
| Detroit-Ann Arbor, MI | 11.0 | 12.0 | 12.3 | 12.4 | 12.8 | 13.1 | 13.2 | 13.0 | 12.8 | 12.9 | 13.2 | 11.9 | 10.6 | 10.9 | 11.1 | 10.4 | 10.2 | 9.69 | 9.45 | 9.33 | 9.60 | 9.90 | 9.45 |
| El Paso, TX | 7.81 | 8.39 | 8.70 | 7.85 | 7.86 | 8.08 | 7.79 | 7.92 | 7.86 | 7.78 | 7.62 | 7.46 | 7.65 | 7.54 | 7.52 | 7.46 | 7.48 | 7.74 | 7.91 | 8.12 | 8.47 | 8.80 | 8.37 |
| Greater Connecticut, CT | 8.80 | 11.6 | 10.7 | 10.5 | 10.6 | 10.8 | 8.89 | 8.49 | 8.98 | 8.02 | 8.17 | 8.60 | 9.23 | 9.10 | 9.45 | 9.83 | 10.1 | 9.91 | 9.82 | 9.12 | 8.64 | 8.57 | 8.74 |
| Houston-Galveston-Brazoria, TX | 10.6 | 10.1 | 9.72 | 9.99 | 10.1 | 10.4 | 10.6 | 10.5 | 10.3 | 8.22 | 7.87 | 8.07 | 8.48 | 8.40 | 8.43 | 8.86 | 9.30 | 9.13 | 9.09 | 8.62 | 8.45 | 8.46 | 8.46 |
| Indianapolis, IN | 7.62 | 8.36 | 8.75 | 8.54 | 8.86 | 8.60 | 8.52 | 8.41 | 8.32 | 8.33 | 8.44 | 8.32 | 8.64 | 8.68 | 8.62 | 8.09 | 9.96 | 12.4 | 12.5 | 12.3 | 12.1 | 12.4 | 12.4 |
| Lake Tahoe South Shore, CA | 7.78 | 7.71 | 7.71 | 7.75 | 7.77 | 7.78 | 0.86 | 0.86 | 9.87 | 9.87 | (a) | (a) | (a) | 9.16 | 10.9 | (a) | (a) | (a) | 6.51 | (a) | (a) | (a) | (a) |
| Las Vegas, NV | 11.0 | 10.9 | 11.2 | 10.6 | 10.1 | 9.85 | 10.4 | 10.3 | 9.99 | 9.96 | 10.4 | 10.4 | 10.5 | 11.0 | 11.5 | 11.2 | 11.1 | 10.4 | 10.5 | 10.1 | 10.1 | 10.5 | 10.7 |
| Los Angeles South Coast Air Basin, CA | 17.1 | 16.4 | 16.0 | 15.5 | 14.8 | 15.4 | 16.7 | 17.3 | 16.6 | 15.2 | 14.8 | 15.7 | 15.4 | 15.0 | 15.2 | 15.1 | 14.8 | 13.8 | 13.7 | 13.7 | 13.8 | 13.5 | 13.7 |
| Louisville, KY-IN | 9.39 | 11.5 | 11.7 | 13.7 | 8.63 | 8.08 | 7.44 | 7.84 | 8.33 | 8.14 | 8.15 | 7.92 | 7.78 | 7.48 | 7.30 | 7.06 | 11.4 | 15.7 | 14.9 | 14.2 | 15.4 | 15.7 | 17.0 |
| Memphis, TN-AR | 10.9 | 11.8 | 12.0 | 11.1 | 9.60 | 9.79 | 9.89 | 9.86 | 9.99 | 10.0 | 10.5 | 10.6 | 10.4 | 9.91 | 10.0 | 10.2 | 11.7 | 14.2 | 15.2 | 15.5 | 15.9 | 16.8 | 16.8 |
| Milwaukee-Racine, WI | 8.41 | 9.22 | 8.31 | 9.90 | 9.38 | 9.05 | 8.96 | 8.89 | 8.52 | 8.61 | 8.59 | 8.53 | 8.35 | 8.54 | 8.74 | 8.44 | 7.11 | 5.77 | 5.96 | 6.06 | 6.39 | 6.52 | 6.82 |
| Minneapolis-St Paul, MN | 12.9 | 13.5 | 13.1 | 14.0 | 13.8 | 13.8 | 13.6 | 13.3 | 12.8 | 12.5 | 12.6 | 11.4 | 10.1 | 10.4 | 10.8 | 10.9 | 10.4 | 9.95 | 9.87 | 9.90 | 10.1 | 10.1 | 9.58 |
| New York-N. New Jersey-Long Island, NY-NJ-CT | 18.3 | 18.9 | 18.8 | 18.9 | 19.4 | 18.7 | 17.4 | 17.2 | 17.4 | 15.8 | 16.1 | 17.0 | 17.2 | 17.2 | 16.7 | 15.7 | 15.0 | 14.1 | 14.1 | 14.2 | 14.5 | 14.5 | 14.2 |

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**Table 3-12. Selected Non-attainment Areas $NO_x$ Emission (kg/LTO) for Commercial Aircraft, Included in the T-100 Dataset (Cont.)**

| Area Name | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Philadelphia-Wilmington-Atlantic City, PA-NY-MD-DE | 12.3 | 11.3 | 11.8 | 12.4 | 11.3 | 11.4 | 10.9 | 10.2 | 10.4 | 9.31 | 9.08 | 10.1 | 11.0 | 11.0 | 11.2 | 11.7 | 11.8 | 10.1 | 10.3 | 9.83 | 9.67 | 9.89 | 9.60 |
| Phoenix-Mesa, AZ | 9.11 | 9.23 | 9.17 | 9.22 | 9.38 | 9.12 | 9.35 | 9.85 | 9.53 | 9.09 | 8.74 | 9.38 | 9.97 | 10.0 | 10.2 | 10.1 | 9.82 | 9.05 | 9.13 | 9.18 | 9.31 | 9.56 | 9.56 |
| Pittsburgh-Beaver Valley, PA | 8.95 | 8.87 | 8.96 | 9.31 | 9.07 | 9.00 | 9.29 | 9.72 | 9.43 | 8.44 | 7.81 | 8.34 | 8.98 | 8.90 | 8.97 | 8.90 | 8.11 | 5.52 | 5.45 | 5.35 | 5.48 | 5.83 | 6.66 |
| Providence (entire State), RI | 6.94 | 8.44 | 8.03 | 8.54 | 8.82 | 8.78 | 6.46 | 5.57 | 6.55 | 5.91 | 7.20 | 7.82 | 7.87 | 8.01 | 7.80 | 8.06 | 8.24 | 6.47 | 6.80 | 6.82 | 5.78 | 5.58 | 5.41 |
| Raleigh-Durham-Chapel Hill, NC | 8.38 | 8.43 | 8.72 | 8.90 | 9.23 | 9.77 | 10.5 | 10.4 | 9.12 | 8.31 | 7.71 | 8.08 | 7.36 | 6.97 | 7.00 | 7.24 | 7.47 | 6.80 | 6.57 | 6.56 | 6.78 | 7.00 | 7.19 |
| Reno, NV | 8.14 | 8.09 | 8.37 | 8.50 | 7.75 | 7.42 | 7.86 | 8.29 | 8.58 | 8.63 | 8.60 | 8.57 | 8.85 | 8.25 | 8.47 | 8.27 | 8.15 | 7.77 | 7.89 | 7.96 | 8.07 | 8.00 | 7.74 |
| Riverside County (Coachella Valley), CA | 9.17 | 9.32 | 8.23 | 6.88 | 5.42 | 4.94 | 4.72 | 7.00 | 7.76 | 5.59 | 5.70 | 6.27 | 5.83 | 4.89 | 5.76 | 4.90 | 4.46 | 3.72 | 4.02 | 4.35 | 4.55 | 4.75 | 5.10 |
| Sacramento Metro, CA | 8.24 | 8.31 | 6.95 | 6.11 | 5.47 | 6.02 | 6.62 | 7.49 | 8.03 | 7.83 | 7.76 | 7.93 | 8.07 | 7.93 | 8.36 | 8.52 | 8.55 | 8.83 | 8.98 | 9.07 | 9.06 | 8.83 | 8.88 |
| Salt Lake City, UT | 8.89 | 9.10 | 9.57 | 9.73 | 9.98 | 10.3 | 10.7 | 10.7 | 10.6 | 10.8 | 10.9 | 11.3 | 11.6 | 11.8 | 12.1 | 12.6 | 11.2 | 8.19 | 7.27 | 7.11 | 7.31 | 7.47 | 7.78 |
| San Diego, CA | 11.6 | 11.1 | 10.3 | 9.74 | 9.60 | 9.19 | 10.1 | 10.9 | 10.1 | 9.49 | 9.51 | 9.55 | 9.12 | 8.59 | 9.26 | 9.37 | 9.48 | 9.06 | 8.91 | 8.89 | 9.06 | 9.05 | 9.28 |
| San Francisco Bay Area, CA | 14.3 | 14.0 | 13.5 | 13.3 | 13.1 | 13.1 | 13.4 | 14.5 | 15.1 | 14.3 | 14.2 | 14.4 | 14.6 | 14.5 | 14.9 | 14.5 | 14.3 | 13.3 | 13.3 | 13.1 | 13.4 | 13.1 | 12.8 |
| San Joaquin Valley, CA | 7.18 | 7.37 | 3.54 | 2.63 | 2.13 | 2.01 | 2.19 | 3.81 | 5.93 | 3.43 | 3.26 | 2.95 | 1.99 | 1.60 | 2.94 | 2.42 | 3.21 | 3.01 | 2.88 | 2.95 | 2.85 | 2.77 | 2.98 |
| Seattle-Tacoma, WA | 13.7 | 11.7 | 11.3 | 11.3 | 11.4 | 9.54 | 9.60 | 10.1 | 10.3 | 10.6 | 10.2 | 10.2 | 10.5 | 10.1 | 9.74 | 10.2 | 10.2 | 10.7 | 10.5 | 10.6 | 11.0 | 10.7 | 11.1 |
| St. Louis, MO-IL | 9.73 | 10.6 | 10.7 | 11.3 | 10.7 | 8.66 | 8.19 | 8.09 | 8.24 | 8.35 | 8.41 | 8.36 | 8.47 | 8.27 | 8.88 | 9.04 | 8.76 | 7.10 | 5.90 | 5.91 | 6.14 | 6.74 | 6.71 |
| Syracuse, NY | 7.24 | 7.23 | 7.28 | 7.91 | 8.17 | 7.88 | 6.93 | 6.63 | 6.76 | 5.62 | 6.51 | 7.31 | 6.75 | 6.87 | 6.28 | 6.33 | 6.40 | 4.84 | 5.14 | 5.26 | 5.31 | 5.69 | 5.55 |
| Washington, DC-MD-VA | 10.8 | 10.8 | 10.5 | 10.7 | 10.8 | 10.1 | 12.4 | 13.5 | 14.0 | 13.1 | 12.6 | 12.6 | 12.7 | 12.5 | 12.6 | 13.0 | 11.2 | 8.41 | 8.06 | 8.18 | 9.09 | 9.54 | 9.68 |

[a] Lake Tahoe periods when commercial airline service (that are required to report T-100 data) was temporarily discontinued to the area.

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**Table 3-13. Selected Non-attainment Areas $NO_x$ Emissions (metric ton) for Commercial Aircraft, Included in the T-100 Dataset**

| Area Name | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Albuquerque, NM | 275 | 270 | 265 | 272 | 261 | 249 | 267 | 290 | 306 | 316 | 335 | 326 | 307 | 306 | 295 | 296 | 318 | 341 | 344 | 336 | 326 | 350 | 347 |
| Anchorage, AK | 715 | 720 | 704 | 858 | 995 | 892 | 880 | 821 | 941 | 966 | 1,120 | 1,296 | 1,522 | 1,628 | 1,664 | 1,700 | 1,962 | 2,294 | 2,559 | 2,835 | 2,932 | 2,917 | 2,324 |
| Aspen | 5.42 | 6.21 | 7.19 | 9.30 | 9.8 | 10.9 | 12.9 | 13.2 | 13.4 | 13.6 | 13.5 | 13.6 | 15.0 | 14.6 | 14.9 | 13.6 | 13.7 | 13.6 | 11.9 | 12.0 | 13.9 | 16.6 | 17.1 |
| Atlanta, GA | 3,491 | 3,534 | 3,510 | 3,080 | 3,631 | 2,642 | 2,820 | 3,201 | 3,408 | 3,671 | 3,814 | 4,063 | 4,377 | 4,770 | 5,098 | 4,985 | 5,265 | 6,006 | 6,367 | 6,559 | 5,614 | 5,355 | 5,293 |
| Baltimore, MD | 687 | 678 | 737 | 727 | 676 | 625 | 539 | 574 | 730 | 704 | 686 | 688 | 756 | 871 | 947 | 1,013 | 1,054 | 1,110 | 1,177 | 1,143 | 1,121 | 1,145 | 1,052 |
| Boston-Lawrence-Worcester (eastern MA), MA | 1,884 | 1,884 | 1,870 | 1,978 | 1,841 | 1,741 | 1,803 | 1,822 | 1,769 | 1,662 | 1,608 | 1,681 | 1,759 | 1,848 | 1,971 | 1,821 | 1,678 | 1,696 | 1,904 | 1,860 | 1,826 | 1,827 | 1,730 |
| Boston-Manchester-Portsmouth (southeast NH), NH | 12.1 | 21.7 | 26.9 | 52.7 | 38.8 | 44.7 | 42.2 | 38.1 | 40.0 | 41.5 | 35.1 | 43.9 | 75.5 | 110 | 144 | 154 | 180 | 219 | 273 | 273 | 221 | 223 | 203 |
| Charlotte-Gastonia-Rock Hill, NC-SC | 798 | 791 | 906 | 964 | 1,017 | 1,040 | 1,071 | 1,001 | 1,141 | 1,184 | 1,191 | 1,169 | 1,114 | 1,042 | 1,245 | 1,253 | 1,333 | 1,374 | 1,453 | 1,715 | 1,678 | 1,799 | 1,850 |
| Chicago-Gary-Lake County, IL-IN | 5,223 | 5,414 | 5,421 | 5,351 | 5,155 | 5,089 | 5,114 | 5,364 | 5,042 | 4,892 | 4,913 | 5,032 | 5,392 | 5,635 | 5,768 | 5,443 | 5,562 | 5,920 | 6,401 | 6,076 | 6,011 | 6,028 | 5,464 |
| Cincinnati-Hamilton, OH-KY-IN | 375 | 592 | 632 | 753 | 657 | 715 | 781 | 795 | 791 | 857 | 1,037 | 1,084 | 1,087 | 1,060 | 1,335 | 1,232 | 1,567 | 1,950 | 2,086 | 2,002 | 1,377 | 1,311 | 1,169 |
| Cleveland-Akron-Lorain, OH | 567 | 630 | 706 | 722 | 764 | 647 | 639 | 583 | 678 | 659 | 687 | 697 | 703 | 666 | 717 | 667 | 662 | 697 | 749 | 747 | 694 | 683 | 646 |
| Dallas-Fort Worth, TX | 3,358 | 3,572 | 3,900 | 4,091 | 4,241 | 4,168 | 4,359 | 4,323 | 3,912 | 3,866 | 3,702 | 3,768 | 3,667 | 3,605 | 3,799 | 3,624 | 3,595 | 3,837 | 4,203 | 3,816 | 3,789 | 3,778 | 3,538 |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | 2,126 | 2,162 | 2,040 | 1,793 | 1,654 | 1,683 | 1,776 | 1,962 | 1,811 | 1,740 | 1,859 | 1,938 | 1,988 | 2,059 | 2,051 | 1,914 | 1,998 | 2,045 | 2,207 | 2,204 | 2,338 | 2,473 | 2,436 |
| Detroit-Ann Arbor, MI | 1,577 | 1,669 | 1,688 | 1,836 | 1,800 | 1,773 | 1,836 | 1,881 | 1,931 | 2,055 | 2,198 | 2,257 | 2,199 | 2,491 | 2,540 | 2,282 | 2,205 | 2,280 | 2,366 | 2,342 | 2,215 | 2,243 | 2,112 |
| El Paso, TX | 173 | 217 | 228 | 219 | 220 | 222 | 210 | 225 | 230 | 231 | 209 | 195 | 200 | 197 | 192 | 173 | 188 | 199 | 208 | 216 | 216 | 228 | 203 |
| Greater Connecticut, CT | 345 | 377 | 361 | 339 | 331 | 318 | 309 | 280 | 291 | 294 | 300 | 298 | 303 | 350 | 409 | 389 | 394 | 431 | 465 | 482 | 423 | 407 | 375 |
| Houston-Galveston-Brazoria, TX | 1,611 | 1,673 | 1,590 | 1,655 | 1,703 | 1,692 | 1,803 | 1,855 | 1,868 | 1,925 | 1,924 | 2,031 | 2,272 | 2,306 | 2,420 | 2,469 | 2,522 | 2,577 | 2,766 | 2,794 | 2,909 | 2,939 | 2,778 |
| Indianapolis, IN | 362 | 371 | 400 | 424 | 403 | 387 | 391 | 341 | 359 | 355 | 354 | 367 | 375 | 394 | 418 | 411 | 546 | 919 | 976 | 1,037 | 984 | 995 | 991 |
| Lake Tahoe South Shore, CA | 7.11 | 7.85 | 7.04 | 7.03 | 6.47 | 1.84 | 0.03 | 0.25 | 0.16 | 2.61 | (a) | (a) | (a) | 2.58 | 0.68 | (a) | (a) | (a) | 0.03 | (a) | (a) | (a) | (a) |
| Las Vegas, NV | 806 | 1,044 | 973 | 985 | 927 | 949 | 944 | 999 | 1,087 | 1,233 | 1,377 | 1,396 | 1,412 | 1,556 | 1,783 | 1,715 | 1,706 | 1,754 | 2,042 | 2,130 | 2,178 | 2,253 | 2,099 |
| Los Angeles South Coast Air Basin, CA | 5,169 | 5,458 | 5,306 | 5,350 | 5,250 | 5,203 | 5,349 | 5,471 | 5,415 | 5,595 | 5,676 | 5,814 | 5,817 | 5,989 | 6,186 | 5,896 | 5,575 | 5,933 | 6,186 | 6,188 | 6,286 | 6,418 | 5,926 |
| Louisville, KY-IN | 326 | 462 | 425 | 565 | 179 | 162 | 144 | 160 | 213 | 223 | 225 | 230 | 219 | 207 | 215 | 210 | 449 | 1,021 | 953 | 962 | 1,014 | 1,094 | 1,098 |
| Memphis, TN-AR | 1,152 | 1,284 | 1,261 | 1,107 | 628 | 576 | 540 | 528 | 553 | 578 | 583 | 604 | 580 | 646 | 737 | 763 | 1,166 | 2,444 | 2,493 | 2,600 | 2,649 | 2,739 | 2,718 |
| Milwaukee-Racine, WI | 268 | 269 | 302 | 374 | 358 | 325 | 345 | 331 | 335 | 337 | 355 | 367 | 365 | 385 | 416 | 388 | 383 | 453 | 492 | 525 | 510 | 521 | 507 |
| Minneapolis-St Paul, MN | 1,564 | 1,535 | 1,472 | 1,635 | 1,545 | 1,554 | 1,664 | 1,711 | 1,696 | 1,759 | 1,859 | 1,958 | 1,899 | 2,166 | 2,376 | 2,260 | 2,164 | 2,283 | 2,429 | 2,396 | 2,173 | 2,089 | 1,969 |
| New York-N. New Jersey-Long Island, NY-NJ-CT | 7,522 | 7,317 | 7,503 | 7,228 | 7,319 | 6,828 | 6,905 | 6,921 | 7,173 | 7,045 | 7,183 | 7,649 | 8,057 | 8,282 | 8,534 | 7,856 | 7,324 | 7,805 | 8,474 | 8,745 | 9,176 | 9,736 | 9,361 |
| Philadelphia-Wilmington-Atlantic City, PA-NY-MD-DE | 1,088 | 1,166 | 1,202 | 1,145 | 1,229 | 1,051 | 1,143 | 1,143 | 1,129 | 1,125 | 1,209 | 1,397 | 1,499 | 1,532 | 1,656 | 1,645 | 1,787 | 2,020 | 2,256 | 2,431 | 2,309 | 2,307 | 2,206 |
| Phoenix-Mesa, AZ | 1,040 | 1,204 | 1,241 | 1,327 | 1,369 | 1,305 | 1,331 | 1,391 | 1,430 | 1,542 | 1,677 | 1,734 | 1,754 | 1,833 | 1,967 | 1,903 | 1,913 | 2,063 | 2,087 | 2,179 | 2,195 | 2,206 | 2,093 |

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**Table 3-13. Selected Non-attainment Areas $NO_x$ Emissions (metric ton) for Commercial Aircraft, Included in the T-100 Dataset (Cont.)**

| Area Name | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pittsburgh-Beaver Valley, PA | 1,038 | 1,074 | 1,145 | 1,147 | 1,121 | 1,110 | 1,278 | 1,230 | 1,286 | 1,218 | 1,179 | 1,144 | 1,083 | 1,001 | 1,069 | 1,113 | 1,025 | 899 | 800 | 612 | 555 | 524 | 461 |
| Providence (entire State), RI | 98.3 | 114 | 113 | 120 | 146 | 140 | 142 | 120 | 126 | 115 | 128 | 176 | 196 | 210 | 237 | 260 | 275 | 271 | 305 | 303 | 256 | 247 | 218 |
| Raleigh-Durham-Chapel Hill, NC | 246 | 398 | 559 | 571 | 596 | 605 | 626 | 604 | 462 | 352 | 329 | 347 | 381 | 454 | 523 | 509 | 471 | 476 | 535 | 548 | 530 | 581 | 538 |
| Reno, NV | 206 | 229 | 188 | 191 | 167 | 178 | 194 | 240 | 250 | 269 | 329 | 356 | 345 | 297 | 262 | 213 | 211 | 234 | 261 | 259 | 247 | 256 | 226 |
| Riverside County (Coachella Valley), CA | 54.0 | 56.8 | 50.4 | 49.0 | 51.1 | 47.7 | 39.4 | 33.5 | 35.3 | 34.5 | 42.1 | 39.0 | 42.7 | 39.2 | 44.1 | 37.2 | 35.6 | 54.3 | 55.8 | 57.4 | 63.4 | 69.1 | 68.0 |
| Sacramento Metro, CA | 212 | 240 | 239 | 218 | 209 | 227 | 254 | 256 | 254 | 302 | 307 | 318 | 321 | 319 | 338 | 355 | 398 | 487 | 515 | 534 | 554 | 593 | 552 |
| Salt Lake City, UT | 608 | 688 | 734 | 763 | 739 | 746 | 781 | 863 | 892 | 945 | 1,015 | 1,024 | 1,012 | 979 | 979 | 970 | 1,000 | 1,144 | 1,098 | 1,238 | 1,147 | 1,189 | 1,134 |
| San Diego, CA | 675 | 709 | 706 | 686 | 673 | 643 | 705 | 735 | 720 | 709 | 725 | 761 | 770 | 745 | 775 | 771 | 777 | 825 | 841 | 887 | 912 | 958 | 949 |
| San Francisco Bay Area, CA | 3,353 | 3,487 | 3,440 | 3,517 | 3,563 | 3,515 | 3,510 | 3,577 | 3,639 | 3,840 | 3,986 | 4,102 | 4,117 | 4,165 | 4,257 | 4,121 | 3,878 | 3,981 | 4,151 | 4,064 | 4,189 | 4,275 | 4,034 |
| San Joaquin Valley, CA | 87.7 | 103 | 75.2 | 70.0 | 70.7 | 56.5 | 49.8 | 47.5 | 36.2 | 28.8 | 35.3 | 21.3 | 17.6 | 17.3 | 19.8 | 15.5 | 33.5 | 79.3 | 76.1 | 82.9 | 80.4 | 83.5 | 77.8 |
| Seattle-Tacoma, WA | 1,328 | 1,326 | 1,290 | 1,365 | 1,411 | 1,346 | 1,371 | 1,385 | 1,401 | 1,601 | 1,603 | 1,613 | 1,665 | 1,726 | 1,690 | 1,653 | 1,679 | 1,991 | 1,999 | 1,939 | 2,003 | 1,960 | 2,034 |
| St. Louis, MO-IL | 1,568 | 1,489 | 1,517 | 1,678 | 1,425 | 1,370 | 1,436 | 1,481 | 1,679 | 1,849 | 1,883 | 1,902 | 1,879 | 1,831 | 1,825 | 1,754 | 1,561 | 1,255 | 750 | 776 | 766 | 784 | 737 |
| Syracuse, NY | 263 | 281 | 282 | 273 | 221 | 206 | 179 | 154 | 143 | 113 | 106 | 107 | 107 | 105 | 106 | 98.2 | 112 | 129 | 152 | 155 | 137 | 151 | 138 |
| Washington, DC-MD-VA | 1,814 | 2,033 | 1,882 | 1,837 | 1,936 | 1,864 | 1,938 | 1,929 | 1,982 | 1,952 | 1,896 | 1,952 | 2,039 | 2,231 | 2,249 | 2,037 | 1,964 | 2,123 | 2,665 | 2,885 | 2,636 | 2,777 | 2,746 |

[a] Lake Tahoe periods when commercial airline service (that are required to report T-100 data) was temporarily discontinued to the area.

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At the NAA level the direction and magnitude of change for these three parameters (annual LTOs, annual $NO_x$, $NO_x$ emissions per LTO) varies and can vary significantly from the national average. In order to identify possible causes for the varying trends, each NAA was grouped based on activity levels and compared to the national trend. Generally, the groups of NAAs with activity levels greater than 200,000 LTOs per year followed a trend similar to the national level, while NAAs with activity levels less than 200,000 LTOs showed greater deviation from the national level. For example, the San Francisco Bay Area, with annual LTOs between 200,000 and 300,000, followed the trend of increasing LTOs, increasing $NO_x$ emissions, and decreasing $NO_x$ per LTO, as seen at the national level. However, the Aspen, Colorado area, with annual LTOs less than 50,000, showed an increase in all three parameters. Conversely, Syracuse, New York, with annual LTOs less than 50,000, showed a decrease in all three parameters $NO_x$ emissions, total LTOs, and $NO_x$ per LTO. Table 3-14 shows how many of the NAAs agreed with the national trend.

**Table 3-14. Selected Non-attainment Areas that Follow the National LTO and $NO_x$ Emissions Trends**

| Grouping (Annual LTO Total) | Number of NAAs in Grouping | Percentage of NAAs That Are Consistent with the National Trend [a] |
|---|---|---|
| x > 300,000 | 5 | 100 |
| 300,000 > x > 200,000 | 4 | 100 |
| 200,000 > x > 100,000 | 12 | 67 |
| 100,000 > x > 50,000 | 8 | 63 |
| x < 50,000 | 13 | 38 |

[a] The National Trend is increased annual $NO_x$; increased LTOs; and decreased $NO_x$ emission per LTO.

The variance between the airports may be due to the unique aircraft fleet operating at each airport. For example, during the study period national LTOs for regional aircraft equipped with two-engines covered by ICAO gaseous emissions provisions increased from 6 to 31 percent (see Table 3-4). Table 3-15 provides examples of how the aggregated fleet at the NAA level can vary from the national average. The table shows six NAA where the contribution of emissions from air transportation is significant.

In Memphis, regional aircraft with two engines represent the dominant fraction of the fleet LTOs, but also has a large fraction (30%) of wide-body LTOs. The Memphis NAA area accounts for 2.5 percent of the national LTOs and three percent of the national $NO_x$ emissions. Las Vegas and Phoenix have very high levels of narrow body two-engine aircraft operations. NAA in the middle rows have fleet compositions where the contributions of two engine narrow body and regional aircraft, like in the national fleet, are dominant (see Tables 3-4 and 3-6 for national trends). Details concerning the mix of aircraft that operate at individual airports are provided in the Access database developed for this project.



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**Table 3-15. 2008 Commercial Aircraft Fleet Composition for Selected Non-attainment Areas**

| | Percent of Annual National Total | | Local Fleet LTO Composition (Percent of Annual LTOs by Aircraft Type) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | LTO | $NO_x$ | Regional Aircraft ,2 | Narrow-body, 2 | Narrow-body, 3 | Narrow-body, 4 | Wide-body, 2 | Wide-body, 3 | Wide-body, 4 |
| **Group 1 NAA – Regional Aircraft with 2 Engines Account for the Largest Fraction of Local Fleet LTOs** | | | | | | | | | |
| Memphis, TN-AR | 2.5% | 3.0% | 38% | 18% | 8% | 0% | 14% | 16% | 0% |
| **Group 2 NAA – Narrow-body with 2 Engines Account for 48% or More of the Local Fleet LTOs** | | | | | | | | | |
| Los Angeles South Coast Air Basin, CA | 6.8% | 6.6% | 14% | 62% | 0% | 0% | 7% | 1% | 5% |
| Dallas-Fort Worth, TX | 5.9% | 3.9% | 27% | 64% | 0% | 0% | 3% | 1% | 1% |
| Denver-Boulder-Greenley-Fort Collins-Loveland, CO | 4.7% | 2.7% | 22% | 60% | 0% | 0% | 2% | 0% | 0% |
| Atlanta, GA | 7.5% | 5.9% | 36% | 55% | 0% | 0% | 6% | 0% | 1% |
| Chicago-Gary-Lake County, IL-IN | 8.2% | 6.1% | 41% | 52% | 0% | 0% | 4% | 0% | 2% |
| New York-Northern New Jersey-Long Island, NY-NJ-CT | 10.3% | 10.4% | 32% | 48% | 0% | 0% | 8% | 1% | 4% |
| **Group 3 NAA – Narrow-body with 2 Engines Account for the Largest Fraction of Local Fleet LTOs (excluding those noted in Group 2)** | | | | | | | | | |
| Las Vegas, NV | 3.1% | 2.3% | 3% | 91% | 0% | 0% | 1% | 0% | 0% |
| Phoenix-Mesa, AZ | 3.4% | 2.3% | 15% | 79% | 0% | 0% | 1% | 1% | 0% |
| San Francisco Bay Area, CA | 4.9% | 4.5% | 11% | 68% | 0% | 0% | 6% | 2% | 3% |

Opening and closing of different types of hubs can also cause considerable changes in activity and emission trends. This observation is illustrated in the historical analysis of the Memphis NAA. In 2003, the number of annual LTOs increased by approximately 170 percent and the $NO_x$ emissions more than doubled in tonnage, which coincides with an expansion of FedEx freight activities at the Memphis, TN airport. Similar results were found for the St. Louis NAA when United Parcel Service (UPS) opened its air freight hub there in 2002.

## 3.4 Evaluation of 2008 Auxiliary Power Unit (APU) Emissions

As part of the scope of work for this project, APU emissions were quantified at the national level and in the 42 nonattainment areas of interest. APUs are small turbine engines that tend to be located in the back of the aircraft. APUs provide power for engine start up, but also generate energy for the cabin, ventilation, hydraulics and pre-flight system checks during periods when the main engines are not operating.

APU national emission totals and emission rates for 2008 are presented in Table 3-16. In this analysis, APUs account for 2.6 percent of the aircraft national $NO_x$ emissions. Table 3-17 shows the APU emission totals in the nonattainment areas of interest.

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**Table 3-16. National APU Emissions Annual Total and Normalized with Respect to Activity for Commercial Aviation, Included in the T-100 Dataset**

| LTO | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{2.5}$[a] |
|---|---|---|---|---|---|---|---|
| **2008 National APU Emissions (metric ton)** | | | | | | | |
| 8,892,776 | 3,694 | 247 | 285 | 286 | 2,578 | 402 | 415 |
| **2008 National APU Emissions per LTO (kg/LTO)** | | | | | | | |
| 8,892,776 | 0.42 | 0.03 | 0.03 | 0.03 | 0.29 | 0.05 | 0.05 |

[a] EDMS calculates both $PM_{2.5}$ and $PM_{10}$, because these values are identical only $PM_{2.5}$ is shown.

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**Table 3-17. Selected Non-attainment Areas APU Activity and Emissions (metric ton) for Commercial Aircraft, Included in the T-100 Dataset**

| Non-attainment Area Name | LTO | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{2.5}$ [a] |
|---|---|---|---|---|---|---|---|---|
| Albuquerque, NM | 43,725 | 19.9 | 1.27 | 1.46 | 1.47 | 12.0 | 1.97 | 2.09 |
| Anchorage, AK | 55,780 | 53.9 | 3.42 | 3.93 | 3.95 | 30.5 | 5.45 | 6.51 |
| Aspen, CO | 3,130 | 2.60 | 0.15 | 0.17 | 0.17 | 0.69 | 0.14 | 0.21 |
| Atlanta, GA | 465,282 | 232 | 14.9 | 17.1 | 17.2 | 134 | 21.4 | 23.7 |
| Baltimore, MD | 109,760 | 52.2 | 3.31 | 3.81 | 3.83 | 31.4 | 5.12 | 5.47 |
| Boston-Lawrence-Worcester (eastern MA), MA | 142,517 | 50.2 | 3.52 | 4.05 | 4.07 | 45.6 | 6.36 | 6.18 |
| Boston-Manchester-Portsmouth (southeast NH), NH | 23,122 | 10.1 | 0.66 | 0.75 | 0.76 | 6.08 | 1.02 | 1.07 |
| Charlotte-Gastonia-Rock Hill, NC-SC | 197,283 | 86.5 | 5.43 | 6.24 | 6.28 | 52.43 | 8.28 | 8.68 |
| Chicago-Gary-Lake County, IL-IN | 520,479 | 233 | 15.5 | 17.8 | 17.9 | 149 | 23.8 | 25.6 |
| Cincinnati-Hamilton, OH-KY-IN | 152,941 | 59.9 | 4.05 | 4.66 | 4.68 | 34.7 | 6.17 | 6.29 |
| Cleveland-Akron-Lorain, OH | 97,744 | 32.6 | 2.32 | 2.67 | 2.68 | 19.8 | 3.65 | 3.64 |
| Dallas-Fort Worth, TX | 356,004 | 196 | 12.3 | 14.2 | 14.3 | 91.5 | 16.0 | 18.8 |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | 258,217 | 88.7 | 5.80 | 6.67 | 6.71 | 86.1 | 11.5 | 10.6 |
| Detroit-Ann Arbor, MI | 197,521 | 81.9 | 5.32 | 6.12 | 6.15 | 58.6 | 8.80 | 9.01 |
| El Paso County, TX | 23,183 | 13.6 | 0.83 | 0.96 | 0.96 | 5.95 | 1.08 | 1.26 |
| Greater Connecticut, CT | 37,729 | 14.6 | 0.99 | 1.14 | 1.14 | 10.6 | 1.63 | 1.65 |
| Houston-Galveston-Brazoria, TX | 309,917 | 119 | 8.20 | 9.43 | 9.48 | 76.4 | 13.2 | 13.5 |
| Indianapolis, IN | 74,478 | 29.7 | 2.05 | 2.36 | 2.37 | 22.2 | 3.42 | 3.23 |
| Las Vegas, NV | 194,332 | 65.1 | 4.41 | 5.07 | 5.10 | 67.3 | 9.25 | 8.52 |
| Los Angeles South Coast Air Basin, CA | 416,555 | 173 | 12.7 | 14.6 | 14.7 | 149 | 21.8 | 23.6 |
| Louisville, KY-IN | 63,845 | 25.2 | 1.87 | 2.15 | 2.16 | 22.7 | 3.20 | 3.23 |
| Memphis, TN-AR | 146,514 | 57.9 | 4.08 | 4.69 | 4.72 | 52.9 | 7.49 | 6.44 |
| Milwaukee-Racine, WI | 70,473 | 30.0 | 1.93 | 2.22 | 2.23 | 15.2 | 2.79 | 2.93 |
| Minneapolis-St Paul, MN | 172,614 | 62.4 | 4.11 | 4.73 | 4.75 | 55.9 | 7.69 | 7.30 |
| New York-N. New Jersey-Long Island, NY-NJ-CT | 589,852 | 211 | 15.5 | 17.9 | 17.9 | 199 | 28.2 | 28.2 |

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**Table 3-17. Selected Non-attainment Areas APU Activity and Emissions (metric ton) for Commercial Aircraft, Included in the T-100 Dataset (Cont.)**

| Non-attainment Area Name | LTO | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{2.5}$ [a] |
|---|---|---|---|---|---|---|---|---|
| Philadelphia-Wilmington-Atlantic City, PA-NY-MD-DE | 184,044 | 61.6 | 4.18 | 4.80 | 4.83 | 54.8 | 8.01 | 7.26 |
| Phoenix-Mesa, AZ | 207,664 | 82.0 | 5.23 | 6.01 | 6.04 | 68.4 | 9.66 | 9.45 |
| Pittsburgh-Beaver Valley, PA | 57,755 | 23.2 | 1.52 | 1.75 | 1.76 | 13.6 | 2.33 | 2.42 |
| Providence (entire State), RI | 27,393 | 10.9 | 0.71 | 0.82 | 0.82 | 7.03 | 1.18 | 1.19 |
| Raleigh-Durham-Chapel Hill, NC | 73,260 | 27.3 | 1.86 | 2.14 | 2.15 | 16.3 | 2.88 | 2.93 |
| Reno, NV | 25,932 | 10.4 | 0.68 | 0.79 | 0.79 | 7.92 | 1.20 | 1.19 |
| Riverside County (Coachella Valley), CA | 12,558 | 5.17 | 0.34 | 0.39 | 0.39 | 2.57 | 0.49 | 0.51 |
| Sacramento Metro, CA | 59,963 | 23.7 | 1.57 | 1.80 | 1.81 | 18.1 | 2.76 | 2.72 |
| Salt Lake City, UT | 143,641 | 53.9 | 3.58 | 4.12 | 4.14 | 37.8 | 6.12 | 5.91 |
| San Diego, CA | 98,328 | 35.0 | 2.38 | 2.74 | 2.75 | 29.9 | 4.42 | 4.26 |
| San Francisco Bay Area, CA | 309,405 | 130 | 9.32 | 10.7 | 10.8 | 107 | 15.6 | 16.9 |
| San Joaquin Valley, CA | 21,887 | 7.55 | 0.53 | 0.61 | 0.61 | 3.91 | 0.77 | 0.79 |
| Seattle-Tacoma, WA | 130,317 | 55.5 | 3.73 | 4.28 | 4.31 | 45.2 | 6.62 | 6.63 |
| St. Louis, MO-IL | 104,784 | 47.5 | 3.11 | 3.58 | 3.60 | 22.9 | 4.22 | 4.75 |
| Syracuse, NY | 18,857 | 6.70 | 0.45 | 0.52 | 0.52 | 4.31 | 0.72 | 0.72 |
| Washington, DC-MD-VA | 261,242 | 90.0 | 6.26 | 7.20 | 7.24 | 76.7 | 11.3 | 10.8 |

[a] EDMS calculates both $PM_{2.5}$ and $PM_{10}$, because these values are identical only $PM_{2.5}$ is shown.

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## 3.5 Evaluation of TAF and 5010 Aircraft

Table 3-18 shows the TAF and 5010 national inventory estimates for aircraft equipped with turbofan or turboprop engines as submitted to the EPA's 2008 National Emission Inventory, as discussed in Section 2.4 of this report. Note that the values presented in this table have been adjusted to account for the overlap with air taxi activities reported in the T-100 data.

**Table 3-18. 2008 National Activity (LTOs) and Emissions (kg) for Aircraft not Equipped with Engines Covered by ICAO Provisions, Included in TAF and 5010 Dataset (turboprop and turbofan engines)**

| Operational Type | LTO | CO (kg) | $NO_X$ (kg) | $PM_{10}$ (kg) | $PM_{2.5}$ (kg) | $SO_2$ (kg) | VOC (kg) |
|---|---|---|---|---|---|---|---|
| AT | 2,641,969 | 4,327,450 | 929,174 | 723,017 | 93,992 | 194,720 | 1,205,643 |
| GA | 11,805,758 | 51,284,864 | 1,733,656 | 1,267,529 | 164,779 | 394,005 | 2,924,638 |

Where AT = Air Taxi, GA = General Aviation

Table 3-19 summarizes the TAF and 5010 inventory data for the 42 non-attainment areas of interest. Airport specific TAF and 5010 estimates are included in the supplemental data files provided with this study. Note because the non-attainment areas of interest do not include all US airports considered in the national analysis, the sum of these is less than the national estimates provided in Table 3-18.

**Table 3-19. 2008 Selected Non-attainment Areas Activity (LTOs) and Emissions (kg) for Aircraft Equipped with Engines that are Not Covered by ICAO Provisions, Included in TAF and 5010 Dataset (turboprop and turbofan engines)**

| Non-Attainment Area | LTO | CO (kg) | $NO_X$ (kg) | $PM_{10}$ (kg) | $PM_{2.5}$ (kg) | $SO_2$ (kg) | VOC (kg) |
|---|---|---|---|---|---|---|---|
| Albuquerque, NM | 14,538 | 39,670.58 | 3,912.62 | 3,004.08 | 2,931.38 | 835.17 | 5,411.91 |
| Anchorage, AK | 17,446 | 57,078.65 | 3,977.88 | 3,022.61 | 2,949.46 | 861.00 | 5,763.84 |
| Aspen | 7,367 | 21,540.69 | 1,873.93 | 1,434.00 | 1,399.29 | 401.81 | 2,631.70 |
| Atlanta, GA | 60,496 | 209,035.66 | 12,953.73 | 9,799.26 | 9,562.12 | 2,820.25 | 19,131.47 |
| Baltimore, MD | 10,727 | 28,467.53 | 2,947.58 | 2,265.80 | 2,210.97 | 628.17 | 4,054.91 |
| Boston-Lawrence-Worcester (eastern MA), MA | 97,898 | 272,554.78 | 25,936.89 | 19,896.08 | 19,414.59 | 5,543.20 | 36,025.38 |
| Boston-Manchester-Portsmouth (southeast NH), NH | 11,727 | 38,283.75 | 2,680.56 | 2,037.17 | 1,987.87 | 580.07 | 3,881.24 |
| Charlotte-Gastonia-Rock Hill, NC-SC | 27,802 | 79,156.18 | 7,233.11 | 5,542.55 | 5,408.42 | 1,548.09 | 10,095.71 |
| Chicago-Gary-Lake County, IL-IN | 61,978 | 200,626.42 | 14,294.89 | 10,870.50 | 10,607.43 | 3,090.90 | 20,642.71 |
| Cincinnati-Hamilton, OH-KY-IN | 27,306 | 67,318.85 | 7,893.26 | 6,084.35 | 5,937.11 | 1,675.84 | 10,719.29 |
| Cleveland-Akron-Lorain, OH | 33,432 | 103,235.85 | 8,088.36 | 6,170.15 | 6,020.83 | 1,741.59 | 11,519.43 |
| Dallas-Fort Worth, TX | 89,294 | 300,811.47 | 19,704.90 | 14,938.78 | 14,577.26 | 4,277.90 | 28,834.09 |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | 105,233 | 383,330.24 | 21,040.33 | 15,834.04 | 15,450.86 | 4,611.96 | 31,759.00 |
| Detroit-Ann Arbor, MI | 59,765 | 201,304.12 | 13,190.96 | 10,000.52 | 9,758.51 | 2,863.69 | 19,301.23 |

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**Table 3-19. 2008 Selected Non-attainment Areas Activity (LTOs) and Emissions (kg) for Aircraft Equipped with Engines that are Not Covered by ICAO Provisions, Included in TAF and 5010 Dataset (turboprop and turbofan engines) (Continued)**

| Non Attainment Area | LTO | CO (kg) | $NO_X$ (kg) | $PM_{10}$ (kg) | $PM_{2.5}$ (kg) | $SO_2$ (kg) | VOC (kg) |
|---|---|---|---|---|---|---|---|
| El Paso County, TX | 8,948 | 26,420.63 | 2,256.51 | 1,725.86 | 1,684.09 | 484.18 | 3,176.53 |
| Greater Connecticut, CT | 8,597 | 23,338.15 | 2,322.76 | 1,783.80 | 1,740.63 | 495.66 | 3,209.51 |
| Houston-Galveston-Brazoria, TX | 57,613 | 192,747.16 | 12,815.10 | 9,720.89 | 9,485.64 | 2,780.09 | 18,707.19 |
| Indianapolis, IN | 8,829 | 23,110.35 | 2,450.42 | 1,884.68 | 1,839.07 | 521.83 | 3,362.30 |
| Las Vegas, NV | 58,680 | 116,383.96 | 19,103.28 | 14,813.12 | 14,454.64 | 4,022.81 | 25,215.66 |
| Los Angeles South Coast Air Basin, CA | 225,122 | 810,877.64 | 45,705.34 | 34,437.01 | 33,603.63 | 10,002.94 | 68,648.31 |
| Louisville, KY-IN | 8,810 | 19,918.72 | 2,683.20 | 2,073.88 | 2,023.69 | 567.57 | 3,597.54 |
| Memphis, TN-AR | 8,548 | 27,566.93 | 1,979.20 | 1,505.47 | 1,469.04 | 427.80 | 2,854.79 |
| Milwaukee-Racine, WI | 12,236 | 26,470.87 | 3,816.88 | 2,953.63 | 2,882.15 | 806.05 | 5,088.41 |
| Minneapolis-St Paul, MN | 26,108 | 82,625.33 | 6,164.75 | 4,695.31 | 4,581.68 | 1,330.20 | 8,841.41 |
| New York-N. New Jersey-Long Island, NY-NJ-CT | 215,857 | 754,211.99 | 45,587.95 | 34,451.49 | 33,617.76 | 9,938.47 | 67,619.16 |
| Philadelphia-Wilmington-Atlantic City, PA-NY-MD-DE | 57,100 | 201,946.02 | 11,874.57 | 8,963.43 | 8,746.52 | 2,592.64 | 17,698.98 |
| Phoenix-Mesa, AZ | 64,450 | 233,126.02 | 13,010.86 | 9,798.79 | 9,561.66 | 2,849.15 | 19,577.85 |
| Pittsburgh-Beaver Valley, PA | 13,805 | 38,111.03 | 3,681.93 | 2,825.48 | 2,757.11 | 786.49 | 5,105.00 |
| Providence (entire State), RI | 4,663 | 14,883.11 | 1,091.72 | 831.02 | 810.91 | 235.74 | 1,569.65 |
| Raleigh-Durham-Chapel Hill, NC | 22,617 | 69,396.59 | 5,505.41 | 4,201.41 | 4,099.73 | 1,184.81 | 7,827.17 |
| Reno, NV | 13,610 | 40,895.78 | 3,378.42 | 2,581.40 | 2,518.93 | 725.86 | 4,776.78 |
| Riverside County (Coachella Valley), CA | 8,164 | 28,385.31 | 1,734.78 | 1,311.59 | 1,279.85 | 377.97 | 2,568.22 |
| Sacramento Metro, CA | 19,155 | 59,450.10 | 4,611.56 | 3,516.78 | 3,431.68 | 993.38 | 6,577.00 |
| Salt Lake City, UT | 22,165 | 50,925.49 | 6,688.74 | 5,167.41 | 5,042.36 | 1,415.76 | 8,987.88 |
| San Diego, CA | 40,989 | 147,362.58 | 8,342.67 | 6,287.07 | 6,134.92 | 1,825.39 | 12,520.36 |
| San Francisco Bay Area, CA | 74,571 | 267,310.93 | 15,237.47 | 11,486.48 | 11,208.51 | 3,332.68 | 22,839.07 |
| San Joaquin Valley, CA | 64,530 | 250,597.90 | 11,726.07 | 8,754.84 | 8,542.97 | 2,596.57 | 18,277.26 |
| Seattle-Tacoma, WA | 85,612 | 271,154.91 | 20,198.60 | 15,383.20 | 15,010.93 | 4,358.67 | 28,975.40 |
| St. Louis, MO-IL | 52,185 | 179,305.81 | 11,250.51 | 8,515.05 | 8,308.98 | 2,447.84 | 16,580.91 |
| Syracuse, NY | 7,336 | 24,903.01 | 1,604.53 | 1,215.67 | 1,186.25 | 348.63 | 2,354.29 |
| Washington, DC-MD-VA | 28,514 | 77,207.45 | 7,719.15 | 5,928.70 | 5,785.22 | 1,646.95 | 10,660.55 |

## 3.6 Non-Commercial Aircraft Equipped with Engines Covered by ICAO Provisions

As noted in Section 2.4, this study also considered non-commercial (non-air carrier) aircraft covered by ICAO provisions that do not report activities to T-100, but are included in the TAF and 5010 data. To evaluate emissions from non-air carrier, baseline emissions were developed that indicate that these aircraft account for five percent of $NO_x$, CO, and PM emissions and 18 percent of VOC emissions in 2008. To determine whether this category of aircraft would continue to be significant in the future, the 2008 baseline emissions were



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projected to estimated emissions in 2020 and 2030. The growth factors used to make this future year adjustment were derived by comparing annual national general aviation LTO levels for 2008, 2020, and 2030 provided in the FAA's TAF dataset. The projected emission estimates are provided in Table 3-20 along with the baseline estimates.

**Table 3-20. Baseline and Projected Activity, Fuel Usage and Emissions for Non-Air Carrier Aircraft Equipped with ICAO Certified Engines**

| Year | LTO | CO_KG | VOC_KG | TOG_KG | $NO_X$_KG | $PM_{10}$_KG | FUEL_KG |
|---|---|---|---|---|---|---|---|
| 2008 | 563,472 | 7,038,627 | 3,484,480 | 3,502,745 | 5,110,719 | 197,625 | 436,473,773 |
| 2020 | 553,332 | 6,911,961 | 3,421,774 | 3,439,710 | 5,018,747 | 194,069 | 428,619,091 |
| 2030 | 627,923 | 7,843,717 | 3,883,040 | 3,903,395 | 5,695,291 | 220,230 | 486,398,384 |

## 3.7 Summary of All Project Data

Table 3-21 compiles the 2008 estimates for all emissions sources included in this study. This table summarized the national results by aircraft type, whether the engine was covered by ICAO provisions, and data source. Note that adjustments have been made to the TAF and 5010 data to address any double counting with the T-100 data and the aircraft registration data for the non-air carrier aircraft equipped with ICAO certified engines. For purposes of this assessment, it is assumed that once the non-air carrier aircraft are removed from the TAF/5010 data then the remaining TAF/5010 data represent aircraft that are equipped with engines not covered by ICAO provisions. Detailed data are provided in the Access data files that supplement this report.

As Table 3-21 indicates aircraft equipped with engines covered by ICAO gaseous emissions provisions accounts for 28 percent of total LTOs (including APUs), but in 2008 are associated with 94 percent of aircraft $NO_x$ emissions (73 percent of VOC emissions, 53 percent of CO emissions, and 38 percent of $PM_{2.5}$).

**Table 3-21. Summary of All 2008 National Aircraft/Airport Emission Estimates for Aircraft Equipped with Turbofan and Turboprop Engines**

| Source | Operational Type | Regulated | LTO | $NO_X$ (kg) | VOC (kg) | CO (kg) | $PM_{10}$ (kg) | $PM_{2.5}$ (kg) | $SO_2$ |
|---|---|---|---|---|---|---|---|---|---|
| T100 | AC | ICAO | 6,354,778 | 77,756,251 | 9,019,675 | 52,370,174 | 1,032,172 | 1,032,172 | 7,784,761 |
| T100 | AT | ICAO | 2,431,408 | 10,315,077 | 2,063,428 | 10,419,912 | 228,701 | 228,701 | 1,247,253 |
| Aircraft [(b)] Registry | GA | ICAO | 563,472 | 5,110,719 | 3,484,480 | 7,038,627 | 197,625 | 197,625 | 563,924 |
| T100 | AT | non ICAO | 1,231,925 | 732,963 | 988,339.48 | 5,800,159 | (a) | (a) | 155,297 |
| 5010/TAF | AT | non ICAO | 2,641,969 | 929,174 | 1,205,643 | 4,327,450 | 723,017 | 705,520 | 194,720 |
| 5010/TAF | GA | non ICAO | 11,242,286 | 1,650,911 | 2,785,050 | 48,837,110 | 1,207,032 | 1,177,822 | 374,667 |
| T100 | APU | non ICAO | 8,892,776 | 2,577,545 | 284,544 | 3,693,825 | 414,601 | 414,601 | 401,838 |
| | | **Total** | | **99,072,640** | **19,831,158** | **132,487,258** | **3,803,160** | **2,124,018** | **10,722,461** |

(a) Although EDMS has a method to estimate PM emissions from engines covered by ICAO provisions, coverage for engines not covered by ICAO provisions was too incomplete to provide an emission estimate at this time.
(b) Emissions for Non-air carrier Aircraft Covered by ICAO Provisions were calculated from the FAA's Aircraft Registry. This information is presented in Appendix I.
(c) AC = air carrier, AT = air taxi, GA = general aviation, and APU = auxiliary power unit.



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# Appendix A

# Interpolation of T-100 LTO Data to Backcast to 1986 to 1989

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## Table A-1. Export of Annual LTOs from the T-100 Database for Linear Interpolation

| | Linear Interpolation | T-100 Data provided by EPA (LTOs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **1989** | **1990** | **1991** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** |
| Foreign Carrier, Nonscheduled | 17,687 | 16,640 | 17,974 | 19,742 | 18,417 | 17,946 | 16,478 | 13,527 | 13,669 |
| Foreign Carrier, Scheduled | 145,854 | 154,749 | 156,859 | 167,263 | 170,748 | 179,684 | 200,777 | 212,704 | 229,980 |
| US Carrier, Nonscheduled | | 12,682 | 12,388 | 17,750 | 18,929 | 19,935 | 21,941 | 25,787 | 28,704 |
| US Carrier, Scheduled | | 6,319,266 | 6,173,691 | 6,363,653 | 6,514,765 | 6,777,589 | 7,292,893 | 7,442,370 | 7,385,628 |

## Table A-2. Calculation of Linear Interpolation Equation

| | Foreign Nonscheduled | Foreign Scheduled |
|---|---|---|
| Intercept | 827,193 | 18,085,318 |
| Slope | -407 | 9,166 |

## Table A-3. Export of Annual LTOs From the T-100 Database After Extrapolation Using the Above Linear Interpolation

| | Linear Interpolation | | | | | T-100 Data provided by EPA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1986** | **1987** | **1988** | **1989** | **1990** | **1991** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** |
| Foreign Carrier, Nonscheduled | 18,891 | 18,484 | 18,077 | 17,670 | 16,640 | 17,974 | 19,742 | 18,417 | 17,946 | 16,478 | 13,527 | 13,669 |
| Foreign Carrier, Scheduled | 118,358 | 127,524 | 136,690 | 145,856 | 154,749 | 156,859 | 167,263 | 170,748 | 179,684 | 200,777 | 212,704 | 229,980 |
| US Carrier, Nonscheduled | 115,158 | 202,678 | 187,402 | 266,022 | 12,682 | 12,388 | 17,750 | 18,929 | 19,935 | 21,941 | 25,787 | 28,704 |
| US Carrier, Scheduled | 6,132,276 | 6,338,620 | 6,375,377 | 6,271,934 | 6,319,266 | 6,173,691 | 6,363,653 | 6,514,765 | 6,777,589 | 7,292,893 | 7,442,370 | 7,385,628 |

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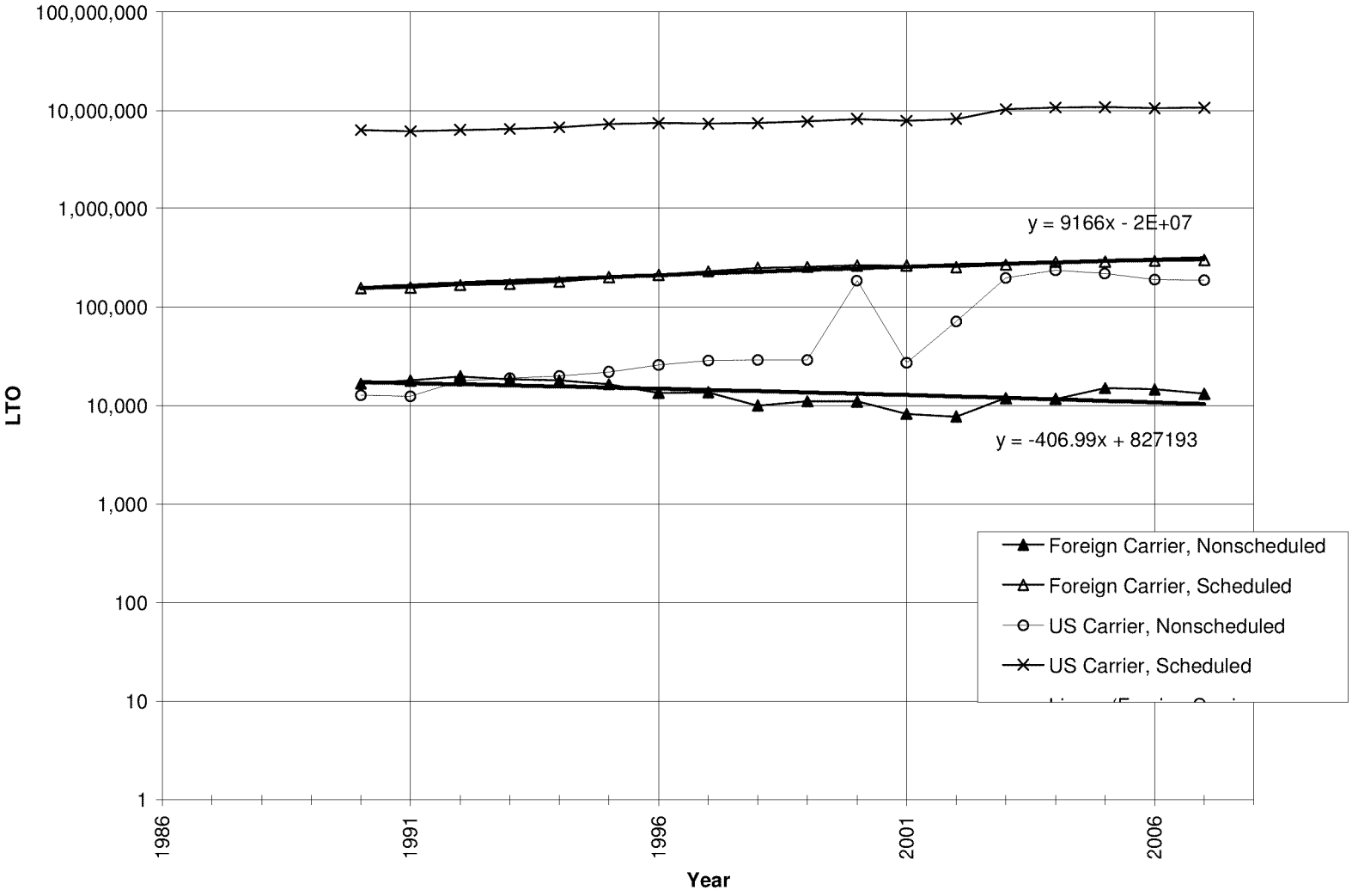


**Figure A-1. Graphic Representation of Historical T-100 Data**

Note that the equations noted in the above graphic describe the slope for the line – these equations were used to backcast the period from 1986 to 1990.



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# Appendix B

# T-100/EDMS Matches

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Approximately 97 percent of aircraft LTOs associated with the T-100 and Ascend data were matched to the aircraft and engines in the EDMS, though matching rates did vary from year to year.

## Appendix B. Percentage of LTOs Matched in EDMS by Year

| Study Year | Percentage of LTOs Matched in EDMS |
|---|---|
| 1986 | 94.1 |
| 1987 | 94.2 |
| 1988 | 94.5 |
| 1989 | 94.3 |
| 1990 | 96.5 |
| 1991 | 98.1 |
| 1992 | 98.5 |
| 1993 | 97.4 |
| 1994 | 99.2 |
| 1995 | 99.4 |
| 1996 | 99.3 |
| 1997 | 99.2 |
| 1998 | 99.4 |
| 1999 | 99.5 |
| 2000 | 99.2 |
| 2001 | 99.4 |
| 2002 | 97.7 |
| 2003 | 93.1 |
| 2004 | 93.7 |
| 2005 | 93.9 |
| 2006 | 93.5 |
| 2007 | 93.2 |
| 2008 | 92.6 |
| Average | 96.5 |



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# Appendix C

# Default Emission Aircraft Data

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| Year | US/For | Units | LTO | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | Fuel |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | Foreign | kg | 125,067 | 4,820,013 | 2,023,953 | 2,327,961 | 2,340,164 | 4,396,505 | 382,965 | 127,234 | 127,234 | 296,412,846 |
| 1986 | US | kg | 5,885,100 | 67,780,271 | 26,868,962 | 30,904,811 | 31,066,809 | 63,751,900 | 8,223,957 | 2,278,963 | 2,278,963 | 6,365,291,419 |
| 1986 | Total | kg | 6,010,167 | 72,600,284 | 28,892,915 | 33,232,772 | 33,406,972 | 68,148,406 | 8,606,922 | 2,406,197 | 2,406,197 | 6,661,704,265 |
| 1986 | Foreign | kg/LTO | | 38.5 | 16.2 | 18.6 | 18.7 | 35.2 | 3.06 | 1.02 | 1.02 | 2,370 |
| 1986 | US | kg/LTO | | 11.5 | 4.57 | 5.25 | 5.28 | 10.8 | 1.40 | 0.39 | 0.39 | 1,082 |
| 1987 | Foreign | kg | 132,381 | 4,165,156 | 1,696,885 | 1,951,765 | 1,961,996 | 4,692,710 | 400,331 | 115,609 | 115,609 | 309,853,935 |
| 1987 | US | kg | 6,159,197 | 68,607,356 | 26,981,839 | 31,034,642 | 31,197,321 | 66,810,749 | 8,569,425 | 2,043,366 | 2,043,366 | 6,632,681,907 |
| 1987 | Total | kg | 6,291,578 | 72,772,512 | 28,678,723 | 32,986,407 | 33,159,316 | 71,503,459 | 8,969,756 | 2,158,975 | 2,158,975 | 6,942,535,842 |
| 1987 | Foreign | kg/LTO | | 31.5 | 12.8 | 14.7 | 14.8 | 35.4 | 3.02 | 0.87 | 0.87 | 2,341 |
| 1987 | US | kg/LTO | | 11.1 | 4.38 | 5.04 | 5.07 | 10.8 | 1.39 | 0.33 | 0.33 | 1,077 |
| 1988 | Foreign | kg | 143,413 | 4,284,858 | 1,768,990 | 2,034,701 | 2,045,366 | 4,971,814 | 422,307 | 121,105 | 121,105 | 326,862,643 |
| 1988 | US | kg | 6,195,081 | 66,960,077 | 25,550,019 | 29,387,753 | 29,541,800 | 68,068,757 | 8,523,104 | 2,018,185 | 2,018,185 | 6,596,829,830 |
| 1988 | Total | kg | 6,338,494 | 71,244,935 | 27,319,009 | 31,422,454 | 31,587,166 | 73,040,571 | 8,945,411 | 2,139,290 | 2,139,290 | 6,923,692,473 |
| 1988 | Foreign | kg/LTO | | 29.9 | 12.3 | 14.2 | 14.3 | 34.7 | 2.9 | 0.84 | 0.84 | 2,279 |
| 1988 | US | kg/LTO | | 10.8 | 4.12 | 4.74 | 4.77 | 10.99 | 1.38 | 0.33 | 0.33 | 1,065 |
| 1989 | Foreign | kg | 152,451 | 4,445,525 | 1,806,603 | 2,077,962 | 2,088,855 | 5,306,613 | 448,965 | 126,462 | 126,462 | 347,495,796 |
| 1989 | US | kg | 6,162,006 | 68,378,173 | 26,838,420 | 30,867,677 | 31,030,374 | 68,373,555 | 8,410,598 | 2,149,542 | 2,149,542 | 6,509,750,636 |
| 1989 | Total | kg | 6,314,457 | 72,823,698 | 28,645,023 | 32,945,639 | 33,119,229 | 73,680,168 | 8,859,562 | 2,276,004 | 2,276,004 | 6,857,246,432 |
| 1989 | Foreign | kg/LTO | | 29.2 | 11.9 | 13.6 | 13.7 | 34.8 | 2.94 | 0.83 | 0.83 | 2,279 |
| 1989 | US | kg/LTO | | 11.1 | 4.36 | 5.01 | 5.04 | 11.1 | 1.36 | 0.35 | 0.35 | 1,056 |
| 1990 | Foreign | kg | 166,963 | 5,467,138 | 2,301,701 | 2,647,428 | 2,661,305 | 6,181,503 | 517,395 | 149,495 | 149,495 | 400,460,228 |
| 1990 | US | kg | 6,100,052 | 59,501,795 | 20,569,936 | 23,659,614 | 23,783,646 | 66,234,682 | 7,980,352 | 1,754,889 | 1,754,889 | 6,176,743,092 |
| 1990 | Total | kg | 6,267,015 | 64,968,932 | 22,871,638 | 26,307,042 | 26,444,951 | 72,416,184 | 8,497,747 | 1,904,384 | 1,904,384 | 6,577,203,320 |
| 1990 | Foreign | kg/LTO | | 32.7 | 13.8 | 15.9 | 15.9 | 37.0 | 3.10 | 0.90 | 0.90 | 2,398 |
| 1990 | US | kg/LTO | | 9.75 | 3.37 | 3.88 | 3.90 | 10.86 | 1.31 | 0.29 | 0.29 | 1,013 |
| 1991 | Foreign | kg | 169,594 | 5,009,844 | 2,143,090 | 2,464,993 | 2,477,914 | 5,841,590 | 494,301 | 146,960 | 146,960 | 382,585,731 |
| 1991 | US | kg | 6,069,886 | 55,202,753 | 17,248,191 | 19,838,953 | 19,942,946 | 64,419,269 | 7,644,197 | 1,646,304 | 1,646,304 | 5,916,560,841 |



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| Year | US/For | Units | LTO | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | Fuel |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1991 | Total | kg | 6,239,480 | 60,212,597 | 19,391,281 | 22,303,946 | 22,420,860 | 70,260,859 | 8,138,497 | 1,793,265 | 1,793,265 | 6,299,146,572 |
| 1991 | Foreign | kg/LTO | | 29.5 | 12.6 | 14.5 | 14.6 | 34.4 | 2.9 | 0.87 | 0.87 | 2,256 |
| 1991 | US | kg/LTO | | 9.09 | 2.84 | 3.27 | 3.29 | 10.61 | 1.26 | 0.27 | 0.27 | 975 |
| 1992 | Foreign | kg | 179,428 | 5,007,924 | 2,042,152 | 2,348,877 | 2,361,197 | 5,961,754 | 510,056 | 143,992 | 143,992 | 394,780,014 |
| 1992 | US | kg | 6,287,453 | 56,562,918 | 17,750,372 | 20,416,564 | 20,523,584 | 65,858,308 | 7,746,488 | 1,688,680 | 1,688,680 | 5,995,733,724 |
| 1992 | Total | kg | 6,466,881 | 61,570,842 | 19,792,524 | 22,765,441 | 22,884,781 | 71,820,062 | 8,256,544 | 1,832,672 | 1,832,672 | 6,390,513,738 |
| 1992 | Foreign | kg/LTO | | 27.9 | 11.4 | 13.1 | 13.2 | 33.2 | 2.8 | 0.80 | 0.80 | 2,200 |
| 1992 | US | kg/LTO | | 9.00 | 2.82 | 3.25 | 3.26 | 10.47 | 1.23 | 0.27 | 0.27 | 954 |
| 1993 | Foreign | kg | 182,630 | 4,782,317 | 1,787,714 | 2,056,231 | 2,067,012 | 5,931,615 | 509,707 | 129,288 | 129,288 | 394,509,784 |
| 1993 | US | kg | 6,358,399 | 49,352,673 | 11,849,193 | 13,628,999 | 13,700,440 | 65,729,753 | 7,596,475 | 1,496,392 | 1,496,392 | 5,879,624,502 |
| 1993 | Total | kg | 6,541,029 | 54,134,991 | 13,636,907 | 15,685,230 | 15,767,452 | 71,661,367 | 8,106,181 | 1,625,679 | 1,625,679 | 6,274,134,285 |
| 1993 | Foreign | kg/LTO | | 26.2 | 9.79 | 11.3 | 11.3 | 32.5 | 2.8 | 0.71 | 0.71 | 2,160 |
| 1993 | US | kg/LTO | | 7.76 | 1.86 | 2.14 | 2.15 | 10.34 | 1.19 | 0.24 | 0.24 | 925 |
| 1994 | Foreign | kg | 192,381 | 4,998,234 | 1,796,640 | 2,066,504 | 2,077,337 | 6,054,168 | 529,619 | 129,164 | 129,164 | 409,921,637 |
| 1994 | US | kg | 6,744,229 | 57,532,799 | 16,306,203 | 18,755,475 | 18,853,788 | 67,951,296 | 7,972,793 | 1,666,322 | 1,666,322 | 6,170,892,342 |
| 1994 | Total | kg | 6,936,610 | 62,531,033 | 18,102,844 | 20,821,979 | 20,931,124 | 74,005,464 | 8,502,412 | 1,795,487 | 1,795,487 | 6,580,813,979 |
| 1994 | Foreign | kg/LTO | | 26.0 | 9.34 | 10.7 | 10.8 | 31.5 | 2.75 | 0.67 | 0.67 | 2,131 |
| 1994 | US | kg/LTO | | 8.53 | 2.42 | 2.78 | 2.80 | 10.1 | 1.18 | 0.25 | 0.25 | 915 |
| 1995 | Foreign | kg | 214,336 | 5,050,504 | 1,821,247 | 2,094,807 | 2,105,788 | 6,665,755 | 578,963 | 137,867 | 137,867 | 448,114,042 |
| 1995 | US | kg | 7,262,232 | 59,314,445 | 16,419,257 | 18,885,509 | 18,984,504 | 67,430,486 | 8,005,757 | 1,629,640 | 1,629,640 | 6,196,405,999 |
| 1995 | Total | kg | 7,476,568 | 64,364,949 | 18,240,504 | 20,980,316 | 21,090,292 | 74,096,241 | 8,584,720 | 1,767,507 | 1,767,507 | 6,644,520,041 |
| 1995 | Foreign | kg/LTO | | 23.6 | 8.50 | 9.77 | 9.82 | 31.1 | 2.70 | 0.64 | 0.64 | 2,091 |
| 1995 | US | kg/LTO | | 8.17 | 2.26 | 2.60 | 2.61 | 9.29 | 1.10 | 0.22 | 0.22 | 853 |
| 1996 | Foreign | kg | 220,505 | 4,982,592 | 1,747,189 | 2,009,625 | 2,020,159 | 6,819,966 | 597,598 | 139,139 | 139,139 | 462,537,206 |
| 1996 | US | kg | 7,419,189 | 61,190,645 | 16,317,906 | 18,768,934 | 18,867,318 | 67,976,689 | 8,025,467 | 1,610,055 | 1,610,055 | 6,211,661,951 |
| 1996 | Total | kg | 7,639,694 | 66,173,237 | 18,065,094 | 20,778,559 | 20,887,477 | 74,796,655 | 8,623,065 | 1,749,194 | 1,749,194 | 6,674,199,157 |

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| Year | US/For | Units | LTO | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | Fuel |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 | Foreign | kg/LTO | | 22.6 | 7.92 | 9.11 | 9.16 | 30.9 | 2.71 | 0.63 | 0.63 | 2,098 |
| 1996 | US | kg/LTO | | 8.25 | 2.20 | 2.53 | 2.54 | 9.16 | 1.08 | 0.22 | 0.22 | 837 |
| 1997 | Foreign | kg | 236,927 | 5,102,866 | 1,662,613 | 1,912,346 | 1,922,370 | 7,508,764 | 646,131 | 139,511 | 139,511 | 500,101,126 |
| 1997 | US | kg | 7,351,670 | 59,015,172 | 14,747,056 | 16,962,056 | 17,051,004 | 69,617,216 | 8,140,329 | 1,618,756 | 1,618,756 | 6,300,564,054 |
| 1997 | Total | kg | 7,588,597 | 64,118,039 | 16,409,669 | 18,874,402 | 18,973,374 | 77,125,980 | 8,786,459 | 1,758,267 | 1,758,267 | 6,800,665,179 |
| 1997 | Foreign | kg/LTO | | 21.5 | 7.02 | 8.07 | 8.11 | 31.7 | 2.73 | 0.59 | 0.59 | 2,111 |
| 1997 | US | kg/LTO | | 8.03 | 2.01 | 2.31 | 2.32 | 9.47 | 1.11 | 0.22 | 0.22 | 857 |
| 1998 | Foreign | kg | 251,758 | 5,089,342 | 1,473,956 | 1,695,352 | 1,704,239 | 8,185,592 | 693,406 | 137,145 | 137,145 | 536,692,250 |
| 1998 | US | kg | 7,459,834 | 57,151,688 | 13,491,513 | 15,517,894 | 15,599,285 | 70,235,406 | 8,120,425 | 1,578,159 | 1,578,159 | 6,285,158,475 |
| 1998 | Total | kg | 7,711,592 | 62,241,030 | 14,965,469 | 17,213,245 | 17,303,524 | 78,420,997 | 8,813,831 | 1,715,304 | 1,715,304 | 6,821,850,725 |
| 1998 | Foreign | kg/LTO | | 20.2 | 5.85 | 6.73 | 6.77 | 32.5 | 2.75 | 0.54 | 0.54 | 2,132 |
| 1998 | US | kg/LTO | | 7.66 | 1.81 | 2.08 | 2.09 | 9.42 | 1.09 | 0.21 | 0.21 | 843 |
| 1999 | Foreign | kg | 256,575 | 5,072,792 | 1,362,846 | 1,567,553 | 1,575,769 | 8,437,026 | 709,946 | 131,931 | 131,931 | 549,493,796 |
| 1999 | US | kg | 7,768,475 | 60,767,623 | 12,099,679 | 13,916,759 | 13,989,864 | 70,251,212 | 8,366,200 | 1,369,935 | 1,369,935 | 6,475,387,201 |
| 1999 | Total | kg | 8,025,050 | 65,840,415 | 13,462,525 | 15,484,311 | 15,565,634 | 78,688,237 | 9,076,146 | 1,501,866 | 1,501,866 | 7,024,880,997 |
| 1999 | Foreign | kg/LTO | | 19.8 | 5.31 | 6.11 | 6.14 | 32.9 | 2.77 | 0.51 | 0.51 | 2,142 |
| 1999 | US | kg/LTO | | 7.82 | 1.56 | 1.79 | 1.80 | 9.04 | 1.08 | 0.18 | 0.18 | 834 |
| 2000 | Foreign | kg | 262,642 | 4,885,715 | 1,205,596 | 1,386,683 | 1,393,951 | 8,534,974 | 717,648 | 125,400 | 125,400 | 555,454,942 |
| 2000 | US | kg | 8,334,398 | 61,546,435 | 9,922,217 | 11,412,582 | 11,472,405 | 73,690,821 | 8,638,841 | 1,275,498 | 1,275,498 | 6,686,409,161 |
| 2000 | Total | kg | 8,597,040 | 66,432,150 | 11,127,813 | 12,799,265 | 12,866,356 | 82,225,795 | 9,356,488 | 1,400,898 | 1,400,898 | 7,241,864,103 |
| 2000 | Foreign | kg/LTO | | 18.6 | 4.59 | 5.28 | 5.31 | 32.5 | 2.73 | 0.48 | 0.48 | 2,115 |
| 2000 | US | kg/LTO | | 7.38 | 1.19 | 1.37 | 1.38 | 8.84 | 1.04 | 0.15 | 0.15 | 802 |
| 2001 | Foreign | kg | 254,831 | 4,147,339 | 906,607 | 1,042,784 | 1,048,250 | 7,854,938 | 661,019 | 110,995 | 110,995 | 511,624,409 |
| 2001 | US | kg | 7,862,396 | 56,808,314 | 8,991,409 | 10,341,962 | 10,396,173 | 73,344,822 | 8,228,595 | 1,224,910 | 1,224,910 | 6,368,881,377 |
| 2001 | Total | kg | 8,117,227 | 60,955,654 | 9,898,017 | 11,384,747 | 11,444,424 | 81,199,760 | 8,889,613 | 1,335,904 | 1,335,904 | 6,880,505,786 |

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| Year | US/For | Units | LTO | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | Fuel |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | Foreign | kg/LTO | | 16.3 | 3.56 | 4.09 | 4.11 | 30.8 | 2.59 | 0.44 | 0.44 | 2,008 |
| 2001 | US | kg/LTO | | 7.23 | 1.14 | 1.32 | 1.32 | 9.33 | 1.05 | 0.16 | 0.16 | 810 |
| 2002 | Foreign | kg | 248,142 | 4,015,048 | 841,918 | 968,378 | 973,454 | 7,321,334 | 611,620 | 98,636 | 98,636 | 473,390,430 |
| 2002 | US | kg | 8,115,134 | 56,519,253 | 8,343,081 | 9,596,136 | 9,646,489 | 74,696,619 | 8,052,655 | 1,170,503 | 1,170,503 | 6,232,705,421 |
| 2002 | Total | kg | 8,363,276 | 60,534,301 | 9,184,999 | 10,564,514 | 10,619,943 | 82,017,953 | 8,664,276 | 1,269,139 | 1,269,139 | 6,706,095,851 |
| 2002 | Foreign | kg/LTO | | 16.2 | 3.39 | 3.90 | 3.92 | 29.5 | 2.46 | 0.40 | 0.40 | 1,908 |
| 2002 | US | kg/LTO | | 6.96 | 1.03 | 1.18 | 1.19 | 9.20 | 0.99 | 0.14 | 0.14 | 768 |
| 2003 | Foreign | kg | 260,145 | 4,462,043 | 1,061,429 | 1,220,861 | 1,227,261 | 7,521,344 | 622,673 | 106,383 | 106,383 | 481,944,894 |
| 2003 | US | kg | 9,772,005 | 65,430,561 | 10,408,591 | 11,971,462 | 12,034,460 | 81,964,741 | 8,725,237 | 1,287,193 | 1,287,193 | 6,753,279,394 |
| 2003 | Total | kg | 10,032,150 | 69,892,604 | 11,470,021 | 13,192,323 | 13,261,721 | 89,486,085 | 9,347,910 | 1,393,577 | 1,393,577 | 7,235,224,288 |
| 2003 | Foreign | kg/LTO | | 17.2 | 4.08 | 4.69 | 4.72 | 28.9 | 2.39 | 0.41 | 0.41 | 1,853 |
| 2003 | US | kg/LTO | | 6.70 | 1.07 | 1.23 | 1.23 | 8.39 | 0.89 | 0.13 | 0.13 | 691 |
| 2004 | Foreign | kg | 278,722 | 4,335,072 | 981,689 | 1,129,143 | 1,135,062 | 7,930,575 | 652,006 | 107,559 | 107,559 | 504,648,658 |
| 2004 | US | kg | 10,287,822 | 66,871,810 | 10,438,887 | 12,006,359 | 12,069,517 | 85,766,738 | 9,022,152 | 1,324,538 | 1,324,538 | 6,983,090,066 |
| 2004 | Total | kg | 10,566,544 | 71,206,882 | 11,420,576 | 13,135,502 | 13,204,579 | 93,697,313 | 9,674,158 | 1,432,097 | 1,432,097 | 7,487,738,724 |
| 2004 | Foreign | kg/LTO | | 15.6 | 3.52 | 4.05 | 4.07 | 28.5 | 2.34 | 0.39 | 0.39 | 1,811 |
| 2004 | US | kg/LTO | | 6.50 | 1.01 | 1.17 | 1.17 | 8.34 | 0.88 | 0.13 | 0.13 | 679 |
| 2005 | Foreign | kg | 281,970 | 4,413,695 | 985,117 | 1,133,083 | 1,139,024 | 8,219,710 | 672,631 | 110,047 | 110,047 | 520,612,093 |
| 2005 | US | kg | 10,379,237 | 66,222,381 | 9,939,628 | 11,432,257 | 11,492,340 | 86,251,018 | 9,054,391 | 1,289,444 | 1,289,444 | 7,008,042,507 |
| 2005 | Total | kg | 10,661,207 | 70,636,075 | 10,924,745 | 12,565,340 | 12,631,363 | 94,470,728 | 9,727,022 | 1,399,491 | 1,399,491 | 7,528,654,600 |
| 2005 | Foreign | kg/LTO | | 15.7 | 3.49 | 4.02 | 4.04 | 29.2 | 2.39 | 0.39 | 0.39 | 1,846 |
| 2005 | US | kg/LTO | | 6.38 | 0.96 | 1.10 | 1.11 | 8.31 | 0.87 | 0.12 | 0.12 | 675 |
| 2006 | Foreign | kg | 287,178 | 4,473,660 | 1,015,344 | 1,167,843 | 1,173,969 | 8,256,924 | 677,979 | 110,795 | 110,795 | 524,751,502 |
| 2006 | US | kg | 10,027,636 | 66,222,381 | 9,293,967 | 10,689,967 | 10,746,002 | 84,000,741 | 8,740,399 | 1,229,802 | 1,229,802 | 6,765,014,783 |
| 2006 | Total | kg | 10,314,814 | 67,660,020 | 10,309,312 | 11,857,810 | 11,919,971 | 92,257,665 | 9,418,378 | 1,340,598 | 1,340,598 | 7,289,766,284 |

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| Year | US/For | Units | LTO | CO | THC | VOC | TOG | $NO_X$ | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | Fuel |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2006 | Foreign | kg/LTO | | 15.6 | 3.54 | 4.07 | 4.09 | 28.8 | 2.36 | 0.39 | 0.39 | 1,827 |
| 2006 | US | kg/LTO | | 6.60 | 0.93 | 1.07 | 1.07 | 8.38 | 0.87 | 0.12 | 0.12 | 675 |
| 2007 | Foreign | kg | 290,666 | 4,690,768 | 1,152,116 | 1,325,163 | 1,332,112 | 8,454,618 | 685,976 | 115,100 | 115,100 | 530,940,869 |
| 2007 | US | kg | 10,118,573 | 64,847,116 | 9,437,331 | 10,854,864 | 10,911,763 | 85,755,987 | 8,792,482 | 1,243,588 | 1,243,588 | 6,805,326,499 |
| 2007 | Total | kg | 10,409,239 | 69,537,884 | 10,589,447 | 12,180,027 | 12,243,875 | 94,210,605 | 9,478,457 | 1,358,688 | 1,358,688 | 7,336,267,368 |
| 2007 | Foreign | kg/LTO | | 16.1 | 3.96 | 4.56 | 4.58 | 29.1 | 2.36 | 0.40 | 0.40 | 1,827 |
| 2007 | US | kg/LTO | | 6.41 | 0.93 | 1.07 | 1.08 | 8.48 | 0.87 | 0.12 | 0.12 | 673 |
| 2008 | Foreign | kg | 277,154 | 3,754,036 | 664,768 | 764,619 | 768,627 | 7,794,345 | 627,461 | 92,245 | 92,245 | 485,651,208 |
| 2008 | US | kg | 9,532,042 | 62,751,803 | 9,820,453 | 11,295,533 | 11,354,742 | 81,114,678 | 8,329,585 | 1,293,178 | 1,293,178 | 6,447,047,586 |
| 2008 | Total | kg | 9,809,196 | 66,505,839 | 10,485,222 | 12,060,152 | 12,123,370 | 88,909,023 | 8,957,047 | 1,385,423 | 1,385,423 | 6,932,698,794 |
| 2008 | Foreign | kg/LTO | | 13.5 | 2.40 | 2.76 | 2.77 | 28.1 | 2.26 | 0.33 | 0.33 | 1,752 |
| 2008 | US | kg/LTO | | 6.58 | 1.03 | 1.19 | 1.19 | 8.51 | 0.87 | 0.14 | 0.14 | 676 |

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# Appendix D

# High Activity Aircraft

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Appendix D. High Activity Aircraft, US Fleet

| Aircraft Name | A/C (a) | ACCODE (b) | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boeing 727-200/231A | 715 | B727-2 | % of US LTOs | 24% | 22% | 21% | 19% | 19% | 17% | 15% | 13% | 11% | 9% | 9% | 9% | 8% | 7% | 6% | 4% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | | | US LTOs | 1,417,383 | 1,384,410 | 1,324,520 | 1,183,402 | 1,145,255 | 1,003,395 | 935,704 | 828,072 | 732,370 | 685,820 | 639,730 | 635,496 | 613,704 | 558,653 | 463,621 | 316,241 | 116,222 | 116,574 | 112,053 | 95,334 | 85,627 | 73,353 | 59,396 |
| Embraer-145 | 675 | ERJ145 | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 9% | 9% | 9% | 8% |
| | | | US LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11,804 | 60,596 | 152,789 | 234,153 | 289,709 | 395,827 | 570,011 | 737,192 | 885,993 | 897,098 | 880,908 | 759,004 |
| Airbus Industrie A320-100/200 | 694 | A320-2 | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 3% | 3% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 5% |
| | | | US LTOs | 0 | 0 | 0 | 3,299 | 11,202 | 33,062 | 73,496 | 97,010 | 122,649 | 144,098 | 154,354 | 160,064 | 183,942 | 216,493 | 272,276 | 297,159 | 343,851 | 348,776 | 400,517 | 437,731 | 445,995 | 450,966 | 442,383 |
| Beech 1900 A/B/C/D | 405 | BEECH1900-C | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 3% | 5% | 3% | 1% | 1% | 3% | 0% | 1% | 3% | 3% | 3% | 3% | 3% | 2% |
| | | | US LTOs | 0 | 0 | 451 | 746 | 703 | 0 | 35,794 | 50,071 | 55,401 | 242,786 | 422,986 | 246,212 | 63,256 | 59,870 | 264,062 | 18,569 | 88,900 | 340,642 | 328,844 | 293,510 | 283,505 | 271,844 | 171,702 |
| Saab-Fairchild 340/B | 456 | SAAB340-B | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 2% | 2% | 1% | 2% | 8% | 8% | 5% | 5% | 4% | 3% | 3% | 3% | 3% | 3% | 2% |
| | | | US LTOs | 0 | 0 | 0 | 1,156 | 1 | 0 | 62,943 | 144,589 | 151,678 | 154,340 | 94,870 | 145,702 | 415,189 | 456,123 | 432,348 | 408,802 | 350,142 | 322,843 | 320,980 | 282,058 | 252,046 | 249,636 | 227,688 |
| Embraer EMB-120 Brasilia | 461 | EMB120 | % of US LTOs | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 2% | 2% | 4% | 4% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| | | | US LTOs | 0 | 0 | 10,383 | 24,070 | 53,614 | 88,378 | 60,130 | 106,246 | 165,184 | 278,881 | 279,783 | 231,716 | 203,699 | 171,201 | 171,138 | 147,691 | 131,998 | 209,864 | 199,304 | 200,630 | 188,196 | 185,460 | 153,293 |
| Swearingen Metro III | 467 | SA227 | % of US LTOs | 1% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | US LTOs | 47,389 | 82,585 | 96,399 | 99,656 | 111,643 | 116,776 | 110,141 | 105,124 | 92,233 | 70,894 | 46,765 | 25,589 | 920 | 284 | 231 | 250 | 8,573 | 29,082 | 25,112 | 14,478 | 6,026 | 5,969 | 2,674 |
| British Aerospace Jetstream 31 | 469 | J31 | % of US LTOs | 0% | 0% | 0% | 0% | 1% | 3% | 3% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | US LTOs | 0 | 0 | 13,634 | 22,123 | 61,479 | 200,246 | 165,268 | 129,735 | 74,397 | 90,750 | 85,495 | 104,454 | 106,345 | 102,786 | 21,164 | 0 | 6,844 | 25,431 | 22,273 | 21,586 | 18,814 | 5,723 | 79 |
| Fokker F28-4000/6000 Fellowship | 602 | F28-4000 | % of US LTOs | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | US LTOs | 133,168 | 138,085 | 132,481 | 104,749 | 125,348 | 67,519 | 61,069 | 57,218 | 64,823 | 70,509 | 65,781 | 44,816 | 43,089 | 52,668 | 50,455 | 34,280 | 7,523 | 524 | 451 | 387 | 0 | 0 | 0 |
| Fokker 100 | 603 | F28-100 | % of US LTOs | 0% | 0% | 0% | 0% | 1% | 1% | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 1% | 1% | 0% | 0% | 0% | 0% | 0% |
| | | | US LTOs | 0 | 0 | 0 | 2,057 | 32,924 | 56,952 | 123,040 | 173,212 | 224,639 | 231,473 | 233,170 | 232,556 | 229,900 | 229,318 | 224,127 | 200,716 | 116,260 | 78,781 | 20,000 | 0 | 0 | 0 | 0 |
| Boeing 737-700/700LR | 612 | B737-7 | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 4% | 3% | 4% | 5% | 6% | 7% | 8% |
| | | | US LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,528 | 215,206 | 311,472 | 324,661 | 402,628 | 512,023 | 609,450 | 723,115 | 804,810 |
| Boeing 737-800 | 614 | B737-8 | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| | | | US LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 844 | 20,229 | 107,508 | 199,756 | 276,720 | 273,528 | 289,833 | 293,382 | 283,097 | 307,436 | 310,061 |
| Boeing 737-500 | 616 | B737-5 | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 3% | 3% | 3% | 4% | 3% | 4% | 4% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 2% |
| | | | US LTOs | 0 | 0 | 0 | 0 | 17,859 | 66,704 | 140,195 | 183,437 | 207,591 | 246,932 | 264,492 | 253,871 | 282,975 | 298,640 | 290,334 | 271,956 | 246,316 | 218,382 | 210,428 | 186,756 | 192,717 | 191,135 | 156,650 |
| Boeing 737-400 | 617 | B737-4 | % of US LTOs | 0% | 0% | 0% | 0% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |
| | | | US LTOs | 0 | 0 | 0 | 18,671 | 75,504 | 106,880 | 121,926 | 139,738 | 163,028 | 155,492 | 145,671 | 158,029 | 171,755 | 174,609 | 173,058 | 157,408 | 159,996 | 137,019 | 139,624 | 132,156 | 124,904 | 124,902 | 119,399 |
| Boeing 737-300 | 619 | B737-3 | % of US LTOs | 4% | 8% | 9% | 11% | 12% | 13% | 12% | 13% | 14% | 14% | 14% | 15% | 16% | 17% | 17% | 15% | 12% | 9% | 9% | 8% | 7% | 7% | 6% |
| | | | US LTOs | 219,028 | 353,787 | 534,186 | 677,307 | 740,590 | 772,995 | 768,806 | 820,443 | 947,942 | 993,850 | 1,059,175 | 1,135,016 | 1,165,837 | 1,294,425 | 1,382,244 | 1,177,836 | 1,014,113 | 886,299 | 880,578 | 814,517 | 710,419 | 682,546 | 567,985 |
| Boeing 737-100/200 | 620 | B737-1 | % of US LTOs | 17% | 16% | 14% | 13% | 13% | 12% | 11% | 10% | 11% | 10% | 9% | 9% | 8% | 7% | 6% | 5% | 2% | 2% | 2% | 1% | 1% | 0% | 0% |
| | | | US LTOs | 1,026,998 | 1,013,343 | 895,455 | 823,206 | 771,878 | 743,705 | 704,310 | 664,744 | 724,039 | 734,141 | 693,907 | 663,532 | 585,829 | 533,297 | 459,577 | 358,191 | 202,038 | 186,191 | 179,335 | 104,017 | 62,003 | 41,051 | 17,934 |
| Boeing 757-200 | 622 | B757-2 | % of US LTOs | 2% | 2% | 2% | 3% | 4% | 4% | 5% | 6% | 6% | 6% | 6% | 7% | 7% | 7% | 7% | 8% | 7% | 6% | 5% | 5% | 5% | 5% | 5% |
| | | | US LTOs | 93,372 | 126,496 | 148,586 | 171,420 | 224,081 | 263,654 | 321,860 | 392,015 | 424,580 | 438,469 | 473,834 | 506,473 | 516,945 | 567,694 | 622,471 | 590,395 | 608,008 | 544,074 | 543,221 | 537,519 | 516,804 | 514,095 | 467,653 |
| Canadair Rj-200ER /RJ-440 | 629 | CRJ2 | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 3% | 4% | 5% | 9% | 11% | 12% | 11% | 11% | 12% |
| | | | US LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26,697 | 87,869 | 270,304 | 283,100 | 368,428 | 860,626 | 1,097,198 | 1,195,653 | 1,078,782 | 1,117,165 | 1,097,758 |
| Mcdonnell Douglas DC-9-10 | 630 | DC9-1 | % of US LTOs | 3% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | US LTOs | 149,321 | 146,390 | 129,535 | 123,434 | 103,942 | 90,626 | 76,442 | 65,466 | 70,298 | 73,083 | 69,771 | 64,893 | 110,753 | 35,176 | 31,185 | 27,620 | 22,681 | 14,008 | 11,094 | 41 | 0 | 0 | 0 |
| Canadair RJ-700 | 631 | CRJ7 | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 3% | 3% | 4% | 4% |
| | | | US LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,338 | 36,766 | 117,959 | 193,203 | 267,141 | 346,994 | 368,769 | 358,627 |
| McDonnell Douglas DC-9-30 | 640 | DC9-3 | % of US LTOs | 12% | 12% | 11% | 10% | 11% | 10% | 8% | 7% | 7% | 7% | 7% | 7% | 6% | 6% | 5% | 4% | 3% | 2% | 2% | 2% | 1% | 1% | 1% |
| | | | US LTOs | 712,098 | 718,940 | 681,983 | 633,437 | 694,217 | 579,967 | 488,017 | 437,790 | 505,438 | 526,634 | 508,975 | 528,274 | 445,295 | 481,473 | 404,060 | 315,733 | 261,461 | 216,841 | 180,833 | 158,177 | 114,128 | 96,094 | 58,489 |
| McDonnell Douglas DC-9-50 | 650 | DC9-5 | % of US LTOs | 3% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 1% | 1% |
| | | | US LTOs | 151,532 | 139,322 | 131,245 | 118,074 | 139,377 | 106,200 | 105,762 | 97,418 | 130,691 | 146,882 | 145,439 | 130,808 | 133,303 | 133,219 | 123,943 | 90,653 | 56,987 | 51,434 | 52,208 | 51,904 | 47,568 | 52,578 | 51,211 |
| McDonnell Douglas DC9 Super 80/MD81/2/3/7/8 | 655 | MD82 | % of US LTOs | 8% | 7% | 9% | 11% | 12% | 14% | 15% | 15% | 15% | 14% | 13% | 14% | 13% | 13% | 12% | 12% | 10% | 7% | 7% | 7% | 7% | 8% | 8% |
| | | | US LTOs | 371,693 | 455,270 | 565,049 | 663,577 | 759,233 | 848,276 | 948,491 | 980,877 | 1,019,324 | 989,356 | 989,289 | 1,001,911 | 1,004,053 | 1,005,209 | 1,002,052 | 940,212 | 820,459 | 717,371 | 737,982 | 711,210 | 653,707 | 627,685 | 590,476 |
| Airbus Industrie A319 | 698 | A319-1 | % of US LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 3% | 4% | 3% | 3% | 4% | 4% | 4% | 4% |
| | | | US LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,894 | 67,967 | 144,199 | 230,111 | 293,194 | 299,731 | 328,354 | 374,148 | 398,587 | 410,291 | 391,519 |
| Boeing 727-100 | 710 | B727-1 | % of US LTOs | 7% | 5% | 5% | 4% | 3% | 2% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | US LTOs | 384,747 | 337,637 | 306,147 | 259,364 | 162,602 | 114,494 | 64,826 | 30,523 | 5,670 | 1,451 | 1,195 | 1,635 | 1,841 | 2,012 | 2,396 | 1,864 | 6,833 | 14,236 | 9,694 | 8,594 | 7,744 | 2,954 | 168 |
| McDonnell Douglas DC-10-10 | 730 | DC10-1 | % of US LTOs | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | US LTOs | 110,223 | 111,779 | 111,401 | 101,981 | 101,306 | 100,846 | 100,518 | 84,062 | 55,780 | 50,732 | 43,052 | 38,272 | 39,780 | 26,473 | 14,501 | 5,675 | 13,501 | 32,817 | 36,261 | 41,501 | 39,813 | 38,651 | 38,626 |
| British Aerospace BAE-146-200 | 887 | BAE146-200 | % of US LTOs | 1% | 2% | 2% | 2% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | US LTOs | 68,880 | 113,861 | 125,113 | 114,982 | 69,872 | 29,731 | 17,191 | 12,629 | 64 | 3,158 | 17,296 | 17,141 | 18,546 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

(a) Each aircraft model reported in the T-100 dataset has a unique identification code (A/C code)

(b) Each aircraft model used in the FAA's EDMS model has a unique identification code (ACCODE)

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Appendix D. High Activity Aircraft, Foreign Fleet

| Aircraft Name | A/C (a) | ACCODE (b) | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Airbus Industrie A319 | 698 | A319-1 | % of Foreign LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 5% | 5% | 5% | 5% | 8% | 8% | 8% | 7% | 6% | 5% | 5% |
| | | | Foreign LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,888 | 12,451 | 13,504 | 14,371 | 13,942 | 19,254 | 21,257 | 21,413 | 20,768 | 17,758 | 14,818 | 13,228 |
| Airbus Industrie A320-100/200 | 694 | A320-2 | % of Foreign LTOs | 3% | 3% | 3% | 3% | 0% | 1% | 4% | 7% | 8% | 7% | 7% | 8% | 8% | 9% | 10% | 10% | 10% | 9% | 9% | 9% | 9% | 8% | 8% |
| | | | Foreign LTOs | 3,995 | 4,220 | 4,572 | 4,862 | 86 | 2,044 | 7,637 | 12,415 | 15,735 | 15,242 | 15,898 | 19,397 | 19,152 | 22,888 | 25,642 | 25,489 | 25,436 | 23,386 | 26,355 | 24,274 | 25,001 | 23,101 | 21,839 |
| Airbus Industrie A330-200 | 696 | A330-2 | % of Foreign LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 5% |
| | | | Foreign LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 407 | 957 | 1,208 | 1,388 | 1,877 | 4,088 | 7,402 | 8,839 | 6,226 | 7,746 | 8,167 | 8,985 | 10,399 | 11,573 | 12,946 |
| Airbus Industrie A340-200 | 873 | A340-2 | % of Foreign LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 2% | 2% | 3% | 3% | 4% | 5% | 4% | 5% | 4% | 5% | 4% | 4% | 4% | 4% |
| | | | Foreign LTOs | 122 | 128 | 142 | 150 | 0 | 0 | 0 | 713 | 3,113 | 5,259 | 5,472 | 6,256 | 7,595 | 9,256 | 12,097 | 11,403 | 11,840 | 11,076 | 12,763 | 12,307 | 11,115 | 11,856 | 12,276 |
| Boeing 727-200/231A | 715 | B727-2 | % of Foreign LTOs | 11% | 11% | 11% | 11% | 15% | 12% | 9% | 8% | 8% | 8% | 7% | 6% | 6% | 5% | 5% | 4% | 3% | 2% | 1% | 1% | 1% | 1% | 1% |
| | | | Foreign LTOs | 13,557 | 14,345 | 15,551 | 16,523 | 24,882 | 19,740 | 16,917 | 14,056 | 14,478 | 16,261 | 15,863 | 14,992 | 14,212 | 13,397 | 12,705 | 10,600 | 6,795 | 4,110 | 3,139 | 2,602 | 1,593 | 1,533 | 1,866 |
| Boeing 737-100/200 | 620 | B737-1 | % of Foreign LTOs | 5% | 5% | 5% | 5% | 6% | 6% | 4% | 4% | 4% | 5% | 6% | 6% | 8% | 7% | 5% | 6% | 3% | 2% | 2% | 2% | 2% | 2% | 1% |
| | | | Foreign LTOs | 6,165 | 6,531 | 7,073 | 7,514 | 9,730 | 10,083 | 7,051 | 7,535 | 7,940 | 10,809 | 12,857 | 13,513 | 18,942 | 17,280 | 13,980 | 15,418 | 7,567 | 5,569 | 5,971 | 6,425 | 4,929 | 4,498 | 3,995 |
| Boeing 737-700/700LR | 612 | B737-7 | % of Foreign LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 2% | 2% | 3% | 5% | 5% |
| | | | Foreign LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 16 | 841 | 1,451 | 1,768 | 4,365 | 6,847 | 9,815 | 13,302 | 14,436 |
| Boeing 747-100 | 816 | B747-1 | % of Foreign LTOs | 3% | 3% | 3% | 3% | 4% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | Foreign LTOs | 4,115 | 4,354 | 4,713 | 5,010 | 6,681 | 5,528 | 5,552 | 5,184 | 4,515 | 4,435 | 4,392 | 4,332 | 5,000 | 3,517 | 1,965 | 1,220 | 264 | 40 | 32 | 18 | 4 | 0 | 0 |
| Boeing 747-200/300 | 817 | B747-2 | % of Foreign LTOs | 13% | 13% | 13% | 13% | 16% | 14% | 12% | 11% | 10% | 9% | 8% | 8% | 9% | 9% | 7% | 6% | 4% | 4% | 4% | 4% | 4% | 4% | 3% |
| | | | Foreign LTOs | 16,552 | 17,510 | 18,975 | 20,168 | 27,044 | 23,392 | 21,224 | 20,562 | 19,215 | 20,086 | 18,497 | 19,704 | 22,190 | 22,150 | 18,402 | 14,811 | 9,227 | 9,128 | 10,292 | 11,346 | 10,891 | 11,170 | 9,096 |
| Boeing 747-400 | 819 | B747-4 | % of Foreign LTOs | 7% | 7% | 7% | 7% | 5% | 6% | 7% | 8% | 10% | 10% | 11% | 12% | 12% | 13% | 15% | 15% | 14% | 13% | 14% | 14% | 14% | 13% | 13% |
| | | | Foreign LTOs | 8,348 | 8,837 | 9,570 | 10,176 | 8,169 | 10,019 | 13,255 | 15,045 | 18,471 | 20,732 | 23,224 | 28,187 | 31,426 | 34,270 | 38,621 | 37,711 | 35,027 | 33,876 | 37,796 | 38,530 | 39,126 | 37,352 | 37,393 |
| Boeing 747F | 820 | B747-1 | % of Foreign LTOs | 6% | 6% | 6% | 6% | 6% | 7% | 6% | 7% | 7% | 7% | 7% | 7% | 8% | 8% | 8% | 8% | 9% | 8% | 9% | 9% | 9% | 9% | 8% |
| | | | Foreign LTOs | 8,067 | 8,539 | 9,257 | 9,832 | 10,663 | 11,174 | 11,204 | 11,934 | 14,245 | 15,579 | 15,918 | 17,242 | 19,848 | 21,263 | 22,155 | 20,323 | 21,266 | 21,410 | 24,102 | 25,887 | 26,749 | 26,873 | 21,266 |
| Boeing 767-200/ER/EM | 625 | B767-2ER | % of Foreign LTOs | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 3% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | | | Foreign LTOs | 5,266 | 5,574 | 6,040 | 6,423 | 6,115 | 7,408 | 7,670 | 8,157 | 8,402 | 8,956 | 9,627 | 6,807 | 4,404 | 3,860 | 4,172 | 3,869 | 3,103 | 3,170 | 2,383 | 3,401 | 3,359 | 4,064 | 3,119 |
| Boeing 767-300/300ER | 626 | B767-3ER | % of Foreign LTOs | 3% | 3% | 3% | 3% | 2% | 2% | 3% | 5% | 6% | 5% | 6% | 7% | 7% | 7% | 7% | 7% | 6% | 5% | 5% | 5% | 6% | 6% | 6% |
| | | | Foreign LTOs | 3,865 | 4,091 | 4,433 | 4,709 | 2,577 | 3,894 | 6,092 | 8,959 | 10,609 | 10,734 | 13,310 | 15,803 | 17,157 | 17,031 | 18,323 | 18,544 | 15,752 | 13,838 | 13,617 | 13,919 | 16,244 | 17,396 | 15,733 |
| Boeing 777-200/200LR/233LR | 627 | B777-2 | % of Foreign LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 2% | 2% | 3% | 5% | 6% | 5% | 5% | 5% | 5% | 5% |
| | | | Foreign LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 1,322 | 2,574 | 4,137 | 5,569 | 7,016 | 11,995 | 14,337 | 13,606 | 14,694 | 13,627 | 14,195 | 15,202 |
| Canadair RJ-100/RJ-100ER | 628 | CRJ1 | % of Foreign LTOs | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 0% | 4% | 7% | 6% | 5% | 5% | 3% | 3% | 3% |
| | | | Foreign LTOs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 522 | 6,662 | 799 | 0 | 0 | 0 | 0 | 8,983 | 18,540 | 16,485 | 14,110 | 14,124 | 8,078 | 8,544 | 7,274 |
| McDonnell Douglas DC-10-10 | 730 | DC10-1 | % of Foreign LTOs | 4% | 4% | 4% | 4% | 6% | 5% | 4% | 2% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | Foreign LTOs | 5,301 | 5,614 | 6,078 | 6,463 | 10,345 | 8,684 | 6,666 | 3,901 | 2,646 | 2,031 | 2,035 | 2,224 | 857 | 647 | 161 | 49 | 171 | 115 | 33 | 0 | 0 | 0 | 0 |
| McDonnell Douglas DC-10-30 | 732 | DC10-3 | % of Foreign LTOs | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 3% | 1% | 1% | 1% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | Foreign LTOs | 4,315 | 4,568 | 4,944 | 5,262 | 5,879 | 5,978 | 6,738 | 5,464 | 2,659 | 2,767 | 2,834 | 3,936 | 3,736 | 1,807 | 1,605 | 1,114 | 982 | 648 | 578 | 245 | 173 | 214 | 12 |
| McDonnell Douglas DC-9-30 | 640 | DC9-3 | % of Foreign LTOs | 7% | 7% | 7% | 7% | 7% | 6% | 7% | 7% | 7% | 8% | 8% | 8% | 6% | 5% | 3% | 3% | 1% | 1% | 1% | 1% | 0% | 0% | 0% |
| | | | Foreign LTOs | 8,329 | 8,814 | 9,551 | 10,153 | 10,865 | 10,427 | 12,027 | 13,092 | 14,056 | 16,129 | 18,707 | 18,087 | 14,941 | 12,158 | 7,959 | 7,456 | 1,830 | 1,733 | 1,959 | 1,788 | 304 | 0 | 0 |
| McDonnell Douglas MD-11 | 740 | MD11 | % of Foreign LTOs | 1% | 1% | 1% | 1% | 0% | 0% | 1% | 2% | 2% | 3% | 4% | 4% | 4% | 5% | 5% | 5% | 5% | 4% | 4% | 4% | 3% | 3% | 2% |
| | | | Foreign LTOs | 1,125 | 1,192 | 1,288 | 1,367 | 0 | 374 | 2,546 | 3,348 | 4,049 | 5,470 | 8,793 | 9,391 | 10,991 | 12,053 | 13,029 | 12,414 | 12,792 | 11,073 | 12,004 | 10,552 | 9,651 | 7,579 | 4,573 |
| McDonnell Douglas DC9 Super 80/MD81/2/3/7/8 | 655 | MD82 | % of Foreign LTOs | 5% | 5% | 5% | 5% | 3% | 5% | 5% | 5% | 5% | 5% | 4% | 4% | 4% | 4% | 5% | 4% | 4% | 4% | 3% | 2% | 2% | 1% | 0% |
| | | | Foreign LTOs | 6,080 | 6,441 | 6,972 | 7,407 | 5,710 | 8,859 | 9,345 | 9,968 | 8,821 | 9,774 | 8,432 | 9,303 | 10,075 | 9,975 | 13,659 | 10,887 | 9,430 | 10,912 | 8,379 | 6,266 | 5,106 | 4,018 | 1,227 |

(a) Each aircraft model reported in the T-100 dataset has a unique identification code (A/C code)
(b) Each aircraft model used in the FAA's EDMS model has a unique identification code (ACCODE)

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# Appendix E

# Aircraft Engine Weighting Data

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Boeing 727-200, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-7 series | Feb-80 | 15.8 | 62.3 | 3,281 | 419 | 9.0% |
| JT8D-9 series | Feb-80 | 15.9 | 64.5 | 3,488 | 433 | 24.6% |
| JT8D-15 | Dec-79 | 16.8 | 68.9 | 4,144 | 486 | 51.8% |
| JT8D-15A | Dec-79 | 16.5 | 68.9 | 3,648 | 454 | 1.1% |
| JT8D-17 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 5.5% |
| JT8D-17A | Dec-79 | 16.9 | 71.2 | 3,935 | 470 | 3.1% |
| JT8D-17R | Dec-79 | 18.2 | 77.4 | 5,623 | 537 | 5.0% |
| JT8D-217C | Feb-99 | 19.1 | 92.7 | 4,216 | 493 | 0.1% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 24% | 22% | 21% | 19% | 19% | 17% | 15% | 13% | 11% | 9% | 9% | 9% | 8% | 7% | 6% | 4% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| 1-Default | NOx (g/LTO) | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 |
| | Fuel Usage (kg/LTO) | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 |
| | Thrust (kN) | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 |
| | Press Ratio | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 |
| Weighted | NOx (g/LTO) | 3,900 | 3,895 | 3,892 | 3,891 | 3,901 | 3,918 | 3,927 | 3,999 | 4,035 | 4,038 | 4,039 | 4,039 | 4,056 | 4,074 | 4,086 | 4,049 | 4,109 | 4,138 | 4,111 | 4,134 | 4,141 | 4,206 | 4,232 |
| | Fuel Usage (kg/LTO) | 463 | 463 | 463 | 463 | 463 | 464 | 466 | 470 | 473 | 473 | 473 | 473 | 474 | 475 | 476 | 473 | 477 | 478 | 476 | 477 | 478 | 482 | 484 |
| | Thrust (kN) | 67.1 | 67.1 | 67.1 | 67.1 | 67.2 | 67.3 | 67.4 | 67.9 | 68.2 | 68.2 | 68.2 | 68.2 | 68.3 | 68.5 | 68.6 | 68.4 | 68.9 | 68.9 | 68.9 | 69.1 | 69.2 | 69.7 | 71.0 |
| | Press Ratio | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.7 | 16.7 | 16.7 | 16.6 | 16.7 | 16.7 | 16.7 | 16.8 | 16.8 | 16.8 | 17.0 |
| | Max NOx (g/LTO) | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 |
| | Min NOx (g/LTO) | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,488 |
| | Percent Difference | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 61% |
| Weighted vs. Default | NOx (g/LTO) | 6% | 6% | 6% | 6% | 6% | 5% | 5% | 3% | 3% | 3% | 3% | 3% | 2% | 2% | 1% | 2% | 1% | 0% | 1% | 0% | 0% | 1% | 2% |
| | Fuel Usage (kg/LTO) | 5% | 5% | 5% | 5% | 5% | 4% | 4% | 3% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 3% | 2% | 2% | 2% | 2% | 2% | 1% | 0% |
| | Thrust (kN) | 3% | 3% | 3% | 3% | 3% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 1% | 3% |
| | Press Ratio | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 1% | 0% | 0% | 0% | 1% |

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Embraer-145, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| AE3007A | Mar-94 | 18.1 | 33.7 | 1,563 | 162 | 4.9% |
| AE3007A1-Type 1 | Mar-94 | 18.0 | 34.9 | 1,456 | 157 | 6.1% |
| AE3007A1-Type 2 | Aug-02 | 18.0 | 34.9 | 1,607 | 157 | 37.2% |
| AE3007A1-Type 3 (low emissions) | Jun-01 | 18.0 | 34.9 | 1,344 | 157 | 4.2% |
| AE3007A1/1-Type 1 | Mar-94 | 17.9 | 34.7 | 1,442 | 156 | 1.8% |
| AE3007A1/1-Type 2 | Aug-02 | 17.9 | 34.7 | 1,592 | 156 | 2.8% |
| AE3007A1/1-Type 3 (low emissions) | Jun-01 | 17.9 | 34.7 | 1,333 | 156 | 0.4% |
| AE3007A1/3-Type 2 | Aug-02 | 17.2 | 33.1 | 1,465 | 151 | 0.3% |
| AE3007A1/3-Type 3 (low emissions) | Jun-01 | 17.2 | 33.1 | 1,245 | 151 | 0.0% |
| AE3007A1E-Type 3 | Jun-01 | 19.1 | 37.2 | 1,501 | 165 | 13.9% |
| AE3007A1P-Type 1 | Mar-94 | 17.9 | 34.7 | 1,444 | 157 | 1.0% |
| AE3007A1P-Type 2 | Aug-02 | 17.9 | 34.7 | 1,567 | 157 | 24.8% |
| AE3007A1P-Type 3 (low emissions) | Jun-01 | 17.9 | 34.7 | 1,334 | 157 | 2.4% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | - | - | - | - | - | - | - | - | - | - | - | 0% | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 9% | 9% | 9% | 8% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 1,563 | 1,442 | 1,456 | 1,456 | 1,344 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 162 | 156 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 | 157 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 33.7 | 34.7 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 | 34.9 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 18.1 | 17.9 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 1,563 | 1,498 | 1,470 | 1,460 | 1,349 | 1,583 | 1,575 | 1,575 | 1,573 | 1,572 | 1,571 | 1,571 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 162 | 159 | 158 | 157 | 157 | 158 | 158 | 158 | 159 | 159 | 159 | 159 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 33.7 | 34.3 | 34.7 | 34.8 | 34.8 | 34.9 | 35.1 | 35.2 | 35.3 | 35.3 | 35.3 | 35.3 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 18.1 | 18.0 | 18.0 | 18.0 | 17.9 | 18.0 | 18.1 | 18.1 | 18.2 | 18.2 | 18.2 | 18.2 |
| | Max NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 1,563 | 1,563 | 1,563 | 1,563 | 1,563 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 |
| | Min NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 1,563 | 1,442 | 1,442 | 1,442 | 1,245 | 1,465 | 1,465 | 1,465 | 1,465 | 1,465 | 1,465 | 1,465 |
| | Percent Difference | - | - | - | - | - | - | - | - | - | - | - | 0% | 8% | 8% | 8% | 26% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 0% | 4% | 1% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 0% | 2% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 0% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% |

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Airbus Industrie A320-100/200, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| V2500-A1 | Jun-88 | 29.8 | 111.2 | 7,716 | 442 | 10.0% |
| V2527-A5 | Aug-92 | 27.2 | 111.2 | 5,382 | 437 | 51.8% |
| V2527E-A5 | Aug-92 | 27.2 | 111.2 | 5,382 | 437 | 0.1% |
| CFM56-5-A1 | Nov-86 | 26.6 | 111.2 | 4,506 | 385 | 16.8% |
| CFM56-5A3 | Nov-86 | 27.9 | 117.9 | 5,110 | 406 | 12.4% |
| CFM56-5B4 | Oct-92 | 27.1 | 117.9 | 5,861 | 421 | 8.7% |
| CF6-50C2 | Jul-87 | 28.4 | 230.4 | 11,884 | 769 | 4.2% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 17% | 15% | 13% | 11% | 9% | 9% | 9% | 8% | 7% | 6% | 4% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% |
| 1-Default | NOx (g/LTO) | 11,884 | 11,884 | 11,884 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 | 5,382 |
| | Fuel Usage (kg/LTO) | 769 | 769 | 769 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 437 | 437 | 437 | 437 | 437 | 437 | 437 | 437 | 437 | 437 | 437 | 437 | 437 |
| | Thrust (kN) | 230.4 | 230.4 | 230.4 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 |
| | Press Ratio | 28.4 | 28.4 | 28.4 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 | 27.2 |
| Weighted | NOx (g/LTO) | 11,884 | 11,884 | 11,884 | 4,506 | 4,506 | 5,771 | 5,611 | 5,479 | 5,509 | 5,519 | 5,649 | 5,646 | 5,626 | 5,563 | 5,394 | 5,462 | 5,444 | 5,438 | 5,435 | 5,430 | 5,419 | 5,432 | 5,448 |
| | Fuel Usage (kg/LTO) | 769 | 769 | 769 | 385 | 385 | 407 | 405 | 405 | 411 | 414 | 419 | 420 | 421 | 421 | 412 | 424 | 425 | 426 | 426 | 427 | 427 | 427 | 428 |
| | Thrust (kN) | 230.4 | 230.4 | 230.4 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 112.2 | 112.3 | 112.7 | 113.1 | 110.2 | 113.0 | 112.9 | 112.8 | 112.8 | 112.6 | 112.6 | 112.7 | 112.8 |
| | Press Ratio | 28.4 | 28.4 | 28.4 | 26.6 | 26.6 | 27.9 | 27.7 | 27.5 | 27.5 | 27.5 | 27.7 | 27.7 | 27.7 | 27.6 | 26.8 | 27.4 | 27.4 | 27.4 | 27.4 | 27.4 | 27.3 | 27.3 | 27.3 |
| | Max NOx (g/LTO) | 11,884 | 11,884 | 11,884 | 4,506 | 4,506 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 13,936 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 |
| | Min NOx (g/LTO) | 11,884 | 11,884 | 11,884 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 |
| | Percent Difference | 0% | 0% | 0% | 0% | 0% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 209% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% |
| Weighted vs. Default | NOx (g/LTO) | 0% | 0% | 0% | 0% | 0% | 28% | 25% | 22% | 22% | 22% | 5% | 5% | 5% | 3% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Fuel Usage (kg/LTO) | 0% | 0% | 0% | 0% | 0% | 6% | 5% | 5% | 7% | 7% | 4% | 4% | 4% | 4% | 6% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% |
| | Thrust (kN) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 2% | 1% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Press Ratio | 0% | 0% | 0% | 0% | 0% | 5% | 4% | 4% | 4% | 3% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% |

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Boeing 737-700/700LR, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-7B20 | Jul-96 | 22.6 | 91.6 | 3,829 | 361 | 7.9% |
| CFM56-7B20/3 | Sep-05 | 22.4 | 91.6 | 2,987 | 348 | 0.5% |
| CFM56-7B22 | Jul-96 | 24.4 | 101.0 | 4,560 | 390 | 64.4% |
| CFM56-7B22/3 | Sep-05 | 24.2 | 101.0 | 3,540 | 377 | 3.1% |
| CFM56-7B24 | Jul-96 | 25.8 | 107.7 | 5,149 | 412 | 21.4% |
| CFM56-7B24/3 | Sep-05 | 25.6 | 107.6 | 3,995 | 398 | 0.2% |
| CFM56-7B26 | Jul-96 | 27.6 | 117.0 | 6,149 | 441 | 2.5% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 4% | 3% | 4% | 5% | 6% | 7% | 8% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 390 | 390 | 390 | 390 | 390 | 390 | 390 | 390 | 390 | 390 | 390 | 390 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 4,560 | 4,807 | 4,839 | 4,781 | 4,755 | 4,774 | 4,782 | 4,721 | 4,647 | 4,594 | 4,494 | 4,393 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 390 | 399 | 400 | 398 | 397 | 398 | 398 | 396 | 393 | 391 | 389 | 387 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 101.0 | 103.8 | 104.1 | 103.4 | 103.1 | 103.3 | 103.4 | 102.7 | 101.9 | 101.2 | 100.9 | 100.7 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 24.4 | 25.0 | 25.1 | 24.9 | 24.8 | 24.9 | 24.9 | 24.8 | 24.6 | 24.5 | 24.4 | 24.3 |
| | Max NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 4,560 | 5,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 5,149 |
| | Min NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 4,560 | 4,560 | 4,560 | 3,829 | 3,829 | 3,829 | 3,829 | 3,540 | 3,540 | 3,540 | 3,540 | 3,540 |
| | Percent Difference | - | - | - | - | - | - | - | - | - | - | - | 0% | 13% | 35% | 61% | 61% | 61% | 61% | 74% | 74% | 74% | 74% | 45% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 0% | 5% | 6% | 5% | 4% | 5% | 5% | 4% | 2% | 1% | 1% | 4% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 0% | 2% | 3% | 2% | 2% | 2% | 2% | 1% | 1% | 0% | 0% | 1% |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 0% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 1% | 0% | 0% | 0% |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 0% | 2% | 3% | 2% | 2% | 2% | 2% | 1% | 1% | 0% | 0% | 0% |

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Boeing 737-800, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-7B24 | Jul-96 | 25.8 | 107.7 | 5,149 | 412 | 0.4% |
| CFM56-7B26 | Jul-96 | 27.6 | 117.0 | 6,149 | 441 | 67.2% |
| CFM56-7B26/3 | Sep-05 | 27.7 | 117.0 | 4,763 | 429 | 0.7% |
| CFM56-7B27 | Jul-96 | 28.6 | 121.4 | 6,719 | 456 | 30.6% |
| CFM56-7B27/3 | Sep-05 | 29.0 | 121.4 | 5,232 | 444 | 1.1% |
| CFM56-7B27/B1 | Jul-96 | 28.6 | 121.4 | 6,719 | 456 | 0.0% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 441 | 441 | 441 | 441 | 441 | 441 | 441 | 441 | 441 | 441 | 441 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | - | 117.0 | 117.0 | 117.0 | 117.0 | 117.0 | 117.0 | 117.0 | 117.0 | 117.0 | 117.0 | 117.0 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | - | 27.6 | 27.6 | 27.6 | 27.6 | 27.6 | 27.6 | 27.6 | 27.6 | 27.6 | 27.6 | 27.6 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 6,149 | 6,149 | 6,149 | 6,195 | 6,381 | 6,375 | 6,368 | 6,334 | 6,357 | 6,323 | 6,199 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 441 | 441 | 441 | 442 | 447 | 447 | 447 | 446 | 446 | 446 | 445 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | - | 117.0 | 117.0 | 117.0 | 117.4 | 118.8 | 118.7 | 118.7 | 118.4 | 118.6 | 118.7 | 118.6 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | - | 27.6 | 27.6 | 27.6 | 27.7 | 28.0 | 28.0 | 28.0 | 27.9 | 28.0 | 28.0 | 28.0 |
| | Max NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 6,149 | 6,149 | 6,149 | 6,719 | 6,719 | 6,719 | 6,719 | 6,719 | 6,719 | 6,719 | 6,719 |
| | Min NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 5,149 | 5,149 | 5,149 | 5,149 | 4,763 | 4,763 |
| | Percent Difference | - | - | - | - | - | - | - | - | - | - | - | - | 0% | 0% | 0% | 9% | 9% | 30% | 30% | 30% | 30% | 41% | 41% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 0% | 0% | 0% | 1% | 4% | 4% | 4% | 3% | 3% | 3% | 1% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | - | 0% | 0% | 0% | 0% | 2% | 2% | 1% | 1% | 1% | 1% | 1% |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | - | 0% | 0% | 0% | 0% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |

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Boeing 737-500, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-3-B1 | Nov-83 | 22.4 | 89.4 | 3,595 | 392 | 58.1% |
| CFM56-3C-1 | Nov-83 | 25.5 | 104.6 | 4,810 | 448 | 41.9% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 3% | 3% | 3% | 4% | 3% | 4% | 4% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 2% |
| 1-Default | NOx (g/LTO) | - | - | - | - | 3,595 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 |
| | Fuel Usage (kg/LTO) | - | - | - | - | 392 | 448 | 448 | 448 | 448 | 448 | 448 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 |
| | Thrust (kN) | - | - | - | - | 89.4 | 104.6 | 104.6 | 104.6 | 104.6 | 104.6 | 104.6 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 |
| | Press Ratio | - | - | - | - | 22.4 | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 |
| Weighted | NOx (g/LTO) | - | - | - | - | 3,942 | 4,280 | 4,416 | 4,448 | 4,284 | 4,213 | 4,218 | 4,153 | 4,104 | 4,104 | 4,099 | 4,094 | 4,091 | 4,076 | 3,971 | 3,914 | 3,914 | 3,923 | 3,884 |
| | Fuel Usage (kg/LTO) | - | - | - | - | 408 | 424 | 430 | 431 | 424 | 420 | 421 | 418 | 415 | 415 | 415 | 415 | 415 | 414 | 409 | 407 | 407 | 407 | 405 |
| | Thrust (kN) | - | - | - | - | 93.8 | 98.0 | 99.7 | 100.1 | 98.0 | 97.1 | 97.2 | 96.4 | 95.8 | 95.8 | 95.7 | 95.7 | 95.6 | 95.4 | 94.1 | 93.4 | 93.4 | 93.5 | 93.0 |
| | Press Ratio | - | - | - | - | 23.3 | 24.2 | 24.5 | 24.6 | 24.2 | 24.0 | 24.0 | 23.8 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 | 23.7 | 23.4 | 23.2 | 23.2 | 23.3 | 23.2 |
| | Max NOx (g/LTO) | - | - | - | - | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 |
| | Min NOx (g/LTO) | - | - | - | - | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 |
| | Percent Difference | - | - | - | - | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | 10% | 11% | 8% | 8% | 11% | 12% | 12% | 16% | 14% | 14% | 14% | 14% | 14% | 13% | 10% | 9% | 9% | 9% | 8% |
| | Fuel Usage (kg/LTO) | - | - | - | - | 4% | 5% | 4% | 4% | 5% | 6% | 6% | 7% | 6% | 6% | 6% | 6% | 6% | 6% | 4% | 4% | 4% | 4% | 3% |
| | Thrust (kN) | - | - | - | - | 5% | 6% | 5% | 4% | 6% | 7% | 7% | 8% | 7% | 7% | 7% | 7% | 7% | 7% | 5% | 4% | 4% | 5% | 4% |
| | Press Ratio | - | - | - | - | 4% | 5% | 4% | 4% | 5% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 5% | 4% | 4% | 4% | 4% | 3% |



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Boeing 737-400, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-3B-2 | Nov-83 | 24.1 | 98.3 | 4,213 | 421 | 56.7% |
| CFM56-3C-1 | Nov-83 | 25.5 | 104.6 | 4,810 | 448 | 43.3% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |
| 1-Default | NOx (g/LTO) | - | - | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,810 | 4,213 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 |
| | Fuel Usage (kg/LTO) | - | - | 421 | 421 | 421 | 421 | 421 | 421 | 421 | 421 | 421 | 421 | 421 | 421 | 421 | 421 | 448 | 421 | 448 | 448 | 448 | 448 | 448 |
| | Thrust (kN) | - | - | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 98.3 | 104.6 | 98.3 | 104.6 | 104.6 | 104.6 | 104.6 | 104.6 |
| | Press Ratio | - | - | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 25.5 | 24.1 | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 |
| Weighted | NOx (g/LTO) | - | - | 4,213 | 4,213 | 4,213 | 4,224 | 4,356 | 4,407 | 4,457 | 4,424 | 4,452 | 4,467 | 4,485 | 4,482 | 4,472 | 4,478 | 4,515 | 4,502 | 4,565 | 4,583 | 4,580 | 4,581 | 4,560 |
| | Fuel Usage (kg/LTO) | - | - | 421 | 421 | 421 | 421 | 427 | 430 | 432 | 431 | 432 | 432 | 433 | 433 | 433 | 433 | 435 | 434 | 437 | 438 | 438 | 438 | 437 |
| | Thrust (kN) | - | - | 98.3 | 98.3 | 98.3 | 98.4 | 99.8 | 100.3 | 100.9 | 100.5 | 100.8 | 101.0 | 101.2 | 101.1 | 101.0 | 101.1 | 101.5 | 101.3 | 102.0 | 102.2 | 102.2 | 102.2 | 102.0 |
| | Press Ratio | - | - | 24.1 | 24.1 | 24.1 | 24.1 | 24.4 | 24.6 | 24.7 | 24.6 | 24.7 | 24.7 | 24.7 | 24.7 | 24.7 | 24.7 | 24.8 | 24.8 | 24.9 | 25.0 | 25.0 | 25.0 | 24.9 |
| | Max NOx (g/LTO) | - | - | 4,213 | 4,213 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 |
| | Min NOx (g/LTO) | - | - | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 |
| | Percent Difference | - | - | 0% | 0% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% | 14% |
| Weighted vs. Default | NOx (g/LTO) | - | - | 0% | 0% | 0% | 0% | 3% | 5% | 6% | 5% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 7% | 5% | 5% | 5% | 5% | 5% |
| | Fuel Usage (kg/LTO) | - | - | 0% | 0% | 0% | 0% | 2% | 2% | 3% | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 3% |
| | Thrust (kN) | - | - | 0% | 0% | 0% | 0% | 2% | 2% | 3% | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 3% |
| | Press Ratio | - | - | 0% | 0% | 0% | 0% | 1% | 2% | 2% | 2% | 2% | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 2% |

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Boeing 737-300, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-3-B1 | Nov-83 | 22.4 | 89.4 | 3,595 | 392 | 65.9% |
| CFM56-3B-2 | Nov-83 | 24.1 | 98.3 | 4,213 | 421 | 24.1% |
| CFM56-3C-1 | Nov-83 | 25.5 | 104.6 | 4,810 | 448 | 10.0% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 4% | 6% | 9% | 11% | 12% | 13% | 12% | 13% | 14% | 14% | 14% | 15% | 16% | 17% | 17% | 15% | 12% | 9% | 9% | 8% | 7% | 7% | 6% |
| 1-Default | NOx (g/LTO) | - | - | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 |
| | Fuel Usage (kg/LTO) | - | - | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 | 392 |
| | Thrust (kN) | - | - | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 | 89.4 |
| | Press Ratio | - | - | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 | 22.4 |
| Weighted | NOx (g/LTO) | - | - | 3,746 | 3,788 | 3,828 | 3,834 | 3,831 | 3,813 | 3,801 | 3,790 | 3,784 | 3,796 | 3,813 | 3,915 | 3,944 | 3,951 | 3,955 | 3,947 | 3,940 | 3,893 | 3,928 | 3,916 | 3,866 |
| | Fuel Usage (kg/LTO) | - | - | 399 | 401 | 403 | 403 | 403 | 402 | 402 | 401 | 401 | 401 | 402 | 407 | 408 | 409 | 409 | 408 | 408 | 406 | 407 | 407 | 405 |
| | Thrust (kN) | - | - | 91.6 | 92.2 | 92.8 | 92.8 | 92.8 | 92.6 | 92.4 | 92.2 | 92.1 | 92.3 | 92.5 | 93.6 | 94.0 | 94.1 | 94.1 | 94.0 | 93.9 | 93.3 | 93.7 | 93.6 | 92.9 |
| | Press Ratio | - | - | 22.8 | 23.0 | 23.1 | 23.1 | 23.1 | 23.0 | 23.0 | 23.0 | 22.9 | 23.0 | 23.0 | 23.3 | 23.3 | 23.4 | 23.4 | 23.3 | 23.3 | 23.2 | 23.3 | 23.3 | 23.1 |
| | Max NOx (g/LTO) | - | - | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,213 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 | 4,810 |
| | Min NOx (g/LTO) | - | - | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 | 3,595 |
| | Percent Difference | - | - | 17% | 17% | 17% | 17% | 17% | 17% | 17% | 17% | 17% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% | 34% |
| Weighted vs. Default | NOx (g/LTO) | - | - | 4% | 5% | 6% | 7% | 7% | 6% | 6% | 5% | 5% | 6% | 6% | 9% | 10% | 10% | 10% | 10% | 10% | 8% | 9% | 9% | 8% |
| | Fuel Usage (kg/LTO) | - | - | 2% | 2% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 3% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 3% |
| | Thrust (kN) | - | - | 2% | 3% | 4% | 4% | 4% | 4% | 3% | 3% | 3% | 3% | 3% | 5% | 5% | 5% | 5% | 5% | 5% | 4% | 5% | 5% | 4% |
| | Press Ratio | - | - | 2% | 2% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 3% | 4% | 4% | 4% | 4% | 4% | 4% | 3% | 4% | 4% | 3% |



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Boeing 737-100/200, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-15 | Dec-79 | 16.8 | 68.9 | 4,144 | 486 | 10.6% |
| JT8D-15A | Dec-79 | 16.5 | 68.9 | 3,648 | 454 | 25.6% |
| JT8D-17 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 9.9% |
| JT8D-17A | Dec-79 | 16.9 | 71.2 | 3,935 | 470 | 3.5% |
| JT8D-7 series | Feb-80 | 15.8 | 62.3 | 3,281 | 419 | 12.1% |
| JT8D-9 series | Feb-80 | 15.9 | 64.5 | 3,488 | 433 | 38.3% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 17% | 16% | 14% | 13% | 13% | 12% | 11% | 10% | 11% | 10% | 9% | 9% | 8% | 7% | 6% | 5% | 2% | 2% | 2% | 1% | 1% | 0% | 0% |
| 1-Default | NOx (g/LTO) | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,281 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,648 | 3,648 | 3,488 | 3,648 | 3,648 | 3,648 | 3,648 | 3,488 | 3,488 | 3,488 |
| | Fuel Usage (kg/LTO) | 433 | 433 | 433 | 433 | 433 | 419 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 454 | 454 | 433 | 454 | 454 | 454 | 454 | 433 | 433 | 433 |
| | Thrust (kN) | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 62.3 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 68.9 | 68.9 | 64.5 | 68.9 | 68.9 | 68.9 | 68.9 | 64.5 | 64.5 | 64.5 |
| | Press Ratio | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.8 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 16.5 | 16.5 | 15.9 | 16.5 | 16.5 | 16.5 | 16.5 | 15.9 | 15.9 | 15.9 |
| Weighted | NOx (g/LTO) | 3,715 | 3,789 | 3,639 | 3,653 | 3,643 | 3,539 | 3,651 | 3,663 | 3,661 | 3,665 | 3,677 | 3,702 | 3,748 | 3,791 | 3,803 | 3,811 | 3,790 | 3,786 | 3,780 | 3,811 | 3,739 | 3,711 | 3,767 |
| | Fuel Usage (kg/LTO) | 447 | 453 | 445 | 446 | 446 | 438 | 447 | 448 | 447 | 448 | 449 | 451 | 454 | 458 | 459 | 459 | 458 | 459 | 459 | 461 | 453 | 452 | 456 |
| | Thrust (kN) | 66.0 | 66.9 | 66.0 | 66.1 | 66.2 | 64.5 | 66.3 | 66.4 | 66.4 | 66.4 | 66.5 | 66.8 | 67.3 | 67.8 | 68.0 | 67.8 | 68.0 | 68.2 | 68.6 | 68.6 | 67.0 | 67.1 | 67.8 |
| | Press Ratio | 16.1 | 16.3 | 16.2 | 16.2 | 16.2 | 16.1 | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | 16.3 | 16.3 | 16.4 | 16.4 | 16.4 | 16.4 | 16.4 | 16.5 | 16.5 | 16.3 | 16.3 | 16.4 |
| | Max NOx (g/LTO) | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,144 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 |
| | Min NOx (g/LTO) | 3,488 | 3,488 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 |
| | Percent Difference | 31% | 31% | 39% | 39% | 39% | 26% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% |
| Weighted vs. Default | NOx (g/LTO) | 7% | 9% | 4% | 5% | 4% | 8% | 5% | 5% | 5% | 5% | 5% | 6% | 7% | 4% | 4% | 9% | 4% | 4% | 4% | 4% | 7% | 6% | 8% |
| | Fuel Usage (kg/LTO) | 3% | 5% | 3% | 3% | 3% | 5% | 3% | 3% | 3% | 3% | 4% | 4% | 5% | 1% | 1% | 6% | 1% | 1% | 1% | 1% | 5% | 4% | 5% |
| | Thrust (kN) | 2% | 4% | 2% | 3% | 3% | 4% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 2% | 1% | 5% | 1% | 1% | 1% | 1% | 4% | 4% | 5% |
| | Press Ratio | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 3% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 3% | 3% | 3% |

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Boeing 757-200, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| PW2037 | Aug-83 | 26.7 | 166.4 | 8,120 | 586 | 50.3% |
| PW2040 | Aug-83 | 29.4 | 182.0 | 9,989 | 631 | 7.2% |
| RB211-535C | Apr-84 | 21.5 | 163.3 | 9,277 | 711 | 0.1% |
| RB211-535E4 | May-99 | 26.0 | 178.4 | 7,492 | 681 | 7.8% |
| RB211-535E4 | Apr-91 | 25.8 | 178.4 | 11,714 | 683 | 3.8% |
| RB211-535E4 | Jul-84 | 25.4 | 176.1 | 13,633 | 711 | 1.7% |
| RB211-535E4B | May-99 | 27.9 | 191.7 | 8,927 | 732 | 20.0% |
| RB211-535E4B | Apr-91 | 27.7 | 191.7 | 14,791 | 734 | 9.0% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 2% | 2% | 2% | 3% | 4% | 4% | 5% | 6% | 6% | 6% | 6% | 7% | 7% | 7% | 7% | 8% | 7% | 6% | 5% | 5% | 5% | 5% | 5% |
| 1-Default | NOx (g/LTO) | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 |
| | Fuel Usage (kg/LTO) | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 | 586 |
| | Thrust (kN) | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 | 166.4 |
| | Press Ratio | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 | 26.7 |
| Weighted | NOx (g/LTO) | 10,430 | 9,996 | 9,782 | 9,937 | 10,117 | 9,887 | 10,059 | 10,090 | 10,460 | 10,646 | 10,647 | 10,693 | 10,760 | 8,415 | 8,401 | 8,404 | 8,422 | 8,417 | 8,410 | 8,442 | 8,438 | 8,451 | 8,450 |
| | Fuel Usage (kg/LTO) | 638 | 629 | 624 | 627 | 631 | 627 | 631 | 632 | 640 | 645 | 645 | 646 | 647 | 647 | 647 | 649 | 649 | 651 | 650 | 650 | 650 | 649 | 650 |
| | Thrust (kN) | 170.4 | 170.3 | 170.8 | 171.5 | 172.8 | 173.8 | 174.4 | 174.5 | 175.9 | 176.5 | 176.4 | 176.5 | 176.8 | 177.0 | 176.8 | 177.0 | 177.1 | 177.4 | 177.3 | 177.5 | 177.4 | 177.4 | 177.4 |
| | Press Ratio | 26.2 | 26.4 | 26.7 | 26.7 | 26.9 | 27.1 | 27.1 | 27.1 | 27.1 | 27.1 | 27.1 | 27.0 | 27.1 | 27.2 | 27.1 | 27.1 | 27.2 | 27.2 | 27.1 | 27.2 | 27.2 | 27.2 | 27.2 |
| | Max NOx (g/LTO) | 13,633 | 13,633 | 13,633 | 14,791 | 14,791 | 14,791 | 14,791 | 14,791 | 14,791 | 14,791 | 14,791 | 14,791 | 14,791 | 9,989 | 9,989 | 9,989 | 9,989 | 9,989 | 9,989 | 9,989 | 9,989 | 9,989 | 9,989 |
| | Min NOx (g/LTO) | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 8,120 | 7,492 | 7,492 | 7,492 | 7,492 | 7,492 | 7,492 | 7,492 | 7,492 | 7,492 | 7,492 |
| | Percent Difference | 68% | 68% | 68% | 82% | 82% | 82% | 82% | 82% | 82% | 82% | 82% | 82% | 82% | 33% | 33% | 33% | 33% | 33% | 33% | 33% | 33% | 33% | 33% |
| Weighted vs. Default | NOx (g/LTO) | 28% | 23% | 20% | 22% | 25% | 22% | 24% | 24% | 29% | 31% | 31% | 32% | 33% | 4% | 3% | 3% | 4% | 4% | 4% | 4% | 4% | 4% | 4% |
| | Fuel Usage (kg/LTO) | 9% | 7% | 6% | 7% | 8% | 7% | 8% | 8% | 9% | 10% | 10% | 10% | 10% | 10% | 10% | 11% | 11% | 11% | 11% | 11% | 11% | 11% | 11% |
| | Thrust (kN) | 2% | 2% | 3% | 3% | 4% | 5% | 5% | 5% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 7% | 7% | 7% | 7% | 7% | 7% |
| | Press Ratio | 2% | 1% | 0% | 0% | 1% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |

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McDonnell Douglas DC-9-10, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-17 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 0.4% |
| JT8D-7 series | Apr-76 | 15.8 | 62.3 | 3,078 | 419 | 99.0% |
| JT8D-1 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 0.6% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 3% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 1-Default | NOx (g/LTO) | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 |
| | Fuel Usage (kg/LTO) | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 |
| | Thrust (kN) | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 |
| | Press Ratio | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 |
| Weighted | NOx (g/LTO) | 3,031 | 3,062 | 3,061 | 3,061 | 3,060 | 3,033 | 3,033 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 |
| | Fuel Usage (kg/LTO) | 411 | 416 | 415 | 415 | 415 | 413 | 413 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 |
| | Thrust (kN) | 61.1 | 61.7 | 61.7 | 61.7 | 61.7 | 61.4 | 61.4 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 |
| | Press Ratio | 15.5 | 15.7 | 15.7 | 15.7 | 15.7 | 15.6 | 15.6 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 |
| | Max NOx (g/LTO) | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 |
| | Min NOx (g/LTO) | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 | 3,078 |
| | Percent Difference | 48% | 48% | 48% | 48% | 48% | 48% | 48% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Weighted vs. Default | NOx (g/LTO) | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Fuel Usage (kg/LTO) | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Thrust (kN) | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Press Ratio | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

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McDonnell Douglas DC-9-30, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-11 | Feb-80 | 17.2 | 66.7 | 3,740 | 475 | 0.5% |
| JT8D-15 | Dec-79 | 16.8 | 68.9 | 4,144 | 486 | 3.6% |
| JT8D-15A | Dec-79 | 16.5 | 68.9 | 3,648 | 454 | 0.6% |
| JT8D-17 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 0.3% |
| JT8D-7 series | Feb-80 | 15.8 | 62.3 | 3,281 | 419 | 42.2% |
| JT8D-9 series | Feb-80 | 15.9 | 64.5 | 3,488 | 433 | 52.6% |
| JT8D-1 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 0.1% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 12% | 12% | 11% | 10% | 11% | 10% | 8% | 7% | 7% | 7% | 7% | 7% | 6% | 6% | 5% | 4% | 3% | 2% | 2% | 2% | 1% | 1% | 1% |
| 1-Default | NOx (g/LTO) | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 |
| | Fuel Usage (kg/LTO) | 419 | 419 | 419 | 419 | 419 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 |
| | Thrust (kN) | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 |
| | Press Ratio | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 |
| Weighted | NOx (g/LTO) | 3,405 | 3,407 | 3,409 | 3,412 | 3,407 | 3,420 | 3,433 | 3,431 | 3,429 | 3,434 | 3,441 | 3,439 | 3,441 | 3,430 | 3,434 | 3,446 | 3,457 | 3,454 | 3,450 | 3,468 | 3,484 | 3,486 | 3,474 |
| | Fuel Usage (kg/LTO) | 428 | 428 | 428 | 428 | 428 | 429 | 430 | 430 | 430 | 430 | 430 | 430 | 430 | 429 | 430 | 431 | 431 | 431 | 431 | 432 | 433 | 434 | 433 |
| | Thrust (kN) | 63.5 | 63.5 | 63.6 | 63.6 | 63.5 | 63.7 | 63.8 | 63.8 | 63.8 | 63.8 | 63.9 | 63.9 | 63.9 | 63.8 | 63.8 | 63.9 | 64.1 | 64.0 | 64.0 | 64.1 | 64.3 | 64.3 | 64.2 |
| | Press Ratio | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 |
| | Max NOx (g/LTO) | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 |
| | Min NOx (g/LTO) | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 |
| | Percent Difference | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 26% | 26% | 26% | 26% | 26% | 26% | 26% | 26% | 26% | 26% |
| Weighted vs. Default | NOx (g/LTO) | 4% | 4% | 4% | 4% | 4% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% |
| | Fuel Usage (kg/LTO) | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Thrust (kN) | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 1% |
| | Press Ratio | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

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McDonnell Douglas DC-9-50, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-17 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 90.9% |
| JT8D-17A | Dec-79 | 16.9 | 71.2 | 3,935 | 470 | 9.1% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 3% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 1% | 1% |
| 1-Default | NOx (g/LTO) | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 |
| | Fuel Usage (kg/LTO) | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 | 499 |
| | Thrust (kN) | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 |
| | Press Ratio | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 |
| Weighted | NOx (g/LTO) | 4,489 | 4,506 | 4,489 | 4,487 | 4,492 | 4,529 | 4,529 | 4,544 | 4,487 | 4,489 | 4,489 | 4,486 | 4,487 | 4,475 | 4,475 | 4,472 | 4,472 | 4,521 | 4,504 | 4,559 | 4,559 | 4,559 | 4,559 |
| | Fuel Usage (kg/LTO) | 496 | 497 | 496 | 496 | 496 | 498 | 498 | 498 | 496 | 496 | 496 | 496 | 496 | 495 | 495 | 495 | 495 | 497 | 496 | 499 | 499 | 499 | 499 |
| | Thrust (kN) | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 | 71.2 |
| | Press Ratio | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 | 17.0 |
| | Max NOx (g/LTO) | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 |
| | Min NOx (g/LTO) | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 3,935 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 |
| | Percent Difference | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 16% | 0% | 0% | 0% | 0% | 0% |
| Weighted vs. Default | NOx (g/LTO) | 2% | 1% | 2% | 2% | 1% | 1% | 1% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 0% | 0% | 0% | 0% |
| | Fuel Usage (kg/LTO) | 1% | 0% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| | Thrust (kN) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Press Ratio | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |



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McDonnell Douglas DC9 Super 80/MD81/2/3/7/8, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-209 | Nov-83 | 18.3 | 85.6 | 5,075 | 469 | 0.1% |
| JT8D-217 | Feb-99 | 19.7 | 92.7 | 4,582 | 504 | 1.3% |
| JT8D-217 series | Nov-83 | 19.7 | 92.7 | 5,985 | 504 | 36.6% |
| JT8D-217A | Feb-99 | 19.7 | 92.7 | 4,582 | 504 | 3.7% |
| JT8D-217C | Feb-99 | 19.1 | 92.7 | 4,216 | 493 | 15.7% |
| JT8D-219 | Feb-99 | 20.3 | 96.5 | 4,604 | 501 | 25.6% |
| JT8D-219 | Nov-83 | 20.3 | 96.5 | 6,106 | 501 | 17.1% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 6% | 7% | 9% | 11% | 12% | 14% | 15% | 15% | 15% | 14% | 13% | 14% | 13% | 13% | 12% | 12% | 10% | 7% | 7% | 7% | 7% | 6% | 6% |
| 1-Default | NOx (g/LTO) | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 |
| | Fuel Usage (kg/LTO) | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 501 | 501 | 501 | 501 | 501 | 501 | 501 | 501 | 501 | 501 |
| | Thrust (kN) | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 96.5 | 96.5 | 96.5 | 96.5 | 96.5 | 96.5 | 96.5 | 96.5 | 96.5 | 96.5 |
| | Press Ratio | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 |
| Weighted | NOx (g/LTO) | 5,975 | 5,991 | 6,002 | 6,011 | 6,017 | 6,018 | 6,026 | 6,030 | 6,031 | 6,031 | 6,032 | 6,032 | 6,033 | 4,496 | 4,451 | 4,438 | 4,433 | 4,431 | 4,471 | 4,498 | 4,500 | 4,501 | 4,500 |
| | Fuel Usage (kg/LTO) | 503 | 503 | 503 | 503 | 503 | 503 | 503 | 503 | 503 | 503 | 503 | 503 | 503 | 500 | 499 | 498 | 498 | 498 | 498 | 499 | 499 | 499 | 499 |
| | Thrust (kN) | 92.8 | 93.1 | 93.3 | 93.6 | 93.7 | 93.8 | 94.0 | 94.1 | 94.2 | 94.2 | 94.2 | 94.2 | 94.2 | 94.3 | 94.3 | 94.4 | 94.4 | 94.5 | 95.1 | 95.4 | 95.5 | 95.5 | 95.5 |
| | Press Ratio | 19.7 | 19.7 | 19.8 | 19.8 | 19.8 | 19.8 | 19.9 | 19.9 | 19.9 | 19.9 | 19.9 | 19.9 | 19.9 | 19.8 | 19.7 | 19.7 | 19.7 | 19.7 | 19.8 | 19.9 | 19.9 | 19.9 | 19.9 |
| | Max NOx (g/LTO) | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 |
| | Min NOx (g/LTO) | 5,075 | 5,075 | 5,075 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 |
| | Percent Difference | 20% | 20% | 20% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 9% | 9% | 9% | 9% | 9% | 9% | 9% | 9% | 9% | 9% |
| Weighted vs. Default | NOx (g/LTO) | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 3% | 4% | 4% | 4% | 3% | 2% | 2% | 2% | 2% |
| | Fuel Usage (kg/LTO) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% |
| | Thrust (kN) | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% |
| | Press Ratio | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 3% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 2% |



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Airbus Industrie A319, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-5A4 | Nov-86 | 23.8 | 97.9 | 3,851 | 346 | 0.2% |
| CFM56-5A5 | Nov-86 | 25.1 | 104.5 | 4,367 | 365 | 22% |
| CFM56-5B5/P | Nov-95 | 23.3 | 97.9 | 3,732 | 344 | 9% |
| CFM56-5B6/2P | Aug-96 | 24.6 | 104.5 | 3,020 | 394 | 0.2% |
| CFM56-5B6/3 | Sep-05 | 24.3 | 104.5 | 3,363 | 361 | 0.3% |
| CFM56-5B6/P | Nov-95 | 24.6 | 104.5 | 4,232 | 363 | 27% |
| CFM56-5B7/P | Nov-95 | 27.7 | 120.1 | 5,641 | 408 | 0.1% |
| V2522-A5 | Aug-92 | 25.6 | 102.7 | 4,720 | 407 | 22% |
| V2524-A5 | Aug-92 | 26.9 | 109.1 | 5,278 | 429 | 18% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 3% | 4% | 3% | 3% | 4% | 4% | 4% | 4% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 4,720 | 4,720 | 4,720 | 4,232 | 4,232 | 4,232 | 4,367 | 4,232 | 4,367 | 4,367 | 4,232 | 5,278 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 407 | 407 | 407 | 363 | 363 | 363 | 365 | 363 | 365 | 365 | 363 | 429 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 102.7 | 102.7 | 102.7 | 104.5 | 104.5 | 104.5 | 104.5 | 104.5 | 104.5 | 104.5 | 104.5 | 109.1 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 25.6 | 25.6 | 25.6 | 24.6 | 24.6 | 24.6 | 25.1 | 24.6 | 25.1 | 25.1 | 24.6 | 26.9 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 4,720 | 4,677 | 4,533 | 4,511 | 4,547 | 4,501 | 4,469 | 4,463 | 4,522 | 4,518 | 4,520 | 4,531 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 407 | 400 | 387 | 383 | 385 | 382 | 381 | 380 | 384 | 384 | 385 | 385 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 102.7 | 103.7 | 104.0 | 104.7 | 104.6 | 104.3 | 104.1 | 104.1 | 104.4 | 104.3 | 104.4 | 104.5 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 25.6 | 25.5 | 25.3 | 25.2 | 25.3 | 25.2 | 25.2 | 25.2 | 25.3 | 25.3 | 25.3 | 25.3 |
| | Max NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 4,720 | 5,278 | 5,278 | 5,278 | 5,278 | 5,278 | 5,278 | 5,278 | 5,278 | 5,278 | 5,641 | 5,641 |
| | Min NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 4,720 | 4,232 | 3,851 | 4,232 | 3,732 | 3,732 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,363 |
| | Percent Difference | - | - | - | - | - | - | - | - | - | - | - | 0% | 25% | 37% | 25% | 41% | 41% | 75% | 75% | 75% | 75% | 87% | 68% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 0% | 1% | 4% | 7% | 7% | 6% | 2% | 5% | 4% | 3% | 7% | 14% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 0% | 2% | 5% | 5% | 6% | 5% | 4% | 5% | 5% | 5% | 6% | 10% |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 0% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 4% |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 0% | 0% | 1% | 2% | 3% | 2% | 0% | 2% | 1% | 1% | 3% | 6% |

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Boeing 727-100, Most Popular vs. Inventory Weighted Average Engine (US Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-15 | Dec-79 | 16.8 | 68.9 | 4,144 | 486 | 0% |
| JT8D-7 series | Feb-80 | 15.8 | 62.3 | 3,281 | 419 | 85% |
| JT8D-9 series | Feb-80 | 15.9 | 64.5 | 3,488 | 433 | 3% |
| JT8D-217C | Feb-99 | 19.1 | 92.7 | 4,216 | 493 | 1% |
| JT8D-219 | Feb-99 | 20.3 | 96.5 | 4,604 | 501 | 0% |
| JT8D-219 | Nov-83 | 20.3 | 96.5 | 6,106 | 501 | 0% |
| RB.183 Tay-651-54 | Mar-88 | 16.4 | 67.2 | 2,875 | 378 | 10% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 7% | 5% | 5% | 4% | 3% | 2% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 1-Default | NOx (g/LTO) | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 |
| | Fuel Usage (kg/LTO) | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 | 419 |
| | Thrust (kN) | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 | 62.3 |
| | Press Ratio | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 |
| Weighted | NOx (g/LTO) | 3,288 | 3,290 | 3,288 | 3,288 | 3,296 | 3,298 | 3,294 | 3,274 | 3,241 | 3,221 | 3,225 | 3,224 | 3,224 | 3,224 | 3,215 | 3,200 | 3,220 | 3,196 | 3,238 | 3,274 | 3,264 | 3,615 | 3,535 |
| | Fuel Usage (kg/LTO) | 420 | 420 | 419 | 419 | 420 | 420 | 419 | 417 | 414 | 412 | 411 | 411 | 411 | 412 | 411 | 409 | 411 | 409 | 412 | 416 | 414 | 444 | 437 |
| | Thrust (kN) | 62.3 | 62.4 | 62.3 | 62.3 | 62.4 | 62.5 | 62.5 | 62.8 | 63.2 | 63.5 | 63.8 | 63.9 | 63.9 | 64.6 | 64.8 | 65.2 | 65.9 | 66.0 | 66.0 | 66.4 | 67.3 | 71.8 | 69.1 |
| | Press Ratio | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.8 | 15.9 | 15.9 | 16.0 | 16.0 | 16.0 | 16.0 | 16.1 | 16.1 | 16.2 | 16.2 | 16.2 | 16.2 | 16.3 | 16.4 | 16.9 | 16.6 |
| | Max NOx (g/LTO) | 4,144 | 4,144 | 3,488 | 3,488 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 | 4,604 |
| | Min NOx (g/LTO) | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 | 2,875 |
| | Percent Difference | 26% | 26% | 6% | 6% | 86% | 86% | 112% | 112% | 112% | 112% | 112% | 112% | 112% | 60% | 60% | 60% | 60% | 60% | 60% | 60% | 60% | 60% | 60% |
| Weighted vs. Default | NOx (g/LTO) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 3% | 1% | 0% | 1% | 10% | 8% |
| | Fuel Usage (kg/LTO) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 6% | 4% |
| | Thrust (kN) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 2% | 3% | 3% | 3% | 4% | 4% | 5% | 6% | 6% | 6% | 7% | 8% | 15% | 11% |
| | Press Ratio | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 2% | 3% | 3% | 3% | 3% | 4% | 7% | 5% |



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Airbus Industrie A319, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-5A4 | Nov-86 | 23.8 | 97.9 | 3,851 | 346 | 2.8% |
| CFM56-5A5 | Nov-86 | 25.1 | 104.5 | 4,367 | 365 | 8.4% |
| CFM56-5B2 | Oct-92 | 31.3 | 137.9 | 8,485 | 489 | 0.0% |
| CFM56-5B5/3 | Sep-05 | 23.1 | 97.9 | 3,047 | 343 | 1.7% |
| CFM56-5B5/P | Nov-95 | 23.3 | 97.9 | 3,732 | 344 | 28.5% |
| CFM56-5B6/2P | Aug-96 | 24.6 | 104.5 | 3,020 | 394 | 6.7% |
| CFM56-5B6/3 | Sep-05 | 24.3 | 104.5 | 3,363 | 361 | 1.6% |
| CFM56-5B6/P | Nov-95 | 24.6 | 104.5 | 4,232 | 363 | 14.9% |
| CFM56-5B7/3 | Sep-05 | 27.3 | 120.1 | 4,511 | 407 | 0.1% |
| CFM56-5B7/P | Nov-95 | 27.7 | 120.1 | 5,641 | 408 | 6.0% |
| V2522-A5 | Aug-92 | 25.6 | 102.7 | 4,720 | 407 | 11.2% |
| V2524-A5 | Aug-92 | 26.9 | 109.1 | 5,278 | 429 | 14.4% |
| V2527M-A5 | Aug-92 | 27.2 | 111.2 | 5,382 | 437 | 3.8% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 5% | 5% | 5% | 5% | 8% | 8% | 8% | 7% | 6% | 5% | 5% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 8,485 | 4,367 | 4,367 | 4,367 | 3,732 | 3,732 | 3,732 | 3,732 | 3,732 | 3,732 | 3,732 | 3,732 | 3,732 | 3,732 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | 489 | 365 | 365 | 365 | 344 | 344 | 344 | 344 | 344 | 344 | 344 | 344 | 344 | 344 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | 137.9 | 104.5 | 104.5 | 104.5 | 97.9 | 97.9 | 97.9 | 97.9 | 97.9 | 97.9 | 97.9 | 97.9 | 97.9 | 97.9 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | 31.3 | 25.1 | 25.1 | 25.1 | 23.3 | 23.3 | 23.3 | 23.3 | 23.3 | 23.3 | 23.3 | 23.3 | 23.3 | 23.3 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 8,485 | 3,916 | 3,941 | 3,980 | 4,054 | 4,095 | 4,243 | 4,271 | 4,235 | 4,280 | 4,365 | 4,411 | 4,429 | 4,305 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | 489 | 372 | 366 | 364 | 374 | 377 | 377 | 379 | 377 | 379 | 381 | 381 | 382 | 378 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | 137.9 | 102.6 | 102.6 | 102.4 | 102.9 | 103.0 | 102.7 | 103.3 | 103.5 | 103.7 | 104.2 | 104.5 | 104.8 | 104.2 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | 31.3 | 24.7 | 24.6 | 24.5 | 24.7 | 24.8 | 24.8 | 24.9 | 24.8 | 24.9 | 25.0 | 25.1 | 25.1 | 25.0 |
| | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 8,485 | 5,278 | 4,720 | 5,278 | 5,382 | 5,641 | 5,641 | 5,641 | 5,641 | 5,641 | 5,641 | 5,641 | 5,641 | 5,641 |
| | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 8,485 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 | 3,020 |
| | Percent Difference | - | - | - | - | - | - | - | - | - | 0% | 75% | 56% | 75% | 78% | 87% | 87% | 87% | 87% | 87% | 87% | 87% | 87% | 87% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 0% | 10% | 10% | 9% | 9% | 10% | 14% | 14% | 13% | 15% | 17% | 18% | 19% | 15% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | 0% | 2% | 0% | 0% | 9% | 10% | 10% | 10% | 10% | 10% | 11% | 11% | 11% | 10% |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | 0% | 2% | 2% | 2% | 5% | 5% | 5% | 6% | 6% | 6% | 6% | 7% | 7% | 6% |
| | Press Ratio | - | - | - | - | - | - | - | - | - | 0% | 2% | 2% | 2% | 6% | 6% | 6% | 7% | 6% | 7% | 7% | 8% | 8% | 7% |

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Airbus Industrie A320-100/200, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-5-A1 | Nov-86 | 26.6 | 111.2 | 4,506 | 385 | 26.9% |
| CFM56-5A3 | Nov-86 | 27.9 | 117.9 | 5,110 | 406 | 6.4% |
| CFM56-5B4 | Oct-92 | 27.1 | 117.9 | 5,861 | 421 | 1.1% |
| CFM56-5B4/2 | Jun-94 | 27.1 | 117.9 | 3,783 | 447 | 1.2% |
| CFM56-5B4/2P | Aug-96 | 27.7 | 120.1 | 3,847 | 442 | 3.0% |
| CFM56-5B4/3 | Sep-05 | 27.3 | 120.1 | 4,511 | 407 | 1.1% |
| CFM56-5B4/P | Nov-95 | 27.7 | 120.1 | 5,641 | 408 | 19.4% |
| CFM56-5B6/3 | Sep-05 | 24.3 | 104.5 | 3,363 | 361 | 0.6% |
| CFM56-5B6/P | Nov-95 | 24.6 | 104.5 | 4,232 | 363 | 0.8% |
| V2500-A1 | Jun-88 | 29.8 | 111.2 | 7,716 | 442 | 15.1% |
| V2527-A5 | Aug-92 | 27.2 | 111.2 | 5,382 | 437 | 17.3% |
| V2527E-A5 | Aug-92 | 27.2 | 111.2 | 5,382 | 437 | 4.2% |
| JT9D-59A | Apr-76 | 24.5 | 235.8 | 12,381 | 900 | 0.4% |
| CF6-50C2R | Oct-79 | 28.8 | 224.2 | 13,436 | 838 | 0.2% |
| CF6-50C1, -C2 | Oct-79 | 29.8 | 230.4 | 14,247 | 859 | 0.9% |
| CF6-50C | Oct-79 | 28.8 | 224.2 | 13,436 | 838 | 0.2% |
| CF6-50C2R | Jul-87 | 27.8 | 224.2 | 11,116 | 751 | 0.3% |
| CF6-50C2 | Jul-87 | 28.4 | 230.4 | 11,884 | 769 | 0.9% |
| CF6-50C | Jul-87 | 27.8 | 224.2 | 11,116 | 751 | 0.1% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 3% | 3% | 3% | 3% | 0% | 1% | 4% | 7% | 8% | 7% | 7% | 8% | 8% | 9% | 10% | 10% | 10% | 9% | 9% | 9% | 9% | 8% | 8% |
| 1-Default | NOx (g/LTO) | 14,247 | 11,884 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 5,641 | 5,641 | 5,641 | 5,641 | 5,641 | 5,641 |
| | Fuel Usage (kg/LTO) | 859 | 769 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 385 | 408 | 408 | 408 | 408 | 408 | 408 |
| | Thrust (kN) | 230.4 | 230.4 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 111.2 | 120.1 | 120.1 | 120.1 | 120.1 | 120.1 | 120.1 |
| | Press Ratio | 29.8 | 28.4 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 27.7 | 27.7 | 27.7 | 27.7 | 27.7 | 27.7 |
| Weighted | NOx (g/LTO) | 13,779 | 11,732 | 4,675 | 5,498 | 5,296 | 5,394 | 5,466 | 5,609 | 5,616 | 5,622 | 5,542 | 5,554 | 5,502 | 5,480 | 5,452 | 5,463 | 5,500 | 5,346 | 5,450 | 5,470 | 5,466 | 5,413 | 5,264 |
| | Fuel Usage (kg/LTO) | 858 | 781 | 388 | 403 | 399 | 401 | 403 | 406 | 406 | 408 | 409 | 411 | 412 | 414 | 414 | 415 | 417 | 416 | 416 | 418 | 418 | 417 | 414 |
| | Thrust (kN) | 229.2 | 229.3 | 111.2 | 111.2 | 111.3 | 111.5 | 111.7 | 111.8 | 111.8 | 111.9 | 112.4 | 112.6 | 112.9 | 113.5 | 113.9 | 114.1 | 114.2 | 114.6 | 114.3 | 114.6 | 114.6 | 114.6 | 114.5 |
| | Press Ratio | 28.9 | 27.7 | 26.8 | 27.6 | 27.4 | 27.5 | 27.6 | 27.8 | 27.8 | 27.8 | 27.7 | 27.7 | 27.7 | 27.7 | 27.6 | 27.6 | 27.7 | 27.4 | 27.6 | 27.6 | 27.5 | 27.5 | 27.3 |
| | NOx (g/LTO) | 14,247 | 12,381 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 | 7,716 |
| | NOx (g/LTO) | 12,381 | 11,116 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 4,506 | 3,783 | 3,783 | 3,783 | 3,783 | 3,783 | 3,783 | 3,783 | 3,783 | 3,363 | 3,783 | 3,783 | 3,783 | 3,363 | 3,363 |
| | Percent Difference | 15% | 11% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 104% | 104% | 104% | 104% | 104% | 104% | 104% | 104% | 129% | 104% | 104% | 104% | 129% | 129% |
| Weighted vs. Default | NOx (g/LTO) | 3% | 1% | 4% | 22% | 18% | 20% | 21% | 24% | 25% | 25% | 23% | 23% | 22% | 22% | 21% | 21% | 22% | 5% | 3% | 3% | 3% | 4% | 7% |
| | Fuel Usage (kg/LTO) | 0% | 2% | 1% | 5% | 4% | 4% | 5% | 5% | 5% | 6% | 6% | 7% | 7% | 7% | 8% | 8% | 8% | 2% | 2% | 2% | 3% | 2% | 2% |
| | Thrust (kN) | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 2% | 3% | 3% | 5% | 5% | 5% | 5% | 5% | 5% |
| | Press Ratio | 3% | 2% | 1% | 4% | 3% | 3% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 1% | 0% | 0% | 1% | 1% | 1% |

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Airbus Industrie A330-200, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CF6-80E1A2 | Jan-95 | 33.1 | 287.0 | 13,796 | 942 | 1.1% |
| CF6-80E1A3 | Jan-95 | 35.7 | 304.8 | 19,254 | 976 | 15.9% |
| CF6-80E1A4 | Jan-96 | 34.5 | 297.4 | 15,027 | 963 | 13.7% |
| PW4168 | Feb-93 | 33.1 | 302.5 | 19,704 | 963 | 0.1% |
| PW4168A | Apr-00 | 31.8 | 302.5 | 13,936 | 1017 | 24.3% |
| PW4168A | Feb-93 | 33.1 | 302.5 | 19,704 | 963 | 2.4% |
| Trent 772 | Sep-94 | 35.8 | 316.3 | 17,784 | 1116 | 42.5% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 5% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 19,704 | 19,704 | 19,704 | 13,936 | 17,784 | 17,784 | 17,784 | 17,784 | 17,784 | 17,784 | 17,784 | 17,784 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 963 | 963 | 963 | 1017 | 1116 | 1116 | 1116 | 1116 | 1116 | 1116 | 1116 | 1116 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 302.5 | 302.5 | 302.5 | 302.5 | 316.3 | 316.3 | 316.3 | 316.3 | 316.3 | 316.3 | 316.3 | 316.3 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 33.1 | 33.1 | 33.1 | 31.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 16,750 | 19,544 | 18,847 | 15,783 | 16,195 | 16,456 | 16,599 | 16,563 | 16,705 | 16,801 | 16,772 | 16,725 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 953 | 976 | 1,024 | 1,062 | 1,067 | 1,050 | 1,036 | 1,048 | 1,041 | 1,043 | 1,042 | 1,040 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 294.8 | 303.6 | 307.8 | 308.9 | 309.8 | 308.3 | 307.1 | 308.1 | 307.6 | 308.0 | 307.9 | 307.6 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 33.1 | 33.3 | 34.2 | 33.8 | 34.2 | 34.3 | 34.4 | 34.6 | 34.6 | 34.7 | 34.8 | 34.7 |
| | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 19,704 | 19,704 | 19,704 | 17,784 | 19,254 | 19,254 | 19,254 | 19,254 | 19,254 | 19,254 | 19,254 | 19,254 |
| | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 13,796 | 17,784 | 15,027 | 13,936 | 13,936 | 13,796 | 13,796 | 13,796 | 13,796 | 13,796 | 13,936 | 13,796 |
| | Percent Difference | - | - | - | - | - | - | - | - | - | - | - | 43% | 11% | 31% | 28% | 38% | 40% | 40% | 40% | 40% | 40% | 38% | 40% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | 15% | 1% | 4% | 13% | 9% | 7% | 7% | 7% | 6% | 6% | 6% | 6% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | 1% | 1% | 6% | 4% | 4% | 6% | 7% | 6% | 7% | 7% | 7% | 7% |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | 3% | 0% | 2% | 2% | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | 0% | 1% | 3% | 6% | 5% | 4% | 4% | 3% | 3% | 3% | 3% | 3% |

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Airbus Industrie A340-200, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-5C2 | Jun-91 | 28.8 | 138.8 | 7,077 | 466 | 44.2% |
| CFM56-5C2/P | Jun-91 | 28.2 | 137.6 | 6,240 | 441 | 15.1% |
| CFM56-5C3/P | Jun-91 | 29.2 | 143.3 | 6,858 | 458 | 34.3% |
| CFM56-5C4 | Jun-91 | 31.2 | 151.3 | 8,702 | 505 | 6.4% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 2% | 2% | 3% | 3% | 4% | 5% | 4% | 5% | 4% | 5% | 4% | 4% | 4% | 4% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | 7,077 | 7,077 | 7,077 | 7,077 | 7,077 | 7,077 | 7,077 | 7,077 | 7,077 | 6,240 | 7,077 | 6,858 | 6,858 | 6,858 | 6,858 | 6,858 | 6,858 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | 466 | 466 | 466 | 466 | 466 | 466 | 466 | 466 | 466 | 441 | 466 | 458 | 458 | 458 | 458 | 458 | 458 |
| | Thrust (kN) | - | - | - | - | - | - | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 138.8 | 137.6 | 138.8 | 143.3 | 143.3 | 143.3 | 143.3 | 143.3 | 143.3 |
| | Press Ratio | - | - | - | - | - | - | 28.8 | 28.8 | 28.8 | 28.8 | 28.8 | 28.8 | 28.8 | 28.8 | 28.8 | 28.2 | 28.8 | 29.2 | 29.2 | 29.2 | 29.2 | 29.2 | 29.2 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | 7,077 | 7,077 | 7,077 | 7,056 | 6,821 | 6,863 | 6,863 | 6,855 | 6,895 | 6,882 | 6,904 | 6,982 | 7,100 | 7,043 | 7,041 | 7,105 | 7,202 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | 466 | 466 | 466 | 465 | 458 | 459 | 459 | 459 | 460 | 459 | 460 | 462 | 465 | 463 | 463 | 465 | 467 |
| | Thrust (kN) | - | - | - | - | - | - | 138.8 | 138.8 | 138.8 | 139.2 | 139.3 | 140.1 | 140.1 | 139.9 | 140.3 | 140.9 | 140.8 | 141.9 | 142.2 | 142.3 | 142.6 | 142.7 | 143.9 |
| | Press Ratio | - | - | - | - | - | - | 28.8 | 28.8 | 28.8 | 28.8 | 28.7 | 28.8 | 28.8 | 28.8 | 28.9 | 28.9 | 28.9 | 29.1 | 29.2 | 29.2 | 29.2 | 29.3 | 29.5 |
| | NOx (g/LTO) | - | - | - | - | - | - | 7,077 | 7,077 | 7,077 | 7,077 | 7,077 | 8,702 | 8,702 | 8,702 | 8,702 | 8,702 | 8,702 | 8,702 | 8,702 | 8,702 | 8,702 | 8,702 | 8,702 |
| | NOx (g/LTO) | - | - | - | - | - | - | 7,077 | 7,077 | 7,077 | 7,077 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 | 6,240 |
| | Percent Difference | - | - | - | - | - | - | 0% | 0% | 0% | 0% | 13% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | 0 | 0 | 0 | 0% | 4% | 3% | 3% | 3% | 3% | 10% | 2% | 2% | 4% | 3% | 3% | 4% | 5% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | 0 | 0 | 0 | 0% | 2% | 2% | 2% | 2% | 1% | 4% | 1% | 1% | 2% | 1% | 1% | 2% | 2% |
| | Thrust (kN) | - | - | - | - | - | - | 0 | 0 | 0 | 0% | 0% | 1% | 1% | 1% | 1% | 2% | 1% | 1% | 1% | 1% | 0% | 0% | 0% |
| | Press Ratio | - | - | - | - | - | - | 0 | 0 | 0 | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 0% | 0% | 1% |

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Boeing 727-200/231A, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-15 | Dec-79 | 16.8 | 68.9 | 4,144 | 486 | 35.2% |
| JT8D-15A | Dec-79 | 16.5 | 68.9 | 3,648 | 454 | 1.1% |
| JT8D-17 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 12.8% |
| JT8D-17A | Dec-79 | 16.9 | 71.2 | 3,935 | 470 | 0.2% |
| JT8D-17R | Dec-79 | 18.2 | 77.4 | 5,623 | 537 | 18.8% |
| JT8D-7 series | Feb-80 | 15.8 | 62.3 | 3,281 | 419 | 6.1% |
| JT8D-9 series | Feb-80 | 15.9 | 64.5 | 3,488 | 433 | 23.3% |
| JT8D-217C | Feb-99 | 19.1 | 92.7 | 4,216 | 493 | 2.2% |
| JT8D-219 | Feb-99 | 20.3 | 96.5 | 4,604 | 501 | 0.2% |
| JT8D-219 | Nov-83 | 20.3 | 96.5 | 6,106 | 501 | 0.0% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 11% | 11% | 11% | 11% | 15% | 12% | 9% | 8% | 8% | 8% | 7% | 6% | 6% | 5% | 5% | 4% | 3% | 2% | 1% | 1% | 1% | 1% | 1% |
| 1-Default | NOx (g/LTO) | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 |
| | Fuel Usage (kg/LTO) | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 |
| | Thrust (kN) | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 |
| | Press Ratio | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 |
| Weighted | NOx (g/LTO) | 4,248 | 4,248 | 4,259 | 4,269 | 4,282 | 4,305 | 4,280 | 4,291 | 4,260 | 4,165 | 4,224 | 4,225 | 4,247 | 4,234 | 4,265 | 4,310 | 4,297 | 4,272 | 4,342 | 4,337 | 4,351 | 4,365 | 4,277 |
| | Fuel Usage (kg/LTO) | 479 | 479 | 480 | 480 | 481 | 482 | 481 | 482 | 480 | 475 | 478 | 478 | 479 | 478 | 480 | 483 | 483 | 482 | 487 | 487 | 487 | 488 | 486 |
| | Thrust (kN) | 69.2 | 69.2 | 69.4 | 69.5 | 69.6 | 69.8 | 69.7 | 69.5 | 69.4 | 68.9 | 69.3 | 69.2 | 69.9 | 70.2 | 71.0 | 71.8 | 71.7 | 70.5 | 71.9 | 71.4 | 71.7 | 71.9 | 73.2 |
| | Press Ratio | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.9 | 16.9 | 16.8 | 16.8 | 16.7 | 16.8 | 16.8 | 16.9 | 16.9 | 17.0 | 17.1 | 17.1 | 16.9 | 17.1 | 17.1 | 17.1 | 17.1 | 17.2 |
| | NOx (g/LTO) | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 6,106 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 | 5,623 |
| | NOx (g/LTO) | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 |
| | Percent Difference | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 86% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% |
| Weighted vs. Default | NOx (g/LTO) | 3% | 3% | 3% | 3% | 3% | 4% | 3% | 4% | 3% | 0% | 2% | 2% | 2% | 2% | 3% | 4% | 4% | 3% | 5% | 5% | 5% | 5% | 3% |
| | Fuel Usage (kg/LTO) | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 2% | 1% | 2% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% |
| | Thrust (kN) | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 2% | 3% | 4% | 4% | 2% | 4% | 4% | 4% | 4% | 6% |
| | Press Ratio | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 1% | 2% | 2% | 1% | 2% | 2% | 2% | 2% | 2% |

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Boeing 737-100/200, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-15 | Dec-79 | 16.8 | 68.9 | 4,144 | 486 | 29.1% |
| JT8D-15A | Dec-79 | 16.5 | 68.9 | 3,648 | 454 | 18.1% |
| JT8D-17 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 17.3% |
| JT8D-17A | Dec-79 | 16.9 | 71.2 | 3,935 | 470 | 16.1% |
| JT8D-7 series | Feb-80 | 15.8 | 62.3 | 3,281 | 419 | 1.9% |
| JT8D-9 series | Feb-80 | 15.9 | 64.5 | 3,488 | 433 | 17.6% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 5% | 5% | 5% | 5% | 6% | 6% | 4% | 4% | 4% | 5% | 6% | 6% | 8% | 7% | 5% | 6% | 3% | 2% | 2% | 2% | 2% | 2% | 1% |
| 1-Default | NOx (g/LTO) | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 4,144 | 3,648 | 3,648 | 3,648 | 3,648 | 3,648 | 3,648 |
| | Fuel Usage (kg/LTO) | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 486 | 454 | 454 | 454 | 454 | 454 | 454 |
| | Thrust (kN) | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 | 68.9 |
| | Press Ratio | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.8 | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 |
| Weighted | NOx (g/LTO) | 4,005 | 3,987 | 3,980 | 3,969 | 3,958 | 3,987 | 3,937 | 3,946 | 3,950 | 3,955 | 3,962 | 3,949 | 3,955 | 3,955 | 3,960 | 3,963 | 3,962 | 3,974 | 3,949 | 3,943 | 3,943 | 3,944 | 3,934 |
| | Fuel Usage (kg/LTO) | 472 | 471 | 470 | 470 | 469 | 471 | 468 | 468 | 469 | 469 | 469 | 468 | 469 | 469 | 469 | 469 | 469 | 471 | 469 | 468 | 469 | 469 | 468 |
| | Thrust (kN) | 68.8 | 68.7 | 68.7 | 68.7 | 68.7 | 68.9 | 68.6 | 68.7 | 68.7 | 68.7 | 68.8 | 68.7 | 68.7 | 68.7 | 68.7 | 68.7 | 68.9 | 69.2 | 69.0 | 68.9 | 69.0 | 69.0 | 69.0 |
| | Press Ratio | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 |
| | NOx (g/LTO) | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 |
| | NOx (g/LTO) | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,488 | 3,488 | 3,488 |
| | Percent Difference | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% |
| Weighted vs. Default | NOx (g/LTO) | 3% | 4% | 4% | 4% | 4% | 4% | 5% | 5% | 5% | 5% | 4% | 5% | 5% | 5% | 4% | 4% | 4% | 9% | 8% | 8% | 8% | 8% | 8% |
| | Fuel Usage (kg/LTO) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 4% | 3% | 4% | 4% | 4% | 3% | 3% | 3% | 4% | 3% | 3% | 3% | 3% | 3% |
| | Thrust (kN) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Press Ratio | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |

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Boeing 737-700/700LR, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CFM56-7B20 | Jul-96 | 22.6 | 91.6 | 3,829 | 361 | 17.0% |
| CFM56-7B20/3 | Sep-05 | 22.4 | 91.6 | 2,987 | 348 | 0.5% |
| CFM56-7B22 | Jul-96 | 24.4 | 101.0 | 4,560 | 390 | 42.7% |
| CFM56-7B22/3 | Sep-05 | 24.2 | 101.0 | 3,540 | 377 | 1.9% |
| CFM56-7B24 | Jul-96 | 25.8 | 107.7 | 5,149 | 412 | 33.5% |
| CFM56-7B24/3 | Sep-05 | 25.6 | 107.6 | 3,995 | 398 | 1.4% |
| CFM56-7B26 | Jul-96 | 27.6 | 117.0 | 6,149 | 441 | 3.1% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 2% | 2% | 3% | 5% | 5% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 4,560 | 4,560 | 5,149 | 5,149 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 | 4,560 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 390 | 390 | 412 | 412 | 390 | 390 | 390 | 390 | 390 | 390 | 390 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | - | 101.0 | 101.0 | 107.7 | 107.7 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | - | 24.4 | 24.4 | 25.8 | 25.8 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 4,807 | 4,863 | 4,825 | 4,751 | 4,643 | 4,593 | 4,607 | 4,662 | 4,683 | 4,615 | 4,555 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 399 | 401 | 400 | 397 | 393 | 392 | 391 | 393 | 394 | 393 | 392 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | - | 103.8 | 104.3 | 103.8 | 103.0 | 101.7 | 101.9 | 101.2 | 101.8 | 102.1 | 102.2 | 102.2 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | - | 25.0 | 25.1 | 25.0 | 24.8 | 24.6 | 24.6 | 24.5 | 24.6 | 24.7 | 24.7 | 24.6 |
| | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 5,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 | 6,149 |
| | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 4,560 | 3,829 | 3,829 | 3,829 | 3,829 | 2,987 | 3,829 | 3,829 | 3,829 | 2,987 | 2,987 |
| | Percent Difference | - | - | - | - | - | - | - | - | - | - | - | - | 13% | 61% | 61% | 61% | 61% | 106% | 61% | 61% | 61% | 106% | 106% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 5% | 7% | 6% | 8% | 2% | 1% | 1% | 2% | 3% | 1% | 0% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | - | - | - | 2% | 3% | 3% | 4% | 1% | 1% | 0% | 1% | 1% | 1% | 1% |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | - | - | - | 3% | 3% | 4% | 4% | 1% | 1% | 0% | 1% | 1% | 1% | 1% |
| | Press Ratio | - | - | - | - | - | - | - | - | - | - | - | - | 2% | 3% | 3% | 4% | 1% | 1% | 0% | 1% | 1% | 1% | 1% |

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Boeing 747-100, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT9D-7 | Mar-76 | 21.5 | 202.4 | 11,892 | 794 | 18.8% |
| JT9D-7A | Mar-76 | 20.3 | 205.3 | 12,291 | 802 | 43.8% |
| JT9D-7F | Sep-80 | 22.8 | 213.5 | 13,703 | 837 | 1.7% |
| JT9D-7J | Sep-80 | 23.5 | 222.4 | 15,885 | 883 | 1.0% |
| CF6-45A | Jul-87 | 25.4 | 202.8 | 9,105 | 701 | 20.9% |
| CF6-50E2 | Jul-87 | 28.4 | 230.4 | 11,884 | 769 | 0.9% |
| RB211-524C2 | Sep-86 | 29.1 | 224.8 | 16,401 | 1016 | 12.9% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 3% | 3% | 3% | 3% | 4% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 1-Default | NOx (g/LTO) | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 9,105 | 9,105 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 | 12,291 |
| | Fuel Usage (kg/LTO) | 802 | 802 | 802 | 802 | 802 | 802 | 802 | 802 | 802 | 802 | 802 | 802 | 802 | 802 | 701 | 701 | 802 | 802 | 802 | 802 | 802 | 802 | 802 |
| | Thrust (kN) | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 202.8 | 202.8 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 | 205.3 |
| | Press Ratio | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 25.4 | 25.4 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 |
| Weighted | NOx (g/LTO) | 12,013 | 12,020 | 12,009 | 12,017 | 11,996 | 12,004 | 11,989 | 11,981 | 12,090 | 12,041 | 11,964 | 11,978 | 11,926 | 12,084 | 12,089 | 12,185 | 12,394 | 12,606 | 13,216 | 13,445 | 13,923 | 13,467 | 12,705 |
| | Fuel Usage (kg/LTO) | 801 | 801 | 801 | 801 | 801 | 802 | 801 | 800 | 805 | 803 | 800 | 800 | 800 | 811 | 813 | 817 | 824 | 831 | 855 | 865 | 886 | 863 | 827 |
| | Thrust (kN) | 206.1 | 206.2 | 206.1 | 206.2 | 206.2 | 206.5 | 206.4 | 206.3 | 207.0 | 207.3 | 207.1 | 207.0 | 207.5 | 208.7 | 209.5 | 209.7 | 210.0 | 210.2 | 211.8 | 212.5 | 213.0 | 210.9 | 207.0 |
| | Press Ratio | 22.4 | 22.4 | 22.4 | 22.4 | 22.5 | 22.6 | 22.6 | 22.5 | 22.7 | 22.8 | 22.9 | 22.7 | 23.2 | 24.0 | 24.4 | 24.4 | 24.2 | 23.8 | 23.9 | 24.0 | 24.0 | 23.0 | 21.7 |
| | NOx (g/LTO) | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 | 16,401 |
| | NOx (g/LTO) | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 9,105 | 11,892 | 11,892 | 11,892 |
| | Percent Difference | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 38% | 38% | 38% |
| Weighted vs. Default | NOx (g/LTO) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 3% | 2% | 2% | 3% | 3% | 3% | 2% | 33% | 34% | 1% | 3% | 8% | 9% | 13% | 10% | 3% |
| | Fuel Usage (kg/LTO) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 16% | 17% | 3% | 4% | 7% | 8% | 11% | 8% | 3% |
| | Thrust (kN) | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 1% | 1% | 1% | 1% | 1% | 2% | 3% | 3% | 2% | 2% | 3% | 4% | 4% | 3% | 1% |
| | Press Ratio | 10% | 10% | 10% | 10% | 11% | 11% | 12% | 11% | 12% | 12% | 13% | 12% | 14% | 18% | 4% | 4% | 19% | 17% | 18% | 18% | 18% | 13% | 7% |

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Boeing 747-200/300, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CF6-50E | Jul-87 | 28.4 | 230.4 | 11,884 | 769 | 0.4% |
| CF6-50E2 | Jul-87 | 28.4 | 230.4 | 11,884 | 769 | 28.1% |
| CF6-50E2 | Oct-79 | 29.8 | 230.4 | 14,247 | 859 | 1.5% |
| CF6-80C2B1 | May-85 | 30.1 | 249.0 | 10,400 | 797 | 0.7% |
| CF6-80C2B1 | Jan-95 | 29.5 | 249.0 | 10,719 | 811 | 1.2% |
| CF6-80C2B1F | Jan-95 | 30.1 | 254.3 | 11,113 | 830 | 0.0% |
| JT9D-7 | Mar-76 | 21.5 | 202.4 | 11,892 | 794 | 0.1% |
| JT9D-70A | Apr-76 | 24.5 | 235.8 | 12,381 | 900 | 0.7% |
| JT9D-7A | Mar-76 | 20.3 | 205.3 | 12,291 | 802 | 7.0% |
| JT9D-7F | Sep-80 | 22.8 | 213.5 | 13,703 | 837 | 3.6% |
| JT9D-7J | Sep-80 | 23.5 | 222.4 | 15,885 | 883 | 6.0% |
| JT9D-7Q | Apr-76 | 24.5 | 235.8 | 12,381 | 900 | 16.2% |
| JT9D-7R4G2 | Oct-81 | 26.3 | 243.5 | 14,253 | 858 | 17.3% |
| JT9D-7W | Sep-80 | 23.5 | 222.4 | 15,885 | 883 | 0.1% |
| RB211-524C2 | Sep-86 | 29.1 | 224.8 | 16,401 | 1016 | 3.3% |
| RB211-524D4 | Sep-86 | 30.2 | 231.3 | 20,124 | 912 | 13.7% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 13% | 13% | 13% | 13% | 16% | 14% | 12% | 11% | 10% | 9% | 8% | 8% | 9% | 9% | 7% | 6% | 4% | 4% | 4% | 4% | 4% | 4% | 3% |
| 1-Default | NOx (g/LTO) | 14,247 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 |
| | Fuel Usage (kg/LTO) | 859 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 |
| | Thrust (kN) | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 |
| | Press Ratio | 29.8 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 |
| Weighted | NOx (g/LTO) | 14,413 | 13,878 | 13,854 | 13,857 | 13,885 | 13,962 | 13,958 | 13,958 | 13,973 | 13,978 | 14,014 | 14,025 | 14,032 | 14,072 | 14,132 | 13,869 | 13,915 | 14,408 | 14,075 | 13,985 | 14,193 | 14,549 | 12,926 |
| | Fuel Usage (kg/LTO) | 873 | 846 | 845 | 845 | 846 | 849 | 846 | 847 | 847 | 846 | 846 | 846 | 844 | 846 | 848 | 844 | 848 | 860 | 851 | 847 | 850 | 852 | 826 |
| | Thrust (kN) | 228.3 | 228.8 | 229.7 | 229.8 | 230.2 | 230.4 | 230.9 | 231.1 | 231.0 | 230.9 | 230.8 | 230.7 | 230.6 | 231.1 | 232.0 | 232.6 | 233.2 | 233.4 | 233.5 | 233.1 | 233.6 | 233.1 | 233.5 |
| | Press Ratio | 26.4 | 26.2 | 26.3 | 26.3 | 26.5 | 26.5 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 26.7 | 26.8 | 27.0 | 26.8 | 26.8 | 26.7 | 27.1 | 27.0 | 27.2 | 27.3 | 26.8 |
| | NOx (g/LTO) | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 |
| | NOx (g/LTO) | 11,884 | 10,400 | 10,400 | 10,400 | 10,400 | 10,400 | 10,400 | 10,400 | 10,400 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 | 10,719 |
| | Percent Difference | 69% | 94% | 94% | 94% | 94% | 94% | 94% | 94% | 94% | 88% | 88% | 88% | 88% | 88% | 88% | 88% | 88% | 88% | 88% | 88% | 88% | 88% | 88% |
| Weighted vs. Default | NOx (g/LTO) | 1% | 17% | 17% | 17% | 17% | 17% | 17% | 17% | 18% | 18% | 18% | 18% | 18% | 18% | 19% | 17% | 17% | 21% | 18% | 18% | 19% | 22% | 9% |
| | Fuel Usage (kg/LTO) | 2% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 12% | 11% | 10% | 11% | 11% | 7% |
| | Thrust (kN) | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Press Ratio | 11% | 8% | 7% | 7% | 7% | 7% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 5% | 6% | 6% | 6% | 5% | 5% | 4% | 4% | 6% |

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Boeing 747-400, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CF6-80C2B1F | May-85 | 30.1 | 254.3 | 10,528 | 809 | 6.5% |
| CF6-80C2B1F | Jan-95 | 30.1 | 254.3 | 11,113 | 830 | 39.7% |
| CF6-80C2B5F | Jan-95 | 32.8 | 272.5 | 13,142 | 887 | 2.3% |
| PW4056 | Aug-87 | 29.3 | 249.1 | 11,987 | 836 | 27.0% |
| PW4x62 | Jan-93 | 31.9 | 275.8 | 15,864 | 920 | 0.6% |
| RB211-524G | Apr-87 | 32.1 | 253.0 | 21,075 | 958 | 4.4% |
| RB211-524G-T | Sep-94 | 32.1 | 253.0 | 12,513 | 970 | 0.0% |
| RB211-524H | Apr-87 | 34.0 | 264.4 | 24,501 | 977 | 19.4% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 7% | 7% | 7% | 7% | 5% | 6% | 7% | 8% | 10% | 10% | 11% | 12% | 12% | 13% | 15% | 15% | 14% | 13% | 14% | 14% | 14% | 13% | 13% |
| 1-Default | NOx (g/LTO) | - | - | - | 21,075 | 10,528 | 10,528 | 10,528 | 10,528 | 10,528 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,987 |
| | Fuel Usage (kg/LTO) | - | - | - | 958 | 809 | 809 | 809 | 809 | 809 | 830 | 830 | 830 | 830 | 830 | 830 | 830 | 830 | 830 | 830 | 830 | 830 | 830 | 836 |
| | Thrust (kN) | - | - | - | 253.0 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 254.3 | 249.1 |
| | Press Ratio | - | - | - | 32.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 30.1 | 29.3 |
| Weighted | NOx (g/LTO) | - | - | - | 14,694 | 15,028 | 14,485 | 14,684 | 14,479 | 14,382 | 14,547 | 14,399 | 14,337 | 14,490 | 14,593 | 14,577 | 14,565 | 14,511 | 14,437 | 14,396 | 14,373 | 14,312 | 14,271 | 12,008 |
| | Fuel Usage (kg/LTO) | - | - | - | 870 | 872 | 864 | 865 | 861 | 859 | 868 | 866 | 865 | 867 | 868 | 868 | 868 | 868 | 868 | 867 | 867 | 867 | 866 | 843 |
| | Thrust (kN) | - | - | - | 252.3 | 253.5 | 253.8 | 254.6 | 254.9 | 254.9 | 254.7 | 254.5 | 254.4 | 254.6 | 254.9 | 255.1 | 255.3 | 255.7 | 256.0 | 256.3 | 256.0 | 256.1 | 256.3 | 253.8 |
| | Press Ratio | - | - | - | 30.6 | 30.8 | 30.8 | 30.9 | 30.9 | 30.8 | 30.8 | 30.7 | 30.7 | 30.7 | 30.8 | 30.8 | 30.8 | 30.9 | 30.9 | 30.9 | 30.9 | 30.9 | 30.9 | 30.0 |
| | NOx (g/LTO) | - | - | - | 21,075 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 |
| | NOx (g/LTO) | - | - | - | 10,528 | 10,528 | 10,528 | 10,528 | 10,528 | 10,528 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 | 11,113 |
| | Percent Difference | - | - | - | 100% | 133% | 133% | 133% | 133% | 133% | 120% | 120% | 120% | 120% | 120% | 120% | 120% | 120% | 120% | 120% | 120% | 120% | 120% | 120% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | 30% | 43% | 38% | 39% | 38% | 37% | 31% | 30% | 29% | 30% | 31% | 31% | 31% | 31% | 30% | 30% | 29% | 29% | 28% | 0% |
| | Fuel Usage (kg/LTO) | - | - | - | 9% | 8% | 7% | 7% | 6% | 6% | 5% | 4% | 4% | 4% | 5% | 5% | 5% | 5% | 5% | 5% | 4% | 4% | 4% | 1% |
| | Thrust (kN) | - | - | - | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 2% |
| | Press Ratio | - | - | - | 5% | 2% | 2% | 3% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 3% | 3% | 2% | 2% | 2% | 2% |

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Boeing 747F, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CF6-50E2 | Jul-87 | 28.4 | 230.4 | 11,884 | 769 | 39.9% |
| CF6-50E2 | Oct-79 | 29.8 | 230.4 | 14,247 | 859 | 1.4% |
| JT9D-70A | Apr-76 | 24.5 | 235.8 | 12,381 | 900 | 2.0% |
| JT9D-7A | Mar-76 | 20.3 | 205.3 | 12,291 | 802 | 1.8% |
| JT9D-7F | Sep-80 | 22.8 | 213.5 | 13,703 | 837 | 7.4% |
| JT9D-7J | Sep-80 | 23.5 | 222.4 | 15,885 | 883 | 1.4% |
| JT9D-7Q | Apr-76 | 24.5 | 235.8 | 12,381 | 900 | 24.3% |
| JT9D-7R4G2 | Oct-81 | 26.3 | 243.5 | 14,253 | 858 | 14.1% |
| RB211-524C2 | Sep-86 | 29.1 | 224.8 | 16,401 | 1016 | 1.3% |
| RB211-524D4 | Sep-86 | 30.2 | 231.3 | 20,124 | 912 | 6.3% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 6% | 6% | 6% | 6% | 6% | 7% | 6% | 7% | 7% | 7% | 7% | 7% | 8% | 8% | 8% | 8% | 9% | 8% | 9% | 9% | 9% | 9% | 8% |
| 1-Default | NOx (g/LTO) | 14,247 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 12,381 | 11,884 | 11,884 | 11,884 | 11,884 | 14,253 |
| | Fuel Usage (kg/LTO) | 859 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 900 | 769 | 769 | 769 | 769 | 858 |
| | Thrust (kN) | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 235.8 | 230.4 | 230.4 | 230.4 | 230.4 | 243.5 |
| | Press Ratio | 29.8 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 24.5 | 28.4 | 28.4 | 28.4 | 28.4 | 26.3 |
| Weighted | NOx (g/LTO) | 13,594 | 12,805 | 12,840 | 13,025 | 13,120 | 13,098 | 13,181 | 13,191 | 13,116 | 13,130 | 13,181 | 13,123 | 13,158 | 13,131 | 13,121 | 13,028 | 13,056 | 13,519 | 13,239 | 13,247 | 13,253 | 13,642 | 13,106 |
| | Fuel Usage (kg/LTO) | 876 | 844 | 840 | 841 | 839 | 839 | 832 | 835 | 832 | 831 | 832 | 829 | 826 | 830 | 832 | 828 | 832 | 856 | 832 | 836 | 838 | 851 | 834 |
| | Thrust (kN) | 229.7 | 229.8 | 230.7 | 231.0 | 231.4 | 231.2 | 231.8 | 231.9 | 232.1 | 232.0 | 231.8 | 231.7 | 231.3 | 231.2 | 232.2 | 232.1 | 232.8 | 233.1 | 231.9 | 232.6 | 232.7 | 233.7 | 236.1 |
| | Press Ratio | 26.4 | 26.0 | 26.2 | 26.3 | 26.5 | 26.5 | 26.6 | 26.6 | 26.7 | 26.7 | 26.6 | 26.8 | 26.7 | 26.6 | 26.8 | 26.7 | 26.8 | 26.3 | 27.0 | 26.8 | 26.9 | 26.8 | 26.4 |
| | NOx (g/LTO) | 16,401 | 16,401 | 16,401 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 | 20,124 |
| | NOx (g/LTO) | 12,291 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 |
| | Percent Difference | 33% | 38% | 38% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% | 69% |
| Weighted vs. Default | NOx (g/LTO) | 5% | 8% | 8% | 10% | 10% | 10% | 11% | 11% | 10% | 10% | 11% | 10% | 11% | 10% | 10% | 10% | 10% | 9% | 11% | 11% | 12% | 15% | 8% |
| | Fuel Usage (kg/LTO) | 2% | 10% | 9% | 9% | 9% | 9% | 8% | 9% | 8% | 8% | 8% | 8% | 7% | 8% | 8% | 8% | 8% | 5% | 8% | 9% | 9% | 11% | 3% |
| | Thrust (kN) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 3% |
| | Press Ratio | 11% | 9% | 8% | 8% | 7% | 7% | 6% | 7% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 7% | 5% | 6% | 6% | 6% | 0% |

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Boeing 767-200/ER/EM, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CF6-80A | Nov-83 | 29.0 | 208.8 | 11,066 | 709 | 25.1% |
| CF6-80A2 | Nov-83 | 30.1 | 216.5 | 11,878 | 731 | 14.4% |
| CF6-80C2B2 | May-85 | 27.7 | 231.1 | 8,796 | 760 | 2.6% |
| CF6-80C2B2 | Jan-95 | 27.5 | 231.1 | 9,169 | 758 | 4.1% |
| CF6-80C2B2F | May-85 | 27.5 | 231.4 | 8,361 | 735 | 0.2% |
| CF6-80C2B2F | Jan-95 | 27.6 | 231.4 | 9,192 | 760 | 2.9% |
| CF6-80C2B4 | May-85 | 30.4 | 254.4 | 11,211 | 830 | 1.5% |
| CF6-80C2B4 | Jan-95 | 30.1 | 254.4 | 11,226 | 828 | 3.0% |
| CF6-80C2B4F | May-85 | 30.2 | 254.8 | 10,635 | 799 | 0.7% |
| CF6-80C2B4F | Jan-95 | 30.2 | 254.8 | 11,137 | 830 | 3.0% |
| CF6-80C2B6F | Jan-95 | 31.7 | 267.0 | 12,420 | 867 | 2.5% |
| CF6-80C2B7F | Jan-95 | 31.7 | 267.0 | 12,420 | 867 | 0.5% |
| JT9D-7R4D, -7R4D1 | Mar-80 | 23.4 | 213.5 | 13,067 | 810 | 9.2% |
| JT9D-7R4E, -7R4E1 | Mar-80 | 24.2 | 222.4 | 14,527 | 818 | 12.2% |
| JT9D-7R4E4, -E1(H) | Oct-81 | 24.2 | 222.4 | 13,117 | 832 | 4.9% |
| PW4x52 | Jan-93 | 26.3 | 231.3 | 10,449 | 774 | 2.0% |
| PW4056 | Aug-87 | 29.3 | 249.1 | 11,987 | 836 | 7.9% |
| PW4060 | Aug-87 | 32.4 | 266.9 | 14,097 | 887 | 3.3% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 4% | 3% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| 1-Default | NOx (g/LTO) | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 11,066 | 14,527 | 14,527 | 11,878 | 11,987 | 11,878 | 11,878 | 11,878 | 11,878 |
| | Fuel Usage (kg/LTO) | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 709 | 818 | 818 | 731 | 836 | 731 | 731 | 731 | 731 |
| | Thrust (kN) | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 208.8 | 222.4 | 222.4 | 216.5 | 249.1 | 216.5 | 216.5 | 216.5 | 216.5 |
| | Press Ratio | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 29.0 | 24.2 | 24.2 | 30.1 | 29.3 | 30.1 | 30.1 | 30.1 | 30.1 |
| Weighted | NOx (g/LTO) | 12,172 | 11,959 | 11,912 | 11,860 | 11,938 | 11,859 | 11,944 | 11,841 | 11,674 | 11,756 | 11,802 | 11,790 | 11,836 | 11,883 | 11,928 | 12,103 | 12,099 | 11,852 | 11,985 | 12,026 | 11,899 | 11,991 | 12,046 |
| | Fuel Usage (kg/LTO) | 754 | 756 | 757 | 759 | 767 | 764 | 769 | 771 | 768 | 770 | 770 | 771 | 776 | 781 | 783 | 797 | 800 | 796 | 805 | 806 | 801 | 798 | 798 |
| | Thrust (kN) | 213.4 | 215.1 | 216.2 | 218.0 | 221.6 | 221.0 | 222.5 | 224.0 | 224.6 | 224.6 | 224.5 | 224.8 | 226.7 | 228.2 | 229.2 | 231.9 | 233.6 | 233.7 | 236.2 | 236.4 | 235.7 | 233.4 | 232.4 |
| | Press Ratio | 27.1 | 27.1 | 27.3 | 27.4 | 27.8 | 27.8 | 27.9 | 28.0 | 28.1 | 28.1 | 28.1 | 28.2 | 28.2 | 28.2 | 28.3 | 27.9 | 28.0 | 28.2 | 28.3 | 28.2 | 28.4 | 28.2 | 28.1 |
| | NOx (g/LTO) | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 | 14,527 |
| | NOx (g/LTO) | 11,066 | 8,796 | 8,796 | 8,796 | 8,796 | 8,796 | 8,796 | 8,796 | 8,361 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 |
| | Percent Difference | 31% | 65% | 65% | 65% | 65% | 65% | 65% | 65% | 74% | 58% | 58% | 58% | 58% | 58% | 58% | 58% | 58% | 58% | 58% | 58% | 58% | 58% | 58% |
| Weighted vs. Default | NOx (g/LTO) | 10% | 8% | 8% | 7% | 8% | 7% | 8% | 7% | 5% | 6% | 7% | 7% | 7% | 7% | 8% | 17% | 17% | 0% | 0% | 1% | 0% | 1% | 1% |
| | Fuel Usage (kg/LTO) | 6% | 7% | 7% | 7% | 8% | 8% | 8% | 9% | 8% | 9% | 9% | 9% | 10% | 10% | 10% | 3% | 2% | 9% | 4% | 10% | 10% | 9% | 9% |
| | Thrust (kN) | 2% | 3% | 4% | 4% | 6% | 6% | 7% | 7% | 8% | 8% | 8% | 8% | 9% | 9% | 10% | 4% | 5% | 8% | 5% | 9% | 9% | 8% | 7% |
| | Press Ratio | 7% | 7% | 6% | 5% | 4% | 4% | 4% | 4% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 15% | 16% | 6% | 3% | 6% | 6% | 6% | 7% |

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Boeing 767-300/300ER, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CF6-80A2 | Nov-83 | 30.1 | 216.5 | 11,878 | 731 | 0.0% |
| CF6-80C2B2 | May-85 | 27.7 | 231.1 | 8,796 | 760 | 2.8% |
| CF6-80C2B2 | Jan-95 | 27.5 | 231.1 | 9,169 | 758 | 10.4% |
| CF6-80C2B2F | May-85 | 27.5 | 231.4 | 8,361 | 735 | 0.5% |
| CF6-80C2B2F | Jan-95 | 27.6 | 231.4 | 9,192 | 760 | 2.8% |
| CF6-80C2B4 | May-85 | 30.4 | 254.4 | 11,211 | 830 | 1.3% |
| CF6-80C2B4 | Jan-95 | 30.1 | 254.4 | 11,226 | 828 | 3.3% |
| CF6-80C2B4F | May-85 | 30.2 | 254.8 | 10,635 | 799 | 0.0% |
| CF6-80C2B4F | Jan-95 | 30.2 | 254.8 | 11,137 | 830 | 0.5% |
| CF6-80C2B6F | May-85 | 31.8 | 267.0 | 12,134 | 834 | 1.1% |
| CF6-80C2B6F | Jan-95 | 31.7 | 267.0 | 12,420 | 867 | 16.1% |
| CF6-80C2B7F | May-85 | 31.8 | 267.0 | 12,134 | 834 | 0.0% |
| CF6-80C2B7F | Jan-95 | 31.7 | 267.0 | 12,420 | 867 | 9.1% |
| JT9D-7R4D, -7R4D1 | Mar-80 | 23.4 | 213.5 | 13,067 | 810 | 5.0% |
| PW4x52 | Jan-93 | 26.3 | 231.3 | 10,449 | 774 | 0.0% |
| PW4056 | Aug-87 | 29.3 | 249.1 | 11,987 | 836 | 4.6% |
| PW4060 | Aug-87 | 32.4 | 266.9 | 14,097 | 887 | 17.5% |
| PW4x62 | Jan-93 | 31.9 | 275.8 | 15,864 | 920 | 3.2% |
| RB211-524H | Apr-87 | 34.0 | 264.4 | 24,501 | 977 | 8.9% |
| CF6-80C2B6 | May-85 | 31.6 | 267.2 | 12,362 | 871 | 2.4% |
| CF6-80C2B6 | Jan-95 | 31.7 | 267.2 | 12,640 | 866 | 10.4% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 3% | 3% | 3% | 3% | 2% | 2% | 3% | 5% | 6% | 5% | 6% | 7% | 7% | 7% | 7% | 7% | 6% | 5% | 5% | 5% | 6% | 6% | 6% |
| 1-Default | NOx (g/LTO) | 13,067 | 13,067 | 13,067 | 13,067 | 8,796 | 14,097 | 14,097 | 14,097 | 14,097 | 14,097 | 14,097 | 14,097 | 14,097 | 12,420 | 12,420 | 12,420 | 12,420 | 12,420 | 12,420 | 12,420 | 12,420 | 12,420 | 12,420 |
| | Fuel Usage (kg/LTO) | 810 | 810 | 810 | 810 | 760 | 887 | 887 | 887 | 887 | 887 | 887 | 887 | 887 | 867 | 867 | 867 | 867 | 867 | 867 | 867 | 867 | 867 | 867 |
| | Thrust (kN) | 213.5 | 213.5 | 213.5 | 213.5 | 231.1 | 266.9 | 266.9 | 266.9 | 266.9 | 266.9 | 266.9 | 266.9 | 266.9 | 267.0 | 267.0 | 267.0 | 267.0 | 267.0 | 267.0 | 267.0 | 267.0 | 267.0 | 267.0 |
| | Press Ratio | 23.4 | 23.4 | 23.4 | 23.4 | 27.7 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 32.4 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 | 31.7 |
| Weighted | NOx (g/LTO) | 13,067 | 11,643 | 11,296 | 11,866 | 12,945 | 13,291 | 13,417 | 13,410 | 13,248 | 13,313 | 13,401 | 13,406 | 13,489 | 13,362 | 13,411 | 13,167 | 13,228 | 13,280 | 13,301 | 13,364 | 13,374 | 13,372 | 13,493 |
| | Fuel Usage (kg/LTO) | 810 | 793 | 805 | 827 | 839 | 852 | 853 | 853 | 850 | 853 | 857 | 858 | 859 | 858 | 859 | 857 | 858 | 860 | 860 | 861 | 862 | 862 | 862 |
| | Thrust (kN) | 213.5 | 219.4 | 232.4 | 244.5 | 247.3 | 253.2 | 254.2 | 254.4 | 254.4 | 254.9 | 256.2 | 256.8 | 257.2 | 257.4 | 257.7 | 257.7 | 257.9 | 258.9 | 258.7 | 258.9 | 259.2 | 259.5 | 258.7 |
| | Press Ratio | 23.4 | 24.8 | 26.9 | 28.8 | 29.6 | 30.3 | 30.5 | 30.6 | 30.6 | 30.6 | 30.7 | 30.8 | 30.8 | 30.8 | 30.8 | 30.8 | 30.8 | 30.9 | 31.0 | 30.9 | 31.0 | 31.0 | 31.0 |
| | NOx (g/LTO) | 13,067 | 13,067 | 13,067 | 14,097 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 | 24,501 |
| | NOx (g/LTO) | 13,067 | 8,796 | 8,796 | 8,796 | 8,361 | 8,361 | 8,361 | 8,361 | 8,361 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 | 9,169 |
| | Percent Difference | 0% | 49% | 49% | 60% | 193% | 193% | 193% | 193% | 193% | 167% | 167% | 167% | 167% | 167% | 167% | 167% | 167% | 167% | 167% | 167% | 167% | 167% | 167% |
| Weighted vs. Default | NOx (g/LTO) | 0% | 11% | 14% | 9% | 47% | 6% | 5% | 5% | 6% | 6% | 5% | 5% | 4% | 8% | 8% | 6% | 7% | 7% | 7% | 8% | 8% | 8% | 9% |
| | Fuel Usage (kg/LTO) | 0% | 2% | 1% | 2% | 10% | 4% | 4% | 4% | 4% | 4% | 3% | 3% | 3% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Thrust (kN) | 0% | 3% | 9% | 15% | 7% | 5% | 5% | 5% | 5% | 4% | 4% | 4% | 4% | 4% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| | Press Ratio | 0% | 6% | 15% | 23% | 7% | 6% | 6% | 6% | 6% | 6% | 5% | 5% | 5% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 2% |

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Boeing 777-200/200LR/233LR, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| GE90-110B1 | Nov-03 | 39.7 | 492.6 | 30,616 | 1479 | 0.8% |
| GE90-76B | Jan-00 | 34.9 | 360.6 | 19,394 | 1017 | 1.0% |
| GE90-76B | Apr-97 | 35.1 | 360.6 | 19,680 | 1048 | 0.5% |
| GE90-76B | Feb-95 | 35.3 | 360.6 | 21,342 | 1082 | 0.2% |
| GE90-85B | Jan-00 | 37.7 | 395.3 | 24,177 | 1107 | 7.2% |
| GE90-85B | Apr-97 | 38.0 | 395.3 | 24,478 | 1134 | 2.0% |
| GE90-85B | Feb-95 | 38.1 | 395.3 | 25,703 | 1149 | 0.2% |
| GE90-90B | Jan-00 | 39.4 | 418.1 | 27,923 | 1166 | 15.6% |
| GE90-90B | Apr-97 | 39.8 | 418.1 | 28,459 | 1193 | 2.5% |
| GE90-94B | Jan-00 | 40.5 | 432.8 | 30,617 | 1203 | 12.2% |
| PW4074 | Apr-94 | 32.2 | 333.2 | 18,078 | 981 | 8.2% |
| PW4077 | Apr-94 | 33.2 | 343.0 | 19,299 | 1008 | 5.8% |
| PW4084 | Apr-94 | 36.2 | 369.6 | 23,229 | 1086 | 0.9% |
| PW4090 | Jun-96 | 39.2 | 395.0 | 31,629 | 1204 | 9.4% |
| Trent 875 | Sep-94 | 35.4 | 351.9 | 17,575 | 1117 | 3.1% |
| Trent 877 | Sep-94 | 36.3 | 361.6 | 18,736 | 1139 | 3.3% |
| Trent 884 | Sep-94 | 39.0 | 390.1 | 22,687 | 1247 | 8.7% |
| Trent 890 | Sep-94 | 41.4 | 411.5 | 26,405 | 1281 | 0.6% |
| Trent 892 | Sep-94 | 41.4 | 411.5 | 26,405 | 1281 | 11.8% |
| Trent 895 | Sep-94 | 41.5 | 413.1 | 28,029 | 1357 | 6.1% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 2% | 2% | 3% | 5% | 6% | 5% | 5% | 5% | 5% | 5% |
| 1-Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 21,342 | 18,078 | 24,478 | 28,459 | 28,459 | 27,923 | 27,923 | 27,923 | 27,923 | 27,923 | 27,923 | 30,617 | 30,617 | 30,617 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | 1082 | 981 | 1134 | 1193 | 1193 | 1166 | 1166 | 1166 | 1166 | 1166 | 1166 | 1203 | 1203 | 1203 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | 360.6 | 333.2 | 395.3 | 418.1 | 418.1 | 418.1 | 418.1 | 418.1 | 418.1 | 418.1 | 418.1 | 432.8 | 432.8 | 432.8 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | 35.3 | 32.2 | 38.0 | 39.8 | 39.8 | 39.4 | 39.4 | 39.4 | 39.4 | 39.4 | 39.4 | 40.5 | 40.5 | 40.5 |
| Weighted | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 20,909 | 19,796 | 22,541 | 23,623 | 24,072 | 24,462 | 25,016 | 25,476 | 25,903 | 25,722 | 26,018 | 26,197 | 26,425 | 26,456 |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | 1,055 | 1,078 | 1,126 | 1,144 | 1,149 | 1,148 | 1,167 | 1,177 | 1,180 | 1,176 | 1,181 | 1,187 | 1,195 | 1,195 |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | 356.6 | 356.0 | 375.7 | 383.8 | 386.8 | 389.8 | 392.5 | 395.6 | 398.7 | 397.3 | 398.4 | 399.7 | 401.9 | 402.2 |
| | Press Ratio | - | - | - | - | - | - | - | - | - | 34.6 | 35.0 | 36.8 | 37.5 | 37.7 | 37.8 | 38.2 | 38.5 | 38.7 | 38.5 | 38.7 | 38.8 | 38.9 | 38.8 |
| | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 25,703 | 25,703 | 31,629 | 31,629 | 31,629 | 31,629 | 31,629 | 31,629 | 31,629 | 31,629 | 31,629 | 31,629 | 31,629 | 31,629 |
| | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 18,078 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 | 17,575 |
| | Percent Difference | - | - | - | - | - | - | - | - | - | 42% | 46% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | - | - | - | - | - | 2% | 10% | 8% | 17% | 15% | 12% | 10% | 9% | 7% | 8% | 7% | 14% | 14% | 14% |
| | Fuel Usage (kg/LTO) | - | - | - | - | - | - | - | - | - | 2% | 10% | 1% | 4% | 4% | 2% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Thrust (kN) | - | - | - | - | - | - | - | - | - | 1% | 7% | 5% | 8% | 7% | 7% | 6% | 5% | 5% | 5% | 5% | 8% | 7% | 7% |
| | Press Ratio | - | - | - | - | - | - | - | - | - | 2% | 9% | 3% | 6% | 5% | 4% | 3% | 2% | 2% | 2% | 2% | 4% | 4% | 4% |

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McDonnell Douglas DC-10-30, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CF6-50C | Jul-87 | 27.8 | 224.2 | 11,116 | 751 | 34.2% |
| CF6-50C1 | Jul-87 | 28.4 | 230.4 | 11,884 | 769 | 1.8% |
| CF6-50C2 | Jul-87 | 28.4 | 230.4 | 11,884 | 769 | 50.5% |
| CF6-50C2B | Jul-87 | 29.1 | 236.7 | 12,482 | 779 | 6.3% |
| CF6-50C2R | Jul-87 | 27.8 | 224.2 | 11,116 | 751 | 7.1% |
| CF6-6D | Aug-79 | 24.7 | 174.8 | 11,611 | 648 | 0.1% |
| CF6-6D1A | Aug-79 | 25.4 | 181.9 | 12,549 | 667 | 0.1% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 3% | 1% | 1% | 1% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 1-Default | NOx (g/LTO) | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 | 11,884 |
| | Fuel Usage (kg/LTO) | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 | 769 |
| | Thrust (kN) | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 | 230.4 |
| | Press Ratio | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 | 28.4 |
| Weighted | NOx (g/LTO) | 11,514 | 11,527 | 11,557 | 11,576 | 11,586 | 11,603 | 11,538 | 11,555 | 11,604 | 11,636 | 11,674 | 11,707 | 11,651 | 11,634 | 11,667 | 11,721 | 11,717 | 11,694 | 11,638 | 11,743 | 11,713 | 11,750 | 11,730 |
| | Fuel Usage (kg/LTO) | 760 | 760 | 761 | 761 | 762 | 762 | 761 | 761 | 762 | 763 | 764 | 765 | 763 | 763 | 764 | 765 | 765 | 764 | 763 | 766 | 765 | 754 | 765 |
| | Thrust (kN) | 227.5 | 227.6 | 227.9 | 228.0 | 228.1 | 228.3 | 227.6 | 227.8 | 228.2 | 228.5 | 228.8 | 229.1 | 228.6 | 228.5 | 228.8 | 229.3 | 229.2 | 229.0 | 228.4 | 229.3 | 229.1 | 224.0 | 229.2 |
| | Press Ratio | 28.1 | 28.1 | 28.2 | 28.2 | 28.2 | 28.2 | 28.1 | 28.2 | 28.2 | 28.2 | 28.3 | 28.3 | 28.2 | 28.2 | 28.3 | 28.3 | 28.3 | 28.3 | 28.2 | 28.3 | 28.3 | 28.0 | 28.3 |
| | NOx (g/LTO) | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 12,482 | 11,884 | 12,482 | 12,482 | 12,549 | 11,884 |
| | NOx (g/LTO) | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 | 11,116 |
| | Percent Difference | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 12% | 7% | 12% | 12% | 13% | 7% |
| Weighted vs. Default | NOx (g/LTO) | 3% | 3% | 3% | 3% | 3% | 2% | 3% | 3% | 2% | 2% | 2% | 1% | 2% | 2% | 2% | 1% | 1% | 2% | 2% | 1% | 1% | 1% | 1% |
| | Fuel Usage (kg/LTO) | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 1% | 2% | 0% |
| | Thrust (kN) | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 1% | 1% | 1% | 0% | 1% | 3% | 1% |
| | Press Ratio | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 1% | 1% | 0% | 1% | 2% | 0% |

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McDonnell Douglas DC-9-30, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-11 | Feb-80 | 17.2 | 66.7 | 3,740 | 475 | 1.1% |
| JT8D-15 | Dec-79 | 16.8 | 68.9 | 4,144 | 486 | 2.2% |
| JT8D-15A | Dec-79 | 16.5 | 68.9 | 3,648 | 454 | 0.6% |
| JT8D-17 | Dec-79 | 17.0 | 71.2 | 4,559 | 499 | 16.6% |
| JT8D-7 series | Feb-80 | 15.8 | 62.3 | 3,281 | 419 | 20.7% |
| JT8D-9 series | Feb-80 | 15.9 | 64.5 | 3,488 | 433 | 58.8% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 7% | 7% | 7% | 7% | 7% | 6% | 7% | 7% | 7% | 8% | 8% | 8% | 6% | 5% | 3% | 3% | 1% | 1% | 1% | 1% | 0% | 0% | 0% |
| 1-Default | NOx (g/LTO) | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | 3,488 | - |
| | Fuel Usage (kg/LTO) | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | 433 | - |
| | Thrust (kN) | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | 64.5 | - |
| | Press Ratio | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | 15.9 | - |
| Weighted | NOx (g/LTO) | 3,625 | 3,633 | 3,643 | 3,652 | 3,656 | 3,639 | 3,626 | 3,627 | 3,628 | 3,662 | 3,665 | 3,696 | 3,701 | 3,666 | 3,700 | 3,726 | 3,686 | 3,529 | 3,546 | 3,552 | 3,578 | 3,530 | - |
| | Fuel Usage (kg/LTO) | 442 | 443 | 443 | 444 | 444 | 442 | 442 | 442 | 441 | 444 | 444 | 446 | 446 | 444 | 446 | 448 | 446 | 436 | 437 | 438 | 440 | 437 | - |
| | Thrust (kN) | 65.2 | 65.3 | 65.4 | 65.4 | 65.4 | 65.3 | 65.2 | 65.2 | 65.1 | 65.3 | 65.3 | 65.5 | 65.5 | 65.3 | 65.7 | 65.9 | 65.6 | 64.6 | 64.7 | 64.8 | 65.0 | 64.7 | - |
| | Press Ratio | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.2 | 16.2 | 16.1 | 16.2 | 16.2 | 16.1 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | - |
| | NOx (g/LTO) | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | 4,559 | - |
| | NOx (g/LTO) | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | 3,281 | - |
| | Percent Difference | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | 39% | - |
| Weighted vs. Default | NOx (g/LTO) | 4% | 4% | 4% | 5% | 5% | 4% | 4% | 4% | 4% | 5% | 5% | 6% | 6% | 5% | 6% | 7% | 6% | 1% | 2% | 2% | 3% | 1% | - |
| | Fuel Usage (kg/LTO) | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 3% | 3% | 3% | 3% | 2% | 3% | 4% | 3% | 1% | 1% | 1% | 2% | 1% | - |
| | Thrust (kN) | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 1% | 2% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | - |
| | Press Ratio | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | - |

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McDonnell Douglas MD-11, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| CF6-80C2D1F | May-85 | 32.9 | 270.0 | 12,714 | 845 | 5.8% |
| CF6-80C2D1F | Jan-95 | 32.1 | 270.0 | 12,724 | 876 | 53.9% |
| PW4460 | Aug-87 | 32.4 | 266.9 | 14,097 | 887 | 23.5% |
| PW4x62 | Jan-93 | 31.9 | 275.8 | 15,864 | 920 | 16.7% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 1% | 1% | 1% | 1% | 0% | 0% | 1% | 2% | 2% | 3% | 4% | 4% | 4% | 5% | 5% | 5% | 5% | 4% | 4% | 4% | 3% | 3% | 2% |
| 1-Default | NOx (g/LTO) | - | - | - | - | 12,714 | 14,097 | 14,097 | 14,097 | 12,714 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 |
| | Fuel Usage (kg/LTO) | - | - | - | - | 845 | 887 | 887 | 887 | 845 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 | 876 |
| | Thrust (kN) | - | - | - | - | 270.0 | 266.9 | 266.9 | 266.9 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 | 270.0 |
| | Press Ratio | - | - | - | - | 32.9 | 32.4 | 32.4 | 32.4 | 32.9 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 |
| Weighted | NOx (g/LTO) | - | - | - | - | 12,714 | 13,613 | 13,521 | 13,520 | 13,676 | 13,709 | 13,731 | 13,744 | 13,677 | 13,715 | 13,699 | 13,592 | 13,529 | 13,310 | 13,444 | 13,489 | 13,419 | 13,406 | 13,213 |
| | Fuel Usage (kg/LTO) | - | - | - | - | 845 | 872 | 870 | 869 | 871 | 887 | 887 | 888 | 887 | 888 | 888 | 887 | 886 | 883 | 886 | 886 | 885 | 884 | 882 |
| | Thrust (kN) | - | - | - | - | 270.0 | 268.0 | 268.2 | 268.6 | 269.5 | 269.9 | 270.0 | 270.3 | 270.4 | 270.6 | 270.6 | 270.5 | 270.6 | 270.1 | 271.0 | 270.8 | 270.6 | 270.4 | 270.3 |
| | Press Ratio | - | - | - | - | 32.9 | 32.6 | 32.6 | 32.6 | 32.6 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.0 | 32.1 | 32.1 | 32.1 | 32.1 |
| | NOx (g/LTO) | - | - | - | - | 12,714 | 14,097 | 14,097 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 | 15,864 |
| | NOx (g/LTO) | - | - | - | - | 12,714 | 12,714 | 12,714 | 12,714 | 12,714 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 | 12,724 |
| | Percent Difference | - | - | - | - | 0% | 11% | 11% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% |
| Weighted vs. Default | NOx (g/LTO) | - | - | - | - | 0% | 3% | 4% | 4% | 8% | 8% | 8% | 8% | 7% | 8% | 8% | 7% | 6% | 5% | 6% | 6% | 5% | 5% | 4% |
| | Fuel Usage (kg/LTO) | - | - | - | - | 0% | 2% | 2% | 2% | 3% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Thrust (kN) | - | - | - | - | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Press Ratio | - | - | - | - | 0% | 0% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

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McDonnell Douglas DC9 Super 80/MD81/2/3/7/8, Most Popular vs. Inventory Weighted Average Engine (Foreign Fleet)

All Possible Engines During The Study Period

| Engine | Test Date | Press Ratio | Thrust (kN) | Nox (g/LTO) | Fuel (kg/LTO) | Distri-bution |
|---|---|---|---|---|---|---|
| JT8D-209 | Nov-83 | 18.3 | 85.6 | 5,075 | 469 | 3.6% |
| JT8D-217 series | Nov-83 | 19.7 | 92.7 | 5,985 | 504 | 43.9% |
| JT8D-217C | Feb-99 | 19.1 | 92.7 | 4,216 | 493 | 19.7% |
| JT8D-219 | Nov-83 | 20.3 | 96.5 | 6,106 | 501 | 32.8% |

| | | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % of LTO | 5% | 5% | 5% | 5% | 3% | 5% | 5% | 5% | 5% | 5% | 4% | 4% | 4% | 4% | 5% | 4% | 4% | 4% | 3% | 2% | 2% | 1% | 0% |
| 1-Default | NOx (g/LTO) | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 5,985 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 |
| | Fuel Usage (kg/LTO) | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 504 | 493 | 493 | 493 | 493 | 493 | 493 | 493 | 493 | 493 | 493 |
| | Thrust (kN) | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 | 92.7 |
| | Press Ratio | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.1 | 19.1 | 19.1 | 19.1 | 19.1 | 19.1 | 19.1 | 19.1 | 19.1 | 19.1 |
| Weighted | NOx (g/LTO) | 5,693 | 5,754 | 5,823 | 5,874 | 5,914 | 5,937 | 5,961 | 5,976 | 5,996 | 6,015 | 6,023 | 6,025 | 6,026 | 5,239 | 5,250 | 5,264 | 5,270 | 5,344 | 5,230 | 5,284 | 5,304 | 5,331 | 5,248 |
| | Fuel Usage (kg/LTO) | 492 | 494 | 496 | 497 | 499 | 500 | 501 | 501 | 502 | 503 | 503 | 503 | 503 | 498 | 498 | 498 | 498 | 499 | 498 | 498 | 498 | 499 | 498 |
| | Thrust (kN) | 90.6 | 91.4 | 92.2 | 92.8 | 93.1 | 93.1 | 93.5 | 93.6 | 93.7 | 93.8 | 93.9 | 94.0 | 94.0 | 94.1 | 94.1 | 94.2 | 94.1 | 94.1 | 94.0 | 94.1 | 94.1 | 94.1 | 94.1 |
| | Press Ratio | 19.2 | 19.4 | 19.5 | 19.6 | 19.7 | 19.7 | 19.8 | 19.8 | 19.8 | 19.8 | 19.9 | 19.9 | 19.9 | 19.6 | 19.6 | 19.6 | 19.6 | 19.7 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 |
| | NOx (g/LTO) | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 | 6,106 |
| | NOx (g/LTO) | 5,075 | 5,075 | 5,075 | 5,075 | 5,075 | 5,075 | 5,075 | 5,075 | 5,075 | 5,075 | 5,985 | 5,985 | 5,985 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 | 4,216 |
| | Percent Difference | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 20% | 2% | 2% | 2% | 45% | 45% | 45% | 45% | 45% | 45% | 45% | 45% | 45% | 45% |
| Weighted vs. Default | NOx (g/LTO) | 5% | 4% | 3% | 2% | 1% | 1% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 24% | 25% | 25% | 25% | 27% | 24% | 25% | 26% | 26% | 24% |
| | Fuel Usage (kg/LTO) | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| | Thrust (kN) | 2% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 1% | 2% | 1% | 1% | 1% | 1% | 2% |
| | Press Ratio | 2% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |

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# Appendix F

# Example Variance in Taxi Times

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## Appendix F. Taxi Times for Selected Airports*

| | Los Angeles International | | Ted Stevens Anchorage International | |
|---|---|---|---|---|
| **Tower Description** | **Large Hub** | | **Medium Hub** | |
| **LTOs in 1986** | **207,210** | | **34,302** | |
| **LTOs in 2008** | **286,787** | | **91,628** | |
| | **Average Taxi Time (minutes)** | | | |
| | **Taxi In** | **Taxi Out** | **Taxi In** | **Taxi Out** |
| 1995 | 5.3 | 15.0 | 3.7 | 11.5 |
| 1996 | 5.4 | 15.3 | 3.9 | 12.4 |
| 1997 | 5.5 | 15.1 | 4.0 | 12.2 |
| 1998 | 5.8 | 14.7 | 4.1 | 12.0 |
| 1999 | 5.7 | 16.1 | 4.4 | 12.2 |
| 2000 | 5.9 | 16.5 | 4.7 | 12.1 |
| 2001 | 5.8 | 15.6 | 5.1 | 12.8 |
| 2002 | 5.9 | 14.3 | 5.2 | 12.3 |
| 2003 | 5.2 | 13.8 | 5.2 | 12.4 |
| 2004 | 5.8 | 14.4 | 5.4 | 12.4 |
| 2005 | 5.9 | 14.2 | 5.6 | 13.0 |
| 2006 | 5.9 | 14.9 | 5.5 | 13.2 |
| 2007 | 6.2 | 16.1 | 5.2 | 14.1 |
| 2008 | 6.3 | 15.2 | 5.2 | 14.1 |

* Note that Los Angeles and Ted Stevens Anchorage International were selected as exampled to demonstrate the variance of taxi-in and taxi-out times.



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# Appendix G

# Aircraft Crosswalk – Category Designations

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| T-100 Code (A/C) | T-100 Aircraft Name | EDMS Aircraft Name | EDMS Aircraft Code (ACCODE) | Helicopter, Military, or Other | Engine Type (propeller or jet) | Aircraft Size Category | Aircraft Type | Seats Count | Regional Jet | Powerplant No | Gross Wgt (Kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 020 | BELLANCA CH-300 | BELLANCA CH-300 | A1B | Other | propeller | RJ | turboprop | 2 | regional aircraft | 1 | 1,847 |
| 080 | PIPER PA-18 | PIPER PA-18 (SUPER-CUB) | A1B | Other | propeller | RJ | turboprop | 2 | regional aircraft | 1 | 1,847 |
| 695 | A300-B2 | AIRBUS INDUSTRIE A300-B2 | A300B2-1 | Other | jet | TA | wide-body | 251 | 100 or more seats | 2 | 136,985 |
| 690 | A300B/C/F-100/200 | AIRBUS INDUSTRIE A300B/C/F-100/200 | A300B4-1 | Other | jet | TA | wide-body | 251 | 100 or more seats | 2 | 157,487 |
| 691 | A300-600/R/CF/RCF | AIRBUS INDUSTRIE A300-600/R/CF/RCF | A300F4-6 | Other | jet | TA | wide-body | 266 | 100 or more seats | 2 | 170,506 |
| 689 | A300-600ST(BELUGA) | AIRBUS INDUSTRIE A330-600ST (BELUGA) | A300F4-6-ST | Other | jet | TA | wide-body | 314 | 100 or more seats | 2 | 140,614 |
| 692 | A310-200C/F | AIRBUS INDUSTRIE A310-200C/F | A310-2 | Other | jet | TA | wide-body | 250 | 100 or more seats | 2 | 142,020 |
| 693 | A310-300 | AIRBUS INDUSTRIE A310-300 | A310-3 | Other | jet | TA | wide-body | 250 | 100 or more seats | 2 | 164,019 |
| 644 | A-318 | AIRBUS INDUSTRIE A-318 | A318-1 | Other | jet | SAE2 | narrow-body | 120 | 100 or more seats | 2 | 67,998 |
| 698 | A319 | AIRBUS INDUSTRIE A319 | A319-1 | Other | jet | SAE2 | narrow-body | 140 | 100 or more seats | 2 | 75,523 |
| 694 | A320-100/200 | AIRBUS INDUSTRIE A320-100/200 | A320-2 | Other | jet | SAE2 | narrow-body | 165 | 100 or more seats | 2 | 77,020 |
| 699 | A321 | AIRBUS INDUSTRIE A321 | A321-1 | Other | jet | SAE2 | narrow-body | 202 | 100 or more seats | 2 | 83,008 |
| 696 | A330-200 | AIRBUS INDUSTRIE A330-200 | A330-2 | Other | jet | TA | wide-body | 316 | 100 or more seats | 2 | 232,997 |
| 697 | A340 | AIRBUS INDUSTRIE A340 | A340-2 | Other | jet | TA | wide-body | 320 | 100 or more seats | 4 | 275,000 |
| 873 | A340-200 | AIRBUS INDUSTRIE A340-200 | A340-2 | Other | jet | TA | wide-body | 320 | 100 or more seats | 4 | 275,000 |
| 871 | A340-300 | AIRBUS INDUSTRIE A340-300 | A340-3 | Other | jet | TA | wide-body | 366 | 100 or more seats | 4 | 276,501 |
| 872 | A340-500 | AIRBUS INDUSTRIE A340-500 | A340-5 | Other | jet | L | wide-body | 344 | 100 or more seats | 4 | 368,000 |
| 874 | A340-600 | AIRBUS INDUSTRIE A340-600 | A340-6 | Other | jet | L | wide-body | 427 | 100 or more seats | 4 | 368,000 |
| 882 | A380 | A380 | A340-6 | Other | jet | L | wide-body | 426 | 100 or more seats | 4 | 560,006 |
| 507 | ANTONOV 12 | ANTONOV 12 | AN12 | Military | propeller | SAE2 | turboprop | 90 | regional aircraft | 4 | 60,999 |
| 880 | ANTONOV 124 | ANTONOV 124 | AN124 | Other | jet | L | Wide-Body | 1000 | 100 or more seats | 4 | 401,997 |
| 444 | ANTONOV 24/26/32 | ANTONOV 24/26/32 | AN26 | Military | propeller | RJ | turboprop | 50 | regional aircraft | 2 | 27,000 |
| 408 | BAE-ATP | BRITISH AEROSPACE BAE-ATP | ATP | Other | propeller | RJ | turboprop | 66 | regional aircraft | 2 | 23,678 |
| 441 | ATR-42 | AEROSPATIALE/AERITALIA ATR-42 | ATR42-2 | Other | propeller | RJ | turboprop | 48 | regional aircraft | 2 | 18,600 |
| 442 | ATR-72 | AEROSPATIALE/AERITALIA ATR-72 | ATR72-2 | Other | propeller | RJ | turboprop | 68 | regional aircraft | 2 | 21,500 |
| 835 | AVROLINER RJ85 | AVROLINER RJ85 | AVRORJ85 | Other | jet | RJ | narrow-body | 90 | regional aircraft | 4 | 43,999 |
| 800 | BOEING 707-100 | BOEING 707-100 | B707-1 | Other | jet | SAE4 | Narrow-Body | 110 | 100 or more seats | 4 | 116,573 |
| 802 | BOEING 707-100B | BOEING 707-100B | B707-1 | Other | jet | SAE4 | Narrow-Body | 179 | 100 or more seats | 4 | 116,573 |
| 804 | BOEING 707-200 | BOEING 707-200 | B707-1 | Other | jet | SAE4 | Narrow-Body | 140 | 100 or more seats | 4 | 116,573 |
| 830 | CONVAIR 990 | CONVAIR 990 CORONADO (CV-30) | B707-1 | Other | jet | SAE4 | Narrow-Body | 106 | 100 or more seats | 4 | 116,573 |
| 806 | BOEING 707-300 | BOEING 707-300 | B707-3 | Other | jet | SAE4 | Narrow-Body | 147 | 100 or more seats | 4 | 151,319 |
| 808 | BOEING 707-300B | BOEING 707-300B | B707-3 | Other | jet | SAE4 | Narrow-Body | 189 | 100 or more seats | 4 | 151,319 |
| 809 | BOEING 707-300C | BOEING 707-300C | B707-3 | Other | jet | SAE4 | Narrow-Body | 202 | 100 or more seats | 4 | 151,319 |
| 810 | BOEING 707-400 | BOEING 707-400 | B707-3 | Other | jet | SAE4 | Narrow-Body | 189 | 100 or more seats | 4 | 151,319 |
| 812 | BOEING 720 | BOEING 720-000 | B720 | Other | jet | SAE4 | narrow-body | 117 | 100 or more seats | 4 | 100,698 |
| 710 | BOEING 727-100 | BOEING 727-100 | B727-1 | Other | jet | SAE2 | narrow-body | 149 | 100 or more seats | 3 | 76,657 |
| 711 | BOEING 727-100C/QC | BOEING 727-100C/QC | B727-1 | Other | jet | SAE2 | narrow-body | 189 | 100 or more seats | 3 | 76,657 |
| 715 | BOEING 727-200 | BOEING 727-200/231A | B727-2 | Other | jet | SAE2 | narrow-body | 138 | 100 or more seats | 3 | 92,125 |
| 620 | BOEING 737-100/200 | BOEING 737-100/200 | B737-1 | Other | jet | SAE2 | narrow-body | 106 | 100 or more seats | 2 | 49,087 |
| 621 | BOEING 737-200C | BOEING 737-200C | B737-2 | Other | jet | SAE2 | narrow-body | 118 | 100 or more seats | 2 | 58,105 |
| 619 | BOEING 737-300 | BOEING 737-300 | B737-3 | Other | jet | SAE2 | narrow-body | 126 | 100 or more seats | 2 | 62,823 |
| 618 | BOEING 737-300LR | BOEING 737-300LR | B737-3 | Other | jet | SAE2 | narrow-body | 126 | 100 or more seats | 2 | 62,823 |

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| T-100 Code (A/C) | T-100 Aircraft Name | EDMS Aircraft Name | EDMS Aircraft Code (ACCODE) | Helicopter, Military, or Other | Engine Type (propeller or jet) | Aircraft Size Category | Aircraft Type | Seats Count | Regional Jet | Powerplant No | Gross Wgt (Kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 617 | BOEING 737-400 | BOEING 737-400 | B737-4 | Other | jet | SAE2 | narrow-body | 144 | 100 or more seats | 2 | 68,039 |
| 615 | BOEING 737-5/600LR | BOEING 737-5/600LR | B737-5 | Other | jet | SAE2 | narrow-body | 113 | 100 or more seats | 2 | 52,390 |
| 616 | BOEING 737-500 | BOEING 737-500 | B737-5 | Other | jet | SAE2 | narrow-body | 110 | 100 or more seats | 2 | 52,390 |
| 633 | BOEING 737-600 | BOEING 737-600 | B737-6 | Other | jet | SAE2 | narrow-body | 110 | 100 or more seats | 2 | 65,091 |
| 612 | BOEING 737-700/LR | BOEING 737-700/700LR | B737-7 | Other | jet | SAE2 | narrow-body | 149 | 100 or more seats | 2 | 70,080 |
| 614 | BOEING 737-800 | BOEING 737-800 | B737-8 | Other | jet | SAE2 | narrow-body | 162 | 100 or more seats | 2 | 79,016 |
| 634 | BOEING 737-900 | BOEING 737-900 | B737-9 | Other | jet | SAE2 | narrow-body | 180 | 100 or more seats | 2 | 79,016 |
| 816 | BOEING 747-100 | BOEING 747-100 | B747-1 | Other | jet | L | wide-body | 409 | 100 or more seats | 4 | 341,556 |
| 818 | BOEING 747C | BOEING 747C | B747-1 | Other | jet | L | wide-body | 409 | 100 or more seats | 4 | 341,556 |
| 820 | BOEING 747F | BOEING 747F | B747-1 | Other | jet | L | wide-body | 409 | 100 or more seats | 4 | 341,556 |
| 817 | BOEING 747-200/300 | BOEING 747-200/300 | B747-2 | Other | jet | L | wide-body | 454 | 100 or more seats | 4 | 377,843 |
| 819 | BOEING 747-400 | BOEING 747-400 | B747-4 | Other | jet | L | wide-body | 470 | 100 or more seats | 4 | 396,894 |
| 822 | BOEING 747SP | BOEING 747SP | B747-SP | Other | jet | L | wide-body | 454 | 100 or more seats | 4 | 303,907 |
| 622 | BOEING 757-200 | BOEING 757-200 | B757-2 | Other | jet | SAE2 | narrow-body | 217 | 100 or more seats | 2 | 115,666 |
| 623 | BOEING 757-300 | BOEING 757-300 | B757-3 | Other | jet | SAE2 | narrow-body | 243 | 100 or more seats | 2 | 123,831 |
| 625 | BOEING 767-200/ER | BOEING 767-200/ER/EM | B767-2ER | Other | jet | TA | wide-body | 181 | 100 or more seats | 2 | 179,169 |
| 626 | BOEING 767-300/ER | BOEING 767-300/300ER | B767-3ER | Other | jet | TA | wide-body | 218 | 100 or more seats | 2 | 186,880 |
| 624 | BOEING 767-400 | BOEING 767-400 | B767-4 | Other | jet | TA | wide-body | 266 | 100 or more seats | 2 | 204,117 |
| 627 | BOEING 777 | BOEING 777-200/200LR/233LR | B777-2 | Other | jet | TA | wide-body | 301 | 100 or more seats | 2 | 247,208 |
| 637 | CESSNA CITATION V | BOEING 777-300/300ER/333ER | B777-3ER | Other | jet | L | wide-body | 365 | 100 or more seats | 2 | 351,535 |
| 605 | BAC-111-200 | BRITISH AEROSPACE BAC-111-200 | BAC111-2 | Other | jet | RJ | Narrow-Body | 89 | regional aircraft | 2 | 33,793 |
| 094 | LAND-TURBINE | LAND-TURBINE | BAC111-2 | Other | jet | RJ | Narrow-Body | 89 | regional aircraft | 2 | 33,793 |
| 610 | BAC-111-400 | BRITISH AEROSPACE BAC-111-400 | BAC111-4 | Other | jet | RJ | Narrow-Body | 89 | regional aircraft | 2 | 33,793 |
| 867 | BAE-146-200 | BRITISH AEROSPACE BAE-146-200 | BAE146-200 | Other | jet | RJ | narrow-body | 90 | regional aircraft | 4 | 42,184 |
| 868 | BAE-146-300 | BRITISH AEROSPACE BAE-146-300 | BAE146-300 | Other | jet | RJ | narrow-body | 103 | 100 or more seats | 4 | 44,225 |
| 866 | BAE-146-100/RJ70 | BRITISH AEROSPACE BAE-146-100/RJ70 | BAE146-RJ70 | Other | jet | RJ | Narrow-Body | 78 | regional aircraft | 4 | 38,102 |
| 409 | BEECH B-100 | BEECHCRAFT KING AIR B100 | BEECH100 | Other | propeller | RJ | turboprop | 7 | regional aircraft | 2 | 5,352 |
| 110 | BEECH 18 | BEECH 18 C-185 | BEECH18 | Military | propeller | RJ | turboprop | 9 | regional aircraft | 2 | 3,266 |
| 402 | BEECH 18 | BEECH MODEL 18 TURBO-PROP CONVERSIONS | BEECH18 | Military | propeller | RJ | turboprop | 9 | regional aircraft | 2 | 3,266 |
| 490 | VOLPAR TURBO 18 | VOLPAR TURBO 18 | BEECH18 | Military | propeller | RJ | turboprop | 15 | regional aircraft | 2 | 3,266 |
| 405 | BEECH 1900 A/B/C | BEECH 1900 A/B/C/D | BEECH1900-C | Other | propeller | RJ | turboprop | 19 | regional aircraft | 2 | 7,983 |
| 406 | BEECH 200 KINGAIR | BEECH 200 SUPER KINGAIR | BEECH200 | Other | propeller | RJ | turboprop | 15 | regional aircraft | 2 | 6,350 |
| 095 | PISTON-LT 450 HP | LAND-PISTON-LT 450 HP | BEECH200 | Other | propeller | RJ | turboprop | 15 | regional aircraft | 2 | 6,350 |
| 010 | BEECH 35/36 | BEECH BONANZA 35A/C/D/E/G/H/J/K/S/V/ 36A | BEECH36 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 1,656 |
| 117 | BEECH BARON B-55 | BEECH BARON (55 SERIES) | BEECH55 | Other | propeller | RJ | turboprop | 5 | regional aircraft | 2 | 2,495 |
| 457 | BEECH KING AIR | BEECH KING AIR C-90 | BEECH90 | Other | propeller | RJ | turboprop | 12 | regional aircraft | 2 | 3,719 |
| 111 | BEECH KINGAIR C-90 | BEECH KING AIR 90 | BEECH90 | Other | propeller | RJ | turboprop | 12 | regional aircraft | 2 | 3,719 |
| 133 | BEECH QUEEN AIR | BEECH 65/65A-80/65B-80 (QUEEN AIR) | BEECH90 | Other | propeller | RJ | turboprop | 9 | regional aircraft | 2 | 3,719 |
| 411 | BEECHCRAFT 65-A90 | BEECH KING AIR 65-A90 QUEEN AIR | BEECH90 | Other | propeller | RJ | turboprop | 7 | regional aircraft | 2 | 3,719 |
| 403 | BEECH 99 | BEECH 99 AIRLINER | BEECH99 | Other | propeller | RJ | turboprop | 15 | regional aircraft | 2 | 5,126 |
| 404 | BEECH C99 | BEECH C99 | BEECH99 | Other | propeller | RJ | turboprop | 15 | regional aircraft | 2 | 5,126 |
| 201 | BN2A TRISLANDER | PILATUS BRITTEN-NORMAN BN2A TRISLANDER | BN2A-III | Other | propeller | RJ | turboprop | 10 | regional aircraft | 2 | 2,994 |
| 131 | BRITT-NORMAN BN2/A | PILATUS BRITTEN-NORMAN BN2/A ISLANDER | BN2A-III | Other | propeller | RJ | turboprop | 10 | regional aircraft | 2 | 2,994 |
| 412 | CASA 212 | CASA/NURTANIO C212 AVIOCAR | CASA212-2 | Military | propeller | RJ | turboprop | 26 | regional aircraft | 2 | 6,500 |

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| T-100 Code (A/C) | T-100 Aircraft Name | EDMS Aircraft Name | EDMS Aircraft Code (ACCODE) | Helicopter, Military, or Other | Engine Type (propeller or jet) | Aircraft Size Category | Aircraft Type | Seats Count | Regional Jet | Powerplant No | Gross Wgt (Kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 520 | CANADAIR CL-44D | CANADAIR CL-44D | CL-44 | Other | propeller | SAE4 | turboprop | 160 | 100 or more seats | 4 | 95,255 |
| 668 | CHALLENGER 601 | CANADAIR (BOMBARDIER) CHALLLENGER 601 | CL601 | Other | jet | RJ | narrow-body | 19 | regional aircraft | 2 | 19,550 |
| 669 | CHALLENGER 604 | BOMBARDIER CHALLENGER 604 | CL604 | Other | jet | RJ | narrow-body | 15 | regional aircraft | 2 | 21,591 |
| 024 | BEECH B-23 | BEECH B-23 MUSKETEER | CNA172 | Other | propeller | RJ | turboprop | 3 | regional aircraft | 1 | 1,089 |
| 036 | CESSNA 172 SKYHAWK | CESSNA 172 SKYHAWK | CNA172 | Other | propeller | RJ | turboprop | 4 | regional aircraft | 1 | 1,111 |
| 031 | CESSNA 180A/B | CESSNA 180A/B | CNA182 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 1,406 |
| 030 | CESSNA 180 | CESSNA 180 | CNA182 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 1,406 |
| 039 | CESSNA 182 SKYLANE | CESSNA 182 SKYLANE | CNA182 | Other | propeller | RJ | turboprop | 4 | regional aircraft | 1 | 1,406 |
| 033 | CESSNA 185A/B/C | CESSNA 185A/B/C SKYWAGON | CNA182 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 1,406 |
| 041 | CESSNA 205 | CESSNA 205 | CNA206 | Military | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 1,633 |
| 035 | CESSNA 206/207/209 | CESSNA C206/207/209/210 STATIONAIR | CNA206 | Military | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 1,633 |
| 416 | CESSNA 208 | CESSNA 208 CARAVAN | CNA208 | Other | propeller | RJ | turboprop | 9 | regional aircraft | 1 | 3,969 |
| 415 | CESSNA 208B | CESSNA C208B/GRAND CARAVAN | CNA208 | Other | propeller | RJ | turboprop | 12 | regional aircraft | 1 | 3,969 |
| 148 | CESSNA C-337 | CESSNA C-337 | CNA310 | Other | propeller | RJ | turboprop | 5 | regional aircraft | 2 | 1,996 |
| 122 | CESSNA C-310 | CESSNA C-310 SERIES | CNA310 | Other | propeller | RJ | turboprop | 5 | regional aircraft | 2 | 2,495 |
| 149 | CESSNA C-401 | CESSNA C-401 | CNA402 | Other | propeller | RJ | turboprop | 8 | regional aircraft | 2 | 3,107 |
| 125 | CESSNA C-402/402A | CESSNA C-402/402A | CNA402 | Other | propeller | RJ | turboprop | 9 | regional aircraft | 2 | 3,107 |
| 128 | CESSNA 404 | CESSNA 404 | CNA404 | Military | propeller | RJ | turboprop | 10 | regional aircraft | 2 | 4,502 |
| 417 | CESSNA 406 | CESSNA 406 CARAVAN II | CNA404 | Other | propeller | RJ | turboprop | 14 | regional aircraft | 2 | 4,502 |
| 639 | CITATIONJET/CJ1/CJ | CESSNA CITATIONJET/CJ1/CJ2/CJ3 | CNA525 | Other | jet | RJ | narrow-body | 6 | regional aircraft | 2 | 6,291 |
| 636 | CESSNA CITATION II | CESSNA CITATION II | CNA550 | Other | jet | RJ | narrow-body | 10 | regional aircraft | 2 | 6,849 |
| 646 | CITATION III 650/550 | CESSNA CITATION X MODEL 650/550B/550XL/560XL | CNA650 | Other | jet | RJ | narrow-body | 8 | regional aircraft | 2 | 16,375 |
| 647 | CITATION X CE750X | CESSNA CITATION X MODEL CE750 X | CNA750 | Other | jet | RJ | narrow-body | 8 | regional aircraft | 2 | 16,375 |
| 103 | AERO COMANDR 500/6 | AERO COMMANDER (500/600 SERIES EXCPT 680FL) | COMMANDER500 | Military | propeller | RJ | turboprop | 7 | regional aircraft | 2 | 3,062 |
| 875 | CONCORDE | AEROSPATIALE/BRITISH AEROSPACE CONCORDE | CONCRD | Other | jet | SAE4 | narrow-body | 128 | 100 or more seats | 4 | 185,070 |
| 628 | CANADAIR RJ-100/ER | CANADAIR RJ-100/RJ-100ER | CRJ1 | Other | jet | RJ | Narrow-Body | 50 | regional aircraft | 2 | 24,040 |
| 629 | RJ-200ER/RJ-440 | CANADAIR RJ-200ER /RJ-440 | CRJ2 | Other | jet | RJ | narrow-body | 50 | regional aircraft | 2 | 23,133 |
| 658 | CANADAIR BD-700 | BOMBARDIER BD-700 GLOBAL EXPRESS | CRJ7 | Military | jet | RJ | narrow-body | 74 | regional aircraft | 2 | 32,999 |
| 657 | CANADAIR RJ 705 | BOMBARDIER CRJ 705 | CRJ7 | Other | jet | RJ | narrow-body | 74 | regional aircraft | 2 | 36,514 |
| 631 | CANADAIR RJ-700 | CANADAIR RJ-700 | CRJ7 | Other | jet | RJ | narrow-body | 74 | regional aircraft | 2 | 32,999 |
| 638 | CANADAIR RJ 900 | CANADAIR CRJ 900 | CRJ9 | Other | jet | RJ | narrow-body | 88 | regional aircraft | 2 | 36,514 |
| 140 | CONVAIR CV-240 | CONVAIR CV-240 | CV440 | Other | propeller | RJ | turboprop | 40 | regional aircraft | 2 | 19,278 |
| 143 | CONVAIR CV-340/440 | CONVAIR CV-340/440 | CV440 | Other | propeller | RJ | turboprop | 52 | regional aircraft | 2 | 22,226 |
| 420 | CONVAIR CV-540 | CONVAIR CV-540 | CV580 | Other | propeller | RJ | turboprop | 34 | regional aircraft | 2 | 26,372 |
| 430 | CONVAIR CV-580 | CONVAIR CV-580 | CV580 | Other | propeller | RJ | turboprop | 56 | regional aircraft | 2 | 26,372 |
| 435 | CONVAIR CV-600 | CONVAIR CV-600 | CV640 | Other | propeller | RJ | turboprop | 40 | regional aircraft | 2 | 25,855 |
| 440 | CONVAIR CV-640 | CONVAIR CV-640 | CV640 | Other | propeller | RJ | turboprop | 40 | regional aircraft | 2 | 25,855 |
| 730 | DOUGLAS DC-10-10 | MCDONNELL DOUGLAS DC-10-10 | DC10-1 | Other | jet | TA | wide-body | 380 | 100 or more seats | 3 | 195,045 |
| 731 | DOUGLAS DC-10-20 | MCDONNELL DOUGLAS DC-10-20 | DC10-1 | Other | jet | TA | wide-body | 380 | 100 or more seats | 3 | 251,744 |

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| T-100 Code (A/C) | T-100 Aircraft Name | EDMS Aircraft Name | EDMS Aircraft Code (ACCODE) | Helicopter, Military, or Other | Engine Type (propeller or jet) | Aircraft Size Category | Aircraft Type | Seats Count | Regional Jet | Powerplant No | Gross Wgt (Kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 732 | DOUGLAS DC-10-30 | MCDONNELL DOUGLAS DC-10-30 | DC10-3 | Other | jet | TA | wide-body | 380 | 100 or more seats | 3 | 263,084 |
| 735 | DOUGLAS DC-10-30CF | MCDONNELL DOUGLAS DC-10-30CF | DC10-3 | Other | jet | TA | wide-body | 380 | 100 or more seats | 3 | 259,455 |
| 733 | DOUGLAS DC-10-40 | MCDONNELL DOUGLAS DC-10-40 | DC10-4 | Other | jet | TA | wide-body | 380 | 100 or more seats | 3 | 251,744 |
| 150 | CURTISS C46 SERIES | CURTISS C46/20T/A/D/F/R COMMANDO | DC3 | Military | propeller | RJ | turboprop | 50 | regional aircraft | 2 | 21,772 |
| 210 | DOUGLAS DC-4 | MCDONNELL DOUGLAS DC-4(C54/C54A/C54B/C54E) | DC6 | Other | propeller | RJ | turboprop | 86 | regional aircraft | 4 | 33,112 |
| 216 | DOUGLAS DC-6 | MCDONNELL DOUGLAS DC-6 | DC6 | Other | propeller | SAE4 | turboprop | 78 | regional aircraft | 4 | 48,534 |
| 218 | DOUGLAS DC-6A | MCDONNELL DOUGLAS DC-6A | DC6 | Other | propeller | SAE4 | turboprop | 78 | regional aircraft | 4 | 48,534 |
| 220 | DOUGLAS DC-6B | MCDONNELL DOUGLAS DC-6B | DC6 | Other | propeller | SAE4 | turboprop | 78 | regional aircraft | 4 | 48,534 |
| 225 | DOUGLAS DC-7A/B | MCDONNELL DOUGLAS DC-7A/B | DC6 | Other | propeller | SAE4 | turboprop | 102 | 100 or more seats | 4 | 64,864 |
| 228 | DOUGLAS DC-7C | MCDONNELL DOUGLAS DC-7C | DC6 | Other | propeller | SAE4 | turboprop | 102 | 100 or more seats | 4 | 64,864 |
| 248 | LOCKHEED 1049C/D/E | LOCKHEED L-1049C/D/E | DC6 | Military | propeller | SAE2 | turboprop | 78 | regional aircraft | 4 | 62,369 |
| 247 | LOCKHEED L-1049 | LOCKHEED L-1049 | DC6 | Military | propeller | SAE2 | turboprop | 78 | regional aircraft | 4 | 62,369 |
| 242 | LOCKHEED L-649 | LOCKHEED L-649 | DC6 | Other | propeller | RJ | turboprop | 81 | regional aircraft | 4 | 44,490 |
| 840 | DOUGLAS DC-8-10 | MCDONNELL DOUGLAS DC-8-10 | DC8-5 | Other | jet | SAE4 | Narrow-Body | 150 | 100 or more seats | 4 | 120,202 |
| 842 | DOUGLAS DC-8-20 | MCDONNELL DOUGLAS DC-8-20 | DC8-5 | Other | jet | SAE4 | Narrow-Body | 150 | 100 or more seats | 4 | 125,192 |
| 844 | DOUGLAS DC-8-30 | MCDONNELL DOUGLAS DC-8-30 | DC8-5 | Other | jet | SAE4 | Narrow-Body | 150 | 100 or more seats | 4 | 150,000 |
| 846 | DOUGLAS DC-8-40 | MCDONNELL DOUGLAS DC-8-40 | DC8-5 | Other | jet | SAE4 | Narrow-Body | 150 | 100 or more seats | 4 | 142,882 |
| 848 | DOUGLAS DC-8-50 | MCDONNELL DOUGLAS DC-8-50 | DC8-5 | Other | jet | SAE4 | Narrow-Body | 150 | 100 or more seats | 4 | 142,880 |
| 850 | DOUGLAS DC-8-50F | MCDONNELL DOUGLAS DC-8-50F | DC8-5 | Other | jet | SAE4 | Narrow-Body | 150 | 100 or more seats | 4 | 147,418 |
| 851 | DOUGLAS DC-8-61 | MCDONNELL DOUGLAS DC-8-61 | DC8-6 | Other | jet | SAE4 | narrow-body | 150 | 100 or more seats | 4 | 161,026 |
| 854 | DOUGLAS DC-8-62 | MCDONNELL DOUGLAS DC-8-62 | DC8-6 | Other | jet | SAE4 | narrow-body | 259 | 100 or more seats | 4 | 161,026 |
| 856 | DOUGLAS DC-8-63 | MCDONNELL DOUGLAS DC-8-63 | DC8-6 | Other | jet | SAE4 | narrow-body | 220 | 100 or more seats | 4 | 161,026 |
| 852 | DOUGLAS DC-8-63F | MCDONNELL DOUGLAS DC-8-63F | DC8-6 | Other | jet | SAE4 | narrow-body | 220 | 100 or more seats | 4 | 161,026 |
| 860 | DOUGLAS DC-8-71 | MCDONNELL DOUGLAS DC-8-71 | DC8-7 | Other | jet | SAE4 | Narrow-Body | 200 | 100 or more seats | 4 | 161,026 |
| 862 | DOUGLAS DC-8-72 | MCDONNELL DOUGLAS DC-8-72 | DC8-7 | Other | jet | SAE4 | Narrow-Body | 200 | 100 or more seats | 4 | 161,026 |
| 864 | DOUGLAS DC-8-73 | MCDONNELL DOUGLAS DC-8-73 | DC8-7 | Other | jet | SAE4 | Narrow-Body | 200 | 100 or more seats | 4 | 161,026 |
| 865 | DOUGLAS DC-8-73F | MCDONNELL DOUGLAS DC-8-73F | DC8-7 | Other | jet | SAE4 | Narrow-Body | 200 | 100 or more seats | 4 | 161,026 |
| 630 | DOUGLAS DC-9-10 | MCDONNELL DOUGLAS DC-9-10 | DC9-1 | Other | jet | RJ | Narrow-Body | 76 | regional aircraft | 2 | 41,141 |
| 635 | DOUGLAS DC-9-15F | MCDONNELL DOUGLAS DC-9-15F | DC9-2 | Other | jet | RJ | Narrow-Body | 99 | regional aircraft | 2 | 44,452 |
| 640 | DOUGLAS DC-9-30 | MCDONNELL DOUGLAS DC-9-30 | DC9-3 | Other | jet | SAE2 | Narrow-Body | 115 | 100 or more seats | 2 | 49,895 |
| 645 | DOUGLAS DC-9-40 | MCDONNELL DOUGLAS DC-9-40 | DC9-4 | Other | jet | SAE2 | Narrow-Body | 109 | 100 or more seats | 2 | 51,710 |
| 608 | BOEING 717-200 | BOEING 717-200 | DC9-5 | Other | jet | SAE2 | Narrow-Body | 117 | 100 or more seats | 2 | 49,895 |

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| T-100 Code (A/C) | T-100 Aircraft Name | EDMS Aircraft Name | EDMS Aircraft Code (ACCODE) | Helicopter, Military, or Other | Engine Type (propeller or jet) | Aircraft Size Category | Aircraft Type | Seats Count | Regional Jet | Powerplant No | Gross Wgt (Kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 650 | DOUGLAS DC-9-50 | MCDONNELL DOUGLAS DC-9-50 | DC9-5 | Other | jet | SAE2 | Narrow-Body | 122 | 100 or more seats | 2 | 54,885 |
| 040 | DEHAVILLAND DHC2 | DEHAVILLAND DHC2 BEAVER | DHC2T | Other | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 2,313 |
| 042 | DEHAVILLAND DHC3 | DEHAVILLAND DHC3 OTTER | DHC3T | Other | propeller | RJ | turboprop | 11 | regional aircraft | 1 | 3,629 |
| 091 | FLT/AMPHIB TURBINE | FLOAT/AMPHIB TURBINE | DHC3T | Other | propeller | RJ | turboprop | 11 | regional aircraft | 1 | 3,629 |
| 485 | DEHAVILLAND DHC-6 | DEHAVILLAND TWIN OTTER DHC-6 | DHC6-1 | Other | propeller | RJ | turboprop | 20 | regional aircraft | 2 | 5,670 |
| 570 | DEHAVILLAND DASH-7 | DEHAVILLAND DHC7 DASH-7 | DHC7-1 | Other | propeller | RJ | turboprop | 54 | regional aircraft | 4 | 19,958 |
| 483 | DHC8-100 DASH 8 | DEHAVILLAND DHC8-100 DASH-8 | DHC8-1 | Other | propeller | RJ | turboprop | 38 | regional aircraft | 2 | 16,465 |
| 491 | DEHAVILLAND DHC8-2 | DEHAVILLAND DHC8-200Q DASH-8 | DHC8-2 | Other | propeller | RJ | turboprop | 39 | regional aircraft | 2 | 16,465 |
| 484 | DHC8-300 DASH 8 | DEHAVILLAND DHC8-300 DASH 8 | DHC8-3 | Other | propeller | RJ | turboprop | 55 | regional aircraft | 2 | 19,504 |
| 482 | DHC8-400 DASH-8 | DEHAVILLAND DHC8-400 DASH-8 | DHC8Q-4 | Other | propeller | RJ | turboprop | 73 | regional aircraft | 2 | 29,574 |
| 449 | DORNIER 328 | DORNIER 328 | DO328-1 | Other | propeller | RJ | turboprop | 33 | regional aircraft | 2 | 13,990 |
| 632 | DORNIER 328 JET | DORNIER 328 JET | DO328JET | Other | jet | RJ | narrow-body | 33 | regional aircraft | 2 | 15,200 |
| 464 | EMBRAER BANDEIRNTE | EMBRAER EMB-110 BANDEIRANTE | EMB110 | Other | propeller | RJ | turboprop | 19 | regional aircraft | 2 | 5,670 |
| 461 | EMB-120 BRASILIA | EMBRAER EMB-120 BRASILIA | EMB120 | Other | propeller | RJ | turboprop | 30 | regional aircraft | 2 | 11,990 |
| 674 | EMBRAER-135 | EMBRAER-135 | ERJ135 | Other | jet | RJ | Narrow-Body | 37 | regional aircraft | 2 | 19,000 |
| 676 | EMBRAER-140 | EMBRAER-140 | ERJ140 | Other | jet | RJ | narrow-body | 44 | regional aircraft | 2 | 20,193 |
| 675 | EMBRAER-145 | EMBRAER-145 | ERJ145 | Other | jet | RJ | narrow-body | 50 | regional aircraft | 2 | 20,990 |
| 677 | EMBRAER 170 | EMBRAER 170 | ERJ170 | Other | jet | RJ | narrow-body | 80 | regional aircraft | 2 | 35,990 |
| 673 | EMBRAER-175 | EMBRAER ERJ-175 | ERJ175 | Other | jet | RJ | narrow-body | 88 | regional aircraft | 2 | 37,500 |
| 678 | EMBRAER 190 | EMBRAER 190 | ERJ190 | Other | jet | RJ | narrow-body | 114 | 100 or more seats | 2 | 47,790 |
| 450 | F-27 | FOKKER FRIENDSHIP F-27/FAIRCHILD F-27/A/B/F/J | F27 | Other | propeller | RJ | turboprop | 44 | regional aircraft | 2 | 19,731 |
| 603 | FOKKER 100 | FOKKER 100 | F28-100 | Other | jet | RJ | narrow-body | 104 | 100 or more seats | 2 | 45,813 |
| 601 | FOKKER F28-1000 | FOKKER F28-1000 FELLOWSHIP | F28-100 | Other | jet | RJ | narrow-body | 104 | 100 or more seats | 2 | 45,813 |
| 602 | F28-4000/6000 | FOKKER F28-4000/6000 FELLOWSHIP | F28-4000 | Other | jet | RJ | Narrow-Body | 85 | regional aircraft | 2 | 33,112 |
| 604 | FOKKER 70 | FOKKER 70 | F28-70 | Other | jet | RJ | narrow-body | 90 | regional aircraft | 2 | 41,731 |
| 681 | DASSAULT MYSTERE-FAL | DASSAULT-BREGUET MYSTERE-FALCON | FAL10 | Other | jet | RJ | narrow-body | 7 | regional aircraft | 2 | 8,500 |
| 682 | DASSAULT 2000EX | DASSAULT FALCON 2000EX | FAL2000EX | Other | jet | RJ | narrow-body | 14 | regional aircraft | 2 | 19,142 |
| 770 | FALCON 900 | DASSAULT FALCON 900 | FAL900 | Military | jet | RJ | narrow-body | 16 | regional aircraft | 3 | 20,640 |
| 454 | FH-227 | FAIRCHILD-HILLER FH-227 | FH227 | Other | propeller | RJ | turboprop | 56 | regional aircraft | 2 | 19,731 |
| 170 | GRUMMAN G-21A | GRUMMAN G-21A (GOOSE) | G21G | Military | propeller | RJ | turboprop | 12 | regional aircraft | 2 | 5,670 |
| 173 | GRUMMAN G-73 | GRUMMAN G-73 (MALLARD) | G-73 | Other | propeller | RJ | turboprop | 10 | regional aircraft | 2 | 5,783 |
| 470 | GULFSTREAM I | GULFSTREAM I | GULF1 | Military | propeller | RJ | turboprop | 19 | regional aircraft | 2 | 15,920 |
| 671 | GULFSTREAM G450 | GULFSTREAM G450 | GULF450 | Other | jet | RJ | narrow-body | 15 | regional aircraft | 2 | 32,160 |
| 667 | GULFSTREAM V/ G-V | GULFSTREAM V/ G-V EXEC/ G-5/550 | GULF5 | Other | jet | RJ | narrow-body | 16 | regional aircraft | 2 | 41,050 |
| 407 | BAE-748 | BRITISH AEROSPACE (HAWKER-SIDDELEY) BAE-748 | HS748-1 | Other | propeller | RJ | turboprop | 51 | regional aircraft | 2 | 21,092 |
| 474 | HAWKER SIDELEY 748 | HAWKER SIDDELEY 748 | HS748-1 | Other | propeller | RJ | turboprop | 51 | regional aircraft | 2 | 21,092 |
| 876 | ILYUSHIN 62 | ILYUSHIN 62 | IL62 | Other | jet | SAE4 | Narrow-Body | 185 | 100 or more seats | 4 | 165,108 |
| 877 | ILYUSHIN 76/TD | ILYUSHIN 76/TD | IL76 | Other | jet | TA | Wide-Body | 250 | 100 or more seats | 4 | 190,000 |
| 878 | ILYUSHIN 86 | ILYUSHIN 86 | IL86 | Other | jet | TA | wide-body | 350 | 100 or more seats | 4 | 208,000 |
| 879 | ILYUSHIN 96 | ILYUSHIN 96 | IL96 | Other | jet | TA | wide-body | 300 | 100 or more seats | 4 | 269,888 |
| 469 | BAE JETSTREAM 31 | BRITISH AEROSPACE JETSTREAM 31 | J31 | Other | propeller | RJ | turboprop | 19 | regional aircraft | 2 | 7,059 |

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| T-100 Code (A/C) | T-100 Aircraft Name | EDMS Aircraft Name | EDMS Aircraft Code (ACCODE) | Helicopter, Military, or Other | Engine Type (propeller or jet) | Aircraft Size Category | Aircraft Type | Seats Count | Regional Jet | Powerplant No | Gross Wgt (Kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 471 | JETSTREAM 41 | BRITISH AEROSPACE JETSTREAM 41 | J41 | Other | propeller | RJ | turboprop | 29 | regional aircraft | 2 | 10,886 |
| 760 | L-1011-1/100/200 | LOCKHEED L-1011-1/100/200 | L1011-3 | Other | jet | TA | wide-body | 400 | 100 or more seats | 3 | 211,374 |
| 765 | L-1011-500 TRISTAR | LOCKHEED L-1011-500 TRISTAR | L1011-3 | Other | jet | TA | wide-body | 330 | 100 or more seats | 3 | 231,332 |
| 550 | LOCKHEED L-188A/C | LOCKHEED L-188A/C ELECTRA | L188 | Other | propeller | SAE2 | turboprop | 104 | 100 or more seats | 4 | 51,256 |
| 660 | LEAR-23 | GATES LEARJET LEAR-23 | LEAR23 | Other | jet | RJ | narrow-body | 6 | regional aircraft | 2 | 5,669 |
| 662 | LEAR-25 | GATES LEARJET LEAR-25 | LEAR25 | Other | jet | RJ | narrow-body | 8 | regional aircraft | 2 | 7,031 |
| 663 | LEAR-35 | GATES LEARJET LEAR-35 | LEAR35 | Military | jet | RJ | narrow-body | 8 | regional aircraft | 2 | 8,301 |
| 659 | LEAR-60 | BOMBARDIER (GATES) LEARJET 60 | LEAR60 | Other | jet | RJ | narrow-body | 10 | regional aircraft | 2 | 10,659 |
| 740 | MD-11 | MCDONNELL DOUGLAS MD-11 | MD11 | Other | jet | TA | wide-body | 298 | 100 or more seats | 3 | 285,990 |
| 655 | MD-80,1,2,3,7,8 | MCDONNELL DOUGLAS DC9 SUPER 80/MD81/2/3/7/8 | MD82 | Other | jet | SAE2 | narrow-body | 143 | 100 or more seats | 2 | 67,812 |
| 654 | MD-87 | MCDONNELL DOUGLAS DC9 SUPER 87 | MD87 | Other | jet | SAE2 | narrow-body | 117 | 100 or more seats | 2 | 67,812 |
| 656 | MD-90 | MCDONNELL DOUGLAS MD-90 | MD90 | Other | jet | SAE2 | narrow-body | 153 | 100 or more seats | 2 | 78,245 |
| 870 | LOCKHEED JETSTAR | LOCKHEED JETSTAR | MIL-C130 | Other | propeller | SAE4 | turboprop | 9 | regional aircraft | 4 | 20,185 |
| 553 | LOCKHEED L100-10 | LOCKHEED L100-10 HERCULES | MIL-C130 | Other | propeller | SAE2 | turboprop | 250 | 100 or more seats | 4 | 70,670 |
| 555 | LOCKHEED L100-20 | LOCKHEED L100-20 HERCULES | MIL-C130 | Other | propeller | SAE2 | turboprop | 250 | 100 or more seats | 4 | 70,670 |
| 556 | LOCKHEED L100-30 | LOCKHEED L100-30/L-382E | MIL-C130 | Other | propeller | SAE2 | turboprop | 250 | 100 or more seats | 4 | 70,670 |
| 552 | LOCKHEED L-382B | LOCKHEED L-382B | MIL-C130 | Other | propeller | SAE2 | turboprop | 250 | 100 or more seats | 4 | 70,670 |
| 890 | ANTONOV 225 | ANTONOV 225 (6 ENGINE) | MIL-C5 | Other | jet | L | Wide-Body | 1000 | 100 or more seats | 6 | 600,104 |
| 034 | HELIO H250/295/395 | HELIO H-250/295/395 | MIL-U10 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 2,000 |
| 190 | PIPER PA-23 | PIPER PA-23-250 (AZTEC/APACHE) | PA23 | Other | propeller | RJ | turboprop | 4 | regional aircraft | 2 | 2,359 |
| 084 | PIPER PA-28 | PIPER PA-28 (CHEROKEE) | PA28 | Other | propeller | RJ | turboprop | 4 | regional aircraft | 1 | 975 |
| 194 | PIPER PA-31/T-1020 | PIPER PA-31 (NAVAJO)/T-1020 | PA31 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 2 | 3,103 |
| 478 | PIPER T-1040 | PIPER T-1040 | PA31T | Other | propeller | RJ | turboprop | 6 | regional aircraft | 2 | 4,082 |
| 079 | PIPER PA-32 | PIPER PA-32 (CHEROKEE 6) | PA32 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 1 | 1,542 |
| 195 | PIPER PA-34/39 | PIPER PA-34/39 (TWIN COMMANCHE) | PA34 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 2 | 1,905 |
| 476 | PIPER PA-31T | PIPER PA-30/31T CHEYENNE II XL | PA42 | Other | propeller | RJ | turboprop | 6 | regional aircraft | 2 | 4,082 |
| 479 | PILATUS PC-12 | PILATUS PC-12 | PC12 | Other | propeller | RJ | turboprop | 10 | regional aircraft | 1 | 4,740 |
| 466 | SWEARINGEN METRO 2 | SWEARINGEN METRO II | SA226TC | Other | propeller | RJ | turboprop | 19 | regional aircraft | 2 | 7,484 |
| 455 | FAIRCHILD METRO 23 | FAIRCHILD METRO 23 | SA227 | Other | propeller | RJ | turboprop | 19 | regional aircraft | 2 | 6,577 |
| 467 | SWEARINGEN METRO 3 | SWEARINGEN METRO III | SA227 | Other | propeller | RJ | turboprop | 19 | regional aircraft | 2 | 6,577 |
| 459 | SAAB-FAIRCHD 340/A | SAAB-FAIRCHILD 340/A | SAAB340-A | Other | propeller | RJ | turboprop | 33 | regional aircraft | 2 | 12,927 |
| 456 | SAAB-FAIRCHD 340/B | SAAB-FAIRCHILD 340/B | SAAB340-B | Other | propeller | RJ | turboprop | 34 | regional aircraft | 2 | 13,154 |
| 670 | ROCKWELL SABRELINR | ROCKWELL SABRELINER | SABR80 | Other | jet | RJ | narrow-body | 10 | regional aircraft | 2 | 10,342 |
| 486 | SHORT HARLAND SC-7 | SHORTS HARLAND SC-7 SKYVAN | SC7-3-1 | Other | propeller | RJ | turboprop | 19 | regional aircraft | 2 | 5,670 |
| 487 | SHORTS 330 | SHORTS 330 | SD330 | Other | propeller | RJ | turboprop | 30 | regional aircraft | 2 | 10,387 |
| 489 | SHORTS 360 | SHORTS 360 | SD360-1 | Other | propeller | RJ | turboprop | 36 | regional aircraft | 2 | 11,793 |
| 560 | SHORTS-BELFAST-SH5 | SHORTS BELFAST FREIGHTER-SH5 | SHORT-SC5 | Other | propeller | RJ | turboprop | 375 | 100 or more seats | 4 | 45,000 |
| 780 | TUPOLEV 154 | TUPOLEV TU-154 | TU154 | Other | jet | SAE2 | Narrow-Body | 147 | 100 or more seats | 3 | 104,000 |
| 465 | NIHON YS-11 | NIHON YS-11 | YS11-1 | Other | propeller | RJ | turboprop | 64 | regional aircraft | 2 | 23,500 |

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# Appendix H

# Airports in Identified Non-attainment Areas

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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| Albuquerque, NM | Albuquerque Intl Sunport | Albuquerque | NM |
| Anchorage, AK | Ted Stevens Anchorage Intl | Anchorage | AK |
| Anchorage, AK | Merrill Field | Anchorage | AK |
| Aspen | Aspen-Pitkin Co/Sardy Field | Aspen | CO |
| Atlanta, GA | Dobbins Air Reserve Base (Atlanta Nas) | Marietta | GA |
| Atlanta, GA | Fulton County Airport-Brown Field | Atlanta | GA |
| Atlanta, GA | Dekalb-Peachtree | Atlanta | GA |
| Atlanta, GA | Gwinnett County - Briscoe Field | Lawrenceville | GA |
| Atlanta, GA | Hartsfield - Jackson Atlanta Intl | Atlanta | GA |
| Baltimore, MD | Lee | Annapolis | MD |
| Baltimore, MD | Baltimore/Washington Intl Thurgood Marshal | Baltimore | MD |
| Baltimore, MD | Martin State | Baltimore | MD |
| Boston-Lawrence-Worcester (eastern MA), MA | Marthas Vineyard | Vineyard Haven | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Worcester Rgnl | Worcester | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Barnstable Muni-Boardman/Polando Field | Hyannis | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Provincetown Muni | Provincetown | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Laurence G Hanscom Fld | Bedford | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | General Edward Lawrence Logan Intl | Boston | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | New Bedford Rgnl | New Bedford | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Norwood Memorial | Norwood | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Mansfield Muni | Mansfield | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Nantucket Memorial | Nantucket | MA |



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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| Boston-Lawrence-Worcester (eastern MA), MA | Lawrence Muni | Lawrence | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Katama Airpark | Edgartown | MA |
| Boston-Lawrence-Worcester (eastern MA), MA | Fitchburg Muni | Fitchburg | MA |
| Boston-Manchester-Portsmouth (southeast NH), NH | Boire Field | Nashua | NH |
| Boston-Manchester-Portsmouth (southeast NH), NH | Portsmouth Intl At Pease | Portsmouth | NH |
| Boston-Manchester-Portsmouth (southeast NH), NH | Manchester | Manchester | NH |
| Charlotte-Gastonia-Rock Hill, NC-SC | Rowan County | Salisbury | NC |
| Charlotte-Gastonia-Rock Hill, NC-SC | Charlotte/Douglas Intl | Charlotte | NC |
| Charlotte-Gastonia-Rock Hill, NC-SC | Concord Rgnl | Concord | NC |
| Chicago-Gary-Lake County, IL-IN | Chicago Executive | Chicago/Prospect Heights/Wheeling | IL |
| Chicago-Gary-Lake County, IL-IN | Chicago O'Hare Intl | Chicago | IL |
| Chicago-Gary-Lake County, IL-IN | Chicago Midway Intl | Chicago | IL |
| Chicago-Gary-Lake County, IL-IN | Dupage | Chicago/West Chicago | IL |
| Chicago-Gary-Lake County, IL-IN | Gary/Chicago Intl | Gary | IN |
| Chicago-Gary-Lake County, IL-IN | Porter County Muni | Valparaiso | IN |
| Cincinnati-Hamilton, OH-KY-IN | Airborne Airpark | Wilmington | OH |
| Cincinnati-Hamilton, OH-KY-IN | Cincinnati/Northern Kentucky Intl | Covington | KY |
| Cincinnati-Hamilton, OH-KY-IN | Cincinnati Muni Airport Lunken Field | Cincinnati | OH |
| Cleveland-Akron-Lorain, OH | Cleveland-Hopkins Intl | Cleveland | OH |
| Cleveland-Akron-Lorain, OH | Lorain County Rgnl | Lorain/Elyria | OH |
| Cleveland-Akron-Lorain, OH | Cuyahoga County | Cleveland | OH |
| Cleveland-Akron-Lorain, OH | Akron-Canton Rgnl | Akron | OH |



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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| Cleveland-Akron-Lorain, OH | Burke Lakefront | Cleveland | OH |
| Cleveland-Akron-Lorain, OH | Kent State Univ | Kent | OH |
| Dallas-Fort Worth, TX | Arlington Muni | Arlington | TX |
| Dallas-Fort Worth, TX | Addison | Dallas | TX |
| Dallas-Fort Worth, TX | Dallas/Fort Worth Intl | Dallas-Fort Worth | TX |
| Dallas-Fort Worth, TX | Dallas Love Field | Dallas | TX |
| Dallas-Fort Worth, TX | Kittyhawk | Allen | TX |
| Dallas-Fort Worth, TX | Denton Muni | Denton | TX |
| Dallas-Fort Worth, TX | Fort Worth Meacham Intl | Fort Worth | TX |
| Dallas-Fort Worth, TX | Fort Worth, Tx: Carswell Air Force Base | Fort Worth | TX |
| Dallas-Fort Worth, TX | Fort Worth Alliance | Fort Worth | TX |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | Denver Intl | Denver | CO |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | Rocky Mountain Metropolitan | Denver | CO |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | Centennial | Denver | CO |
| Denver-Boulder-Greeley-Fort Collins-Loveland, CO | Fort Collins-Loveland Muni | Fort Collins/Loveland | CO |
| Detroit-Ann Arbor, MI | Coleman A. Young Muni | Detroit | MI |
| Detroit-Ann Arbor, MI | Oakland County Intl | Pontiac | MI |
| Detroit-Ann Arbor, MI | Detroit Metropolitan Wayne County | Detroit | MI |
| Detroit-Ann Arbor, MI | Detroit, MI: (Metropolitan Area) | Detroit | MI |
| Detroit-Ann Arbor, MI | Willow Run | Detroit | MI |
| Detroit-Ann Arbor, MI | Selfridge Angb | Mount Clemens | MI |
| Detroit-Ann Arbor, MI | St Clair County Intl | Port Huron | MI |
| Greater Connecticut, CT | Groton-New London | Groton (New London) | CT |

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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| Greater Connecticut, CT | Bradley Intl | Windsor Locks | CT |
| Greater Connecticut, CT | Hartford-Brainard | Hartford | CT |
| Houston-Galveston-Brazoria, TX | Ellington Field | Houston | TX |
| Houston-Galveston-Brazoria, TX | Sugar Land Rgnl | Houston | TX |
| Houston-Galveston-Brazoria, TX | William P Hobby | Houston | TX |
| Houston-Galveston-Brazoria, TX | George Bush Intercontinental/Houston | Houston | TX |
| Houston-Galveston-Brazoria, TX | Lake Jackson, TX: Brazoria County | Lake Jackson | TX |
| Houston-Galveston-Brazoria, TX | Scholes Intl At Galveston | Galveston | TX |
| Indianapolis, IN | Anderson Muni-Darlington Field | Anderson | IN |
| Indianapolis, IN | Indianapolis Intl | Indianapolis | IN |
| Las Vegas, NV | Nellis AFB | Las Vegas | NV |
| Las Vegas, NV | North Las Vegas | Las Vegas | NV |
| Las Vegas, NV | Mc Carran Intl | Las Vegas | NV |
| Las Vegas, NV | Boulder City Muni | Boulder City | NV |
| Los Angeles South Coast Air Basin, CA | Bob Hope | Burbank | CA |
| Los Angeles South Coast Air Basin, CA | March Arb | Riverside | CA |
| Los Angeles South Coast Air Basin, CA | Long Beach /Daugherty Field/ | Long Beach | CA |
| Los Angeles South Coast Air Basin, CA | Los Angeles Intl | Los Angeles | CA |
| Los Angeles South Coast Air Basin, CA | Santa Monica Muni | Santa Monica | CA |
| Los Angeles South Coast Air Basin, CA | Ontario Intl | Ontario | CA |
| Los Angeles South Coast Air Basin, CA | John Wayne Airport-Orange County | Santa Ana | CA |
| Los Angeles South Coast Air Basin, CA | Van Nuys | Van Nuys | CA |
| Los Angeles South Coast Air Basin, CA | Los Alamitos Aaf | Los Alamitos | CA |

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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| Los Angeles South Coast Air Basin, CA | Southern California Logistics | Victorville | CA |
| Los Angeles South Coast Air Basin, CA | Palmdale Rgnl/USAF Plant 42 | Palmdale | CA |
| Louisville, KY-IN | Louisville Intl-Standiford Field | Louisville | KY |
| Memphis, TN-AR | Memphis Intl | Memphis | TN |
| Memphis, TN-AR | Millington Rgnl Jetport | Millington | TN |
| Milwaukee-Racine, WI | General Mitchell Intl | Milwaukee | WI |
| Milwaukee-Racine, WI | John H Batten | Racine | WI |
| Milwaukee-Racine, WI | Waukesha County | Waukesha | WI |
| Milwaukee-Racine, WI | Kenosha Rgnl | Kenosha | WI |
| Minneapolis-St Paul, MN | St Paul Downtown Holman Fld | St Paul | MN |
| Minneapolis-St Paul, MN | Minneapolis-St Paul Intl/Wold-Chamberlain | Minneapolis | MN |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Stewart Intl | Newburgh | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | New York, NY: Metropolitan | New York | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Waterbury-Oxford | Oxford | CT |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Montauk | Montauk | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | West 30th St. | New York | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Teterboro | Teterboro | NJ |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Morristown Muni | Morristown | NJ |
| New York-N. New Jersey-Long Island, NY-NJ-CT | La Guardia | New York | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Republic | Farmingdale | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Elizabeth Field | Fishers Island | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Monmouth Executive | Belmar/Farmingdale | NJ |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Igor I Sikorsky Memorial | Bridgeport | CT |

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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| New York-N. New Jersey-Long Island, NY-NJ-CT | Newark Liberty Intl | Newark | NJ |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Francis S Gabreski | Westhampton Beach | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Port Auth-Dwntn-Manhattan/Wall St | New York | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Tweed-New Haven | New Haven | CT |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Long Island Mac Arthur | Islip | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Essex County | Caldwell | NJ |
| New York-N. New Jersey-Long Island, NY-NJ-CT | East Hampton | East Hampton | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Westchester County | White Plains | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | John F Kennedy Intl | New York | NY |
| New York-N. New Jersey-Long Island, NY-NJ-CT | Danbury Muni | Danbury | CT |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | New Castle | Wilmington | DE |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Pottstown Muni | Pottstown | PA |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Willow Grove Nas Jrb | Willow Grove | PA |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Mc Guire AFB | Wrightstown | NJ |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Northeast Philadelphia | Philadelphia | PA |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Trenton Mercer | Trenton | NJ |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Philadelphia Intl | Philadelphia | PA |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Robert J. Miller Air Park | Toms River | NJ |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Millville Muni | Millville | NJ |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Dover AFB | Dover | DE |
| Phildelphia-Wilmington-Atlantic City, PA-NY-MD-DE | Atlantic City Intl | Atlantic City | NJ |
| Phoenix-Mesa, AZ | Gateway East Knxv Tv | Phoenix | AZ |
| Phoenix-Mesa, AZ | Falcon Fld | Mesa | AZ |



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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| Phoenix-Mesa, AZ | Phoenix Goodyear | Goodyear | AZ |
| Phoenix-Mesa, AZ | Phoenix Deer Valley | Phoenix | AZ |
| Phoenix-Mesa, AZ | Glendale Muni | Glendale | AZ |
| Phoenix-Mesa, AZ | Southern Command Police Station | Phoenix | AZ |
| Phoenix-Mesa, AZ | Chandler Muni | Chandler | AZ |
| Phoenix-Mesa, AZ | Phoenix Sky Harbor Intl | Phoenix | AZ |
| Pittsburgh-Beaver Valley, PA | Allegheny County | Pittsburgh | PA |
| Pittsburgh-Beaver Valley, PA | Arnold Palmer Rgnl | Latrobe | PA |
| Pittsburgh-Beaver Valley, PA | Pittsburgh Intl | Pittsburgh | PA |
| Pittsburgh-Beaver Valley, PA | Butler County/K W Scholter Field | Butler | PA |
| Providence (entire State), RI | Block Island State | Block Island | RI |
| Providence (entire State), RI | Theodore Francis Green State | Providence | RI |
| Providence (entire State), RI | North Central State | Pawtucket | RI |
| Providence (entire State), RI | Newport State | Newport | RI |
| Providence (entire State), RI | Quonset State | North Kingstown | RI |
| Providence (entire State), RI | Westerly State | Westerly | RI |
| Raleigh-Durham-Chapel Hill, NC | Raleigh-Durham Intl | Raleigh/Durham | NC |
| Raleigh-Durham-Chapel Hill, NC | Person County | Roxboro | NC |
| Reno, NV | Reno/Tahoe Intl | Reno | NV |
| Riverside County (Coachella Valley), CA | Palm Springs Intl | Palm Springs | CA |
| Sacramento Metro, CA | Mc Clellan Airfield | Sacramento | CA |
| Sacramento Metro, CA | Sacramento Intl | Sacramento | CA |
| Sacramento Metro, CA | Sacramento Mather | Sacramento | CA |



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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| Salt Lake City, UT | Salt Lake City Intl | Salt Lake City | UT |
| San Diego, CA | Miramar Mcas | San Diego | CA |
| San Diego, CA | North Island Nas /Halsey Field/ | San Diego | CA |
| San Diego, CA | San Diego Intl | San Diego | CA |
| San Diego, CA | Brown Field Muni | San Diego | CA |
| San Diego, CA | Mc Clellan-Palomar | Carlsbad | CA |
| San Francisco Bay Area, CA | Metropolitan Oakland Intl | Oakland | CA |
| San Francisco Bay Area, CA | Napa County | Napa | CA |
| San Francisco Bay Area, CA | Travis AFB | Fairfield | CA |
| San Francisco Bay Area, CA | San Francisco Intl | San Francisco | CA |
| San Francisco Bay Area, CA | Charles M. Schulz - Sonoma County | Santa Rosa | CA |
| San Francisco Bay Area, CA | San Francisco, CA: China Basin Heliport | San Francisco | CA |
| San Francisco Bay Area, CA | Norman Y. Mineta San Jose Intl | San Jose | CA |
| San Francisco Bay Area, CA | Moffett Federal Afld | Mountain View | CA |
| San Joaquin Valley, CA | Merced Muni/Macready Field | Merced | CA |
| San Joaquin Valley, CA | Porterville Muni | Porterville | CA |
| San Joaquin Valley, CA | Visalia Muni | Visalia | CA |
| San Joaquin Valley, CA | Fresno Yosemite Intl | Fresno | CA |
| San Joaquin Valley, CA | Meadows Field | Bakersfield | CA |
| San Joaquin Valley, CA | Madera Muni | Madera | CA |
| San Joaquin Valley, CA | Stockton Metropolitan | Stockton | CA |
| San Joaquin Valley, CA | Castle | Merced | CA |
| San Joaquin Valley, CA | Modesto City-Co-Harry Sham Fld | Modesto | CA |



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| Nonattainment Area Name | Airport Name | City | STATE |
|---|---|---|---|
| Seattle-Tacoma, WA | Kenmore Air Harbor Inc | Kenmore | WA |
| Seattle-Tacoma, WA | Snohomish County (Paine Fld) | Everett | WA |
| Seattle-Tacoma, WA | Tacoma Narrows | Tacoma | WA |
| Seattle-Tacoma, WA | Boeing Field/King County Intl | Seattle | WA |
| Seattle-Tacoma, WA | Lake Union Seaplane Base, Wa: Lake Union Sea Plane Base | Lake Union Seaplane Base | WA |
| Seattle-Tacoma, WA | Renton Muni | Renton | WA |
| Seattle-Tacoma, WA | Seattle-Tacoma Intl | Seattle | WA |
| Seattle-Tacoma, WA | Mcchord AFB | Tacoma | WA |
| St. Louis, MO-IL | St Louis Downtown | Cahokia/St Louis | IL |
| St. Louis, MO-IL | Lambert-St Louis Intl | St Louis | MO |
| St. Louis, MO-IL | Scott AFB/Midamerica | Belleville | IL |
| St. Louis, MO-IL | Spirit of St Louis | St Louis | MO |
| Syracuse, NY | Syracuse Hancock Intl | Syracuse | NY |
| Washington, DC-MD-VA | Leesburg Executive | Leesburg | VA |
| Washington, DC-MD-VA | Washington Dulles Intl | Washington | VA |
| Washington, DC-MD-VA | Andrews AFB | Camp Springs | MD |
| Washington, DC-MD-VA | Ronald Reagan Washington National | Washington | VA |
| El Paso County, TX | El Paso Intl | El Paso | TX |
| Lake Tahoe South Shore, CA | Lake Tahoe | South Lake Tahoe | CA |

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# Appendix I

# Non-Commercial Aircraft Covered by ICAO Provisions

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**TO:** Bryan Manning
U.S. EPA Office of Transportation and Air Quality Assessment and Standards Division

**FROM:** Richard Billings, Bryan Lange, and Jennifer Marik
Eastern Research Group, Inc. (ERG)

**DATE:** January 27, 2011

**SUBJECT:** Non-Commercial Aircraft Covered by ICAO Provisions

## 1.0 INTRODUCTION

It is acknowledged that the T-100 data under-represents the activity of aircraft whose engines are covered by ICAO provisions; for instance, some of the aircraft included in the TAF and 5010 data are equipped with engines covered by the ICAO gaseous emissions provisions but are not included in the T-100 data as they do not provide commercial air carrier services (e.g., those aircraft used in general aviation service). We will refer to these aircraft as non-air carrier aircraft equipped with engines covered by ICAO gaseous emissions provisions. These aircraft include, aircraft used by business to transport senior employees to meetings or move high value materials to their manufacturing facilities. This would also include aircraft used for government services such as fire control.

These non-commercial or non-air carrier aircraft are included in the FAA's Terminal Area Forecast (TAF) and airport master plan (5010) data, but these data sources do not provide sufficient details about the aviation fleet (i.e., airframe make and model, engine model and thrust) to differentiate ICAO applicability. ERG has determined that an appropriate approach for approximating the activity and emissions from these non-air carrier aircraft is by using the FAA Aircraft Registry to identify aircraft equipped with engines covered by ICAO provisions that are not associated with airline-type activities, applying typical general aviation annual LTO activity to each aircraft, and then applying these data to the FAA's EDMS to calculate airport related emissions for 2008.

## 2.0 FAA AIRCRAFT REGISTRY

Aircraft owned by individuals, corporations, the U.S. Government, States and territories must be registered with the FAA. Registrants can include a trustee or someone who holds a legal title to the aircraft. Registrant types included in the FAA data base are summarized in Table 1 for aircraft not pending sale.



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**Table 1. Aircraft Included in FAA Registration Database[a]**

| Registrant Type | Percent of Total |
|---|---|
| Individual | 49 |
| Corporation | 35 |
| Co-Owned | 11 |
| Partnership | 2.1 |
| Government | 1.6 |
| Non Citizen Corporation | <1 |
| Non Citizen Co-Owned | <1 |
| Total aircraft population (excluding aircraft pending sale) | 349,641 |

[a] Excludes aircraft where the registrants name is either "Sale Reported" or "Registration Pending"

The FAA has recently noted "registration records for as many as one-third of all private aircraft are out-of-date and inaccurate, [21] specifically regarding aircraft ownership. Therefore, some uncertainty is associated with the owner types noted in Table 1.

The Registry also includes a list of certificated dealers. Dealer's Aircraft Registration Certificates are issued to allow manufacturers to make any required flight tests of aircraft or to facilitate operating, demonstrating, and merchandising aircraft by the manufacturer without the burden of obtaining a Certificate of Aircraft Registration.[22] In some cases, dealers may hold aircraft until the title transfer with the owner is finalized. Because dealer activities are not considered to be typical of general aviation, aircraft associated with them are not included in this analysis

## 2.1 AIRCRAFT AND ENGINES

There are over 50,000 different aircraft models included in the registration database. It should be noted that this total is inflated by the many variations or series for each model; Boeing alone has over 1,200 models including nine versions of the 777 Freighter (i.e., 777FZN, 777FZB, 777FHT, 777FDZ, 777-F6N, 777F28, 777F1H, 777F1B, and 777F). The most popular aircraft (1.7 percent of total or 5,989 aircraft) is the fixed wing single engine Piper model PA-28-140.

Table 2 below shows the Registry engine types. A large fraction of aircraft are equipped with either a reciprocating engines (i.e., piston) or the engine had been removed for service, maintenance, or replacement. Note that the focus of this analysis is turbo-fans and turbo-jet powered aircraft which account for six percent of all registered aircraft.

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[21] Meserve, Jeanne & Mike M. Ahlers. FAA Orders Re-registration of Thousands of Private Aircraft. CNN, 10 Dec. 2010. Web. 24 Jan. 2011. <http://www.cnn.com/2010/US/12/10/faa.re.registration/index.html?iref=allsearch>.

Chris Hawley, Missing airplanes data has FAA forcing owners to submit information again, December 10, 2010, http://www.csmonitor.com/USA/Latest-News-Wires/2010/1210/Missing-airplanes-data-has-FAA-forcing-owners-to-submit-information-again

[22] 14 CFR Part 47.61



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**Table 2. Aircraft Engine Types[a]**

| Aircraft Type | Percent of Total |
|---|---|
| Reciprocating | 71 |
| None | 9.8 |
| 4 Cycle | 5.4 |
| Turbo-prop | 3.6 |
| Turbo-fan | 3.4 |
| Turbo-jet | 2.4 |
| Turbo-shaft | 2.4 |
| 2 Cycle | 1.9 |
| Not Specified | <1 |
| Total | 374,019 |

[a] Number of aircraft that does not match Table 1 above. This is attributed to two facts: 1) not all aircraft have a registrant identified and 2) table 1 excludes all records identified as "sale reported" or "registration pending."

To quantify aircraft activity covered by ICAO provisions the Registry was filtered using the following criteria:

1) All aircraft that were not powered by a turbo-fan or turbo-jet were removed leaving 21,921 aircraft.

2) All aircraft whose engines are rated less than or equal to 26.7 kN were removed leaving 11,194.

## 2.2 IDENTIFICATION OF NON-AIR CARRIER REGISTRANTS

To identify registrants who likely performed commercial air carrier activities all registrants were divided into 6 generic categories: A) Banks, B) Leasing Companies and Air Service Providers, C) Airlines / Couriers, D) Aircraft Manufacturers, E) Misc. Fortune 500 Companies (excluding banks), and F) Other Small Companies / Individuals / Government Agencies.

To identify aircraft that are not associated with air carrier activities, the following assumptions were made:

1. Banks may own executive jets for their own purposes or they may be shown as owners for aircraft that are in default of payment. This latter category of aircraft are likely parked and not actively flown. Because it is not possible to easily determine which aircraft are owned and used by bank executives for banking activities and which aircraft are associated with repossession, it was assumed that during this economic period bank related activities were less significant than aircraft repossessions. Therefore, any aircraft associated with banking was excluded in this analysis. (Registrant Category A).

2. Leasing companies lease aircraft to airlines and freight couriers for the purposes of generating operating revenue. These aircraft would also be included in the T-

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100 data for the airlines that are leasing them and therefore should be excluded from this analysis (Registration Category B).

3. Airlines and freight couriers generate operating revenue. Since these operations are documented in T-100 forms, these aircraft are excluded from this analysis (Registration Category C).

4. This leaves Fortune 500, other small companies, and government agencies that do not generate revenue as air carriers. Examples of these activities would include corporations flying staff to meetings or shipment of high value equipment to manufacturing facilities. Collectively these registrants own a total of 3,096 non-air carrier aircraft (Registration Categories E and F).

Search terms used to identify owners for categories A through D are noted in Table 3. The category assignments were made by searching the corporation names for terms that would indicate their core business.

**Table 3. Registrant Key Words**

| Generic Category | Key Words | Other Databases |
|---|---|---|
| A - Bank [a] | Bank, Trust, Investment, Financial, Insurance, Finance | |
| B - Leasing Companies and Air Service Providers [a] | Holdings, Rental, Lease, Leasing, Air Service, Charter, Helicopter Service, Sales, Asset Management | |
| C - Airlines / Couriers [a] | Airline [b], Cargo, DHL, Packaging | FAA Air Carrier Groupings[c] |
| D - Aircraft Manufacturers | Lockheed, Boeing, Raytheon, Grumman, General Dynamics, Honeywell, General Electric, Cessna, Beechcraft, Gulfstream Aerospace, Hunter Aviation, Bombardier, | Certificated Dealers[d] |

[a] These registrants perform commercial activities (see discussion below in Section 3.0) and are excluded from the final analysis.

[b] The FAA Aircraft Registry often includes variants of a corporations name (e.g., Southwest Airlines, Southwest Airlines Co). Therefore, the combination of both the key word "airline" and the FAA Air Carrier Grouping database create a more comprehensive filter.

[c] Carriers are grouped according to the operating revenue boundaries contained in 14 CFR Part 241, Section 04. The Bureau of Transportation Statistics - Office of Airline Information issues directives that provide regulatory clarity. Directive Number 299, issued October 19th 2010, defines the Air Carrier Groupings. For example, "Air Tran" operating revenue is over $1 billion therefore their reporting level is Group III. Suissa, Anne. Y. Air Carrier Groupings. U. S. Department of Transportation, Office of Airline Information, 19 Oct. 2010. Web. 24 Jan. 2011. <http://www.bts.gov/programs/airline_information/accounting_and_reporting_directives/number_299.html>.

[d] Pursuant to 14 CFR §47.61, the FAA issues a Dealer's Aircraft Registration Certificate to U.S. manufacturers and dealers to allow manufacturers to make any required flight tests of aircraft, facilitate operating, demonstrating, and merchandising aircraft by the manufacturer or dealer without the burden of obtaining a Registration.

A complete list of non-air carrier aircraft subject to ICAO provisions identified in this study are provided in Appendix A to this memo.



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## 2.3 ACTIVITY

LTO activity for registration categories E and F are assumed to match the activity level observed in the General Aviation and Part 135 Activity (GA) Survey for calendar year 2009.[23] According to the survey, there were 2.208 million landings for the 12,121 fixed wing turbojets surveyed (Survey Result Tables 2.4 and 2.1 respectively) or 182 LTO per airframe per year.

**Table 7. Non-air carrier Aircraft – Activity**

| | Number of Aircraft | LTO Activity Rate [a] (per plane per yr) | Annual LTO Total |
|---|---|---|---|
| Aircraft [b] | 3,096 [c] | 182 | 563,472 |

[a] Fixed wing turbojets activity, calculated from the General Aviation and Part 135 Activity Survey – CY 2009.
[b] Excludes aircraft that perform commercial activities as discussed above.
[c] Not all combinations of airframe and engine could be matched to aircraft in EDMS. In order to estimate emissions for these unmatched aircraft, default emission factors were developed.

## 2.4 EMISSION CALCULATIONS

All identified non-air carrier aircraft equipped with engines covered by ICAO provisions were matched to airframes and engines in EDMS 5.2 using the crosswalk table developed for this project that links engines to each airframe. The model was run assuming the default values for time-in-mode,[24] taxi time, and mixing height.[25] Note that not all combinations of airframe and engine could be matched to aircraft in EDMS. In order to estimate emissions for these unmatched aircraft, default emission factors were developed from the matched aircraft by summing emissions for each pollutant and dividing by the total LTOs associated with the matched aircraft. This same approach was used for aircraft that did not have PM estimates, total PM from matched aircraft were divided by the associated LTO activity to get a default PM factor. These default emission factors were then applied to the LTOs of all unmatched aircraft. Matched and unmatched emissions were compiled and presented in Table 8 for the 2008 baseline emissions.

**Table 8. Summary of Activity and Emissions for Non-air carrier Aircraft Covered by ICAO Provisions**

| Year | LTO | CO (kg) | VOC (kg) | $NO_X$ (kg) | PM2.5 (kg) | FUEL (kg) |
|---|---|---|---|---|---|---|
| 2008 | 563,472 | 7,038,627 | 3,484,480 | 5,110,719 | 197,625 | 436,473,773 |

[23] The General Aviation and Part 135 Activity Survey provides the FAA with information on general aviation and on-demand Part 135 aircraft activity. The survey enables the FAA to monitor the general aviation fleet so that it can anticipate and meet demand. Since 1978, the FAA has collect data on general aviation activity. In 1993, the name of the survey was changed to the General Aviation and Air Taxi Activity Survey to reflect that the survey included air taxi (that is, on-demand 14 CFR §135) aircraft.
General Aviation and Part 135 Activity Surveys - Calendar Year 2009. FAA, 29 Oct. 2010. Web. 24 Jan. 2011. <http://www.faa.gov/data_research/aviation_data_statistics/general_aviation/ CY2009/>.
[24] Time in mode is the amount of time an aircraft spends in the different portions of a LTO cycle. In EDMS an LTO cycle is divided into six phases: approach, taxi in, startup, taxi out, takeoff and climb out.
[25] The mixing height provides a vertical cutoff for EDMS's modeling of aircraft emissions.

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## Appendix A. Non-air carrier Aircraft Covered by ICAO Provisions

| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Bombardier Inc | CL-600-2B19 | 583 |
| Boeing | 737-7H4 | 345 |
| Embraer | EMB-145LR | 337 |
| McDonnell Douglas | DC-9-82(MD-82) | 276 |
| Bombardier Inc | CL-600-2C10 | 254 |
| Cessna | 750 | 251 |
| Bombardier Inc | CL-600-2B16 | 216 |
| Cessna | 680 | 202 |
| Bombardier Inc | BD-100-1A10 | 192 |
| Canadair Ltd | CL-600-2B16 | 177 |
| Boeing | 737-823 | 167 |
| Gulfstream Aerospace | GV-SP (G550) | 165 |
| Gulfstream Aerospace | GIV-X (G450) | 164 |
| Dassault Aviation | FALCON 2000 | 159 |
| Gulfstream Aerospace | G-V | 153 |
| Boeing | 737-3H4 | 144 |
| McDonnell Douglas | DC-9-83(MD-83) | 144 |
| Bombardier Inc | BD-700-1A10 | 140 |
| Bombardier Inc | CL600-2D24 | 139 |
| Aero Vodochody | L39C | 134 |
| Airbus Industrie | A320-232 | 134 |
| Boeing | 737-824 | 130 |
| Boeing | 757-223 | 124 |
| Boeing | 717-200 | 122 |
| Airbus | A320-232 | 122 |
| McDonnell Douglas | MD-11F | 114 |
| Boeing | 757-232 | 112 |
| McDonnell Douglas Aircraft Co | MD-88 | 111 |
| Israel Aircraft Industries | GULFSTREAM 200 | 107 |
| Embraer | EMB-145XR | 104 |
| Canadair | CL-600-2B19 | 99 |
| Boeing | 757-222 | 97 |
| Embraer | ERJ 190-100 IGW | 82 |
| Gulfstream Aerospace | G-1159A | 82 |
| Boeing | 767-332 | 79 |
| Boeing | 757-24APF | 75 |
| Embraer-Empresa Brasileira De | ERJ 170-200 LR | 75 |
| Embraer | EMB-135KL | 74 |
| Boeing | 737-832 | 71 |



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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Dassault | FALCON 2000EX | 67 |
| Douglas | DC-9-31 | 67 |
| Embraer | EMB-135LR | 65 |
| McDonnell Douglas | MD-10-10F | 59 |
| Canadair Ltd | CL-600 CHALLENGER | 58 |
| Airbus Industrie | A319-112 | 58 |
| Boeing | 767-323 | 57 |
| Boeing | 737-890 | 56 |
| Boeing | 777-222 | 55 |
| Airbus | A320-214 | 54 |
| Boeing | 737-322 | 52 |
| Boeing | 757-251 | 50 |
| Airbus Industrie | A319-131 | 50 |
| McDonnell-Douglas | DC-10-30 | 49 |
| Embraer | EMB-135BJ | 49 |
| McDonnell Douglas | DC-9-51 | 46 |
| Airbus | A319-132 | 44 |
| Boeing | 767-34AF | 43 |
| Airbus Industrie | A320-212 | 42 |
| Boeing | 727-227 | 41 |
| Boeing | 727-232 | 40 |
| Boeing | 737-524 | 40 |
| Bombardier Inc | BD-700-1A11 | 40 |
| Embraer | ERJ 170-100 SE | 40 |
| Boeing | 727-223 | 38 |
| Boeing | 737-724 | 36 |
| Airbus Industrie | A300F4-605R | 36 |
| Boeing | 767-322 | 35 |
| Embraer | ERJ 170-100SU | 35 |
| Airbus Industrie | A319-132 | 35 |
| Boeing | 727-233 | 34 |
| Boeing | 737-3TO | 34 |
| Embraer | EMB-145EP | 34 |
| Hawker Beechcraft Corp | HAWKER 4000 | 34 |
| Boeing | 737-7BD | 33 |
| Boeing | 737-924ER | 33 |
| Canadair Ltd | CL-600-2A12 | 33 |
| Dassault Aviation | FALCON 2000EX | 33 |
| Douglas | DC-9-32 | 33 |
| Airbus Industrie | A320-231 | 33 |
| Airbus | A300 F4-622R | 32 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 727-225 | 31 |
| Airbus | A319-114 | 31 |
| Grumman American Avn. Corp. | G-1159 | 31 |
| Boeing | 747-422 | 30 |
| Airbus Industrie | A320-211 | 30 |
| Airbus | A319-112 | 30 |
| McDonnell Douglas | MD-90-30 | 29 |
| Airbus | A319-111 | 29 |
| Boeing | 727-224 | 28 |
| Airbus Industrie | A300B4-605R | 28 |
| Gulfstream Aerospace | G1159B | 28 |
| Dassault Aviation | FALCON 7X | 27 |
| Douglas | DC-8-73F | 27 |
| McDonnell Douglas | DC-9-41 | 27 |
| Boeing | 727-231 | 26 |
| McDonnell Douglas | DC-9-32 | 26 |
| Airbus Industrie | A319-114 | 26 |
| Airbus | A321-231 | 26 |
| Lockheed | L-1011-385-1 | 26 |
| Boeing | 737-5H4 | 25 |
| Airbus Industrie | A321-211 | 25 |
| Boeing | 767-223 | 24 |
| Convair | 22 | 24 |
| McDonnell Douglas Aircraft Co | MD 83 | 24 |
| Airbus Industrie | A310-203 | 24 |
| Boeing | 727-222 | 23 |
| Boeing | 737-522 | 23 |
| McDonnell Douglas | DC-9-81(MD-81) | 23 |
| Airbus Industrie | A320-214 | 23 |
| Israel Aircraft Industries | GALAXY | 23 |
| Boeing | 737-76N | 22 |
| Boeing | 777-224 | 22 |
| Boeing | 767-432ER | 21 |
| Dornier | 328-300 | 21 |
| Airbus Industrie | A300F4-622R | 21 |
| Airbus | A330-323 | 21 |
| Boeing | 747-121 | 20 |
| Airbus Industrie | A300 B4-203 | 20 |
| Boeing | 727-23 | 19 |
| Boeing | 737-790 | 19 |
| Boeing | 737-4Q8 | 18 |
| Boeing | 757-2B7 | 18 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 757-236 | 18 |
| Boeing | 767-281 | 18 |
| McDonnell Douglas | DC-9-87 | 18 |
| McDonnell Douglas | DC-10-30F | 18 |
| Embraer | EMB-135ER | 18 |
| Fokker | F.28 MK 0100 | 18 |
| Boeing | 727-200 | 17 |
| Boeing | 727-251 | 17 |
| Boeing | 737-490 | 17 |
| Boeing | 747-451 | 17 |
| Fairchild Dornier | DORNIER 328-300 | 17 |
| Lockheed | L-1011-385-3 | 17 |
| Boeing | 737-2H4 | 16 |
| Boeing | 757-2Q8 | 16 |
| Boeing | 757-351 | 16 |
| Boeing | 767-424ER | 16 |
| McDonnell Douglas Corp | DC-9-82 | 16 |
| Boeing | 737-3G7 | 15 |
| Douglas | DC-9-14 | 15 |
| McDonnell Douglas | DC-9-31 | 15 |
| Douglas | DC-10-40 | 15 |
| McDonnell Douglas | MD-10-30F | 15 |
| Embraer | ERJ170-200LR | 15 |
| Airbus | A330-243 | 15 |
| Gulfstream Aerospace Corp | GVI | 15 |
| Hamburger Flugzeugbau | HFB 320 HANSA | 15 |
| Boeing | 727-22 | 14 |
| Boeing | 727-247 | 14 |
| Douglas | DC-8-21 | 14 |
| Douglas | DC-8-51 | 14 |
| Douglas | DC-8-71F | 14 |
| McDonnell Douglas Corporation | MD-88 | 14 |
| Airbus Industrie | A310-222 | 14 |
| Israel Aerospace Industriesltd | G200 | 14 |
| Boeing | 737-3B7 | 13 |
| Boeing | 737-247 | 13 |
| Boeing | 737-401 | 13 |
| Boeing | 747-400 | 13 |
| Boeing | 757-28A | 13 |
| Boeing | 767-232 | 13 |
| Canadair | CL-600-1A11 | 13 |
| McDonnell Douglas | A4N | 13 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Douglas | DC-9-41 | 13 |
| Airbus | A320-233 | 13 |
| Israel Aerospace Ind Ltd | GULFSTREAM 200 | 13 |
| Boeing | 737-990 | 12 |
| Boeing | 747-47UF | 12 |
| Boeing | 737-924 | 12 |
| Airbus | A300B4-622R | 12 |
| Iai Ltd | GULFSTREAM 200 | 12 |
| Boeing | 737-232 | 11 |
| Boeing | 767-33A | 11 |
| Douglas | DC-8F-54 | 11 |
| Airbus Industrie | A310-324 | 11 |
| Boeing | 737-200 | 10 |
| Boeing | 737-222 | 10 |
| Boeing | 737-400 | 10 |
| Boeing | 737-8Q8 | 10 |
| Boeing | 737-7ES | 10 |
| Boeing | 737-732 | 10 |
| Boeing | 747-243B | 10 |
| Boeing | 757-23A | 10 |
| Boeing | 767-224 | 10 |
| Boeing | 777-232LR | 10 |
| Douglas | DC-9-15F | 10 |
| McDonnell Douglas | DC-10-10 | 10 |
| McDonnell Douglas | MD-11 | 10 |
| Embraer | EMB-145 | 10 |
| Airbus Industrie | A300B4-622R | 10 |
| Airbus | A330-223 | 10 |
| Gulfstream Aerospace | G-IV (G400) | 10 |
| Boeing | 737-7BC | 9 |
| Boeing | 757-324 | 9 |
| Boeing | 757-200 SERIES | 9 |
| Boeing | 767-222 | 9 |
| Boeing Co | 777-FS2 | 9 |
| McDonnell Douglas | DC-9-15F | 9 |
| Airbus Industrie | A330-323 | 9 |
| Gates Lear Jet | 25C | 9 |
| Boeing | 727-22C | 8 |
| Boeing | 727-51 | 8 |
| Boeing | 727-2S2F | 8 |
| Boeing | 727-277 | 8 |
| Boeing | 737-300 | 8 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 737-3Q8 | 8 |
| Boeing | 757-231 | 8 |
| Boeing | 777-232 | 8 |
| Airbus | A321-211 | 8 |
| Gulfstream Aerospace | GV-SP (G500) | 8 |
| Hawker Beechcraft Corp | 4000 | 8 |
| Boeing | 707-321B | 7 |
| Boeing | 727-25 | 7 |
| Boeing | 727-214 | 7 |
| Boeing | 737-700 | 7 |
| Boeing | 737-291 | 7 |
| Boeing | 737-752 | 7 |
| Boeing | 747-123 | 7 |
| Boeing | 747-230B | 7 |
| Boeing | 747-251F | 7 |
| Boeing | 747-44AF | 7 |
| Boeing | 767-3P6 | 7 |
| McDonnell Douglas | DC-8-62 | 7 |
| McDonnell Douglas | DC-8-63 | 7 |
| Douglas | DC9-15 | 7 |
| McDonnell Douglas | DC-9-33F | 7 |
| Airbus | A318-111 | 7 |
| Hawker Aircraft Ltd | HAWKER HUNTER MK.58 | 7 |
| Lockheed | L-1011-385-1-15 | 7 |
| Boeing | 737-66N | 6 |
| Boeing | 707-138B | 6 |
| Boeing | 727-21 | 6 |
| Boeing | 727-281 | 6 |
| Boeing | 737-201 | 6 |
| Boeing | 737-205 | 6 |
| Boeing | 737-301 | 6 |
| Boeing | 737-3Y0 | 6 |
| Boeing | 747-246F | 6 |
| Boeing | 747-212B | 6 |
| Boeing | 747-251B | 6 |
| Boeing | 757-2S7 | 6 |
| Boeing | 767-200 | 6 |
| Boeing | 767-231 | 6 |
| British Aircraft Corp. | BAC 1-11 401/AK | 6 |
| Douglas | DC-9-33F | 6 |
| Airbus | A300F4-605R | 6 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Airbus | A320-212 | 6 |
| Airbus | A310-324 | 6 |
| Gulfstream Aerospace | GV-SP | 6 |
| Israel Aircraft Industries | KFIR-C2 | 6 |
| North American | F-100F | 6 |
| Boeing | 707-321C | 5 |
| Boeing | 727-31 | 5 |
| Boeing | 727-212 | 5 |
| Boeing | 727-228 | 5 |
| Boeing | 737-3A4 | 5 |
| Boeing | 737-3L9 | 5 |
| Boeing | 737-236 | 5 |
| Boeing | 757-204 | 5 |
| Boeing | 737-7AX | 5 |
| Boeing | 747-2D7B | 5 |
| Boeing | 747-4H6 | 5 |
| Boeing | 747-46NF | 5 |
| Boeing | 757-23N | 5 |
| Boeing | 767-2B7 | 5 |
| Boeing | 767-201 | 5 |
| Boeing | 767-316F | 5 |
| British Aircraft | BAC 1-11 204/AF | 5 |
| Canadair Ltd | CT-33 | 5 |
| Douglas | DC-8F-55 | 5 |
| Douglas | DC-8-61 | 5 |
| Douglas | DC-8-62 | 5 |
| Airbus Industrie | A300B4 | 5 |
| Airbus | A319-131 | 5 |
| Airbus | A320-211 | 5 |
| Gulfstream Aerospace | GIV-X | 5 |
| Gulfstream Aerospace | G-IV (G350) | 5 |
| Fokker | F.28 MK4000 | 5 |
| McDonnell Douglas | TA-4J | 4 |
| Hawker Aircraft Factory | HAWKER HNTR FMK 58 | 4 |
| Boeing | 707-131 | 4 |
| Boeing | 720-022 | 4 |
| Boeing | 720-027 | 4 |
| Boeing | 727-287 | 4 |
| Boeing | 727-2B7 | 4 |
| Boeing | 727-2M7 | 4 |
| Boeing | 727-230 | 4 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 727-243 | 4 |
| Boeing | 727-254 | 4 |
| Boeing | 737-317 | 4 |
| Boeing | 737-3S3 | 4 |
| Boeing | 737-3K2 | 4 |
| Boeing | 737-7BX | 4 |
| Boeing | 747-228F | 4 |
| Boeing | 747-446 | 4 |
| Boeing | 747-481 | 4 |
| Boeing | 757-2G5 | 4 |
| Boeing | 757-212 | 4 |
| Boeing | 767-238 | 4 |
| Boeing | 767-2EY | 4 |
| Boeing | 777-2Q8 | 4 |
| Canadair Ltd | CL600-2B16(CL601-3A) | 4 |
| Canadair | CT-133 | 4 |
| Douglas | DC-9-83 | 4 |
| McDonnell Douglas | DC-9-32F | 4 |
| McDonnell Douglas | DC-9-34 | 4 |
| Douglas | ERA-3B | 4 |
| Airbus Industrie | A300 B4-622 | 4 |
| Airbus | A319-115 | 4 |
| Saab-Scania | SK35XD | 4 |
| Boeing | 707-382B | 3 |
| Boeing | 707-323B | 3 |
| Boeing | 707-351C | 3 |
| Boeing | 727-30 | 3 |
| Boeing | 727-30C | 3 |
| Boeing | 727-25C | 3 |
| Boeing | 727-27C | 3 |
| Boeing | 727-2J4 | 3 |
| Boeing | 727-77 | 3 |
| Boeing | 727-100 | 3 |
| Boeing | 727-191 | 3 |
| Boeing | 727-221 | 3 |
| Boeing | 727-2A1 | 3 |
| Boeing | 727-235 | 3 |
| Boeing | 737-347 | 3 |
| Boeing | 737-2L9 | 3 |
| Boeing | 737-48E | 3 |
| Boeing | 737-76Q | 3 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 747-SR-46 | 3 |
| Boeing | 747-206B | 3 |
| Boeing | 747-246B | 3 |
| Boeing | 757-2T7 | 3 |
| Boeing | 757-21B | 3 |
| Boeing | 757-2G7 | 3 |
| Boeing | 767-3CB | 3 |
| Douglas | DC-8-33 | 3 |
| McDonnell Douglas | DC-8-61 | 3 |
| McDonnell Douglas | DC-8-62F | 3 |
| McDonnell Douglas | DC-8-63F | 3 |
| McDonnell Douglas | DC-8-71 | 3 |
| Douglas | DC-8-72 | 3 |
| Douglas | DC-9-21 | 3 |
| Douglas | DC-9-32F | 3 |
| Douglas | DC-10-30F | 3 |
| Douglas Aircraft Company | NRA3B | 3 |
| Airbus Industrie | A319-111 | 3 |
| Airbus | A310-203 | 3 |
| Gulfstream Aerospace | GIV-X (G350) | 3 |
| Vought-Thunderbird Avn Inc | F-8 | 2 |
| Boeing | 707-368C | 2 |
| Boeing | 707-123B | 2 |
| Boeing | 707-331B | 2 |
| Boeing | 707-331C | 2 |
| Boeing | 707-338C | 2 |
| Boeing | 720-025 | 2 |
| Boeing | 720-047B | 2 |
| Boeing | 727-17 | 2 |
| Boeing | 727-27 | 2 |
| Boeing | 727-35 | 2 |
| Boeing | 727-95 | 2 |
| Boeing | 727-2H3 | 2 |
| Boeing | 727-2S7 | 2 |
| Boeing | 727-290 | 2 |
| Boeing | 737-832 | 2 |
| Boeing | 737-112 | 2 |
| Boeing | 737-214 | 2 |
| Boeing | 737-2A1 | 2 |
| Boeing | 737-2X6C | 2 |
| Boeing | 737-297 | 2 |
| Boeing | 737-290C | 2 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 737-2K5 | 2 |
| Boeing | 737-293 | 2 |
| Boeing | 737-2T4 | 2 |
| Boeing | 737-4S3 | 2 |
| Boeing | 737-228 | 2 |
| Boeing | 737-75V | 2 |
| Boeing | 737-705 | 2 |
| Boeing | 737-81Q | 2 |
| Boeing | 737-7DM | 2 |
| Boeing | 737-73V | 2 |
| Boeing | 737-2H6 | 2 |
| Boeing | 737-73Q | 2 |
| Boeing | 737-3T5 | 2 |
| Boeing | 747SP-21 | 2 |
| Boeing | 747-2F6B | 2 |
| Boeing | 747-2B4B | 2 |
| Boeing | 747-238B | 2 |
| Boeing | 747-2B5F | 2 |
| Boeing | 747-200 | 2 |
| Boeing | 747-249F | 2 |
| Boeing | 747-282B | 2 |
| Boeing | 747-243B | 2 |
| Boeing | 747-122 | 2 |
| Boeing | 747-131 | 2 |
| Boeing | 747-132 | 2 |
| Boeing | 747-4HQF | 2 |
| Boeing | 747-273C | 2 |
| Boeing | 747-281F | 2 |
| Boeing | 747-341 | 2 |
| Boeing | 747-346 | 2 |
| Boeing | 747-409 | 2 |
| Boeing | 747-412F | 2 |
| Boeing | 747-446 | 2 |
| Boeing | 747SP-09 | 2 |
| Boeing | 747-222B | 2 |
| Boeing | 747-45E | 2 |
| Boeing | 767-200ER | 2 |
| Boeing | 767-300ER | 2 |
| Boeing | 767-324 | 2 |
| Boeing | 767-383 | 2 |
| Boeing | 767-3Y0 | 2 |
| Boeing | 777F28 | 2 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 777-F6N | 2 |
| Boeing | 777FZB | 2 |
| Boeing | 767-328 | 2 |
| British Aircraft | BAC 1-11 203/AE | 2 |
| Bombardier Inc | CL-600-2B16(CL-604) | 2 |
| Canadair Ltd | CL600-1A11 | 2 |
| Dassault Aviation | MYSTERE FALCON 20 | 2 |
| Douglas | DC-8-31 | 2 |
| Douglas | DC-8-52 | 2 |
| Douglas | DC-8-62F | 2 |
| Douglas | DC-8-63F | 2 |
| Douglas | DC-8-73 | 2 |
| McDonnell Douglas | DC-8-71F | 2 |
| McDonnell Douglas | DC-9-15 | 2 |
| Douglas | TA-3B | 2 |
| Douglas | EA3B | 2 |
| Gulfstream Aerospace | GULFSTREAM 200 | 2 |
| Gulfstream Aerospace Lp | GULFSTREAM 200 | 2 |
| Israel Aircraft Industries Ltd | G200 | 2 |
| Lockheed | YF-22A | 2 |
| Northrop | YF-23A | 2 |
| Raytheon Aircraft Company | HAWKER 4000 | 2 |
| Mcdougall/Douglas | TA-4J | 1 |
| Scaled Composites Llc | 348 | 1 |
| Boeing | 727-2K5 | 1 |
| Boeing | 727-2K3 | 1 |
| Boeing | 367-80 | 1 |
| Boeing | 707-131B | 1 |
| Boeing | 707-311C | 1 |
| Boeing | 707-328 | 1 |
| Boeing | 707-331 | 1 |
| Boeing | 707-330B | 1 |
| Boeing | 707-323C | 1 |
| Boeing | 707-330C | 1 |
| Boeing | 707-349C | 1 |
| Boeing | 720-023B | 1 |
| Boeing | 720-059B | 1 |
| Boeing | 727 | 1 |
| Boeing | 727-2J7 | 1 |
| Boeing | 727-51C | 1 |
| Boeing | 727-76 | 1 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 727-81 | 1 |
| Boeing | 727-116 | 1 |
| Boeing | 727-44 | 1 |
| Boeing | 727-155C | 1 |
| Boeing | 727-172C | 1 |
| Boeing | 727-269 | 1 |
| Boeing | 727-2F9 | 1 |
| Boeing | 727-2B6 | 1 |
| Boeing | 727-2D3 | 1 |
| Boeing | 727-2Q6 | 1 |
| Boeing | 727-2Q8 | 1 |
| Boeing | 727-2Q9 | 1 |
| Boeing | 727-259 | 1 |
| Boeing | 727-264 | 1 |
| Boeing | 727-276 | 1 |
| Boeing | 727-282 | 1 |
| Boeing | 727-291 | 1 |
| Boeing | 737-219 | 1 |
| Boeing | 737-296 | 1 |
| Boeing | 737-7ET | 1 |
| Boeing | 737-2CO | 1 |
| Boeing | 737-2E1 | 1 |
| Boeing | 737-2Q8 | 1 |
| Boeing | 737-284 | 1 |
| Boeing | 737-2V6 | 1 |
| Boeing | 737-2M6C | 1 |
| Boeing | 737-9HWER | 1 |
| Boeing | 737-282 | 1 |
| Boeing | 737-282C | 1 |
| Boeing | 737-330 | 1 |
| Boeing | 737-35B | 1 |
| Boeing | 737-408 | 1 |
| Boeing | 737-448 | 1 |
| Boeing | 737-230C | 1 |
| Boeing | 737-72T | 1 |
| Boeing | 737-75T | 1 |
| Boeing | 737-8DC | 1 |
| Boeing | 737-79U | 1 |
| Boeing | 737-7CG | 1 |
| Boeing | 737-7CJ | 1 |
| Boeing | 737-7HJ | 1 |
| Boeing | 737-436 | 1 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 737-83N | 1 |
| Boeing | 737-8FH | 1 |
| Boeing | 737-7EG | 1 |
| Boeing | 737-7CU | 1 |
| Boeing | 737-7EL | 1 |
| Boeing | 737-7EI | 1 |
| Boeing | 737-8EF | 1 |
| Boeing | 737-8EQ | 1 |
| Boeing | 737-73T | 1 |
| Boeing | 737-74Q | 1 |
| Boeing | 737-7AV | 1 |
| Boeing | 737-7BF | 1 |
| Boeing | 737-7GV | 1 |
| Boeing | 737-7AH | 1 |
| Boeing | 737-7KK | 1 |
| Boeing | 737-73W | 1 |
| Boeing | 737-7BQ | 1 |
| Boeing | 737-2Y5 | 1 |
| Boeing | 737-8KT | 1 |
| Boeing | 737-9BQER | 1 |
| Boeing Co | 737-9LBER | 1 |
| Boeing | 737-505 | 1 |
| Boeing | 747-SP44 | 1 |
| Boeing | 747 212B | 1 |
| Boeing | 747-230F | 1 |
| Boeing | 747-2L5B | 1 |
| Boeing | 747-284B | 1 |
| Boeing | 747-267B | 1 |
| Boeing | 747-136 | 1 |
| Boeing | 747-209B | 1 |
| Boeing | 747-281B | 1 |
| Boeing | 747-271C | 1 |
| Boeing | 747-4J6 | 1 |
| Boeing | 747-4B5 | 1 |
| Boeing | 747-143 | 1 |
| Boeing | 757-26D | 1 |
| Boeing | 757-256 | 1 |
| Boeing | 757-23APF | 1 |
| Boeing | 767-269 | 1 |
| Boeing | 767-2J6 | 1 |
| Boeing | 767-24Q | 1 |
| Boeing | 767-241 | 1 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| Boeing | 767-258 | 1 |
| Boeing | 767-205 | 1 |
| Boeing | 767-323ER | 1 |
| Boeing | 767-2S1 | 1 |
| Boeing | 767-306 | 1 |
| Boeing | 767-36N | 1 |
| Boeing | 767-2Q8 | 1 |
| Boeing | 767-3Z9 | 1 |
| Boeing | 777-24Q | 1 |
| Boeing | 737-7JR | 1 |
| Boeing | 737-7JZ | 1 |
| Boeing | 767-2AX | 1 |
| British Aircraft Corp. | BAC 1-11 212/AR | 1 |
| British Aircraft Corp. | BAC 1-11 215/AU | 1 |
| British Aircraft Corp. | BAC 1-11 410/AQ | 1 |
| British Aerospace | SEA HARRIER FA2 | 1 |
| Canadair | CL-601-3A | 1 |
| Canadair | CL-600-2A12(CL-601) | 1 |
| Canadair | CL601-3R | 1 |
| Convair | 30A | 1 |
| Convair | 30A-6 | 1 |
| Convair | 22M | 1 |
| Dornier Luftfahrt Gmbh | 328-300 | 1 |
| Douglas | NTA3B | 1 |
| Douglas | DC-8-43 | 1 |
| McDonnell Douglas | DC-8-33 | 1 |
| Douglas | DC-8-54 | 1 |
| Douglas | DC-8-55 | 1 |
| McDonnell Douglas | DC-8-52 | 1 |
| McDonnell Douglas | DC-8F-54 | 1 |
| Douglas | DC8-72-CF | 1 |
| McDonnell Douglas | DC-9-21 | 1 |
| McDonnell-Douglas | DC-10-10F | 1 |
| Airbus Industrie | A300-B4-2C | 1 |
| Airbus Industrie | A319-133 | 1 |
| Airbus Industrie | A330-223 | 1 |
| Airbus | A310-304 | 1 |
| Gulfstream Aerospace | G-IV (G300) | 1 |
| Gulfstream Aerospacecorp | G-IIB | 1 |
| Fokker | F.28 MK 1000 | 1 |
| Lockheed | 300-50A-01 | 1 |
| Lockheed | L-1011-385-1-14 | 1 |

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| Aircraft_Mfr | Aircraft_Model | Count |
|---|---|---|
| North American | F-100D | 1 |
| Saab Scandia | S-35XD | 1 |

Federal Aviation Administration

# Aviation Emissions, Impacts & Mitigation: A Primer

Office of Environment and Energy

January 2015

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# Aviation Emissions, Impacts & Mitigation

# A Primer

*FAA Office of Environment and Energy*

*January 2015*

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# Introduction

Transportation is an essential contributor to the health and well-being of the nation's economy. Within the transportation sector, commercial aviation has evolved into the fastest, safest, and most far-reaching transportation mode in little more than a century. The world economy benefits greatly from the ability to move people and products all over the globe - quickly and safely. The statistics are impressive. Today, over 3 billion people, nearly half the global population, use the world's airlines.[1] The air transport industry provides 56 million direct, indirect, and induced jobs worldwide, which is double the number of jobs only eight years ago. While aircraft carry only 0.5% of world trade shipments, that represents about 35% of the value of all world trade.[2] This productivity is achieved consuming just 2.2% of world energy. [3]

Aviation contributes to quality of life – allowing us to visit friends and relatives, to travel, to experience new places, to shrink the world. Aviation must develop if it is to continue to meet the needs of a growing economy and an expanding population. At the same time, aviation must be environmentally sustainable, operating harmoniously within the constraints imposed by the need for clean air and water, limited noise impacts, and a livable climate.

The Federal Aviation Administration (FAA) is working with other stakeholders to transform the aviation system to address the challenges and opportunities of the future. In July 2012, it published the "Aviation Environmental and Energy Policy Statement"[4] which identifies and reaffirms FAA's commitment to *environmental protection that allows sustained aviation growth.* The Policy Statement lists the guiding principles of: 1) limiting and reducing future aviation environmental impacts to levels that protect public health and welfare and 2) ensuring energy availability and sustainability.

FAA's Next Generation Air Transportation System (NextGen) will establish the programs, systems, and policies needed for safer, responsive, and more efficient air transport. The FAA's Office of Environment and Energy (AEE) is working to develop new technologies, operations, systems, and fuels to ensure aviation can meet the goals of NextGen while minimizing aviation's impact on the environment. AEE has established a strategic framework to guide research programs for mitigating the environmental impacts of aviation. The framework calls for working with the Environmental Protection Agency (EPA), the National Aeronautics and Space Administration (NASA), and other federal agencies as well as industry stakeholders and academia to ensure aviation emissions do not pose health concerns for U.S. citizens or degrade the global climate.

Aviation affects the environment in many ways: people living near airports are exposed to noise from aircraft; streams, rivers, and wetlands may be exposed to pollutants discharged in storm water runoff from airports; and aircraft engines emit pollutants to the atmosphere. This primer describes the emissions associated with commercial aviation and the health and welfare impacts that can result from those aviation emissions that degrade not only air quality but also the broader climate. Noise[5] and water quality[6] considerations are not included in this report but are addressed in other FAA materials.



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# Aviation Emissions

Aircraft, cars, trucks, and other vehicles operating at the airport create emissions as a result of the combustion of fuel as summarized in Table 1. Aircraft engines produce carbon dioxide ($CO_2$), which comprises about 70% of the exhaust, and water vapor ($H_2O$), which comprises about 30%. Less than 1% of the exhaust is composed of pollutants like nitrogen oxides ($NO_x$), oxides of sulfur ($SO_x$), carbon monoxide (CO), partially combusted or unburned hydrocarbons (HC), particulate matter (PM), and other trace compounds.

Generally, about 10 percent of aircraft pollutant emissions[7] are emitted close to the surface of the earth (less than 3000 feet above ground level). The remaining 90 percent of aircraft emissions are emitted at altitudes above 3000 feet. The pollutants CO and HCs are exceptions to this rule as they are produced when aircraft engines are operating at their lowest combustion efficiency (while wheels are on the ground), which makes their split about 30 percent below 3000 feet, and 70 percent above 3000 feet.[8]

Aircraft are not the only source of aviation emissions. Airport access and ground support vehicles typically burn fossil fuels and produce similar emissions. This includes traffic to and from the airport, shuttle buses and vans serving passengers, and ground support equipment (GSE) that services aircraft. Other common emissions sources at the airport include auxiliary power units (APU) providing electricity and air conditioning to aircraft parked at airport terminal gates, stationary airport power sources, and construction equipment operating on the airport.

### Emission Formation and Transformation.

Many of the pollutants that form in the combustion process transform when they are emitted to the atmosphere. Aircraft pollutants generally transform in three different zones: 1) immediately after exiting the combustor within the engine, 2) downstream from the engine in the hot exhaust plume, and 3) after emissions have cooled and mixed with the ambient atmosphere. At the aircraft engine exit, hot combustion gases mix with ambient air to quickly cool the gas stream. Some gases, like heavy hydrocarbons, can condense under these conditions to form aerosol particles. In the exhaust plume, as emissions continue to cool, some molecules undergo chemical reactions producing other molecules that can also condense into particles. Small particles in the plume collide and form larger particles, although still microscopic in size. The resulting PM in the plume can be solid or liquid and include carbon in the form of soot, inorganic salts (like ammonium nitrate and ammonium sulfate), and heavy hydrocarbons that condense into aerosol particles.

Likewise, gaseous and particle emissions from cars, trucks, and ground vehicles that have exhaust pipes, catalytic converters or particle traps, and mufflers, transform in the exhaust plume after mixing with the ambient atmosphere. Most of the aviation-related PM that reaches airport communities are particle emissions that are released during ground operations and landing and takeoff. Local communities are less affected by PM emissions from cruise operations.



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**Table 1: Aviation Emissions**

| Emission | Description | Emission Sources | Impacts |
|---|---|---|---|
| **$CO_2$** | Carbon dioxide is the product of complete combustion of hydrocarbon fuels like gasoline, jet fuel, and diesel. Carbon in fuel combines with oxygen in the air to produce $CO_2$ | • Aircraft<br>• APU<br>• GSE<br>• Vehicles<br>• Stationary power plants<br>• Construction equipment | • Climate change |
| **$H_2O$** | Water vapor is the other product of complete combustion as hydrogen in the fuel combines with oxygen in the air to produce $H_2O$. This is the source of water in condensation trails (contrails). | • Aircraft<br>• APU<br>• GSE<br>• Vehicles<br>• Stationary power plants<br>• Construction equipment | • Climate change |
| **$NO_x$** | Nitrogen oxides are produced when air passes through high temperature/high pressure combustion and nitrogen and oxygen present in the air combine to form $NO_x$. Contributes to ozone and secondary particulate matter formation. | • Aircraft<br>• APU<br>• GSE<br>• Vehicles<br>• Stationary power plants<br>• Construction equipment | • Air quality<br>• Climate change |
| **HC** | Hydrocarbons are emitted due to incomplete fuel combustion. They are often referred to as unburned hydrocarbons (UHC) or volatile organic compounds (VOCs) [VOC excludes some low reactivity compounds found in measures of HC[9]] Some of the compounds in the HC emissions are toxic and hazardous air pollutants (HAPs). Contributes to ozone formation. | • Aircraft<br>• APU<br>• GSE<br>• Vehicles<br>• Stationary power plants<br>• Construction equipment | • Air quality |
| **$CH_4$** | Methane is the most basic hydrocarbon. Commercial aircraft are net consumers of methane during cruise and are not listed in the emissions source column. The net impact of methane from airport sources is highly dependent on local circumstances. | • APU<br>• GSE<br>• Vehicles<br>• Stationary power plants<br>• Construction equipment | • Air quality |
| **CO** | Carbon monoxide is formed due to the incomplete combustion of the carbon in the fuel. Contributes to ozone formation. | • Aircraft<br>• GSE<br>• Vehicles<br>• Construction equipment | • Air quality |



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| | | | |
|---|---|---|---|
| **$SO_x$** | Sulfur oxides are produced when small quantities of sulfur, present in essentially all petroleum fuels, combine with oxygen from the air during combustion. Contributes to secondary particulate matter formation. | • Aircraft<br>• APU<br>• GSE<br>• Construction equipment | • Air quality<br>• Climate change |
| **Particulate Matter (non-volatile)** | Small particles of soot (a.k.a. black carbon) that form as a result of incomplete combustion and aerosols from condensed gases, which are small enough to be inhaled, are referred to as particulate matter. Discussed in detail in Health and Environmental Effects Section. | • Aircraft<br>• APU<br>• GSE<br>• Vehicles<br>• Stationary power plants<br>• Construction equipment | • Air quality<br>• Climate change |
| | | | |

As aircraft and vehicle emissions mix with the ambient atmosphere, further chemical reactions occur. These reactions involve both molecules emitted from the aircraft and vehicle engines as well as molecules already in the air. For example, ozone is formed by the reaction of VOCs and $NO_x$ in the presence of heat and sunlight. Also, complex chemical reactions and/or particle nucleation processes can produce new particles or add to pre-existing particles. The subsequent particles that are formed can be an order of magnitude greater than primary particles[10]. These particles are estimated to represent more than 95% of total particle formation[11] and expose people over a much broader geographic range. Other examples are the conversion of nitrogen dioxide ($NO_2$) from the plume to nitric acid ($HNO_3$) vapor that interacts with ammonia in the atmosphere and forms ammonium nitrate ($NH_4NO_3$) particles and oxidation reactions involving gaseous hydrocarbons from the plume, yielding condensable organic compounds that form organic aerosol particles. Ammonia, stemming primarily from agricultural activities, is the main alkaline component in the atmosphere and is highly reactive in forming aerosols.

### Aviation Climate Change Emissions Compared to Other Transportation Modes.

Only some, but not all, greenhouse gas emissions, such as $CO_2$, are directly related to fuel use, and most transportation modes use similar fuels. For that reason, energy intensity – the amount of energy consumed to transport one passenger one mile – is a useful metric for comparing greenhouse gas emissions among different transportation modes. Rail, at 2,750 BTU/passenger miles, has the lowest energy use per passenger mile among primary transport modes and transit buses the highest at 4,364 BTU/passenger miles.[12] Aviation and automobiles have efficiencies between those two.

Aviation stands out among transportation modes, however, in terms of improving fuel efficiency over the past decade. As shown in Figure 1: Comparison of Vehicle Fuel Efficiency, in 2004, automobiles and airlines operating in the U.S. had very similar energy intensities, with automobiles at 3,496 BTU/passenger mile versus airlines at 3,505 BTU/passenger mile. Between 2004 and 2012, auto energy intensity fell to



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3,193 BTU/passenger mile, for an 8.8% improvement. For the same period, aviation energy intensity fell to 2,654 BTU/passenger mile, a 24.3% improvement and is now significantly lower than automobiles.

These trends were confirmed in a recent study. Aviation is now approaching rail as the most energy efficient transportation mode based on energy intensity per passenger mile.

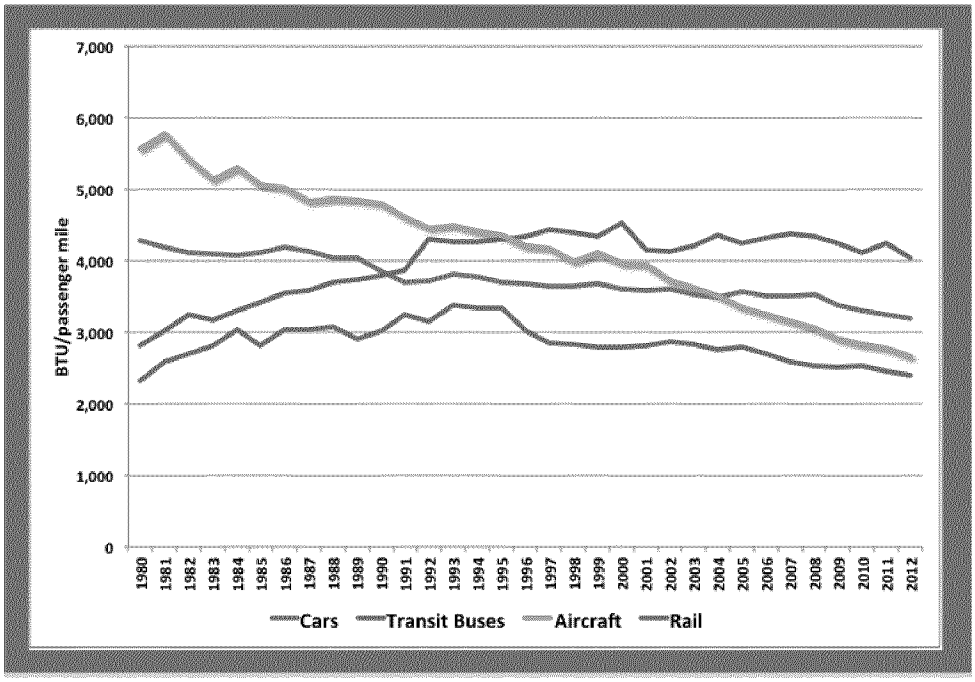


**Figure 1: Comparison of Vehicle Fuel Efficiency**
U.S. data for different transportation modes from various government agency data resources as compiled by the Oak Ridge National Laboratory Center for Transportation Analysis[13]

### Aviation Emissions Compared to Other Transportation Modes.

Aviation has grown faster than other modes of transportation and is expected to outpace them in the future. Despite this growth, aviation's contribution to emissions inventories compared to other transportation sources has remained modest, particularly compared to on-road sources. Although the *rate of growth* in the mass of aviation $NO_x$ emissions has exceeded on-road (i.e., cars and trucks) $NO_x$ emissions growth, the *quantity of emissions* of other transport modes still far exceeds those from aviation as illustrated in Figure 2: Transportation Emissions. In part this is not surprising as most of an aircraft's operations take place at altitude where emissions have an uncertain and indirect effect on ground-level air quality spread out over a wide geographic area. This is in contrast to cars and trucks that primarily operate within a single air quality region and always at ground level.



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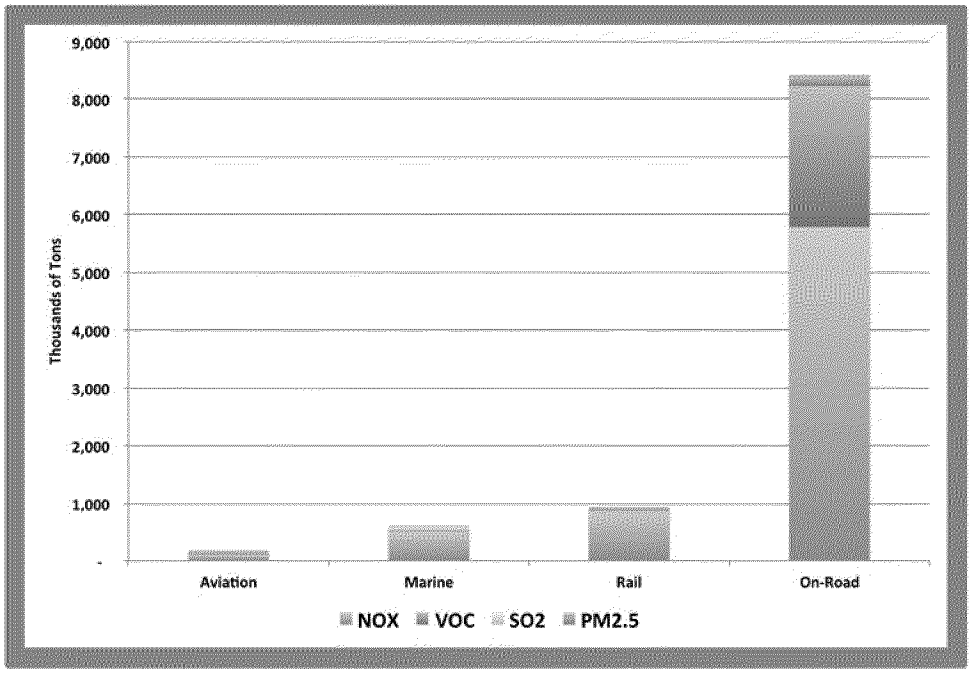


**Figure 2: U.S. Transportation Emissions**
2011 total U.S. pollutant emissions from primary transportation modes[14]

In the future, $NO_x$ emissions from on-road vehicles will fall in response to the most recent environmental regulations, which call for nearly doubling corporate average fuel economy from 29 miles per gallon currently to 54.5 miles per gallon by 2025.[15] Nonetheless, pressure on aviation sources will likely remain as many states and localities will face the challenges of meeting new ozone and particulate matter standards at the same time non-aviation source reductions become more difficult and costly.

### Aviation Emissions Compared to Other Sources of Emissions.

There is an understandable interest in comparing the total mass of emissions coming from an airport to those of a power plant or petroleum refinery in the same region.[16] Airports, however, are quite different from most other emissions sources. Like cities, they comprise a variety of different emission sources. Aircraft arrive at the airport, stay for a short period and depart, with a different aircraft taking off or landing every few minutes. Passenger cars, shuttle buses, and taxis calling on the airport do not operate there exclusively, also serving homes and retail, commercial, and governmental establishments. Power boilers and chillers at the airport are independently permitted, as is similar equipment at other locations. For these reasons it is difficult to compare the composite of sources that make up an airport to another emission source like an industrial facility or power plant. Table 2 provides a list of the contributions of aircraft emissions to major metropolitan statistical areas inventories with the highest contribution of aircraft emissions to total inventory.



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**Table 2: Aircraft Emissions Contribution to Metropolitan Area Emissions Inventories**

| Metropolitan Area | $NO_x$% | VOC% | $PM_{2.5}$% |
|---|---|---|---|
| **Washington, DC** | 1.22 | 0.57 | 0.21 |
| **Philadelphia** | 0.64 | 0.35 | 0.20 |
| **New York** | 1.40 | 0.42 | 0.41 |
| **Denver** | 1.42 | 0.54 | 0.31 |
| **San Francisco** | 1.57 | 0.63 | 0.29 |
| **Dallas** | 1.76 | 0.58 | 0.23 |
| **Minneapolis** | 1.07 | 0.59 | 0.39 |
| **Chicago** | 1.27 | 0.49 | 0.36 |

The contribution of aircraft LTO (Landing-Take Off) operations at commercial service airports to emissions inventories has been calculated at an average of 0.37% for $SO_x$ (with a range of 0.002% to 6.91%) and 0.44% for CO (ranging from 0.06% to 4.36%).[17]

### Effects of Economic Growth on Emissions.

The level of aviation activity reflects the overall demand for worldwide travel and trade. Demand for travel services, both passenger travel and freight transportation, increased substantially in the last third of a century. Since 1980, gross domestic product (GDP) in the U.S. has increased by 140%[18] and air travel has increased by 134%.[19] Over the long term, it is expected that demand for air transportation will continue to grow. Current forecasts are for 2.3% per year growth of enplanements over the next two decades, resulting in 58% more passengers.[20] As a result, growth of the aircraft fleet and expansion and further development of existing airports are expected. This also means that emissions from aviation activity are expected to increase unless the improvements in operational efficiency, sustainable alternative fuels, and associated low-emissions technologies discussed below can offset that growth.

### Trends in Aviation Emissions.

While aviation activity is forecasted to grow, emissions are also dependent on other factors including:

- Aircraft construction materials and technological sophistication – the lighter, more aerodynamic and technologically sophisticated an aircraft is, the less fuel it will use.
- Aircraft operations – the less time an aircraft spends taxiing or idling on the ground and the more direct routing a flight can take, the less fuel it will use. Restricted or congested air space, adverse weather, congested airports, and inefficient ground operations can all result in increased emissions.
- Fuel composition – while they are needed in small quantities, the presence of sulfur and heavy or complex hydrocarbon molecules such as aromatic compounds create particle pollutants and reduce combustion efficiency.



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As demonstrated by the fuel efficiency trends in Figure 1, technological advancement in aircraft engine design has reduced aircraft fuel consumption and emissions on a per flight basis significantly over the past several decades. During this same era, the industry developed and deployed new, lightweight, high-strength materials, automated navigational, operational, and engine control systems, and employed vast new computational capabilities to improve aerodynamic efficiency and integrate highly complex operational structures such as hub and spoke airport networks. Jet aircraft in service today are over 70% more fuel efficient per seat-kilometer than the first jets in the 1960s.[21]

Although new aircraft are significantly more fuel efficient, average fuel economy for the worldwide commercial aircraft fleet improves slowly because commercial passenger service aircraft typically remain in the fleet for 30-35 years. As they age, existing aircraft are retired and replaced with new aircraft as illustrated in Figure 3: Growth and Replacement of Passenger Aircraft. New aircraft also are added to the fleet for new capacity. In 10 years, 52% of the fleet will be new aircraft, increasing to 86% in 20 years. These new aircraft will incorporate advanced technology and capabilities with a corresponding improvement in fuel efficiency.

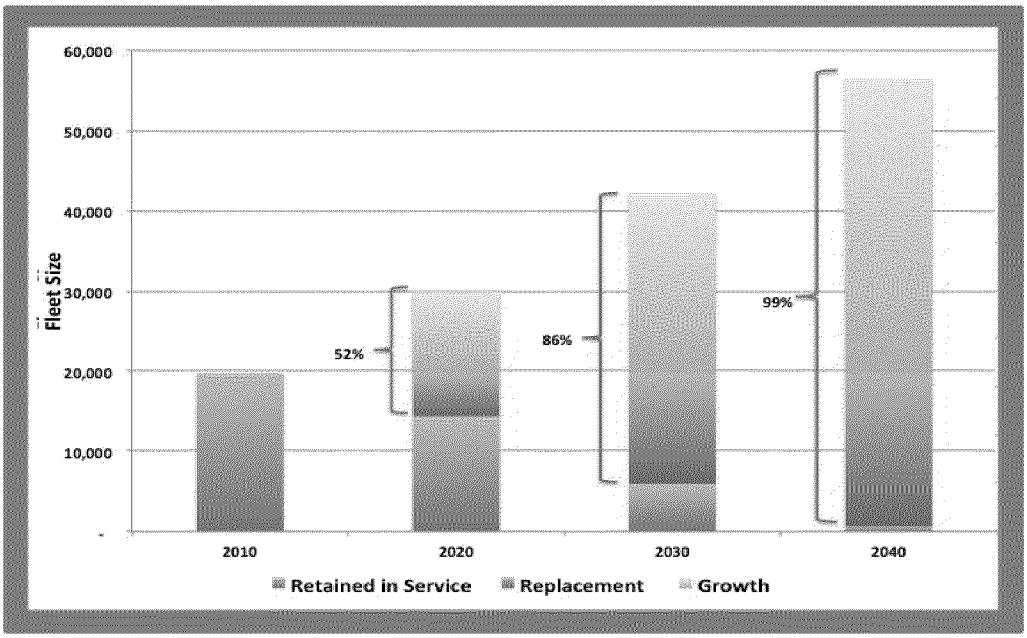


**Figure 3: Growth and Replacement of Passenger Aircraft**
Worldwide fleet growth and replacement forecast based on historic aircraft retirement for large commercial aircraft [22]

The FAA today is focused on transforming the Nation's airspace system. The Agency has launched the NextGen program,[23] which will overhaul the nation's air traffic control system. Significant effort is going into reducing congestion and delay. The planned improvements will also increase system reliability. These changes will speed up the reductions in emissions on a per flight basis.



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Efforts are underway to improve the jet fuel being used, which has the effect of reducing emissions. New alternative fuels such as those produced from biological materials could dramatically reduce aviation $CO_2$ emissions. By tailoring fuel quality to engine design aircraft will be able to produce fewer emissions per flight. Jet fuel issues are the subject of research by the Partnership for Air Transportation Noise and Emissions Reduction (PARTNER) program. Recently completed Project 28 (Environmental Cost-Benefit Analysis of Alternative Jet Fuels)[24] has significantly improved understanding of the environmental costs and benefits of alternative jet fuels. It evaluated life cycle greenhouse gas emissions from alternative jet fuels on a screening level, developed a first-order fuel production cost model, developed alternative fuel usage scenarios that deliver specified greenhouse gas reductions and expanded the environmental analysis to consider sustainability in terms of land, water, and air. The sustainability assessment started under Project 28 is the primary basis for ongoing research extending the applicability of that assessment to additional technology sets and feedstock options, to develop scenarios for biofuel deployment, and to conduct tradeoff analyses among different metrics and options. Alternative jet fuel sustainability has become a focused topic for research by the FAA. The results of this work are relevant to the NextGen environmental and energy goals relating to the development of alternative jet fuels, and offer important information to regulators, fuel producers and fuel procuring agencies as to the overall sustainability of different feedstock and technology options.



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# Emission Impacts

Aviation emissions affect both air quality and the global climate. Compared to other economic sectors, commercial aviation is a relatively small contributor to emissions of concern for both air quality and climate change. However, aviation emissions occur in the climatically sensitive upper troposphere and lower stratosphere where they may have a disproportionate impact on climate. They also occur at high altitudes where their impact may be felt at large distances away from where they are released.

In this section we discuss how aircraft emissions affect human health and the environment and how they are regulated to limit harmful effects. There are three factors to consider in evaluating emissions' impacts: 1) The quantity and characteristics of emissions; 2) how humans and sensitive environments get exposed to them; and 3) their human health and environmental effects.

### Measuring Aviation Emissions.

Aviation stakeholders, including the FAA, commercial airlines, airframe and engine manufacturers, NASA, EPA, and the U.S. military, have a long history of conducting research to measure the amount and composition of aviation emissions. In recent years there have been several emission measurement programs that have significantly increased the knowledge of aircraft emissions. The Aircraft Particle Emissions eXperiment (APEX)[25] tests were conducted between 2004 and 2006 and measured emissions throughout the power range of aircraft engines using a variety of fuels. The tests measured emissions at the exit of the engine as well as downstream in the exhaust plume as they cooled and mixed with ambient air to evaluate the chemical and physical changes that take place. Engines of various sizes were included in these programs. More recent tests have measured emissions from other aviation sources such as APU, GSE, and aircraft tires and brakes.

Knowing the amount and characteristics of the emissions from various aviation sources is only part of the story. It is also important to know about their combined emissions at airports. The FAA,[26] commercial airports, the U.S. military,[27] National Academy of Science Transportation Research Board,[28] and other stakeholders have carried out several projects that measured emissions and air quality in and around airports. Measurements have been conducted on airports, in communities adjacent to airports, and downwind of airports for airports ranging from large hub airports to small, local airports.

Over the past decade many more projects[29] have measured and characterized aviation emissions. These projects have helped researchers understand where emissions are released, what they are made of and how they change chemically and physically, how they disperse in the air, and where they end up.

Today a great deal is understood about the amount and type of emissions that come from aviation operations. However, tracking emissions from a wide variety of sources operating simultaneously, which are spread out over an airport, and which are being influenced by changing operating schedules and the dynamic effects of variable weather, is challenging. To make sense of all of the measurement data and



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information that has been gained about emissions, powerful tools have been developed that help to track and assess the impacts of aviation emissions.

### Modeling Emissions and Exposure.

Computer models are the tools we use to assess environmental effects. The first models were simple and quantified emissions from individual sources. In the past decade, FAA has developed a suite of software tools that allow for a more thorough assessment of the environmental effects of aviation. NASA, Transport Canada, industry, and academia aided this multi-year development process.

The focus of this development effort has been to incorporate the best scientific understanding into the tools, by building on the body of data from the measurement programs. After quantifying emissions from multiple sources over a common time period, current models show how weather and other atmospheric conditions cause the emissions to migrate or disperse into the environment. Adding dispersion capabilities was a significant milestone in model development. Dispersion analysis allows the modeler to calculate the concentration of emissions at various points on and off the airport. This in turn shows the degree to which passengers, citizens living nearby, and the local community are exposed to aviation emissions. Furthermore, these tools can provide a before-and-after comparison of pollutant concentrations for planned airport improvements as a way of demonstrating project impacts.

The primary building block of this new suite of software tools is the Aviation Environmental Design Tool (AEDT)[30], which integrates existing noise and emissions models and helps assess interdependencies. AEDT is currently used by the U.S. Government for domestic planning, environmental compliance, and research analysis. Another element of the suite, targeted to the government research community, is the assessment of aircraft performance using tools such as Environmental Design Space (EDS)[31] Piano (Project Interactive Analysis and Optimization)[32], TASOPT (Transport Aircraft System OPTimization[33], and SUAVE (Stanford University Aerospace Vehicle Environment)[34]. These tools are used to address different types of questions that are being asked. EDS is an aircraft and engine analysis tool capable of estimating source noise, exhaust emissions, performance and economic parameters for future aircraft designs under different technological, operational, policy, and market scenarios. EDS can assess interdependencies between noise, emissions, and performance at the aircraft level. PIANO is used to extract aerodynamic and performance data for aircraft manufactures that did not provide this data. TASOPT was used in PARTNER Project 48 [35](Development of a Distributed Approach to System Level Uncertainty Quantification) in the creation of a new aircraft conceptual design capability in the FAA tools suite and in developing an approach to perform a system-level quantification of uncertainty. SUAVE is a design tool that allows for an arbitrary aerospace vehicle to be designed with an arbitrary level of fidelity in its supporting data. It was used in PARTNER Project 43 (Analysis of Mission Specifications).[36]

This allows FAA to analyze fleet level impacts of future aircraft designs. To complete the suite of tools, the Aviation Environmental Portfolio Management Tool (APMT) is under development. Initially targeted



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for government use, APMT adds environmental impact and economic analysis capabilities to the tool suite.[37]

Each model in this environmental tools suite can be run independently, to allow focus on specific aspects of the analysis, but also can operate in an integrated fashion. This current suite of tools provides the ability to characterize and quantify aviation emissions, impacts on health and welfare, and industry and consumer costs, at local, regional, national and international levels. Users can assess different policy, technology, operational, and market scenarios and also evaluate the interdependencies between emissions and noise and understand the cost impacts. With this suite of models, different options for mitigating the impacts of emissions can be evaluated. For example, FAA can assess the environmental benefits of air traffic management system modernization alternatives, evaluate new engine and airframe designs, and assess health and economic impacts from the use of alternative fuels. The models also allow the FAA to coordinate with foreign counterparts through the International Civil Aviation Organization (ICAO), a United Nations intergovernmental body responsible for worldwide planning, implementation, and coordination of civil aviation, and ICAO's Committee on Aviation Environmental Protection (CAEP).[38]

### Aviation Emissions and Air Quality.

Particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead are common air pollutants found in the atmosphere across the United States. These pollutants can harm human health and the environment, and cause property damage. Of the six pollutants, particle pollution and ground-level ozone are the most widespread health threats. EPA regulates ground-level ozone, which is not emitted directly but is formed when nitrogen oxides and hydrocarbons react in the atmosphere in the presence of sunlight. Since 1980, total U.S. emissions of certain air pollutants EPA regulates ($NO_x$, $SO_x$, PM, CO, and lead (Pb)) have declined significantly, according to their 2012 report *National Emissions Inventory (NEI) Air Pollutant Emissions Trends Data*.[39] As shown in Figure 4, $NO_x$ decreased 46 percent, sulfur dioxide ($SO_2$) emissions have decreased 63 percent, and emissions of particles less than 2.5 micrometers ($PM_{2.5}$ ) declined by 11 percent. At least half of these reductions occurred within the last five years. In spite of these successes, ground-level ozone and particles less than 2.5 micrometers ($PM_{2.5}$) continue to present challenges in many areas of the country.[40]

Total national pollutant emissions do not tell the full story with regard to aviation's contribution in regions with air quality problems. EPA data confirms that the worst air quality generally occurs in and around cities, which is also where aviation activity primarily occurs. The Clean Air Act, which will be discussed in further detail later in the document, requires EPA to determine whether regions within the U.S. comply with (i.e. attain) National Ambient Air Quality Standards (NAAQS).[41] Many U.S. airports are in nonattainment areas: 43 of the 50 largest airports are in ozone ($O_3$) nonattainment areas and 12 are in $PM_{2.5}$ nonattainment areas.[42] Aviation's contribution to a region's air emissions inventory is generally small, as is shown in Table 2.[43]



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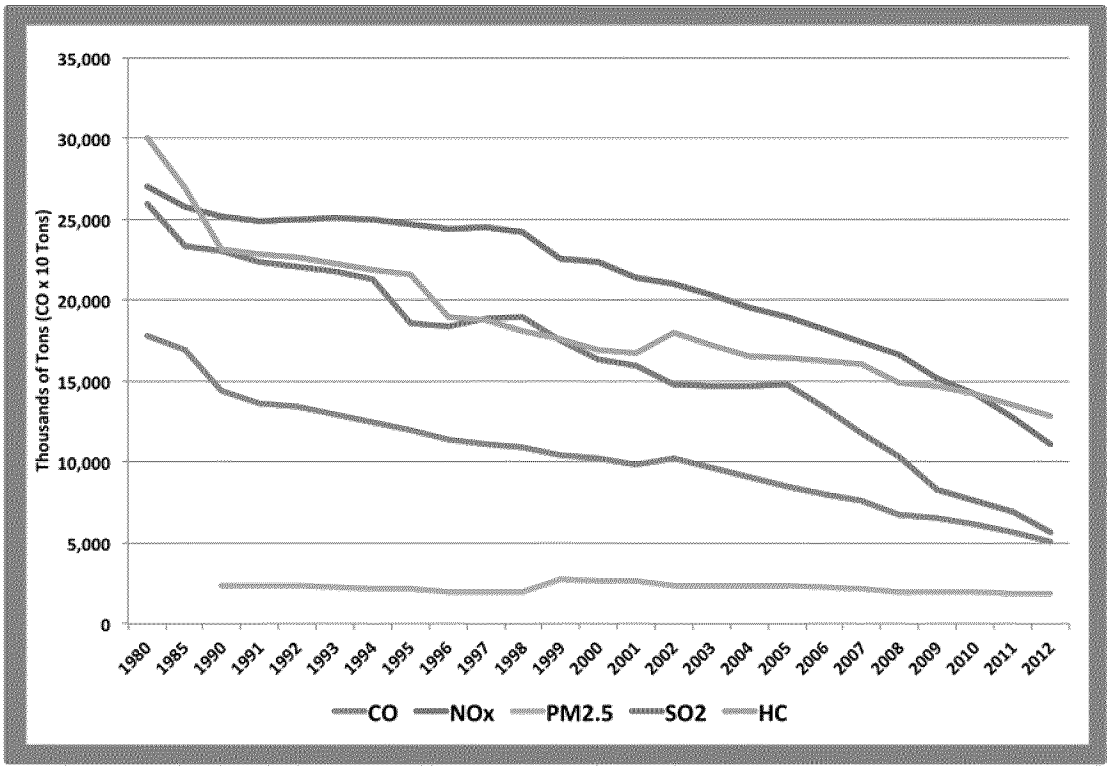


**Figure 4: U.S. Pollutant Emissions from All Emission Sources**
U.S. annual pollutant emissions[44]

According to the National Environmental Policy Act, airport construction projects that are funded with public dollars must not interfere with a region's ability to attain the NAAQS. For capacity enhancing projects, emissions mitigation projects may be necessary for an airport expansion to proceed. Such projects may include converting airport shuttle buses and other vehicles to low emission alternative fuels such as compressed natural gas or electricity, installing gate electrification and preconditioned air services so that aircraft do not have to run their auxiliary power units when parked at the gate, or installing solar energy panels to produce electricity.

In the past few years, scientists have hypothesized that aircraft emissions released at cruise altitude, particularly $SO_x$ and $NO_x$, are likely to produce additional secondary PM that is transported very long distances (continent to continent) and then deposited to the surface of the Earth to affect air quality.[45] These results need to be confirmed to understand the significance of these emissions. FAA has several research projects underway to better understand the science and mechanisms involved and to quantify local air quality impacts from cruise emissions.[46]



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### Aviation Emissions and Climate Change.

Concern regarding greenhouse gas emissions has been building worldwide. Total U.S. greenhouse gas emissions have increased at an average annual rate of 0.4 percent since 1990.[47] Transportation emissions in the U.S. have increased about twice that fast and by 2012 accounted for about 28% of total U.S. $CO_2$ emissions, as illustrated in Figure 5: U.S. Greenhouse Gas Emissions by Economic Sector. Aviation accounts for about 12% of transportation emissions, or 3.36% of total $CO_2$ emissions in the U.S.

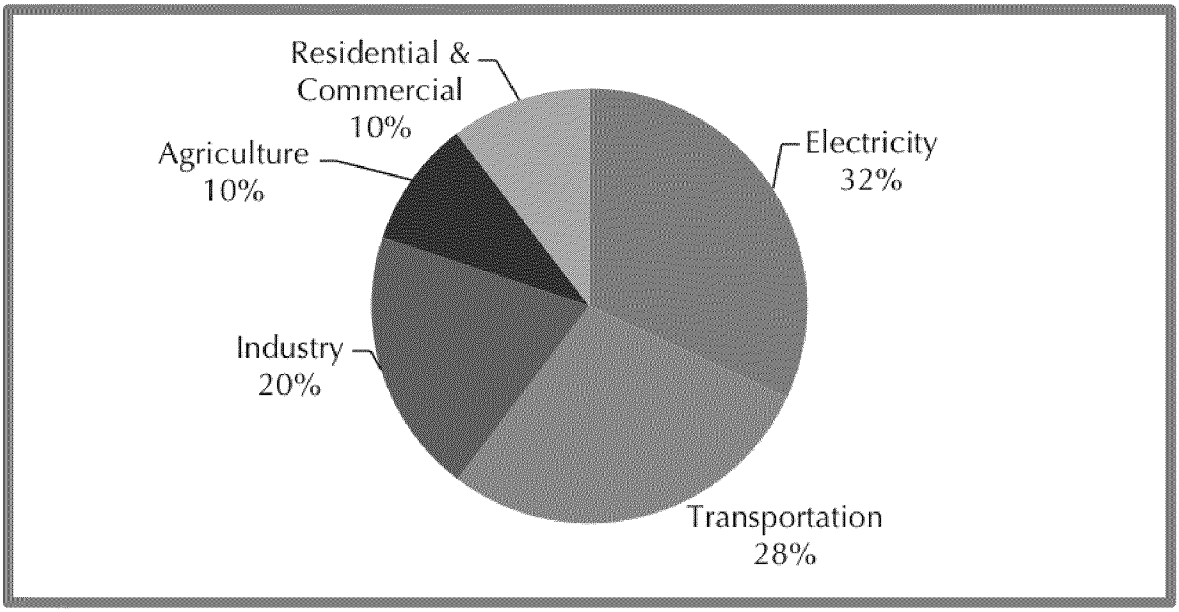


**Figure 5: U.S. Greenhouse Gas Emissions by Economic Sector (2012)** [48]

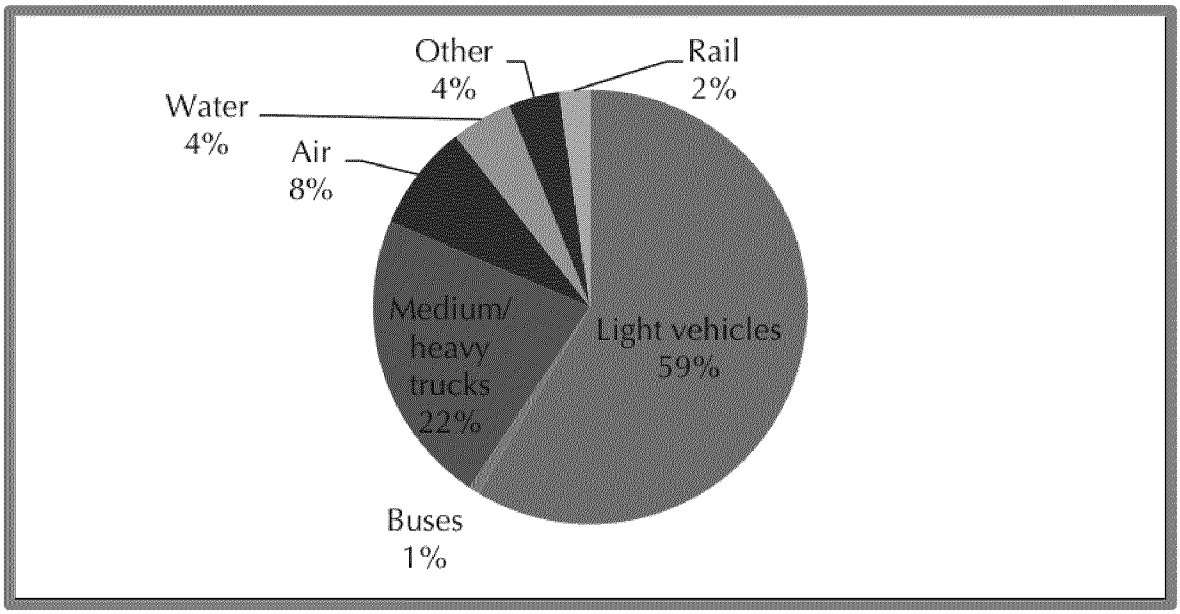


**Figure 6: Transportation Energy Use by Mode (2012)**[49]



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Similarly the latest global climate research indicates that aviation's contribution to human-induced climate change is between 3.5% and 4.9%.[50] This share is forecast to increase to between 4.4% and 6.2%, by 2050[51] unless new technologies and policies are adopted to reduce aviation emissions. There remains a great deal of uncertainty in estimated impacts on climate change, which is being resolved through ongoing research efforts.[52]

The climatic impacts of aviation emissions are quite complex and include direct climate effects from $CO_2$ and water vapor emissions, the indirect effect on climate resulting from changes in the distributions and concentrations of $O_3$ and methane ($CH_4$) due to $NO_x$ emissions, the direct effects (and indirect effects on clouds) from emitted aerosols and aerosol precursors, and the climate effects associated with contrails and cirrus cloud formation.

Climate effects are due to interaction with solar and thermal radiation by gases such as carbon-dioxide and water vapor (see Figure 7 below), as well as pollutants such as CO, HC and black carbon (BC) particles arising from incomplete combustion in the gas turbine combustor. SOx emissions form sulfuric acid in the presence of water vapor, which further interacts with ammonia ($NH_3$) in the Earth's boundary layer to form ammonium sulfate particles. NOx emissions affect the formation of ozone and form nitric acid ($HNO_3$) at cruise altitudes and ammonium nitrate particles in the boundary layer in the presence of ammonia, thus affecting air quality. The soot particles at cruise altitudes interact with other chemicals such as sulfuric acid and nitric acid to form small particles that act as nucleating sites for condensation of water vapor present in the upper atmosphere under certain conditions to form larger particles to form condensation trails or contrails, for short. These contrails are visible along flight tracks with a short lifetime around a few hours. At times, under the right meteorological conditions these contrails expand perpendicular to the flight tracks to form contrail-induced cirrus clouds that also interact with shortwave and longwave radiation, thus affecting climate.



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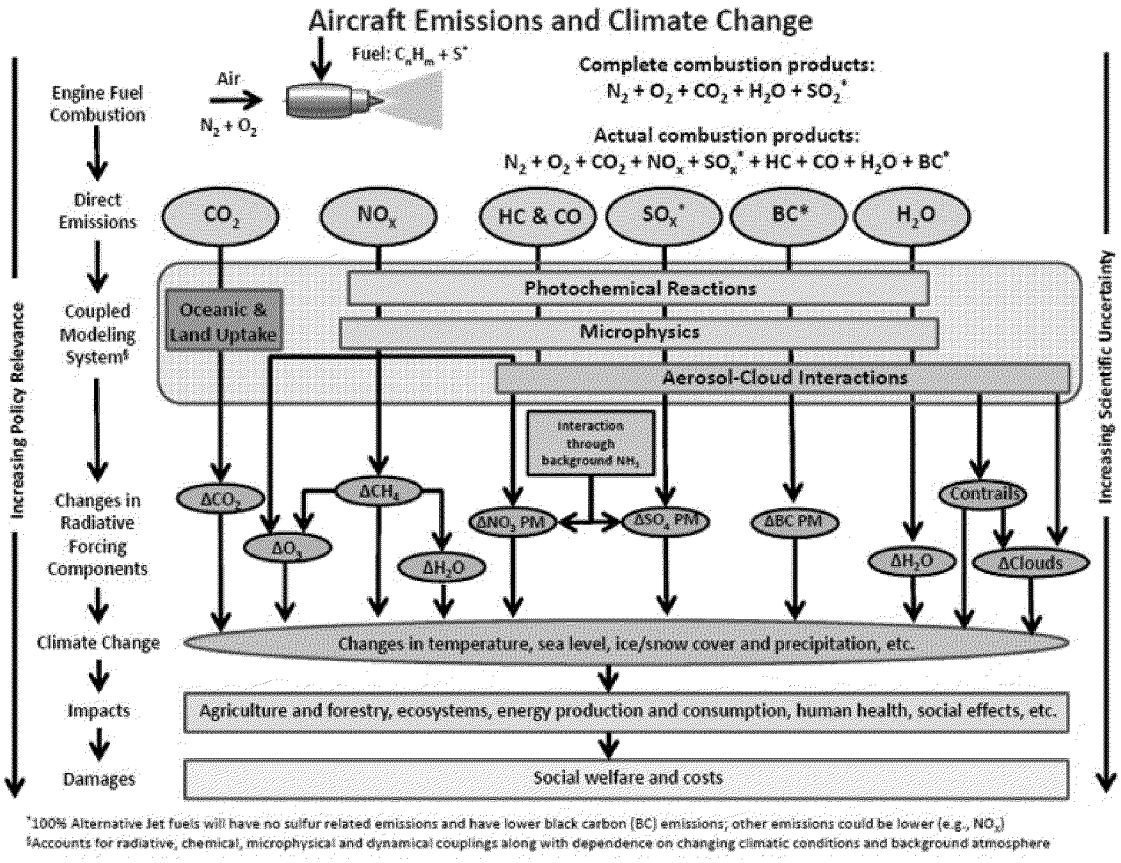


**Figure 7: Schematic representation of emissions from aircraft combustion[53]**

Atmospheric and climate system interactions (e.g. chemical, microphysical, dynamical and radiative) of aircraft emissions remain poorly understood and require more research. Figure 7 is a graphical representation of the current understanding of the potential climate and social welfare impacts of emissions from aircraft combustion.

The figure above also shows policy implications at various stages of these emissions, with increasing policy relevance downward. The formation of gases and particles that interact with radiation affect climate and air quality at the surface. Minimization of these products is therefore desirable. Mitigation options such as altering the routes to prevent formation of contrails, redesigning engine combustors with high bypass ratios to reduce temperatures to minimize formation of NOx, and reducing impurities such as sulfur in the fuel to minimize formation of particles are all examples of results of policy decisions to minimize climate impacts. Ultimately such actions result in reducing the costs to the society and increase social welfare in the form of impacts on health and wellbeing.



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### Regulation of Aviation Emissions.

A wide range of environmental regulations applies to airport activity and equipment. Aircraft engines have certification requirements for CO, HC, $NO_x$, and smoke emissions. Ground access vehicles are subject to tailpipe emission standards, and GSE may be subject to nonroad engine standards. The composition of jet fuel, diesel fuel, and gasoline are all regulated to limit harmful emissions, ensure proper performance of engines and fuel systems, and avoid engine durability concerns. The reduction in the level of sulfur in gasoline is justified by its known reduction in the efficiency of catalytic converters, which means these devices are less capable of removing emissions from exhaust gases. Thus, removing sulfur is a means of reducing other emissions of toxins from ground vehicle exhausts. Reduction of naphthalenes in fuel reduces the formation of carbonaceous particles that are potentially harmful, because they can cause erosion on turbine blades and form hot spots that can lead to premature engine failure. Many operational activities and equipment require permits. The FAA must consider the air quality impact of actions it undertakes, licenses, or funds and determine that airport expansion plans conform to regional air quality plans.

The Clean Air Act (CAA)[54] is the primary, overarching air quality law in the U.S. The CAA establishes EPA as the agency responsible for setting appropriate air quality standards and developing regulations to meet those standards. EPA sets standards for ambient air quality in geographic regions that generally represent metropolitan areas. Under the CAA, EPA sets the NAAQS for $NO_2$, $SO_2$, $PM_{2.5}$, CO, $O_3$ and lead (Pb). EPA sets most regulatory standards but many permitting programs are administered by state agencies. With respect to aircraft engines, the CAA requires EPA to consult with the FAA and provides the FAA with the authority to enforce EPA's aircraft engine emissions standards through its certification regulations.[55] FAA is responsible for ensuring these regulations do not pose conflicts with safety and other aircraft operational requirements. For example there are more than 60 standards[56] that apply to aircraft engine design, materials of construction, durability, instrumentation and control, and safety, among others. These are in addition to the Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes,[57] which specify compliance with EPA's aircraft exhaust emission standards.

The National Environmental Policy Act of 1969 (NEPA)[58] requires federal agencies to consider the environmental impacts of their actions, which could include grants, loans, leases, permits and approval of plans or projects. NEPA applies to most airport construction projects as a result of FAA funding or approval. Some actions that are subject to NEPA review also trigger the CAA's "general conformity" provision, which seeks to ensure that actions approved by the federal government do not interfere with a region's plan to meet air quality standards.[59] Federal agencies must ensure that proposed project emissions from Federal actions at airports located in nonattainment areas "conform" to the applicable State Implementation Plan.



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Internationally, ICAO has long been the forum for evaluating the environmental performance of aircraft engines. ICAO has taken a "technology progressing" approach, raising standards within the capabilities of proven technologies and certified products (engines and aircraft) rather than a "technology forcing" approach, which would set standards based on technology that is not certified or may not even exist. The reason for ICAO's approach is quite simple – the very high premium placed on the safety of aircraft operation restricts the use of unproven new technologies.

## Health and Environmental Effects of Aviation Emissions.

### *Particulate Matter (PM).*

The FAA continues to sponsor research[60] to understand and evaluate how aviation emissions contribute to local and regional air quality, through a combination of measurement and modeling studies using the most advanced computer tools, and to evaluate the potential incremental health risks due to air pollutants such as particulate matter, ozone, and hazardous air pollutants. This research has built on the extensive health impacts research undertaken over many years by EPA and medical research organizations. Research to date indicates that fine particulate matter is responsible for the majority of the health risks from aviation emissions, although ozone also has a substantial health impact too. A comprehensive health impacts analysis should include the impacts of ozone and other pollutants as well.[61]

Throughout the transformation process, particles form in various sizes. As a general rule, the smaller the particle the further it travels in the atmosphere, the longer it remains suspended in the atmosphere, and the more risk it poses to human health. Particulate matter includes both primary PM, which is directly emitted into the air, and secondary PM, which is formed through physical and chemical atmospheric processes. $PM_{2.5}$ can be readily inhaled and thus potentially pose increased health risks. These particles are too small to readily settle out of the atmosphere. They can be transported thousands of miles and remain in the atmosphere for days to weeks.[62] Additionally, fine particles suspended in the atmosphere absorb and reflect light, which is the major cause of reduced visibility (haze) in parts of the United States. Ultrafine particles are a subset of $PM_{2.5}$, measuring less than 0.1 micrometer in diameter.

There are multiple health effects associated with exposure to PM, including impacts to the respiratory, cardiovascular, and neurological systems.[63] Smaller particles less than 2.5 micrometers in diameter, which are typical of aviation emission, tend to pose higher risk since they migrate deeper into the lungs and bloodstream causing cardiovascular effects and even affecting the nervous system. Human exposure to small particles can aggravate heart and lung disease resulting in increased hospital admissions, emergency room visits, and absences from school or work. Older adults, children, and people with heart or lung disease are the most sensitive to exposure to PM.

Preliminary research suggests that of the premature mortalities related to emissions from all combustion sources, less than 1% are associated with aviation emissions.[64] In the future, the relative health risks of



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aviation emissions will be strongly influenced by changing background pollutant concentrations and population growth as well as changing non-aviation emissions.

EPA set the first PM standards[65] in 1971. The standards were revised in 1987, 1997, 2006, and again in 2013.[66] EPA no longer regulates particles larger than 10 micrometers (e.g., sand and large dust), which was the focus of the original standards, since they are not deemed readily inhalable. The local PM concentration is the sum of all regional sources of PM and the regional ambient background. PM emissions from airports and other regional sources mix relatively quickly with the ambient background PM. The combination of emissions from airports and other regional sources and ambient concentrations of PM result in a combined atmospheric PM loading that depends on complex atmospheric processes, including chemical reactions and pollution transport. This makes it difficult to isolate the contribution of airport activity from all other emissions sources in an area.

In addition to the CAA's NAAQS there are other regulations that directly or indirectly effect PM emissions from aviation. For example, ICAO has established aircraft engine certification standards[67] that limit smoke emissions, as measured by "smoke number."[68] The smoke standards took effect in 1983. Since smoke is an indicator of PM emissions, these standards have been indirectly influencing aircraft PM emissions for the past 30 years.

As described earlier, sulfur in jet fuel combines with oxygen from the air during combustion, producing $SO_2$, a portion of which eventually produces secondary particulate matter. Sulfur emissions are directly related to the sulfur content of the fuel. Internationally accepted standards[69] for Jet A, which is the commercial aviation fuel used in the US, limit fuel sulfur content to 0.30% wt. (3,000 PPM S) maximum. In practice, however, weighted mean sulfur levels for Jet A sulfur measured in the 2010 survey are well below the typical maximum specification limit. The four month averaged weighted mean sulfur level on the overall U.S. was 544 PPMS, a 23% drop from the 2007 to the 2010 levels.[70]

EPA has required diesel fuel suppliers for nonroad equipment to reduce fuel sulfur content to the same ultra-low sulfur limits required for on-road diesel. This allows the nonroad equipment to use advanced emission control technologies. These requirements for diesel fuel sulfur limits and engine emission standards will reduce PM emissions from nonroad equipment by 90%.[71] GSE using alternative fuels such as compressed natural gas and propane have 25% lower PM emissions[72] and those powered by electricity[73] have no PM emissions.

In 2007, EPA proposed new exhaust emission standards[74] for non-road diesel engines. These standards are being phased in between 2008 and 2014 and require engine manufacturers to produce new engines with advanced emission control technologies. New GSE with diesel engines are required to meet these standards. This new equipment achieves emission performance comparable to today's automobiles.

Stationary emission sources at airports include various facilities and equipment like boilers, emergency generators, incinerators, fire training facilities, and fuel storage tanks. Many of these equipment types



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require specific operating permits with PM emission limits. Stationary sources typically represent about 1-2% of PM emissions at airports.[75] Individual particle species that do not appear to be harmful may be so when occurring in a mixture. PM can be solids, like dust, ash, or soot, and it can also be completely liquid aerosols or solids suspended in liquid mixtures.[76] Measures to reduce particles will reduce all components of the mixtures. Batteries of scientific studies have linked particulate matter, especially fine particles either alone or in combination with other air pollutants, with a series of significant health problems. The relation to adverse health effects has made fine particulate matter of primary concern in aviation studies. These are topics for ongoing and future research.[77]

### *Oxides of Nitrogen (NOx).*

ICAO has established international certification limits[78] for oxides of nitrogen ($NO_x$) emissions from jet engines that limit the amount of $NO_x$ emitted. EPA has adopted ICAO's certification standards as national regulations.[79] FAA, in turn, enforces these standards through engine certification.

Current $NO_x$ emission standards for aircraft engines were established in 2012[80], which is a tightening of the prior standards. This is the fourth change since the original standards were agreed to in 1981. New standards went into effect for engines entering service beginning in 2013, which reflect a 12 percent $NO_x$ reduction over the 2008 standards. ICAO's CAEP has since recommended new certification standards that represent a further 15 percent $NO_x$ reduction, with an effective date of 2014.[81] For aircraft, new $NO_x$ certification standards are being considered that will reduce their total $NO_x$ emissions. Aviation $NO_x$ emissions are still projected to be less than 3 percent of the transportation $NO_x$ inventory by 2020.[82]

While there currently are no national or international regulations for greenhouse gas emissions that apply to aircraft or other airport sources, the aviation industry has made significant strides here as well. Aircraft have a long history of continuously improved fuel efficiency (measured in fuel use per passenger mile), which reduces all greenhouse gas emissions. For example, according to Boeing, the Boeing-787 is 20 percent more efficient than the Boeing-767, which it succeeds[83] and the Boeing-737N (the Max) burns 14% less fuel than today's Beoing-737-800NG.[84] Fuel efficiency and energy conservation are also priorities at many airports.[85]

### Future Regulations.

The FAA is working through ICAO to evaluate policy options to limit or reduce greenhouse gas emissions from international aviation. ICAO has developed a range of standards, policies and guidance material for the application of integrated measures to address aircraft noise and engine emissions. Efforts include progress on new aircraft technology advancement, operational improvements and development and deployment of alternative fuels, as well as a commitment to develop a global market-based measure for international aviation and appropriate airport and land-use planning. Through the ICAO's CAEP, FAA is supporting development of an aircraft $CO_2$ emission standard. The standard is expected to reduce aircraft $CO_2$ emissions by integrating fuel-efficient technologies into aircraft design and development. It has been



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developed such that effective improvements observed through the $CO_2$ standard will correlate with reductions of $CO_2$ emissions by aircraft during day-to-day operations. CAEP is developing an aircraft engine PM certification standard as well.

In October 2013, the 38th ICAO Assembly adopted a comprehensive climate change resolution that includes a commitment to develop a global market-based measure to address GHG emissions from international aviation. The U.S. is committed to pursuing development of a global market-based measure (MBM) proposal. It has to be considered as gap filler in the basket of measures that includes technology, operations and alternative fuels. These efforts contribute to achieving ICAO's aspirational goal of carbon neutral growth by 2020 using a 2005 baseline. The U.S. is engaged both in supporting policy and technical work contributing to the proposal for a global MBM.

Under this multidimensional regulatory and voluntary structure, aviation has made significant environmental progress. Given the complexity of the industry and the need for different strategies and technological approaches for different types of vehicles and equipment, a coordinated effort will continue between the aviation industry and the many regulatory agencies that share environmental responsibilities.



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# Mitigating Aviation Emissions

The efficiency of each part of the National Airspace System (NAS) affects the production, and resultant impacts, of aviation emissions. Each of the NAS parts -- aircraft operations, aircraft materials and technologies, and fuel composition -- has made significant advances in mitigating emissions over the past decade. Regulations are in place to limit harmful effects of aviation emissions on human health and the environment. The FAA, in working closely with industry and other government agencies, continues to invest significant resources into research and technology development to improve emissions mitigation. This section describes FAA's approach to addressing environmental concerns and details some of the future research and development activities.

### STRATEGY FOR REDUCING AVIATION EMISSIONS – Five-Pillar Environmental Approach.

FAA sets its specific goals for environmental initiatives based on the latest scientific understanding of aviation's environmental impacts. The Agency relies on a five-pillar comprehensive and integrated approach to set the specific initiatives needed to achieve aviation environmental goals.

#### *PILLAR 1: Improved Scientific Knowledge and Integrated Modeling.*

Aviation environmental analyses, impact determinations, and mitigation decisions for NextGen activities must be based on a solid scientific foundation. This requires continued investments in research to improve scientific understanding of the impacts of aviation. In addition, developing and using advanced decision-support tools that account for interdependencies of impacts and cost-benefit analyses of potential solutions facilitates more informed decision-making. Prospective solutions and combinations of solutions have different impacts, benefits, and costs. Some solutions optimize for one area of environmental protection at the expense of another; where trade-offs are made they are explicitly defined and as transparent as possible.

*Centers of Excellence (COE).* The FAA has long had a successful partnership with the nation's academic research community, working with more than 75 U.S. colleges and universities to foster important research conducted by faculty and students. For almost two decades, these efforts have contributed significantly to advancing aviation science and technology while providing the agency and the industry a high return on investments. Through FAA COEs, the government, academic institutions, and industry leverage the combined resources available for aviation research and maximize technological competence for public purpose.

*Alternative Fuel Effects on Contrails and Cruise Emissions (ACCESS).* NASA initiated the ACCESS program as a follow-on to the APEX emissions measurement projects as part of their Fundamental Aeronautics Aviation Emissions Research program. With FAA's active participation, the first ACCESS project sampled aircraft cruise emissions with inflight testing of a 50/50 blend of an alternative jet fuel and conventional jet fuel. Tests were conducted over a range of power-settings at different altitudes. Also extensive measurements of ice particle size and concentrations were made to evaluate contrail formation.



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Additional alternative jet fuel testing and inflight emissions measurements will be part of future ACCESS projects conducted in the next few years. These projects may also provide an opportunity to verify the models used to evaluate aviation emissions impacts.

***Aviation Emissions Characterization (AEC) Roadmap***. The AEC Roadmap is a unified regulatory research and development (R&D) roadmap for understanding and quantifying aircraft emissions. FAA, NASA, DOD, and EPA all are members of the AEC Roadmap Coordination Council. There is collaboration on the roadmap with manufacturers, airports, airlines, and other stakeholders. The Roadmap coordinates research activities and communicates research findings among stakeholders and other parties with an interest in PM, hazardous air pollutants (HAP), and other emissions from aviation sources. The Roadmap's objective is to gain the necessary understanding of emissions' formation, composition, and growth and transport mechanisms to assess aviation's emissions and understand their impact on human health and the environment. The AEC Roadmap does not fund research projects but it does help agencies identify research priorities and leverage their budgets to accomplish more than they would otherwise.

***Airport Cooperative Research Program (ACRP)***. FAA funds an industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators. The Transportation Research Board (TRB) of the National Academy of Sciences manages ACRP. The program carries out applied research on problems that are shared by airport operating agencies, which may not be adequately addressed by other federal research programs. A substantial number of ACRP projects have addressed environmental concerns ranging from emissions measurement campaigns to model development and enhancement to practical guidance to airports for improving their environmental performance. Of FAA's $15 million annual funding for the ACRP, $5 million is allocated for environmental projects. Since the ACRP is identified in FAA reauthorization legislation,[86] it is anticipated that this program will continue in the future.

***Aviation Climate Change Research.*** In 2010, FAA initiated the 3-year Aviation Climate Change Research Initiative (ACCRI) program under its climate change research program to evaluate the impacts of aviation emissions on climate change from a 2006 baseline and into the future (2050). It evaluated the effects of aerosols, induced contrail effects, contrail-induced cirrus effects, and aerosol indirect effects. In addition to the tools FAA developed, this research used a number of large-scale general circulation models and simple-climate models, satellite and laboratory measurements, and detailed aerosol and ice-particle microphysical models. This research recognized the potential impact of indirect aerosol and contrail effects. Quantifying these impacts is the subject of ongoing current climate research.[87] The current scientific opinion as expressed in this effort emphasizes the need to lower uncertainties while characterizing the aviation chemical and physical impacts on climate. Additional studies are currently underway in analyzing data from 2012 to estimate their reliability and accuracy.



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***PILLAR 2: Air Traffic Management Modernization.***

Developing and integrating advanced operational procedures and infrastructure improvements enhances operational capabilities that function more efficiently, improving energy efficiency and thus mitigating environmental impacts. Air traffic management modernization and improvements being made as part of NextGen increase the efficiency of aircraft operations, both in the air and on the airport surface. Improving efficiency saves time and fuel. Reducing fuel consumption reduces $CO_2$ emissions that affect climate and other emissions that adversely affect air quality. Performance Based Navigation (including area navigation (RNAV) and required navigation performance (RNP)) routes can cut fuel burn, emissions, and flight times. Optimized Profile Descents (OPD) can reduce noise, emissions, and fuel consumption. New technology and procedures that optimize gate-to-gate operations are being demonstrated with international partners in Europe and Asia-Pacific to reduce fuel burn, emissions, and noise. One of the most significant programs for improving operations is NextGen.

***Transforming the Air Transportation System – NextGen.*** FAA has begun the transformation of the air transportation system through NextGen a metamorphosis of the air traffic control system. The FAA's environmental vision for NextGen is to provide environmental protection that allows sustained aviation growth. NextGen will provide many opportunities for accomplishing emission mitigation goals by giving impetus to and accommodating changes that are needed for system efficiency and operational improvements. FAA is developing NextGen capabilities that will guide and track aircraft more precisely and efficiently in the air and on the ground to save fuel, decrease emissions and manage the impact of noise on communities. In addition, the Agency is advancing efforts to reduce aircraft fuel burn, emissions, and noise through innovative aircraft technologies. In this way, FAA's environmental goals mesh well with the broader agency goals.

***PILLAR 3: New Aircraft and Airport Technologies.***

Historically, new technologies have offered the greatest success in reducing aviation's environmental impacts. New engine and airframe technologies continue to play key roles in achieving aviation environment and energy goals. The FAA and other agencies support advances in engine technology and airframe configurations to lay the foundation for the next generation of aircraft. Its technological strategy envisions a fleet of quieter, cleaner aircraft that operate more efficiently with less energy. The FAA and NASA, along with the Department of Defense, closely coordinate efforts on aeronautics technology research through the National Aeronautics Research and Development Plan. Each agency focuses on different elements but they share the same national goals. The FAA's focus is on maturing technologies for near term application while NASA focuses on a broader range of time frames of technology development. FAA's Continuous Lower Energy, Emissions and Noise (CLEEN) program is a NextGen effort to accelerate development and commercial deployment of environmentally promising aircraft technologies and sustainable alternative fuels. The aircraft technologies focus on reduction in aircraft noise, emissions, and fuel burn. Under this program, FAA has awarded five-year agreements to Boeing, General Electric,



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Honeywell, Pratt & Whitney, and Rolls-Royce. The total federal investment is expected to be $125 million over five years.

***Continuous Lower Energy, Emissions, and Noise (CLEEN)***. The CLEEN program is a five-year effort to accelerate technology development. Advancements from the program reduce aircraft emissions, fuel burn, and noise through a cost shared initiative between FAA and industry where companies provide at least 50% or greater funding.

CLEEN has demonstrated engine technology that reduced landing and takeoff $NO_x$ emissions by more than 60 percent below the ICAO standard adopted in 2004. It is also developing aircraft technology that contributes toward a 33% aircraft fuel burn goal relative to current technology with commensurate energy consumption and greenhouse gas emission reductions. Improved engine technologies, avionics, aircraft aerodynamics, and weight-related technologies also are being developed that will reduce aircraft fuel burn further. These achievements are expected to appear in the commercial airline fleet in the next several years.

CLEEN has also made significant contributions in the development and deployment of alternative jet fuels that are a drop-in replacement to fuels derived from petroleum. Alternative jet fuels are being tested to confirm the environmental benefits, technological feasibility, and economic cost. The efforts of CLEEN on aircraft technology maturation and alternative fuels development and deployment will help the FAA ensure that NextGen provides environmental protection that allows sustained aviation growth.

Following the success of the CLEEN program to date, FAA has established new goals for a second phase program, CLEEN II, from 2015 to 2020. CLEEN II will again have components focusing on emissions, fuel burn, and noise. New technologies, new aircraft designs, new system designs, and new alternative fuels from this program are expected to appear in use in the commercial fleet beginning at the end of this decade and will achieve reduced emissions, fuel burn, and noise in the decades to come.

***Voluntary Airport Low Emission (VALE) program and Zero Emission Airport Vehicle and Infrastructure Pilot Program (ZEV).*** The FAA's Office of Airports has two specific programs underway to reduce emissions from ground support equipment and other airport vehicles. The VALE program[88] expands eligibility for airport low emission projects under the Airport Improvement Program (AIP) and the Passenger Facility Charges (PFC) program. Through the use of funding and emission credit incentives, the voluntary program supports converting airport vehicles and ground support equipment to low emission technologies, modifying airport infrastructure for alternative fuels, providing terminal gate electricity and air for parked aircraft, a pilot program to explore retrofit technology for airport ground support equipment, and other related emissions improvements. Between 2005 and 2012, more than $146 million[89] from AIP, PFC, and local matching funds has been invested thorough the VALE program to reduce airport emissions.

The ZEV program[90] allows FAA to award AIP funds to airports to purchase zero emissions vehicles and make infrastructure changes necessary to charge or otherwise fuel these vehicles. Authorized in 2012, the ZEV program encourages the use and development of electric and hydrogen fuel cell vehicles. There are a



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wide variety of vehicles used at airports, from automobiles and vans to large passenger buses, and this program encourages manufacturers to develop zero emission alternatives to meet these needs.

***PILLAR 4: Sustainable Alternative Aviation Fuels.***

Developing and deploying sustainable alternative aviation fuels enables environmental improvements, energy security, and economic stability for aviation. The aviation industry is committed to converting its fuel supply to alternative fuels.[91] Government and industry are working cooperatively with coordinating mechanisms such as the Commercial Aviation Alternative Fuels Initiative (CAAFI) and are supporting alternative fuels research. Near term efforts include adding new classes of fuels to the approved alternative jet fuel standard by American Society for Testing and Materials (ASTM) International and conducting aircraft flight tests using alternative fuels to confirm their suitability and environmental benefits. To date, these efforts have led to the certification of three alternative jet fuel types by ASTM International. ASTM International D7566 specification[92] covers the manufacture of aviation turbine fuel that consists of conventional and synthetic blending components.

To date, three alternative jet fuels have been approved for blending with jet fuel by standard setting organization ASTM International. They include fuels from biomass, coal or natural gas known as Fischer-Tropsch (FT) jet fuel; fuel from fats, plant oils and greases known as Hydroproccessed Esters and Fatty Acids (HEFA) jet fuel; and, fuel from fermented sugars known as Synthesized Iso-Paraffins (SIP) jet fuel. At this time additional fuel types are under evaluation for future approval.

One of the hallmark efforts in this area is Farm to Fly, commenced in July 2010,as a result of the U.S. Department of Agriculture (USDA), Airlines for America, Inc. (A4A), and the Boeing Company (Boeing) signing a resolution formalizing their commitment to work together on the initiative. The FARM to FLY 2.0 program[93] will "accelerate the availability of a commercially viable and sustainable aviation biofuel industry in the United States, increase domestic energy security, establish regional supply chains, and support rural development." In April 2013, the USDA and FAA joined with industry partners from Airlines for America (A4A), Aerospace Industries Association (AIA), Airports Council-North America (ACI-NA), National Business Aviation Association (NBAA) and the General Aviation Manufacturers Association (GAMA) in an expanded "Farm to Fly 2.0" collaboration "to enable commercially viable, sustainable bio-Jet Fuel supply chains in the U.S. that are able to support the goal of one billion gallons of bio-Jet Fuel production capacity and use for the Aviation Enterprise by 2018. In July, 2014 the U.S. DOE also signed on as a partner to the agreement.

***Commercial Aviation Alternative Fuels initiative (CAAFI).*** CAAFI[94] is a coalition of airlines, aircraft and engine manufacturers, energy producers, researchers, international participants, and U.S. government agencies formed to develop and deploy alternative jet fuels for commercial aviation. CAAFI's goal is to develop alternative jet fuel options that offer equivalent levels of safety and compare favorably on cost with petroleum based jet fuel, while also offering environmental improvement and security of energy supply for



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aviation. To date, CAAFI has seen three fuel development pathways approved by ASTM and more than 1500 international demonstration and commercial aircraft flights using alternative fuels. Since aviation is international in scope, highly integrated in its fuel supply chain, and has a significant ability to align and coordinate within the industry, it is a very promising first mover among customers for alternative fuels.

***Unleaded Avgas Transition (UAT Plan).*** Almost all aviation gasoline (avgas) used to power piston engine general aviation aircraft is designated "100 low lead." 100 low lead contains small amounts of tetraethyl lead, which boosts fuel octane. High-octane fuels are required in many aircraft so that their piston engines will not "knock," which can cause severe engine damage. However, EPA and the Centers for Disease Control and Prevention (CDC) have found in the past decade that there is no safe level of lead in blood. For that reason, the aviation community and government are coming under pressure to eliminate lead emissions from aircraft. At the request of the aviation, petroleum, and other concerned interests, FAA has initiated and is implementing the UAT Plan, which calls for a two-phase approach to identifying and approving an operationally safe unleaded avgas. One component of the plan is formation of the Piston Aircraft Fuels Initiative, which is composed of members from FAA, general aviation industry, and petroleum interests who will fund and coordinate identification and approval of the most promising unleaded candidate fuels. At the same time EPA is working to gain a better understanding of aircraft lead emissions and potential exposure through monitoring, modeling, demographic, and other studies. FAA's goal is to have a replacement fuel for leaded avgas available by 2018,[95] which is usable by most general aviation aircraft.

***PILLAR 5: Policies, Environmental Standards, and Market-Based Measures.***

Developing and implementing appropriate policies, standards, programs, and mechanisms are critical steps in quickly integrating advantageous technology and operational innovations into the commercial fleet, the airport environment, and entire national aviation system. An example is the development of the NextGen Environmental Management System (EMS), which integrates environmental protection objectives into NextGen. Cooperative partnerships between government and industry focus effort and leverage funding in ways that are beneficial for aviation and good for the environment. Internationally, the U.S. is leading efforts at ICAO to limit and reduce international aviation emissions, most notably through development of an aircraft $CO_2$ standard and an engine PM certification requirement. ICAO has additionally agreed to explore more ambitious goals for the aviation sector including carbon neutral growth in the mid-term and reductions in the long term. The FAA is exploring the effectiveness of various policies, including economic incentives to limit and reduce $CO_2$ emissions. Additionally, to achieve environmental and energy goals beyond the near term, policies are needed that accelerate the integration of new technologies into the civil fleet compared to the normal rate of introduction and replacement.

***Aviation Sustainability Center (ASCENT).*** FAA recently established a new Center of Excellence for Alternative Jet Fuels and Environment. ASCENT will explore ways to meet the environmental and energy goals for NextGen, which will provide environmental protection that allows sustained aviation growth.



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ASCENT is structured as a cost sharing partnership with academia to provide R&D support to inform FAA's environmental commitments and aspirational goals.

To achieve the aspirational 2018 alternative jet fuels target of one billion gallons used[96] per year and help to ensure the wide spread use of sustainable alternative jet fuels in the longer term, ASCENT will assist the FAA and the community with research to develop viable supply as well as secure ASTM International approval of alternative jet fuels.

***Partnership for Air Transportation Noise and Emissions Reduction (PARTNER).*** PARTNER, an FAA COE, was cosponsored by NASA, Transport Canada, the U.S. Department of Defense, and the U.S. Environmental Protection Agency. PARTNER was comprised of 12 universities,[97] and approximately 50 advisory board[98] members including aerospace manufacturers, airlines, airports, national, state and local government, professional and trade associations, non-governmental organizations and community groups. They were united to foster collaboration and consensus to jointly advance environmental performance, efficiency, safety and security.

As an incentive to collaboration, equal matches were required for federal funds granted to PARTNER. The universities provided some of these matching funds, but most were obtained from the organizations represented on the advisory board. This collaborative process fueled unique research efforts on emissions, operations, alternative fuels, noise, and policy evaluations involving a wide spectrum of participants. More than 48 research projects have been completed or are underway representing a total budget of more than $56 million over the past 10 years. With the completion of the PARTNER program, a new Center of Excellence, ASCENT, was established. Some of the PARTNER projects were transitioned, through a competitive process to ASCENT, discussed above.

**Reducing Aviation Emissions in the Future.**

FAA has made significant progress addressing environmental concerns through the strategy and programs it has created under the Five Pillar Environmental Approach. New engine designs and technologies, like those developed in the CLEEN program, are improving fuel efficiency further, while simultaneously reducing noise, $NO_x$ and PM emissions. New aircraft designs are taking advantage of advanced computer models to improve operating performance and fuel efficiency, reducing all pollutants at the same time. New air traffic control technologies and operating practices are reducing emissions by reducing fuel consumption. Airports are using low emission equipment. And alternative jet fuels are being developed that will cut the impact of aviation on climate change and air quality significantly. More progress in reducing environmental impacts will be needed, however, to meet the challenges of the future posed by growth in aviation and the need to reduce emissions beyond current levels, particularly with respect to climate emissions.

It is clear that aviation emissions' impacts on health and the global climate will drive the FAA's research program in the future. These impacts are continually interpreted through regulatory and policy mandates,



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such as the Clean Air Act, the National Environmental Policy Act, FAA's NextGen program, and ICAO requirements, which in turn set new levels of performance that must be achieved. Those mandates are evaluated using the Five-Pillar Environmental Approach to define research plans and objectives as noted in Figure 8: Defining Research Initiatives.

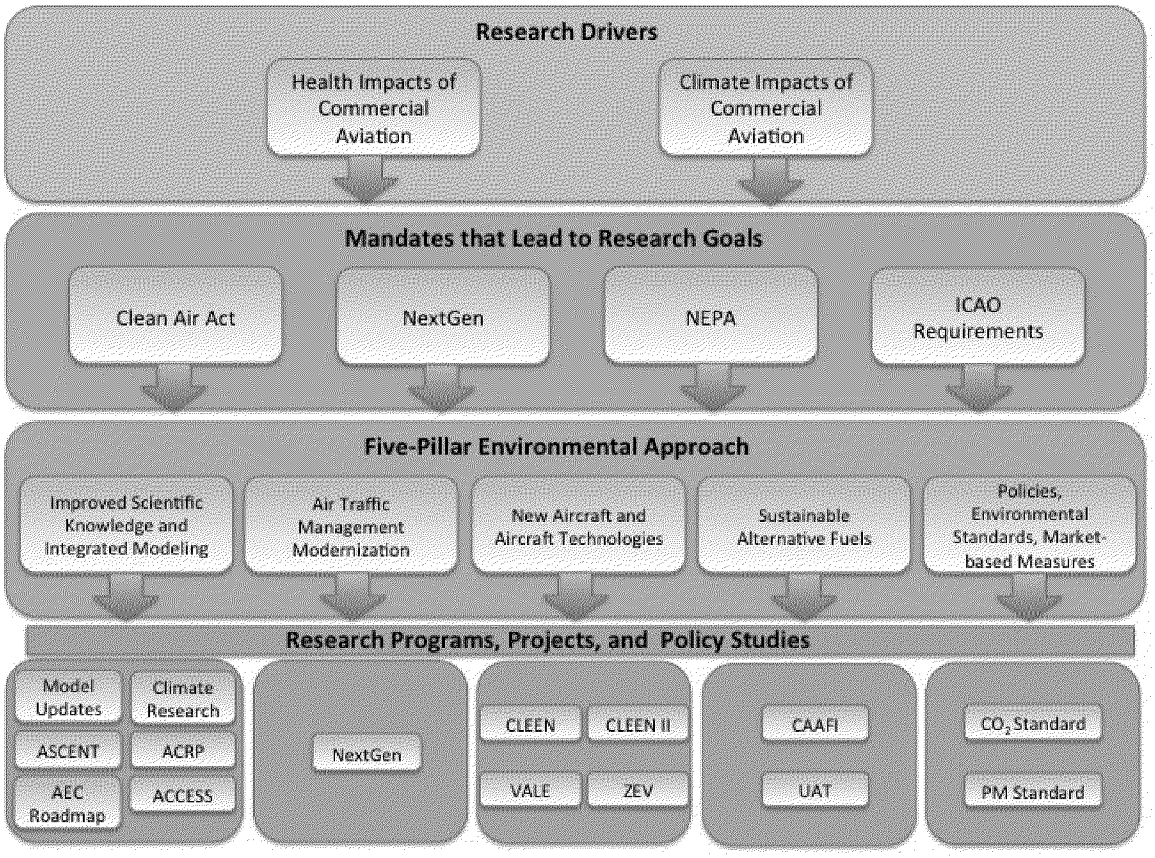


**Figure 8: Defining Research Initiatives**

FAA has set ambitious goals for the future. As expressed in the Aviation Environmental and Energy Policy Statement,[99] FAA's air quality goal is to achieve an absolute reduction of significant health and welfare impacts attributable to aviation, notwithstanding aviation growth. The Agency's climate goal is to limit the impact of aircraft $CO_2$ emissions on the global climate by achieving carbon neutral growth by 2020 compared to 2005 (i.e., zero growth in $CO_2$ emissions) and to achieve a net reduction of the climate impact from all aviation emissions by 2050. The energy efficiency goal of the US is to achieve at least 1 percent per year improvement in the energy efficiency of the National Airspace System. The FAA also recognizes ICAO's aspirational energy goals for international aviation as 2 percent improvement per year. Taken together, these goals represent a significant improvement in aviation's environmental performance but will take an ambitious R&D program to accomplish.



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Planning is underway for CLEEN II with new, demanding goals for new technologies, new aircraft designs, new system designs, and new alternative fuels. New emissions measurement projects such as ACCESS in concert with NASA and collaborations with the international community developing particulate matter and $CO_2$ engine emission standards are envisioned. Emissions models must be have their dispersion modeling capabilities upgraded to meet the more demanding information required to fully understand health risks. FAA desires a better understanding of the interdependencies of emissions and noise and their interrelated impacts. And much more information is needed to understand the climate impacts of non-$CO_2$ aviation emissions.

The FAA cannot achieve these ambitious goals alone. Continued cooperation with other Federal agencies such as NASA, EPA, DOD, DOE, and USDA, as well as collaboration with corporations and industry associations, and the scientific community will be essential.

Achieving research goals will allow the aviation industry to significantly reduce its environmental impacts and begin to reduce its total emissions of PM, $NO_x$, and $CO_2$. This takes time, however. As noted earlier it takes 20 years for 86% of the fleet to achieve current new technology performance. This also assumes that funding will be available to continue current projects and to support new projects as planned.

The FAA Modernization and Reform Act of 2012 (FAA Reauthorization)[100] stipulated that an independent, outside panel of experts review energy-related and environment-related research programs. The review was conducted during the summer of 2013[101] to determine whether the programs (1) have well-defined, prioritized, and appropriate research objectives; (2) are properly coordinated with research programs at NASA, National Oceanic and Atmospheric Administration (NOAA), and other relevant agencies; (3) have allocated appropriate resources to the research objectives; and (4) have mechanisms for transitioning the results into FAA's broader activities.

The independent panel review found that FAA's research is well defined, effectively prioritized, and has relevant objectives. They also found the research is well coordinated with other agencies and significant efforts have been made to transition research to other parts of FAA. However, "***funding is, and will continue to be, a major constraint on the ability of the FAA to achieve its energy and environmental goals***." They further stated that, at current levels of funding, the programs have allocated appropriate resources to achieve research objectives yet given potential reductions in future funding levels, the achievement of research goals may be put in jeopardy. Further federal investment in aviation research and technology development will be essential to meet the government's commitment.



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# Conclusion

Aviation is a complex and vital industry serving not only the U.S. but also the entire world. It supplies tremendous economic benefits to those countries that embrace it. Its speed and accessibility are well suited to modern society as globalization, technology development, and just-in-time manufacturing transform the world. To maintain its central transportation role, aviation must ensure it can mitigate any environmental constraints that result from its operations.

There are features that distinguish aviation from other transportation modes and industries that must be factored into environmentally-motivated strategies. Aviation places a high premium on safety, which demands the incorporation of only proven and technically sound technologies to reduce environmental impacts. Aircraft are high cost and have a long life span, requiring long lead times for new technologies to be widely incorporated in the fleet. Airframe and engine manufacturers as well as airlines will need to invest the capital to build and operate aircraft with new technologies for aviation to realize the environmental and operational benefits. Airport infrastructure requires substantial planning and construction effort, as well as public and financial support. Such considerations increase the challenge of achieving the ambitious environmental and energy performance expectations envisioned in the NextGen transformation of the U.S. aviation system.

Within this framework of constraints, aviation has safely and progressively improved its environmental performance. This commitment to operating in balance with the environment and in support of beneficial environmental mitigation practices are forcefully stated in the FAA's Aviation Environmental and Energy Policy Statement, as further advanced by the Aviation Greenhouse Gas Emissions Reduction Plan[102]. Fuel economy, which is one strong indicator of environmental performance, has consistently improved. Aircraft engines have gotten more efficient and been designed with environmental performance in mind. Regulatory frameworks have developed to constrain emissions growth from many aviation sources. Improvements to the efficient operation of the complex aviation network have had a positive effect on the environment. And new fuels are being developed to reduce harmful emissions as well as aviation's impact on climate change. Much of this progress is a direct result of the research conducted in the programs planned and managed by FAA's Office of Environment and Energy.

FAA, together with EPA and NASA, is committed to ensuring aviation emissions do not pose human health risks, degrade the global climate, or restrain aviation's mobility and economic benefits enjoyed by society. Its consistent, coordinated effort and continuing success in technology research and development will ensure NextGen's goals can be met and environmental goals can be achieved. And the broad inclusion and sustained commitment to working with all stakeholders will ensure the U.S. will be a global leader in researching, developing, and implementing technological, operational, and policy initiatives that address both aviation's growth opportunities and environmental challenges.



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Looking to the future, FAA has the strategic framework in place for planning and implementing an emissions research roadmap for continuing to mitigate the environmental impacts of aviation emissions. This includes continuing to improve understanding of the role of aviation emissions on health impacts on the surface of the Earth as well as climate change. FAA is working with industry and other stakeholders to advance the performance of the national and international aviation system as well as to improve individual system components. For example within ICAO, the FAA continues to work on a comprehensive basket of solutions to mitigate aviation noise and emissions impacts while simultaneously working to improve energy efficiency and security. The U.S. is committed to pursuing development of a global MBM for international aviation through ICAO. The global MBM is considered gap filler in the basket of measures that includes improvements in technology, operations and sustainable alternative fuels to achieve carbon neutrality for the world-wide aviation industry.



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# Abbreviations & Acronyms

ACCESS – Alternative Fuel Effects on Contrails and Cruise Emissions

ACCRI – Aviation Climate Change Research Initiative

ACRP – Airport Cooperative Research Program

AEC – Aviation Emissions Characterization Roadmap

AEE – Office of Environment and Energy

AIP – Airport Improvement Program

APEX – Aircraft Particle Emissions Experiment

APU – Auxiliary Power Unit

ASCENT – Aviation Sustainability Center

ASTM – American Society for Testing and Materials

BC – black carbon

BTU – British Thermal Unit

CAA – Clean Air Act

CAAFI – Commercial Aviation Alternative Fuels Initiative

CAEP – Committee on Aviation Environmental Protection

CCR – Climate Change Research

CDC – Centers for Disease Control and Prevention

$CH_4$ – methane

CLEEN – Continuous Lower Energy, Emissions, and Noise

CO – carbon monoxide

$CO_2$ – carbon dioxide

COE – Center of Excellence

EMS – Environmental Management System

EPA – Environmental Protection Agency

FAA – Federal Aviation Administration

GDP – gross domestic product

GSE – ground support equipment

HAP – hazardous air pollutant

HC – hydrocarbon

$HNO_3$ – nitric acid

$H_2O$ – water

$H_2SO_4$ – sulfuric acid

ICAO – International Civil Aviation Organization

LTO – Landing Take Off

MBM – Market-Based Measure



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$N_2$ – nitrogen

NAAQS – National Ambient Air Quality Standards

NASA – National Aeronautics and Space Administration

NEPA – National Environmental Policy Act

NextGen – Next Generation Air Transportation System

$NH_3$ – ammonia

$NH_4NO_3$ – ammonium nitrate

$(NH_4)_2SO_4$ – ammonium sulfate

$N_2O$ – nitrous oxide

NOAA – National Oceanic and Atmospheric Administration

$NO_2$ – Nitrogen dioxide

$NO_x$ – nitrogen oxides

$O_2$ – oxygen

$O_3$ – ozone

OPD – Optimized Profile Descents

PARTNER – Partnership for AiR Transportation Noise and Emissions Reduction

Pb – lead

PFC – Passenger Facility Charges

PM – particulate matter

$PM_{2.5}$ – particulate matter 2.5 microns and smaller

R&D – research and development

RNAV – area navigation

RNP – required navigation performance

S – sulfur

$SO_2$ – sulfur dioxide

$SO_x$ – sulfur oxides

TRB – Transportation Research Board

UHC – unburned hydrocarbons

UAT – United Avgas Transition Plan

VALE – Voluntary Airport Low Emission Program

VOC – volatile organic compound

ZEV – Zero Emission Airport Vehicle and Infrastructure Pilot Program



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# Health Effects of Noise Exposure in Children

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**Abstract** Environmental noise exposure, such as road traffic noise and aircraft noise, is associated with a range of health outcomes in children. Children demonstrate annoyance responses to noise, and noise is also related to lower well-being and stress responses, such as increased levels of adrenaline and noradrenaline. Noise does not cause more serious mental health problems, but there is growing evidence for an association with increased hyperactivity symptoms. Studies also suggest that noise might cause changes in cardiovascular functioning, and there is some limited evidence for an effect on low birth weight. There is robust evidence for an effect of school noise exposure on children's cognitive skills such as reading and memory, as well as on standardised academic test scores. Environmental noise does not usually reach levels that are likely to affect children's hearing; however, increasing use of personal electronic devices may leave some children exposed to harmful levels of noise.

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## Introduction

Children are exposed to environmental noise, and a range of different health effects have been described [1]. Yet, there has been less research on the effects of environmental noise in children than in adults. Children have been described as a group vulnerable to the effects of noise [2]. This is because children are exposed to environmental noise and associated pollutants at a time of rapid growth and cognitive development and will perhaps have less developed coping repertoires than adults to deal with environmental noise and less control over noise. This paper examines each of the different health outcomes in which environmental noise has been found to have an impact on children and reports details of illustrative studies in Appendix 1.

## Measurement of Noise

External noise exposure metrics are generally used in studies of noise effects on children's health. These measure the average sound pressure over a specific period using dBA as the unit (dBA is the unit of A-weighted sound pressure level in decibels where A-weighted means that the sound pressure levels in various frequency bands across the audible range have been weighted in accordance with differences in human hearing sensitivity at different frequencies) [3, 4]. $L_{Aeq16}$ and $L_{day}$ indicating noise exposure over a 16-h daytime period are the most often used. The daytime period is most often defined 7 am–11 pm; $L_{night}$ indicating night-time noise exposure (11



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pm–7 am); and $L_{dn}$ that is a combination of day-time and night-time noise exposure averaged over 24 h. This includes a 10-dB penalty added to the night-time indicator. The 10-dB penalty reflects people's greater sensitivity to noise exposure at night, and assumes that the effects of noise at night are equivalent to 10 dB more than the same level of exposure during the daytime. In recent studies, noise modelling is used employing geographical information systems, whilst older studies as well as some contemporary studies measure community noise exposure. Direct measurements over brief time periods can be less reliable because noise levels often vary by time of day, and short-term measures may not accurately capture long-term average exposure. More recently, there has been a trend towards measuring exposure to maximum noise levels (e.g. $L_{Amax}$). It is still not certain whether the 'dose' of overall sound energy, the number of events or the peak sound pressure level of key events is most important for human health effects [3] These are relevant distinctions as, for instance, the number of aircraft overflights and cars on the road are increasing, whilst individual noise emission levels for each event are declining.

'Noise' is usually used to refer to the child's exposure to sound in research on non-auditory effects of noise exposure. This term is used, for both high and low exposure: lower levels in particular may strictly be better described using the term sound. Noise typically implies that the sound exposure is unwanted and that it is a source of environmental stress. We follow this convention in our review.

## The Effects of Noise on Low Birth Weight and Prematurity

Low birth weight and prematurity have been the outcomes most examined in relation to environmental noise. Two recent reviews have been published [5, 6]. No consistent associations were found between chronic noise exposure and pregnancy outcomes, but the studies included in both of these reviews varied in study design and measurement of exposure, confounding factors and outcomes. Occupational noise levels assessed in these studies range from above 78 dBA, to 85 dB $L_{eq8h}$, to above 90 dBA. In the aircraft noise studies, levels are lower with high noise exposure defined as above 65 and 87 dBA. Assessment methods for noise exposure varied using dosimetry, assessments by occupational hygienists, questionnaires and aircraft noise contour maps. The second review found some suggestive evidence of an association between environmental noise and low birth weight but certainly no definitive evidence [5]. Modelled road traffic noise exposure has been linked to low birth weight in a Canadian study of 70,000 administrative birth records [7•]. This association remained after adjustment for air pollution exposure, suggesting that noise has an effect on low birth weight, independent of air pollution. Road traffic is a source of both noise and air pollution both of which have been implicated in health effects. Air pollution is usually measured in terms of gases such as nitrogen dioxide and particulate emissions of different sizes, e.g. $PM_{2.5}$ and $PM_{10}$. A small significant risk was also found for noise and gestational age but not pre-term birth. There is scope for further studies in this area using standardised measures of noise exposure and birth outcomes.

## Endocrine Responses to Noise Exposure

In adults, the mechanism for noise effects on health is thought to be related to the stress hypothesis where noise exposure increases physiological arousal through repeated stimulation of the endocrine system and autonomic nervous system [8]. It is likely that the same mechanism pertains to children as well. Catecholamine and cortisol secretion have been studied as indicators of chronic stress in children exposed to aircraft and road traffic noise. Levels of adrenaline and noradrenaline were raised in both cross-sectional and longitudinal reports from the Munich Study in relation to aircraft noise exposure above 68 dBA and increases in aircraft noise exposure to 62 dBA around the newly opened Munich Airport [9, 10]. This is strong evidence of effects in children because of the longitudinal nature of the study and the increased hormone levels with lengthening duration of noise exposure. However, urinary catecholamines were not raised in the aircraft noise-exposed sample from the West London Schools Study (high noise group >63 dBA, low noise group <57 dBA) [11], albeit a cross-sectional study, and there are insufficient studies to be certain whether noise exposure is related to increased catecholamines. None of these studies have consistently showed a relationship between aircraft noise and urinary cortisol exposure [9–11]. There is undoubtedly a need for further studies in this area where perhaps measures of prolonged raised cortisol might be appropriate.

## Blood Pressure Responses to Noise Exposure

There have now been a number of studies investigating the association between road traffic and aircraft noise exposure and blood pressure in children. Whilst it is premature to examine cardiovascular risk in children, studies from adults suggest that repeated elevation of blood pressure in relation to noise exposure might have pathological effects on health in the long term [12•]. Thus, it is appropriate to examine whether noise might be having an effect on blood pressure in children. A recent review [13] found small positive relationships between aircraft noise and blood pressure in children. In this review, road traffic noise studies, although methodologically diverse, showed a stronger relationship with systolic blood



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pressure. The studies varied in methodology and control for confounding factors. In one study, traffic noise exposure was classified in terms of traffic volume; children whose bedrooms were facing a street with low traffic had the lowest blood pressure readings, whilst the highest readings were found in the group where the children's bedrooms were facing a street with high, or extremely high traffic volume. The difference in blood pressure between the two groups was 1.8 mmHg, (95 % confidence interval (CI) 0.1–3.5, $P$=0.036) for systolic and 1.0 mmHg (95 % CI −0.4–2.4, $P$=0.148) for diastolic blood pressure [14]. These sorts of differences are not unlike those seen in other studies of road traffic noise, although in some studies, the differences were as great as 4–5 mmHg [15].

Diastolic blood pressure was related to a 5-dBA increase in $L_{den}$ and $L_{night}$ in 10-year-old children from the GINI-plus, LISA-plus studies adjusting for nitrogen dioxide and three types of particles including PM 2.5 [14]. In adjusted analyses, road traffic noise, ranging from 27–86 dBA, measured in front of the child's bedroom, was independently and positively associated with blood pressure, whereas air pollution was not [16•]. In contrast, another study of 12-year-old children found associations between long-term exposure to nitrogen dioxide and PM 2.5 and diastolic blood pressure but no association with noise exposure, although there were trends with diastolic blood pressure [17]. This could be because traffic noise levels were quite low (45–70.5 dBA $L_{den}$) with a limited range of exposure in this study. Also, noise measurements made only at the façade of the building may not accurately assess noise exposure in bedrooms at the back of the dwelling. Future studies could adopt a more standardised methodology, but overall, there is increasing evidence of associations between transport noise and blood pressure. Even if these associations are small, the long-term consequences of these blood pressure increases across the lifecourse are unknown and should be studied.

## Annoyance

Children may be annoyed by environmental noise in the same way as adults. In the cross-sectional multi-country RANCH study, a curvilinear exposure response relationship was demonstrated between exposure to aircraft noise at school and severe annoyance in children adjusting for confounding factors [18]. The percentage of severely annoyed children increased from about 5.1 % at 50 dB to 12.1 % at 60 dB. Similar associations were found with exposure to aircraft noise at home. In the same study, a linear relationship was found between road traffic noise exposure and annoyance responses. In general, children were less annoyed than their parents at levels above 55 dB, but the shapes of the exposure response relationships were comparable to those in their parents. These associations have also been demonstrated longitudinally in a South African study, where aircraft noise exposure was related to increased levels of annoyance in children over time [19].

Generally, it seems that children are less annoyed by road traffic noise than adults. In a large German study, 7.3 % of 8- to 10-year olds were annoyed by road traffic noise during daytime (yes on a dichotomous scale) compared to 16.4 % of 11- to 14-year olds (collapsed 5-point scale) [20]. This may partly be because of different time activity patterns of children and adults, but also various types of environmental noise may have a different meaning for children and adults. For instance, in this German study, noise from neighbours and noise from family were reported as more annoying for children than road traffic noise. Additionally, children of lower socioeconomic status were more annoyed by road traffic and also those who lived in larger agglomerations of more than 100,000 inhabitants.

## Noise-Induced Hearing Loss

Environmental noise does not usually reach levels that are likely to affect hearing in the community. Tinnitus, often associated with hearing loss, has been reported in community surveys of young people associated not only with occupational noise exposure but also with other sources of noise exposure [21]. For young people, the risks to hearing are more likely to result from leisure noise from clubs and rock concerts, and recently, there has been concern over sound levels from personal listening devices. Over the last 20–30 years the number of young people with social noise exposure has tripled to around 19 % [22]. Recently, the sales to young people of personal electronic devices for listening to music have increased enormously. The risks of noise-induced hearing loss from these devices have been compared to the European Noise at Work Regulations recommending an equivalent noise exposure level to 80 dBA for an 8-h working day. The equivalent sound pressure levels of personal electronic devices at maximum volume range from about 80–115 dBA with a mean exposure time ranging from 1 to 14 h a week. On average, it has been estimated that the sound exposure levels from personal electronic devices range from 75 to 85 dBA, so for the majority of personal electronic device users, the risk to hearing is minimal. However, approximately 5–10 % of listeners are considered to be at higher risk due to listening at high level and the long duration of their listening [22]. There may be differences in effects by country, and a much greater prevalence of audiometric notches was demonstrated in the USA than in Germany, although this could also relate to methodological differences between studies [23]. However, it would be fair to say that the risk of hearing loss from these devices is as yet uncertain, and further research will be needed in the future when there is greater experience with these devices. Suffice it to say, there is a need for monitoring hearing



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over time in young people to check for hearing loss as, although there may be no risk of hearing impairment, if there were a risk it could involve large numbers of young people.

## Noise and Sleep Disturbance in Children

Surprisingly, there have been relatively few studies on environmental noise and sleep in children, although children have been identified as a group vulnerable to the effects of sleep disturbance [24]. Prolonged sleep disturbance in children may result in tiredness, difficulties in focussing attention, increased irritability and lowered frustration tolerance [25]. A cross-sectional study of 12-year-old children found a moderate exposure response relationship between road traffic noise exposure at night and sleep quality and problems with sleepiness during the day, but no significant association with difficulties falling asleep [26]. The level of noise exposure at the least exposed façade of a dwelling, perhaps more associated with levels of noise exposure within bedrooms, than noise exposure on the most exposed façade, has been associated with difficulties falling asleep and sleeping problems in a recent community study [27•]. However, night-time aircraft noise exposure did not increase the risk of cognitive impairment beyond the effects of day-time noise exposure in the RANCH and Munich studies [28]. Vulnerable young people may be more at risk of sleep disturbance: ill children in hospital were both more likely to have disturbed sleep before admission, probably related to existing illness and were also found to be woken by noise such as alarms, and attention of hospital staff, potentially disturbing their recovery [29].

## Noise and Psychological Health in Children

### Quality of Life and Well-being

There have been several studies examining well-being or quality of life in children assessing less severe aspects of psychological disturbance than psychiatric disorder. In Munich, children living in areas exposed to high aircraft noise had lower levels of psychological well-being than children living in quieter environments [9]. The longitudinal data from around Munich showed that after the inauguration of the new airport, the newly noise-exposed communities demonstrated a significant decline in self-reported quality of life, measured on the Kindl scale, after being exposed to the increased aircraft noise for 18 months, compared with a control sample [10]. These studies suggest that noise does not influence children's mental health, though it may affect their stress responses and sense of well-being.

### Psychiatric Disorders and Noise Exposure

Anxiety and depression (measured with psychometrically valid scales) were not associated with chronic aircraft noise exposure adjusting for socioeconomic factors in the Schools Health & Environment Study around the Heathrow Airport [30], although road traffic noise at the least exposed façade has been associated with a small increased risk of emotional symptoms on the Strengths and Difficulties Questionnaire (SDQ) [27•, 31].

In a further study of children's health around Heathrow Airport—the West London Schools Study [11]—an association was found between aircraft noise exposure levels and increased scores on the hyperactivity subscale measured by the SDQ. These analyses were revisited in the RANCH Study of 2844, 9- to 10-year-old children living around the Schiphol Airport in the Netherlands, Barajas Airport in Spain and Heathrow Airport in the UK [32]. There were no overall effects of aircraft noise or road traffic noise on children's mental health, measured by the SDQ, but a small association was found with increased hyperactivity subscale scores as in the earlier West London Schools Study [33]. Recent German studies of road traffic noise exposure in 10-year-old children have also shown an association between noise exposure measured as $L_{den}$ at the most exposed façade and increased scores on the hyperactivity subscale of the SDQ [27•], suggesting that this is not an isolated finding. Overall, there is reasonable evidence that noise impairs quality of life in children but does not cause more serious mental health problems. The mechanism by which noise exposure might influence hyperactivity deserves further attention.

### Noise and Cognitive Impairment in Children

Studies suggest that the evidence of the effects of noise on children's cognition has grown stronger over recent years, with over 20 studies showing detrimental effects of noise on children's memory and reading outcomes [34]. Recent advances include the use of larger samples, longitudinal studies, the examination of exposure-effect relationships and more thorough assessment of a range of relevant confounding factors [5]. Social deprivation is often associated with high levels of noise exposure; it is also associated with poorer cognitive achievement. Thus, there is considerable potential for confounding in these associations and measures of socioeconomic position must be adjusted for in analyses of noise exposure and cognition and health.

Studies have shown that children exposed to chronic aircraft or road traffic noise at school have poorer reading comprehension and memory than children who are not exposed [11, 30, 35]. A study of 9- to 10-year-old children from rural Alpine areas [36] found that modest levels of ambient community noise (train and road traffic noise above 60 dBA) were



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associated with poorer memory performance, but not with performance on a test of attention. Several studies have suggested that the effects of noise on children's cognition are not uniform across all cognitive tasks: tasks which involve central processing and language comprehension, such as reading, problem solving and memory appear to be most affected by exposure to noise [37, 38].

Robust evidence for noise effects on children's cognitive performance comes from intervention studies and natural experiments where changes in noise exposure have been accompanied by changes in cognitive performance, such as the Munich Airport study [9, 10, 39]. Prior to the relocation of the airport in Munich, high noise exposure was associated with deficits in long-term memory and reading comprehension in children of 10 years of age. Two years after the airport closed, these cognitive impairments were no longer present, suggesting that effects of noise on cognitive performance may be reversible if noise stops. Furthermore, in a new cohort of noise-exposed children living around the newly opened airport, impairments in memory and reading comprehension developed over the following 2 years. The Munich study remains one of the few longitudinal studies in the field, providing important evidence for a cause-effect relationship between noise exposure and cognitive deficits.

Demonstrating exposure-effect relationships between aircraft noise exposure and children's cognition and learning is important for confirming causal associations between noise and cognition, as well as for identifying thresholds for the effects that can be used by policy makers. The RANCH study found a linear exposure-effect relationship between chronic aircraft noise exposure experienced at school, but not road traffic noise exposure, and impaired reading comprehension and recognition memory, after adjusting for a number of relevant socioeconomic and confounding factors including mother's education, long-standing illness, the extent of classroom insulation against noise, and acute noise during testing [32]. A 5-dB $L_{Aeq16}$ increase in aircraft noise exposure at school was associated with a 2-month delay in reading age in the UK and a 1-month delay in the Netherlands [40]: this association remained after adjustment for aircraft noise annoyance and other cognitive abilities including episodic memory, working memory and attention, as well as air pollution [41•]. The RANCH study suggests that reading comprehension begins to fall below average at aircraft noise exposure greater than 55 dB $L_{Aeq16}$, but as the association is linear, any reduction in aircraft noise exposure should improve reading comprehension. Long-term exposure to road traffic noise was not associated with cognitive performance. The exception to this was conceptual recall and information recall, which unexpectedly demonstrated better performance in school pupils exposed to higher levels of road traffic noise. Attention and working memory were not consistently influenced by either aircraft noise or road traffic noise.

The development of cognitive abilities such as reading is important not only in terms of educational achievement but also for subsequent life chances and adult health [42]. However, few studies have examined the effects of persistent noise exposure throughout the child's education. The UK subsample of the RANCH study was followed up longitudinally to examine the associations of aircraft noise exposure at primary school on children's reading comprehension at secondary school. This 6-year follow-up of 461 children aged 15 to 16 years, who attended primary and secondary schools around London Heathrow Airport, found that aircraft noise exposure at primary school was associated with a nonsignificant decrease in reading comprehension at follow-up [43]. There was also a weak nonsignificant association between aircraft noise at secondary school and reading comprehension after adjustment for sociodemographic factors. This was a small-scale study, where the small sample size could potentially limit and influence the power to detect significant effects. Further longitudinal lifecourse studies of noise exposure at school and educational outcomes should be conducted.

Studies have also shown effects of noise on standardised achievement tests. Over 40 years ago, Bronzaft and McCarthy [44] demonstrated that children who were taught in classrooms on the noisy side of a school near a railway line had poorer performance on the school achievement tests than those taught in classrooms on the quiet side of the same school in New York. The mean reading age of children in the classrooms on the noisy side of the school was 3 to 4 months behind the children in the low noise-exposed classrooms. A more recent study of national standardised test scores (SATs) carried out around the Heathrow Airport [45], examined test scores for 11,000 11-year-old children in relation to aircraft noise exposure contours for their school. The results showed that there was an exposure-effect relationship between noise exposure and performance on reading and math tests, but that this was influenced by socioeconomic factors. There have been less studies that include assessments of the effects of noise exposure within classrooms as well as external noise exposure, although Shield and Dockrell found associations with both sources of noise at school in relation to national tests for primary school children aged 7–11 years [46]. Older children's performance was most affected by external noise. As the strongest association of test scores was with $L_{Amax}$, this may be interpreted as individual noise events being important in effects on children's cognition.

The Federal Interagency Committee on Aviation Noise (FICAN) funded a study which assessed the relationship between aircraft noise reduction and standardised test scores in the USA [47, 48]. The study evaluated whether abrupt aircraft noise reduction within classrooms, caused either by airport closure or newly implemented sound insulation, was associated with improvements in test scores, in 35 public schools near three US airports in Illinois and Texas. The study relied



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on computed noise exposure metrics, which were converted to indoor values, making a comparison with other studies, which use outdoor exposure values, difficult. Overall, this study did find some evidence for effects of aircraft noise reduction and improved standardised test results, although it must be acknowledged that some associations were null and some associations were not in the direction hypothesised. This was a pilot study, and the authors stress that the airports and schools selected for the study may not be representative; that further, larger studies are required; that future studies should utilise airport data for noise exposure assessment; and that outdoor to indoor noise measurements at each school should be considered.

The findings of studies of noise effects on children's cognitive performance suggest that noise may directly affect reading comprehension or that noise effects could be accounted for by other mechanisms including teacher and pupil frustration [38], learned helplessness [49] and impaired attention [38, 50]. Noise might interfere with the interactions between teachers and pupils. In the noisiest schools, teachers may have to stop teaching whilst aircraft fly over, and if this is frequent, it may contribute to interruptions in communication and fatigue in teachers and children and to a reduction of morale and motivation in teachers. Noise also causes annoyance, especially if an individual feels their activities are being disturbed or if it causes difficulties with communication. In some individuals, this annoyance may lead to stress responses. However, at present, there is little evidence to directly support the annoyance pathway as a mechanism for effects on cognition.

Another pathway is that of sleep disturbance caused by noise exposure at home. Where catchment areas for schools are fairly small, there is a strong correlation between home and school aircraft noise exposure [40]. The consequences of sleep disturbance may include poorer well-being resulting in a range of responses: annoyance, irritation, low mood, fatigue and impaired task performance [51]. Overall few studies have examined sleep disturbance as a mediator of noise effects on cognitive performance. A recent analysis of the cross-sectional Munich and RANCH datasets found that self-reported sleep disturbance did not mediate the association of aircraft noise exposure and cognitive impairment in children [28]. Overall, several plausible pathways and mechanisms for the effects of noise on children's cognition have been put forward, but in general evidence for these mechanisms is fairly sparse.

Given the mounting evidence that environmental noise is related to impairment of school performance, the question of what can be done to reduce noise-induced learning impairments becomes salient. One possibility is a reduction of external sound in the classroom through sound insulation. Overall, few studies have examined the influence of noise abatement, via insulation schemes or airport relocation, on children's learning and cognition. Overall, these studies suggest that a reduction of noise exposure can eliminate previously observed cognitive deficits associated with noise but further studies in this area remain a priority.

Further knowledge about exposure-effect relationships would enhance decision-making concerning the design of physical, educational and psychological interventions for children exposed to high levels of noise. Such relationships can be assessed using either individually collected cognitive performance data or via standardised school test data. It may also be productive and informative to derive relationships for a range of additional noise exposure metrics, such as the number of noise events. Recent advances in noise modelling can only further enhance our knowledge about noise effects upon children's learning outcomes.

## Conclusion

Environmental noise has multiple effects on children's health. Some of these effects such as raised blood pressure and cognitive impairments may have implications for adult health as well.

In summary, there is sufficient evidence for the effects of environmental noise in children on catecholamine secretion, annoyance, well-being and cognitive effects such as reading comprehension, long-term memory and performance on standardised tests (Table 1). There is scope for further research on hormone responses to noise in children which may link to elevated blood pressure in relation to noise. Findings on elevated blood pressure have been very mixed and further studies with better measures of noise exposure are needed. Similarly, the impact of environmental noise on low birth weight and

**Table 1** Noise and children's health: strength of evidence

| | No evidence | Limited | Sufficient |
|---|---|---|---|
| Low birth weight/prematurity | | | |
| Occupational noise | + | | |
| Environmental noise | | + | |
| Endocrine responses | | | |
| Catecholamines | | | + |
| Cortisol | + | | |
| Elevated blood pressure | | + | |
| Annoyance | | | + |
| Noise induced hearing loss | | + | |
| Sleep disturbance | | + | |
| Well-being | | + | |
| Anxiety and depression | + | | |
| Hyperactivity | | + | |
| Reading comprehension and long-term memory | | | + |
| Standardised achievement tests | | | + |



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prematurity deserves further investigation because of recent suggestive findings. The repeated finding that aircraft noise is related to hyperactivity symptoms requires some systematic investigation and undoubtedly the prolonged use of personal listening devices on hearing needs to be assessed in longitudinal studies, not least because of the public health implications of almost universal use in young people.

There is need for studies in the future which take a lifecourse perspective partly because noise exposure can have different effects at different developmental stages, and partly, because that allows consideration of the effects of cumulative exposure to pollutants and how these might influence developmental trajectories and health into adult life.

#### Compliance with Ethics Guidelines

**Conflict of Interest** Stephen Stansfeld reports personal fees from High Speed 2 Ltd., Arup Engineering, and the World Health Organisation.

Charlotte Clark reports personal fees as an expert panel member of the UK Airport's Commission, personal fees from WHO Europe Community Noise Guideline revisions, and a grant from the Department of Environment, Food and Rural Affairs, UK.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

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**Motion to Address Health Impacts of Airplane Noise on Toronto Residents**

**Whereas** the operation of Pearson International Airport in Peel Region falls under federal jurisdiction but has significant and detrimental health impacts on the residents of Toronto;

**Whereas** prolonged exposure to excessive aircraft noise, particularly at night, has been scientifically linked to sleep deprivation, cardiovascular disease, cognitive impairment, and increased stress levels;

**Whereas** poor air quality, often associated with increased air traffic, contributes to respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD), exacerbates cardiovascular problems, and further harms the health of residents already suffering from noise pollution;

**Whereas** the Environmental Protection Agency (EPA) has reported that aircraft traveling below 3,000 feet can contribute to air pollution, releasing potentially dangerous toxins such as carbon monoxide, hydrocarbons, sulfur dioxides, and other harmful trace compounds, especially during take-off and landing, further exacerbating the environmental and health risks to residents impacted by airplane noise and pollution (see Appendices 1 and 2);

**Whereas** chronic sleep deprivation caused by nighttime aircraft noise leaves children arriving at school in a cognitively impaired state comparable to intoxication, affecting their ability to learn and perform academically (see Appendix 3);

**Whereas** frequent daytime over-flights further disrupt classrooms, hindering students' concentration, academic potential, and overall well-being (see Appendix 3);

**Whereas** individuals with preexisting conditions such as depression, anxiety, epilepsy, chronic stress disorders (e.g., PTSD), hypertension, heart disease, asthma, diabetes, and other health issues are particularly vulnerable to the detrimental effects of prolonged exposure to high levels of noise, which can worsen their symptoms, trigger seizures, exacerbate respiratory issues, increase cardiovascular risks, and significantly impact their mental and physical well-being;

**Whereas** commercial drivers are required by Transport Canada regulations to obtain eight consecutive hours of quality sleep before operating a vehicle, a condition that becomes impossible to meet when subjected to hundreds of nightly over-flights reaching up to 85 decibels;

**Whereas** other safety-critical professions—such as healthcare workers, public transit operators, construction and heavy machinery operators, and first responders—depend on adequate sleep to ensure safe and effective performance, and are therefore also placed at risk by persistent nighttime noise exposure;

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**Whereas** additional safety-critical professions such as firefighters, law enforcement officers, air traffic controllers, emergency medical technicians (EMTs), military personnel, public safety communications operators, pilots and cabin crew, utility workers, railroad operators, nuclear plant operators, and judges and lawyers also rely on quality sleep to make life-saving decisions, respond to emergencies, and maintain public safety, and are similarly compromised by sleep deprivation due to persistent airplane noise;

**Whereas** noise data collected from the Acacia Park community noise monitor station provides clear evidence of excessive air traffic and high decibel levels affecting Toronto residents (see Appendices 4, 5 and 6);

**Whereas** Toronto residents have repeatedly raised concerns about the negative health consequences of airplane noise, yet have been met with delays, evasions, and a lack of meaningful action from the Greater Toronto Airports Authority (GTAA) and all levels of government;

**Whereas** similar communities, such as the Town of North Hempstead and Hempstead, New York, have pursued legal action against their respective airport authorities and federal regulators due to the failure to mitigate these harms;

**Whereas** a health study comparing morbidity rates, emergency room visits, and the prevalence of chronic health issues between residents living under major flight paths and those in unaffected areas would provide vital data for understanding the public health impact of aircraft operations;

**Whereas** the City of Toronto should formally request that Toronto Public Health—in collaboration with provincial and federal health authorities and local research institutions—undertake a comprehensive study examining correlations between exposure to airplane noise and air pollution and adverse health outcomes, including but not limited to sleep deprivation, cardiovascular disease, anxiety, depression, asthma, and increased use of emergency health services;

**Whereas** those responsible for environmental and health harms—such as the GTAA and Transport Canada—should be held financially accountable under the “polluter pays” principle, widely recognized in Canadian environmental policy, and the costs of investigating, mitigating, and compensating for these harms must not fall on the victims, but rather on those who have benefited from or permitted the conditions that caused them;

**Therefore, be it resolved that** the City of Toronto formally acknowledge the severe health consequences of excessive airplane noise on its residents and demand immediate action;

**Be it further resolved that** the City of Toronto write to the Minister of Transport, the Ontario Minister of Health, the Ontario Minister of Education, the federal Minister of Health, and the federal Minister of Mental Health and Addictions requesting urgent intervention, including

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stricter regulations, noise mitigation measures, and meaningful consultation with affected communities;

**Be it further resolved that** the City of Toronto explore all available legal options, including potential litigation against the GTAA and the federal government, to seek compensation and enforce stronger protections for residents;

**Be it further resolved that** the City request a transparent and public response from the GTAA and federal authorities outlining concrete steps to address this crisis, with a commitment to accountability and meaningful engagement with impacted communities.

**Be it further resolved that** the City of Toronto request a comprehensive, independently overseen health study—funded by the GTAA and/or Transport Canada—comparing health outcomes of residents under flight paths to those in unaffected areas, with findings to be made public and used to inform mitigation and compensation efforts.

**Be it further resolved that** the Toronto Board of Health work with their partners at TDSB and TCDSB to review the effects on airplane noise on students.

ATIA - 19(1)

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**From:** Fabio Ovettini
**To:** [redacted]
**Cc:** [redacted]; judy.sgro@parl.gc.ca; pm@pm.gc.ca; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc; ministre-minister@ec.gc.ca; Speaker.President@parl.gc.ca; TRAN@parl.gc.ca; ENVI@parl.gc.ca; HESA@parl.gc.ca; OGGO@parl.gc.ca; ETHI@parl.gc.ca; trcm@sen.parl.gc.ca; soci@sen.parl.gc.ca; enev@sen.parl.gc.ca; pierre.poilievre@parl.gc.ca
**Subject:** Fw: List of Attendees - September 4th, 2025 Airplane Noise Meeting
**Date:** 2025-11-04 7:34:51 AM
**Attachments:** Untitled.msg
image001.png
image006.png

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**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject: Renewed request for complete attendee contact details – St. Jude's meeting (Sept 4) – deadline Nov 5, 2025**

Hi [redacted]

Thank you for sending another version of the attendee list. We are now two months past the September 4, 2025 meeting at St. Jude's. It is not reasonable for residents to keep chasing basic contact information.

We require, for **every** attendee, full name, title/role, and **direct** organizational email (not a generic inbox).
**Please provide the corrected list by November 5, 2025 at 5:00 p.m. ET**, or confirm a concrete delivery date this week. Absent that, I will continue escalating through ATIP/OIC and parliamentary channels **while** maintaining this request open until fulfilled.

1. **Full name** (first and last)
2. **Job title/role**
3. **Direct organizational email** (not a generic inbox)

**Outstanding gaps to resolve immediately:**

- **Transport Canada (Toronto Region):**
  • "Duwayne Williams" — provide **title** and **direct @tc.gc.ca email** (not aviation.ont@tc.gc.ca).
  • "Ovais" — confirm **full legal name (first + last)**, **title**, and **direct @tc.gc.ca email**.
- **NAV CANADA:**
  • **Jonathan Bagg** and **Ian Giesbrecht** — listed only with **service@navcanada.ca**. Provide **direct @navcanada.ca emails** and **titles**.
- **"Chase"** — the person who identified himself as **Chase** at St. Jude's is still missing. Provide **full name**, **title**, **organization**, and **direct email**.
- **GTAA:**
  • You note **Andrew Larsen** has moved on. Provide the **current GTAA contact** covering his portfolio (name, title, direct email).

Everyone in the room agreed to share contact details so residents could follow up with officials present. Generic inboxes defeat that purpose and obstruct accountability.

**Deadline:** Please circulate a corrected list with the above fields completed for each attendee **no later than Wednesday, November 5, 2025 at 5:00 p.m. ET**.

**Notice of escalation:** Because the list has still not been provided in complete form, I have already filed an Access to Information / FOI request with **Transport Canada** to obtain the names of those who attended. TC has advised they must consult "third parties" before releasing that information. That should not be necessary for a public community meeting convened so residents could follow up with federal and aviation officials. If the corrected list is not received by the deadline, I will treat the omission as a refusal to disclose and will append that fact to my ATIP file and escalate to parliamentary committees and the Senate (TRAN/ENVI/HESA/OGGO/ETHI; TRCM/SOCI/ENEV), as well as the Speaker and the Leader of the Official Opposition already copied.

To avoid further delay, please also confirm in writing that the final list you provide is **complete and accurate**.

Thank you for closing this loop.

Sincerely,
**Fabio Ovettini**
On behalf of affected residents surrounding Toronto Pearson Airport
34 Jodphur Avenue, Toronto, ON M9M 2J4

fabio217@yahoo.com

----- Forwarded Message -----
**From:** [redacted]
**To:** Fabio Ovettini
**Cc** [redacted]; Sgro, Judy - M.P.
**Sent:** Monday, November 3, 2025 at 02:12:27 p.m. EST
**Subject:** RE: List of Attendees - September 4th, 2025 Airplane Noise Meeting

Hello Fabio,

This is the updated list that I have (below), as the original one I sent you on September 22nd (copy of email attached) was missing the email addresses for the attendees who attended from Transport Canada.

[redacted]

List of Attendess

September 4th, 2025 Airplane Noise Meeting

St. Jude's Catholic Church

6:30 pm

ATIA - 19(1)

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1. Steve Thomas – GTAA - steven.thomas@gtaa.com
2. GTAA – Gijs Van Laethem - community.engagement@gtaa.com
3. GTAA – Andrew Larsen - andrew.larsen@gtaa.com
4. NAV Canada – Jonathan Bagg - service@navcanada.ca
5. NAV Canada – Ian Giesbrecht - service@navcanada.ca
6. Transport Canada Toronto Region – Duwayne Williams - aviation.ont@tc.gc.ca
7. Transport Canada Toronto Region – Ovais - aviation.ont@tc.gc.ca
8. Judy Sgro – MP – judy.sgro@parl.gc.ca
9. Amy Calderan – MP Office – amy.calderan.521@parl.gc.ca
10. Albert Meneses – MP Office – albert.meneses.521@parl.gc.ca
11. Stephanie Loor-Ruiz – MP Office – stephanie.loorruiz.521@parl.gc.ca
12. Alida Troni – MPP Rakocevic's Office – trakocevic-co@ndp.on.ca
13. Saumya Singh - Councillor Perruzza's Office – councillor_perruzza@toronto.ca
14. City Councillor Office – councillor_perruzza@toronto.ca
15. [redacted]
16. [redacted]
17. Fabio Ovettini – Constituent – fabio217@yahoo.com
18. [redacted]
19. [redacted]
20. [redacted]
21. [redacted]
22. [redacted]
23. [redacted]
24. [redacted]

**From:** Fabio Ovettini
**Sent:** October 31, 2025 7:26 AM
**To:** [redacted]
**Cc:** tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; [redacted]; Sgro, Judy - M.P. ; hcminister.ministresc@hc-sc.gc.ca; Prime Minister's Office ; ministre-minister@ec.gc.ca; hcminister.ministresc@canada.ca; ~Access to Information, Privacy and Ethics/Accès à l'information, protection des renseignements personnels et éthique ; Speaker's Office/Bureau du Président ; trcm@sen.parl.gc.ca; ~Health/Santé ; ~Transport, Infrastructure and Communities/Transports, infrastructure et collectivités ; ~Government Operations and Estimates/Opérations gouvernementales et des prévisions budgétaires ; ~Environment & Sustainable Development/Environnement et développement durable ; soci@sen.parl.gc.ca; enev@sen.parl.gc.ca; Poilievre, Pierre - M.P. ; community.relations@gtaa.com
**Subject:** Fw: List of Attendees - September 4th, 2025 Airplane Noise Meeting

[redacted]

Before I go through the transcript you sent, I need to address something fundamental: the attendee list you provided is not complete.

1. Who was the participant who identified themselves as "Chase"?
2. You and Blair Ostrom organized and chaired this **in-person** meeting at **St. Jude's** on behalf of MP Judy Sgro's office.
3. There were two representatives from **NAV CANADA** and two from **Transport Canada** present.
4. At the meeting there was clear agreement that contact details would be shared with the community.
5. Amy Calderan has told us that **you** are the one who is supposed to circulate the full list.

Please send the **full attendee list** — names, roles, organizations, and emails — for:

- the person identified as "Chase"
- both NAV CANADA attendees
- both Transport Canada attendees
- anyone else present who is not currently listed

For the record, because the attendee list was not shared as agreed, I was forced to file an Access to Information / FOI request with **Transport Canada** to obtain the names of the people who attended the St. Jude's meeting. Transport Canada has now told me they must consult with "third parties" before releasing that information. That should not be necessary for a public community meeting that GTAA and MP Sgro's office convened specifically so residents could follow up with federal and aviation officials. This suggests the information is being withheld at your level.

I am copying federal and parliamentary bodies because this is now an accountability issue. Leadership changes at GTAA were supposed to restore trust. Instead, under **Steven Thomas's** direction we are seeing tighter control of information, withholding of agreed-upon attendee details, disregard for affected communities, repeated manipulation of reports, and a growing contempt for both the affected communities and for parliamentary oversight. That frustrates federal oversight of a federally regulated airport.

**Cc (House of Commons):**

- Standing Committee on Transport, Infrastructure and Communities (TRAN)
- Standing Committee on Environment and Sustainable Development (ENVI)
- Standing Committee on Health (HESA)
- Standing Committee on Government Operations and Estimates (OGGO)
- Standing Committee on Access to Information, Privacy and Ethics (ETHI)

**Cc (Senate):**

- Standing Senate Committee on Transport and Communications
- Standing Senate Committee on Energy, the Environment and Natural Resources
- Standing Senate Committee on Social Affairs, Science and Technology

**Cc (Executive):**

- Prime Minister of Canada
- Minister of Transport
- Minister of Health
- Minister of Environment and Climate Change
- Speaker of the House of Commons
- Office of MP Judy Sgro
- Amy Calderan

**Cc (Opposition):**

- Pierre Poilievre, Leader of the Official Opposition

Once we have the complete list, we can properly review and respond to the transcript and your answers.

Fabio Ovettini
34 Jodphur Avenue,

Toronto, Ontario. M9M 2J4

On behalf of affected residents and community members surrounding Toronto Pearson Airport

ATIA - 19(1)

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----- Forwarded Message -----

**From:** [redacted]

**To:** [redacted] Fabio Ovettini <fabio217@yahoo.com>

**Cc:** [redacted] judy.sgro@parl.gc.ca <judy.sgro@parl.gc.ca>; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca <tc.ministeroftransport-ministredestransports.tc@tc.gc.ca>; hcminister.ministresc@hc-sc.gc.ca <hcminister.ministresc@hc-sc.gc.ca>; hcminister.ministresc@canada.ca <hcminister.ministresc@canada.ca>; pm@pm.gc.ca <pm@pm.gc.ca>; ministre-minister@ec.gc.ca <ministre-minister@ec.gc.ca>

**Sent:** Thursday, October 30, 2025 at 06:23:04 p.m. EDT

**Subject:** RE: List of Attendees - September 4th, 2025 Airplane Noise Meeting

Hello Fabio,

Thank you for your continued engagement and advocacy on behalf of your community and your patience with our response. It was more challenging than anticipated to pull the transcript together based on the overlapping speaking points from the different attendees speaking at the same time, resulting in a longer response time than we would have liked.

Attached you will find a copy of the transcript from the recent meeting, along with answers and supporting links to the different questions that were posed to the GTAA.

Contact details are as follows for GTAA staff that attended our recent meeting:

Steven Thomas – Director, Government Relations (steven.thomas@gtaa.com)

Andrew Larsen – Assoc. Director Airport and Aviation Policy was also in attendance, but has since moved on to another opportunity.

Gijs Van Laethem – Senior Noise Officer (community.relations@gtaa.com)

As always, if you'd like to discuss anything in further detail, please reach out to our noise management office through our website, via phone at [redacted] or via email at [redacted]

@Calderan, Amy (Sgro, Judy A. - MP) Could I ask you to please help distribute the attached and above to the other members of the community that were present at the last meeting as I do not have access to all of their respective contact information.

Thank you, and have a great day.

Regards,

[redacted]

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---

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** Wednesday, October 1, 2025 8:32 PM
**To:** [redacted] judy.sgro@parl.gc.ca; [redacted]; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc@hc-sc.gc.ca; hcminister.ministresc@canada.ca; pm@pm.gc.ca; ministre-minister@ec.gc.ca
**Cc:** [redacted] eric.costen@hc-sc.gc.ca; greg.orencsak@hc-sc.gc.ca; jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; [redacted] humberleacommunitygroup@gmail.com; [redacted] mayor_chow@toronto.ca; councillor_perruzza@toronto.ca; [redacted] w5@ctv.ca; [redacted] doug.fordco@pc.ola.org; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted]

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[redacted] judy.sgro.a1@parl.gc.ca [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; [redacted]; [redacted] mark.carney@parl.gc.ca; chrystia.freeland@parl.gc.ca; marjorie.michel@parl.gc.ca; amy.calderan.521@parl.gc.ca; councillor_ainslie@toronto.ca; ZZG-Community Engagement <communityengagement@gtaa.com>; petitions@oag-bvg.gc.ca; info.com@chrc-ccdp.gc.ca; hcinfo.infosc@canada.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; [redacted] publichealth@toronto.ca; boh@toronto.ca; [redacted]
**Subject:** Re: List of Attendees - September 4th, 2025 Airplane Noise Meeting

CAUTION: External Sender. Do not click on any links or open any attachments unless you trust the sender and know the content is safe.

Dear [redacted]

Thank you for your response.

While I appreciate your note, it is not reasonable to expect individual residents to chase multiple federal agencies and the GTAA for basic information. Transport Canada is the landlord under the Pearson Ground Lease, and Parliament – through our elected representatives – holds oversight responsibility.

To avoid further confusion, I would ask the following be actioned:

1. **Lease obligations:** [redacted] please provide the exact clause and page in the Ground Lease where it states GTAA has a mandate to "meet demand."
2. **Night operations data:** Chase, please provide the GTAA website link where historical yearly operations for night-time traffic are published.
3. **Contact information:** Correct contact details for all agencies and participants present at the September 4 meeting.
4. **Minutes and responses:** The official minutes of the meeting and written responses to the questions raised.
5. **Transport Canada oversight:** Clarification from Transport Canada on their role in enforcing compliance with the Ground Lease and the Noise Management Program.

It is the role of an MP's office to press for accountability and obtain these answers from federal bodies on behalf of constituents. Redirecting us back to GTAA or NAV CANADA only leaves residents without representation or recourse.

I would ask your office to follow up directly with Transport Canada and GTAA on these items and confirm a timeline for when we will receive a response.

Thank you for your attention to this matter.

Sincerely,
Fabio Ovettini

On Wednesday, October 1, 2025 at 03:23:07 p.m. EDT, [redacted] wrote:

Good afternoon Fabio,

I hope this email finds you well, and thank you for following up.

Apologies for the delay in responding, our office handles an extremely high volume of emails and calls daily, and we're not always able to reply as quickly as we'd like.

Regarding the mix-up with the names on the list, [redacted] perhaps you could kindly provide the correct information for Chase, who attended the meeting?

As for NAV Canada, the details I shared were based on the information provided to us. If you're seeking something more specific, I would recommend reaching out to them directly for clarification.

I've yet to receive a response from Transport Canada regarding contact information. [redacted] would you be able to assist Fabio in obtaining that?

Lastly, any answers to questions raised during the meeting, as well as the official minutes, will need to come directly from GTAA.

I hope this helps clarify things. Thanks again for your follow-up, and wishing you a great day!

Regards,

[redacted]

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---

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** September 22, 2025 7:22 PM
**To:** [redacted]; Sgro, Judy - M.P. <judy.sgro@parl.gc.ca>; [redacted] tc.ministerofitransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc@hc-sc.gc.ca; hcminister.ministresc@canada.ca; Prime Minister's Office <pm@pm.gc.ca>; ministre-minister@ec.gc.ca; Sgro, Judy - M.P. <judy.sgro@parl.gc.ca>
**Cc:** [redacted]; eric.costen@hc-sc.gc.ca; greg.orencsak@hc-sc.gc.ca; jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; [redacted]; humberleacommunitygroup@gmail.com; [redacted]

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mayor_chow@toronto.ca; councillor_perruzza@toronto.ca; [redacted] trakocevic-co@ndp.on.ca; [redacted] w5@ctv.ca; [redacted] doug.fordco@pc.ola.org; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] Sgro, Judy - Assistant 1 <judy.sgro.a1@parl.gc.ca>; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; matias.dedovitiis@tdsb.on.ca; [redacted] Carney, Mark - M.P. <mark.carney@parl.gc.ca>; Freeland, Chrystia - M.P. <Chrystia.Freeland@parl.gc.ca>; Michel, Marjorie - Députée <marjorie.michel@parl.gc.ca>; Calderan, Amy (Sgro, Judy A. - MP) <amy.calderan.521@parl.gc.ca>; councillor_ainslie@toronto.ca; communityengagement@gtaa.com; petitions@oag-bvg.gc.ca; info.com@chrc-ccdp.gc.ca; info.infosc@canada.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; [redacted] publichealth@toronto.ca; boh@toronto.ca; [redacted]
**Subject:** Re: List of Attendees - September 4th, 2025 Airplane Noise Meeting

**Subject: Accountability Required – September 4 Noise Meeting Follow-Up**

Good afternoon [redacted]

Thank you for sending the attendee list. Unfortunately, it is incomplete. While the names are included, the organizational email addresses that participants provided are missing. For example:

- NAV Canada – Jonathan Bagg (service@navcanada.ca
- NAV Canada – Ian Giesbrecht (service@navcanada.ca
- Transport Canada Toronto Region – Duwayne Williams
- Transport Canada Toronto Region – Ovais

In addition, an individual who introduced himself as *Chase* at the meeting does not appear on the list. Everyone in the room agreed to share their contact information, and leaving these details out undermines that agreement.

More importantly, we are still waiting for:

- **The promised responses** to the questions raised during the meeting.
- **The official minutes of the meeting**, so there is a transparent and reliable record.

The community has shown good faith by attending, engaging, and even offering supporting documentation. In contrast, delays, omissions, and incomplete records reflect poorly on the process and risk reinforcing the perception of bad faith from the institutions involved.

As the organizer, are you prepared to exercise the powers and responsibilities of your position to obtain the missing materials, and get back to us with either the requested information or a firm date when it will be delivered?

Finally, I personally committed during the meeting to provide certain documents for review to one of the Transport Canada representatives. Without a complete and accurate contact list, I cannot fulfill that commitment.

The time for partial answers has long passed. We expect full transparency and follow-through.

Sincerely,

Fabio Ovettini

On Monday, September 22, 2025 at 04:45:33 p.m. EDT, [redacted] wrote:

Good afternoon Fabio,

I hope you are doing well and had a good weekend.

Please see attached, the complete list of attendees at the September 4th, 2025 Noise Meeting.

Have a wonderful evening!

[redacted]

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Good afternoon Fabio,

I hope you are doing well and had a good weekend.

Please see attached, the complete list of attendees at the September 4th, 2025 Noise Meeting.

Have a wonderful evening!

[redacted]

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[redacted]

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Good afternoon Fabio,

I hope you are doing well and had a good weekend.

Please see attached, the complete list of attendees at the September 4th, 2025 Noise Meeting.

Have a wonderful evening!

[redacted]

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List of Attendess

September 4th, 2025 Airplane Noise Meeting

St. Jude's Catholic Church

6:30 pm

1. Steve Thomas – GTAA - steven.thomas@gtaa.com
2. GTAA – Gijs Van Laethem - community.engagement@gtaa.com
3. GTAA – Andrew Larsen - andrew.larsen@gtaa.com
4. NAV Canada – Jonathan Bagg - service@navcanada.ca
5. NAV Canada – Ian Giesbrecht - service@navcanada.ca
6. Transport Canada Toronto Region – Duwayne Williams
7. Transport Canada Toronto Region – Ovais
8. Judy Sgro – MP – judy.sgro@parl.gc.ca
9. Amy Calderan – MP Office – amy.calderan.521@parl.gc.ca
10. Albert Meneses – MP Office – albert.meneses.521@parl.gc.ca
11. Stephanie Loor-Ruiz – MP Office – stephanie.loorruiz.521@parl.gc.ca
12. Alida Troni – MPP Rakocevic's Office – trakocevic-co@ndp.on.ca
13. Saumya Singh - Councillor Perruzza's Office – councillor_perruzza@toronto.ca
14. City Councillor Office – councillor_perruzza@toronto.ca
15. [redacted]
16. [redacted]
17. Fabio Ovettini – Constituent – fabio217@yahoo.com
18. [redacted]
19. [redacted]
20. [redacted]
21. [redacted]
22. [redacted]
23. [redacted]
24. [redacted]

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**From:** Fabio Ovettini
**To:** [redacted] aara.saks@parl.gc.ca; [redacted] mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); [redacted] (he, him | il, lui) (HC/SC); pierre.poilievre@parl.gc.ca; Jagmeet - M.P.; Francesco Sorbara; [redacted] humberleacommunitygroup@gmail.com; [redacted] Mayor Chow; [redacted] Tom Rakocevic; [redacted] WS Viewer Visit; [redacted] Zorzi-Silcock; Minister of Transport / Ministre des Transports (TC); [redacted] newstips@thestar.ca; [redacted] ZZG-Community Engagement; doug.fordco@pc.ola.org; [redacted] hcminister.ministresc; MHA Minister / Ministre SMD (HC/SC); [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] Anita.Anand@parl.gc.ca; anita.anand@parl.gc.ca; [redacted]
**Subject:** Fw: The Silent Scream: The Hidden Toll of Airplane Noise Pollution
**Date:** 2025-02-09 9:00:42 PM

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**Warning:** This message is from an EXTERNAL SENDER - be CAUTIOUS, particularly with links and attachments.
**Attention:** Ce message provient d'un EXPÉDITEUR EXTERNE - soyez PRUDENT, en particulier avec les liens et les pièces jointes.

I am re-sending it because many people were not properly added in the original email.

----- Forwarded Message -----
**From:** Fabio Ovettini
**To:** Councillor_Crisanti@toronto.ca ; councillor_holyday@toronto.ca ; Councillor_Morley@toronto.ca ; councillor_perks@toronto.ca ; councillor_nunziata@toronto.ca ; councillor_pasternak@toronto.ca ; councillor_perruzza@toronto.ca ; councillor_colle8@toronto.ca ; Councillor_Malik@toronto.ca ; Councillor_Saxe@toronto.ca ; councillor_matlow@toronto.ca ; Councillor_Moise@toronto.ca ; councillor_fletcher@toronto.ca ; Councillor_ChernosLin@toronto.ca ; Councillor_Burnside@toronto.ca ; councillor_carroll@toronto.ca ; Councillor_Cheng@toronto.ca ; councillor_bradford@toronto.ca ; Councillor_Kandavel@toronto.ca ; councillor_thompson@toronto.ca ; Councillor_Mantas@toronto.ca ; Councillor_Myers@toronto.ca ; councillor_ainslie@toronto.ca ; councillor_mckelvie@toronto.ca ; Judy - M.P. Sgro [redacted] ; fabio ovettini [redacted]
**Cc:** [redacted] aara.saks@parl.gc.ca ; [redacted] mark.holland@parl.gc.ca ; yaara.saks@parl.gc.ca ; eric.costen@hc-sc.gc.ca ; greg.orencsak@hc-sc.gc.ca ; pierre.poilievre@parl.gc.ca ; [redacted] humberleacommunitygroup@gmail.com ; [redacted] ; newstips@thestar.ca ; [redacted] doug.fordco@pc.ola.org ; [redacted] hcminister.ministresc@hc-sc.gc.ca ; mhaminister.ministresmd@hc-sc.gc.ca ; [redacted] piac.ward04@tdsb.on.ca ; [redacted] office@timothycs.com ; piac.ward01@tdsb.on.ca ; [redacted] Anita.Anand@parl.gc.ca [redacted]
**Sent:** Sunday, February 9, 2025 at 05:39:31 p.m. EST
**Subject:** The Silent Scream: The Hidden Toll of Airplane Noise Pollution

The Silent Scream: The Hidden Toll of Airplane Noise Pollution

In the final days of her life, an elderly woman longed for peace, but the relentless roar of aircraft overhead denied her even that small comfort. Her frail body, already worn by age, trembled under the weight of the ceaseless noise. As she strained to hear her grandson's final words, the deafening engines swallowed them whole, leaving her with nothing but a memory of disruption, isolation, and loss..

The story of this elderly woman is not an isolated incident. Across the GTA, countless individuals in vulnerable communities are subjected to the harmful effects of airplane noise pollution. The constant barrage of sound from airplanes activities disrupts their lives, affecting their health and well-being.

Studies have shown that prolonged exposure to high levels of noise can lead to serious health issues, including cardiovascular problems, sleep disturbances, and mental health challenges. For those already struggling with illnesses or disabilities, the impact is even more severe.

It's time to acknowledge the silent scream of those who suffer from airplane noise pollution. By raising awareness and advocating for stricter regulations and better urban planning, we can work towards creating a quieter, healthier environment for all.

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Inline image

Sincerely,
Fabio Ovettini

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**From:** Fabio Ovettini
**To:** [redacted] corporatesecretary@gtaa.com
**Cc:** [redacted] community.relations@gtaa.com; Steven.MacKinnon@parl.gc.ca; hcminister.ministresc; hcminister.ministresc@canada.ca; pm@pm.gc.ca; ministre-minister@ec.gc.ca; service@navcanada.ca; ethi@parl.gc.ca; speaker.president@parl.gc.ca; trcm@sen.parl.gc.ca; hesa@parl.gc.ca; tran@parl.gc.ca; oggo@parl.gc.ca; envi@parl.gc.ca; soci@sen.parl.gc.ca; enev@sen.parl.gc.ca; pierre.poilievre@parl.gc.ca; Minister of Transport / Ministre des Transports (TC); Judy - M.P. Sgro
**Subject:** Fw: Transcript & List of Attendees - September 4th, 2025 Noise Meeting
**Date:** 2025-11-05 9:37:42 AM
**Attachments:** 2025-10-23 Sep 4 Meeting with Mp Sgro Follow-up&Transcription.pdf
image002.png
image007.png

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**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

**Subject:** GTAA leadership conduct — request for HR action, records hold, and corrective plan (St. Jude's meeting follow-ups)

Dear [redacted] and Members of the Board,

Residents were told that GTAA leadership changes would restore transparency and accountability in community engagement. **The opposite has occurred under Steven Thomas (Director, Government Relations & Aviation Policy) and Blair Ostrom.** The pattern since the **Sept 4, 2025 St. Jude's** meeting is now clear:

### 1) Usable attendee list still withheld

For each official attendee from **GTAA, NAV CANADA, and Transport Canada**, we have repeatedly requested:

- **Full name** (first & last)
- **Title/role**
- **Direct organizational email** (not a generic inbox)

Instead of named follow-up contacts, residents are being routed to generic inboxes (e.g., **community.relations@gtaa.com**), which defeats the purpose of a public meeting where officials expressly agreed to share contact details.

### 2) Leadership has not corrected the culture

GTAA promised a reset. **Under Steven Thomas and Blair Ostrom the culture has hardened**—information is filtered, contact details agreed to in person are replaced by generic inboxes, and timelines slip without accountability. **After two months, GTAA cannot produce a complete, verifiable attendee list.** Parliament and the Senate should be aware that *engagement claims are not matched by operational conduct*.

### 3) Public meeting logistics and access failure

The most recent public session was scheduled for **3.5 hours** and was **ended after ~38 minutes**. **No notice** was posted on the platform. Many residents—including me—were left for hours seeing a message such as "**someone will soon let you in the room**," with no admission and no update. This is not an acceptable standard for a federally relevant public meeting.

**Please provide:**

- **Who** ended the meeting and **at what time**;
- The **reason** for early termination and for posting **no notice**;
- **Platform logs** (waiting-room/admit logs, host changes, start/stop times) and any **chat transcript**;
- A **make-good plan**: reschedule a properly hosted **full 3.5-hour** session (named hosts, multiple co-hosts, monitored waiting room), with the link and instructions **published 7 days in advance**.

### 4) Record integrity and reporting concerns

Residents have observed **repeated manipulation of reports** and a pattern of **noise monitor (NMT) outages** that erode trust and undermine transparency. These issues compound the access failures above and make it impossible to conduct informed follow-up on health and safety concerns.

---

## Requests for action (Board and CEO)

1. **Immediate records-preservation hold** at GTAA, NAV CANADA, and Transport Canada for all St. Jude's-related records (sign-in sheets, emails, drafts, chats/messages, calendars, transcript versions, platform logs).
2. **Management/HR review** into the conduct of **Steven Thomas** and **Blair Ostrom** regarding:
   - Withholding of usable contact details despite on-the-record commitments;
   - Failure to provide complete, verifiable follow-up;
   - Early termination of a publicly scheduled session without notice;
   - Patterns of report manipulation and NMT transparency failures.
     Please confirm whether interim measures (e.g., temporary reassignment from community-facing duties) will be put in place pending findings.
3. **Corrective plan (10 business days):**
   - Deliver the **complete attendee list** (names/titles/**direct** emails) for GTAA/NAV/TC;
   - Publish **final minutes/transcripts** with version date/editor;
   - Commit to **post-meeting service standards** (e.g., named contacts within 5 business days; written answers within 15 business days; raw materials and logs on request);
   - **Independent facilitator** for the re-scheduled 3.5-hour session to ensure access, fairness, and a clean record.

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For transparency: because GTAA has not provided the attendee list in usable form, I have already filed an **ATIP** with Transport Canada; TC has replied that it must consult "third parties" before releasing basic attendance information from a community meeting—an outcome that should never have been necessary.

Residents attended in good faith and were promised straightforward follow-through. **The Board and CEO now need to enforce it.** Please confirm receipt of this request, the institution of a records hold, and the initiation of an HR/management review into Mr. Thomas and Mr. Ostrom, with timelines for the corrective plan above.

Sincerely,
**Fabio Ovettini**
On behalf of affected residents surrounding Toronto Pearson Airport
34 Jodphur Avenue, Toronto, ON M9M 2J4
fabio217@yahoo.com

----- Forwarded Message -----
**From:** [redacted]
**To:** [redacted] fabio217@yahoo.com ; [redacted]
; [redacted]
**Cc:** [redacted] judy.sgro@parl.gc.ca ; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca ; hcminister.ministresc@hc-sc.gc.ca ; hcminister.ministresc@canada.ca ; pm@pm.gc.ca ; ministre-minister@ec.gc.ca ; [redacted]
**Sent:** Wednesday, November 5, 2025 at 08:32:28 a.m. EST
**Subject:** Transcript & List of Attendees - September 4th, 2025 Noise Meeting

Hello everyone,

Thank you for your continued engagement and advocacy on behalf of your community and your patience with our response. It was more challenging than anticipated to pull the transcript together based on the overlapping speaking points from the different attendees speaking at the same time, resulting in a longer response time than we would have liked.

Attached you will find a copy of the transcript from the recent meeting, along with answers and supporting links to the different questions that were posed to the GTAA.

Contact details of GTAA staff present at the last meeting were requested by community members and are as follows:

GTAA:

Steven Thomas – Director, Government Relations & Aviation Policy (steven.thomas@gtaa.com)

Andrew Larsen – Assoc. Director Airport and Aviation Policy was also in attendance, but has since moved on to another opportunity. This role is still being filled.

Gijs Van Laethem – Senior Noise Officer (community.relations@gtaa.com) (Please note that a request for the contact information for a "Chase" has been made multiple times. There is no "Chase" employed by the GTAA Noise department, but Gijs is pronounced in a similar fashion).

As always, if you'd like to discuss anything in further detail, please reach out to our noise management office through our website, via phone at [redacted] or via email at community.relations@gtaa.com

Thank you, and have a great day.

Regards,

[redacted]

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*Although this e-mail and any attachments are believed to be free of any virus or other defects that might affect any computer or IT system into which they are received, no responsibility is accepted by the* [redacted] *for any loss or damage arising in any way from the receipt or use thereof.*

**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** Wednesday, October 1, 2025 8:32 PM
**To:** [redacted]; judy.sgro@parl.gc.ca; [redacted]; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc@hc-sc.gc.ca; hcminister.ministresc@canada.ca; pm@pm.gc.ca; ministre-minister@ec.gc.ca
**Cc:** [redacted] eric.costen@hc-sc.gc.ca; greg.orencsak@hc-sc.gc.ca; jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; [redacted] humberleacommunitygroup@gmail.com [redacted] mayor_chow@toronto.ca; councillor_perruzza@toronto.ca; [redacted] trakocevic-co@ndp.on.ca; [redacted] w5@ctv.ca; [redacted]

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[redacted]; doug.fordco@pc.ola.org; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] judy.sgro.a1@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; [redacted] mark.carney@parl.gc.ca; chrystia.freeland@parl.gc.ca; marjorie.michel@parl.gc.ca; amy.calderan.521@parl.gc.ca; councillor_ainslie@toronto.ca; ZZG-Community Engagement <communityengagement@gtaa.com>; petitions@oag-bvg.gc.ca; info.com@chrc-ccdp.gc.ca; hcinfo.infosc@canada.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; robvjus@gmail.com; publichealth@toronto.ca; boh@toronto.ca; joanthebug@gmail.com
**Subject:** Re: List of Attendees - September 4th, 2025 Airplane Noise Meeting

CAUTION: External Sender. Do not click on any links or open any attachments unless you trust the sender and know the content is safe.

Dear [redacted]

Thank you for your response.

While I appreciate your note, it is not reasonable to expect individual residents to chase multiple federal agencies and the GTAA for basic information. Transport Canada is the landlord under the Pearson Ground Lease, and Parliament – through our elected representatives – holds oversight responsibility.

To avoid further confusion, I would ask the following be actioned:

1. **Lease obligations:** [redacted] please provide the exact clause and page in the Ground Lease where it states GTAA has a mandate to "meet demand."
2. **Night operations data:** Chase, please provide the GTAA website link where historical yearly operations for night-time traffic are published.
3. **Contact information:** Correct contact details for all agencies and participants present at the September 4 meeting.
4. **Minutes and responses:** The official minutes of the meeting and written responses to the questions raised.
5. **Transport Canada oversight:** Clarification from Transport Canada on their role in enforcing compliance with the Ground Lease and the Noise Management Program.

It is the role of an MP's office to press for accountability and obtain these answers from federal bodies on behalf of constituents. Redirecting us back to GTAA or NAV CANADA only leaves residents without representation or recourse.

I would ask your office to follow up directly with Transport Canada and GTAA on these items and confirm a timeline for when we will receive a response.

Thank you for your attention to this matter.

Sincerely,
Fabio Ovettini

On Wednesday, October 1, 2025 at 03:23:07 p.m. EDT, [redacted] wrote:

Good afternoon Fabio,

I hope this email finds you well, and thank you for following up.

Apologies for the delay in responding, our office handles an extremely high volume of emails and calls daily, and we're not always able to reply as quickly as we'd like.

Regarding the mix-up with the names on the list, [redacted] perhaps you could kindly provide the correct information for Chase, who attended the meeting?

As for NAV Canada, the details I shared were based on the information provided to us. If you're seeking something more specific, I would recommend reaching out to them directly for clarification.

I've yet to receive a response from Transport Canada regarding contact information. [redacted] would you be able to assist Fabio in obtaining that?

Lastly, any answers to questions raised during the meeting, as well as the official minutes, will need to come directly from GTAA.

I hope this helps clarify things. Thanks again for your follow-up, and wishing you a great day!

Regards,

[redacted]

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**From:** Fabio Ovettini <fabio217@yahoo.com>
**Sent:** September 22, 2025 7:22 PM
**To:** Calderan, Amy (Sgro, Judy A. - MP) <amy.calderan.521@parl.gc.ca>; [redacted] Sgro, Judy - M.P. <judy.sgro@parl.gc.ca>; steven.thomas@gtaa.com; deborah.flint@gtaa.com; tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; hcminister.ministresc@hc-sc.gc.ca; hcminister.ministresc@canada.ca; Prime Minister's Office <pm@pm.gc.ca>; ministre-minister@ec.gc.ca; Sgro, Judy - M.P. <judy.sgro@parl.gc.ca>
**Cc:** [redacted]

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[redacted]

eric.costen@hc-sc.gc.ca; greg.orencsak@hc-sc.gc.ca; jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; [redacted] humberleacommunitygroup@gmail.com; [redacted] mayor_chow@toronto.ca; councillor_perruzza@toronto.ca; [redacted] trakocevic-co@ndp.on.ca; [redacted] w5@ctv.ca; [redacted] doug.fordco@pc.ola.org; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca [redacted] Sgro, Judy - Assistant 1 <judy.sgro.a1@parl.gc.ca>; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; [redacted] Carney, Mark - M.P. <mark.carney@parl.gc.ca>; Freeland, Chrystia - M.P. <Chrystia.Freeland@parl.gc.ca>; Michel, Marjorie - Députée <marjorie.michel@parl.gc.ca>; Calderan, Amy (Sgro, Judy A. - MP) <amy.calderan.521@parl.gc.ca>; councillor_ainslie@toronto.ca; communityengagement@gtaa.com; petitions@oag-bvg.gc.ca; info.com@chrc-ccdp.gc.ca; hcinfo.infosc@canada.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; [redacted]
**Subject:** Re: List of Attendees - September 4th, 2025 Airplane Noise Meeting

**Subject: Accountability Required – September 4 Noise Meeting Follow-Up**

Good afternoon [redacted]

Thank you for sending the attendee list. Unfortunately, it is incomplete. While the names are included, the organizational email addresses that participants provided are missing. For example:

- NAV Canada – Jonathan Bagg (service@navcanada.ca
- NAV Canada – Ian Giesbrecht (service@navcanada.ca
- Transport Canada Toronto Region – Duwayne Williams
- Transport Canada Toronto Region – Ovais

In addition, an individual who introduced himself as *Chase* at the meeting does not appear on the list. Everyone in the room agreed to share their contact information, and leaving these details out undermines that agreement.

More importantly, we are still waiting for:

- **The promised responses** to the questions raised during the meeting.
- **The official minutes of the meeting**, so there is a transparent and reliable record.

The community has shown good faith by attending, engaging, and even offering supporting documentation. In contrast, delays, omissions, and incomplete records reflect poorly on the process and risk reinforcing the perception of bad faith from the institutions involved.

As the organizer, are you prepared to exercise the powers and responsibilities of your position to obtain the missing materials, and get back to us with either the requested information or a firm date when it will be delivered?

Finally, I personally committed during the meeting to provide certain documents for review to one of the Transport Canada representatives. Without a complete and accurate contact list, I cannot fulfill that commitment.

The time for partial answers has long passed. We expect full transparency and follow-through.

Sincerely,

Fabio Ovettini

On Monday, September 22, 2025 at 04:45:33 p.m. EDT, [redacted] wrote:

Good afternoon Fabio,

I hope you are doing well and had a good weekend.

Please see attached, the complete list of attendees at the September 4th, 2025 Noise Meeting.

Have a wonderful evening!

[redacted]

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**Follow-ups**

**November Pearson Public Meeting**

The next Pearson Public Meeting (part of our Noise Management Forums) will be held on November 6th. More information and a link to register will be made available on the Noise Management Forums page.

**Lease reference to "fulfill demand"**

*Page 137 of the Ground Lease*

8.02.03 Without limiting the generality of Subsection 8.02.01, the Tenant shall, at its cost, in particular: (a) provide all capital improvements to the Airport in order to ensure that the Airport has the **ability and the facilities required to accommodate the capacity demands** at the Airport;

**Night Flight budget**

More information on the Night Flight Restriction Program can be found on the Toronto Pearson webpage and the InsightFull portal. Reporting on Night Flight budget use can be found on the Annual Noise Management Statistics.

**Air Quality**

Community members can learn more about Toronto Pearson's Environmental Programs here. There is also air quality monitoring on airport property with results made available here.

**A320 Retrofit Program**

The Airbus A320 family aircraft produce a high-pitch whining sound on approach caused by Toronto Pearson monitors the usage of the A320 family operations based on retrofit status information provided by airlines.
Reports can be viewed here.

**Fleet Transition and projections**

In 2024, 21.7% of flights by chapter 14 aircraft, up from 17.6% by chapter 14 in 2023. Chapter 4 is remaining stable at 52% year over year.
Toronto Pearson's hub carriers continue to transition to newer, quieter and more efficient aircraft.



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# Transcript

September 4, 2025, 6:31PM

started transcription

**Introductions**

(Steven) Sorry folks, I'm sorry to interrupt your conversation, but it is just past 6:30, so we would like to just convene the meeting. I'm Steve Thomas.

We are looking to do a round of introductions today just to introduce any new faces to the group. There's a lot of people that are familiar with others, but there may be some that are not, so we'll do a little bit of an introduction. But I'm Steve Thomas. I'm the Director of Government Relations and Aviation Policy for the Greater Toronto Airports Authority.

You know, we've helped convene this meeting today on behalf of MP Sgro, who has reached out based on community feedback and advocated on your behalf to have this meeting today. I can say very candidly that MP Sgro is a great advocate for you and your community.

On this matter, the GTAA and has helped convene this meeting today. We have brought a couple different organizations to the table today to talk to the community, not only the GTAA. So we'll do some introductions on our side, on the industry side to begin.

And then we will move into introductions for the community members. If you would like to introduce yourself to the group, we have had a request from one of the community members today to record the meeting and so we can look to do that. But we do need consent from the group that it's OK to record the meeting on their behalf.

We are recording this because we are going to make minutes of the meeting and we're going to be sending over. Yes, I think that's a great idea. That's correct. We can always follow up on it, right? Absolutely. And so we're open to doing that and we're going to begin the recording.

I'm just going to do a quick around the room for anybody who's not comfortable with recording the meeting. If you could just raise your hand and in absence of that, that's how we'll proceed to monitor the meeting and then a few minutes subsequently. So at this point we'll do some industry introductions and afterwards

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we'll do community introductions and then obviously we'll allow the MP and our team to introduce themselves as well. So I've already introduced myself, but once again Steve Thomas, Director of Relations and Aviation Policy for the GTAA and I'm joined today by my colleagues.

(Gijs) Yes, Gijs Van Laethem, Senior Noise Management Officer. I might have spoken to a lot of you on the phone, e-mail in the past as well.

(Andrew) Good evening. I'm Andrew Larsen. I'm the Associate Director of Airport and Aviation Policy with the GTAA. I've been here all of a month, so still learning. Most of my career has been in aviation safety.

Thank you so much. And our partners from NAV CAN.

(Jonathan) Sure. Jonathan Bagg commuity and industry relations at NAV Canada, includes our work around community Engagement around the airspace and related files and working closely with the team at GTAA. Pass it over to Ian.

(Ian) Yep, here also doing the same thing with Jonathan in Ottawa and for the rest of the country as well.

(Steven) And MP Scro has kindly invited some of the partners and colleagues from the federal and provincial government. And maybe I'll just ask you to introduce yourself then.

(Duwayne) Yeah, sure. Hey, everyone, I'm Duwayne, I'm the Regional Director General at Transport Canada.

(Ovais) I'm Ovais, I'm the technical team lead for specialties.

(Amy) Uh, I'm Judy. Amy, uh, constituency office manager for Judy.

(Somnath ) I'm Somnath. I'm from Councillor Anthony Perruzza office.

[redacted]

(Steven) Thank you so much and in the back if you'd like to introduce yourself.

[redacted]

(Steven) OK. And that concludes the round of introduction. So thank you all so much for taking the time to join us today. As I mentioned, we are joined by our colleagues and I do see some new faces in the room. So I thought it would be a good idea for



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the industry partners here today to just give a very high level brief summary of roles and responsibilities and sort of what we do. Sorry to interrupt. No, absolutely.
We're actually just finishing introductions. If you'd like to introduce yourself, if not, (Counc Perruzza's staffer) I'm with the City Council Officer Perruzza.
(Steven) Thank you so much for joining. Thank you. And so sorry before I was interrupted, just to restart that little bit, we're just going to do a brief overview of sort of the overall roles and responsibilities.

**Role and responsibilities**

Of the different organizations in the room today to provide some clarity for anybody in the room that isn't familiar with the different organizations. So the Greater Toronto Airports Authority is a private, not-for-profit organization that is in place to operate, maintain and develop Toronto Pearson International Airport.
And ensure that capacity and demand are aligned. And you know, we're joined by Jonathan and Ian, our NAV partners. We do the same thing. Yeah, yeah, so.
So NAV Canada, obviously we're the air navigation service, the most known service within that kind of responsibility is air traffic control. So our people are in the tower control tower at the airport. We also have an area control centre nearby which manages airspace around the airport. So once an aircraft takes off, they're pretty quickly handed off to area control center controller. So they manage traffic day in, day out, giving them instructions, climb, descend, head towards this way point, use this procedure so they direct traffic. First goal obviously is to keep what we would say aircraft separated.
Which is obviously maintaining a safe distance. So that's what they do like very tactically and practically speaking. When we talk about aircraft, aircraft and airspace operations, we do work very closely with the airport on things like airspace design.
So we publish the procedures that are used at the airport.
They get put into aeronautical information products that pilots use in the cockpit to navigate. So even though the sky, you know, obviously there's invisible flight paths, as you all know, because you're exposed to some of many, some of them.
And so we published the routes and have the procedures to ensure that we have operational safety first and foremost, also meet capacity of the demand. So we have a mandate to ensure we can keep a throughput at the airport. And then when we look at things like airspace design, Ian's team will work with our airspace designers and look at things like community impact, how can we mitigate noise? Understand that a place like Toronto Pearson is a challenging place to mitigate noise because it's

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surrounded by population, but it is something that Ian's team does very actively working with our designers when we have airspace projects.
We don't currently have an airspace project underway, but that is a practice that that we undertake and he'll work with the GTAA in terms of some of our when we do Engagement sessions and things like that. And that's why we're here today because it's ultimately our team...
(Fabio) Who finances your organization? So you have clients?
(Jonathan) Yeah, we have customers. Absolutely. So similarly, we're a private, not-for-profit.
(Fabio) You must make money. Yeah, someone pays you.
(Steven) So can we just finish doing introductions and then we can get into the questions?
(Fabio) On scope of what you guys do, I want to understand who finances you.
(Steven) Absolutely fine. We can look to answer those questions. Yeah. If you just hold those questions until we're done with introductions, then we're happy to answer your question.
(Jonathan) Yeah, I'm happy to say. Sure. Yeah. But just cuz I was there. Like I literally got 3 words left. But we're a private, not-for-profit organization, non-capital corporations, so not traded on the market, we're not looking to pay dividends. We do charge airline operators and other aircraft operators. They pay for the system in Canada. So air traffic control in Canada is the users. It's you've heard of it made as a user pay system.
And it's similar with the airport. So people use the airport, pay airport fees. That's how it's paid. It's not taxpayer funded in Canada.
[redacted] and Fabio) So the more planes that you get in, the more money you make, right? They work for the airlines.
(Jonathan) So we're not-for-profit, just to mention, right? But we do have a mandate to serve the demand.
(Jonathan) But we don't set the demand.
(Fabio) Who gave you that mandate?
(Jonathan) The government of federal government.
(Steven) Fabio, we are getting a little derailed from the introductions and I we're happy to answer questions, right. But can we get through the introductions first? Fabio, let's get through the introduction, Fabio.
(Fabio) I'm being polite, but if someone lies, he's not being polite.



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(MP Sgro) Listen, please be polite. Let the gentlemen explain their roles. Make sure everybody understands everything.

[redacted] Basically, everyone don't see each other's roles and we're here basically. We're here. We're here to talk about the noise, Judy. We're not. We're not here to listen to how the person...

(Steven) There are some new faces in the room today, and I'd just like to get through the introductions. It'll only take another 2 minutes. That's all we're understand.

[redacted] We're not here to listen about how business economic growth. We're here about the noise.

(Steven) We haven't. We haven't started that conversation, [redacted] until we'd just like to get through introductions before we get to questions. The rest of them.

[redacted] We're we're here about the noise. That's what we're here about.

(Dwane) I'll, I'll be brief. So we're from Transport Canada. We prefer with our role. So we regulate aviation and all military transportation in the country.

(Fabio) The Minister of Transport, Pablo Rodriguez contradicts what you just said. He said you guys have nothing to do with noise.

(MP Sgro) Can we can we, let's complete this so that we can have something to say about that. I'll hand it back over.

(Steven) Yeah. So Fabio, the rest of the session is dedicated to answering Q&A from the community, we would ask that one question at a time and we would like to give all the residents equal opportunity to ask any questions they have. And so we're happy to answer any questions you have.

(Fabio) There is a disconnect to what you guys are telling us...

**Q&A**

[redacted] Can I ask a question? So I understand he's been here for. He's been here at other meetings. This is my first meeting. My only question right now is how long has this been going on for and what and what resolutions have come? That's all because then I know where I can stand.

Because right now, I'll tell you right now, he's ******. He's ******. And I bet you everybody else of the residents here are ****** and nobody's doing anything. I had a guy from your office tell me we've spoken to the government to reduce your taxes. I told him, are you OK?

[redacted] That's not what I said. I'm not. I'll get the e-mail. I'll get the e-mail. You could get the e-mail, but I'm sorry. Like if we're gonna. No, no, you gotta. You can show the e-mail. And that's not what it says there. That's not what it says. You got the e-mail.

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You're the one that says. I don't have anything. I'm just saying it's.
[redacted] Remember one thing? You guys, you guys don't live. You guys hold on.
[redacted] and [redacted] talking over each other)
We're here. We're folks. Let's understand. We want to get defensive with me.
Don't you, you don't like this. And you stole me a ******* liar. That's nerve. I dare call me a liar. Let's all take a record. You you you have nerve buster. You've got nerve to even have the point of the meeting.
Everyone has you. You wouldn't put it. Thank you. Can you completely identify this fellow?
Yeah, we we say that the I think many times, Fabio. I spoke to you many times, so we wanted to.
...
(Steven) Excuse me, can we quiet down for a moment, please?
Fabio.
[redacted] But you're being mature, but when people make better connections, how dare, how dare they? OK, I just a simple question and then he stood up. So remember, if he's if he is part of her office, we do have to be professionals.
(MP Sgro's staff) Everyone to be professional just so we can get here, everyone. If not, it's we're not going to conclude with anything. So please, one at a time.
[redacted] Yeah, but this thing has been going on for a long time. Nothing's been resolved as of yet.
(MP Sgro) We're going to check it that we won't get something going on for at least 35 years that I'm fully aware of.
[redacted] You know what? You know what? I apologize. But when when somebody calls me a liar, I don't like it.
(MP Sgro) And you're right not to like it. Absolutely no one wants to be called a liar. And nobody should. I turn the floor back to you. We have questions from each one of these individuals.
(Steven) If they would like to speak and have a question or if you'd just like to listen, that is also fine. We're asking prepared to listen. So let's move past that question, OK, and we can move on to any other questions that other residents or yourself may have. Just wait one second, Fabio, and then we'll get to you.
[redacted] OK, but just we'll give you guys 4 minutes just to introduce yourselves.
(Steven) I think we're done the introduction here. We don't need any more time. We're into the Q&A. But what we are asking for is a level of decorum and

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professionalism. If there is threats of violence or if there is anything of that nature, then.

You know the safety of the staff is foremost and this meeting cannot continue, so I would ask that everyone take a breath.

We understand this is a contentious issue and we're here to talk to you about it, but we have to be respectful. All parties have to be respectful on the topic. Fabio let me finish, please. Fabio, you need to let me finish speaking so I can let you finish speaking up, please.

Fabio, if you would like to let me finish, yourself and all the other residents will have a chance to speak, ask questions and receive answers from us. That's why we're here today. If you keep interjecting, we cannot facilitate that. OK, we're here today to talk to you and answer questions, but you have to let us talk.

And you have to be willing to listen to the answers and then we can listen to your questions and provide those answers. So everyone take a breath, let's reset and we will open the floor to all the residents. And if you'd like to ask a question, please just raise your hand and we will respectfully answer them one at a time.

And we are going to move from resident to resident. If you have multiple questions, that's fine, we can come back to you. But we will give opportunity to all the residents today to ask questions and answer them. OK, OK.

[redacted] No, no, I'm, I'm OK. I I'm listening. I I just want to be aware with everybody's all this because I've spoken to people, I filled up the petition like most people have in this area. They only speak to my area.

And I just wasn't sure who I spoke to but I'm just telling you the response that I got was basically it's got to do with flight paths and wind speed, whether it's coming from the East or the West and basically they're not going to do anything about it. And that's what I was told. And I the the person that responded to me was from the GTAA. I don't remember his name. I just know that basically too bad.

It's not gonna. Nothing is gonna change. What do you feel about that?

(Steven) Well, I have not seen the individual e-mail that you're talking about. And first, thank you for your attention to that or phone call? OK, perfect.

[redacted] It was a phone call. Absolutely. And so maybe I have any paper trail of that because I did put in a complaint.

Because one night it was unbearable. I, you know, [redacted] Nobody sleeps at night when they're flying over my head early in the morning. Sometimes it's 6:00 AM and they're flying. I mean, come on.

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People, like you said, are tired because we just went through a summer stretch. I couldn't even sit out on my veranda or in my backyard because the planes are going through like every few seconds. Like it was it's. Like before I came here, I was speaking to neighbors and they said good luck. And I said, well, if you don't do anything, you agree with what's happening, right? So I just we're here because I want to know what you guys are going planning to do about this. There's got to be more than the the planes are flying from the east. The winds where it's coming from the East or the West. That can't be possible. It's never been this bad. I don't know. I don't remember it being as bad as it is now.

[redacted] It hasn't been.

(Steven) So Darrell, give us an opportunity to respond and you're welcome to voice your thoughts during your time.

So thank you very much for attending today. So maybe I'll just do a little bit of a deeper dive as you're looking for answers as to who does what. So the noise office that the GTAA operates is part of our ground lease obligations to have a noise management plan and we have a noise office, both Andrew and Gijs are part of that office. And so Gijs, I'm not 100% sure, but may have been the one that have been could have not that spoken.

[redacted] Because when I was talking to the individual, we had to stop several times because the planes were flying over my head. So we I couldn't hear you. You couldn't hear me, right?

(Steven) Absolutely. So the answer To your question is a complicated one in that our runways are located in a certain locations at Toronto Pearson Airport and obviously aircraft land and take off on those runways and. Not to paraphrase the answer that was given to you, but they do that based on based on wind direction in most cases, the main driver, yeah. And so maybe Jonathan and Ian can talk a little bit about the the drivers of runway use.

(Jonathan) Yeah, so I mean what I was going to say. So you know, I mean obviously again also having a conversation with what Steven was saying is accurate. So the main driver of runway selection is wind direction. So we take off and land into the wind, so opposite direction.

The operations that you tend To see are operations all off of runway 05. That's the one that generates for the communities here, the people, the different neighborhoods that were mentioned. It's departures off runway 5. That's usually when winds are coming out of the east towards the West, so we'll take off.

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And so runway 05 is really the busiest runway in Canada for commercial operations, one of the busiest. One of its advantages for our operation is that it's a long runway, it can handle large aircraft.

We can have a good amount of like throughput as you know in terms of the meeting capacity and demand. So it sees a lot of use of utilization as a result of that. And so when you know hear things about like you know and I just want to acknowledge to just to everybody like. We definitely are aware that there's a lot of overflight in these communities. Like we're not going to sit here and say you don't have a lot of overflight. Of course, the next question is, well, what, what can you do about it? We acknowledging that, right? And I think that's the question that most community members have here today. So when we look at things like departures and mitigation. Our goal is to mitigate where we can, when we can. The airport is a very fluid operation. There's a there's a lot of the biggest piece of infrastructure from our perspective that the airport delivers to us is the pavement that we launch aircraft off and land aircraft on and so those are pointed in certain directions. Obviously can't be pointed in different directions and at any time we want to use that that infrastructure optimally for capacity in the...

So that that's the main driver. When when we look at mitigation concepts, we are looking at you know where can we deliver mitigation and how. And so sometimes when we've had some consultations in the past that go, we're able to change a procedure here, procedure there, small adjustments, the challenge that I know. Many of some of you that we've spoken to before and which would be a great cause of frustration for you and makes it sound like, you know, we can't do anything is it's a very challenging area to deliver mitigation to because at this point they're flying off the runway and they have to climb to a certain altitude before they turn. Go ahead.

(Gijs) Might be arrivals on 24. Oh, arrival on 24 because the ones going that way, not the ones going that way, right Rita?. Yeah, yeah, arrivals on 24.

(Jonathan) Well, same concepts, same concept arrivals that are taking off.

[redacted] The ones that are usually making the most noise. And literally you were talking to a few people when we got here earlier this evening. It gets to the point that you can, you can feel as though you can touch the plane. There's the and we've seen arrivals as well. Not really on the arrivals, all on the.

More on the departure. OK, yeah. And so do the mix. Yeah.

(Gijs) So there's some folks here that are just South and some folks that are Humber Summit, which is just north.

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(Jonathan) Thank you, Gijs.

[redacted] Because I'll say this. And again, I apologize for the interruption. The one thing is, like my sister said, it gets to the point that if you're on the veranda.

And the summer's been gorgeous. You're on the veranda talking with people. Can't have a conversation. Yeah, you're in the house. You can't have a conversation. No. As Fabio, I got your name. I apologize if I'm very bad with names, but I remember your name.

It's so loud that it doesn't allow you to sleep. I've done. I've done a fair amount of traveling for business in my career. And I remember at one point you stopped flying at midnight. You didn't start flying until 6:30 now.

It's been a it's been a few times, 1:00, 2:00, 3:00, 4:00, 6:00. It's like 24/7. And when you know we're human beings and this basically it's our quality of life has been thrown out the window. I'm sorry, yeah.

(Jonathan) Yeah, and we can talk a bit about how the nighttime system works, but I just want to clarify on that just to correct because I was talking about the partial of 05. You're experiencing arrivals when the winds are actually kind of the West. Just to to clarify, no, I'm not. Departure. I'm sorry. Both groups are here.

Yeah, she's in the north part, OK, so she's affected by the north runway.

(Steven) So folks, maybe just to prevent this confusion from happening again, because there are constituents here from both ends of the airport. Yeah, maybe just to be accurate in our responses, if you could just identify which. Which section.

(Fabio) we have people from the south.

(Jonathan) Yes, of course, which makes total sense. And and I was assuming departures, which is correct in this case. That's right. Yeah. Yeah.

[redacted] When they're starting to take off and they're low and you can actually see the people.

That's right. That's how low they are. Yeah. I'm not joking that they are because they're climbing. Yeah. So, you know, they're climbing, but they're standing. Yeah.

And my concern, I also part of another part of my question is.

What is that doing to our air quality? Because they're so low, I'm concerned for my the health of our children because they're so low and they're like, just coming over us. And I'm thinking we're breathing that air, how bad is it? OK, no, I'm just.

(Fabio) I wrote to her [Minister of environment] several times and they refused to reply. They said talk to GTAA, talk to Transport Canada.

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[redacted] Yeah, no, that's my question as well. All those chem trails that are coming with these planes, I understand people have to travel.
I understand. But do they have to do it all over us? You know, there's got to be a better way.
(Fabio) I'm sure runways can run in a more, you know, even base. Basically the South, north-south runways are not being utilized.
At all. And the wind factor is basically a lie because I downloaded entire years of data from the Transport channel, from the weather station at Pearson Airport and there are entire months.
But wind is on the factor planes.
Are able to land and take off the old planes with winds up to 33 knots. That's 65 kilometres an hour. We hardly ever had 65 kilometre an hour winds in this aerial.
So entire months where wind is not a factor at all. So like he just said a few minutes ago and you know he in Alberta deal.
(Jonathan) My name's John.
(Fabio) John, sorry, John said a minute ago.
Is the main driver is operational efficiencies because who pays them? The airlines. So they work for the airlines.
[redacted] He’s in the middle of peaking here and you guys interrupt them. It's like you guys are allowed to talk and finish. You're completely. Let's say one one talk first moment.
[redacted] There was a talk about runways and arrivals right. So what we've perhaps to be. First of all, I'm also on Humber Summit Riverside and it's so we affected by the 05, all of the departures. Yes, it's not all the time because sometimes they go, they actually take up To the West, right? Yes, and.
I did. Those on Humberlea to our S they definitely there's no question they have it worse because you get you get the arrivals. As I understand from one of your previous meetings that 95% of all traffic is east-west out of the airport. Only 5%. So first of all, I'll let him answer me. Perhaps the...
(Jonathan) So absolutely we have, we have to get the aircraft in and out, right. So when you say operational efficiency, it could be expressed in a lot of different ways. For us it's, you know, meeting demand because
[redacted] we've just said the more planes you get in and out, the more money you make.

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(Jonathan)I I never said that, but.
(Fabio) But you do,
(Steven) Fabio, you need to give us the opportunity to respond to the other answered question conversation, right? No. But the gentleman had a question for us for the industry side of the table. Fabio, and during your speaking time, you're welcome to bring up whatever you like, but please give the other residents a chance to have their questions answered. Yeah.
So, but he's he's not asking you. He's asking the industry side of the table. If he'd like to ask you a question, that's fine as well, but he's asking us right now.
(Jonathan) Yeah, and I'm happy to address a whole bunch of things. Obviously, you know, with rapid fire kind of comebacks, we can't keep up with the responses because we have to explain, right? So and that actually often leads to a lot of misinformation, such as quick, you know, accusation and I don't get a chance to address it and then you're like, oh, it's on record, but he didn't refute it.
I'm fine with it. We can do that all night. If you guys want to like have that type of conversation, I'm OK. I'm here to listen to you and hear you out. And I know it's a it's a it's a tough topic for people, so I'm OK with it. I just want to let you know, but I I do want to be able to give people their answer that they ask as well. So you know, let's try to find a balance there.
So the question on East West, you are correct. We do have more East West, way more East West operations at the GTA. One of the reasons is the infrastructure layout. So back to the same concept of how we move that traffic when we go to a north-south, one of the reasons there's three parallel runways.
And in an east-west configuration, whether we're taking off towards the east or taking off towards the West, there's three runways, right? We can use the runway in each direction. NS we have two runways and whenever we go to a NS operation, there is Canadian system wide delays in the aviation system and we get backlogs and it has days and days of impact and so our requirements try to move that traffic and so that's why we're east-west more than north-south and so that is an accurate statement that 95 plus percent of the time we are east-west.
[redacted] So basically it's not exactly the winds, it's more efficient. No, they wait, no, they when you're using the three runways. So they're they're you just said, you just said that, yeah, so yeah.
(Jonathan) And so first predominant winds in Canada, yeah, are east or West.
So OK, predominant winds are east or west, which would be a big percentage.

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There's there's limits to crosswinds. What speed of crosswind will force you To a north-south we.
We'll go north and South when we have To and that cross wind limit gets hit. So in terms of winds,
(Fabio)what's the limit, the the wind limit.
(Jonathan)So first of all, we land into the wind. It doesn't have to be a strong wind. We land into the wind, the wind.
Wind is not just what's measured on the ground. There's also winds aloft.
(Fabio and Jonathan) Do you publish that? We do not publish that data. It's it's it's a secret. No, it's it's provided to us from the airlines, from data from the airlines. So it's we don't have a a manner of publishing.
(Fabio)Oh, you do. If if if it gets provided to you, you have it, you can. So I would like To see that data published on webtrak. That would be good if you publish the the the wings on on the ground.
Because you can publish the winds on the on the air, at different altitude.
(Jonathan) I have no way to validate your wind data.
(Fabio) This is not mine. This is the weather station that belongs to environment.
(Jonathan) You're expressing a relationship to runway utilization and I have no way To validate your statement.
[redacted] That's basically what you've said To us right now. Yeah, OK, you get paid by the planes that land and take off
(Jonathan) as a not-for-profit.
(Fabio) Yeah, the three nonprofit doesn't mean that that you guys don't make money. You need to make money.
[redacted] The three, the three EW frontways are more efficient.
To get more planes in and out. If you use the North and South runways, then you have delays. It's not in your best interest to use the north and south runways.
(Jonathan) Correct.
[redacted] And this is what Gijs from the day I talked to him, the first day he was telling me, no, it's because of wind direction.
(Jonathan) It's still the main drivers, though. Yeah, it's under one. It's east or west in Canada. It makes sense. So that, wait, wait, Fabio, you need to wait.
(Gijs) So to give you an example, today, most of the day we were on the North S, so wind from the north as well as wet runways from the rain this morning. So like it does

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happen and runway surface for instance is another factor that brings down that tolerance for that wind as well surface conditions.
(Fabio) So what is GTAA's response to this?
Is to increase the traffic so the sacrificial people on the ground become a larger group. So instead of reducing the traffic to accommodate the use of all runways so the harm can be spread evenly in instead of, you know, East and West To East, West, north-south GTAA has the mandate from God To expand, you know...
(Steven) So that's not an accurate statement, Fabio.
That's not an accurate statement. No, it's not an accurate statement. If Fabio would like to give me an opportunity to speak, I'd be happy to respond to him. (Fabio) Steven.
On your website it says that you are have a plan To expand airport operations To move from 48 millions in 2019 To 85 million in 2037 I think.
Correct me if I'm wrong, it's on the website. That's what we've been talking meetings. You know what I mean? The recordings of other meetings where Cynthia Woods and Robin Conley, they said it. If you look at the old recordings of public meetings.
They said, yeah, we are going to increase the traffic. This is what it's going to get worse and this is the way it's going To go. So if the traffic gets worse.
Then the north-south runways today are utilized at 1% per month.
(Steven) So Fabio, yeah, Fabio, you need to give me an opportunity to respond to you. You asked me a question, Fabio. Would you like an answer to your question and then you can continue.
(Fabio) No, because this is this continues to be part of my question.
So please allow me To talk to you know what I mean?
(Steven) Absolutely. But if you're asking, we're asking you to ask one question at a time. OK, so if you want me to if you would like To ask one question so we can answer that question adequately,
(Fabio) GTAA has a mandate to meet demand.
Or not?
(Steven) Yes. So that part is on the Transport Canada. So allow me to get on that.
Where? Allow me To answer the question.
(Fabio) What is the document? You need to give me.
(Steven Yes, it is in the lease.
(Fabio) No, it's not on the lease.

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(Steven) Will you give me the opportunity to answer your question or not? (Fabio) Can you tell me which page?
(Steven) I can tell you the section and I can look it up during the meeting.
(lots of people talking over each other)
(Steven) Fabio, If you would like this meeting to proceed and you would like us to answer questions, that's what we're here to do, right? We're here at the residence request. You need to stop. Stop talking for a moment and let me respond, please. [redacted] Before you talk, I just want to say one thing, one thing that I have. Notice people have been here more than one time. Absolutely. And for sure, the problem is they've been here longer and I think the frustration level is hitting the roof. To me, my frustration is already at the roof and this is my first meeting because it doesn't seem as though. And I'm and I'm sorry what I'm about to say. It looks like this meeting has been going on for however long and no resolution still. And my hope is and I hope and I pray we're in the church that this will get resolved because the because remember we've got a very short. We've got a very small community here. I can, I can guarantee you dollars to donuts. I would go knock on every door on Riverside and Whitfield and I would get 99.9% people to attend and you would hear the same frustration from them. So my point to you guys. Enough, enough with the dilly dally, because this has been going on for a while. Please tell us what your prayer, what helps. I knew how to know how to speak. What is the preparation and what is going to be done? Because this guy, Fabio, looks like he knows his stuff. He's done. He's done a hell of a lot, but I can. I can just imagine how many meetings he's been to and he hasn't seen zero resolution.
(Fabio) 2017 Honorable Judy Sgro, headed in Parliament.
A whole thing about do you want to tell us about it?
(MP Sgro) It hasn't resolved the issue, so why bother? We're talking about the solution.
(Fabio) It hasn't resolved the issue. This went through Parliament. I have not resolved the issue. We have Minister of Transport. Who tells us that they are not responsible for the noise. So basically they are telling they abuse people, the people that have been raped to go to the rape.
(Steven) Fabio, Fabio, Fabio, we talked about this at the start of the meeting.
(Fabio) A fair deal from the raper.
(Steven) Fabio. Fabio. We are here today.

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(Fabio) Understand it clearly. You are harming us. You are taking. I'm talking, Grant. I'm talking. Grant.
(Steven) Fabio, you need to give everyone the opportunity. You have had your opportunity to speak. Absolutely.
(Fabio)You are taking a life away. You are taking the chance for our kids.
To achieve their full, you know. Academical potential. You're not allowing us to sleep. You are not allowing us to be productive members of this society. You're making us sick, contaminating our air. With noise. Does that make you proud?
[redacted] It's all about money.
(Fabio) Yeah, it is about money, but let him answer. Does that make you proud?
(Steven) So first of all, Fabio.
The gentleman had a question and he would like to answer the question and you are when you are
(Fabio) when you are basically killing me slowly.
(Jonathan) Let him get it out. Let him get it out. Don't try to answer it.
(Fabio) And you want me to be respectful? The the person that is respectful here is all of you guys, all of you. You know what I mean? We are the sacrificial lambs here. You understand that? Now you can answer. Do you understand me?
(Steven) But I have heard your commentary, Fabio, for sure.
(Fabio)I am asking if you understand and not if you heard that
(Mp Sgro) Fabio, there are other.
(Fabio) There is a difference between understanding and hearing something. Do you understand it? Do you understand?
(Steven) I I understand. That's your perspective, Fabio. I I heard you.
(Fabio) You do not. You do not agree because you agree with me now, you know what I mean?
[redacted] He's very smart. He's very well educated. Of course he does. He's a position where he's living a paycheck and he has show a level of respect.
(Fabio) Show respect for us. Show respect for our life. Show respect for our life, [redacted] Judy. We've been asking for this meeting since December. I asked Robin Connelly. No, no, listen, listen to me. I I can I can I just talk? I asked for this meeting in December. I spoke with Robin Connelly. Who used to be in charge of this. She was getting ready for Christmas. She got mad at me. She told me, Darrell, in a bully way, the planes are going to get busier. They're going to get louder. And that's just the way it's going to be. That's what she told me. You know what? She never spoke to



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me. After that, I asked her and I asked you. I asked you and I asked you about a meeting since December. Stephanie put me on hold for 54 minutes. I guess it's a joke. Amy never responded to me. She she called me. We had a nice conversation. And it went well, she said she caught, she contacted. She was trying. You [MP Sgro] go away for the summer, so you don't come back until September. That's when the meetings are usually for the airplanes. So we we try to contact you before the summer To have a meeting. We don't get the meeting until September.
October. We've done this for about three or four years now, so you don't want to deal with airplane issue in the summertime. So I had a nice conversation with Amy and we talked and she said that she's arranging the meeting. When I called back to Stephanie, I asked, did Amy get my message? Just. Or what the meeting is. Oh yeah, yeah, yeah, yeah. Amy got the message. Amy didn't replied to me. So for three or four weeks I I'm calling and then I had a friend call your office and asked about the progress of the petition that you presented in the House of Commons.
So in 5 minutes she answered his question. She said that the petition never went anywhere because there was only four people, 40 people that signed it. You guys, when we're doing the Marion shrine, we contacted your office. We asked Judy, could we do maybe a petition that you could. And you said, yeah, you never, you never told us about this. We asked you. Albert took it. He said to [redacted] we're going to go around. We're going to knock on doors. We're going to collect the petition, the signatures. I talked to him and he said, [redacted] yeah, the planes are really loud in your neighborhood. We talked. So I thought he was collecting out, collecting the signatures. So yeah, so a few weeks later I I called your office. I was told that one of [redacted] and that OK, so out of respect, I'm not going to bother Albert. Then when I called Albert back, I was told that we're not doing the the collecting, we're not allowed to. So then a month's passed and then we Albert sent us instructions on how to do the petition.
So we already knew how to do the petition out of the Marion Shrine. So we we were lucky to get 4 new signatures that you could present it in To the House of Commons. So when she was talking to my friend she and I I've been asking for a whole year now how the progress of that petition went. That Stephanie never replied to me, Amy never replied to me, or you never replied to me. So in 5 minutes, Stephanie answered him and she said that the petition never went anywhere. Why couldn't Stephanie, when I called her to ask her about the progress of the petition, why couldn't she give

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me the answer?

(Mp Sgro) Should have.

[redacted] She should have. And every time I phoned your office, I talked to Stephanie. She told me that she used to live by Dixon and she said that you know what? The plane noise never bothered her. And why is it bothering me? Now she lives at Weston and Shepherd and the plane noise doesn't bother her.

(People talking over each other)

[redacted] OK, well, so I'm just trying to say we we've been in the first meeting that we had with you, Judy, you remember, remember this. No, can I can I just say this? This can I can I just say this?

You you started the meeting. You said that you lived here many years ago, so around 20 years ago.

(MP Sgro) No, I'm here. I'm from here in 12 years ago.

[redacted] OK. You said you many years ago you lived here and you put up with the plane noise. Can I finish? OK, Fabio heard. No, can I just so everyone in the room hears this? So you basically told us that you learned to live with the plane noise and you expected us to. Yes, you did. Fabio, did she say that?

(Fabio) Yeah.

(MP Sgro)And then get used to it because you have no freaking choice they come over your head every minute.

[redacted]l) But this is OK. You're supposed to be our MP. No, because this is about the noise. Absolutely. And I phoned you one night. I phoned you one night. I phoned you one night during the night. How many times? No, no, this.

This is one time. Can I just finish? Amy, can I finish? So one time I phoned by mistake. I was trying to get your office. Judy answered at 1:00 in the morning. She said. Why are you calling? Why are you? Why are you calling? And I said, you know what happened? No, no.

(People talking over each other)

[redacted] So, I wish I could hang up the phone. I wish I could hang up the planes, but I can't. You know, I have. And then we have Gijs. We have Gijs here from the airport who we were asking questions at the start about the rehabilitation and he told me,

[redacted] we're not going to reply to any of your questions anymore.

(Gijs)I said once previously answered

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[redacted] I I I said no, I I contacted you with different questions and you and Cynthia Woods did not reply to me. So I would call when planes were flying over my house and you never responded to me for months on end.

(Steven) So [redacted] we're here today to answer any questions you may have. That's the opportunity to answer. Absolutely.

[redacted] But again, my question to you is this seems to have been going on since 2017. It is now 2025, eight years later.

(Fabio)Yeah, the OK, so if not an e-mail. We sent To Judith. OK, so let's go. So we have.

(Steven) So folks, folks, can we take a breath here just for a moment and we'll come back to your question. I'll give you absolutely time to speak.

(MP Sgro's staff) So our the first time two years ago, our team actually went out door to door in the area. We actually said to collect the signature. Can you can you finish first? It was there when he actually did not say that, but let's not have the conversation 'cause we won't. So the first time we went two years ago, we actually gave an update, physical update.

Instead of sending it through a householder, letting people know about current things going through legislatively through federal, I mean literally went to the house to try to get people momentum like if you have a complaint, if you have anything that you want to tell us, we literally want physically door to door. We even have documented evidence, videos, pictures that we want door to door to all these houses To get them to come out and tell us about what's going on.

And then after that, because again, we can as an office ask for a petition, the only the only thing we can do is give people the resources to actually know how to submit a defect for and then for her to support it. We said it multiple times. We even had a virtual call with you, which again, you turn a little bit too aggressive during that virtual call and it was with our writing for Vaughan.

We had to and we had to cancel it midway because again, people were not listening. But we were very specific. We send it in the e-mail, we send it to the house, we send it physically and we explained it so many times. We can only support it. The thing is that that's the only thing in how we have to work in an office. We were very clear. We will present the petition, which she did. She supported it.

We cannot basically collect the data. We give everyone the resources to do something and that's what we want to get to. No, no, I'll that to me.

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(Fabio) Send the petition means means the bureau presented in Parliament. We're never notified of the answer. Yeah, you guys will see that comes from the appropriate.
Department director. No, I'm asking the question over here.
(MP Sgro) These gentlemen are here with the knowledge.
(Daryl) So you just push it off. That's the public director. Judy, you're pushing it off to them and it's terrible. It's disgusting. You know what I made you at the polling station.
(MP Sgro) It is these people came here To listen To the community. We have some of the Transport Canada right here and and it's relevant. Yeah, are there any people should, you know what I mean?
(Fabio) The Minister of the Minister of Transport. Responded to the petition presented by and basically he said that they were not responsible for. This is a public record.
(Duwayne) Well, as a GTS said, there is a noise management plan.
(Fabio) No, no, no, no, no. Let me finish. He said that there is no they are not responsible for any noise related to airplane. Now I have sent out a department about it and I'm not sure if you received it or not. I sent it to the ministers. I sent it to Judy Sgro. Where basically in your website it says that the Ministry of Transport is responsible for the noise. The lease agreement in several sections, it says that you as the leaser of of the of the airport are responsible for enforcing a series of clauses within the list within those clauses.
There are several regarding noise. There are several regarding the environment. Right. So you need to understand that the ministerial record presented to the House and presented to entirety of the Canadian people. Is false and someone needs to.
Fix it. I have asked the current Minister of Transport. Miss Freeland.
The right to go to the house to please correct that because that's wrong and I presented all the information why he's, you know, it's wrong. She has not even taken the time to write back to me. Miss Sgro has not taken the time to write back to me about it. You know what I mean? I asked me. I have asked Miss Sgro. I said, what are you going to do about this? Do you want to go and tell the house? You know what the minister told us? It's a lie.
She did not respond.
So.

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That's what will be very important. You know, people don't share the names and e-mail addresses because I want to forward this e-mail to you.
(Duwayne) Yeah, I listen, I'll have no problem by talking to my e-mail here for anyone to use it.
(Fabio) Yeah, but I think, you know, as a because you have to see this.
In order to speak with some type of knowledge, it seems like someone just threw your gear.
(Steven) Well, Fabio, we do have industry partners from across the aviation world here to answer questions for you today, but you have to give us the opportunity to answer.
Are those questions and and right now
(Fabio) I have the right to speak to.
(Steven) no one is trying to take that way that right away from you, Fabio.
[redacted] So basically where your what is your plan to decrease the airplane noise?
That's that's all we want to know. That's why we came.
And no one seems to have an answer. John is saying that we're we're going to increase and Robin already told me that, you know what, the planes are going to increase. There's nothing I can go about and that's just the way it's going to be.
(Jonathan) I just want then the thing to grow like we have to enable it. We have a mandate to respond to it. But we’re agnostic to it. We don't drive growt. We don't have a mission to increase traffic in the sky.
(Steven) So folks, we are trying to respond to your question here.
You're not giving us an opportunity. If you would like to just keep talking, we can facilitate that
(Fabio) you never responded is. Uou guys.
(Steven) We're about 10 questions behind right now, to be honest, because the conversation just continues without giving any of the industry partners an opportunity to respond To you. And we're Daryl, just let me finish. Let me finish.
Thank you. OK. We are trying to give you an opportunity.
You To ask questions and we are also willing to be here To just listen to your opinions and thoughts. That's fine also, but we have convened this table today at the behest of MP Sgro to provide experts for you to ask questions of.
And we are more.
(Fabio) He doesn't want to talk.

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(Steven) Fabio, You've interrupted everybody here at least three times. OK. And so I'm going to reiterate this one more time. Daryl, you need to let me finish, please.
(Fabio talking over)
(Fabio) That's inappropriate.
(MP Sgro) Let the professional people share their information.
[redacted] Can you just tell us what you're doing about the noise? That's the only reason I can't.
(Jonathan)OK, you wanna stop for a second? Nobody answered. That question's been asked five times. I'm answering now.
You say anything. OK. OK. Thank you. So that's five times and we're cutting each other off. So let me try to take a stab at that. So and I'm going to be honest with you as I was last time for the people that were here before, right?
There is not a magic bullet on aircraft noise. There is progress being made over time. ICAO is about to publish new engine certification requirements that have noise requirements for a new generation acquired aircraft. It's doesn't mean no no noise. But they are. Those are steps that they're taking. You promised. Let me answer the question that was asked like 7 times. I'm going to be honest with you, right? You came here. You want information. You want solutions. I want to be honest with you guys.
And so when we look at at at the airport, the things, the the way we manage traffic today, the way international standards are set to manage traffic, we're following those. Transport Canada regulates those they you know, they make sure that we follow those international standards that come from the International Civil Aviation Organization that are passed on to the state that have to be enacted in Canada. In terms of the levers to reduce noise, they're tough because the the location of this, the your community in relation to the runway is very close.
It's very close and we have to climb them to a certain altitude before we turn them. So from that perspective, I don't want to pretend that I have a quick fix.
(Phone goes off)
So look, I want to be honest, we do care about mitigation, but it's not like we have an endless toolkit that we can apply. And our philosophy is where we can, when we can, we seek opportunities for mitigation. We do have something called the Industry Noise Management Board, which brings together technical expertise, airlines, Transport Canada, NAV Canada, airport that is following the emerging trends, emerging technology and looks for opportunities and assesses them for applicability



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in Canada. And this is a GTA focused activity. It gets reported back. The work that happens at the INMB gets reported back to the neighborhood table, to the public forums. So we come back with that information. It is something we care about.
And we do know you're impacted. Like you don't have to convince me. I can pull the tracks and see the aircraft over your neighborhoods and they're climbing and they're noisy. Some operations are at night and we want to we want to have be good neighbors, but we don't have a way to make the planes go away.
(Fabio) So are you aware that? You aren't allowing us to sleep.
(Jonathan) Yes, you've made that statement.
[redacted] If I don't sleep for hours, yeah, I I could be in serious trouble. Yeah, it's serious. Yeah. So. It's Judy. I told Judy. I told you. So no one really. Yeah. Do I move? Will you guys give me a couple $100,000
[redacted] so I can I say something? I haven't heard any solutions. No, no. If I may just see something. Perhaps this is an oversimplification, just like soundproofing everyone's house. That's like the house is burned down, the fire department comes and then you put the fire on so. Great Lakes. Are they not federal waters?
The question Are they federal waters? There's an airport already in federal waters off the City of Toronto. Here's a solution. Perhaps you're going to think it's oversimplification. Toronto Islands are spits. They were constructed. They are man made. Put the airport there. What's going to happen here? Like 621 1970 Air Canada crashed into a field if it were to crash into that field today.
There's a subdivision there. So what we're waiting for here is a catastrophic disaster to happen. And we're talking about airplanes flying at all. What's more important? People are more important. Put the airport. Out in the lake, like what Hong Kong did. We've got all kinds of construction projects going up. Landfill it. Make it huge. Go ahead, build it, build it right to Rochester, for crying out loud.
Make it safe for everybody. The planes are over water. There's no collateral damage if the plane were to go down, except for the people that are on board. Unfortunately that may happen. So oversimplification, right? That airport has grown. So is the city. That airport is on A1A farmland. The other thing is, I'm just wondering, maybe we should let the indigenous people come here. Perhaps there's some Indian burial ground there. They'd like their land back, give it back to them.
Build houses there, put crops there, put the airport out in the middle of the lake. That's a solution. Perhaps it oversimplified, but so soundproofing everybody's house. The other oversimplification. John, buy our houses.

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Turn the whole city into an airport. Put the airport out in the lake. Period. Federal land. I'm sorry, federal waters. They control it. There it is. Start building.
By the way, Mr. Ford, I think, wants to put a tunnel under the 401. Maybe we can get him somebody's there.
(Jonathan) That little island next To the Montreal Lavon, where they have an amusement park, was built out of a subway, a subway system. Just interesting fact there, not as deep as the Great Lakes, mind you.
[redacted] The river in Lake Ontario is a fishbowl. Anyway, I mean, you know, it's there are been, I agree the the kind of thinking like I do.
[redacted] No, that's that's a great, that's a great thought because it goes back to the question I had. OK, it's my first meeting and this has been going on for however long.
What solutions have been presented up until now? And it seems as though, and this is me talking, doesn't seem as it seems as though we're going, we're we're going around and around in circles and you know what at least.
share some possible options. You came up with certain things, which you know what I I commend you for it because you're not. You're not playing us for a fool. Please just be very frank. All of you people from different industries, don't play us for fool because what's gonna happen is we come again.
And it's going to be the same, the same speech. Fabio, I commend him. Why? He's done. He's done more than enough research, Daryl. He's done a lot of research and these guys care. And just imagine if there were this guy. I think this is your first meeting. No, I didn't.
Sorry, I apologize. It's been my first time. Yeah, but I commend him for it because you know what? We're we're simple people. And I apologize if I offend you guys. We're simple people. We want solutions. We don't want rethoric.
We don't want BS. Please be be upfront with us and then at least we know what our options are. Don't tell us, oh, we're going to have a meeting next time and then next time it's the same BS again.
(Fabio) They've been thinking about it since 1996.
[redacted] Hold on. In addition to that, Jonathan said something tonight, he said.
That one of their solutions is to make the aircraft the aircraft quieter. The same thing was said on October 18th. The new generation of aircraft will be quieter. And Judy said the same thing at Julius Caesar Banquet Hall in 2009, that the new generation of aircraft will be quieter.


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And the question is, they're not. They're not. They're not. They're not. They're the same one.
(Fabio) Which one is the two?
The A220, the Boeing 8320 family has an issue that they make an extremely annoying.
(Jonathan) A320 and that at least largely been retrofitted.
(Fabio) I'm speaking. Let me finish.
Yeah, the 320s. They they made this annoying, really, really loud noise. Whistle. Yeah, whistle. 25 years ago I think it was Lufthansa was the first one in applied retrofit. It's about this retrofit retrofit. It takes a couple of hours to install. It gives a couple of $1000 To buy. Can you believe I've been asking these guys to ban every 320 who doesn't have the retrofit in place? And this was 25 years ago.
You know what I mean? Today, these guys are doing nothing about it because they they care about the money that this coming. I don't think it's their responsibility. It is. It's it is.
(Steven) We can answer this question if we're giving an opportunity
(Fabio) But they can mandate the airline. Yes, the airline. Exactly. That's what happened. You put you put the it's 2000 bucks, a couple of hours of work, 25 years after the bills have been available. We still have been coming here, but don't. So why? Because we don't pay them, we don't pay the airlines pay them and these guys, you know, our representatives, the members of institutions like the ministries and stuff like that. They keep silent, you know what I mean? They like the revenue coming in. They like the perks that they get, you know what I mean here and there.
(Steven) So, Fabio, we do have answers to these questions if you're interested in hearing them afterwards.
(Fabio) So nobody's doing nothing and the ones affected are...
[redacted] So let me go and I apologize for putting my two cents worth.
(MP Sgro) Thank you so much. Very much appreciate it. Let me just say.
You know, we all know how bad it is, and I'm being 100% honest with you. I don't know that there's going to be a solution. We're not going to move the airport. That's inpractical. Yeah, it's been built in the 1st place, but it didn't. It's here.
OK. And there I I do not see a solution to the noise issue. Yeah, eventually, you know, they've gone from track two to three and it's a little bit quieter. It's still too noisy then four.
I don't see any changes coming.

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[redacted] Judy, have you spoke to Tom Racovic?
(MP Sgro) Would you wait a minute, please? Because there's no sense going on with this. If if there is anything constructive coming out of it every time you have one. As Mr. Erich said, it's the same thing. There's nothing comes out of it because there are not a whole lot of things.
It's To be done, as Jonathan indicated, right? It's still. So I don't know. It's still being. I just ask these different folks to come.
Make sure they continue to know how important this issue is and how bad it is and so they can report back to their supervisor shows and possibly provide some information To some of the members that have.
[redacted] We want answers. We don't like information.
Have you, have you spoken to Tom? There is no solution. Judy, Judy, as it is today. Can I just? I see no. Can you mention about what Tom did recently? We know what he did. OK, so he asked the GTAA to do something similar to Chicago, the O'Hare airport.
So they provide money to residents that live around the airport, they soundproof their homes and stuff like that. Robin Connolly at a meeting, she said there's no nowhere in Canada has that ever happened and it will never, the GTAA will never ever do that.
That's that's what she told us. And like what Tom. But no, I So what Tom told me is, you know something? If Judy doesn't get behind me, he goes, that will not go anywhere. That's we had a meeting. Yeah, we did. He said the federal. He said the federal government.
He said the federal government. (MP Sgro trying to interject)
(Daryl) So Judy's federal government. I'm not. I'm a member of. No, your federal government. Your federal government.
(Mp Sgro) I would do anything humanly.
To help with this issue, because I understand
[redacted] when I call your office and I call you and you don't reply me, can we get off this and we have this is what we're talking about.
[redacted] When you, when you, when you, [redacted] hold on, you were at the last meeting. Was sitting right next To Judy, yes, and he suggested.
Financial compensation for acoustic install insulation and triple pane windows. And you said to all of us you were going to take that into advisement. Here we are 11 months later. What have you done?

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(MP Sgro) Have I asked? Ministry about it. I asked the minister. Have we talked about those issues? We have. Have you seen any? You think anything gets resolved like that anyway? Quickly. It's a great idea. Will they do it? I doubt it. I'm being honest. I'm not going to tell you.

[redacted] But if you don't do anything To speak up, Charles O'Hara, you wrote a.

A letter To Charles Ahair, the Minister of Transport. It was great. We we even thanked you. He never responded to you. He ignored the letter completely.

(Mp Sgro) I think it's impractical. I guess that's what they do. Can't we have the gentleman respond to you?

(Daryl) No, no, this is you. You're you're on the spotlight now.

So we've had problems with your office. Like I said, I've been, I've been trying to phone you for nine months.

(MP Sgro) No, you call me.

[redacted] I want To interrupt. I don't have you, but I have to. I mean, listen To Jason. No, I know it is ridiculous for me to have you as my MP.

[redacted] You and I. [redacted] Whether or not it relates to the year of living under a flight path, I don't know, but in any event.

I think, I think we can be a little bit realistic here in terms of first of all having an understanding of jurisdiction when we've talked about MPP, Tom Racovic, he's taken the initiative on. It was very important thing. Yes, but but but regardless, let's forget the personal things. I I actually went today and looked over some of your e-mail and I've e-mail it since you all. So are you going to say I want to tell you? No, no, I'm not going to offend anybody.

But if you want, it's funny because wait a second, I'm talking not you, OK?

Yeah, shut up. OK.

[redacted] Don't tell me to shut up, please.

[redacted] If we're To do another meeting like this, I'm just sure we have minutes because we haven't done diddly squat tonight. I'm sorry. Exactly.

[redacted] OK. I'm sorry. I apologize for saying.

But it's a big issue and it's a a huge issue, much beyond a local MP, our our local MP and much beyond our local MPP. There's it's a huge issue.

You know this, so you have a new a new Prime Minister. His major mandate is to create have major projects to reinvent Canada. Maybe here's an opportunity, maybe here's an opportunity to do something better, but it's not going to be just.

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Decreases the more planes up on our airport. If it's that bad, maybe as reluctant as we might want to be, maybe we, you know, individually we we we have to maybe we have to.

Maybe the idea is to have a new airport, as [redacted] mentioned, have a have a creative idea, have it out in the lake. But regardless, it's not an issue that we can even discuss. It's a waste of time discussing it the most. We all know that the big noise problem, but we also know. It's worse now than it was. [redacted]

I think [redacted] a little bit longer than us and we know it's a problem and we know that it is worse, but I think you have to look at.

What are the solutions or what are the paths? No, these gentlemen are all employees. They're just like you are an employee somewhere else, right? They're employees. They don't make decisions.

[redacted] Yes, they do. Deborah Flint, the GTAA makes decisions.

Great emails over the past year is that Deborah has been hired because she makes so much money coming from Los Angeles and so so she/her mandate may be to increase the number the volume of planes. From from the airport, maybe that's not a good thing. Maybe that's to me that in itself is a problem, but I think the issue is, is. Wrapping on by having more planes and coming out of YYZ, but having to to look at another another airport somewhere else. But you realize what's going to happen. You put another airport somewhere else, somebody else get a plane. Well, that's what you do with.

(Fabio) You do it using, you know, like thinking about it. So there is very solution which is and I think it has many, many positives. I have proposed a solution.

Years ago, where the airport is built in Pickering, somewhere far away, somewhere, no, no Pickering, some even farther away. And we connected the the airport with major city centers with high-speed trains.

You know what I mean? Are we a third world country that cannot afford, you know, high-speed trains? Japan has it. You know what I mean? China even has it. When are we? Let me finish. OK, so the next solution. There is no political will.

You know what I mean? And when you talk about jurisdiction, I was surprised to find that the the lease agreement is a very interesting weapon we can use against all of them. Was written by and that in there it says that the GTAA has to comply to every. federal, provincial, municipal environmental regulation.

It's very. So in terms of jurisdiction, they have been also been lying to us and saying, hey, there's nothing we can do. Why do they please say?

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That they have to comply. So and as and as the environmental loss, it it goes even further and it says that the environmental loss is right.

[redacted] I mean in that I mean Canada was built upon a railway going from east To West. You got to you have to take the big picture. So we need to think the big picture. We cannot deal with this. You know what I mean? Yeah. You know, personal attacks on anybody here, the employees of the NAV Can, employees of GTAA, they need to.

(Fabio) They need To feel the heat. We need, we need To make them.

These guys, you know, you know what? You know what?

[redacted] Some people, you know what I mean with with the with the acoustic installation in the triple pane windows

(MP Sgro) To the Minister of Transport asking that question, making that recommendation.

(Fabio) Did she get back to you?

(MP Sgro) So in a little bit much new, we have had a few changes. We have another new minister.

When I get an answer, when I get, when I get an answer, I'll be glad to share it. I followed up with what we've had a change in the minister now. So the election was not too long ago.

April, do you think that people become those positions and are going to turn around with those answers? When I get an answer to that suggestion, I'll be happy to share it. I want To turn the last 9 minutes if you have anything that you would like To add.

(Fabio) I need to get something two minutes. If you want to no, no, no, no, no, no. After, after. After which one? After me.

(MP Sgro) It's your time. Steve. Any of you folks have anything else? I'm talking about the transition of the A three.

(Gijs) Yeah, yeah, the A 320 retrofit Program is something that has been in place for a couple of years. It's something that we report on as well publicly.

(Steven) You need to give us the opportunity to respond, Fabio, if you want an answer to your question. So Fabio, if you you need to let us respond in a respectful manner, Fabio, we're trying To give you an answer to your question.

And you need to give us the opportunity to do that if you want the answer. Are you willing to give us that opportunity? Pardon me. OK. So thank you. Let us have the opportunity to respond. Have the floor for the remaining

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(Gijs) and the reporting and the progress of that reporting is available on our web pages as well. The last numbers that I've seen, we were anywhere I think in the low 90% of a 320 movements that happened at Pearson that have been retrofitted Airbus 320 aircraft family which have that particular issue with the fueling hole under the wing where a vortex generator, it's it's a fancy word for an air flow diverter that can fix that particular whistle.

(Jonathan)There's been a lot of progress. Air Canada, one of the main fleets that had this issue, invested significantly when they do annual retrofit, annual check safety checks. As you're taking the aircraft and where this gets installed, it's not just you don't go up to Home Depot To put this on, even though it's a it's a simple piece of metal, it's a specialized process to put this on.

Uh, and they actually invested significantly almost their whole fleet is now.

[redacted] Can I just ask a question I asked you right at the beginning, but you said you know, going into the why was Robin Conley and uh, Cynthia Woods, uh, let go?

(MP Sgro makes a remark)

So just be quiet. I I asked him questions. Oh, Judy, I've been asking for eight months for this meeting, so please be quiet. And he said he would answer me. He said he would answer me before you came. OK, you haven't answered. Oh, thank you. Did you hear what?

She just said, can I have an apology, please? No, she said. That's why we don't talk to you. I didn't say that. No, I want an apology. Well, you know what? Another person from your office said I have to kiss your feet if I want anything from you.

And and you know what I see. No, you're not. He would give me an answer before the meeting. I would like to know.

We're gonna speak again. I did. I asked him the question.

(Fabio) Yeah. Let me get this in. OK. OK, guys.

(MP Sgro) Sorry about that. So why didn't you just ask the question?

(Steven) I I have not looked at the document yet. If you'd like me to if you'd like me to look at that instead of answering questions, I can do that.

(MP Sgro) Gentlemen, government relations, are you prepared to offer compensation to residents?

(Steven) So at this point in time, there is no plan for compensation to residents from the GTAA.

[redacted] What options or what solutions outside of what? John? John, thank you. I apologize. Outside of what John had mentioned earlier, because again, it goes back

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to what I said earlier. Yeah, it seems as though this meeting's been ongoing. Unfortunately, there's not been an agenda which basically throws everything up out the wall, out the window. So if we are to do another meeting, I would, I would, I would hope that somebody would put an agenda so that we can get to the crux of it. And I think all the people that have spoken or the residents that have been invited. I'll tell you this, as I said earlier, I can go just down Riverside and I get 99% of the people here. Now the question is what, what solutions or what potential solutions have been presented or what is GTAA, Transport Canada and whoever else looking to do outside of that piece, that metal piece, whatever, to make our lives a little bit more bearable because I as and I'm sorry, I didn't get your name.

[redacted] and when we first moved there, beautiful neighborhood, beautiful park and all of a sudden now the last six months, maybe I maybe I wasn't home enough, but it's it's been really bad.

Like I said earlier, that Emirates that flies over. And again, I don't want to give you BS, I'm just saying agenda needs to be addressed and what has been spoken internally and what are possible solutions going forward outside of that metal piece, whatever it's called.

OK.

(Steven) Happy to answer that question if we're given the opportunity to speak. If we are interrupted again, though, I can't guarantee you get an answer to your questions. OK, by the other community members. We've tried to answer this question. I don't know how many times now, OK, but we continue to get interruptions.

[redacted] I just want to make sure I get satisfaction at least that for my first meeting.

(Steven) So just because I know this is your first meeting, I'm not sure if you're aware, but there are other forums throughout the course of the year where we talk about noise as part of our noise management program and you're welcome to attend. The public sessions of those, there are sessions that are for elected officials and there are sessions that are for neighborhood table members and the such, but you're always welcome to attend those meetings in the future if you would like to come.

OK, OK. And so in a number of those meetings, we have discussed the progress against a number of the different transitions of fleet.

And other things that we have tried to work with our industry partners on to reduce noise from aviation impacting communities and the same answer as Jonathan gave transparently with you, honestly with you, we recognize that there are impacts from

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aviation on communities around us.
And we are working with our aviation industry partners and government partners to understand where there are opportunities to mitigate noise in certain areas. So one of the things we can talk about is the transition of fleet. I know it was mentioned earlier that they're not getting quieter, but they are getting quieter.
And so aircraft are certified per noise perspective, from a noise perspective by chapter and as the chapters sort of progress in the certification of aircraft, they get progressively quieter, but that's.
Fast. Still jets, right? They're still jets. It's like they're not silent. jets, but we're not. I mean, they're silent. We're cutting each other off.
(Jonathan) Yeah, but you know, if you look over 40 years, like literally like having of noise. Measurable noise. Now noise is perceived differently by different people. It affects people differently. And you know, some people will live under a flight path and they're like, oh, that bugs you, you know, and other people are impacted more and and that's individual and the experience is yours, right?
And but definitely on the noise front, the the next generation is going to be in quiet. But again, not a silver bullet because it's generation. How long is a plane in a fleet? It's in a fleet for 20 years, 15 years and then and then the next the new planes come on. The new planes that are coming up with the line today are quieter than the previous one.
That's for sure. The A220 in comparison, the 737 Max, they're quieter than the 737200, measurably, empirically quieter, you know? But it doesn't mean you won't be a proper, sorry for that anymore.
(Steven) What we can do is we can share based on the group here today for anyone that was not able to attend one of our last meetings. We did provide some data which I don't have in front of me right now on the percentage of the fleet that has transitioned and some of the projections.
For continued fleet transition to quieter aircraft in the future. So that's one of the things that we look at. It was also referenced earlier and I'm sorry, I can't remember exactly by who. It may have been by you. There's been a lot of commentary tonight about night flight operations. Yeah, that was, that was, yeah, of course. And so we can talk about night flights and the use of night flight budget and the associated night flight curfew hours, if that's a question you would like. But there is a program in place that defines sort of reduced operational hours in the nighttime hours in response to the effect.

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[redacted] Yeah, because I know at one point when I I travel for business, wouldn't you'd have to be, you'd have to land in YYZ by midnight and take off by 6:30. Why do I know I catch my first flight from Toronto to New York at 6:30 in the morning if I was taking a red eye home from the West Coast, I'd be home at 7:30 because they couldn't leave the airport, let's say from Vegas or California from at about 11:00.
(Gijs) And so just to give you a little bit of like colour around that, so the the airport has been 24/7. For decades, yes. So there's always been scheduled night flights. Whether or not you can book that nighttime flight with an air carrier will depend on whether or not they got a slot, so a spot within that night flight budget. So that cap number that we can operate on a yearly basis between those night times.
(Fabio) Now let me interrupt you. In 1996, how many night flights did we have?
(Gijs) So that's publicly available information on our web pages as well, but we can definitely follow up with that. We report on the night flight budget stats every year on on the reporting and statistics page. OK, I can I can follow up with that.
(Steven) Would you like us to follow up with those statistics? We don't have those statistics in front of us right now.
(Fabio) What has been the increase? The increment?
(Gijs) Don't know off the top of my head.
(Fabio) OK, the increase, the increase from 1996 to today has been over 1000% there were 1800 flights.
In.During the night hours that was, uh, 12 for 6:30.In 1996, today they are getting close to 20 thousand.
[redacted] But with respect To the night flight perfuse, and to answer your question that it's wrong, I brought this up at the last meeting. You've got Sunwing coming in at 123 o'clock in the morning. Go book a flight with Sunwing coming back from the Caribbean. And guess what? You can fly into Toronto.
At 123 o'clock in the morning.
(Steven) Absolutely.
[redacted] So why are you letting that happen?
(Gijs) Because we are a 24/7 airport. There are scheduled night flights as well.
[redacted] So there are no curfews.
(Gijs) There is no curfew hours. There are restricted hours.
[redacted] Oh, so there's that's there's a difference between. Yeah, right. Not like, no like flights. Oh, you know, because I remember like when I was traveling as much as I

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was, whenever I would book my flight, they say, OK, you got to be in Toronto by this time.

(Jonathan) It's because all the flights would have slots that would have been taken overall. Yeah, it's not that there was none. It's just that they were all.

(Steven) So we do have one other, yeah, resident question.

[redacted]When did Humber Summit become a flight path? Because when I bought in 1988, Humber Summit was not in flight path. That's my question. I didn't buy in a flight path, so. When did it become a flight path? So can somebody answer?

(Jonathan) Yeah, I can definitely answer. I mean, so planes were the part of that runway since that runway was built. I don't know when it was built.

(Gijs) One of the older ones.

(Jonathan) Yeah, I think it predates me. That runway. So now what's happened is obviously traffic has grown over time. All things are using it might be periods of the year or weather wise or wind direction wise that we're we're using it more and makes it more noticeable. Summer very noticeable. Obviously you're outside on your your deck, you won't have your windows open, which by the way, noise insulation doesn't help with. Just side note, once your windows are open, that that reduction factor is out the window. That wasn't intended, but. And so it's been there for a long time, but definitely there's been growth over time, more usage of of of that runway and that's what's being observed. One other thing I was just mentioned because it's just more informative, which is like a bit of a double whammy in summer is that. Air density as the air is warmer is lower, so planes climb. I was trying to get to your question. So in summer they're kind of groaning their way into the sky because the air density is so low because of that warm temperature and those hotter the day, the more it's groaning in the sky. So then we've had some hot days, right? So when you're looking at that plane, it's like, hey, that feels low. It's it's it's pointing to climb.

Climb it the same way, same thrust, same setting, same heading.

(Fabio) How come you haven't updated the NEF forecast in the last 20 years? I think you are responsible for it, right? Or is it? No, no. GTAA is responsible. It it says in the lease too. Yeah, you guys are responsible for updating the noise exposure forecast, noise exposure forecast and you haven’t done so, why?

(Steven) Well, the current noise exposure forecast is still valid.

(Fabio) Oh, it's not. It's not in 20 years, things have changed.

(Jonathan) Actually, if it's taking the noise exposure forecast, it just said the way they're calculated and TC can speak to it as well, I'm sure. But noise exposure

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forecasts are intended as a planning tool, not as a lived experience tool.
So they're intended to say to municipalities in a non regulated manner like there's no law that you have to build according to noise exposure forecast in Canada. It's To inform municipalities that the the I'm gonna finish the things that you have
(Fabio) You have to do it periodically.
(Jonathan) So the noise exposure forecast, it's more it's an information tool for municipalities to support zoning.
(Fabio) How come they do so when they have a document at least 20 years old?
(Jonathan) Let me tell you. I got I got insight for you, Fabio. If you wanna give me a second, we're gonna be wrapping up in a SEC. But what you should know is that the way it's calculated is a cumulative noise metric, and cumulative noise metrics don't depend just on number of incidents of noise.
It's a level of noise and and you can't just average noise the way as a calculation. Noise isn't something you can just average. You can't say one plane was 60 decibels, another plane was 70 decibels. So the average noise is 65 bucks.
(Fabio)That's why they do in every report. These guys do in every report. That's what they do to trick the people.
(Jonathan) So, but what I was going to say is, but my last thing I'm going to say, we're going to wrap this up is that most noise forecasts that are redone shrink. They're they're not going to get there. There's nothing in a noise exposure forecast for you the one that they use in Australia and New Zealand.
They shrink.
(Dawayne) So if I get this quickly, it's different than the one that way you see it. But you explained this pretty consistent globally. Like, yeah, every single airport where they run the process. Yeah. And some sometimes it's even lagging indicator as well, but it's predominantly for developers. Yeah. Yeah. So it's honest, the developer.
(Fabio) How someone, a member of society who wants to purchase a home, and I want to purchase a home where there is no traffic. So I look at the nose exposure forcast. It doesn't say anywhere that has been made 20 years ago. And I said, OK, I'll go and buy a house here. And I go purchase a home. Well, they have hundreds of planes every day. How can a planner? A city planner done do his job, her job properly. When they don’t, he's like trying to you know, you're you're you're driving a plane without instruments. Where the sky is full of clouds. Crash. So basically you guys are making the system crash because you're not updating what you're supposed to be updating, it says in the lease. GTAA is responsible for periodically

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update in the and you guys haven't done so. We have been asking why haven't you done so? Oh, we have been done in one of the meetings and the recording is online actually.

The Transport Canada.

Align.

Do you guys have a response? This this is GTAA who's responsible. So I want an answer from you.

(MP Sgro) The meeting wants to end at 8:00. We want to answer.

[redacted] We want to answer that schedule another meeting then.

In a couple of weeks, maybe two months.

(MP Sgro) Not unless there's something construct that's going to come out of it.

[redacted] We're we're not finished yet. We we we haven't even addressed that. Let's let's let's quickly finish this one. I think we'll deal with Judy. We don't really need you here. If you want you can leave.

(MP Sgro) Thank you very much. I asked the gentleman. Anything else you want to add or any of the gentleman at the table? Well, I think.

[redacted] and MP Sgro) Judy, if you want to go, you can go. We're still so we're all but it's your personal. Come on. Do you want to argue with me? No, I'm not arguing with you. I asked you eight months ago for this meeting and you know what? You never even responded to me so. And then she's she's saying and that the people came here to talk about friggin noise and get some answers and some of the solutions. I've watched that. They're all they're all I'll keep for it. Please please. Have you anything more to offer anybody if not so.

(MP Sgro) Thank you all very much for coming. I'm sorry I I I need to give this To you. Won't talk about compensation. These aren't the proof that we talk about compensation to be given. That's a different. Let me peddle a fish. You won't talk about compensation. It's a different group of people. .

(Fabio) Who do we need with about that?

(MP Sgro) So Steve, can you call this meeting? So I would like to thank all the residents for coming today.

(Jonathan) Yeah, the next meeting, excuse me, the next meeting is the noise forum, which is accessible to everybody here, multiple meetings a year. And I I would recommend you attend that as the next meeting. I think that it actually has. How do we get this information? I know it's on, it's on a website, I I asked.

(Steven) So we can circulate the information with all the members that or the

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community member. Stop. Let me finish, please. All the community members that signed in today with their information for circulating that information. We will happily share that with you. That's OK. OK. And we will schedule another meeting. We will provide the information about the scheduling of that meeting coming up.
(Fabio) Can you answer the question about the council?
(Steven) Fabio, we already answered your question.

◉ **Van Laethem, Gijs** stopped transcription

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**From:** Fabio Ovettini
**To:** tc.ministeroftransport-ministredestransports.tc@tc.gc.ca; Steven.MacKinnon@parl.gc.ca; steven.mackinnon@parl.gc.ca; hcminister.ministresc; hcminister.ministresc@canada.ca; pm@pm.gc.ca; ministre-minister@ec.gc.ca; [redacted] service@navcanada.ca; ethi@parl.gc.ca; speaker.president@parl.gc.ca; trcm@sen.parl.gc.ca; hesa@parl.gc.ca; tran@parl.gc.ca; oggo@parl.gc.ca; envi@parl.gc.ca; soci@sen.parl.gc.ca; enev@sen.parl.gc.ca; pierre.poilievre@parl.gc.ca
**Cc:** [redacted] Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); jagmeet.singh@parl.gc.ca; francesco.sorbara@parl.gc.ca; [redacted] humberjeacommunitygroup@gmail.com; [redacted] mayor_chow@toronto.ca; councillor_perruzza@toronto.ca; [redacted] trakocevic-co@ndp.on.ca; [redacted] w5@ctv.ca; [redacted] doug.fordco@pc.ola.org; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] judy.sgro.a1@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; [redacted] mark.carney@parl.gc.ca; chrystia.freeland@parl.gc.ca; marjorie.michel@parl.gc.ca; amy.calderan.521@parl.gc.ca; councillor_ainslie@toronto.ca; communityengagement@gtaa.com; petitions@oag-bvg.gc.ca; info.com@chrc-ccdp.gc.ca; hcinfo.infosc@canada.ca; complaint.plainte@chrc-ccdp.gc.ca; info@psic-ispc.gc.ca; robvjus@gmail.com; publichealth@toronto.ca; [redacted] judy.sgro@parl.gc.ca; steven.thomas@gtaa.com; [redacted]
**Subject:** Fw: Urgent: Sustained Noise Pattern Resembling Psychological Harm – Immediate Federal Action Required
**Date:** 2025-11-04 11:58:40 AM
**Attachments:** Noise as a Mechanism of Harm.pdf
Oct3-4-5-Ops.pdf
Nov1-2-3-Ops.pdf

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**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

This message and its attachments contain evidence of sustained day- and night-time aircraft operations (including during WHO- and ICAO-protected night hours, 23:00–07:00) contrary to international health and environmental standards.

Ministers and Ms. Flint,

I am resending my **Oct 6, 2025** submission because **no acknowledgement** has been received. The conditions described have **continued in substantially the same fashion** through late October and into November, with additional protected-hours events recorded.

**What's happening now (and why this is urgent):**

- **Many hours/day of identical paths with zero practical variation** over our community;
- **Night operations (23:00–07:00)** that fragment sleep and deny recovery; and
- **NAV CANADA staffing shortfalls** that appear **preventable** and are **pushing daytime delays into the night**, compounding health harms and elevating **safety risk** for people in the air and on the ground.

**Fresh evidence — Acacia Park NMT2 (Nov 1–3, 2025):**
Please see the attached **Nov1-2-3-Ops.pdf**, listing numerous events, including repeated nighttime levels in the high-60s to high-70s dB and concentrated bursts around midnight and in the early-morning protected window—consistent with the pattern described above.

**Context — Transportation Safety Board (Oct 15, 2025 Watchlist):**
The TSB reported **runway incursions reached a record 639 in 2024** and stated that **Transport Canada's regulatory surveillance has not always been effective in detecting non-compliance or ensuring timely corrective action**. This underscores that current measures are insufficient and that federal oversight must respond decisively to reduce risk and harm.

**Conflict-of-interest risks (governance):**

- **GTAA:** The GTAA is both the **beneficiary of traffic growth** and the **party responsible for community engagement and key noise artefacts** (e.g., NEF updates and public reporting) that influence whether and how growth proceeds. **Transport Canada** is simultaneously a **policy promoter for aviation** and the **landlord/oversight authority** under the Pearson Ground Lease. This mix creates at minimum the **appearance of conflict** and helps explain why community protections (protected night hours and a current NEF) remain unenforced despite documented harms.
- **NAV CANADA:** NAV CANADA's user-fee revenue is **linked to traffic volume and service units**, creating a built-in incentive to **maximize throughput**. When paired with constrained staffing, this can lead to **operational choices that prioritize movement volume** and **shift daytime delays into the protected 23:00–07:00 window**, intensifying harm to nearby communities. These **volume-linked incentives** should be examined and balanced against **public-health protections** and **night-noise limits**.

**Requested actions (now time-bound):**

1. **Immediately suspend** the current fixed-path operating pattern and **restore operational variation** to reduce concentrated exposure.
2. **Cancel non-essential flights 23:00–07:00** (MEDEVAC/CAP/emergencies excepted) in line with WHO/ICAO protected-hours principles.
3. **Independent review** of GTAA community-relations conduct, including **cessation of replies** by named officials during a period of documented harm.
4. **Enforce** GTAA **Ground Lease** obligations (environmental protection, current NEF, meaningful consultation).
5. **Joint Health–Transport–ECCC assessment** of cumulative health impacts from sustained night noise and particulate exposure.
6. **Explain what steps NAV CANADA is taking** to remediate **ATC staffing shortfalls** and to **avoid displacing daytime delays into the night** over residential areas.
7. **Independent conflict-of-interest review and transparency safeguards:** Commission an **independent governance review** (e.g., OAG performance audit) into conflicts between **growth incentives** and **noise/health protections** at Pearson; require **third-party production and publication of the Pearson-specific NEF**, **independent auditing of noise-monitor uptime/complaint reporting**, and transparency around **ATC staffing/throughput decisions** that affect protected night hours. Consider extending **public-access/records obligations** to the GTAA for community-impact data.
8. **Align NAV CANADA incentives with health & safety outcomes:** Publish an analysis of **how fee and staffing structures affect nighttime operations** and delay displacement; establish **guardrails** so **growth or staffing shortfalls cannot be offset by using protected night hours**;

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implement **independent review** of **staffing models, night-hour utilization, and delay management** with **public quarterly reporting**.

**Response requested:**
Please **confirm receipt within 48 hours** and provide a **substantive update by Monday, November 10, 2025**. If this is routed elsewhere, **forward internally** and advise the contact and file number.

**Attachments:**

- **Attachment A (original):** Acacia Park NMT2 — Oct 3–5, 2025 (recurring long operating stretches + night events).
- **Attachment B (new): Nov1-2-3-Ops.pdf** — Acacia monitor events, Nov 1–3, 2025 (timestamps, dB levels, day/night designation).
- **Annex:** *Noise as a Mechanism of Harm* — WHO/UN synopsis on chronic noise and sleep disruption.

**Parliamentary notice:** I have copied committee clerks so that members may review the attached materials **for information** and consider the need for **study or briefings** on protected night hours, NAV CANADA staffing impacts, and Ground Lease enforcement.

Given the federal landlord role under the Pearson Ground Lease and the clear public-health and **safety** dimensions, **silence is not an acceptable outcome.**

Sincerely,
Fabio Ovettini
34 Jodphur Avenue, Toronto, M9M 2J4
On behalf of affected residents

----- Forwarded Message -----
**From:** Fabio Ovettini
**To:** tc.ministeroftransport-ministredestransports.tc@tc.gc.ca ; Steven.MacKinnon@parl.gc.ca ; steven.mackinnon@parl.gc.ca ; hcminister.ministresc@hc-sc.gc.ca ; hcminister.ministresc@canada.ca ; pm@pm.gc.ca ; ministre-minister@ec.gc.ca ; Deborah Flint
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**Sent:** Monday, October 6, 2025 at 10:24:43 p.m. EDT
**Subject:** Urgent: Sustained Noise Pattern Resembling Psychological Harm – Immediate Federal Action Required

This message and its attachments contain evidence of sustained day- and night-time aircraft operations (including during WHO- and ICAO-protected night hours, 23:00–07:00) contrary to international health and environmental standards.

**Subject: Urgent: Sustained Noise Pattern Resembling Psychological Harm – Immediate Federal Action Required**

**To:**
The Honourable Steven MacKinnon, Minister of Transport
The Honourable Marjorie Michel, Minister of Health
The Right Honourable Mark Carney, Prime Minister of Canada
The Honourable Julie Dabrusin, Minister of Environment & Climate Change
Ms. Deborah Flint, President & CEO, GTAA

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**Ministers and Ms. Flint,**

Over the past three days our community has been subjected to an operational pattern at Toronto Pearson Airport that is unprecedented in its intensity:

- **18 consecutive hours per day of identical arrival paths**, with zero variation.
- **Targeted flights during designated "preferential" quiet hours**, breaking residents' sleep and leaving no time for recovery.

This pattern has continued despite repeated written concerns from our community.
Mr. **Steven Thomas**, Mr. **Blair Ostrom**, and others responsible for GTAA's community engagement have **unilaterally ceased communication**, effectively abandoning their obligations to affected residents.
The result is that a federally regulated operation is being used as a **real-world noise experiment**—inflicting predictable suffering on the very people who have exercised their right to complain.

International human rights and medical authorities—including the **UN Special Rapporteur on Torture**, **Amnesty International**, and the **World Health Organization**—have recognized that sustained, sleep-fragmenting noise, particularly when directed at identifiable groups, causes serious mental and physical suffering comparable to **cruel, inhuman, or degrading treatment**.

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The operational choices now in effect at Pearson reproduce many of these same characteristics: predictability during the day, deliberate disruption at night, and cumulative exhaustion over time.

We are not alleging "torture" in a legal sense. We are stating that the **behaviour of Transport Canada, the GTAA, and its representatives now mirrors internationally condemned patterns of psychological harm when applied knowingly.**
Given the federal government's oversight role as landlord under the Pearson Ground Lease, this continued inaction represents an ethical and administrative failure with measurable health consequences.

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**Requested Actions**

1. **Immediate suspension** of the current 18-hour fixed-path arrival pattern and restoration of operational variation to reduce concentrated exposure.
2. **Cancellation of all non-essential flight activity between 23:00 and 07:00 hours**, consistent with WHO and ICAO standards, **except MEDEVAC, CAP, or emergency operations**.
3. **Independent investigation** into the cessation of communication by GTAA community-relations officials with affected residents.
4. **Formal enforcement** of the GTAA's Ground Lease obligations regarding environmental protection, NEF updates, and community consultation.
5. **Joint Health-Transport-ECCC assessment** of the cumulative health impacts of sustained nighttime aircraft noise and associated particulate pollution.

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**Attachment:**
*Attachment A – Local Noise Monitor Data (Acacia Park NMT2, Oct3to5, 2025*
This dataset documents the recurring 18-hour arrival patterns and sleep-disrupting night flights referenced above.

An additional annex, *"Noise as a Mechanism of Harm,"* summarizing WHO and UN findings on chronic noise exposure and sleep deprivation, will follow.

We ask for a **written response within 10 business days** outlining the steps you will take to address these harms.

Sincerely,
Fabio Ovettini
34 Jodphur Avenue, Toronto, M9M 2J4

On behalf of affected residents

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# Annex A — Noise as a Mechanism of Harm

## 1) ICAO: the standard "night" is 23:00–07:00

ICAO Balanced Approach (Doc 9829) — "The night period is 2300 to 0700 hours (local time) …"
Source: https://www.icao.int/environmental-protection/Pages/noise.aspx

Annex 16, Vol I (Aircraft Noise) — defines the standard night for noise-abatement assessment.
Source: https://store.icao.int/en/annex-16-environmental-protection-volume-i-aircraft-noise-11th-edition-2021

ICAO Circular 303 — further operational examples referencing the 23:00–07:00 night period.
Source: https://www.icao.int/environmental-protection/Pages/noise.aspx

## 2) European Union Environmental Noise Directive (2002/49/EC)

Article 2(6) defines "night-time" as the period from 23:00 to 07:00 local time.
Source: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049

This directive is the legal basis for all EU environmental noise mapping and health-risk reporting.

## 3) WHO: night-noise health thresholds & sleep disturbance

WHO Environmental Noise Guidelines for the European Region (2018) — documents sleep, cardiovascular, and cognitive effects of chronic noise exposure.
Source: https://www.who.int/publications/i/item/9789289053563

Night Noise Guidelines for Europe (2009) — explicitly defines the night period as 23:00–07:00 for Lnight assessment and identifies thresholds:
– Adverse effects above 40 dB Lnight
– Dangerous effects above 55 dB Lnight
Source: https://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf

## 4) EASA / EUROCONTROL

EUROCONTROL Aircraft Noise and Performance Manual (2009) — applies 23:00–07:00 as the night period for Lnight exposure calculation.
EASA Environmental Protection Portal — aligns with WHO and ICAO night definitions for regulatory consistency.
Source: https://www.easa.europa.eu/domains/environment

## 5) United Kingdom Department for Transport (DfT)

UK Night Flight Restrictions Policy — defines night as 23:00–07:00, with a stricter "night-quota" period of 23:30–06:00.
Source: https://www.gov.uk/government/consultations/night-flight-restrictions-at-heathrow-gatwick-and-stansted-airports

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## 6) Canadian Practice: GTAA Noise Management

GTAA Annual Noise Reports 2019 & 2020 reports classify "night operations" as those occurring between 23:00 and 07:00.
Source: https://www.torontopearson.com/en/community/noise-management

This aligns local airport operations with international norms.

## Summary Table: Global Recognition of the 23:00–07:00 Night Period

| Source | Defines Night As | Type | Reference |
|---|---|---|---|
| ICAO Doc 9829 / Annex 16 | 23:00–07:00 | Aviation Standard | https://www.icao.int/environmental-protection/Pages/noise.aspx |
| EU Directive 2002/49/EC | 23:00–07:00 | Legal Directive | https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0049 |
| WHO Night Noise Guidelines | 23:00–07:00 | Health Standard | https://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf |
| EASA / EUROCONTROL | 23:00–07:00 | Operational | https://www.easa.europa.eu/domains/environment |
| UK Department for Transport | 23:00–07:00 | National Policy | https://www.gov.uk/government/consultations/night-flight-restrictions-at-heathrow-gatwick-and-stansted-airports |
| GTAA Noise Reports | 23:00–07:00 | Operator Practice (Canada) | https://www.torontopearson.com/en/community/noise-management |

Finding: The 23:00–07:00 timeframe is consistently defined across ICAO, EU, WHO, EASA, UK, and Canadian frameworks as the standard night period for environmental noise management.
All recognize the biological need for undisturbed sleep during these hours and recommend restricting operations to essential services only (e.g., MEDEVAC, CAP, emergencies).

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1 | 2025-10-03 00:51:34 | | 45dB | ? | ? | Night |
| 2 | 2025-10-03 03:19:05 | 66 | 45dB | 4.0 | 300% | Night |
| 3 | 2025-10-03 03:42:02 | | 45dB | ? | ? | Night |
| 4 | 2025-10-03 06:26:44 | 75 | 45dB | 8.0 | 700% | Night |
| 5 | 2025-10-03 06:28:54 | 73 | 45dB | 6.5 | 550% | Night |
| 6 | 2025-10-03 06:31:20 | 70 | 45dB | 5.3 | 428% | Night |
| 7 | 2025-10-03 06:33:00 | 69 | 45dB | 5.3 | 428% | Night |
| 8 | 2025-10-03 06:34:06 | 73 | 45dB | 7.0 | 596% | Night |
| 9 | 2025-10-03 06:35:33 | 69 | 45dB | 5.3 | 428% | Night |
| 10 | 2025-10-03 06:36:52 | 72 | 45dB | 6.1 | 506% | Night |
| 11 | 2025-10-03 06:38:08 | 70 | 45dB | 5.7 | 466% | Night |
| 12 | 2025-10-03 06:39:20 | 72 | 45dB | 6.1 | 506% | Night |
| 13 | 2025-10-03 06:40:45 | 70 | 45dB | 5.7 | 466% | Night |
| 14 | 2025-10-03 06:42:03 | 74 | 45dB | 7.5 | 646% | Night |
| 15 | 2025-10-03 06:44:03 | 76 | 45dB | 8.6 | 757% | Night |
| 16 | 2025-10-03 06:45:15 | 70 | 45dB | 5.7 | 466% | Night |
| 17 | 2025-10-03 06:46:35 | 68 | 45dB | 4.9 | 392% | Night |
| 18 | 2025-10-03 06:47:46 | 70 | 45dB | 5.3 | 428% | Night |
| 19 | 2025-10-03 06:49:07 | 74 | 45dB | 7.5 | 646% | Night |
| 20 | 2025-10-03 06:50:20 | 70 | 45dB | 5.7 | 466% | Night |
| 21 | 2025-10-03 06:51:49 | 72 | 45dB | 6.1 | 506% | Night |
| 22 | 2025-10-03 06:53:22 | 70 | 45dB | 5.7 | 466% | Night |
| 23 | 2025-10-03 06:55:33 | 67 | 45dB | 4.6 | 359% | Night |
| 24 | 2025-10-03 06:57:33 | 69 | 45dB | 4.9 | 392% | Night |
| 25 | 2025-10-03 06:59:01 | 75 | 45dB | 7.5 | 646% | Night |
| 26 | 2025-10-03 07:01:17 | 71 | 55dB | 3.0 | 203% | Day |
| 27 | 2025-10-03 07:02:36 | 69 | 55dB | 2.5 | 146% | Day |
| 28 | 2025-10-03 07:04:02 | 70 | 55dB | 2.8 | 183% | Day |
| 29 | 2025-10-03 07:07:24 | 71 | 55dB | 3.0 | 203% | Day |
| 30 | 2025-10-03 07:09:51 | 71 | 55dB | 2.8 | 183% | Day |
| 31 | 2025-10-03 07:12:12 | 68 | 55dB | 2.5 | 146% | Day |
| 32 | 2025-10-03 07:13:53 | 75 | 55dB | 4.0 | 300% | Day |
| 33 | 2025-10-03 07:15:52 | 84 | 55dB | 7.5 | 646% | Day |
| 34 | 2025-10-03 07:18:48 | 70 | 55dB | 2.8 | 183% | Day |
| 35 | 2025-10-03 07:20:31 | 70 | 55dB | 2.6 | 164% | Day |
| 36 | 2025-10-03 07:30:30 | 69 | 55dB | 2.6 | 164% | Day |
| 37 | 2025-10-03 07:37:17 | 70 | 55dB | 2.6 | 164% | Day |
| 38 | 2025-10-03 07:49:22 | 74 | 55dB | 3.5 | 248% | Day |

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|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 39 | 2025-10-03 07:51:57 | 74 | 55dB | 3.5 | 248% | Day |
| 40 | 2025-10-03 07:53:30 | 75 | 55dB | 3.7 | 273% | Day |
| 41 | 2025-10-03 07:54:53 | 75 | 55dB | 3.7 | 273% | Day |
| 42 | 2025-10-03 07:56:24 | 77 | 55dB | 4.6 | 359% | Day |
| 43 | 2025-10-03 07:58:46 | 76 | 55dB | 4.3 | 329% | Day |
| 44 | 2025-10-03 08:05:00 | 76 | 55dB | 4.0 | 300% | Day |
| 45 | 2025-10-03 08:10:54 | 70 | 55dB | 2.8 | 183% | Day |
| 46 | 2025-10-03 08:19:22 | 72 | 55dB | 3.2 | 225% | Day |
| 47 | 2025-10-03 08:21:12 | 74 | 55dB | 3.7 | 273% | Day |
| 48 | 2025-10-03 08:25:16 | 73 | 55dB | 3.2 | 225% | Day |
| 49 | 2025-10-03 08:30:11 | 72 | 55dB | 3.0 | 203% | Day |
| 50 | 2025-10-03 08:34:16 | 72 | 55dB | 3.2 | 225% | Day |
| 51 | 2025-10-03 08:38:29 | 73 | 55dB | 3.5 | 248% | Day |
| 52 | 2025-10-03 08:44:06 | 73 | 55dB | 3.2 | 225% | Day |
| 53 | 2025-10-03 08:48:00 | 72 | 55dB | 3.2 | 225% | Day |
| 54 | 2025-10-03 08:50:56 | 73 | 55dB | 3.5 | 248% | Day |
| 55 | 2025-10-03 08:53:11 | 75 | 55dB | 3.7 | 273% | Day |
| 56 | 2025-10-03 08:57:01 | 72 | 55dB | 3.2 | 225% | Day |
| 57 | 2025-10-03 08:59:32 | 74 | 55dB | 3.7 | 273% | Day |
| 58 | 2025-10-03 09:02:33 | 72 | 55dB | 3.2 | 225% | Day |
| 59 | 2025-10-03 09:10:56 | 73 | 55dB | 3.2 | 225% | Day |
| 60 | 2025-10-03 09:15:32 | 71 | 55dB | 2.8 | 183% | Day |
| 61 | 2025-10-03 09:18:09 | 74 | 55dB | 3.5 | 248% | Day |
| 62 | 2025-10-03 09:20:39 | 76 | 55dB | 4.0 | 300% | Day |
| 63 | 2025-10-03 09:25:18 | 73 | 55dB | 3.2 | 225% | Day |
| 64 | 2025-10-03 09:27:07 | 74 | 55dB | 3.5 | 248% | Day |
| 65 | 2025-10-03 09:29:54 | 69 | 55dB | 2.5 | 146% | Day |
| 66 | 2025-10-03 09:35:14 | 70 | 55dB | 2.8 | 183% | Day |
| 67 | 2025-10-03 09:37:49 | 71 | 55dB | 3.0 | 203% | Day |
| 68 | 2025-10-03 09:39:36 | 71 | 55dB | 3.0 | 203% | Day |
| 69 | 2025-10-03 09:41:19 | 71 | 55dB | 2.8 | 183% | Day |
| 70 | 2025-10-03 09:51:00 | 72 | 55dB | 3.2 | 225% | Day |
| 71 | 2025-10-03 09:55:34 | 73 | 55dB | 3.5 | 248% | Day |
| 72 | 2025-10-03 09:58:36 | 75 | 55dB | 3.7 | 273% | Day |
| 73 | 2025-10-03 10:06:04 | 70 | 55dB | 2.8 | 183% | Day |
| 74 | 2025-10-03 10:08:22 | 74 | 55dB | 3.7 | 273% | Day |
| 75 | 2025-10-03 10:11:23 | 74 | 55dB | 3.7 | 273% | Day |
| 76 | 2025-10-03 10:15:12 | 71 | 55dB | 3.0 | 203% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 77 | 2025-10-03 10:18:37 | 74 | 55dB | 3.7 | 273% | Day |
| 78 | 2025-10-03 10:23:10 | 72 | 55dB | 3.2 | 225% | Day |
| 79 | 2025-10-03 10:24:22 | 72 | 55dB | 3.0 | 203% | Day |
| 80 | 2025-10-03 10:25:49 | 73 | 55dB | 3.2 | 225% | Day |
| 81 | 2025-10-03 10:27:36 | 74 | 55dB | 3.5 | 248% | Day |
| 82 | 2025-10-03 10:30:18 | 72 | 55dB | 3.0 | 203% | Day |
| 83 | 2025-10-03 10:32:37 | 73 | 55dB | 3.5 | 248% | Day |
| 84 | 2025-10-03 10:34:43 | 71 | 55dB | 3.0 | 203% | Day |
| 85 | 2025-10-03 10:36:26 | 72 | 55dB | 3.0 | 203% | Day |
| 86 | 2025-10-03 10:37:36 | 71 | 55dB | 3.0 | 203% | Day |
| 87 | 2025-10-03 10:39:02 | 68 | 55dB | 2.5 | 146% | Day |
| 88 | 2025-10-03 10:40:34 | 72 | 55dB | 3.0 | 203% | Day |
| 89 | 2025-10-03 10:42:18 | 73 | 55dB | 3.5 | 248% | Day |
| 90 | 2025-10-03 10:43:56 | 70 | 55dB | 2.8 | 183% | Day |
| 91 | 2025-10-03 10:45:56 | 75 | 55dB | 3.7 | 273% | Day |
| 92 | 2025-10-03 10:47:23 | 74 | 55dB | 3.5 | 248% | Day |
| 93 | 2025-10-03 10:48:56 | 73 | 55dB | 3.5 | 248% | Day |
| 94 | 2025-10-03 10:50:16 | 70 | 55dB | 2.6 | 164% | Day |
| 95 | 2025-10-03 10:52:27 | 84 | 55dB | 7.5 | 646% | Day |
| 96 | 2025-10-03 10:53:39 | 70 | 55dB | 2.8 | 183% | Day |
| 97 | 2025-10-03 11:10:37 | 73 | 55dB | 3.2 | 225% | Day |
| 98 | 2025-10-03 11:12:55 | 78 | 55dB | 4.6 | 359% | Day |
| 99 | 2025-10-03 11:15:24 | 71 | 55dB | 3.0 | 203% | Day |
| 100 | 2025-10-03 11:18:17 | 77 | 55dB | 4.3 | 329% | Day |
| 101 | 2025-10-03 11:20:56 | 73 | 55dB | 3.2 | 225% | Day |
| 102 | 2025-10-03 11:22:26 | 77 | 55dB | 4.3 | 329% | Day |
| 103 | 2025-10-03 11:24:10 | 71 | 55dB | 3.0 | 203% | Day |
| 104 | 2025-10-03 11:31:03 | 72 | 55dB | 3.2 | 225% | Day |
| 105 | 2025-10-03 11:33:13 | 74 | 55dB | 3.5 | 248% | Day |
| 106 | 2025-10-03 11:34:36 | 69 | 55dB | 2.5 | 146% | Day |
| 107 | 2025-10-03 11:35:52 | 72 | 55dB | 3.0 | 203% | Day |
| 108 | 2025-10-03 11:37:21 | 74 | 55dB | 3.5 | 248% | Day |
| 109 | 2025-10-03 11:39:00 | 72 | 55dB | 3.0 | 203% | Day |
| 110 | 2025-10-03 11:40:30 | 76 | 55dB | 4.0 | 300% | Day |
| 111 | 2025-10-03 11:42:52 | 71 | 55dB | 3.0 | 203% | Day |
| 112 | 2025-10-03 11:47:20 | 72 | 55dB | 3.0 | 203% | Day |
| 113 | 2025-10-03 11:49:14 | 79 | 55dB | 4.9 | 392% | Day |
| 114 | 2025-10-03 11:50:48 | 74 | 55dB | 3.7 | 273% | Day |

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|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 115 | 2025-10-03 11:54:47 | 74 | 55dB | 3.7 | 273% | Day |
| 116 | 2025-10-03 11:58:12 | 71 | 55dB | 3.0 | 203% | Day |
| 117 | 2025-10-03 12:00:08 | | 55dB | ? | ? | Day |
| 118 | 2025-10-03 12:02:58 | 72 | 55dB | 3.0 | 203% | Day |
| 119 | 2025-10-03 12:06:53 | 73 | 55dB | 3.5 | 248% | Day |
| 120 | 2025-10-03 12:09:18 | 76 | 55dB | 4.0 | 300% | Day |
| 121 | 2025-10-03 12:11:11 | 75 | 55dB | 3.7 | 273% | Day |
| 122 | 2025-10-03 12:12:25 | 74 | 55dB | 3.7 | 273% | Day |
| 123 | 2025-10-03 12:13:52 | 73 | 55dB | 3.2 | 225% | Day |
| 124 | 2025-10-03 12:15:01 | 72 | 55dB | 3.0 | 203% | Day |
| 125 | 2025-10-03 12:16:26 | 76 | 55dB | 4.0 | 300% | Day |
| 126 | 2025-10-03 12:18:24 | 71 | 55dB | 3.0 | 203% | Day |
| 127 | 2025-10-03 12:25:43 | 73 | 55dB | 3.5 | 248% | Day |
| 128 | 2025-10-03 12:27:12 | 71 | 55dB | 2.8 | 183% | Day |
| 129 | 2025-10-03 12:28:24 | 67 | 55dB | 2.1 | 114% | Day |
| 130 | 2025-10-03 12:29:55 | 67 | 55dB | 2.3 | 130% | Day |
| 131 | 2025-10-03 12:32:34 | 73 | 55dB | 3.5 | 248% | Day |
| 132 | 2025-10-03 12:33:56 | 75 | 55dB | 3.7 | 273% | Day |
| 133 | 2025-10-03 12:35:08 | 72 | 55dB | 3.0 | 203% | Day |
| 134 | 2025-10-03 12:36:21 | 74 | 55dB | 3.7 | 273% | Day |
| 135 | 2025-10-03 12:40:47 | 71 | 55dB | 3.0 | 203% | Day |
| 136 | 2025-10-03 12:42:05 | 79 | 55dB | 5.3 | 428% | Day |
| 137 | 2025-10-03 12:45:27 | 73 | 55dB | 3.5 | 248% | Day |
| 138 | 2025-10-03 12:47:46 | 72 | 55dB | 3.2 | 225% | Day |
| 139 | 2025-10-03 12:49:20 | 74 | 55dB | 3.7 | 273% | Day |
| 140 | 2025-10-03 12:50:52 | 72 | 55dB | 3.2 | 225% | Day |
| 141 | 2025-10-03 12:53:43 | 72 | 55dB | 3.0 | 203% | Day |
| 142 | 2025-10-03 12:55:52 | 69 | 55dB | 2.5 | 146% | Day |
| 143 | 2025-10-03 12:56:53 | 69 | 55dB | 2.5 | 146% | Day |
| 144 | 2025-10-03 12:58:53 | 74 | 55dB | 3.7 | 273% | Day |
| 145 | 2025-10-03 13:00:53 | 70 | 55dB | 2.6 | 164% | Day |
| 146 | 2025-10-03 13:02:38 | | 55dB | ? | ? | Day |
| 147 | 2025-10-03 13:04:23 | 71 | 55dB | 2.8 | 183% | Day |
| 148 | 2025-10-03 13:05:52 | 72 | 55dB | 3.2 | 225% | Day |
| 149 | 2025-10-03 13:07:18 | 70 | 55dB | 2.8 | 183% | Day |
| 150 | 2025-10-03 13:09:26 | 70 | 55dB | 2.6 | 164% | Day |
| 151 | 2025-10-03 13:11:20 | | 55dB | ? | ? | Day |
| 152 | 2025-10-03 13:13:02 | 69 | 55dB | 2.5 | 146% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 153 | 2025-10-03 13:16:04 | | 55dB | ? | ? | Day |
| 154 | 2025-10-03 13:22:36 | 70 | 55dB | 2.6 | 164% | Day |
| 155 | 2025-10-03 13:25:02 | 71 | 55dB | 3.0 | 203% | Day |
| 156 | 2025-10-03 13:28:58 | 76 | 55dB | 4.3 | 329% | Day |
| 157 | 2025-10-03 13:30:54 | 75 | 55dB | 4.0 | 300% | Day |
| 158 | 2025-10-03 13:32:26 | 69 | 55dB | 2.5 | 146% | Day |
| 159 | 2025-10-03 13:35:55 | 69 | 55dB | 2.6 | 164% | Day |
| 160 | 2025-10-03 13:37:33 | | 55dB | ? | ? | Day |
| 161 | 2025-10-03 13:38:51 | 71 | 55dB | 2.8 | 183% | Day |
| 162 | 2025-10-03 13:40:21 | 70 | 55dB | 2.6 | 164% | Day |
| 163 | 2025-10-03 13:41:28 | 73 | 55dB | 3.2 | 225% | Day |
| 164 | 2025-10-03 13:47:21 | 69 | 55dB | 2.5 | 146% | Day |
| 165 | 2025-10-03 13:49:14 | 69 | 55dB | 2.5 | 146% | Day |
| 166 | 2025-10-03 13:55:34 | 69 | 55dB | 2.5 | 146% | Day |
| 167 | 2025-10-03 13:56:53 | 76 | 55dB | 4.0 | 300% | Day |
| 168 | 2025-10-03 13:59:14 | 70 | 55dB | 2.6 | 164% | Day |
| 169 | 2025-10-03 14:00:39 | 73 | 55dB | 3.5 | 248% | Day |
| 170 | 2025-10-03 14:02:50 | 70 | 55dB | 2.8 | 183% | Day |
| 171 | 2025-10-03 14:04:20 | 69 | 55dB | 2.6 | 164% | Day |
| 172 | 2025-10-03 14:09:48 | 68 | 55dB | 2.3 | 130% | Day |
| 173 | 2025-10-03 14:13:58 | | 55dB | ? | ? | Day |
| 174 | 2025-10-03 14:20:15 | 78 | 55dB | 4.9 | 392% | Day |
| 175 | 2025-10-03 14:22:26 | 70 | 55dB | 2.8 | 183% | Day |
| 176 | 2025-10-03 14:25:00 | 77 | 55dB | 4.6 | 359% | Day |
| 177 | 2025-10-03 14:27:41 | 70 | 55dB | 2.6 | 164% | Day |
| 178 | 2025-10-03 14:29:02 | | 55dB | ? | ? | Day |
| 179 | 2025-10-03 14:30:15 | 70 | 55dB | 2.6 | 164% | Day |
| 180 | 2025-10-03 14:31:41 | 69 | 55dB | 2.5 | 146% | Day |
| 181 | 2025-10-03 14:33:38 | 74 | 55dB | 3.7 | 273% | Day |
| 182 | 2025-10-03 14:35:58 | 68 | 55dB | 2.5 | 146% | Day |
| 183 | 2025-10-03 14:37:54 | 75 | 55dB | 3.7 | 273% | Day |
| 184 | 2025-10-03 14:39:50 | 74 | 55dB | 3.5 | 248% | Day |
| 185 | 2025-10-03 14:41:23 | 69 | 55dB | 2.5 | 146% | Day |
| 186 | 2025-10-03 14:42:38 | 69 | 55dB | 2.6 | 164% | Day |
| 187 | 2025-10-03 14:44:13 | 75 | 55dB | 3.7 | 273% | Day |
| 188 | 2025-10-03 14:45:28 | 75 | 55dB | 4.0 | 300% | Day |
| 189 | 2025-10-03 14:47:34 | 71 | 55dB | 2.8 | 183% | Day |
| 190 | 2025-10-03 14:48:56 | 71 | 55dB | 3.0 | 203% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 191 | 2025-10-03 14:50:30 | 78 | 55dB | 4.9 | 392% | Day |
| 192 | 2025-10-03 14:52:48 | 67 | 55dB | 2.3 | 130% | Day |
| 193 | 2025-10-03 14:54:15 | 73 | 55dB | 3.5 | 248% | Day |
| 194 | 2025-10-03 14:55:53 | 70 | 55dB | 2.6 | 164% | Day |
| 195 | 2025-10-03 14:57:07 | 69 | 55dB | 2.6 | 164% | Day |
| 196 | 2025-10-03 14:58:18 | 68 | 55dB | 2.5 | 146% | Day |
| 197 | 2025-10-03 14:59:50 | 69 | 55dB | 2.6 | 164% | Day |
| 198 | 2025-10-03 15:01:13 | | 55dB | ? | ? | Day |
| 199 | 2025-10-03 15:02:27 | 67 | 55dB | 2.3 | 130% | Day |
| 200 | 2025-10-03 15:03:43 | 69 | 55dB | 2.5 | 146% | Day |
| 201 | 2025-10-03 15:07:13 | 68 | 55dB | 2.5 | 146% | Day |
| 202 | 2025-10-03 15:09:19 | 75 | 55dB | 4.0 | 300% | Day |
| 203 | 2025-10-03 15:11:22 | 71 | 55dB | 3.0 | 203% | Day |
| 204 | 2025-10-03 15:12:45 | 73 | 55dB | 3.5 | 248% | Day |
| 205 | 2025-10-03 15:14:06 | 67 | 55dB | 2.3 | 130% | Day |
| 206 | 2025-10-03 15:15:24 | | 55dB | ? | ? | Day |
| 207 | 2025-10-03 15:17:24 | | 55dB | ? | ? | Day |
| 208 | 2025-10-03 15:18:50 | 73 | 55dB | 3.2 | 225% | Day |
| 209 | 2025-10-03 15:20:01 | 72 | 55dB | 3.0 | 203% | Day |
| 210 | 2025-10-03 15:21:10 | 71 | 55dB | 3.0 | 203% | Day |
| 211 | 2025-10-03 15:22:23 | 67 | 55dB | 2.1 | 114% | Day |
| 212 | 2025-10-03 15:23:39 | 71 | 55dB | 2.8 | 183% | Day |
| 213 | 2025-10-03 15:24:53 | 74 | 55dB | 3.7 | 273% | Day |
| 214 | 2025-10-03 15:27:28 | 72 | 55dB | 3.2 | 225% | Day |
| 215 | 2025-10-03 15:29:41 | 67 | 55dB | 2.3 | 130% | Day |
| 216 | 2025-10-03 15:31:10 | | 55dB | ? | ? | Day |
| 217 | 2025-10-03 15:33:42 | 74 | 55dB | 3.7 | 273% | Day |
| 218 | 2025-10-03 15:35:58 | 68 | 55dB | 2.3 | 130% | Day |
| 219 | 2025-10-03 15:37:55 | 67 | 55dB | 2.1 | 114% | Day |
| 220 | 2025-10-03 15:39:17 | 69 | 55dB | 2.6 | 164% | Day |
| 221 | 2025-10-03 15:40:46 | 74 | 55dB | 3.5 | 248% | Day |
| 222 | 2025-10-03 15:42:50 | 69 | 55dB | 2.5 | 146% | Day |
| 223 | 2025-10-03 15:44:05 | 68 | 55dB | 2.5 | 146% | Day |
| 224 | 2025-10-03 15:52:03 | | 55dB | ? | ? | Day |
| 225 | 2025-10-03 15:55:47 | 68 | 55dB | 2.5 | 146% | Day |
| 226 | 2025-10-03 15:59:14 | 69 | 55dB | 2.6 | 164% | Day |
| 227 | 2025-10-03 16:00:26 | 75 | 55dB | 3.7 | 273% | Day |
| 228 | 2025-10-03 16:02:20 | 72 | 55dB | 3.0 | 203% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 229 | 2025-10-03 16:03:47 | 72 | 55dB | 3.2 | 225% | Day |
| 230 | 2025-10-03 16:06:38 | 71 | 55dB | 2.8 | 183% | Day |
| 231 | 2025-10-03 16:07:57 | 69 | 55dB | 2.6 | 164% | Day |
| 232 | 2025-10-03 16:09:10 | 74 | 55dB | 3.7 | 273% | Day |
| 233 | 2025-10-03 16:10:45 | 74 | 55dB | 3.5 | 248% | Day |
| 234 | 2025-10-03 16:12:53 | 76 | 55dB | 4.3 | 329% | Day |
| 235 | 2025-10-03 16:14:04 | 67 | 55dB | 2.3 | 130% | Day |
| 236 | 2025-10-03 16:16:04 | | 55dB | ? | ? | Day |
| 237 | 2025-10-03 16:17:25 | 74 | 55dB | 3.5 | 248% | Day |
| 238 | 2025-10-03 16:18:57 | 74 | 55dB | 3.7 | 273% | Day |
| 239 | 2025-10-03 16:21:09 | 73 | 55dB | 3.5 | 248% | Day |
| 240 | 2025-10-03 16:22:55 | 74 | 55dB | 3.7 | 273% | Day |
| 241 | 2025-10-03 16:25:02 | 69 | 55dB | 2.6 | 164% | Day |
| 242 | 2025-10-03 16:26:17 | 69 | 55dB | 2.6 | 164% | Day |
| 243 | 2025-10-03 16:27:56 | | 55dB | ? | ? | Day |
| 244 | 2025-10-03 16:29:20 | 70 | 55dB | 2.6 | 164% | Day |
| 245 | 2025-10-03 16:30:42 | 72 | 55dB | 3.2 | 225% | Day |
| 246 | 2025-10-03 16:32:21 | 71 | 55dB | 3.0 | 203% | Day |
| 247 | 2025-10-03 16:33:50 | | 55dB | ? | ? | Day |
| 248 | 2025-10-03 16:35:47 | 70 | 55dB | 2.6 | 164% | Day |
| 249 | 2025-10-03 16:37:07 | 71 | 55dB | 2.8 | 183% | Day |
| 250 | 2025-10-03 16:38:48 | 75 | 55dB | 4.0 | 300% | Day |
| 251 | 2025-10-03 16:40:11 | 68 | 55dB | 2.5 | 146% | Day |
| 252 | 2025-10-03 16:41:18 | 73 | 55dB | 3.5 | 248% | Day |
| 253 | 2025-10-03 16:42:34 | 71 | 55dB | 3.0 | 203% | Day |
| 254 | 2025-10-03 16:44:20 | | 55dB | ? | ? | Day |
| 255 | 2025-10-03 16:45:49 | 71 | 55dB | 2.8 | 183% | Day |
| 256 | 2025-10-03 16:47:02 | | 55dB | ? | ? | Day |
| 257 | 2025-10-03 16:48:30 | 72 | 55dB | 3.0 | 203% | Day |
| 258 | 2025-10-03 16:49:45 | 72 | 55dB | 3.0 | 203% | Day |
| 259 | 2025-10-03 16:51:05 | 69 | 55dB | 2.5 | 146% | Day |
| 260 | 2025-10-03 16:52:17 | 73 | 55dB | 3.5 | 248% | Day |
| 261 | 2025-10-03 16:53:36 | 69 | 55dB | 2.5 | 146% | Day |
| 262 | 2025-10-03 16:54:53 | 67 | 55dB | 2.3 | 130% | Day |
| 263 | 2025-10-03 16:56:19 | | 55dB | ? | ? | Day |
| 264 | 2025-10-03 16:57:46 | 68 | 55dB | 2.5 | 146% | Day |
| 265 | 2025-10-03 16:59:11 | 72 | 55dB | 3.2 | 225% | Day |
| 266 | 2025-10-03 17:00:43 | 69 | 55dB | 2.6 | 164% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 267 | 2025-10-03 17:03:30 | 73 | 55dB | 3.5 | 248% | Day |
| 268 | 2025-10-03 17:05:01 | 74 | 55dB | 3.5 | 248% | Day |
| 269 | 2025-10-03 17:07:55 | | 55dB | ? | ? | Day |
| 270 | 2025-10-03 17:09:17 | 68 | 55dB | 2.5 | 146% | Day |
| 271 | 2025-10-03 17:10:41 | | 55dB | ? | ? | Day |
| 272 | 2025-10-03 17:12:03 | 70 | 55dB | 2.8 | 183% | Day |
| 273 | 2025-10-03 17:14:00 | 68 | 55dB | 2.3 | 130% | Day |
| 274 | 2025-10-03 17:15:28 | 67 | 55dB | 2.3 | 130% | Day |
| 275 | 2025-10-03 17:18:07 | 71 | 55dB | 2.8 | 183% | Day |
| 276 | 2025-10-03 17:19:36 | 74 | 55dB | 3.7 | 273% | Day |
| 277 | 2025-10-03 17:21:09 | 71 | 55dB | 3.0 | 203% | Day |
| 278 | 2025-10-03 17:22:27 | 68 | 55dB | 2.3 | 130% | Day |
| 279 | 2025-10-03 17:24:22 | 71 | 55dB | 3.0 | 203% | Day |
| 280 | 2025-10-03 17:28:31 | 69 | 55dB | 2.5 | 146% | Day |
| 281 | 2025-10-03 17:30:02 | 68 | 55dB | 2.3 | 130% | Day |
| 282 | 2025-10-03 17:31:26 | 69 | 55dB | 2.5 | 146% | Day |
| 283 | 2025-10-03 17:32:43 | 70 | 55dB | 2.6 | 164% | Day |
| 284 | 2025-10-03 17:34:09 | 68 | 55dB | 2.3 | 130% | Day |
| 285 | 2025-10-03 17:35:37 | 77 | 55dB | 4.3 | 329% | Day |
| 286 | 2025-10-03 17:37:00 | 73 | 55dB | 3.2 | 225% | Day |
| 287 | 2025-10-03 17:39:31 | 71 | 55dB | 2.8 | 183% | Day |
| 288 | 2025-10-03 17:41:26 | | 55dB | ? | ? | Day |
| 289 | 2025-10-03 17:44:27 | 67 | 55dB | 2.3 | 130% | Day |
| 290 | 2025-10-03 17:46:04 | 80 | 55dB | 5.3 | 428% | Day |
| 291 | 2025-10-03 17:47:18 | 65 | 55dB | 2.0 | 100% | Day |
| 292 | 2025-10-03 17:48:44 | | 55dB | ? | ? | Day |
| 293 | 2025-10-03 17:50:05 | 69 | 55dB | 2.6 | 164% | Day |
| 294 | 2025-10-03 17:51:14 | 72 | 55dB | 3.0 | 203% | Day |
| 295 | 2025-10-03 17:53:33 | 68 | 55dB | 2.3 | 130% | Day |
| 296 | 2025-10-03 17:54:53 | 68 | 55dB | 2.5 | 146% | Day |
| 297 | 2025-10-03 17:57:10 | 70 | 55dB | 2.6 | 164% | Day |
| 298 | 2025-10-03 17:59:20 | | 55dB | ? | ? | Day |
| 299 | 2025-10-03 18:00:50 | 73 | 55dB | 3.5 | 248% | Day |
| 300 | 2025-10-03 18:02:49 | 69 | 55dB | 2.5 | 146% | Day |
| 301 | 2025-10-03 18:05:03 | 70 | 55dB | 2.6 | 164% | Day |
| 302 | 2025-10-03 18:07:22 | 71 | 55dB | 2.8 | 183% | Day |
| 303 | 2025-10-03 18:09:36 | 70 | 55dB | 2.6 | 164% | Day |
| 304 | 2025-10-03 18:11:08 | 67 | 55dB | 2.1 | 114% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 305 | 2025-10-03 18:12:38 | 69 | 55dB | 2.5 | 146% | Day |
| 306 | 2025-10-03 18:13:56 | 70 | 55dB | 2.8 | 183% | Day |
| 307 | 2025-10-03 18:15:16 | 71 | 55dB | 3.0 | 203% | Day |
| 308 | 2025-10-03 18:20:12 | 69 | 55dB | 2.5 | 146% | Day |
| 309 | 2025-10-03 18:21:45 | 69 | 55dB | 2.5 | 146% | Day |
| 310 | 2025-10-03 18:23:03 | 70 | 55dB | 2.6 | 164% | Day |
| 311 | 2025-10-03 18:28:07 | 72 | 55dB | 3.2 | 225% | Day |
| 312 | 2025-10-03 18:29:48 | 75 | 55dB | 4.0 | 300% | Day |
| 313 | 2025-10-03 18:33:02 | 68 | 55dB | 2.3 | 130% | Day |
| 314 | 2025-10-03 18:34:31 | 69 | 55dB | 2.5 | 146% | Day |
| 315 | 2025-10-03 18:36:16 | | 55dB | ? | ? | Day |
| 316 | 2025-10-03 18:37:42 | 78 | 55dB | 4.6 | 359% | Day |
| 317 | 2025-10-03 18:38:53 | 68 | 55dB | 2.5 | 146% | Day |
| 318 | 2025-10-03 18:41:40 | 73 | 55dB | 3.5 | 248% | Day |
| 319 | 2025-10-03 18:43:30 | 67 | 55dB | 2.3 | 130% | Day |
| 320 | 2025-10-03 18:44:47 | 70 | 55dB | 2.6 | 164% | Day |
| 321 | 2025-10-03 18:45:58 | 70 | 55dB | 2.8 | 183% | Day |
| 322 | 2025-10-03 18:47:14 | 72 | 55dB | 3.0 | 203% | Day |
| 323 | 2025-10-03 18:48:50 | 74 | 55dB | 3.5 | 248% | Day |
| 324 | 2025-10-03 18:52:20 | 73 | 55dB | 3.2 | 225% | Day |
| 325 | 2025-10-03 18:54:11 | 73 | 55dB | 3.2 | 225% | Day |
| 326 | 2025-10-03 18:56:00 | 70 | 55dB | 2.8 | 183% | Day |
| 327 | 2025-10-03 18:57:56 | 78 | 55dB | 4.9 | 392% | Day |
| 328 | 2025-10-03 18:59:21 | 79 | 55dB | 5.3 | 428% | Day |
| 329 | 2025-10-03 19:01:18 | 77 | 55dB | 4.6 | 359% | Day |
| 330 | 2025-10-03 19:02:23 | | 55dB | ? | ? | Day |
| 331 | 2025-10-03 19:03:40 | 79 | 55dB | 4.9 | 392% | Day |
| 332 | 2025-10-03 19:04:54 | 70 | 55dB | 2.8 | 183% | Day |
| 333 | 2025-10-03 19:06:01 | | 55dB | ? | ? | Day |
| 334 | 2025-10-03 19:07:15 | 75 | 55dB | 4.0 | 300% | Day |
| 335 | 2025-10-03 19:08:41 | 67 | 55dB | 2.3 | 130% | Day |
| 336 | 2025-10-03 19:11:22 | 71 | 55dB | 3.0 | 203% | Day |
| 337 | 2025-10-03 19:14:27 | 71 | 55dB | 2.8 | 183% | Day |
| 338 | 2025-10-03 19:15:51 | | 55dB | ? | ? | Day |
| 339 | 2025-10-03 19:17:31 | 70 | 55dB | 2.6 | 164% | Day |
| 340 | 2025-10-03 19:19:58 | 69 | 55dB | 2.6 | 164% | Day |
| 341 | 2025-10-03 19:21:23 | 72 | 55dB | 3.2 | 225% | Day |
| 342 | 2025-10-03 19:23:09 | 69 | 55dB | 2.5 | 146% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 343 | 2025-10-03 19:24:25 | 69 | 55dB | 2.5 | 146% | Day |
| 344 | 2025-10-03 19:25:31 | 69 | 55dB | 2.5 | 146% | Day |
| 345 | 2025-10-03 19:26:42 | 69 | 55dB | 2.6 | 164% | Day |
| 346 | 2025-10-03 19:29:03 | 71 | 55dB | 2.8 | 183% | Day |
| 347 | 2025-10-03 19:31:18 | 70 | 55dB | 2.6 | 164% | Day |
| 348 | 2025-10-03 19:34:48 | 68 | 55dB | 2.3 | 130% | Day |
| 349 | 2025-10-03 19:36:06 | 77 | 55dB | 4.6 | 359% | Day |
| 350 | 2025-10-03 19:38:14 | 68 | 55dB | 2.3 | 130% | Day |
| 351 | 2025-10-03 19:41:39 | | 55dB | ? | ? | Day |
| 352 | 2025-10-03 19:44:12 | 69 | 55dB | 2.6 | 164% | Day |
| 353 | 2025-10-03 19:45:54 | 69 | 55dB | 2.6 | 164% | Day |
| 354 | 2025-10-03 19:47:04 | | 55dB | ? | ? | Day |
| 355 | 2025-10-03 19:48:14 | 72 | 55dB | 3.2 | 225% | Day |
| 356 | 2025-10-03 19:50:55 | 67 | 55dB | 2.3 | 130% | Day |
| 357 | 2025-10-03 19:54:37 | 67 | 55dB | 2.1 | 114% | Day |
| 358 | 2025-10-03 20:02:09 | 69 | 55dB | 2.5 | 146% | Day |
| 359 | 2025-10-03 20:03:58 | 69 | 55dB | 2.6 | 164% | Day |
| 360 | 2025-10-03 20:05:17 | 68 | 55dB | 2.5 | 146% | Day |
| 361 | 2025-10-03 20:06:42 | 73 | 55dB | 3.2 | 225% | Day |
| 362 | 2025-10-03 20:08:56 | 67 | 55dB | 2.3 | 130% | Day |
| 363 | 2025-10-03 20:10:13 | 77 | 55dB | 4.3 | 329% | Day |
| 364 | 2025-10-03 20:11:39 | 67 | 55dB | 2.1 | 114% | Day |
| 365 | 2025-10-03 20:12:57 | 69 | 55dB | 2.5 | 146% | Day |
| 366 | 2025-10-03 20:15:25 | 70 | 55dB | 2.8 | 183% | Day |
| 367 | 2025-10-03 20:16:40 | 70 | 55dB | 2.6 | 164% | Day |
| 368 | 2025-10-03 20:18:27 | 70 | 55dB | 2.6 | 164% | Day |
| 369 | 2025-10-03 20:19:46 | 73 | 55dB | 3.2 | 225% | Day |
| 370 | 2025-10-03 20:21:17 | 72 | 55dB | 3.0 | 203% | Day |
| 371 | 2025-10-03 20:22:53 | | 55dB | ? | ? | Day |
| 372 | 2025-10-03 20:26:41 | 71 | 55dB | 3.0 | 203% | Day |
| 373 | 2025-10-03 20:29:23 | 68 | 55dB | 2.3 | 130% | Day |
| 374 | 2025-10-03 20:33:44 | 72 | 55dB | 3.0 | 203% | Day |
| 375 | 2025-10-03 20:35:16 | 72 | 55dB | 3.2 | 225% | Day |
| 376 | 2025-10-03 20:38:40 | 69 | 55dB | 2.6 | 164% | Day |
| 377 | 2025-10-03 20:39:47 | 70 | 55dB | 2.8 | 183% | Day |
| 378 | 2025-10-03 20:41:17 | 68 | 55dB | 2.5 | 146% | Day |
| 379 | 2025-10-03 20:42:39 | 68 | 55dB | 2.5 | 146% | Day |
| 380 | 2025-10-03 20:43:50 | 71 | 55dB | 2.8 | 183% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 381 | 2025-10-03 20:45:07 | 70 | 55dB | 2.6 | 164% | Day |
| 382 | 2025-10-03 20:46:23 | 66 | 55dB | 2.1 | 114% | Day |
| 383 | 2025-10-03 20:47:24 | 68 | 55dB | 2.3 | 130% | Day |
| 384 | 2025-10-03 20:48:50 | 70 | 55dB | 2.8 | 183% | Day |
| 385 | 2025-10-03 20:50:11 | 69 | 55dB | 2.6 | 164% | Day |
| 386 | 2025-10-03 20:51:33 | 70 | 55dB | 2.6 | 164% | Day |
| 387 | 2025-10-03 20:52:45 | 71 | 55dB | 3.0 | 203% | Day |
| 388 | 2025-10-03 20:54:46 | 69 | 55dB | 2.5 | 146% | Day |
| 389 | 2025-10-03 20:57:37 | 70 | 55dB | 2.6 | 164% | Day |
| 390 | 2025-10-03 20:58:56 | | 55dB | ? | ? | Day |
| 391 | 2025-10-03 21:00:22 | 69 | 55dB | 2.5 | 146% | Day |
| 392 | 2025-10-03 21:01:58 | 76 | 55dB | 4.0 | 300% | Day |
| 393 | 2025-10-03 21:03:52 | 69 | 55dB | 2.5 | 146% | Day |
| 394 | 2025-10-03 21:05:26 | 70 | 55dB | 2.6 | 164% | Day |
| 395 | 2025-10-03 21:07:23 | 75 | 55dB | 3.7 | 273% | Day |
| 396 | 2025-10-03 21:13:05 | 72 | 55dB | 3.0 | 203% | Day |
| 397 | 2025-10-03 21:14:58 | 68 | 55dB | 2.5 | 146% | Day |
| 398 | 2025-10-03 21:17:08 | 69 | 55dB | 2.5 | 146% | Day |
| 399 | 2025-10-03 21:20:49 | 69 | 55dB | 2.5 | 146% | Day |
| 400 | 2025-10-03 21:22:25 | 69 | 55dB | 2.5 | 146% | Day |
| 401 | 2025-10-03 21:23:45 | 69 | 55dB | 2.6 | 164% | Day |
| 402 | 2025-10-03 21:25:00 | 68 | 55dB | 2.5 | 146% | Day |
| 403 | 2025-10-03 21:26:18 | 69 | 55dB | 2.5 | 146% | Day |
| 404 | 2025-10-03 21:27:56 | 84 | 55dB | 7.0 | 596% | Day |
| 405 | 2025-10-03 21:30:02 | 67 | 55dB | 2.3 | 130% | Day |
| 406 | 2025-10-03 21:33:53 | 67 | 55dB | 2.1 | 114% | Day |
| 407 | 2025-10-03 21:35:09 | 70 | 55dB | 2.8 | 183% | Day |
| 408 | 2025-10-03 21:36:26 | 70 | 55dB | 2.8 | 183% | Day |
| 409 | 2025-10-03 21:37:43 | 71 | 55dB | 3.0 | 203% | Day |
| 410 | 2025-10-03 21:39:27 | 70 | 55dB | 2.6 | 164% | Day |
| 411 | 2025-10-03 21:41:00 | 71 | 55dB | 3.0 | 203% | Day |
| 412 | 2025-10-03 21:43:02 | 71 | 55dB | 2.8 | 183% | Day |
| 413 | 2025-10-03 21:45:12 | 69 | 55dB | 2.5 | 146% | Day |
| 414 | 2025-10-03 21:49:16 | | 55dB | ? | ? | Day |
| 415 | 2025-10-03 21:52:08 | 69 | 55dB | 2.6 | 164% | Day |
| 416 | 2025-10-03 21:54:22 | 68 | 55dB | 2.3 | 130% | Day |
| 417 | 2025-10-03 21:56:04 | 79 | 55dB | 4.9 | 392% | Day |
| 418 | 2025-10-03 21:57:28 | 65 | 55dB | 2.0 | 100% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 419 | 2025-10-03 21:58:52 | 69 | 55dB | 2.6 | 164% | Day |
| 420 | 2025-10-03 22:00:16 | 71 | 55dB | 3.0 | 203% | Day |
| 421 | 2025-10-03 22:01:34 | 68 | 55dB | 2.5 | 146% | Day |
| 422 | 2025-10-03 22:02:48 | 68 | 55dB | 2.5 | 146% | Day |
| 423 | 2025-10-03 22:04:27 | 81 | 55dB | 6.1 | 506% | Day |
| 424 | 2025-10-03 22:06:03 | | 55dB | ? | ? | Day |
| 425 | 2025-10-03 22:07:31 | | 55dB | ? | ? | Day |
| 426 | 2025-10-03 22:13:18 | 74 | 55dB | 3.5 | 248% | Day |
| 427 | 2025-10-03 22:15:41 | 69 | 55dB | 2.6 | 164% | Day |
| 428 | 2025-10-03 22:18:01 | 68 | 55dB | 2.5 | 146% | Day |
| 429 | 2025-10-03 22:20:32 | 68 | 55dB | 2.3 | 130% | Day |
| 430 | 2025-10-03 22:22:35 | 70 | 55dB | 2.6 | 164% | Day |
| 431 | 2025-10-03 22:26:21 | 85 | 55dB | 8.0 | 700% | Day |
| 432 | 2025-10-03 22:29:28 | 75 | 55dB | 3.7 | 273% | Day |
| 433 | 2025-10-03 22:31:06 | 70 | 55dB | 2.8 | 183% | Day |
| 434 | 2025-10-03 22:32:26 | 67 | 55dB | 2.1 | 114% | Day |
| 435 | 2025-10-03 22:33:46 | 77 | 55dB | 4.3 | 329% | Day |
| 436 | 2025-10-03 22:35:03 | 69 | 55dB | 2.5 | 146% | Day |
| 437 | 2025-10-03 22:37:26 | | 55dB | ? | ? | Day |
| 438 | 2025-10-03 22:40:13 | 72 | 55dB | 3.0 | 203% | Day |
| 439 | 2025-10-03 22:41:52 | 69 | 55dB | 2.5 | 146% | Day |
| 440 | 2025-10-03 22:43:27 | 73 | 55dB | 3.2 | 225% | Day |
| 441 | 2025-10-03 22:45:48 | | 55dB | ? | ? | Day |
| 442 | 2025-10-03 22:47:46 | | 55dB | ? | ? | Day |
| 443 | 2025-10-03 22:52:43 | | 55dB | ? | ? | Day |
| 444 | 2025-10-03 23:01:13 | | 45dB | ? | ? | Night |
| 445 | 2025-10-03 23:06:22 | 72 | 45dB | 6.1 | 506% | Night |
| 446 | 2025-10-03 23:07:43 | 70 | 45dB | 5.3 | 428% | Night |
| 447 | 2025-10-03 23:09:12 | 68 | 45dB | 4.6 | 359% | Night |
| 448 | 2025-10-03 23:10:46 | 69 | 45dB | 5.3 | 428% | Night |
| 449 | 2025-10-03 23:17:28 | 70 | 45dB | 5.7 | 466% | Night |
| 450 | 2025-10-03 23:22:52 | 69 | 45dB | 5.3 | 428% | Night |
| 451 | 2025-10-03 23:24:50 | 68 | 45dB | 4.9 | 392% | Night |
| 452 | 2025-10-03 23:27:47 | 71 | 45dB | 5.7 | 466% | Night |
| 453 | 2025-10-03 23:32:08 | 77 | 45dB | 8.6 | 757% | Night |
| 454 | 2025-10-03 23:33:36 | 70 | 45dB | 5.7 | 466% | Night |
| 455 | 2025-10-03 23:36:35 | 70 | 45dB | 5.7 | 466% | Night |
| 456 | 2025-10-03 23:38:07 | 70 | 45dB | 5.7 | 466% | Night |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 457 | 2025-10-03 23:39:25 | 71 | 45dB | 6.1 | 506% | Night |
| 458 | 2025-10-03 23:41:42 | 69 | 45dB | 4.9 | 392% | Night |
| 459 | 2025-10-03 23:59:50 | | 45dB | ? | ? | Night |
| 460 | 2025-10-04 00:01:35 | 76 | 45dB | 8.0 | 700% | Night |
| 461 | 2025-10-04 00:06:11 | 69 | 45dB | 5.3 | 428% | Night |
| 462 | 2025-10-04 00:08:35 | 71 | 45dB | 6.1 | 506% | Night |
| 463 | 2025-10-04 00:11:32 | 68 | 45dB | 4.9 | 392% | Night |
| 464 | 2025-10-04 00:18:07 | 70 | 45dB | 5.3 | 428% | Night |
| 465 | 2025-10-04 00:20:16 | 69 | 45dB | 5.3 | 428% | Night |
| 466 | 2025-10-04 00:22:05 | 70 | 45dB | 5.3 | 428% | Night |
| 467 | 2025-10-04 00:25:53 | 70 | 45dB | 5.7 | 466% | Night |
| 468 | 2025-10-04 00:31:49 | 71 | 45dB | 5.7 | 466% | Night |
| 469 | 2025-10-04 06:29:23 | 70 | 45dB | 5.3 | 428% | Night |
| 470 | 2025-10-04 06:30:55 | 68 | 45dB | 4.9 | 392% | Night |
| 471 | 2025-10-04 06:32:34 | 69 | 45dB | 5.3 | 428% | Night |
| 472 | 2025-10-04 06:35:03 | 70 | 45dB | 5.3 | 428% | Night |
| 473 | 2025-10-04 06:36:32 | 71 | 45dB | 6.1 | 506% | Night |
| 474 | 2025-10-04 06:37:57 | 71 | 45dB | 5.7 | 466% | Night |
| 475 | 2025-10-04 06:39:16 | 69 | 45dB | 5.3 | 428% | Night |
| 476 | 2025-10-04 06:41:51 | 69 | 45dB | 5.3 | 428% | Night |
| 477 | 2025-10-04 06:43:23 | 69 | 45dB | 5.3 | 428% | Night |
| 478 | 2025-10-04 06:44:31 | 68 | 45dB | 4.9 | 392% | Night |
| 479 | 2025-10-04 06:46:02 | 70 | 45dB | 5.7 | 466% | Night |
| 480 | 2025-10-04 06:47:38 | 73 | 45dB | 6.5 | 550% | Night |
| 481 | 2025-10-04 06:49:01 | 70 | 45dB | 5.3 | 428% | Night |
| 482 | 2025-10-04 06:50:11 | 74 | 45dB | 7.0 | 596% | Night |
| 483 | 2025-10-04 06:52:12 | 70 | 45dB | 5.7 | 466% | Night |
| 484 | 2025-10-04 06:53:26 | 69 | 45dB | 4.9 | 392% | Night |
| 485 | 2025-10-04 06:54:33 | 70 | 45dB | 5.3 | 428% | Night |
| 486 | 2025-10-04 06:55:46 | 70 | 45dB | 5.7 | 466% | Night |
| 487 | 2025-10-04 06:56:52 | 71 | 45dB | 5.7 | 466% | Night |
| 488 | 2025-10-04 06:58:08 | 68 | 45dB | 4.6 | 359% | Night |
| 489 | 2025-10-04 07:00:47 | 71 | 55dB | 2.8 | 183% | Day |
| 490 | 2025-10-04 07:03:08 | 71 | 55dB | 3.0 | 203% | Day |
| 491 | 2025-10-04 07:04:30 | 68 | 55dB | 2.5 | 146% | Day |
| 492 | 2025-10-04 07:06:28 | 68 | 55dB | 2.3 | 130% | Day |
| 493 | 2025-10-04 07:07:54 | | 55dB | ? | ? | Day |
| 494 | 2025-10-04 07:09:24 | 73 | 55dB | 3.2 | 225% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 495 | 2025-10-04 07:11:42 | 74 | 55dB | 3.7 | 273% | Day |
| 496 | 2025-10-04 07:13:45 | 73 | 55dB | 3.2 | 225% | Day |
| 497 | 2025-10-04 07:15:36 | 67 | 55dB | 2.1 | 114% | Day |
| 498 | 2025-10-04 07:17:05 | 78 | 55dB | 4.9 | 392% | Day |
| 499 | 2025-10-04 07:19:14 | 76 | 55dB | 4.0 | 300% | Day |
| 500 | 2025-10-04 07:23:35 | 69 | 55dB | 2.5 | 146% | Day |
| 501 | 2025-10-04 07:27:03 | 74 | 55dB | 3.7 | 273% | Day |
| 502 | 2025-10-04 07:30:56 | 72 | 55dB | 3.2 | 225% | Day |
| 503 | 2025-10-04 07:32:37 | 71 | 55dB | 2.8 | 183% | Day |
| 504 | 2025-10-04 07:34:46 | 69 | 55dB | 2.5 | 146% | Day |
| 505 | 2025-10-04 07:37:23 | 68 | 55dB | 2.3 | 130% | Day |
| 506 | 2025-10-04 07:40:09 | 72 | 55dB | 3.0 | 203% | Day |
| 507 | 2025-10-04 07:41:57 | 71 | 55dB | 2.8 | 183% | Day |
| 508 | 2025-10-04 07:48:48 | 71 | 55dB | 3.0 | 203% | Day |
| 509 | 2025-10-04 07:54:17 | 70 | 55dB | 2.6 | 164% | Day |
| 510 | 2025-10-04 07:56:57 | 67 | 55dB | 2.3 | 130% | Day |
| 511 | 2025-10-04 08:01:46 | 68 | 55dB | 2.5 | 146% | Day |
| 512 | 2025-10-04 08:05:27 | 76 | 55dB | 4.3 | 329% | Day |
| 513 | 2025-10-04 08:18:02 | 67 | 55dB | 2.1 | 114% | Day |
| 514 | 2025-10-04 08:25:47 | 79 | 55dB | 4.9 | 392% | Day |
| 515 | 2025-10-04 08:28:00 | 72 | 55dB | 3.0 | 203% | Day |
| 516 | 2025-10-04 08:31:09 | 70 | 55dB | 2.6 | 164% | Day |
| 517 | 2025-10-04 08:33:01 | 69 | 55dB | 2.6 | 164% | Day |
| 518 | 2025-10-04 08:42:46 | 68 | 55dB | 2.3 | 130% | Day |
| 519 | 2025-10-04 08:46:01 | | 55dB | ? | ? | Day |
| 520 | 2025-10-04 08:53:14 | 77 | 55dB | 4.3 | 329% | Day |
| 521 | 2025-10-04 08:54:54 | 69 | 55dB | 2.5 | 146% | Day |
| 522 | 2025-10-04 08:59:38 | 70 | 55dB | 2.6 | 164% | Day |
| 523 | 2025-10-04 09:02:03 | 69 | 55dB | 2.5 | 146% | Day |
| 524 | 2025-10-04 09:05:45 | 67 | 55dB | 2.1 | 114% | Day |
| 525 | 2025-10-04 09:08:55 | 72 | 55dB | 3.2 | 225% | Day |
| 526 | 2025-10-04 09:11:02 | 70 | 55dB | 2.6 | 164% | Day |
| 527 | 2025-10-04 09:12:53 | 72 | 55dB | 3.2 | 225% | Day |
| 528 | 2025-10-04 09:20:03 | 75 | 55dB | 3.7 | 273% | Day |
| 529 | 2025-10-04 09:25:30 | 78 | 55dB | 4.6 | 359% | Day |
| 530 | 2025-10-04 09:27:49 | | 55dB | ? | ? | Day |
| 531 | 2025-10-04 09:30:06 | 68 | 55dB | 2.3 | 130% | Day |
| 532 | 2025-10-04 09:32:51 | 72 | 55dB | 3.0 | 203% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 533 | 2025-10-04 09:35:46 | 70 | 55dB | 2.6 | 164% | Day |
| 534 | 2025-10-04 09:37:28 | 66 | 55dB | 2.1 | 114% | Day |
| 535 | 2025-10-04 09:45:27 | 68 | 55dB | 2.5 | 146% | Day |
| 536 | 2025-10-04 09:47:31 | 72 | 55dB | 3.0 | 203% | Day |
| 537 | 2025-10-04 09:49:55 | | 55dB | ? | ? | Day |
| 538 | 2025-10-04 09:53:58 | 70 | 55dB | 2.6 | 164% | Day |
| 539 | 2025-10-04 09:57:15 | 72 | 55dB | 3.0 | 203% | Day |
| 540 | 2025-10-04 10:02:27 | 73 | 55dB | 3.2 | 225% | Day |
| 541 | 2025-10-04 10:04:56 | 74 | 55dB | 3.5 | 248% | Day |
| 542 | 2025-10-04 10:07:40 | 71 | 55dB | 2.8 | 183% | Day |
| 543 | 2025-10-04 10:09:50 | 68 | 55dB | 2.5 | 146% | Day |
| 544 | 2025-10-04 10:13:33 | 68 | 55dB | 2.3 | 130% | Day |
| 545 | 2025-10-04 10:17:12 | 69 | 55dB | 2.6 | 164% | Day |
| 546 | 2025-10-04 10:19:57 | 68 | 55dB | 2.3 | 130% | Day |
| 547 | 2025-10-04 10:21:35 | | 55dB | ? | ? | Day |
| 548 | 2025-10-04 10:23:36 | 70 | 55dB | 2.6 | 164% | Day |
| 549 | 2025-10-04 10:27:22 | 72 | 55dB | 3.0 | 203% | Day |
| 550 | 2025-10-04 10:30:28 | | 55dB | ? | ? | Day |
| 551 | 2025-10-04 10:31:51 | 68 | 55dB | 2.5 | 146% | Day |
| 552 | 2025-10-04 10:39:40 | 68 | 55dB | 2.5 | 146% | Day |
| 553 | 2025-10-04 10:41:39 | 68 | 55dB | 2.5 | 146% | Day |
| 554 | 2025-10-04 10:43:27 | 73 | 55dB | 3.2 | 225% | Day |
| 555 | 2025-10-04 10:45:00 | 69 | 55dB | 2.6 | 164% | Day |
| 556 | 2025-10-04 10:49:21 | 71 | 55dB | 3.0 | 203% | Day |
| 557 | 2025-10-04 10:51:44 | 68 | 55dB | 2.3 | 130% | Day |
| 558 | 2025-10-04 10:52:57 | 70 | 55dB | 2.6 | 164% | Day |
| 559 | 2025-10-04 10:54:33 | 72 | 55dB | 3.2 | 225% | Day |
| 560 | 2025-10-04 10:56:38 | 70 | 55dB | 2.8 | 183% | Day |
| 561 | 2025-10-04 10:57:50 | 68 | 55dB | 2.5 | 146% | Day |
| 562 | 2025-10-04 10:59:02 | | 55dB | ? | ? | Day |
| 563 | 2025-10-04 11:00:19 | 72 | 55dB | 3.2 | 225% | Day |
| 564 | 2025-10-04 11:04:44 | 67 | 55dB | 2.3 | 130% | Day |
| 565 | 2025-10-04 11:15:05 | 67 | 55dB | 2.1 | 114% | Day |
| 566 | 2025-10-04 11:17:14 | 75 | 55dB | 3.7 | 273% | Day |
| 567 | 2025-10-04 11:24:26 | 69 | 55dB | 2.6 | 164% | Day |
| 568 | 2025-10-04 11:27:23 | 68 | 55dB | 2.5 | 146% | Day |
| 569 | 2025-10-04 11:29:09 | 69 | 55dB | 2.6 | 164% | Day |
| 570 | 2025-10-04 11:31:42 | 70 | 55dB | 2.6 | 164% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 571 | 2025-10-04 11:34:23 | 72 | 55dB | 3.2 | 225% | Day |
| 572 | 2025-10-04 11:36:00 | 68 | 55dB | 2.3 | 130% | Day |
| 573 | 2025-10-04 11:37:48 | | 55dB | ? | ? | Day |
| 574 | 2025-10-04 11:39:27 | | 55dB | ? | ? | Day |
| 575 | 2025-10-04 11:41:09 | 71 | 55dB | 2.8 | 183% | Day |
| 576 | 2025-10-04 11:42:27 | 70 | 55dB | 2.8 | 183% | Day |
| 577 | 2025-10-04 11:43:44 | 71 | 55dB | 3.0 | 203% | Day |
| 578 | 2025-10-04 11:46:47 | 69 | 55dB | 2.5 | 146% | Day |
| 579 | 2025-10-04 11:50:08 | 70 | 55dB | 2.6 | 164% | Day |
| 580 | 2025-10-04 11:51:26 | 72 | 55dB | 3.0 | 203% | Day |
| 581 | 2025-10-04 11:53:02 | | 55dB | ? | ? | Day |
| 582 | 2025-10-04 11:54:27 | 68 | 55dB | 2.3 | 130% | Day |
| 583 | 2025-10-04 11:57:19 | 69 | 55dB | 2.5 | 146% | Day |
| 584 | 2025-10-04 11:58:35 | 68 | 55dB | 2.5 | 146% | Day |
| 585 | 2025-10-04 11:59:45 | | 55dB | ? | ? | Day |
| 586 | 2025-10-04 12:01:15 | 71 | 55dB | 2.8 | 183% | Day |
| 587 | 2025-10-04 12:02:53 | 67 | 55dB | 2.3 | 130% | Day |
| 588 | 2025-10-04 12:05:54 | 70 | 55dB | 2.8 | 183% | Day |
| 589 | 2025-10-04 12:07:56 | | 55dB | ? | ? | Day |
| 590 | 2025-10-04 12:13:22 | 68 | 55dB | 2.3 | 130% | Day |
| 591 | 2025-10-04 12:15:45 | | 55dB | ? | ? | Day |
| 592 | 2025-10-04 12:18:02 | 71 | 55dB | 3.0 | 203% | Day |
| 593 | 2025-10-04 12:20:44 | 69 | 55dB | 2.5 | 146% | Day |
| 594 | 2025-10-04 12:22:47 | 72 | 55dB | 3.2 | 225% | Day |
| 595 | 2025-10-04 12:24:45 | 78 | 55dB | 4.6 | 359% | Day |
| 596 | 2025-10-04 12:28:19 | 68 | 55dB | 2.5 | 146% | Day |
| 597 | 2025-10-04 12:30:05 | 69 | 55dB | 2.6 | 164% | Day |
| 598 | 2025-10-04 12:31:24 | 68 | 55dB | 2.5 | 146% | Day |
| 599 | 2025-10-04 12:32:55 | | 55dB | ? | ? | Day |
| 600 | 2025-10-04 12:34:20 | 70 | 55dB | 2.8 | 183% | Day |
| 601 | 2025-10-04 12:35:26 | | 55dB | ? | ? | Day |
| 602 | 2025-10-04 12:36:48 | 71 | 55dB | 3.0 | 203% | Day |
| 603 | 2025-10-04 12:38:09 | 70 | 55dB | 2.8 | 183% | Day |
| 604 | 2025-10-04 12:45:18 | 70 | 55dB | 2.6 | 164% | Day |
| 605 | 2025-10-04 12:47:48 | | 55dB | ? | ? | Day |
| 606 | 2025-10-04 12:49:06 | 69 | 55dB | 2.5 | 146% | Day |
| 607 | 2025-10-04 12:51:07 | 69 | 55dB | 2.6 | 164% | Day |
| 608 | 2025-10-04 12:54:47 | 75 | 55dB | 4.0 | 300% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 609 | 2025-10-04 12:57:48 | 82 | 55dB | 6.5 | 550% | Day |
| 610 | 2025-10-04 12:59:41 | 70 | 55dB | 2.8 | 183% | Day |
| 611 | 2025-10-04 13:01:01 | 75 | 55dB | 3.7 | 273% | Day |
| 612 | 2025-10-04 13:08:04 | 69 | 55dB | 2.5 | 146% | Day |
| 613 | 2025-10-04 13:09:26 | | 55dB | ? | ? | Day |
| 614 | 2025-10-04 13:10:45 | 71 | 55dB | 3.0 | 203% | Day |
| 615 | 2025-10-04 13:14:26 | 70 | 55dB | 2.8 | 183% | Day |
| 616 | 2025-10-04 13:16:50 | 71 | 55dB | 3.0 | 203% | Day |
| 617 | 2025-10-04 13:18:48 | 72 | 55dB | 3.0 | 203% | Day |
| 618 | 2025-10-04 13:23:49 | 69 | 55dB | 2.6 | 164% | Day |
| 619 | 2025-10-04 13:26:17 | 70 | 55dB | 2.6 | 164% | Day |
| 620 | 2025-10-04 13:28:10 | 69 | 55dB | 2.5 | 146% | Day |
| 621 | 2025-10-04 13:29:30 | | 55dB | ? | ? | Day |
| 622 | 2025-10-04 13:30:48 | 69 | 55dB | 2.5 | 146% | Day |
| 623 | 2025-10-04 13:32:43 | 69 | 55dB | 2.6 | 164% | Day |
| 624 | 2025-10-04 13:34:51 | | 55dB | ? | ? | Day |
| 625 | 2025-10-04 13:36:14 | 80 | 55dB | 5.7 | 466% | Day |
| 626 | 2025-10-04 13:38:19 | | 55dB | ? | ? | Day |
| 627 | 2025-10-04 13:40:43 | 71 | 55dB | 3.0 | 203% | Day |
| 628 | 2025-10-04 13:42:08 | 70 | 55dB | 2.8 | 183% | Day |
| 629 | 2025-10-04 13:43:33 | 69 | 55dB | 2.6 | 164% | Day |
| 630 | 2025-10-04 13:44:48 | 69 | 55dB | 2.5 | 146% | Day |
| 631 | 2025-10-04 13:46:41 | 71 | 55dB | 2.8 | 183% | Day |
| 632 | 2025-10-04 13:52:03 | 67 | 55dB | 2.3 | 130% | Day |
| 633 | 2025-10-04 13:54:02 | 75 | 55dB | 3.7 | 273% | Day |
| 634 | 2025-10-04 13:55:49 | 72 | 55dB | 3.2 | 225% | Day |
| 635 | 2025-10-04 13:57:56 | 74 | 55dB | 3.7 | 273% | Day |
| 636 | 2025-10-04 13:59:18 | 74 | 55dB | 3.5 | 248% | Day |
| 637 | 2025-10-04 14:06:05 | | 55dB | ? | ? | Day |
| 638 | 2025-10-04 14:07:35 | 72 | 55dB | 3.0 | 203% | Day |
| 639 | 2025-10-04 14:09:51 | 68 | 55dB | 2.5 | 146% | Day |
| 640 | 2025-10-04 14:11:30 | 69 | 55dB | 2.5 | 146% | Day |
| 641 | 2025-10-04 14:12:56 | 69 | 55dB | 2.6 | 164% | Day |
| 642 | 2025-10-04 14:16:56 | | 55dB | ? | ? | Day |
| 643 | 2025-10-04 14:18:36 | 75 | 55dB | 3.7 | 273% | Day |
| 644 | 2025-10-04 14:21:06 | 69 | 55dB | 2.6 | 164% | Day |
| 645 | 2025-10-04 14:24:00 | 71 | 55dB | 2.8 | 183% | Day |
| 646 | 2025-10-04 14:26:39 | 71 | 55dB | 2.8 | 183% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 647 | 2025-10-04 14:30:55 | 75 | 55dB | 4.0 | 300% | Day |
| 648 | 2025-10-04 14:33:36 | 73 | 55dB | 3.2 | 225% | Day |
| 649 | 2025-10-04 14:35:40 | | 55dB | ? | ? | Day |
| 650 | 2025-10-04 14:36:55 | 70 | 55dB | 2.8 | 183% | Day |
| 651 | 2025-10-04 14:39:04 | 70 | 55dB | 2.8 | 183% | Day |
| 652 | 2025-10-04 14:40:23 | | 55dB | ? | ? | Day |
| 653 | 2025-10-04 14:41:43 | 72 | 55dB | 3.0 | 203% | Day |
| 654 | 2025-10-04 14:43:49 | 71 | 55dB | 3.0 | 203% | Day |
| 655 | 2025-10-04 14:45:11 | 73 | 55dB | 3.5 | 248% | Day |
| 656 | 2025-10-04 14:47:29 | 72 | 55dB | 3.0 | 203% | Day |
| 657 | 2025-10-04 14:48:50 | 70 | 55dB | 2.8 | 183% | Day |
| 658 | 2025-10-04 14:50:16 | 69 | 55dB | 2.6 | 164% | Day |
| 659 | 2025-10-04 14:51:48 | 73 | 55dB | 3.5 | 248% | Day |
| 660 | 2025-10-04 14:53:23 | 73 | 55dB | 3.2 | 225% | Day |
| 661 | 2025-10-04 14:55:28 | 72 | 55dB | 3.0 | 203% | Day |
| 662 | 2025-10-04 14:56:46 | 72 | 55dB | 3.2 | 225% | Day |
| 663 | 2025-10-04 14:58:04 | 71 | 55dB | 2.8 | 183% | Day |
| 664 | 2025-10-04 15:02:01 | | 55dB | ? | ? | Day |
| 665 | 2025-10-04 15:04:49 | 69 | 55dB | 2.6 | 164% | Day |
| 666 | 2025-10-04 15:11:27 | 68 | 55dB | 2.5 | 146% | Day |
| 667 | 2025-10-04 15:12:49 | 71 | 55dB | 2.8 | 183% | Day |
| 668 | 2025-10-04 15:14:07 | | 55dB | ? | ? | Day |
| 669 | 2025-10-04 15:15:49 | 70 | 55dB | 2.6 | 164% | Day |
| 670 | 2025-10-04 15:18:53 | 71 | 55dB | 2.8 | 183% | Day |
| 671 | 2025-10-04 15:20:53 | 74 | 55dB | 3.5 | 248% | Day |
| 672 | 2025-10-04 15:23:11 | 68 | 55dB | 2.5 | 146% | Day |
| 673 | 2025-10-04 15:25:27 | 72 | 55dB | 3.2 | 225% | Day |
| 674 | 2025-10-04 15:27:42 | 72 | 55dB | 3.0 | 203% | Day |
| 675 | 2025-10-04 15:28:54 | 68 | 55dB | 2.5 | 146% | Day |
| 676 | 2025-10-04 15:30:16 | 76 | 55dB | 4.0 | 300% | Day |
| 677 | 2025-10-04 15:34:53 | 69 | 55dB | 2.6 | 164% | Day |
| 678 | 2025-10-04 15:38:46 | 70 | 55dB | 2.6 | 164% | Day |
| 679 | 2025-10-04 15:40:18 | 70 | 55dB | 2.6 | 164% | Day |
| 680 | 2025-10-04 15:41:54 | 68 | 55dB | 2.5 | 146% | Day |
| 681 | 2025-10-04 15:44:35 | 82 | 55dB | 6.1 | 506% | Day |
| 682 | 2025-10-04 15:46:34 | 71 | 55dB | 2.8 | 183% | Day |
| 683 | 2025-10-04 15:49:54 | 73 | 55dB | 3.5 | 248% | Day |
| 684 | 2025-10-04 15:51:58 | 69 | 55dB | 2.6 | 164% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 685 | 2025-10-04 15:53:36 | 72 | 55dB | 3.0 | 203% | Day |
| 686 | 2025-10-04 15:55:25 | | 55dB | ? | ? | Day |
| 687 | 2025-10-04 16:00:02 | 72 | 55dB | 3.2 | 225% | Day |
| 688 | 2025-10-04 16:01:46 | 73 | 55dB | 3.5 | 248% | Day |
| 689 | 2025-10-04 16:04:24 | 67 | 55dB | 2.1 | 114% | Day |
| 690 | 2025-10-04 16:06:10 | 70 | 55dB | 2.6 | 164% | Day |
| 691 | 2025-10-04 16:09:11 | 74 | 55dB | 3.5 | 248% | Day |
| 692 | 2025-10-04 16:10:26 | 72 | 55dB | 3.0 | 203% | Day |
| 693 | 2025-10-04 16:12:20 | 69 | 55dB | 2.5 | 146% | Day |
| 694 | 2025-10-04 16:13:37 | 75 | 55dB | 4.0 | 300% | Day |
| 695 | 2025-10-04 16:15:02 | 71 | 55dB | 3.0 | 203% | Day |
| 696 | 2025-10-04 16:16:22 | 73 | 55dB | 3.2 | 225% | Day |
| 697 | 2025-10-04 16:20:16 | 70 | 55dB | 2.6 | 164% | Day |
| 698 | 2025-10-04 16:21:39 | 69 | 55dB | 2.5 | 146% | Day |
| 699 | 2025-10-04 16:25:52 | 75 | 55dB | 4.0 | 300% | Day |
| 700 | 2025-10-04 16:27:10 | 67 | 55dB | 2.1 | 114% | Day |
| 701 | 2025-10-04 16:28:35 | 72 | 55dB | 3.0 | 203% | Day |
| 702 | 2025-10-04 16:30:01 | | 55dB | ? | ? | Day |
| 703 | 2025-10-04 16:32:32 | 75 | 55dB | 3.7 | 273% | Day |
| 704 | 2025-10-04 16:34:33 | 71 | 55dB | 3.0 | 203% | Day |
| 705 | 2025-10-04 16:35:55 | 74 | 55dB | 3.5 | 248% | Day |
| 706 | 2025-10-04 16:37:14 | 71 | 55dB | 3.0 | 203% | Day |
| 707 | 2025-10-04 16:38:25 | 69 | 55dB | 2.6 | 164% | Day |
| 708 | 2025-10-04 16:40:32 | 74 | 55dB | 3.7 | 273% | Day |
| 709 | 2025-10-04 16:42:40 | 74 | 55dB | 3.5 | 248% | Day |
| 710 | 2025-10-04 16:44:36 | 70 | 55dB | 2.6 | 164% | Day |
| 711 | 2025-10-04 16:46:00 | 70 | 55dB | 2.6 | 164% | Day |
| 712 | 2025-10-04 16:49:02 | 78 | 55dB | 4.6 | 359% | Day |
| 713 | 2025-10-04 16:50:27 | 73 | 55dB | 3.5 | 248% | Day |
| 714 | 2025-10-04 16:51:46 | 73 | 55dB | 3.2 | 225% | Day |
| 715 | 2025-10-04 16:53:07 | 71 | 55dB | 3.0 | 203% | Day |
| 716 | 2025-10-04 16:54:25 | 72 | 55dB | 3.2 | 225% | Day |
| 717 | 2025-10-04 16:55:42 | 71 | 55dB | 2.8 | 183% | Day |
| 718 | 2025-10-04 16:57:02 | 70 | 55dB | 2.8 | 183% | Day |
| 719 | 2025-10-04 16:58:19 | 68 | 55dB | 2.3 | 130% | Day |
| 720 | 2025-10-04 16:59:42 | | 55dB | ? | ? | Day |
| 721 | 2025-10-04 17:01:03 | 74 | 55dB | 3.5 | 248% | Day |
| 722 | 2025-10-04 17:02:13 | | 55dB | ? | ? | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 723 | 2025-10-04 17:04:13 | 73 | 55dB | 3.2 | 225% | Day |
| 724 | 2025-10-04 17:06:50 | | 55dB | ? | ? | Day |
| 725 | 2025-10-04 17:09:30 | 68 | 55dB | 2.5 | 146% | Day |
| 726 | 2025-10-04 17:10:46 | | 55dB | ? | ? | Day |
| 727 | 2025-10-04 17:13:43 | 76 | 55dB | 4.0 | 300% | Day |
| 728 | 2025-10-04 17:15:25 | 71 | 55dB | 3.0 | 203% | Day |
| 729 | 2025-10-04 17:17:00 | 70 | 55dB | 2.6 | 164% | Day |
| 730 | 2025-10-04 17:18:30 | 73 | 55dB | 3.2 | 225% | Day |
| 731 | 2025-10-04 17:21:58 | 70 | 55dB | 2.6 | 164% | Day |
| 732 | 2025-10-04 17:24:26 | 71 | 55dB | 2.8 | 183% | Day |
| 733 | 2025-10-04 17:27:30 | | 55dB | ? | ? | Day |
| 734 | 2025-10-04 17:29:46 | 69 | 55dB | 2.6 | 164% | Day |
| 735 | 2025-10-04 17:32:10 | 73 | 55dB | 3.2 | 225% | Day |
| 736 | 2025-10-04 17:33:25 | 69 | 55dB | 2.6 | 164% | Day |
| 737 | 2025-10-04 17:34:45 | 71 | 55dB | 3.0 | 203% | Day |
| 738 | 2025-10-04 17:36:57 | 72 | 55dB | 3.2 | 225% | Day |
| 739 | 2025-10-04 17:40:17 | 71 | 55dB | 2.8 | 183% | Day |
| 740 | 2025-10-04 17:43:19 | | 55dB | ? | ? | Day |
| 741 | 2025-10-04 17:44:53 | 70 | 55dB | 2.6 | 164% | Day |
| 742 | 2025-10-04 17:46:39 | 71 | 55dB | 3.0 | 203% | Day |
| 743 | 2025-10-04 17:48:52 | 67 | 55dB | 2.3 | 130% | Day |
| 744 | 2025-10-04 17:50:22 | 70 | 55dB | 2.8 | 183% | Day |
| 745 | 2025-10-04 17:51:32 | 77 | 55dB | 4.6 | 359% | Day |
| 746 | 2025-10-04 17:52:45 | 69 | 55dB | 2.5 | 146% | Day |
| 747 | 2025-10-04 17:54:11 | 71 | 55dB | 2.8 | 183% | Day |
| 748 | 2025-10-04 17:55:27 | 73 | 55dB | 3.2 | 225% | Day |
| 749 | 2025-10-04 17:57:00 | 73 | 55dB | 3.2 | 225% | Day |
| 750 | 2025-10-04 17:59:41 | 67 | 55dB | 2.3 | 130% | Day |
| 751 | 2025-10-04 18:01:06 | 67 | 55dB | 2.3 | 130% | Day |
| 752 | 2025-10-04 18:02:19 | 72 | 55dB | 3.0 | 203% | Day |
| 753 | 2025-10-04 18:03:38 | 71 | 55dB | 3.0 | 203% | Day |
| 754 | 2025-10-04 18:05:32 | 78 | 55dB | 4.9 | 392% | Day |
| 755 | 2025-10-04 18:06:41 | 72 | 55dB | 3.0 | 203% | Day |
| 756 | 2025-10-04 18:08:14 | 72 | 55dB | 3.0 | 203% | Day |
| 757 | 2025-10-04 18:09:28 | 74 | 55dB | 3.7 | 273% | Day |
| 758 | 2025-10-04 18:10:43 | 67 | 55dB | 2.3 | 130% | Day |
| 759 | 2025-10-04 18:11:56 | | 55dB | ? | ? | Day |
| 760 | 2025-10-04 18:13:18 | 69 | 55dB | 2.6 | 164% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 761 | 2025-10-04 18:15:51 | 71 | 55dB | 2.8 | 183% | Day |
| 762 | 2025-10-04 18:17:00 | 69 | 55dB | 2.6 | 164% | Day |
| 763 | 2025-10-04 18:18:28 | 70 | 55dB | 2.8 | 183% | Day |
| 764 | 2025-10-04 18:19:41 | 68 | 55dB | 2.5 | 146% | Day |
| 765 | 2025-10-04 18:21:15 | 71 | 55dB | 3.0 | 203% | Day |
| 766 | 2025-10-04 18:28:53 | 74 | 55dB | 3.5 | 248% | Day |
| 767 | 2025-10-04 18:32:27 | | 55dB | ? | ? | Day |
| 768 | 2025-10-04 18:35:03 | | 55dB | ? | ? | Day |
| 769 | 2025-10-04 18:37:50 | 73 | 55dB | 3.5 | 248% | Day |
| 770 | 2025-10-04 18:39:47 | 71 | 55dB | 2.8 | 183% | Day |
| 771 | 2025-10-04 18:42:24 | 68 | 55dB | 2.5 | 146% | Day |
| 772 | 2025-10-04 18:43:46 | | 55dB | ? | ? | Day |
| 773 | 2025-10-04 18:45:02 | 71 | 55dB | 2.8 | 183% | Day |
| 774 | 2025-10-04 18:46:20 | 74 | 55dB | 3.5 | 248% | Day |
| 775 | 2025-10-04 18:49:21 | 72 | 55dB | 3.0 | 203% | Day |
| 776 | 2025-10-04 18:52:32 | 72 | 55dB | 3.0 | 203% | Day |
| 777 | 2025-10-04 18:54:46 | | 55dB | ? | ? | Day |
| 778 | 2025-10-04 18:56:08 | 72 | 55dB | 3.0 | 203% | Day |
| 779 | 2025-10-04 18:58:26 | 71 | 55dB | 2.8 | 183% | Day |
| 780 | 2025-10-04 19:00:20 | 69 | 55dB | 2.6 | 164% | Day |
| 781 | 2025-10-04 19:01:52 | 71 | 55dB | 2.8 | 183% | Day |
| 782 | 2025-10-04 19:03:58 | 72 | 55dB | 3.0 | 203% | Day |
| 783 | 2025-10-04 19:05:41 | 73 | 55dB | 3.5 | 248% | Day |
| 784 | 2025-10-04 19:07:07 | 71 | 55dB | 2.8 | 183% | Day |
| 785 | 2025-10-04 19:09:06 | 68 | 55dB | 2.5 | 146% | Day |
| 786 | 2025-10-04 19:13:13 | 70 | 55dB | 2.8 | 183% | Day |
| 787 | 2025-10-04 19:14:41 | 71 | 55dB | 2.8 | 183% | Day |
| 788 | 2025-10-04 19:15:58 | 70 | 55dB | 2.6 | 164% | Day |
| 789 | 2025-10-04 19:17:18 | 71 | 55dB | 3.0 | 203% | Day |
| 790 | 2025-10-04 19:18:36 | 69 | 55dB | 2.6 | 164% | Day |
| 791 | 2025-10-04 19:20:02 | 67 | 55dB | 2.3 | 130% | Day |
| 792 | 2025-10-04 19:21:37 | 69 | 55dB | 2.5 | 146% | Day |
| 793 | 2025-10-04 19:23:22 | 71 | 55dB | 2.8 | 183% | Day |
| 794 | 2025-10-04 19:26:06 | 69 | 55dB | 2.5 | 146% | Day |
| 795 | 2025-10-04 19:30:10 | 67 | 55dB | 2.3 | 130% | Day |
| 796 | 2025-10-04 19:35:34 | 70 | 55dB | 2.8 | 183% | Day |
| 797 | 2025-10-04 19:37:58 | 74 | 55dB | 3.7 | 273% | Day |
| 798 | 2025-10-04 19:40:09 | 79 | 55dB | 4.9 | 392% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 799 | 2025-10-04 19:42:48 | 68 | 55dB | 2.3 | 130% | Day |
| 800 | 2025-10-04 19:44:43 | 69 | 55dB | 2.5 | 146% | Day |
| 801 | 2025-10-04 19:49:05 | 72 | 55dB | 3.0 | 203% | Day |
| 802 | 2025-10-04 19:51:31 | 72 | 55dB | 3.2 | 225% | Day |
| 803 | 2025-10-04 19:52:54 | 69 | 55dB | 2.6 | 164% | Day |
| 804 | 2025-10-04 19:54:15 | | 55dB | ? | ? | Day |
| 805 | 2025-10-04 19:55:48 | 70 | 55dB | 2.6 | 164% | Day |
| 806 | 2025-10-04 19:57:57 | 80 | 55dB | 5.7 | 466% | Day |
| 807 | 2025-10-04 19:59:40 | 76 | 55dB | 4.3 | 329% | Day |
| 808 | 2025-10-04 20:07:04 | 74 | 55dB | 3.5 | 248% | Day |
| 809 | 2025-10-04 20:09:23 | 71 | 55dB | 3.0 | 203% | Day |
| 810 | 2025-10-04 20:11:05 | 71 | 55dB | 2.8 | 183% | Day |
| 811 | 2025-10-04 20:12:43 | 71 | 55dB | 3.0 | 203% | Day |
| 812 | 2025-10-04 20:14:27 | 68 | 55dB | 2.3 | 130% | Day |
| 813 | 2025-10-04 20:17:05 | 70 | 55dB | 2.6 | 164% | Day |
| 814 | 2025-10-04 20:18:37 | 71 | 55dB | 3.0 | 203% | Day |
| 815 | 2025-10-04 20:20:07 | 72 | 55dB | 3.0 | 203% | Day |
| 816 | 2025-10-04 20:22:11 | 71 | 55dB | 2.8 | 183% | Day |
| 817 | 2025-10-04 20:23:58 | 67 | 55dB | 2.1 | 114% | Day |
| 818 | 2025-10-04 20:31:03 | 70 | 55dB | 2.6 | 164% | Day |
| 819 | 2025-10-04 20:32:48 | 69 | 55dB | 2.5 | 146% | Day |
| 820 | 2025-10-04 20:34:07 | 70 | 55dB | 2.6 | 164% | Day |
| 821 | 2025-10-04 20:35:55 | 78 | 55dB | 4.6 | 359% | Day |
| 822 | 2025-10-04 20:38:13 | 70 | 55dB | 2.8 | 183% | Day |
| 823 | 2025-10-04 20:39:35 | 68 | 55dB | 2.3 | 130% | Day |
| 824 | 2025-10-04 20:43:05 | 68 | 55dB | 2.5 | 146% | Day |
| 825 | 2025-10-04 20:45:58 | 71 | 55dB | 2.8 | 183% | Day |
| 826 | 2025-10-04 20:47:50 | 70 | 55dB | 2.6 | 164% | Day |
| 827 | 2025-10-04 20:50:02 | 68 | 55dB | 2.3 | 130% | Day |
| 828 | 2025-10-04 20:51:39 | | 55dB | ? | ? | Day |
| 829 | 2025-10-04 20:54:12 | 77 | 55dB | 4.6 | 359% | Day |
| 830 | 2025-10-04 20:55:49 | 73 | 55dB | 3.2 | 225% | Day |
| 831 | 2025-10-04 20:58:05 | 80 | 55dB | 5.7 | 466% | Day |
| 832 | 2025-10-04 20:59:39 | 69 | 55dB | 2.6 | 164% | Day |
| 833 | 2025-10-04 21:03:50 | 75 | 55dB | 3.7 | 273% | Day |
| 834 | 2025-10-04 21:06:03 | 67 | 55dB | 2.3 | 130% | Day |
| 835 | 2025-10-04 21:08:14 | 72 | 55dB | 3.2 | 225% | Day |
| 836 | 2025-10-04 21:13:04 | 74 | 55dB | 3.5 | 248% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 837 | 2025-10-04 21:14:39 | 68 | 55dB | 2.5 | 146% | Day |
| 838 | 2025-10-04 21:17:24 | 68 | 55dB | 2.3 | 130% | Day |
| 839 | 2025-10-04 21:18:52 | 67 | 55dB | 2.3 | 130% | Day |
| 840 | 2025-10-04 21:20:19 | 72 | 55dB | 3.0 | 203% | Day |
| 841 | 2025-10-04 21:21:57 | 70 | 55dB | 2.6 | 164% | Day |
| 842 | 2025-10-04 21:23:33 | 70 | 55dB | 2.8 | 183% | Day |
| 843 | 2025-10-04 21:26:54 | 68 | 55dB | 2.3 | 130% | Day |
| 844 | 2025-10-04 21:28:36 | 70 | 55dB | 2.8 | 183% | Day |
| 845 | 2025-10-04 21:31:08 | 73 | 55dB | 3.2 | 225% | Day |
| 846 | 2025-10-04 21:32:42 | 68 | 55dB | 2.3 | 130% | Day |
| 847 | 2025-10-04 21:34:27 | 69 | 55dB | 2.5 | 146% | Day |
| 848 | 2025-10-04 21:36:58 | 71 | 55dB | 2.8 | 183% | Day |
| 849 | 2025-10-04 21:40:13 | 86 | 55dB | 8.6 | 757% | Day |
| 850 | 2025-10-04 21:41:54 | 73 | 55dB | 3.5 | 248% | Day |
| 851 | 2025-10-04 21:44:05 | 68 | 55dB | 2.5 | 146% | Day |
| 852 | 2025-10-04 21:45:39 | 68 | 55dB | 2.5 | 146% | Day |
| 853 | 2025-10-04 21:47:20 | 72 | 55dB | 3.2 | 225% | Day |
| 854 | 2025-10-04 21:48:56 | 69 | 55dB | 2.5 | 146% | Day |
| 855 | 2025-10-04 21:55:24 | 76 | 55dB | 4.0 | 300% | Day |
| 856 | 2025-10-04 21:57:18 | 68 | 55dB | 2.5 | 146% | Day |
| 857 | 2025-10-04 21:58:33 | 74 | 55dB | 3.5 | 248% | Day |
| 858 | 2025-10-04 22:00:12 | 66 | 55dB | 2.1 | 114% | Day |
| 859 | 2025-10-04 22:02:14 | 68 | 55dB | 2.3 | 130% | Day |
| 860 | 2025-10-04 22:11:49 | | 55dB | ? | ? | Day |
| 861 | 2025-10-04 22:14:09 | | 55dB | ? | ? | Day |
| 862 | 2025-10-04 22:15:51 | 67 | 55dB | 2.1 | 114% | Day |
| 863 | 2025-10-04 22:17:28 | 70 | 55dB | 2.8 | 183% | Day |
| 864 | 2025-10-04 22:19:30 | 67 | 55dB | 2.1 | 114% | Day |
| 865 | 2025-10-04 22:21:13 | 73 | 55dB | 3.5 | 248% | Day |
| 866 | 2025-10-04 22:22:56 | | 55dB | ? | ? | Day |
| 867 | 2025-10-04 22:24:22 | 67 | 55dB | 2.1 | 114% | Day |
| 868 | 2025-10-04 22:26:11 | 70 | 55dB | 2.8 | 183% | Day |
| 869 | 2025-10-04 22:32:17 | 68 | 55dB | 2.5 | 146% | Day |
| 870 | 2025-10-04 22:33:37 | 70 | 55dB | 2.6 | 164% | Day |
| 871 | 2025-10-04 22:35:04 | 70 | 55dB | 2.6 | 164% | Day |
| 872 | 2025-10-04 22:36:46 | | 55dB | ? | ? | Day |
| 873 | 2025-10-04 22:38:08 | 70 | 55dB | 2.8 | 183% | Day |
| 874 | 2025-10-04 22:40:16 | 71 | 55dB | 2.8 | 183% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 875 | 2025-10-04 22:47:49 | 70 | 55dB | 2.6 | 164% | Day |
| 876 | 2025-10-04 22:49:13 | 67 | 55dB | 2.3 | 130% | Day |
| 877 | 2025-10-04 22:51:36 | 69 | 55dB | 2.6 | 164% | Day |
| 878 | 2025-10-04 22:53:00 | 68 | 55dB | 2.3 | 130% | Day |
| 879 | 2025-10-04 22:55:00 | 72 | 55dB | 3.0 | 203% | Day |
| 880 | 2025-10-04 22:56:40 | | 55dB | ? | ? | Day |
| 881 | 2025-10-04 23:01:07 | 68 | 45dB | 4.9 | 392% | Night |
| 882 | 2025-10-04 23:06:46 | 71 | 45dB | 5.7 | 466% | Night |
| 883 | 2025-10-04 23:09:43 | 71 | 45dB | 5.7 | 466% | Night |
| 884 | 2025-10-04 23:12:50 | 70 | 45dB | 5.3 | 428% | Night |
| 885 | 2025-10-04 23:18:02 | 71 | 45dB | 5.7 | 466% | Night |
| 886 | 2025-10-04 23:23:22 | 72 | 45dB | 6.1 | 506% | Night |
| 887 | 2025-10-04 23:32:24 | 74 | 45dB | 7.0 | 596% | Night |
| 888 | 2025-10-04 23:34:46 | 73 | 45dB | 7.0 | 596% | Night |
| 889 | 2025-10-04 23:39:09 | 70 | 45dB | 5.7 | 466% | Night |
| 890 | 2025-10-04 23:42:39 | 75 | 45dB | 7.5 | 646% | Night |
| 891 | 2025-10-04 23:46:56 | 72 | 45dB | 6.5 | 550% | Night |
| 892 | 2025-10-04 23:48:44 | 74 | 45dB | 7.0 | 596% | Night |
| 893 | 2025-10-05 00:01:24 | 75 | 45dB | 7.5 | 646% | Night |
| 894 | 2025-10-05 00:05:21 | 74 | 45dB | 7.5 | 646% | Night |
| 895 | 2025-10-05 00:06:53 | 75 | 45dB | 7.5 | 646% | Night |
| 896 | 2025-10-05 00:08:56 | 72 | 45dB | 6.5 | 550% | Night |
| 897 | 2025-10-05 00:10:19 | 72 | 45dB | 6.5 | 550% | Night |
| 898 | 2025-10-05 00:11:29 | 70 | 45dB | 5.7 | 466% | Night |
| 899 | 2025-10-05 00:13:12 | 72 | 45dB | 6.5 | 550% | Night |
| 900 | 2025-10-05 00:16:43 | 74 | 45dB | 7.0 | 596% | Night |
| 901 | 2025-10-05 00:20:26 | 73 | 45dB | 6.5 | 550% | Night |
| 902 | 2025-10-05 00:22:56 | 71 | 45dB | 6.1 | 506% | Night |
| 903 | 2025-10-05 06:30:06 | 70 | 45dB | 5.3 | 428% | Night |
| 904 | 2025-10-05 06:31:57 | 79 | 45dB | 10.6 | 956% | Night |
| 905 | 2025-10-05 06:34:20 | 67 | 45dB | 4.6 | 359% | Night |
| 906 | 2025-10-05 06:35:38 | 69 | 45dB | 5.3 | 428% | Night |
| 907 | 2025-10-05 06:37:06 | 71 | 45dB | 5.7 | 466% | Night |
| 908 | 2025-10-05 06:38:56 | 70 | 45dB | 5.3 | 428% | Night |
| 909 | 2025-10-05 06:40:20 | 71 | 45dB | 5.7 | 466% | Night |
| 910 | 2025-10-05 06:41:54 | 69 | 45dB | 4.9 | 392% | Night |
| 911 | 2025-10-05 06:43:17 | | 45dB | ? | ? | Night |
| 912 | 2025-10-05 06:44:33 | 72 | 45dB | 6.1 | 506% | Night |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 913 | 2025-10-05 06:45:44 | 70 | 45dB | 5.7 | 466% | Night |
| 914 | 2025-10-05 06:47:15 | 71 | 45dB | 5.7 | 466% | Night |
| 915 | 2025-10-05 06:49:20 | 69 | 45dB | 4.9 | 392% | Night |
| 916 | 2025-10-05 06:51:18 | 73 | 45dB | 6.5 | 550% | Night |
| 917 | 2025-10-05 06:52:43 | 76 | 45dB | 8.6 | 757% | Night |
| 918 | 2025-10-05 06:54:09 | 69 | 45dB | 5.3 | 428% | Night |
| 919 | 2025-10-05 06:55:56 | 66 | 45dB | 4.3 | 329% | Night |
| 920 | 2025-10-05 06:57:20 | 71 | 45dB | 6.1 | 506% | Night |
| 921 | 2025-10-05 06:59:10 | 71 | 45dB | 5.7 | 466% | Night |
| 922 | 2025-10-05 07:00:45 | 67 | 55dB | 2.3 | 130% | Day |
| 923 | 2025-10-05 07:02:20 | 69 | 55dB | 2.5 | 146% | Day |
| 924 | 2025-10-05 07:04:10 | | 55dB | ? | ? | Day |
| 925 | 2025-10-05 07:05:43 | 70 | 55dB | 2.6 | 164% | Day |
| 926 | 2025-10-05 07:06:57 | 69 | 55dB | 2.6 | 164% | Day |
| 927 | 2025-10-05 07:08:45 | 71 | 55dB | 2.8 | 183% | Day |
| 928 | 2025-10-05 07:10:32 | 71 | 55dB | 2.8 | 183% | Day |
| 929 | 2025-10-05 07:12:19 | 71 | 55dB | 3.0 | 203% | Day |
| 930 | 2025-10-05 07:14:53 | 73 | 55dB | 3.2 | 225% | Day |
| 931 | 2025-10-05 07:23:44 | 70 | 55dB | 2.8 | 183% | Day |
| 932 | 2025-10-05 07:30:43 | 68 | 55dB | 2.5 | 146% | Day |
| 933 | 2025-10-05 07:32:17 | 74 | 55dB | 3.5 | 248% | Day |
| 934 | 2025-10-05 07:38:05 | 68 | 55dB | 2.3 | 130% | Day |
| 935 | 2025-10-05 07:45:02 | 75 | 55dB | 4.0 | 300% | Day |
| 936 | 2025-10-05 07:47:36 | 68 | 55dB | 2.5 | 146% | Day |
| 937 | 2025-10-05 07:53:13 | 74 | 55dB | 3.7 | 273% | Day |
| 938 | 2025-10-05 07:55:40 | 70 | 55dB | 2.8 | 183% | Day |
| 939 | 2025-10-05 07:58:01 | | 55dB | ? | ? | Day |
| 940 | 2025-10-05 08:00:24 | 68 | 55dB | 2.3 | 130% | Day |
| 941 | 2025-10-05 08:05:39 | 73 | 55dB | 3.2 | 225% | Day |
| 942 | 2025-10-05 08:18:36 | 69 | 55dB | 2.6 | 164% | Day |
| 943 | 2025-10-05 08:20:42 | 67 | 55dB | 2.3 | 130% | Day |
| 944 | 2025-10-05 08:25:23 | 71 | 55dB | 3.0 | 203% | Day |
| 945 | 2025-10-05 08:32:04 | 68 | 55dB | 2.5 | 146% | Day |
| 946 | 2025-10-05 08:41:20 | 69 | 55dB | 2.6 | 164% | Day |
| 947 | 2025-10-05 08:44:20 | 68 | 55dB | 2.3 | 130% | Day |
| 948 | 2025-10-05 08:46:12 | 67 | 55dB | 2.1 | 114% | Day |
| 949 | 2025-10-05 08:47:45 | 69 | 55dB | 2.6 | 164% | Day |
| 950 | 2025-10-05 08:53:15 | 69 | 55dB | 2.6 | 164% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 951 | 2025-10-05 08:55:32 | 68 | 55dB | 2.5 | 146% | Day |
| 952 | 2025-10-05 09:04:15 | | 55dB | ? | ? | Day |
| 953 | 2025-10-05 09:10:26 | | 55dB | ? | ? | Day |
| 954 | 2025-10-05 09:23:49 | 73 | 55dB | 3.5 | 248% | Day |
| 955 | 2025-10-05 09:26:44 | 73 | 55dB | 3.5 | 248% | Day |
| 956 | 2025-10-05 09:30:46 | | 55dB | ? | ? | Day |
| 957 | 2025-10-05 09:33:06 | | 55dB | ? | ? | Day |
| 958 | 2025-10-05 09:35:05 | 79 | 55dB | 4.9 | 392% | Day |
| 959 | 2025-10-05 09:36:39 | 69 | 55dB | 2.6 | 164% | Day |
| 960 | 2025-10-05 09:38:05 | | 55dB | ? | ? | Day |
| 961 | 2025-10-05 09:40:04 | 70 | 55dB | 2.8 | 183% | Day |
| 962 | 2025-10-05 09:48:11 | | 55dB | ? | ? | Day |
| 963 | 2025-10-05 09:49:40 | 74 | 55dB | 3.5 | 248% | Day |
| 964 | 2025-10-05 09:51:03 | | 55dB | ? | ? | Day |
| 965 | 2025-10-05 09:53:34 | 74 | 55dB | 3.5 | 248% | Day |
| 966 | 2025-10-05 10:00:52 | | 55dB | ? | ? | Day |
| 967 | 2025-10-05 10:03:02 | 71 | 55dB | 2.8 | 183% | Day |
| 968 | 2025-10-05 10:05:17 | 67 | 55dB | 2.3 | 130% | Day |
| 969 | 2025-10-05 10:09:26 | 72 | 55dB | 3.2 | 225% | Day |
| 970 | 2025-10-05 10:15:32 | 75 | 55dB | 3.7 | 273% | Day |
| 971 | 2025-10-05 10:19:01 | 73 | 55dB | 3.2 | 225% | Day |
| 972 | 2025-10-05 10:21:33 | | 55dB | ? | ? | Day |
| 973 | 2025-10-05 10:23:02 | 69 | 55dB | 2.6 | 164% | Day |
| 974 | 2025-10-05 10:29:34 | 68 | 55dB | 2.5 | 146% | Day |
| 975 | 2025-10-05 10:31:21 | | 55dB | ? | ? | Day |
| 976 | 2025-10-05 10:34:32 | 70 | 55dB | 2.8 | 183% | Day |
| 977 | 2025-10-05 10:37:45 | | 55dB | ? | ? | Day |
| 978 | 2025-10-05 10:39:43 | 68 | 55dB | 2.5 | 146% | Day |
| 979 | 2025-10-05 10:41:00 | 68 | 55dB | 2.5 | 146% | Day |
| 980 | 2025-10-05 10:42:32 | 70 | 55dB | 2.8 | 183% | Day |
| 981 | 2025-10-05 10:44:07 | | 55dB | ? | ? | Day |
| 982 | 2025-10-05 10:45:50 | 72 | 55dB | 3.0 | 203% | Day |
| 983 | 2025-10-05 10:48:23 | 76 | 55dB | 4.3 | 329% | Day |
| 984 | 2025-10-05 10:51:24 | | 55dB | ? | ? | Day |
| 985 | 2025-10-05 10:53:26 | 70 | 55dB | 2.6 | 164% | Day |
| 986 | 2025-10-05 10:55:41 | 91 | 55dB | 12.1 | 1113% | Day |
| 987 | 2025-10-05 10:57:07 | | 55dB | ? | ? | Day |
| 988 | 2025-10-05 10:58:32 | 71 | 55dB | 3.0 | 203% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 989 | 2025-10-05 11:00:19 | 70 | 55dB | 2.6 | 164% | Day |
| 990 | 2025-10-05 11:01:43 | | 55dB | ? | ? | Day |
| 991 | 2025-10-05 11:02:49 | | 55dB | ? | ? | Day |
| 992 | 2025-10-05 11:06:32 | 66 | 55dB | 2.1 | 114% | Day |
| 993 | 2025-10-05 11:13:52 | 74 | 55dB | 3.5 | 248% | Day |
| 994 | 2025-10-05 11:15:28 | | 55dB | ? | ? | Day |
| 995 | 2025-10-05 11:18:23 | | 55dB | ? | ? | Day |
| 996 | 2025-10-05 11:20:54 | | 55dB | ? | ? | Day |
| 997 | 2025-10-05 11:22:28 | | 55dB | ? | ? | Day |
| 998 | 2025-10-05 11:24:02 | | 55dB | ? | ? | Day |
| 999 | 2025-10-05 11:25:13 | 85 | 55dB | 7.5 | 646% | Day |
| 1000 | 2025-10-05 11:26:48 | 68 | 55dB | 2.5 | 146% | Day |
| 1001 | 2025-10-05 11:28:32 | 70 | 55dB | 2.6 | 164% | Day |
| 1002 | 2025-10-05 11:30:44 | 67 | 55dB | 2.3 | 130% | Day |
| 1003 | 2025-10-05 11:32:23 | 72 | 55dB | 3.2 | 225% | Day |
| 1004 | 2025-10-05 11:34:52 | | 55dB | ? | ? | Day |
| 1005 | 2025-10-05 11:39:06 | 69 | 55dB | 2.5 | 146% | Day |
| 1006 | 2025-10-05 11:41:30 | | 55dB | ? | ? | Day |
| 1007 | 2025-10-05 11:43:21 | 70 | 55dB | 2.6 | 164% | Day |
| 1008 | 2025-10-05 11:45:48 | 67 | 55dB | 2.1 | 114% | Day |
| 1009 | 2025-10-05 11:56:32 | 68 | 55dB | 2.3 | 130% | Day |
| 1010 | 2025-10-05 11:58:46 | 73 | 55dB | 3.5 | 248% | Day |
| 1011 | 2025-10-05 12:01:09 | | 55dB | ? | ? | Day |
| 1012 | 2025-10-05 12:02:45 | 70 | 55dB | 2.8 | 183% | Day |
| 1013 | 2025-10-05 12:04:18 | 69 | 55dB | 2.5 | 146% | Day |
| 1014 | 2025-10-05 12:05:35 | | 55dB | ? | ? | Day |
| 1015 | 2025-10-05 12:07:09 | 69 | 55dB | 2.6 | 164% | Day |
| 1016 | 2025-10-05 12:09:13 | | 55dB | ? | ? | Day |
| 1017 | 2025-10-05 12:11:16 | 73 | 55dB | 3.5 | 248% | Day |
| 1018 | 2025-10-05 12:13:29 | 69 | 55dB | 2.6 | 164% | Day |
| 1019 | 2025-10-05 12:15:45 | | 55dB | ? | ? | Day |
| 1020 | 2025-10-05 12:23:01 | 70 | 55dB | 2.8 | 183% | Day |
| 1021 | 2025-10-05 12:25:47 | 69 | 55dB | 2.5 | 146% | Day |
| 1022 | 2025-10-05 12:27:26 | 74 | 55dB | 3.7 | 273% | Day |
| 1023 | 2025-10-05 12:32:00 | 72 | 55dB | 3.2 | 225% | Day |
| 1024 | 2025-10-05 12:33:37 | | 55dB | ? | ? | Day |
| 1025 | 2025-10-05 12:39:02 | 79 | 55dB | 5.3 | 428% | Day |
| 1026 | 2025-10-05 12:41:06 | | 55dB | ? | ? | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1027 | 2025-10-05 12:43:01 | 70 | 55dB | 2.6 | 164% | Day |
| 1028 | 2025-10-05 12:44:53 | 70 | 55dB | 2.8 | 183% | Day |
| 1029 | 2025-10-05 12:46:17 | 72 | 55dB | 3.0 | 203% | Day |
| 1030 | 2025-10-05 12:47:30 | | 55dB | ? | ? | Day |
| 1031 | 2025-10-05 12:48:45 | 69 | 55dB | 2.5 | 146% | Day |
| 1032 | 2025-10-05 12:51:47 | | 55dB | ? | ? | Day |
| 1033 | 2025-10-05 12:54:03 | | 55dB | ? | ? | Day |
| 1034 | 2025-10-05 12:56:10 | 74 | 55dB | 3.5 | 248% | Day |
| 1035 | 2025-10-05 12:57:24 | 68 | 55dB | 2.5 | 146% | Day |
| 1036 | 2025-10-05 12:58:35 | 70 | 55dB | 2.8 | 183% | Day |
| 1037 | 2025-10-05 12:59:39 | 67 | 55dB | 2.1 | 114% | Day |
| 1038 | 2025-10-05 13:05:30 | | 55dB | ? | ? | Day |
| 1039 | 2025-10-05 13:09:31 | 70 | 55dB | 2.6 | 164% | Day |
| 1040 | 2025-10-05 13:11:00 | | 55dB | ? | ? | Day |
| 1041 | 2025-10-05 13:13:28 | | 55dB | ? | ? | Day |
| 1042 | 2025-10-05 13:16:12 | | 55dB | ? | ? | Day |
| 1043 | 2025-10-05 13:18:15 | | 55dB | ? | ? | Day |
| 1044 | 2025-10-05 13:20:32 | 74 | 55dB | 3.5 | 248% | Day |
| 1045 | 2025-10-05 13:22:54 | 68 | 55dB | 2.5 | 146% | Day |
| 1046 | 2025-10-05 13:24:30 | 67 | 55dB | 2.3 | 130% | Day |
| 1047 | 2025-10-05 13:26:11 | | 55dB | ? | ? | Day |
| 1048 | 2025-10-05 13:28:19 | 69 | 55dB | 2.6 | 164% | Day |
| 1049 | 2025-10-05 13:29:56 | 72 | 55dB | 3.2 | 225% | Day |
| 1050 | 2025-10-05 13:31:56 | | 55dB | ? | ? | Day |
| 1051 | 2025-10-05 13:33:39 | 70 | 55dB | 2.6 | 164% | Day |
| 1052 | 2025-10-05 13:36:44 | 75 | 55dB | 3.7 | 273% | Day |
| 1053 | 2025-10-05 13:39:14 | 74 | 55dB | 3.7 | 273% | Day |
| 1054 | 2025-10-05 13:44:02 | 69 | 55dB | 2.5 | 146% | Day |
| 1055 | 2025-10-05 13:45:45 | 70 | 55dB | 2.8 | 183% | Day |
| 1056 | 2025-10-05 13:47:01 | 69 | 55dB | 2.6 | 164% | Day |
| 1057 | 2025-10-05 13:49:05 | | 55dB | ? | ? | Day |
| 1058 | 2025-10-05 13:50:44 | 69 | 55dB | 2.5 | 146% | Day |
| 1059 | 2025-10-05 13:53:13 | 70 | 55dB | 2.8 | 183% | Day |
| 1060 | 2025-10-05 13:54:46 | 72 | 55dB | 3.0 | 203% | Day |
| 1061 | 2025-10-05 13:56:48 | 70 | 55dB | 2.8 | 183% | Day |
| 1062 | 2025-10-05 13:58:24 | | 55dB | ? | ? | Day |
| 1063 | 2025-10-05 14:00:32 | | 55dB | ? | ? | Day |
| 1064 | 2025-10-05 14:01:41 | 72 | 55dB | 3.0 | 203% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1065 | 2025-10-05 14:03:10 | | 55dB | ? | ? | Day |
| 1066 | 2025-10-05 14:04:25 | 68 | 55dB | 2.5 | 146% | Day |
| 1067 | 2025-10-05 14:07:24 | 71 | 55dB | 3.0 | 203% | Day |
| 1068 | 2025-10-05 14:09:04 | | 55dB | ? | ? | Day |
| 1069 | 2025-10-05 14:13:28 | 73 | 55dB | 3.5 | 248% | Day |
| 1070 | 2025-10-05 14:15:56 | 68 | 55dB | 2.3 | 130% | Day |
| 1071 | 2025-10-05 14:19:47 | 75 | 55dB | 3.7 | 273% | Day |
| 1072 | 2025-10-05 14:22:27 | | 55dB | ? | ? | Day |
| 1073 | 2025-10-05 14:24:12 | | 55dB | ? | ? | Day |
| 1074 | 2025-10-05 14:25:36 | 70 | 55dB | 2.8 | 183% | Day |
| 1075 | 2025-10-05 14:27:09 | 70 | 55dB | 2.6 | 164% | Day |
| 1076 | 2025-10-05 14:28:41 | 76 | 55dB | 4.0 | 300% | Day |
| 1077 | 2025-10-05 14:31:00 | 68 | 55dB | 2.5 | 146% | Day |
| 1078 | 2025-10-05 14:32:37 | 72 | 55dB | 3.0 | 203% | Day |
| 1079 | 2025-10-05 14:38:32 | 76 | 55dB | 4.0 | 300% | Day |
| 1080 | 2025-10-05 14:40:54 | 69 | 55dB | 2.6 | 164% | Day |
| 1081 | 2025-10-05 14:42:26 | 74 | 55dB | 3.7 | 273% | Day |
| 1082 | 2025-10-05 14:45:25 | | 55dB | ? | ? | Day |
| 1083 | 2025-10-05 14:46:52 | | 55dB | ? | ? | Day |
| 1084 | 2025-10-05 14:48:21 | 70 | 55dB | 2.6 | 164% | Day |
| 1085 | 2025-10-05 14:49:35 | 73 | 55dB | 3.2 | 225% | Day |
| 1086 | 2025-10-05 14:50:58 | 69 | 55dB | 2.5 | 146% | Day |
| 1087 | 2025-10-05 14:52:09 | 73 | 55dB | 3.5 | 248% | Day |
| 1088 | 2025-10-05 14:53:19 | 76 | 55dB | 4.3 | 329% | Day |
| 1089 | 2025-10-05 14:54:40 | | 55dB | ? | ? | Day |
| 1090 | 2025-10-05 14:56:03 | 74 | 55dB | 3.5 | 248% | Day |
| 1091 | 2025-10-05 14:57:41 | | 55dB | ? | ? | Day |
| 1092 | 2025-10-05 15:01:03 | 72 | 55dB | 3.2 | 225% | Day |
| 1093 | 2025-10-05 15:02:20 | 72 | 55dB | 3.0 | 203% | Day |
| 1094 | 2025-10-05 15:03:34 | 73 | 55dB | 3.2 | 225% | Day |
| 1095 | 2025-10-05 15:04:52 | 74 | 55dB | 3.5 | 248% | Day |
| 1096 | 2025-10-05 15:06:47 | 71 | 55dB | 2.8 | 183% | Day |
| 1097 | 2025-10-05 15:08:08 | | 55dB | ? | ? | Day |
| 1098 | 2025-10-05 15:09:22 | | 55dB | ? | ? | Day |
| 1099 | 2025-10-05 15:11:25 | 69 | 55dB | 2.5 | 146% | Day |
| 1100 | 2025-10-05 15:12:52 | | 55dB | ? | ? | Day |
| 1101 | 2025-10-05 15:15:04 | | 55dB | ? | ? | Day |
| 1102 | 2025-10-05 15:17:39 | 73 | 55dB | 3.2 | 225% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1103 | 2025-10-05 15:19:31 | 68 | 55dB | 2.3 | 130% | Day |
| 1104 | 2025-10-05 15:20:42 | 73 | 55dB | 3.2 | 225% | Day |
| 1105 | 2025-10-05 15:21:57 | 72 | 55dB | 3.2 | 225% | Day |
| 1106 | 2025-10-05 15:23:22 | 69 | 55dB | 2.6 | 164% | Day |
| 1107 | 2025-10-05 15:24:36 | 70 | 55dB | 2.8 | 183% | Day |
| 1108 | 2025-10-05 15:26:15 | 69 | 55dB | 2.5 | 146% | Day |
| 1109 | 2025-10-05 15:27:54 | 72 | 55dB | 3.0 | 203% | Day |
| 1110 | 2025-10-05 15:29:44 | 72 | 55dB | 3.2 | 225% | Day |
| 1111 | 2025-10-05 15:31:25 | 72 | 55dB | 3.2 | 225% | Day |
| 1112 | 2025-10-05 15:33:09 | 69 | 55dB | 2.6 | 164% | Day |
| 1113 | 2025-10-05 15:34:41 | 73 | 55dB | 3.2 | 225% | Day |
| 1114 | 2025-10-05 15:36:15 | 69 | 55dB | 2.5 | 146% | Day |
| 1115 | 2025-10-05 15:38:37 | 69 | 55dB | 2.5 | 146% | Day |
| 1116 | 2025-10-05 15:40:01 | 72 | 55dB | 3.2 | 225% | Day |
| 1117 | 2025-10-05 15:41:31 | 76 | 55dB | 4.3 | 329% | Day |
| 1118 | 2025-10-05 15:43:22 | 71 | 55dB | 3.0 | 203% | Day |
| 1119 | 2025-10-05 15:45:43 | 72 | 55dB | 3.2 | 225% | Day |
| 1120 | 2025-10-05 15:47:06 | | 55dB | ? | ? | Day |
| 1121 | 2025-10-05 15:48:20 | 72 | 55dB | 3.0 | 203% | Day |
| 1122 | 2025-10-05 15:51:21 | 78 | 55dB | 4.9 | 392% | Day |
| 1123 | 2025-10-05 15:54:36 | 75 | 55dB | 3.7 | 273% | Day |
| 1124 | 2025-10-05 15:57:10 | 72 | 55dB | 3.0 | 203% | Day |
| 1125 | 2025-10-05 15:59:42 | 68 | 55dB | 2.3 | 130% | Day |
| 1126 | 2025-10-05 16:01:02 | | 55dB | ? | ? | Day |
| 1127 | 2025-10-05 16:03:07 | | 55dB | ? | ? | Day |
| 1128 | 2025-10-05 16:05:36 | 70 | 55dB | 2.6 | 164% | Day |
| 1129 | 2025-10-05 16:07:45 | | 55dB | ? | ? | Day |
| 1130 | 2025-10-05 16:09:13 | | 55dB | ? | ? | Day |
| 1131 | 2025-10-05 16:10:27 | 83 | 55dB | 7.0 | 596% | Day |
| 1132 | 2025-10-05 16:12:35 | 69 | 55dB | 2.5 | 146% | Day |
| 1133 | 2025-10-05 16:13:58 | 70 | 55dB | 2.6 | 164% | Day |
| 1134 | 2025-10-05 16:15:46 | 71 | 55dB | 2.8 | 183% | Day |
| 1135 | 2025-10-05 16:16:55 | 72 | 55dB | 3.2 | 225% | Day |
| 1136 | 2025-10-05 16:18:46 | 75 | 55dB | 4.0 | 300% | Day |
| 1137 | 2025-10-05 16:21:06 | 71 | 55dB | 2.8 | 183% | Day |
| 1138 | 2025-10-05 16:22:17 | 70 | 55dB | 2.8 | 183% | Day |
| 1139 | 2025-10-05 16:23:33 | 66 | 55dB | 2.1 | 114% | Day |
| 1140 | 2025-10-05 16:24:48 | | 55dB | ? | ? | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1141 | 2025-10-05 16:26:07 | 73 | 55dB | 3.5 | 248% | Day |
| 1142 | 2025-10-05 16:27:35 | 70 | 55dB | 2.6 | 164% | Day |
| 1143 | 2025-10-05 16:29:30 | 72 | 55dB | 3.0 | 203% | Day |
| 1144 | 2025-10-05 16:31:42 | 68 | 55dB | 2.5 | 146% | Day |
| 1145 | 2025-10-05 16:32:52 | 69 | 55dB | 2.6 | 164% | Day |
| 1146 | 2025-10-05 16:34:36 | 76 | 55dB | 4.0 | 300% | Day |
| 1147 | 2025-10-05 16:36:58 | | 55dB | ? | ? | Day |
| 1148 | 2025-10-05 16:38:20 | 71 | 55dB | 2.8 | 183% | Day |
| 1149 | 2025-10-05 16:39:37 | 73 | 55dB | 3.5 | 248% | Day |
| 1150 | 2025-10-05 16:41:38 | 68 | 55dB | 2.5 | 146% | Day |
| 1151 | 2025-10-05 16:43:01 | | 55dB | ? | ? | Day |
| 1152 | 2025-10-05 16:44:21 | 71 | 55dB | 2.8 | 183% | Day |
| 1153 | 2025-10-05 16:45:46 | 74 | 55dB | 3.5 | 248% | Day |
| 1154 | 2025-10-05 16:48:14 | 67 | 55dB | 2.3 | 130% | Day |
| 1155 | 2025-10-05 16:49:36 | 75 | 55dB | 4.0 | 300% | Day |
| 1156 | 2025-10-05 16:52:13 | | 55dB | ? | ? | Day |
| 1157 | 2025-10-05 16:54:36 | | 55dB | ? | ? | Day |
| 1158 | 2025-10-05 16:56:03 | 73 | 55dB | 3.5 | 248% | Day |
| 1159 | 2025-10-05 16:57:46 | 75 | 55dB | 4.0 | 300% | Day |
| 1160 | 2025-10-05 16:58:56 | 71 | 55dB | 2.8 | 183% | Day |
| 1161 | 2025-10-05 17:00:09 | 72 | 55dB | 3.0 | 203% | Day |
| 1162 | 2025-10-05 17:01:35 | 69 | 55dB | 2.6 | 164% | Day |
| 1163 | 2025-10-05 17:02:58 | 68 | 55dB | 2.3 | 130% | Day |
| 1164 | 2025-10-05 17:04:17 | | 55dB | ? | ? | Day |
| 1165 | 2025-10-05 17:05:46 | 68 | 55dB | 2.5 | 146% | Day |
| 1166 | 2025-10-05 17:07:25 | | 55dB | ? | ? | Day |
| 1167 | 2025-10-05 17:08:40 | 68 | 55dB | 2.3 | 130% | Day |
| 1168 | 2025-10-05 17:09:55 | | 55dB | ? | ? | Day |
| 1169 | 2025-10-05 17:11:28 | 74 | 55dB | 3.5 | 248% | Day |
| 1170 | 2025-10-05 17:12:49 | 72 | 55dB | 3.2 | 225% | Day |
| 1171 | 2025-10-05 17:14:14 | 70 | 55dB | 2.8 | 183% | Day |
| 1172 | 2025-10-05 17:15:30 | 73 | 55dB | 3.2 | 225% | Day |
| 1173 | 2025-10-05 17:16:52 | | 55dB | ? | ? | Day |
| 1174 | 2025-10-05 17:18:15 | 66 | 55dB | 2.0 | 100% | Day |
| 1175 | 2025-10-05 17:19:34 | 72 | 55dB | 3.2 | 225% | Day |
| 1176 | 2025-10-05 17:21:24 | 79 | 55dB | 5.3 | 428% | Day |
| 1177 | 2025-10-05 17:23:25 | | 55dB | ? | ? | Day |
| 1178 | 2025-10-05 17:25:09 | 71 | 55dB | 3.0 | 203% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1179 | 2025-10-05 17:27:35 | | 55dB | ? | ? | Day |
| 1180 | 2025-10-05 17:31:47 | 74 | 55dB | 3.5 | 248% | Day |
| 1181 | 2025-10-05 17:33:27 | 73 | 55dB | 3.5 | 248% | Day |
| 1182 | 2025-10-05 17:35:37 | 71 | 55dB | 3.0 | 203% | Day |
| 1183 | 2025-10-05 17:37:05 | 72 | 55dB | 3.0 | 203% | Day |
| 1184 | 2025-10-05 17:38:36 | 67 | 55dB | 2.3 | 130% | Day |
| 1185 | 2025-10-05 17:40:08 | 68 | 55dB | 2.5 | 146% | Day |
| 1186 | 2025-10-05 17:44:04 | 72 | 55dB | 3.2 | 225% | Day |
| 1187 | 2025-10-05 17:45:56 | 73 | 55dB | 3.2 | 225% | Day |
| 1188 | 2025-10-05 17:48:31 | 72 | 55dB | 3.2 | 225% | Day |
| 1189 | 2025-10-05 17:50:44 | 72 | 55dB | 3.0 | 203% | Day |
| 1190 | 2025-10-05 17:52:20 | 69 | 55dB | 2.6 | 164% | Day |
| 1191 | 2025-10-05 17:53:54 | 72 | 55dB | 3.0 | 203% | Day |
| 1192 | 2025-10-05 17:55:30 | 69 | 55dB | 2.6 | 164% | Day |
| 1193 | 2025-10-05 17:57:09 | | 55dB | ? | ? | Day |
| 1194 | 2025-10-05 17:58:57 | 70 | 55dB | 2.8 | 183% | Day |
| 1195 | 2025-10-05 18:00:25 | | 55dB | ? | ? | Day |
| 1196 | 2025-10-05 18:01:58 | 69 | 55dB | 2.5 | 146% | Day |
| 1197 | 2025-10-05 18:03:27 | 72 | 55dB | 3.0 | 203% | Day |
| 1198 | 2025-10-05 18:04:57 | 72 | 55dB | 3.0 | 203% | Day |
| 1199 | 2025-10-05 18:06:18 | 69 | 55dB | 2.5 | 146% | Day |
| 1200 | 2025-10-05 18:07:52 | | 55dB | ? | ? | Day |
| 1201 | 2025-10-05 18:09:25 | | 55dB | ? | ? | Day |
| 1202 | 2025-10-05 18:11:17 | 73 | 55dB | 3.5 | 248% | Day |
| 1203 | 2025-10-05 18:12:49 | 69 | 55dB | 2.5 | 146% | Day |
| 1204 | 2025-10-05 18:14:31 | | 55dB | ? | ? | Day |
| 1205 | 2025-10-05 18:16:07 | | 55dB | ? | ? | Day |
| 1206 | 2025-10-05 18:17:34 | 71 | 55dB | 2.8 | 183% | Day |
| 1207 | 2025-10-05 18:18:57 | 74 | 55dB | 3.5 | 248% | Day |
| 1208 | 2025-10-05 18:20:42 | 71 | 55dB | 3.0 | 203% | Day |
| 1209 | 2025-10-05 18:22:17 | 68 | 55dB | 2.5 | 146% | Day |
| 1210 | 2025-10-05 18:23:45 | 72 | 55dB | 3.2 | 225% | Day |
| 1211 | 2025-10-05 18:25:12 | 74 | 55dB | 3.7 | 273% | Day |
| 1212 | 2025-10-05 18:28:12 | 72 | 55dB | 3.0 | 203% | Day |
| 1213 | 2025-10-05 18:29:34 | 80 | 55dB | 5.3 | 428% | Day |
| 1214 | 2025-10-05 18:31:04 | 68 | 55dB | 2.5 | 146% | Day |
| 1215 | 2025-10-05 18:32:35 | 69 | 55dB | 2.5 | 146% | Day |
| 1216 | 2025-10-05 18:34:07 | 71 | 55dB | 2.8 | 183% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1217 | 2025-10-05 18:35:38 | | 55dB | ? | ? | Day |
| 1218 | 2025-10-05 18:37:16 | 76 | 55dB | 4.3 | 329% | Day |
| 1219 | 2025-10-05 18:39:04 | 69 | 55dB | 2.6 | 164% | Day |
| 1220 | 2025-10-05 18:40:32 | 70 | 55dB | 2.8 | 183% | Day |
| 1221 | 2025-10-05 18:42:00 | 70 | 55dB | 2.8 | 183% | Day |
| 1222 | 2025-10-05 18:43:32 | 70 | 55dB | 2.6 | 164% | Day |
| 1223 | 2025-10-05 18:44:57 | 69 | 55dB | 2.5 | 146% | Day |
| 1224 | 2025-10-05 18:46:31 | 72 | 55dB | 3.0 | 203% | Day |
| 1225 | 2025-10-05 18:48:10 | 70 | 55dB | 2.8 | 183% | Day |
| 1226 | 2025-10-05 18:49:58 | | 55dB | ? | ? | Day |
| 1227 | 2025-10-05 18:53:27 | | 55dB | ? | ? | Day |
| 1228 | 2025-10-05 18:56:00 | 72 | 55dB | 3.2 | 225% | Day |
| 1229 | 2025-10-05 18:59:33 | 72 | 55dB | 3.0 | 203% | Day |
| 1230 | 2025-10-05 19:01:36 | 67 | 55dB | 2.3 | 130% | Day |
| 1231 | 2025-10-05 19:03:16 | 69 | 55dB | 2.6 | 164% | Day |
| 1232 | 2025-10-05 19:05:02 | 71 | 55dB | 3.0 | 203% | Day |
| 1233 | 2025-10-05 19:06:38 | 72 | 55dB | 3.2 | 225% | Day |
| 1234 | 2025-10-05 19:08:56 | | 55dB | ? | ? | Day |
| 1235 | 2025-10-05 19:10:34 | | 55dB | ? | ? | Day |
| 1236 | 2025-10-05 19:12:06 | 69 | 55dB | 2.6 | 164% | Day |
| 1237 | 2025-10-05 19:13:40 | 68 | 55dB | 2.3 | 130% | Day |
| 1238 | 2025-10-05 19:15:09 | 71 | 55dB | 3.0 | 203% | Day |
| 1239 | 2025-10-05 19:16:34 | 79 | 55dB | 5.3 | 428% | Day |
| 1240 | 2025-10-05 19:18:20 | 70 | 55dB | 2.8 | 183% | Day |
| 1241 | 2025-10-05 19:20:02 | 80 | 55dB | 5.3 | 428% | Day |
| 1242 | 2025-10-05 19:21:46 | 72 | 55dB | 3.0 | 203% | Day |
| 1243 | 2025-10-05 19:23:16 | 78 | 55dB | 4.6 | 359% | Day |
| 1244 | 2025-10-05 19:24:47 | 74 | 55dB | 3.5 | 248% | Day |
| 1245 | 2025-10-05 19:26:37 | 71 | 55dB | 2.8 | 183% | Day |
| 1246 | 2025-10-05 19:28:33 | 70 | 55dB | 2.6 | 164% | Day |
| 1247 | 2025-10-05 19:30:16 | 70 | 55dB | 2.6 | 164% | Day |
| 1248 | 2025-10-05 19:31:58 | 69 | 55dB | 2.5 | 146% | Day |
| 1249 | 2025-10-05 19:33:26 | 72 | 55dB | 3.2 | 225% | Day |
| 1250 | 2025-10-05 19:34:56 | 71 | 55dB | 3.0 | 203% | Day |
| 1251 | 2025-10-05 19:36:30 | 71 | 55dB | 2.8 | 183% | Day |
| 1252 | 2025-10-05 19:38:07 | 74 | 55dB | 3.5 | 248% | Day |
| 1253 | 2025-10-05 19:40:17 | 68 | 55dB | 2.5 | 146% | Day |
| 1254 | 2025-10-05 19:41:51 | 71 | 55dB | 2.8 | 183% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1255 | 2025-10-05 19:43:11 | 73 | 55dB | 3.5 | 248% | Day |
| 1256 | 2025-10-05 19:45:06 | 70 | 55dB | 2.6 | 164% | Day |
| 1257 | 2025-10-05 19:46:35 | | 55dB | ? | ? | Day |
| 1258 | 2025-10-05 19:48:09 | 68 | 55dB | 2.5 | 146% | Day |
| 1259 | 2025-10-05 19:49:35 | | 55dB | ? | ? | Day |
| 1260 | 2025-10-05 19:51:05 | 70 | 55dB | 2.6 | 164% | Day |
| 1261 | 2025-10-05 19:52:31 | 70 | 55dB | 2.8 | 183% | Day |
| 1262 | 2025-10-05 19:53:50 | | 55dB | ? | ? | Day |
| 1263 | 2025-10-05 19:55:23 | 69 | 55dB | 2.5 | 146% | Day |
| 1264 | 2025-10-05 19:56:56 | 68 | 55dB | 2.3 | 130% | Day |
| 1265 | 2025-10-05 19:58:19 | 74 | 55dB | 3.5 | 248% | Day |
| 1266 | 2025-10-05 19:59:44 | | 55dB | ? | ? | Day |
| 1267 | 2025-10-05 20:02:04 | 67 | 55dB | 2.1 | 114% | Day |
| 1268 | 2025-10-05 20:03:40 | 84 | 55dB | 7.0 | 596% | Day |
| 1269 | 2025-10-05 20:05:36 | 70 | 55dB | 2.8 | 183% | Day |
| 1270 | 2025-10-05 20:07:11 | 77 | 55dB | 4.3 | 329% | Day |
| 1271 | 2025-10-05 20:08:55 | 69 | 55dB | 2.5 | 146% | Day |
| 1272 | 2025-10-05 20:10:20 | | 55dB | ? | ? | Day |
| 1273 | 2025-10-05 20:14:26 | 69 | 55dB | 2.6 | 164% | Day |
| 1274 | 2025-10-05 20:15:55 | 70 | 55dB | 2.8 | 183% | Day |
| 1275 | 2025-10-05 20:17:25 | 72 | 55dB | 3.2 | 225% | Day |
| 1276 | 2025-10-05 20:19:26 | 69 | 55dB | 2.6 | 164% | Day |
| 1277 | 2025-10-05 20:21:27 | 73 | 55dB | 3.5 | 248% | Day |
| 1278 | 2025-10-05 20:23:25 | 70 | 55dB | 2.8 | 183% | Day |
| 1279 | 2025-10-05 20:25:31 | 71 | 55dB | 3.0 | 203% | Day |
| 1280 | 2025-10-05 20:27:23 | 70 | 55dB | 2.6 | 164% | Day |
| 1281 | 2025-10-05 20:28:51 | | 55dB | ? | ? | Day |
| 1282 | 2025-10-05 20:30:32 | 68 | 55dB | 2.5 | 146% | Day |
| 1283 | 2025-10-05 20:32:08 | 74 | 55dB | 3.5 | 248% | Day |
| 1284 | 2025-10-05 20:33:46 | 70 | 55dB | 2.8 | 183% | Day |
| 1285 | 2025-10-05 20:35:39 | | 55dB | ? | ? | Day |
| 1286 | 2025-10-05 20:37:11 | 71 | 55dB | 2.8 | 183% | Day |
| 1287 | 2025-10-05 20:39:03 | 70 | 55dB | 2.8 | 183% | Day |
| 1288 | 2025-10-05 20:40:55 | | 55dB | ? | ? | Day |
| 1289 | 2025-10-05 20:42:21 | 71 | 55dB | 2.8 | 183% | Day |
| 1290 | 2025-10-05 20:43:52 | 70 | 55dB | 2.8 | 183% | Day |
| 1291 | 2025-10-05 20:45:51 | 70 | 55dB | 2.8 | 183% | Day |
| 1292 | 2025-10-05 20:47:27 | 69 | 55dB | 2.6 | 164% | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1293 | 2025-10-05 20:48:51 | 69 | 55dB | 2.6 | 164% | Day |
| 1294 | 2025-10-05 20:50:21 | 71 | 55dB | 2.8 | 183% | Day |
| 1295 | 2025-10-05 20:51:50 | 70 | 55dB | 2.6 | 164% | Day |
| 1296 | 2025-10-05 20:53:25 | 70 | 55dB | 2.6 | 164% | Day |
| 1297 | 2025-10-05 20:55:32 | | 55dB | ? | ? | Day |
| 1298 | 2025-10-05 20:57:07 | 76 | 55dB | 4.3 | 329% | Day |
| 1299 | 2025-10-05 20:59:20 | 74 | 55dB | 3.7 | 273% | Day |
| 1300 | 2025-10-05 21:01:44 | | 55dB | ? | ? | Day |
| 1301 | 2025-10-05 21:03:17 | 71 | 55dB | 2.8 | 183% | Day |
| 1302 | 2025-10-05 21:04:44 | 71 | 55dB | 3.0 | 203% | Day |
| 1303 | 2025-10-05 21:06:11 | | 55dB | ? | ? | Day |
| 1304 | 2025-10-05 21:08:26 | | 55dB | ? | ? | Day |
| 1305 | 2025-10-05 21:09:46 | 70 | 55dB | 2.6 | 164% | Day |
| 1306 | 2025-10-05 21:11:21 | 69 | 55dB | 2.6 | 164% | Day |
| 1307 | 2025-10-05 21:12:56 | 69 | 55dB | 2.5 | 146% | Day |
| 1308 | 2025-10-05 21:15:13 | 68 | 55dB | 2.5 | 146% | Day |
| 1309 | 2025-10-05 21:19:28 | 69 | 55dB | 2.5 | 146% | Day |
| 1310 | 2025-10-05 21:21:32 | | 55dB | ? | ? | Day |
| 1311 | 2025-10-05 21:24:46 | 75 | 55dB | 4.0 | 300% | Day |
| 1312 | 2025-10-05 21:26:58 | 69 | 55dB | 2.5 | 146% | Day |
| 1313 | 2025-10-05 21:30:01 | 67 | 55dB | 2.1 | 114% | Day |
| 1314 | 2025-10-05 21:31:36 | 66 | 55dB | 2.1 | 114% | Day |
| 1315 | 2025-10-05 21:33:32 | | 55dB | ? | ? | Day |
| 1316 | 2025-10-05 21:35:03 | 70 | 55dB | 2.6 | 164% | Day |
| 1317 | 2025-10-05 21:36:41 | 70 | 55dB | 2.8 | 183% | Day |
| 1318 | 2025-10-05 21:38:13 | | 55dB | ? | ? | Day |
| 1319 | 2025-10-05 21:40:18 | 74 | 55dB | 3.7 | 273% | Day |
| 1320 | 2025-10-05 21:44:08 | 71 | 55dB | 2.8 | 183% | Day |
| 1321 | 2025-10-05 21:45:39 | 68 | 55dB | 2.3 | 130% | Day |
| 1322 | 2025-10-05 21:47:07 | 68 | 55dB | 2.3 | 130% | Day |
| 1323 | 2025-10-05 21:48:44 | 68 | 55dB | 2.3 | 130% | Day |
| 1324 | 2025-10-05 21:50:01 | 73 | 55dB | 3.2 | 225% | Day |
| 1325 | 2025-10-05 21:51:37 | 71 | 55dB | 2.8 | 183% | Day |
| 1326 | 2025-10-05 21:53:27 | 74 | 55dB | 3.5 | 248% | Day |
| 1327 | 2025-10-05 21:55:16 | 77 | 55dB | 4.3 | 329% | Day |
| 1328 | 2025-10-05 21:56:56 | 68 | 55dB | 2.3 | 130% | Day |
| 1329 | 2025-10-05 21:58:26 | 70 | 55dB | 2.8 | 183% | Day |
| 1330 | 2025-10-05 21:59:55 | | 55dB | ? | ? | Day |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1331 | 2025-10-05 22:02:40 | 69 | 55dB | 2.5 | 146% | Day |
| 1332 | 2025-10-05 22:04:44 | 69 | 55dB | 2.5 | 146% | Day |
| 1333 | 2025-10-05 22:06:52 | | 55dB | ? | ? | Day |
| 1334 | 2025-10-05 22:09:15 | 67 | 55dB | 2.3 | 130% | Day |
| 1335 | 2025-10-05 22:12:14 | 79 | 55dB | 4.9 | 392% | Day |
| 1336 | 2025-10-05 22:13:56 | 68 | 55dB | 2.3 | 130% | Day |
| 1337 | 2025-10-05 22:15:43 | 68 | 55dB | 2.5 | 146% | Day |
| 1338 | 2025-10-05 22:17:22 | | 55dB | ? | ? | Day |
| 1339 | 2025-10-05 22:23:17 | 68 | 55dB | 2.5 | 146% | Day |
| 1340 | 2025-10-05 22:25:32 | 68 | 55dB | 2.5 | 146% | Day |
| 1341 | 2025-10-05 22:27:16 | 70 | 55dB | 2.8 | 183% | Day |
| 1342 | 2025-10-05 22:29:16 | | 55dB | ? | ? | Day |
| 1343 | 2025-10-05 22:30:58 | 75 | 55dB | 3.7 | 273% | Day |
| 1344 | 2025-10-05 22:32:28 | 71 | 55dB | 2.8 | 183% | Day |
| 1345 | 2025-10-05 22:34:14 | 68 | 55dB | 2.3 | 130% | Day |
| 1346 | 2025-10-05 22:35:55 | 68 | 55dB | 2.5 | 146% | Day |
| 1347 | 2025-10-05 22:37:41 | 71 | 55dB | 2.8 | 183% | Day |
| 1348 | 2025-10-05 22:39:03 | | 55dB | ? | ? | Day |
| 1349 | 2025-10-05 22:40:39 | 69 | 55dB | 2.6 | 164% | Day |
| 1350 | 2025-10-05 22:42:41 | 67 | 55dB | 2.3 | 130% | Day |
| 1351 | 2025-10-05 22:44:16 | 71 | 55dB | 2.8 | 183% | Day |
| 1352 | 2025-10-05 22:47:28 | 68 | 55dB | 2.3 | 130% | Day |
| 1353 | 2025-10-05 22:50:11 | 70 | 55dB | 2.8 | 183% | Day |
| 1354 | 2025-10-05 22:52:52 | 70 | 55dB | 2.6 | 164% | Day |
| 1355 | 2025-10-05 22:57:40 | 69 | 55dB | 2.6 | 164% | Day |
| 1356 | 2025-10-05 22:59:13 | 67 | 55dB | 2.3 | 130% | Day |
| 1357 | 2025-10-05 23:01:18 | | 45dB | ? | ? | Night |
| 1358 | 2025-10-05 23:03:11 | 71 | 45dB | 6.1 | 506% | Night |
| 1359 | 2025-10-05 23:05:02 | 73 | 45dB | 6.5 | 550% | Night |
| 1360 | 2025-10-05 23:07:37 | | 45dB | ? | ? | Night |
| 1361 | 2025-10-05 23:10:08 | 67 | 45dB | 4.6 | 359% | Night |
| 1362 | 2025-10-05 23:12:06 | 70 | 45dB | 5.3 | 428% | Night |
| 1363 | 2025-10-05 23:16:24 | 71 | 45dB | 5.7 | 466% | Night |
| 1364 | 2025-10-05 23:23:58 | | 45dB | ? | ? | Night |
| 1365 | 2025-10-05 23:27:20 | 84 | 45dB | 14.9 | 1393% | Night |
| 1366 | 2025-10-05 23:29:37 | 66 | 45dB | 4.3 | 329% | Night |
| 1367 | 2025-10-05 23:33:55 | 70 | 45dB | 5.7 | 466% | Night |
| 1368 | 2025-10-05 23:36:00 | 72 | 45dB | 6.5 | 550% | Night |

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| October 3, 4 and 5, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1369 | 2025-10-05 23:40:39 | 69 | 45dB | 5.3 | 428% | Night |
| 1370 | 2025-10-05 23:43:06 | 72 | 45dB | 6.1 | 506% | Night |
| 1371 | 2025-10-05 23:45:05 | 69 | 45dB | 5.3 | 428% | Night |
| 1372 | 2025-10-05 23:46:32 | 77 | 45dB | 9.2 | 819% | Night |
| 1373 | 2025-10-05 23:50:52 | 70 | 45dB | 5.7 | 466% | Night |
| 1374 | 2025-10-05 23:54:48 | 70 | 45dB | 5.7 | 466% | Night |
| 1375 | 2025-10-05 23:57:27 | 71 | 45dB | 5.7 | 466% | Night |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1 | 2025-11-01 00:01:00 | 70 | 45dB | 5.3 | 428% | Night |
| 2 | 2025-11-01 00:03:55 | 70 | 45dB | 5.3 | 428% | Night |
| 3 | 2025-11-01 00:07:37 | 71 | 45dB | 5.7 | 466% | Night |
| 4 | 2025-11-01 00:13:54 | 78 | 45dB | 9.2 | 819% | Night |
| 5 | 2025-11-01 06:28:21 | 71 | 45dB | 6.1 | 506% | Night |
| 6 | 2025-11-01 06:30:26 | 69 | 45dB | 4.9 | 392% | Night |
| 7 | 2025-11-01 06:31:57 | 72 | 45dB | 6.1 | 506% | Night |
| 8 | 2025-11-01 06:33:52 | 70 | 45dB | 5.7 | 466% | Night |
| 9 | 2025-11-01 06:35:28 | | 45dB | ? | ? | Night |
| 10 | 2025-11-01 06:36:55 | 73 | 45dB | 6.5 | 550% | Night |
| 11 | 2025-11-01 06:38:13 | 73 | 45dB | 6.5 | 550% | Night |
| 12 | 2025-11-01 06:40:08 | 68 | 45dB | 4.9 | 392% | Night |
| 13 | 2025-11-01 06:41:39 | 71 | 45dB | 5.7 | 466% | Night |
| 14 | 2025-11-01 06:44:12 | 71 | 45dB | 5.7 | 466% | Night |
| 15 | 2025-11-01 06:45:47 | 71 | 45dB | 5.7 | 466% | Night |
| 16 | 2025-11-01 06:47:17 | 68 | 45dB | 4.9 | 392% | Night |
| 17 | 2025-11-01 06:48:26 | 74 | 45dB | 7.0 | 596% | Night |
| 18 | 2025-11-01 06:49:41 | 73 | 45dB | 7.0 | 596% | Night |
| 19 | 2025-11-01 06:51:15 | 69 | 45dB | 5.3 | 428% | Night |
| 20 | 2025-11-01 06:52:32 | 70 | 45dB | 5.7 | 466% | Night |
| 21 | 2025-11-01 06:53:58 | 73 | 45dB | 6.5 | 550% | Night |
| 22 | 2025-11-01 06:56:14 | 69 | 45dB | 4.9 | 392% | Night |
| 23 | 2025-11-01 06:57:31 | 67 | 45dB | 4.3 | 329% | Night |
| 24 | 2025-11-01 06:58:50 | | 45dB | ? | ? | Night |
| 25 | 2025-11-01 07:00:34 | 68 | 55dB | 2.5 | 146% | Day |
| 26 | 2025-11-01 07:06:08 | 73 | 55dB | 3.2 | 225% | Day |
| 27 | 2025-11-01 07:08:12 | | 55dB | ? | ? | Day |
| 28 | 2025-11-01 07:10:05 | | 55dB | ? | ? | Day |
| 29 | 2025-11-01 07:12:03 | 69 | 55dB | 2.5 | 146% | Day |
| 30 | 2025-11-01 07:13:51 | 70 | 55dB | 2.8 | 183% | Day |
| 31 | 2025-11-01 07:15:06 | 71 | 55dB | 3.0 | 203% | Day |
| 32 | 2025-11-01 07:16:18 | 69 | 55dB | 2.5 | 146% | Day |
| 33 | 2025-11-01 07:17:44 | 74 | 55dB | 3.5 | 248% | Day |
| 34 | 2025-11-01 07:28:39 | 82 | 55dB | 6.1 | 506% | Day |
| 35 | 2025-11-01 07:31:10 | 82 | 55dB | 6.1 | 506% | Day |
| 36 | 2025-11-01 07:41:03 | 68 | 55dB | 2.5 | 146% | Day |
| 37 | 2025-11-01 07:44:16 | 81 | 55dB | 6.1 | 506% | Day |
| 38 | 2025-11-01 07:50:51 | 81 | 55dB | 6.1 | 506% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 39 | 2025-11-01 07:54:45 | 81 | 55dB | 6.1 | 506% | Day |
| 40 | 2025-11-01 07:58:14 | 70 | 55dB | 2.8 | 183% | Day |
| 41 | 2025-11-01 08:02:02 | 82 | 55dB | 6.1 | 506% | Day |
| 42 | 2025-11-01 08:06:31 | 81 | 55dB | 6.1 | 506% | Day |
| 43 | 2025-11-01 08:08:48 | 81 | 55dB | 6.1 | 506% | Day |
| 44 | 2025-11-01 08:29:05 | 75 | 55dB | 3.7 | 273% | Day |
| 45 | 2025-11-01 08:40:21 | 81 | 55dB | 6.1 | 506% | Day |
| 46 | 2025-11-01 08:41:44 | 78 | 55dB | 4.9 | 392% | Day |
| 47 | 2025-11-01 08:43:15 | 82 | 55dB | 6.1 | 506% | Day |
| 48 | 2025-11-01 08:56:04 | 81 | 55dB | 6.1 | 506% | Day |
| 49 | 2025-11-01 09:06:57 | 81 | 55dB | 6.1 | 506% | Day |
| 50 | 2025-11-01 09:14:52 | 81 | 55dB | 6.1 | 506% | Day |
| 51 | 2025-11-01 09:18:24 | 71 | 55dB | 3.0 | 203% | Day |
| 52 | 2025-11-01 09:20:47 | 81 | 55dB | 6.1 | 506% | Day |
| 53 | 2025-11-01 09:26:16 | 68 | 55dB | 2.3 | 130% | Day |
| 54 | 2025-11-01 09:29:02 | 81 | 55dB | 6.1 | 506% | Day |
| 55 | 2025-11-01 09:42:02 | 81 | 55dB | 6.1 | 506% | Day |
| 56 | 2025-11-01 09:43:23 | 69 | 55dB | 2.6 | 164% | Day |
| 57 | 2025-11-01 09:45:07 | 73 | 55dB | 3.2 | 225% | Day |
| 58 | 2025-11-01 09:47:16 | 81 | 55dB | 6.1 | 506% | Day |
| 59 | 2025-11-01 09:50:41 | 81 | 55dB | 6.1 | 506% | Day |
| 60 | 2025-11-01 09:52:46 | | 55dB | ? | ? | Day |
| 61 | 2025-11-01 09:54:32 | 77 | 55dB | 4.6 | 359% | Day |
| 62 | 2025-11-01 09:56:20 | 81 | 55dB | 6.1 | 506% | Day |
| 63 | 2025-11-01 09:58:32 | 66 | 55dB | 2.1 | 114% | Day |
| 64 | 2025-11-01 10:01:15 | 85 | 55dB | 7.5 | 646% | Day |
| 65 | 2025-11-01 10:06:50 | 83 | 55dB | 7.0 | 596% | Day |
| 66 | 2025-11-01 10:12:18 | 84 | 55dB | 7.0 | 596% | Day |
| 67 | 2025-11-01 10:15:14 | 72 | 55dB | 3.2 | 225% | Day |
| 68 | 2025-11-01 10:18:03 | 84 | 55dB | 7.0 | 596% | Day |
| 69 | 2025-11-01 10:21:52 | 72 | 55dB | 3.0 | 203% | Day |
| 70 | 2025-11-01 10:23:30 | 70 | 55dB | 2.6 | 164% | Day |
| 71 | 2025-11-01 10:26:18 | 82 | 55dB | 6.5 | 550% | Day |
| 72 | 2025-11-01 10:30:36 | 75 | 55dB | 4.0 | 300% | Day |
| 73 | 2025-11-01 10:32:27 | 83 | 55dB | 7.0 | 596% | Day |
| 74 | 2025-11-01 10:37:02 | 82 | 55dB | 6.5 | 550% | Day |
| 75 | 2025-11-01 10:39:21 | 82 | 55dB | 6.5 | 550% | Day |
| 76 | 2025-11-01 10:41:11 | 67 | 55dB | 2.3 | 130% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 77 | 2025-11-01 10:42:43 | 82 | 55dB | 6.5 | 550% | Day |
| 78 | 2025-11-01 10:44:39 | 83 | 55dB | 6.5 | 550% | Day |
| 79 | 2025-11-01 10:46:30 | 69 | 55dB | 2.6 | 164% | Day |
| 80 | 2025-11-01 10:48:24 | 83 | 55dB | 6.5 | 550% | Day |
| 81 | 2025-11-01 10:49:58 | 82 | 55dB | 6.5 | 550% | Day |
| 82 | 2025-11-01 10:54:33 | 73 | 55dB | 3.5 | 248% | Day |
| 83 | 2025-11-01 10:55:54 | 69 | 55dB | 2.6 | 164% | Day |
| 84 | 2025-11-01 10:57:18 | 82 | 55dB | 6.5 | 550% | Day |
| 85 | 2025-11-01 10:59:01 | 83 | 55dB | 6.5 | 550% | Day |
| 86 | 2025-11-01 11:01:00 | 69 | 55dB | 2.5 | 146% | Day |
| 87 | 2025-11-01 11:02:26 | 82 | 55dB | 6.5 | 550% | Day |
| 88 | 2025-11-01 11:04:43 | 82 | 55dB | 6.5 | 550% | Day |
| 89 | 2025-11-01 11:06:28 | 71 | 55dB | 2.8 | 183% | Day |
| 90 | 2025-11-01 11:12:05 | 72 | 55dB | 3.0 | 203% | Day |
| 91 | 2025-11-01 11:13:52 | 68 | 55dB | 2.3 | 130% | Day |
| 92 | 2025-11-01 11:15:54 | | 55dB | ? | ? | Day |
| 93 | 2025-11-01 11:18:24 | 69 | 55dB | 2.6 | 164% | Day |
| 94 | 2025-11-01 11:21:03 | 68 | 55dB | 2.5 | 146% | Day |
| 95 | 2025-11-01 11:26:22 | 68 | 55dB | 2.5 | 146% | Day |
| 96 | 2025-11-01 11:28:18 | 70 | 55dB | 2.8 | 183% | Day |
| 97 | 2025-11-01 11:30:39 | | 55dB | ? | ? | Day |
| 98 | 2025-11-01 11:32:52 | 77 | 55dB | 4.6 | 359% | Day |
| 99 | 2025-11-01 11:37:23 | 69 | 55dB | 2.5 | 146% | Day |
| 100 | 2025-11-01 11:39:50 | 68 | 55dB | 2.3 | 130% | Day |
| 101 | 2025-11-01 11:42:40 | 69 | 55dB | 2.6 | 164% | Day |
| 102 | 2025-11-01 11:44:15 | 68 | 55dB | 2.5 | 146% | Day |
| 103 | 2025-11-01 11:48:22 | 69 | 55dB | 2.5 | 146% | Day |
| 104 | 2025-11-01 11:55:06 | 74 | 55dB | 3.7 | 273% | Day |
| 105 | 2025-11-01 12:00:17 | | 55dB | ? | ? | Day |
| 106 | 2025-11-01 12:01:49 | 70 | 55dB | 2.6 | 164% | Day |
| 107 | 2025-11-01 12:04:30 | 69 | 55dB | 2.5 | 146% | Day |
| 108 | 2025-11-01 12:06:10 | 75 | 55dB | 4.0 | 300% | Day |
| 109 | 2025-11-01 12:08:13 | 76 | 55dB | 4.0 | 300% | Day |
| 110 | 2025-11-01 12:09:33 | | 55dB | ? | ? | Day |
| 111 | 2025-11-01 12:13:46 | 73 | 55dB | 3.2 | 225% | Day |
| 112 | 2025-11-01 12:15:25 | 69 | 55dB | 2.6 | 164% | Day |
| 113 | 2025-11-01 12:17:36 | 72 | 55dB | 3.2 | 225% | Day |
| 114 | 2025-11-01 12:19:40 | 70 | 55dB | 2.8 | 183% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 115 | 2025-11-01 12:22:01 | 68 | 55dB | 2.5 | 146% | Day |
| 116 | 2025-11-01 12:24:07 | 68 | 55dB | 2.5 | 146% | Day |
| 117 | 2025-11-01 12:28:09 | 67 | 55dB | 2.1 | 114% | Day |
| 118 | 2025-11-01 12:30:40 | 71 | 55dB | 2.8 | 183% | Day |
| 119 | 2025-11-01 12:32:56 | 70 | 55dB | 2.8 | 183% | Day |
| 120 | 2025-11-01 12:35:40 | 71 | 55dB | 3.0 | 203% | Day |
| 121 | 2025-11-01 12:38:26 | 68 | 55dB | 2.5 | 146% | Day |
| 122 | 2025-11-01 12:40:09 | 68 | 55dB | 2.3 | 130% | Day |
| 123 | 2025-11-01 12:42:20 | 71 | 55dB | 2.8 | 183% | Day |
| 124 | 2025-11-01 12:46:50 | 69 | 55dB | 2.5 | 146% | Day |
| 125 | 2025-11-01 12:49:06 | 70 | 55dB | 2.6 | 164% | Day |
| 126 | 2025-11-01 12:50:45 | 69 | 55dB | 2.6 | 164% | Day |
| 127 | 2025-11-01 12:52:35 | 72 | 55dB | 3.0 | 203% | Day |
| 128 | 2025-11-01 12:54:51 | 75 | 55dB | 4.0 | 300% | Day |
| 129 | 2025-11-01 12:57:02 | 70 | 55dB | 2.8 | 183% | Day |
| 130 | 2025-11-01 13:01:21 | | 55dB | ? | ? | Day |
| 131 | 2025-11-01 13:08:09 | 71 | 55dB | 3.0 | 203% | Day |
| 132 | 2025-11-01 13:12:22 | 71 | 55dB | 2.8 | 183% | Day |
| 133 | 2025-11-01 13:14:50 | 74 | 55dB | 3.5 | 248% | Day |
| 134 | 2025-11-01 13:18:05 | 69 | 55dB | 2.5 | 146% | Day |
| 135 | 2025-11-01 13:20:22 | 78 | 55dB | 4.6 | 359% | Day |
| 136 | 2025-11-01 13:23:25 | 70 | 55dB | 2.8 | 183% | Day |
| 137 | 2025-11-01 13:25:48 | | 55dB | ? | ? | Day |
| 138 | 2025-11-01 13:27:48 | 68 | 55dB | 2.5 | 146% | Day |
| 139 | 2025-11-01 13:29:12 | 75 | 55dB | 3.7 | 273% | Day |
| 140 | 2025-11-01 13:30:26 | 69 | 55dB | 2.6 | 164% | Day |
| 141 | 2025-11-01 13:32:01 | 70 | 55dB | 2.6 | 164% | Day |
| 142 | 2025-11-01 13:33:37 | 69 | 55dB | 2.5 | 146% | Day |
| 143 | 2025-11-01 13:50:30 | | 55dB | ? | ? | Day |
| 144 | 2025-11-01 13:52:36 | 74 | 55dB | 3.7 | 273% | Day |
| 145 | 2025-11-01 13:54:52 | 69 | 55dB | 2.6 | 164% | Day |
| 146 | 2025-11-01 13:56:22 | 71 | 55dB | 2.8 | 183% | Day |
| 147 | 2025-11-01 13:58:26 | | 55dB | ? | ? | Day |
| 148 | 2025-11-01 14:08:34 | 71 | 55dB | 3.0 | 203% | Day |
| 149 | 2025-11-01 14:10:53 | 73 | 55dB | 3.5 | 248% | Day |
| 150 | 2025-11-01 14:13:13 | 70 | 55dB | 2.6 | 164% | Day |
| 151 | 2025-11-01 14:15:18 | 69 | 55dB | 2.6 | 164% | Day |
| 152 | 2025-11-01 14:16:47 | 71 | 55dB | 2.8 | 183% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 153 | 2025-11-01 14:17:56 | 79 | 55dB | 5.3 | 428% | Day |
| 154 | 2025-11-01 14:20:17 | 81 | 55dB | 6.1 | 506% | Day |
| 155 | 2025-11-01 14:21:54 | 76 | 55dB | 4.0 | 300% | Day |
| 156 | 2025-11-01 14:23:56 | 70 | 55dB | 2.6 | 164% | Day |
| 157 | 2025-11-01 14:25:28 | 69 | 55dB | 2.5 | 146% | Day |
| 158 | 2025-11-01 14:27:10 | 73 | 55dB | 3.2 | 225% | Day |
| 159 | 2025-11-01 14:29:38 | 70 | 55dB | 2.6 | 164% | Day |
| 160 | 2025-11-01 14:31:24 | 72 | 55dB | 3.2 | 225% | Day |
| 161 | 2025-11-01 14:33:57 | 68 | 55dB | 2.3 | 130% | Day |
| 162 | 2025-11-01 14:37:00 | 68 | 55dB | 2.5 | 146% | Day |
| 163 | 2025-11-01 14:38:18 | 71 | 55dB | 3.0 | 203% | Day |
| 164 | 2025-11-01 14:39:51 | 80 | 55dB | 5.3 | 428% | Day |
| 165 | 2025-11-01 14:41:12 | 70 | 55dB | 2.8 | 183% | Day |
| 166 | 2025-11-01 14:42:46 | 76 | 55dB | 4.3 | 329% | Day |
| 167 | 2025-11-01 14:45:09 | 69 | 55dB | 2.6 | 164% | Day |
| 168 | 2025-11-01 14:46:58 | | 55dB | ? | ? | Day |
| 169 | 2025-11-01 14:48:35 | 74 | 55dB | 3.7 | 273% | Day |
| 170 | 2025-11-01 14:50:27 | 70 | 55dB | 2.6 | 164% | Day |
| 171 | 2025-11-01 14:51:39 | 70 | 55dB | 2.8 | 183% | Day |
| 172 | 2025-11-01 14:53:12 | 71 | 55dB | 3.0 | 203% | Day |
| 173 | 2025-11-01 14:55:00 | 71 | 55dB | 2.8 | 183% | Day |
| 174 | 2025-11-01 15:02:27 | | 55dB | ? | ? | Day |
| 175 | 2025-11-01 15:08:27 | 71 | 55dB | 2.8 | 183% | Day |
| 176 | 2025-11-01 15:10:27 | 70 | 55dB | 2.8 | 183% | Day |
| 177 | 2025-11-01 15:12:24 | | 55dB | ? | ? | Day |
| 178 | 2025-11-01 15:14:28 | | 55dB | ? | ? | Day |
| 179 | 2025-11-01 15:16:16 | 80 | 55dB | 5.3 | 428% | Day |
| 180 | 2025-11-01 15:17:52 | 69 | 55dB | 2.6 | 164% | Day |
| 181 | 2025-11-01 15:19:38 | 71 | 55dB | 3.0 | 203% | Day |
| 182 | 2025-11-01 15:22:01 | 75 | 55dB | 4.0 | 300% | Day |
| 183 | 2025-11-01 15:24:10 | 73 | 55dB | 3.5 | 248% | Day |
| 184 | 2025-11-01 15:27:27 | 71 | 55dB | 3.0 | 203% | Day |
| 185 | 2025-11-01 15:30:40 | 70 | 55dB | 2.8 | 183% | Day |
| 186 | 2025-11-01 15:33:15 | 69 | 55dB | 2.5 | 146% | Day |
| 187 | 2025-11-01 15:34:51 | 71 | 55dB | 3.0 | 203% | Day |
| 188 | 2025-11-01 15:36:32 | 71 | 55dB | 2.8 | 183% | Day |
| 189 | 2025-11-01 15:38:44 | 69 | 55dB | 2.6 | 164% | Day |
| 190 | 2025-11-01 15:40:56 | 74 | 55dB | 3.5 | 248% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 191 | 2025-11-01 15:43:15 | 71 | 55dB | 3.0 | 203% | Day |
| 192 | 2025-11-01 15:46:30 | | 55dB | ? | ? | Day |
| 193 | 2025-11-01 15:49:37 | | 55dB | ? | ? | Day |
| 194 | 2025-11-01 15:51:46 | 72 | 55dB | 3.0 | 203% | Day |
| 195 | 2025-11-01 15:53:24 | 70 | 55dB | 2.6 | 164% | Day |
| 196 | 2025-11-01 15:55:16 | 73 | 55dB | 3.2 | 225% | Day |
| 197 | 2025-11-01 15:57:16 | 73 | 55dB | 3.5 | 248% | Day |
| 198 | 2025-11-01 15:59:44 | | 55dB | ? | ? | Day |
| 199 | 2025-11-01 16:01:52 | 74 | 55dB | 3.7 | 273% | Day |
| 200 | 2025-11-01 16:05:00 | 68 | 55dB | 2.3 | 130% | Day |
| 201 | 2025-11-01 16:06:42 | 78 | 55dB | 4.6 | 359% | Day |
| 202 | 2025-11-01 16:08:23 | | 55dB | ? | ? | Day |
| 203 | 2025-11-01 16:10:31 | | 55dB | ? | ? | Day |
| 204 | 2025-11-01 16:16:07 | 74 | 55dB | 3.7 | 273% | Day |
| 205 | 2025-11-01 16:18:26 | 70 | 55dB | 2.6 | 164% | Day |
| 206 | 2025-11-01 16:20:42 | 71 | 55dB | 2.8 | 183% | Day |
| 207 | 2025-11-01 16:22:16 | 72 | 55dB | 3.2 | 225% | Day |
| 208 | 2025-11-01 16:24:25 | 71 | 55dB | 2.8 | 183% | Day |
| 209 | 2025-11-01 16:26:03 | 69 | 55dB | 2.5 | 146% | Day |
| 210 | 2025-11-01 16:27:38 | | 55dB | ? | ? | Day |
| 211 | 2025-11-01 16:31:39 | 72 | 55dB | 3.0 | 203% | Day |
| 212 | 2025-11-01 16:35:55 | | 55dB | ? | ? | Day |
| 213 | 2025-11-01 16:37:37 | 76 | 55dB | 4.3 | 329% | Day |
| 214 | 2025-11-01 16:40:09 | | 55dB | ? | ? | Day |
| 215 | 2025-11-01 16:41:51 | 72 | 55dB | 3.0 | 203% | Day |
| 216 | 2025-11-01 16:44:18 | 69 | 55dB | 2.6 | 164% | Day |
| 217 | 2025-11-01 16:46:02 | 69 | 55dB | 2.5 | 146% | Day |
| 218 | 2025-11-01 16:48:01 | 70 | 55dB | 2.6 | 164% | Day |
| 219 | 2025-11-01 16:51:01 | 68 | 55dB | 2.5 | 146% | Day |
| 220 | 2025-11-01 16:52:51 | 70 | 55dB | 2.6 | 164% | Day |
| 221 | 2025-11-01 16:54:32 | 71 | 55dB | 2.8 | 183% | Day |
| 222 | 2025-11-01 16:57:05 | 73 | 55dB | 3.2 | 225% | Day |
| 223 | 2025-11-01 16:59:30 | 71 | 55dB | 2.8 | 183% | Day |
| 224 | 2025-11-01 17:00:59 | 69 | 55dB | 2.5 | 146% | Day |
| 225 | 2025-11-01 17:02:28 | 73 | 55dB | 3.5 | 248% | Day |
| 226 | 2025-11-01 17:04:45 | 69 | 55dB | 2.6 | 164% | Day |
| 227 | 2025-11-01 17:06:30 | 70 | 55dB | 2.8 | 183% | Day |
| 228 | 2025-11-01 17:08:32 | 70 | 55dB | 2.6 | 164% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 229 | 2025-11-01 17:10:22 | | 55dB | ? | ? | Day |
| 230 | 2025-11-01 17:12:56 | 68 | 55dB | 2.5 | 146% | Day |
| 231 | 2025-11-01 17:15:00 | 75 | 55dB | 3.7 | 273% | Day |
| 232 | 2025-11-01 17:20:10 | 68 | 55dB | 2.5 | 146% | Day |
| 233 | 2025-11-01 17:22:19 | 72 | 55dB | 3.2 | 225% | Day |
| 234 | 2025-11-01 17:25:40 | 70 | 55dB | 2.8 | 183% | Day |
| 235 | 2025-11-01 17:27:12 | 66 | 55dB | 2.1 | 114% | Day |
| 236 | 2025-11-01 17:29:10 | 75 | 55dB | 4.0 | 300% | Day |
| 237 | 2025-11-01 17:31:18 | 74 | 55dB | 3.7 | 273% | Day |
| 238 | 2025-11-01 17:33:18 | 71 | 55dB | 3.0 | 203% | Day |
| 239 | 2025-11-01 17:35:15 | 70 | 55dB | 2.8 | 183% | Day |
| 240 | 2025-11-01 17:38:22 | 71 | 55dB | 2.8 | 183% | Day |
| 241 | 2025-11-01 17:42:42 | 72 | 55dB | 3.2 | 225% | Day |
| 242 | 2025-11-01 17:44:36 | 72 | 55dB | 3.0 | 203% | Day |
| 243 | 2025-11-01 17:46:44 | | 55dB | ? | ? | Day |
| 244 | 2025-11-01 17:48:17 | 69 | 55dB | 2.6 | 164% | Day |
| 245 | 2025-11-01 17:50:06 | | 55dB | ? | ? | Day |
| 246 | 2025-11-01 17:52:10 | 75 | 55dB | 4.0 | 300% | Day |
| 247 | 2025-11-01 17:55:38 | 70 | 55dB | 2.8 | 183% | Day |
| 248 | 2025-11-01 17:57:15 | 70 | 55dB | 2.8 | 183% | Day |
| 249 | 2025-11-01 17:58:41 | 69 | 55dB | 2.5 | 146% | Day |
| 250 | 2025-11-01 18:00:05 | | 55dB | ? | ? | Day |
| 251 | 2025-11-01 18:02:09 | | 55dB | ? | ? | Day |
| 252 | 2025-11-01 18:05:31 | 70 | 55dB | 2.6 | 164% | Day |
| 253 | 2025-11-01 18:07:39 | 67 | 55dB | 2.1 | 114% | Day |
| 254 | 2025-11-01 18:11:27 | 68 | 55dB | 2.3 | 130% | Day |
| 255 | 2025-11-01 18:13:06 | 73 | 55dB | 3.2 | 225% | Day |
| 256 | 2025-11-01 18:14:55 | 69 | 55dB | 2.5 | 146% | Day |
| 257 | 2025-11-01 18:17:36 | 73 | 55dB | 3.2 | 225% | Day |
| 258 | 2025-11-01 18:19:37 | 68 | 55dB | 2.3 | 130% | Day |
| 259 | 2025-11-01 18:21:33 | | 55dB | ? | ? | Day |
| 260 | 2025-11-01 18:23:50 | 68 | 55dB | 2.3 | 130% | Day |
| 261 | 2025-11-01 18:25:46 | 69 | 55dB | 2.6 | 164% | Day |
| 262 | 2025-11-01 18:28:05 | 72 | 55dB | 3.0 | 203% | Day |
| 263 | 2025-11-01 18:29:53 | 70 | 55dB | 2.8 | 183% | Day |
| 264 | 2025-11-01 18:31:57 | | 55dB | ? | ? | Day |
| 265 | 2025-11-01 18:34:11 | 70 | 55dB | 2.8 | 183% | Day |
| 266 | 2025-11-01 18:36:11 | 69 | 55dB | 2.5 | 146% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 267 | 2025-11-01 18:39:02 | 70 | 55dB | 2.8 | 183% | Day |
| 268 | 2025-11-01 18:40:42 | 72 | 55dB | 3.0 | 203% | Day |
| 269 | 2025-11-01 18:44:58 | 70 | 55dB | 2.8 | 183% | Day |
| 270 | 2025-11-01 18:46:24 | 72 | 55dB | 3.2 | 225% | Day |
| 271 | 2025-11-01 18:48:21 | 70 | 55dB | 2.8 | 183% | Day |
| 272 | 2025-11-01 18:50:40 | 70 | 55dB | 2.6 | 164% | Day |
| 273 | 2025-11-01 18:52:37 | 68 | 55dB | 2.3 | 130% | Day |
| 274 | 2025-11-01 18:54:52 | 71 | 55dB | 3.0 | 203% | Day |
| 275 | 2025-11-01 18:57:23 | 74 | 55dB | 3.7 | 273% | Day |
| 276 | 2025-11-01 18:59:28 | 68 | 55dB | 2.3 | 130% | Day |
| 277 | 2025-11-01 19:01:07 | 70 | 55dB | 2.6 | 164% | Day |
| 278 | 2025-11-01 19:02:54 | 73 | 55dB | 3.2 | 225% | Day |
| 279 | 2025-11-01 19:04:53 | 69 | 55dB | 2.6 | 164% | Day |
| 280 | 2025-11-01 19:06:58 | 72 | 55dB | 3.0 | 203% | Day |
| 281 | 2025-11-01 19:09:12 | 68 | 55dB | 2.5 | 146% | Day |
| 282 | 2025-11-01 19:10:48 | 69 | 55dB | 2.5 | 146% | Day |
| 283 | 2025-11-01 19:13:18 | 66 | 55dB | 2.1 | 114% | Day |
| 284 | 2025-11-01 19:15:05 | 69 | 55dB | 2.5 | 146% | Day |
| 285 | 2025-11-01 19:16:50 | 69 | 55dB | 2.5 | 146% | Day |
| 286 | 2025-11-01 19:19:41 | 73 | 55dB | 3.5 | 248% | Day |
| 287 | 2025-11-01 19:22:19 | 71 | 55dB | 2.8 | 183% | Day |
| 288 | 2025-11-01 19:24:10 | 77 | 55dB | 4.6 | 359% | Day |
| 289 | 2025-11-01 19:25:56 | 68 | 55dB | 2.5 | 146% | Day |
| 290 | 2025-11-01 19:27:38 | 68 | 55dB | 2.5 | 146% | Day |
| 291 | 2025-11-01 19:29:58 | 72 | 55dB | 3.2 | 225% | Day |
| 292 | 2025-11-01 19:32:58 | 68 | 55dB | 2.5 | 146% | Day |
| 293 | 2025-11-01 19:34:55 | 68 | 55dB | 2.5 | 146% | Day |
| 294 | 2025-11-01 19:37:33 | 69 | 55dB | 2.5 | 146% | Day |
| 295 | 2025-11-01 19:39:07 | 68 | 55dB | 2.3 | 130% | Day |
| 296 | 2025-11-01 19:40:50 | | 55dB | ? | ? | Day |
| 297 | 2025-11-01 19:42:37 | 68 | 55dB | 2.3 | 130% | Day |
| 298 | 2025-11-01 19:44:34 | 68 | 55dB | 2.5 | 146% | Day |
| 299 | 2025-11-01 19:46:56 | 69 | 55dB | 2.6 | 164% | Day |
| 300 | 2025-11-01 19:49:37 | 70 | 55dB | 2.6 | 164% | Day |
| 301 | 2025-11-01 19:51:27 | 73 | 55dB | 3.5 | 248% | Day |
| 302 | 2025-11-01 19:54:02 | 70 | 55dB | 2.8 | 183% | Day |
| 303 | 2025-11-01 19:55:39 | 70 | 55dB | 2.6 | 164% | Day |
| 304 | 2025-11-01 19:57:22 | 69 | 55dB | 2.5 | 146% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 305 | 2025-11-01 19:59:34 | | 55dB | ? | ? | Day |
| 306 | 2025-11-01 20:01:27 | 69 | 55dB | 2.5 | 146% | Day |
| 307 | 2025-11-01 20:04:39 | 66 | 55dB | 2.1 | 114% | Day |
| 308 | 2025-11-01 20:06:23 | 74 | 55dB | 3.5 | 248% | Day |
| 309 | 2025-11-01 20:08:42 | 75 | 55dB | 3.7 | 273% | Day |
| 310 | 2025-11-01 20:10:50 | 69 | 55dB | 2.5 | 146% | Day |
| 311 | 2025-11-01 20:12:31 | 69 | 55dB | 2.5 | 146% | Day |
| 312 | 2025-11-01 20:14:14 | | 55dB | ? | ? | Day |
| 313 | 2025-11-01 20:16:02 | 71 | 55dB | 2.8 | 183% | Day |
| 314 | 2025-11-01 20:18:26 | 74 | 55dB | 3.5 | 248% | Day |
| 315 | 2025-11-01 20:20:11 | 70 | 55dB | 2.6 | 164% | Day |
| 316 | 2025-11-01 20:21:36 | 71 | 55dB | 2.8 | 183% | Day |
| 317 | 2025-11-01 20:23:05 | | 55dB | ? | ? | Day |
| 318 | 2025-11-01 20:24:53 | 70 | 55dB | 2.6 | 164% | Day |
| 319 | 2025-11-01 20:27:07 | 68 | 55dB | 2.5 | 146% | Day |
| 320 | 2025-11-01 20:29:46 | 69 | 55dB | 2.5 | 146% | Day |
| 321 | 2025-11-01 20:31:46 | 69 | 55dB | 2.5 | 146% | Day |
| 322 | 2025-11-01 20:33:42 | 70 | 55dB | 2.8 | 183% | Day |
| 323 | 2025-11-01 20:35:50 | 71 | 55dB | 2.8 | 183% | Day |
| 324 | 2025-11-01 20:37:12 | 68 | 55dB | 2.5 | 146% | Day |
| 325 | 2025-11-01 20:40:42 | 68 | 55dB | 2.5 | 146% | Day |
| 326 | 2025-11-01 20:44:26 | 68 | 55dB | 2.5 | 146% | Day |
| 327 | 2025-11-01 20:45:35 | 73 | 55dB | 3.2 | 225% | Day |
| 328 | 2025-11-01 20:46:58 | 70 | 55dB | 2.6 | 164% | Day |
| 329 | 2025-11-01 20:48:11 | 68 | 55dB | 2.3 | 130% | Day |
| 330 | 2025-11-01 20:49:57 | 75 | 55dB | 4.0 | 300% | Day |
| 331 | 2025-11-01 20:51:59 | 67 | 55dB | 2.1 | 114% | Day |
| 332 | 2025-11-01 20:53:24 | 71 | 55dB | 2.8 | 183% | Day |
| 333 | 2025-11-01 20:55:03 | 71 | 55dB | 2.8 | 183% | Day |
| 334 | 2025-11-01 20:57:49 | 70 | 55dB | 2.8 | 183% | Day |
| 335 | 2025-11-01 20:59:08 | 74 | 55dB | 3.7 | 273% | Day |
| 336 | 2025-11-01 21:00:51 | 88 | 55dB | 9.2 | 819% | Day |
| 337 | 2025-11-01 21:02:13 | 67 | 55dB | 2.3 | 130% | Day |
| 338 | 2025-11-01 21:03:50 | | 55dB | ? | ? | Day |
| 339 | 2025-11-01 21:05:09 | 68 | 55dB | 2.5 | 146% | Day |
| 340 | 2025-11-01 21:06:34 | 68 | 55dB | 2.5 | 146% | Day |
| 341 | 2025-11-01 21:08:30 | 71 | 55dB | 2.8 | 183% | Day |
| 342 | 2025-11-01 21:10:12 | 70 | 55dB | 2.8 | 183% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 343 | 2025-11-01 21:11:42 | 71 | 55dB | 2.8 | 183% | Day |
| 344 | 2025-11-01 21:13:30 | 69 | 55dB | 2.6 | 164% | Day |
| 345 | 2025-11-01 21:15:15 | 75 | 55dB | 3.7 | 273% | Day |
| 346 | 2025-11-01 21:16:25 | 71 | 55dB | 2.8 | 183% | Day |
| 347 | 2025-11-01 21:17:34 | 69 | 55dB | 2.5 | 146% | Day |
| 348 | 2025-11-01 21:18:51 | 69 | 55dB | 2.5 | 146% | Day |
| 349 | 2025-11-01 21:20:04 | 66 | 55dB | 2.0 | 100% | Day |
| 350 | 2025-11-01 21:21:26 | 70 | 55dB | 2.6 | 164% | Day |
| 351 | 2025-11-01 21:23:45 | 68 | 55dB | 2.3 | 130% | Day |
| 352 | 2025-11-01 21:25:12 | 66 | 55dB | 2.1 | 114% | Day |
| 353 | 2025-11-01 21:27:03 | 69 | 55dB | 2.6 | 164% | Day |
| 354 | 2025-11-01 21:28:56 | 69 | 55dB | 2.6 | 164% | Day |
| 355 | 2025-11-01 21:30:06 | 69 | 55dB | 2.5 | 146% | Day |
| 356 | 2025-11-01 21:31:20 | 73 | 55dB | 3.5 | 248% | Day |
| 357 | 2025-11-01 21:33:50 | 71 | 55dB | 2.8 | 183% | Day |
| 358 | 2025-11-01 21:35:34 | 69 | 55dB | 2.6 | 164% | Day |
| 359 | 2025-11-01 21:38:26 | 79 | 55dB | 4.9 | 392% | Day |
| 360 | 2025-11-01 21:42:34 | 72 | 55dB | 3.2 | 225% | Day |
| 361 | 2025-11-01 21:44:34 | 72 | 55dB | 3.0 | 203% | Day |
| 362 | 2025-11-01 21:45:45 | 67 | 55dB | 2.3 | 130% | Day |
| 363 | 2025-11-01 21:47:09 | 71 | 55dB | 2.8 | 183% | Day |
| 364 | 2025-11-01 21:50:48 | 68 | 55dB | 2.3 | 130% | Day |
| 365 | 2025-11-01 21:52:18 | 73 | 55dB | 3.2 | 225% | Day |
| 366 | 2025-11-01 21:55:31 | 68 | 55dB | 2.5 | 146% | Day |
| 367 | 2025-11-01 22:02:44 | 69 | 55dB | 2.5 | 146% | Day |
| 368 | 2025-11-01 22:04:17 | 68 | 55dB | 2.3 | 130% | Day |
| 369 | 2025-11-01 22:05:44 | 68 | 55dB | 2.3 | 130% | Day |
| 370 | 2025-11-01 22:08:15 | 71 | 55dB | 2.8 | 183% | Day |
| 371 | 2025-11-01 22:10:36 | 70 | 55dB | 2.8 | 183% | Day |
| 372 | 2025-11-01 22:12:27 | 69 | 55dB | 2.5 | 146% | Day |
| 373 | 2025-11-01 22:13:41 | 69 | 55dB | 2.6 | 164% | Day |
| 374 | 2025-11-01 22:15:12 | 68 | 55dB | 2.5 | 146% | Day |
| 375 | 2025-11-01 22:19:52 | 74 | 55dB | 3.7 | 273% | Day |
| 376 | 2025-11-01 22:22:21 | 70 | 55dB | 2.8 | 183% | Day |
| 377 | 2025-11-01 22:23:44 | 70 | 55dB | 2.6 | 164% | Day |
| 378 | 2025-11-01 22:25:01 | 68 | 55dB | 2.5 | 146% | Day |
| 379 | 2025-11-01 22:27:42 | 68 | 55dB | 2.5 | 146% | Day |
| 380 | 2025-11-01 22:29:32 | 71 | 55dB | 2.8 | 183% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 381 | 2025-11-01 22:31:07 | 71 | 55dB | 2.8 | 183% | Day |
| 382 | 2025-11-01 22:32:20 | 66 | 55dB | 2.1 | 114% | Day |
| 383 | 2025-11-01 22:33:53 | 69 | 55dB | 2.6 | 164% | Day |
| 384 | 2025-11-01 22:36:39 | 70 | 55dB | 2.8 | 183% | Day |
| 385 | 2025-11-01 22:39:46 | 69 | 55dB | 2.6 | 164% | Day |
| 386 | 2025-11-01 22:41:58 | 70 | 55dB | 2.6 | 164% | Day |
| 387 | 2025-11-01 22:44:22 | 68 | 55dB | 2.3 | 130% | Day |
| 388 | 2025-11-01 22:45:57 | 74 | 55dB | 3.7 | 273% | Day |
| 389 | 2025-11-01 22:47:42 | 67 | 55dB | 2.3 | 130% | Day |
| 390 | 2025-11-01 22:50:00 | 69 | 55dB | 2.6 | 164% | Day |
| 391 | 2025-11-01 22:55:55 | 69 | 55dB | 2.5 | 146% | Day |
| 392 | 2025-11-01 22:58:07 | 69 | 55dB | 2.6 | 164% | Day |
| 393 | 2025-11-01 23:00:42 | 73 | 45dB | 7.0 | 596% | Night |
| 394 | 2025-11-01 23:03:52 | | 45dB | ? | ? | Night |
| 395 | 2025-11-01 23:10:49 | 69 | 45dB | 4.9 | 392% | Night |
| 396 | 2025-11-01 23:13:18 | 76 | 45dB | 8.6 | 757% | Night |
| 397 | 2025-11-01 23:15:02 | 71 | 45dB | 6.1 | 506% | Night |
| 398 | 2025-11-01 23:20:49 | | 45dB | ? | ? | Night |
| 399 | 2025-11-01 23:22:51 | 72 | 45dB | 6.5 | 550% | Night |
| 400 | 2025-11-01 23:25:12 | | 45dB | ? | ? | Night |
| 401 | 2025-11-01 23:27:21 | 70 | 45dB | 5.3 | 428% | Night |
| 402 | 2025-11-01 23:29:21 | 77 | 45dB | 9.2 | 819% | Night |
| 403 | 2025-11-01 23:31:10 | | 45dB | ? | ? | Night |
| 404 | 2025-11-01 23:34:23 | 69 | 45dB | 4.9 | 392% | Night |
| 405 | 2025-11-01 23:35:55 | 70 | 45dB | 5.3 | 428% | Night |
| 406 | 2025-11-01 23:37:27 | 71 | 45dB | 5.7 | 466% | Night |
| 407 | 2025-11-01 23:39:15 | 72 | 45dB | 6.1 | 506% | Night |
| 408 | 2025-11-01 23:42:31 | 69 | 45dB | 5.3 | 428% | Night |
| 409 | 2025-11-01 23:43:50 | 70 | 45dB | 5.3 | 428% | Night |
| 410 | 2025-11-01 23:45:42 | | 45dB | ? | ? | Night |
| 411 | 2025-11-01 23:48:13 | 74 | 45dB | 7.0 | 596% | Night |
| 412 | 2025-11-01 23:51:53 | 70 | 45dB | 5.3 | 428% | Night |
| 413 | 2025-11-01 23:54:34 | 68 | 45dB | 4.6 | 359% | Night |
| 414 | 2025-11-01 23:55:42 | 71 | 45dB | 6.1 | 506% | Night |
| 415 | 2025-11-01 23:59:08 | 69 | 45dB | 5.3 | 428% | Night |
| 416 | 2025-11-02 00:00:32 | 67 | 45dB | 4.6 | 359% | Night |
| 417 | 2025-11-02 00:03:08 | 68 | 45dB | 4.9 | 392% | Night |
| 418 | 2025-11-02 00:04:30 | 72 | 45dB | 6.1 | 506% | Night |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 419 | 2025-11-02 00:10:44 | 71 | 45dB | 5.7 | 466% | Night |
| 420 | 2025-11-02 00:13:17 | 70 | 45dB | 5.3 | 428% | Night |
| 421 | 2025-11-02 00:14:58 | 75 | 45dB | 7.5 | 646% | Night |
| 422 | 2025-11-02 00:17:08 | 72 | 45dB | 6.1 | 506% | Night |
| 423 | 2025-11-02 00:19:51 | 71 | 45dB | 5.7 | 466% | Night |
| 424 | 2025-11-02 00:21:15 | 70 | 45dB | 5.3 | 428% | Night |
| 425 | 2025-11-02 00:25:13 | 71 | 45dB | 5.7 | 466% | Night |
| 426 | 2025-11-02 00:26:46 | 68 | 45dB | 4.9 | 392% | Night |
| 427 | 2025-11-02 00:28:20 | 78 | 45dB | 9.8 | 885% | Night |
| 428 | 2025-11-02 00:31:05 | 68 | 45dB | 4.6 | 359% | Night |
| 429 | 2025-11-02 00:32:42 | 75 | 45dB | 7.5 | 646% | Night |
| 430 | 2025-11-02 00:34:02 | 75 | 45dB | 7.5 | 646% | Night |
| 431 | 2025-11-02 00:35:21 | 71 | 45dB | 6.1 | 506% | Night |
| 432 | 2025-11-02 00:36:50 | 69 | 45dB | 5.3 | 428% | Night |
| 433 | 2025-11-02 06:24:33 | 71 | 45dB | 5.7 | 466% | Night |
| 434 | 2025-11-02 06:29:24 | 70 | 45dB | 5.7 | 466% | Night |
| 435 | 2025-11-02 06:30:51 | 69 | 45dB | 4.9 | 392% | Night |
| 436 | 2025-11-02 06:32:16 | 70 | 45dB | 5.3 | 428% | Night |
| 437 | 2025-11-02 06:33:39 | 69 | 45dB | 5.3 | 428% | Night |
| 438 | 2025-11-02 06:37:49 | 69 | 45dB | 4.9 | 392% | Night |
| 439 | 2025-11-02 06:39:15 | 68 | 45dB | 4.6 | 359% | Night |
| 440 | 2025-11-02 06:40:40 | 69 | 45dB | 5.3 | 428% | Night |
| 441 | 2025-11-02 06:41:50 | 70 | 45dB | 5.7 | 466% | Night |
| 442 | 2025-11-02 06:43:07 | 71 | 45dB | 5.7 | 466% | Night |
| 443 | 2025-11-02 06:44:39 | 69 | 45dB | 5.3 | 428% | Night |
| 444 | 2025-11-02 06:46:25 | 72 | 45dB | 6.1 | 506% | Night |
| 445 | 2025-11-02 06:47:47 | 70 | 45dB | 5.7 | 466% | Night |
| 446 | 2025-11-02 06:49:15 | 71 | 45dB | 6.1 | 506% | Night |
| 447 | 2025-11-02 06:51:23 | 68 | 45dB | 4.9 | 392% | Night |
| 448 | 2025-11-02 06:53:49 | | 45dB | ? | ? | Night |
| 449 | 2025-11-02 07:02:20 | 73 | 55dB | 3.5 | 248% | Day |
| 450 | 2025-11-02 07:03:45 | | 55dB | ? | ? | Day |
| 451 | 2025-11-02 07:07:46 | 72 | 55dB | 3.2 | 225% | Day |
| 452 | 2025-11-02 07:09:35 | 70 | 55dB | 2.6 | 164% | Day |
| 453 | 2025-11-02 07:13:14 | 75 | 55dB | 3.7 | 273% | Day |
| 454 | 2025-11-02 07:20:34 | 71 | 55dB | 2.8 | 183% | Day |
| 455 | 2025-11-02 07:22:20 | 73 | 55dB | 3.2 | 225% | Day |
| 456 | 2025-11-02 07:25:27 | | 55dB | ? | ? | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 457 | 2025-11-02 07:27:17 | 68 | 55dB | 2.3 | 130% | Day |
| 458 | 2025-11-02 07:46:18 | 68 | 55dB | 2.5 | 146% | Day |
| 459 | 2025-11-02 07:48:30 | 69 | 55dB | 2.6 | 164% | Day |
| 460 | 2025-11-02 07:51:23 | 69 | 55dB | 2.5 | 146% | Day |
| 461 | 2025-11-02 07:53:04 | 69 | 55dB | 2.5 | 146% | Day |
| 462 | 2025-11-02 07:54:37 | 69 | 55dB | 2.6 | 164% | Day |
| 463 | 2025-11-02 07:57:21 | 71 | 55dB | 2.8 | 183% | Day |
| 464 | 2025-11-02 08:02:24 | | 55dB | ? | ? | Day |
| 465 | 2025-11-02 08:05:53 | 71 | 55dB | 3.0 | 203% | Day |
| 466 | 2025-11-02 08:08:46 | 70 | 55dB | 2.6 | 164% | Day |
| 467 | 2025-11-02 08:16:03 | 69 | 55dB | 2.5 | 146% | Day |
| 468 | 2025-11-02 08:17:53 | 70 | 55dB | 2.6 | 164% | Day |
| 469 | 2025-11-02 08:19:26 | 69 | 55dB | 2.5 | 146% | Day |
| 470 | 2025-11-02 08:22:50 | 72 | 55dB | 3.2 | 225% | Day |
| 471 | 2025-11-02 08:25:27 | 73 | 55dB | 3.5 | 248% | Day |
| 472 | 2025-11-02 08:27:22 | 68 | 55dB | 2.5 | 146% | Day |
| 473 | 2025-11-02 08:38:28 | 74 | 55dB | 3.7 | 273% | Day |
| 474 | 2025-11-02 08:42:31 | 73 | 55dB | 3.5 | 248% | Day |
| 475 | 2025-11-02 08:45:03 | 72 | 55dB | 3.0 | 203% | Day |
| 476 | 2025-11-02 08:46:42 | 75 | 55dB | 3.7 | 273% | Day |
| 477 | 2025-11-02 08:50:26 | | 55dB | ? | ? | Day |
| 478 | 2025-11-02 08:52:06 | 68 | 55dB | 2.3 | 130% | Day |
| 479 | 2025-11-02 09:00:21 | 69 | 55dB | 2.6 | 164% | Day |
| 480 | 2025-11-02 09:05:30 | 74 | 55dB | 3.5 | 248% | Day |
| 481 | 2025-11-02 09:12:22 | 76 | 55dB | 4.0 | 300% | Day |
| 482 | 2025-11-02 09:21:58 | 69 | 55dB | 2.6 | 164% | Day |
| 483 | 2025-11-02 09:25:33 | | 55dB | ? | ? | Day |
| 484 | 2025-11-02 09:28:45 | 69 | 55dB | 2.6 | 164% | Day |
| 485 | 2025-11-02 12:24:02 | | 55dB | ? | ? | Day |
| 486 | 2025-11-02 12:24:55 | | 55dB | ? | ? | Day |
| 487 | 2025-11-02 13:26:14 | 69 | 55dB | 2.6 | 164% | Day |
| 488 | 2025-11-02 13:27:54 | 69 | 55dB | 2.6 | 164% | Day |
| 489 | 2025-11-02 13:29:28 | 72 | 55dB | 3.0 | 203% | Day |
| 490 | 2025-11-02 13:31:31 | 74 | 55dB | 3.5 | 248% | Day |
| 491 | 2025-11-02 13:33:28 | 69 | 55dB | 2.6 | 164% | Day |
| 492 | 2025-11-02 13:37:27 | 79 | 55dB | 4.9 | 392% | Day |
| 493 | 2025-11-02 13:39:41 | | 55dB | ? | ? | Day |
| 494 | 2025-11-02 13:41:02 | 69 | 55dB | 2.6 | 164% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 495 | 2025-11-02 13:42:54 | 67 | 55dB | 2.3 | 130% | Day |
| 496 | 2025-11-02 13:45:31 | 74 | 55dB | 3.7 | 273% | Day |
| 497 | 2025-11-02 13:47:35 | 73 | 55dB | 3.5 | 248% | Day |
| 498 | 2025-11-02 13:49:22 | 70 | 55dB | 2.6 | 164% | Day |
| 499 | 2025-11-02 13:52:17 | 71 | 55dB | 2.8 | 183% | Day |
| 500 | 2025-11-02 13:53:44 | 68 | 55dB | 2.5 | 146% | Day |
| 501 | 2025-11-02 13:55:40 | 73 | 55dB | 3.5 | 248% | Day |
| 502 | 2025-11-02 13:57:36 | 70 | 55dB | 2.6 | 164% | Day |
| 503 | 2025-11-02 13:59:22 | 73 | 55dB | 3.2 | 225% | Day |
| 504 | 2025-11-02 14:01:05 | 73 | 55dB | 3.5 | 248% | Day |
| 505 | 2025-11-02 14:03:31 | 71 | 55dB | 3.0 | 203% | Day |
| 506 | 2025-11-02 14:04:58 | 71 | 55dB | 2.8 | 183% | Day |
| 507 | 2025-11-02 14:06:26 | 69 | 55dB | 2.6 | 164% | Day |
| 508 | 2025-11-02 14:10:15 | 67 | 55dB | 2.3 | 130% | Day |
| 509 | 2025-11-02 14:12:07 | 69 | 55dB | 2.6 | 164% | Day |
| 510 | 2025-11-02 14:13:51 | 71 | 55dB | 2.8 | 183% | Day |
| 511 | 2025-11-02 14:15:03 | 76 | 55dB | 4.0 | 300% | Day |
| 512 | 2025-11-02 14:17:09 | 73 | 55dB | 3.5 | 248% | Day |
| 513 | 2025-11-02 14:21:34 | 69 | 55dB | 2.6 | 164% | Day |
| 514 | 2025-11-02 14:22:58 | 72 | 55dB | 3.0 | 203% | Day |
| 515 | 2025-11-02 14:24:14 | 71 | 55dB | 2.8 | 183% | Day |
| 516 | 2025-11-02 14:25:32 | 67 | 55dB | 2.3 | 130% | Day |
| 517 | 2025-11-02 14:26:47 | 69 | 55dB | 2.5 | 146% | Day |
| 518 | 2025-11-02 14:28:19 | 71 | 55dB | 2.8 | 183% | Day |
| 519 | 2025-11-02 14:29:50 | 81 | 55dB | 6.1 | 506% | Day |
| 520 | 2025-11-02 14:32:14 | 73 | 55dB | 3.2 | 225% | Day |
| 521 | 2025-11-02 14:34:52 | 75 | 55dB | 4.0 | 300% | Day |
| 522 | 2025-11-02 14:36:30 | 75 | 55dB | 4.0 | 300% | Day |
| 523 | 2025-11-02 14:38:32 | 72 | 55dB | 3.0 | 203% | Day |
| 524 | 2025-11-02 14:39:47 | 69 | 55dB | 2.5 | 146% | Day |
| 525 | 2025-11-02 14:41:32 | 75 | 55dB | 4.0 | 300% | Day |
| 526 | 2025-11-02 14:43:12 | 68 | 55dB | 2.5 | 146% | Day |
| 527 | 2025-11-02 14:44:24 | 70 | 55dB | 2.6 | 164% | Day |
| 528 | 2025-11-02 14:45:54 | 71 | 55dB | 3.0 | 203% | Day |
| 529 | 2025-11-02 14:47:54 | 70 | 55dB | 2.8 | 183% | Day |
| 530 | 2025-11-02 14:49:28 | 69 | 55dB | 2.5 | 146% | Day |
| 531 | 2025-11-02 14:50:49 | 70 | 55dB | 2.8 | 183% | Day |
| 532 | 2025-11-02 14:52:35 | 73 | 55dB | 3.2 | 225% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 533 | 2025-11-02 14:54:51 | 73 | 55dB | 3.2 | 225% | Day |
| 534 | 2025-11-02 14:55:58 | | 55dB | ? | ? | Day |
| 535 | 2025-11-02 14:58:28 | 72 | 55dB | 3.2 | 225% | Day |
| 536 | 2025-11-02 15:02:30 | 74 | 55dB | 3.7 | 273% | Day |
| 537 | 2025-11-02 15:04:30 | 70 | 55dB | 2.6 | 164% | Day |
| 538 | 2025-11-02 15:05:41 | 70 | 55dB | 2.8 | 183% | Day |
| 539 | 2025-11-02 15:06:50 | 70 | 55dB | 2.8 | 183% | Day |
| 540 | 2025-11-02 15:08:16 | 74 | 55dB | 3.7 | 273% | Day |
| 541 | 2025-11-02 15:09:32 | 73 | 55dB | 3.2 | 225% | Day |
| 542 | 2025-11-02 15:10:43 | 73 | 55dB | 3.5 | 248% | Day |
| 543 | 2025-11-02 15:12:43 | 70 | 55dB | 2.8 | 183% | Day |
| 544 | 2025-11-02 15:13:56 | 71 | 55dB | 3.0 | 203% | Day |
| 545 | 2025-11-02 15:15:40 | 70 | 55dB | 2.6 | 164% | Day |
| 546 | 2025-11-02 15:18:04 | 70 | 55dB | 2.8 | 183% | Day |
| 547 | 2025-11-02 15:21:35 | 69 | 55dB | 2.6 | 164% | Day |
| 548 | 2025-11-02 15:24:38 | 74 | 55dB | 3.7 | 273% | Day |
| 549 | 2025-11-02 15:26:54 | 72 | 55dB | 3.2 | 225% | Day |
| 550 | 2025-11-02 15:31:14 | 71 | 55dB | 2.8 | 183% | Day |
| 551 | 2025-11-02 15:32:47 | | 55dB | ? | ? | Day |
| 552 | 2025-11-02 15:36:22 | 72 | 55dB | 3.0 | 203% | Day |
| 553 | 2025-11-02 15:39:27 | 70 | 55dB | 2.8 | 183% | Day |
| 554 | 2025-11-02 15:41:12 | 74 | 55dB | 3.7 | 273% | Day |
| 555 | 2025-11-02 15:43:00 | 70 | 55dB | 2.6 | 164% | Day |
| 556 | 2025-11-02 15:44:32 | 75 | 55dB | 4.0 | 300% | Day |
| 557 | 2025-11-02 15:46:35 | | 55dB | ? | ? | Day |
| 558 | 2025-11-02 15:47:54 | 73 | 55dB | 3.2 | 225% | Day |
| 559 | 2025-11-02 15:49:35 | 66 | 55dB | 2.1 | 114% | Day |
| 560 | 2025-11-02 15:51:00 | 73 | 55dB | 3.2 | 225% | Day |
| 561 | 2025-11-02 15:53:12 | 68 | 55dB | 2.3 | 130% | Day |
| 562 | 2025-11-02 15:54:38 | 71 | 55dB | 3.0 | 203% | Day |
| 563 | 2025-11-02 15:56:10 | 76 | 55dB | 4.3 | 329% | Day |
| 564 | 2025-11-02 15:57:58 | 72 | 55dB | 3.0 | 203% | Day |
| 565 | 2025-11-02 15:59:08 | | 55dB | ? | ? | Day |
| 566 | 2025-11-02 16:00:54 | | 55dB | ? | ? | Day |
| 567 | 2025-11-02 16:04:58 | 74 | 55dB | 3.5 | 248% | Day |
| 568 | 2025-11-02 16:11:50 | 71 | 55dB | 2.8 | 183% | Day |
| 569 | 2025-11-02 16:13:53 | 70 | 55dB | 2.8 | 183% | Day |
| 570 | 2025-11-02 16:20:30 | 77 | 55dB | 4.3 | 329% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 571 | 2025-11-02 16:24:01 | | 55dB | ? | ? | Day |
| 572 | 2025-11-02 16:25:19 | 73 | 55dB | 3.5 | 248% | Day |
| 573 | 2025-11-02 16:26:26 | | 55dB | ? | ? | Day |
| 574 | 2025-11-02 16:27:44 | | 55dB | ? | ? | Day |
| 575 | 2025-11-02 16:30:21 | 72 | 55dB | 3.2 | 225% | Day |
| 576 | 2025-11-02 16:31:40 | 71 | 55dB | 3.0 | 203% | Day |
| 577 | 2025-11-02 16:33:13 | 67 | 55dB | 2.3 | 130% | Day |
| 578 | 2025-11-02 16:34:54 | 70 | 55dB | 2.8 | 183% | Day |
| 579 | 2025-11-02 16:36:45 | 69 | 55dB | 2.5 | 146% | Day |
| 580 | 2025-11-02 16:38:17 | 70 | 55dB | 2.8 | 183% | Day |
| 581 | 2025-11-02 16:42:33 | 76 | 55dB | 4.0 | 300% | Day |
| 582 | 2025-11-02 16:43:48 | 72 | 55dB | 3.2 | 225% | Day |
| 583 | 2025-11-02 16:45:16 | 72 | 55dB | 3.2 | 225% | Day |
| 584 | 2025-11-02 16:46:32 | 75 | 55dB | 4.0 | 300% | Day |
| 585 | 2025-11-02 16:48:47 | 69 | 55dB | 2.6 | 164% | Day |
| 586 | 2025-11-02 16:51:42 | 73 | 55dB | 3.2 | 225% | Day |
| 587 | 2025-11-02 16:58:40 | | 55dB | ? | ? | Day |
| 588 | 2025-11-02 17:01:33 | 77 | 55dB | 4.6 | 359% | Day |
| 589 | 2025-11-02 17:04:35 | 72 | 55dB | 3.0 | 203% | Day |
| 590 | 2025-11-02 17:09:39 | 72 | 55dB | 3.2 | 225% | Day |
| 591 | 2025-11-02 17:12:08 | 77 | 55dB | 4.6 | 359% | Day |
| 592 | 2025-11-02 17:16:50 | 73 | 55dB | 3.2 | 225% | Day |
| 593 | 2025-11-02 17:19:26 | 74 | 55dB | 3.5 | 248% | Day |
| 594 | 2025-11-02 17:28:22 | 72 | 55dB | 3.2 | 225% | Day |
| 595 | 2025-11-02 17:31:05 | 74 | 55dB | 3.5 | 248% | Day |
| 596 | 2025-11-02 17:33:28 | 72 | 55dB | 3.2 | 225% | Day |
| 597 | 2025-11-02 17:36:02 | 76 | 55dB | 4.0 | 300% | Day |
| 598 | 2025-11-02 17:40:08 | 75 | 55dB | 4.0 | 300% | Day |
| 599 | 2025-11-02 17:43:54 | 73 | 55dB | 3.2 | 225% | Day |
| 600 | 2025-11-02 17:46:19 | 74 | 55dB | 3.7 | 273% | Day |
| 601 | 2025-11-02 17:48:39 | 74 | 55dB | 3.7 | 273% | Day |
| 602 | 2025-11-02 17:51:17 | 73 | 55dB | 3.2 | 225% | Day |
| 603 | 2025-11-02 17:53:40 | 72 | 55dB | 3.2 | 225% | Day |
| 604 | 2025-11-02 17:56:19 | 72 | 55dB | 3.0 | 203% | Day |
| 605 | 2025-11-02 17:59:17 | 73 | 55dB | 3.2 | 225% | Day |
| 606 | 2025-11-02 18:01:45 | 75 | 55dB | 3.7 | 273% | Day |
| 607 | 2025-11-02 18:07:25 | 80 | 55dB | 5.7 | 466% | Day |
| 608 | 2025-11-02 18:10:24 | | 55dB | ? | ? | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 609 | 2025-11-02 18:12:55 | 74 | 55dB | 3.5 | 248% | Day |
| 610 | 2025-11-02 18:15:52 | 74 | 55dB | 3.5 | 248% | Day |
| 611 | 2025-11-02 18:18:48 | 72 | 55dB | 3.0 | 203% | Day |
| 612 | 2025-11-02 18:21:17 | 69 | 55dB | 2.6 | 164% | Day |
| 613 | 2025-11-02 18:23:47 | 75 | 55dB | 3.7 | 273% | Day |
| 614 | 2025-11-02 18:26:23 | 73 | 55dB | 3.5 | 248% | Day |
| 615 | 2025-11-02 18:28:44 | 77 | 55dB | 4.6 | 359% | Day |
| 616 | 2025-11-02 18:31:18 | 73 | 55dB | 3.2 | 225% | Day |
| 617 | 2025-11-02 18:33:55 | 78 | 55dB | 4.9 | 392% | Day |
| 618 | 2025-11-02 18:36:34 | 74 | 55dB | 3.7 | 273% | Day |
| 619 | 2025-11-02 18:39:09 | 68 | 55dB | 2.3 | 130% | Day |
| 620 | 2025-11-02 18:44:21 | 75 | 55dB | 3.7 | 273% | Day |
| 621 | 2025-11-02 18:46:58 | 76 | 55dB | 4.0 | 300% | Day |
| 622 | 2025-11-02 18:49:30 | 76 | 55dB | 4.3 | 329% | Day |
| 623 | 2025-11-02 18:53:04 | 74 | 55dB | 3.7 | 273% | Day |
| 624 | 2025-11-02 18:55:37 | 76 | 55dB | 4.0 | 300% | Day |
| 625 | 2025-11-02 18:58:13 | 74 | 55dB | 3.5 | 248% | Day |
| 626 | 2025-11-02 19:00:51 | 75 | 55dB | 3.7 | 273% | Day |
| 627 | 2025-11-02 19:03:57 | 77 | 55dB | 4.6 | 359% | Day |
| 628 | 2025-11-02 19:06:40 | 77 | 55dB | 4.3 | 329% | Day |
| 629 | 2025-11-02 19:09:06 | 73 | 55dB | 3.2 | 225% | Day |
| 630 | 2025-11-02 19:13:39 | 72 | 55dB | 3.0 | 203% | Day |
| 631 | 2025-11-02 19:16:14 | 77 | 55dB | 4.3 | 329% | Day |
| 632 | 2025-11-02 19:19:03 | 75 | 55dB | 4.0 | 300% | Day |
| 633 | 2025-11-02 19:21:30 | 72 | 55dB | 3.2 | 225% | Day |
| 634 | 2025-11-02 19:24:04 | 77 | 55dB | 4.6 | 359% | Day |
| 635 | 2025-11-02 19:26:58 | 75 | 55dB | 4.0 | 300% | Day |
| 636 | 2025-11-02 19:30:54 | 75 | 55dB | 3.7 | 273% | Day |
| 637 | 2025-11-02 19:34:26 | 77 | 55dB | 4.6 | 359% | Day |
| 638 | 2025-11-02 19:37:07 | 76 | 55dB | 4.0 | 300% | Day |
| 639 | 2025-11-02 19:39:57 | 75 | 55dB | 3.7 | 273% | Day |
| 640 | 2025-11-02 19:42:34 | 76 | 55dB | 4.0 | 300% | Day |
| 641 | 2025-11-02 19:44:49 | 78 | 55dB | 4.6 | 359% | Day |
| 642 | 2025-11-02 19:48:03 | 74 | 55dB | 3.7 | 273% | Day |
| 643 | 2025-11-02 19:50:44 | 75 | 55dB | 4.0 | 300% | Day |
| 644 | 2025-11-02 19:53:16 | 74 | 55dB | 3.7 | 273% | Day |
| 645 | 2025-11-02 19:55:45 | 73 | 55dB | 3.5 | 248% | Day |
| 646 | 2025-11-02 19:57:34 | | 55dB | ? | ? | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 647 | 2025-11-02 19:58:53 | 69 | 55dB | 2.6 | 164% | Day |
| 648 | 2025-11-02 20:00:13 | 70 | 55dB | 2.8 | 183% | Day |
| 649 | 2025-11-02 20:01:41 | 72 | 55dB | 3.0 | 203% | Day |
| 650 | 2025-11-02 20:04:41 | | 55dB | ? | ? | Day |
| 651 | 2025-11-02 20:05:58 | 74 | 55dB | 3.7 | 273% | Day |
| 652 | 2025-11-02 20:07:52 | 73 | 55dB | 3.2 | 225% | Day |
| 653 | 2025-11-02 20:09:08 | 77 | 55dB | 4.6 | 359% | Day |
| 654 | 2025-11-02 20:10:15 | 71 | 55dB | 2.8 | 183% | Day |
| 655 | 2025-11-02 20:11:40 | 70 | 55dB | 2.8 | 183% | Day |
| 656 | 2025-11-02 20:12:57 | 70 | 55dB | 2.8 | 183% | Day |
| 657 | 2025-11-02 20:14:07 | 70 | 55dB | 2.6 | 164% | Day |
| 658 | 2025-11-02 20:15:21 | 74 | 55dB | 3.5 | 248% | Day |
| 659 | 2025-11-02 20:17:11 | 68 | 55dB | 2.3 | 130% | Day |
| 660 | 2025-11-02 20:18:49 | 73 | 55dB | 3.5 | 248% | Day |
| 661 | 2025-11-02 20:22:08 | 69 | 55dB | 2.5 | 146% | Day |
| 662 | 2025-11-02 20:23:27 | 71 | 55dB | 3.0 | 203% | Day |
| 663 | 2025-11-02 20:25:02 | 71 | 55dB | 2.8 | 183% | Day |
| 664 | 2025-11-02 20:26:25 | 78 | 55dB | 4.6 | 359% | Day |
| 665 | 2025-11-02 20:28:09 | 89 | 55dB | 9.8 | 885% | Day |
| 666 | 2025-11-02 20:29:31 | 71 | 55dB | 2.8 | 183% | Day |
| 667 | 2025-11-02 20:30:46 | 76 | 55dB | 4.0 | 300% | Day |
| 668 | 2025-11-02 20:32:01 | 74 | 55dB | 3.5 | 248% | Day |
| 669 | 2025-11-02 20:34:06 | 77 | 55dB | 4.3 | 329% | Day |
| 670 | 2025-11-02 20:35:53 | 69 | 55dB | 2.6 | 164% | Day |
| 671 | 2025-11-02 20:37:18 | 72 | 55dB | 3.2 | 225% | Day |
| 672 | 2025-11-02 20:38:36 | | 55dB | ? | ? | Day |
| 673 | 2025-11-02 20:39:47 | 74 | 55dB | 3.5 | 248% | Day |
| 674 | 2025-11-02 20:41:04 | 77 | 55dB | 4.3 | 329% | Day |
| 675 | 2025-11-02 20:42:51 | 70 | 55dB | 2.6 | 164% | Day |
| 676 | 2025-11-02 20:44:11 | 69 | 55dB | 2.6 | 164% | Day |
| 677 | 2025-11-02 20:45:36 | 71 | 55dB | 3.0 | 203% | Day |
| 678 | 2025-11-02 20:46:51 | 71 | 55dB | 3.0 | 203% | Day |
| 679 | 2025-11-02 20:48:16 | 74 | 55dB | 3.5 | 248% | Day |
| 680 | 2025-11-02 20:51:17 | | 55dB | ? | ? | Day |
| 681 | 2025-11-02 20:52:44 | | 55dB | ? | ? | Day |
| 682 | 2025-11-02 20:54:00 | 73 | 55dB | 3.2 | 225% | Day |
| 683 | 2025-11-02 20:55:21 | 70 | 55dB | 2.8 | 183% | Day |
| 684 | 2025-11-02 20:56:37 | 75 | 55dB | 4.0 | 300% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 685 | 2025-11-02 20:58:35 | 70 | 55dB | 2.6 | 164% | Day |
| 686 | 2025-11-02 20:59:58 | 73 | 55dB | 3.2 | 225% | Day |
| 687 | 2025-11-02 21:01:44 | 70 | 55dB | 2.6 | 164% | Day |
| 688 | 2025-11-02 21:03:34 | 71 | 55dB | 2.8 | 183% | Day |
| 689 | 2025-11-02 21:05:05 | 72 | 55dB | 3.0 | 203% | Day |
| 690 | 2025-11-02 21:06:28 | 79 | 55dB | 5.3 | 428% | Day |
| 691 | 2025-11-02 21:07:53 | 69 | 55dB | 2.5 | 146% | Day |
| 692 | 2025-11-02 21:09:31 | 77 | 55dB | 4.3 | 329% | Day |
| 693 | 2025-11-02 21:10:57 | | 55dB | ? | ? | Day |
| 694 | 2025-11-02 21:12:25 | | 55dB | ? | ? | Day |
| 695 | 2025-11-02 21:13:50 | | 55dB | ? | ? | Day |
| 696 | 2025-11-02 21:15:22 | 70 | 55dB | 2.8 | 183% | Day |
| 697 | 2025-11-02 21:16:44 | | 55dB | ? | ? | Day |
| 698 | 2025-11-02 21:17:57 | | 55dB | ? | ? | Day |
| 699 | 2025-11-02 21:19:30 | 69 | 55dB | 2.6 | 164% | Day |
| 700 | 2025-11-02 21:20:48 | 72 | 55dB | 3.2 | 225% | Day |
| 701 | 2025-11-02 21:22:10 | | 55dB | ? | ? | Day |
| 702 | 2025-11-02 21:24:56 | 70 | 55dB | 2.8 | 183% | Day |
| 703 | 2025-11-02 21:29:24 | 73 | 55dB | 3.2 | 225% | Day |
| 704 | 2025-11-02 21:31:19 | 78 | 55dB | 4.9 | 392% | Day |
| 705 | 2025-11-02 21:33:50 | 69 | 55dB | 2.5 | 146% | Day |
| 706 | 2025-11-02 21:35:23 | 73 | 55dB | 3.2 | 225% | Day |
| 707 | 2025-11-02 21:37:07 | 84 | 55dB | 7.0 | 596% | Day |
| 708 | 2025-11-02 21:38:27 | 72 | 55dB | 3.0 | 203% | Day |
| 709 | 2025-11-02 21:40:21 | 68 | 55dB | 2.3 | 130% | Day |
| 710 | 2025-11-02 21:42:15 | 75 | 55dB | 3.7 | 273% | Day |
| 711 | 2025-11-02 21:43:28 | | 55dB | ? | ? | Day |
| 712 | 2025-11-02 21:45:09 | 69 | 55dB | 2.6 | 164% | Day |
| 713 | 2025-11-02 21:48:04 | 76 | 55dB | 4.0 | 300% | Day |
| 714 | 2025-11-02 21:50:24 | | 55dB | ? | ? | Day |
| 715 | 2025-11-02 21:52:18 | 72 | 55dB | 3.0 | 203% | Day |
| 716 | 2025-11-02 21:58:32 | 71 | 55dB | 2.8 | 183% | Day |
| 717 | 2025-11-02 22:00:11 | | 55dB | ? | ? | Day |
| 718 | 2025-11-02 22:02:36 | 71 | 55dB | 3.0 | 203% | Day |
| 719 | 2025-11-02 22:05:19 | | 55dB | ? | ? | Day |
| 720 | 2025-11-02 22:08:02 | 69 | 55dB | 2.5 | 146% | Day |
| 721 | 2025-11-02 22:10:52 | 72 | 55dB | 3.0 | 203% | Day |
| 722 | 2025-11-02 22:13:25 | | 55dB | ? | ? | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 723 | 2025-11-02 22:17:15 | 70 | 55dB | 2.8 | 183% | Day |
| 724 | 2025-11-02 22:20:43 | | 55dB | ? | ? | Day |
| 725 | 2025-11-02 22:23:28 | 74 | 55dB | 3.7 | 273% | Day |
| 726 | 2025-11-02 22:25:31 | 70 | 55dB | 2.6 | 164% | Day |
| 727 | 2025-11-02 22:29:26 | | 55dB | ? | ? | Day |
| 728 | 2025-11-02 22:31:04 | 71 | 55dB | 2.8 | 183% | Day |
| 729 | 2025-11-02 22:34:52 | 71 | 55dB | 2.8 | 183% | Day |
| 730 | 2025-11-02 22:36:22 | | 55dB | ? | ? | Day |
| 731 | 2025-11-02 22:45:26 | 69 | 55dB | 2.5 | 146% | Day |
| 732 | 2025-11-02 22:47:43 | 69 | 55dB | 2.6 | 164% | Day |
| 733 | 2025-11-02 23:01:15 | | 45dB | ? | ? | Night |
| 734 | 2025-11-02 23:04:03 | 75 | 45dB | 7.5 | 646% | Night |
| 735 | 2025-11-02 23:08:51 | 73 | 45dB | 6.5 | 550% | Night |
| 736 | 2025-11-02 23:10:06 | 70 | 45dB | 5.7 | 466% | Night |
| 737 | 2025-11-02 23:11:28 | | 45dB | ? | ? | Night |
| 738 | 2025-11-02 23:20:14 | 73 | 45dB | 6.5 | 550% | Night |
| 739 | 2025-11-02 23:22:54 | 70 | 45dB | 5.7 | 466% | Night |
| 740 | 2025-11-02 23:24:30 | 71 | 45dB | 5.7 | 466% | Night |
| 741 | 2025-11-02 23:27:21 | 71 | 45dB | 6.1 | 506% | Night |
| 742 | 2025-11-02 23:29:22 | 72 | 45dB | 6.5 | 550% | Night |
| 743 | 2025-11-02 23:31:27 | 73 | 45dB | 7.0 | 596% | Night |
| 744 | 2025-11-02 23:32:57 | | 45dB | ? | ? | Night |
| 745 | 2025-11-02 23:34:41 | 74 | 45dB | 7.5 | 646% | Night |
| 746 | 2025-11-02 23:36:13 | 71 | 45dB | 6.1 | 506% | Night |
| 747 | 2025-11-02 23:38:02 | 74 | 45dB | 7.5 | 646% | Night |
| 748 | 2025-11-02 23:40:12 | 69 | 45dB | 5.3 | 428% | Night |
| 749 | 2025-11-02 23:42:50 | 68 | 45dB | 4.6 | 359% | Night |
| 750 | 2025-11-02 23:47:14 | 71 | 45dB | 5.7 | 466% | Night |
| 751 | 2025-11-02 23:49:54 | 77 | 45dB | 8.6 | 757% | Night |
| 752 | 2025-11-02 23:52:09 | 69 | 45dB | 5.3 | 428% | Night |
| 753 | 2025-11-02 23:54:36 | 72 | 45dB | 6.1 | 506% | Night |
| 754 | 2025-11-02 23:57:19 | 72 | 45dB | 6.1 | 506% | Night |
| 755 | 2025-11-02 23:58:42 | 72 | 45dB | 6.1 | 506% | Night |
| 756 | 2025-11-03 00:02:07 | 72 | 45dB | 6.5 | 550% | Night |
| 757 | 2025-11-03 00:03:55 | 74 | 45dB | 7.0 | 596% | Night |
| 758 | 2025-11-03 00:05:33 | 70 | 45dB | 5.7 | 466% | Night |
| 759 | 2025-11-03 00:07:50 | 72 | 45dB | 6.1 | 506% | Night |
| 760 | 2025-11-03 00:09:14 | 69 | 45dB | 4.9 | 392% | Night |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 761 | 2025-11-03 00:10:41 | 70 | 45dB | 5.7 | 466% | Night |
| 762 | 2025-11-03 00:12:32 | 75 | 45dB | 8.0 | 700% | Night |
| 763 | 2025-11-03 06:26:33 | | 45dB | ? | ? | Night |
| 764 | 2025-11-03 06:29:06 | 69 | 45dB | 5.3 | 428% | Night |
| 765 | 2025-11-03 06:30:38 | 73 | 45dB | 6.5 | 550% | Night |
| 766 | 2025-11-03 06:32:30 | 72 | 45dB | 6.5 | 550% | Night |
| 767 | 2025-11-03 06:34:08 | 72 | 45dB | 6.1 | 506% | Night |
| 768 | 2025-11-03 06:35:43 | 73 | 45dB | 6.5 | 550% | Night |
| 769 | 2025-11-03 06:37:00 | 69 | 45dB | 4.9 | 392% | Night |
| 770 | 2025-11-03 06:38:38 | 70 | 45dB | 5.7 | 466% | Night |
| 771 | 2025-11-03 06:40:27 | 73 | 45dB | 6.5 | 550% | Night |
| 772 | 2025-11-03 06:45:24 | 70 | 45dB | 5.7 | 466% | Night |
| 773 | 2025-11-03 06:47:09 | 72 | 45dB | 6.1 | 506% | Night |
| 774 | 2025-11-03 06:48:37 | | 45dB | ? | ? | Night |
| 775 | 2025-11-03 06:50:11 | 69 | 45dB | 5.3 | 428% | Night |
| 776 | 2025-11-03 06:51:50 | 71 | 45dB | 5.7 | 466% | Night |
| 777 | 2025-11-03 06:53:39 | | 45dB | ? | ? | Night |
| 778 | 2025-11-03 06:55:05 | 73 | 45dB | 7.0 | 596% | Night |
| 779 | 2025-11-03 06:57:38 | 73 | 45dB | 6.5 | 550% | Night |
| 780 | 2025-11-03 07:01:31 | 73 | 55dB | 3.5 | 248% | Day |
| 781 | 2025-11-03 07:03:32 | 71 | 55dB | 2.8 | 183% | Day |
| 782 | 2025-11-03 07:05:10 | 73 | 55dB | 3.5 | 248% | Day |
| 783 | 2025-11-03 07:07:13 | 73 | 55dB | 3.5 | 248% | Day |
| 784 | 2025-11-03 07:11:59 | 72 | 55dB | 3.0 | 203% | Day |
| 785 | 2025-11-03 07:15:43 | 73 | 55dB | 3.2 | 225% | Day |
| 786 | 2025-11-03 07:17:39 | 71 | 55dB | 2.8 | 183% | Day |
| 787 | 2025-11-03 07:29:37 | 74 | 55dB | 3.5 | 248% | Day |
| 788 | 2025-11-03 07:34:07 | 70 | 55dB | 2.6 | 164% | Day |
| 789 | 2025-11-03 07:36:36 | 74 | 55dB | 3.5 | 248% | Day |
| 790 | 2025-11-03 07:40:12 | 71 | 55dB | 2.8 | 183% | Day |
| 791 | 2025-11-03 07:42:13 | 72 | 55dB | 3.2 | 225% | Day |
| 792 | 2025-11-03 07:43:58 | 76 | 55dB | 4.3 | 329% | Day |
| 793 | 2025-11-03 07:49:53 | 68 | 55dB | 2.3 | 130% | Day |
| 794 | 2025-11-03 07:51:47 | 76 | 55dB | 4.0 | 300% | Day |
| 795 | 2025-11-03 07:53:56 | | 55dB | ? | ? | Day |
| 796 | 2025-11-03 07:56:13 | 70 | 55dB | 2.8 | 183% | Day |
| 797 | 2025-11-03 07:59:07 | 75 | 55dB | 3.7 | 273% | Day |
| 798 | 2025-11-03 08:00:47 | 74 | 55dB | 3.7 | 273% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 799 | 2025-11-03 08:03:26 | 71 | 55dB | 2.8 | 183% | Day |
| 800 | 2025-11-03 08:05:23 | 74 | 55dB | 3.7 | 273% | Day |
| 801 | 2025-11-03 08:07:24 | 72 | 55dB | 3.0 | 203% | Day |
| 802 | 2025-11-03 08:20:01 | 72 | 55dB | 3.0 | 203% | Day |
| 803 | 2025-11-03 08:22:28 | 77 | 55dB | 4.6 | 359% | Day |
| 804 | 2025-11-03 08:24:34 | 71 | 55dB | 3.0 | 203% | Day |
| 805 | 2025-11-03 08:26:31 | 77 | 55dB | 4.3 | 329% | Day |
| 806 | 2025-11-03 08:30:12 | 71 | 55dB | 3.0 | 203% | Day |
| 807 | 2025-11-03 08:31:52 | 70 | 55dB | 2.6 | 164% | Day |
| 808 | 2025-11-03 08:33:26 | 75 | 55dB | 3.7 | 273% | Day |
| 809 | 2025-11-03 08:35:58 | 73 | 55dB | 3.5 | 248% | Day |
| 810 | 2025-11-03 08:37:23 | 70 | 55dB | 2.6 | 164% | Day |
| 811 | 2025-11-03 08:40:37 | 76 | 55dB | 4.0 | 300% | Day |
| 812 | 2025-11-03 08:45:56 | 75 | 55dB | 4.0 | 300% | Day |
| 813 | 2025-11-03 08:51:01 | 76 | 55dB | 4.3 | 329% | Day |
| 814 | 2025-11-03 08:57:25 | 75 | 55dB | 4.0 | 300% | Day |
| 815 | 2025-11-03 09:00:31 | | 55dB | ? | ? | Day |
| 816 | 2025-11-03 09:11:32 | | 55dB | ? | ? | Day |
| 817 | 2025-11-03 09:14:55 | 71 | 55dB | 3.0 | 203% | Day |
| 818 | 2025-11-03 09:23:49 | 70 | 55dB | 2.6 | 164% | Day |
| 819 | 2025-11-03 09:27:39 | 70 | 55dB | 2.6 | 164% | Day |
| 820 | 2025-11-03 09:31:34 | 78 | 55dB | 4.6 | 359% | Day |
| 821 | 2025-11-03 09:33:47 | 74 | 55dB | 3.5 | 248% | Day |
| 822 | 2025-11-03 09:35:32 | 78 | 55dB | 4.9 | 392% | Day |
| 823 | 2025-11-03 09:43:11 | 66 | 55dB | 2.1 | 114% | Day |
| 824 | 2025-11-03 09:49:25 | 71 | 55dB | 3.0 | 203% | Day |
| 825 | 2025-11-03 09:52:34 | 68 | 55dB | 2.5 | 146% | Day |
| 826 | 2025-11-03 09:54:46 | 70 | 55dB | 2.6 | 164% | Day |
| 827 | 2025-11-03 09:57:19 | | 55dB | ? | ? | Day |
| 828 | 2025-11-03 10:00:25 | 76 | 55dB | 4.0 | 300% | Day |
| 829 | 2025-11-03 10:01:48 | 76 | 55dB | 4.0 | 300% | Day |
| 830 | 2025-11-03 10:05:26 | 75 | 55dB | 4.0 | 300% | Day |
| 831 | 2025-11-03 10:06:52 | 77 | 55dB | 4.3 | 329% | Day |
| 832 | 2025-11-03 10:08:21 | | 55dB | ? | ? | Day |
| 833 | 2025-11-03 10:11:39 | 75 | 55dB | 3.7 | 273% | Day |
| 834 | 2025-11-03 10:20:56 | 71 | 55dB | 2.8 | 183% | Day |
| 835 | 2025-11-03 10:24:54 | 73 | 55dB | 3.2 | 225% | Day |
| 836 | 2025-11-03 10:26:34 | 70 | 55dB | 2.6 | 164% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 837 | 2025-11-03 10:28:03 | 70 | 55dB | 2.6 | 164% | Day |
| 838 | 2025-11-03 10:30:37 | 78 | 55dB | 4.9 | 392% | Day |
| 839 | 2025-11-03 10:35:31 | 72 | 55dB | 3.2 | 225% | Day |
| 840 | 2025-11-03 10:37:27 | 73 | 55dB | 3.2 | 225% | Day |
| 841 | 2025-11-03 10:38:51 | 74 | 55dB | 3.5 | 248% | Day |
| 842 | 2025-11-03 10:40:39 | 73 | 55dB | 3.2 | 225% | Day |
| 843 | 2025-11-03 10:42:23 | 71 | 55dB | 3.0 | 203% | Day |
| 844 | 2025-11-03 10:44:24 | 77 | 55dB | 4.3 | 329% | Day |
| 845 | 2025-11-03 10:46:26 | 74 | 55dB | 3.7 | 273% | Day |
| 846 | 2025-11-03 10:48:52 | 75 | 55dB | 3.7 | 273% | Day |
| 847 | 2025-11-03 10:50:56 | 68 | 55dB | 2.5 | 146% | Day |
| 848 | 2025-11-03 10:53:22 | 70 | 55dB | 2.6 | 164% | Day |
| 849 | 2025-11-03 10:56:09 | 73 | 55dB | 3.5 | 248% | Day |
| 850 | 2025-11-03 10:57:47 | 75 | 55dB | 4.0 | 300% | Day |
| 851 | 2025-11-03 10:59:39 | 72 | 55dB | 3.2 | 225% | Day |
| 852 | 2025-11-03 11:01:26 | 71 | 55dB | 2.8 | 183% | Day |
| 853 | 2025-11-03 11:07:07 | 71 | 55dB | 2.8 | 183% | Day |
| 854 | 2025-11-03 11:08:32 | 71 | 55dB | 3.0 | 203% | Day |
| 855 | 2025-11-03 11:10:02 | 70 | 55dB | 2.6 | 164% | Day |
| 856 | 2025-11-03 11:11:33 | 71 | 55dB | 3.0 | 203% | Day |
| 857 | 2025-11-03 11:13:51 | 69 | 55dB | 2.6 | 164% | Day |
| 858 | 2025-11-03 11:15:32 | 72 | 55dB | 3.0 | 203% | Day |
| 859 | 2025-11-03 11:17:04 | 70 | 55dB | 2.6 | 164% | Day |
| 860 | 2025-11-03 11:20:42 | 79 | 55dB | 5.3 | 428% | Day |
| 861 | 2025-11-03 11:22:31 | 73 | 55dB | 3.5 | 248% | Day |
| 862 | 2025-11-03 11:24:11 | 68 | 55dB | 2.5 | 146% | Day |
| 863 | 2025-11-03 11:28:13 | 71 | 55dB | 2.8 | 183% | Day |
| 864 | 2025-11-03 11:30:09 | | 55dB | ? | ? | Day |
| 865 | 2025-11-03 11:32:26 | 68 | 55dB | 2.5 | 146% | Day |
| 866 | 2025-11-03 11:34:40 | 71 | 55dB | 3.0 | 203% | Day |
| 867 | 2025-11-03 11:36:12 | 69 | 55dB | 2.6 | 164% | Day |
| 868 | 2025-11-03 11:38:08 | 73 | 55dB | 3.5 | 248% | Day |
| 869 | 2025-11-03 11:39:38 | 74 | 55dB | 3.7 | 273% | Day |
| 870 | 2025-11-03 11:42:15 | 72 | 55dB | 3.2 | 225% | Day |
| 871 | 2025-11-03 11:47:55 | 70 | 55dB | 2.8 | 183% | Day |
| 872 | 2025-11-03 11:52:12 | | 55dB | ? | ? | Day |
| 873 | 2025-11-03 11:57:33 | | 55dB | ? | ? | Day |
| 874 | 2025-11-03 11:59:12 | | 55dB | ? | ? | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 875 | 2025-11-03 12:06:20 | 70 | 55dB | 2.8 | 183% | Day |
| 876 | 2025-11-03 12:08:13 | 69 | 55dB | 2.6 | 164% | Day |
| 877 | 2025-11-03 12:11:42 | 74 | 55dB | 3.7 | 273% | Day |
| 878 | 2025-11-03 12:19:44 | 76 | 55dB | 4.0 | 300% | Day |
| 879 | 2025-11-03 12:21:32 | 70 | 55dB | 2.6 | 164% | Day |
| 880 | 2025-11-03 12:22:49 | 71 | 55dB | 3.0 | 203% | Day |
| 881 | 2025-11-03 12:24:07 | 70 | 55dB | 2.6 | 164% | Day |
| 882 | 2025-11-03 12:26:15 | 73 | 55dB | 3.5 | 248% | Day |
| 883 | 2025-11-03 12:29:15 | 72 | 55dB | 3.0 | 203% | Day |
| 884 | 2025-11-03 12:31:11 | 70 | 55dB | 2.6 | 164% | Day |
| 885 | 2025-11-03 12:32:46 | 72 | 55dB | 3.2 | 225% | Day |
| 886 | 2025-11-03 12:34:25 | 74 | 55dB | 3.7 | 273% | Day |
| 887 | 2025-11-03 12:36:19 | 70 | 55dB | 2.6 | 164% | Day |
| 888 | 2025-11-03 12:40:14 | | 55dB | ? | ? | Day |
| 889 | 2025-11-03 12:43:30 | 74 | 55dB | 3.7 | 273% | Day |
| 890 | 2025-11-03 12:47:06 | 72 | 55dB | 3.2 | 225% | Day |
| 891 | 2025-11-03 12:50:07 | 73 | 55dB | 3.2 | 225% | Day |
| 892 | 2025-11-03 12:52:30 | 73 | 55dB | 3.2 | 225% | Day |
| 893 | 2025-11-03 12:54:36 | 70 | 55dB | 2.8 | 183% | Day |
| 894 | 2025-11-03 13:02:27 | 71 | 55dB | 3.0 | 203% | Day |
| 895 | 2025-11-03 13:05:31 | 72 | 55dB | 3.2 | 225% | Day |
| 896 | 2025-11-03 13:07:34 | 73 | 55dB | 3.5 | 248% | Day |
| 897 | 2025-11-03 13:09:15 | 72 | 55dB | 3.2 | 225% | Day |
| 898 | 2025-11-03 13:10:45 | 72 | 55dB | 3.2 | 225% | Day |
| 899 | 2025-11-03 13:12:06 | 72 | 55dB | 3.2 | 225% | Day |
| 900 | 2025-11-03 13:14:51 | 70 | 55dB | 2.6 | 164% | Day |
| 901 | 2025-11-03 13:16:49 | 75 | 55dB | 3.7 | 273% | Day |
| 902 | 2025-11-03 13:20:20 | 73 | 55dB | 3.2 | 225% | Day |
| 903 | 2025-11-03 13:21:40 | 71 | 55dB | 2.8 | 183% | Day |
| 904 | 2025-11-03 13:27:10 | 70 | 55dB | 2.8 | 183% | Day |
| 905 | 2025-11-03 13:29:08 | 73 | 55dB | 3.5 | 248% | Day |
| 906 | 2025-11-03 13:34:17 | | 55dB | ? | ? | Day |
| 907 | 2025-11-03 13:38:53 | 73 | 55dB | 3.2 | 225% | Day |
| 908 | 2025-11-03 13:41:40 | 75 | 55dB | 4.0 | 300% | Day |
| 909 | 2025-11-03 13:44:49 | 67 | 55dB | 2.3 | 130% | Day |
| 910 | 2025-11-03 13:46:20 | 69 | 55dB | 2.5 | 146% | Day |
| 911 | 2025-11-03 13:48:27 | 80 | 55dB | 5.3 | 428% | Day |
| 912 | 2025-11-03 13:50:50 | 74 | 55dB | 3.5 | 248% | Day |

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|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 913 | 2025-11-03 13:52:58 | 71 | 55dB | 2.8 | 183% | Day |
| 914 | 2025-11-03 13:54:53 | 69 | 55dB | 2.6 | 164% | Day |
| 915 | 2025-11-03 13:56:32 | 68 | 55dB | 2.5 | 146% | Day |
| 916 | 2025-11-03 13:58:22 | 74 | 55dB | 3.5 | 248% | Day |
| 917 | 2025-11-03 14:01:17 | 71 | 55dB | 3.0 | 203% | Day |
| 918 | 2025-11-03 14:02:56 | 71 | 55dB | 3.0 | 203% | Day |
| 919 | 2025-11-03 14:04:46 | 76 | 55dB | 4.0 | 300% | Day |
| 920 | 2025-11-03 14:07:30 | 76 | 55dB | 4.0 | 300% | Day |
| 921 | 2025-11-03 14:09:57 | 75 | 55dB | 3.7 | 273% | Day |
| 922 | 2025-11-03 14:11:54 | 72 | 55dB | 3.2 | 225% | Day |
| 923 | 2025-11-03 14:16:25 | 70 | 55dB | 2.8 | 183% | Day |
| 924 | 2025-11-03 14:23:22 | 77 | 55dB | 4.3 | 329% | Day |
| 925 | 2025-11-03 14:25:56 | 69 | 55dB | 2.6 | 164% | Day |
| 926 | 2025-11-03 14:27:25 | 68 | 55dB | 2.5 | 146% | Day |
| 927 | 2025-11-03 14:28:57 | 75 | 55dB | 3.7 | 273% | Day |
| 928 | 2025-11-03 14:30:32 | 71 | 55dB | 3.0 | 203% | Day |
| 929 | 2025-11-03 14:32:16 | 70 | 55dB | 2.8 | 183% | Day |
| 930 | 2025-11-03 14:33:48 | 76 | 55dB | 4.0 | 300% | Day |
| 931 | 2025-11-03 14:35:47 | 70 | 55dB | 2.6 | 164% | Day |
| 932 | 2025-11-03 14:37:24 | 70 | 55dB | 2.8 | 183% | Day |
| 933 | 2025-11-03 14:38:50 | 71 | 55dB | 3.0 | 203% | Day |
| 934 | 2025-11-03 14:40:11 | 70 | 55dB | 2.8 | 183% | Day |
| 935 | 2025-11-03 14:41:47 | 70 | 55dB | 2.8 | 183% | Day |
| 936 | 2025-11-03 14:43:03 | | 55dB | ? | ? | Day |
| 937 | 2025-11-03 14:44:21 | 76 | 55dB | 4.3 | 329% | Day |
| 938 | 2025-11-03 14:46:08 | 75 | 55dB | 3.7 | 273% | Day |
| 939 | 2025-11-03 14:47:48 | 71 | 55dB | 2.8 | 183% | Day |
| 940 | 2025-11-03 14:49:03 | 76 | 55dB | 4.0 | 300% | Day |
| 941 | 2025-11-03 14:51:21 | 70 | 55dB | 2.8 | 183% | Day |
| 942 | 2025-11-03 14:52:45 | 74 | 55dB | 3.7 | 273% | Day |
| 943 | 2025-11-03 14:54:37 | 74 | 55dB | 3.5 | 248% | Day |
| 944 | 2025-11-03 14:56:18 | 71 | 55dB | 3.0 | 203% | Day |
| 945 | 2025-11-03 14:57:43 | 70 | 55dB | 2.8 | 183% | Day |
| 946 | 2025-11-03 14:58:56 | 72 | 55dB | 3.0 | 203% | Day |
| 947 | 2025-11-03 15:00:20 | 75 | 55dB | 4.0 | 300% | Day |
| 948 | 2025-11-03 15:02:08 | 72 | 55dB | 3.0 | 203% | Day |
| 949 | 2025-11-03 15:03:27 | 72 | 55dB | 3.0 | 203% | Day |
| 950 | 2025-11-03 15:04:49 | 70 | 55dB | 2.8 | 183% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 951 | 2025-11-03 15:07:51 | 71 | 55dB | 2.8 | 183% | Day |
| 952 | 2025-11-03 15:09:15 | 75 | 55dB | 4.0 | 300% | Day |
| 953 | 2025-11-03 15:10:36 | | 55dB | ? | ? | Day |
| 954 | 2025-11-03 15:12:13 | 75 | 55dB | 4.0 | 300% | Day |
| 955 | 2025-11-03 15:14:43 | 71 | 55dB | 3.0 | 203% | Day |
| 956 | 2025-11-03 15:16:22 | 72 | 55dB | 3.2 | 225% | Day |
| 957 | 2025-11-03 15:18:28 | 71 | 55dB | 3.0 | 203% | Day |
| 958 | 2025-11-03 15:19:56 | 76 | 55dB | 4.3 | 329% | Day |
| 959 | 2025-11-03 15:21:17 | | 55dB | ? | ? | Day |
| 960 | 2025-11-03 15:25:43 | 72 | 55dB | 3.2 | 225% | Day |
| 961 | 2025-11-03 15:30:39 | 73 | 55dB | 3.2 | 225% | Day |
| 962 | 2025-11-03 15:32:17 | 74 | 55dB | 3.7 | 273% | Day |
| 963 | 2025-11-03 15:34:11 | 67 | 55dB | 2.1 | 114% | Day |
| 964 | 2025-11-03 15:35:38 | 70 | 55dB | 2.8 | 183% | Day |
| 965 | 2025-11-03 15:37:06 | 73 | 55dB | 3.5 | 248% | Day |
| 966 | 2025-11-03 15:38:55 | 72 | 55dB | 3.2 | 225% | Day |
| 967 | 2025-11-03 15:40:09 | | 55dB | ? | ? | Day |
| 968 | 2025-11-03 15:41:41 | 74 | 55dB | 3.7 | 273% | Day |
| 969 | 2025-11-03 15:43:33 | 70 | 55dB | 2.6 | 164% | Day |
| 970 | 2025-11-03 15:45:08 | 75 | 55dB | 3.7 | 273% | Day |
| 971 | 2025-11-03 15:46:37 | 69 | 55dB | 2.6 | 164% | Day |
| 972 | 2025-11-03 15:48:04 | 70 | 55dB | 2.8 | 183% | Day |
| 973 | 2025-11-03 15:49:19 | 71 | 55dB | 3.0 | 203% | Day |
| 974 | 2025-11-03 15:50:45 | 78 | 55dB | 4.6 | 359% | Day |
| 975 | 2025-11-03 15:52:19 | 73 | 55dB | 3.5 | 248% | Day |
| 976 | 2025-11-03 15:53:45 | 70 | 55dB | 2.8 | 183% | Day |
| 977 | 2025-11-03 15:55:03 | 74 | 55dB | 3.7 | 273% | Day |
| 978 | 2025-11-03 15:57:02 | | 55dB | ? | ? | Day |
| 979 | 2025-11-03 15:58:44 | 66 | 55dB | 2.1 | 114% | Day |
| 980 | 2025-11-03 16:00:30 | 74 | 55dB | 3.5 | 248% | Day |
| 981 | 2025-11-03 16:02:37 | 73 | 55dB | 3.2 | 225% | Day |
| 982 | 2025-11-03 16:04:30 | 74 | 55dB | 3.5 | 248% | Day |
| 983 | 2025-11-03 16:06:43 | 70 | 55dB | 2.6 | 164% | Day |
| 984 | 2025-11-03 16:10:08 | 73 | 55dB | 3.2 | 225% | Day |
| 985 | 2025-11-03 16:11:46 | 69 | 55dB | 2.6 | 164% | Day |
| 986 | 2025-11-03 16:16:34 | 71 | 55dB | 3.0 | 203% | Day |
| 987 | 2025-11-03 16:21:32 | 80 | 55dB | 5.3 | 428% | Day |
| 988 | 2025-11-03 16:23:20 | 76 | 55dB | 4.3 | 329% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 989 | 2025-11-03 16:27:12 | 70 | 55dB | 2.6 | 164% | Day |
| 990 | 2025-11-03 16:28:40 | 69 | 55dB | 2.5 | 146% | Day |
| 991 | 2025-11-03 16:30:06 | | 55dB | ? | ? | Day |
| 992 | 2025-11-03 16:32:18 | 73 | 55dB | 3.2 | 225% | Day |
| 993 | 2025-11-03 16:35:50 | 69 | 55dB | 2.5 | 146% | Day |
| 994 | 2025-11-03 16:37:19 | 73 | 55dB | 3.5 | 248% | Day |
| 995 | 2025-11-03 16:39:42 | | 55dB | ? | ? | Day |
| 996 | 2025-11-03 16:42:12 | 73 | 55dB | 3.5 | 248% | Day |
| 997 | 2025-11-03 16:44:02 | 71 | 55dB | 3.0 | 203% | Day |
| 998 | 2025-11-03 16:47:10 | | 55dB | ? | ? | Day |
| 999 | 2025-11-03 16:49:03 | 70 | 55dB | 2.8 | 183% | Day |
| 1000 | 2025-11-03 16:51:00 | 72 | 55dB | 3.2 | 225% | Day |
| 1001 | 2025-11-03 16:52:44 | 71 | 55dB | 3.0 | 203% | Day |
| 1002 | 2025-11-03 16:54:20 | 71 | 55dB | 3.0 | 203% | Day |
| 1003 | 2025-11-03 16:56:02 | 72 | 55dB | 3.2 | 225% | Day |
| 1004 | 2025-11-03 16:57:39 | | 55dB | ? | ? | Day |
| 1005 | 2025-11-03 16:59:52 | 69 | 55dB | 2.6 | 164% | Day |
| 1006 | 2025-11-03 17:02:02 | | 55dB | ? | ? | Day |
| 1007 | 2025-11-03 17:03:50 | 67 | 55dB | 2.3 | 130% | Day |
| 1008 | 2025-11-03 17:05:27 | | 55dB | ? | ? | Day |
| 1009 | 2025-11-03 17:07:48 | | 55dB | ? | ? | Day |
| 1010 | 2025-11-03 17:09:32 | 73 | 55dB | 3.2 | 225% | Day |
| 1011 | 2025-11-03 17:11:02 | 68 | 55dB | 2.5 | 146% | Day |
| 1012 | 2025-11-03 17:12:21 | | 55dB | ? | ? | Day |
| 1013 | 2025-11-03 17:14:00 | 71 | 55dB | 2.8 | 183% | Day |
| 1014 | 2025-11-03 17:15:23 | | 55dB | ? | ? | Day |
| 1015 | 2025-11-03 17:16:32 | 75 | 55dB | 4.0 | 300% | Day |
| 1016 | 2025-11-03 17:18:00 | 72 | 55dB | 3.2 | 225% | Day |
| 1017 | 2025-11-03 17:19:21 | 79 | 55dB | 5.3 | 428% | Day |
| 1018 | 2025-11-03 17:21:10 | 67 | 55dB | 2.1 | 114% | Day |
| 1019 | 2025-11-03 17:22:33 | | 55dB | ? | ? | Day |
| 1020 | 2025-11-03 17:23:49 | 69 | 55dB | 2.6 | 164% | Day |
| 1021 | 2025-11-03 17:25:04 | | 55dB | ? | ? | Day |
| 1022 | 2025-11-03 17:26:24 | | 55dB | ? | ? | Day |
| 1023 | 2025-11-03 17:27:48 | 71 | 55dB | 2.8 | 183% | Day |
| 1024 | 2025-11-03 17:29:26 | | 55dB | ? | ? | Day |
| 1025 | 2025-11-03 17:30:55 | | 55dB | ? | ? | Day |
| 1026 | 2025-11-03 17:32:33 | | 55dB | ? | ? | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1027 | 2025-11-03 17:34:14 | 80 | 55dB | 5.7 | 466% | Day |
| 1028 | 2025-11-03 17:35:47 | 73 | 55dB | 3.2 | 225% | Day |
| 1029 | 2025-11-03 17:39:01 | 70 | 55dB | 2.8 | 183% | Day |
| 1030 | 2025-11-03 17:40:54 | 73 | 55dB | 3.2 | 225% | Day |
| 1031 | 2025-11-03 17:43:06 | 67 | 55dB | 2.3 | 130% | Day |
| 1032 | 2025-11-03 17:44:45 | 72 | 55dB | 3.2 | 225% | Day |
| 1033 | 2025-11-03 17:46:28 | | 55dB | ? | ? | Day |
| 1034 | 2025-11-03 17:47:52 | | 55dB | ? | ? | Day |
| 1035 | 2025-11-03 17:49:33 | 69 | 55dB | 2.5 | 146% | Day |
| 1036 | 2025-11-03 17:51:05 | | 55dB | ? | ? | Day |
| 1037 | 2025-11-03 17:52:35 | 67 | 55dB | 2.1 | 114% | Day |
| 1038 | 2025-11-03 17:54:09 | 73 | 55dB | 3.2 | 225% | Day |
| 1039 | 2025-11-03 17:58:07 | 72 | 55dB | 3.2 | 225% | Day |
| 1040 | 2025-11-03 17:58:29 | | 55dB | ? | ? | Day |
| 1041 | 2025-11-03 17:59:26 | | 55dB | ? | ? | Day |
| 1042 | 2025-11-03 18:01:04 | 72 | 55dB | 3.2 | 225% | Day |
| 1043 | 2025-11-03 18:04:23 | | 55dB | ? | ? | Day |
| 1044 | 2025-11-03 18:07:45 | 69 | 55dB | 2.6 | 164% | Day |
| 1045 | 2025-11-03 18:10:20 | 74 | 55dB | 3.5 | 248% | Day |
| 1046 | 2025-11-03 18:12:31 | 68 | 55dB | 2.3 | 130% | Day |
| 1047 | 2025-11-03 18:14:00 | 71 | 55dB | 3.0 | 203% | Day |
| 1048 | 2025-11-03 18:15:28 | | 55dB | ? | ? | Day |
| 1049 | 2025-11-03 18:17:49 | | 55dB | ? | ? | Day |
| 1050 | 2025-11-03 18:19:55 | | 55dB | ? | ? | Day |
| 1051 | 2025-11-03 18:21:42 | 72 | 55dB | 3.0 | 203% | Day |
| 1052 | 2025-11-03 18:23:35 | 77 | 55dB | 4.6 | 359% | Day |
| 1053 | 2025-11-03 18:25:06 | 73 | 55dB | 3.2 | 225% | Day |
| 1054 | 2025-11-03 18:28:12 | | 55dB | ? | ? | Day |
| 1055 | 2025-11-03 18:29:57 | 69 | 55dB | 2.5 | 146% | Day |
| 1056 | 2025-11-03 18:31:22 | | 55dB | ? | ? | Day |
| 1057 | 2025-11-03 18:32:47 | 77 | 55dB | 4.3 | 329% | Day |
| 1058 | 2025-11-03 18:34:21 | 71 | 55dB | 2.8 | 183% | Day |
| 1059 | 2025-11-03 18:35:40 | | 55dB | ? | ? | Day |
| 1060 | 2025-11-03 18:37:09 | 70 | 55dB | 2.6 | 164% | Day |
| 1061 | 2025-11-03 18:38:51 | 74 | 55dB | 3.7 | 273% | Day |
| 1062 | 2025-11-03 18:40:54 | 75 | 55dB | 3.7 | 273% | Day |
| 1063 | 2025-11-03 18:42:20 | 69 | 55dB | 2.6 | 164% | Day |
| 1064 | 2025-11-03 18:43:50 | 71 | 55dB | 2.8 | 183% | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1065 | 2025-11-03 18:45:32 | 71 | 55dB | 2.8 | 183% | Day |
| 1066 | 2025-11-03 18:47:14 | 74 | 55dB | 3.5 | 248% | Day |
| 1067 | 2025-11-03 18:49:27 | 71 | 55dB | 2.8 | 183% | Day |
| 1068 | 2025-11-03 18:51:20 | | 55dB | ? | ? | Day |
| 1069 | 2025-11-03 18:52:50 | 74 | 55dB | 3.5 | 248% | Day |
| 1070 | 2025-11-03 18:54:39 | 70 | 55dB | 2.6 | 164% | Day |
| 1071 | 2025-11-03 18:58:37 | 68 | 55dB | 2.5 | 146% | Day |
| 1072 | 2025-11-03 19:00:08 | 69 | 55dB | 2.6 | 164% | Day |
| 1073 | 2025-11-03 19:01:37 | 70 | 55dB | 2.8 | 183% | Day |
| 1074 | 2025-11-03 19:02:58 | 69 | 55dB | 2.6 | 164% | Day |
| 1075 | 2025-11-03 19:04:46 | 69 | 55dB | 2.6 | 164% | Day |
| 1076 | 2025-11-03 19:06:32 | 68 | 55dB | 2.5 | 146% | Day |
| 1077 | 2025-11-03 19:08:25 | 69 | 55dB | 2.6 | 164% | Day |
| 1078 | 2025-11-03 19:10:02 | 70 | 55dB | 2.6 | 164% | Day |
| 1079 | 2025-11-03 19:11:34 | 72 | 55dB | 3.2 | 225% | Day |
| 1080 | 2025-11-03 19:13:01 | 68 | 55dB | 2.3 | 130% | Day |
| 1081 | 2025-11-03 19:14:40 | 80 | 55dB | 5.3 | 428% | Day |
| 1082 | 2025-11-03 19:16:51 | 69 | 55dB | 2.6 | 164% | Day |
| 1083 | 2025-11-03 19:18:31 | 70 | 55dB | 2.6 | 164% | Day |
| 1084 | 2025-11-03 19:20:05 | 71 | 55dB | 3.0 | 203% | Day |
| 1085 | 2025-11-03 19:21:30 | 68 | 55dB | 2.5 | 146% | Day |
| 1086 | 2025-11-03 19:22:55 | 69 | 55dB | 2.6 | 164% | Day |
| 1087 | 2025-11-03 19:24:23 | 69 | 55dB | 2.6 | 164% | Day |
| 1088 | 2025-11-03 19:25:38 | 70 | 55dB | 2.6 | 164% | Day |
| 1089 | 2025-11-03 19:27:09 | 69 | 55dB | 2.5 | 146% | Day |
| 1090 | 2025-11-03 19:28:35 | | 55dB | ? | ? | Day |
| 1091 | 2025-11-03 19:31:03 | | 55dB | ? | ? | Day |
| 1092 | 2025-11-03 19:33:05 | 73 | 55dB | 3.2 | 225% | Day |
| 1093 | 2025-11-03 19:34:49 | 73 | 55dB | 3.2 | 225% | Day |
| 1094 | 2025-11-03 19:37:21 | | 55dB | ? | ? | Day |
| 1095 | 2025-11-03 19:38:50 | 69 | 55dB | 2.6 | 164% | Day |
| 1096 | 2025-11-03 19:40:11 | 67 | 55dB | 2.3 | 130% | Day |
| 1097 | 2025-11-03 19:41:46 | 74 | 55dB | 3.5 | 248% | Day |
| 1098 | 2025-11-03 19:44:22 | 73 | 55dB | 3.2 | 225% | Day |
| 1099 | 2025-11-03 19:46:09 | | 55dB | ? | ? | Day |
| 1100 | 2025-11-03 19:47:36 | 67 | 55dB | 2.1 | 114% | Day |
| 1101 | 2025-11-03 19:49:00 | | 55dB | ? | ? | Day |
| 1102 | 2025-11-03 19:53:11 | 71 | 55dB | 2.8 | 183% | Day |

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|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1103 | 2025-11-03 19:55:01 | 71 | 55dB | 2.8 | 183% | Day |
| 1104 | 2025-11-03 19:57:21 | | 55dB | ? | ? | Day |
| 1105 | 2025-11-03 19:58:42 | | 55dB | ? | ? | Day |
| 1106 | 2025-11-03 20:00:09 | 79 | 55dB | 4.9 | 392% | Day |
| 1107 | 2025-11-03 20:01:47 | 68 | 55dB | 2.3 | 130% | Day |
| 1108 | 2025-11-03 20:03:05 | | 55dB | ? | ? | Day |
| 1109 | 2025-11-03 20:04:39 | 71 | 55dB | 2.8 | 183% | Day |
| 1110 | 2025-11-03 20:06:00 | | 55dB | ? | ? | Day |
| 1111 | 2025-11-03 20:07:21 | 71 | 55dB | 2.8 | 183% | Day |
| 1112 | 2025-11-03 20:08:54 | 68 | 55dB | 2.5 | 146% | Day |
| 1113 | 2025-11-03 20:10:21 | | 55dB | ? | ? | Day |
| 1114 | 2025-11-03 20:11:31 | 77 | 55dB | 4.6 | 359% | Day |
| 1115 | 2025-11-03 20:13:10 | 69 | 55dB | 2.6 | 164% | Day |
| 1116 | 2025-11-03 20:14:32 | 67 | 55dB | 2.3 | 130% | Day |
| 1117 | 2025-11-03 20:17:30 | 71 | 55dB | 2.8 | 183% | Day |
| 1118 | 2025-11-03 20:19:41 | 69 | 55dB | 2.6 | 164% | Day |
| 1119 | 2025-11-03 20:21:13 | 71 | 55dB | 3.0 | 203% | Day |
| 1120 | 2025-11-03 20:23:00 | 74 | 55dB | 3.5 | 248% | Day |
| 1121 | 2025-11-03 20:25:53 | | 55dB | ? | ? | Day |
| 1122 | 2025-11-03 20:27:31 | 70 | 55dB | 2.8 | 183% | Day |
| 1123 | 2025-11-03 20:29:09 | 70 | 55dB | 2.8 | 183% | Day |
| 1124 | 2025-11-03 20:30:42 | | 55dB | ? | ? | Day |
| 1125 | 2025-11-03 20:33:14 | 71 | 55dB | 2.8 | 183% | Day |
| 1126 | 2025-11-03 20:35:11 | 70 | 55dB | 2.8 | 183% | Day |
| 1127 | 2025-11-03 20:36:48 | | 55dB | ? | ? | Day |
| 1128 | 2025-11-03 20:39:02 | | 55dB | ? | ? | Day |
| 1129 | 2025-11-03 20:40:39 | 70 | 55dB | 2.6 | 164% | Day |
| 1130 | 2025-11-03 20:42:18 | 70 | 55dB | 2.8 | 183% | Day |
| 1131 | 2025-11-03 20:43:34 | | 55dB | ? | ? | Day |
| 1132 | 2025-11-03 20:45:22 | 71 | 55dB | 2.8 | 183% | Day |
| 1133 | 2025-11-03 20:46:56 | 69 | 55dB | 2.5 | 146% | Day |
| 1134 | 2025-11-03 20:48:25 | 71 | 55dB | 2.8 | 183% | Day |
| 1135 | 2025-11-03 20:49:48 | 70 | 55dB | 2.8 | 183% | Day |
| 1136 | 2025-11-03 20:51:15 | 66 | 55dB | 2.1 | 114% | Day |
| 1137 | 2025-11-03 20:52:56 | | 55dB | ? | ? | Day |
| 1138 | 2025-11-03 20:54:37 | | 55dB | ? | ? | Day |
| 1139 | 2025-11-03 20:56:03 | 73 | 55dB | 3.2 | 225% | Day |
| 1140 | 2025-11-03 20:57:35 | | 55dB | ? | ? | Day |

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| November 1, 2 and 3, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1141 | 2025-11-03 20:59:10 | 74 | 55dB | 3.5 | 248% | Day |
| 1142 | 2025-11-03 21:01:40 | | 55dB | ? | ? | Day |
| 1143 | 2025-11-03 21:03:05 | 72 | 55dB | 3.0 | 203% | Day |
| 1144 | 2025-11-03 21:05:08 | 78 | 55dB | 4.6 | 359% | Day |
| 1145 | 2025-11-03 21:08:53 | 71 | 55dB | 3.0 | 203% | Day |
| 1146 | 2025-11-03 21:11:54 | | 55dB | ? | ? | Day |
| 1147 | 2025-11-03 21:13:12 | 70 | 55dB | 2.8 | 183% | Day |
| 1148 | 2025-11-03 21:15:10 | 75 | 55dB | 3.7 | 273% | Day |
| 1149 | 2025-11-03 21:17:18 | 70 | 55dB | 2.6 | 164% | Day |
| 1150 | 2025-11-03 21:18:28 | 82 | 55dB | 6.1 | 506% | Day |
| 1151 | 2025-11-03 21:19:48 | 70 | 55dB | 2.6 | 164% | Day |
| 1152 | 2025-11-03 21:21:26 | | 55dB | ? | ? | Day |
| 1153 | 2025-11-03 21:26:24 | 70 | 55dB | 2.6 | 164% | Day |
| 1154 | 2025-11-03 21:29:02 | 70 | 55dB | 2.6 | 164% | Day |
| 1155 | 2025-11-03 21:31:46 | | 55dB | ? | ? | Day |
| 1156 | 2025-11-03 21:33:38 | 68 | 55dB | 2.5 | 146% | Day |
| 1157 | 2025-11-03 21:35:20 | 68 | 55dB | 2.5 | 146% | Day |
| 1158 | 2025-11-03 21:37:16 | 68 | 55dB | 2.3 | 130% | Day |
| 1159 | 2025-11-03 21:38:39 | 69 | 55dB | 2.5 | 146% | Day |
| 1160 | 2025-11-03 21:40:09 | 73 | 55dB | 3.2 | 225% | Day |
| 1161 | 2025-11-03 21:41:25 | 70 | 55dB | 2.6 | 164% | Day |
| 1162 | 2025-11-03 21:42:46 | 70 | 55dB | 2.8 | 183% | Day |
| 1163 | 2025-11-03 21:44:07 | 68 | 55dB | 2.3 | 130% | Day |
| 1164 | 2025-11-03 21:47:27 | 69 | 55dB | 2.5 | 146% | Day |
| 1165 | 2025-11-03 21:57:10 | 70 | 55dB | 2.6 | 164% | Day |
| 1166 | 2025-11-03 21:59:48 | 69 | 55dB | 2.5 | 146% | Day |
| 1167 | 2025-11-03 22:01:34 | | 55dB | ? | ? | Day |
| 1168 | 2025-11-03 22:03:34 | 67 | 55dB | 2.1 | 114% | Day |
| 1169 | 2025-11-03 22:08:55 | 70 | 55dB | 2.6 | 164% | Day |
| 1170 | 2025-11-03 22:13:00 | 66 | 55dB | 2.1 | 114% | Day |
| 1171 | 2025-11-03 22:15:07 | 71 | 55dB | 2.8 | 183% | Day |
| 1172 | 2025-11-03 22:18:48 | | 55dB | ? | ? | Day |
| 1173 | 2025-11-03 22:21:01 | 71 | 55dB | 3.0 | 203% | Day |
| 1174 | 2025-11-03 22:23:17 | 70 | 55dB | 2.8 | 183% | Day |
| 1175 | 2025-11-03 22:25:35 | | 55dB | ? | ? | Day |
| 1176 | 2025-11-03 22:28:18 | | 55dB | ? | ? | Day |
| 1177 | 2025-11-03 22:30:12 | | 55dB | ? | ? | Day |
| 1178 | 2025-11-03 22:41:11 | 71 | 55dB | 2.8 | 183% | Day |

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|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1179 | 2025-11-03 22:43:11 | 70 | 55dB | 2.6 | 164% | Day |
| 1180 | 2025-11-03 22:45:06 | | 55dB | ? | ? | Day |
| 1181 | 2025-11-03 22:46:52 | | 55dB | ? | ? | Day |
| 1182 | 2025-11-03 22:51:12 | | 55dB | ? | ? | Day |
| 1183 | 2025-11-03 23:02:10 | 71 | 45dB | 6.1 | 506% | Night |
| 1184 | 2025-11-03 23:14:12 | | 45dB | ? | ? | Night |
| 1185 | 2025-11-03 23:16:11 | | 45dB | ? | ? | Night |
| 1186 | 2025-11-03 23:17:57 | | 45dB | ? | ? | Night |
| 1187 | 2025-11-03 23:26:26 | 70 | 45dB | 5.7 | 466% | Night |
| 1188 | 2025-11-03 23:28:11 | | 45dB | ? | ? | Night |
| 1189 | 2025-11-03 23:30:16 | 68 | 45dB | 4.6 | 359% | Night |
| 1190 | 2025-11-03 23:31:52 | 70 | 45dB | 5.7 | 466% | Night |
| 1191 | 2025-11-03 23:33:52 | 68 | 45dB | 4.9 | 392% | Night |
| 1192 | 2025-11-03 23:35:39 | 69 | 45dB | 5.3 | 428% | Night |
| 1193 | 2025-11-03 23:37:09 | 70 | 45dB | 5.7 | 466% | Night |
| 1194 | 2025-11-03 23:39:00 | 71 | 45dB | 6.1 | 506% | Night |
| 1195 | 2025-11-03 23:41:14 | 69 | 45dB | 4.9 | 392% | Night |
| 1196 | 2025-11-03 23:42:41 | 70 | 45dB | 5.7 | 466% | Night |
| 1197 | 2025-11-03 23:44:22 | 69 | 45dB | 5.3 | 428% | Night |
| 1198 | 2025-11-03 23:46:09 | 70 | 45dB | 5.3 | 428% | Night |
| 1199 | 2025-11-03 23:47:28 | 70 | 45dB | 5.3 | 428% | Night |
| 1200 | 2025-11-03 23:49:35 | 68 | 45dB | 4.6 | 359% | Night |
| 1201 | 2025-11-03 23:51:08 | 71 | 45dB | 5.7 | 466% | Night |
| 1202 | 2025-11-03 23:52:46 | 70 | 45dB | 5.3 | 428% | Night |
| 1203 | 2025-11-03 23:55:40 | 70 | 45dB | 5.3 | 428% | Night |
| 1204 | 2025-11-03 23:57:31 | 69 | 45dB | 5.3 | 428% | Night |

ATIA - 19(1)

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**From:** Fabio Ovettini
**To:** hcminister.ministresc; Minister of Transport / Ministre des Transports (TC); Deborah; Prime Minister | Premier Ministre
**Cc:** [redacted] mark.holland@parl.gc.ca; yaara.saks@parl.gc.ca; Costen, Eric (he, him | il, lui) (HC/SC); Orencsak, Greg (he, him | il, lui) (HC/SC); Jagmeet - M.P.; Francesco Sorbara; [redacted] humberleacommunitygroup@gmail.com; [redacted] Mayor Chow; Councillor Perruzza; Tom Rakocevic; [redacted] W5 Viewer Mail; [redacted] doug.fordco@pc.ola.org; [redacted] hcminister.ministresc; [redacted] piac.ward04@tdsb.on.ca; [redacted] office@timothycs.com; piac.ward01@tdsb.on.ca; [redacted] judy.sgro.a1@parl.gc.ca; [redacted] judy.sgro@parl.gc.ca; [redacted] councillor_crisanti@toronto.ca; councillor_holyday@toronto.ca; councillor_morley@toronto.ca; councillor_perks@toronto.ca; councillor_nunziata@toronto.ca; councillor_pasternak@toronto.ca; councillor_colle8@toronto.ca; councillor_malik@toronto.ca; councillor_saxe@toronto.ca; councillor_matlow@toronto.ca; councillor_moise@toronto.ca; councillor_fletcher@toronto.ca; councillor_chernoslin@toronto.ca; councillor_burnside@toronto.ca; councillor_carroll@toronto.ca; councillor_cheng@toronto.ca; councillor_bradford@toronto.ca; councillor_kandavel@toronto.ca; councillor_thompson@toronto.ca; councillor_mantas@toronto.ca; councillor_myers@toronto.ca; councillor_mckelvie@toronto.ca; [redacted] councillor_ainslie@toronto.ca; [redacted]
**Subject:** GTAA Acknowledges 45 dB as Harm Threshold — Why Are Residents Being Exposed to Noise Over 1000% Louder?
**Date:** 2025-06-11 10:02:04 AM
**Attachments:** Noise-Events-Feb-2025-.pdf
Noise-Events-Jan-2025-.pdf
Noise-Events-March-2025.pdf
GTAA Restricted Hours Operating Policy v4-1.pdf

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**Warning:** This message is from an EXTERNAL SENDER – be CAUTIOUS, particularly with links and attachments.
**Attention :** Ce message provient d'un EXPÉDITEUR EXTERNE – soyez PRUDENT, en particulier avec les liens et les pièces jointes.

Subject: GTAA Acknowledges 45 dB as Harm Threshold — Why Are Residents Being Exposed to Noise Over 1000% Louder?

Dear Minister Freeland, Minister Michel, and GTAA Leadership,

I am writing to bring your attention to a deeply alarming disconnect between the GTAA's own stated noise mitigation standards and the conditions endured nightly by Toronto residents.

The GTAA's Restricted Hours Operating Policy (v4.1) clearly states:

> *"To minimize noise, the GTAA works with NAV CANADA to implement and maintain flight procedures for arriving and departing aircraft that minimize the number of community residents that are overflown at a decibel rating above 45dB during the restricted hours."*

This policy acknowledges that 45 dB is the threshold beyond which aircraft noise is considered harmful and must be minimized.

Yet in reality, residents in communities like Acacia Park are routinely exposed to nighttime noise levels between 75 and 80 dB — and sometimes even higher. On a logarithmic scale, 80 dB is perceived as more than 1000% louder than 45 dB. That is not a minor violation — it is a staggering escalation of acknowledged harm.

Exposure to this level of noise is not merely disruptive. It causes sleep deprivation, cognitive impairment, cardiovascular strain, mental health deterioration, and long-term health consequences that are well documented by the World Health Organization and other global health authorities. The GTAA's own threshold makes it clear: harm begins at 45 dB. So why are residents being forced to endure 80 dB, night after night?

I am calling on:

- Transport Canada to explain why such harmful exposures are permitted and escalating;
- GTAA to justify its ongoing violation of its own 45 dB standard;
- And Health Canada, under Minister Michel, to formally recognize this as a serious and preventable public health issue.

I have attached data from the Acacia Park noise monitor showing repeated instances of nighttime noise exceeding 70 dB. These figures are not rare — they are routine.

Canadians deserve better than this. If 45 dB is the acknowledged harm threshold, then 80 dB is not simply negligent — it is an **institutionalized assault on public health.**

Sincerely,
Fabio Ovettini

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| March, 2025 | | | | | | |
|---|---|---|---|---|---|---|
| Events | Date and Time of Airplane Noise Event | Decibels as reported by Acacia's noise Monitor | max recommended dB, day 55dB, night 45dB | X Louder | % louder than recommended | Day or Night |
| 1 | 2025-02-26 00:00:24 | ? | 45dB | ? | ? | Night |
| 2 | 2025-02-26 00:10:30 | 76 | 45dB | 8.6 | 757% | Night |
| 3 | 2025-02-26 00:12:37 | 72 | 45dB | 6.5 | 550% | Night |
| 4 | 2025-02-26 00:14:09 | 72 | 45dB | 6.5 | 550% | Night |
| 5 | 2025-02-26 00:15:37 | 72 | 45dB | 6.5 | 550% | Night |
| 6 | 2025-02-26 00:24:23 | 71 | 45dB | 6.1 | 506% | Night |
| 7 | 2025-02-26 00:29:27 | 70 | 45dB | 5.7 | 466% | Night |
| 8 | 2025-02-26 00:31:48 | 71 | 45dB | 6.1 | 506% | Night |
| 9 | 2025-02-26 00:37:52 | 70 | 45dB | 5.7 | 466% | Night |
| 10 | 2025-02-26 00:49:25 | 71 | 45dB | 6.1 | 506% | Night |
| 11 | 2025-02-26 00:53:27 | 74 | 45dB | 7.0 | 596% | Night |
| 12 | 2025-02-26 00:56:35 | 71 | 45dB | 6.1 | 506% | Night |
| 13 | 2025-02-26 01:00:36 | 68 | 45dB | 4.6 | 359% | Night |
| 14 | 2025-02-26 06:29:09 | 68 | 45dB | 4.9 | 392% | Night |
| 15 | 2025-02-26 06:31:06 | ? | 45dB | ? | ? | Night |
| 16 | 2025-02-26 06:32:21 | 71 | 45dB | 5.7 | 466% | Night |
| 17 | 2025-02-26 06:34:26 | 69 | 45dB | 4.9 | 392% | Night |
| 18 | 2025-02-26 06:35:26 | 68 | 45dB | 4.6 | 359% | Night |
| 19 | 2025-02-26 06:36:28 | 67 | 45dB | 4.6 | 359% | Night |
| 20 | 2025-02-26 06:37:42 | ? | 45dB | ? | ? | Night |
| 21 | 2025-02-26 06:39:13 | 68 | 45dB | 4.9 | 392% | Night |
| 22 | 2025-02-26 06:40:44 | ? | 45dB | ? | ? | Night |
| 23 | 2025-02-26 06:41:58 | 67 | 45dB | 4.6 | 359% | Night |
| 24 | 2025-02-26 06:43:04 | 67 | 45dB | 4.6 | 359% | Night |
| 25 | 2025-02-26 06:44:54 | 69 | 45dB | 4.9 | 392% | Night |
| 26 | 2025-02-26 06:46:32 | 66 | 45dB | 4.3 | 329% | Night |
| 27 | 2025-02-26 06:47:36 | 69 | 45dB | 5.3 | 428% | Night |
| 28 | 2025-02-26 06:49:31 | 67 | 45dB | 4.3 | 329% | Night |
| 29 | 2025-02-26 06:50:54 | ? | 45dB | ? | ? | Night |
| 30 | 2025-02-26 06:52:01 | 69 | 45dB | 4.9 | 392% | Night |
| 31 | 2025-02-26 06:53:28 | 72 | 45dB | 6.5 | 550% | Night |
| 32 | 2025-02-26 06:55:31 | 68 | 45dB | 4.9 | 392% | Night |
| 33 | 2025-02-26 06:56:48 | 70 | 45dB | 5.3 | 428% | Night |
| 34 | 2025-02-26 06:58:20 | ? | 45dB | ? | ? | Night |
| 35 | 2025-02-26 07:00:10 | 69 | 55dB | 2.5 | 146% | Day |
| 36 | 2025-02-26 07:02:00 | 70 | 55dB | 2.6 | 164% | Day |
| 37 | 2025-02-26 07:04:19 | 74 | 55dB | 3.5 | 248% | Day |
| 38 | 2025-02-26 07:06:05 | ? | 55dB | ? | ? | Day |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 39 | 2025-02-26 07:07:25 | ? | 55dB | ? | ? | Day |
| 40 | 2025-02-26 07:09:40 | 67 | 55dB | 2.1 | 114% | Day |
| 41 | 2025-02-26 07:10:55 | 69 | 55dB | 2.6 | 164% | Day |
| 42 | 2025-02-26 07:12:48 | ? | 55dB | ? | ? | Day |
| 43 | 2025-02-26 07:26:05 | 68 | 55dB | 2.5 | 146% | Day |
| 44 | 2025-02-26 07:27:57 | ? | 55dB | ? | ? | Day |
| 45 | 2025-02-26 07:32:44 | 72 | 55dB | 3.2 | 225% | Day |
| 46 | 2025-02-26 07:35:56 | 70 | 55dB | 2.6 | 164% | Day |
| 47 | 2025-02-26 07:38:00 | 69 | 55dB | 2.5 | 146% | Day |
| 48 | 2025-02-26 07:45:53 | ? | 55dB | ? | ? | Day |
| 49 | 2025-02-26 07:50:20 | 69 | 55dB | 2.5 | 146% | Day |
| 50 | 2025-02-26 07:51:39 | ? | 55dB | ? | ? | Day |
| 51 | 2025-02-26 07:58:26 | 69 | 55dB | 2.5 | 146% | Day |
| 52 | 2025-02-26 08:04:05 | ? | 55dB | ? | ? | Day |
| 53 | 2025-02-26 08:08:06 | 70 | 55dB | 2.6 | 164% | Day |
| 54 | 2025-02-26 08:17:28 | 70 | 55dB | 2.6 | 164% | Day |
| 55 | 2025-02-26 08:21:17 | 69 | 55dB | 2.6 | 164% | Day |
| 56 | 2025-02-26 08:23:27 | 69 | 55dB | 2.6 | 164% | Day |
| 57 | 2025-02-26 08:26:00 | ? | 55dB | ? | ? | Day |
| 58 | 2025-02-26 08:28:07 | 70 | 55dB | 2.6 | 164% | Day |
| 59 | 2025-02-26 08:29:57 | 69 | 55dB | 2.5 | 146% | Day |
| 60 | 2025-02-26 08:31:24 | ? | 55dB | ? | ? | Day |
| 61 | 2025-02-26 08:32:43 | ? | 55dB | ? | ? | Day |
| 62 | 2025-02-26 08:34:03 | ? | 55dB | ? | ? | Day |
| 63 | 2025-02-26 08:35:33 | 70 | 55dB | 2.8 | 183% | Day |
| 64 | 2025-02-26 08:38:39 | ? | 55dB | ? | ? | Day |
| 65 | 2025-02-26 08:40:35 | 68 | 55dB | 2.5 | 146% | Day |
| 66 | 2025-02-26 08:47:33 | ? | 55dB | ? | ? | Day |
| 67 | 2025-02-26 08:49:08 | 66 | 55dB | 2.0 | 100% | Day |
| 68 | 2025-02-26 08:57:30 | 89 | 55dB | 9.8 | 885% | Day |
| 69 | 2025-02-26 08:58:46 | 68 | 55dB | 2.5 | 146% | Day |
| 70 | 2025-02-26 09:11:13 | 66 | 55dB | 2.1 | 114% | Day |
| 71 | 2025-02-26 09:12:35 | ? | 55dB | ? | ? | Day |
| 72 | 2025-02-26 09:13:52 | ? | 55dB | ? | ? | Day |
| 73 | 2025-02-26 09:15:14 | 83 | 55dB | 6.5 | 550% | Day |
| 74 | 2025-02-26 09:16:39 | 71 | 55dB | 2.8 | 183% | Day |
| 75 | 2025-02-26 09:18:43 | ? | 55dB | ? | ? | Day |
| 76 | 2025-02-26 09:27:06 | 79 | 55dB | 4.9 | 392% | Day |
| 77 | 2025-02-26 09:32:58 | ? | 55dB | ? | ? | Day |
| 78 | 2025-02-26 09:38:43 | ? | 55dB | ? | ? | Day |
| 79 | 2025-02-26 09:55:06 | ? | 55dB | ? | ? | Day |
| 80 | 2025-02-26 09:56:52 | 79 | 55dB | 4.9 | 392% | Day |
| 81 | 2025-02-26 10:06:16 | ? | 55dB | ? | ? | Day |
| 82 | 2025-02-26 10:15:39 | 68 | 55dB | 2.3 | 130% | Day |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 83 | 2025-02-26 10:17:39 | 68 | 55dB | 2.5 | 146% | Day |
| 84 | 2025-02-26 10:19:12 | 68 | 55dB | 2.3 | 130% | Day |
| 85 | 2025-02-26 10:20:35 | ? | 55dB | ? | ? | Day |
| 86 | 2025-02-26 10:21:58 | 77 | 55dB | 4.6 | 359% | Day |
| 87 | 2025-02-26 10:23:24 | ? | 55dB | ? | ? | Day |
| 88 | 2025-02-26 10:25:43 | 69 | 55dB | 2.5 | 146% | Day |
| 89 | 2025-02-26 10:27:41 | ? | 55dB | ? | ? | Day |
| 90 | 2025-02-26 10:29:45 | 68 | 55dB | 2.3 | 130% | Day |
| 91 | 2025-02-26 10:31:58 | 70 | 55dB | 2.8 | 183% | Day |
| 92 | 2025-02-26 10:34:05 | 67 | 55dB | 2.1 | 114% | Day |
| 93 | 2025-02-26 10:37:09 | ? | 55dB | ? | ? | Day |
| 94 | 2025-02-26 10:38:39 | 67 | 55dB | 2.1 | 114% | Day |
| 95 | 2025-02-26 10:40:20 | 82 | 55dB | 6.1 | 506% | Day |
| 96 | 2025-02-26 10:46:06 | 69 | 55dB | 2.6 | 164% | Day |
| 97 | 2025-02-26 10:47:56 | 68 | 55dB | 2.5 | 146% | Day |
| 98 | 2025-02-26 10:49:57 | ? | 55dB | ? | ? | Day |
| 99 | 2025-02-26 10:51:18 | ? | 55dB | ? | ? | Day |
| 100 | 2025-02-26 10:53:16 | 71 | 55dB | 2.8 | 183% | Day |
| 101 | 2025-02-26 10:57:49 | ? | 55dB | ? | ? | Day |
| 102 | 2025-02-26 10:59:57 | 73 | 55dB | 3.2 | 225% | Day |
| 103 | 2025-02-26 11:02:13 | 69 | 55dB | 2.6 | 164% | Day |
| 104 | 2025-02-26 11:03:54 | 69 | 55dB | 2.6 | 164% | Day |
| 105 | 2025-02-26 11:08:42 | ? | 55dB | ? | ? | Day |
| 106 | 2025-02-26 11:10:18 | ? | 55dB | ? | ? | Day |
| 107 | 2025-02-26 11:11:48 | ? | 55dB | ? | ? | Day |
| 108 | 2025-02-26 11:13:40 | 66 | 55dB | 2.1 | 114% | Day |
| 109 | 2025-02-26 11:15:38 | 81 | 55dB | 6.1 | 506% | Day |
| 110 | 2025-02-26 11:17:17 | ? | 55dB | ? | ? | Day |
| 111 | 2025-02-26 11:18:56 | ? | 55dB | ? | ? | Day |
| 112 | 2025-02-26 11:20:58 | ? | 55dB | ? | ? | Day |
| 113 | 2025-02-26 11:23:14 | ? | 55dB | ? | ? | Day |
| 114 | 2025-02-26 11:26:41 | 72 | 55dB | 3.2 | 225% | Day |
| 115 | 2025-02-26 11:29:11 | ? | 55dB | ? | ? | Day |
| 116 | 2025-02-26 11:30:51 | ? | 55dB | ? | ? | Day |
| 117 | 2025-02-26 11:32:40 | ? | 55dB | ? | ? | Day |
| 118 | 2025-02-26 11:34:46 | 69 | 55dB | 2.5 | 146% | Day |
| 119 | 2025-02-26 11:39:12 | 68 | 55dB | 2.3 | 130% | Day |
| 120 | 2025-02-26 11:40:26 | 68 | 55dB | 2.5 | 146% | Day |
| 121 | 2025-02-26 11:41:56 | ? | 55dB | ? | ? | Day |
| 122 | 2025-02-26 11:44:05 | 71 | 55dB | 2.8 | 183% | Day |
| 123 | 2025-02-26 11:46:21 | ? | 55dB | ? | ? | Day |
| 124 | 2025-02-26 11:47:36 | ? | 55dB | ? | ? | Day |
| 125 | 2025-02-26 11:49:08 | 77 | 55dB | 4.3 | 329% | Day |
| 126 | 2025-02-26 11:50:32 | 70 | 55dB | 2.6 | 164% | Day |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 127 | 2025-02-26 11:55:12 | 68 | 55dB | 2.3 | 130% | Day |
| 128 | 2025-02-26 11:57:39 | ? | 55dB | ? | ? | Day |
| 129 | 2025-02-26 11:59:12 | ? | 55dB | ? | ? | Day |
| 130 | 2025-02-26 12:01:18 | ? | 55dB | ? | ? | Day |
| 131 | 2025-02-26 12:06:18 | 70 | 55dB | 2.6 | 164% | Day |
| 132 | 2025-02-26 12:08:08 | ? | 55dB | ? | ? | Day |
| 133 | 2025-02-26 12:10:42 | ? | 55dB | ? | ? | Day |
| 134 | 2025-02-26 12:12:43 | ? | 55dB | ? | ? | Day |
| 135 | 2025-02-26 12:14:26 | 67 | 55dB | 2.3 | 130% | Day |
| 136 | 2025-02-26 12:17:04 | 71 | 55dB | 2.8 | 183% | Day |
| 137 | 2025-02-26 12:19:20 | ? | 55dB | ? | ? | Day |
| 138 | 2025-02-26 12:21:28 | 67 | 55dB | 2.3 | 130% | Day |
| 139 | 2025-02-26 12:23:32 | 70 | 55dB | 2.6 | 164% | Day |
| 140 | 2025-02-26 12:26:07 | 70 | 55dB | 2.6 | 164% | Day |
| 141 | 2025-02-26 12:28:10 | 68 | 55dB | 2.3 | 130% | Day |
| 142 | 2025-02-26 12:29:54 | 67 | 55dB | 2.1 | 114% | Day |
| 143 | 2025-02-26 12:34:13 | ? | 55dB | ? | ? | Day |
| 144 | 2025-02-26 12:36:48 | 66 | 55dB | 2.1 | 114% | Day |
| 145 | 2025-02-26 12:40:52 | ? | 55dB | ? | ? | Day |
| 146 | 2025-02-26 12:42:14 | ? | 55dB | ? | ? | Day |
| 147 | 2025-02-26 12:44:04 | 67 | 55dB | 2.3 | 130% | Day |
| 148 | 2025-02-26 12:45:21 | 68 | 55dB | 2.3 | 130% | Day |
| 149 | 2025-02-26 12:50:50 | 74 | 55dB | 3.7 | 273% | Day |
| 150 | 2025-02-26 12:52:40 | ? | 55dB | ? | ? | Day |
| 151 | 2025-02-26 12:54:05 | 69 | 55dB | 2.5 | 146% | Day |
| 152 | 2025-02-26 12:55:54 | 69 | 55dB | 2.5 | 146% | Day |
| 153 | 2025-02-26 13:01:00 | 71 | 55dB | 3.0 | 203% | Day |
| 154 | 2025-02-26 13:03:12 | ? | 55dB | ? | ? | Day |
| 155 | 2025-02-26 13:04:32 | 74 | 55dB | 3.5 | 248% | Day |
| 156 | 2025-02-26 13:09:16 | ? | 55dB | ? | ? | Day |
| 157 | 2025-02-26 13:12:31 | 70 | 55dB | 2.6 | 164% | Day |
| 158 | 2025-02-26 13:18:11 | 71 | 55dB | 3.0 | 203% | Day |
| 159 | 2025-02-26 13:19:52 | 69 | 55dB | 2.5 | 146% | Day |
| 160 | 2025-02-26 13:22:05 | 68 | 55dB | 2.5 | 146% | Day |
| 161 | 2025-02-26 13:23:20 | 72 | 55dB | 3.0 | 203% | Day |
| 162 | 2025-02-26 13:24:53 | ? | 55dB | ? | ? | Day |
| 163 | 2025-02-26 13:26:37 | ? | 55dB | ? | ? | Day |
| 164 | 2025-02-26 13:28:11 | ? | 55dB | ? | ? | Day |
| 165 | 2025-02-26 13:29:51 | 69 | 55dB | 2.5 | 146% | Day |
| 166 | 2025-02-26 13:34:13 | ? | 55dB | ? | ? | Day |
| 167 | 2025-02-26 13:35:56 | 67 | 55dB | 2.1 | 114% | Day |
| 168 | 2025-02-26 13:37:25 | 75 | 55dB | 3.7 | 273% | Day |
| 169 | 2025-02-26 13:38:48 | 68 | 55dB | 2.3 | 130% | Day |
| 170 | 2025-02-26 13:40:16 | 71 | 55dB | 3.0 | 203% | Day |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 171 | 2025-02-26 13:45:41 | 67 | 55dB | 2.3 | 130% | Day |
| 172 | 2025-02-26 13:47:21 | 76 | 55dB | 4.0 | 300% | Day |
| 173 | 2025-02-26 13:54:02 | ? | 55dB | ? | ? | Day |
| 174 | 2025-02-26 13:56:04 | 70 | 55dB | 2.6 | 164% | Day |
| 175 | 2025-02-26 13:57:25 | 71 | 55dB | 3.0 | 203% | Day |
| 176 | 2025-02-26 14:02:39 | ? | 55dB | ? | ? | Day |
| 177 | 2025-02-26 14:03:57 | ? | 55dB | ? | ? | Day |
| 178 | 2025-02-26 14:05:19 | 70 | 55dB | 2.6 | 164% | Day |
| 179 | 2025-02-26 14:06:36 | 69 | 55dB | 2.5 | 146% | Day |
| 180 | 2025-02-26 14:07:51 | ? | 55dB | ? | ? | Day |
| 181 | 2025-02-26 14:09:22 | 67 | 55dB | 2.1 | 114% | Day |
| 182 | 2025-02-26 14:10:59 | 66 | 55dB | 2.1 | 114% | Day |
| 183 | 2025-02-26 14:12:22 | 68 | 55dB | 2.5 | 146% | Day |
| 184 | 2025-02-26 14:13:36 | 69 | 55dB | 2.6 | 164% | Day |
| 185 | 2025-02-26 14:17:06 | 70 | 55dB | 2.8 | 183% | Day |
| 186 | 2025-02-26 14:18:47 | 67 | 55dB | 2.1 | 114% | Day |
| 187 | 2025-02-26 14:20:41 | ? | 55dB | ? | ? | Day |
| 188 | 2025-02-26 14:28:35 | 68 | 55dB | 2.3 | 130% | Day |
| 189 | 2025-02-26 14:29:56 | 68 | 55dB | 2.3 | 130% | Day |
| 190 | 2025-02-26 14:31:54 | 67 | 55dB | 2.3 | 130% | Day |
| 191 | 2025-02-26 14:33:11 | ? | 55dB | ? | ? | Day |
| 192 | 2025-02-26 14:34:58 | 75 | 55dB | 3.7 | 273% | Day |
| 193 | 2025-02-26 14:37:12 | 73 | 55dB | 3.5 | 248% | Day |
| 194 | 2025-02-26 14:38:46 | 70 | 55dB | 2.8 | 183% | Day |
| 195 | 2025-02-26 14:41:04 | ? | 55dB | ? | ? | Day |
| 196 | 2025-02-26 14:42:28 | ? | 55dB | ? | ? | Day |
| 197 | 2025-02-26 14:43:36 | ? | 55dB | ? | ? | Day |
| 198 | 2025-02-26 14:44:51 | 74 | 55dB | 3.7 | 273% | Day |
| 199 | 2025-02-26 14:46:57 | 70 | 55dB | 2.6 | 164% | Day |
| 200 | 2025-02-26 14:48:21 | ? | 55dB | ? | ? | Day |
| 201 | 2025-02-26 14:49:57 | ? | 55dB | ? | ? | Day |
| 202 | 2025-02-26 14:51:17 | 70 | 55dB | 2.6 | 164% | Day |
| 203 | 2025-02-26 14:52:42 | 68 | 55dB | 2.5 | 146% | Day |
| 204 | 2025-02-26 14:54:56 | 71 | 55dB | 3.0 | 203% | Day |
| 205 | 2025-02-26 14:57:05 | 68 | 55dB | 2.5 | 146% | Day |
| 206 | 2025-02-26 14:59:50 | ? | 55dB | ? | ? | Day |
| 207 | 2025-02-26 15:01:08 | 68 | 55dB | 2.5 | 146% | Day |
| 208 | 2025-02-26 15:04:48 | 66 | 55dB | 2.1 | 114% | Day |
| 209 | 2025-02-26 15:06:09 | 73 | 55dB | 3.5 | 248% | Day |
| 210 | 2025-02-26 15:07:57 | 75 | 55dB | 4.0 | 300% | Day |
| 211 | 2025-02-26 15:09:53 | ? | 55dB | ? | ? | Day |
| 212 | 2025-02-26 15:11:04 | ? | 55dB | ? | ? | Day |
| 213 | 2025-02-26 15:18:32 | ? | 55dB | ? | ? | Day |
| 214 | 2025-02-26 15:21:23 | 69 | 55dB | 2.5 | 146% | Day |

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|---|---|---|---|---|---|---|
| 215 | 2025-02-26 15:26:06 | 69 | 55dB | 2.5 | 146% | Day |
| 216 | 2025-02-26 15:28:57 | 72 | 55dB | 3.0 | 203% | Day |
| 217 | 2025-02-26 15:31:00 | 67 | 55dB | 2.1 | 114% | Day |
| 218 | 2025-02-26 15:32:22 | 67 | 55dB | 2.1 | 114% | Day |
| 219 | 2025-02-26 15:35:00 | 68 | 55dB | 2.3 | 130% | Day |
| 220 | 2025-02-26 15:36:22 | 72 | 55dB | 3.0 | 203% | Day |
| 221 | 2025-02-26 15:39:47 | ? | 55dB | ? | ? | Day |
| 222 | 2025-02-26 15:41:14 | ? | 55dB | ? | ? | Day |
| 223 | 2025-02-26 15:42:39 | ? | 55dB | ? | ? | Day |
| 224 | 2025-02-26 15:43:51 | ? | 55dB | ? | ? | Day |
| 225 | 2025-02-26 15:45:25 | 68 | 55dB | 2.5 | 146% | Day |
| 226 | 2025-02-26 15:47:56 | 68 | 55dB | 2.5 | 146% | Day |
| 227 | 2025-02-26 15:49:17 | 69 | 55dB | 2.5 | 146% | Day |
| 228 | 2025-02-26 15:51:17 | ? | 55dB | ? | ? | Day |
| 229 | 2025-02-26 15:52:36 | ? | 55dB | ? | ? | Day |
| 230 | 2025-02-26 15:56:16 | 67 | 55dB | 2.3 | 130% | Day |
| 231 | 2025-02-26 15:57:44 | ? | 55dB | ? | ? | Day |
| 232 | 2025-02-26 15:58:55 | ? | 55dB | ? | ? | Day |
| 233 | 2025-02-26 16:01:09 | 71 | 55dB | 3.0 | 203% | Day |
| 234 | 2025-02-26 16:03:33 | 69 | 55dB | 2.5 | 146% | Day |
| 235 | 2025-02-26 16:06:51 | 78 | 55dB | 4.6 | 359% | Day |
| 236 | 2025-02-26 16:08:03 | ? | 55dB | ? | ? | Day |
| 237 | 2025-02-26 16:09:50 | 71 | 55dB | 3.0 | 203% | Day |
| 238 | 2025-02-26 16:11:56 | 67 | 55dB | 2.1 | 114% | Day |
| 239 | 2025-02-26 16:13:11 | 69 | 55dB | 2.5 | 146% | Day |
| 240 | 2025-02-26 16:16:23 | ? | 55dB | ? | ? | Day |
| 241 | 2025-02-26 16:18:13 | 71 | 55dB | 2.8 | 183% | Day |
| 242 | 2025-02-26 16:21:55 | 70 | 55dB | 2.8 | 183% | Day |
| 243 | 2025-02-26 16:26:07 | 73 | 55dB | 3.5 | 248% | Day |
| 244 | 2025-02-26 16:27:35 | 69 | 55dB | 2.6 | 164% | Day |
| 245 | 2025-02-26 16:29:18 | 68 | 55dB | 2.3 | 130% | Day |
| 246 | 2025-02-26 16:30:52 | 67 | 55dB | 2.1 | 114% | Day |
| 247 | 2025-02-26 16:32:32 | 69 | 55dB | 2.5 | 146% | Day |
| 248 | 2025-02-26 16:34:02 | 68 | 55dB | 2.5 | 146% | Day |
| 249 | 2025-02-26 16:35:31 | 74 | 55dB | 3.7 | 273% | Day |
| 250 | 2025-02-26 16:37:39 | 67 | 55dB | 2.1 | 114% | Day |
| 251 | 2025-02-26 16:43:09 | 66 | 55dB | 2.1 | 114% | Day |
| 252 | 2025-02-26 16:44:42 | 70 | 55dB | 2.6 | 164% | Day |
| 253 | 2025-02-26 16:45:56 | 68 | 55dB | 2.5 | 146% | Day |
| 254 | 2025-02-26 16:47:28 | 69 | 55dB | 2.5 | 146% | Day |
| 255 | 2025-02-26 16:49:56 | ? | 55dB | ? | ? | Day |
| 256 | 2025-02-26 16:52:02 | 68 | 55dB | 2.5 | 146% | Day |
| 257 | 2025-02-26 16:59:38 | 67 | 55dB | 2.1 | 114% | Day |
| 258 | 2025-02-26 17:02:43 | 68 | 55dB | 2.5 | 146% | Day |

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|---|---|---|---|---|---|---|
| 259 | 2025-02-26 17:08:27 | 68 | 55dB | 2.5 | 146% | Day |
| 260 | 2025-02-26 17:09:56 | 72 | 55dB | 3.2 | 225% | Day |
| 261 | 2025-02-26 17:11:13 | 69 | 55dB | 2.5 | 146% | Day |
| 262 | 2025-02-26 17:13:26 | 68 | 55dB | 2.5 | 146% | Day |
| 263 | 2025-02-26 17:14:57 | ? | 55dB | ? | ? | Day |
| 264 | 2025-02-26 17:17:48 | 73 | 55dB | 3.5 | 248% | Day |
| 265 | 2025-02-26 17:19:47 | 72 | 55dB | 3.2 | 225% | Day |
| 266 | 2025-02-26 17:24:15 | ? | 55dB | ? | ? | Day |
| 267 | 2025-02-26 17:25:30 | 67 | 55dB | 2.1 | 114% | Day |
| 268 | 2025-02-26 17:26:45 | ? | 55dB | ? | ? | Day |
| 269 | 2025-02-26 17:27:51 | ? | 55dB | ? | ? | Day |
| 270 | 2025-02-26 17:29:08 | 69 | 55dB | 2.5 | 146% | Day |
| 271 | 2025-02-26 17:30:19 | 70 | 55dB | 2.6 | 164% | Day |
| 272 | 2025-02-26 17:31:30 | 67 | 55dB | 2.3 | 130% | Day |
| 273 | 2025-02-26 17:32:57 | 68 | 55dB | 2.3 | 130% | Day |
| 274 | 2025-02-26 17:35:14 | 67 | 55dB | 2.1 | 114% | Day |
| 275 | 2025-02-26 17:37:01 | 69 | 55dB | 2.6 | 164% | Day |
| 276 | 2025-02-26 17:38:20 | 72 | 55dB | 3.0 | 203% | Day |
| 277 | 2025-02-26 17:40:05 | 71 | 55dB | 2.8 | 183% | Day |
| 278 | 2025-02-26 17:42:04 | 71 | 55dB | 3.0 | 203% | Day |
| 279 | 2025-02-26 17:44:28 | ? | 55dB | ? | ? | Day |
| 280 | 2025-02-26 17:45:41 | ? | 55dB | ? | ? | Day |
| 281 | 2025-02-26 17:47:06 | 67 | 55dB | 2.3 | 130% | Day |
| 282 | 2025-02-26 17:48:25 | 68 | 55dB | 2.3 | 130% | Day |
| 283 | 2025-02-26 17:49:43 | ? | 55dB | ? | ? | Day |
| 284 | 2025-02-26 18:01:35 | ? | 55dB | ? | ? | Day |
| 285 | 2025-02-26 18:03:56 | 69 | 55dB | 2.5 | 146% | Day |
| 286 | 2025-02-26 18:05:22 | 68 | 55dB | 2.5 | 146% | Day |
| 287 | 2025-02-26 18:06:52 | 66 | 55dB | 2.0 | 100% | Day |
| 288 | 2025-02-26 18:08:21 | 69 | 55dB | 2.5 | 146% | Day |
| 289 | 2025-02-26 18:09:50 | ? | 55dB | ? | ? | Day |
| 290 | 2025-02-26 18:11:43 | 68 | 55dB | 2.3 | 130% | Day |
| 291 | 2025-02-26 18:13:22 | 70 | 55dB | 2.8 | 183% | Day |
| 292 | 2025-02-26 18:15:18 | 68 | 55dB | 2.5 | 146% | Day |
| 293 | 2025-02-26 18:16:35 | 70 | 55dB | 2.8 | 183% | Day |
| 294 | 2025-02-26 18:19:23 | 71 | 55dB | 3.0 | 203% | Day |
| 295 | 2025-02-26 18:22:16 | ? | 55dB | ? | ? | Day |
| 296 | 2025-02-26 18:23:49 | 71 | 55dB | 2.8 | 183% | Day |
| 297 | 2025-02-26 18:25:38 | 68 | 55dB | 2.5 | 146% | Day |
| 298 | 2025-02-26 18:26:34 | 66 | 55dB | 2.1 | 114% | Day |
| 299 | 2025-02-26 18:27:57 | ? | 55dB | ? | ? | Day |
| 300 | 2025-02-26 18:31:36 | 72 | 55dB | 3.0 | 203% | Day |
| 301 | 2025-02-26 18:33:28 | 67 | 55dB | 2.1 | 114% | Day |
| 302 | 2025-02-26 18:35:02 | 67 | 55dB | 2.1 | 114% | Day |

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| 303 | 2025-02-26 18:38:05 | 72 | 55dB | 3.2 | 225% | Day |
| 304 | 2025-02-26 18:39:31 | 67 | 55dB | 2.1 | 114% | Day |
| 305 | 2025-02-26 18:40:46 | 68 | 55dB | 2.5 | 146% | Day |
| 306 | 2025-02-26 18:42:09 | ? | 55dB | ? | ? | Day |
| 307 | 2025-02-26 18:43:55 | ? | 55dB | ? | ? | Day |
| 308 | 2025-02-26 18:45:39 | 67 | 55dB | 2.1 | 114% | Day |
| 309 | 2025-02-26 18:47:15 | ? | 55dB | ? | ? | Day |
| 310 | 2025-02-26 18:48:54 | 69 | 55dB | 2.5 | 146% | Day |
| 311 | 2025-02-26 18:50:18 | 67 | 55dB | 2.3 | 130% | Day |
| 312 | 2025-02-26 18:51:49 | 68 | 55dB | 2.5 | 146% | Day |
| 313 | 2025-02-26 18:53:13 | ? | 55dB | ? | ? | Day |
| 314 | 2025-02-26 18:54:39 | ? | 55dB | ? | ? | Day |
| 315 | 2025-02-26 18:56:02 | 84 | 55dB | 7.5 | 646% | Day |
| 316 | 2025-02-26 18:57:42 | 68 | 55dB | 2.3 | 130% | Day |
| 317 | 2025-02-26 18:59:00 | 67 | 55dB | 2.3 | 130% | Day |
| 318 | 2025-02-26 19:00:26 | 71 | 45dB | 5.7 | 466% | Night |
| 319 | 2025-02-26 19:01:47 | 68 | 45dB | 4.9 | 392% | Night |
| 320 | 2025-02-26 19:04:39 | 68 | 45dB | 4.6 | 359% | Night |
| 321 | 2025-02-26 19:06:01 | 70 | 45dB | 5.3 | 428% | Night |
| 322 | 2025-02-26 19:08:21 | 67 | 45dB | 4.3 | 329% | Night |
| 323 | 2025-02-26 19:10:36 | 69 | 45dB | 4.9 | 392% | Night |
| 324 | 2025-02-26 19:13:51 | ? | 45dB | ? | ? | Night |
| 325 | 2025-02-26 19:15:26 | 69 | 45dB | 4.9 | 392% | Night |
| 326 | 2025-02-26 19:19:14 | 72 | 45dB | 6.5 | 550% | Night |
| 327 | 2025-02-26 19:20:53 | ? | 45dB | ? | ? | Night |
| 328 | 2025-02-26 19:22:26 | 68 | 45dB | 4.6 | 359% | Night |
| 329 | 2025-02-26 19:24:20 | 68 | 45dB | 4.6 | 359% | Night |
| 330 | 2025-02-26 19:26:16 | 67 | 45dB | 4.6 | 359% | Night |
| 331 | 2025-02-26 19:27:49 | 68 | 45dB | 4.6 | 359% | Night |
| 332 | 2025-02-26 19:29:23 | 67 | 45dB | 4.3 | 329% | Night |
| 333 | 2025-02-26 19:30:47 | 67 | 45dB | 4.3 | 329% | Night |
| 334 | 2025-02-26 19:32:17 | 68 | 45dB | 4.6 | 359% | Night |
| 335 | 2025-02-26 19:34:10 | 71 | 45dB | 5.7 | 466% | Night |
| 336 | 2025-02-26 19:36:02 | 73 | 45dB | 6.5 | 550% | Night |
| 337 | 2025-02-26 19:37:24 | 70 | 45dB | 5.7 | 466% | Night |
| 338 | 2025-02-26 19:39:28 | 68 | 45dB | 4.9 | 392% | Night |
| 339 | 2025-02-26 19:41:00 | 71 | 45dB | 5.7 | 466% | Night |
| 340 | 2025-02-26 19:43:12 | ? | 45dB | ? | ? | Night |
| 341 | 2025-02-26 19:44:34 | 68 | 45dB | 4.6 | 359% | Night |
| 342 | 2025-02-26 19:46:02 | 80 | 45dB | 10.6 | 956% | Night |
| 343 | 2025-02-26 19:47:22 | 70 | 45dB | 5.3 | 428% | Night |
| 344 | 2025-02-26 19:48:58 | 83 | 45dB | 13.0 | 1200% | Night |
| 345 | 2025-02-26 19:50:20 | 66 | 45dB | 4.3 | 329% | Night |
| 346 | 2025-02-26 19:51:43 | 71 | 45dB | 5.7 | 466% | Night |

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|---|---|---|---|---|---|---|
| 347 | 2025-02-26 19:53:18 | ? | 45dB | ? | ? | Night |
| 348 | 2025-02-26 19:54:51 | ? | 45dB | ? | ? | Night |
| 349 | 2025-02-26 19:56:25 | 68 | 45dB | 4.6 | 359% | Night |
| 350 | 2025-02-26 20:01:27 | 71 | 45dB | 5.7 | 466% | Night |
| 351 | 2025-02-26 20:04:11 | 67 | 45dB | 4.6 | 359% | Night |
| 352 | 2025-02-26 20:06:04 | 71 | 45dB | 6.1 | 506% | Night |
| 353 | 2025-02-26 20:10:34 | 68 | 45dB | 4.9 | 392% | Night |
| 354 | 2025-02-26 20:12:57 | ? | 45dB | ? | ? | Night |
| 355 | 2025-02-26 20:14:28 | 68 | 45dB | 4.6 | 359% | Night |
| 356 | 2025-02-26 20:16:30 | ? | 45dB | ? | ? | Night |
| 357 | 2025-02-26 20:18:07 | 70 | 45dB | 5.7 | 466% | Night |
| 358 | 2025-02-26 20:20:25 | 67 | 45dB | 4.6 | 359% | Night |
| 359 | 2025-02-26 20:22:01 | 69 | 45dB | 5.3 | 428% | Night |
| 360 | 2025-02-26 20:24:04 | 67 | 45dB | 4.6 | 359% | Night |
| 361 | 2025-02-26 20:25:23 | 72 | 45dB | 6.1 | 506% | Night |
| 362 | 2025-02-26 20:26:52 | 69 | 45dB | 4.9 | 392% | Night |
| 363 | 2025-02-26 20:28:21 | 67 | 45dB | 4.6 | 359% | Night |
| 364 | 2025-02-26 20:30:03 | 72 | 45dB | 6.5 | 550% | Night |
| 365 | 2025-02-26 20:31:27 | 71 | 45dB | 6.1 | 506% | Night |
| 366 | 2025-02-26 20:33:06 | 68 | 45dB | 4.6 | 359% | Night |
| 367 | 2025-02-26 20:34:31 | 68 | 45dB | 4.6 | 359% | Night |
| 368 | 2025-02-26 20:36:02 | 67 | 45dB | 4.3 | 329% | Night |
| 369 | 2025-02-26 20:40:26 | 69 | 45dB | 4.9 | 392% | Night |
| 370 | 2025-02-26 20:41:56 | 68 | 45dB | 4.6 | 359% | Night |
| 371 | 2025-02-26 20:43:13 | 66 | 45dB | 4.3 | 329% | Night |
| 372 | 2025-02-26 20:44:55 | 67 | 45dB | 4.6 | 359% | Night |
| 373 | 2025-02-26 20:47:46 | 71 | 45dB | 6.1 | 506% | Night |
| 374 | 2025-02-26 20:51:01 | 74 | 45dB | 7.0 | 596% | Night |
| 375 | 2025-02-26 20:52:33 | 71 | 45dB | 6.1 | 506% | Night |
| 376 | 2025-02-26 20:53:57 | 66 | 45dB | 4.3 | 329% | Night |
| 377 | 2025-02-26 20:55:21 | 68 | 45dB | 4.9 | 392% | Night |
| 378 | 2025-02-26 20:56:53 | 69 | 45dB | 5.3 | 428% | Night |
| 379 | 2025-02-26 20:58:18 | 71 | 45dB | 5.7 | 466% | Night |
| 380 | 2025-02-26 20:59:45 | 67 | 45dB | 4.6 | 359% | Night |
| 381 | 2025-02-26 21:01:14 | 67 | 45dB | 4.6 | 359% | Night |
| 382 | 2025-02-26 21:02:33 | 68 | 45dB | 4.9 | 392% | Night |
| 383 | 2025-02-26 21:03:57 | 70 | 45dB | 5.3 | 428% | Night |
| 384 | 2025-02-26 21:05:20 | 68 | 45dB | 4.6 | 359% | Night |
| 385 | 2025-02-26 21:07:55 | 68 | 45dB | 4.6 | 359% | Night |
| 386 | 2025-02-26 21:10:00 | 68 | 45dB | 4.9 | 392% | Night |
| 387 | 2025-02-26 21:12:02 | 68 | 45dB | 4.9 | 392% | Night |
| 388 | 2025-02-26 21:13:35 | 67 | 45dB | 4.6 | 359% | Night |
| 389 | 2025-02-26 21:15:09 | 71 | 45dB | 5.7 | 466% | Night |
| 390 | 2025-02-26 21:17:27 | 79 | 45dB | 10.6 | 956% | Night |

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|---|---|---|---|---|---|---|
| 391 | 2025-02-26 21:19:01 | 74 | 45dB | 7.5 | 646% | Night |
| 392 | 2025-02-26 21:20:23 | 70 | 45dB | 5.7 | 466% | Night |
| 393 | 2025-02-26 21:21:57 | 66 | 45dB | 4.0 | 300% | Night |
| 394 | 2025-02-26 21:24:04 | 71 | 45dB | 6.1 | 506% | Night |
| 395 | 2025-02-26 21:25:56 | 70 | 45dB | 5.3 | 428% | Night |
| 396 | 2025-02-26 21:28:32 | 73 | 45dB | 6.5 | 550% | Night |
| 397 | 2025-02-26 21:31:21 | 70 | 45dB | 5.3 | 428% | Night |
| 398 | 2025-02-26 21:33:32 | 67 | 45dB | 4.3 | 329% | Night |
| 399 | 2025-02-26 21:34:56 | 68 | 45dB | 4.6 | 359% | Night |
| 400 | 2025-02-26 21:36:29 | ? | 45dB | ? | ? | Night |
| 401 | 2025-02-26 21:37:58 | 67 | 45dB | 4.3 | 329% | Night |
| 402 | 2025-02-26 21:39:33 | 68 | 45dB | 4.6 | 359% | Night |
| 403 | 2025-02-26 21:41:47 | ? | 45dB | ? | ? | Night |
| 404 | 2025-02-26 21:43:35 | 67 | 45dB | 4.3 | 329% | Night |
| 405 | 2025-02-26 21:45:19 | ? | 45dB | ? | ? | Night |
| 406 | 2025-02-26 21:47:30 | 68 | 45dB | 4.9 | 392% | Night |
| 407 | 2025-02-26 21:51:09 | ? | 45dB | ? | ? | Night |
| 408 | 2025-02-26 21:53:44 | ? | 45dB | ? | ? | Night |
| 409 | 2025-02-26 21:55:46 | 71 | 45dB | 6.1 | 506% | Night |
| 410 | 2025-02-26 21:57:57 | 70 | 45dB | 5.7 | 466% | Night |
| 411 | 2025-02-26 22:00:54 | 68 | 45dB | 4.9 | 392% | Night |
| 412 | 2025-02-26 22:03:08 | ? | 45dB | ? | ? | Night |
| 413 | 2025-02-26 22:06:02 | ? | 45dB | ? | ? | Night |
| 414 | 2025-02-26 22:08:17 | 67 | 45dB | 4.3 | 329% | Night |
| 415 | 2025-02-26 22:09:53 | 68 | 45dB | 4.9 | 392% | Night |
| 416 | 2025-02-26 22:14:27 | ? | 45dB | ? | ? | Night |
| 417 | 2025-02-26 22:20:04 | 66 | 45dB | 4.3 | 329% | Night |
| 418 | 2025-02-26 22:22:02 | 67 | 45dB | 4.6 | 359% | Night |
| 419 | 2025-02-26 22:24:08 | 68 | 45dB | 4.6 | 359% | Night |
| 420 | 2025-02-26 22:27:17 | ? | 45dB | ? | ? | Night |
| 421 | 2025-02-26 22:30:00 | 66 | 45dB | 4.3 | 329% | Night |
| 422 | 2025-02-26 22:31:54 | 68 | 45dB | 4.9 | 392% | Night |
| 423 | 2025-02-26 22:36:22 | 69 | 45dB | 5.3 | 428% | Night |
| 424 | 2025-02-26 22:37:56 | ? | 45dB | ? | ? | Night |
| 425 | 2025-02-26 22:39:53 | 66 | 45dB | 4.3 | 329% | Night |
| 426 | 2025-02-26 22:43:26 | 73 | 45dB | 6.5 | 550% | Night |
| 427 | 2025-02-26 22:46:39 | 66 | 45dB | 4.3 | 329% | Night |
| 428 | 2025-02-26 22:51:40 | ? | 45dB | ? | ? | Night |
| 429 | 2025-02-26 22:53:30 | 69 | 45dB | 5.3 | 428% | Night |
| 430 | 2025-02-26 23:00:17 | 67 | 45dB | 4.6 | 359% | Night |
| 431 | 2025-02-26 23:02:01 | 68 | 45dB | 4.6 | 359% | Night |
| 432 | 2025-02-26 23:03:53 | 68 | 45dB | 4.9 | 392% | Night |
| 433 | 2025-02-26 23:05:28 | 67 | 45dB | 4.6 | 359% | Night |
| 434 | 2025-02-26 23:07:45 | 67 | 45dB | 4.6 | 359% | Night |