

Unleaded Aviation Gasoline for Piston Aircraft in Canada

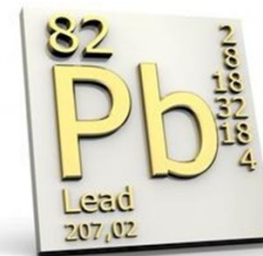


Overview

- Objectives
- About Transport Canada and Civil Aviation
- Aviation Environmental Impacts
- Lead in Aviation Gasoline
- Current Situation and US (FAA/EPA) Approach
- Canadian Approaches
- Next Steps

Objectives

- Common Understanding
- Stakeholder Views
- Reduction / elimination of harmful lead emissions
- Safe operation of aircraft and engines on replacement UL fuel(s)
- Discuss approaches for Canada

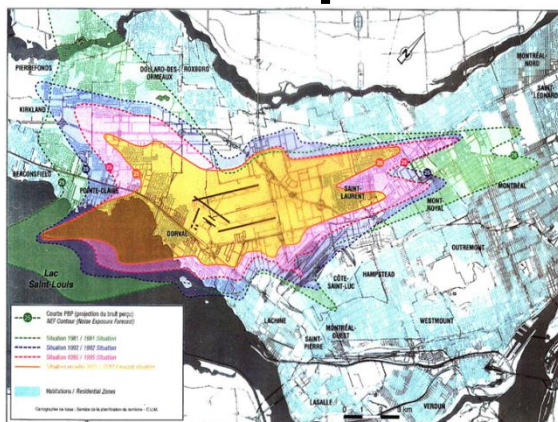


Transport Canada

- Transport Canada Mission - to serve the public interest through the promotion of a safe and secure, efficient and environmentally responsible transportation system in Canada.
- Civil Aviation Mission - to develop and administer policies and regulations for the safest civil aviation system for Canada and Canadians using a systems approach to managing risks.

Aviation Environmental Impacts

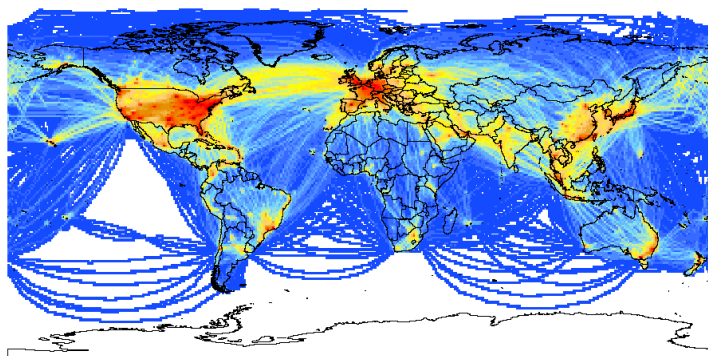
Noise Impacts



Air Quality Impacts



Climate Impacts



Other Impacts



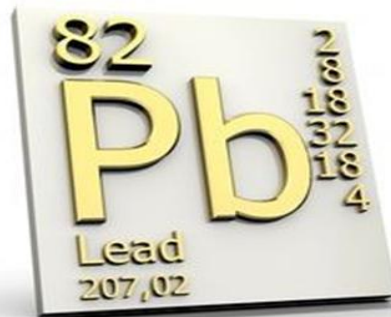
Aviation Gasoline (Avgas)

- Aviation fuel for piston engine aircraft
- Produced to a world-wide standard. Current grade is 100 octane low lead (100LL).
- It is the only remaining transportation fuel in widespread use that still contains the additive tetraethyl lead (TEL).
- 65 to 70 million litres are used annually in Canada by roughly 30,000 aircraft
(850 million litres in US by 167,000 aircraft)



Regulation of Lead in Gasoline in Canada

- Environment Canada / Health Canada
- Canadian Environmental Protection Act (CEPA)
 - CEPA Toxic Substance
- Gasoline Regulations
 - exemption for aviation gasoline



Rational for Exemption

- Piston aircraft engines require high octane fuel for safe operation
- The use of fuels with lower octane ratings could result in detonation (premature ignition of the fuel) and other operational safety issues that could lead to engine failure
- No unleaded (UL) replacement fuels that meet the needs of the entire fleet are presently available

Recent Developments

- Health effects of lead at lower levels than previously considered
- Efforts within the US (FAA, EPA) to consider regulatory actions to eliminate or reduce lead emissions from aircraft by 2018
- Questions regarding the continued production of 100LL
- Canada's Clean Transportation Initiative (CTI)

Lead in Avgas

Health Implications

- Switch to Health Canada presentation

Lead in Avgas

Safety and Operational Considerations

- Aircraft engine certification
 - Engines designed with fuels available at the time of design / certification
- Flight safety is directly affected by fuel properties other than octane rating and different fuels could lead to:
 - performance deterioration (energy content), vapour lock, carburetor icing, material and lubricant compatibility issues, miscibility issues (water / fuel separation), and other issues (eg. storage stability)

Lead in Avgas

Other Considerations

- National
 - Opportunity to harmonize with U.S. in the identification / certification of UL aviation gasoline(s)
 - Importance of GA in Canada (esp. the North)
 - Possible disruption of the avgas supply (U.S. phase-out, TEL supply, production issues)
 - Use of MOGAS (automotive gasoline – 0% ethanol)
- Economic
 - Opportunity to leverage US / Canadian research \$\$\$
 - Canada's Clean Air Agenda

Canadian Efforts

- 2013 – Initial scope and collaborations with FAA to better understand US approach
- 2014 – Assess industry standards /best practices and FAA technical capabilities
- 2014 – Stakeholder consultations
 - Communicate efforts
 - Solicit views, support and financial / in-kind contributions

Next Steps

- Specific collaborations with FAA to identify most appropriate options for Canadian support and involvement
- Acquire and establish the tools, capabilities and expertise to partner with the US to identify, test and certify replacement UL fuel(s) for GA

Canadian Collaboration and Support is Needed

- Federal Departments
- Member Associations
- Engine / Aircraft Manufacturers
- Other stakeholders

Questions

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Canada