Every Country Must Transition to Unleaded AvGas

By Elizabeth O'Brien, Lead Scientist and Lead Advisor, orchestrated by Ian Smith, Systems Analyst, using OpenClaw on top of Claude AI and Ollama local AI models where possible, on solar-powered infrastructure. © The LEAD Group Inc. November 2026. Australian legal duty of care precedent found by Joe Schembri.

Continuing to use leaded aviation gasoline (AvGas 100LL) poses serious public health risks, particularly for childhood lead exposure near general aviation airports, while transitioning to unleaded alternatives involves cost-beneficial though complex logistical, infrastructure and aircraft adaptation costs.

The United States (US) is the most advanced country in organising to phase out leaded AvGas, because a Congressional Mandate of the 2024 Federal Aviation Administration (FAA) Reauthorization Act legally required the FAA to partner with the aviation industry to create a roadmap for transitioning the US piston-engine aircraft fleet away from leaded 100LL fuel.

Every country can benefit by following in the footsteps of the US FAA.



In Australia, the government has a legal duty of care precedent to do so. The motto of Australia's Civil Aviation Safety Authority (CASA) is "safe skies for all" (see at right). CASA's 2010 Aeronautical Study of Point Cook states (CASA 2010):

> *"It is important to note that the study may make recommendations based on existing and projected data. The following comment as summarised by Chief Justice Sir Harry Gibbs of the High Court of Australia has been considered while conducting the study:*
>
> > *Where it is possible to guard against a foreseeable risk which, though perhaps not great, nevertheless cannot be called remote or fanciful, by adopting a means which involves little difficulty or expense, the failure to adopt such means will in general be negligent. **
>
> *CASA applies a precautionary approach when conducting aeronautical studies*
>
> ** Gibbs, Chief Justice Sir Harry. Turner v State of South Australia (1982). High Court of Australia before Gibbs CJ, Murphy, Brennan, Deane and Dawson JJ."*

So, why didn't the CASA report apply the Harry Gibbs precedent for a government having a

duty of care to protect residents under general aircraft flightpaths like at Point Cook, to the fact that leaded AvGas is still used in all general aircraft airports in Australia?

Health Risks of Leaded Aviation Fuel

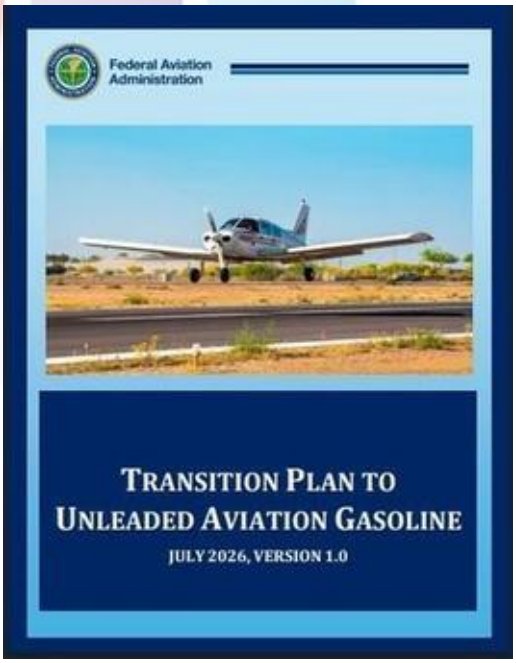
- **Neurodevelopmental Impact:** Lead is a potent neurotoxin that impairs cognitive development, lowers intelligence quotient (IQ), and causes behavioural and academic difficulties in children living or attending school near general aviation airfields.
- **Primary Source of Air Lead:** Leaded AvGas accounts for roughly 70% of total lead emitted into the air in the US, as documented in the US Environmental Protection Agency (EPA) Clean Air Act Endangerment Finding (US EPA 2023).
- **Persistent Accumulation:** Lead particles do not degrade; they settle in soils and playgrounds surrounding airports, creating long-term exposure pathways through inhalation and hand-to-mouth contact.

Economic Costs and Challenges of the Transition

- **Timeline and Mandates:** Under the FAA Transition Plan to Unleaded Aviation Gasoline (US FAA 2026) and the 2024 FAA Reauthorization Act, the industry is targeting the elimination of leaded 100LL by the end of 2030 (and 2032 for Alaska).
- **Replacement Fuel Hurdles:** High-compression piston engines require high-octane performance to prevent destructive engine knock. While drop-in replacements like General Aviation Modifications, Inc.'s (GAMI's) G100UL, Swift Fuels 100R and UL100E are advancing through certifications (such as Supplemental Type Certificates and Piston Aviation Fuels Initiative (PAFI) fleet authorisations), a universal drop-in fuel is technically and logistically challenging.
- **Infrastructure and Price Gaps:** Airports and Fixed Base Operators (FBOs) face supply chain, storage and co-mingling logistics, and initial unleaded alternatives may carry higher production or retail costs compared to legacy 100LL. Federal grant rules currently force airports to continue stocking 100LL until safe, wide-scale alternatives are fully deployed.

In the US, the transition of the general aviation (GA) fleet from leaded aviation gasoline (100LL) to unleaded alternatives is guided by the FAA Transition Plan to Unleaded Aviation Gasoline Version 1.0, released in July 2026 under the Eliminate Aviation Gasoline Lead Emissions (EAGLE) initiative (US FAA 2026).

The federal target is to phase out 100LL nationally by the **end of 2030**, with a two-year carve-out extending to the **end of 2032 for Alaska**.



Four Phase Roadmap

- **Phase 1: Fuel Authorisations and Comparisons (ongoing through Spring 2027):** completing final technical evaluations, laboratory and engine testing, and direct fuel comparisons.
- **Phase 2: Market Experience (mid to late 2028):** scaling initial distribution and gathering operational data from early-adopter airports and FBOs.
- **Phase 3: National Transition (targeted completion by 2030):** phasing out 100LL across the lower 48 states as refiners and fuel sponsors ramp up high-octane unleaded production to meet an estimated annual demand of 180 million gallons.
- **Phase 4: Alaska Transition (targeted completion by 2032):** managing unique logistics for remote Alaskan communities where piston aircraft provide essential infrastructure.

References

CASA (Civil Aviation Safety Authority), Office of Airspace Regulation (OAR), Australian Government (2010) Aeronautical Study of Point Cook, December 2010, https://www.radschool.org.au/magazines/Vol46/pdf/pointcook-aero-study.pdf [LID 30086]

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