




ENGINEERS  
AUSTRALIA



# Aviation Green Paper: Towards 2050

Engineers Australia's Submission

## Engineers Australia's Submission - Aviation Green Paper: Towards 2050

© Institution of Engineers Australia 2023

All rights reserved. Other than brief extracts, no part of this publication may be reproduced in any form without the written consent of the publisher. The report can be downloaded at [engineersaustralia.org.au](https://engineersaustralia.org.au)

Engineers Australia  
11 National Circuit, Barton ACT 2600  
Tel: [+61 2 6270 6555](tel:+61262706555)  
Email: [policy@engineersaustralia.org.au](mailto:policy@engineersaustralia.org.au)

[engineersaustralia.org.au](https://engineersaustralia.org.au)

# Contents

Introduction.....	2
About Engineers Australia.....	2
Contact.....	3
Likely Future Directions out to 2050.....	3
Disability access.....	3
Maximising Aviation’s Contribution to Net Zero .....	4
Airport Development Planning Processes and Consultation Mechanisms .....	6
Emerging Aviation Technologies .....	9
Future Industry Workforce .....	9

# Introduction

In an era where the skies are not merely a boundless expanse but a domain of progress and connectivity, the importance of aviation cannot be overstated. Advancements in aviation have shaped our world and engineers are vital to propelling the industry forward.

Aviation stands as a symbol of human ingenuity and our collective ambition to defy gravity. Beyond its role in connecting people and places, the aviation sector drives economic growth, enables global trade, and nurtures technological innovation. Engineers, with their expertise in design, innovation, and problem-solving steer the trajectory of this dynamic industry.

This submission highlights the importance of aviation, challenges and opportunities for the industry over the coming decades, and the unique contributions that engineers bring to the sector. Engineers' expertise ensures the safety, efficiency, and sustainability of aviation operations, laying the groundwork for a future where air travel is not just a mode of transportation but a seamless integration of technology and human ambition.

Engineers Australia is committed to promoting excellence and innovation in engineering, and we welcome the opportunity to contribute our perspective on the following areas:

- Likely future directions out to 2050
- Disability access
- Maximising aviation's contribution to net zero
- Airport development planning processes and consultation mechanisms
- Emerging aviation technologies
- Future industry workforce

## About Engineers Australia

Engineering is the essential link between thinking and doing. Between idea, and implementation. It's our means for positive, sustainable change, with an influence on every aspect of modern society. Engineers are the enablers of productivity because they convert smart ideas into new products, processes and services.

As Australia's national body for engineering, we are the voice and champion of our 120,000-plus members. We provide them with the resources, connections, and growth they need to do ethical, competent and high-value work in our communities.

A mission-based, not-for-profit professional association, Engineers Australia is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community. We back today's problem-solvers, so they can shape a better tomorrow.

Engineers are passionate participants in public discourse, contributing to important community and policy discussions that impact the economy and society. Engineers Australia's policy agenda is focused on engineering:

- a sustainable future
- a skilled future
- an innovative and productive future.

## Contact

Engineers Australia would welcome the opportunity to contribute to the policy planning for aviation in Australia. To discuss this further, please contact Caitlin Buttress, Policy Lead – Innovative Future, at [cbuttress@engineersaustralia.org.au](mailto:cbuttress@engineersaustralia.org.au).

# Likely Future Directions out to 2050

The key trends that the Australian Government should prioritise in the development of their Aviation White Paper are sustainability and workforce drivers.

Sustainability drivers, including identifying more sustainable fuelling solutions such as sustainable aviation fuel (SAF) and the gradual introduction of more fuel-efficient aircraft, are critical for achieving industry decarbonisation. Additionally, the emergence of electric, hydrogen-electric, and hydrogen aircraft in the medium to long term requires strategic planning. Maximising aviation's contribution to net-zero carbon emissions will require a whole-of-system approach including a combination of SAF, emerging propulsion systems and market-based measures, indicating a significant industry transformation over the next 27 years. The focus on emerging aviation technologies such as Advanced Air Mobility (AAM) and drones should guide regulations and airspace management; potentially requiring new approaches to promote earlier adoption.

Supply-side and workforce drivers including domestic airline competition, ensuring adequate capacity, and managing labour shortages, are crucial factors. The workforce skills and training requirements, particularly for pilots, engineers and technicians, present both immediate and enduring challenges, but they also offer new opportunities with the growth of innovative technologies in the sector. Engineering is experiencing a skills crisis across Australia, therefore comprehensive approaches to sustainability and workforce development should be at the forefront of the Australian Aviation White Paper.

## Disability access

Designing transport as a system requires consideration of equity and inclusion.<sup>1</sup> The concept of universal access allows for an environment which is accessible to everyone. This takes into consideration the needs of people with disabilities and other mobility challenges (for example, people with injuries, the elderly and parents with prams) as well as financial constraints and those who face additional socioeconomic barriers. In 2018, just under 18 per cent of Australians had a disability with the prevalence of this increasing with age (over 65 years).<sup>2</sup> Using the concept of universal design, environments can be created that are usable by more people. Applying universal design processes improves quality of life and independence by facilitating the broader population to achieve peak human performance, health and wellness through equitable access to all facilities and social participation.<sup>3</sup>

In Australia, the *Disability Discrimination Act 1992* (Cth) (the Act) and the Disability Standards for Accessible Public Transport 2002 (Transport Standards) aim to prevent discrimination against disabled people and set guidelines for transport accessibility. The Act prevents discrimination against an individual because of disability and includes when to provide services and facilities. Transport Standards

---

<sup>1</sup> Bell, M. 'Future of Transport Discussion Paper' *Engineers Australia* (January 2023)

<sup>2</sup> 'Disability, Ageing and Carers, Australia: Summary of Findings' *Australian Bureau of Statistics* (Released October 2019) <https://www.abs.gov.au/statistics/health/disability/disability-ageing-and-carers-australia-summary-findings/latest-release>

<sup>3</sup> 'Transit Universal Design Guidelines: Principles and Best Practices for Implementing Universal Design in Transit' *American Public Transportation Association* (July 2020) <https://www.apta.com/wp-content/uploads/APTA-SUDS-UDGL-010-20.pdf>

provide minimum accessibility requirements for public transport. This is contrary to global best practice, which is less about complying with standards and more about adopting the concept of universal access.

The Transport Australia society's universal design for transport discussion paper outlines several benefits of adopting the concept of universal access, which can be applied to the aviation industry.<sup>4</sup> These include:<sup>5</sup>

- Accessibility benefits to individual through inclusion. Those with a disability live a more independent life. It also benefits the broader community through good design, easing the complexity and pressure in transport system use and eliminates some of the barriers to mobility in everyday life.
- Equalising employment opportunity and participation by providing a safer and easier environment for everyone which helps keep working-aged people with a disability in the workforce.
- Ageing society and enhancing quality of life through improved access to basic needs and social engagements. Increasing access for the elderly can help to ease pressure on aged care resources. As Australia's population continues to age, these considerations are particularly important.
- Improved standards and guidelines resulting in savings. Greater effort in the early stages to deliver universally accessible transport infrastructure can result in savings to society in other areas because of adopting well thought-out plans and best practice approaches.

The imperative to move to a more inclusive view of access is evident, although it is not without challenges. These are mainly seen in upgrading of existing infrastructure and systems, particularly older networks which were built to very different standards initially. While universal design requires collaboration from all parties, particularly the users, to ensure it is fit for purpose, it also requires greater collaboration between governments particularly where delineation of responsibility occurs.<sup>6</sup>

## Maximising Aviation's Contribution to Net Zero

Domestic aviation is the third highest carbon emitter in the transport sector<sup>7</sup>. Achieving net-zero emissions needs to be a top priority for the aviation sector. Engineers Australia advocates for a holistic systems approach to improving sustainability and addressing decarbonisation of the aviation industry, relying on the critical thinking and problem-solving expertise of engineers.

---

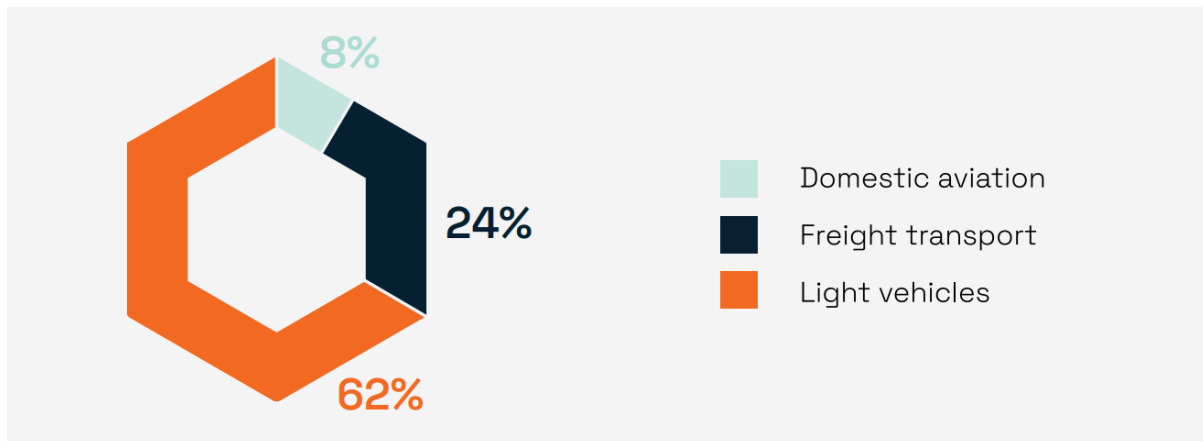
<sup>4</sup> Transport Australia society 'Universal design for transport discussion paper' (April 2022) <https://www.engineersaustralia.org.au/sites/default/files/2022-04/Universal-Design-for-Transport-TAs-discussionpaper-20220421.pdf>

<sup>5</sup> *ibid*

<sup>6</sup> Transport Australia society. 'Aviation transport infrastructure Discussion Paper' *Engineers Australia* (March 2021) <https://www.engineersaustralia.org.au/sites/default/files/2022-10/aviation-infrastructure-discussion-paper.pdf>

<sup>7</sup> Bell, M. 'Future of Transport Discussion Paper' *Engineers Australia* (January 2023) <https://www.engineersaustralia.org.au/sites/default/files/2023-01/future-transport-discussion-paper-jan-2023.pdf>

Figure 1: Top three carbon emitters in the transport sector<sup>8</sup>



Rather than focusing on one solution in the ‘hard to abate’ aviation sector<sup>9</sup>, the Australian Government should consider a combination of factors and interdependencies within the sector and its relationships to other sectors. Incorporating the development and implementation of sustainable aviation fuels (SAFs), electric and hybrid propulsion systems, and the integration of renewable energy sources in airport infrastructure are just some of the ways that this should be approached. Additionally, the Australian Government should establish clear regulatory frameworks and provide incentives to accelerate the adoption of environmentally-friendly technologies; and consider alternative ways of transport such as high-speed rail and other digital technologies that enable a reduction in air travel overall. Engineers Australia acknowledges that Australia’s dispersed population and geographical isolation may limit flight alternatives, but unimpeded growth of the aviation industry will have significant effects on the environment, and therefore sustainability must be central to the discussion of the future of aviation in Australia.

Sustainability is a broad concept which embraces environment, social and economic aspects of business operations and human activity.<sup>10</sup> Even though aviation is an enabler of international mobility and is recognised as essential to achieving the UN Sustainable Development Goals<sup>11</sup>, the industry alone is responsible for two per cent of the world’s total carbon emissions globally and eight per cent of the transport sector’s carbon emissions in Australia<sup>12</sup>.

Some of the main environmental and sustainable development issues for aviation include but are not limited to emissions, noise, land use in and around airports and energy consumption. Given that airports are complex infrastructure assets, the implementation of any new emission reduction initiatives typically require endorsement from multiple stakeholders. Airports will face different challenges in implementation according to operational size and scope. This may include lack of information or awareness of clean energy opportunities, lack of human and financial resources, or lack of strategic vision and/or leadership. Airport authorities must find a balanced approach for maximising the capacity of airports and capitalise on the possibilities and potentials for future growth while simultaneously minimising the accompanying negative impacts.<sup>13</sup>

While a policy and regulatory framework is needed to ensure safe and efficient operation of air transport, environmentally-friendly materials, and cutting-edge technology are essential to embedding sustainability and resilience in the aviation sector now and in the future. The development of new

<sup>8</sup> ibid

<sup>9</sup> Australian Government, ‘Aviation Green Paper – Towards 2050’ (September 2023)

<https://www.infrastructure.gov.au/department/media/publications/aviation-green-paper-towards-2050>

<sup>10</sup> Transport Australia society. ‘Aviation transport infrastructure Discussion Paper’ *Engineers Australia* (March 2021)

<https://www.engineersaustralia.org.au/sites/default/files/2022-10/aviation-infrastructure-discussion-paper.pdf>

<sup>11</sup> ICAO (2020) The Future of Aviation, <https://www.icao.int/Meetings/FutureOfAviation/Pages/default.aspx>

<sup>12</sup> Bell, M. ‘Future of Transport Discussion Paper’ *Engineers Australia* (January 2023)

<https://www.engineersaustralia.org.au/sites/default/files/2023-01/future-transport-discussion-paper-jan-2023.pdf>

<sup>13</sup> Maha Mousavi Sameh and Juliana Scavuzzi, 2016, Environmental sustainability measures for airports. Occasional paper series: sustainable international civil aviation.

polymers, composites, and stronger but lighter memory metals will lead to continued reductions in aircraft weight and fuel burn<sup>14</sup>.

Biofuels are strongly advocated for aircraft. While biofuels, also known as Sustainable Aviation Fuels, are technically viable, their availability on a domestic or global scale does not meet the demand for existing aircraft fleets, let alone an expanding fleet. It is anticipated that biofuels will be significantly pricier than current fuel options. The heightened fuel costs resulting from the integration of biofuels will further incentivise the development of more efficient conventional aircraft designs and operational practices. These enhanced designs will play a crucial role in the decarbonisation of both international and domestic aviation operations.

On the ground, aircraft turnarounds and passenger terminals require significant quantities of electrical energy, gas, and potable and non-potable water as well as high quality waste disposal systems<sup>15</sup>. Telecommunications, security, lighting, heating, cooling, servicing, and ventilating large passenger terminals are energy intensive. Therefore, airports are developing new systems that can produce reliable and affordable sustainable energy and lower energy costs. Increasing the use of energy from renewable sources is one way in which airport operators are improving their environmental performance. Biomass boilers can increase the amount of natural light and ventilation, solar farms and battery storage should be encouraged to generate and store electrical energy along with boreholes to exploit sources of geothermal energy where feasible. Initiatives to encourage and facilitate public transport use for airport access are also essential<sup>16</sup>.

## Airport Development Planning Processes and Consultation Mechanisms

Aviation is critical to Australia's prosperity due to our relative geographic isolation requiring long distance coverage both nationally and internationally. Aviation is essential to passenger travel and freight, connecting individuals and providing services for Australian communities. It is essential for the international tourism, business, and education markets, enabling overseas travel for Australians and international visitors. The resources sector and other critical industries, such as trade-exposed high value, security sensitive and time critical freight, also see air transport as essential to their business.

Australia's aviation industry, with a 2019-2020 annual revenue of \$26.94 billion, plays a vital role in connecting people and businesses globally. Despite a decrease in revenue compared to the previous year and intense pressure from many economic, social, technological and environmental factors, over 65,000 people are employed across key subsectors, including domestic and international commercial aviation, general aviation, air freight, and aviation support infrastructure,<sup>17</sup>.

The Australian aviation industry served over 3.5 billion passengers and carried more than 50 million tons of cargo prior to COVID-19 in 2017. The impact of COVID-19 has been severe on the whole of the aviation industry, with demand dropping dramatically to unsustainable levels during the pandemic.<sup>18</sup> Many airlines have been forced to consider structural and business model transformation to encourage long-term profitability and limit associated risks. The repercussions of COVID-19 and associated

---

<sup>14</sup> Transport Australia society. 'Aviation transport infrastructure Discussion Paper' *Engineers Australia* (March 2021) <https://www.engineersaustralia.org.au/sites/default/files/2022-10/aviation-infrastructure-discussion-paper.pdf>

<sup>15</sup> *ibid*

<sup>16</sup> Budd L., and Budd T., 2013, Environmental technology and the future of flight. Sustainable Aviation Futures (Transport and Sustainability, Vol. 4), Emerald Group Publishing Limited, pp. 87-107.

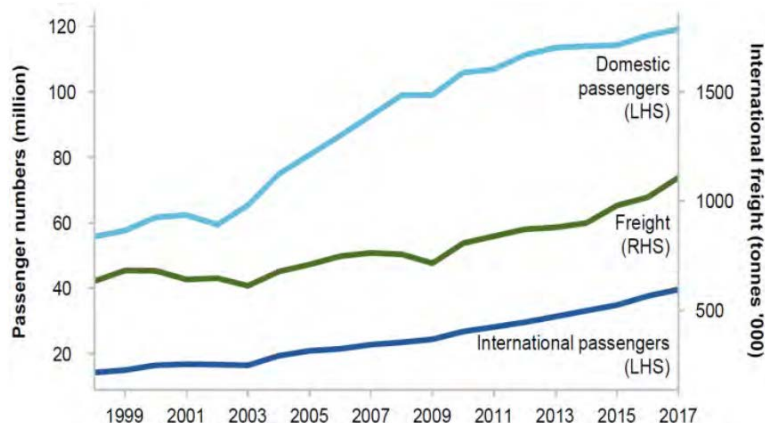
<sup>17</sup> Aviation Industry Reference Committee. 'Industry Outlook' *Australian Industry Standards* (2021) [https://www.australianindustrystandards.org.au/wp-content/uploads/2021/06/20210609\\_AVI\\_IOv3.pdf](https://www.australianindustrystandards.org.au/wp-content/uploads/2021/06/20210609_AVI_IOv3.pdf)

<sup>18</sup> Transport Australia society. 'Aviation transport infrastructure Discussion Paper' *Engineers Australia* (March 2021) <https://www.engineersaustralia.org.au/sites/default/files/2022-10/aviation-infrastructure-discussion-paper.pdf>



restrictions have been industry wide, including airports and associated aviation service providers. Airport investment and profitability models have been severely disrupted, particularly since businesses have been relying on long term, continual growth in demand. Market confidence in aviation investment and risk appetite will be diminished as a consequence. Therefore, it is expected that different business approaches must emerge.

Figure 1: Passenger and international freight movements by aircraft in Australia<sup>19</sup>



Robust planning processes and effective consultation mechanisms are vital in airport development. Engineers Australia recommends a holistic approach that considers environmental impact assessments, community engagement, and long-term infrastructure resilience to manage current and emerging technologies. Collaboration between engineers, local communities, and regulatory bodies is crucial to address concerns, ensure transparency, and optimise the benefits of airport development.

Engineers Australia's 'Enhancing productivity in infrastructure delivery'<sup>20</sup> directions paper outlines how innovation and the use of digital infrastructure solutions will ensure Australia is future ready and our infrastructure can be managed efficiently, sustainably, safely and effectively. Greater emphasis is needed on integrating nationally consistent digital approaches to public infrastructure planning and operations if Australia is going to be ready for the demands of the future.

Recommendations of particular relevance to the aviation industry include:

#### Recommendation 1: Long-term Collaborative Planning

Governments must commit to long-term collaborative planning to mitigate the negative effects of short-term electoral cycles on aviation infrastructure planning and delivery.

#### Recommendation 2: Consideration of Asset Lifecycle

The aviation sector must better communicate the desired outcomes of projects and embed sustainability, resilience and circular economy principles at all stages of the asset lifecycle.

#### Recommendation 3: Inclusion of Technical Experts

In addition to independent statutory infrastructure bodies (iBodies) providing training to decision-makers, relevant technical experts must be incorporated into all project planning, procurement, and decision-making processes at all stages of the project lifecycle.

#### Recommendation 4: Incentivising Knowledge Capture

<sup>19</sup> Productivity Commission (2019). Economic Regulation of Airports. Overview & Recommendations. Canberra: Australian Government.

<sup>20</sup> Grady, S. 'Enhancing productivity in infrastructure delivery: Directions Paper' *Engineers Australia* (March 2022) <https://www.engineersaustralia.org.au/sites/default/files/resource-files/2022-04/policy-directions-paper-enhancing-productivity-infrastructure-delivery.pdf>

Engineers Australia recommends the Australian Government consider use of funding and payment withholding mechanisms to incentivise knowledge capture and sharing at project kick-off and completion.

#### **Recommendation 5: Infrastructure Benchmarking Tool**

State and territory treasuries should develop a whole-of-life infrastructure benchmarking tool and mandate its use on aviation projects of national significance.

#### **Recommendation 6: Consistent National Design Standards**

Collaboration between government and industry is encouraged to ensure consistent national design standards, guidelines, and specifications for both new designs and retro-fitting. This can drive efficiency and control costs in aviation infrastructure development.

Collaboration is a critical element of ensuring the aviation system is fit for future needs and delivers on the outcomes required for a productive and connected society. Collaboration can be grouped into two forms, vertical collaboration which links the different levels of government (federal, state/territory and local government) and horizontal collaboration which links planners, operators and others.<sup>21</sup> Australia's vertical fiscal imbalance makes collaboration between the federal and state/territory governments critical to ensure funding is provided based on a shared vision for the future<sup>22</sup>. It is also important for land-use planners, transport planners and others to collaborate to help lessen the reliance on already congested road networks and create more locally sustainable communities. Currently, land development plans for airports may exist, however, they don't always provide sufficient attention to the transport networks and funding required to connect these developments. Integrated planning should be required for all regional and local strategies. Changes are needed to improve the integration of aviation infrastructure and urban development with transport. These include<sup>23</sup>:

- Better use of urban informatics to identify trends and understand the intricacies of the system, to help inform the development and evaluation of a sustainable urban transport system.
- Developing land as mixed use providing for greater activity through density, helping to encourage and enable different modes of transport (aviation, public transport, active transport).
- Integrating rail options which link outer areas with central areas, to meet long term demand and reduce the reliance on air travel.

The move to a 'vision and validate' approach to aviation and transport system improvements requires changes in paradigms, principles and practices<sup>24</sup>. Strategic plans need to set out to achieve what is needed in the long term, looking at the needs holistically and equitably. This includes:

- A need to put human welfare and the environment above simple microeconomic efficiency.
- Moving away from deterministic, short-term, single-view assessments to flexibly plan for a range of futures to be resilient when changes occur.
- A move away from reliance on traditional transport modelling and microeconomic benefits to more analysis and assessments which consider variations like real options analysis and scenario visioning.

---

<sup>21</sup> Paulsson, A, Isaksson K, et al. 'Collaboration in public transport planning – Why, how and what?' *Research in Transportation Economics*, Volume 69 (2018) <https://www.sciencedirect.com/science/article/abs/pii/S0739885917302512>

<sup>22</sup> Bell, M. 'Future of Transport Discussion Paper' *Engineers Australia* (January 2023) <https://www.engineersaustralia.org.au/sites/default/files/2023-01/future-transport-discussion-paper-jan-2023.pdf>

<sup>23</sup> *ibid*

<sup>24</sup> *ibid*

- More holistic assessments such as the balanced scorecard approach which consider how to fairly compensate for unacceptable impacts.

## Emerging Aviation Technologies

The aviation industry in Australia remains pivotal to the nation's economic and societal well-being. In order to effectively respond to shifts in consumer behaviour and leverage technological advancements, the aviation system must undergo adaptation. This necessitates the establishment of innovative funding models, with governments actively investing in a shared vision for the industry while recognising its inherent complexities<sup>25</sup>.

Given the intricacies of aviation, optimal performance requires collaboration, a commitment to equity, inclusivity, and reliability. Acknowledging the challenges of change, recent events such as the COVID-19 pandemic underscore the critical importance of planning for the unexpected. It is imperative to develop flexible systems capable of adapting to unforeseen circumstances.

The aviation industry is on the cusp of significant technological advancements. Engineers Australia supports investments in research and development to explore and integrate innovations such as urban air mobility, artificial intelligence in air traffic management, and advanced materials in aircraft manufacturing. We advocate for a regulatory framework that fosters innovation while ensuring safety and security standards are met.

Engineers Australia's 'Enhancing productivity in infrastructure delivery'<sup>26</sup> directions paper outlines how innovation and the use of digital infrastructure solutions will ensure Australia is future ready and our infrastructure can be managed efficiently, sustainably, safely and effectively.

Recommendations of particular relevance to the aviation industry include;

**Recommendation 20:** Governments must allocate funding for training and upskilling of the labour force, and subsidise programs to promote collaboration between industry and academia to encourage greater integration of current and emerging technologies. This will be essential to designing a better future for Australian infrastructure.

**Recommendation 21:** Governments must provide a streamlined grants process and additional funding for start-ups and scale-ups to support innovation (for more information, refer to Engineers Australia's Commercialisation of engineering innovation discussion paper).

## Future Industry Workforce

In light of the increasing skills demand in the global aviation industry<sup>27</sup>, engineers are poised to play a critical role, and this holds true for Australia as well. Looking ahead, the aviation sector is undergoing significant transformations with the introduction of new propulsion technologies, increasing automation, and the adoption of new fuels. These advancements necessitate a fresh set of skills to meet the evolving demands of the sector in the medium and longer term. Engineers are best placed to provide these skills to the industry, but the profession in Australia is also undergoing significant skills

---

<sup>25</sup> Grady, S. 'The future of Australia's aviation sector' *Engineers Australia* (November 2020)  
<https://www.engineersaustralia.org.au/sites/default/files/2022-06/future-australia-aviation-sector-submission-nov-2020.pdf>

<sup>26</sup> Grady, S. 'Enhancing productivity in infrastructure delivery: Directions Paper' *Engineers Australia* (March 2022)  
<https://www.engineersaustralia.org.au/sites/default/files/resource-files/2022-04/policy-directions-paper-enhancing-productivity-infrastructure-delivery.pdf>

<sup>27</sup> Australian Government, 'Aviation Green Paper – Towards 2050' (September 2023)  
<https://www.infrastructure.gov.au/department/media/publications/aviation-green-paper-towards-2050>

shortages<sup>28</sup> which will require addressing by all levels of government and industry in order to deliver on the abatement and progress of the aviation industry.

The aftermath of the COVID-19 outbreak resulted in a substantial global loss of jobs in airlines, airports, and civil aerospace groups, with Australia experiencing a departure of approximately one third of its aviation workforce. Skilled aerospace workers, uncertain about their career prospects, shifted to other industries or retired during the pandemic. As restrictions eased and demand returned, the aviation sector faced challenges in reassembling its workforce promptly, highlighting the need for a strategic approach to talent management.

Historically, the aviation industry has followed a cyclical pattern, with fluctuations in demand for skills corresponding to economic conditions. However, there is anticipation within the industry that this cyclical nature will undergo a change in the next two decades. Projected worldwide growth in aviation indicates sustained demand for aviation skills until 2050.

The shortage of engineering skills is exacerbated by declining domestic engineering graduates, border closures affecting skilled migrants, and systemic issues in workforce supply channels. The National Skills Commission predicts a 12.9% increase in STEM occupations over the next five years, highlighting the urgent need for intervention.

To address this challenge, the aviation industry should focus on six key areas<sup>29</sup>:

1. **Encourage Education:** Raise awareness and understanding of engineering among young Australians, emphasising its rewarding and impactful nature. Promote uptake of prerequisite subjects for engineering study.
2. **Improve Completion Rates:** Address factors contributing to low and slow completion rates for engineering students, currently at around 25% within four years.
3. **Retain Engineering Talent:** Actively retain qualified engineers in the workforce, recognising the versatility and value of their skillset beyond engineering roles.
4. **Re-evaluate Skilled Migration:** Examine and enhance systems supporting the skilled migrant workforce, recognising the long-term reliance on migrant engineers and the need for better support systems. State and territory governments should provide specialist programs that remove barriers to employment for skilled migrants in jobs that align with their skills, qualifications and level of experience. Programs should also provide greater opportunities for skilled migrant engineers to engage in leadership roles across the sector. Where such programs exist, they should be subject to regular review to determine efficacy and allow for continuous improvement.
5. **Enhance Workforce Planning:** Improve demand data to inform universities and schools, ensuring the training of engineers aligns with future needs.
6. **Encourage Diversity:** People from various socioeconomic and sociocultural backgrounds, with different genders, abilities, and experiences, must be included in the planning and design of infrastructure assets to maximise accessibility for all users.

Collaboration among government, industry, tertiary education, and professional associations is crucial for success. Initiatives should be implemented promptly to strengthen the aviation engineering workforce, and feedback and collaboration are welcomed as the industry progresses toward effective solutions.

---

<sup>28</sup> Briggs, P. 'The Engineering Profession: A statistical overview' Fifteenth Edition, *Engineers Australia* (November 2023) <https://www.engineersaustralia.org.au/publications/engineering-profession-statistical-overview-15th-edition>

<sup>29</sup> Bell, M., Briggs, P. et al 'Strengthening the engineering workforce in Australia' *Engineers Australia* (August 2022) <https://www.engineersaustralia.org.au/sites/default/files/2022-08/strengthening-engineering-workforce-australia.pdf>