

Electric Aviation

How new technology could reshape regional NSW



Foreword



New and emerging electric aviation has the potential to reshape regional travel in Australia.

The technology, which includes electric planes and drones, can make passenger travel cheaper and more sustainable. It can open up new destinations and routes for people and increase freight efficiency.

Given these benefits, it's unsurprising that global investment in the sector now totals in the billions. And momentum is increasing. Electric aircraft prototypes are available now and scaled production is forecast for the coming years.

In Australia, uncrewed drones are already used in surveying, surveillance, defence, mining, agriculture, and emergency response. Local industry trials to develop innovative aviation products such as eVTOL (electric vertical take off and landing aircraft) are underway.

The next generation of electric aviation technology will be a step up. These new aircraft will be cleaner, quieter and potentially cheaper to run. Using them on regional networks offers the opportunity to decentralise regional aviation from Sydney-centric to more regionally focused. In doing so we could connect regional communities in a way that has never been done before.

This technology has the potential to enable more convenient, personalised, and sustainable mobility solutions for customers and communities, particularly in regional NSW but also in our cities.

We have an opportunity to act now to work with the Australian Government, councils, and industry to guide and accelerate the adoption of emerging aviation technologies to deliver positive outcomes for NSW.

We are committed to accelerating the real-world, commercial adoption of electric aviation technology to benefit the customers and communities of NSW. But we cannot do it alone. We need to work with industry and other stakeholders to develop this exciting future for all of NSW. And we recognise that for NSW to be a leading adopter of electric aviation, we need to prepare for tomorrow through our actions today.

Our Future Transport Strategy sets the direction for connecting people, communities and businesses in NSW to provide a successful and thriving future. We're pleased to build on this work and release Transport's vision for electric aviation in NSW.

Rob Sharp, Secretary
Transport for NSW

Introduction

Affordable, accessible, and sustainable aviation is vital for the development of vibrant, thriving communities and regional economic growth.

eCTOL



Transport for NSW's role is to accelerate the adoption of innovative electric aviation solutions, support industry development through R&D and trials and also has a limited role in regulating intrastate routes in NSW.

There are many stakeholders who play important roles in the Australian aviation space. The industry is largely led by the private sector who invest in aircraft and plan and operate air services. Sydney and Newcastle airports are owned and managed by private operators.

The Commonwealth Government is predominantly responsible for the policy and regulatory framework for the management and safety of Australian airspace, the aviation industry and airports (more information can be found [here](#)).

Local councils own and operate most regional airports.

We know that regional communities benefit from connections to and from capital cities, major regional centres, and international destinations. Strong aviation links support local tourism, improve access to services such as healthcare and business opportunities and allow regional Australians to easily visit family and friends. Regional

producers also benefit through fast, efficient delivery of high-value perishable goods to Australian cities and international markets.

Regional NSW's vast size, rugged topography and dispersed population centres pose a unique challenge for the transport, freight, and logistics sectors.

Aviation allows us to travel vast distances and overcome challenging geographies. But regional airlines are susceptible to rising fossil fuel costs and ageing regional aircraft fleets are expensive to operate and maintain. This offers a challenge for the industry.

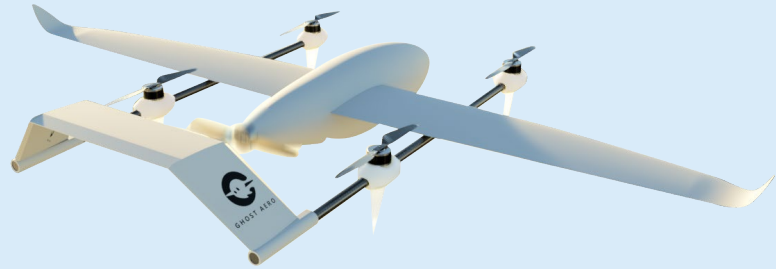
Electric aviation presents a unique opportunity for the sector. In the coming years, advances in energy storage technology and light weight composite materials have the potential to make air travel more sustainable and affordable.

The sector is growing at a rapid pace with significant investment being made internationally over the last few years and local industry also moving to develop and adopt emerging aviation technologies. Airlines around the world have already committed to ordering hundreds of electric aircraft to be delivered in the second half of this decade.

eVTOL



RPAS



New aircraft types could improve rural and regional connections. The most promising include Electric Conventional Take-Off & Landing (eCTOL), Electric Vertical Take-Off & Landing (eVTOL) and Remotely Piloted Aircraft Systems (RPAS).

Electric Conventional Take-Off & Landing (eCTOL) have an expected range of 400-800km. They are well suited to longer-range regional trips, small cargo deliveries, and passenger transfers from regional and rural airstrips.

Electric Vertical Take-Off & Landing (eVTOL) have a range of up to 100km, with potential for longer distances in the future. These aircraft could be used for on-demand air taxis, airport passenger transfers, patient transfers, cross-town trips and, sightseeing. Some eVTOLs offer onboard or remote pilots while others propose “self-driving” automated navigation.

Remotely Piloted Aircraft Systems (RPAS), popularly known as drones or Unmanned Aerial Vehicles (UAVs), enable small package deliveries and efficient transfer of medical supplies.

To unlock the potential of this new technology, NSW needs to start planning now. Electric aviation trials will put NSW on the front foot. But we must also determine what role emerging electric aviation technologies will play in the wider network, how it will connect our customers to traditional transport modes and interchanges.

Transport for NSW hopes to accelerate the adoption of electric aviation by:

1. Promoting the adoption of innovative electric aviation solutions
2. Supporting industry development through R&D and trials
3. Ensuring electric aviation integrates with our transport network to provide a seamless end-to-end journey for our customers.

Our vision

Transport for NSW wants to accelerate the adoption of electric aviation and ensure its integration into a multi-modal network that benefits customers and communities.

Expanding the role of electric aviation could make air travel more accessible and affordable for people in both urban and regional areas. It could also improve the movement of freight and goods across the state.

We want to collaborate with stakeholders to make this vision a reality and drive medium-term outcomes for NSW that meet the strategic directions set in our Future Transport Strategy and:

- improve mobility and connect customers whole lives by integrating aviation into our wider transport networks
- support successful places by revitalising airport precincts and strengthening connections to the rest of the state and country
- enable economic activity by fostering the development of emerging industries, the creation of new jobs and optimising regional connections.



Connecting our customers whole lives

The emergence of new aviation technologies has the potential to enhance the way we work and how we connect, live and move across NSW.

Electric aviation is expected to lower operating costs and reduce the need for ground infrastructure for private aviation companies. This could allow companies to unlock new air routes, giving customers and businesses high speed access to and between regional cities.

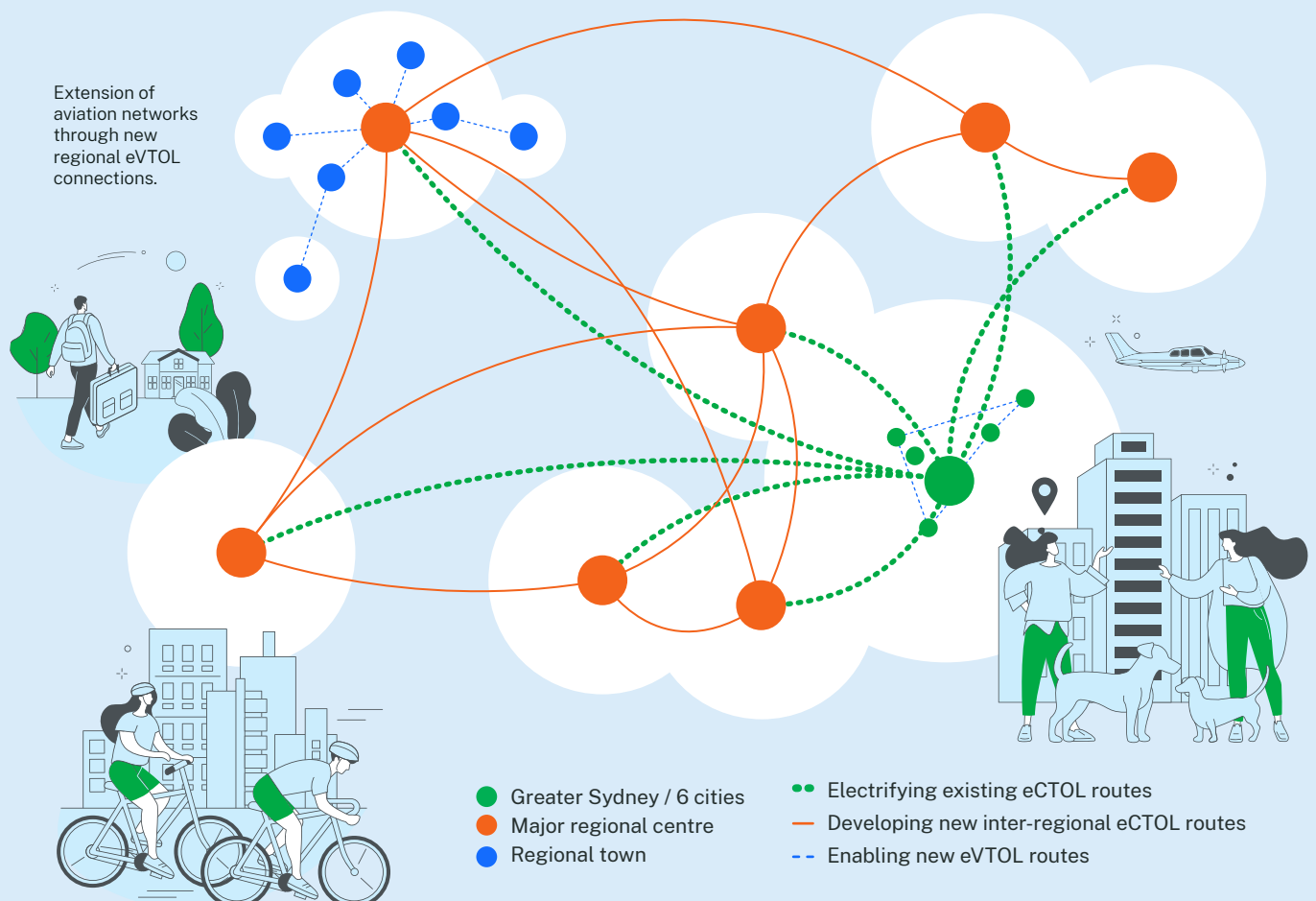
On existing routes, electric aviation could drive efficiency and reduce the reliance on fossil fuels. The cost-savings would increase business resilience and could be passed on to customers.

The electrification of aviation is expected to decrease noise pollution making areas near airports more pleasant to live and work.

New eVTOL connections will enable fast connections between our 6 cities and between regional centres. It could also provide a cost-competitive alternative to road-travel on long range journeys between major regional centres.

Over the coming years we aim to better integrate electric aviation into our wider transport network. Our vision would give customers seamless end-to-end journeys with safe, efficient, sustainable, and reliable access to their destinations.

Below: Electrification and new technology will enable cheaper, quieter journeys with more frequent services on existing routes as well as access to new locations unlocked due to economics of electric aircraft operations and new eVTOL technology.



Conceptual only and not representative of future routes.

Aviation networks are largely deregulated and route design is led by the private sector.

Successful places for communities



Electric aircraft will create new opportunities for airports, aviation precincts and regional NSW communities.

With vertical or short takeoff and landing capabilities, and low carbon emissions or exhaust pollution, the new technology would allow more efficient, sustainable access smaller airports. This would enable communities to turn regional airports into transportation hubs accelerating the growth of successful regional communities and precincts.

However it's vital that the electric aviation sector grows in a manner that is safe, secure and considerate of the community and the environment.

Transport for NSW plans to work with communities and across all levels of government to ensure that noise, visual impacts, and privacy are considered when planning for the adoption of new technologies. We will also work to ensure the technology is accessible for all.

Effective planning can support improved placemaking around precincts and aviation hubs. Early planning and investment should include reinvigoration of regional airports and other infrastructure. This will provide new destinations for visitors and unlock clear benefits for residents.

Future communities must also be sustainable. Transport for NSW is already moving to decarbonise transport by greening public transport, providing incentives for EVs and supporting net-zero goals.

Decarbonisation of aviation is a complex and challenging problem. However, electric aviation offers a significant opportunity to lower emissions. Encouraging the uptake and advancement of electric propulsion systems and next-generation battery and hydrogen fuel-cell technology could allow us to decarbonise the transport sector.

Enabling economic activity

Harnessing the full potential of electric aviation could unlock significant economic growth.

The Australian Government has forecast that emerging aviation technology will deliver a \$14.5 billion benefit to Australia's Gross Domestic Product and create 5,500 jobs annually over the next 20 years¹. It is important to ensure NSW attracts a large proportion of this investment.

To increase the uptake of electric aviation, NSW will need to facilitate the creation of a local emerging aviation technology ecosystem.

We will need to be open for business and drive collaboration between technology providers, operators and infrastructure providers to support local capability to successfully adopt electric aviation technologies.

This emerging technology would support the growth of new jobs and skills. It can enable the development of adjacent industries and lift business resilience by opening more pathways to trade. This will require support from the private sector and academia with research projects focused on emerging electric aviation R&D. We must ensure TAFE and university training courses supply the necessary skills for a future workforce. The adoption of emerging aviation technology is already transforming a range of industries, including agriculture, mining, construction, defence, and emergency services.

Freight efficiency and connectivity is critical to link regional and remote producers and for the development of new agricultural export markets. Emerging electric aviation technologies offer significant opportunities to support the export of time-sensitive goods such as agricultural products, particularly high value seafood, meat, dairy and fruit and nuts. It has the potential to provide effective and affordable freight transport solutions for businesses in regional and remote communities and to help meet the growing demand for Australian commodities.

The development of the Western Sydney International Airport offers a unique opportunity to create a state-of-the-art freight precinct. This will create new export opportunities for products such as premium agricultural produce from regional NSW.

The NSW Government is working to realise such opportunities by partnering with the Australian Government to attract transport and logistics industries to Western Sydney. The NSW Government has announced the creation of a world-class agribusiness precinct in the Western Sydney Aerotropolis which will support production and value-adding of sustainable, high-quality fresh produce and pre-prepared consumer foods.

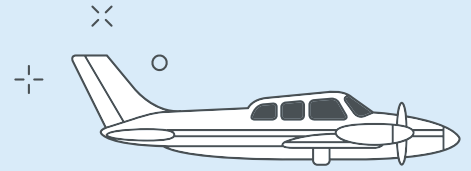
Regional Airports and the visitor economy also stand to benefit from potentially stronger aviation links across the regions. In time, electric aviation offers the potential for improved operating economics for airlines, which may create new network and frequency opportunities across the state.



1. National Emerging Aviation Technologies Policy Statement May 2021.

Harnessing benefits

Adopting rapidly emerging aviation technology could provide significant benefits to NSW and regional communities if harnessed effectively.



Customer mobility

Expanded travel options and lower cost travel enabled through lower aircraft operating costs



Environmental

Emissions, noise and air quality improvements



Network integration

Greater connectivity between airports and with main transport hubs



Placemaking

Activate regional airports, precincts and new destinations



Economic Growth

New tourism and charter opportunities



Productivity

Business and freight productivity improvements leveraging Western Sydney Airport



Regional Development

Local technology development, skills and jobs



Next Steps

Transport for NSW Role

Transport for NSW, wants to accelerate the adoption of electric aviation by supporting industry through R&D and trials. We want to ensure electric aviation integrates with our transport network. But we cannot do it alone. We need to work with industry and other stakeholders to develop this exciting future for all of NSW. Responsibility for aviation sits primarily with the Commonwealth Government and local councils. However, Transport for NSW can collaborate and utilise a holistic transport lens, thinking about the role of aviation in a multi-modal network to deliver customer mobility solutions.

The Commonwealth Government has committed funding over two years to establish the Emerging Aviation Technology Partnership (EATP) Program. This program will support industry to develop and test their technology, operational concepts, and operational processes. Transport for NSW is looking to build on the advances made through the Commonwealth program and explore how electric aviation technology can improve customer journeys and inform a future NSW aviation roadmap. This would lay the path for industry to transition to industry-led operations at scale in the second half of the decade.

Local Councils largely have responsibility for airports and control over zoning. They will need to consider infrastructure requirements for electric aviation. Early engagement has indicated councils are receptive and excited for the benefits the new technology will bring.

Aviation is a key transport mode for many customers and Transport for NSW has a role to foster seamless customer journeys across our state. We are acting now to promote the development of emerging technologies and capabilities to ensure this new technology meets our unique NSW use case requirements – otherwise we risk missing out or adopting technology which is not fit for our customer needs.

Aviation is led by the private sector who invest in aircraft, plan routes and operate services. That's why we are committed to working with industry to shape a future NSW aviation roadmap.

Transport for NSW will work with the Commonwealth, local government, and industry to identify, guide and support transition to electric aviation technologies to deliver sustainability, safety, freight, and connectivity outcomes for customers, particularly in regional NSW.

Transport for NSW is committed to supporting the accelerated adoption of electric and emerging aviation technologies.

We will continue to actively engage with the sector and progress key activities:

1. Release a market sounding to seek industry insights into a future electric aviation roadmap and provide emerging aviation proof of concept proposals for consideration. Feedback sought will include:
 - input on NSW integrated network vision and opportunities to improve regional connectivity
 - Identifying initiatives that can form the roadmap to electrify and extend regional aviation networks including the development, testing and trialling of electric aviation technology
 - highlighting potential roadblocks and offering insight into how the NSW government could support the industry to accelerate the adoption of electric aviation.
2. Develop an integrated network vision and aviation strategy for NSW to ensure the technology meets customers' needs and considers the wider social benefits and impacts, including environmental sustainability, amenity, equity, and economic productivity. This strategy will be backed by:
 - detailed analysis of key issues
 - demand modelling
 - customer value proposition
 - concept of operations
 - collaborative feasibility studies
3. Continue to collaborate with the Commonwealth Government to ensure the regulatory framework is structured for safe and efficient adaption of emerging aviation technology
4. Define and communicate NSW priority use cases to foster and accelerate research and development, ecosystem development and trials.
5. Proactively support regional passenger mobility and freight trials in partnership with industry, subject to funding approvals
6. Develop a framework to support industry-led trials that interact with NSW assets or areas of responsibility
7. Review and adapt aviation strategy, incorporating trial learnings and insights from ongoing industry collaboration.

Commitment to collaboration



Transport is committed to working in close collaboration with local and international industry, researchers, councils, and other jurisdictions to enable electric aviation in NSW.

Our vision and focus areas will be further developed through industry feedback. We look forward to partnering to bring these initiatives to life over the coming years.

We welcome feedback on our approach and encourage you to get in contact via aviation@transport.nsw.gov.au to explore opportunities to partner on future initiatives.

