

# Transport and Infrastructure Net Zero Consultation Roadmap

## Take the survey

Department of Climate Change, Energy, Environment and Water

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Response received at:

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- 1 Confirm that you have read and understand this privacy notice.  
Yes
- 2 Please indicate how and if you want your submission published.  
Public
- 3 Published name  
Australian Airports Association
- 4 Confirm that you have read and understand this declaration.  
Yes
- 5 First name  
Not answered
- 6 Last name  
Not answered
- 7 Email  
Not answered

- 8 Phone  
Not answered
- 9 Who are you answering on behalf of?  
Organisation
- 10 Organisation name  
Australian Airports Association
- 11 What best describes you or your organisation?  
Not answered
- 12 What sector do you represent?  
Other: "Aviation"
- 13 What state or territory do you live in?  
Australian Capital Territory
- 14 Postcode  
2600
- 15 What area best describes where you live?  
City
- 16 1. Do you support the proposed guiding principles?  
Not answered
- 17 1.1 Please add details to your response.  
Not answered
- 18 2. Do you support the use of the avoid-shift-improve framework as a tool to identify opportunities for abatement?  
Not answered

19 2.1 Please add details to your response.

Not answered

20 3. Do you agree the development of a national policy framework for active and public transport will support emissions reduction?

Not answered

21 3.1 Please add details to your response.

Not answered

22 4. What should be included in a national policy framework for active and public transport and how should it be developed?

Not answered

23 5. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the movement of people contributes to transport emissions reduction?

Public transport is a key opportunity to decarbonise ground transport access to airports.

While private

light vehicle movements will continue to represent the largest mode share of airport travel, high

frequency bus and rail connections to airports will be critical in decarbonising the sector as

passenger and worker numbers increase. Ensuring networks are planned and optimised for

connections between airports and key activity centres along with internal airport precinct connections

is critical. At airports with legacy rail connections, the higher cost (and in the case of Brisbane low

frequency/span of hours) precludes a greater rail mode share for travel to and from the airport

precinct. In Brisbane, exclusivity arrangements between the Airtrain operator and the State

Government means other public transport services (e.g., buses) are effectively 'barred' from

servicing Brisbane Airport. A lack of accessible options therefore drives commuters to

personal

vehicles, negating potential reduction in emissions afforded by mass transit. The AAA strongly

recommends all levels of Australian governments in improving public transport access to airports

and better connecting airports into urban and regional public transport networks.

- 24 6.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction?

Not answered

- 25 6.2. How would these actions address the identified challenges and opportunities for emissions reduction in the movement of goods?

Not answered

- 26 7. Do you agree with the proposed net zero pathway for light road vehicles?

Not answered

- 27 7.1 Please add details to your response.

Not answered

- 28 8. The Australian Government is currently developing an Australian New Vehicle Efficiency Standard and has already begun to implement actions in the National Electric Vehicle Strategy.8.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce light vehicle emissions?

As precincts attract thousands of vehicles a day, the interaction of light passenger vehicles and their

electrification needs to be considered by airports, both for car parking facilities and passenger

transport services (Rideshare and Taxis). Options to emissions technologies (public or private EV infrastructure, supply side regulatory reforms, circular economy initiatives), need to consider airports as part of a wider decarbonization strategy for the light vehicle fleet. For example, different customer groups will require tailored charging solutions at airport parking facilities, ranging from 'trickle' charging to high output DC charging, depending on the type of vehicle, the length of stay, and proximity to the terminals. How airports develop infrastructure and investment profiles to address these requirements needs input and co-ordination from governments as part of a wider EV infrastructure strategy. accelerate the uptake of EVs and other zero

**29** 8.2 How would these actions address the identified challenges and opportunities to reduce light vehicle emissions?

Not answered

**30** 9. Do you agree with the proposed net zero pathway for heavy road vehicles?

Not answered

**31** 9.1 Please add details to your response

Not answered

**32** 10. The proposed pathway for heavy road vehicles relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels. Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

**33** 10.1 Please add details to your response. Why did you rank them in that order?

Not answered

34 11. What role should low carbon liquid fuels play in the heavy vehicle decarbonisation?

Not answered

35 12. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce heavy vehicle emissions?

Many FLAs are major freight and transport hubs in their regions and serve as key activity centres for

heavy and light freight vehicle fleets. Any consideration of road freight decarbonisation initiatives

needs to consider interactions between urban planning, infrastructure development and road

management against operating profiles of airport precincts. An FLAs traffic profile includes a mixture

of articulated (e.g., semi-trailer, B-Double) and rigid heavy freight vehicles operating across the

precinct, driven by both freight and logistics operators and aeronautical support services (e.g.,

catering, cleaning and heavy maintenance). Any move to decarbonise freight vehicles requires a

range of on-airport refuelling and recharging solutions facilitated by Airport Leasing Companies.

36 13. Do you agree with the proposed net zero pathway for rail?

Not answered

37 13.1 Please add details to your response.

Not answered

38 14. The proposed pathway for rail relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels. Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

39

14.1 Please add details to your response. Why did you rank them in that order?

Not answered

40 15. What role should low carbon liquid fuels play in rail decarbonisation?

Not answered

41 16. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce rail emissions?

Not answered

42 16.1 How would these actions address the identified challenges and opportunities to reduce rail emissions?

Not answered

43 17. Do you agree with the proposed net zero pathway for maritime?

Not answered

44 17.1 Please add details to your response.

Not answered

45 18. The Australian Government is engaging in consultation as part of the development of the Maritime Emissions Reduction National Action Plan and those consultations will also inform the final Roadmap and Action Plan. 18.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce maritime emissions?

Not answered

46 18.2 How would these actions address the identified challenges and opportunities to reduce maritime emissions?

Not answered

47 19. Do you agree with the proposed net zero pathway for aviation?

Yes

48 19.1 Please add details to your response.

The AAA broadly agrees with the net zero pathway for aviation. However, the Department's almost exclusive focus on aircraft-based solutions such as sustainable aviation fuels (SAF), battery electric and hydrogen propulsion overlooks the role airports are already playing and will continue to play in decarbonising the transport and infrastructure (T&I) sectors towards a 2050 Net Zero target

49 20. The Australian Government has already engaged in consultation on aviation decarbonisation through the development of the Aviation White Paper and those consultations will also inform final Roadmap and Action Plan.

Not answered

50 20.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce aviation emissions?

Low Carbon Liquid Fuels (LCLFs) will be an important part of reducing aviation emissions. The AAA's submission to the LCLF discussion paper is provided at Attachment B. Reduction in emissions from aircraft fuel consumption will affect the Scope 3 emissions of the airport sector, which makes up over 90% of aviation sector emissions. There are also other ways in which aviation fuel use and emissions can be reduced, including Government direction to Airservices Australia and the Civil Aviation Safety Authority (CASA) to implement:

- Improved airspace management and design such as Airspace modernisation through

deployment of the Civil-Military Air Traffic Management System (OneSky),

- Trajectory Based Operations (TBO) using Continuous Climb Operations/Continuous Descent Operations (CCO/CDO) and Performance-Based Navigation (PBN),
- Reduction of airborne and ground fuel burn through implementation of Air Traffic Flow Management (ATFM) and Ground Delay Programs (GDP), and;
- Consequent improvements to air traffic control and navigation aids.

51 21. Do you agree with the proposed net zero pathway for transport infrastructure?

Not answered

52 21.1 Please add details to your response.

Federally Leased Airports (FLAs) present a unique challenge for decarbonisation when considering

ground transport provision to and from airport precincts. As outlined in the Road Map, ground

transport provision is primarily a state and local government responsibility, with additional investment

and facilitation from the federal government. FLAs, as private entities leased on Australian

Government land, are considered as activity centres outside state and local government remit.

Conversely, the Australian Government regards ground transport as a state and local government

responsibility. This means airport precincts are not readily considered and integrated into transport

policy, planning and investment frameworks, with decarbonisation being no exception.

53 22. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce transport infrastructure emissions and ensure that transport infrastructure is ready for and enables low-emission transport modes?

The AAA strongly recommends airports are more closely engaged by Government with decarbonisation efforts in transport infrastructure as the Road Map continues to roll out, including:

- Support a technical advisory body to commission and develop low carbon standards for pavements and concrete that can be adopted across the transport and infrastructure

sector,

- Funding support or grants provided for R&D to develop sustainable construction materials

54 22.1 How would these actions address the identified challenges and opportunities to reduce transport infrastructure emissions?

Not answered

55 23. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the energy mix is ready to support transport emissions reduction?

Not answered

56 24. How should the use of low carbon liquid fuels (LCLFs) be prioritised across different transport modes over time to achieve maximum abatement?

Not answered

57 25. What are the best ways for the Australian Government to work collaboratively with industry, business, governments and communities to implement the proposed pathways?

Not answered

58 25.1 What are good domestic or international examples of partnership and collaboration on transport and transport infrastructure emissions reduction that could inform the final Roadmap and Action Plan?

Not answered

59 25.2 What opportunities can Government leverage to show leadership in Australia and internationally?

Not answered

- 60 26. What measures and metrics should be used to evaluate the final Transport and Infrastructure Net Zero Roadmap and Action Plan?  
Not answered
- 61 26.1 What other data and evidence could governments use and how could this offer further insights on the pace, scale and location of transport emissions reduction pathways?  
Not answered
- 62 27. Do you have any feedback on the proposed review process?  
Not answered
- 63 28. Do you have any further feedback on the Consultation Roadmap and proposed pathways?  
Not answered
- 64 28.1 Is there anything missing? Are the sections appropriately integrated? Is the Roadmap appropriately ambitious?  
Not answered
- 65 29. Is there any further information or documentation that you wish to be considered with your submission?  
Not answered
- 66 Would you like to upload a document?  
Yes
- 67 Have you removed any identifying information from your submission?  
Yes
- 68 Upload a submission  
AAA\_Submission\_Transport\_Infrastructure\_Net\_Zero\_Road\_Map.b1d62817\_Redacted.pdf

69 Upload a submission

Attachment A - AAA Submission - Jet Zero Council Airport Decarbonisation Study July 2024.pdf

70 Upload supporting file

Attachment\_B\_AAA\_Submission\_Low\_Carbon\_Liquid\_Fuels\_Discussion\_Paper.0978d7af\_Redacted.pdf

71 Upload supporting file

Not answered



AUSTRALIAN  
AIRPORTS  
ASSOCIATION

26 July 2024

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CANBERRA ACT 2601

Email: [NetZero@infrastructure.gov.au](mailto:NetZero@infrastructure.gov.au)

### **Response to the Transport and Net Zero Consultation Road Map**

The Australian Airports Association (AAA) welcomes the opportunity to provide this response to the Department's Transport and Infrastructure Net Zero Consultation Road Map (the Road Map).

The AAA is the national voice for airports, representing the interests of more than 340 airports and aerodromes across Australia. It also represents more than 150 corporate members supplying goods and services to airports and the wider aviation industry.

As the airport sector's recommendations on decarbonisation and reaching Net Zero have been substantially addressed through both its response to Workplan item 5 of the Australian Jet Zero Council (JZC)<sup>1</sup> and in its submission to the Department's Low Carbon Liquid Fuels (LCLF) consultation paper, this submission covers areas in the Road Map not previously addressed, with specific reference to airports:

#### Do you agree with the proposed net zero pathway for aviation?

The AAA broadly agrees with the net zero pathway for aviation. However, the Department's almost exclusive focus on aircraft-based solutions such as sustainable aviation fuels (SAF), battery electric and hydrogen propulsion overlooks the role airports are already playing and will continue to play in decarbonising the transport and infrastructure (T&I) sectors towards a 2050 Net Zero target.

While the role of airports in decarbonising the aviation sector is largely covered by the work of the JZC, its focus on aircraft-based solutions also overlooks the role of airports in the T&I sectors reaching. In 2024, the AAA and its Sustainability Working Group commissioned Airbiz to develop an Airport Decarbonisation Study (Attachment A) to address airport-specific decarbonisation strategies as part of fulfilling Item 5 in the JZC's workplan. The airport response to decarbonisation is built around four key areas that are within the locus of airports to directly influence:

- Electrification of airport ground support equipment (GSE) and airport vehicle fleets.
- Electrification of Gate infrastructure such as Ground Power Units (GPUs) and Pre-conditioned Air (PCA) equipment.

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<sup>1</sup> Department of Infrastructure, Transport, Regional Development, Communications and the Arts (2023), *Australian Jet Zero Council – Workplan*, December, p.4. Item 5 tasks airports with "Identifying changes required to airport operations and infrastructure that will support decarbonising aviation"

- On-airport renewable energy generation and storage powering buildings and infrastructure.
- SAF and readiness of future aviation technology such as Advanced Air Mobility (AAM) and Alternative Aviation Fuels (AAF).<sup>2</sup>

What additional actions by governments, communities, industry and other stakeholders need to be taken now and, in the future to reduce aviation emissions?

Low Carbon Liquid Fuels (LCLFs) will be an important part of reducing aviation emissions. The AAA's submission to the LCLF discussion paper is provided at Attachment B. Reduction in emissions from aircraft fuel consumption will affect the Scope 3 emissions of the airport sector, which makes up over 90% of aviation sector emissions. There are also other ways in which aviation fuel use and emissions can be reduced, including Government direction to Airservices Australia and the Civil Aviation Safety Authority (CASA) to implement:

- Improved airspace management and design such as Airspace modernisation through deployment of the Civil-Military Air Traffic Management System (OneSky),
- Trajectory Based Operations (TBO) using Continuous Climb Operations/Continuous Descent Operations (CCO/CDO) and Performance-Based Navigation (PBN),
- Reduction of airborne and ground fuel burn through implementation of Air Traffic Flow Management (ATFM) and Ground Delay Programs (GDP), and;
- Consequent improvements to air traffic control and navigation aids.

Do you agree with the proposed net zero pathway for transport infrastructure?

This section covers two key areas of decarbonisation for airports not addressed elsewhere, centred around ground transport connections to airports along with recycled and low carbon materials.

#### *Ground transport connections to airports*

Federally Leased Airports (FLAs) present a unique challenge for decarbonisation when considering ground transport provision to and from airport precincts. As outlined in the Road Map, ground transport provision is primarily a state and local government responsibility, with additional investment and facilitation from the federal government. FLAs, as private entities leased on Australian Government land, are considered as activity centres outside state and local government remit. Conversely, the Australian Government regards ground transport as a state and local government responsibility. This means airport precincts are not readily considered and integrated into transport policy, planning and investment frameworks, with decarbonisation being no exception.

#### *Freight vehicles*

Many FLAs are major freight and transport hubs in their regions and serve as key activity centres for heavy and light freight vehicle fleets. Any consideration of road freight decarbonisation initiatives needs to consider interactions between urban planning, infrastructure development and road management against operating profiles of airport precincts. An FLAs traffic profile includes a mixture of articulated (e.g., semi-trailer, B-Double) and rigid heavy freight vehicles operating across the precinct, driven by both freight and logistics operators and aeronautical support services (e.g., catering, cleaning and heavy maintenance). Any move to decarbonise freight vehicles requires a range of on-airport refuelling and recharging solutions facilitated by Airport Leasing Companies.

#### *Light vehicles*

As precincts attract thousands of vehicles a day, the interaction of light passenger vehicles and their electrification needs to be considered by airports, both for car parking facilities and passenger transport services (Rideshare and Taxis). Options to accelerate the uptake of EVs and other zero

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<sup>2</sup> Airbiz for Australian Airports Association (2024), *Summary Report, Airport Decarbonisation Study*, p. 6.

emissions technologies (public or private EV infrastructure, supply side regulatory reforms, circular economy initiatives), need to consider airports as part of a wider decarbonization strategy for the light vehicle fleet. For example, different customer groups will require tailored charging solutions at airport parking facilities, ranging from 'trickle' charging to high output DC charging, depending on the type of vehicle, the length of stay, and proximity to the terminals. How airports develop infrastructure and investment profiles to address these requirements needs input and co-ordination from governments as part of a wider EV infrastructure strategy.

### *Public Transport*

Public transport is a key opportunity to decarbonise ground transport access to airports. While private light vehicle movements will continue to represent the largest mode share of airport travel, high frequency bus and rail connections to airports will be critical in decarbonising the sector as passenger and worker numbers increase. Ensuring networks are planned and optimised for connections between airports and key activity centres along with internal airport precinct connections is critical. At airports with legacy rail connections, the higher cost (and in the case of Brisbane low frequency/span of hours) precludes a greater rail mode share for travel to and from the airport precinct. In Brisbane, exclusivity arrangements between the Airtrain operator and the State Government means other public transport services (e.g., buses) are effectively 'barred' from servicing Brisbane Airport. A lack of accessible options therefore drives commuters to personal vehicles, negating potential reduction in emissions afforded by mass transit. The AAA strongly recommends all levels of Australian governments in improving public transport access to airports and better connecting airports into urban and regional public transport networks.

### *Recycled and low carbon materials*

There does, however, need to be greater effort by Government to better integrate the aviation and broader transport infrastructure pathways in the Road Map to recognise the commonalities between the materials used and infrastructure needs of aviation and other transport infrastructure types.

For example, airports are significant users of concrete and bitumen in the construction and maintenance of airfield pavements, with strong crossovers in material types and specification with concrete and bitumen used in road transport infrastructure. Airports are also consumers of steel, aluminium and other building products for aeronautical infrastructure and non-aeronautical infrastructure and the construction of terminals and other buildings on airport precincts. Similarly, there is a significant commonality in supply chains and between firms designing and delivering airport infrastructure and other transport infrastructure.

The energy and emissions embodied in the production of construction materials would also need to be accounted for as part of the airport sector's Scope 1 and 3 emissions, while the use of externally-produced energy to run aeronautical and non-aeronautical buildings are part of an airport's Scope 2 emissions. Australian Government data shows the buildings account for around 19% of Australia's total energy use and 18% of direct carbon emissions.

The increased use of recycled and low-carbon pavement and construction materials provide a key pathway for airports to reduce the sector's Scope 1 and 3 emissions. Reduction of Scope 2 emissions is another pathway for emissions reduction at airports through a combination of increased renewable energy generation, improvements to the Building Code of Australia and the increased use of recycled materials.

The AAA strongly recommends airports are more closely engaged by Government with decarbonisation efforts in transport infrastructure as the Road Map continues to roll out, including:

- Support a technical advisory body to commission and develop low carbon standards for pavements and concrete that can be adopted across the transport and infrastructure sector,
- Funding support or grants provided for R&D to develop sustainable construction materials.

## Other comments

A major concern of the AAA is that the aviation sector's decarbonisation and transition to Net Zero will not be evenly distributed among all airports. All major airports in Australia are well on their way to Net Zero; most metropolitan airports are well along the path to net zero, together with some regional airports. Many smaller regional and remote airports along with some mid-sized airports cannot muster the financial and other capacity to meet the sector's decarbonisation goals.

As part of the Road Map, the Department should identify suitable funding mechanisms to support regional, remote and mid-sized airport emissions reduction initiatives, including:

- Deployment of SAF and other alternative aviation fuels,
- Airside electrification solutions for vehicles/GSE and aircraft GPU/PCA,
- Adoption of recycled and low carbon/zero carbon construction materials, and
- Behind the meter renewable electricity generation and storage, including induction and bi-directional vehicle-to-grid (V2G) charging systems.

As such, there is a vital role for the Australian Government to co-fund decarbonisation activities at regional, remote and mid-sized airports. The AAA views this should take place through a new grant funding program in the Infrastructure and Transport portfolio, separate from the existing Regional Airports Program and Remote Airstrip Upgrade Program. This with an extended scope or grant funding programs led by environmental agencies such as those managed by the Australian Renewable Energy Agency (ARENA), the Clean Energy Finance Corporation (CEFC) or through the National Recovery Fund (NRF).

The AAA appreciates the opportunity to provide a submission to the Consultation Paper. Should you have any further questions regarding this submission, please contact [REDACTED].

Yours sincerely

[REDACTED]

Natalie Heazlewood

**Head of Policy and Advocacy**

Attachment A: Airbiz for Australian Airports Association (2024), *Summary Report, Airport Decarbonisation Study*. Work Item 5 for the Jet Zero Council, July.

Attachment B: Australian Airports Association (2024), *Response to the Low Carbon Liquid Fuels Consultation Paper*, July.



# Summary Report

## Airport Decarbonisation Study

Australian Jet Zero Council  
Work Item 5

13 July 2024

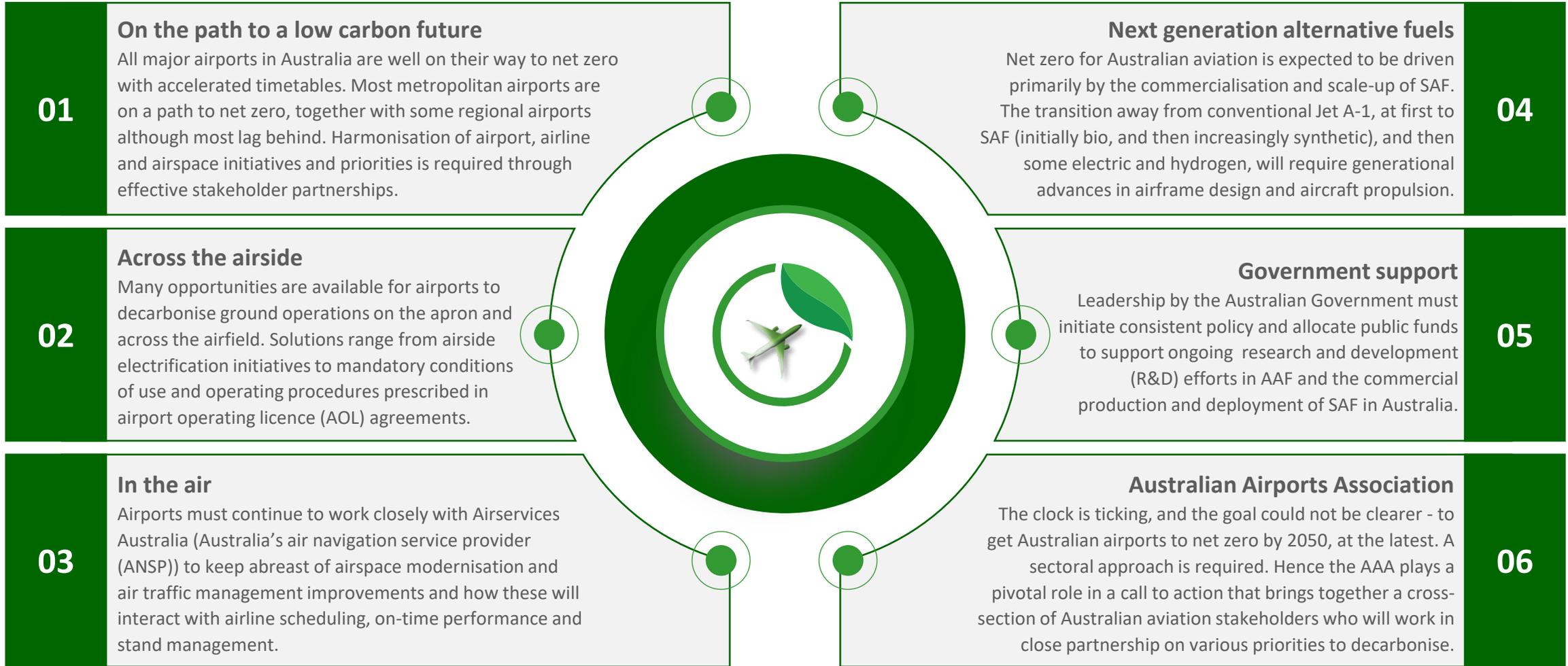


AUSTRALIAN  
AIRPORTS  
ASSOCIATION



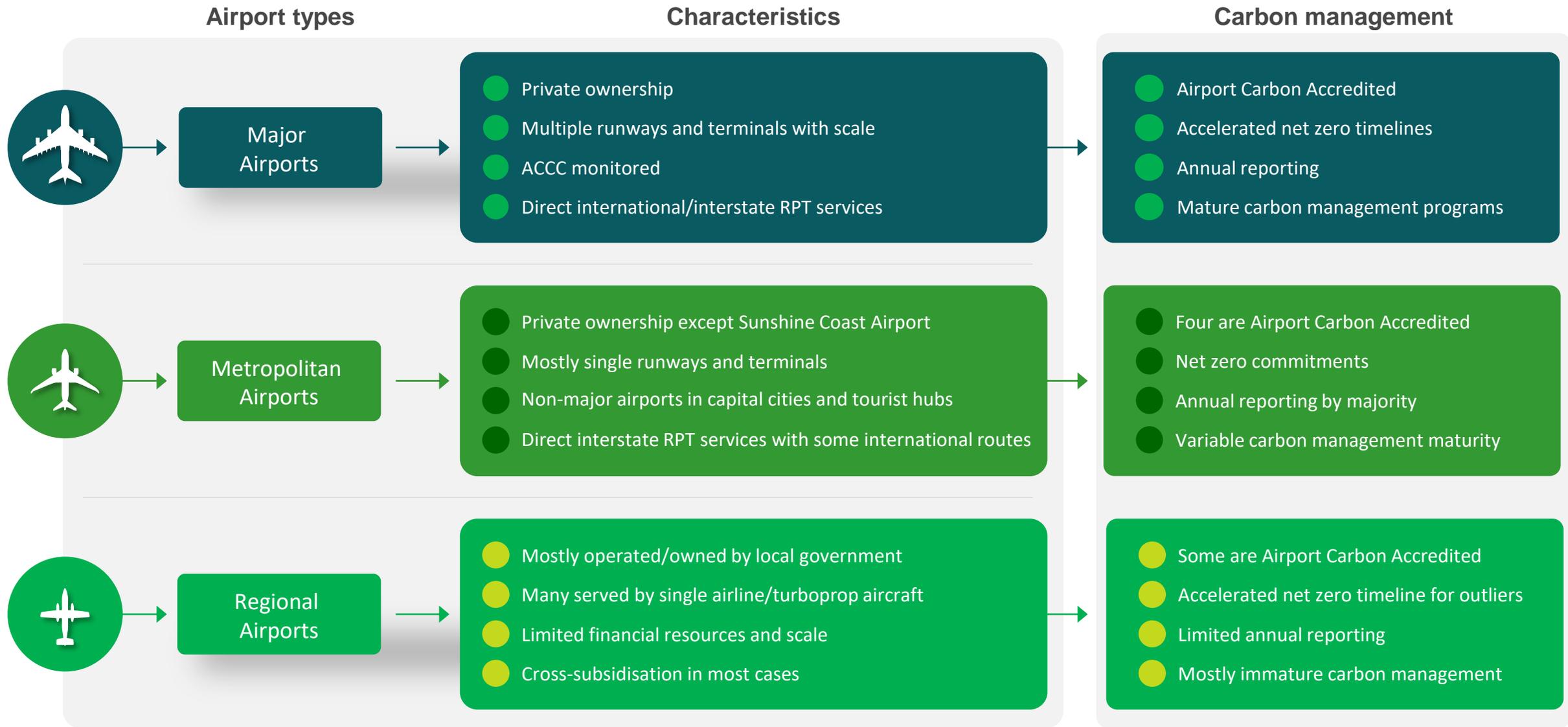


## ↗ The headlines





# ↗ Australia airport profiles





# Work item 5: Airport decarbonisation roadmap

## VISION

Lead the decarbonisation of Australian aviation through more optimal operations and investment in green airport infrastructure

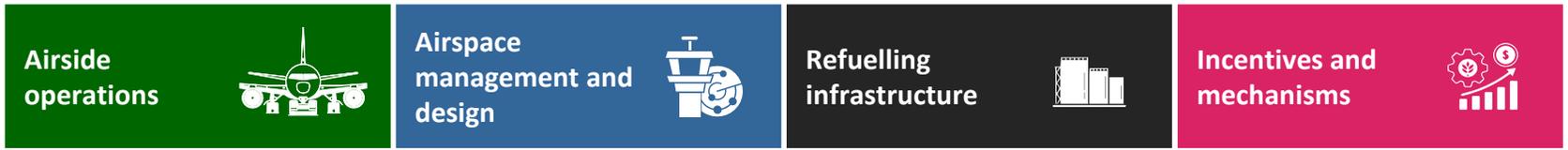


## OBJECTIVES

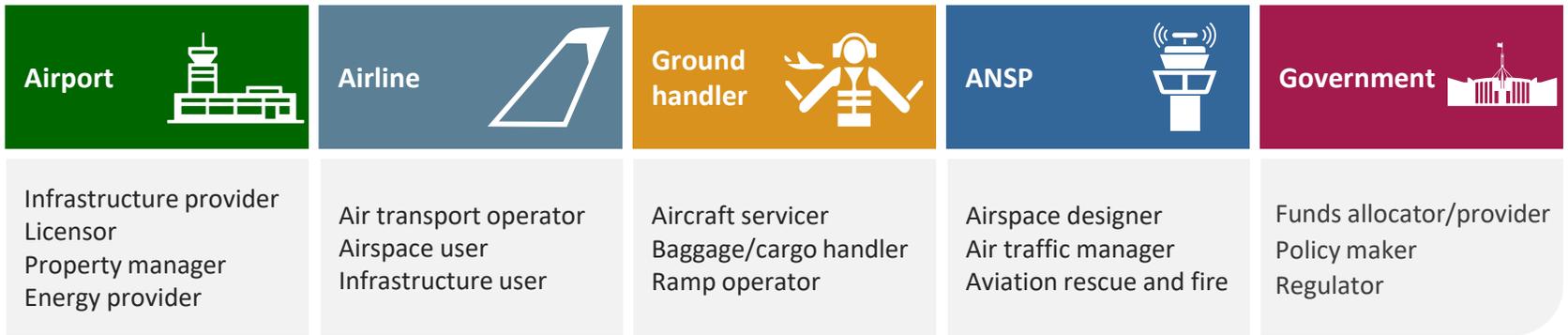


- Identify the airport infrastructure and operational changes required to decarbonise Australian airports.
- Greenprint how these changes can be implemented in a structured roadmap and strategic action plan.

### Key areas of focus



### Primary stakeholder roles





# ↗ Australian airports in action

 800 kWp of installed behind the meter solar generation capacity

 Mobile electric GPU units charged with electricity generated from onsite 5.5 MWp airside solar farm

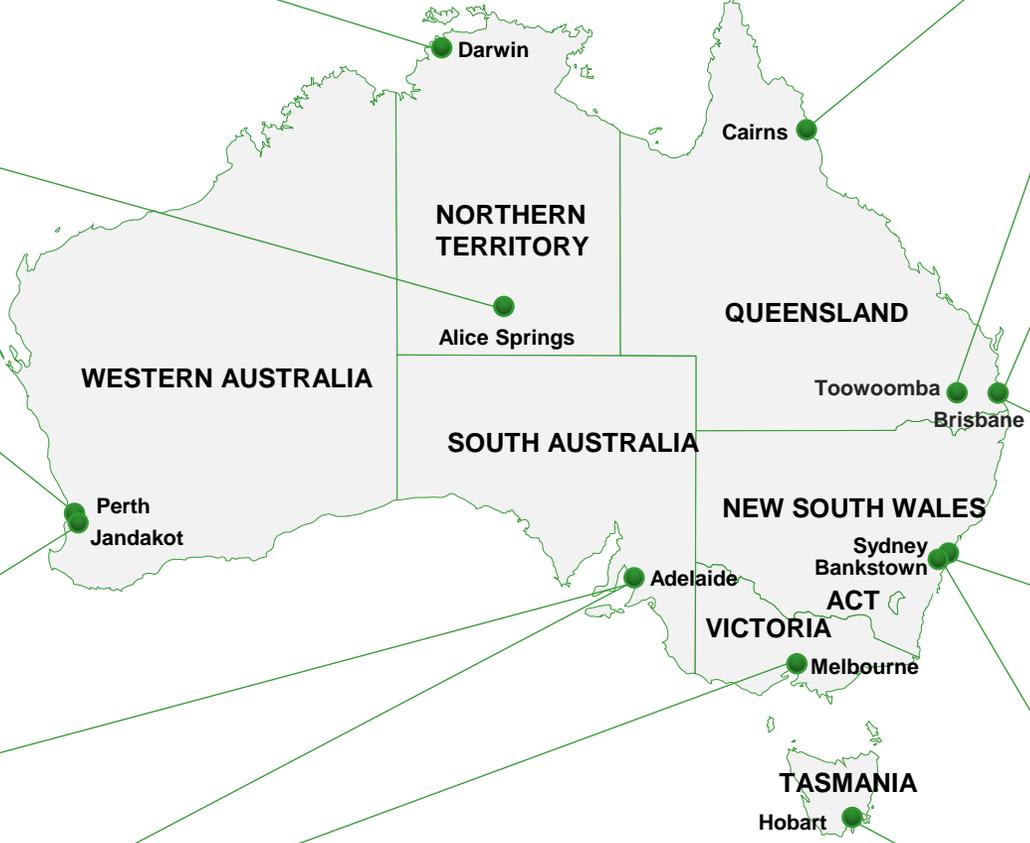
 Onsite blue carbon sequestration using tropical mangrove forests

 Sustainable design guidelines with minimum requirements for all capital projects (new build and retrofits)

 Electric aircraft flight training and trials in a Pipistrel Aircraft (20-30-minute flights)

 All-renewable electricity through a green PPA and additional 2.3 MWp of installed solar generation capacity

 Open access aviation fuel facility



 Earth Friendly Concrete with low embodied carbon used in apron and aircraft turning node pavements

 H2 flight trials with Stralis scheduled for 2026 between Brisbane and Gladstone

 Australia's first SAF trial by Virgin Australia using the airport's jet fuel supply infrastructure

 Gate electrification rollout/upgrade to support GSE/vehicle fleet transitions and improve GPU utilisation

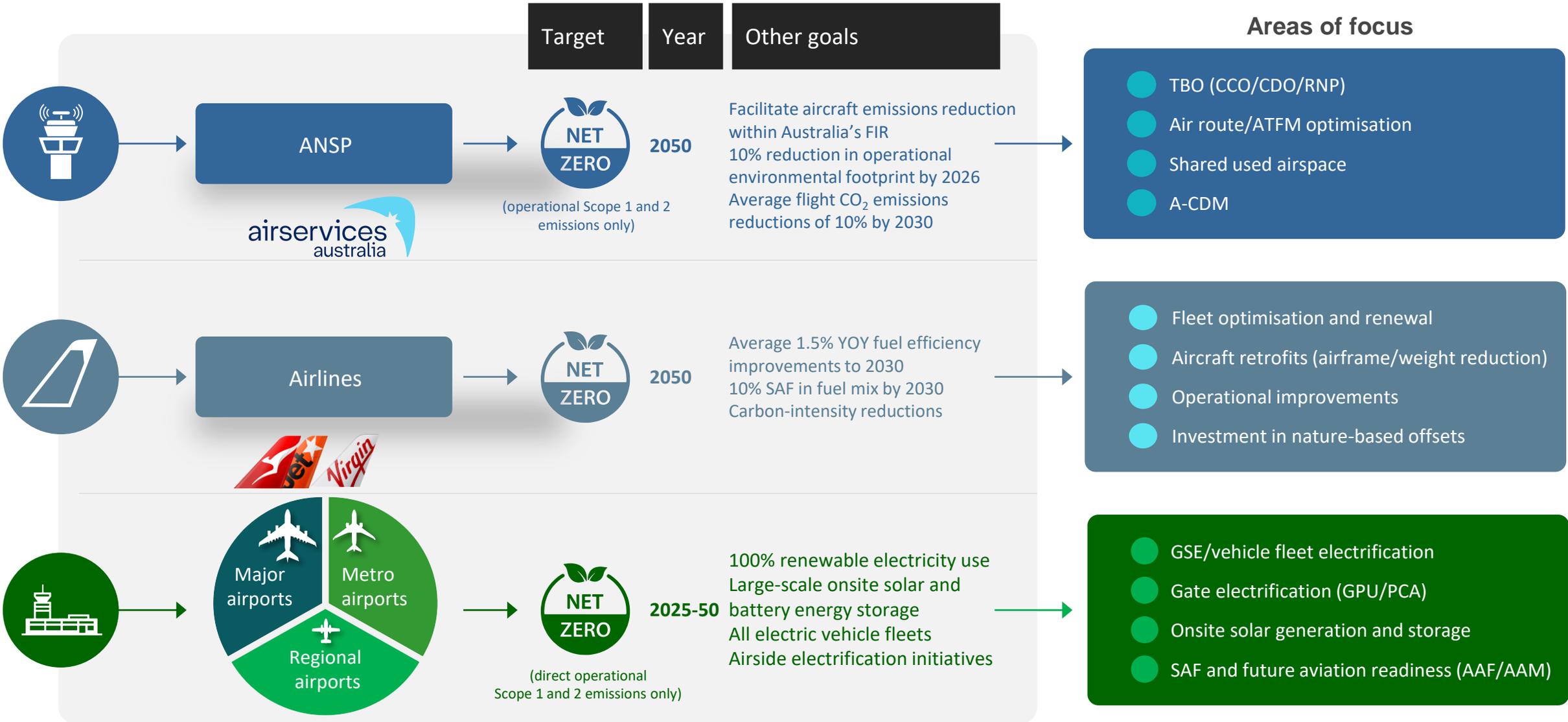
 Launchpad for eVTOL aircraft flight trials (air taxi services)

 First approved GreenPower Provider to supply renewable electricity to airport partners and tenants

 Australia's first intelligent LED high intensity runway lighting system



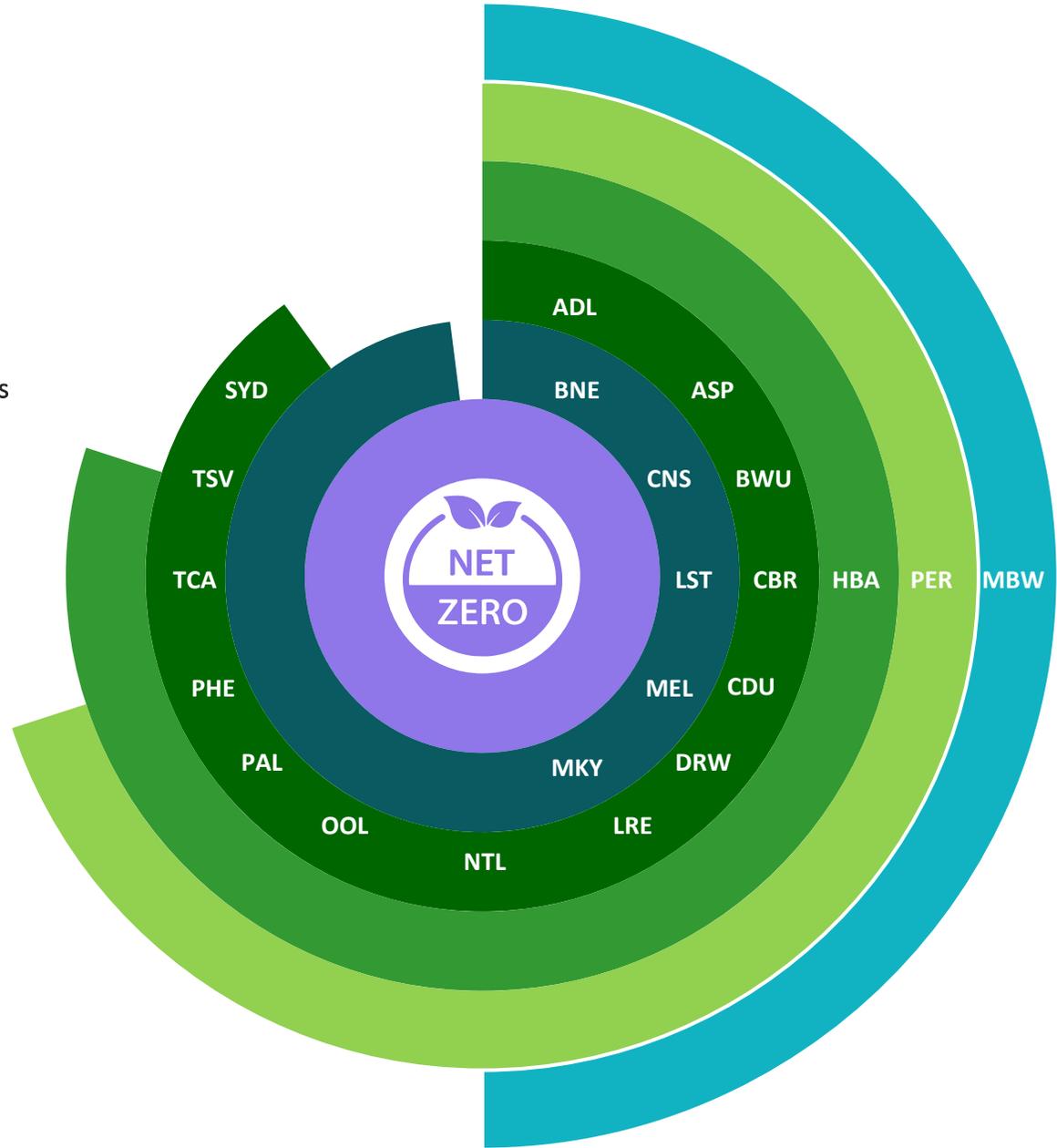
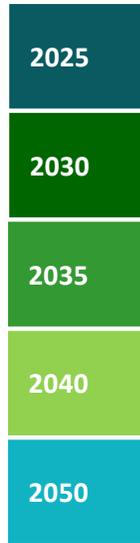
# ↗ Raising the bar on carbon management





↗ Towards net zero

Net zero timelines





## ↗ Emissions reduction initiatives



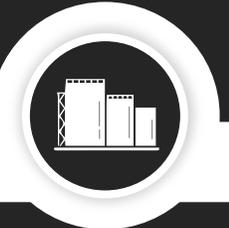
### Airside operations

- Electric GSE/vehicle charger points
- H2 fuelling stations for airside busses/GSE
- GPU/PCA units for aircraft turnarounds
- AOL/COU for multiple airside activities
- Reduced engine/autonomous taxiing
- LEDs for AGL and high-mast apron lights
- Low carbon concrete airfield pavements
- Gate management systems
- Electrical infrastructure capacity and peak demand
- Behind the meter renewables and BESS
- Battery energy storage systems
- Electric, remote-controlled pushbacks



### Airspace management and design

- OneSky airspace modernisation using an advanced Civil Military Air Traffic Management System
- TBO – CCO/CDO and performance-based navigation (PBN)
- Free-route airspace
- ATFM platforms and systems
- A-CDM and ground delay program
- AAM with eVTOL aircraft
- Digital towers at remote airports
- Drone surveillance (navaids)
- Virtual ARFF learning and training
- Retirement of ground-based navaids in line with shift to satellite-based navigation



### Refuelling infrastructure

- Forecast fuel demand and fleet mix
- Fuel storage and supply system
- Fuel mix and technologies
- SAF feedstock diversity
- SAF supply chain logistics and blending facilities
- Joint User Hydrant Installation agreements
- Airport fuel/AAF delivery systems
- Future electric/H2 aircraft reality
- Energy resilience and peak demand readiness
- ITP services (battery swap system and H2)
- Market and regulatory conditions



### Incentives and mechanisms

- Airport buddy system to build capacity and share knowledge
- Shadow carbon price
- Carbon market and levy systems
- Passenger Movement Charge (PMC)
- Green finance products
- Carbon removal technologies
- Sustainable design, construction and procurement guidelines
- Australian airports carbon tracker
- Fly Green and Smart Program
- Aircraft ecolabel scheme
- AAA Long-Term Carbon Goal for airports



## ↗ Near-term roadmap 2024-26

	Airside operations/infrastructure		Major airports
	Airspace management/design		Metropolitan airports
	Refuelling infrastructure		Regional airports (major)
	Incentives/mechanisms		Regional/remote airports (other)

 Key stakeholder involvement

Near-term (2024-26)	Item	Description	Applicability				Key stakeholder(s)						
			Major airports	Metropolitan airports	Major Regional airports	Other regional/remote airports	Airport	Airline	Ground handler	Airservices	AAA	Government	
1		Establish an online knowledge hub and quarterly squawk boxes for Australian airports hosted by AAA on airport net zero programs, and wider (applicable) industry guidance and handbooks produced by ACI, CANSO, IATA and ICAO.											
2		Seek airport alignment to achieve net zero emissions by 2050 for Scope 1 and 2 emissions sources and support the achievement of the global aviation industry's goal of net zero by 2050.											
3		Metropolitan airports to develop minimum sustainable design, construction and procurement requirements to guide capital project development in line with best practices and corporate sustainability goals (internal to airports).											
4		Conduct a study on aeronautical pricing principles to support emissions and noise reductions that help to reduce the environmental impact of air travel.											
5		Strengthen airport master plans through the inclusion of ERIs and the infrastructure and land use requirements to accommodate next generation aircraft designs, AAF technologies and energy transition over a 20-year planning horizon.											
6		Consider how the PMC could be used through ringfencing a percentage of current revenue, to fund or finance ERIs at major and metropolitan Australian airports.											
7		Identify suitable funding mechanisms to support regional airport ERIs, including AAF and SAF deployment, first/last-mile AAM, airside electrification solutions for vehicles/GSE and aircraft GPU/PCA, behind the meter renewable electricity generation and storage, induction and bi-directional V2G charging.											
8		Investigate a consistent approach to embed a shadow carbon price into decision-making (for internal airport purposes only).											
9		Evaluate the existing capacity of fuel storage/distribution systems, supply chains and fuel types against air traffic demand projections to pinpoint infrastructure capacity bottlenecks, supply chain glitches and AAF/SAF penetration levels into the future aircraft fleet mix and ITP delivery services.											
10		Conduct research into the feasibility, practicality and readiness of Australia's airports to adopt new AAF technologies and hydrogen (H2) hubs.											
11		Consider the infrastructure requirements and timelines of eVTOL (powered by H2) aircraft operations at major, metropolitan and regional airports.											



## ↗ Near-term roadmap 2024-26 (cont'd)

<span style="display:inline-block; width:15px; height:15px; background-color:darkgreen;"></span> Airside operations/infrastructure		Major airports
<span style="display:inline-block; width:15px; height:15px; background-color:blue;"></span> Airspace management/design		Metropolitan airports
<span style="display:inline-block; width:15px; height:15px; background-color:black;"></span> Refuelling infrastructure		Regional airports (major)
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span> Incentives/mechanisms		Regional/remote airports (other)

 Key stakeholder involvement

		Applicability				Key stakeholder(s)					
		Major airports	Metropolitan airports	Major Regional airports	Other regional/remote airports	Airport	Airline	Ground handler	Airservices	AAA	Government
Near-term (2024-26)	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										
	21										
	22										



## ↗ Medium-term roadmap 2027-30

	Airside operations/infrastructure		Major airports
	Airspace management/design		Metropolitan airports
	Refuelling infrastructure		Regional airports (major)
	Incentives/mechanisms		Regional/remote airports (other)

 Key stakeholder involvement

		Applicability				Key stakeholder(s)								
		Major airports	Metropolitan airports	Major Regional airports	Other regional/remote airports	Airport	Airline	Ground handler	Airservices	AAA	Government			
Near-term (2024-26)	1	Continue the incremental installation and rollout of airside electrical charger points in line with the growing number of electric airside vehicles and GSE being deployed by the airports themselves and their airlines and GHSPs.												
	2	Review the resilience of grid electrical supplies and capacity/redundancy of airport distributed energy networks (HV/LV infrastructure) based on future demand projections for electric vehicle/GSE charging (including V2G), GPU/PCA use, electric aircraft BSS and digital platforms (software).												
	3	Partner with airlines to trial reduced engine pushbacks and taxiing to determine operational benefits to aircraft operators and Scope 3 emissions budgets.												
	4	Observe pilot and GHSP interactions with GPU/PCA systems to pinpoint operational challenges and opportunities to increase current low utilization levels.												
	5	Establish low emissions operational procedures for aircraft ground operations and gate electrification and update AOL/COU agreements for all airside users.												
	6	Develop a Code of Practice that identifies the steps and techniques to reduce both GHG emissions and noise generated by arriving and departing aircraft.												
	7	Develop Australia's first green flight concept between a selection of compatible airport-pairs to demonstrate ultra-low emissions performance benefits of various advancements in aircraft ground operations and handling, airspace modernisation, aircraft navigation and operating techniques and SAF.												
	8	Install gate management software to better define gate availability, dynamic flight schedules, airport traffic constraints, airline preferences and adjacency rules to ease airfield congestion, minimise the time aircraft spend idling on the tarmac waiting for a gate and to monitor/report GPU/PCA use.												
	9	Upgrade all airfield ground (runway/taxiway), apron high-mast and airfield signage lighting to ultra-low energy LEDs and pair with smart digital controls.												
	10	Trial the suitability and evaluate the embodied carbon savings of low carbon concrete asphalt/pavements to upgrade aprons and taxiways.												
	11	Identify regional airports as suitable test hubs to trial next generation aircraft, AAM and AAF technologies, including SAF.												



## ↗ Role of the Australian Government

- 

**Efficient flight operations and data sharing**  
Collaborate with Airservices and CASA to reduce fuel use and emissions, and increase CCO/CDO and implementation of A-CDM

01
- 

**Regional airports decarbonisation activities**  
Co-fund decarbonisation activities at regional airports, through an extended Regional Airports Program or existing structures such as the ARENA, CEFC or the NRF

03
- 

**Capacity building and knowledge sharing**  
Work closely with airports and other aviation industry partners to build decarbonisation literacy through knowledge sharing structures

05
- 

**Refuelling demonstrator hubs**  
Co-fund refuelling demonstration hubs at airports to test novel infrastructure and refuelling practices, and develop industry knowledge and capability

07
- 

**Passenger Movement Charge**  
Consider how the Passenger Movement Charge (PMC) could fund or finance emissions reduction activities at airports

02
- 

**Airport fuel study**  
Co-fund an airport fuel study that explores aviation fuel transition pathways and the infrastructure required to support the transition to SAF

04
- 

**Sustainable design/infrastructure standards**  
Partner with industry to develop new infrastructure standards that allow for the use of low carbon materials in airport infrastructure like taxiway/runway pavements

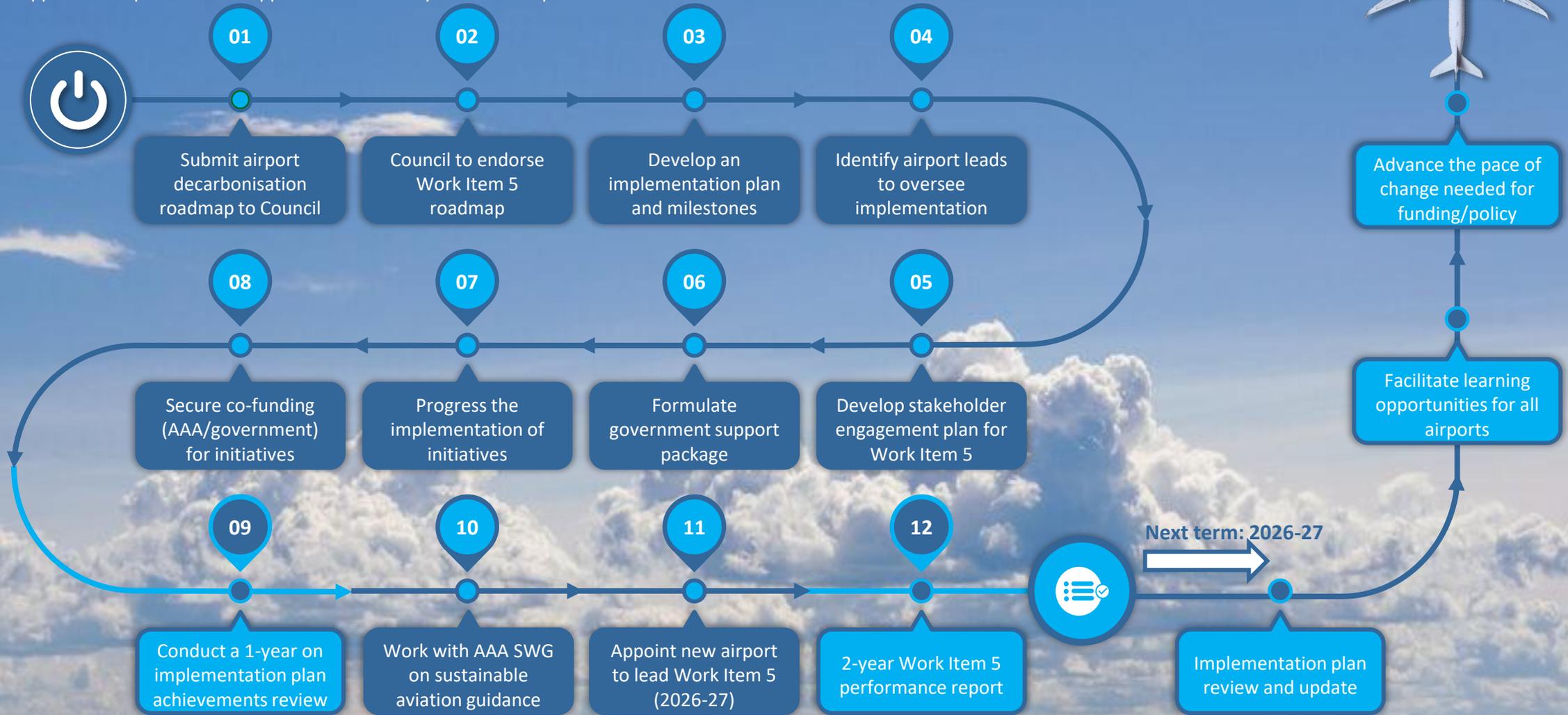
06
- 

**Initiative to reduce aircraft operational CO<sub>2</sub>**  
Partner with Airservices, airlines and compatible “airport-pairs” to design an operational initiative to reduce emissions based on procedural and technology advances

08

➤ Next steps

Alongside the roadmaps to help Australian airports decarbonise, the journey ahead for the Council will be guided by a series of multifaceted next steps to support the implementation approach and delivery milestones up to 2026.





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AUSTRALIAN  
AIRPORTS  
ASSOCIATION

24 July 2024

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GPO Box 594  
CANBERRA ACT 2601

Email: [lcfconsultation@infrastructure.gov.au](mailto:lcfconsultation@infrastructure.gov.au)

### **Response to the Low Carbon Liquid Fuels Consultation Paper**

The Australian Airports Association (AAA) welcomes the opportunity to provide this response to the Department's Low Carbon Liquid Fuels Consultation Paper (the Consultation Paper).

The AAA is the national voice for airports, representing the interests of more than 340 airports and aerodromes across Australia. It also represents more than 150 corporate members supplying goods and services to airports and the wider aviation industry.

This submission was developed in conjunction with the AAA's Sustainability Working Group, which consists of representatives from major airports (Adelaide, Brisbane, Canberra, Darwin, Gold Coast, Melbourne, Perth, Sydney), mid-sized airports (Alice Springs, Bankstown, Camden, Moorabbin, Newcastle, Parafield, Sunshine Coast, Townsville) and regional airports (Coffs Harbour, Longreach, Mt Isa, Tennant Creek). The contribution of the SWG covers an indicative range of Australian airports in consideration of the questions in the Consultation Paper.

There are significant opportunities and challenges in Australia becoming a producer of low carbon liquid fuels (LCLFs). While opportunities are covered throughout this submission, it is also important to understand the challenges facing Australia in shaking its path dependence on imported fuels. The AAA recognises the need for a policy framework that supports both supply-side and demand-side measures to develop a sustainable Australian LCLF sector and supports the Government's efforts to collaborate with the industry to create a robust regulatory framework that provides certainty for investment in the LCLF industry.

Australia currently produces very minimal amounts of LCLFs and will be entirely reliant on imports without significant changes to the policy and regulatory environment. To change this, government must support through policy interventions measures which build on Australia's competitive advantages to establish domestic production of LCLFs.

#### The low carbon liquid fuels opportunity

Australia has a major opportunity to become an LCLF producer, not the least being its existing high level of demand for jet fuel and an overwhelming reliance on imported product. With an average annual jet fuel consumption of 7,700 million litres between 2018 and 2023<sup>1</sup>, this provides a significant base upon which to build a domestic Sustainable Aviation Fuel (SAF) industry.

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<sup>1</sup> Deloitte for Queensland Government (2023), *Catalysing sustainable aviation fuel in Australia*, p. 2.

Australia's advantages include:

1. *Abundant renewable resources:*

- Biomass and feedstock availability – Australia's agricultural and forestry sectors can provide ample feedstock for production of 'drop in' LCLFs, such as:
  - broadacre crops (wheat, sugar, canola), crop residues and
  - by-products from animal and forest production.

There is also an opportunity to utilise municipal solid waste as a feedstock, providing a potential solution in addressing Australia's problems in disposal of solid waste.

- Solar and wind energy – Australia's abundant solar and wind energy resources can provide the renewable electricity for green hydrogen production, a key component in producing SAF using Power-to-Liquid (PtL) production processes. PtL is considered the long-term scalable SAF supply solution with advantages over biofuels which can depend on biomass feedstocks, which compete with food production and land use.

2. *Technological Expertise:*

- Advanced manufacturing – Australia maintains a capability to develop and implement advanced manufacturing processes for biofuel production, including hydro processing.
- Skilled workforce - Australia also maintains a well-trained and highly skilled workforce across the range of engineering disciplines required to produce LCLFs.
- Research and Development – R&D capability in renewable energy and biofuels, which is supported by leading universities, research institutions and the Australian Government through bodies such as the Future Fuels co-operative research centre.

3. *Supportive Policy Environment:*

- The supportive domestic policy environment includes initiatives such as:
  - 'Future Made in Australia' which supports incentives to produce low carbon liquid fuels through grants, subsidies and mandates.
  - Jet Zero Council to specifically guide the aviation sector's transition to net zero emissions by 2050 through adoption of SAF and other alternative aviation fuels.
- Regulatory Frameworks - A stable and transparent regulatory environment that supports investments in sustainable fuel technologies. The recent Federal Budget announcement allocating \$18.5 million to put a robust system of certification in place for LCLFs is a positive step to further improving the regulatory framework. A robust and credible accounting framework for emissions reduction from feedstock supply and domestic SAF production will be essential to ensure emissions are correctly accounted and attributed across the aviation sector.

4. *Strategic Location:*

- Australia's proximity to Asia is an advantage as being closer to major aviation markets provides a strategic advantage in supplying SAF to airlines operating in the region. In addition, Australia's economic and geographic location in the South Pacific provides an opportunity to become a SAF production hub supplying New Zealand and other Pacific Island nations.

From an airport perspective, Australia is likely to face competition from countries/regions that are more advanced in LCLFs, including:

- The United States: A leader in biofuel technology and a robust infrastructure for renewable fuel production. They also have strong federal and state policies supporting renewable fuels, including the Federal Renewable Fuel Standard (RFS) and various state-level incentives.

- European Union: Has stringent regulations promoting the use of SAF, such as the Renewable Energy Directive (RED II) and the European Green Deal. There is also strong collaboration between governments, airlines, and fuel producers and a policy framework designed to scale up SAF production and ensure uptake of SAF by airlines operating in the EU.
- China: A rapidly growing domestic aviation sector presents a significant ready-made market for SAF. The Chinese government is also investing heavily in a range of renewable energy technologies and infrastructure including PV solar and batteries.
- Singapore: Strategically positioned as a major aviation hub in Asia, it has an existing advantage in oil refining and its location provides a logistical advantage for SAF distribution across the global aviation network.
- Brazil: A well-established biofuel industry, particularly in ethanol production, and is expanding its capabilities in SAF to build on its abundant agricultural resources, especially sugarcane as a feedstock for biofuel production.

More broadly four further competitive considerations for a domestic SAF industry include:

- Competition between domestic and offshore producers for the supply of Australian-made feedstocks, potentially bidding up the price of key inputs for domestic SAF production.
- Without robust and credible emissions accounting for Australian-made feedstocks, there is the potential for emissions abatement of overseas-produced SAF using local feedstocks to be fully credited to offshore producers.
- Consideration of the emissions and monetary costs of transport and distribution in the cost base for a domestic SAF industry, including the transportation of feedstock for production, but also the transport and distribution system for the refined SAF product. While making use of existing fuel delivery networks and systems is important, the location of production and distribution facilities would need to be on or near road, rail and sea transport nodes to reduce emissions.
- When the money and emissions costs of transport for imported SAF is factored in, this may give a domestic SAF industry further advantage.

#### Options to support Australian domestic low carbon liquid fuel production

The AAA supports the continued work between fuel producers and the Government in creating a stable regulatory landscape which provides industry with certainty to invest for the long term. For the Australian aviation sector, the primary goal is to secure an efficient, commercially viable and secure supply chain for SAF. Incentive systems providing stability and supporting domestic production are important to achieve this goal. The policy framework needs to be “stackable” with long-term and effective policy support that enables:

- Increase in SAF supply capacity with policy options that attract capital to expand SAF supply.
- Promote SAF price competitiveness via appropriately timed mandate policies paired with fiscal measures to help reduce the cost differential between SAF and conventional Jet Fuel.
- Increased research and development and promotion of enhanced and sustainable production pathways.
- Environmental benefit recognition via effective SAF accounting principles.

From a supply perspective, the AAA's view is that this can be achieved by setting up a domestic low carbon liquid fuel production and distribution industry using a tax credit system. The AAA's views on the importance of a tax credit system to spur production of SAF is based on the following reasons:

#### *1. Investment Attraction:*

Production Tax Incentives would stimulate capital investment by making projects more financially attractive, encouraging companies to invest in new facilities, technologies, and infrastructure.

Particularly for a 'greenfield' fuel such as SAF, the industry needs to de-risk early-stage investment in production facilities. Additionally, favourable tax policies can attract new or additional foreign direct investment into Australia, bringing capital, technology, and expertise.

## 2. *Increased Competitiveness:*

Production tax credits can reduce the effective cost of production, allowing companies to price their products more competitively in both domestic and international markets. A new onshore SAF production market in Australia would face direct competition from established industries in countries such as US and Singapore. It is therefore important for Australian-made SAF to be priced competitively as an import substitute. By making production more financially viable, tax credits can help companies achieve economies of scale, further reducing costs.

## 3. *Economic Diversification:*

Production Tax Incentives support the development and growth of emerging industries, reducing Australia's economic dependence on a narrow range of sectors and enhancing economic stability in addition to stimulating R&D and innovation, leading to the growth of complementary industries and services.

## 4. *Tax Revenue:*

Although Production Tax Incentives reduce tax revenue per unit of production, overall economic growth and job creation can lead to an expanded tax base through increased corporate, income, and sales tax revenues. The initial reduction in tax revenue can be offset by the long-term economic benefits of a more robust and diversified economy. Use of the taxation system to increase excise on high-carbon liquid fuels (conventional Jet Fuel, AvGas, diesel) and lower excise on LCLFs could also be an important way to support domestic production.

There are -additional mechanisms Australian governments (Federal, State and Territory) could consider in providing support for a domestic SAF industry, including:

- Low interest loans
- Loan guarantees
- Green bonds (targeted at sourcing capital for green industries)
- Project facilitation (partnering with producers to navigate and streamline regulatory approvals and compliance)
- Changed accounting standards or taxation rules (e.g. fast-tracking depreciation schedules for equipment)

### Production incentives to appropriately incentivise the production of SAF and renewable diesel and different pathways to produce LCLF:

A key issue for Australian airports is securing supply chains of SAF and other LCLFs such as renewable diesel as it is an intermediary user of these products. Airports are looking for a viable domestic market to diversify the aviation sector's fuel sources and reduce airport Scope 3 emissions from the use of aviation fuels by airlines and diesel fuel in ground support equipment.

Airports and the fuel industry have a set of complex interactions that allow for airports to receive, store and distribute the aviation fuel on site for refuelling. In producing LCLFs airports are most interested in ensuring appropriate access to infrastructure that may be required to store and distribute SAF.

Consideration will need to be given to any additional infrastructure that may be required to supplement existing Joint User Hydrant Installation (JUHI) systems at major airports it would need to be built into any tax credit system that is employed to incentivise production. Investors in airport infrastructure such as superannuation funds will need to understand the spillover costs for LCLFs.

More broadly, allocation of incentives between SAF and renewable diesel would need to be considered. It is critical for SAF to be 'quarantined' as part of any support program to ensure consistent and scalable supply. While certain sectors of the heavy road vehicle fleet will transition to electric power, a sizable proportion of road and rail freight movements will still require internal combustion power for the foreseeable future. There will be adverse effects where aviation competes with road and rail transport for production volumes of LCLFs at domestic refineries.

Production of SAF should also be prioritised over low-emissions diesel given aviation is a harder to abate sector compared to land transport which has easier and faster access to electrification options for their operations. The AAA recommends the Australian Government deeply examines how the production of LCLFs fits within its parallel transport and infrastructure decarbonisation road map<sup>2</sup> to work out a realistic allocation of domestic refinery resources.

It is difficult to remain technology agnostic given the differing cost structures of various technologies. The AAA suggests modelling a range of support mechanisms against cost and revenue models provided from industry whilst also taking into consideration long term demand implications. These cost models could include different technology pathways, including emerging LCLF production pathways beyond Bio SAF production such as synthetic fuels (PtL SAF) which are required to achieve the scale of SAF required to achieve Net Zero targets. These emerging technologies may well affect the costs of production in the medium term. Given this, government should take this into consideration and provide incentives accordingly. This would also help de-risk SAF production and relieve pressures of bio feedstock availability over the medium-to-long term.

The AAA supports the establishment of an Australian book and claim system to support the development of a domestic SAF industry and to enable the availability of domestically-produced SAF at Australian airports. Any domestic system would need to recognise and be able to be integrated with international systems (ICAO, RSB) in the future.

#### Design of demand-side mechanisms:

The introduction of SAF target before a SAF mandate will help the sector transition smoothly and will also provide a clear signal of demand to the market. SAF mandates (e.g., 10% SAF blending standard by 2030) are "internationally recognised as critical to SAF deployment and scaling" and should be a component of Australia's efforts in this area. That said, any SAF mandate must be calibrated towards building up domestic supply. If not, this will mean importation of SAF produced offshore to meet domestic mandates.

The World Economic Forum notes that SAF mandates "should be set at such a level each year that it supports the development of SAF production capacity in line with a net-zero trajectory... but the blending level should not expose the sector to excessive technological and financial risk nor create any risk of insufficient supply in the face of growing demand that would drive prices up".<sup>3</sup>

The second component of the demand side measures is the establishment of an emissions intensity scheme for liquid fuels. These schemes are designed to reduce emissions intensity of fuels relative to a specified benchmark over time. Emissions intensity schemes are a market-based metric which allows the market to determine the most cost-effective way to reduce emissions.

#### Considerations regarding emissions and sustainability criteria:

Setting an ideal threshold for eligibility criteria for low carbon liquid fuels (LCLF) involves balancing environmental effectiveness, economic feasibility, and technological practicality.

There are four key facts to be considered when creating a policy framework for emissions criteria:

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<sup>2</sup> Department of Infrastructure, Transport, Regional Development (2024), Communications and the Arts, *Transport and Infrastructure Net Zero Consultation Roadmap*.

<sup>3</sup> World Economic Forum, *Guidelines for Sustainable Aviation Fuel Blending Mandate in Europe*, 2021.

1. *Economic Viability* - In terms of cost competitiveness LCLFs should be economically competitive with traditional fuels, considering current and projected market conditions.
2. *Technological Feasibility* – For production scalability the technology for producing LCLFs should be scalable to meet significant portions of the market demand.
3. *Alignment with broader climate goals* - Criteria should align with national and international climate targets and commitments. Additionally, adherence to recognised certifications and standards for sustainability and emissions reductions should also be made.
4. *Sustainable feedstock* - LCLFs should be derived from renewable and sustainable feedstocks such as green hydrogen for production of synthetic fuels, agricultural or animal by-products, waste materials or dedicated energy crops. At the same time, it should not affect food security and land use.

Policymakers can ensure that LCLFs can contribute effectively to reducing greenhouse gas emissions while being economically and technically viable. Key benefits include:

1. *Environmental improvement* – Lowers carbon emissions benefitting local ecosystems and improved public health.
2. *Economic Benefits*:
  - *Job Creation*: Developing and maintaining low carbon fuel production facilities can create jobs in engineering, manufacturing, and other sectors.
  - *Local Investment*: Investments in local infrastructure for producing low carbon fuels can stimulate the economy.
  - *Energy Independence*: Reducing dependence on imported fuels enhances national fuel security and stabilises energy prices, benefiting consumers and businesses.
3. *Community Resilience*: Domestically produced energy can make communities more resilient to global fuel supply disruptions. Transitioning to LCLFs can be structured to ensure fair distribution of access and benefits across all segments of the aviation sector, including regional and remote areas.

The community benefits of producing LCLFs domestically span environmental, economic, public health, social, and technological domains, contributing to a more sustainable and equitable future.

The AAA supports an emissions reduction threshold being part of the eligibility criteria in a production incentive program. This would ensure LCLF suppliers work towards a production pathway that keeps them accountable for decarbonisation. An indicative threshold could begin at a 25 per cent emissions intensity reduction relative to conventional fuels and move over time. Production Tax Incentives could be used as an incentive for LCLF producers to exceed the threshold.

#### Other comments

There also needs to be consideration over the allocation of feedstocks used for LCLF production over time and their use for producing diesel and SAF. In the short term, renewable diesel is important as a 'bridging' fuel for decarbonisation efforts at regional airports, particularly in relation to ground support equipment such as starter carts, baggage tugs and ground power equipment. However, SAF will provide the greatest share of emissions reduction potential, and is therefore considered a priority for all airports. Over time, transition of feedstocks from renewable diesel to SAF is likely to be required. Government in conjunction with industry will need to establish a roadmap for this transition.

The need to keep costs for SAF comparable to conventional fuels is a key demand driver. As noted in the discussion paper, there is a strong potential for the higher initial costs of SAF production is a premium of between 2-5 times the price of aviation fuel. While the price of SAF is likely to fall over time, there will be a need for government intervention through regulation (fuel standards, mandates) or taxation (increasing excise on conventional aviation fuels) to narrow price gaps in the short term.

Containing the cost of domestic SAF is also a retail issue for the travelling public, with AAA research on consumer intentions over the past two years shows flyers polled unwilling to pay any additional costs to fly on a flight fuelled by SAF steadily increasing from 30% in December 2021 to 40% in June 2024. The percentages of flyers willing to pay more for a SAF fuelled flight is more price sensitive and has consistently decreased over time, with only 32% prepared to pay between \$1-\$20 in June 2024, down from 50% in December 2021.<sup>4</sup>

The AAA appreciates the opportunity to provide a submission to the Consultation Paper. Should you have any further questions regarding this submission, please contact [REDACTED].

Yours sincerely

[REDACTED]

Natalie Heazlewood

**Head of Policy and Advocacy**

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<sup>4</sup> Zing! Research for the AAA, *Passenger Intentions Survey*. Waves 4-11, December 2021 – June 2023.