

IMPLICATIONS OF AAM OPERATIONS FOR FUTURE SHARED AIRSPACE IN VICTORIA, AUSTRALIA

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Abstract

This paper presents a statewide market assessment of Advanced Air Mobility (AAM) services in Victoria, Australia. Using a large-scale mobility dataset and econometric demand modelling, the study evaluates the potential adoption of AAM services across regional and metropolitan corridors. Nearly 3,600 one-way passenger corridors (almost 1,800 roundtrip corridors) were assessed by use of a three-stage framework comprising generalised cost analysis, discrete-choice modelling, and Monte Carlo simulation.

The results indicate substantial long-term market potential. Passenger demand on five selected roundtrip corridors with the potential for early adoption is predicted to increase from 55,400 annual trips in the initial deployment phase to more than 669,000 annual trips over a 15-year horizon, assuming full uptake on the corridors from the first year. The market value of the full 1,789 corridors deemed suitable for AAM services is predicted to have an upper limit of growth from A$327 million to A$2.96 billion. A more realistic scenario based on uptake on the 200 corridors with the greatest potential market value is projected to have a total market value that grows from A$155 million to A$1.40 billion over 15 years. The analysis shows that significant travel-time savings can be achieved, particularly on regional corridors with poor surface-transport connectivity.

The findings suggest that the commercial success of AAM services in Victoria will depend less on vehicle performance and more on airspace integration, infrastructure deployment, operating costs, and regulatory evolution. The analysis identifies emerging regional and metropolitan demand clusters that have implications for future low-altitude airspace management, vertiport and drone-port planning, uncrewed traffic management systems, and integration with conventional aviation. The results provide an evidence base for policymakers, regulators, and industry stakeholders seeking to support the safe and efficient introduction of modern forms of aviation technology within a shared-airspace environment.

Keywords: Advanced Air Mobility; shared airspace; eVTOL; airspace integration; market analysis

1. Introduction

The aviation sector is undergoing a significant technological transition as governments and industry seek pathways toward lower-emission systems while promoting connectivity and mobility. Advanced Air Mobility (AAM), typically relying on electric vertical take-off and landing (eVTOL) aircraft, has emerged as a promising approach for addressing the short- to medium-distance passenger-transport markets. Zero-Emission Aviation Technology (ZEAT) offers the potential to reduce travel times, improve access to underserved regions, and support national de-carbonisation objectives, as well as create new forms and volumes of aviation activity within increasingly complex airspace.

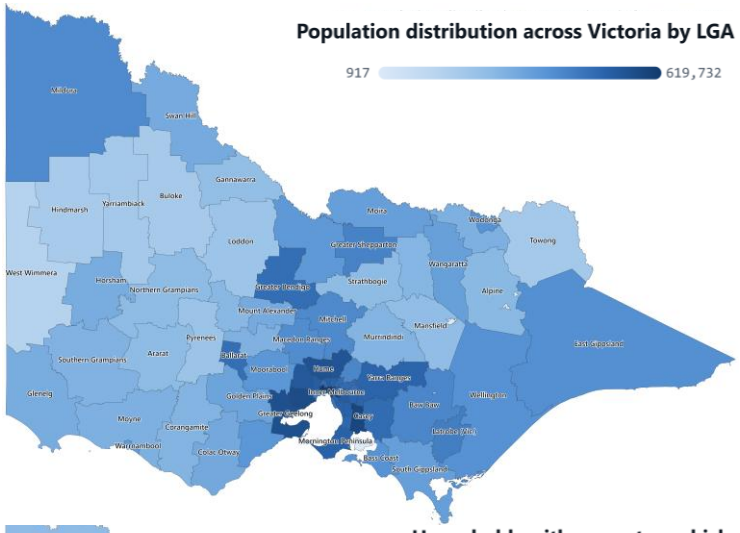
Considerable attention has been devoted to aircraft technologies, propulsion systems, and certification pathways; however, the ultimate success of the new aviation technologies will depend on the existence of sustainable markets capable of supporting regular operations. Understanding where demand exists, the scale of that demand, and the characteristics of likely users is therefore critical for informing investment decisions, infrastructure planning, regulatory development, and airspace-management strategies. This need is especially prevalent in Australia, where large travel distances,

dispersed populations, and uneven transport accessibility create conditions that may favour emerging aviation services. Australia may also benefit to a greater extent than other parts of the world from the new technologies because of its unique characteristics.

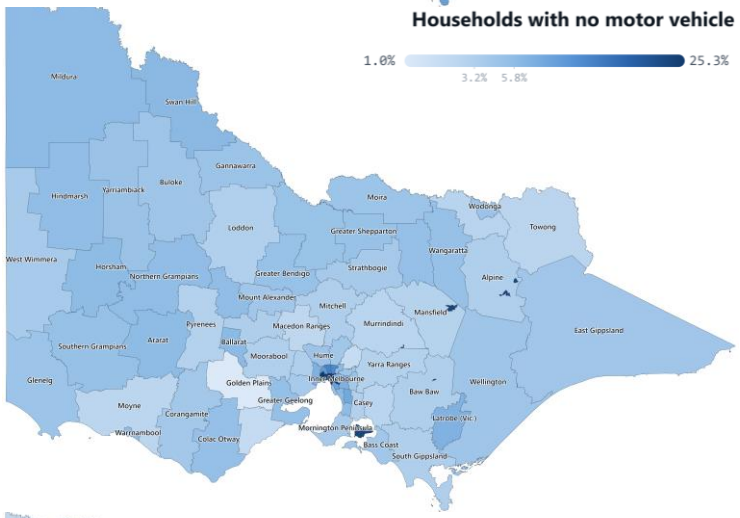
1.1 Case Study: Victoria, Australia

Victoria provides an important case study for examining these opportunities. The need for AAM in Victoria is supported by the data shown in Figure 1, which illustrates the population density of the state by Local Government Area (LGA), the distribution of car-less households, and the high concentration of public-transportation use for commuting to work near Victoria's largest city, Melbourne.

(a)



(b)



(c)

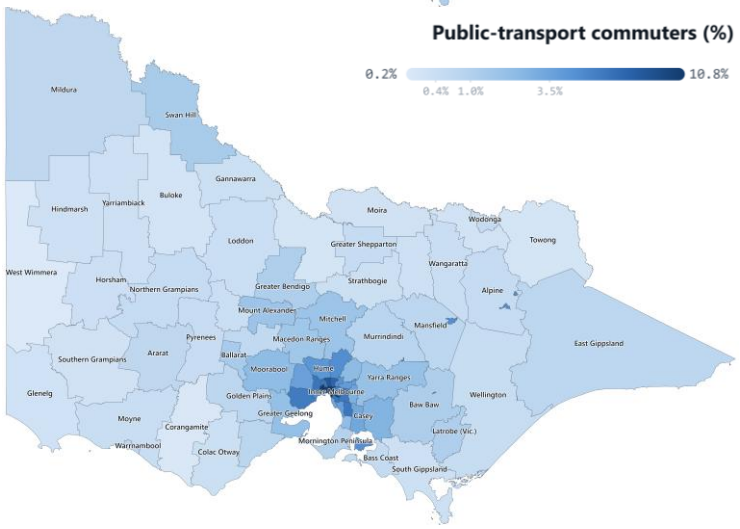


Figure 1 – (a) Population distribution by Victorian LGA [1] and proportions of (b) car-less households and (c) households relying on public transportation to commute to work.

The state contains a mix of metropolitan, suburban, and regional communities linked by transport networks that vary considerably in quality and accessibility. Many regional corridors are characterised by long travel times, limited public-transport options, and increasing pressures associated with population growth and economic development. These conditions have led policymakers and industry stakeholders to consider whether AAM services could complement existing transport systems by providing a faster and more responsive passenger-mobility network.

Mobility data for 2024 [2], as represented by movements of personal electronic device (e.g., phones), across all Victorian LGAs are displayed in Figure 2. The data highlight likely routes for future AAM services, several of which (the overlaid corridors) are targeted for further analysis.

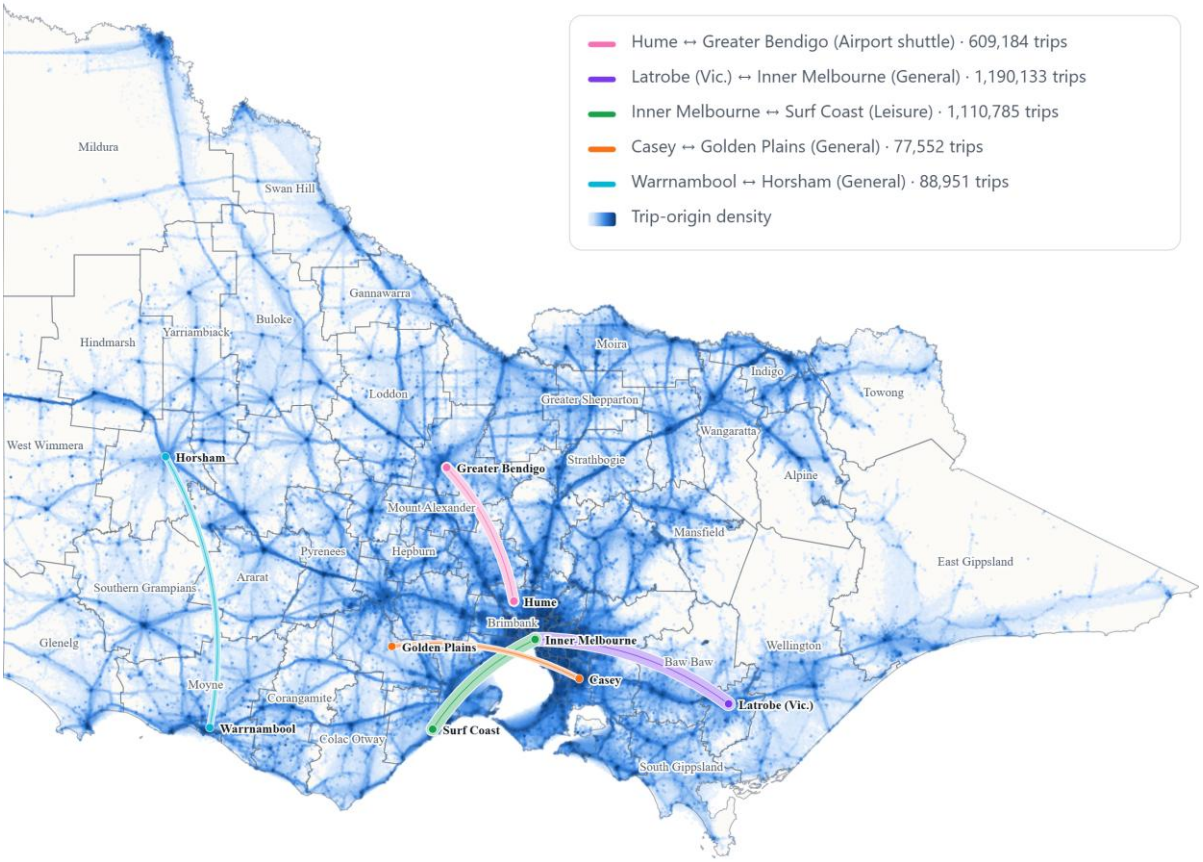


Figure 2 – Surface mobility across all Victorian LGAs, where the width of each line represents the frequency of movement and the overlaid coloured corridors have been selected for detailed analysis.

The introduction of AAM raises important questions regarding future low-altitude airspace operations. Unlike conventional aviation, which is largely concentrated around airports and in established air routes, AAM operations are expected to involve a combination of major and regional airports, vertiports, logistics hubs, and urban activity centres. The resulting traffic patterns will require the integration of existing crewed aviation, uncrewed aircraft operations (a related industry growth area), and future digital traffic-management services. Consequently, understanding where demand is likely to emerge is necessary for understanding how future users will share airspace safely and efficiently.

This paper presents the analytical methodology and the results of a statewide market assessment of passenger opportunities for AAM services in Victoria. Using the large-scale mobility dataset, a sample of which is shown in Figure 2, nearly 3,578 passenger corridors (equating to 1,789 roundtrip corridors) were evaluated through a modelling framework combining corridor screening, generalised-cost analysis, and discrete-choice modelling. Monte Carlo simulation was also performed to assess uncertainty and validate the results. The analysis provides estimates of potential mode shift from surface transport, identifies representative passenger markets, and evaluates their economic value.

The findings demonstrate that substantial market opportunities exist, particularly where surface-transport alternatives are slow, indirect, or expensive. Assuming all routes are exploited fully and immediately, passenger demand across the 3,578 corridors would increase from 2.66 million annual one-way trips during early deployment to 32.0 million over a 15-year horizon.

1.2 Implications for Policy Makers, Regulators, and Infrastructure Investment

Beyond estimating market size, this paper examines the implications of these findings for future shared-airspace operations. The geographic distribution of demand highlights emerging activity clusters around Melbourne Airport, the Latrobe Valley (east of Melbourne), major tourism destinations, and key regional corridors. These patterns provide insights into future infrastructure requirements, vertiport-development strategies, traffic-management systems, and regulatory priorities that will be necessary to support the safe integration of new airspace users into Victoria's aviation ecosystem.

2. Methodology

2.1 Analytical Framework

The objective of this study was to estimate the market potential of AAM services in Victoria and to evaluate the implications of the projected demand for future aviation operations. The analysis employed a three-stage modelling framework comprising corridor identification, mode-choice analysis relying on discrete-choice modelling via a binary logit model, and long-term market forecasting based on expected gross domestic product (GDP) growth estimates, as illustrated in Figure 3. The inputs to the model are travel time and speed for AAM aircraft, fixed and operating costs for AAM services, origin–destination (OD) flows, and the value of travel-time saving (VTTS) for passengers.

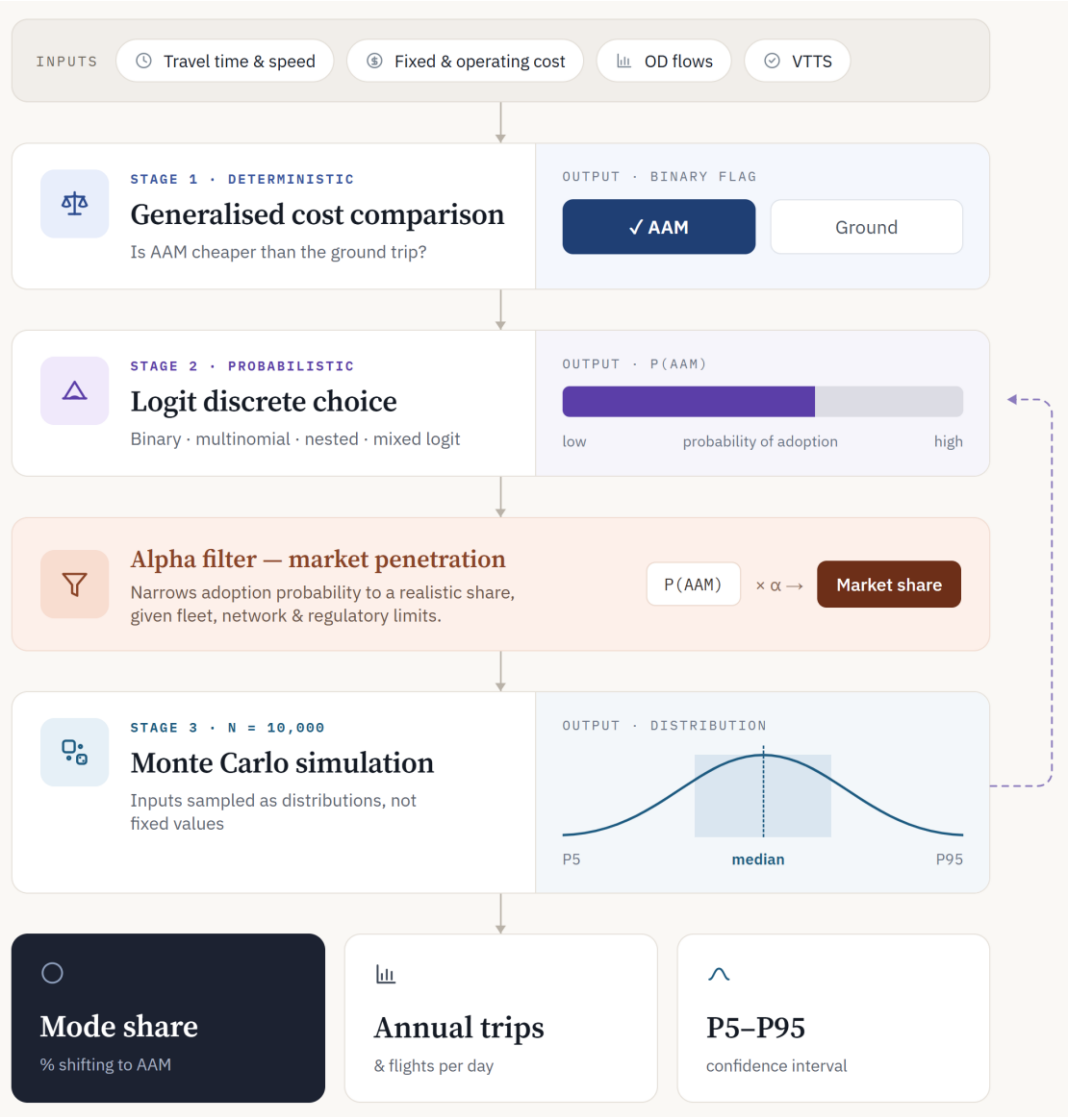


Figure 3 – Three-stage modelling framework.

The assessment was undertaken at the LGA level across Victoria. Passenger demand was derived from multiple years of the large-scale mobility dataset illustrated in Figure 2. The resulting framework enabled the identification of corridors where emerging aviation services could provide advantages over existing surface-transport options.

2.2 Corridor Identification

Passenger analysis commenced with a statewide assessment of inter-LGA travel demand. More than 4,500 passenger corridors were identified from observed mobility patterns, of which 3,578 one-way (1,789 roundtrip) corridors met the minimum suitability criteria. A multi-criteria screening process was then applied, incorporating:

- Existing travel demand
- Socio-economic capacity
- Surface-transport inefficiency
- Likelihood of road congestion
- Potential travel-time savings
- Regional accessibility and remoteness.

A distance-based filter was then applied, restricting the analysis to corridors within the assumed operating range of future AAM aircraft (70–300 km). This process produced a shortlist of representative candidate corridors spanning airport access, regional connectivity, tourism, and regional-to-regional travel markets.

The lower bound of 70 km reflects the project's focus on corridors where existing surface travel times exceed one hour by car because, below this threshold, the time savings offered by AAM are unlikely to justify the fare premium or the access/egress overhead associated with vertiport transfers. The 300 km upper bound is informed by the current literature, which considers near-term battery limits. Published aircraft specifications from Joby [3] and Lilium [4] [5] claim operational ranges of 250 km, while Australian start-up AMSL Aero claims 1000 km [6] and the CASA RPAS/AAM Roadmap [7] identifies an 80–400 km envelope for anticipated Australian operations. The 300 km limit used here accounts for the regulatory requirement to retain sufficient battery reserves for emergency diversion, which effectively reduces the usable range below the nominal maximum. This range is also consistent with Jang et al. [8], who scope their stated-preference experiment to 100–300 km, and falls within the broader bands reported in the literature [9] [10] [11] [12] [13] [14] [15]. The same sources were used to identify the expected AAM cruise speed of 200 km/hr and the number of passengers per flight used in the analysis, which varied from one to six, with a mean of 2.5.

2.3 Mode-Choice Modelling

Adoption of AAM services was estimated by use of a three-stage mode-choice framework consisting of a generalised cost analysis, discrete-choice modelling, and an uncertainty analysis. The framework is outlined here and will be detailed in full in future publications.

2.3.1 Generalised Cost Analysis

In the first stage, corridors where AAM could deliver measurable advantages over road or rail transport were identified. The relative competitiveness of AAM services was compared with existing transport alternatives. For passenger travel, generalised cost incorporated:

- Monetary travel cost for ground transport and projections of AAM fares
- Travel time
- Access and processing time
- Value of travel-time savings.

Travel cost for ground transport varied based on corridor type. For most corridors, the cost of fuel for a typical car (A$0.40/km) and the cost of parking at the destination (A$40/day for central business district (CBD), A$5 for metropolitan, and $0 for regional destinations) were used. For the airport-shuttle corridor discussed below (termed Hume↔Bendigo), pricing for Uber Black was used; while for international visitors travelling from Melbourne to the Surf Coast (the Great Ocean Road, a major Victoria tourist destination), the cost of car hire and fuel was used.

Figure 4 shows the evolution of AAM fares under different scenarios. The starting fare of A$0.88/km reflects a benchmark [16] relying on an Australian stated-preference design across urban, suburban, and regional contexts and confirmed by [12] and [17]. The base case applies a 2% annual decline, which is conservative and comparable to general-aviation cost trends. Faster decline rates of 3%/yr and 5%/yr would require more rapid technology breakthroughs in battery density and manufacturing

scale. A fare floor of A$0.55/km is assumed, consistent with the confirmed mid-term base case. A zero-decline scenario in which costs remain fixed is included as a pessimistic bound, though this is unlikely given historical technology cost curves [18] [19].

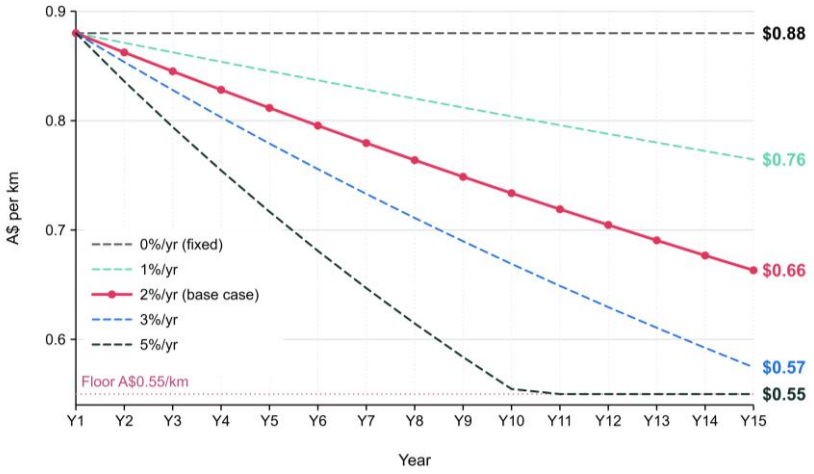


Figure 4 – Evolution of AAM fare (AUD/km/passenger) under different price-decline scenarios.

Figure 5 illustrates the end-to-end AAM journey profile for general and airport-originating corridors, broken down by stage. For general corridors, the total groundside overhead is expected to be 45 min. For airport corridors, the overhead is substantially reduced. Processing is not modelled as a separate stage because passengers will have completed security and check-in procedures as part of the airport-departure process. Access time is reduced to 5 min on the assumption that the vertiport is located with or immediately adjacent to the airport-terminal exit.

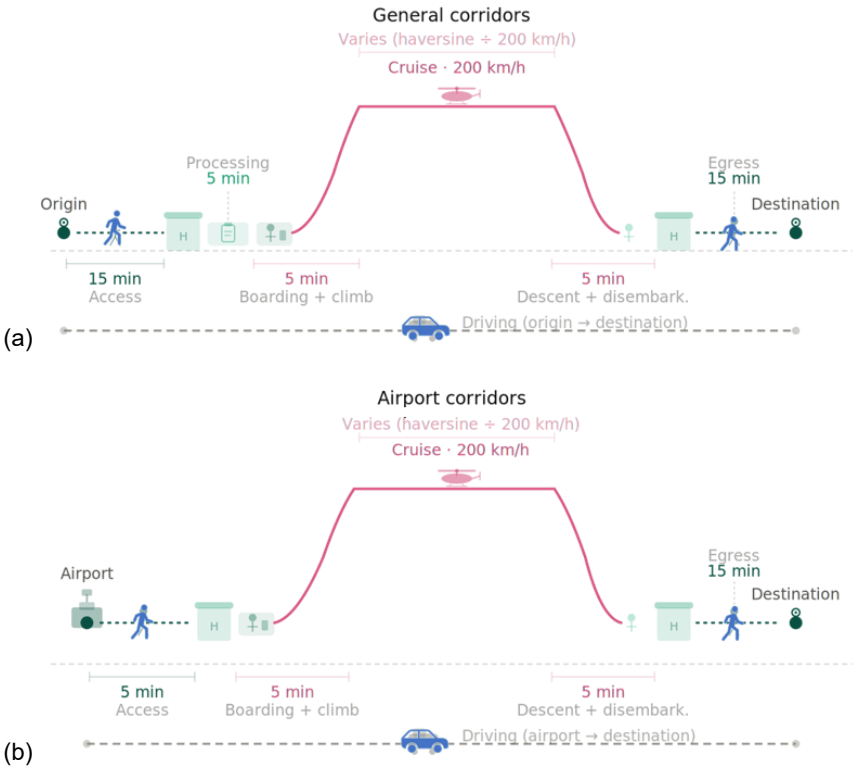


Figure 5 – Travel-time models for driving and AAM transport for (a) general (non-airport) and (b) airport corridors.

The remaining stages (i.e., boarding, climb, cruise, descent, and disembarkation) are identical for the two corridor types, giving a groundside overhead of 30 min. The dashed grey line at the base of each profile represents the competing ground-transport alternative, which operates point-to-point with no process overhead. The time saving that AAM must deliver relative to this baseline, net of its own groundside overhead, is what drives mode share in the model.

2.3.2 Binary Logit Model

A binary logit model [20] was applied to estimate the probability that passengers would select an AAM service rather than existing ground-based alternatives. The model incorporated:

- Relative travel costs
- Travel-time differences
- Behavioural sensitivity parameters
- Adoption resistance associated with emerging technologies.

The logit framework recognises that travellers do not always select the lowest-cost alternative and instead estimates the probability of adoption based on the totality of factors.

2.4 Uncertainty Analysis

To examine the uncertainty in future AAM development, Monte Carlo simulation was employed for several selected corridors. Key variables represented as probability distributions included:

- AAM fares
- Operating costs of AAM
- Behavioural parameters
- Market-penetration rates
- Service-availability assumptions.

A total of 10,000 simulation runs were undertaken to generate demand ranges and long-term market trajectories. This approach allowed an assessment of uncertainty surrounding future adoption while identifying the parameters that most strongly influence market performance.

2.5 Market Forecasting

Passenger forecasts were developed over a 15-year horizon, with demand projections incorporating:

- Population and travel growth
- Fare evolution
- Increasing public awareness and market acceptance
- Declining technology costs.

Demand forecasts were subsequently integrated with macroeconomic (GDP) projections to estimate future market value and identify potential deployment pathways for AAM services across Victoria.

3. Results

3.1 Passenger-Market Potential

The statewide passenger assessment evaluated 4,565 one-way corridors across OD pairs in Victoria, of which 3,578 satisfied the suitability criteria of exceeding either 70 km travel distance or one hour of travel time by road. Localis [2] recorded 103 million trips collectively on those corridors in 2024. Because Localis sampled movements on the corridors, rather than collecting exhaustive records, a correction specific to each corridor was applied to estimate the total number of passenger trips on the corridor. The total number of passenger trips on the 3,578 one-way corridors was estimated at 475 million, demonstrating a substantial addressable market for AAM services.

Analysis of five selected passenger corridors indicates that AAM adoption is strongly influenced by the interaction between travel-time savings and cost. While all investigated corridors demonstrated meaningful travel-time reductions, the highest adoption probabilities occurred where AAM services also delivered a cost advantage over existing travel options. Airport-access services and tourism-travel markets were therefore among the strongest candidates for early AAM adoption.

Figure 6 shows the probabilities of AAM-travel selection for the routes highlighted in Figure 2, where the single leisure corridor is separated into domestic and international markets. The probability of a mode switch (i.e., a passenger's choosing AAM over ground transport, the nature of which varies depending on corridor) is plotted as a function of a utility-function difference that captures three factors: the inherent reluctance of people to use a novel transport mode, the time difference between the two modes, and the cost difference. Detailed analyses of several of the corridors are described in the following sections, along with their projected market values and capacities.

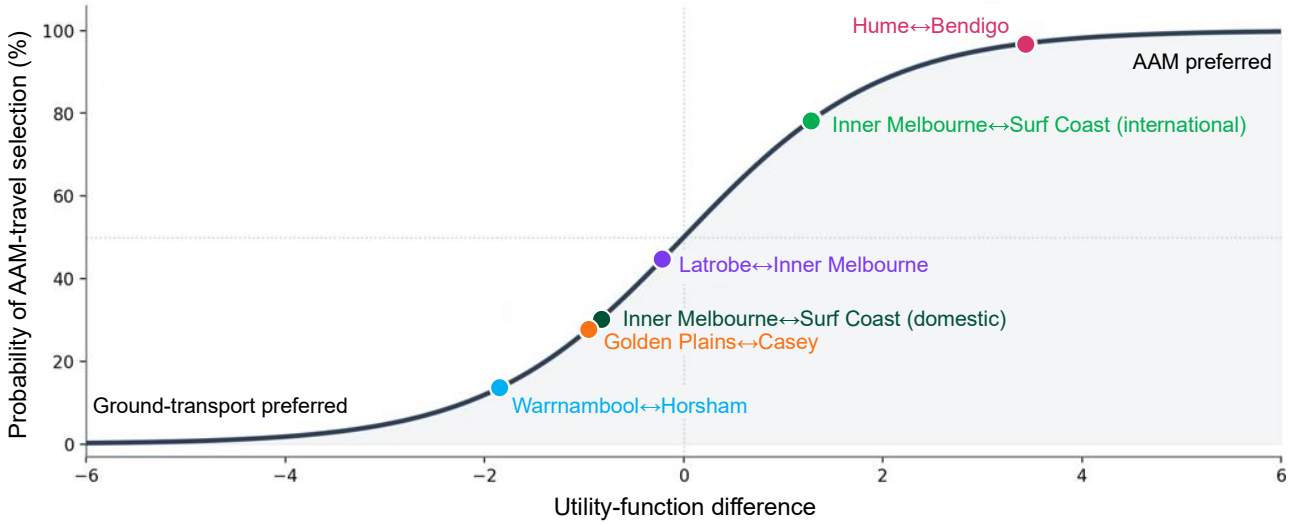


Figure 6 – Logit 'S-curve' describing the probability of a decision to switch from ground transport to AAM service as a function of a utility-function difference (i.e., the difference between the utility function for AAM travel and the competing ground-transport mode: private car plus fuel and parking, ride share, or rental car plus fuel, depending on corridor and traveller type).

Table 1 presents findings for the five selected roundtrip corridors for which detailed analyses were conducted. The mode-choice model gave a projected total initial passenger demand of 55,400 one-way trips (27,700 roundtrips) per year for the portfolio, assuming all passengers desiring AAM service were able to obtain it and that passenger flows were equal on the legs of each corridor. The projected volume increased to 669,000 annual one-way trips by Year 15.

Table 1 – Predictions of total annual AAM trips, market value, and cost per trip for groups of corridors.

Roundtrip corridors	Analysis type	Annual one-way AAM trips (millions)		AAM market value (AUD millions)		Avg market share	Avg cost per trip (AUD)	
		Year 1	Year 15	Year 1	Year 15	All years	Year 1	Year 15
Five selected (Figure 2)	Detailed	0.0554	0.669	$4.94	$48.5	N/A	$89.2	$72.6
	Simplified	0.0705	0.787	$7.08	$64.0	2.2%	$100	$75.5
Top 5 by market value	Simplified	0.128	1.54	$16.1	$145	4.9%	$125	$94.3
Top 10 by market value	Simplified	0.210	2.53	$25.9	$234	7.9%	$123	$92.9
Top 20 by market value	Simplified	0.387	4.65	$41.2	$373	13%	$106	$80.1
Top 50 by market value	Simplified	0.654	7.86	$72.3	$654	22%	$111	$83.3
Top 100 by market value	Simplified	0.982	11.8	$107	$967	33%	$109	$81.9
Top 200 by market value	Simplified	1.36	16.4	$155	$1,400	47%	$114	$85.6
1,789 AAM-suitable	Simplified	2.66	32.0	$327	$2,960	100%	$123	$92.5

As shown in Table 1, a simplified mode-choice analysis relying on averages for the cost of ground transport and simplifying assumptions about the time required to use AAM services produced larger values for the five selected corridors: 70,500 one-way trips in Year 1 and 787,000 in Year 15. This analysis was also applied to the 1,789 roundtrip corridors deemed suitable for AAM services. As displayed in Table 1, the market value is predicted to have an upper limit of growth from A$327 million to A$2.96 billion over the 15-year horizon. Data for more realistic scenarios based on uptake on the corridors with the largest potential market value are provided as well. The top 200 corridors are projected to have a market value that grows from A$155 million to A$1.40 billion over 15 years. As indicated in Table 1, these values are about half of those for the 1,789 corridors considered suitable for AAM, indicating that the most valuable corridors will contribute overwhelmingly to the total market value and suggesting that commercialisation will occur in a much smaller number of corridors than the 1,789 that are potentially suitable in Victoria.

Monte Carlo simulations produced more conservative (i.e., lower) central estimates for the five corridors, but nonetheless served to validate the detailed analyses, given that the figures obtained by the latter method were encompassed by those from the former. As shown in Figure 7, the median forecast across the five selected corridors totalled 44,000 and 594,000 one-way trips in Years 1 and 15, respectively, values that are 20% and 11% lower than those obtained by use of the detailed deterministic analysis (shown in Table 1). The numbers of flights per day noted in Figure 7 were computed under the assumption that each flight will carry 2.5 passengers. The Monte Carlo findings suggest substantial growth under a wide range of future operating assumptions. Demand was found to be driven by declining fares, increasing market familiarity, expansion of service availability, and continued population and GDP growth. The analysis showed that significant travel-time savings can be achieved, particularly on regional corridors with poor surface-transport connectivity.

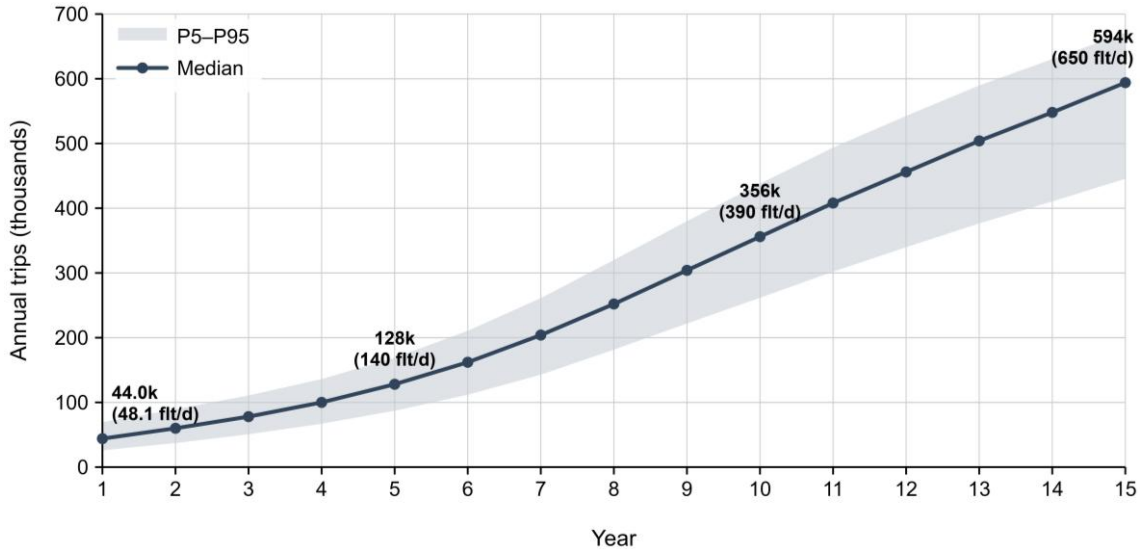


Figure 7 – Monte Carlo simulation results for AAM passenger demand on five selected corridors.

3.1.1 Airport Access: Hume↔Bendigo

As shown in Figure 6, the Hume (Melbourne Airport)↔Greater Bendigo corridor (termed Hume↔Bendigo for brevity) produced the highest AAM-adoption probability in the study. Hume LGA, where Melbourne Airport is located, is one of Victoria's largest and fastest-growing municipalities, while Greater Bendigo covers a large area and has a substantial population that is older and more economically disadvantaged than Hume. The model estimated an AAM choice probability of ~97%, primarily because the modelled AAM fares were substantially lower than comparable ride-share travel (at A$308), while simultaneously providing a travel-time advantage over the 71-km haversine distance. Although the absolute travel market was relatively small, the corridor represents an attractive first-mover opportunity due to its favourable economics and relative operational simplicity.

Figure 8 shows projections of the market value of passenger services on the Hume↔Bendigo corridor and AAM-service volume obtained from the detailed deterministic analysis of the corridor. The width of the demand interval reflects not demand-side uncertainty (which is minimal on this corridor) but rather macroeconomic uncertainty about the pace of economic growth across Victoria, confirming that the corridor's fortunes are tied more closely to the broader trajectory of regional-aviation demand than to AAM-specific parameters.

Several converging developments support near-term AAM deployment. Melbourne Airport's A$3 billion third runway, to be completed in 2031, will expand the catchment market; however, the planned Airport Rail Link will not serve the Bendigo corridor, reinforcing rather than competing with AAM. Bendigo Airport offers existing airside permissions, available land, and proximity to the CBD, while the City of Greater Bendigo Managed Growth Strategy [21] explicitly prioritises improved metropolitan connectivity. The corridor's flat terrain and favourable weather conditions generally support operations under visual flight rules. Combined with high mode-choice probability, low demand-side risk, and alignment with federal, state, and local policy priorities, the Hume↔Bendigo airport shuttle is the clearest candidate for first-mover AAM deployment in Victoria.

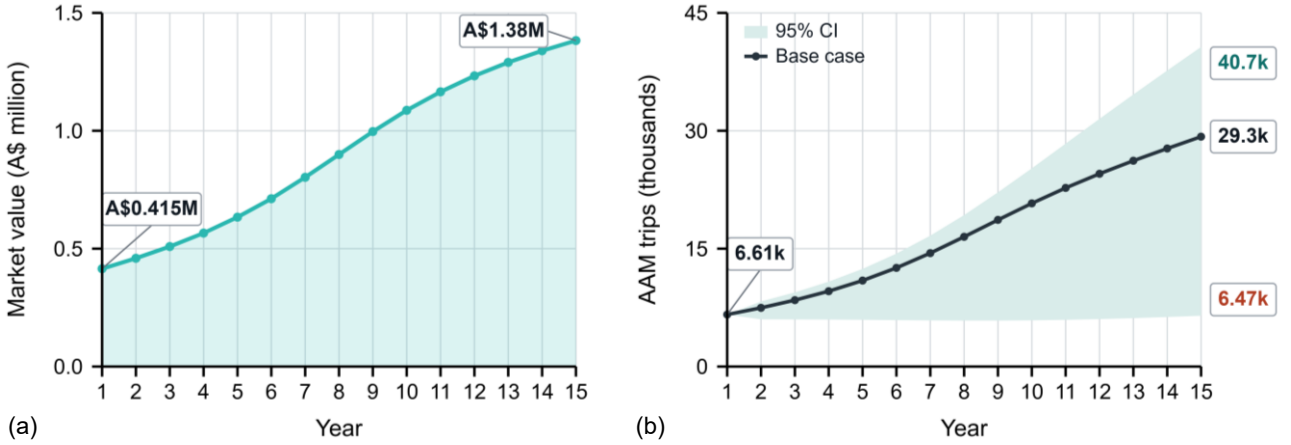


Figure 8 – (a) Market value and (b) GDP-linked forecast of AAM passenger service uptake on the Hume↔Bendigo airport corridor.

3.1.2 Tourism: Inner Melbourne↔Surf Coast

The Inner Melbourne↔Surf Coast corridor emerged as the largest tourism-related opportunity in Victoria. “Inner Melbourne” is an artificial entity derived by combining the several small LGAs comprising the city of Melbourne; while the Surf Coast, located west of Melbourne, attracts domestic and international visitors, with a sharp summer peak period. International visitors were projected to choose AAM services for the 77-km point-to-point journey (101 km by road) at higher rates than domestic travellers because AAM is projected to be competitive with vehicle rental plus fuel costs, while reducing journey time. A detailed analysis of this corridor indicated that combined demand is projected to increase from 28,600 one-way trips in Year 1 to 326,000 one-way trips in Year 15 (14,300 and 163,000 roundtrips, respectively), making tourism one of the largest contributors to future passenger demand across Victoria. The corresponding economic projections are provided in Figure 9(a), while Figure 9(b) illustrates the proportion of demand expected to comprise international visitors vs domestic travellers. The international market is expected to dominate the corridor, with transport congestion and seasonal access identified as key constraints on tourism potential and visitor growth expected to exceed infrastructure capacity [22].

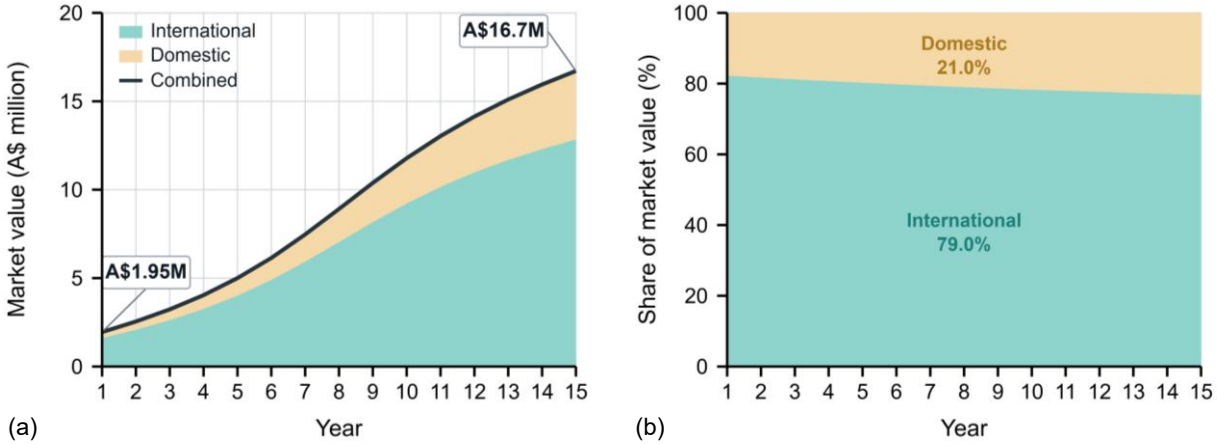


Figure 9 – (a) Market value and (b) segment composition of AAM passenger service on the Inner Melbourne↔Surf Coast corridor.

The corridor’s flat coastal terrain and proximity to Avalon Airport (a potential vertiport site between the two LGAs) provide operational advantages; however, its viability is more contingent on fare levels than the airport shuttle. At early commercial pricing levels, the domestic segment would generate negligible demand, and the cost advantage could narrow significantly for the international market.

3.1.3 Regional Connectivity: Latrobe↔Inner Melbourne

The 145-km Latrobe↔Inner Melbourne corridor generated the largest long-term market opportunity. Despite lower mode-choice probabilities for AAM uptake than airport-access services, the corridor

contains a substantially larger market, which leads to larger expected numbers of AAM trips and correspondingly greater market values. Annual AAM demand was predicted to increase from 17,700 to more than 267,000 one-way trips (8,860 and 134,000 roundtrips, respectively) over the forecast horizon; however, uptake of AAM services is heavily influenced by fare and macroeconomic conditions, making the confidence interval large. The projected market value and volume of AAM services are displayed in Figure 10. The results suggest that regional accessibility may ultimately drive a larger share of AAM demand in Victoria than premium airport-shuttle services.

The corridor delivers its primary benefit through time rather than cost savings. The computed 50 min reduction in journey time (89 min vs 138 min by car) is the largest of the three case studies, valued at A$58 per trip for business travellers and A$18 for non-business travellers. For Latrobe's 78,845 residents (the most disadvantaged population in the study [1]), AAM services would offer improved access to Melbourne's employment, healthcare, and education services at near cost-parity with driving, addressing the connectivity deficit that compounds regional disadvantage.

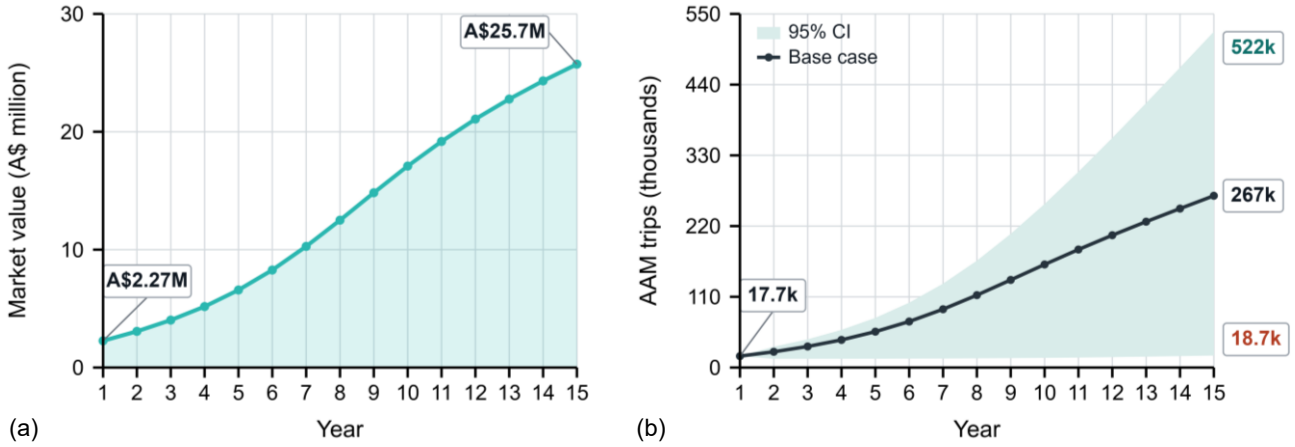


Figure 10 – (a) Market value and (b) GDP-linked forecast of AAM passenger service uptake on the Latrobe↔Inner Melbourne regional-connectivity corridor.

3.2 Productivity Benefits

The analysis identified significant productivity benefits associated with travel-time reduction. Across the passenger network, average time savings ranged from 73 to 80 min depending on corridor and time of day. The largest benefits were observed on regional corridors with poor surface-transport connectivity, where AAM could enable direct point-to-point travel while avoiding road congestion and indirect public-transport journeys. Travel-time savings across the Victorian corridor network are summarised in Figure 11.

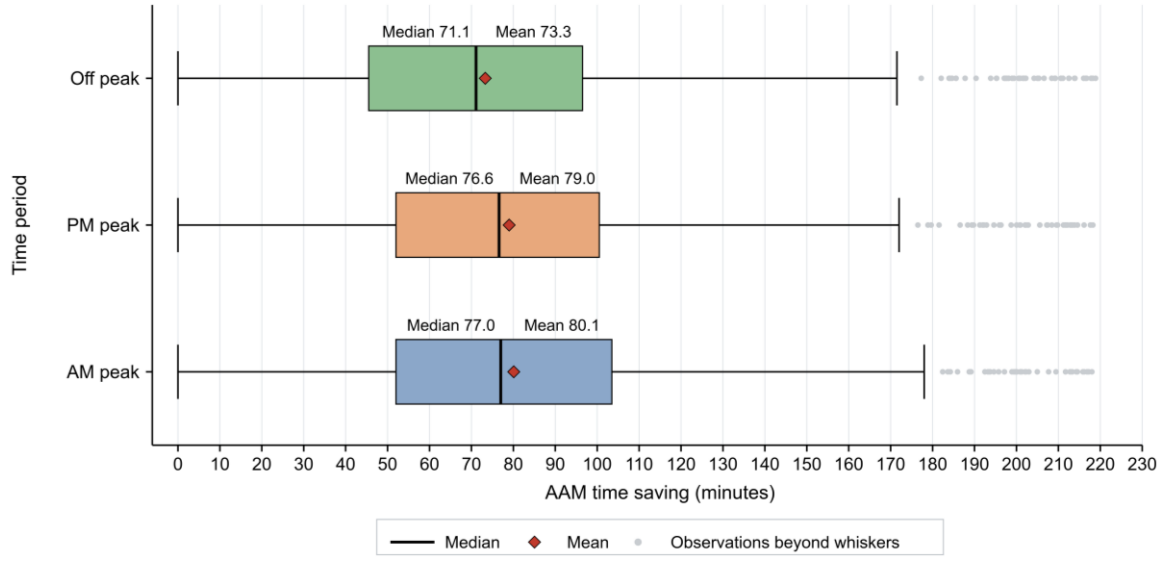


Figure 11 – Travel-time savings for AAM passengers across the Victorian corridor network, where the coloured bars span the middle 50% interval of the data (covering the second and third quartiles).

3.3 Key Findings

Two major findings emerge from the analysis:

1. Victoria contains a substantial passenger market capable of supporting future AAM operations, particularly for airport access, tourism, and regional connectivity.
2. The projected demand distribution reveals distinct geographic clusters around Melbourne Airport (Hume), the Latrobe Valley, and major tourism destinations. These emerging concentrations of activity have important implications for future low-altitude airspace utilisation for AAM, vertiport infrastructure planning, and traffic-management systems.

4. Discussion: Implications for Sharing the Air

4.1 From Market Potential to Airspace Demand

The results indicate that future AAM services in Victoria are unlikely to emerge uniformly across the state. Instead, demand is projected to be concentrated in a small number of corridors, including airport-access services, regional-connectivity markets, and tourism destinations. These emerging demand clusters provide an early indication of where future low-altitude aviation activity is most likely to occur and, consequently, where airspace-integration challenges are likely to arise first.

Several of the highest-value passenger corridors connect locations that already experience significant aviation activity. This is highlighted in Figure 12, which shows ground-transport corridors with either the greatest likelihood of early AAM adoption or the greatest potential long-term market value, as discussed above, and the locations of major and regional airports.

The Hume↔Bendigo corridor is closely associated with Melbourne Airport, while the Latrobe↔Inner Melbourne corridor aligns with one of Victoria's most strategically important regional-development corridors and potentially connects with Latrobe Regional Airport. Similarly, the Surf Coast tourism market connects a major metropolitan origin with one of Australia's most heavily visited regional destinations (the Great Ocean Road) and is advantaged by easy access to Avalon Airport. Rather than generating isolated operations, these markets would introduce new aircraft movements into airspace that is already shared by commercial aviation, general aviation, emergency-services aircraft, and (at <400 ft) small uncrewed aircraft systems (UAS) operated by the public, emergency services, and commercial entities in sectors such as real estate and agriculture.

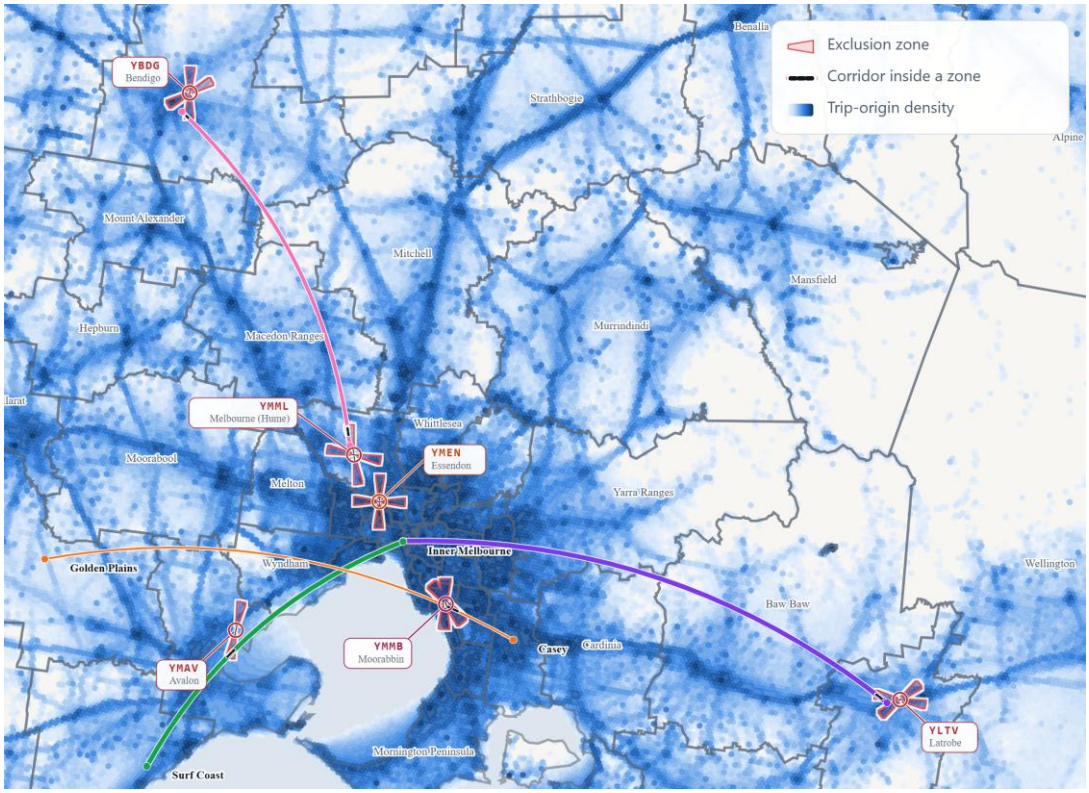


Figure 12 – Map of Victoria showing runways for the largest airports in the state, overlaid with potentially valuable AAM routes.

Figure 13 shows a region centred on the Melbourne CBD and several recorded tracks of emergency-services and tourist helicopter flights reported publicly [23] [24]. The data highlight the need for multiple airspace users to operate at low altitudes above the city and around the airports located close to Melbourne. The analysis suggests that market and airspace demand are intrinsically linked. As AAM services become commercially viable, passenger movements are likely to create concentrated aerial transport corridors that require coordinated management rather than *ad hoc* integration.

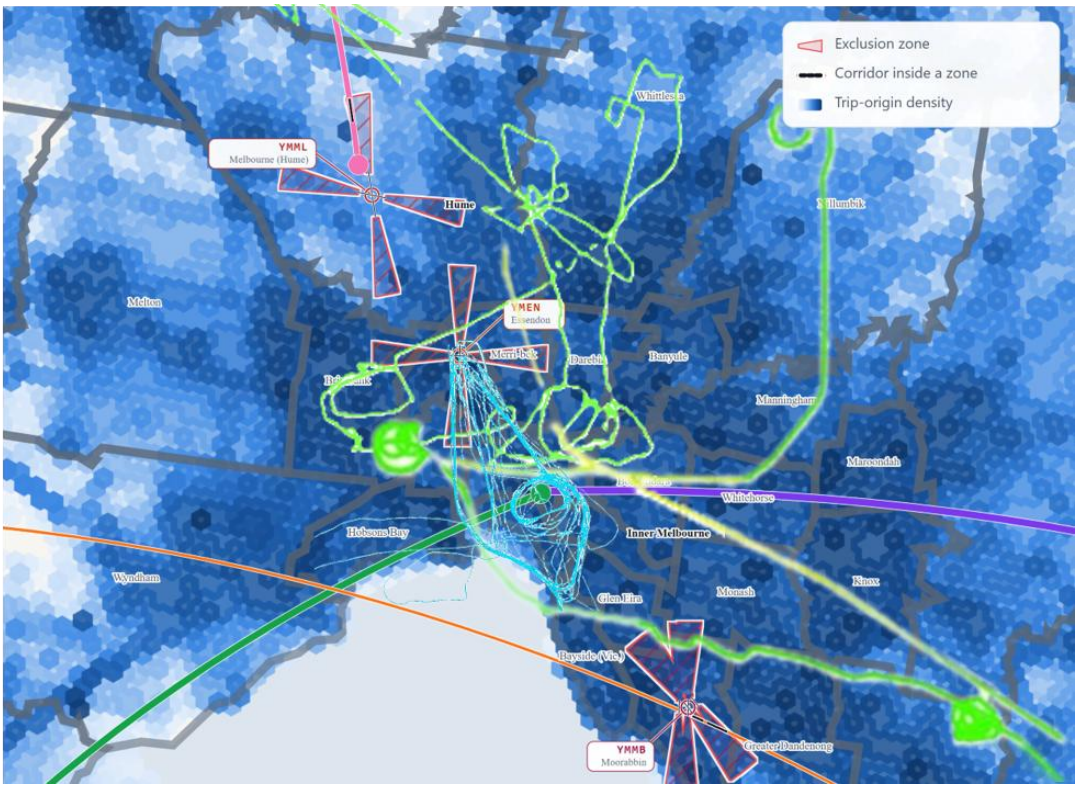


Figure 13 – Ground traffic near Melbourne's CBD, overlaid with airport runways, potentially valuable AAM routes, and publicly reported flight tracks of scenic and police helicopters.

4.2 Emerging Low-Altitude Aviation Networks

A significant finding of the study is that many of the strongest market opportunities occur on routes that are poorly served by existing transport systems (e.g., Hume↔Bendigo) but are within the operating range of electric aircraft expected to enter the marketplace within a decade. These corridors provide travel-time savings exceeding one hour and are distributed across regional Victoria.

The resulting network differs from traditional aviation. Conventional air transport is largely organised around airports and high-capacity routes, whereas AAM passenger operations may involve a dispersed system of vertiports, regional airports, and tourism destinations. This shift implies that future aviation activity may extend beyond traditional aviation infrastructure into locations that have historically experienced limited aircraft operations. Consequently, future airspace systems must support a mixture of conventional commercial and general aviation, emergency-service operations, passenger AAM services, cargo-drone operations, and other UAS.

This transition represents a shift from managing a relatively small number of high-value aircraft movements to managing a larger number of distributed operations at lower altitudes.

4.3 Infrastructure Implications

The market analysis highlights the importance of infrastructure availability as a driver of long-term AAM adoption. Sensitivity analysis demonstrated that market penetration and service availability have a substantially greater influence on service demand than marginal improvements in vehicle performance. From an infrastructure perspective, this suggests that future growth will depend largely on the development of vertiport networks, charging and energy (e.g., hydrogen) infrastructure, passenger-processing facilities, digital-communication systems, and regional-airport integration [25] [26].

The passenger-demand analysis indicates several candidate locations for early infrastructure deployment, including Melbourne Airport, Bendigo, Latrobe, and major tourism destinations. Rather than constructing entirely new aviation networks, many AAM services will benefit from integration with existing airports and logistics facilities, reducing both regulatory complexity and infrastructure costs while enabling staged deployment.

4.4 Digital Airspace Management

The forecast growth trajectories indicate that long-term demand cannot be accommodated through conventional air-traffic management approaches alone. By Year 15, passenger services on the 200 corridors with the highest market value would require 18,000 flights per day at an average occupancy of 2.5 passengers per flight.

Freight operations expected with cargo drones would further increase movement volumes. Although freight will likely remain smaller than passenger demand for the foreseeable future, medical logistics, perishable-freight distribution, and emergency-response operations may require higher operational priority and dynamic routing capabilities that will spur the adoption of new technologies.

These trends highlight the need for digital traffic-management capabilities capable of supporting:

- Real-time trajectory management
- Dynamic route allocation
- Automated separation services
- Airspace deconfliction
- Emergency prioritisation
- Integration with existing air-traffic management systems.

The findings are consistent with emerging international concepts such as uncrewed traffic management and other services that seek to enable safe drone operations in increasingly complex low-altitude environments [25] [26].

4.5 Policy and Regulatory Considerations

The modelling results suggest that technology readiness alone will not determine the success of AAM deployment. The most influential demand drivers identified in the analysis relate to factors that are strongly affected by government policy, regulation, and infrastructure investment [25] [27] [28].

The study highlights four priority areas:

1. **Airspace integration** frameworks capable of supporting crewed and uncrewed operations
2. **Vertiport planning** and land-use approvals in metropolitan and regional locations
3. **Digital traffic-management architectures** suitable for high-density, low-altitude operations
4. **Community acceptance** and social licence, particularly in areas experiencing increased aviation activity.

The results also suggest that airport-access and regional-connectivity services are likely to emerge before widespread urban air-taxi operations. This creates an opportunity for regulators and infrastructure providers to adopt a phased deployment strategy, allowing operational experience and public confidence to develop progressively as demand grows.

4.6 Strategic Implications for Victoria

In totality, the findings indicate that Victoria possesses a measurable and economically significant market for passenger services provided by AAM technology. The greatest challenge to creating this market is unlikely to be vehicle technologies. Instead, it will involve integrating AAM into an already complex aviation environment.

The market analysis identifies where future operations are most likely to occur, while simultaneously providing insight into the infrastructure, regulatory, and airspace-management requirements necessary to support them. In this sense, the forecast demand patterns represent more than a market opportunity. They provide an evidence base for anticipating how future aviation operators and users can share the air and for designing the systems needed to support safe, efficient, and scalable AAM operations across Victoria.

5. Conclusions

5.1 Econometric Outcomes

This paper has presented a statewide assessment of the potential market for AAM in Victoria, Australia, with an emphasis on the implications of future demand for shared airspace operations. Using large-scale passenger mobility datasets, the study combined corridor screening, generalised-cost modelling, discrete-choice analysis, and Monte Carlo simulation to identify locations where emerging AAM services may provide meaningful transport benefits and to draw out what that demand means for how the airspace above these corridors will need to be managed.

The results point to a substantial addressable market for passenger AAM services in Victoria: nearly 3,600 one-way passenger corridors satisfied the study's suitability criteria, currently representing 475 million annual ground trips. Across the five selected corridors for which detailed case studies were performed, passenger demand was forecast to rise from 55,400 annual one-way trips during the initial deployment phase to 669,000 annual trips over a 15-year horizon, if each corridor were exploited to meet the demand from passengers willing to switch to AAM services. That represents a market value of A$4.94 million initially to A$48.5 million after 15 years. The corresponding values obtained from a simplified analysis were 70,500 and 787,000 annual one-way trips in Years 1 and 15, respectively, valued at A$7.08 million and A$64.0 million.

The model also provided estimates showing that the statewide market value will grow from A$327 million to A$2.96 billion over the same period if all 1,789 eligible roundtrip corridors are fully exploited. When only the 200 most valuable roundtrip corridors were considered, annual passenger demand was projected to increase from 1.36 million to 16.4 million one-way trips, and the market value is projected to grow from A$155 million to A$1.40 billion. Notably, growth is projected to be broadly distributed across the network rather than concentrated on a handful of corridors, with the top 200 most valuable corridors representing 47% of the total market value of the eligible Victorian corridors.

The detailed analyses identified strong passenger opportunities in three distinct market segments: airport-access services, tourism-oriented travel, and regional connectivity. Airport-shuttle services demonstrated the highest mode-choice probabilities, while regional corridors such as Latrobe↔Inner Melbourne generated the largest long-term market potential due to their substantial demand pools and significant travel-time savings. The tourism market associated with Victoria’s Surf Coast also emerged as an important early-adoption opportunity.

The methodology described here is currently being applied to Australia as a whole to investigate the potential uptake of AAM for passenger services within other states and territories, as well as across borders. A similar methodology has also been applied to freight transport considering ZEAT in the form of electrically powered UAS.

5.2 Governance, Airspace Management, and Infrastructure Implications

Beyond market size, the findings have important implications for future airspace management. Demand is concentrated around identifiable geographic clusters, including the Melbourne Airport region (Hume LGA), the Latrobe Valley and Latrobe Regional Airport, and major tourism destinations. These locations, along with regional logistics hubs, where the growth of cargo-drone operations can also be anticipated, are likely to experience the earliest growth in low-altitude aviation activity and therefore represent priority areas for infrastructure planning, vertiport development, regulatory preparation, and traffic-management innovation.

Importantly, the analysis suggests that long-term success will depend less on incremental improvements in aircraft performance and more on the development of enabling systems. Market penetration, service availability, infrastructure deployment, and regulatory integration were shown to have a substantially greater influence on projected demand than operational parameters such as cruise speed. This suggests that coordinated investment in airspace governance, digital traffic-management systems, and supporting infrastructure will matter as much as advances in aircraft technology.

From the perspective of equitably and safely sharing airspace, the study demonstrates that market forecasting can provide an evidence base for anticipating future aviation activity and identifying where integration challenges are most likely to emerge. As passenger AAM services, traditional air-freight operations, general aviation, and UAS increasingly operate within the same airspace environment, demand-driven planning will be essential for ensuring safe, efficient, and scalable operations.

The projected growth of AAM activity in Victoria highlights the need for early development of integrated airspace-management frameworks supporting a diverse and expanding aviation ecosystem.

In summary, Victoria possesses a credible long-term market for passenger services relying on AAM. While significant technical, regulatory, and commercial challenges remain, forecast-demand patterns suggest that emerging aviation services can play a meaningful role in improving regional accessibility and supporting decarbonisation objectives. Equally importantly, they provide valuable insight into how future aviation users may need to share the airspace and how policymakers, regulators, and industry stakeholders can prepare for that future.

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7. Acknowledgments

This research is funded by the iMOVE CRC and supported by the Cooperative Research Centres program, an Australian Government initiative, as well as by the Commonwealth of Australia Department of Infrastructure, Regional Development, Transport, Communities, Sport, and the Arts, the State of Victoria Department of Jobs, Skills, Industry and Regions, and RDA Melbourne.

The authors also acknowledge the contributions of project partners who provided guidance throughout the project and assisted in refining the research objectives and methodological framework. The authors particularly appreciated suggestions by Prof Cees Bil on the manuscript.

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