6

Aviation Forecasts

6.1. Introduction

Passenger and aircraft movement forecasts fundamentally influence the development and timing of infrastructure. To ensure that planned development and infrastructure can adequately accommodate aviation growth, forecasts have been prepared for annual movements as well as for peak-period demand.

The timing of specific development is informed by comparing the forecast peak-period demand to the capacity of each infrastructure element (such as check-in, security screening and aircraft parking).

Modelling is undertaken for high, central and low-growth scenarios to ensure planning is adaptable to actual growth. The main assumptions that vary are those related to estimates of Gross Domestic Product (GDP) and airfares.

The forecasts considered in this Master Plan reflect the current knowledge of future aircraft technologies and economic predictions. The forecasts will be reviewed and reassessed throughout the Master Plan period; and AAL will provide updates on performance and trends to the Planning Coordination Forum to ensure key stakeholders remain informed.

Tourism Futures International (TFI), which specialises in aviation, tourism and travel forecasting, has prepared the long-term passenger and aircraft movement forecasts for Adelaide Airport.

6.2. Overview

Snapshot of Aviation Forecasts

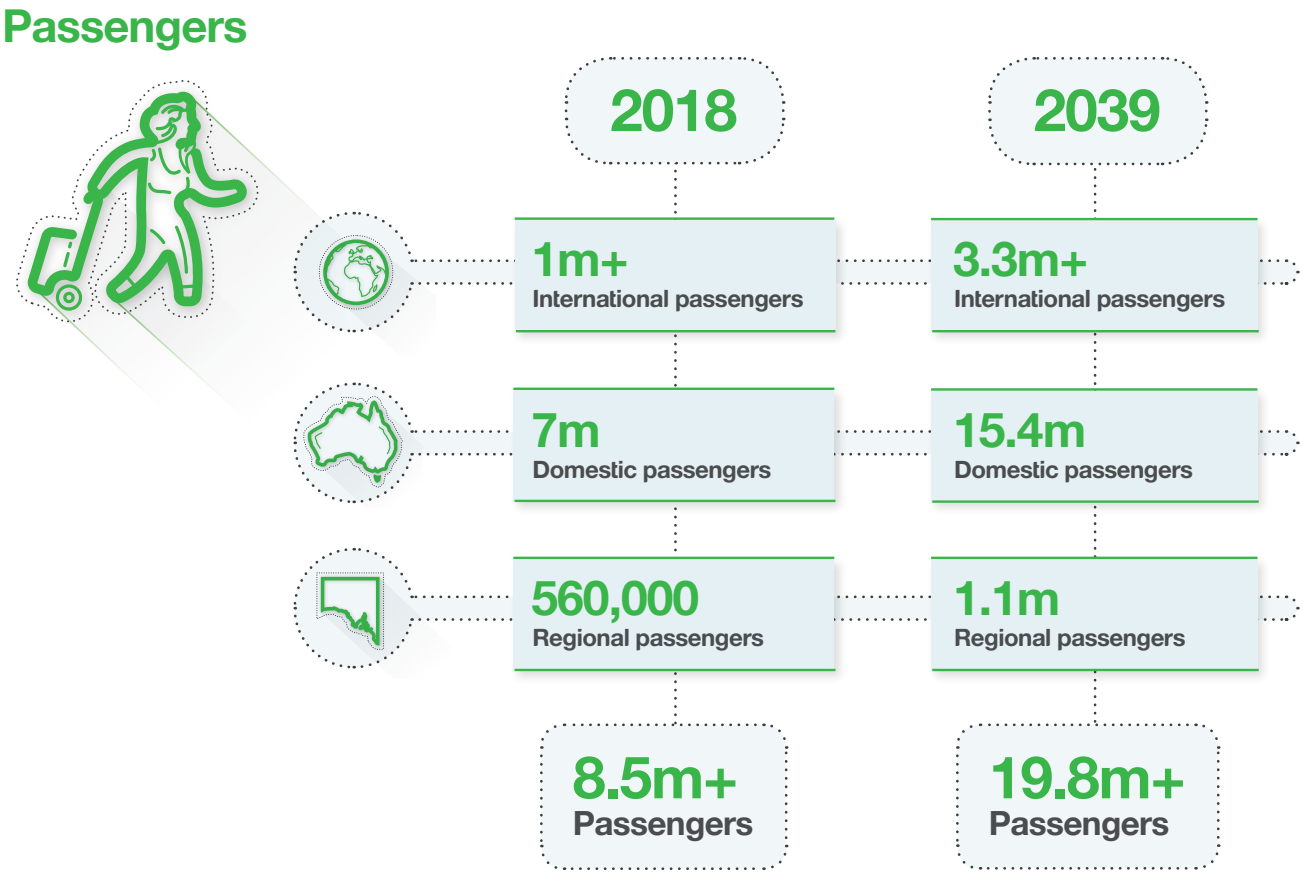
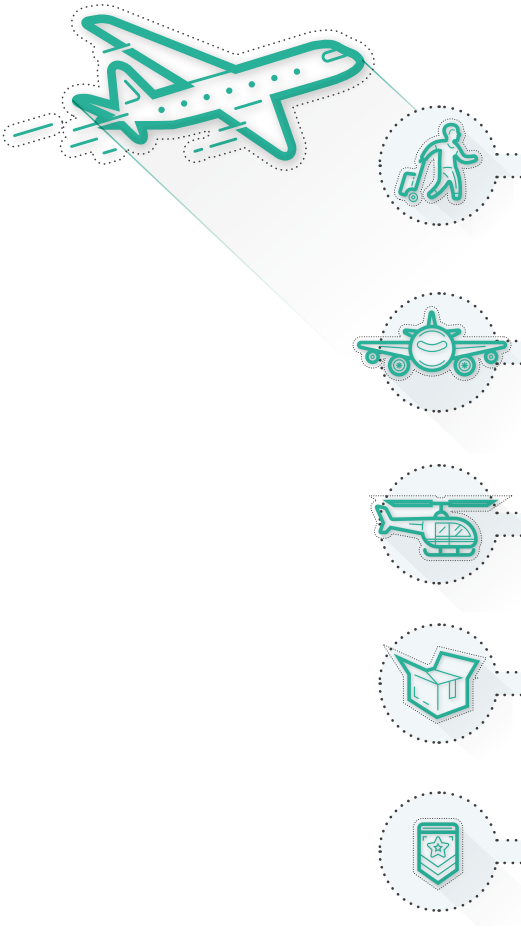


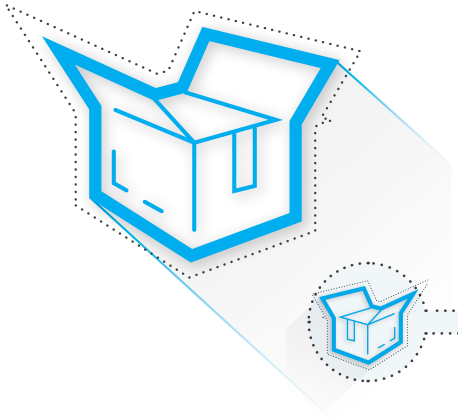
Figure 6-1: Snapshot of Aviation Forecasts

Aircraft Movements



	2018	2039
Passenger RPT Aircraft movements	80,968	142,300
General Aviation Aircraft movements	18,732	19,400
Helicopter Movements	4,586	4,800
Dedicated Freight Aircraft movements	1,326	1,600
Military Aircraft movements	463	500
Total aircraft movements	106,075	168,500

Freight



2018	2039
58,500 Tonnes of freight	146,000 Tonnes of freight

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6.3. Forecasting Approach

The aviation forecasting approach has used top-down econometric modelling to determine air passenger forecasts. Aircraft forecasts were prepared using the passenger forecasts and the average numbers of passengers per movement (a movement being a take-off or landing of an aircraft). Passengers per movement depend on aircraft type, passenger-load factors and seating density.

Many factors influence the growth of passenger movements at an airport. These include:

- Economic factors (such as the incomes of travellers or potential travellers, the price of air transport and ground component of travel and exchange rates)
- The competitiveness (quality, product attributes and price) of a destination compared to alternative destinations
- The supply of airline services (frequency, reliability and quality of service)
- Visitor promotion by governments, airlines and industry bodies
- Demographic factors such as population growth and composition, consumer tastes and available time for travel
- One-off factors and shocks: these include the travel impacts of events such as the Olympics, September 11, the collapse of an airline such as Ansett and health concerns

While all types of factors have an influence on demand, only some can be measured and factored into the type of modelling generally undertaken in forecasting.

Key drivers for international traffic include international economic and population growth, exchange rate movements, movements in travel costs and airline capacity developments.

For the domestic and regional markets, drivers include Australian and South Australian economic and population growth, mining developments, movements in domestic travel costs and airline capacity developments.

The forecasting approach is outlined in Table 6-1.

TASKS	COMPONENTS
Segmentation International, National and State/Local Drivers	• Global economic factors • Exchange rates • Oil prices • Regulatory factors • Market growth • Australian and State economic factors • Demographic factors • Airline capacities • Travel costs and fares • Infrastructure
Market Analysis	• Review of historical data and trends in passenger and aircraft movements • Review and analysis of current airline schedules, general aviation and business environments • Assumptions about future capacity, as well as identifying qualitative factors that may influence movements • Review of official tourism forecasts for Australia and internationally
Model Development	• Linking drivers of traffic which were identified for international and domestic travel: – Macro models linking drivers and traffic – Micro models based on extensive statistical analysis and published studies – Final model outcomes (iterative process) • Modelling of typical 'busy day' in 2039
Review Risks/ Sensitivities	• Review key drivers for international traffic (international economic and population growth, exchange rate movements, movements in travel costs and airline capacity developments) • Review domestic market drivers (Australian and South Australian economic and population growth, mining developments, movements in domestic travel costs and airline capacity developments)

Table 6-1: *Forecasting Approach*

Several data sources have been used as inputs into forecasting the number of international passengers and aircraft movements; and the number of domestic passengers and movements. These are described in Table 6-2.

Many factors that influence passenger growth are unpredictable. These include diverging views on the future direction and impact of factors such as interest rates, oil prices and population growth rates.

In response, the forecast model varies assumptions to produce upper and lower passenger estimates as well as a 'central' forecast. The 'central' forecast has been used to support the planning throughout this Master Plan 2019.

The main assumptions include:

- Economic forecasts for South Australia's Gross State Product (GSP), Australia's Gross Domestic Product (GDP) and the Organisation for Economic Co-operation and Development's (OECD) GDP
- Airline capacity
- Aviation industry supply inclusive of air services, pilots and airport capacity will not impede or limit growth in the long term
- Governments' policy responses to global warming will lead to an increase in fares of around 0.25 to 0.5 percentage points per year (in inflation-adjusted terms) but not to restrictions on travel
- Mining growth will continue in South Australia, supported by continued demand from China

CATEGORY	DATA SOURCES
International Passenger Forecasts and Movements	• Australian Bureau of Statistics (ABS) collection of overseas arrivals and departures – This information is provided by purpose of travel for each Australian gateway and was used to examine markets for visitor arrivals and destinations for Australian residents travelling overseas • Bureau of Infrastructure, Transport and Regional Economics (BITRE) publication of International Scheduled Air Transport – This information is based on data provided by international airlines. It includes aggregate airport passenger movements and city pair information • International Visitor Survey (IVS) which is compiled by Tourism Research Australia (TRA) – This survey of international visitors to Australia is used to identify characteristics of the visitor markets including those that visit Adelaide by port of arrival and departure
Domestic Passenger Forecasts and Movements	• BITRE publication of Australian Domestic Airline Activity – This information includes the passengers, aircraft movement and freight for the top routes. This data is published as traffic on-board by stages and includes all traffic on each flight stage between two directly connected airports; and thus, includes domestic transit passengers • BITRE publication of Air Transport Statistics: Airport Traffic Data – This information contains a time series of annual airport traffic data for Australian airports receiving more than 7,000 revenue passenger movements annually. This includes international, domestic and regional airline data • National Visitor Survey (NVS) compiled by TRA – This is a survey of Australian travelling within Australia and to overseas destinations. It details the demographic and other characteristics of Australian travellers

Table 6-2: *Data Sources to Predict Forecast Movements*

6.4. Recent Performance

From a global perspective, the evolution of low-cost carriers and technological advances has led to a reduction in real airfares, which has in turn stimulated air-traffic growth. The liberalisation of air rights has encouraged growth in air travel and improved tourism and trade ties between nations. Global demand for air travel over the next 20 years is forecast to double, with the biggest growth area being the Asia-Pacific region.

Airports globally are competing for next-generation aircraft, many of which are being delivered to growing airline markets in Asia and the Middle East.

Higher oil prices have in the past slowed aviation growth. However, increased fuel prices have led to aircraft manufacturers and airlines introducing more fuel-efficient aircraft which has also enabled more direct routes.

Since the privatisation of Adelaide Airport in 1998, the airport has experienced significant growth. Growth in global aviation – coupled with new facilities, and new airline routes – has contributed to passenger movements more than doubling over the past 20 years. Passengers have increased from almost 4.0 million in 1998 to 8.5 million in 2018.

Since the Master Plan 2014, further connections to markets in Asia and the Middle East have been introduced. They now account for almost 90 per cent of international flights (59 per cent and 28 per cent, respectively).

The main international passenger routes in 2018 were to/from the following regions:

- South East Asia accounting for 41 per cent of passengers: Singapore Airlines, Malaysia Airlines and Jetstar provide services to/from this region
- The Middle East accounting for 32 per cent of passengers: two airlines, Emirates and Qatar, provide services via the Middle East mainly for the Adelaide/Europe market
- North East Asia accounting for 17 per cent of passengers: Cathay Pacific and China Southern serve Hong Kong and China
- New Zealand and the Pacific accounting for 10 per cent of passengers: Air New Zealand and Fiji Airlines provide these services

Adelaide Airport has continued to experience strong growth since the approval of Master Plan 2014. In this time:

- International passengers have grown from 806,000 in 2013 to 1 million in 2018 (equating to a five-year Compound Annual Growth Rate (CAGR) of 5.0 per cent)
- Domestic passengers have grown from 6.1 million in 2013 to 6.9 million in 2018 (equating to a CAGR of 2.5 per cent)
- Regional passengers have decreased from 584,000 in 2013 to 563,000 in 2018 primarily due to the decline in mining activity and associated business development
- The number of aircraft movements has remained relatively constant, with the increase in passenger movements largely due to increased size and seating capacity of aircraft being used

Domestic and regional passengers have increased with a CAGR of 2.2 per cent since the last Master Plan. This lower than expected growth was due mainly to the end of the mining investment boom in Australia and the decline in regional traffic.

Passenger aircraft movements between 2008 and 2018 are shown in Figure 6-2. Historical aircraft movement data is shown in Figure 6-3.

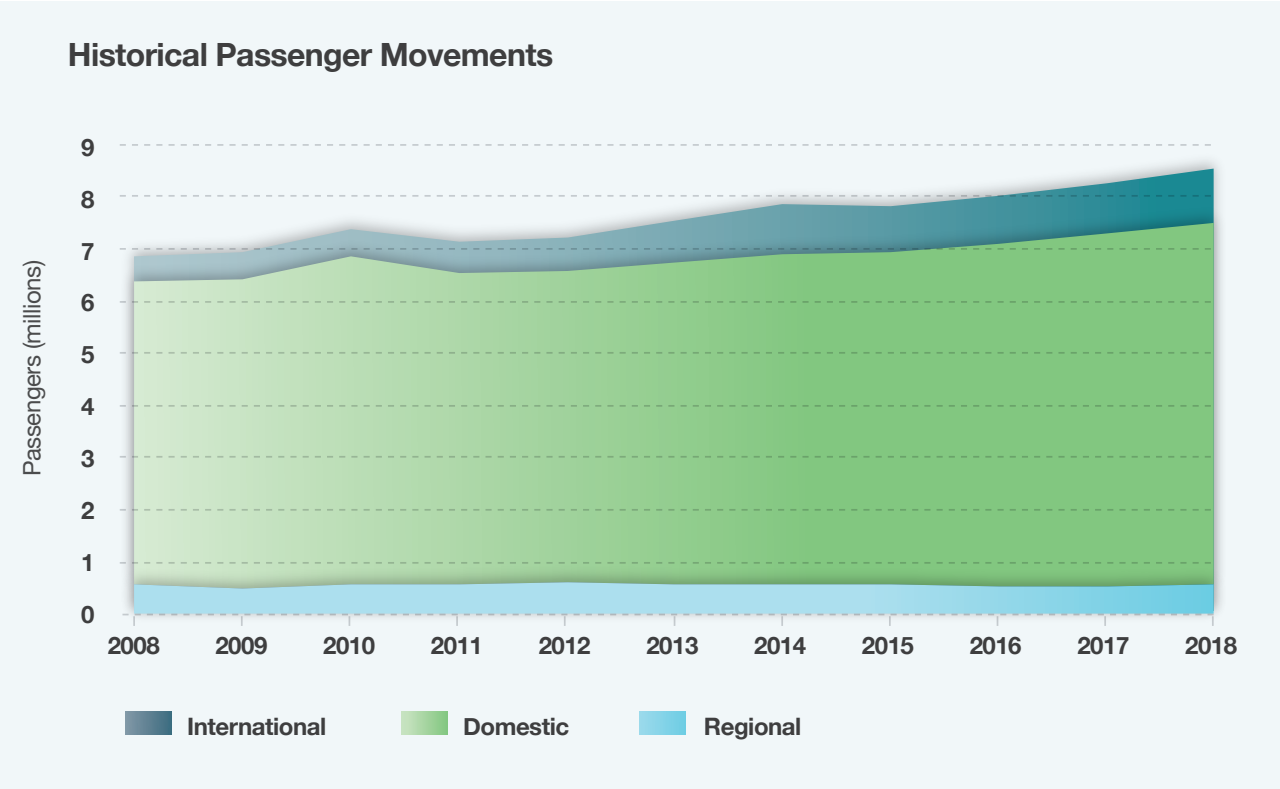


Figure 6-2: *Historical Passenger Movements 2008-2018*

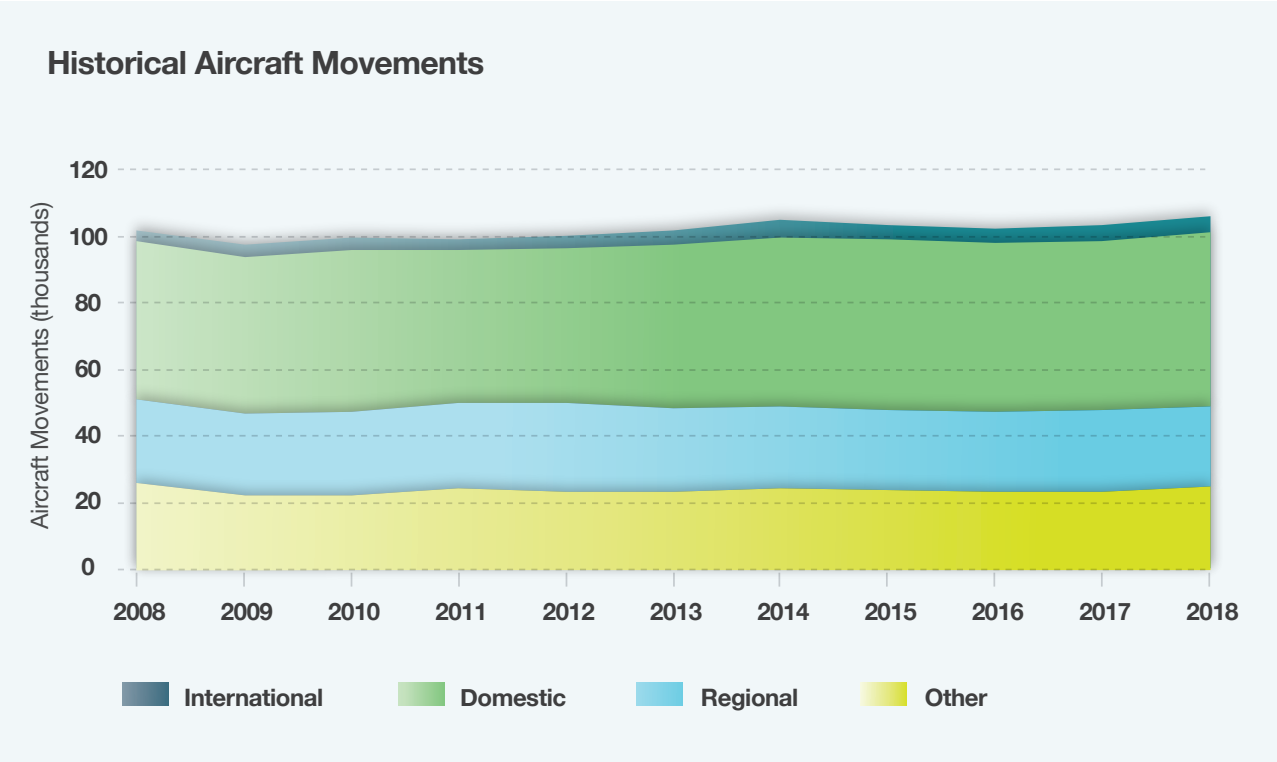
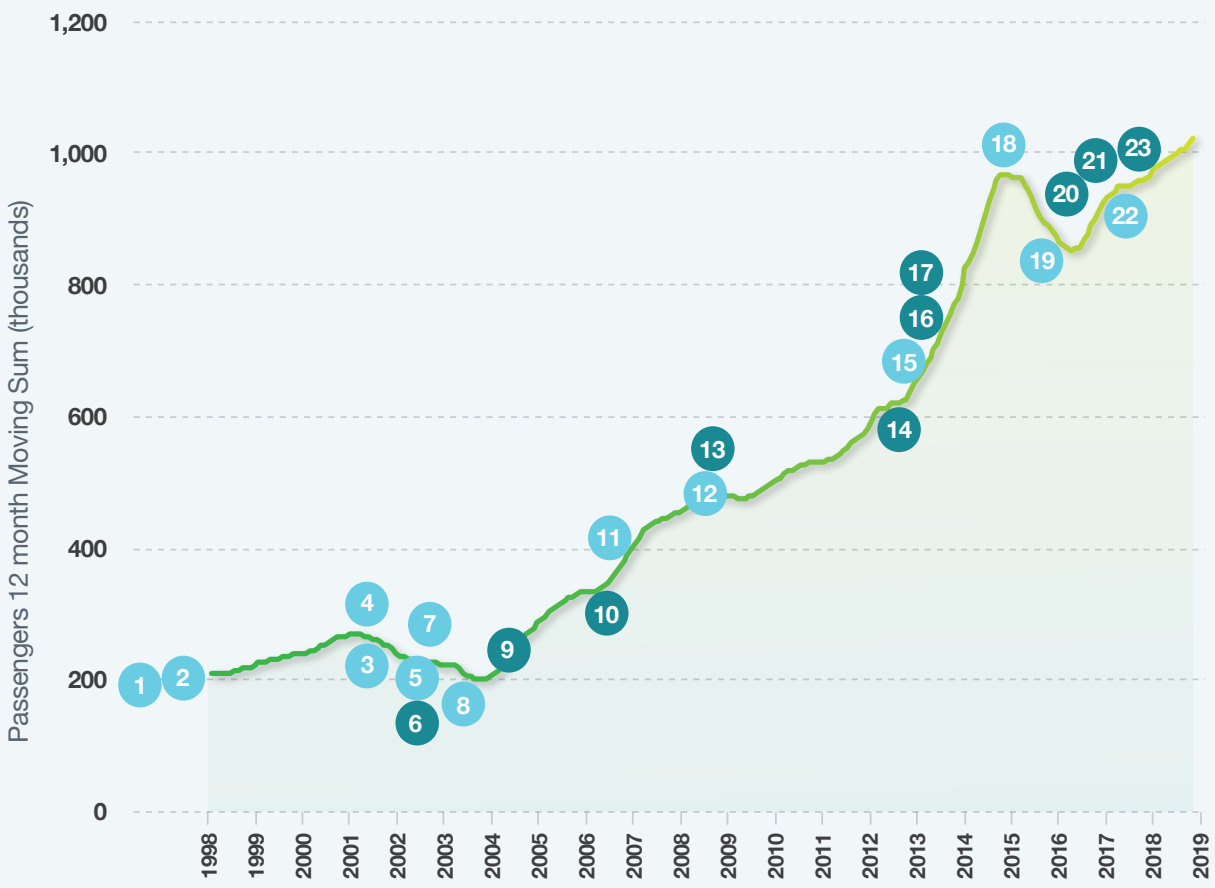


Figure 6-3: *Historical Aircraft Movements 2008-2018*

The growth in passenger numbers passing through Adelaide Airport is influenced by local and global changes.

The international market is relatively small, compared to the domestic market. It is therefore highly sensitive to airline decisions to add or remove services. Each additional daily international service adds between nine and 13 per cent of additional international passengers to Adelaide. Changes to several services have occurred in recent years, including the withdrawal of AirAsia X and a reduction in the frequency of Malaysia Airlines' services which resulted in a decline in international passenger movements during the financial years of 2015 and 2016. Since 2016, the entry of airlines such as Qatar, China Southern and Fiji Airways has boosted growth in passenger numbers, as these airlines open up new routes and connect more markets to Adelaide.

Growth Trend for International Passengers Since 1998



1. **1995:** British Airways Ceases Flights
2. **1997:** Thai Bhat Falls/Asian Financial Crisis
3. **2001:** Ansett in Administration
4. **2001:** September 11
5. **2002:** Ansett Ceases Operation
6. **2002:** Malaysia Airlines Entry
7. **2002:** Bali Bombings
8. **2003:** SARS Outbreak
9. **2004:** Garuda Introduces Bali Flights
10. **2006:** Air NZ Commences Auckland Flights
11. **2006:** Garuda Services Suspended
12. **2008:** Lehman Brothers Collapse: Global Financial Crisis
13. **2008:** Pacific Blue Commences Flights to Bali
14. **2012:** Emirates Commences Dubai Flights
15. **2013:** Qantas Withdrawal
16. **2013:** AirAsia X Commences Malaysia Services
17. **2013:** Jetstar International Commences
18. **2015:** AirAsia X Withdraws
19. **2015:** Malaysia Reduces Frequency
20. **2016:** Qatar Commences
21. **2016:** China Southern Commences
22. **2017:** Tigerair Withdraws from Bali
23. **2017:** Fiji AL Commences

Figure 6-4: *Growth Trend for International Passengers Since 1994*

For the domestic market, growth in passenger numbers has been spurred by the entry of Jetstar and Tigerair into the Adelaide domestic market. The slower growth in recent years has been caused by the end of the mining boom, a slowing State economy and limited growth in domestic airline capacity.

Figure 6-4 and Figure 6-5 show the growth trends for international and domestic passengers since 1998 and the impacts of various global and regional issues influencing passenger growth and highlights some of the unpredictable influences on both international and domestic passenger movements over time.

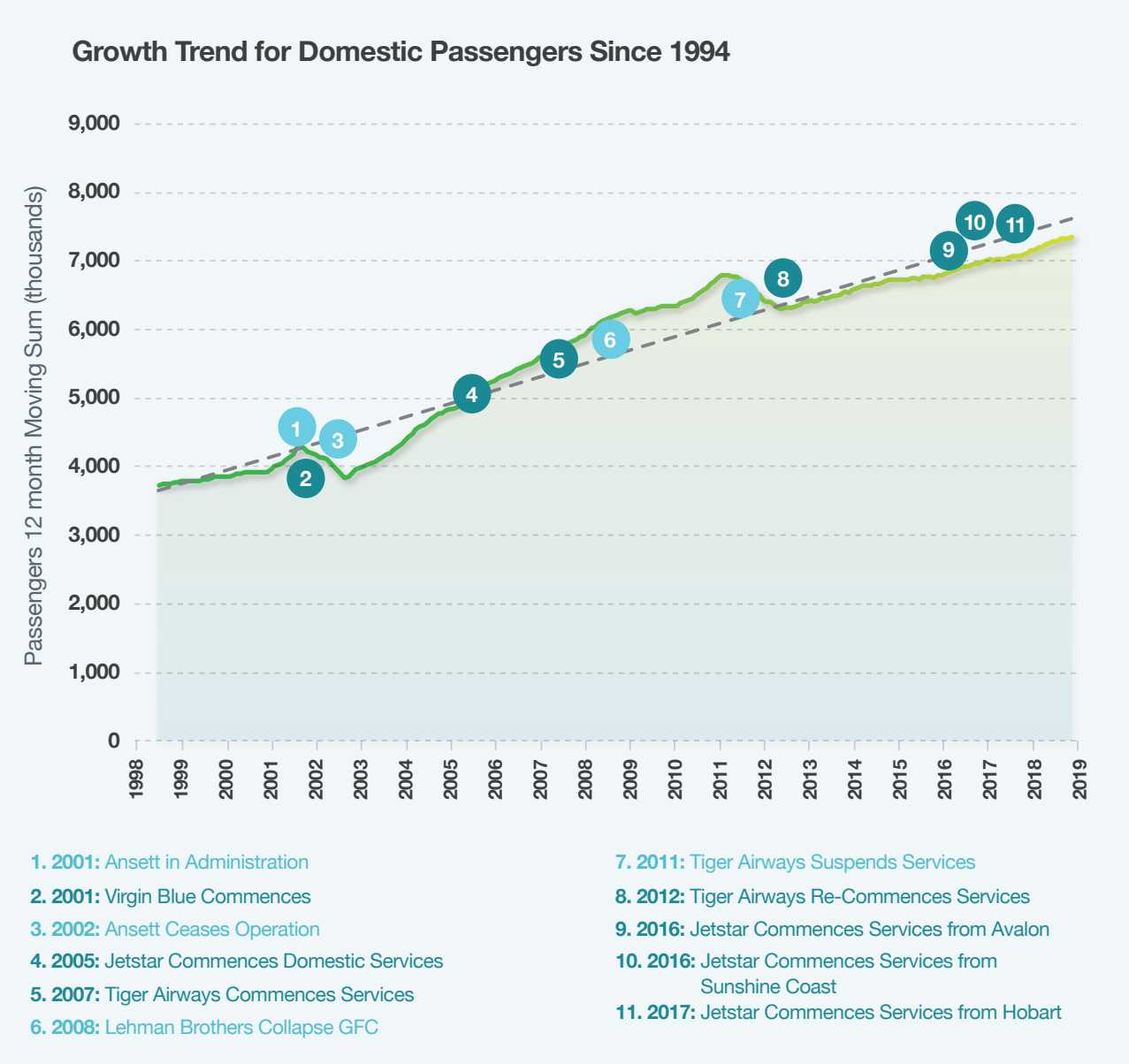


Figure 6-5: Growth Trend for Domestic Passengers Since 1994

Over the past decade, growth has been driven predominantly by Australian residents travelling outbound, with international resident travel having a ten year CAGR of 8.9 per cent, outpacing the international visitor ten year CAGR of 5.9 per cent. Future growth is dependent on inbound visitors, particularly from Asia and an expectation that the resident and visitor shares will return closer to parity (see Figure 6-6).

Figure 6-7 shows that in 2018, nearly 35 per cent of international visitors to Adelaide were from the traditional markets of Europe and the United Kingdom, and a further ten per cent from New Zealand. Current trends show that Asia is the highest growth region for international visitors, a trend that is expected to continue due to the burgeoning middle class in Asia and a growing propensity to travel (see Figure 6-7).

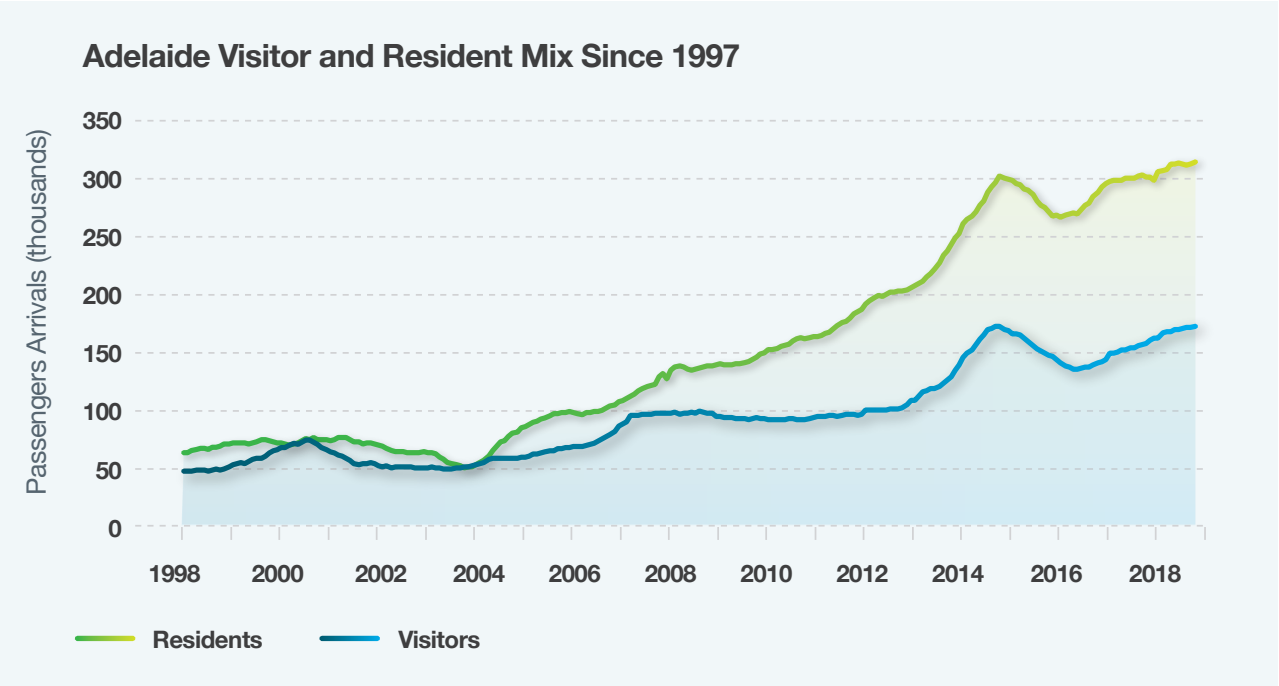


Figure 6-6: *Adelaide Visitor and Resident Mix Since 1997*
Source: ABS Overseas Arrivals and Departure Data

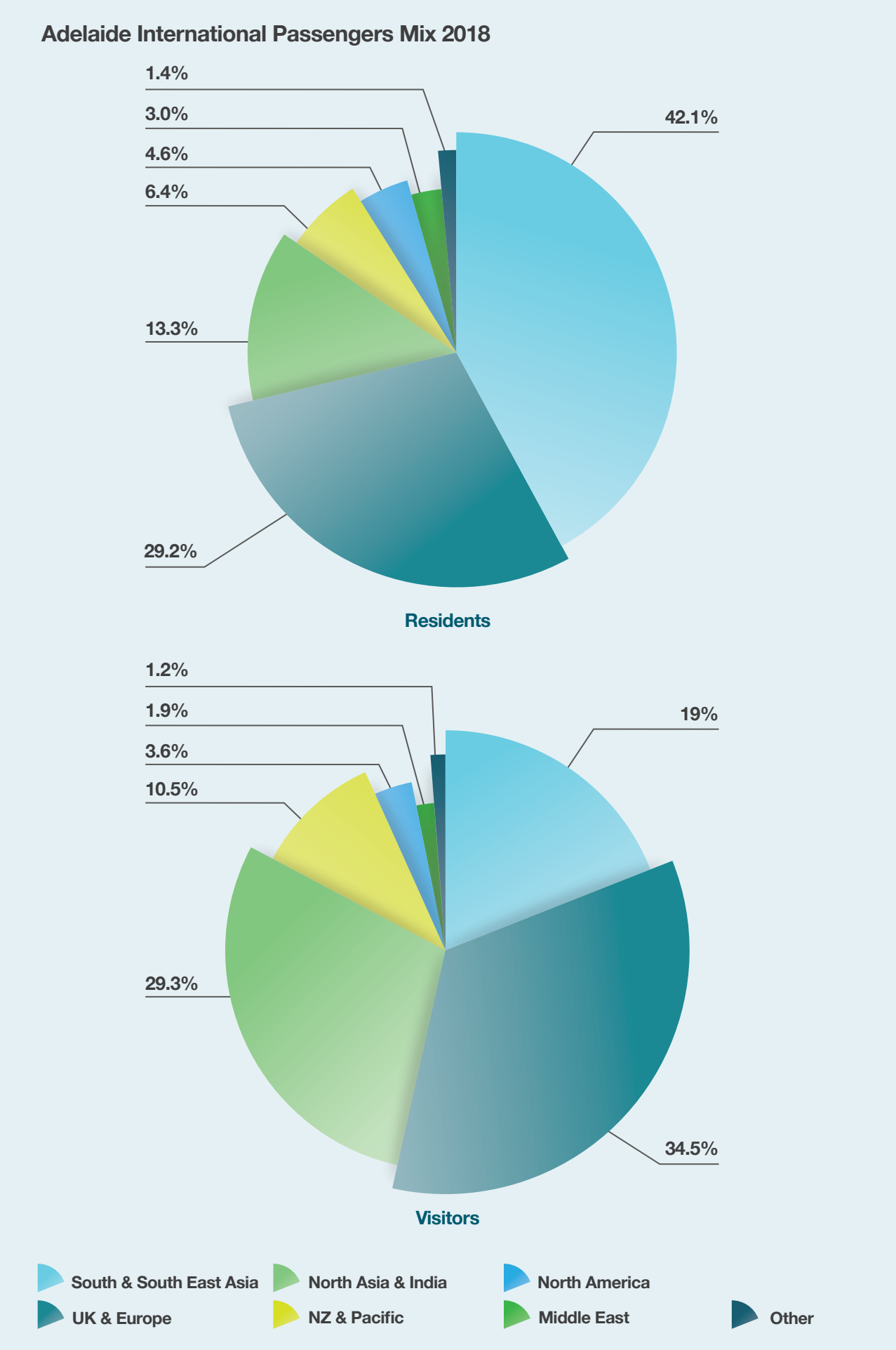


Figure 6-7: Adelaide International Passengers Mix 2018
Source: ABS Overseas Arrivals and Departure Data

6.5. Adelaide Airport Activity Forecasts

6.5.1. Industry Outlook

The outlook for aviation activity in Australia is good, and for Adelaide Airport it is based on estimates of Gross Domestic Product (GDP) and airfares. The GDP estimates for Australia indicate an increase of 2.5 per cent per annum over the forecast period and for Gross State Product (GSP) to increase by an average 2.1 per cent per annum over this period. Domestic and international airline capacities are likely to continue to increase, with additional domestic routes and new international carriers operating out of Adelaide Airport. Fuel prices are likely to continue to increase at around 1.4 per cent per annum over the forecast period and are not expected to significantly affect aviation growth in Adelaide.

In the longer term, it is likely that increased passenger movements will result from the growth of the South Australian population, the mining investment industry in South Australia and from continued tourism demand from a growing middle class in Asia. This demand is likely to include the addition of more international low-cost carriers operating out of Adelaide Airport. The predicted doubling of aviation capacity in the Asian region in the forecast period is likely to stimulate competition and potentially lower airfares, which could also increase demand for international and domestic air travel both to and from South Australia.

As domestic capacity increases across Australia, interstate services are forecast to increase, particularly as other capital city airports commence operations of new runways. This will influence more movements in and out of Adelaide Airport as a component of the Australian network of airports, driving more domestic and regional flights. The introduction of new, larger aircraft types will also provide greater capacity for international and domestic flights arriving at and departing Adelaide Airport.

Technology will continue to change how people travel and how aviation transport and connections are delivered. Changes in the next 20 years could include the use of sustainable biofuel, electric-powered aircraft, supersonic aircraft, the introduction of air taxis, and growth in aircraft drones.

6.5.2. Base Year

To determine the base year for the forecasting of passenger and aircraft movements, Airservices actual data for the first nine months for the calender year 2018 was used. The remaining three months was estimated based on the means of the corresponding three periods from the last three years at Adelaide Airport and then checked against actual movements.

The numbers of aircraft movements for calendar year 2018 was therefore set at 106,075 movements. This represents the base year for the forecasts in this Master Plan.

6.5.3. Passenger Forecasts

Total passenger movements at Adelaide Airport are forecast to increase by more than 130 per cent over the 20-year planning period of Master Plan 2019, from 8.5 million in 2018 to 19.8 million in 2039.

Over the forecast planning period to 2039, central forecasts indicate:

- International passenger movements are expected to more than triple – from 1 million passengers in 2018 to 3.3 million passengers by 2039
- Domestic passenger movements are expected to more than double – from 6.9 million passengers in 2018 to 15.4 million by 2039
- Regional passenger movements are expected to double – from 563,000 in 2018 to 1.1 million passengers by 2039

This represents a CAGR of 5.8, 3.9 and 3.2 per cent, for international, domestic and regional passengers respectively, as shown in Table 6-3.

PASSENGERS (MILLION)	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2039	CAGR (%)
International	1.03	1.08	1.14	1.21	1.30	1.40	1.52	1.63	1.73	1.83	3.34	5.8 %
Domestic	6.91	7.05	7.25	7.48	7.78	8.13	8.50	8.90	9.38	9.88	15.41	3.9 %
Regional	0.56	0.56	0.58	0.60	0.63	0.66	0.70	0.73	0.76	0.78	1.10	3.2 %
Total	***8.50***	***8.67***	***8.97***	***9.23***	***9.71***	***10.20***	***10.72***	***11.26***	***11.87***	***12.50***	***19.84***	***4.1 %***

Table 6-3: *Forecast Passenger Movements* Source: TFI

Based on a high passenger-growth scenario, total annual passengers are forecast to grow from 8.5 million in 2018 to 26.3 million in 2039. The comparison of passenger forecasts, including the central, high and low scenarios are shown in Figure 6-8.

Figure 6-9 provides a breakdown of the forecast passenger movements for international, domestic and regional passengers based on the central passenger growth scenario.

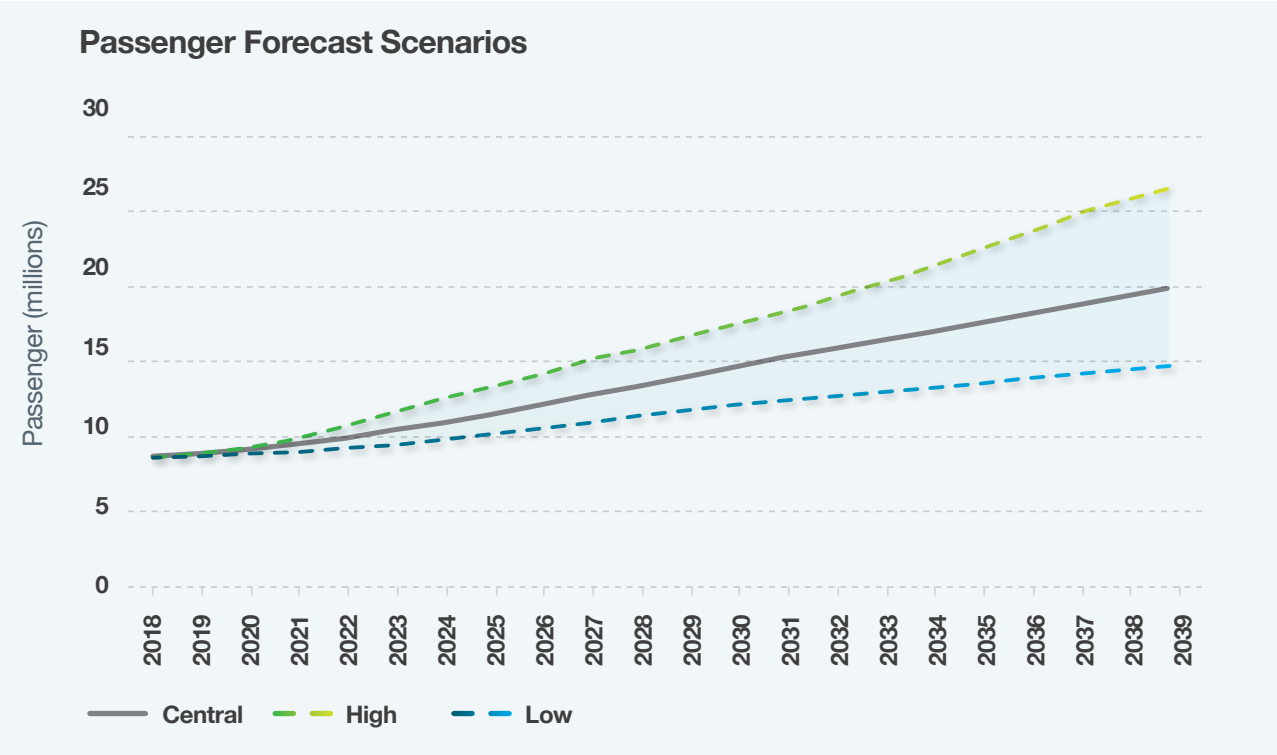


Figure 6-8: Total Passenger Growth Forecasts (including growth scenarios) Source: TFI

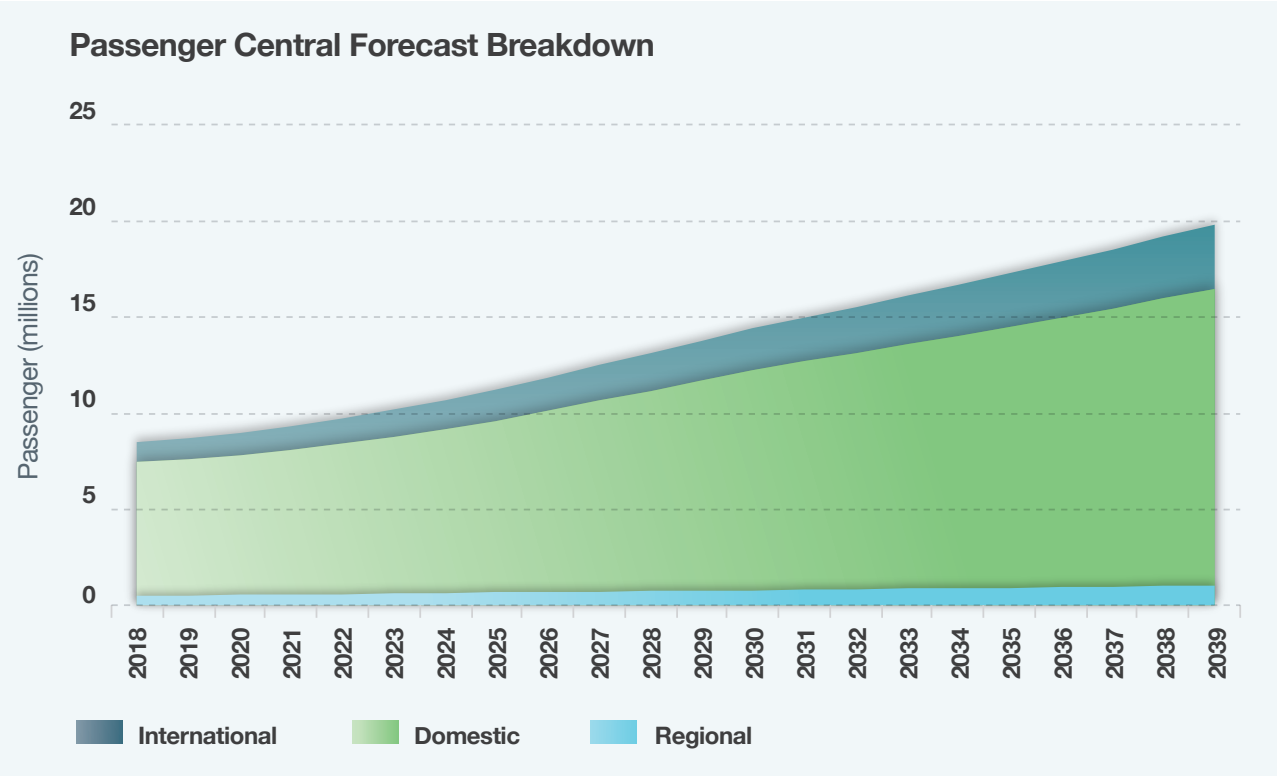


Figure 6-9: Total Passenger Growth Forecasts (International, Domestic and Regional) Source: TFI

6.5.4. Aircraft Movement Forecasts

Total aircraft movements at Adelaide Airport are forecast to increase by 60 per cent over the 20-year planning period from 106,000 movements in 2018 to 168,500 movements in 2039.

This forecast is derived from airline feedback and expectations regarding increasing sizes of aircraft and increases in seat density and load factors.

Over the planning period to 2039:

- International movements are forecast to grow from approximately 5,000 movements in 2018 to 14,400 movements in 2039
- Domestic aircraft movements are forecast to grow from 52,000 movements in 2018 to 96,600 movements in 2039
- Regional aircraft movements are forecast to grow from 23,900 movements in 2018 to 31,300 movements in 2039

Table 6-4 and Figure 6-10 show the forecast trends for passenger aircraft movements.

Based on a high scenario aircraft movement growth rate, total annual aircraft movements are forecast to grow from 106,000 aircraft movements in 2018 to 179,500 aircraft movements in 2039.

The comparison of aircraft movement forecasts, including the central, high and low scenarios, is shown in Figure 6-10.

AIRCRAFT MOVEMENTS	2018	2027	2039	CAGR (%)
International	5,000	8,500	14,400	5.1%
Domestic	52,000	66,000	96,600	3.0%
Regional	23,900	27,700	31,300	1.3%
Others*	25,100	25,600	26,200	0.2%
Total	***106,000***	***127,800***	***168,500***	***2.23%***

**Includes General Aviation, freight, military and helicopter movements*

Table 6-4: *Forecast Aircraft Movements*

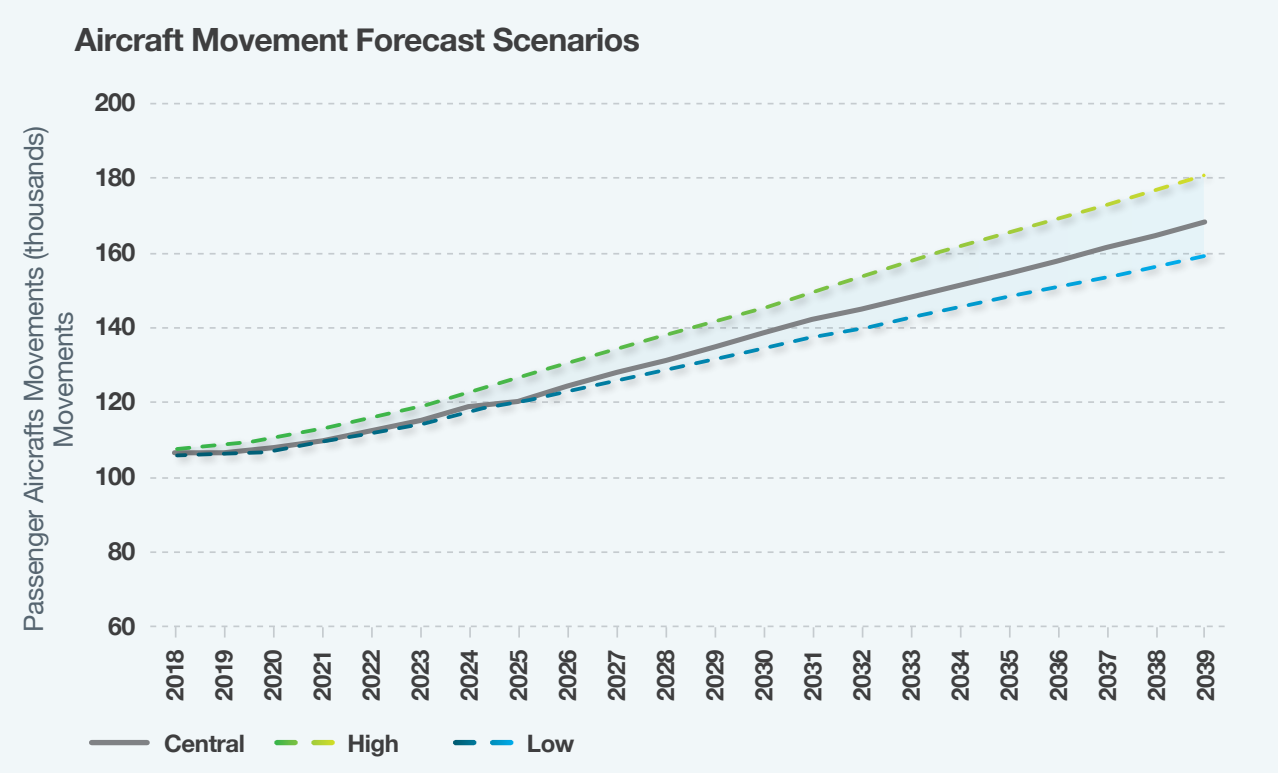


Figure 6-10: *Aircraft Movement Forecast Scenarios*

6.5.4.1. General Aviation Movement Forecasts

Adelaide Airport is primarily used for passenger and freight movements. Parafield Airport is the principal general aviation and pilot training airport in South Australia so the extent of general aviation operations at Adelaide Airport is therefore limited.

General aviation aircraft movements at Adelaide Airport accounted for some 18,700 movements in 2018. This is expected to remain relatively constant over the 20-year planning period, with an estimated 19,400 general aviation movements in 2039 (see Figure 6-11). This represents a low annual growth rate (0.2 per cent per annum).

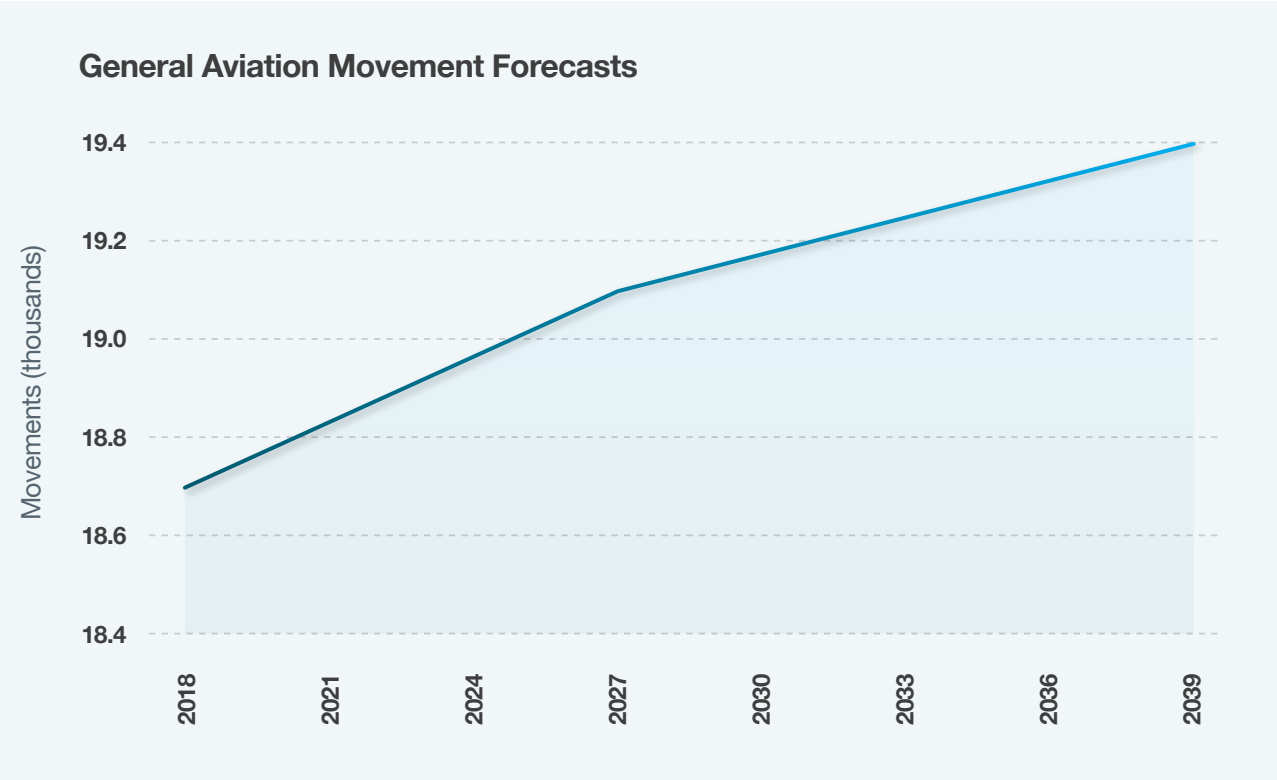


Figure 6-11: *General Aviation Movement Forecasts*

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6.5.4.2. Helicopters Movement Forecasts

Most helicopter operations from Adelaide Airport are associated with medical and police services.

In 2018, there were approximately 4,600 helicopter movements at Adelaide Airport. The forecast number of helicopter movements in 2039 is anticipated to be almost 4,800. This is based on an annual growth of 1.0 per cent per annum (see Figure 6-12). This growth is dependent on South Australian Government contracts for helicopter use and the locations of various private helicopter operations.

Helicopter movement forecasts do not include any growth assumptions around emerging technologies of other non-fixed wing aircraft such as air taxis.

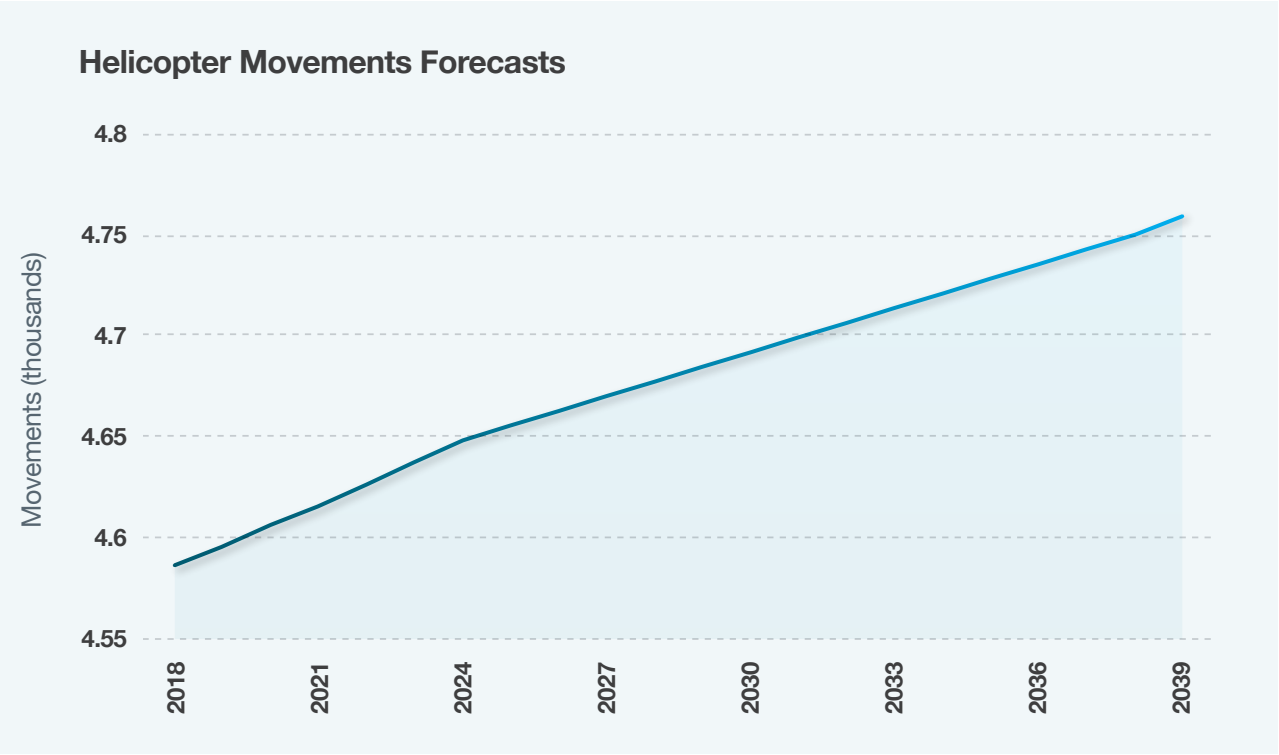

Figure 6-12: *Helicopter Movements Forecasts*

6.5.5. Air Freight Forecasts

Air freighted goods are typically characterised as high value, time-sensitive and perishable. Air freight is important to many industries including manufactured goods, electronics, medical products and consumables.

Most of Adelaide's air freight is carried in the cargo hold of passenger aircraft, with 63 per cent of domestic and 94 per cent of international air freight transported this way, providing access to 300-plus global destinations via direct flights or one-stop connections.

Air freight plays a key factor in the sustainability of passenger services – particularly international services – with the success of any business case for new routes or increased capacity predicated on the ability to match passenger growth with air freight growth. Exporters and importers seek the reliability of regular passenger transport (RPT) services to reach their market in a predictable and timely manner as opposed to ad-hoc dedicated freighter services. There is existing and forecast surplus air freight capacity on international services.

A smaller quantity of air freight is transported by dedicated freighters. Dedicated international freight is currently chartered on a low-frequency as-needed basis, mostly for live animal export and occasional large imports for mining and defence projects. Dedicated freighter aircraft movements are forecast to grow moderately from 1,326 movements in 2018 (average 3.6 movements per day) to almost 1,600 movements in 2039 (average 4.2 movements per day).

Air freight projections for Adelaide Airport to 2039 were provided by TFI. The approach adopted by TFI in preparing the air freight projections for Adelaide Airport was based on several elements:

- A review of the limited traffic history available for Adelaide Airport and an assessment of statistical trends
- The development of models linking drivers and air freight traffic
- A review of official freight forecasts in Australia and elsewhere

Given the limited data available on air freight to/from Adelaide, TFI prepared central, low and high freight volumes. Models were developed for inbound and outbound freight volumes for both the international and domestic markets.

Based on the analysis and models, international forecasts were prepared for inbound and outbound freight.

Forecast for dedicated freighter aircraft movements

3.6/day

growing to

4.2/day

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6.5.5.1. International Freight Forecasts

- Inbound air freight is influenced by Australian economic growth, international aircraft movement growth and the trade weighted index. Inbound air freight volumes to increase with a CAGR within the range of 4.8 per cent to 6.8 per cent per annum
- Outbound air freight is influenced by OECD economic growth, South Australia export growth, international aircraft movement growth and the trade weighted index. Outbound air freight volumes are forecast to increase with a CAGR within the range of 3.6 per cent to 5.0 per cent per annum

6.5.5.2. Domestic Freight Forecasts

- Inbound air freight is influenced by Australian and South Australian economic growth. Inbound air freight volumes to increase with a CAGR within the range of 2.1 per cent to 3.6 per cent per annum
- Outbound air freight is influenced by Australian economic growth. Outbound air freight volumes are forecast to increase with a CAGR within the range of 3.1 per cent to 4.6 per cent per annum

Growth Potential

South Australia's total air freight in the 2018 financial year was 58,000 tonnes. Air freight is expected to more than double over the next 20 years to 146,000 tonnes in 2039.

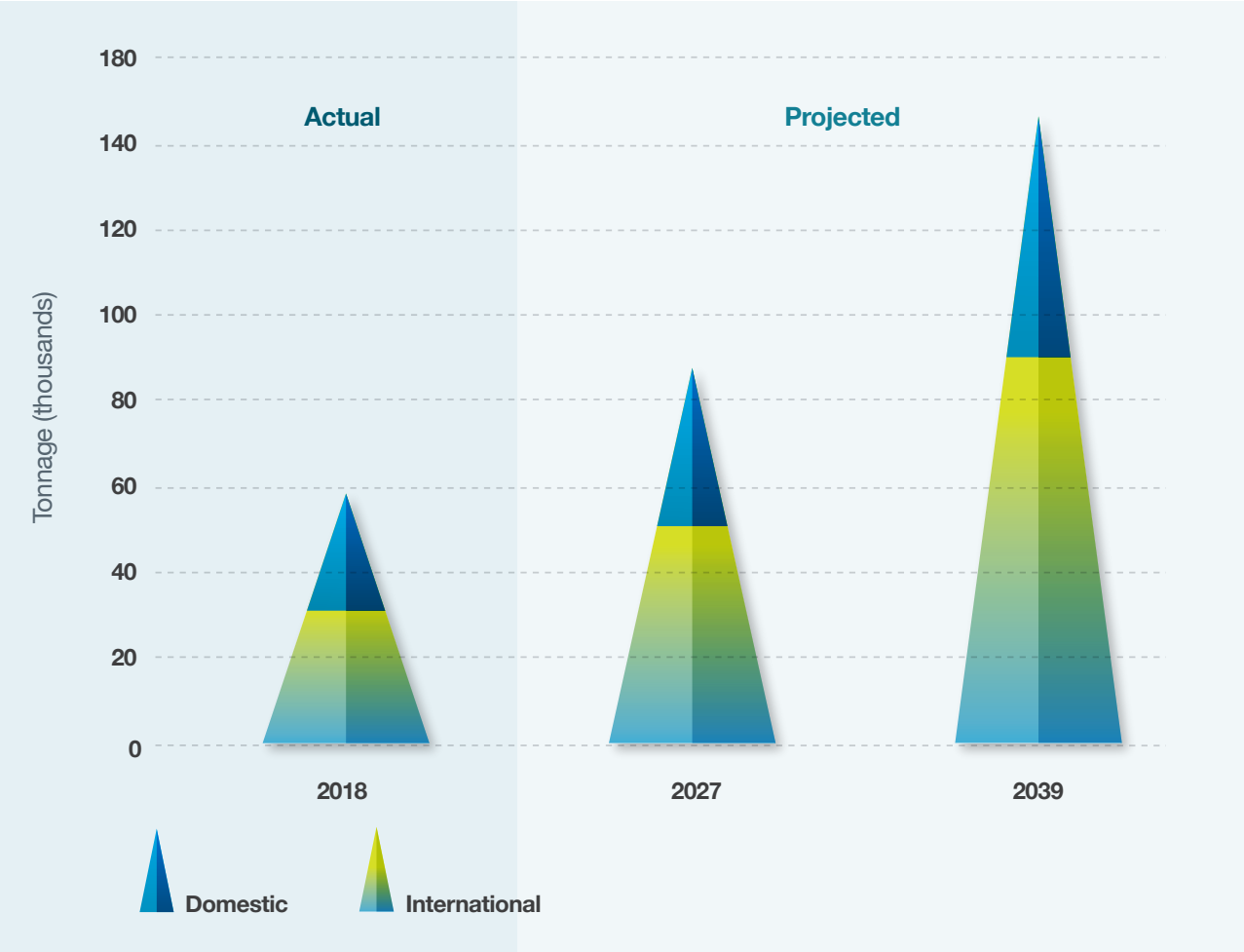

Figure 6-13: Air Freight Forecasts

An assessment of capacity in the cargo hold of aircraft (both current and forecast) to operate at Adelaide Airport was also undertaken. There is significant capacity available in both domestic and international aircraft to cater for the expected forecast in freight tonnage. As shown in Figure 6-14, it is expected that there will continue to be a surplus of international air freight capacity on passenger aircraft services over the next 20 years, due to the projected increase in passenger flights. Market demand is unlikely to increase the need for additional dedicated domestic air freight capacity within the next 20 years.

The major air freight destinations and origins for Adelaide are expected to continue to be South East Asia, North East Asia and the Middle East. These destinations are expected to account for around 88 per cent of international air freight movements by 2039. It is expected that there will be adequate capacity to fulfil demand from these markets. In addition, new direct international connections are likely to create air freight demand from new markets.

Major air freight destinations:

South East Asia, North East Asia and the Middle East

88%

International air freight movements by 2039

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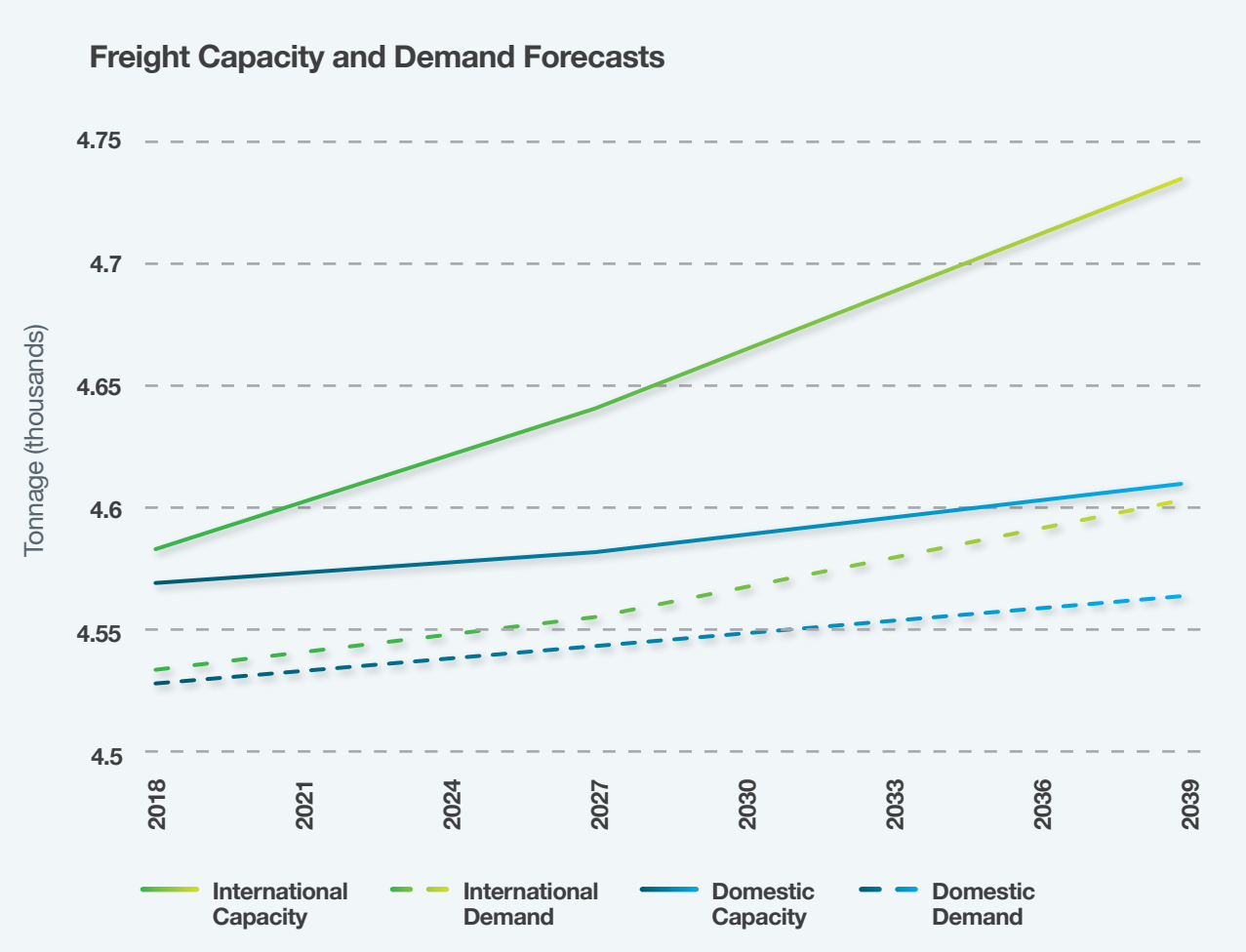

Figure 6-14: *Freight Capacity and Demand Forecasts*

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The Plan for Adelaide Airport

C The Plan for Adelaide Airport

7

Land Use Plan

Sets out the Land Use Plan for Adelaide Airport, which is used to guide all on-airport development and is used to assess non-aviation development proposals.

8

Aviation Development

Describes the Aviation Development Plans for both airfield and terminal facilities.

9

Commercial Development

Outlines the proposed airport commercial developments within the first eight years of the Master Plan.

10

Ground Transport Plan

Outlines the Ground Transport Plan for Adelaide Airport based on the infrastructure needed to cater for increased travel to the airport for passengers, employees, freight and commercial vehicles. It sets out the actions required to address the forecast increases in vehicle trips to and within Adelaide Airport.

11

Services Infrastructure

Outlines the existing and future service infrastructure requirements for Adelaide Airport.

12

Safeguarding the Airport

Provides the measures required for safeguarding the ongoing operations and growth of Adelaide Airport.

13

Aircraft Noise

Outlines current and future aircraft noise exposure for areas surrounding Adelaide Airport and details AAL's approach to aircraft noise management.

14

Environment Strategy

Outlines the Environment Strategy and the objectives for environmental management, the impacts of aviation operations on the environment and AAL's approach to prevent, control and reduce environmental impacts.