



**Sydney  
Airport**

The right future.  
Starting now.



A large Emirates aircraft is shown from a low angle, focusing on the tail and wing. The tail features the distinctive blue and orange stripes. Below the aircraft, cargo loading is in progress with several metal cargo containers on a tarmac. One container is clearly marked with the Emirates logo and the text 'ALF 80316 EK'.

# 3.0

## AIR TRAFFIC HISTORY AND FORECASTS



## 3.0 AIR TRAFFIC HISTORY AND FORECASTS



### Key points

- Sydney Airport is able to accommodate forecast traffic demand beyond the 2033 planning period
- The aviation industry has changed rapidly, frequently and profoundly over the past two decades including:
  - New airline entrants including low cost carriers
  - Improved aircraft technology and capacity
  - Route expansion
- The traffic forecasts have been independently prepared by Tourism Futures International (TFI) and independently reviewed by CAPA:
  - The traffic forecasts were prepared in consultation with the major international, domestic and regional airlines and the airline associations
  - The passenger forecasts are broadly consistent with the recent forecasts prepared by the joint study and by the Bureau of Infrastructure, Transport and Regional Economics (BITRE)
  - The reset of the baseline to take into account the impact to date of the global financial crisis (GFC) accounts for most of the difference between this forecast and the forecast in the 2009 Master Plan. The major economic forecasters are not predicting a period of above-average economic growth that would typically give rise to a period of above-average traffic growth. Accordingly, traffic is not expected to recover to the pre-GFC trends
- The aircraft size forecasts are consistent with past trends and with comparable international airports
- Traffic developments in 2013 suggest the 2033 traffic forecasts (prepared in mid-2012) are more likely to be too high rather than too low. Both international and domestic traffic levels are lower than forecast, and the domestic airlines' stated short term growth expectations are lower than previously expected
- Given the operational regulations, which limit aircraft movements in the peak hour, peak period aircraft volumes in 2033 are likely to be relatively insensitive to changes in passenger demand. Instead, growth in peak passenger demand will be accommodated through larger capacity aircraft, increased seat density and further increases in load factors. As a result, the infrastructure requirements in 2033 are likely to be relatively insensitive to reasonable changes in passenger demand.
- In 2033, Sydney Airport is projected to handle approximately 74.3 million passengers and 388,000 passenger aircraft movements
  - As a consequence of the GFC the forecast traffic at the end of the 2033 planning period remains about 5% below the traffic forecasts for 2029 in the 2009 Master Plan
- There will continue to be on-going opportunities for noise sharing in 2033



**Forecasts of peak period passengers, aircraft movements and air freight volumes provide the fundamental basis for the planning of airport facilities. The traffic forecasts were independently prepared in consultation with the major international, domestic and regional airlines and airline associations.**

In 2033, Sydney Airport is projected to handle approximately:

- 74.3 million passengers
- 388,000 passenger aircraft movements
- 1.0 million tonnes of freight.

For international and domestic (including regional) passengers these forecasts represent annual average growth rates of 4.2% and 2.9% respectively. Overall, this is a forecast average annual growth rate of 3.4%.

Aircraft movement forecasts for scheduled passenger operations at Sydney Airport represent annual average growth rates of 2.3% and 1.0% for international and

domestic (including regional) services respectively. Overall, this represents an average annual growth of 1.4% for passenger aircraft movements.

As a consequence of the global financial crisis (GFC) the projected level of passengers in 2029 is around 15% below the 2009 Master Plan forecast. Forecast traffic at the end of the 2033 planning period remains about 5% below the traffic forecasts for 2029 in the 2009 Master Plan.

Sydney Airport anticipates that the aviation industry shift towards larger, cleaner, quieter, new generation aircraft will continue and passenger numbers will continue to grow at a faster rate than aircraft movements. This has positive outcomes for noise and environmental impacts.

Sydney Airport's existing runways<sup>1</sup> can continue to enable the forecast growth of air travel for tourism and trade beyond the 2033 horizon of the Preliminary Draft Master Plan (PDMP), within the existing regulatory environment.

The detailed forecast schedules, built up year-by-year by TFI and Airbiz, demonstrate that there will also continue to be ongoing opportunities for noise sharing.

### **3.1 The aviation industry is continually and rapidly changing**

For this Master Plan covering the period from 2013 to 2033, it is relevant to consider the development of the industry and Sydney Airport over the 21 years from 1991 to 2012.

The importance of aviation and Sydney Airport to the community has increased substantially since 1991, with

1 Chapters 4–9 demonstrate that Sydney Airport's taxiways, aprons, terminals, freight, aviation support and ground transport capacity will also be sufficient to enable the forecast growth of air travel beyond the 2033 horizon of the PDMP.

a 190% increase in total passengers, a 187% increase in international passengers.

The evolution of low cost carriers (LCCs) and technology advancement has led to significant reductions in real airfares, which has in turn stimulated traffic growth. Further, liberalisation of air rights has encouraged growth in air travel and improved tourism and trade ties between nations.

Many of the industry changes reflect gradual changes sustained over long periods of time – and are still ongoing. These broad trends were and are taken into account in preparing forecasts of passengers, aircraft movements and airport capacity requirements:

- Passenger demand has grown more quickly than the general economy
- New generation aircraft have steadily become larger, quieter, safer, more fuel efficient and more comfortable for passengers
- Airlines have increased the average number of passengers on a given size aircraft through increased seating density and improving technology so that a higher proportion of seats are filled
- Lower fares as a result of increased efficiencies and new technology are stimulating demand
- The gradual increase in the proportion of leisure passengers, which has enabled and been supported by the growth of low cost airlines
- Changing airline partnerships and alliances have resulted in new products and offerings for passengers

Other changes are more unpredictable and frequently produce changes in the short term. At the most extreme are the periodic disruptions arising from terrorism, war, natural events (including volcanic ash clouds, floods and earthquakes) and health scares (such as SARS and H5N1). In most cases, traffic levels quickly return to the previous trend once the circumstances causing the disruption have abated.

On the other hand, higher oil prices, concerns over climate change, and the GFC have combined to reduce aviation traffic growth over the past several years and it is widely expected that traffic will not recover to the preceding trends. In particular, the major economic forecasters are not predicting a period of above-average economic growth that would typically give rise to a period of above-average traffic growth. Accordingly, traffic is not expected to recover to the pre-GFC trends.

Internationally, airlines no longer serve national catchments but instead serve regional (e.g. Europe or Asia) or global catchments. All airports globally are competing for the new generation aircraft that are being delivered to predominantly Asian, Middle Eastern and LCC airlines. These developments have dramatically

increased the level of competition among airports for traffic in Australia, as elsewhere.

In addition, the importance of international inbound airlines to Sydney Airport has been steadily growing and Sydney Airport expects that this trend will continue.

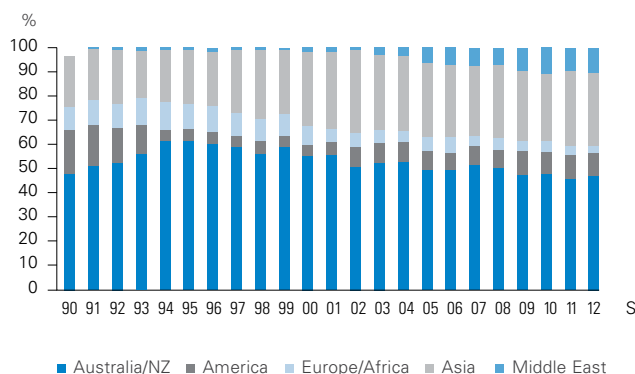
### 3.1.1 Past evolution of airline activities at Sydney Airport

Individual airline strategies can change very quickly and are very difficult to forecast. Over time, the accumulation of these changes to strategies and business models, airline alliances, and relative growth rates can completely transform the landscape for any given airport. Some of the changes that have occurred in the aviation industry serving Sydney Airport over the period from 1991 to 2012<sup>2</sup> include:

- More than half of the international airlines which operated to Sydney Airport during the past two decades have been replaced by other airlines
- In particular, Asian and Middle Eastern airlines have replaced all of the continental European airlines that have flown to Sydney Airport, reflected in the changes shown in **Figure 3.1**
- 88% of international capacity growth since 1991 is being offered by airlines that were not operating to Sydney Airport in 1991, as shown in **Figure 3.2**
- Since Ansett stopped flying in 2001, three low-cost airlines commenced flying, one of which has transformed itself into a full service airline
- Almost 30% of the international airlines operating to Sydney Airport in 1999 were no longer operating in 2004 and had been replaced by new airlines
- The Qantas Group created Jetstar, an airline which has very different service and infrastructure requirements to Qantas
- Airlines have introduced new aircraft types across the fleet, including the replacement of older generation B737-300 and B737-400 aircraft with B737-800s (with 25-50% more seats), the up-gauging of Dash8-200 aircraft to predominantly Dash8-Q400s (with double the number of seats), and the introduction of A380s. The newer aircraft are typically more comfortable for passengers, more fuel efficient for airlines and quieter for the community

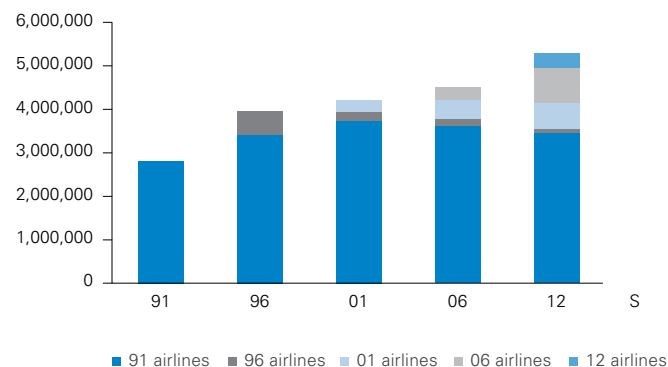
<sup>2</sup> Based on the northern summer seasons, which runs approximately from 1 April to 31 October.

**Figure 3.1 International aircraft seats by region of airlines, from northern summer 1990 to northern summer 2012**



Source: TFI

**Figure 3.2 International aircraft seats by date of commencement at Sydney Airport (northern summers)**



Source: TFI

### 3.1.2 Ongoing evolution of airline activities at Sydney Airport

Individual airline strategies have continued to change during the writing of this Master Plan. For example, over the past two years:

- Virgin Australia has significantly changed its business model since it commenced operations in 2000 as a domestic LCC with a single class offering on short-haul aircraft. Today, Virgin Australia offers a full service product including lounges, business class, a frequent flyer program and multiple aircraft types to serve its domestic, regional and international operations. More recently, it has increased its international presence by creating a virtual network by partnering with international airlines including Air New Zealand, Delta, Etihad Airways, Hawaiian Airlines and Singapore Airlines.
- Tiger Airways Australia commenced domestic operations in 2007 based in Melbourne and established Sydney-based operations in 2012. Through its LCC model, Tiger has generated a step-change in traffic growth on routes that it has served. Tiger's introduction has led to a competitive response from incumbent airlines, generating further traffic growth.
- Virgin Australia bought 60% of Tiger Australia and 100% of SkyWest. Subsequently (and since the PDMP), both domestic airline groups have publicly reduced their short term growth expectations to 1-2% pa, reflecting both the re-establishment of a domestic duopoly (with each airline group comprising a full service and low cost airline) and lower demand.

- Scoot and AirAsia X have commenced operations to Sydney Airport, increasing the number of international LCCs from one to three.
- Qantas has restructured its business, including the separation of the Jetstar, Qantas Domestic, Qantas International and the Qantas Frequent Flyer businesses. In March 2013, Qantas commenced a strategic partnership with Emirates, allowing Qantas to efficiently serve the European market through codeshare agreements while operating the majority of its own aircraft in the Asia Pacific region.

As the airlines have changed to compete for market share and to meet passenger demand, Sydney Airport's development plans have adapted and evolved to meet the airlines' changing needs and priorities. The development plan in this Master Plan ensures that Sydney Airport will have the ability to be responsive and flexible in the development and use of its facilities to accommodate an ever-changing landscape of airlines and associated passenger services.

Over recent years, the importance of Sydney Airport for all aviation activities has been increased as a result of the closure of other aviation capacity in the Sydney region. Unusually for a major capital city airport, Sydney Airport is not just Australia's primary airport for passenger and core freight operations but is also Sydney's primary airport for specialised freight, executive aviation and helicopters.

While Sydney Airport can continue to accommodate other activities where they do not interfere with the core tourism and trade priorities, it could operate more efficiently with increased focus on core international, domestic and regional passenger operations (and related freight).



### 3.1.3 Off-peak growth

The changes to the aviation industry, together with the maturation of specific routes, is also supporting the spreading of the peaks. For example, from 2000 to 2011, average busiest hour movements<sup>3</sup> decreased by 3% while total movements increased by 1%.

Peak spreading will continue to be driven by a number of factors, including:

- LCCs' focus on maximising aircraft utilisation throughout the day rather than business passengers and transfer connections for international and domestic operations
- Origin and destination (O&D) services to Asia have different scheduling windows to the traditional Europe-bound transfer services
- The Middle Eastern hubs have different scheduling windows to the traditional Asian hubs
- The creation of second and subsequent departure banks in Asia and within Australia as carriers grow. For example, Singapore Airline's eight movements are scheduled for eight different hours, with the majority well outside peak periods. Similarly, Brindabella Airlines increased weekly services to Moree from 20 to 36 from 30 March 2013, with 88% of the new services taking place outside the weekday busy periods.

## 3.2 Scope and preparation of the traffic forecasts

The forecasts for passengers and commercial aircraft movements<sup>4</sup> prepared for this Master Plan cover the 20 year planning period to 2033 as required under the Airports Act.

### 3.2.1 Authors of the forecasts

The annual forecasts that appear in this Master Plan were prepared by Tourism Futures International (TFI). TFI is a research-oriented company specialising in the future of aviation, travel and tourism. TFI has been very active in the consulting area for over 20 years, undertaking projects for airports, airlines and tourism organisations in Australia, New Zealand and the Pacific as well as in Asia and the Middle East. TFI has produced forecasts for:

- All of the larger and many regional airports in Australia, including all of the capital city airports, including Sydney Airport's previous master plans
- Auckland, Wellington, Dunedin and a number of smaller airports in New Zealand
- Airports across Asia including Hong Kong and major airports in India

The forecasts were prepared in an iterative manner in consultation with key airlines and their representatives, to review assumptions and issues. TFI has stated that these consultations were the most extensive that TFI has been involved in, and provided TFI with detailed airline input to the development of the forecast. The airline consultation and inputs included:

- Detailed input airlines provided to Sydney Airport as part of the New Vision discussions
- Meetings during the preparation of the draft forecasts, and additional meetings following the preparation of the draft forecasts
- Discussion of methodology, assumptions and the draft forecasts. This included discussions of passenger demand, aircraft types, seating densities, load factors, frequencies, peak and off-peak operations, turnaround times, belly-hold freight and other factors
- Meetings with the Board of Airline Representative of Australia (BARA) and the Regional Airlines Association of Australia (RAAA) and the network development teams of Virgin Australia, Qantas Group airlines (Qantas, QantasLink and Jetstar), Regional Express Group (Rex) and Air New Zealand.

Following delivery of the draft forecasts they were peer-reviewed by CAPA Centre for Aviation. CAPA, established in 1990, is the leading provider of independent aviation market intelligence, analysis and data services, covering worldwide developments.

The representative day forecast schedules were prepared by Airbiz in consultation with TFI.

Schedules were prepared for selected years, including 2018 and 2033.

Airbiz is a specialist international aviation consultancy, providing expert advice to airport owners, operators, investors, airlines, government agencies and other aviation stakeholders. The Airbiz team consists of airport and terminal planners, business analysts, aviation marketing specialists, project facilitators, simulation experts and creative strategists. With over 30 years experience in the aviation industry, the Airbiz team has successfully completed over 2000 projects in 50 countries on 5 continents.

Airbiz specialises in various aspects of the aviation business including strategic planning, simulation and modelling, airport operations, terminal design, traffic projections, route development, and planning. Airbiz has offices throughout Australia, New Zealand and Canada.

<sup>3</sup> This was calculated as the average of the 7am-8am movements on the busiest day of each month.

<sup>4</sup> Relatively small numbers of military and emergency aircraft movements occur on an irregular basis at Sydney Airport. These operations are not included in the forecasts and are not subject to the aircraft movement cap under the Sydney Airport Demand Management Act 1997.

A world business partner with the Airports Council International, Airbiz is recognised globally as an aviation industry domain specialist and currently has active airport and aviation projects in Australia, New Zealand, Asia-Pacific, North America, Europe and Africa. In recent years Airbiz has done studies for all the first and second level airports in the region.

As an end user as well as a producer of air transport forecasts, Airbiz is often requested to take annual forecasts and extend these to busy hour runway, stand and terminal passenger demand forecasts. Airbiz prepares synthetic schedules where this level of detail is required.

Forecasts of air freight volumes were prepared by Airport Strategic Consulting (ASC). ASC experts have experience in traffic forecasting, freight and logistics in Australia, Europe and worldwide.

### 3.2.2 Forecast methodology and assumptions

TFI's approach to forecast development involved a number of steps:

- Top down econometric modelling. Economic factors include gross domestic product (GDP) for the countries contributing visitors to Sydney and Australia, Australian GDP, NSW gross state product (GSP), Australian trade weighted index and exchange rates. TFI utilises forecasts for these variables from the International Monetary Fund (IMF), Organisation for Economic Cooperation and Development (OECD), governments, central

banks and private forecasters such as Consensus Economics. Demographic factors that might impose constraints on demand in the long term include population forecasts for overseas visitor markets, Australia and Australian states and territories

- Development of segment-based forecast models for individual markets and/or routes. Trend assessments and segment models were developed at the route level for the domestic market, and at the country level for the international market
- Review of the fleet orders of airlines and the forecasts of aircraft type by the aircraft manufacturers
- Iterative consultation with the key airlines and their representatives, as described in Section 3.2.1, particularly in relation to aviation factors such as airline capacity, air fares, fuel costs and airline schedules
- Benchmarking of the outputs to forecasts for Sydney (BITRE and the joint study), Australia (BITRE and Tourism Forecasting Committee) and worldwide (aircraft manufacturers, US Federal Aviation Administration, Eurocontrol, UK Department of Transport).

Aircraft movements forecasts were prepared using the passenger forecasts and forecasts for the average numbers of passengers per movement, following consultation with the airlines. Passengers per movement depend on passenger load factors, seating density and aircraft types.

**Table 3.1: Passenger forecasts (millions)**

	2012	%	2033	%	CAGR
International	12.4	33.5%	29.6	39.8%	4.2%
Domestic	22.5	60.8%	41.5	55.8%	3.0%
Regional	2.1	5.7%	3.2	4.3%	2.1%
<b>Total</b>	<b>36.9</b>	<b>100%</b>	<b>74.3</b>	<b>100%</b>	<b>3.4%</b>

**Table 3.2: Movements forecasts ('000)**

	2012	%	2033	%	CAGR
International	63.1	19.6%	102.4	25.0%	2.3%
Domestic	165.7	51.5%	211.6	51.7%	1.2%
Regional	64.0	19.9%	74.5	18.2%	0.7%
Freight	7.4	2.3%	9.1	2.2%	1.0%
GA	21.4	6.7%	11.9	2.9%	-2.8%
<b>Total</b>	<b>321.7</b>	<b>100%</b>	<b>409.5</b>	<b>100%</b>	<b>1.2%</b>

Source: TFI



Aircraft movement forecasts are prepared using the passenger forecasts and forecasts for the average numbers of passengers per movement. Passengers per movement depend on passenger load factors, seating density and aircraft types<sup>5</sup>.

Broad assumptions underlying the forecasts used in this Master Plan include:

- Continued strong economic growth during the medium and longer term for China, India and for much of Asia
- Strong growth in the middle classes across Asia
- The delivery of new aircraft types to airlines in Australia that combine fuel efficiency, lower noise profiles and longer range. This factor, combined with the growth in the middle classes, should facilitate an increase in city pair connections across Asia and between Australia and Asia
- A slow economic recovery of the major long haul markets contributing tourists to Sydney and Australia including the UK, Europe and the USA
- An increase in the average number of seats per aircraft movement for Sydney Airport across all traffic segments, international and domestic
- The ongoing development of new passenger markets by LCCs.

### 3.3 Traffic forecasts

#### 3.3.1 Passenger forecasts

The passenger forecasts for Sydney Airport indicate growth from 36.9 million passengers in 2012 to 74.3 million passengers in 2033. This represents annual average growth rates of 4.2% and 2.9% respectively for international and domestic (including regional) passengers. Annual regional passengers are forecast to grow from 2.1 million in 2012 to 3.2 million by 2033.

Overall, this is an average annual growth of 3.4%.

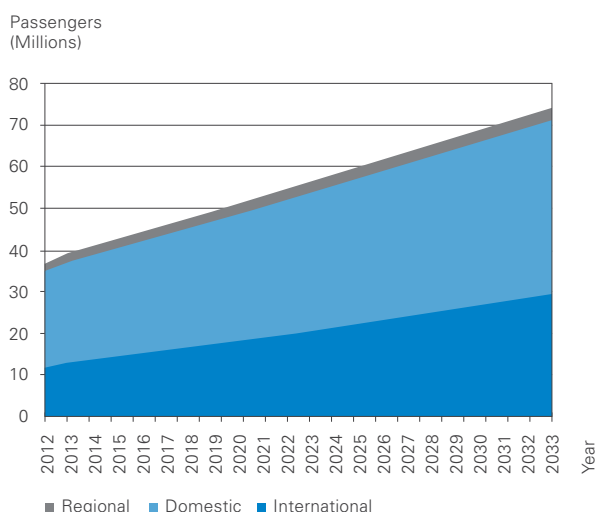
**Figure 3.3** shows forecast passenger growth over the planning period to 2033 (also refer to **Table 3.1**).

#### 3.3.2 Aircraft movement forecasts

Aircraft movement forecasts for scheduled passenger operations at Sydney Airport indicate growth from 292,852 movements in 2012 to 388,466 movements in 2033. This represents annual average growth rates of 2.3% and 1.0% for international and domestic (including regional) services respectively. Overall, this represents an average annual growth of 1.4% for passenger aircraft movements.

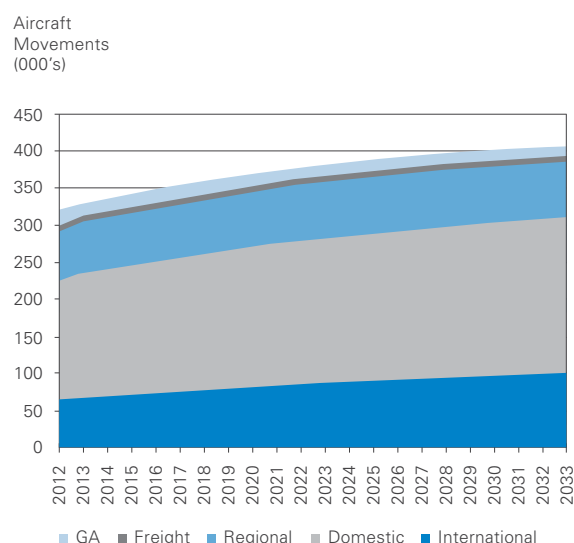
**Figure 3.4** shows forecast aircraft movements growth over the planning period to 2033. Total fixed wing aircraft movement growth (including freight and general aviation movements) is forecast to increase to 409,464 movements in 2033 (also refer to **Table 3.2**).

**Figure 3.3 Forecast passenger growth, 2012 to 2033**



Source: TFI

**Figure 3.4 Forecast movements growth, 2012 to 2033**



Source: TFI

<sup>5</sup> A 70% load factor is equivalent to 70 paying passengers on a 100 seat aircraft. Seating density refers to the number of seats on a given size aircraft, which is affected by the number of seats in each row and the distance between each row (eg business class seats have a lower density than economy class seats).

### 3.3.2.1 Average number of passengers per flight forecast

The lower rate of growth in aircraft movements relative to passengers results from the forecast increase in both passenger load factors and the average number of seats per aircraft movement (aircraft size and seat density) – albeit that passengers per aircraft are forecast to grow more slowly than they have historically. Over the long term, passengers per aircraft approximately doubled in the 20 years between 1966 and 1986, and then approximately doubled again by 2006. By contrast, passengers per aircraft are forecast to increase by approximately 50% over the next 20 years. **Figure 3.5** depicts the historical growth in the average number of passengers per movement over the past 10 years and the projected increase to 2033.

This increase in the average number of passengers per flight is expected to be achieved through increased use of:

- Larger capacity aircraft, such as the Airbus A380 (international), A330, B787 and A321 (domestic) and continued up-gauging of regional aircraft. In addition to the A380, for which 64 movements per day are projected in 2033 (around 6% of total aircraft movements and almost 25% of international passenger aircraft), the forecasts assume a progressive up-scaling in aircraft size across the fleet
- Increased seat density, particularly as a result of the growth of LCCs which frequently operate without premium cabins and provide less leg room for passengers

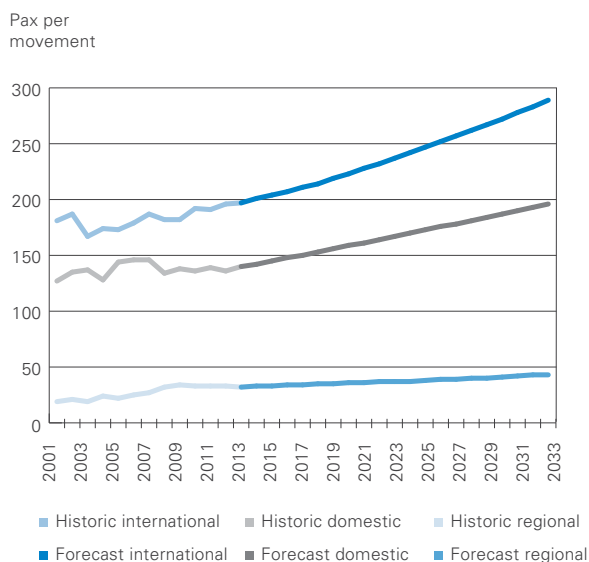
- Further increases in load factors, continuing the international and Australian trends of the past several decades, to levels consistent with today's best practice.

For regional services, the average number of passengers per movement is forecast to grow from 33 in 2012 to around 43 in 2033. The forecast schedule anticipates that regional destinations will continue to be served predominately by turbo-prop aircraft, although by 2033 12% of the movements to regional destinations are expected to be operated by jet services to predominantly leisure destinations. Due to aircraft technology improvements, particularly for jet aircraft, these jet aircraft are no longer materially louder than the much smaller turboprop aircraft they replace.

The airlines that participated in the consultation generally accepted the forecast approach, assumptions and forecasts. During the consultation, the airlines commented that they:

- Expected to see continued increases to seating density across the industry. For example, Qantas has increased the seating density of its A380s, B747s and B717s by 8-19% between 2011 and 2013, and intends to replace B767s with the 20-25% larger A330s
- Expected to increase load factors as yield management systems continue to improve, and were comfortable with the forecast load factors. One airline noted that it hoped to exceed the forecast domestic load factor. The forecast domestic load factors are comparable to the latest Federal Aviation Administration forecasts for domestic load factors in the USA over the next 20 years, and to load factors being achieved by LCCs in Europe and the USA today by airlines such as Jetblue and easyJet
- Expected to continue to increase the size of both the narrow-body fleet (for example, by replacing A320s with A321s) and the wide-body fleet (for example, by replacing B767s with A330s)
- Understood the need to add larger aircraft for Sydney routes during the peak periods given the regulatory cap of 80 movements per hour at Sydney.
- Recognised the opportunity to deploy wide-body aircraft on the domestic trunk routes though they were concerned about use of these aircraft in off-peak periods. Some airlines noted that the ability to use swing gates in the terminal to operate an aircraft domestically during the peaks and internationally during the off-peaks would assist in the deployment of wide-body aircraft. The airlines also recognised that, for the larger leisure routes where frequency is not as important as on business routes (eg Melbourne off-peak and Cairns), the near-

**Figure 3.5 Historic and forecast average passengers per movement, 2001 to 2033**



Source: TFI

doubling of passenger volumes over the next 20 years would provide a greater opportunity to deploy wide-body aircraft in the future where demand today only supports a narrow-body aircraft.

As an example, the deployment of larger aircraft on the peak business routes could be facilitated in part by the development of the Cairns route with a combination of narrow-body and wide-body aircraft. This could include:

- A 44% increase in frequency from a departure every 2 hours on average to a departure every 80 minutes on average
- A 29% increase in seats per aircraft from 178 to 228, including 8 Code C departures (unchanged from 2012) and 5 Code E departures (an increase from 1 in 2012)
- An increase in passengers per aircraft (including the forecast increase in load factors) of 1.7% pa

While the major aircraft manufacturers have experienced delays in the production and delivery of new aircraft types (eg. the A380 and the B787) due to the challenges of such innovative aircraft designs, the delivery process is now under way. It is expected that, over the next 20 years, these aircraft and others such as the A350s will meet airline demand in a manner that does not constrain passenger growth or airline requirements for narrow and wide-body aircraft.

While the fleet plans of airlines are known in broad terms for a decade ahead, the airlines have significant flexibility and can advance or delay orders and retirements. Nonetheless both major Australian airlines plan to increase the number of wide-body aircraft in their fleets:

- Virgin Australia is expected to increase its fleet of A330-200 aircraft from six to eight over the period to June 2016.
- By 2025 Qantas is expected to have 20 A380s compared to the current 12, and around 30 A330s (including those transferred from Jetstar as it receives its B787-800s) compared to 20 currently. In October 2013 Qantas indicated that it had retained 50 B787-9 options and purchase rights, available for delivery from 2017 to 2025. During the period 2013 to 2016 Jetstar expects delivery of 11 B787-800 aircraft and a further three during 2017 to 2025.

### 3.3.3 Air freight forecast

The efficient handling of air freight is an important component of Sydney Airport's aviation business. It is estimated that 80% of freight is carried by passenger aircraft with the remainder transported in dedicated freight aircraft.

Total freight is forecast to grow from 615,378 tonnes in 2012 to 1,011,312 tonnes in 2033. This represents an

average annual growth of 2.4%. Forecasts of international and domestic freight tonnages are shown in **Figure 3.6**. Dedicated freight aircraft movements are forecast to grow to 9,086 in 2033 which represents an annual average growth rate of 1.1%.

### 3.3.4 General and business aviation

In the 10 years to 2011, annual general and business aviation (GA) movements at Sydney Airport averaged 20,881 and remained flat over the period to 21,401 in 2012. Annual helicopter movements averaged approximately 5,500 over the past five years, a reduction from the previous period, but have increased in 2011 and 2012.

The Master Plan forecasts that GA traffic demand will continue to decline at Sydney Airport over the planning period and that helicopter movements will remain around the average level of the past two years. Helicopter movements and the majority of GA movements could also operate from Bankstown Airport at any time during operational hours.

In the long term, there will be increased demand for specialised freight, executive aviation and helicopter activities at other airports and heliports. It is important for a helicopter strategy to be developed for the Sydney market. Sydney Airport's understanding is that the demand for helicopters is tightly centred on the CBD and the harbour, and that most helicopter operators have a strong desire to be able to operate from the CBD rather than from Sydney Airport. Sydney's competitiveness as a tourist and business destination would be enhanced if a suitable location could be found closer to the CBD.

RAAF Base Richmond should be developed for non-core civilian use, including specialised freight, general aviation, helicopters and other aviation activities. Sydney Airport should not be expected to be the primary airport in Sydney for all aviation users, but should focus on international, domestic and regional passenger operations (and related freight).

## 3.4 Benchmarking of the traffic forecasts

The annual traffic forecasts have been benchmarked against:

- Historic traffic development at Sydney Airport
- Projections from the 2009 Master Plan, the joint study, BITRE and IATA
- Existing large Asian routes at busy airports.

### 3.4.1 Comparison to historical performance

Sydney Airport is Australia's busiest airport for scheduled passenger services, currently handling approximately 42% of all international and approximately 45% of all domestic and regional passengers.



**Table 3.3: Historical and forecast compound annual growth rates (CAGR)**

	Passengers	Passenger aircraft movements	Passengers per movement
<b>International</b>			
1992 to 2012	5.1%	3.2%	1.8%
2012 to 2033	4.2%	2.3%	1.9%
<b>Domestic</b>			
1992 to 2012	4.1%	2.0%	2.1%
2012 to 2033	2.9%	1.0%	1.8%
<b>Total</b>			
1992 to 2012	4.4%	2.2%	2.2%
2012 to 2033	3.4%	1.4%	2.0%

Source: Historical data based on BITRE data for fiscal years ending 30 June. Forecast data is calendar year.

In the period from 2000 to 2012, total annual passengers through Sydney Airport increased from 25.2 million to 36.9 million. This represents an average annual growth rate of 3.4%.

Total fixed-wing aircraft movements increased from 291,238 to 321,666, an annual increase of just 0.9%. This marginal increase in aircraft movements reflects a trend to larger capacity aircraft with higher average load factors using the airport.

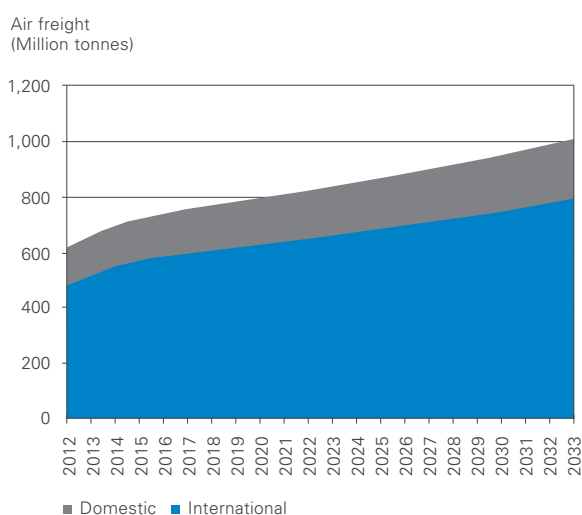
**Figure 3.7** shows the growth of passenger and aircraft movements at Sydney Airport over the period from 2001 to 2012.

**Table 3.3** compares the historic and forecast growth rates for international and domestic (including regional) passengers, aircraft movements and passengers per aircraft. Passengers, passengers per aircraft and aircraft movements are all forecast to grow less quickly than historical averages.

The passenger growth reflects:

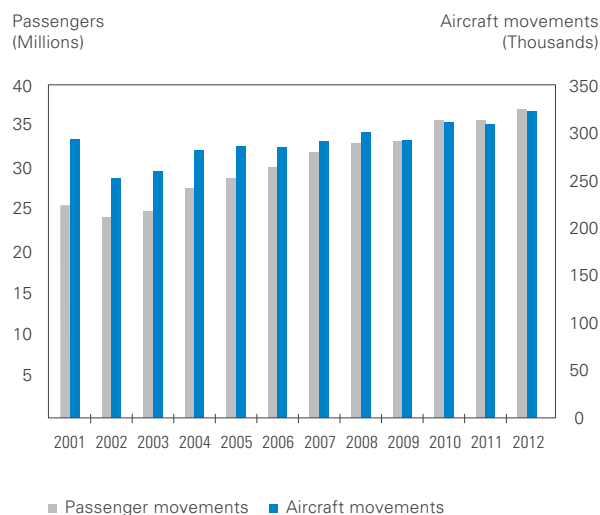
- Increasing competition from a growing number of Asian destinations
- The slowing economic growth in Australia given the declining proportion of the Australian population in the workforce

**Figure 3.6 Forecast freight tonnage**



Source: ASC

**Figure 3.7 Passenger and aircraft movements, 2001 to 2012**



Source: TFI

- Growing maturity of the Australian domestic passenger market
- Development of new markets and passenger segments by LCCs and airlines operating new generation aircraft

The main impact of the GFC was to lower the growth traffic over the 2009 to 2011 time period. Longer term GDP (and traffic) growth rates in the Master Plan are similar to the 2009 Master Plan.

The impact of the GFC has been long lasting with recovery still under way in the USA and in UK/Europe. Uncertainty remains about Europe's ability to deal with the debt issues resulting from the GFC. For these reasons there has not been the bounce-back in traffic growth often seen following economic recessions in the past.

- GDP in the USA averaged annual growth of 3.2% prior to the GFC. Forecasts to 2020 are now around 2.0% to 2.5% per annum on average
- GDP in the Eurozone averaged annual growth of 2.1% for the decade to 2007. Forecasts to 2020 average 1.5% per annum
- GDP in the UK averaged annual growth of 3.1% for the decade to 2007. Forecasts to 2020 average 2.0% per annum
- Unemployment remains at high levels in all these areas.

Despite the sluggish nature of the recovery in these major developed economies, oil prices have rebounded, impacting on airlines. In addition the Australian economy has now slowed with the transition from the investment phase of the mining boom moving to the production and export phase. This transition has been associated with lower commodity prices and there is an expectation of a lower Australian dollar into the future.

### 3.4.2 Comparison to the 2009 Master Plan

Annual traffic forecasts for this Master Plan are lower than those used in the 2009 Master Plan for the period up to 2029. As would be expected, the decrease in overall forecasts is largely a result of the global financial crisis – with 2012 passengers 13% below the forecast for that year in the 2009 Master Plan.

The 2009 Master Plan forecast a total of 78.9 million passengers and 402,000 passenger aircraft movements by 2029. The forecasts prepared for this Master Plan indicate that in 2029 it is expected the airport will be handling 67.0 million passengers (15% below the previous plan) and 379,600 passenger aircraft movements (6% below the previous plan). This also results in a different hourly profile for the busy day (see **Figures 3.10 to 3.12**), with fewer movements in the middle of the day when noise sharing is most likely.

### 3.4.3 Comparison to other passenger forecasts

**Table 3.4** compares the traffic forecasts with other passenger forecasts for Sydney, Asia Pacific and the world. The Master Plan forecasts are broadly consistent with the other forecasts for Sydney Airport, and the Master Plan international growth rates are similar to the forecasts for total world growth.

The latest Airbus global market forecast indicates that low cost carriers will be the fastest growing airlines, increasing their share of world revenue per passenger kilometre (RPK) traffic from 15% in 2011 to 20% by 2031.

### 3.4.4 Comparison of Sydney-Melbourne in 2033 to large Asian routes today

In preparing the domestic-interstate aircraft movement forecasts it was assumed that the average number of seats per movement on Sydney-Melbourne would grow from 183 in 2012 to 251 in 2033. This was based on a review of interstate routes to/from Sydney.

The result was then compared with the top 15 Asian domestic routes worldwide. Comparing **Figures 3.8** and **3.9**, it is noticeable that:

- Sydney-Melbourne ranks 4th in terms of aircraft seats (and Sydney-Brisbane 8th)
- Sydney-Melbourne ranks only 12th in terms of aircraft size (and Sydney-Brisbane 15th)
- Growth to an average 251 seats per movement in 20 years for Sydney-Melbourne would still be outside the top 5 for today's Asian routes.

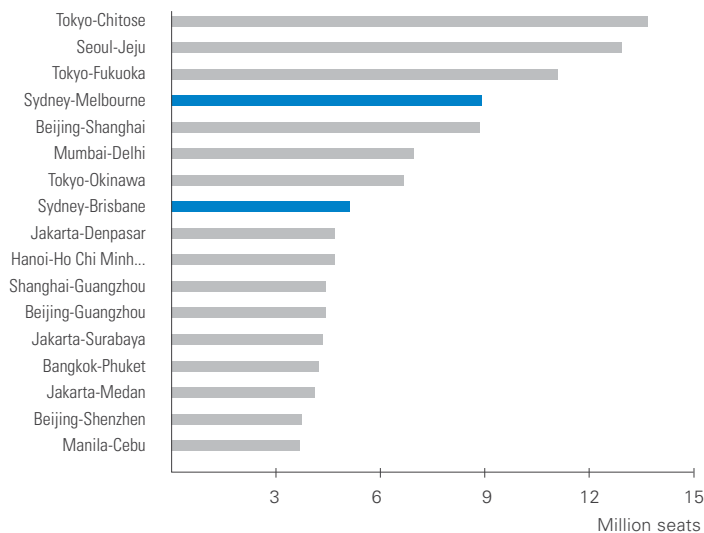
This indicates that there is significant scope for an increase in average aircraft size at Sydney Airport and that the forecast increase is supported by experience elsewhere in Asia.

### 3.4.5 Comparison of 2013 traffic results to passenger forecasts

As at November 2013, passengers and regular public transport aircraft movements are expected to be approximately 3% below the Master Plan forecasts, which were prepared in mid-2012. Both domestic airline groups have stated that they expect Australian domestic traffic growth of 1-2% pa for the next few years, below the domestic traffic forecasts for Sydney in this Master Plan. This reflects both the re-establishment of a domestic duopoly (with each airline group comprising a full service and low cost airline) and lower demand.

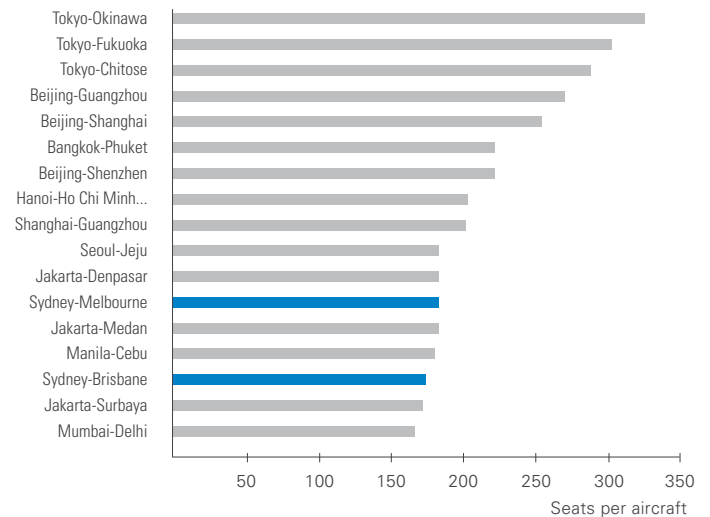
Traffic forecasts always include a degree of uncertainty. In isolation, these factors would suggest that traffic is more likely to be lower than the forecasts rather than higher, particularly for domestic traffic. However, the Master Plan forecasts for 2033 remain appropriate for the preparation of a long term development plan.

**Figure 3.8 Top Asian and Sydney Airport routes based on annual seats in 2011/12**



Source: TFI

**Figure 3.9 Top Asian and Sydney Airport routes based on annual seats in 2011/12 – ranked by seats per aircraft**

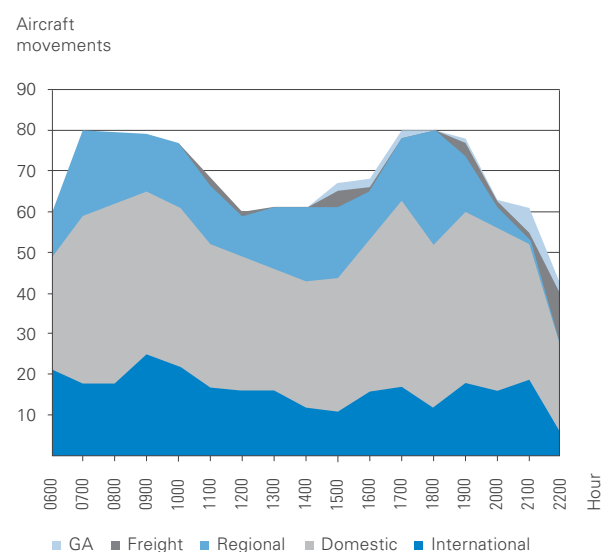


Source: TFI

**Table 3.4: Comparison of traffic forecasts**

PDMP: Sydney 2010-2030	
- International	4.4% pa
- Domestic	2.8% pa
- Total	3.4% pa
Joint study: Sydney 2010-2030	
- International	4.1% pa
- Domestic	2.8% pa
- Total	3.2% pa
BITRE: Sydney 2010-2030	
- International	4.5% pa
- Domestic	3.1% pa
- Total	3.6% pa
ICAO: world 2010-2030	
- Low	3.7% pa
- Most likely	4.7% pa
- High	5.2% pa
ACI / DKMA: world 2010-2029	
	4.1% pa
Airbus: world 2012-2031	
	4.7% pa

**Figure 3.10 Forecast representative busy day hourly aircraft movements, 2033**



Source: Airbiz and TFI



As discussed in Chapter 4, the development plan included in this Master Plan is the best plan for infrastructure development for a wide range of traffic developments. Traffic growth that is significantly different to the forecasts would predominantly result in changes to the development timetable and phasing rather than the development plan itself.

### 3.5 Representative days and noise sharing

A representative busy day schedule was developed for 2033 for use in assessing facility requirements. This was based on a busy Monday in August selected as a representative busy day for Sydney Airport. This is consistent with previous airport master plans and with the practice of the slot coordinator for Sydney Airport.

The representative busy day analysis assessed:

- The operational suitability of an aircraft type for a given route network
- The aircraft rotations compatible with a high level of utilisation
- The use of commercially feasible arrival and departure timings throughout the network
- All regulatory requirements

**Figure 3.10** shows the forecast representative busy day hourly aircraft movement profile for 2033 broken down by flight category. This covers Sydney Airport's normal 17-hour operating day between 6am and 11pm, as well as a small number of international passenger aircraft arrivals in the 5am-6am curfew shoulder period. During the 11pm-6am curfew period, permitted freight and GA aircraft movements are projected to be four and

18 respectively. In 2011, a representative busy day (9 August) had 24 movements by freight and GA aircraft collectively. It is expected that NSW regional air traffic at Sydney Airport will continue to account for a substantial proportion of slots in the peak hours in 2033.

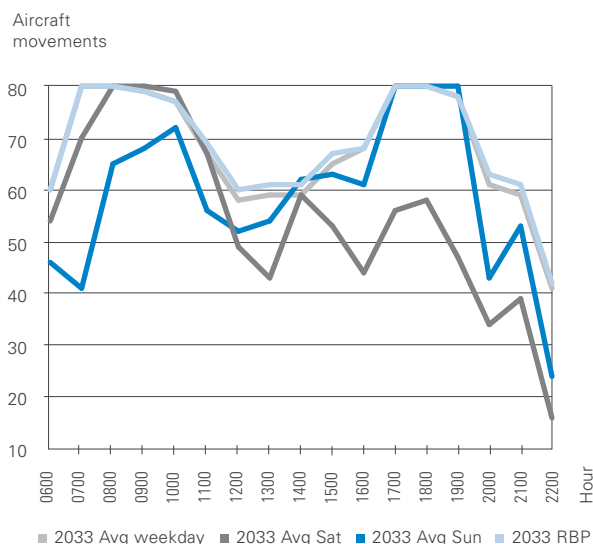
**Figure 3.11** compares the representative busy day with an averaged weekday, Saturday and Sunday. The averaged weekday is lower outside the peak hours than the representative busy day. The averaged weekend days show different peak patterns, due to the reduced domestic business traffic over the weekend and increased leisure traffic.

Based on current and historic practice, overall runway capacities for noise sharing modes are within a range of 55 to 70 movements per hour (dependent on the weather). Expert noise consultants have demonstrated that the noise sharing modes can continue to be used throughout the planning period. The estimated times of the day during which noise sharing modes would be available in 2033 on the projected representative busy day include periods in the early morning, middle of the day and evening, as shown in Section 14.2.1.

The forecast number of aircraft movements per hour in 2033 is lower than was forecast for 2029 in the 2009 Master Plan, particularly during the hours when there is the greatest potential for noise sharing. This is shown in **Figure 3.12**.

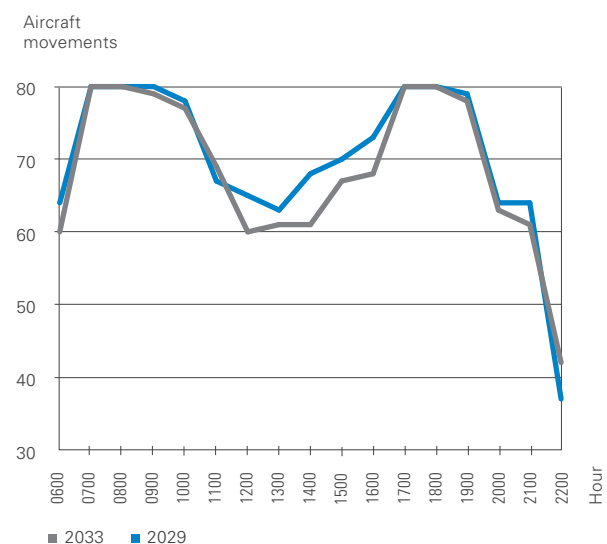
Modernisation of the operational regulations that govern Sydney Airport, as recommended by the joint study, could reduce the number of aircraft movements during the off-peak and increase the potential for noise sharing.

**Figure 3.11 Representative busy and typical days, 2033**



Source: Airbiz and TFI

**Figure 3.12 Comparison with 2009 Master Plan forecasts**



Source: Airbiz and TFI

