PART THREE DEMAND FOR AVIATION IN THE SYDNEY REGION



Key points

- Aviation activities in the Sydney region have been growing over the past decade. As at 2010, the sector consisted of:
 - 40.1 million Regular Public Transport (RPT) passenger movements and 344,000 RPT aircraft movements accommodated through Sydney (Kingsford-Smith) Airport, Canberra Airport and Newcastle Airport;
 - 400,000 tonnes of international freight and more than 100,000 tonnes of domestic freight, accounting for 50 per cent and 30 per cent of Australia's international and domestic air freight tonnage respectively;
 - more than 400,000 General Aviation (GA) movements across a number of aerodromes in the region.
- With the continued economic and population growth, there will be increased aviation demand in the region. On an unconstrained basis (presuming all necessary capacity is provided to meet growth), estimated demand in the Sydney region would be for:
 - 57.6 million passenger and 421,200 RPT aircraft movements by 2020;
 - 87.4 million passenger and 528,600 RPT aircraft movements by 2035; and
 - 165 million passenger and 800,800 RPT aircraft movements by 2060.
- This exceeds the total number of current domestic and international passenger movements across Australia (135 million in 2010).
- It is estimated that unconstrained demand for air freight tonnage would quadruple between 2010 and 2060.
 - Demand for international and domestic air freight tonnage in the region is forecast to grow rapidly by approximately 3.2 per cent per year between 2010 and 2060.
 - The majority of air freight demand in the Sydney region is expected to continue at Sydney (Kingsford-Smith) Airport. However, the roles of Bankstown, Newcastle and Canberra airports in serving air freight demand are expected to increase.
- GA growth in the Sydney region has been modest compared to RPT but is expected to increase by 50 per cent between 2010 and 2060.
 - Bankstown Airport is forecast to continue to provide the largest volume of GA activity in terms of aircraft movements, with modest growth expected at Canberra and Camden airports and RAAF Base Richmond.
- With the exception of RAAF Base Williamtown, military movement growth in the region is likely to remain relatively constant throughout the forecast period. It is expected that military operations at RAAF Base Williamtown will rapidly increase as a result of the introduction of the Joint Strike Fighter program from around 2017.
- Sydney (Kingsford-Smith) Airport will continue to be the primary airport in the region in terms of both RPT and freight services.
- While Canberra and Newcastle airports will see continuing growth in demand for RPT services, this is not expected to reduce demand at Sydney (Kingsford-Smith) Airport.

- Unconstrained demand for passenger movements at Sydney (Kingsford-Smith) Airport, which already facilitates 89 per cent of passenger movements in the Sydney region, is forecast to more than double by 2035 and quadruple by 2060, to 76.8 and 145.7 million passenger movements respectively.
 - This correlates with expected unconstrained demand for approximately 430,000 and 650,000 RPT aircraft movements in 2035 and 2060 respectively.
- As Sydney's spatial and economic growth continues to increase population and income growth in Western Sydney, demand for usage of the airport from this area will increase.
- Continued growth in business, the strength of emerging international markets such as China and India and the development of new innovative Low Cost Carrier (LCC) markets will be significant drivers of demand growth which will need to be accommodated in the Sydney region.

Civil aviation activity in the Sydney region includes a diverse range of operations that can be grouped into three main types of activity - regularly scheduled passenger movements available to the public (RPT),³⁸ the movement of air freight, and GA activity.

Military activity is another relevant component of aviation in the Sydney region, with a number of key aviation bases supporting military-related operations in the area. While examination of military aviation activity is not part of the Terms of Reference for this Joint Study, an estimation of the future operational frequency and types of services within the region is important in understanding the interaction between civil and military facilities and the potential for military facilities to help in meeting civil aviation requirements.

This part of the Report looks at the trends and characteristics of historical and future demand, considering the different types of aviation activity. It also considers the variation in demand for different aerodromes in the Sydney region.

For the purposes of this Joint Study, the Steering Committee has considered a number of key aerodromes across the broader Sydney region, from RAAF Base Williamtown (Newcastle Airport) in the north to Canberra Airport in the south.

Details of these key aerodromes, their physical layout, pattern of operation and scope for development are detailed in greater depth in Technical Paper A1.

Figure 26 shows the location of the key RPT, military and GA aerodromes examined.

³⁸ RPT refers to the movement of passengers or freight on a scheduled basis for a fee. For the purpose of this Report, RPT is limited to the discussion of passenger movements, with passengers on such services referred to as RPT passengers. Freight movements are considered separately.



Note: Map is not an exhaustive representation of all aerodromes in the mapped area. Source: Australian Department of Infrastructure and Transport.

3.1 Historical demand for aviation in the Sydney region

Despite some challenging conditions, including the aftermath of September 11, 2001, the collapse of Ansett Australia in September 2001 and the Global Financial Crisis in 2008, Sydney region airports have experienced growth in aviation activity over the past decade (2000 to 2010). This growth was facilitated by a number of key factors including:

- the opening of the domestic market to increased competition with the removal of the 'two airlines' policy in 1990–91 and the associated deregulatory measures;
- widespread liberalisation on a number of major international routes, such as the Single Aviation Market with New Zealand, 'open skies' arrangements with the United States, open capacity arrangements with Singapore and the UK and the substantial expansion of capacity under air services arrangements with China and the Middle East; and
- technological change in the aviation industry, with larger, more fuel-efficient aircraft, greater operating ranges and the introduction of regional jets.

In addition, the emergence of successful LCC business models, first with Virgin Blue (now Virgin Australia) and more recently with Jetstar and Tiger Airways Australia, has stimulated growth in smaller regional airports around Australia, including at Newcastle Airport. As a result, there has been rapid growth in new point-to-point market segments, with LCCs replacing regional or charter services. There is also increasingly a merging between the LCC and traditional full-service carriers, particularly given that the LCC model is increasingly embracing international operations as well as domestic, which will bring growth opportunities to more sectors.

RPT

There are only three airports in the Sydney region at which scheduled RPT services currently operate – Sydney (Kingsford-Smith) Airport, Canberra Airport and Newcastle Airport (located inside the boundary of RAAF Base Williamtown). These airports serve the Sydney region as well as a broader geographical area.

Between 2000 and 2010, together they have experienced passenger growth of a total of 50 per cent, from 26.8 million to 40.1 million passenger movements per year. Strong growth of six per cent per year³⁹ has been experienced since 2002, driven by the recovery after the events of 2001 and the emergence of the LCCs.

Figure 27 shows the growth over the last 10 years across the region's three RPT airports, broken down by international, domestic and regional (intrastate) markets.⁴⁰

³⁹ Throughout this Report, where a growth rate is presented or discussed it represents a compound annual (or year-on-year) growth rate (CAGR) unless otherwise stated.

^{40 &#}x27;Regional' is defined as services to and from destinations within NSW other than Sydney. As such, flights between Canberra and Sydney (Kingsford-Smith) Airport are defined as domestic, but flights between Canberra and the rest of NSW are defined as regional. Additionally, flights between Newcastle and Sydney airports are regional. All other flights to non-capital-city centres outside of NSW are defined as domestic.



Figure 27 Sydney region RPT passenger movements by market, 2000 to 2010

Source: Booz & Company, based on BITRE data.

Aircraft movements in the region decreased more dramatically and have grown less quickly than passenger growth, with the total number of movements only now returning to the levels seen in 2000 before the collapse of Ansett Airlines. This is illustrated in Figure 28.



Figure 28 Sydney region RPT aircraft movements by airport, 2000 to 2010

Source: Booz & Company, based on BITRE data.

This is consistent with trends for:

- the use of larger aircraft to operate each service, enabling more passengers to be carried per aircraft movement (aircraft upgauging); and
- airlines employing business practices to ensure a greater proportion of their seats are occupied (or increasing 'load factors').

As shown in Figure 29, between 2001 and 2010 the average number of seats provided on each service across Australia increased from approximately 138 to 173 seats for domestic aircraft, 28 to 45 seats for regional aircraft and 250 to 289 seats for international aircraft. This is reflected in the types of aircraft being operated. For example, in many regional areas jet services have been introduced to replace turboprops, while larger aircraft, including the A380, have also been introduced for international services.

Figure 29 Seat capacity on aircraft movements in Australia, by market type, 2001 to 2010



Source: Booz & Company, based on BITRE data.

Figure 30 shows the load factors (percentage occupancy) of services operating domestic and international services to and from Australia from 2000 to 2010. While they fluctuate, they show a general increasing trend: the average domestic passenger load factor increases from 76.5 per cent in 2000 to 80 per cent in 2010 and the average international load factor increases from 69 per cent in 2000 to 75 per cent in 2010.

That means that not only has there been a trend towards the use of larger aircraft with more seats per aircraft movement but also the occupancy is greater, with a higher percentage of seats occupied on average on each service.



Figure 30 Average load factors on RPT services in Australia, by market type, 2000 to 2010

Source: Booz & Company, based on BITRE data.

International, domestic and regional RPT

While there has been overall RPT growth, it has not been uniform across the different parts of the RPT market. As shown in Figure 31, at Sydney (Kingsford-Smith) Airport, the only airport in the region in which international services regularly operate, the number of international passenger movements has increased by more than 40 per cent in total, from 8.2 million to 11.5 million, between 2000 and 2010. This represents a 3.4 per cent increase per year.



Figure 31 Sydney region – international passenger movements, 2000 to 2010

Year

Source: Booz & Company, based on BITRE data.

Figure 32 shows the number of domestic passenger movements in the region between 2000 and 2010 - a total increase of more than 60 per cent from 16.3 million to 26.5 million. This represents a five per cent increase per year.



Figure 32 Sydney region – domestic passenger movements by airport, 2000 to 2010

Unlike the international and domestic passenger movement growth, Figure 33 shows a more fluctuating rate of regional passenger movements. After a peak of 2.3 million passengers in 2000, regional passenger activity dropped to 1.8 million passengers per year for 2002 and 2003 before recovering to levels between 2.0 and 2.3 million per year between 2004 to 2010. Overall, a growth rate of 2.5 per cent per year was experienced from 2002 to 2010, following the loss of services from Ansett Australia; activity for the decade is still slightly lower than the peak in 2001 (or a 0.4 per cent per year decline from 2000 figures).

Some of the fluctuation can be attributed to the changes in intrastate routes. The collapse of Ansett in 2001 resulted in a substantial reduction in regional services. In 2010 a number of the top 10 routes were to leisure destinations such as Ballina, Port Macquarie and Coffs Harbour. Since 2000, seat capacity on these routes has increased by approximately 180, 150 and 140 per cent respectively, indicating a move to larger aircraft. In contrast, five regional routes (Taree, Narrabri, Newcastle, Cooma and Grafton) have reduced seat capacity substantially since 2000, and a further nine services (Belmont, Casino, Cowra, Deniliquin, Forbes, Gunnedah, Inverell, West Maitland, Wollongong) no longer operate.

Source: Booz & Company, based on BITRE data.



Figure 33 Sydney region – regional passenger movements by airport, 2000 to 2010

Source: Booz & Company, based on BITRE data.

RPT by travel purpose – business and leisure travel

Passengers choose to fly for a range of purposes, including business, leisure, visiting friends and family, education, or for other commercial, sporting or cultural events.

The demands of business and leisure travellers differ. In general, business demand is driven by need, with peak travel times correlating to business hours to enable passengers to arrive in time for morning commitments or depart late in the afternoon. Business travel typically generates a higher yield per passenger and is a key market for full-service carriers. This is demonstrated by the substantial investments in frequent flyer programs, lounges and other services by these airlines.

In contrast, leisure passengers are typically more price sensitive and have more flexibility in service choice. For example, they might be willing to travel further or at a less convenient time for cheaper flights. Budget-conscious leisure travellers are a key market for LCCs, which can offer service times that fall outside of business peak times such as early morning and late evening and which offer lower fares, reflecting lower service levels and operating costs.

Booz & Company's analysis suggests that, in 2010, of the three RPT airports, Newcastle Airport's business traffic constituted a considerably smaller share of total traffic than that of Canberra Airport or Sydney (Kingsford-Smith) Airport (14 per cent, compared with 29 and 25 per cent respectively). The comparison is shown in Figure 34.



Figure 34 Sydney region - business traffic as a share of passenger movements by airport, 2010

Note: The analysis aggregates NVS and IVS data on travel purpose such that:

business passengers include those travelling for work, to attend conferences, exhibitions or conventions, or as part of employed research, or for work-related training; and

other traffic (broadly, leisure passengers) includes those travelling to visit friends and relatives; for holiday, leisure, relaxation, entertainment or sport; to shop; to attend special events; as an incentive reward provided by an employer; or to accompany someone attending a conference.

Source: Booz & Company analysis.

In addition, whereas 20 per cent of international traffic in the region was for business purposes, more than 25 per cent of domestic and regional passengers travelled for business.

Data from Tourism Research Australia's National and International Visitor Surveys (NVS and IVS) show an even more significant difference in business and leisure travel between user types. Figure 35 provides a breakdown of RPT by travel purpose (business, leisure, visiting friends and relatives) based on the different origins and destinations of airport users in the Sydney region. It breaks down airport traffic into Sydney residents travelling domestically, other Australian residents travelling to the region (domestic visitors), international (inbound) visitors to the region, and Australian residents travelling overseas (outbound travellers) through Sydney (Kingsford-Smith) Airport.41

41 Further information on aviation users can be found in Technical Paper A2.



Note: Total percentages may not equal 100 per cent due to rounding. The NVS does not provide information on which airport was used. It is presumed that a majority used Sydney (Kingsford-Smith) Airport, with a small proportion using Newcastle and Canberra airports.

Source: BITRE, analysis of NVS and IVS data for 2004 to 2009 (Tourism Research Australia).

This data shows that half of the domestic visitors travelled to Sydney for business, while a smaller proportion (43 per cent) of Sydney residents travelled to other Australian centres for business purposes. In terms of international movements, a quarter of international outbound travel was for business purposes, as compared with 19 per cent of inbound international travel.

This underscores the importance of Sydney as a business centre for the country and the critical nature of international business travel access for the Sydney economy. It also highlights the importance of business travel peaks in driving demand for use of the airport.

The 'other' category within the inbound international market is also significant, as it partly consists of the large volume of international students arriving in Sydney.

RPT by service type – LCC and full service carriers

LCCs have further segmented the RPT market beyond the traditional 'full service' first, business and economy class model that previously characterised the RPT market. Typically, full service carriers have provided a price and seating structure based on varying levels of service, food and other facilities. Under the standard LCC model, traditionally such carriers have sought to pare back the benefits of all-inclusive fares in exchange for lower ticket prices.

Figure 36 considers the distribution, from 2006 to 2009, of all passengers (domestic, regional and international) between major Australian airlines, LCCs and other airlines. Qantas (including QantasLink) accounted for the largest proportion of passengers at airports in the Sydney region (41 per cent), followed by the then Virgin Blue / -V Australia (24 per cent). A number of LCCs (including Jetstar, Tiger Airways Australia, the then Polynesian Blue and Pacific Blue, and Freedom Air) accounted for 14 per cent of all passengers, representing a larger share of the domestic sector compared with international sectors.⁴²

⁴² As of December 2011, a number of airlines including Virgin Blue, V Australia and Pacific Blue have been operated collectively under the name 'Virgin Australia'. Polynesian Blue has been renamed Virgin Samoa.

Figure 36 also shows that LCCs captured only a very small share of business-related domestic air trips at Sydney region airports (seven per cent, as compared with 17 per cent for all domestic passengers).





Source: BITRE, Airport Traffic Statistics 2006 to 2009 and NVS data for 2006 to 2009 (Tourism Research Australia).

Despite a smaller share of passengers, the LCC market has grown markedly in recent years and is expected to continue to grow. Figure 37 shows the increase in share of seats provided by LCCs. As shown, LCCs have been the key to growth in aviation services.



Figure 37 Sydney region – LCC share of scheduled seat capacity, 2004 to 2010

NOTE: Shows seats available for sale by airlines (rather than actual movements discussed in other sections of this Report). Includes services provided by Virgin Australia (then called Virgin Blue), which at the time was branded as an LCC. Source: Booz & Company, analysis of SRSanalyser. This is likely to continue as the division between LCCs and full service carriers becomes increasingly blurred. Full service carriers are seeking to reduce operating costs and are using yield management practices in an effort to remain competitive in terms of cost. Some LCCs are also diversifying their service offerings, providing premium economy or business class options for some segments and other services such as terminal lounge access. LCCs are now offering long-haul low-cost options.

To meet the future aviation demand, it will be important to address the requirements of carriers across all service options.

RPT by aerodrome

Levels of operations have also grown at each of the region's three RPT airports but at different rates, reflecting the different mix of activity provided at each airport.

Sydney (Kingsford-Smith) Airport

Sydney (Kingsford-Smith) Airport is Australia's most connected domestic and international airport and is currently Australia's busiest domestic and international airport in terms of passengers. Total passenger movement numbers continue to increase despite the growth of services at other airports, including the growth of international services to other locations.

In 2010, Sydney (Kingsford-Smith) Airport handled the vast majority (89 per cent) of the region's RPT traffic, facilitating throughput of 35.7 million passenger movements (including all of the region's international passenger movements) and 286,600 RPT aircraft movements. It was the world's 27th busiest international airport in terms of international passenger numbers.⁴³

To put this in context, just the last five years of growth at Sydney (Kingsford-Smith) Airport, 7.2 million passengers, is the equivalent of all the activity in 2010 at Adelaide Airport, the fifth busiest airport in Australia (at 7.3 million passenger movements in 2010).

As shown in Figure 38, the largest contributor to passenger growth at Sydney (Kingsford-Smith) Airport was domestic traffic, which comprised just over 60 per cent of the airport's passenger market. There were 22.2 million domestic passenger movements in 2010.



Figure 38 Sydney (Kingsford-Smith) Airport passenger movements by market, 2000 to 2010

Source: Booz & Company, based on BITRE data.

As discussed earlier, international services also continued to grow. In contrast, regional passenger movements at Sydney (Kingsford-Smith) Airport have only recently returned to levels comparable to those before 2001 (2.01 million passenger movements in 2010 compared with 2.04 million passenger movements in 2000).

Growth in the number of aircraft movements at Sydney (Kingsford-Smith) Airport has been slower than growth in the number of passengers because of fleet upgauging. As shown in Figure 39, the number of RPT aircraft movements at Sydney (Kingsford-Smith) Airport (excluding dedicated freight services and GA) grew from 221,500 in 2002 to 286,600 in 2010. Total aircraft movements at Sydney (Kingsford-Smith) Airport did experience a sudden drop following the collapse of Ansett in September 2001 before a period of strong recovery.

Regional aircraft movements comprised a relatively large share of movements, despite the aircraft having significantly lower passenger numbers due to the smaller aircraft size.



Figure 39 Sydney (Kingsford-Smith) Airport RPT aircraft movements by market, 2000 to 2010

Source: Booz & Company, analysis of BITRE data.

Canberra Airport

Canberra Airport is the region's second largest airport, supporting eight per cent of its RPT passenger movements. As shown in Figure 40, in the decade between 2000 and 2010, the number of passenger movements at Canberra Airport increased from two million to 3.3 million (a total 65 per cent increase between 2000 and 2010 or 4.9 per cent per year).

Canberra Airport currently provides direct passenger services to 12 domestic destinations, including all capital cities, the Gold Coast, Townsville, Newcastle, Tamworth and Albury.

The focus of services to and from Canberra Airport continues to be domestic services, consistently accounting for 99.9 per cent of all passenger movements, even though regional passenger activity at the airport has tripled from 11,900 to 38,000 passenger movements in the same period. One-third of all Canberra Airport's passenger movements in 2010 involved traffic to and from Sydney.

Canberra Airport had a small number of international RPT movements in 2004, when Air Pacific offered a service between Canberra and Fiji for a number of months.⁴⁴ However, no regular international services have since operated to the airport.

44 Australian Department of Infrastructure and Transport



Figure 40 Canberra Airport passenger movements by market, 2000 to 2010

In terms of aircraft movements, following a decline after the events of September 11, 2001, and the collapse of Ansett, Canberra Airport returned to growth from 2002 driven by the introduction of services by Virgin Blue (now Virgin Australia). The number of aircraft movements has still not returned to the peaks of 2000 and 2001, as shown in Figure 41. Analysis shows a significant factor influencing this is the use of larger aircraft; load factors have remained comparatively consistent, averaging around 66.5 per cent over the last 10 years.



Figure 41 Canberra Airport RPT aircraft movements by market, 2000 to 2010

Source: Booz & Company, based on BITRE data.

Source: Booz & Company, based on BITRE data.

Newcastle Airport

Newcastle Airport operates with limited civil capacity as part of RAAF Base Williamtown. In 2010, it was the fifth largest non-capital city airport in Australia, in terms of passenger movements, after Gold Coast, Cairns, Townsville and Launceston. It currently provides domestic and regional services only, and accounts for three per cent of RPT passengers in the Sydney region.

Newcastle Airport has experienced annual growth since 2000 of 17.8 per cent per year, with a particularly rapid increase since 2003 of 27.1 per cent per year. This was driven by the introduction of jet services by Virgin Blue in November 2003 and Jetstar in May 2004.⁴⁵

Excluding regional traffic, the growth in domestic traffic has been even more dramatic, with domestic passenger movement numbers increasing from 32,600 in the year 2000 to more than one million in 2010. A slight plateau has occurred, particularly in domestic passenger movements, since 2008.

In contrast, regional passenger movements declined from 198,500 to 106,300 (a total reduction of 46 per cent or 6.1 per cent per year) over the same period. Figure 42 shows the large increase in interstate passenger movements over a very short period of time, underlining the major shift in the market for the airport.

Traffic at Newcastle Airport is dominated by LCC airlines: Jetstar provided 68 per cent of scheduled seats in 2010, followed by Virgin Australia with 21 per cent. QantasLink, Brindabella Airlines, Aeropelican and Norfolk Air provided the remaining services. Routes to and from Brisbane, Melbourne and the Gold Coast supported the largest share of passenger movements at the airport (50 per cent, 30 per cent and 10 per cent respectively), followed by Sydney with five per cent. Other destinations include Canberra, Narrabri and Norfolk Island.



Figure 42 Newcastle Airport passenger movements by market, 2000 to 2010

Year

Source: Booz & Company, based on BITRE data; actual movements may vary slightly due to rounding. 45 Newcastle Airport Limited, Newcastle Airport Master Plan, 2007. Aircraft movement numbers fell from a peak of 17,000 in 2000 to 11,000 in 2003, mainly due to the collapse of Ansett and the impact on air travel of the events of September 11, 2001.

Figure 43 shows the change in aircraft movement numbers since 2000, with overall decline from the peak in 2000. The decline has been in regional movements (a decline of nine per cent per year between 2000 and 2010). The number of domestic movements has continued to increase over the 11-year period, with only a temporary reduction in 2002 and 2003.





Source: Booz & Company, based on BITRE data.

Sources and locations of RPT demand in the Sydney region

The Steering Committee sought advice on the location of people who are more likely to use aviation services so that it understood where demand is primarily generated within the Sydney region.

Analysis of NVS data shows that residents from some Statistical Local Areas (SLAs) had a noticeably higher propensity to travel than others. A larger number of aviation trips were undertaken by residents in Warringah, Ku-ring-gai, Randwick, North Sydney, Sutherland Shire West and Baulkham Hills Central. In contrast, residents in the Fairfield West, Bankstown North West, Parramatta South and Wollondilly SLAs took relatively fewer trips.

The patterns remain consistent when comparing domestic and international outbound trips by Sydney region residents. Figure 44 shows that, of the NSW planning subregions, residents of the South (including Sutherland (East and West) and Marrickville) have the largest share of use (12.5 and 12 per cent each of domestic and outbound trips) followed by those in the North West (10.9 and 10.1 per cent of outbound domestic and international trips respectively) and Inner North (10.9 and 10.4 per cent respectively). Illawarra and the Lower Hunter accounted for between four and six per cent of each type of trip.



Figure 44 Share of outbound trips made by residents in the Sydney region, 2004 to 2009

Note: Figure shows information from residents of the Sydney region in response to the question: 'where do you live'. It excludes trips made by international visitors and those travelling domestically from other parts of Australia to Sydney. Sydney subregions may vary in population or land area.

Source: BITRE analysis of NVS data for 2004 to 2009 (Tourism Research Australia) aggregated into NSW planning subregions.

Figure 45 maps out this information in more detail using aggregated NVS data and deidentified frequent flyer data from major airlines.



Figure 45 Distribution of air trips in the Sydney region, by suburb

Source: BITRE analysis of NVS data for 2004 to 2009 (Tourism Research Australia) and deidentified frequent flyer data from major airlines. Dots show the centroids of the suburbs identified.

Data published by Sydney Airport Corporation Limited (SACL) from 2006 is aggregated slightly differently but, similarly, it shows the highest usage in Inner Sydney, Lower Northern Sydney, St George–Sutherland, Northern Beaches and the Eastern Suburbs areas, with less usage from the Illawarra to Wollongong, outer South West and Newcastle areas.

Location is not the only factor that impacts on access to air services. The use of air travel varies a great deal across different demographic and socio-economic groups. In particular, research has shown that there is a higher representation by high income earners among air travellers. This is demonstrated in Figure 45: those from inner city regions are the highest income earners and also take the largest number of trips.

Figure 46 shows the incomes identified by Sydney residents travelling domestically, domestic visitors (other Australian residents travelling to Sydney) and outbound passengers (residents travelling overseas).⁴⁶ In particular, 28 per cent of Australians lived in a household earning more than \$104,000 per year, with this group accounting for between 50 per cent and 61 per cent

⁴⁶ Data on inbound international passengers was not available.

of passenger trips. In contrast, 39 per cent of the population, earning less than \$52,000, only accounted for 11 per cent to 17 per cent of trips.⁴⁷



Figure 46 Passenger type at Sydney region airports by household income, 2004 to 2009

Note: Greater Sydney Metropolitan Area (GMA) covers the Sydney and Illawarra Statistical Divisions and the Newcastle (or Lower Hunter) Statistical Subdivision. Income information was not available for international visitors. 'Don't know' and 'refused responses' to the income question were also excluded (18 per cent of visitors).

Source: BITRE analysis of NVS data for 2004 to 2009 (Tourism Research Australia).

In terms of purpose of travel, the NVS suggests high income earners (defined as having a household income of more than \$104,000 per year) also dominate business travel, with 71 per cent of passengers travelling for business purposes in 2004 to 2009. This income category is also overrepresented among passengers travelling for non-business purposes, with a 46 per cent market share. The trend towards increased outbound travel by Australians since 2005, however, was largely driven by middle income households taking outbound trips for leisure purposes, as NVS data shows a greater increase in outbound travel by these households.

Age, gender, employment status, education and household status and structure showed similar relationships with income and business travel. Regression analysis undertaken by the Bureau of Infrastructure, Transport and Regional Economics (BITRE) found there was noticeable correlation between the age of a person and their frequency of travel. Australians aged 15 to 19 years and those over 65 were found to have the lowest rate of air travel per capita, while males aged between 35 and 54 were found to be the most prolific air travellers.

The use of LCCs generally follows the same broad patterns across demographic categories as overall airline usage. However, the limited penetration of the business travel market by LCCs means they capture a relatively small proportion of high-income domestic air travellers (14 per cent of households earning over \$104,000 per year) and the full-time employed (15 per cent). In contrast, they capture a much higher share of students travelling domestically by air (27 per cent) in Australia.

As shown in Figure 47, there is a relationship between passenger incomes and the types of airlines on which they travel: 26 per cent of low income earners travelled on the LCCs Jetstar and Tiger in 2006–09 compared with 14 per cent for high income earners. Similarly, 55 per cent of high income earners travelled on Qantas compared with 14 per cent on LCCs. The share of

usage of Virgin Blue (now Virgin Australia) remained consistent with this trend as it evolved from its LCC origins to more recent times.



Figure 47 Domestic air trips by household income and airline, Australia, 2006 to 2009

Note: Data analysed responses from around Australia, not just the Sydney region, for domestic overnight stays. Airlines in the 'other' category include Regional Express and Skywest. Excludes trips with unknown airlines. Income information was not available for international visitors. 'Don't know' and 'refused responses' to the income question were excluded from the chart.

Source: BITRE analysis of NVS data for 2006 to 2009 (Tourism Research Australia).

These factors are indicative of the demographic characteristics which may be associated with air travel. In addition to demographic characteristics, airlines' services offering (such as pricing, frequency of services and destinations) was considered to have the largest influence on demand for certain airports. This is particularly the case for international travellers, as the range of services available tends to vary between airports.

Whereas most capital cities provide a variety of domestic services, international services may be more limited. Sydney (Kingsford-Smith) Airport is a connection point for:

- 65 per cent of Canberra's international passengers, 22 per cent of Adelaide's international passengers and nine per cent of Melbourne's and Brisbane's international passengers; and
- five per cent of Perth's international passengers.⁴⁸

From a domestic perspective, the proportion of passengers at other airports which connected via Sydney (Kingsford-Smith) Airport was slightly smaller (between four per cent and nine per cent). Put another way, while the domestic catchment may be considered to be the airport's surrounding region, international air travel draws its demand from across the country.⁴⁹

Air freight

Aviation plays an important role in moving freight, especially low-volume, high-value freight. The average value of air cargo, by weight, is in the order of 300 to 350 times that of sea cargo.⁵⁰ While air freight represents one-tenth of a per cent of total Australian international trade by volume, it represents approximately 24 per cent of Australia's total international trade by value.

⁴⁸ Booz & Company analysis.

⁴⁹ Booz & Company analysis.

⁵⁰ The average value of air cargo is \$117.90 per kg versus 36c per kg for sea cargo (Booz & Company analysis of Australian Transport Statistics 2007, BITRE 2005–06).

Air freight is particularly important for same-day and overnight transport for time-critical or perishable goods such as seafood, medical supplies, newspapers, banking and express post. Increasingly, it supports new manufacturing and trade models – for example, 'just-in-time' business, where component parts or stocks are maintained in a limited number of central depots and dispatched to the point of need as required. The quicker transit times also allow businesses, including importers and exporters, to be more responsive to immediate market needs, taking advantage of market and price (including exchange rate) opportunities.

The majority of freight is carried in the cargo hold of passenger aircraft and the major air freighthandling facilities are co-located with passenger operations at major airports. Consequently, Sydney (Kingsford-Smith) Airport, as the main international airport and domestic hub, dominates international and domestic air freight. In 2010, the Sydney region's airports handled approximately half a million tonnes of air freight, with the bulk (more than 95 per cent) being handled by Sydney (Kingsford-Smith) Airport.

There is currently no freight-only civil airport in the Sydney region. However, a number of airlines provide dedicated freight transport services. At Sydney (Kingsford-Smith) Airport, this includes Qantas, Australian air Express (a Qantas Freight joint venture with Australia Post), and Virgin Australia working with Toll Air Express and Tasman Cargo Airlines/DHL. Emirates, Cathay Pacific Airways, Federal Express, Korean Air, Malaysia Airlines, Singapore Airlines, Cargolux and United Parcel Service also operate dedicated international freight services to and from Sydney (Kingsford-Smith) Airport.⁵¹

Six of the top 10 international air freight flows for Australia occur through Sydney (Kingsford-Smith) Airport, including routes to and from Auckland, Hong Kong, Singapore, Los Angeles and Bangkok. In particular, Sydney (Kingsford-Smith) Airport plays a significant role in air freight flows from New Zealand to Asia and Europe. (As a comparison, it handles almost twice the volume of air freight from New Zealand than that being moved through Melbourne).⁵²

Dedicated freight services currently account for 30 per cent of inbound international and 20 per cent of outbound international freight tonnage at Sydney (Kingsford-Smith) Airport; they also account for 25 per cent of domestic freight. More recent data suggests this may be increasing slightly, although it is unclear yet whether this will develop into a long-term trend given the economics of dedicated air freight services vis-à-vis freight carried in the cargo hold of passenger aircraft.

Australian Department of Infrastructure and Transport, International Airlines Timetable Summaries Northern Winter 2011–12, 2011
 Booz & Company analysis of BITRE data.



Note: Peak for freight in cargo hold was due to an incidental spike in commercial opportunity. Source: BITRE.

In terms of aircraft movements, dedicated international and domestic freight accounts for approximately 2.4 per cent of movements throughout the year at Sydney (Kingsford-Smith) Airport.

Canberra Airport is seeking to expand its dedicated freight capacity, including as a centre for freight services in the region, having already built significant air freight hangar and distribution facilities for Australian air Express and also supporting Toll and Corporate Air services. In addition, both Newcastle and Bankstown airports anticipate that they will handle increased air freight volumes.

International air freight

A significant portion (approximately 400,000 tonnes) of freight in the Sydney region in 2010 was international. This represented approximately 50 per cent of Australia's international air freight. As the only current provider of international air freight in the region, Sydney (Kingsford-Smith) Airport is particularly important.⁵³

According to Customs clearance data obtained through the ABS, in 2010 air freight imports through Sydney (Kingsford-Smith) Airport were valued at \$33.3 billion, while air freight exports were valued at \$13 billion. Compared with 2009, the value of air freight imports in 2010 increased by 0.6 per cent and the value of air freight exports increased by 1.4 per cent.

Nearly all (96.9 per cent) of the imported air freight cleared at Sydney (Kingsford-Smith) Airport was destined for NSW, while half of the exports departing from the airport originated in NSW. Another 15 per cent of exports originated in Victoria, while 23 per cent was identified as Foreign Origin (for example, re-exported after arriving into the country by air).⁵⁴

⁵³ Melbourne Airport provides the next largest share of inbound and outbound freight of 25 and 30 per cent respectively.

⁵⁴ Data analysis by BITRE. Note that the data does not distinguish the ultimate point of origin or destination of the goods or the most immediate stop (for example, a redistribution facility to other destinations in the region or across the country).

Domestic and regional air freight

Airports in the Sydney region handled more than 100,000 tonnes of domestic air freight in 2010, representing between 25 and 30 per cent of Australia's domestic freight.⁵⁵ Again, Sydney (Kingsford-Smith) Airport handled approximately 95 per cent of this.

The limited data available on domestic freight suggests that movements through Sydney (Kingsford-Smith) Airport decreased by 5.6 per cent in tonnage between 2006 and 2010.

More than 90 per cent of the domestic freight moved from Sydney (Kingsford-Smith) Airport to other areas of Australia originated from the Sydney area. In terms of inbound domestic freight, more than 85 per cent of domestic freight arriving at Sydney (Kingsford-Smith) Airport was shipped from other capital cities (Melbourne–Sydney, Brisbane–Sydney and Perth–Sydney).

In terms of other airports in the region, BITRE estimates that Newcastle Airport handled more than 100 tonnes of domestic freight, while between 2,500 and 3,500 tonnes of domestic air freight was carried to and from Canberra Airport in 2010–11 (approximately 22 per cent of this was to and from Sydney (Kingsford-Smith) Airport). Melbourne and Brisbane are the other key freight routes to and from Canberra Airport.

Bankstown Airport supported one dedicated freight operator, which moved approximately 2,400 tonnes of freight in 2010. The majority of this was carried by small aircraft in the late evening and early morning.

General Aviation

GA is often used as a catch-all term for the range of aviation activity that is not commercial (passenger or freight), state or military operations. This includes activities such as private leisure flying or sightseeing operations, emergency (aero-medical, search and rescue, fire fighting) services, pilot training, surveying and aerial photography, and aero-agriculture services. It usually also refers to niche charter services (passenger or freight) operated on an ad-hoc basis.

Currently, a level of GA operations take place at all major airports in the Sydney region and are also accommodated at several aerodromes that provide services solely for GA. Together, at these airports there were more than 400,000 aircraft movements in 2010, at facilities ranging from small grass strips and privately-owned clubs to larger commercial operations such as Bankstown Airport.

Figure 49 Sydney region, share of GA movements, 2010



Source: Booz & Company analysis, BITRE and Airservices Australia data.

⁵⁵ Share consistent over the last five years.

Bankstown Airport is one of Australia's two busiest airports in terms of aircraft movements.⁵⁶ Despite a number of fluctuations (as shown in Figure 50) resulting from the difficult business environment for some GA operations (particularly smaller flight training schools), it has supported an average 310,000 movements per year over the last 10 years. These movements are predominantly flight training (including for large numbers of international student pilots), freight, emergency services and charter. Approximately 260 aircraft are permanently based at the airport. The majority of aircraft are single-engine piston aircraft (nearly 70 per cent) and twinengine piston aircraft (nearly 22 per cent).





Financial Years

Source: Booz & Company, from Bankstown Preliminary Draft Master Plan 2010 for data 2000–08, Airservices Australia data 2008–11.

Camden Airport is the next busiest airport, accommodating approximately 20 per cent of the region's GA movements. Camden Airport is predominantly used for sport aviation, private flying, flight training and hot air ballooning activities. It also serves as Sydney's main glider facility.

The RPT airports also provide a level of GA services. These are usually business jet services, which often require larger runway capacity (length and strength) than the piston and turboprop aircraft primarily used in the GA market. For example, analysis of the planning day profile⁵⁷ for Sydney (Kingsford-Smith) Airport shows that 60 per cent of GA movements (24 of the total 40 GA movements on that day) were by corporate charters operating Code B/C aircraft (such as Beechcraft Super King Air 200) and business jets (such as the Dassault Falcon 2000 and the Learjet 60). GA also accounts for approximately five per cent of the airport's aircraft movements.

Canberra and Newcastle airports provide for approximately six per cent and four per cent respectively of the GA movements in the region. Beside RAAF Base Williamtown, some military aerodromes in the region are also open, on a limited basis, to GA services. They include HMAS Albatross and RAAF Base Richmond.

56 The other airport is Jandakot Airport in Western Australia; Bankstown Airport's relative primacy is subject to the fluctuations discussed in this section.

⁵⁷ Chosen by convention as the 30th busiest day.

Summary of current demand

- Aviation activities in the Sydney region are diverse and have been growing over the past decade.
- An analysis of historical information shows aviation activity in the Sydney region in 2010 consisted of:
 - 40.1 million RPT passenger movements and 344,000 RPT aircraft movements provided by Sydney (Kingsford-Smith) Airport, Canberra Airport and Newcastle Airport;
 - approximately 400,000 tonnes of international freight and more than 100,000 tonnes of domestic freight; this accounted for 50 per cent and 30 per cent of Australia's international and domestic air freight tonnage respectively;
 - more than 400,000 GA movements across a variety of aerodromes in the region.
- Sydney (Kingsford-Smith) Airport was the dominant airport in the region, supporting 89 per cent of RPT passenger movements and 95 per cent of freight tonnage.
- While there has been significant growth at both Canberra and Newcastle airports, aviation demand at these airports represents eight and three per cent of RPT passengers in the Sydney region respectively.
- As a large proportion of freight is carried in the cargo hold of passenger aircraft, demand for freight is linked to the provision of RPT services. GA growth has been modest compared with RPT. Bankstown Airport is the predominant airport for GA movements.

3.2 Future demand for aviation in the Sydney region

Over the next 50 years, projected population and economic growth in Sydney is expected to result in continued strong demand for aviation in the Sydney region.

Developing a forecast for unconstrained aviation demand

Booz & Company was engaged to develop an econometric model to assess future aviation demand. The forecasts were developed, based on historical trends and taking into account factors including economic growth, airfares and inbound visitor trends, to present an understanding of the level of demand for aviation over the short, medium and long term (10, 10–25 and 25+ years respectively). The forecasts also considered the sensitivities of demand to rising fuel prices as a result of future scarcity and carbon pricing objectives.

This part of the Report presents unconstrained forecasts – that is, forecasts that assume no capacity limitations, presuming factors such as aerodromes, terminal and air traffic space are adequately provided to meet demand.⁵⁸ The forecasts presented are based on historical actual movement data as opposed to scheduled data.

Other key assumptions for the model can be found at Technical Paper A3.

Total unconstrained demand in the region

Future demand for aviation in the Sydney region is expected to reflect a continuation of historic growth. As shown in Figure 51, unconstrained demand for aircraft movements for all air segments is projected to show steady growth over the next 50 years.

⁵⁸ Part Four of this Report compares the level of unconstrained demand with the capacity of existing infrastructure to establish where, and in what time frame there may be a shortfall in capacity over the period.

The fastest-growing segment is projected to be in RPT passenger movements. RPT aircraft movements are also forecast to increase although at a lower rate, given the trend towards the upgauging of aircraft is expected to continue.

Air freight tonnes carried in the cargo hold of passenger aircraft and in dedicated air freight aircraft are also expected to have relatively strong growth. Military and GA movement growth is projected to be comparatively more stable.



Figure 51 Sydney region – unconstrained aircraft movement demand, 2010 to 2060

Source: Booz & Company forecasts.

Regular Public Transport demand in the future

RPT is expected to grow substantially over the short, medium and long term.

In unconstrained conditions, RPT passenger demand in the region is forecast to rise from 40.1 million passenger movements in 2010 to:

- 57.6 million passengers in 2020;
- 87.4 million passengers in 2035; and
- 165 million in 2060 (as shown in Figure 52).

This exceeds all current domestic and international passenger movements throughout Australia (at 135 million in 2010).⁵⁹

Forecast growth represents a total increase of approximately 43 per cent, 120 per cent and more than 310 per cent on current passenger movement levels, or nearly three per cent per year over the next 50 years.

⁵⁹ Forecasts by Booz & Company; Australian figure from BITRE, *Airport Traffic Data* 1985–86 to 2010–11.



Figure 52 Sydney region – expected unconstrained passenger movement demand, 2010 to 2060

Source: Booz & Company forecasts.

Consistent with historical trends, it is expected that aircraft sizes will increase. Average seat capacity on domestic and international services in the forecasts was assumed to increase according to Table 5. Forecasts were developed based on an analysis of historical trends in aircraft seat capacity, together with the fleet mix, aircraft orders and aircraft retirement plans of the main airlines currently operating in, to and from Australia.⁶⁰

Market	2010	2015	2020	2030	2060
Domestic					
Sydney (domestic)	173	180	188	203	248
Sydney (regional)	45	50	55	65	95
Canberra	109	114	119	129	159
Newcastle	103	110	126	128	166
International	289	301	314	339	414

Table 5	Average aircraft	seat capacity, unconstr	ained forecast, 2010 to 2060
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Source: Booz & Company analysis.

Load factors are also expected to increase for Sydney international, Canberra and Newcastle domestic and regional services while remaining constant for the other market types. As a result, RPT aircraft movements are also expected to grow between 2010 and 2060 but at a slower rate than passenger movements.

Despite the anticipated upgauging of aircraft and associated increased passenger numbers per movement, demand for aircraft movements is expected, on an unconstrained basis, to increase from 344,500 movements in 2010 to:

- 421,200 movements in 2020;
- · 528,600 movements in 2035; and
- 800,800 movements in 2060 (as shown in Figure 53).

This represents a total increase of more than 20 per cent, 50 per cent and 130 per cent respectively on current movement levels, or 1.7 per cent per year, over the next 50 years.





Source: Booz & Company forecasts.

Domestic and regional RPT demand in the future

The projections identify a shift in the future passenger mix towards international services, relative to domestic and regional demand. As shown in Figure 54, domestic and regional markets together currently comprise the largest segment in terms of passenger movements.





Note: 2010 total movements do not add to 40.1 due to rounding. Source: Booz & Company forecasts.

Domestic and regional demand in the region is projected to increase on an unconstrained basis from 28.7 million passenger movements in 2010 to:

- · 39.2 million passenger movements in 2020;
- 56.8 million passenger movements in 2035; and
- 100.2 million passenger movements in 2060.

This represents total growth of nearly 40, 100 and 250 per cent respectively or 2.5 per cent per year between 2010 and 2060.

Demand for associated domestic and regional RPT aircraft movements in the region is projected to increase from approximately 282,000 in 2010 to 613,600 movements in 2060 (a total increase of more than 115 per cent, or 1.6 per cent per year).

International RPT demand in the future

In contrast, international passenger movements are expected to grow at a rate of 3.5 per cent per year between 2010 and 2060. Consequently, the unconstrained share of international traffic is projected to increase from 28.5 per cent of total passenger movements to 35 per cent in 2035 and to 39.1 per cent in 2060.

This trend is expected in part to be driven by increased economic activity in key international inbound markets, including China and India. In 2010, approximately:

- 56 million Chinese travelled overseas. This is projected to increase to 100 million in 2020;⁶¹
- 12 million Indians travelled overseas. This is forecast to rise to 50 million by 2020.62

⁶¹ Tourism Australia, China Market Profile 2011.

⁶² Tourism Australia, *India Market Profile 2011*.

Australia has historically captured a portion of this market, being China's 14th and India's 18th largest outbound markets.

China

China is currently Australia's fifth largest international market, with 1.7 million passenger movements in 2010. This represented a growth of 22 per cent on the previous year. Trips to Sydney comprised nearly 50 per cent of these movements (857,000 out of 1.7 million passenger movements).⁶³

In terms of international visitor arrivals, the Tourism Forecasting Committee expects demand from China to grow a total 110 per cent (or eight per cent per year) between 2010 and 2020. Key growth areas will be in family visits and education.⁶⁴

A comparison of services scheduled between Australia and mainland China between 2000 and 2010 shows a substantial increase in demand for and supply of services. In particular:

- in 2000, a total of four Australian and Chinese carriers provided 18 return services a week to Sydney (Kingsford-Smith) Airport; five of these also landed at Melbourne Airport en route; whereas
- in 2010, a total of four Australian and Chinese carriers provided 63 return services a week, including 39 to Sydney (Kingsford-Smith) Airport, 21 to Melbourne Airport and three to Brisbane Airport.⁶⁵

China Southern Airlines has introduced direct services to Perth and expanded its existing services to Melbourne and Brisbane. It has also made numerous public statements about its intention to grow Australian services to 110 services per week by 2015 – more than triple its current operations. Assuming Sydney maintains its market share, this would mean the equivalent of up to seven daily services to and from Sydney. The airline also recently announced that it hopes to establish a new 'Canton route' between Australia and Europe, via its base in Guangzhou, from June 2012, subject to slot availability.

In 2010, Chinese visitors replaced the Japanese as Australia's fourth largest inbound visitor market. Growth is expected to continue following a Memorandum of Understanding signed between the two countries to extend Australia's Approved Destination Status beyond leisure travellers to corporate incentives and education markets.⁶⁶

India

India is currently Australia's 10th largest international market. In 2010, there were 0.7 million passenger movements – an 8.6 per cent increase on the previous year. Nearly 40 per cent were to and from Sydney.

Forecasts from the Tourism Forecasting Committee suggest that this trend is expected to continue. Similarly, the number of visitors from India is expected to increase a total 115 per cent (or eight per cent per year) from 2010 to 2020, although from a substantially smaller base than the Chinese market. Key growth areas will be in family visits and business.⁶⁷

Figure 55 demonstrates the expected aviation demand in these two key markets as forecast by Booz & Company.

- Tourism Forecasting Committee, Forecast 2011 Issue 2, October 2011.
 Australian Department of Infrastructure and Transport. International Airli
- 65 Australian Department of Infrastructure and Transport, International Airlines Timetable Summaries Northern Winter 2000 and 2010, 2011.
- 66 Tourism Research Australia, Snapshots 2011 China Inbound and Outbound Travel; Tourism Australia, China Market Profile 2011.
- 67 Tourism Forecasting Committee, *Forecast 2011 Issue 2*, October 2011.

⁶³ BITRE, based on Australian Department of Immigration and Citizenship air passenger card data and ABS Overseas Arrivals and Departures.



Figure 55 Sydney (Kingsford-Smith) Airport – share of expected international passenger movement demand to and from China and India, 2010 to 2060

Source: Booz & Company analysis.

2015

2020

2025

2010

Providing for the growth of air services will be of great importance because, as demand increases, so do the associated benefits to the wider Australian economy. In 2010:

2030

 nearly 460,000 Chinese visitors spent almost \$3 billion in Australia. Based on historical trends, the Tourism Forecasting Committee expects this to grow to \$6.4 billion by 2020;

2035

Forecast Year

2040

2045

2050

2055

2000

 visitors from India generated \$870 million in total expenditure in 2010. This is expected to nearly double by 2020.⁶⁸

Approximately 43 per cent of Australia's Chinese community and 36 per cent of Australia's Indian community, approximately 40 per cent and 60 per cent of whom were born overseas, lived in Sydney in 2006.⁶⁹ With residents born overseas more likely to travel, outbound growth on these routes is also expected to continue. Demand from markets that are currently the source of a greater number of visitors, such as New Zealand, the United States (US) and the UK, is still expected to grow but at a slower pace.

Within the Sydney region, Sydney (Kingsford-Smith) Airport is currently the only airport to and from which international RPT regularly operate. A small number of international services are planned to commence operating from Canberra and Newcastle airports in the near future.⁷⁰ If successful, these additional services could provide important injections for regional business and tourism. However, it is considered unlikely that Canberra and Newcastle airports will capture significant amounts of the emerging markets, as the owners of both plan to target existing markets (for example, New Zealand and Singapore). In particular, it is not expected over the long term that such operations will diminish the total demand at Sydney (Kingsford-Smith) Airport but, rather, add to growth in the overall international sector.

⁶⁸ Tourism Forecasting Committee, Forecast 2011 Issue 2, October 2011.

⁶⁹ BITRE, analysis of ABS 2006 Basic Community Profile.

⁷⁰ A possible profile of forecast international services for Canberra and Newcastle airports is detailed further in Technical Paper A3.

In the Sydney region, unconstrained international RPT passenger demand is forecast to increase from 11.5 million movements in 2010 to:

- 18.4 million passenger movements in 2020;
- · 30.6 million passenger movements in 2035; and
- 64.4 million passenger movements in 2060.

That represents a total increase of more than 60 per cent, 165 per cent and 460 per cent respectively from 2010 figures, or 3.5 per cent per year between 2010 and 2060. The forecast indicates that, in 2060, unconstrained demand for international RPT passenger movements at Sydney (Kingsford-Smith) Airport will still account for at least 97 per cent of international passenger demand in the Sydney region.

Associated demand for aircraft movements is expected to increase from 62,500 aircraft movements in 2010 to 80,500 movements in 2020; 105,000 movements in 2035; and 187,100 movements in 2060 (a total increase of 200 per cent, or 2.2 per cent per year between 2010 and 2060).

Future RPT demand by travel purpose – leisure and business travel

In an unconstrained setting, business passenger demand in the region is forecast to grow from 10.1 million to 40.5 million passenger movements between 2010 and 2060, whereas leisure passenger demand is forecast to grow from 30 million to 124.1 million passengers over the same period. As is currently the case, the largest share of business traffic will travel through Sydney (Kingsford-Smith) Airport. Travel for leisure is a larger market than business travel, as shown in Figure 56 and is projected to grow slightly faster than business travel (at 2.9 per cent per year compared with 2.8 per cent per year for business). As a result, business travel will represent a smaller share of total traffic (24.6 per cent in 2060 compared with 25.2 per cent in 2010).



Figure 56 Sydney region – expected unconstrained passenger demand by purpose of travel, 2010 to 2060

Source: Booz & Company forecasts.

When considering the different levels of business and leisure demand across international and domestic and regional traffic, or between airports, the profile becomes more complex. In particular, at Sydney (Kingsford-Smith) Airport demand for business traffic as a share of the total domestic and regional forecast is expected to decline from 27.9 per cent in 2010 to:

- · 25.8 per cent of the total domestic and regional forecast in 2020;
- 24.1 per cent of the total domestic and regional forecast in 2035; and
- 23.3 per cent of the total domestic and regional forecast in 2060.

In contrast, demand for business traffic on international routes is expected to increase from a share of 19.8 per cent of total international traffic to:

- 21.0 per cent of the total international traffic forecast in 2020;
- · 22.9 per cent of the total international traffic forecast in 2035; and
- 26.2 per cent of the total international traffic forecast in 2060.

This can be attributed to the greater penetration of LCCs in the domestic market, stimulating local leisure travel, and to the growing importance of Sydney business in the international context.

Similarly, the domestic and regional business share of passenger demand to and from Canberra Airport is expected to increase from 28.5 per cent in 2010 to 31.4 per cent in 2060, while that at Newcastle Airport will decline from 14.1 to 13.2 per cent share of traffic over the same period. This demonstrates the different mixes of travel at the two airports, with Canberra facilitating volumes of government and parliamentary business travel and Newcastle facilitating a high proportion of leisure travel.

Future RPT demand by service type – LCC and full service carriers

The rise of LCCs is a significant driver of growth in the domestic tourism sector. This market is expected to continue to grow as increased competition encourages further reduction in fares.⁷¹

With LCCs now emerging in the international market, this is likely to provide similar growth opportunities for inbound and outbound tourists, as well as international business, as was experienced in the domestic sector. The Jetstar Group of Airlines are expanding to a wide range of destinations; its entry into the Japanese market demonstrated the potential to stimulate rapid growth in the tourism market, and this is likely to continue as its individual airline franchises explore growth in their local areas. The Pacific Blue and Polynesian Blue ventures (now Virgin Australia and Virgin Samoa) have similarly provided additional competition in the tourist and family visitation markets in the Pacific region.

The growth prospects for LCC operations are reflected in the expansiveness of their forward commercial plans. For example:

- the continued expansion of franchised LCCs (e.g. Tiger Airways/Tiger Airways Australia/ Thai Tiger; Air Asia Indonesia/Air Asia/Air AsiaX; Jetstar Japan/Jetstar Asia/Jetstar Australia);
- new LCC services are being introduced the Malaysian LCC Air AsiaX, which currently operates to the Gold Coast, Melbourne and Perth, will begin daily services to Sydney (Kingsford-Smith) Airport from mid-2012; and
- other airlines (such as Qantas Airways and Singapore Airlines) have developed so-called 'two-brand' strategies, investing in low-cost offshoots (Jetstar for Qantas, and more
- 71 In the forecasts presented in this Report, there is an assumption of continued reduction of airfares in the short term. It was assumed that, in the medium to long term, a continued decline in real airfares will become unsustainable and, therefore, airfares will stabilise in real terms.

recently Scoot Airlines for Singapore Airlines) to capture the benefits of both types of operations.

Airlines are also seeking to provide business service options (for example, flat beds and premium economy services) from a low cost base. The inclusion of business style offerings on these services is also providing new diversity in the market for international business travellers. It will be important to ensure that growth opportunities from these business models are catered for so that Australian airlines can remain competitive amidst these global trends.

Future RPT demand by aerodrome

Sydney (Kingsford-Smith) Airport

Sydney (Kingsford-Smith) Airport is expected to remain the most significant RPT airport in the region. Forecasts suggest unconstrained demand is expected to grow from 11.5 million international and 24.2 million domestic and regional passenger movements in 2010 to:

- 17.9 million international and 32.7 domestic and regional passenger movements in 2020;
- 29.7 million international and 47.1 domestic and regional passenger movements in 2035; and
- 62.7 million international and 82.9 million domestic and regional passenger movements in 2060.

This represents a total increase in all passenger numbers of approximately 40 per cent, 115 per cent and 310 per cent over the different time periods, or 2.9 per cent per year respectively between 2010 and 2060. This is consistent with historical growth patterns.

It is expected that demand at Sydney (Kingsford-Smith) Airport will be more than four and a half times the current number of passengers by 2060.

In terms of aircraft movements, unconstrained demand is expected to grow from 62,500 international and 224,000 domestic and regional aircraft movements in 2010 to:

- 76,900 international and 266,400 domestic and regional RPT aircraft movements in 2020;
- 99,700 international and 329,200 domestic and regional RPT aircraft movements in 2035; and
- 178,400 international and 474,300 domestic and regional RPT aircraft movements by 2060.

This represents more than 185 per cent and 110 per cent total increases respectively between 2010 and 2060.

There is a variety of forecasts available on Sydney (Kingsford-Smith) Airport. Both BITRE and SACL undertook forecasts up to 2029–30 (for SACL In the context of the consideration of SACL's *Sydney Airport Master Plan 2009*).⁷² For illustrative purposes Booz & Company have extrapolated these from 2029–30 to 2060 (as shown in Figure 57).⁷³

⁷² Aircraft movements through capital city airports to 2029-30, Research Report 117, 2010; currently approved Sydney Airport Master Plan 2009.

⁷³ Forecasts were undertaken from different base years with BITRE forecasting from financial year 2008-09; SACL from 2007 and the forecasts for this Report from 2010. These were rebased to 2015 so that comparison could be made from the same start point. For consistency, long-run growth rates were also assumed to moderate in all cases, in line with the forecasts of this Report. Further information can be found in Technical Paper A4.





Source: Booz & Company forecasts for Joint Study, and analysis of BITRE Research Report 117 and SACL Master Plan 2009

Figure 58 compares the Joint Study's forecasts of aircraft movement numbers with BITRE and SACL forecasts as extrapolated by Booz & Company. Comparing unconstrained aircraft movement forecasts show little variation between the forecasts for the short to medium term, especially between the Joint Study and the SACL Master Plan forecasts. There is larger divergence in the long term with BITRE forecasts; mainly because it assumes slower upgauging of aircraft, particularly for international passenger aircraft.





Source: Booz & Company forecasts for Joint Study, and analysis of BITRE Research Report 117 and SACL Master Plan 2009

Indeed, aircraft size and load factors drive the relationship between passenger and aircraft movements. The assumptions about passengers per aircraft movement over the forecast period used in this analysis, including the extrapolation to 2060, are shown in Figure 59.⁷⁴ The Booz & Company extrapolations of SACL and BITRE forecasts suggest that by 2060, in the most extreme case, an expectation that an aircraft averaging the size of an A380 will be operating the average international service, while an A330-sized aircraft will be operating the average domestic service.





Forecast Year

Note: Average passengers per movement are a reflection of both aircraft size and load factor expectations. BITRE's definition of 'regional' differs from this Joint Study and is based on aircraft and airline type. The dotted lines in the 2060 graph reflect the extrapolation of the BITRE and SACL forecasts.

Source: Booz & Company forecasts for the Joint Study and analysis of BITRE Research Report 117 and SACL Master Plan 2009

Key inputs to these forecasts are assessments of the expected size of aircraft, load factors and number of passenger movements.

In developing the forecast Booz & Company examined the fleet orders for the major airline groups operating at Sydney (Kingsford-Smith) Airport and the likely make-up of their fleets over the forecast period. SACL have advised the Steering Committee that this step was also undertaken in 2008 to inform preparation of their Master Plan.

Although it is anticipated that average fleet size will slowly increase, both Boeing and Airbus anticipate a continued reliance on single-aisle narrow body aircraft. For example, in the Asia Pacific Region, Boeing has forecast that the total fleet size will increase from 3,910 aircraft in 2008 to 11,170 aircraft in 2028 (an increase of 186 per cent). However, the proportion of narrow body aircraft in the total fleet is expected to increase from 60 to 65 per cent over this period. Over this same period the number of "large" Boeing aircraft in the Asia Pacific fleet is only forecast to grow marginally (from 400 to 500 aircraft).⁷⁵ Airbus projections suggest a similar outcome. Although regional forecasts are not published, some 69 per cent of Airbus deliveries globally over the 20 years from 2010 are forecast to be single-aisle aircraft.⁷⁶

⁷⁴ Load factors can also affect the number of aircraft movements. Assumptions on load factors are set out on the next page.

⁷⁵ Boeing Current Market Outlook 2009–2028

⁷⁶ Airbus Global Market Forecast 2009–2029

Booz & Company factored in an expectation for load factors for international services of an increase from 64 to 85 per cent, over a 20 year period; load factors for domestic services (80 per cent) and regional services (69 per cent) remaining unchanged.

Airlines will generally move to larger aircraft only when supported by growth in passenger demand. Other factors will also impact such decisions including aircraft technology reducing costs per Available Seat Kilometre, or alternatively the limited availability of slots. This means that there will be a degree of correlation between passenger growth rates and the rate of increasing average aircraft size. There is also a degree of correlation between the level of aircraft movements and the rate of increasing average aircraft size, particularly when the level of aircraft movements approaches the capacity of an airport. When additional flights cannot be added, meeting growth in passenger movements becomes significantly more dependent on the use of larger aircraft.

To illustrate the sensitivity of these forecasts to changes in these assessments, Booz & Company modelled the impact if passenger numbers from one forecast were paired with upgauging rates from another, without sensitivity to the interdependence of these factors.⁷⁷ Figure 60 illustrates this point. It shows aircraft movements over time for Joint Study forecasts, and for SACL's Master Plan forecasts with Booz & Company extrapolation, and the highest and lowest scenarios resulting from pairing different assumptions. The high scenario pairs passenger movement numbers from the Master Plan with Joint Study assumptions on aircraft size. The low scenario shows the Joint Study passenger movement numbers with the Master Plan assumptions on aircraft size.



Figure 60 Aircraft movement scenarios

Source: Booz & Company forecasts for Joint Study, and analysis of BITRE Research Report 117 and SACL Master Plan 2009

All show that the airport will reach 414,000 RPT movements in the long term, the level of RPT activity estimated when the airport reaches 440,000 overall movements, the likely capacity of the airport as discussed in Part Four of this report. For instance the Joint Study line exceeds 414,000 RPT movements around 2033, but this would occur around 2025 under the high scenario, or 2047 under the low scenario.

The high scenario reaches this level so quickly because it applies the Joint Study's expected aircraft size assumptions to a level of passenger growth which would see over 29 million more forecast cumulative passenger movements in the period 2015 to 2025.

77 This covered forecasts by BITRE, SACL and Booz. Further details are in Technical Paper A4.

The low scenario does not reach 414,000 RPT movements until 2047 because it retains SACL's Master Plan aircraft size assumptions, despite a reduction of more than 55 million in forecast cumulative passenger movements in the period 2015 to 2029, and over 420 million in the period 2015 to 2047. At 2047 this scenario would require the 414,000 movements (which would be mix of international, domestic and regional services) to carry over 105 million passengers, or an average of over 250 passengers on every flight. This kind of average for each movement would require aircraft averaging the size of an A380 to be operating the large majority of international services. This would see the extrapolations contained in Figure 60, brought forward from 2060 to 2047.

It is important to note that the two scenario lines are not forecasts, but are included solely to illustrate the importance of recognising the relationship between passenger numbers and assumptions concerning aircraft size.

SACL have advised the Steering Committee that, linked with their concept for changed terminal usage, they are in the process of preparing updated long term forecasts – particularly in the light of the impacts of the global financial crisis and other industry changes. SACL have advised that their expectation is that revised passenger forecasts will more closely reflect those of Booz & Company, though how close the two forecasts will be is not known.

The Committee notes preliminary analysis by BITRE which suggests that growth in average aircraft size since 2009 has been significantly below the forecasts in SACL's Master Plan. Despite this, and the expectation of revised passenger forecasts, SACL have advised that they do not anticipate their revised forecasts will adjust assumptions regarding increases in aircraft size. Consequently, SACL expects that its amended long-term aircraft movement forecasts will be closer to the low scenario in Figure 60 than to the Booz & Company extrapolation of their Master Plan, though how close the two will be is not known.

The Committee notes this advice, but has based assessments in this Report on the independent advice from Booz & Company indicating a level of around 414,000 RPT aircraft movements by around 2033.

Canberra and Newcastle airports

Both Canberra and Newcastle airports are also expected to have increased passenger demand. However, as shown in Figure 61, the proportion of RPT catered for by these airports is not expected to represent a major proportion of the demand in the region.

Figure 61 Sydney region – expected unconstrained RPT passenger movement demand by airport, 2010 to 2060



Source: Booz & Company forecasts.

Domestic (including regional) aviation demand at Canberra Airport is forecast to grow from 3.3 million passenger movements and 43,600 aircraft movements in 2010 to:

- 4.5 million passenger movements and 54,000 aircraft movements in 2020;
- · 6.5 million passenger movements and 64,500 aircraft movements in 2035; and
- 11.2 million passenger movements and 93,600 aircraft movements in 2060.

This represents 2.5 per cent and 1.5 per cent per year growth respectively between 2010 and 2060.

In comparison, in its currently approved Master Plan, Canberra Airport forecasts a mid-range growth of nearly 7.25 million passenger movements and 82,700 aircraft movements per year by 2029–30 (a compound annual growth rate of 4.2 per cent and 3.4 per cent respectively).⁷⁸ This is based on 2007–08 passenger movement figures, prior to the impact of the GFC. In its estimate, Canberra Airport noted that historical trends analysed were significantly higher than the forecasts, with passenger numbers in 2007–08 growing by 5.9 per cent, and that it did not take into account the significant capacity increases by both Virgin Blue (now Virgin Australia) and Qantas on their Canberra routes from early 2008 and the commencement of services by Tiger Airways.

At Newcastle Airport, demand for domestic (including regional) passenger movements is expected to increase from 1.2 million passenger movements and 14,300 aircraft movements to:

- 2.0 million passenger movements and 21,300 aircraft movements in 2020;
- · 3.2 million passenger movements and 29,900 aircraft movements in 2035; and
- 6.1 million passenger movements and 45,700 aircraft movements in 2060.

This represents a 3.3 per cent and 2.3 per cent per year increase respectively between 2010 and 2060.

⁷⁸ Canberra Airport 2009 Master Plan.

In comparison, Newcastle Airport's Master Plan⁷⁹ forecasts approximately 1.5 million passenger movements and more than 25,000 aircraft movements per year by 2024.

As previously mentioned, a small volume of international traffic is also planned by these airports.

Air freight

The majority of air freight demand in the Sydney region is expected to continue to occur at Sydney (Kingsford-Smith) Airport. However, air freight demand at Newcastle and Canberra airports is expected to increase and Bankstown is expected to continue to have a niche role. Air freight is expected to continue to be carried primarily in the cargo hold of passenger aircraft. As shown in Figure 62, demand for international and domestic air freight tonnage in the Sydney region is forecast to grow from approximately half a million tonnes in 2010 to:

- 0.7 million tonnes in 2020;
- 1.1 million tonnes in 2035; and
- 2.3 million tonnes in 2060.

This represents a total growth of 375 per cent, or 3.2 per cent per year between 2010 and 2060. The share of international freight of the total is expected to remain relatively consistent at approximately 80 per cent.



Figure 62 Sydney region – expected unconstrained air freight demand by airport, 2010 to 2060

Source: Booz & Company forecasts.

As shown in Figure 63, demand for dedicated air freight (both international and domestic) is expected to increase modestly in the short term as trade stabilises in the aftermath of the Global Financial Crisis. It is then forecast to increase more rapidly. Demand by 2060 is expected to be approximately 14,000 international freight movements per year and 33,000 domestic freight movements per year, increasing from nearly 3,000 international and 7,600 domestic movements in 2010 (this is a total increase of nearly 395 and 330 per cent, or 3.1 and three per cent per year respectively). This includes the estimated demand for international air freight handling at both Newcastle and Canberra airports.

⁷⁹ Newcastle Airport Master Plan 2007. Note that Newcastle Airport is not a leased federal airport and, as such, its Master Plan does not require approval by the Australian Government.



Figure 63 Sydney region - expected unconstrained demand for dedicated freight movements by airport, 2010 to 2060





Source: Booz & Company forecasts.

General Aviation

The overarching trend projected for GA demand in the region is for relatively flat growth in movements, below projected gross domestic product (GDP) or population for the region.

GA demand in the Sydney region is projected to increase from more than 400,000 movements to approximately 630,000 movements between 2010 and 2060 - a total increase of more than 50 per cent (or 0.8 per cent per year).

Bankstown Airport is expected to continue to provide the largest volume of GA activity in the region in terms of aircraft movements (as shown in Figure 64). Demand for the airport is projected to grow to 416,200 movements in 2060 (a total increase of 50 per cent, or 0.8 per cent per year).

At Canberra Airport, GA movements are forecast to grow modestly in line with historical trends (0.8 per cent per year between 2010 and 2060).

Camden Airport's GA demand is forecast to grow by more than 50 per cent from 84,000 movements in 2010 to 127,700 in 2060 (0.8 per cent per year), while GA demand at RAAF Base Richmond is forecast to grow from 5,400 to 8,200 movements between 2010 and 2060 (a total 50 per cent or 0.8 per cent per year).

GA movement demand at RAAF Base Williamtown (Newcastle Airport) is forecast to remain constant at approximately 14,500 movements per year, as operations such as extensive light aircraft training at the airport are considered by Defence to be incompatible with RAAF Base Williamtown operations.



Figure 64 Sydney region – expected unconstrained GA demand by airport, 2010 to 2060

Source: Booz & Company forecasts.

Military

With the exception of RAAF Base Williamtown, military movement growth is assumed to remain relatively constant throughout the forecast period.

RAAF Base Williamtown will see the introduction of the Joint Strike Fighter (JSF) program from around 2017. It is expected that this will rapidly increase military operations at that aerodrome. The JSF will also require significantly different operational requirements, including larger restricted airspace access for active training operations and greater separation distances from other aircraft than the current RAAF operations at the base require.

Airlines have already indicated challenges in meeting their operational needs at Newcastle Airport while respecting the broader operations at RAAF Base Williamtown.

Demand for military movements in the aerodrome generally is forecast to grow from 25,000 movements per year in 2010 to 43,000 movements by 2060. Aircraft activity at RAAF Base Williamtown (Newcastle Airport) is shown in Figure 65.



Figure 65 RAAF Base Williamtown (Newcastle Airport) expected unconstrained aircraft movement demand by market type, 2010 to 2060

Source: Booz & Company forecasts.

Reliability of forecasts

Many public and private sector organisations have published forecasts of air passenger movements through Australian airports to inform planning and investment decisions in the aviation sector.

BITRE undertook an evaluation of such forecasts to test their accuracy in light of actual movement numbers experienced in the meantime. This analysis of past forecast work highlighted some of the challenges of forecasting over long time periods and, in particular, indicated the following main reasons for inaccuracies:

- Shocks and longstanding changes to the industry: shocks such as the 1989 pilot strike, the Asian Financial Crisis, the events of September 11, 2001, the collapse of Ansett Australia and the Global Financial Crisis were found to have had a significant impact on air passenger movements. Since these shocks were not known to forecasters at the time of preparing the forecasts, their influences were not adjusted for and often no provision was made to capture the likelihood of some shock event during a forecast period.
- Challenges to estimates for inbound travel: BITRE's comparative analysis suggests it is more difficult to predict inbound international travel than outbound or domestic and therefore forecasts containing assumptions about inbound sectors were found to be less accurate.

To ensure such factors were taken into account, historical information used to identify trends for this Joint Study was taken over a decade-long time frame or more to include some shocks. In addition, less reliance was placed on the likely accuracy of short-term forecasts that could be significantly impacted by shocks, with more reliable long-term trend information preferred. Booz & Company drew attention to the following factors that could result in actual aviation activity outside the forecast range:

- actual economic growth rates in Australia and/or those countries expected to provide a significant source of inbound international air passengers turning out to be substantially different from those assumed;
- shifts in government policy that directly, or indirectly, impact on Sydney region aviation activity;
- · aviation industry developments that impact on Sydney region aviation activity;
- a significant shift in the distribution of aviation traffic between Sydney region airports and competing international and domestic airports;
- · significant changes in airline costs (which could affect airfares for passengers);
- external factors including, for example, natural disasters, political unrest, acts of terrorism and associated security concerns, and labour disputes.

Forecasts are by their nature only estimates, based on an expectation that historical information can best inform future trends. Compared with the variety of available forecasts, the Steering Committee opted for a conservative approach.⁸⁰

Sensitivities

There are a number of factors that may affect the realisation of this expected demand, including economic growth rates; airfares and cost of air operations; and commercial decisions by airlines and others, including in relation to the level of upgauging of aircraft size. The forecasts were tested against more than 10 sensitivities over the 50-year period.⁸¹ The impact of some of the more significant of these is illustrated against the base case in Figure 66.

These resulted in a small amount of variance in the forecasts in the short to medium term, while, over the long term, the impact on forecasts appeared more pronounced.

For example, for:

- economic growth, the most pronounced impact on long-term economic growth is shown in the difference between higher or lower than expected economic growth rates in Australia or with its key inbound partners;
- exchange rates, it is generally cheaper for Australians to travel overseas when the Australian dollar is high against the foreign currency of that country, as is the case now, whereas it is cheaper for tourists to travel to Australia when the Australian dollar is weaker (lower) against their currency; and
- **increased costs**, such as through higher fuel prices or carbon price mechanisms impact more significantly on LCC operating costs and margins than on those of legacy airlines.

A combination of all these factors could have a cumulative impact on forecast growth. However, the modelling assumes that such factors are sustained over the long term and are pervasive across all markets, and this may not necessarily result (for example, rates of economic growth tend to fluctuate less than airfares or exchange rates, with low economic growth in one area being offset by higher economic growth elsewhere).

⁸⁰ A more detailed comparison of existing forecasts can be found in Technical Papers A3 and B3.

⁸¹ Information on parameters tested can be found in Technical Paper A3.





Source: Booz & Company forecasts.

One factor frequently cited as being able to change the level of demand for aviation services is the operation of a High Speed Rail (HSR) system between the Sydney region and other cities. However, the extent to which HSR could reduce the demand for air travel will depend on the relative attractiveness (in terms of price, frequency and travel times) of the services offered, routes served (including the station locations) and the timing of its construction. Internationally, many nations build or extend HSR networks while also expanding their aviation capacity – the two should not be considered in a mutually exclusive manner.

In this context, a study is currently underway on the feasibility of implementing an HSR system along the east coast of Australia, with a view to potentially linking Sydney to large cities such as Melbourne and Brisbane.⁸² This study identifies that early stages of HSR development from Sydney will probably involve limited links to either Newcastle or Canberra.

The Newcastle–Sydney route accounted for 0.1 per cent of all passenger movements and 1.1 per cent of all aircraft movements at Sydney (Kingsford-Smith) Airport in 2010.

Canberra–Sydney is a bigger aviation market than Newcastle–Sydney but still only accounts for 3.1 per cent of passenger movements and 6.2 per cent of aircraft movements at Sydney (Kingsford-Smith) Airport. A diversion of most or even all of this volume therefore would not provide significant capacity for growth in other market segments accessing Sydney (Kingsford-Smith) Airport.⁸³

More substantial reductions in air passenger demand at Sydney (Kingsford-Smith) Airport would potentially be provided if HSR were linked to Melbourne and Brisbane, particularly if routed via the Gold Coast.

⁸² The High Speed Rail Phase 1 report, released in August 2011, estimated that HSR would need to carry around 8.0 million passengers on the Melbourne–Sydney route and 3.5 million passengers on the Brisbane–Sydney route by 2036 to be feasible. This would equate to approximately half of the projected air market for both sectors in 2036.
82 PIDE repetition

However, the level of potential diversion of traffic from air to HSR is heavily dependent on a number of factors that militate against the HSR dealing with the peak capacity gap identified at Sydney (Kingsford-Smith) Airport.

These assumptions and factors include, first, the timing of the availability of any HSR network. The HSR study currently being undertaken by the Australian Government sets out an indicative construction and implementation program for an east coast network being developed over a 25-year time frame. The challenges of constructing and operationalising the HSR should not be underestimated and a full network would inevitably be rolled out in stages over a number of years – meaning that the full impact and diversion from air to HSR would not be realised for some time.

Second, the timetabling, frequency and capacity of services on the HSR system will be critical in determining its ability to attain mode shift from aviation and the extent of that shift. For example, the HSR study is premised on attaining a journey time for non-stop high-speed services between the CBDs of Sydney and Melbourne, and Sydney and Brisbane, within three hours. However, this is for a limited number of peak hour services and the HSR may not provide the frequency of services between the east coast cities that aviation services currently provide to the business peak hour traveller.

Third, the cost to governments of constructing the HSR network is very high in comparison with the cost of providing additional capacity expansion of the aviation system. The Phase 1 report estimates that the total cost of building an east coast HSR network extending from Brisbane to Melbourne could be in the range of \$61 billion to \$108 billion (in 2011 dollars) depending upon the route and station locations selected. These cost estimates include land acquisition, stations and city access, maintenance and stabling facilities, power infrastructure, civil and rail infrastructure, and information technology and ticketing systems. They exclude planning and procurement management costs (likely to be in the order of 10 per cent to 15 per cent) and operating costs.

This range of estimates reflects the level of uncertainty of the possible costs that is typical of such projects at this stage. For example, the lower figure of \$61 billion represents a 'P10' estimate, meaning that there is currently a 10 per cent chance that the total cost will not exceed \$61 billion (or a 90 per cent chance that it will). Similarly, the upper estimate of \$108 billion represents a 'P90' estimate, meaning that there is currently a 90 per cent chance that the cost will not exceed \$108 billion (that is, a 10 per cent chance that it will). These estimates are likely to be refined as the study continues.

The average and range of costs for the four segments that would make up the network have been estimated to be:

- Brisbane to Newcastle \$28.0 billion (between \$20.0 billion and \$40.6 billion);
- Newcastle to Sydney \$14.2 billion (between \$10.7 billion and \$17.9 billion);
- · Sydney to Canberra \$17.5 billion (between \$10.9 billion and \$24.5 billion); and
- Canberra to Melbourne \$22.4 billion (between \$19.5 billion and \$25.6 billion).

The Phase 1 report also notes that international experience suggests that it is unrealistic to expect the capital cost of the HSR network to be recovered.

One factor influencing the cost estimates of HSR and its ability to compete with aviation is the location of the rail stations. In Sydney, station options and their estimated costs (including city entry construction costs, in 2011 dollars) are:

- Central or Redfern \$13.8 billion;
- Parramatta \$9.5 billion; and
- Homebush \$7.8 billion.

Only the first of these options provides improved access to the Sydney CBD in comparison to Sydney (Kingsford-Smith) Airport without significant transport links being provided.

The location of the HSR stations would affect the capacity of HSR to attract a substantial proportion of airline passengers travelling through Sydney and transferring to or from other flights. HSR services may not attract a significant share of transferring traffic unless there is an HSR at the airport. Analysis of ticketing data by Booz & Company suggests that connecting passengers accounted for approximately 20 per cent of passenger movements at Sydney (Kingsford-Smith) Airport in 2010.⁸⁴ However, an extra HSR station at the airport could potentially raise significant issues in relation to costs, route definition and journey times for HSR users. This is being examined further in Phase 2 of the HSR study.

Even under a scenario where HSR is operational, the aviation industry has shown its ability to compete against new alternatives. The introduction of LCCs demonstrates the willingness of airlines to compete based on airfares and a diversification of service offerings. Airlines may also choose to utilise vacated capacity by providing low-volume, high-frequency services in response to passenger demand, which will result in the further uptake of aircraft movements.

Furthermore, HSR would not be a direct substitute for all air travel. There remains a substantial amount of traffic to and from Sydney (Kingsford-Smith) Airport that accesses destinations other than the east coast, especially international services, which are the fastest-growing segment for Sydney (accounting for approximately 22 per cent of aircraft movements to the airport in 2010), but also services to domestic destinations such as Perth and Adelaide (nearly eight per cent of aircraft movements). In this context, HSR can only ever be one of a number of means of accessing the Sydney region.

Most HSR systems in the world providing frequent services are connections less than 500 kilometres in length. In these cases, HSR can provide significant competition in travel time to air services. However, this would not be the case given the distances between Sydney, Brisbane and Melbourne and the travel time and frequency advantages provided by airlines in these travel corridors, particularly for higher value business traffic. Accordingly, the Australian market may be unlikely to see a high level of direct substitution of HSR for air services in the east coast market. The extent of the substitution would be contingent on many factors (some still to be explored as part of the HSR study). It cannot be assumed to be a panacea for aviation capacity challenges.