

PART FIVE

IMPACTS IF DEMAND IS NOT MET



Key points

- If no additional capacity is made available, demand would exceed capacity by 54 million passenger movements and more than 760,000 tonnes of air freight per year in 2060.
 - The cumulative total of unmet demand would be more than 665 million passenger movements and nine million tonnes of air freight between 2035 and 2060.
- By 2060, the economy-wide (direct and flow-on) impacts of the Australian economy could accumulate to a total of \$59.5 billion in foregone expenditure and \$34.0 billion in foregone gross domestic product (GDP) (in 2010 discounted dollars and considering a medium elasticity scenario).
 - The NSW economy would be the worst affected, with losses across all industries totalling \$30.6 billion in foregone expenditure and \$17.5 billion in foregone gross state product (GSP) (discounted).
 - In terms of employment impacts, an annual average of 12,700 full time equivalent (FTE) positions in NSW and 17,300 FTE positions nationally could be foregone.
- Any delay in acting would have adverse economic impacts for NSW and Australia.
- By 2035, the economy-wide impacts could accumulate to as much as \$2.3 billion in foregone NSW GSP and \$6.0 billion in foregone GDP for the Australian economy. In terms of expenditure within the economy, over the period to 2035 foregone expenditure could total \$2.6 billion for NSW and \$8.9 billion for Australia.
 - Over the period to 2035, 400 FTE jobs per year could be foregone in NSW and 600 FTE jobs per year nationally. This means that employment is expected to be lower than would otherwise be the case if capacity were made available.
- In the short term, other cities could gain a boost to passenger numbers and consequent economic activity from services, passengers and freight operators that cannot access Sydney. However, given a portion of unmet Sydney region demand would be diverted overseas instead of interstate, and some travel will be suppressed, overall, Australia would experience a net economic loss.
- These estimates are considered conservative, given the use of medium scenarios for redistribution and suppression of unmet demand. In addition, a wide range of impacts associated with aviation infrastructure is difficult to monetise due to the role of aviation as a facilitator for trade and economic activity.
- Delay brings the risk that the remaining options to add aviation capacity will disappear, as Sydney's spatial growth and associated land use development encroach on the few potential sites remaining.
 - Delay in action would constrain the ability of governments to provide additional airport capacity in the future.

Options for adding aviation capacity in the Sydney region have been considered on several occasions over many years. In 1986, Badgerys Creek was selected as a site for a second major airport. In 1989, the decision was made to build a third runway at Sydney (Kingsford Smith) Airport as an interim measure, and action on the Badgerys Creek site was suspended. On other occasions, governments have deferred decisions to expand capacity in the region or to protect potential sites for additional capacity. As a result, the number of viable options to add capacity has reduced.

As set out in Part Four of this Report, there is a clear gap between the capacity of existing airports and the forecast demand – a gap that cannot be addressed by action at Sydney (Kingsford-Smith) Airport alone. Unaddressed, this will present not only increasing operational problems but constrain aviation growth and productivity.

The challenge of connecting surface transport to Sydney (Kingsford-Smith) Airport must also be addressed, or congestion will continue to grow, with further impacts on economic and social wellbeing. The problems will only increase over time.

If a decision to expand capacity in the region is again deferred, there will be substantial economic costs. The continuing growth of Sydney will make it harder to add airport capacity in the future.

This Part identifies the problems that will be caused by capacity constraints and their impacts, focusing on both immediate practical implications and the long-term economic costs.

5.1 The timing and nature of impacts

Timing of impacts

As identified in Part Four of this Report, aviation capacity constraints in the Sydney region will begin to impact at different times, with many increasing in severity in the medium to long term.

Impacts are already being felt at Sydney (Kingsford-Smith) Airport. Slot availability is currently limited for all types of services at peak times of the busy weekdays, with two hours each in the morning peak and afternoon peak already at the legislated 80 movements per hour. No protected regional slots are available at peak times, nor are there International Terminal gates available for arrivals on weekdays, during the morning peak between 7.30am and 10.00am.

The opportunities to obtain a suitable series of equivalent slots across the days of the week are also becoming very restricted. As a result, new services will be increasingly turned away as airlines are unable to obtain pairs of arrival and departure slots suitable for their schedules. New routes (particularly on international services) will be foregone and significant opportunities will be lost.

Sydney (Kingsford-Smith) Airport is already experiencing capacity pressure on the roads within, and immediately surrounding, the airport precinct. Between 2015 and 2023, passengers, along with those employed at the airport, will experience significant delays travelling to and from the airport, as road capacity is reached in peak periods, with flow-on congestion in the surrounding road network impacting on other road users.

By 2015, unless the proposed terminal and apron work set out in the *Sydney Airport Master Plan 2009* (the Master Plan) is brought forward, the number of aircraft stands will not meet demand.

By 2020, the scope for noise-sharing arrangements under Long Term Operating Plan (LTOP) will be dramatically reduced, with remaining scope to use noise-sharing modes only in the very late evening and for a small number of weekend hours.

At this level of activity, it will also take much longer for operations at the airport to recover from any periods of disrupted operations. For example, it will take five hours to recover from a two-hour weather event in the morning peak, with substantial impacts on the broader network delays and recovery times continuing to increase.

Growth in services at Sydney (Kingsford-Smith) Airport will start to stagnate from 2027, when all slots are expected to be allocated, and a large number of potential services will be turned away. Increases in passenger capacity will be limited to existing carriers with multiple existing allocated slots which can upgauge the size of aircraft operated on those services. The extent of upgauging to Code E and Code F aircraft will be restricted by the airport site constraints, as well as the constraints at other airports and airport operating requirements.

As outlined in Part Four, conservative forecasting shows that, by 2035, just in the busiest morning hour alone, 30 movements (or 27 per cent of demand) will be unmet. Demand at other hours of the day will similarly be approaching and exceeding the slot allocations.

At that time, all but the last two hours of the non-curfew period will have levels of activity which preclude noise sharing, and communities will experience the effects of almost continuous use of the parallel runway system. It will take approximately 13 hours to recover from a two-hour weather event in the morning peak.

By 2060, the economic and social benefits of some 54 million passenger movements per year and more than 760,000 tonnes of air freight per year will be foregone,¹²⁴ with the cumulative impact expected to be as high as 665 million passenger movements between 2035 and 2060.

As access to the city by air becomes constrained, and as delays grow, Sydney's reputation as a global city, the attractiveness of the region for business and as a host for major events will decline.

The nature of impacts

A number of studies¹²⁵ have identified a range of impacts which arise when aviation capacity is limited, including:

- direct impacts on aviation-related activity, such as the activity of passengers, freight operators, airlines and airports;
- effects on aviation-facilitated activity, such as tourism and freight expenditure; and
- indirect and catalytic effects that the aviation sector has in facilitating developments in other businesses and improving personal wellbeing in the broader economy.

Impact on aviation-related activity

Aviation-related activities and businesses serving aviation (airport operators, airlines, retail businesses and freight operators) generate significant economic activity for NSW and Australia.

If the industry is limited in its growth, with new activity suppressed or displaced interstate or overseas, a significant level of aviation-related economic activity will be foregone.

¹²⁴ This assumes a consistent volume of tonnage is carried per passenger aircraft movement, as described in Part 3.

¹²⁵ Cited by Ernst & Young in Technical Paper B7.

Increasing congestion and delays, and the impact on passenger welfare

If aviation capacity does not keep up with demand, not only will the growth of passenger and freight travel be restricted but increased delays will be experienced. Travellers and freight already face a level of congestion and delay at Sydney (Kingsford-Smith) Airport. Other factors that can result from delays at the airport or in the air include:

- longer queues for passengers;
- increased time taken to load and disembark passengers, baggage and freight;
- extended wait time for aircraft on aprons, taxiways and runways, and potential en route delays or extended holding patterns for aircraft in the air.

Increased queuing, congestion and delay in the aviation sector also have an economic cost associated with the value of time for users. The additional time taken to access and use an airport, including accommodating the risk of delay, adds to the opportunity cost of users in choosing to access the airport. This diverts time and assets which could be better spent elsewhere.

Additionally, when the airport is operating close to full capacity, there will be a higher propensity for further unexpected delays with less ability to catch up. The impact of adverse conditions in the morning peak to a day's schedule was discussed in Part Four of this Report. In a constrained environment it will take longer to clear the backlog and recover.

Service reliability is an important factor for passengers; estimates suggest unexpected wait time is valued by travellers to be three to four times as important as normal wait time.¹²⁶

Delay impacts on connecting services

Sydney (Kingsford-Smith) Airport is strongly interconnected to other major Australian airports. Delays at the airport impact significantly on the performance of the national aviation system and cause delays and associated costs for passengers at other airports.

Delays in the system also contribute to the frequency of missed connections. Table 15 shows the proportions of international passengers from five capital cities who travel via Sydney (Kingsford-Smith) Airport.

Table 15 International passenger traffic travelling to capital city airports via Sydney (Kingsford-Smith) Airport, 2010

	Final Origin or Destination				
	ADL	BNE	CBR	MEL	PER
Proportion of international passengers travelling to and from other Australian destinations who transfer through Sydney (Kingsford-Smith) Airport (per cent)	22	9	65	9	5

Source: Market Information Data Tapes (MIDT) and Booz & Company analysis. MIDT provides passenger ticketing data captured by the Global Distribution Systems, such as indirect passenger bookings.

Large proportions of passengers from other states connect through Sydney (Kingsford-Smith) Airport for travel to the following major markets:

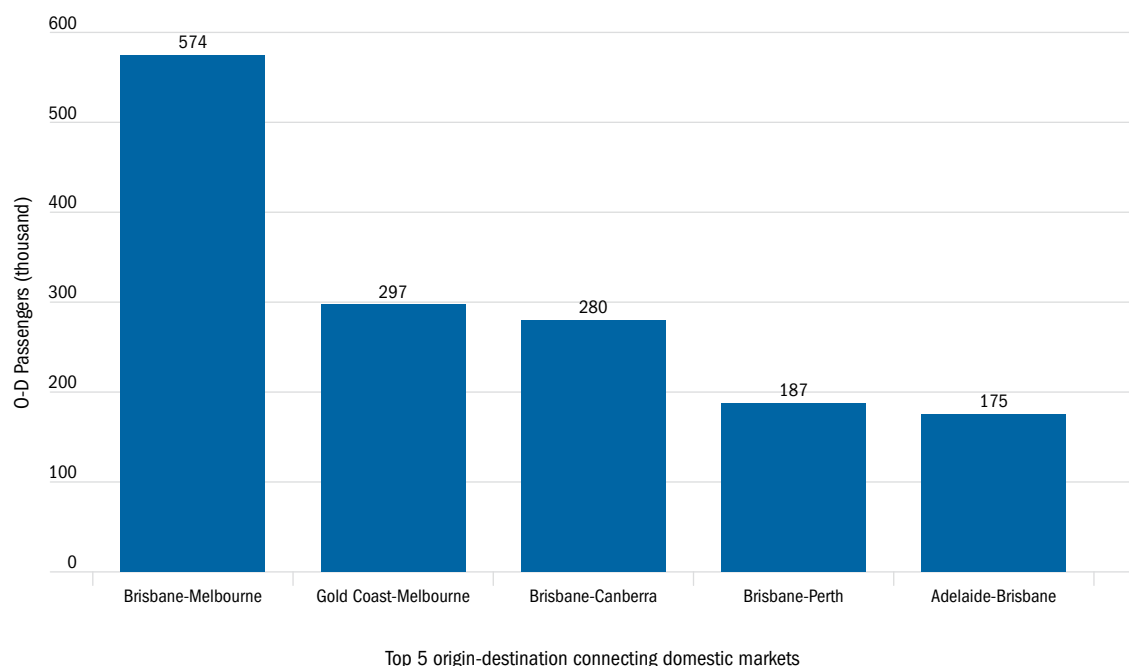
- **Europe, Asia, Middle East and Africa:** Queensland (38 per cent of passengers connecting between these destinations) and Victoria (33 per cent);
- **the Americas:** Victoria (42 per cent); and
- **New Zealand:** Queensland (39 per cent) and Victoria (20 per cent).

¹²⁶ Australian Transport Council, *National Guidelines for Transport Sydney Management in Australia Volume 4*, 2006.

Delays at Sydney (Kingsford-Smith) Airport therefore have significant impacts for individual states, outside of NSW.

In terms of domestic passengers, there are a number of domestic markets connecting via Sydney (Kingsford-Smith) Airport. In 2010, there were 2.5 million domestic passenger connections through Sydney (Kingsford-Smith) Airport.¹²⁷ This is about 10.3 per cent of total domestic and regional passenger movements at Sydney (Kingsford-Smith) Airport. The five domestic markets that comprise the majority (61 per cent) of total domestic connecting traffic over Sydney (Kingsford-Smith) Airport are presented in Figure 112.

Figure 112 Top five domestic markets connecting through Sydney (Kingsford Smith) Airport, 2010



Note: O-D represents origin-destination – city pairs where a passenger starts and ends their journey (that is, this does not consider intermediary stops, in this case Sydney (Kingsford-Smith) Airport.)

Source: Booz & Company analysis of MIDT data.

A 24-hour snapshot of these five markets was undertaken to illustrate the potential effect of a missed connection on a passenger. As shown in Table 16, on 12 November 2010, the average effect for a passenger on these routes missing a connection at Sydney (Kingsford-Smith) Airport would have been a delay of 93 minutes. It can be expected that the incidence (and possibly impact) of such delays will only get worse as capacity is further constrained.

Further detail on the impact of aviation service delays is available in Technical Paper B8.

¹²⁷ Booz & Company analysis of MIDT data for 2010.

Table 16 Delay minutes for passengers missing connections through Sydney (Kingsford-Smith) Airport, 12 November 2010

Origin–Destination Markets	Qantas and Jetstar	Virgin Australia	Tiger Airways	Average
Brisbane–Melbourne	37	58	n/a ¹	48
Melbourne–Brisbane	60	60	160	93
Gold Coast–Melbourne	61	83	130	91
Melbourne–Gold Coast	92	60	n/a ²	76
Brisbane–Canberra	73	314	n/a ³	194
Canberra–Brisbane	53	60	n/a ³	56
Brisbane–Perth	158	190	n/a ³	174
Perth–Brisbane	69	60	n/a ³	65
Adelaide–Brisbane	64	60	n/a ³	62
Brisbane–Adelaide	101	175	n/a ³	138
Average Weighted by Origin–Destination Passengers	69	100	145	93

Note: This is the weighted average of delay minutes based on an analysis of airlines operating on the top five domestic origin–destination markets connecting through Sydney (Kingsford-Smith) Airport.

N/A (1) Analysis not undertaken for this route as Tiger Airways had no Brisbane–Sydney services on the date of analysis.

N/A (2) Delay minutes not calculated for this sector as the Tiger Airways schedule would require passengers with missed connections to either wait for a flight the next day or switch to another airline.

N/A (3) Tiger Airways did not fly those routes in 2010.

Source: Booz & Company analysis of OAG data (of airline schedules and related data) for 12 November 2010

Aviation delays will be also compounded by delays in surface transport access to Sydney (Kingsford-Smith) Airport. Queues and congestion will be experienced at key access points as a result of slower traffic on roads and fuller trains.

Over time, these delays could deter demand, with some passengers electing not to undertake air travel due to the growing transit times, congestion and the risk of further unexpected delays. While, for some, congestion and delay may result in trips being cancelled, for others it will result in longer trip times and costs in terms of efficiency.

Delay impacts on airlines

Not only will passengers be affected by delay but airline operations will also be affected across the network. Airlines rely more and more on high utilisation of aircraft, setting demanding schedules for the use of each aircraft across different airports during the day. Once an aircraft is delayed at one airport, such as at Sydney (Kingsford-Smith) Airport in the morning peak, it may be difficult to make up time in an already tight schedule. An initial delay in a flight from Sydney is likely to create a flow-on effect as other services are also affected.

Limiting service options

A high degree of connectivity is critical in maintaining the reputation of Australia and Sydney as world-class destinations for business and leisure, particularly given the geographical distance between Sydney and many other cities. In a country of Australia's geographic size, reliable and affordable air transport links are also important for ensuring access to and from other cities and regional/remote communities.

International airlines plan their routes and scheduling carefully to maximise commercial returns. Some airlines, if unable to secure suitable access to Sydney (Kingsford-Smith) Airport, will not operate to Australia at all, opting for alternative destinations.

Australia already faces challenges as a long-haul end point destination and because of its remoteness from key partners in Europe, the United States and Asia.¹²⁸ Limiting service options and efficiency of connections is likely to exacerbate this.

A number of airlines that have recently started operations in Australia have decided to base their operations in cities other than Sydney, despite their acknowledgment that Sydney has a sizable and attractive market. Key reasons for this are likely to be the constraints on obtaining movement slots at more viable times of day, the need for suitably paired arrival and departure slots, the impact of the curfew at Sydney (Kingsford-Smith) Airport and the slot constraints of airports at the other end of the desired route.

The current lack of unallocated protected regional slots in peak periods means no new intrastate services can be operated to Sydney in these times. For the communities involved, opportunities for improved access to professional services, business opportunities and connections between communities will be lost.

As movement slots become less available by 2035, airlines are also likely to give preference to higher-yielding routes they can serve with larger aircraft. These routes may not necessarily correlate to the routes of greatest social benefit.

Impact on employment in the aviation industry

As mentioned in Part Two, approximately 60,000 people are currently employed in the air transport sector and many more are engaged in the retail, hospitality and service industries on airport sites.¹²⁹

International evidence shows that airports are significant generators of employment, with about 1,000 jobs being created for every million passengers at an airport.¹³⁰ Australian airports generate a similar number of jobs and are associated with employment growth in the immediate vicinity that is substantially higher than their city's overall rate of employment growth.¹³¹ Employing industries include those directly servicing aviation, such as accommodation, hospitality and air services, as well as industries that value proximity to airports, such as electronics and pharmaceuticals. In addition, a new airport expands the industry base of the local economy, increasing local resilience to domestic economic downturns.¹³²

If aviation capacity is not increased to meet the growth in demand, it will similarly limit the growth of new jobs in NSW in a range of sectors, including tourism, airlines, airport maintenance and construction, and aircraft maintenance.

Impact on aviation-facilitated activity

The direct impact on business and the economy of constrained aviation activity has been discussed above. In the medium to long term, constraints to aviation growth will have flow-on effects to other industries. Aviation in the Sydney region underpins key components of the economic activity in NSW and the national economy by facilitating:

- tourism by domestic and international visitors who arrive in the region by air; and
- the movement of freight goods that are transported to and from the Sydney region by air.

128 Flight times from Sydney to Australia's nearest international partners are approximately 3.5 hours (for Auckland, New Zealand) and eight hours (for Jakarta, Indonesia). In contrast, access by European countries to their neighbours is typically one hour to three hours, or less than six hours to northern African states and the Middle East.

129 ABS Cat. 5206.0 *Australian National Accounts: National Income, Expenditure and Product* and ABS Cat. 6291.0.55.003 *Labour Force, Australia, Detailed, Quarterly*.

130 Robertson, J.A.W, Airports and economic regeneration, *Journal of Air Transport Management*, 1995; and York Aviation, *The social and economic impact of airports in Europe*, Report prepared for Airports Council International, 2004.

131 BITRE analysis of ABS, *Census Population and Housing 2006 (also 2001 Census)*, 2006.

132 BITRE, *Economic Benefits of Airports*, 2011.

Tourism and business travellers

Constrained aviation capacity in the region will result in unmet demand for tourist travel to NSW and Australia, as new services will be unable to have access to suitable slots. This will be particularly the case for growing international markets such as China. The impact will particularly be felt, as the limited availability of slots will also affect the growth of low cost carriers and other new, innovative airline products which have been driving growth in recent years.

Tourists could travel to other parts of Australia, but many will instead choose other international locations, especially when the Australian dollar is high. Losses to the tourism industry (including business travel) could result in lower expenditure in other visitor-impacted industries, a reduction in potential economic activity and foregone employment growth in a range of sectors.

Freight

Access to efficient air freight services is an important element in many contemporary businesses. While alternatives such as express road freight may be available in some cases, the nature of many freight deliveries (for example, fresh produce and 'live' medical supplies) makes the longer times required for road travel impracticable, particularly over significant distances. The curfew at Sydney (Kingsford-Smith) Airport already limits its potential for overnight freight activities.

Businesses which rely on air freight services will choose locations which provide convenient access to those services. Any lack of convenient access to air freight services and facilities for Sydney businesses will result in foregone expenditure, economic activity and employment for the region and the state.

Commercial developments

Another implication of suppressed demand for aviation-facilitated tourism and business is its impact on the associated commercial developments that will otherwise accompany that activity. Airports now often feature business parks and logistics centres and are increasingly more than transport interchanges, creating sizable economic growth centres in their own right. These typically form as businesses identify the efficiency gains of co-locating with complementary service providers and business partners.

In a constrained aviation environment, associated development of business parks and hotels, redistribution centres, freight and logistics handling terminals and other synergistic businesses will also be constrained, though this can also happen when a small airport site has already been extensively developed. This will have downstream impacts on growth and productivity.

The Kenan Institute Centre for Air Commerce has argued that a new urban form is emerging – the Aerotropolis – creating an airport city with clusters of aviation-linked businesses and associated residential development.¹³³ By locating near each other, firms can benefit from significant economies of scale and network effects.

Sydney (Kingsford-Smith) Airport has already been included in the Global Economic Corridor identified by the NSW Government as a key centre of development in the Sydney region.

A UK analysis of trends in airport cities in Hong Kong, South Korea and Taiwan has demonstrated that, with the growth in passenger flows and related logistical activities, some airports have added intermodal functions, a wider array of organisations and enterprises and have become the focus of a logistics economic zone. In addition, the developments of Seoul, Atlanta and Memphis airports were all cited in the UK analysis as being the catalysts for nearby clusters of

¹³³ Strategic development trend and key factor analysis of Airport City in Taiwan, 2011, cited by Ernst & Young.

development, with a \$23.6 billion development housing 65,000 residents and 300,000 offices workers being proposed upon reclaimed land near Seoul's Incheon Airport in South Korea.¹³⁴

Additional aviation capacity could provide:

- agglomeration benefits from businesses clustering nearby airports;
- productivity increases from improved transport connections by the provision of aviation services;
- economic attractiveness and connectivity of Sydney, NSW and Australia;
- facilitation of international and interstate trade connectivity; and
- continued attractiveness of Sydney for foreign direct investment in business and events.

Productivity

Provision of efficient aviation capacity has the potential to reduce transport costs, improve transport quality and increase productivity for businesses, freight operators and other airport users.

Boosting productivity growth is a strong focus of the Australian Government and all state and territory governments. In recent years, productivity growth has fallen well below historical levels, in part, due to growing traffic congestion within Australia's larger capital cities.

International trade can increase economic growth. The availability of both air freight and passenger services plays a vital role in facilitating trade and enabling businesses to serve bigger markets. The ability to serve a larger market is likely to have a significant impact on the ability of businesses to innovate and potentially leads to increased sales and profits, more scope to exploit economies of scale and increased competition. Econometric research conducted by Oxford Economic Forecasting across 24 countries in the European Union suggests that, other things being equal, a 10 per cent increase in output of air services will raise productivity and potential output by 0.56 per cent in the long term.¹³⁵

Economic attractiveness and connectivity

Integrated transport networks help businesses to access larger markets. The widespread use of aviation, which in Australia has seen a broad trend of falling air fares over the last two decades, is a key driver in the transformation of the connectivity of both the manufacturing and service sectors globally. As a part of a national and global transport network, airports play an important role in attracting international events, as well as supporting new employment and education opportunities.

Connectivity generates wider economic benefits for businesses through the efficiency of direct linkages and also by providing an environment that benefits businesses, including access to an international labour force, as well as customers, suppliers and knowledge-sharing around the world. Global connectivity is particularly important for those sectors characterised by internationalised, high-value products and services which are dependent on mobile workforces and face-to-face relations. These include high-tech sectors, pharmaceuticals and financial and business services.

In a detailed review undertaken by Oxford Economic Forecasting for the International Air Transport Association, nearly 85 per cent of firms reported air services were important for their sales and more than half of the businesses surveyed believed their ability to compete internationally would be very severely or moderately affected by constraints on the availability

¹³⁴ Mayor of London, *A new airport for London Part 1, January 2011*, as cited by Ernst & Young.

¹³⁵ Oxford Economic Forecasting, *The Economic Contribution of the Aviation Industry in the UK*, October 2006, cited by Ernst & Young.

of air transport.¹³⁶ In particular, the ability to hold face-to-face meetings with overseas contacts is perceived as crucial to doing business effectively. While it has been argued developments in communication technology (for example, the use of video conference facilities) should diminish the importance of air travel in business, a number of studies have concluded this is not the case due to the importance placed by businesses on building strong personal relationships with their clients.¹³⁷

In addition, it has been argued there is a direct correlation between connectivity through a hub airport and a country's trading performance. For example, in the context of the United Kingdom (UK), analysis has suggested that a lack of direct flights from London Heathrow Airport to emerging markets (including Manila, Guangzhou and Jakarta), may already be costing the economy \$1.2 billion each year as trade goes to better-connected competitors.¹³⁸ This is despite a recent study conducted for the UK Government which found London had better connections to the key business centres of the world than any other European city (with 1,113 departure flights to the key business destinations in the week studied compared with Paris's 499, Frankfurt's 443 and Amsterdam's 282).¹³⁹ While a similar study has not been completed for Sydney, the implications are relevant.

Workforce productivity

The international labour force is particularly significant to Australia's economy in certain skilled sectors. As highlighted by the Productivity Commission,¹⁴⁰ migration contributes to the economy in many ways, including the upskilling of the workforce, economies of scale and the development of new export markets. Indeed, the Productivity Commission concluded increasing skilled migration would make a positive overall contribution to Australia's future per capita income levels. Maintaining strong aviation links will be important to enable the effective flow of international labour both in and out of Australia.

Foreign investment in business and events

Constraints to aviation growth can damage the competitive position of individual companies based in Sydney and reduce the attractiveness of Sydney for foreign direct investment.¹⁴¹ It can also erode Sydney's national and global competitiveness as the city loses its edge as a gateway to the nation for international travellers. The economic impacts of inaction can lead businesses to relocate to more accessible domestic or international destinations. Businesses considering options for investment or business travel may look elsewhere.

For example, organisers of key business meetings, major events or international conferences may be dissuaded from using Sydney as the venue due to the growing likelihood of travel delays, the larger planning implications required in organising the event (moving large volumes of people through a crowded airport and congested roads) and the overall costs (to pay for services in limited supply).

5.2 Cost of impacts

Many of the impacts associated with aviation infrastructure are difficult to monetise. It is difficult to show a precise link between certain levels of aviation activity and services and the wider economy, due to the inevitable complexity of factors that underpin events such as location or investment decisions by companies.

¹³⁶ International Air Transport Association, *Airline Network Benefits*, 2007, cited by Ernst & Young.

¹³⁷ Cited in analysis undertaken for Mayor of London, *A new airport for London Part 1*, January 2011.

¹³⁸ Frontier Economics, *Connecting for growth: the role of Britain's hub airport in economic recovery*, September 2011, cited by Ernst & Young.

¹³⁹ AirportWatch, *International Air Connectivity for Business*, 2011, cited by Ernst & Young.

¹⁴⁰ Productivity Commission, *Economic Impacts of Migration and Population Growth*, 2006.

¹⁴¹ Ernst & Young, Technical Paper B7.

In other instances, while a dollar cost can be put on time, personal or business expense, it may not fully reflect the value an individual will place on the opportunities air travel makes possible, such as access to professional services (including city-based professionals travelling to regional communities); connecting families; leisure, study or business activities; and economic opportunities. Similarly, it is difficult to fully capture how some people value the time lost when delayed on a plane, at an airport or caught up in traffic elsewhere on the transport network travelling to or from an airport.

For these reasons, any analysis of cost is likely to understate the overall implications of capacity limitations.

Approach to analysis

Ernst & Young, in association with the Centre of Policy Studies (CoPS) at Monash University, undertook an assessment to quantify the economic costs of not proceeding with additional aviation capacity in the Sydney region, using a bottom-up economic computable general equilibrium (CGE) model of the Australian economy.¹⁴² The analysis estimated the potential economic impacts of not acting, with consideration of the cumulative impact in 2020, 2035 and 2060.

Analysis was based on the Booz & Company forecasts for unconstrained aviation demand and the expected capacity shortfall in the Sydney region detailed in Parts Three and Four of this Report. Supplementary information was sourced from the Bureau of Infrastructure, Transport and Regional Economics (BITRE) and other government references, as well as international case studies.

The analysis assessed the direct economic impacts of not acting to meet unconstrained demand in the Sydney region, and then calculated the indirect impacts on economic growth and employment. It was undertaken from both the perspective of the NSW and the Australian economies, as the consequences of limited capacity have both local and national impacts.

The following direct economic impacts were able to be quantified and incorporated in the analysis:

1. **delays and passenger welfare:** the impact of lost value of time on travellers from flight delays, peak demand spreading and, ultimately, the lack of capacity and opportunity to access aviation services;
2. **aviation and airports:** losses to airports and the aviation industry as a result of passengers who will not fly – this includes the impacts on airlines and airport retail outlets;
3. **tourism:** losses to the tourism industry (including business travel) and other industries within which visitors to NSW and Australia undertake expenditure;
4. **freight:** losses to the freight industry in terms of foregone domestic and international freight expenditure;
5. **commercial developments:** losses in traveller expenditure in business industries – for example, revenue and employment; losses to commercial business parks and hotels in the airport vicinity as a result of reduced number of passengers flying in the region.

The estimates of the direct impacts listed above were incorporated into a CGE economic model, which estimated the flow-on effects of those initial impacts on other industries and activities in the economy. This estimation of indirect and total impacts of not proceeding with provision of additional aviation capacity in the Sydney region was captured in terms of:

¹⁴² The assessment was undertaken using The Enormous Regional Model (TERM) general equilibrium model developed at the CoPS (the version comprising 144 industry sectors in 57 regions). It is a bottom-up economic CGE model of Australia which treats each region of Australia as a separate economy.

- **expenditure:** impacts on the main components of economic activity from an expenditure perspective (comprising private consumption, investment and international exports and imports);
- **value add:** impacts on GSP and GDP in terms of value add (that is industry profit and wages, a net benefits figure). This is a measure of the value of goods and services minus the value of intermediate consumption at purchase prices; and
- **employment:** the estimated change in employment in terms of FTE employment numbers.

There is a range of possible outcomes for unmet aviation demand in the Sydney region:

- it may enter NSW through different transport modes (road, rail);
- it may enter NSW through airports other than Sydney (Kingsford-Smith) Airport (Canberra Airport or Newcastle Airport);
- it may be redistributed to other airports in Australia;
- it may be redistributed to airports overseas; or
- it may be suppressed, with travellers deciding not to travel.

Any demand that can no longer be accommodated in NSW will represent a loss to the NSW economy. Moreover, the level of unmet demand that is either redistributed overseas or suppressed will represent a loss to not only the NSW economy but to the Australian economy as a whole.

In order to factor this into the assessment of economic impacts, but reflecting the challenges in accurately estimating possible demand outcomes over the long term, low, medium and high scenarios were developed to enable analysis of a range of possible redistribution/suppression outcomes.

This Report presents the medium scenario, unless otherwise stated. The full Ernst & Young analysis can be found at Technical Paper B7.

Direct economic impacts on aviation and related industries

Economic activity

Table 17 presents the flow of expenditure and value add (impact on GSP/GDP) estimated over the 50-year period from 2010 to 2060. The outcomes of the analysis (discounted to 2010 dollars) show:

- foregone direct expenditure of \$29.7 billion for NSW and \$21.2 billion for Australia; and
- foregone direct value add (GSP/GDP impact) of \$8.1 billion for NSW and \$5.6 billion for Australia.

Any delay in acting will result in foregone direct economic activity. Over the period to 2035, foregone activity could total \$5.1 billion in expenditure for NSW and \$4.7 billion for Australia. In terms of value add, GSP impact of \$100 million will be foregone in NSW and a GDP impact of \$100 million will be foregone in Australia.

Table 17 Foregone direct expenditure and value add (medium scenario, 2010 dollars, \$ billions)

Economic Indicator	Jurisdiction	2011–2035		2011–2060	
		Undiscounted	Discounted	Undiscounted	Discounted
Expenditure	NSW	16.4	5.1	401.9	29.7
	Australia	14.7	4.7	268.5	21.2
Value Add	NSW	3.9	0.1	113.1	8.1
	Australia	3.5	0.1	73.2	5.6

Note: Australia includes NSW.

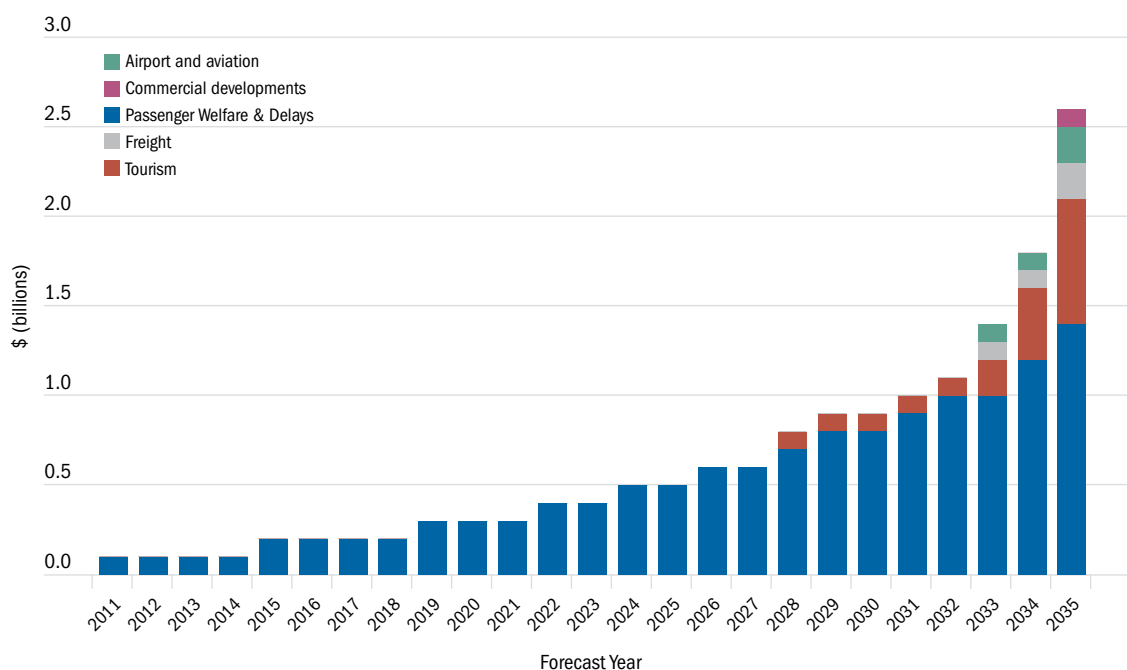
Source: Ernst & Young, medium scenario.

As can be seen, there is some difference between the level of foregone expenditure and value add for the Australian economy relative to the NSW economy alone. This is because, while some travellers, airlines or freight operators may no longer travel as a result of capacity shortfalls experienced in the Sydney region, some travellers are expected to divert to other Australian cities such as Melbourne, Brisbane or the Gold Coast. The economic impact is therefore transferred from NSW to another state, negatively affecting NSW tourism and the NSW economy but having no overall impact on the Australian economy. Where travel is suppressed and not diverted to an alternative mode of travel or airport, this will result in a loss to both the NSW and Australian economies.

Expenditure

Figure 113 presents the expected annual foregone expenditure in NSW over the short and medium term, based on the five direct impact categories identified above and for a medium elasticity scenario. Over the initial period to approximately 2024, expenditure into the economy expected to be lost due to passenger delay is estimated to amount to less than \$500 million per year. However, the impacts on passenger delay and welfare is estimated to increase over time as congestion increases and capacity shortfalls are experienced across more operating hours of the day. The impacts on expenditure foregone become more pronounced by 2035.

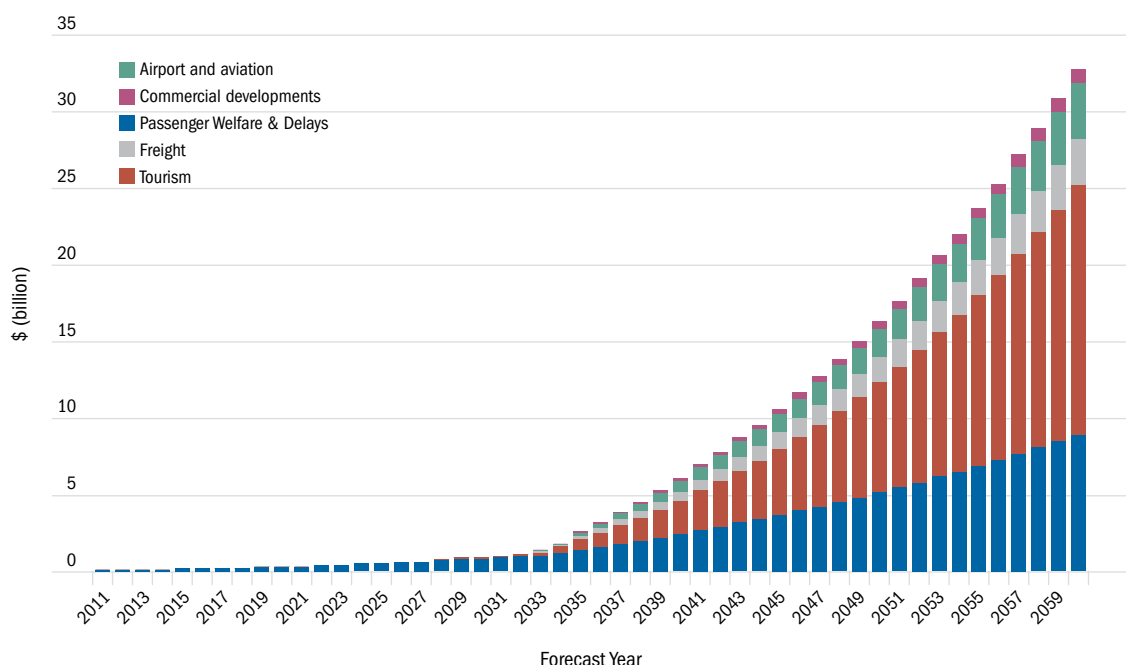
Figure 113 Foregone NSW direct expenditure, 2011 to 2035 (medium scenario, undiscounted)



Source: Ernst & Young.

The estimated cumulative loss to the NSW economy is \$16.4 billion from 2011 to 2035 (undiscounted) or \$5.1 billion (in discounted 2010 dollars). The cumulative foregone expenditure in NSW when viewed to 2060 is substantially higher, at up to \$401.9 billion (undiscounted) or \$29.7 billion in discounted 2010 dollars. This represents a 480 per cent rise on the discounted cumulative loss to 2035. The way this loss grows over time by component, particularly the sizable losses to the tourism sector after 2035, is illustrated in Figure 114.

Figure 114 Foregone NSW direct expenditure, 2011 to 2060 (medium scenario, undiscounted)



Source: Ernst & Young.

Value add

Over the period to 2060, the level of foregone value add is estimated, on an undiscounted basis, at \$113.1 billion for NSW and \$73.2 billion for Australia (or \$8.1 billion for NSW and \$5.6 billion nationally on a discounted basis). If more travel is suppressed or redistributed overseas as assumed in the high scenario, the size of the economic losses is far greater, at 1.5 to 1.8 times higher than the medium scenario.

Employment

The direct employment outcomes are presented in Table 18.

Table 18 Foregone NSW direct employment 2011 to 2060 (medium scenario, annual average)

Economic Indicator	2011–2035	2011–2060
FTE Jobs	1,490	44,700

Source: Ernst & Young.

Over the period to 2060 an annual average of 44,700 direct FTE jobs are estimated to be foregone if aviation capacity is not increased to meet demand in the Sydney region. The high scenario shows this could be as high at 74,300.

Total impacts on the broader economy

Economic activity

Total (direct and indirect) economic impacts

The CGE analysis examined NSW state impacts and the national impacts on economic growth of not adding aviation capacity, derived from the direct impacts outlined above. Specifically, the CGE analysis estimated the impacts on GSP and GDP, which are defined as the total market value of goods and services after deducting costs of goods and services, excluding capital costs for NSW and Australia.

The analysis found any delay in acting would result in foregone total economic activity over the period to 2035 totalling \$2.3 billion in GSP for NSW and \$6.0 billion in GDP for Australia. The cost of not enhancing aviation capacity is estimated to be a reduction in economic activity from 2011 to 2060 of approximately:

- \$17.5 billion of foregone GSP for NSW; and
- \$34.0 billion of foregone GDP for Australia (both discounted to 2010 dollars).

Table 19 Long-term total impacts on GSP and GDP (medium scenario, 2010 dollars, \$ billions)

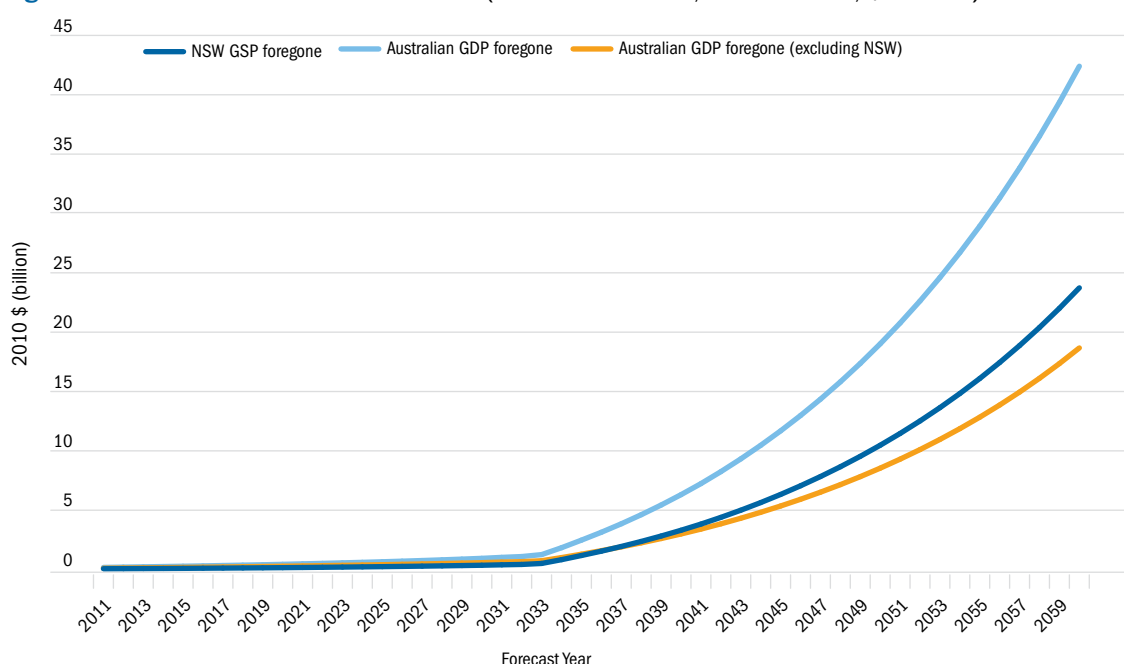
Jurisdiction and Economic Indicator	2011–2035		2011–2060	
	Undiscounted	Discounted	Undiscounted	Discounted
NSW GSP	7.1	2.3	258.8	17.5
Australia GDP	17.7	6.0	747.5	34.0

Note: Australia includes NSW.

Source: Ernst & Young analysis of CoPS and TERM.

The profile of economic activity lost to NSW and Australia over the period to 2060 is presented in Figure 115.

Figure 115 NSW GSP and national GDP (medium scenario, 2010 dollars, \$ billions)



Source: Ernst & Young analysis of CoPS and TERM, medium scenario.

The impacts of not adding aviation capacity in the Sydney region on the main components of GSP from the expenditure side are reported in Table 20.

Real expenditure changes estimated are based on changes in private consumption, investment, and impacts on the volume of foreign trade in and out of NSW and Australia. As a whole, the overseas trade position as well as other expenditure is estimated to be lower if aviation capacity within the Sydney region is not expanded.

Any delay in acting will result in foregone total economic activity. Over the period to 2035, foregone activity could total \$2.6 billion in real expenditure for NSW and \$8.9 billion for Australia (discounted).

Over the period to 2060, analysis found that the cost of not enhancing aviation capacity is estimated to be a reduction in economic activity from 2011 to 2060 of:

- foregone expenditure of \$30.6 billion for NSW; and
- foregone expenditure of \$59.5 billion for Australia (both discounted to 2010 dollars).

Table 20 Long-term total impacts on expenditure (medium scenario, 2010 dollars, \$ billions)

Jurisdiction	2011–2035		2011–2060	
	Undiscounted	Discounted	Undiscounted	Discounted
NSW	8.7	2.6	463.7	30.6
Australia	26.9	8.9	838.6	59.5

Note: Australia includes NSW.

Source: Ernst & Young analysis of CoPS and TERM.

NSW total economic impacts

An indication of the annual profile of the foregone expenditure and GSP for NSW is presented in Table 21.

Table 21 Impact on foregone NSW expenditure and GSP (medium scenario, 2010 dollars, \$ millions)

	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Real Expenditure	87	146	249	399	2,065	6,151	11,681	19,094	28,950	42,016
Real GSP	102	160	245	363	1,184	3,310	6,327	10,472	16,096	23,733

Note: Australia includes NSW.

Source: Ernst & Young analysis of CoPS and TERM.

The most significant foregone expenditure and GSP impacts are estimated in the Sydney metropolitan region. However, the CGE assessment indicates there will be adverse impacts in economic performance across most parts of NSW as different areas experience cost increases in aviation movements.

Australia-wide total economic impacts

The difference between the outcomes for NSW and Australia is determined by the impacts on other states and territories – in particular, the extent to which parts of the unmet Sydney aviation demand are shifted to airports in other states.

There were two general influences on real GSP and Australian GDP in the modelling undertaken. The first was positive: resources move from NSW to other parts of Australia when aviation

capacity is reached in the Sydney region. In addition, decreased activity in NSW releases labour and capital into other parts of Australia, further increasing activity in those areas relative to NSW. The second is negative: the Sydney aviation constraints are expected to lead to a net decrease in foreign visitor expenditure in Australia as a whole, including outside of NSW.

Later in the analysis period, after the mid-2030s, the impacts on the rest of the Australian economy (i.e. the national economy excluding NSW) as a result of status quo aviation are generally lower than the impact on the NSW economy. This indicates that some of the national resources underlying foregone NSW activity are expected to be drawn to other jurisdictions, causing the economy in the rest of Australia to contract slightly less. In the earlier years, Australian foregone levels of economic activity excluding the impact on NSW are for some years larger than the NSW foregone impacts alone. This suggests that, for those years, the rest of Australia is also negatively impacted from no expansion in aviation capacity in Sydney.

The total impacts for the national economy are shown in Table 22.

Table 22 Impact on foregone national expenditure and GDP (medium scenario, 2010 dollars, \$ millions)

	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
Real Expenditure	403	621	938	1,371	4,423	11,635	21,270	34,081	51,039	73,504
Real GDP	281	440	656	944	2,478	6,308	11,681	19,013	28,932	42,405

Note: National figures include NSW.

Source: Ernst & Young analysis of CoPS and TERM, medium scenario.

Employment

The CGE model has also been used to estimate the impact on employment outcomes, which were analysed based on the changes in GSP, GDP and expenditure levels.

The total (direct and indirect) employment outcomes under the medium elasticity scenario are presented in Table 23.

Table 23 Foregone total employment 2011 to 2060 (medium scenario, annual average)

Economic Indicator	2011–2035	2011–2060
NSW	400	12,700
Australia	600	17,300

Note: Australia includes NSW.

Source: Ernst & Young analysis of CoPS and TERM, medium scenario.

The number of total jobs that will not be created is estimated to be an annual average of 12,700 FTE positions in NSW over the period between 2011 and 2060, and 17,300 positions in Australia as a whole. The number of foregone jobs is estimated to increase over time as unmet demand increases, such that by 2060, the annual estimate of foregone jobs is approximately 57,000 in NSW and 77,900 nationally. New jobs in NSW will be foregone in a range of sectors, including airlines, tourism, hospitality and aircraft maintenance.

The number of total jobs that will not be created is estimated to grow over time as unmet demand increases. As indicated in Table 24, employment impacts in NSW are modest in the short and medium term but then rise sharply in the long term as peak spreading is fully utilised and the extent of unmet demand rises significantly. Foregone employment impacts are also expected for Australia, though NSW is expected to experience the most significant impacts, given that some NSW employment growth will be transferred to other states. The estimates of

total jobs foregone in NSW and Australia. In particular, in 2060 alone, the annual estimate of foregone jobs is approximately 57,000 in NSW and 77,900 nationally.

Table 24 Foregone NSW and Australian employment, 2015 to 2060 (medium scenario, FTEs)

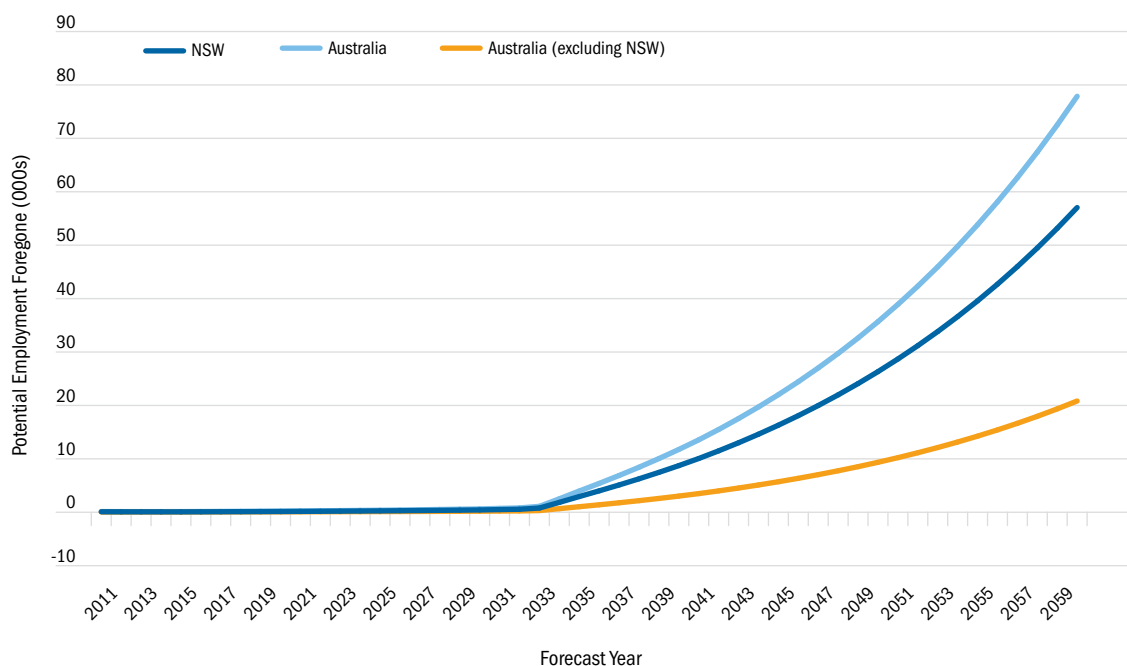
	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060
NSW	80	139	257	431	2,938	8,731	16,302	26,329	39,583	57,048
Australia	124	213	382	628	3,975	11,757	22,015	35,681	53,834	77,879

Note: Australia includes NSW.

Source: Ernst & Young analysis of CoPS and TERM, medium scenario.

A graphical comparison of these impacts is provided in Figure 116.

Figure 116 NSW and Australia employment outcomes (medium scenario)



Source: Ernst & Young.

The analysis assumes each employee continues to work the same number of hours, and that there is no change in labour productivity over the evaluation period. In reality, some of the increased requirement for labour could be met by increasing working hours of both existing and newly acquired employees or increasing their skill level. Consequently, the analysis is likely to overstate the foregone employment of individuals. However, qualitative impacts – for example, standard of living affected by longer more demanding work conditions – have not been captured.

5.3 Unquantified impacts

Ernst & Young's analysis highlighted a number of other possible impacts which were difficult to quantify. Such impacts should, however, be considered, and include adverse impacts on:

- **regional growth** – while it is difficult to quantify the impact of individual transport investments on overall long-term economic growth and development, Sydney's role and reputation as the 'gateway' to Australia could be at risk if Sydney cannot meet demand for aviation;
- **industry development** – firms may find it more difficult to access emerging markets or connect with key business destinations, which has significant implications for our reputation as a world-class destination for business;
- **tourism** – Sydney's and Australia's international reputation, and the economic and social benefits it generates;
- **social impacts** – contact between residents and friends and families overseas and expanding the choice of products available to consumers. However, quantifying these benefits is challenging, as they are not measured and are highly subjective.

These issues are explored in more detail in Technical Paper B7.

The costs of one further issue – the continuing loss of suitable sites – have not been included in the quantitative analysis but needs to be factored into decision making.

Capacity constraints at Sydney (Kingsford-Smith) Airport have been managed in the past through a variety of infrastructure augmentations. However, as capacity has become more constrained, the improvements have become increasingly incremental. At the same time, the ability to construct and deliver large-scale economic infrastructure within major cities has become more difficult and costly.

As shown in Figure 117, numerous potential sites for alternative airports were identified in studies during the 1970s and 1980s. However, as no decision was made to develop aviation infrastructure at these sites or to protect them for future development, some have progressively been converted to other land uses. A number of these sites have ceased to be viable options. Meanwhile, pressure has continued to grow on existing facilities and resources.

Figure 117 Potential new Sydney aviation sites previously identified

	Benefit/Cost Study of alternative Airport Proposals for Sydney (1971-74)			Major Airport needs of Sydney Study (1977-79)			Second Sydney Airport Site Selection Programme (1983-85)	
	Medium list	Select list	Short list	Zones	Sites/layouts	Short list	Nominated locations	Short list
North and west of city centre	Wyang*						Warnervale	
	Somersby						Somersby	
	Richmond**						Londonderry	
	St Marys			NW	Londonderry			
	Blue Gum Ck ⁺	Blue Gum Ck	Blue Gum Ck		Richmond			
	Marsden Pk	Marsden Pk	Marsden Pk		Scheyville	Scheyville	Scheyville	
	Rouse Hill			N				
	Galston	Galston						
	Prospect	Prospect				Sites foregone		
	Duffys Fst							
South and west of city centre	Towra Pt	Towra Pt	Towra Pt					
	Wattamolla							
	Long Point ⁺⁺	Long Point	Long Point	S	Holsworthy		Holsworthy	
	Bringelly	Bringelly	Bringelly	SW	Bringelly		Bringelly	
	Badgerys Ck				Badgerys Ck	Badgerys Ck	Badgerys Ck	Badgerys Ck
							Darkes Forest	
	Canberra - Goulburn						Wilton	Wilton

* Later called Warnervale.

** East of the Londonderry site.

⁺ Later called Scheyville.

⁺⁺ Later called Holsworthy.

Source: Department of Aviation Sydney Second Airport Site Selection Programme Draft Environmental Impact Statement prepared by Kinhill Stearns, 1985.

As identified in the Australian Government's *Our Cities, Our Future* National Urban Policy, 'a major impediment to the placement of new infrastructure or the expansion of existing infrastructure is the lack of planning for, and protection of critical infrastructure corridors. A further concern is the adequate protection of sufficient buffers to prevent facilities from being encroached upon by incompatible land uses'.

Continued delay in action to secure an alternative site will increasingly constrain governments' options for future action.

If new capacity is provided, the economic and social benefits could be expected to resume at full natural rates as all passenger demand growth is accommodated. However, the economic and social costs incurred while awaiting extra capacity will never be recaptured.

The choice governments now face is more urgent than in the past, with serious capacity constraints beginning in the near future and serious impacts emerging progressively in the medium term. Given the time required to establish a working airport – as further outlined in Part Seven of this Report – there is a need to commit to action now.

