Joint Study on aviation capacity in the Sydney region

Volume 1

TECHNICAL PAPERS

REPORT TO

Australian Government

NSW GOVERNMENT

Airport infrastructure in the Sydney region

A1

Sydney Region Aviation Capacity Study

Airport Infrastructure in the Sydney Region

WorleyParsons
resources & energy

AMPC
Airport Master Planning Consultants

Overview and Outline of Report

WorleyParsons

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DEPARTMENT OF INFRASTRUCTURE AND TRANSPORT

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OVERVIEW AND OUTLINE OF THE REPORT

A.1 This Study

As an early task in the development of the Aviation Capacity Study, the Department of Infrastructure and Transport (the Department) determined to undertake this study to collect data about the infrastructure of 12 aerodromes[1] in the Sydney Region in order to inform it about the infrastructure, function and development plans at each of those aerodromes.

It is relevant to note that the aviation strategic plan will be based around a comprehensive whole of aviation consideration i.e. covering passenger, freight and general aviation matters, in regard to all of the aviation activities that occur in and around Sydney. This initial study of the existing aerodrome facilities is cognisant of any linkages and dependencies between them and their particular functions in relation to the overall needs of aviation.

The aerodromes for which data has been collected are as listed below:

- Newcastle Airport (RAAF Base Williamtown)
- Maitland Airport
- Cessnock Airport
- Sydney (Kingsford Smith) Airport
- Bankstown Airport
- RAAF Base Richmond
- Holsworthy Army Air Base
- Camden Airport
- Illawarra Regional Airport
- HMAS Albatross Naval Air Station
- Goulburn Airport
- Canberra Airport

Broadly, the information about each aerodrome sought by the Department covers:

- the infrastructure and facilities currently available and the extent of aviation operations they can support;
- any anticipated infrastructure development and the extent of aviation operations it can support; and
- factors which potentially impact on the aerodrome's ability to meet any current or future demand.

Such factors were specified to include:

- Current Site Attributes and Constraints;

[1] The term aerodrome is used specifically herein where describing a Defence facility and where a group of aviation facilities also includes a Defence facility – it is also used interchangeable with the word airport where civil usage only occurs at that facility as often these places were originally called aerodromes but have now become known as airports.

- Aerodrome Operations;
- Accessibility and Surface Transport;
- Land Planning Policies and Frameworks;
- Environmental Factors, Frameworks and Policies;
- Community and Public Amenity Factors;
- Future Patronage, Freight, Investment and business attributes;
- Utilities.

A.2 Background to this Study

In the National Aviation Policy White Paper – *Flight Path to the Future*, the Federal Government has identified as a policy goal, that the future aviation needs of the Sydney region are met through the provision of additional aviation capacity, effectively integrated with future land transport, and other infrastructure developments and state land use planning.

A range of actions have been identified which will lead to the development of an aviation strategic plan prepared in conjunction with the NSW Government. These actions are summarised as:

1. Consider the immediate aviation infrastructure requirements for the Sydney region; the capacity of the existing aviation infrastructure, and the land transport network linkages to meet forecast demand;
2. Determine the medium and long-term aviation infrastructure requirements for the Sydney region, and the capability of the existing aviation assets serving the region, to meet the forecast market demand in passenger and freight transport and general aviation sectors of the industry. This would include consideration of:
   - current airport capacity;
   - the implications of future long-term demand forecasts for aviation services;
   - the planning of future economic infrastructure including long-term spatial with land use planning for employment for the region;
   - the location and nature of future urban growth in the Sydney region, and
   - key linkages between existing aviation infrastructure with other transport networks.
3. Review existing investment strategies for the civil and Defence aerodrome facilities in the region, including an assessment of their capacity to meet the Sydney region's future aviation requirements.
4. Identify strategies and locations to meet the aviation infrastructure needs of the Sydney region, through examining:
   - current and future state land use and land transport planning strategies;

- Sydney's future requirements for transport and economic infrastructure, including Sydney's future employment nodes;
- existing and required transport infrastructure to support additional aviation capacity for the region;
- the need for other supporting infrastructure (energy, communications gas, water etc);
- the availability and application of off-airport protection measures to ensure existing and future aerodrome capacity is protected from inappropriate development which may limit its effective long-term operations and growth;
- the interaction between airports in the region, including Sydney (Kingsford Smith) Airport;
- economic, investment, environmental opportunities and challenges associated with future land use; and
- existing airport policy and legislative requirements.

5. Identify any other matters that will need to be considered in delivering additional aviation capacity for the Sydney region.

A.3 General Approach to this Study

The general approach adopted to collect information has been as follows:

- Set up matrices and populate these by desktop research using public domain sources;
- Establish a contact for each aerodrome and inform them of the nature of this work;
- Issue each aerodrome contact with the draft matrices for their review;
- Set up meetings at each aerodrome site[2] with the manager of the aerodrome and review the data matrices line by line or by exception on site (in the case of Newcastle Airport this was a joint meeting with representatives of RAAF Base Williamtown);
- If available, during the visit to the aerodrome, undertake a site inspection for familiarisation purposes[3].
- Receive comment and / or additional information from each aerodrome and update the data matrices.

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[2] On advice from the Department, no site meetings were required to be held at HMAS Albatross Naval Air Station or Holsworthy Army Air Base

[3] "Window screen" or "walk around" tours in the company of the aerodrome management were able to undertaken at Cessnock, RAAF Base Richmond, Bankstown, Camden, Goulburn, Illawarra Regional Airport and Maitland.

A.4 Meetings and Consultations

The following table lists the primary contacts for each aerodrome where data has been collected.

Aerodrome	Contact Name and Role
Newcastle Airport (RAAF Base Williamtown)	NAL Chief Executive Officer: Paul Hughes Support Manager Mr Charles Mangion
Maitland Airport	Mr Peter Meguyer President Royal Newcastle Aero Club
Cessnock Airport	Peter Roberts CEO Airport & Leisure Corporation
Sydney (Kingsford Smith) Airport	John Gunek Manager Planning & Development
Bankstown Airport	Mr Colin Grove Chief Executive Officer
RAAF Base Richmond	Base Support Manager Mr Chris Young
Holsworthy Army Air Base	Graham Lacey, Director Estate Strategic Planning, Defence
Camden Airport	Mr Colin Grove Chief Executive Officer
Illawarra Regional Airport	Mr Arthur Webster Director – Operations and Services
HMAS Albatross Naval Air Station	Graham Lacey, Director Estate Strategic Planning, Defence
Goulburn Airport	Mr Ian Aldridge Manager Engineering Development
Canberra Airport	Mr Stephen Byron Managing Director Andrew Leece

A.5 Sources, Forms and Presentation Of Data Collected

The Department's Brief sought that information collected be *"in a clearly and easily understandable form, suitable for non-aviation experts"*. Against this requirement however, (like all forms of infrastructure), is that aerodromes have their own special *"language"* and technical descriptions which establish their ability to perform their functions to the required standards of design and safe operation. In view of the need to use technical language, a glossary of terms is included.

The data is therefore presented in three ways:

- A comparative analysis in tabular form which lists each aerodrome and some 43 factors on which a comment is made for each aerodrome. The data is distilled from the detailed matrices described following. This table uses simple descriptions as much as possible and allows ready comparison of how each of the twelve aerodromes rates on any one factor;
- Detailed data matrices which address the broad factors listed in A1 above, but in the detail as described below. Much of this data is taken directly from source documents, such as Airport Master Plans and the like, and preserves the precise technical language and descriptions of the source;
- A GIS model which allows a more interactive and graphical presentation of some of the information in the detailed matrices, as well as allowing the aerodrome sites to be viewed at different scales.

In all cases the most reliable information should be regarded as that in the detailed matrices.

Data has been sourced as follows:

- Public domain documentation, available on Aerodrome websites and sources such as Airservices Australia and the like;
- Data or comment provided by aerodrome management;
- Digital data on land use zonings in the Sydney region provided under license by the NSW Department of Planning for the purposes of this study only, and used in the GIS model described elsewhere herein;
- Some digital data provided under license by two local government authorities for the purposes of this study only, and used in the GIS model described elsewhere herein;[4]
- Public domain documentation available on local government websites, noting that some Local Government Authorities have extensive disclaimers as to the accuracy of such online electronic mapping data as is illustrated by the following extract example:

  "Shoalhaven City Council is committed to quality and makes every attempt to ensure that the information contained in this site is accurate, current (as at the date specified on the map) and complete, however, Shoalhaven City Council, its employees, servants or agents, make

[4] Shoalhaven City and Shellharbour Councils only

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Therefore, these pictures, as included in the data matrices, should be regarded as being for the purpose of helping the Commonwealth to understand the circumstances at any given aerodrome more clearly than can be achieved by description only.

In going beyond this study to consider any particular aerodrome in more detail, it is strongly recommended that source documentation on any given topic be revisited. For example, in respect of land use and zoning, the material may be indicative only and in the event that a particular location is investigated in more detail, then the relevant Council should be approached and asked to issue official information such as a section 149 certificate.

A.6 Comparative Factor Assessment

The factors documented in the Comparative Factor Assessment are as follows:

- Main uses;
- Operator;
- Lease expiry;
- Owner;
- Area of site;
- Location;
- Proximity to freeway system;
- Distance/time from nearest major city – by road;

- Distance/time of nearest rail station;
- Distance/time from Sydney CBD - by road;
- Distance/time from Sydney central - by rail;
- Other transport available;
- RPT airlines services;
- RPT connection to Sydney;
- Current maximum aircraft type;
- Maximum current direct RPT destination capability;
- Main runway dimensions;
- Secondary runway (s);
- Aircraft parking/gates;
- Aerobridges;
- Terminal floor space;
- Airside master plan proposals;
- Landside master plan proposals;
- Ability to receive international flights;
- Curfew;
- Current number of movements;
- Future maximum number of movements per annum;
- Current commercial freight;
- Future commercial freight;
- Planning control;
- Development control;
- Surrounding land uses at aerodrome boundary;
- Significant land uses within 5 kms radius;
- Immediate road network;
- Immediate passenger rail network;
- Noise impacts >25 ANEF
- Flooding;

- Bushfire and other hazards;
- Rare and endangered species;
- SEPP 14 wetlands;
- Other environmental issues;
- Bird strike per 10,000 movements per annum (unless otherwise stated);

A.7 Detailed Data Matrices

The factors documented in the Detailed Data Matrices, to the extent that data could be obtained, are as follows:

Current Site Attributes

- Aerodrome location;
- LGA;
- Ownership and management; lessee/operator;
- Aerodrome Category;
- Applicable regulatory regime;
- Site area and physical dimensions;
- Major centres of population, population growth;
- Elevation;
- Surrounding topography;
- Liability for flooding;
- Atmospheric conditions;

Aerodrome Operations

- Summary of main activities;
- Current passenger numbers;
- Current aircraft movement numbers;
- Current freight throughput;
- Known sources of delay in aerodrome and runway operations;
- Movement/manoeuvring area details;
- Runways;
- Runway strips;
- Taxiways;
- Aprons;
- Airfield pavements;
- Airfield operating restrictions;
- Airfield lighting and approach systems;
- Visual navigation aids;
- Radio navigation aids;

- Surveillance systems;
- Operational procedures;
- Aviation fuel;
- Terminals and other major aviation support infrastructure elements;
- Security;
- Border agencies;
- Air traffic management and airspace management arrangements;
- Aerodrome Rescue and Fire Fighting Services (ARFFS);
- Operating restrictions;
- Known development capability and expansion planning;
- Known constraints on future capacity or ability to meet current and future demand;
- Aircraft noise contours and status;

Future Patronage, Freight, Investment and Business Attributes

- Business enterprises present or related;
- Freight forecasts;
- Plans to invest in upgrading;
- Passenger patronage forecasts;
- Aircraft movements forecast by type;
- Costs for upgrades;

Accessibility and Surface transport

- Connections to road;
- Traffic volume;
- Access to rail;
- Aerodrome parking capacity - short term and long term;
- Other transportation services available at aerodrome;
- Walking and cycling;

Utilities and services

- Water and sewer;
- Gas;
- Police, fire, ambulance, hospitals;
- Power;
- Telecoms;

Land Planning Policies and Frameworks

- Statutory and policy framework;
- National, State and local planning policies and Instruments;
- Provisions for aerodrome development;

Environmental Factors, Frameworks and Policies

- Site characteristics;
- Surrounding land uses and land characteristics;
- Adjacent land use - planning controls;
- Type, spatial extent and proximity of land uses;
- Incompatible developments planned or approved;
- Threatened or endangered species;
- Designated environmental management areas;
- Existing environmental assets;
- Heritage scientific and aesthetic qualities/issues;
- Wetlands and other sources of bird hazard;
- Existing Environmental Management - Factors, Frameworks and Policies;
- Aerodrome's environmental management plan;
- Management of sources of pollution - air, water, noise;
- Environmental management policies for the aerodrome;
- Challenges to expansion / sensitive adjacent land uses;
- Proximity of incompatible land use - for existing and any possible expanded aerodrome usage;

Community and Public Amenity Factors

- Community attitudes to aerodrome;
- Aerodrome interaction with communities;

A.8 GIS model

Information about each aerodrome is also presented in the form of a graphical interface model using geo-referenced aerial photos of NSW east coast.

This model provides a convenient way of being able to view each aerodrome in a general sense within its surroundings and environment and to refer to selected data drawn from the data matrices. This information includes basic data on:

- Site attributes;
- Aerodrome operations;
- Runways and taxiways;
- The ANEF for that aerodrome;
- Expansion aerodrome overlay – this shows, for comparison purposes only and as an example of its impact, a medium size existing aerodrome – in this case Adelaide has been adopted – being overlaid on the subject aerodrome and showing the relative extent of infrastructure and ANEF footprint;
- Road and Rail transport options – in the form of indications of routes of major road and rail access to and from the aerodrome;
- The local government areas and boundaries in the vicinity of the aerodrome;
- Land Use Zones – this data, which is in integrated form across the State, was sourced in digital form under license from the NSW Department of Planning and hence may be considered current and may be more authoritative than the data derived from each Council and as included in the data matrices.

The following should be noted:

The underlying aerial photography may not be up to date and therefore may not show recent developments;

The model is presented in the form of WorleyParsons *waterRide* Software for which a license is granted to the Department to use to view the information contained therein for the purposes of the study.

A User Help Guide for this model in included in Section E elsewhere herein.

Table A1 – Source of Digital Zoning data

Aerodrome	Source of Digital Zoning data
Bankstown Airport	Bankstown LEP 2001
	Auburn LEP 2000
	Fairfield LEP 1994
	Liverpool LEP 2008
Camden Airport	Camden LEP
	Wollondilly LEP 1991
Canberra Airport	Landuse data
Cessnock Airport	Cessnock LEP 1989
Goulburn Airport	Goulbourn LEP 2009
Holsworthy Army Air Base	Bankstown LEP 2001
	Liverpool LEP 2008
	Sutherland LEP 2006
Illawarra Regional Airport	Shellharbour LEP 2000
	Shellharbour Rural Environmental Plan 2004
Maitland Airport	Maitland LEP 1993
HMAS Albatross Naval Air Station	Shoalhaven LEP 1985
RAAF Base Richmond	Blacktown LEP 1989
	Hawkesbury LEP 1989
	Penrith LEP No 201
	Penrith Planning Scheme
Sydney (Kingsford Smith) Airport	Ashfield LEP 1985
	Botany LEP 1995
	BurwoodPlanning Scheme Ordinance
	Canterbury LEP No 148 - Campsie Precinct
	Canterbury LEP No 178 - Belmore-Lakemba Precinct

Aerodrome	Source of Digital Zoning data
	Canterbury LEP No 178 - Canterbury Precinct
	Canterbury LEP No 205
	Canterbury LEP No 205 - Campsie Precinct
	Canterbury Planning Scheme Ordinance
	Central Sydney Local Environmental Plan 1996
	Hurstville Local Environmental Plan 1994
	Kogarah Local Environmental Plan 1998
	Leichhardt Local Environmental Plan 2000
	Marrickville Local Environmental Plan 2001
	Randwick Local Environmental Plan 1998
	Rockdale Local Environmental Plan 2000
	Rockdale Planning Scheme 1973
	South Sydney Local Environmental Plan 1998
	Strathfield Planning Scheme
	Sutherland Shire Local Environmental Plan 2006
	Sydney Local Environmental Plan 2005
	Sydney Regional Environmental Plan No 26 - City West
	Waverley Local Environmental Plan 1996
	Waverley/Woollahra Joint LEP 1991
	Woollahra Local Environmental Plan 1995
Newcastle Airport (RAAF Base Williamtown)	Port Stephens LEP 2000

A.9 Capability Analysis

The following tables provide an assessment of the likely future capability of each of the twelve aerodromes taking account of the information presented in the Summary and Detailed matrices which follow. The assessments are necessarily judgemental in nature based on the data collected and the plans disclosed by the owners/operators of the aerodromes for their development.

Table A.2 Future aerodrome capability

Aerodrome	Current Likely Future Operational RPT Function	Future Operational Capability after any proposed/possible development	Major Issues for Aerodrome Operational Development
Newcastle Airport (RAAF BASE Williamtown)	Short Haul International to Code 4C (B737/A320) and Domestic RPT as permitted by RAAF operations. Note: Civil Operations cap per hour	Short Haul International to Code E (B787) and Domestic RPT as permitted by RAAF operations. Note: Civil Operations cap per hour	Further urban development encroachment (Acoustic effects); Aircraft movement slots potentially limited by Defence needs; Limited land designated for Civil operation to expand beyond current proposals; NB: Rail link not easily provided.
Maitland Airport	General aviation - maintenance, training, recreation and sports aviation	Intrastate propeller domestic commuter RPT and small executive aircraft	Further urban development encroachment (Acoustic effects); Site too small to lengthen runways; NB: Rail link not easily provided.
Cessnock Airport	General aviation - maintenance, training, recreation and sports aviation; Charter operations	Intrastate propeller domestic commuter RPT and small executive aircraft	Further urban development encroachment (Acoustic effects); No further runways extensions beyond restoration of the original runway length possible within site; NB: Rail link not easily provided.
Sydney (Kingsford Smith) Airport	All International to Code F (B747-400/A380/B777) and Unrestricted Domestic RPT	All International to Code F (B747-400/A380/B777) and Unrestricted Domestic RPT	Existing and further urban development encroachment (Acoustic effects) Operational cap (80 movements per hour and curfew) NB: Rail link already serves

Aerodrome	Current Likely Future Operational RPT Function	Future Operational Capability after any proposed/possible development	Major Issues for Aerodrome Operational Development
			airport terminals.
Bankstown Airport	Short Haul Domestic RPT to Code 3C (Embraer 170).	Short Haul Domestic RPT to Code 3C (Embraer 170)	Existing urban development encroachment (Acoustic effects) No further runway extensions possible beyond Masterplan proposal; Flood potential; NB: Rail link not easily provided
RAAF Base Richmond	Domestic RPT to Code 4C (B737/A320)	Short Haul International and Domestic RPT to Code E aircraft(B787)	Existing and further urban development encroachment (Acoustic effects); Ordnance Loading Area clearances; Fog and major flooding potential; NB: Rail link is closely proximate to aerodrome.
Holsworthy Army Air Base	Army Aviation (principally helicopters)	Military operations as required	Incompatibility with continued military operations in Holsworthy Military Reserve; Airfield requires major development for civil operations; NB: Rail link not easily provided
Camden Airport	General aviation, maintenance, training, recreation and sports aviation	General aviation, maintenance, training, recreation and sports aviation	Existing and further urban development encroachment (Acoustic effects); Site too small to lengthen runways; NB: Rail link not easily provided

Aerodrome	Current Likely Future Operational RPT Function	Future Operational Capability after any proposed/possible development	Major Issues for Aerodrome Operational Development
Illawarra Regional Airport	General aviation, maintenance, training, aviation related industry recreation and sports aviation;	Domestic RPT to Code 3C (EMB170)	Existing and further urban development encroachment (Acoustic effects) NB Rail link is closely proximate to airport
HMAS Albatross Naval Air Station	Navy Aviation (Principally Helicopters)	Short Haul International Code E aircraft (B787) and Domestic RPT to Code 4C (B737/A320)	Remote from major population centres; NB: Rail link not easily provided Rail link not easily provided
Goulburn Airport	General aviation, maintenance, training, historic, recreation and sports aviation	Intrastate propeller domestic RPT and small executive aircraft	Remote from major population centres; NB: Rail link not easily provided
Canberra Airport	Short Haul International to Code F (B747-400/A380/B777) and Unrestricted Domestic RPT as demanded	Full International to Code F (B747-400/A380/B777) and Unrestricted Domestic RPT	Further urban development encroachment (Acoustic effects); NB: Rail link not easily provided although corridor designated by ACTPlan.

The following table provides a further indication of the type of RPT operation that could be provided from the existing or upgraded infrastructure – to the extent this is proposed or possible – from each of the aerodromes.

Whether this occurs or not is wholly dependant on market demand and the willingness of operators to provide services as indicated.

Nevertheless from this it can be seen that the region has two airports – ***Sydney and Canberra*** - whose infrastructure already allows the operation of any form of RPT service – domestic or international; Three aerodromes – ***Newcastle, RAAF Base Richmond and HMAS Albatross Naval Air Station*** whose basic infrastructure, if developed appropriately, could sustain up to a regional level of RPT service including a regional international service – however HMAS Albatross Naval Air Station, although an excellent facility, would seem unlikely to be a candidate for the development of commercially viable RPT service in the foreseeable future by virtue of its location distant from major population centres; two airports – ***Bankstown and Illawarra Regional Airport*** which could provide for East Coast RPT level services; at least two – ***Cessnock and Maitland*** –

which could accommodate a local NSW level of RPT services; one – ***Holsworthy*** – which is unsuitable for any form of RPT service in its present and likely future condition; and two – ***Camden and Goulburn*** which are probably most suitable as general aviation facilities, although of the two Goulburn would have the greater potential for expansion due to its much lower level of constraints.

Table A.3 Possible Future RPT Capability by Service Type

RPT Capability by Service type.					
Aerodrome	**Long Haul International**	**Short Haul International**	**Australia wide Domestic**	**East Coast Domestic**	**NSW Regional Domestic**
Sydney (Kingsford Smith) Airport	✓	✓	✓	✓	✓
Canberra Airport	✓ (Note 1)	✓	✓	✓	✓
Newcastle Airport (RAAF Base Williamtown)	✗	✓	✓	✓	✓
RAAF Base Richmond	✗	✓	✓	✓	✓
HMAS Albatross Naval Air Station	✗	✓	✓	✓	✓
Bankstown Airport	✗	✗	✗	✓ (Note 2)	✓
Illawarra Regional Airport	✗	✗	✗	✓ (Note 3)	✓
Cessnock Airport	✗	✗	✗	✗	✓
Maitland Airport	✗	✗	✗	✗	✓
Holsworthy Army Air Base	✗	✗	✗	✗	✗
Camden Airport	✗	✗	✗	✗	✗
Goulburn Airport	✗	✗	✗	✗	✗

Note 1: subject to runway length capability

Note 2: limited to Code 3C aircraft

Note 3: subject to being able to achieve Code 3/4C operational capability

Glossary of Terms

Glossary of Terms

B. GLOSSARY OF TERMS[1]

B1 Aviation Terminology, Abbreviations and Acronyms

ACN	Aircraft Classification Number: a number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.
ANEC	Australian Noise Exposure Concept: used as a planning tool to investigate likely changes to aircraft noise exposure resulting from proposed changes to conditions at an airport. Those changes include, among other things, changes to aircraft types or numbers.
ANEF	Australian Noise Exposure Forecast: the only metric approved and promoted by the Federal Government for use in determining the suitability of land use in regards to aircraft noise. The ANEF is generally provided for a 20-year time frame, is updated regularly and there can be only one approved set of ANEF contours at a given time. The approving authority is Airservices Australia.
ANEI	Australian Noise Exposure Index: provides historical data on aircraft noise exposure. Normally one year's actual traffic at an airport is used to generate the ANEI and the approval process is the same as that for the ANEF.
ARC	Aerodrome Reference Code: a convenient method of to specifying the standards for individual aerodrome facilities which are suitable for use by airplanes within a range of performances and sizes. The Code is composed of two elements: element 1 is a number related to the airplane reference field length; and element 2 is a letter related to the airplane wingspan and outer main gear wheel span as per the table below. A particular specification is related to the more appropriate of the two elements of the Code or to an appropriate combination of the two Code elements. Typical examples are the B737 which is a Code 4C airplane, while the B747 is a Code 4E airplane. The Code letter or number within an element selected for design purposes is related to the critical airplane characteristics for which the facility is provided. There could be more than one critical airplane, as the critical airplane for a particular facility, such as a runway, may not be the critical airplane for another facility, such as the taxiway.

[1] Note: abbreviations for some terms are also given in the text as these terms are used.

Aerodrome Reference Code				
Code Element 1		Code Element 2		
Code Number	Airplane Reference Field Length	Code Letter	Wing Span	Outer Main Gear Span
1	Less than 800m	A	Up to but not including 15m	Up to but not including 4.5m
2	800m up to but not including 1200m	B	15m up to but not including 24m	4.5m up to but not including 6m
3	1200m up to but not including 1800m	C	24m up to but not including 36m	6m up to but not including 9m
4	1800m and over	D	36m up to but not including 52m	9m up to but not including 14m
		E	52m up to but not including 65m	9m up to but not including 14m
		F	65m up to but not including 80m	14m up to but not including 16m

Source: CASA 2008

ARFFS	Aerodrome Rescue and Fire Fighting Services: a special category of firefighting that involves the response, hazard mitigation, evacuation and possible rescue of passengers and crew of an aircraft involved in (typically) an airport ground emergency.
ARFL	Aerodrome Reference Field Length: the minimum field length required for take-off at maximum certificated take-off mass, sea level, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate airplane flight manual prescribed by the certificating authority or equivalent data from the airplane manufacturer. The determination of the ARFL is solely for the selection of a Code number and must not be confused with the actual runway length requirement for a particular operation which may influenced by other factors.
ATC	Air Traffic Control: a service provided by ground-based controllers who direct aircraft on the ground and in the air.
AWIS	Automatic Weather Information Service: a system which provides information on a range of current parameters and made available via phone or discrete radio frequency.
CTAF	Common Traffic Advisory Frequency: a procedure which assigns common radio frequencies to geographic areas and used for the purpose of air to air and air to ground pilot communications.
DME	Distance Measuring Equipment: a ground-based navigation aid which provides a pilot with the slant distance from the aircraft to the DME ground transmitter.
ERSA	En-Route Supplement Australia: a document which provides a range of aeronautical information including information for aerodromes.
GNSS	Global Navigation Satellite System: generic terminology to identify all satellite navigation systems where the user performs onboard position determination from satellite information. The widely known Global Positioning System (GPS) is one form of GNSS.
IATA	International Air Transport Association: the peak international body which represents most of the world's airline's interests.
ICAO	International Civil Aviation Organization; the United Nations body to which Australia is a signatory, which codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth.
IMC	Instrument Meteorological Conditions, expressed in terms of visibility, distance from cloud, and ceiling, less than the minimum specified for visual meteorological conditions.

INM	Integrated Noise Model: the software published by the US Federal Aviation Administration used to derive aircraft noise contours.
IFR	Instrument Flight Rules: regulations and procedures for flying aircraft by referring only to aircraft instruments for navigation. Scheduled airline flights operate under IFR.
IWDI	Illuminated Wind Direction Indicator: a ground based visual navigation aid which provides an estimate of wind speed and direction to pilots and illuminated for night use.
MAGS	Movement Area Guidance Signs: mandatory, direction and information signs placed adjacent to runways, taxiways and aprons which provide operational information to pilots.
MTOW	Maximum Take-off Weight: the maximum weight at which the pilot of the aircraft is allowed to attempt to take off, due to structural or other limits.
NDB	Non-Directional Beacon: a ground-based radio navigation aid that provides a pilot with relative bearing information to the NDB station.
N60	Number of daily flights above 60 dB(A): noise contours based on the estimate of daily flights.
N70	Number of daily flights above 70 dB(A): noise contours based on the estimate of daily flights.
OLS	Obstacle Limitation Surfaces: a series of planes associated with each runway at an aerodrome that defines the desirable limits to which objects may project into the airspace around the aerodrome so that aircraft operations at the aerodrome may be conducted safely.
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations: a term denominating rules for designing instrument approach and departure procedures.
PAPI	Precision Approach Path Indicator system; a lighting array which provides pilots with visual approach slope guidance for landing.
PCN	Pavement Classification Number: a number expressing the bearing strength for unrestricted operations by aircraft with ACN value less than or equal to the PCN.
RESA	Runway End Safety Area: an area symmetrical about the extended runway centre line and adjacent to the end of the strip, primarily intended to reduce the risk of damage to an airplane undershooting or overrunning the runway. RESA are a mandatory requirement for Code 3 and 4 runways.
RNAV	Area Navigation: a method of navigation which permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids, or within the limits of the capability of self-contained aids, or a combination of these.
RNP	Required Navigation Performance: a statement of the navigation performance necessary for operation within a defined airspace. It is part of a broader concept called "Performance-based Navigation or PBN." RNP is a method of implementing routes and flight paths that differs from previous methods in that not only does it have an associated performance specification that an aircraft must meet before the path can be flown, but it must also monitor the achieved performance and provide an alert in the event that this fails to meet the specification. It is the monitoring and alerting facility that distinguishes RNP from RNAV from which it developed.
RPT	Regular Public Transport: a generic term which signifies scheduled air passenger transport operations.
RWS	Runway Strip: a defined area including the runway and stopway, (if provided), intended to reduce the risk of damage to aircraft running off a runway and to protect aircraft flying over it during take-off or landing operations.
WDI	Wind Direction Indicator: a ground based visual navigation aid which provides an estimate of wind speed and direction to pilots for day time use.

B2 Other Terminology, Abbreviations and Acronyms

EP&A Act 1979	Environmental Planning and Assessment Act 1979
EP&A Regs 2000	Environmental Planning and Assessment Regulations 2000
ha	hectare
hrs	hours
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
kg	kilograms
kms	kilometres
LEP	Local environment Plan – a statutory planning instrument in NSW
LGA	Local Government Area
m^2	Metres squared
Major Development SEPP	State Environmental Planning Policy (Major Development) 2005
mins	minutes
ML	Million litres
MVA	Mega Volt Ampere – a measure of electrical power
SWSOOS	South Western Ocean Outfall Sewer (near Sydney Airport)
UTC	Coordinated Universal Time - Coordinated Universal Time (UTC) is a time standard based on International Atomic Time (TAI) with leap seconds added at irregular intervals to compensate for the Earth's slowing rotation.[2] Leap seconds are used to allow UTC to closely track UT1, which is mean solar time at the Royal Observatory, Greenwich. The difference between UTC and UT1 is not allowed to exceed 0.9 seconds so, if high precision is not required, the general term Universal Time (UT) may be used. *Source: Wikipedia*

Summary Data Matrix

Summary Data Matrix

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	Factor/Issues	Northern Region			Sydney Basin					Southern Region		Southwestern Region	
		Newcastle Airport (RAAF Base Williamtown)	Maitland Airport	Cessnock Airport	Sydney (Kingsford Smith) Airport	Bankstown Airport	RAAF Base Richmond	Holsworthy Army Air Base	Camden Airport	Illawarra Regional Airport	HMAS Albatross Naval Air Station	Goulburn Airport	Canberra Airport
Use	Main Uses	**1.Defence** 2. Regional RPT operation and maintenance	**General aviation** - maintenance, training, recreation and sports	**General aviation** - maintenance, training, recreation and sports aviation RFS Operational Base Charter operations	**Civil – Full International and Domestic** RPT operations and maintenance	**General aviation** Airfreight, maintenance, aviation related industry, training, recreation and sports Limited Domestic RPT Operations capable	**Defence**	**Defence**	**General aviation** maintenance, training, recreation and sports aviation	**General aviation** maintenance, training, aviation related industry recreation and sports aviation; Air Ambulance and Fire Brigade Operational Base	**Defence**	**General aviation** maintenance, training, recreation and sports	**1. Civil – Full Domestic and International** capable RPT Operations General aviation - maintenance, training, recreation and sports 2. Defence & VIP
Location and Access	Operator	Department of Defence Newcastle Airport Limited (principal lessee for Civil Precinct),	Royal Newcastle Aero Club (RNAC)	Aviation & Leisure Corporation P/L	Sydney Airport Corporation Limited.	Bankstown Airport Limited (part of BAC Airports P/L)	Department of Defence	Department of Defence	Camden Airport Limited (part of BAC Airports P/L)	Shellharbour Shire Council	Department of Defence	Goulburn Mulwaree Council	Canberra International Airport Pty Limited
	Lease expiry	2045	N/A - Freehold	ALC 25 year Operating lease N/A - Freehold	2101	2097	N/A	N/A	2097	N/A - Freehold	N/A	N/A - Freehold	2097
	Owner	Department of Defence	Royal Newcastle Aero Club (RNAC	Cessnock City Council	Commonwealth of Australia	Commonwealth of Australia	Department of Defence	Department of Defence	Commonwealth of Australia	Shellharbour Shire Council	Department of Defence	Goulburn Mulwaree Council	Commonwealth of Australia
	Area of site	800 ha (civil lease 28 ha)	114.4 ha	~ 50 ha	907ha	313 ha	227.5 ha	~53 ha	196 ha	104.8 ha	876 ha	63 ha	440 ha
	Location (approximate straight-line distance	17 kms north of Newcastle	7 kms west of Maitland	6 kms north of Cessnock	8 kms south of Sydney CBD	36.9 km south west of Sydney CBD	Between the townships of Windsor and Richmond, NSW, 48 kms northwest of CBD	Within the Secured Holsworthy Military Reserve, 28km southwest of Sydney	2 kms north of Camden	18 kms south of Wollongong at Albion Park	11.5 km southwest of Nowra	6 kms southeast of Goulburn.	6 kms southeast of Canberra CBD
	Proximity to Freeway system	F3 28 kms/31 mins	New England Hwy at boundary, thence F3 20.8 kms 27 mins	F3 27.8 km/31 mins	Domestic Terminal. 2.0 kms/ 8 mins South Western Motorway (M5) and Eastern Distributor.	5.5 kms/11 mins to M5 South Western Motorway)	M7 Westlink 19.8kms/29 minutes	7.1 km/14 minutes to F5 South-Western Freeway	11.9km to M5 South-western Motorway	4.2 km and 5 minutes to the Southern Freeway	Princes Highway via Albatross Road. 9.3 km /12 minutes	Hume Highway 3.8 km/5 mins via Airport Rd to Windellama Rd, and local roads to junction at Hume St.	Via Majura Road . 1.9 km and 4 minutes to the Monaro Highway.
	Distance/Time from nearest major City – by road	Newcastle CBD 28 kms / 35 mins	Newcastle 60.8 kms / 1 hr 20 mins	Newcastle 61 km 1hr 20 min Maitland 30.6 kms / 40 mins	Sydney CBD 17.3 km / 20 mins Parramatta 30.0 km / 40 mins Liverpool 26.5 kms/ 26 mins	Liverpool 9.4 km / 20 mins Parramatta 14.4 km / 32 mins Bankstown 4.7 km / 11 mins	Penrith 27 km / 39 mins Blacktown 27.1 km / 44 mins Parramatta 44kms / 52 mins	Sydney 44.1 km / 48 mins Liverpool 10.4 km / 21 mins	Campbelltown 15 kms / 30 mins Liverpool 30.3 km / 43 mins Parramatta 55kms / 61 mins	Nowra 56.4 kms / 54 mins Wollongong 22 kms / 24 mins Canberra 211 km / 2Hours 48 mins	Nowra 11.5kms/16 mins Wollongong 89.9 km / 1 hrs 34 mins Canberra 227 km / 3 hrs 10 mins	Goulburn 7.1 km / 14 mins Canberra 94 kms / 1 hr 17 mins Wollongong 145 km / 2 hrs 11 mins	Canberra CBD 7.9 km / 16 mins
	Distance/time of nearest rail station	No direct rail Broadmeadow Station 26 km / 35 mins	No direct rail Maitland Station 9 km / 11 mins	No direct rail Maitland Station 30.6 kms / 40mins 52.3 kms / 58 mins	Direct rail at Domestic and International Terminals to Sydney CBD and SW Sydney	No direct rail Bankstown Station 4.7 km / 11 mins	No direct rail 800 m / 11 mins to Clarendon <u>walk</u>	No direct rail Holsworthy Station 4 km / 7 mins	No direct rail Campbelltown 15 kms / 30 mins	No direct rail Albion Park Station 1.5 m and travel time 17 minutes <u>walk</u>	No direct rail Bomaderry Station 13.6 km / 20 mins	No direct rail Goulburn Station 7.1 km / 14 mins	No direct rail Canberra Railway Station 6.5 km / 14 mins
	Distance/time from–Sydney CBD - by road	175kms / 2 hrs 16 mins	172 kms / 2 hrs 17 mins	160 km / 2hrs 18 mins	17.3 km / 20 mins	36.9 km / 39 mins	65kms / 1 hr 5 mins	44.1 km / 48 min	66 kms / 1 hr 8 mins	103 km / 1 hr 36 mins	171 km / 2 hrs 42 mins	201 km / 2 hrs 42 mins.	289 km / 3 hrs 36 mins
	Distance/time from Sydney Central - by rail	Ex Broadmeadow 156kms / 2 hrs 40 mins	Ex Maitland 185kms / 3hrs 20 mins	Ex Maitland 185kms / 3hrs 20 mins	International Airport 8.2 kms/12 mins Domestic Airport 6.7 km / 10 mins	Ex Bankstown 19 km/36 mins	Ex Clarendon 58km/ 1hr 20 mins	Ex Holsworthy 27 km / 40 mins	Ex Campbelltown 46 kms / 1 hour	Ex Albion Park Station 104 km / 1 hr 56 min	Ex Bomaderry Station 153.37 km / 3 hrs 30 mins	Ex Goulburn 216.8 km / 3 hrs 50 mins	Ex: Canberra Railway Station 4 hrs 20 mins
	Other transport available	Bus/taxi/rental car/shuttle	Nil at site – available in Maitland	Nil at site – available in Cessnock	Bus, Taxi, Rental cars, Shuttle services	Direct bus to Bankstown (Route 905) Taxi – on call	Bus 500m; taxi on call	At Holsworthy station - Nil at site	1500 m to bus on site; taxi on call	Bus 520 m –8 mins walk taxi on call	Direct bus to Bomaderry (Nowra) Station (Route 724) ;taxi on call	Nil at site - Available in Goulburn	Bus, taxi, rental cars, Shuttles

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Aerodrome and Aviation operations	RPT Airlines services	Qantas, Jetstar, Virgin Blue, Brindabella, Aeropelican, NorfolkAir	Nil	Nil	All Domestic and International carriers	Nil	Nil	Nil	Nil	Nil (QantasLink I n 2008)	Nil	Nil	Qantas, QantasLink, Virgin Blue, Tiger, Brindabella plus RAAF VIP flights
	RPT Connection to Sydney	Yes	Nil	Nil	N/A	N/A	N/A	N/A	N/A	Nil (Melbourne previously)	Nil	Nil	Yes
	Current Max Aircraft type	B737/A320 (Code C) (Design aircraft B787)	Light single and twin engine aircraft and Rotary wing	Light single and twin engine aircraft and Rotary wing	A380-800/B747 - 400/B777-300ER	BAE146 (Code 3C) (weight limited)	C130H/J Hercules (plus other RAAF assets)	S70A Black Hawke Helicopter plus very small fixed wing	Metro II	Dash 8 100/200 series	C130H/JHercules SK50 SeaHawk helicopters	Dash 8-300	A380-800/B747 - 400/B777-300ER
	Max. current direct RPT destination capability	All major Australian destinations; New Zealand	N/A	N/A	Maximum long haul eg Los Angeles; Johannesburg; Dubai	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Maximum long haul eg Los Angeles; Johannesburg; Dubai
	Main Runway Dimensions	2438m by 45m (Code E- Civil equivalent)	1244 by 15m (Code 2)	1100m by 18 m (potentially Code 2 if registered or certified)	3962m by 45m (Code 4)	1416m by 30m (Code 3)	2134m by 45 m (Code 4e – Civil)	670m by 30m (~Civil Code 1A)	1464m by 30m (Code 2)	1819m by 30m (Code 2)	2046m by 45m (Code 4 - Civil equivalent)	1283m by 30m (Code 3)	3283m by 45m (Code 4E/F)
	Secondary Runway (s)	N/A	815m by 10 m (Code 1)	N/A	2438m by 45m (Code 4) 2530m by 45m (Code 4)	1100m by 30m (Code 2) 1038m by 23m (Code 2)	Glider Strip	N/A	723m by 30 m (Code 1) Glider strips	1331m by 30m (Code 2)	2094m by 45m (Civil Code 4 equivalent)	676m by 30m (Code1)	1679m by 45m (Code 3C)
	Aircraft parking/gates	10 RPT on sealed apron	Nil for RTP – Sealed Aprons and grassed parking	Nil for RTP - Sealed Apron and grassed parking	Approx 98 (primary positions)	Nil for RPT - 70,600 sq m sealed plus 45,000 sq on grass for GA	Nil for RPT Civil Operations 20 for C130H/J Hercules	Nil for RPT Civil Operations	Nil for RTP Sealed and Grasses aprons for GA	1 Parking position for Dash 8 100/200 Large sealed aprons	Extensive Sealed Aprons including for former Civil Operations	Nil for RPT Sealed and Grasses aprons for GA	18 RPT at Terminal (primary positions) 11 at RAAF Fairbairn (primary positions) 10 GA plus grassed GA area
	AeroBridges	Nil	Nil	Nil	54 aerobridged positions currently	Nil	Nil	Nil	Nil	Nil	Nil	Nil	5 currently
	Terminal floor space	5000 sq m	RNAC has Club facilities and private hangars	Numerous private hangars	354,000 sq m	715 sq. m plus over 90 other buildings	Terminal For RAAF activities	Nil for RPT Civil Operations	None, 17 hangars	No operational passenger terminal	No operational passenger terminal	Small former terminal and >20 private hangars	Not reported but provides for operation of 5 RPT airlines
	Airside Master plan Proposals	Code E Aircraft (B787); No runway length Change Code E full-length taxi way; 300 m runway strip; Additional Apron (all civil)	No known plans for Upgrade or development	No airside expansion planned	No changes to runway lengths New taxiways and aprons	Runway extension to 1636 m for Code 3C aircraft (Embraer 170); Expanded Aprons;	Not known	No significant plans reported	No significant plans reported	Expansion to accommodate Code 3C and Code 4C aircraft under consideration	No significant plans reported for airside	A proposal was made to extent the runway to 1600m (code 3C aircraft) as a part of a failed purchase	Refer to data matrices – no reported airfield upgrades other than aprons for new terminal.
	Landside Master plan Proposals	Terminal expansion to 10000sq m;	No known plans for Upgrade or development	Possible Expansion of Western and Eastern Area Building precinct	Airport facilities - including terminals, hangars, freight facilities, aircraft parking, airport roads and car parking - are proposed to be progressively upgraded over the next 20 years.	Enhanced terminal capacity; 20 new hangars;	Not known	No significant plans reported	None reported	Expansion to accommodate Code 3C and Code 4C aircraft under consideration	$123 million upgrade of landside facilities	Terminal and other landside facilities have been sold. Council developed a 20 lot hangar subdivision	Refer to data matrices – extensive redevelopment of terminal to 44 check-in desks and 6 baggage carousels. Plus international processing facilities.
	Ability to receive International Flights	Yes though none operational currently. 1 gate area set up for C&I	Nil	Nil	Yes	Nil	RAAF C130H/JHercules C&I facilities for military not known	Nil	Nil	Nil	Nil for RPT C&I facilities not known	Nil	Yes
	Curfew	Self imposed 0600 to 2300	Nil but Circuit training restricted to 0730 to 2200 M to F & 2000 S&S	Nil but Circuit training restricted to 0800 to 2200	Yes - refer to Sydney Airport Curfew Act 1995 and regulations thereunder for detail	No but noise abatement procedures in place eg Circuit Training ~0600 to 2300	No but noise abatement procedures in place	Not Reported	Runway 06 preference; Circuit training restricted to 0615 to 2300 M to F & 2000 S&S	No but noise abatement procedures in place eg circuit training not permitted after 2200	No but noise abatement procedures are in place.	Nil	Extensive and complex noise abatement procedures – Runway 35 prioritised ie northerly landings and take offs

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	Current number of Movements	15,113 Civil (2008/09) Currently 6 Civil / hr (arrivals)	N/A	N/A	289,741 (2009)	370,842 per annum (08/09)	Approx 12,300 military and civil (2009)	Not Reported	63,390 per annum (08/09)	26,600 per annum (2008/09)	35,489 per annum (2009)	11,000 per annum	84,756 (44,125 by RPT)
	Future Max Number of Movements Per Annum	Approx 30,000 (Civil)	25,500	N/A	417,000 (2029)	450,000 by 2029/30		Not Reported	145,000 by 2029/30	Not assessed but airport considered underutilised	Not reported but would be included in Defence ANEF prediction – see below	Not predicted but could accommodate substantial GA growth	2029/30 Medium Forecast 157,257 Total 85,206 RPT
	Current Commercial Freight	23 tonnes belly freight	Nil	Nil	366,332 tonnes (international including mail) (2008/09)	Toll operates ~ 9,500 movements p.a. of low weight, high value freight	Nil	Nil	Nil	Nil	N/A	Nil	4 turbo prop movements to/from Sydney and Melbourne
	Future Commercial Freight	Continued belly freight plus 6 -10 freighter movement s per day by 2025 tonnes	Nil	Nil	1,077,000 tonnes (international + domestic) (2029)	Expanded capacity over 7-8 ha of Airport land	Nil unless Civil RPT Operation Introduced.	Nil	Nil	Nil unless Civil RPT Operation Introduced	Nil unless Civil RPT Operation Introduced	Proposed runway extension was associated with a freight operation proposal	Freight Hub Strategy planned By 2030 30 jet movements per day
Regional Context and Infrastructure	Airports Act 1996 (Cmth) and Airports Regulations 1997 (Cmth)	Applies An Airport Master Plan has been made under the Commonwealth Airports Act 1996	Not applicable	Not applicable	Sydney Airport is a "core regulated airport" under the Airports Act 1996 (Cmth) The Sydney Airport Master Plan 2009 has been made under the Commonwealth Airports Act 1996	Bankstown Airport is an airport specified in the Airports Regulations 1997 (Cmth) The Bankstown Airport Masterplan 2010 has been made under the Airports Act 1996 (Cmth)	Not applicable	Not applicable	Camden Airport is an airport specified in the Airports Regulations 1997 (Cmth) The Camden Airport Masterplan has been made under the Commonwealth Airports Act 1996	Not applicable	Not applicable	Not applicable	Canberra Airport is a "core regulated airport" under the Airports Act 1996 (Cmth) The Canberra Airport 2009 Master Plan (approved 28 August 2009) has been prepared by Canberra Airport Pty Ltd under the Commonwealth Airports Act 1996
	State planning legislation and statutes	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	- EP&A Act 1979 (and specifically the "Critical Infrastructure Provisions" under Section 75C - EP&A Regs - ISEPP - Major Development SEPP	The Airport Master Plan takes precedence over Territory planning controls.
	Gazetted Local Environmental Plans (LEP)	Zoned 5(a) Special Uses – Defence Purposes and SP1 Special activities – Defence and Airport Related Employment and development under Port Stephens LEP 2000	5(a) Special Uses Aerodrome under Maitland LEP 1993	5(e) Special Uses Aerodrome under Cessnock LEP 1989	Note the land is zoned "Special Uses 5(a)" under Botany LEP 1995	Zoned 5 Special Uses "Aerodrome" under Bankstown LEP 2001 (maps dated 2010)	The aerodrome is currently zoned "5(a) Aerodrome" under the Hawkesbury LEP 1989	Zoned SP2 Infrastructure – Defence under the Liverpool LEP 2008	The airport is currently zoned 5(a) Special Uses "Aerodrome" under Camden LEP No. 48	Zoned 5(a) Special Uses and 4(a3) Airport Light Industrial Zone under the Shellharbour LEP 2000	Zoned 5(a) Special Uses under the Shoalhaven LEP 1985	SP2 Infrastructure under the Goulburn Mulwaree LEP 2009	ACT Territory Plan n
	Draft Local Environmental Plans (LEPs)	None	The Draft Maitland LEP 2011 is currently being prepared and will supersede the 1993 LEP. Maitland City LEP 2011 draft Zoned SP1 Special; Activities LZN_003 and 0005	The Draft Cessnock LEP 2009 is currently being prepared and will supersede the 1989 LEP. The airport will be zoned SP2 Air Transport Facility under draft Cessnock LEP 2009 Land Zoning Map - Sheet LZN-002	None	None	The aerodrome is proposed to be zoned SP1 Aerodrome/Defence services under the Draft Hawkesbury LEP 2009	None	The airport is proposed to be Zoned SP2 Infrastructure "Air Transport facility" under the Draft Camden LEP	None	None	None	None

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	Non-statutory State policy documents	Lower Hunter Regional Strategy (2006), Department of Planning. Newcastle Airport is identified as providing a strong economic link. Vacant land has been identified as available to create an airport-related employment zone. North Raymond Terrace within the vicinity of the Aerodrome, has been identified as a major residential release area, subject to meeting noise requirements.	Lower Hunter Regional Strategy (2006), Department of Planning. The Regional Strategy makes no reference of Maitland Airport.	Lower Hunter Regional Strategy (2006), Department of Planning. The Regional Strategy makes no reference of Cessnock Airport.	- Sydney Metropolitan Strategy (2005) , Department of Planning - Draft Sydney City Subregional Strategy (2008) , Department of Planning The Sydney Metropolitan Strategy and the Draft Subregional Strategy both recognise Sydney Airport as a major international economic gateway.	- Sydney Metropolitan Strategy (2005) , Department of Planning - Draft West Central Subregional Strategy (2007), Department of Planning The Draft Subregional Strategy identifies Bankstown Airport as a key economic driver for the subregion.	- Sydney Metropolitan Strategy (2005) , Department of Planning - Draft North West Subregional Strategy (2007), Department of Planning The Draft Subregional Strategy makes no reference of RAAF Base Richmond Aerodrome.	- Sydney Metropolitan Strategy (2005) , Department of Planning - Draft South West Subregional Strategy (2007), Department of Planning The Draft Subregional Strategy makes no reference of Holsworthy Army Air Base.	- Sydney Metropolitan Strategy (2005) , Department of Planning - Draft South West Subregional Strategy (2007), Department of Planning The Draft Subregional Strategy identifies "surplus land at Camden Airport that could be used for employment uses" (p.38).	Illawarra Regional Strategy (2007), Department of Planning The Regional Strategy makes no reference of Illawarra Airport.	South Coast Regional Strategy (2007), Department of Planning The Regional Strategy makes no reference of HMAS Albatross.	Sydney-Canberra Corridor Regional Strategy (2008), Department of Planning. The Regional Strategy makes no reference of Goulburn Airport.	None
	Non-statutory local government policy documents	No Aerodrome Specific DCP sighted	No Airport Specific DCP sighted	Cessnock Draft DCP 2009	No Airport Specific DCP sighted	No Airport Specific DCP sighted	No Aerodrome Specific DCP sighted	Liverpool DCP 2008 does not appear to specifically cover this location	Camden Development Control Plan was adopted 10 July 2006, effective from the 19 July 200 No Airport Specific DCP sighted 6	The Shellharbour Council "Albion Park Aerodrome Buffer Area DCP" includes provisions for residential areas in the immediate vicinity of the airport to the east. The Shellharbour Council "Industrial Development Control Plan" includes specific provisions for the land zoned 4(a3) Airport Light Industrial Zone	No Aerodrome Specific DCP sighted	No Airport Specific DCP sighted There is an existing Plan of Management, dated 2001	No applicable local government non-statutory controls
	Surrounding land use zones at airport boundary	Port Stephens LEP 2000: 1(a) Rural Small Holdings and 7(c) Environmental protection	Maitland City draft LEP 2011: LZN_003 RU2 Rural landscape R5 Large Lot Residential E3 Environmental protection	Cessnock LEP 1989: "1(b) Secondary Rural Land)" Draft Cessnock LEP 2009: RU1 Primary Production	Botany LEP 1995: Industrial, residential, Botany Bay	Bankstown LEP 2001: 2a(residential; 6(a) Open Space; 5 Special Uses "Educational and community Purposes"; 6b Private Recreation 4a General industrial 4b Light Industrial Arterial Road.	Draft Hawkesbury LEP 2009: SP1 education; RU2 Rural landscape; R2 Low density residential; SP1 special Activities;SP2 Classified road	LLEP 2008: Holsworthy Military Reserve	Draft Camden LEP: R1 General Residential, R5 Large lot Residential, RU1 Primary Production	Shellharbour LEP 2000: 2(a) Residential Industrial and 4(a3) Airport Light Industrial Zone Shellharbour Rural LEP 2004: 1(a) Agriculture	Shoalhaven LEP 1985: 1(a) Agricultural Production	Goulburn Mulwaree LEP 2009: RU1 Primary Production	Surrounding land uses at airport boundary: Surrounding by broad acre rural areas with an industrial to the south, a forest to the west
	Significant land uses within 5 kms radius (based on aerial photo &/or zoning maps)	Townships - Raymond Terrace (Kings Hill) and Medowie	City of Maitland Land Zoned R1 General residential	Cessnock Township; Cessnock Gaol; Winegrowing; Tourism resorts. Urban release area adjacent to 20 ANEF	Sydney Airport is located approximately 8km from the Sydney CBD and consequently is in the immediate vicinity of a range of urban areas	Major concentrations of residential, commercial , industrial and open space lands	Heritage items within the townships of Windsor and Richmond under flight path	Holsworthy Military reserve is bounded to the east by Heathcote Road; to the north by the East hills Railway and to the west by the Georges River. Beyond these boundaries is residential development. It extends as bushland south more than 4 kms	Heritage township of Camden adjacent to flight path; surrounded by residential development	Within 1km of the site are the Haywards Bay, Albion Park and Oaks Flat townships and the Shellharbour City Centre is located approximately 3km to the east.	Nowra, a major regional centre, is located approximately 8km to the north.	Goulburn is located approximately 5km to the north. Small land holdings (possibly recent subdivisions) approximately 1 to 1.5km to the north and north-west.	Significant land uses within 5 kms radius: 8km to the west is Canberra's CBD and 4km to the south-east of Queanbeyan

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	Factor/Issues	Northern Region			Sydney Basin					Southern Region		Southwestern Region	
		Newcastle Airport (RAAF Base Williamtown)	Maitland Airport	Cessnock Airport	Sydney (Kingsford Smith) Airport	Bankstown Airport	RAAF Base Richmond	Holsworthy Army Air Base	Camden Airport	Illawarra Regional Airport	HMAS Albatross Naval Air Station	Goulburn Airport	Canberra Airport
	Immediate Road Network	"adequate capacity (subject to some intersection upgrades) to cater with traffic demands to the design horizon of 2025". Key issue however is the development of major industrial precinct and congestion resulting from non airport related activity.	Frontage onto the New England Highway	Main Road 220 "Wine Country Drive", rural two lane road Links to Cessnock and the New England Highway at Branxton	Access via Airport Road system to Eastern Distributor, F5 South-western freeway and O'Riordan Street/Botany Road	Access via local roads, thence Bounded by arterial Roads Henry Lawson Drive and Milperra Road with grade separated interchange on M5 giving access eat to Sydney CBD and west to SW Sydney and Canberra	Hawkesbury Valley Way connected east to Windsor Road and west to Bells Line of Road	Unnamed Road within military Reserve	Macquarie Grove Road to Camden thence Camden Valley Way	Close connections to Princes and Illawarra Highways	Direct connection onto Princes Highway via BTU Road	Airport Rd to Windellama Rd, and local roads to Hume Freeway	Connections via Pialligo road to Majura road and Federal Highway, via dairy road to Monaro Highway and via Fairbairn Avenue to Northbourne Avenue and Barton Highway
	Immediate Passenger rail network	None	None	None	Stations for domestic and international terminal on airport	None.	Richmond Line Clarendon Station;	None	None	Albion Park Station 1.5 m and travel time 17 minutes walk	None	None	None
Environmental Factors	Noise Impacts >25 ANEF	2012 - Raymond Terrace - Houses partially affected 2025 - Raymond Terrace - Houses substantially affected	None identified	2021 – no impacts on residential property but development occurring to SE of airport	2029 ANEF appears to have a smaller "footprint than does the 2023/24 ANEF indicating a reduction in the area of metro Sydney exposed to aircraft noise	2024/25 ANEF Covers NW residential precinct and SW industrial precinct.	Significant part of East Richmond and Windsor lies within 2014 >25 ANEF	Not reported but location is ~4 km remote from any other development other than military	Significant area of residential property with >25 ANEF in 2029/30	Some impact on residential properties on north-eastern boundary	No impact on urban areas properties as yet – however flight path for runway 21 is over urban areas.	No noise impacts reported	No impact to the north – to the south urban area of Queanbeyan on the boundary of the 25 ANEF. Airport actively opposed residential development
	Flooding	1:00 year storm inundation of Aerodrome and access roads; Runway damage impacts	Not affected by major flooding	Not affected by major flooding	Potential for inundation due to combined sea level change tidal surge and flooding in Cooks river.	Majority of Airport subject to Low Risk flooding with SW quadrant liable to Medium to High Risk Flooding as would be Milperra Road and Henry Lawson Drive	Aerodrome mostly above 1:100 flood but totally submerged under PMF event; Transport links flooded for both.	230 feet above Sea level & not affected by major flooding	Airport runways entirely covered by PMF event and significantly covered by 1:100 yr event.	No significant flood prone land	No significant flood prone land	The site is not identified as "Flood Planning Land" in the LEP maps, although it is in close proximity to Gundary Creek	No significant flood prone land
	Bushfire and other hazards	Surrounded by vegetation Category 1	East boundary identified as category 1 with 100m buffer	Predominantly Category 2 vegetation with some Category 1	None anticipated as there is no significant bush land	Southern Boundary along Milperra road rated bushfire buffer Zone	Aerodrome and immediate environs not bushfire prone	Buffered all round but totally surrounded by Vegetation rated Category 1. Holsworthy is an Army Live Firing Range with unexploded ordnance.	No specific data reported but has bushland fringes	Small areas in the site (along the eastern and southern boundaries) are identified as being bushfire prone land.	Site surrounded by Bushfire prone land with Western part of the site including Vegetation Category 1	Located in open grazing land with significant distances and buffering to bushland.	Airport Lies within the boundary of the ACT bushfire abatement Zone and to the north east lies a Future Bushfire abatement zone
	Rare and Endangered Species	Koala habitat report as proximate	None reported	None reported	No flora Birds – Little Tern; Herpetofauna – Green and Gold Bell Frog (possibly Mammals – Grey Headed Flying Fox (vulnerable)	Two small sites identified by Masterplan containing *Hibbertia glabrescens MS* and *Acacia pubescens*	None reported	None reported	River Flat Forest Community lining river bank boundary of airport	Illawarra Lowlands Grassy Woodlands community, located within the airport site,	The "Jervis Bay Habitat Corridor" and the "Illawarra Regional Environmental Plan Wildlife Corridor" are located in the immediate vicinity of the site to the south, west and east.	A large proportion of the site is identified as "Environmentally Sensitive Land – Biodiversity" in the LEP maps	Grasslands Grassland Earless Dragon Golden Sun Moth Perguna Grasshopper http://www.canberraairport.com.au/PDF/masterplan/approved/15_EnvironmentalManagement.pdf

Study of Aerodrome Infrastructure in the Sydney Region – Comparative Assessment (n.b. data herein is generally abbreviated from the detailed data matrices for each airport which must be read in conjunction)												
Factor/Issues	Northern Region			Sydney Basin					Southern Region		Southwestern Region	
	Newcastle Airport (RAAF Base Williamtown)	**Maitland Airport**	**Cessnock Airport**	**Sydney (Kingsford Smith) Airport**	**Bankstown Airport**	**RAAF Base Richmond**	**Holsworthy Army Air Base**	**Camden Airport**	**Illawarra Regional Airport**	**HMAS Albatross Naval Air Station**	**Goulburn Airport**	**Canberra Airport**
SEPP 14 Wetlands	None directly adjoining airport but surrounding Aerodrome	None reported	None reported	Sydney Airport Wetlands (rated as "Significant") and on southern side of Botany Bay at Towra Point	None reported	None reported	None reported	None reported	None contiguous with the airport but there appear to be wetlands to the east and north-east, around Lake Illawarra – rating not identified.	None reported	None reported	None reported
Other Environmental Issues	Newcastle water supply reservoir under flight paths	Land on Eastern boundary rated environmentally sensitive	Entire site and surrounding rated as "environmentally sensitive land.	Sydney Airport's environmental strategy is strongly focused on the airport performance to reduce or eliminate adverse environmental effects of aviation and the airport as a source of pollution	None reported	Heritage listed precincts under flight path in Richmond and Windsor. Land on northern Aerodrome boundary rated as "significant vegetation"	The whole of the site is surrounded by vegetation rated as "environmentally significant"	Banks of Nepean River rated as Environmentally Sensitive "Regionally Significant" Urban Release areas "Mater Dei" adjacent to airport and under flight paths	areas of environmental protection to the north-east and south-west.	There are substantial areas of land to the west of the site which is identified as "Environmental Protection" in Council's mapping system.	A large proportion of the site is identified as "Environmentally Sensitive Land – Biodiversity" in the LEP maps	Canberra' Airport's environmental strategy is strongly focused on the airport performance to reduce or eliminate adverse environmental effects of aviation and the airport as a source of pollution
Bird Strike per 10,000 mvts per annum (unless otherwise stated)[1]	Average of 9 strikes per annum over past 9 years with average of 18 per annum for past 4 years	None reported	None reported	2.78.	0.29	Not reported	Not reported	0.24	Not reported	Not reported	Not reported	2.96

[1] Source ATSB Australian Aviation Wildlife Strike Statistics Bird and Animal strikes 2002- 2009

Detailed Data Matrices

Detailed Data Matrices

1

Newcastle Airport

Newcastle Airport

CONTENTS

1 NEWCASTLE AIRPORT (RAAF BASE WILLIAMTOWN)

1.1 Introduction

Newcastle Airport, which is located on RAAF Base Williamtown[1], is located approximately 17km north-east[2] of the City of Newcastle and is accessed from Nelson Bay Road and Medowie Road. RAAF Base Williamtown is the RAAF's primary operational air base in NSW. RAAF operations are located on the northern side of the runway which is under the control of the RAAF. Civil operations are conducted from a dedicated leased area on the southern side of the runway. **Figures 1** and **2** depict aerial images of the aerodrome site.

Figure 1 – Aerial Image (Overall)

Source: Department of Defence 2010

[1] As appropriate, referred to as "Williamtown"

[2] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Civil Area)

Source: Google Earth Pro 2010 (Imagery Date December 2006)

Civil operations began in 1947, when the Commonwealth Government agreed to allow civilian flights at the RAAF Base, Williamtown. The Commonwealth Government continued to run the aerodrome until 1990 when Newcastle City Council and Port Stephens Council accepted an invitation by the Government to jointly operate the civil area at RAAF Williamtown. The two Councils accepted full responsibility for operating, maintaining and developing what was to become Newcastle Airport. As a consequence, Newcastle Airport Limited (NAL), a company limited by guarantee, was formed on 25 May 1993 by the two Councils and a 30-year lease was signed with the Commonwealth Government for 28 ha, including the site of the terminal and land for commercial development. In 2005, the lease was extended until 2045.

The following image gives an updated view of the civil apron as of 2010. This clearly shows recent upgrades including terminal, aprons and associated infrastructure as well as the extended Jetstar maintenance facility and BAE systems hangars.

Civil Area 2010

1.2 Current Site Attributes

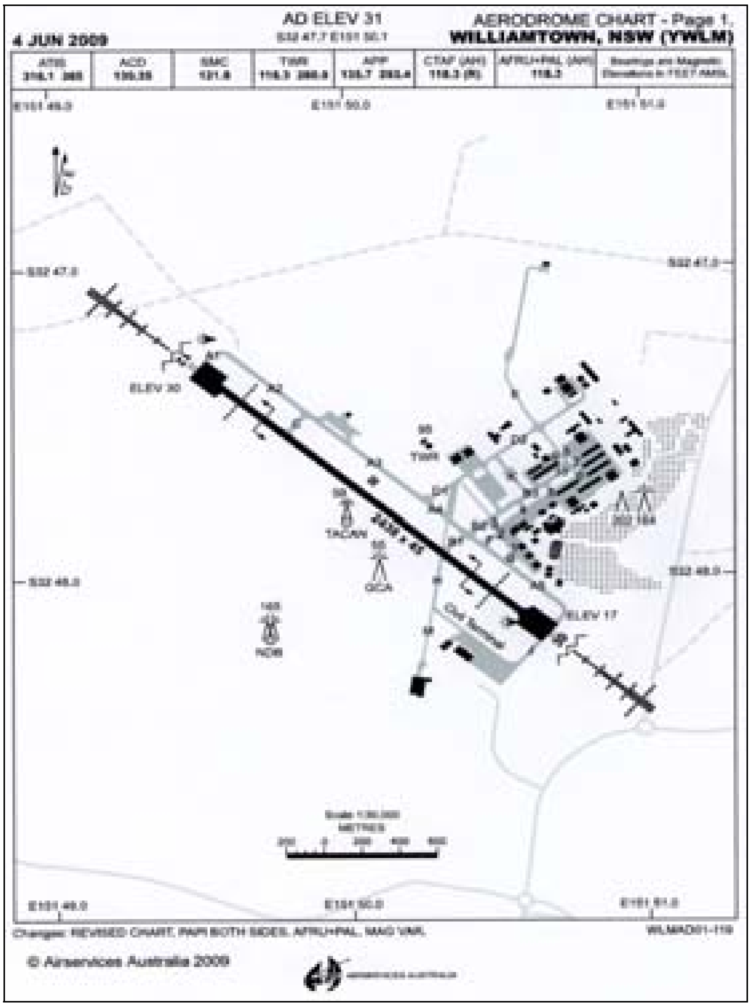
Aerodrome location and LGA	S32 degrees 47.7 minutes E 151 degrees 50.1 minutes Port Stephens Council LGA
Ownership and management; lessee/operator	1. Ownership and Management – Department of Defence (RAAF). 2. Lessee – Newcastle Airport Limited (NAL) Civil side 3. Operator – Military – RAAF; Civilian – NAL NAL civil area is under a lease to Port Stephens and Newcastle City Councils. There is a trust deed and an operating agreement with NAL.
Aerodrome Category	Military (note **not** Joint User Aerodrome)
Applicable regulatory regime	ADFP 602 and MOS 139 (where applicable). Major differences relate to military requirements such as barriers at ends of runways, hook cables and signage (distance to run markers and the like).
Site area and physical dimensions	Overall approximately 800ha Civil lease area approximately 28ha
Major centres of population, population growth	Newcastle, Hunter Valley, Port Stephens, Mid North Coast, Lake Macquarie, Central Coast, North Sydney. Passenger catchment approximately 1.2 million

Elevation	31 feet
Surrounding topography	Flat coastal farmland, with areas of wetland and swampy forest.
Liability for flooding	The aerodrome site is generally above 1:100 year flood levels but access to the aerodrome would be cut off by such an event. Some drainage works required. The area is subject to some flooding, but currently the main issue is poor subsoil drainage causing “bubbles” to appear under the movement area pavements. (High water table).
Atmospheric conditions	Fog about 10 days pa. Limited visibility lower than ILS.

1.3 Aerodrome Operations

Summary of main activities	<u>RAAF</u> The base accommodates the following operational flying units: • 3SQN – operating the F/A-18 Hornet • 77SQN – operating the F/A-18 Hornet • 2 Operational Conversion Unit – operating the F/A-18 Hornet • 76SQN – operating the Hawk 127 • 2SQN – operating the Wedgetail Airborne Early Warning and Control (AEW&C)aircraft (based on a B737-700 derivative airframe) • 4SQN - Forward Air Control Development Unit – operating the PC-9/A The base accommodates a further number of support units and is intended to become the main operational base for the forthcoming F-35A Joint Strike Fighter (JSF). <u>Civil</u> NAL operates the civil area including the feeder taxiways and apron supporting the passenger terminal and associated facilities. The aerodrome provides for a wide range of domestic/regional (and limited international to Norfolk Island) passenger services and accommodates two major aircraft maintenance activities i.e. Jetstar’s A320 heavy maintenance and BAe Systems through life support for the RAAF Hawk 127 fleet. Scheduled services are provided by the following airlines: • QantasLink • Jetstar • Virgin Blue

	• Brindabella • Aeropelican • Norfolkair
Current passenger numbers	<u>Military</u> Not applicable <u>Civil</u> 1.17 million (2008/09)
Current aircraft movement numbers	<u>Military</u> 2009 Departures/Arrivals – 24,786 Transit – 229 <u>Civil</u> 2008/09 15,113 by passenger aircraft
Current freight throughput	Current freight throughput for Virgin Blue is 23,000kg carried in aircraft belly.
Known sources of delay in aerodrome and runway operations	Primacy of RAAF access to the runway may be a source of delay under some circumstances. The current operating agreement between NAL and RAAF limits civil aircraft arrivals to six per hour between the hours of 0600 and 2200. Current civil movements take up approximately 27% of the daily movement cap allowing significant room for growth. Discussions are ongoing with AFHQ to consider increasing the cap for periods outside of military operations e.g. 0600 – 0800. Military flight numbers are likely to increase once the joint strike fighter becomes operational. The intensity of operations is expected to increase. The ordnance loading apron (OLA) has impacts on civilian operations. The extent of impact depends upon the wind direction. Hawk Aircraft at the 30 threshold are angled to avoid pointing towards the civil terminal. A new OLA complex has been built to the north east of the main runway and will become operational in September 2010 which should halve the delays. The use of the new OLA will reduce the extent frequency of impacts on civilian operations on the northern end of runway 12/30 and parallel taxiway. The use of the OLA near taxiway

	A is advised by NOTAM. The civil operators can then take management action (eg shift flight times). In the first 6 months of 2010 there have been about 4 events affecting civil operations.
Movement/manoeuvring area details	
Runway	12/30 – 2438m x 45m (Code E – civil equivalent)
Runway strip	2558m x 230m (note 230m is a military standard)
Taxiways	Military There is a comprehensive taxiway system supporting the RAAF operational areas including a full length parallel taxiway on the northern side of Runway 12/30. This taxiway's centreline to centreline separation with the runway is approx. 175 m, which means it meets Code D (176m) civil requirements. **Figure 3** shows the runway and taxiway layout. **Figure 3 – Runway and Taxiway Layout**  *Source: Airservices Australia 2010*

	Civil (note mainly located outside the NAL lease area) • Taxiway H – Code C • Taxiway J – Code E • Taxiway M – Code B
Aprons	Military There is a comprehensive apron and aircraft shelter system supporting the RAAF operational areas. Civil There are 10 free-moving parking positions as follows: • Parking position 1 – Code B • Parking position 2 – Code B • Parking position 3 – Code C – push back • Parking position 4 – Code C – push back • Parking position 5 – Code C • Parking position 6 – Code C – push back • Parking position 7 – Code C • Parking position 8 – Code D • Parking position 9 – Code E • Parking position 10 – Code E
Airfield pavements	Runway 12/30 - 80a/b PCN 50/F/A/1750 (245 PSI)/U/B Grooved (eg approximately A330-200) Pavement strength is able to accommodate all present and proposed RAAF aircraft including Wedgetail (AEW&C) aircraft (based on the B737-700 airframe) and the proposed KC-30A multi role tanker transport (based on the A330-200 airframe). Military Taxiways as per Runway 12/30. Civil • Taxiway H PCN 44/F/A/1414/T • Taxiway J PCN 53/ F/A/1414/U • Taxiway M PCN 15 • Apron parking positions 1 & 2 – PCN 43/F/A/1500 (217PSI)/T (eg B737-800) • Apron parking positions 3 & 4 – PCN 43/R/A/1500 (217PSI)/T

	(eg B737-800) • Apron parking positions 5 & 6 – PCN 43/F/A/1500 (217PSI)/T (eg B737-800) • Apron parking positions 7, 8, 9 & 10 – PCN 53/R/A/1500 (217PSI)/T (eg approximately A330-200)
Airfield operating restrictions	As the aerodrome is under military control, it is not available for general civil use. Prior permission is required for all civil operations in accordance with Civil Aviation Order 20.17.
Airfield lighting and approach systems	• Runway edge lighting • Taxiway centreline green lighting • High Intensity Approach Lighting (HIAL) 12 and 30 approaches • Double sided Precision Approach Path Indicator (PAPI) 12 and 30 approaches
Visual navigation aids	• Runway, taxiway and apron markings and markers • Two illuminated wind direction indicators (IWDI) • Runway distance to run markers
Radio navigation aids	<u>Military</u> • Ground Control Approach (GCA) • Tactical Air Navigation System (TACAN) <u>Civil</u> • Instrument Landing System (ILS) with marker beacons Runway 12 • Non-Directional Beacon (NDB)
Surveillance systems	<u>Military</u> • L-Band radar <u>Civil</u> Nil
Operational procedures	• Right hand circuits Runway 12. • Circuit height: medium and heavy wake turbulence jet aircraft 1,500 feet. All other fixed wing aircraft 1,000 feet and helicopters 500 feet.
Aviation fuel	<u>Military</u> The fuel farm has a capacity of about 8 megalitres which is suitable

	for current and anticipated usage although more settling tanks may be required under co-location of ACG groups at Williamtown. Fuel is delivered by tanker to the aerodrome. There are about 8-12 deliveries by 30,000 litre tankers per day. <u>Civil</u> Two operators: Air BP and Caltex, JET A-1 is available. (A new fuel farm has been built and is expandable).
Terminals and other major aviation support infrastructure elements	<u>Military</u> Not applicable <u>Civil</u> The civil terminal has undergone significant upgrading over the last few years. It is primarily a single level structure with a partial upper level accommodating administrative and office areas. The terminal footprint is approximately 5,000m^2. Functional areas within the terminal provide for: • A check-in area with 17 desks and two self serve check-in kiosks; • Baggage make-up area; • Passenger and checked bag screening; • Departures hall; • Baggage break-down area; • Arrivals hall with two baggage reclaim units; • A retail area including food and beverage outlets; • Car rental desks; • Offices; and • Amenities.
Security	<u>Military</u> As per Department of Defence requirements. <u>Civil</u> Security Controlled Aerodrome. Passenger, cabin and 100% checked baggage screening undertaken.
Border Agencies	Customs, Immigration and Health available 24 hours with prior notice.
Air traffic management and airspace management	Military Air Traffic Control (ATC) is applicable within the Williamtown Control Zone (CTR) and adjacent Control Areas (CTA) during the

arrangements	tower's hours of operations which are based on ACG operations as notified by NOTAM. Note that ATC will have an extended coverage 16/7 as a part of the operating agreement with NAL. Rescue fire fighting will be Cat 6 out of hours. The control tower is relatively short and may provide inadequate line of sight coverage if runway operations were significantly altered. There is an obstruction to the control tower line of sight to a small segment of the horizon to the east due the presence of the AWIC hangars. The CTR generally extends laterally to a radius of 12 nautical miles from the aerodrome to the north, east and south, with truncated sides to the west. It operates from the surface to an altitude of 5,000 feet. Outside of tower operations hours, the airspace reverts to Class G and Common Traffic Area Frequency (CTAF) procedures apply. A Certified Air/Ground Radio Service (CA/GRS may also be provided outside the tower's hours of operations which is notified on the Williamtown Automatic Terminal Information Service (ATIS). Within the CTR is Restricted Area R596 which operates from the surface to Flight Level 120 and is activated by NOTAM. It is associated with firing. Overlying the CTR and extending in an arc of 25 nautical miles to the north, east and south are a series of Restricted Areas associated with terminal airspace. These Restricted Areas, (R587A, R587B, R587C, R587D, and R587E) operate variously from the surface or higher and up to Flight Level 600 or lower, and are all activated by NOTAM. A general aviation (GA) transit lane (Danger Area D589A and 589B) is established for Visual Flight Rules Aircraft (VFR) to the west of the aerodrome through R578E. Also, a coastal VFR route is promulgated through the CTR and R587B. **Figure 4** shows the airspace arrangements in the vicinity of the aerodrome.

Figure 4 – Williamtown Aerodrome Airspace Arrangements

Source: Airservices Australia 2010

The majority of traffic utilising Williamtown Aerodrome or transiting Williamtown airspace is assumed to be operating under Instrument Flight Rules (IFR), other than GA VFR using the transit lanes above. Flight tracks established in relation to aircraft operating under IFR are shown in **Figure 5**. IFR departure and approach procedures are promulgated in the relevant Departure and Approach Charts (DAP).

	Figure 5 – Williamtown Aerodrome IFR Flight Tracks  *Source: Airservices Australia 2010* Other airports/aerodrome facilities as shown on aeronautical charts within 50km of the aerodrome are: Cessnock Airport approximately 46km to the west Maitland Airport approximately 34km to the north-west
Aerodrome Rescue and Fire Fighting Services (ARFFS)	Category 6 (provide by RAAF) between 0600-2200 hours local. Category 4 at other times. RFFS vehicles carry water and foam but no significant quantities of complementary fire fighting agents as recommended by the International Civil Aviation Organization (ICAO). 4 x 50kg dry chemical extinguishers available on the NAL civil apron.
Operating restrictions	The aerodrome is subject to a RAAF self imposed curfew (2200 (extend to 2300 for civil) to 0600 to manage noise impacts on local environment).
Known development capability and expansion planning	<u>Military</u> The length of runway is shorter than the military planning standard of 3,050m adopted by the ADF publication 602 and consideration may need to be given to extending the runway in an easterly direction.

	Defence is reviewing the final version of the aerodrome master plan which will show staged development of the military parts of the aerodrome. The final document has not been approved for release and is not available to the current study. The ANEF contours show significant noise impacts. Early consideration has been given to a possible runway extension for the JSF. The extra runway length is intended to avoid the need for operation of aircraft after burners, which will reduce aircraft noise impacts. The planning is not yet at the feasibility stage. Civil NAL has developed a Master Plan, launched in 2006, that provides a blueprint for planning and development for the next 20 years. The Master Plan was prepared in consultation with the Department of Defence and other key stakeholders and has been developed to support NAL's long-term vision. The Master Plan identifies key growth areas for Newcastle Airport that enhance the airport's contribution to the economy by promoting competitive air services that underpin the efficiency of business and tourism, and by establishing an aerospace industry cluster. The Master Plan focuses on domestic passenger growth, the growth of international services, the establishment of new precincts for aircraft maintenance, and a business park for airport and aerospace related business. It is intended that the Master Plan will be reviewed at least every five years, and more frequently if circumstances require. Key airport operational provisions are: • Adoption of Code E as design aircraft; • Allowance for a full length Code E parallel taxiway on the southern side of the runway, this is also identified by Defence as a need to address the operational deficiencies in relation to joint military/civil movements as well as a widening of existing taxiways to cater for larger RAAF aircraft; • Allowance for a 300m wide runway strip (currently 230m); • No change to runway length (understood also to be RAAF proposal); • Allowance for additional aircraft parking aprons (to provide for up to 14 positions overall); and

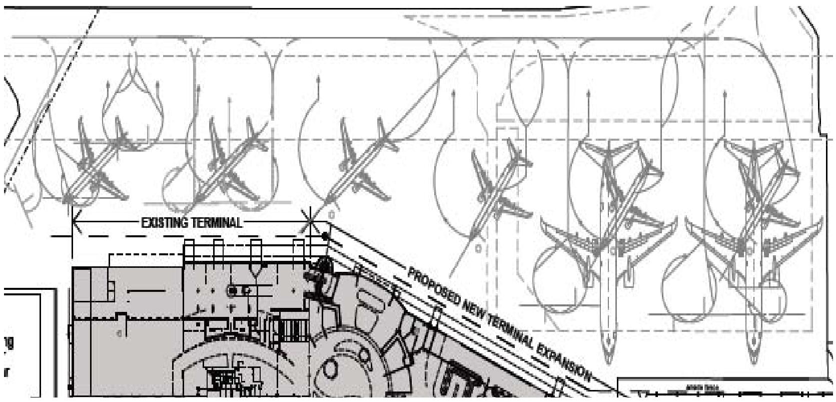
- Allowance for an ultimate terminal footprint of approximately 10,000m^2.

The B787 is the design aircraft for NAL. Possible future routes may include Darwin, Perth and Adelaide (domestic) and some international to Asia in the longer term. The constraints to international flights include the need to extend the terminal and provide AQIS.

RAAF is concerned with the use of heavy aircraft as these require greater separation distances (wake turbulence) which will disrupt traffic patterns and cause delays in the airspace. Currently, the civil operations peak occurs early in the morning and later in the day. Increasing civil operations in the middle of the day are more likely to cause problems for military operations.

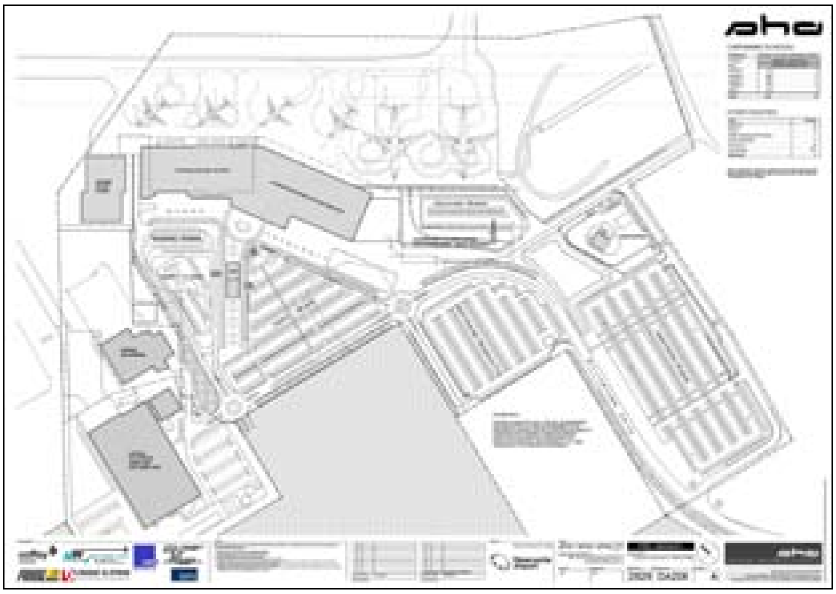
Figures 6, 7 and **8** show the Master Plan concepts.

Figure 6 – Indicative 2015 Apron Layout



Source: NAL 2007

Figure 7 – Indicative 2025 Terminal Expansion

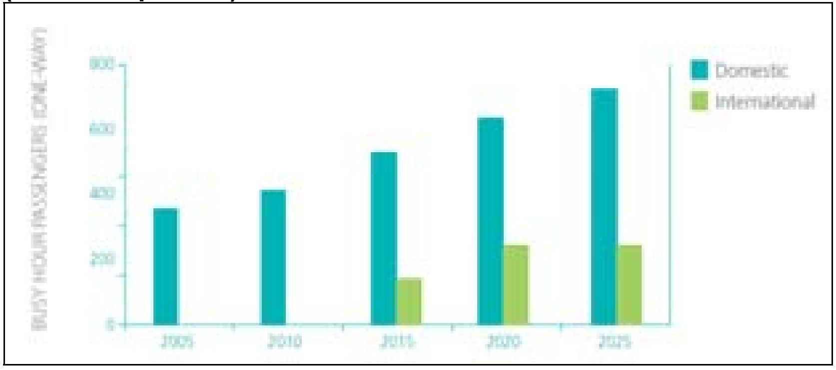


Source: NAL 2010

Figure 8

An Aerospace Precinct has been identified to the south west of the aerodrome. An extension of the NAL lease is being discussed.

Figure 9 – Busy Hour Passenger Flow – One-Way (Arrival/Departure)



Source: NAL 2007

Figures 10 and 11 show the Master Plan concepts on aerial images.

Figure 10 – Indicative 2015 Apron Layout

Source: NAL 2007

Figure 11 – Indicative 2025 Terminal Expansion

Source: NAL 2007

	A KBR report of 2003 sourced from Port Stephens Council's website depicts possible options for a future parallel runway to the south of Runway 12/30 as shown in **Figure 12**. It is understood that the State Government has rezoned the area which has effectively eliminated this option. **Figure 12 – Parallel Runway Siting Options**  *Source: KBR (PSC) 2003*
Known constraints on future capacity or ability to meet current and future demand	Land transport is a key issue for the aerodrome. There is single road access from the aerodrome to Newcastle CBD across a single carriageway bridge at Tourle Street on Kooragang Island and industrial development is taking place along Cabbage Tree Road which connected to the Pacific Highway near Hexham bridge, both of which cause road congestion. The F3 extension and location of interchange is of interest noting the growth corridor. The aerodrome is the single largest employer in the region with about 3,500 people. The main constraint on the ability to grow future civil operations is the Operational Agreement with the RAAF in terms of runway access. It is understood civil movements are limited to a maximum of six arrivals per hour. NAL currently serves 1.1 million passengers and

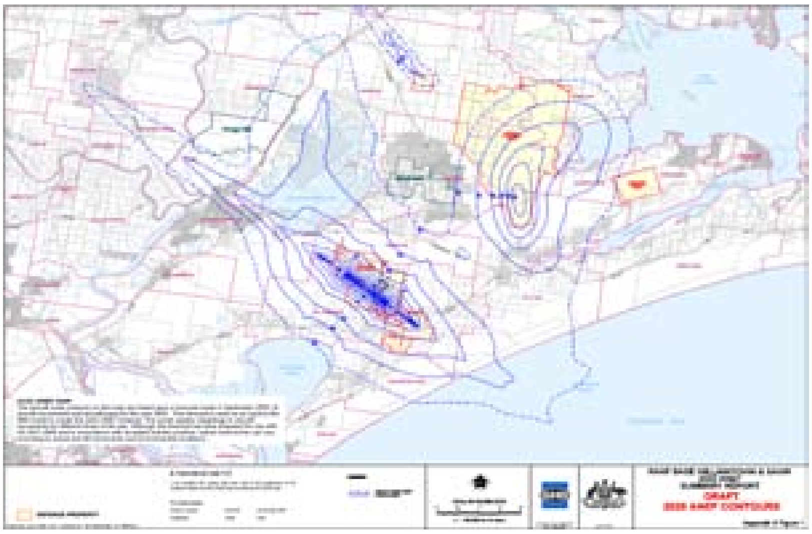
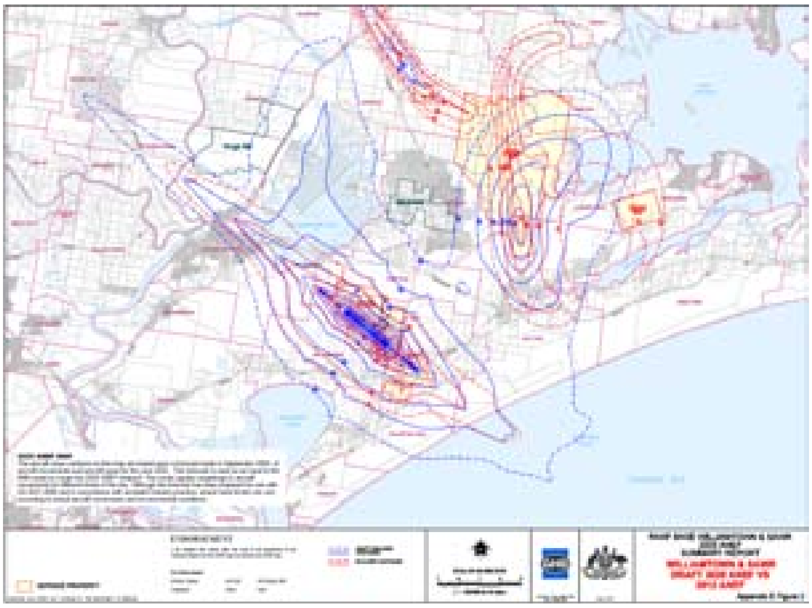
	15,113 movements per year but utilises only 27% of the operational cap. . Also, the area available for NAL to develop is governed by the lease with the Commonwealth. A recent aviation development study by Aspirion highlighted potential growth in the next 5 years that could mean NAL serving 2 million passengers and this would still fall well below 50% of the daily cap. Also, the area available for NAL to develop is governed by the lease with the Commonwealth. Other than the normal lateral and vertical constraints applicable to obstacle limitation surfaces (OLS) protection, military operational constraints apply to planning within the NAL lease area. These mainly relate to height limitation surfaces over the site, to protect airfield and radar signal operations and the "gunsafe" considerations which define the lease boundary in the north-western corner.
Aircraft noise contours and status	A draft Australian Noise Exposure Forecast (ANEF) for the Year 2025 was recently released for RAAF Base Williamtown and the nearby Salt Ash Air Weapons Range. The modelling includes the impact of the introduction of the F-35A JSF and NAL's projected civilian operations to the maximum level allowed under the Operating Agreement. The 2025 Draft ANEF shows an increase in the contours when compared to the current ANEF (2012). This is primarily due to the introduction of the F-35A JSF. Figure 13 shows the Draft 2025 ANEF and **Figure 14** shows a comparison between the 2025 Draft ANEF and 2012 ANEF. **Figure 13– Draft 2025 ANEF** 

	Figure 14 -- Comparison Between the 2025 Draft ANEF and 2012 ANEF 

1.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related;	Williamtown Aerospace Centre comprises 80 hectares of employment generating land specifically zoned as a Defence & Airport Related Employment Zone (DAREZ). It includes the Newcastle Airport Precinct and 120 hectares of industrial land – soon to be providing world class facilities, tow-way access and a variety of infrastructure solutions to meet the needs of individual organisations of any size or requirement. It will be a major employment zone providing direct access to RAAF Base Williamtown and Newcastle Airport and transport linkages to national and international business. The Centre's tow-way will provide access to the Newcastle Airport taxiway and RAAF Base Williamtown runways. Williamtown Aerospace Centre will constitute a mix of industrial and commercial development including commercial office buildings, aerospace and aviation industries, aerodrome support businesses, human amenity support businesses, hotel accommodation, logistics and handling, avionics support industries, and training facilities.

	
Freight forecasts	<u>Military</u> Not applicable <u>Civil</u> NAL’s Master Plan notes that most freight is carried as belly freight in passenger aircraft. However, the potential was identified for some dedicated services. For planning purposes it was assumed Newcastle would capture six to 10 freight movements/day progressively from 2015 as follows: • 2015 – two to four movements/day • 2020 – four to eight movements/day • 2025 – six to 10 movements/day
Plans to invest in upgrading	<u>Military</u> The Government has committed to a $132 million investment for new and upgraded facilities (Williamtown Stage 2 Works) including: • A new hangar and headquarters • Engineering services • New working accommodation • Upgraded pavements, sewerage and electrical systems A second major project will be for the infrastructure for the F-35A – JSF (Joint Strike Fighter) which has a total value (including works at Amberley Aerodrome of about $400 million).

Civil

NAL's Master Plan outlines the indicative timeframes for possible triggers to development categorised as:

- Short-term (1-5 years)
- Medium-term (5-10 years)
- Long-term (10-20 years)

Corresponding to the trigger is the diagram showing on the plan the cumulative extent of development on the NAL site. The staging is illustrated by the series of diagrams showing the nature of the trigger (safety/compliance, operational and/or commercial) in the background colour, and the timeframe and number for the priority (Stages one to three, for the indicative timeframes of 1-5, 5-10 and 10-20 years) (refer **Figures 15 and 16**).

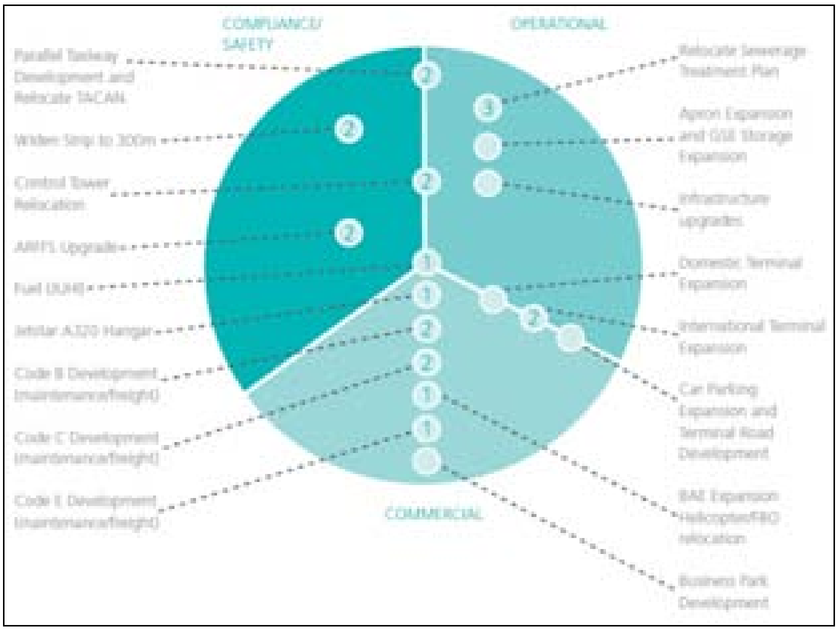
Recent upgrades include:

- Major Terminal Upgrade 2005
- New Code E apron (April 2008)
- Airside and landside passenger covered walkway
- New 880 space long term car park (October 2009)
- Check in area extension and relocation of airline offices (September 2009)
- New fuel farm (March 2010)

Figure 15 – Master Plan

Source: NAL 2007

Figure 16– Staging Priority Chart



Source: NAL 2007

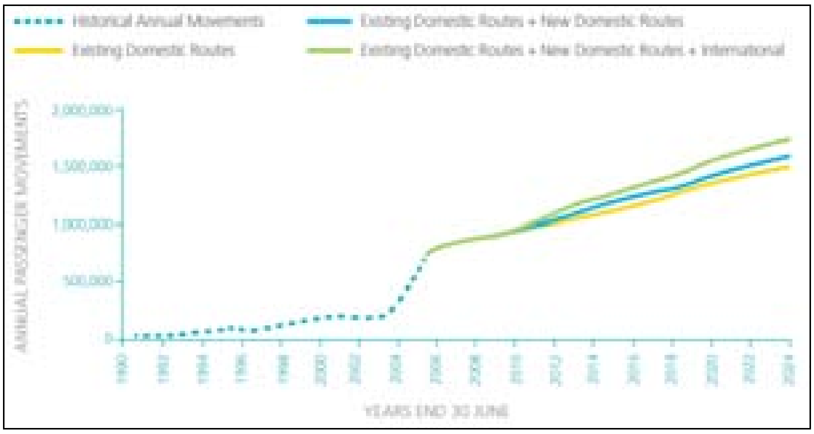
Passenger patronage forecasts	<u>Military</u> Not applicable <u>Civil</u> An average growth of around 3% per annum over the period 2005-06 to 2009-10 is projected. This is considered a “slow-capacity” period with seat factors increasing to match increased passenger demand. Stronger growth is forecast over 2009-10 to 2014-15 as new capacity becomes available (refer **Table 1** and **Figure 17**).

Table 1

Cumulative growth timeline

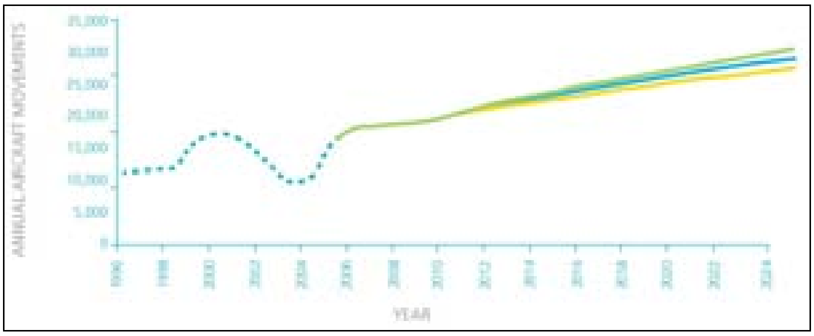
	Mid 2010 (1/2 year)		2011		2012		2013		2014	
	Return flights weekly	Pax annually	Return flights weekly	Pax annually	Return flights weekly	Pax annually	Return flights weekly	Pax annually	Return flights weekly	Pax annually
Existing domestic route growth	3	19,344	11	141,856	13	167,848	20	257,920	23	296,608
New domestic routes	25	161,200	38	490,048	40	515,840	43	554,528	47	606,112
International	0	0	0	0	0	0	11	58,720	15	72,287
Total	28	180,544	49	631,904	53	683,488	74	871,168	85	974,887
2009 inclusive (1,150,000)		1,330,544		1,781,904		1,833,488		2,021,168		2,124,887
Cumulative annual movements	20,887	28.4% of annual cap	24,307	34.8% of annual cap	24,723	35.2% of annual cap	26,907	38.3% of annual cap	28,061	40% of annual cap

Figure 17 – Passenger Forecasts



Source: NAL 2007

Aircraft movements forecast by type	<u>Military</u> Can be inferred from the draft ANEF as approximately 29,000 in 2025 (excluding Salt Ash Range bombing aircraft). <u>Civil</u> The number of daily civil aircraft arrivals and departures permitted to and from the aerodrome is prescribed in the Head Operating Agreement. Any future growth in aircraft movements must fall within its prescribed limits. Based on passenger movement forecasts, aircraft movement forecasts were projected based on likely aircraft types to be operated at Newcastle Airport in the future. These are shown in **Figure 18**.

	Figure 18 – Aircraft Movement Forecasts  *Source: NAL 2007*
Costs for upgrades	<u>Military</u> See Plans to invest in upgrading above <u>Civil</u> Not specified

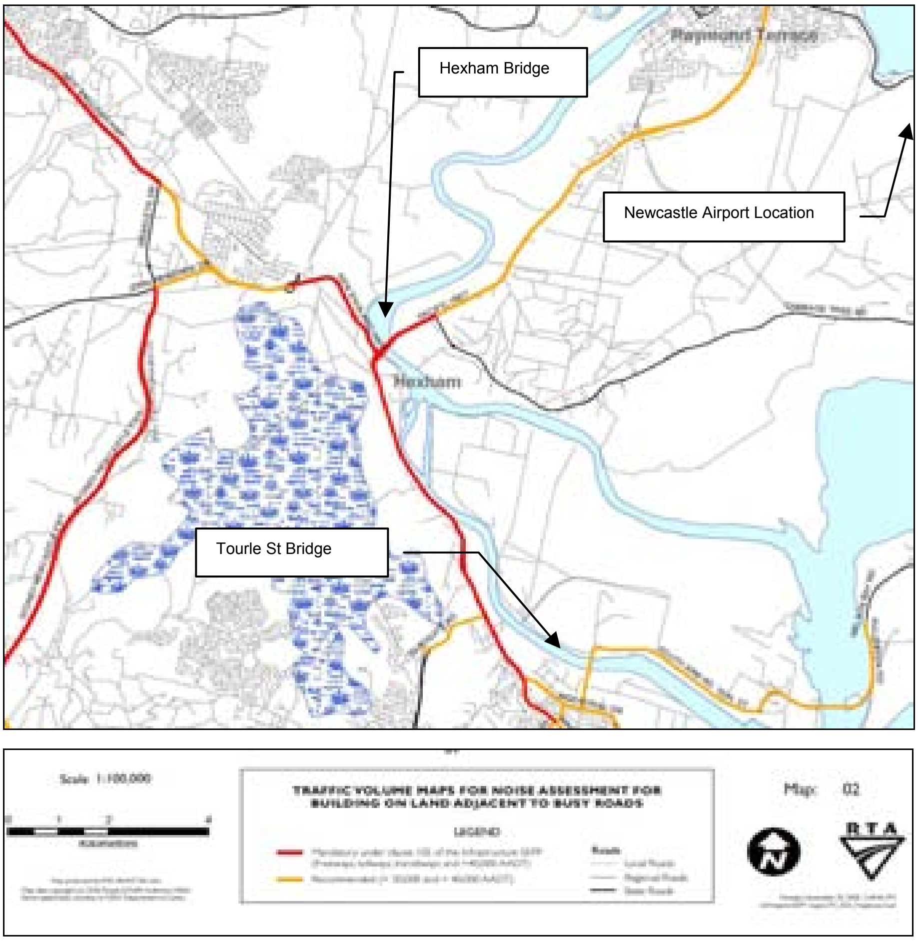
1.5 Accessibility and Surface Transport

Connections to Road	Nearest connection to the major road network 27.8 km and 31 minutes at F3 John Renshaw Drive Distance to Sydney CBD 175 km and travel time 2hours 16 minutes approximately. **Figure 19 – Access to freeway**  Distance to Newcastle 28 km and travel time 35 minutes approximately.

Figure 20 – Access to Newcastle

<table>
<tr>
<td>Traffic Volumes in Vicinity of Aerodrome</td>
<td>

Figure 21 – Access to Newcastle



As noted elsewhere access to Newcastle Airport for a large part of its market is via either the Hexham Bridge or the Tourle St Bridge both of which can become congested during peak periods.
</td>
</tr>
<tr>
<td>Access to rail</td>
<td>

Broadmeadow Station:

Distance to nearest station (Broadmeadow) 26 km and approximate time 35 minutes. Note: Hexham is 20kms away but services to Sydney and Newcastle are more frequent at Broadmeadow).

Distance to Sydney Central station: 156 km

Time to Sydney Central Station: 2hrs 40mins

Frequency of service: every hour

Cost: $7.80
</td>
</tr>
</table>

	Figure 22 – Access to Rail 
Aerodrome Parking capacity - short term and long term	• Platinum Car Park (secure covered parking facility), one to two minutes walk to terminal building • Gold Car Park (pick up/drop off passengers), less than one minute walk to terminal building • Silver Car Parks (long term parking), three to five minutes walk walk to terminal building • Bronze Car Park (800 long term parking), five to ten minutes by a free-of-charge bus. NAL has a total of 1850 car parking spaces which equates to an annual passenger throughput figure of approximately 1.8million passengers as indicated in a recent airport capacity study conducted by Airbiz.
Other transportation services available at aerodrome	Bus – • Bus stop at the aerodrome • Operator: Port Stephens Coaches (16 Services per day to Newcastle train station and Nelson Bay) • Operator: Hunter Valley Buses (Services to Medowie and Stockton ferry wharf) Taxi – • Contactable through a free of charge dedicated taxi phone. There is also a taxi rank adjacent to the arrivals area of the terminal

	Rental cars • The car rental desks for five providers are located at the arrivals end of the terminal • Shuttle services - Newcastle Airport operates a transport desk inside the arrivals section of the terminal (Newcastle Airport Information Services). The function of the desk is to provide tourism information but also to book passenger transfers via licensed shuttle bus operators. The operators serve Newcastle and the surrounding areas including Central Coast and Mid North Coast. (http://www.newcastleairport.com.au)
Walking and cycling	Walking not practical Cycling possible via road network

1.6 Utilities and Services

Work is proceeding to separate the utility supplies between civil and military operations for a variety of reasons including diversity of supply, billing and control.

Water and Sewer	Serviced by Hunter Water Corporation The RAAF Base Williamtown water reticulation network is fed from a 250mm diameter Hunter Water Corporation supply main which enters the base from Slades Road. The primary water supply for NAL is fed from the reticulation system within the RAAF Base via a main that runs along the eastern end of the runway. The normal non-boosted pressures operating within the system vary between 400 kPa and 500 kPa.
Gas	NAL and BAE Systems are the only user of gas at Newcastle Airport. This gas usage is provided via the gas main pipeline located approximately 200m from the NAL site near the main access road.
Police, fire, ambulance; hospitals	Police • Raymond Terrace Local Area Command Police Station, Stockton Police Station Fire • Medowie Fire Station, Raymond Terrace Fire Station, Stockton Fire Station Various Hospitals in the locality: • John Hunter • Maitland • Mater • Lingard Private Hospital
Power	Energy Australia Hunter Based on the Newcastle Airport demand information shown in table below and the known BAE Systems demand, the present demand (accurate as of Jul/Aug 06) at the NAL site is approximately 1700kVA and BAE Systems is

approximately 800kVA. Therefore the total demand within the Newcastle Airport precincts is 2.5MVA.

	Existing Capacity and Configuration			Future Capacity of existing cables
TOTALS SITE AMPS	2400	1200	1200	3700
	MSB	TX1	TX2	
DBT	400	400		600
DBTS	600	600		600
Ancillary	200	200		200
DBTS_E	100		100	400
DB-R (Retail)	600		600	800
DBTS-W(Jetstar 500A)	500		500	800
Spare cable MSB1 to Terminal (DBT) 4x185mm SDI (300A)				300

Telecoms	Telstra, Newcastle The communication backbones to area are by means of fibre optic cables and copper cables. These fibre optics and copper cables are drawn from an exchange and terminated in a Fibre Access Panels within the existing sites. The nearest telephone exchange is approximately 500m away from this existing BAE Systems and Aerodrome sites. At the moment, BAE Systems and Aerodrome are provided with high-speed data, broadband and voice via these copper and fibre optics cables. These transmission mediums consist of in built spares for the expansion of its high-speed data, broadband and voice requirements.

1.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for aerodrome development	The key planning and environmental legislation and planning policies which is responsible for guiding the development of the Williamtown Aerodrome site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979 • Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Port Stephens Local Environmental Plan 2000 • Port Stephens Development Control Plan 2007 – Section B2.13 Aircraft Noise The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales.

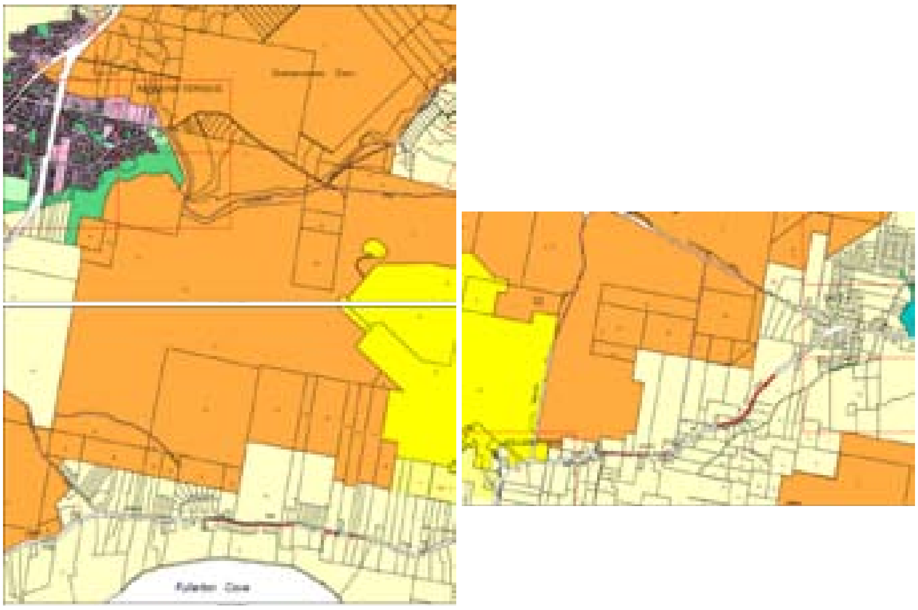
	State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) is a state statutory policy that aims to "facilitate the effective delivery of infrastructure across the State". This infrastructure includes "airports" and the provisions which specifically relate to airports are contained in Part 3, Division 1 "Air transport facilities". ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent. The *Port Stephens Local Environmental Plan 2000* (the LEP) is the local statutory planning instrument that guides development in the Port Stephens Local Government Area (LGA). The aerodrome is currently zoned 5(a) Special Uses – Defence Purposes and SP1 Special activities – Defence and Airport Related Employment and development under the LEP. The LEP includes provisions that are specifically relevant to the aerodrome:- • Clause 26, Zone SP1 Defence and Airport Related Employment Development Zone – the objectives of the SP1 zone are to: *(a) to provide opportunities for the establishment of employment generating activities supporting the ongoing operation of RAAF Base Williamtown and Newcastle Airport, and* *(b) to permit development that is appropriate and supportive to the continued operation of RAAF Base Williamtown and Newcastle Airport in terms of its land use type and location within the employment zone, and* *(c) to prevent development that is not compatible with or that may compromise the continued operation of RAAF Base Williamtown or Newcastle Airport, and* *(d) to minimise any adverse impacts on the surrounding land while protecting the inherent natural qualities and groundwater recharge areas, and* *(e) to minimise the impact of the particular characteristics of the site including flooding constraints, groundwater quality and surface drainage, and* *(f) to prevent urban encroachment to airfield operations.* • Clause 26A "Development in the vicinity of RAAF Base Williamtown/Newcastle Airport" applies to land within Zone SP1 Defence and Airport Related Employment Development. The clause states that "(2) Despite any other provisions of this plan, consent to any development on land to which this clause applies must not be granted unless the consent authority is satisfied that: (a) it complies with the relevant provisions of Australian Standard AS 2021–2000, Acoustics—Aircraft noise intrusion—Building siting and construction as applicable, and (b) it will not compromise the continued operation of RAAF Base Williamtown or Newcastle Airport, and (c) the location and type of development supports a focused defence and aerodrome related

	employment area." • Clause 26B "*Restrictions on certain subdivisions—infrastructure, facilities and services" applies to applies to land within Zone SP1 Defence and Airport Related Employment Development'… except if it is in a special contributions area. Subclause (3) states "(3) …the consent authority must not grant consent to the subdivision of land to which this clause applies if the subdivision would create a lot smaller than the minimum lot size permitted on the land immediately before the commencement of Port Stephens Local Environmental Plan 2000 (Amendment No 29), unless…. satisfactory arrangements have been made to contribute to the provision of designated State public infrastructure...*". • Clause 26C *"Subdivision of land zoned SP1 Defence and Airport Related Employment Development*" requires that a *"consent authority may grant consent for a subdivision of land within Zone SP1 Defence and Airport Related Employment Development only if each allotment to be created by the proposed subdivision will be of a size, and will have a ratio of depth to frontage, that the consent authority considers appropriate: (a) having regard to the purpose for which the allotment is intended to be used, or (b) to facilitate the future development of the land for defence and airport related employment development.*" Port Stephens Development Control Plan 2007 – Section B2.13 Aircraft Noise applies to all land identified within the Australian Noise Exposure Forecast (ANEF) contours as identified in Figure B2.2 ANEF Chart and aims to ensure that the impacts of aircraft noise is minimised through design and construction methods.

1.8 Environmental Factors, Frameworks and Policies

Site characteristics	As stated above, the aerodrome is currently zoned 5(a) Special Uses – Defence Purposes and SP1 Special activities – Defence and Airport Related Employment and development under the LEP.

Figure 23 – Zoning

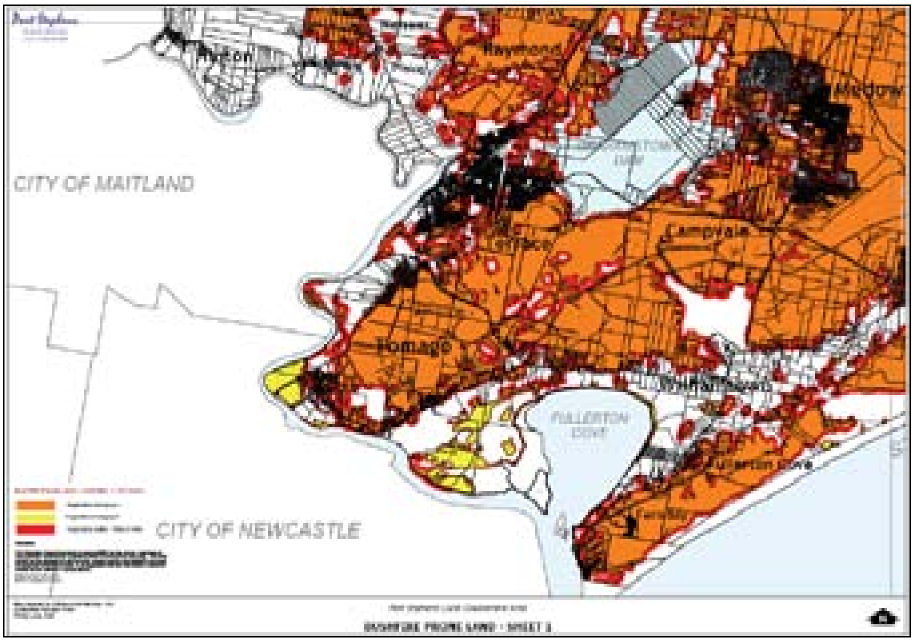


Extract from the Port Stephens LEP Zoning Map

Source : http://www.portstephens.nsw.gov.au

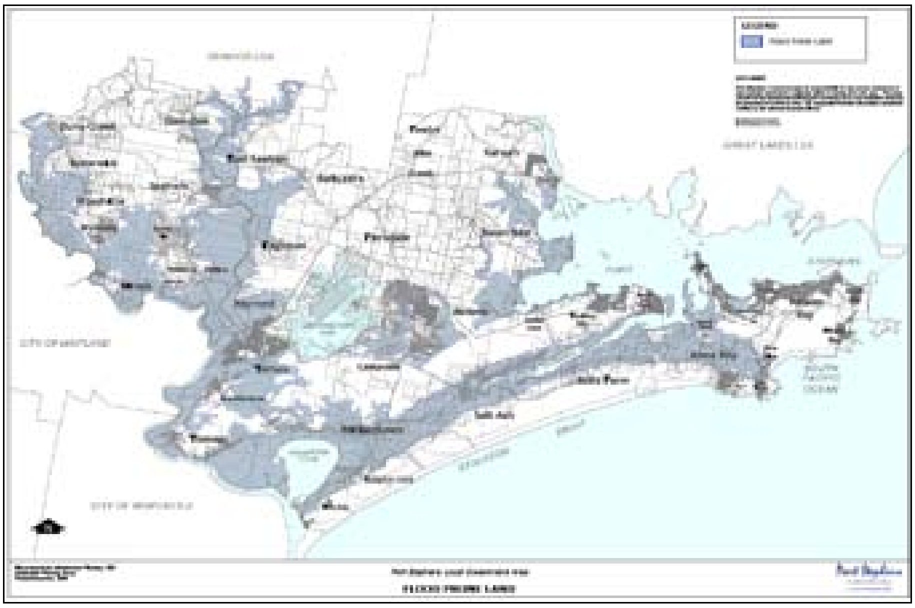
With regard to bushfire affectation, it appears that the site is surrounded by vegetation Category 1.

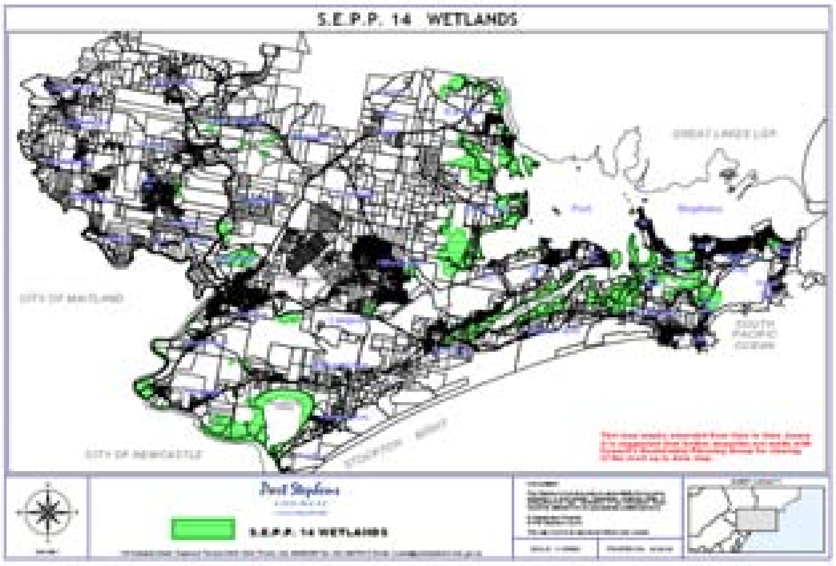
Figure 24 – Bushfire prone land



Extract from the Port Stephens Bushfire Prone Land Map

Source : http://www.portstephens.nsw.gov.au

	The Flood Prone Land Map below shows that flooding from the 1 in 100 year storm event would inundate access roads and part of the aerodrome. **Figure 25 – Flood prone land**  Extract of the Port Stephens Flood Prone Map Source : http://www.portstephens.nsw.gov.au
Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangers species Designated environmental management areas Existing environmental assets Heritage scientific and	The aerodrome is located approximately 4km to the east of the Raymond Terrace township and 2km to the south of the Medowie township. The site is surrounded by land zoned 1(a) Rural Small Holdings and 7(c) Environmental Protection (it is unknown why the land is zoned environmental protection). As shown in the figures above, much of the surrounding land is bushfire prone and/or flood prone.

aesthetic qualities/issues Wetlands and other sources of bird hazard	 Extract of the Port Stephens SEPP 14 Wetlands Map Source : http://www.portstephens.nsw.gov.au
Environmental management policies for Aerodrome	***Newcastle Airport's Environmental policy states that:*** *"As a regional transport hub, Newcastle Airport recognises the importance of maintaining the highest standards of environmental management and has implemented systems to minimise the impact of Airport operations and expansion.* *Newcastle Airport is committed to sustainability in operations and development, and is working closely with the Australian Municipal Energy Improvement Facility (AMEIF) through Newcastle City Council to implement programs aimed at improving performance in the areas of energy, water use, and waste reduction.* *The Newcastle Airport Development Guidelines (incorporated within the Master Plan) assist in implementing Ecologically Sustainable Development standards and achieving high levels of environmental performance.* ***Environmental initiatives*** *Newcastle Airport's goal is to progressively reduce water and power on the Airport precinct. The Airport is also committed to maximising its recycling outcomes and minimising its waste contribution to land fill.* *To achieve these goals, Newcastle Airport has taken a multi-targeted approach to minimise its water, power and waste; this includes:*

	• *All storm-water is captured and held on site in large retention ponds. Water is slowly returned to the ground water table and local aquifers. It is planned that this water will be used to meet Airport needs.* • *The Airport uses ground water instead of town water in areas such as garden and lawn watering.* • *The gardens on the Airport precinct are planted (where possible) with drought tolerant plants, are mulched and equipped with water-saving irrigation systems.* • *Introduction of Power Factor Correction equipment (PFC). Power Factor Correction equipment allows a reduction of peak load across the Airport reducing any over load on the network.* *Where possible, Newcastle Airport has installed timed energy-efficient street lighting, allowing certain lights to turn-off during low traffic periods. Inside the terminal, the Airport has installed sensor lighting to reduce the Airport's power demand.* *Newcastle Airport has implemented a full recycling and waste reduction strategy with our partners Veolia. Co-mingled and general waste bins have been installed throughout the terminal. The co-mingled material is fully recycled, while the general waste is sorted and organic material mulched and recycled.* *Newcastle Airport has implemented water-efficient taps (timed taps with reduced flow), shower and toilet fittings in all its public facilities resulting in water savings of more than 80% each year.* ***Environmental management system*** *Newcastle Airport renewed the Environmental Management System (EMS) in December 2007. Providing the day-to-day management objectives the EMS provides a framework to ensure the ongoing improvement of environmental procedures.* *The EMS will ensure that all operations at the Airport are carried out according to industry best practice, both now and in the future. The EMS has been designed to be consistent with AS/NZ ISO14001: 2004."*
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded	The 25 ANEF for 2012 extends to cover parts of the residential areas of Raymond Terrace. Under the forecast 25 ANEF for 2025, this area of impact increases substantially. There is a proposed residential development at Kings Hill for about 3,500 houses. The site is under the ILS approaches and military departures. The proposal needs to be reviewed in relation to the new ANEF once prepared.

aerodrome usage	The major supply of water for Newcastle, the Grahamstown Reservoir, to the immediate north East of the aerodrome. In the district surrounding the aerodrome are a number of SEPP14 wetlands and which act are major bird refuges. The aerodrome site is within the water catchment area. There is Koala habitat reported near the aerodrome. Defence has purchased lands for noise abatement (voluntary acquisition about 5 years ago). There was about an 80% take up rate. The extent was based on the 25 ANEF.

1.9 Community and Public Amenity Factors

Community attitudes to aerodrome	In 2008 Newcastle Airport commissioned a community attitude survey. This survey is being conducted again in 2010. As a council owned airport NAL believes its relationship with the community is essential in the long term success of the airport. The 2008 survey (executive summary to be provided in hard copy) found that 74% of respondents described the airport as extremely important to the Hunter region, and 72% as either extremely important or important to themselves as an individual. 2 out of 3 respondents believed the Hunter region was proud of the airport. Customer feedback from passengers remains positive and there continues to be a hunger for travel and new destinations.
Airport interaction with Communities	Newcastle Airport states that it is *“committed to working with and contributing to the local community through our Community Engagement Program. As a significant economic contributor to the region as a whole, Newcastle Airport also takes pride in 'giving something back' to the community that it operates within.”* And that: *“We believe it is vital that the local community shares in the success story of Newcastle Airport. Therefore the Airport actively engages with its surrounding communities whilst endeavouring to listen to and address their concerns.”* As part of its community engagement program, Newcastle Airport is working in partnership with its neighbours to help foster a sense of community and pride in the Airport's operations. Newcastle Airport aims to be an outstanding corporate citizen and says that: *“we are proud to support a number of initiatives that promote positive relationships with our local community. Newcastle Airport has adopted*

	four areas that underpin our actions within the community" being: • Education • Charity • Sport • Arts and culture • Business and tourism As well as presenting regularly at community forums Newcastle Airport distributes monthly a community based newsletter and encourages customer feedback via in terminal feedback terminals

1.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-3 Newcastle, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, En Route Supplement Australia (ERSA), *effective 3 June 2010*. www.btre.gov.au/info.aspx?NodeId=49 www.newcastleairport.com.au/page345/Home.aspx www.raaf.gov.au/Bases/Williamtown.aspx http://www.newcastleairport.com.au/page467/Environment_strategy.aspx http://www.portstephens.nsw.gov.au

Maitland Aerodrome

CONTENTS

2 MAITLAND AERODROME

2.1 Introduction

Maitland Aerodrome (also known as Russell Field) is located approximately 7km north-west[1] of the City of Maitland and is accessed from the New England Highway. **Figures 1** and **2** depict aerial images of the airport site.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date December 2006)

Figure 1 is significantly outdated (imagery 2006). There are now more residences on the north western boundary of the airport and runway 08/26 has been modified. Additionally, a grass runway has been reoriented away from increasing residential development on the north west boundary.

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Area)

Source: Google Earth Pro 2010 (Imagery Date December 2006)

Maitland Aerodrome was established by the Royal Newcastle Aero Club (RNAC) in the early 1960s when the club moved from its former Broadmeadow site which it had occupied since the 1930s. Today the RNAC provides for flying training and other aeroclub activities. The airport also accommodates a number of private hangars and aircraft operations are primarily conducted by light single and twin engine aircraft.

Figure 2 is not up to date. There are four new hangars to the east of the easternmost row of hangars shown above. Hangar sites are available for lease to full members on a 10 year lease term. The hangar constructed on the leased site is owned by the member. A further five hangars are about to proceed.

Currently there are about 50 aircraft on the airport. With the new hangars this number will increase to about 62 aircraft.

2.2 Current Site Attributes

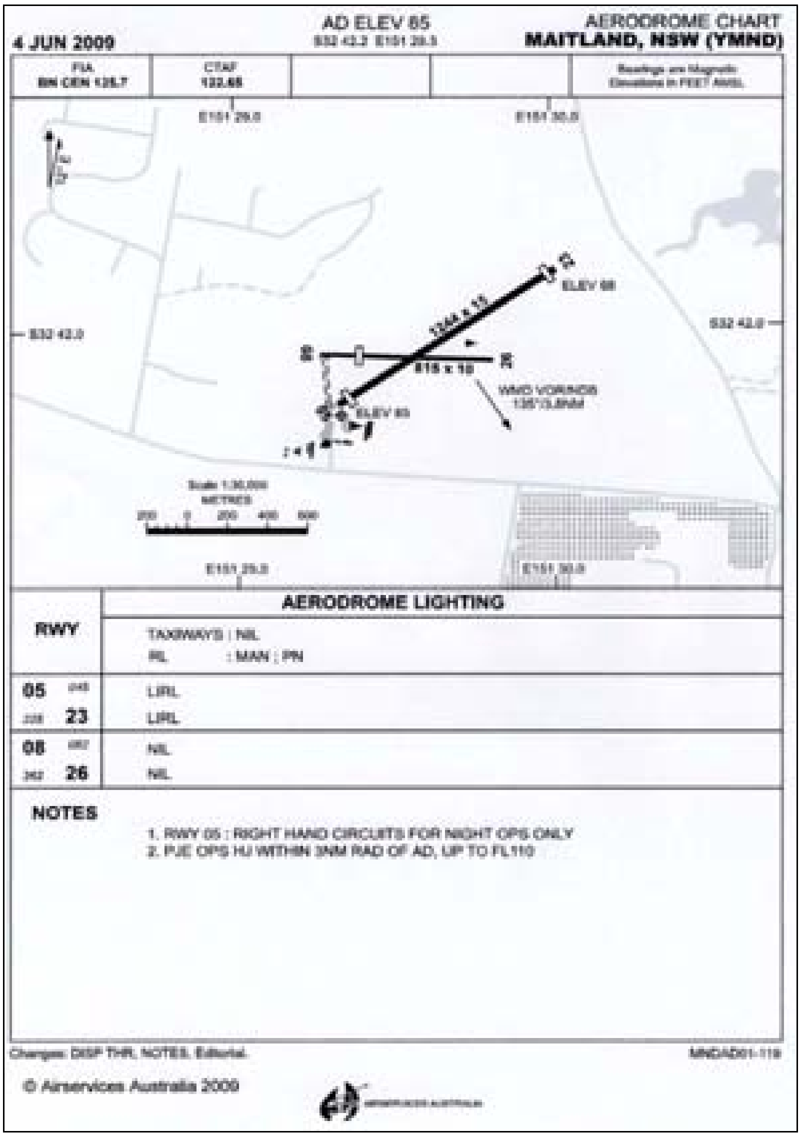
Airport location and LGA	S 32 degrees 42.2 minutes E 151 degrees 29.3 minutes Maitland City Council LGA
Ownership and management; lessee/operator	Royal Newcastle Aero Club (RNAC) – Owner and Operator – a non-profit member association. The RNAC has entered into a Joint Venture development of a business park for the eastern portion of the site. Details of the development (Anambah Business Park) are available on www.hunterland.com.au .The same company is developing the Aerospace Industrial Estate at Williamtown airport
Aerodrome Category	Registered
Applicable regulatory regime	Civil Aviation Safety Regulations (CASR) Part 139 - Aerodromes
Site area and physical dimensions	Site was originally 480 ha but the now 206.6ha (about half will remain for use as an airport and the remainder will be a Buffer Zone plus the Business Park).
Major centres of population, population growth	Maitland, Singleton, Newcastle
Elevation above sea level	85 feet
Surrounding topography	The site lies south of the Hunter River in a shallow valley which runs down to the river, with low rising ground to the east and the west. Higher ground exists north of the River.
Liability for flooding	Site is above 1:100 year level – see Section 3.8

2.3 Airport Operations

Summary of main activities	Flying training and private hire provided the RNAC, privately owned aircraft accommodation and operations. Helicopter flying training and parachuting is also undertaken. The airport is also used by Air Ambulance aircraft. Other current activities include: • Freight charter; • Commercial charter • Aircraft maintenance and overhaul; • Aircraft refuelling;

	• Private hangerage and usage. The airport is suitable for use by single and multiengine fixed and rotary wing aircraft up to a take off weight of 5700 kgs.
Current passenger numbers	Not applicable – no RPT services
Current aircraft movement numbers	Estimated by RNAC at about 15,000 to 17,000 movements per annum;
Current freight throughput	Not applicable
Known sources of delay in airport and runway operations	No significant delays. RNAC estimates that fog affects the airport on about 10-14 mornings per annum;
Movement/manoeuvring area details	
Runway	• 05/23 – 1244m x 15m (Code 2) • 08/26 – 815m x 10m (Code 1 • A grass strip is used as an emergency runway and for training aligned in a north/south direction is not reported in ERSA – (but is visible in Figure 1). The alignment of the grass strip has been rotated about 15 degrees to shift aircraft operations away from residences on the north western side of the airport. • Runway 08 threshold has been displaced to the east. The eastern end of the runway was extended and sealed to provide a greater landing distance for runway 08. The 26 threshold did not move.
Runway strips	• 05/23 – 1364m x 80m • 08/26 – 875m x 60m
Taxiways	• Sealed taxiway from the Runway 05 end to the main apron. • Grassed parallel taxiway on southern side of Runway 05/23. • Grassed taxiway linking the Runway 05 and 08 ends. • Partial parallel grassed taxiway on southern side of Runway 08/26 at eastern end. • Grassed taxiways supporting individual hangar areas. **Figure 3** shows the runway and taxiway layout.

Figure 3 – Runway and Taxiway Layout



Source: Airservices Australia 2010

Aprons	• Main sealed apron in front of RNAC facilities. • Grassed aprons/aircraft parking areas elsewhere.
Airfield pavements	• Runway 05/23 – sealed (unrated) • Runway 08/26 – sealed (unrated)
Airfield operating restrictions	• Prior permission required for use. • Aerodrome operational September to April 0600-2300 hours local and May to August 0630-2300 hours local.

Airfield lighting and approach systems	• Runway 05/23 low intensity edge lighting. Available by prior arrangement only.
Visual navigation aids	• Runway, taxiway and apron markings and markers. • One illuminated wind direction indicator (IWDI) and one wind direction indicator (WDI).
Radio navigation aids	Nil on aerodrome but nearby West Maitland very high frequency omni-range (VOR) and non-directional beacon (NDB), and Singleton NDB all owned and operated by Airservices Australia, provide instrument approach procedures for Maitland Aerodrome.
Surveillance systems	Nil
Operational procedures	• Right hand circuits Runway 05 for night operations normally – but not currently in effect due to obstacles. • Runway 23 preferred direction in nil or light and variable conditions. • Circuit training permitted September to April 0700-2200 hours local and May to August 0700-2130 hours local. • Circuit training before 0800 hour local restricted to single engine aircraft less than 1,900kg maximum take-off weight (MTOW).
Aviation fuel	Air BP (RNAC) AVGAS available. (Note RNAC to provide details)
Terminals and other major aviation support infrastructure elements	No RPT terminal: main buildings are RNAC club house and hangar, plus numerous other hangars.
Security	Not a Security Controlled Airport
Border Control Agencies	Not applicable
Air traffic management and airspace management arrangements	Non-towered aerodrome in Class G airspace requiring mandatory carriage of radio. Common Traffic Area Frequency (CTAF) procedures apply. The airport is in close proximity to the RAAF Base Williamtown Control Zone (CTR) and Restricted Area R578E which is approximately 3 nautical miles to the east and north. It is activated by NOTAM and operates from the surface to an altitude of 10,000 feet. Restricted Areas (R564A and R564B) are located approximately 12 nautical miles to the west. These Restricted Areas are associated with the Singleton Army Base (Firing) and operate continuously from the surface to an altitude of 4,000 feet (R564A) and above 4,000 feet as advised by NOTAM (R564B).

The airport lies within Danger Area D600 which is a military jet corridor operating from the surface to an altitude of 8,500 feet. It is active continuously.

The entry/exit to an inland light aircraft access lane (Danger Area D589A) through the Williamtown airspace is located approximately 2 nautical miles to the east of the airport. It operates from the surface to an altitude of 1,600 feet. It is active continuously.

Figure 4 shows the airspace arrangements in the vicinity of the airport.

Figure 4 – Maitland Aerodrome Airspace Arrangements

Source: Airservices Australia 2010

The majority of traffic utilising Maitland Aerodrome is assumed to operate under Visual Flight Rules (VFR). Flight tracks associated with operations under Instrument Flight Rules (IFR) in the vicinity of the airport are shown in **Figure 5.** IFR approach procedures are promulgated in the relevant Departure and Approach Charts (DAP).

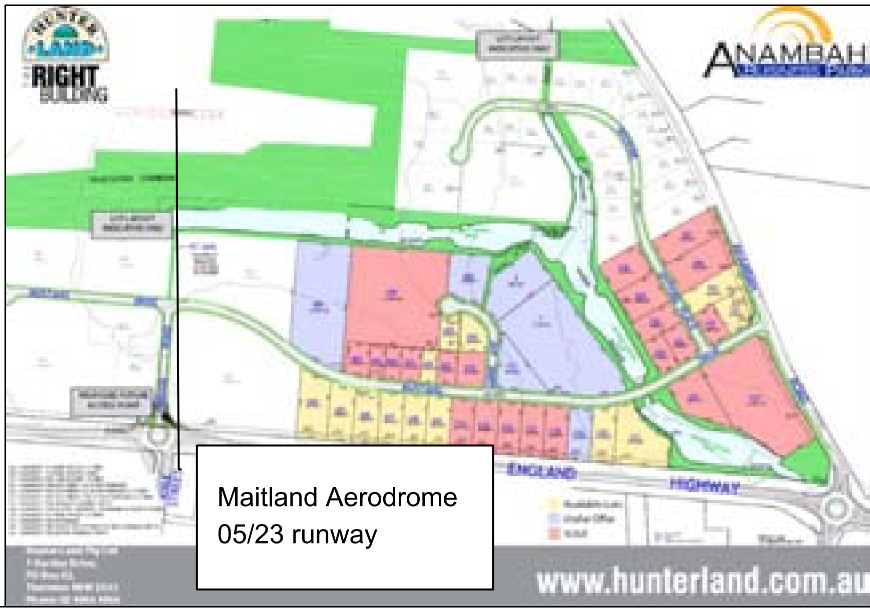
The training area for Maitland Aerodrome is marked on the VTC south of the airport.

	Figure 5 – Maitland Aerodrome IFR Flight Tracks  *Source: Airservices Australia 2010* Other airports/aerodrome facilities as shown on aeronautical charts within 50km of Maitland Aerodrome are: • RAAF Base Williamtown approximately 34km to the south-east • Cessnock Airport approximately 17km to the south-west • Luskintyre Airfield approximately 8km north-west • Singleton (military Airfield) approximately 27km north-west • Singleton (civil Airfield) approximately 29km north-west • Warkworth Airfield approximately 47km north-west
Aerodrome Rescue and Fire Fighting Services (ARFFS)	Nil however RFS has a training facility on the airport.

Operating restrictions	Noise abatement procedures note the nearby noise sensitive urban areas of Windella and Rutherford
Known development capability and expansion planning	A master plan is being produced for the airport and will need to be approved by Maitland City Council. The RNAC is not chasing any further flying training schools. There are some charter flights at the airport. A small airpark is something that might be considered. The RNAC may purchase a couple of lots in the joint venture business park for aviation purposes. If the F3 proceeds there may be further development opportunities for the airport.
Known constraints on future capacity or ability to meet current and future demand	The runways are not readily extendable. The RNAC has an agreed cap of 25,500 aircraft movements with Maitland City Council
Aircraft noise contours and status	There do not appear to be any noise contours relating to the airport from a check of the 2011 Draft LEP & DCP material. RNAC has however undertaken noise studies previously 2001/2002 which indicated that the then 20 ANEF contour would be contained with the airport site. However, RNAC has an established Community Operational Undertaking designed to address noise impact issues which sets out recommended procedures to be adopted by pilots when landing or taking off at Maitland Aerodrome, noting however that RNAC does not have operational control over the flight paths of every aircraft that may use the airfield. RNAC also participates in an Aerodrome Consultative Panel comprising representatives of RNAC, Council and the community. It meets 3 times per year. Maitland City Council appears to have an aerodrome committee with councillor representation. (Note: RNAC to send further information on the noise studies when available)

2.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related;	RNAC major business undertaking was to release part of its site for Industrial development as described earlier and as shown below.

	Figure 6 – Industrial development at Maitland Aerodrome 
Freight forecasts;	Not applicable – no commercial freight;
Plans to invest in upgrading;	Non aviation specific Joint Venture Business Park proceeding.
Passenger patronage forecasts;	Not applicable – no RPT operations currently
Aircraft movements forecast by type;	No RPT forecast
Costs for upgrades	No airport related upgrades currently other than possible additional private hangars for which demand is apparently strong.

2.5 Accessibility and Surface Transport

<table>
<tr>
<td>Connections to Road</td>
<td>
Nearest connection to the major road network is the airport boundary with the New England Highway - 100 metres. Thence, 20.8 km and 27 minutes to the F3 Freeway

Distance to Sydney CBD: 172 km and travel time 2 hours 17 minutes approximately.

Figure 7 – Access to Freeway


Distance to Newcastle: 60.8 km and travel time 1 hour 20 minutes approximately.
</td>
</tr>
</table>

Figure 8 – Access to Newcastle

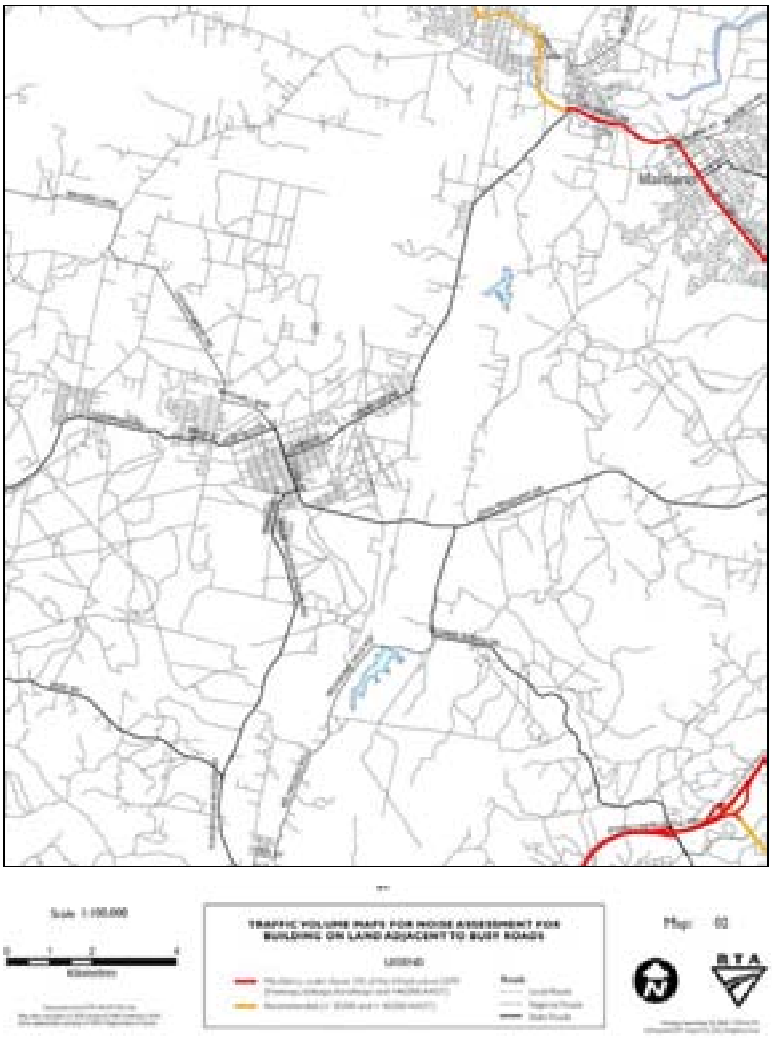
Traffic Volumes	**Figure 9 – Major Road System**  Traffic Volumes on the New England Highway in the vicinity of Maitland Aerodrome are less than 40,000 AADT.
Access to rail	Maitland Station: Distance to nearest station (Maitland) 9 km and travel time 11 minutes approximately Maitland to Central 185 km Time to Sydney Central Station: (Maitland to Central 3hrs and 20mins through Hunter Line train + Central Coast And Newcastle Line train) Frequency of service: approximately every half hour Cost: $7.80 one way

	Figure 10 – Access to Rail 
Airport Parking capacity - short term and long term	Virtually unlimited capacity for scale of operations
Other transportation services available at airport	Bus – o Closest bus stop (4.2 km – approximately 52 mins walk) o Operator: Hunter Valley Buses Taxi – available on call Rental cars – Nil Shuttle services – Nil
Walking and cycling	Walking not practical. Cycling possible via road network.

2.6 Utilities and Services

Water and sewer	Serviced by Hunter Water Corporation adequate supply at present Fire brigade does training on site with hydrant supply. Main carrier sewer line from Lochinvar runs parallel to the adjacent highway on the airport's western boundary and RNAC is trying to get access. This would require tanks and pumps to discharge to the main carrier.
Gas	Jemena Gas North serviced this area but gas not available on site currently.
Police, fire, ambulance, hospitals.	Police o Lochinvar Police Station: (3.7 km - approximately 5 mins)

	Fire o Lochinvar Fire Station: (3.9 km - approximately 5 mins) o Telarah Fire Station: (5.8 km - approximately 9 mins) Hospitals o Maitland Hospital (8.3 km – approximately 12 mins)
Power	Energy Australia Hunter upgraded transformer, underground to future hangar sites.
Telecoms	Serviced by Telstra, Maitland

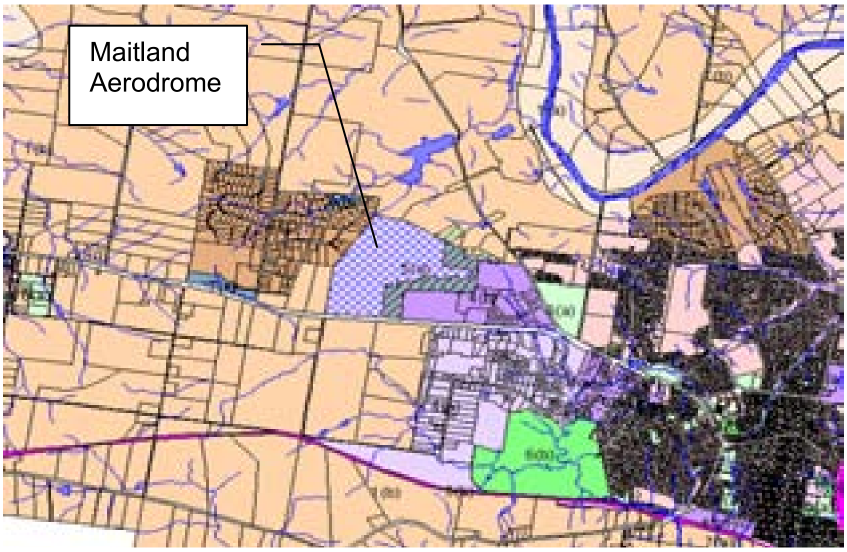
2.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for airport development	The key planning and environmental legislation and planning policies which are responsible for guiding the development of the Maitland Aerodrome site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979 • Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Maitland Local Environmental Plan 1993 • Draft Maitland Local Environmental Plan 2011 The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales. *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a state statutory policy that aims to "facilitate the effective delivery of infrastructure across the State". This infrastructure includes "airports" and the provisions which specifically relate to airports are contained in Part 3, Division 1 "Air transport facilities". ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent. The *Maitland Local Environmental Plan 1993* (the 1993 LEP) is the local statutory planning instrument that guides development in the Maitland Local Government Area (LGA). The *Draft Maitland Local Environmental Plan 2011* (the draft 2011 LEP) is currently being prepared and will supersede the 1993 LEP. The airport is currently zoned 5(a) "Special Uses Aerodrome" under the 1993 LEP. The 1993 LEP includes provisions that are specifically relevant to the airport:- • Clause 45 "What restrictions apply to development in the flight path

> of Rutherford Airport?" (also known as Maitland Aerodrome) requires that "(1) A person shall not erect a building on land that is within the flight path of Rutherford airport to a height above the obstacle height limitation surface for that airport for the time being determined by the Commonwealth Department of Transport and Communications without the consent of the Council" and that "(2) The Council shall not grant consent as referred to in subclause (1) unless it is satisfied … that the building will not constitute an obstruction, hazard or potential hazard to aircraft flying in the vicinity". In addition, subclause (3) states: "(3) In granting consent as referred to in subclause (1), the Council shall give consideration to any noise exposure forecasts … and to whether the proposed use of the building will be adversely affected by exposure to aircraft noise".

The draft 2011 LEP written instrument, which is available at Maitland City Council's website, does not include any specific provisions that relate to airports, or development within the vicinity of airports. Cessnock Airport is proposed to be zoned "SP1 Special Activities" under the draft 2011 LEP.

Figure 10 - Zoning



Extract of the Maitland "Zoning" map

Source: http://www.maitland.nsw.gov.au

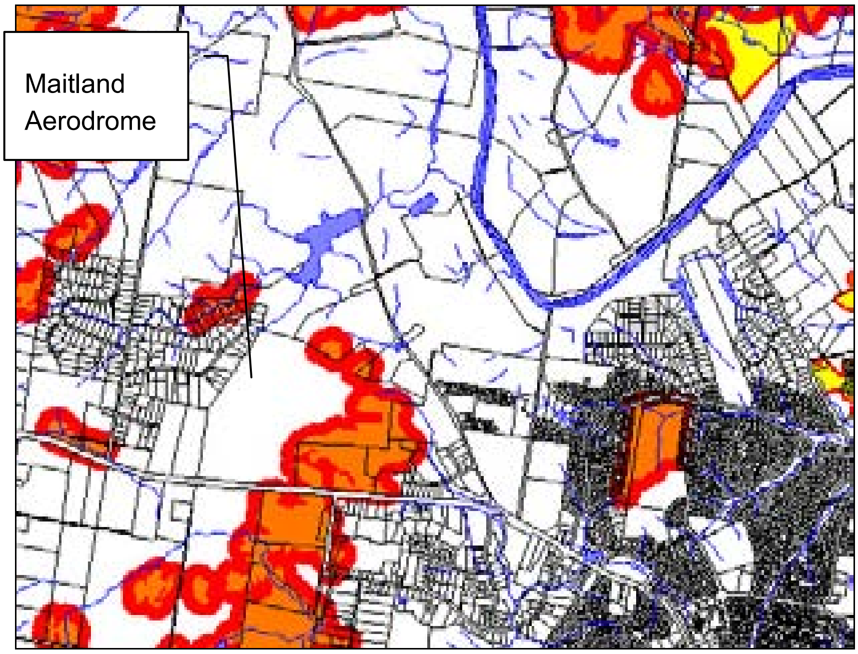
2.8 Environmental Factors, Frameworks and Policies

<table>
<tr>
<td>Site characteristics</td>
<td>

As stated above, the site is currently zoned 5(a) "Special Uses Aerodrome" under the 1993 LEP and is proposed to be zoned "SP1 Special Activities" under the draft 2011 LEP.

With regard to bushfire affectation, it appears that the site contains Category 1 vegetation with a 100m buffer.

Figure 11 – Bush fire prone land



Extract of the Maitland bushfire affectation map

Source: http://www.maitland.nsw.gov.au

The site is also identified as being "environmentally sensitive" along the eastern boundary, although no further information is provided in Council's mapping as to the nature of the environmental sensitivity. The site is also identified as being affected by Class 5 Acid Sulfate Soils. It appears that the site is not affected by the 1 in 100 year flood event.

</td>
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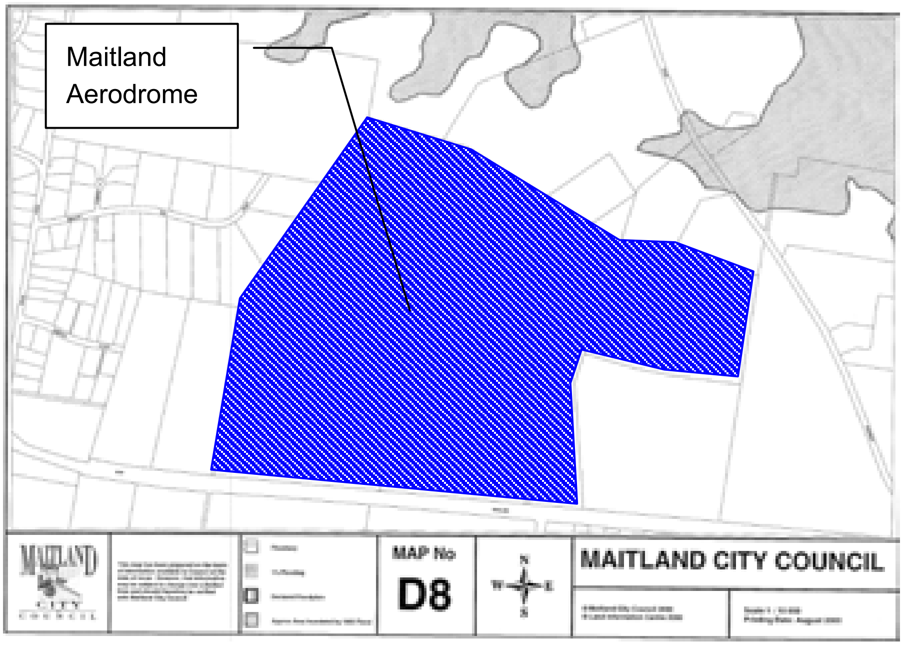
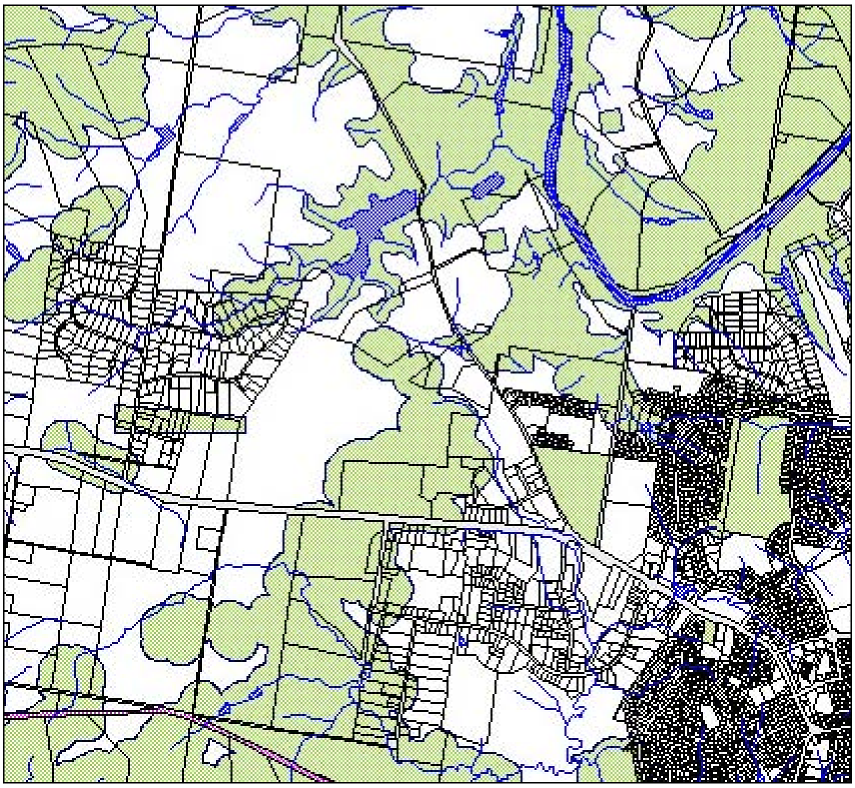
</table>

	Figure 12 – Flood prone land  Extract of the Maitland flood prone land map Source: http://www.maitland.nsw.gov.au
Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangers species Designated environmental management areas Existing environmental assets Heritage scientific and aesthetic qualities/issues	The site is located approximately 1km to the east of the Windella township, 4km to the east of the Lochinvar township and 3km to the west o the Rutherford township. The land surrounding the airport is zoned 1(b) “Secondary Rural Land” under the 1993 LEP. The draft LEP 2011 (LZN_003 and LZN_005 maps) identify the following proposed land use zones around Maitland Aerodrome: • RU2 Rural landscape to the north and south; • R5 Large Lot Residential adjacent the site to the west; • E3 Environmental protection adjacent the site to the south-east; • IN1 General Industrial immediate vicinity of the site to the south-east; • B5 Business Development to the south-east; and • Land Zoned R1 General residential approximately 4km to the west and 1km to the east. The Rutherford Industrial Release Area is proposed to be located adjacent the site to the south, whilst the Lochinvar Urban Release Area is proposed to be located approximately 1.2km to the south-west of the site. With regard to bushfire affectation, it appears that, in addition to the airport, a

Wetlands and other sources of bird hazard	large tract of land to the south is identified as Category 1 vegetation. A similar area of land is also identified as being "environmentally sensitive". It appears that some land to the north may be affected by the 1 in 100 year flood event. **Figure 13 – Environmentally sensitive land**  Extract of the Maitland "*Environmentally Sensitive Vegetation*" map Source: http://www.maitland.nsw.gov.au

Existing Environmental Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	No existing environmental management policies were located other than the Community Operational Undertaking on noise. However RNAC indicated that an Environmental Management Plan was in the process of being prepared and a copy has been requested.
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	It is considered that the proposed encroachment of urban areas to within 1.2 km from Maitland Aerodrome to the west may limit the potential for Maitland Aerodrome to expand.

2.9 Community and Public Amenity Factors

Community attitudes to airport	RNAC indicate that there are complaints about aircraft noise but these are usually associated with emergency operations. Such issues are managed through the Aerodrome Consultative Panel
Airport interaction with Communities	RNAC reports generally good relations with Maitland City Council which has approved developments which assist in financial management of the aerodrome eg new hangars and the industrial development and with changes to runaway configurations which assist in environmental management.

2.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-3 Newcastle, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010.* Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. http://www.maitland.nsw.gov.au/ http://mapping.maitland.nsw.gov.au/exponare/ http://www.rnac.com.au/ RNAC Document entitled "*Community Operational Undertaking*" No date.

3

Cessnock Aerodrome

Cessnock Aerodrome

CONTENTS

3 CESSNOCK AERODROME

3.1 Introduction

Cessnock Aerodrome is located approximately 6km north[1] of the City of Cessnock and is accessed from Wine Country Drive. **Figures 1 and 2** depict aerial images of the airport site.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date December 2006)

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Areas)

Source: Google Earth Pro 2010 (Imagery Date December 2006)

Cessnock Aerodrome was originally built in 1942 by the RAAF as part of a system of parent and satellite aerodromes throughout NSW. Today the airport is a popular flying training aerodrome servicing Newcastle and Lower Hunter based pilots and students. There are two major flight training schools (Hunter Valley Aviation and Avondale Aviation, now owned by Wollongong University). The airport is also home to a helicopter joy flight centre. There are a number of private hangars and home-based light aircraft. The airport also accommodates a number of private hangars and aircraft. Operations are primarily conducted by light single and twin engine aircraft. Ultralight and balloon flying is also undertaken.

BAS is out fielding operations to Cessnock from Bankstown Airport. BAS has 50 aircraft in total. There are about 30 training aircraft based on Cessnock Aerodrome.

3.2 Current Site Attributes

Airport location and LGA	S 32 degrees 47.3 minutes E 151 degrees 20.5 minutes Cessnock City Council LGA
Ownership and management; lessee/operator	Cessnock City Council – owner Aviation & Leisure Corporation – Operator ALC has 25 year lease and a management agreement with Cessnock City Council and ALC is the manager and operator of the airport
Aerodrome Category	Unlicensed
Applicable regulatory regime	Civil Aviation Safety Regulations (CASR) Part 139 – Aerodromes Note that the ERSA entries are about to be modified.
Site area and physical dimensions	~50ha approximately
Major centres of population, population growth	Cessnock, Maitland, Singleton, Newcastle
Elevation	211 feet
Surrounding topography	Brokenback Range to the south
Liability for flooding	No major flood liability on runways or taxiways; grassed areas can become waterlogged.
Atmospheric conditions	Westerly winds and some early morning fogs affect operations – about 5 days pa

3.3 Airport Operations

Summary of main activities	Flying training and private operations by light fixed and rotary wing aircraft including executive jets and other charters. Ultralight and

	balloon activities also undertaken. Private hangar accommodation. 30 training aircraft are based on airport. There are two major flying training schools, Warbirds,four aircraft maintenance facilities, planned assembly of Jabiru aircraft, jet fuel depot, charter by executive jets (mining companies), Rural Fire Service head quarters, Rothbury District Fire station and base for parachute operations (to Hope Estate). The Hunter Recreational Flying Club (HRFC) has a base for RAA aircraft types.
Current passenger numbers	Not applicable
Current aircraft movement numbers	44,188 movements to 30 June 2008 53,740 movements to 30 June 2009 Percentage of total: • Training schools – 81.1% • Recreational flights – 10.0% • Executive visits – 0.6% • Tourist charter flights – 4.3% (includes resident tourist helicopter) • Parachuting – 1.1% • Fire fighting – 0.02% • Helicopters – 1.5% • Warbirds – 1.4%
Current freight throughput	Not applicable
Known sources of delay in airport and runway operations	Parallel taxiway plus run up bays at each end of taxiway ensures runway can be efficiently used for a high level of movements. Operations can be disrupted by early morning fog and (for training aircraft) high cross wind component, but this only occurs a few days per year.
Movement/manoeuvring area details	Note that the details below are from the ERSA as currently published. The ERSA details are about to be modified, with some changes likely.
Runway	17/35 – 1097m x 18m (potentially Code 2 if aerodrome registered

	or certified). Note old runway provided for potential length of 1480m.
Runway strip	17/35 – 1220m x 90m
Taxiways	• Sealed full length parallel taxiway on western side of Runway 17/35. Three position aircraft run-up bays at each end of the taxiway prior to runway entry. • Sealed entry and exit taxiways at runway ends and intermediate locations. • Partial parallel sealed taxiway on eastern side of Runway 17/35 at northern end which serves the main apron in the Eastern Building Area. • Other sealed taxiways serving the Western Building Area. There is no Airservices Australia published runway and taxiway layout.
Aprons	• Main sealed apron serves the Eastern Building Area. • Sealed apron serves the Western Building Area at its northern end. • Sealed and grassed aprons/aircraft parking areas elsewhere. • Additional apron/access taxiway construction in association with Skyfuel facility at north east end of runway.
Airfield pavements	Runway 17/35 – sealed (no rating stated)
Airfield operating restrictions	Prior permission required for use.
Airfield lighting and approach systems	Pilot Activated Lighting (PAL) low intensity runway edge lighting.
Visual navigation aids	Runway, taxiway and apron markings and markers. One illuminated wind direction indicator (IWDI).
Radio navigation aids	Nil
Surveillance systems	Nil

Operational procedures	• Right hand circuits Runway 35. • Runway 35 preferred direction in nil or light and variable conditions. • Circuit training restricted to 0800-2200 hours local. • Straight-in approaches not permitted. • Circuit operations to be conducted within 2 nautical miles radius due to terrain and noise abatement. • Circuit altitude 1,200 feet for all aircraft except ultralights.
Aviation fuel	Shell (SkyFuel/Hunter Valley Aviation) AVGAS available, JET A-1 on request.
Terminals and other major aviation support infrastructure elements	Small terminal (open 24hrs/day) with toilets and pay phone, numerous other buildings and hangars supporting current level of operations.
Security	Not a Security Controlled Airport
Border Control Agencies	Not applicable
Air traffic management and airspace management arrangements	Non-towered aerodrome in Class G airspace and being unlicensed does not require mandatory carriage of radio. Common Traffic Area Frequency (CTAF) procedures apply for radio equipped aircraft. The airport is in relatively close proximity to the RAAF Base Williamtown Control Zone (CTR) and Restricted Area R578E which is approximately 12 nautical miles to the north-east. It is activated by NOTAM and operates from the surface to an altitude of 10,000 feet. Restricted Areas (R564A and R564B) are located approximately 5 nautical miles to the north-west. These Restricted Areas are associated with the Singleton Army Base (Firing) and operate continuously from the surface to an altitude of 4,000 feet (R564A) and above 4,000 feet as advised by NOTAM (R564B). The airport lies within Danger Area D600 which is a military jet corridor operating from the surface to an altitude of 8,500 feet. It is active continuously. The entry/exit to a light aircraft access lane (Danger Area D589A)

through the Willamtown airspace is located approximately 11 nautical miles to the north-east of the airport. It operates from the surface to an altitude of 1,600 feet. It is active continuously.

Maitland (Rutherford) navigation aids are available for aircraft arriving into the Cessnock Area.

Figure 3 shows the airspace arrangements in the vicinity of the airport.

Figure 3 – Cessnock Aerodrome Airspace Arrangements

Source: Airservices Australia 2010

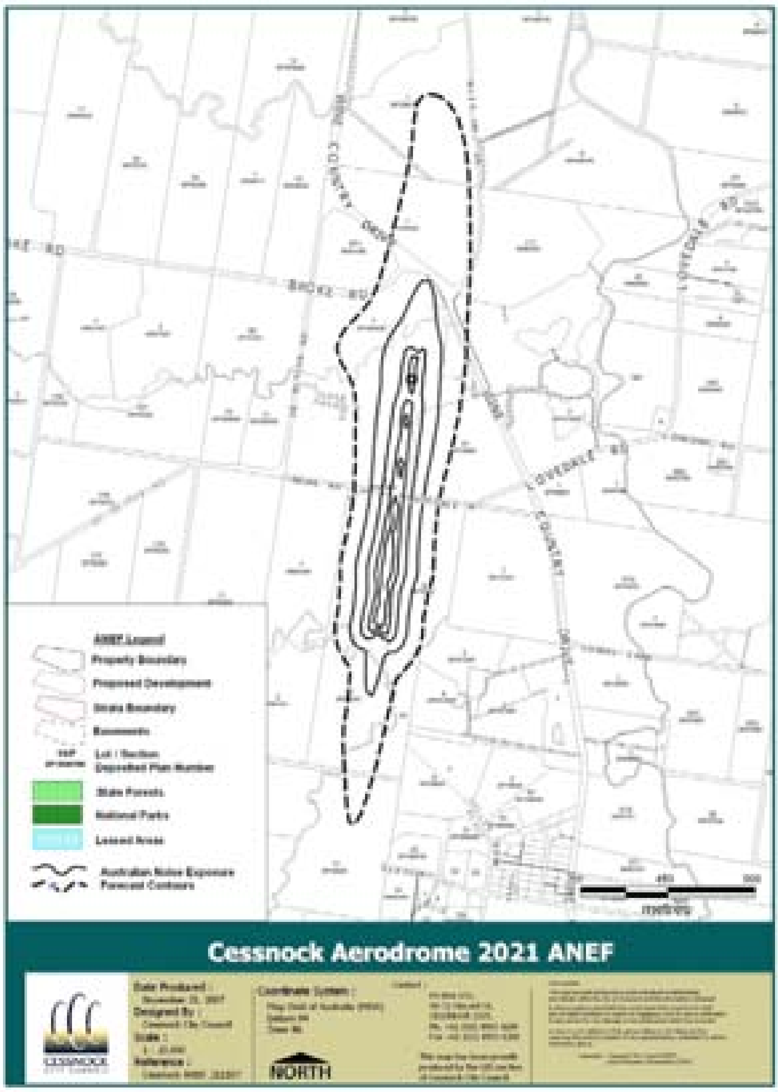
All traffic utilising Cessnock Aerodrome operates under Visual Flight Rules (VFR). Flight tracks associated with operations under Instrument Flight Rules (IFR) in the vicinity of the airport are shown in **Figure 4.** There are no promulgated IFR aerodrome procedures.

	Figure 4 – Cessnock Aerodrome IFR Flight Tracks in the Vicinity  *Source: Airservices Australia 2010* Other airports/aerodrome facilities as shown on aeronautical charts within 50km of Cessnock Aerodrome are: • Maitland Airport approximately 17km north-east • Luskintyre Airfield approximately 15km north-east • RAAF Base Williamtown approximately 45km east • Singleton (military Airfield) approximately 20km north-west • Singleton (civil Airfield) approximately 22km north-west • Warkworth Airfield approximately 40km north-west Scone Airport is 85km north west.
Aerodrome Rescue and Fire Fighting Services (ARFFS)	Nil – however RFS has two installations on airport.
Operating restrictions	Noise abatement procedures in place. Runway 35 has right hand

	circuits at night due to presence of Brokenback Range.
Known development capability and expansion planning	Council's Strategic Plan notes the following: ***"Aerodrome Development*** *Cessnock Aerodrome is recognised as a City asset with enormous potential to contribute to the growth of tourism in the City. To promote this, Council will:* • *establish and regularly review planning controls for the site including Local Environment Plan (LEP), Development Control Plan (DCP), Obstacle Limitation Survey [sic] (OLS) and Noise Exposure Forecasts [sic] (NEF);* • *maintain and enhance the Aerodrome in line with the Aerodrome Operations Manual; and* • *seek out partnerships which will allow the Aerodrome to fulfil its operational potential."* Council's Draft 2009 Development Control Plan (DCP) notes the following: *"Previous studies have identified growth and development options based on variables in runway design, aircraft type and size, usage scenarios and environmental considerations. Indicative costs for various runway options have also been provided previously. These options have included a range of possible runway lengths based directly on aircraft requirements, and the possibility of an east-west runway.* *In June 1998, Council resolved to pursue a moderate extension of the airport, based on a combination of the two growth options proposed by GHD. Council has adopted and acted upon some of the recommendations of the 1998 GHD Plan and has disposed of the land previously purchased on the western side of De Beyers Road for the east-west cross runway.* *This Chapter constitutes the next phase in implementing change and development at Cessnock Aerodrome. It is based on a strategy of moderate growth, capitalising on the locational advantages of the airport in relation to expanding tourist related developments in the Lower Hunter Vineyards District. The proposals for expansion of the airport and associated facilities are based on a realistic balance between the potential for growth in aircraft movements over a range of categories against the cost of development and maintenance of facilities, and the need to complement those activities which make the Vineyards District a unique and important part of the City of Cessnock."* The DCP outlines the vision, objectives, development guidelines and area specific requirements. These contemplate further development of the Western Building Area (including airpark features i.e. aviation residential) as well as further airport-related

	development of the Eastern Building Area. The LEP and DCP reviews are currently in progress and are yet to be approved. ALC noted several development opportunities: • A major opportunity is for the airport to further develop as a centre for aviation education; • Emphasis should be for the airport's role to be to provide the "best aviation airport within easy driving distance north of Sydney and west of Newcastle"; • The possibility of RPT services is for the more distant future as it would require runway upgrade, navigational aids, airport registration and associated costs of security upgrades; • ALC is presently developing a master plan for the airport (in conjunction with Council Officers) to reflect these opportunities. Note that the runway could be extended to 1480m.
Known constraints on future capacity or ability to meet current and future demand	Additional student accommodation is required. The airport master plan has yet to be finished, and a new ANEF is being prepared.
Aircraft noise contours and status	Council's draft 2009 DCP and draft Local Environmental Plan (LEP) contains an Australian Noise Exposure Forecast (ANEF) for the year 2021 which is shown in **Figure 5**. It does not appear to have been endorsed by Airservices Australia.

Figure 5 – 2021 ANEF



3.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related	• ALC – airport management • Bassair/Hunter Valley Aviation – flying training • Avondale – Flying training • Hunter Wine Helicopters – Helicopter charters

	• Jet Ride – L39 war birds flights • Top Red – Yak war birds flights • Vintage Aviation – Tiger Moth Flights • Cutty Shark Holdings – the hangar – function venue, aviation museum, war birds flights • Cessnock Aircraft Maintenance – aircraft maintenance • Murray's Air Repair –aircraft maintenance • Scone Maintenance – aircraft maintenance • Various hangars offering rental space to aircraft owners
Freight forecasts	Not applicable
Plans to invest in upgrading	Processes underway include: ALC is currently preparing with assistance of a town planning consultant, a master plan for Cessnock Aerodrome. Council Officers will participate in the finalisation of this plan; Future projects on airport include a residential block for students, classrooms for students, additional hangars, improved aircraft parking facilities with permanent tie down wires, relocation of eastern side helicopter facilities to provide separation from fixed wing aircraft and a FBO building near the existing terminal to provide facilities for visiting aircraft. ALC will include in its plans an Airpark development on the western side of the airport. Future plans will include "mid-term" an upgrade of the runway (length, width, strength) and expansion of the terminal apron areas. It is assumed that State/Federal government grants would be sought for such improvements.
Passenger patronage forecasts	Not applicable – No RPT services
Aircraft movements forecast by type	Due to a downturn in flying training year ended 30 June 2010, figures for year ended 30 June 2009 represent a "high" point for likely aircraft movements over the next three years.
Costs for upgrades	No cost reported for proposed upgrades. These may be reported

	in the forthcoming master plan being prepared by ALC.

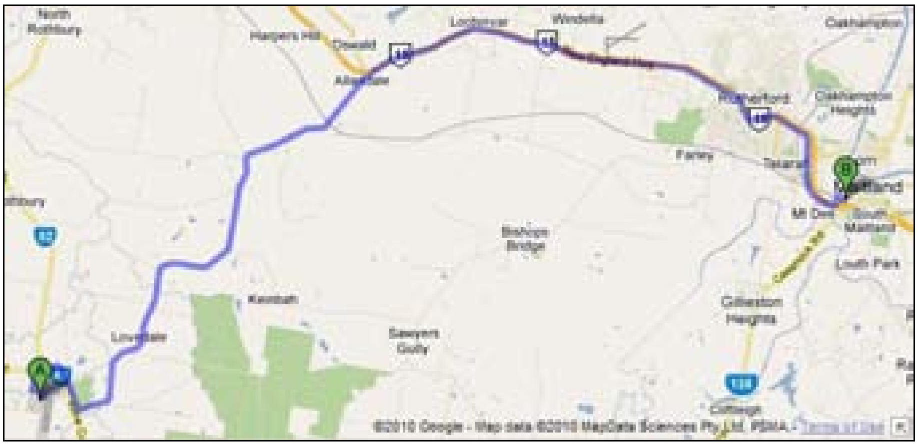
3.5 Accessibility and Surface Transport

Connections to Road	Nearest connection to the major road network 27.8 km and 31 minutes at F3 (Freemans Drive) (Point B) Distance to Sydney CBD 160 km and travel time 2 hours 18 minutes approximately. **Figure 6 – Access to freeway**  Distance to Newcastle CBD: 61 km and travel time 1 hour and 20 minutes approximately.

Figure 7 - Access to Newcastle

Access to rail	Maitland Station: Distance to nearest station: Maitland - 30.6 km and approximate time 40minutes; Distance to Sydney Central station: Maitland to Central 185 km; Time to Sydney Central Station: Maitland to Central 3 hrs and 20 mins through Hunter Line train + Central Coast and Newcastle Line train; Frequency of service: approximately every half hour; Cost: $7.80 one way;

Figure 8- Access to rail



Morisset Station:

	The preferred Railway access point is Morisset, 52.3 kms and 58 minutes from Cessnock Aerodrome due to superior rail service to Sydney available on this line. Rover Coaches providing connections several times per day and total travel time of the order of 2 hours 45 minutes with the rail component being 1 hr 50 mins and the rail cost of $7.80.
Airport Parking capacity - short term and long term	Virtually unlimited parking available relative to scale of operations.
Other transportation services available at airport	Bus – • Nearest bus stop: Cessnock city centre (8.4 km, 1 hr 45 mins walk) • Operator: Rover Coaches • Services available to Newcastle, Morisset Taxi – available on call Rental cars – Hertz is available in Cessnock and has requested designated parking spaces at the airport as it regularly delivers cars for pickup to the airport. Shuttle services – Nil
Walking and cycling	Walking for airport access is possible but not practical. Cycling possible via road network. Cycle hire available at a backpacker lodge near the airport and will deliver to the Airport.

3.6 Utilities and Services

Water and Sewer	Hunter Water Corporation – available along Wine Country Drive – no known issues with either current of expanded supply. Not available on western side of airport currently but there are plans to expand to service this precinct.
Motor Fuel Service stations	Nearest outlet is Shell at Nulkaba – 4 kms towards Cessnock
Gas	Served by Jemena Gas North and available along Wine Country Drive
Police, fire, ambulance, hospitals	Police, fire ambulance and hospitals are available in Cessnock RFS Volunteer Shed is on site at eastern side of the airport with two fire fighting vehicles

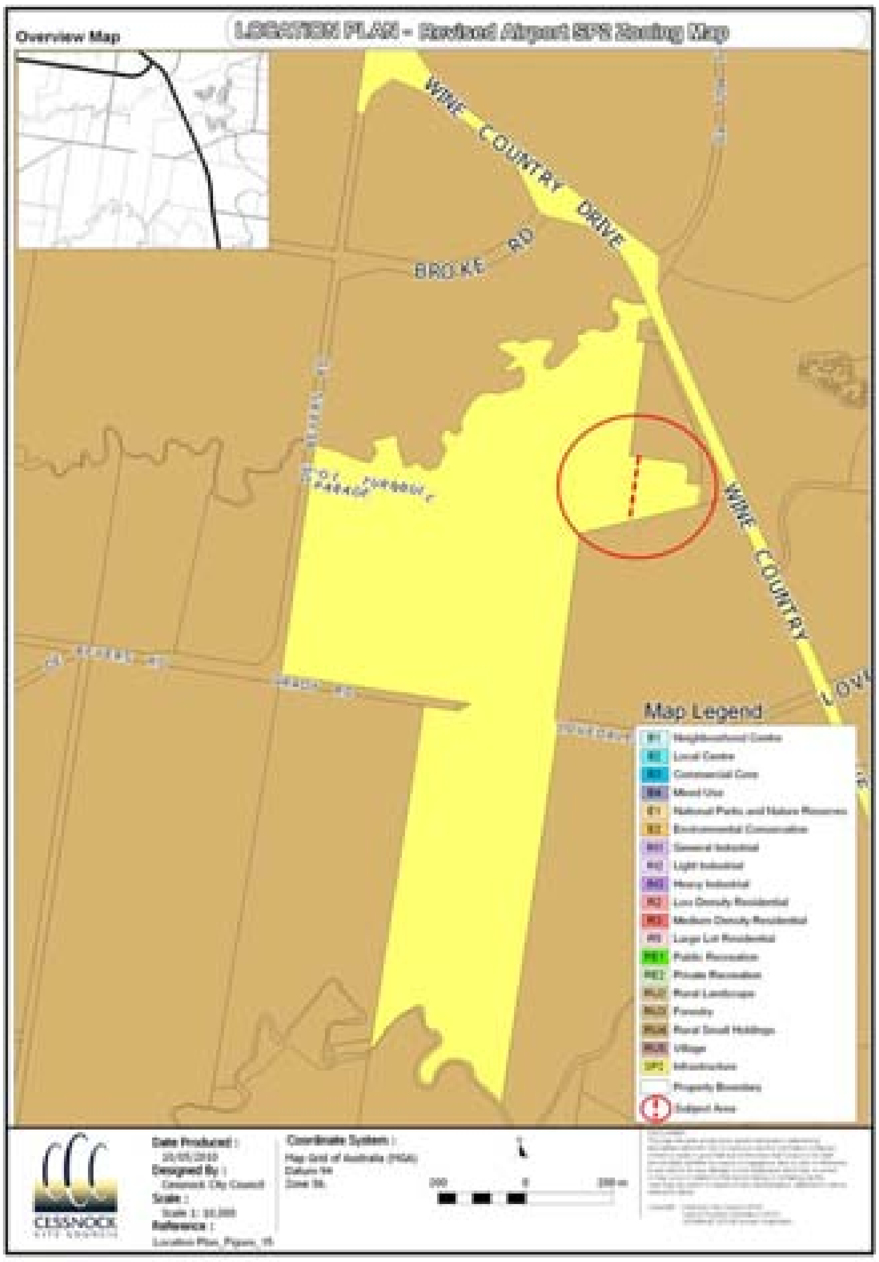
Power	Served by Energy Australia Hunter and available along Wine Country Drive
Telecoms	Served by Telstra-Maitland and available along Wine Country Drive

3.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for airport development	The key planning and environmental legislation and planning policies which are responsible for guiding the development of the Cessnock Aerodrome site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979 • Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Cessnock Local Environmental Plan 1989 • Draft Cessnock Local Environmental Plan 2009 • Cessnock Development Control Plan 2006, Part E.7: Cessnock Aerodrome The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales. *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a state statutory policy that aims to “facilitate the effective delivery of infrastructure across the State”. This infrastructure includes “airports” and the provisions which specifically relate to airports are contained in Part 3, Division 1 “Air transport facilities”. ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent. The *Cessnock Local Environmental Plan 1989* (the 1989 LEP) is the local statutory planning instrument that guides development in the Cessnock Local Government Area (LGA). The *Draft Cessnock Local Environmental Plan 2009* (the draft 2009 LEP) is currently being prepared and will supersede the 1989 LEP. There is a current proposed amendment to the 1989 LEP which is proposing to rezone land from rural uses to urban uses. Part of this area is located within 1km from the airport to the south. The airport is currently zoned 5(e) Special Uses Aerodrome under the 1989 LEP. The 1989 LEP includes provisions that are specifically relevant to the airport:-

	• Zone 5(e) objectives, Clause 9 – the objectives of land zoned Zone 5(e) are "(a) to enable development for aerodromes, airline terminals and associated and ancillary purposes on aerodrome land and adjoining land associated with it, whether in public or private ownership, and (b) to enable development for compatible tourist-related purposes identified in a development control plan for Cessnock Aerodrome approved by the Council". • Clause 25 "Development in flight paths" – requires that "(1) a person shall not erect a building on land that is within the flight path of an airport to a height above the obstacle height limitation surface for that airport without the consent of the Council" and that "(3) in granting consent under subclause (1), the Council shall give consideration to any noise exposure forecasts prepared by officers of the Commonwealth Department of Transport and Communications and to whether the proposed use of the building will be adversely affected by exposure to aircraft noise". • Clause 25A "Development in areas subject to airport noise" - This clause applies to certain land at Nulkaba, being land affected by Australian Noise Exposure Forecast contours of between 20 and 25. The clause states that "(2) A person shall not, without the consent of the Council, erect a building for residential purposes, or intended for human occupation, on land to which this clause applies" and that "(3) The Council shall not grant consent to the erection of such a building unless it is satisfied that measures will be taken which accord with section 3 of AS 2021 and that there is incorporated in the building's envelope an extent of aircraft noise reduction estimated in accordance with clause 3.2.2 of AS 2021". The draft 2009 LEP is not available on Council's website at the time of writing this report. Cessnock Aerodrome is proposed to be zoned "SP2 Air Transport Facility" under the draft 2009 LEP. Therefore final positions may not necessary still align with those currently expressed.

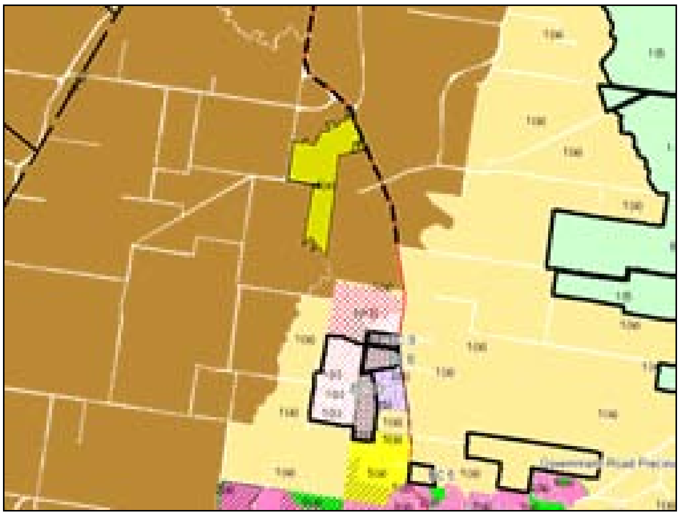
Figure 8 - Zonings



The “Cessnock Development Control Plan 2006, Part E.7: Cessnock Aerodrome” contain detailed development guidelines for future development of the Cessnock Aerodrome. Development or expansion of Cessnock Aerodrome should have consideration of the specific development controls contained within Part E.7: Cessnock Aerodrome of the Cessnock

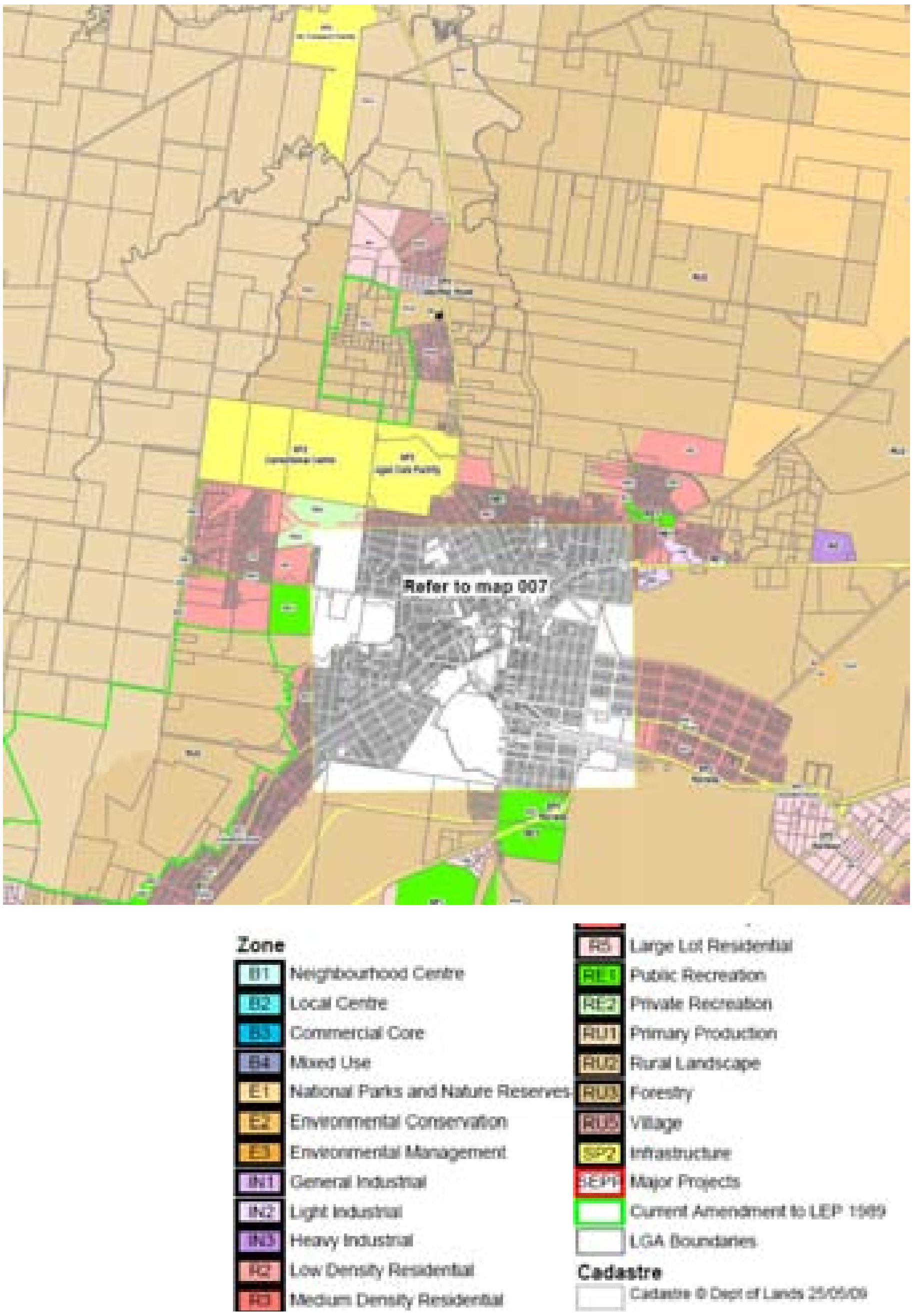
	Development Control Plan 2006.

3.8 Environmental Factors, Frameworks and Policies

Site characteristics	As stated above, the site is currently zoned 5(e) Special Uses Aerodrome under the 1989 LEP and is proposed to be zoned “SP2 Air Transport Facility” under the draft 2009 LEP.
Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangered species Designated environmental management areas Existing environmental assets Heritage scientific and aesthetic qualities/issues Wetlands and other sources of bird hazard	The site is located approximately 5km to the north of the Cessnock township. The land is surrounded by land zoned “1(v) Rural (Vineyards) Zone” under the 1989 LEP. The land is proposed to be zoned RU1 Primary Production under the draft 2009 LEP. **Figure 9 – Land use context**  Extract of the Cessnock zoning map Source: http://www.cessnock.nsw.gov.au In addition, within the general area is Cessnock Gaol, wineries and tourist resorts. There is also a proposed urban release area adjacent to 20 ANEF to the south of the airport. Council has exhibited an OLS diagram indicating the limitations of building height on development surrounding the airport. With regard to bushfire affectation, it appears that the majority of the site contains Category 2 vegetation but with some Category 1 vegetation adjacent.

	No formal information could be found regarding whether or not the surrounds are flood prone or "environmentally sensitive" for a specific reason. However, ALC has advised that it is not aware of any dominant environmentally sensitive issues that would significantly limit development of the airport and has also advised that the site is adequately drained by two creek systems north and south of the runway
Existing Environmental Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	No existing environmental management policies were located. However, a specific aim of the LEP, DCP and ANEF currently on display is to advise Council on issues in relation to surrounding lands to ensure unnecessary constraints are not imposed on the airport, particularly in respect of rebuilding the runway to its full length of 1480 metres (ALC, July 2010).
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	It is considered that the proposed encroachment of urban areas to within 1km from Cessnock Aerodrome to the south will limit the potential for Cessnock Aerodrome to expand.

Figure 10 – Wider Land use context



Extract of the Draft Cessnock LEP 2009 zoning map and legend

Source: http://www.cessnock.nsw.gov.au

3.9 Community and Public Amenity Factors

Community attitudes to airport	ALC advises that Council has *"repeatedly stated that the airport is a community facility it wishes to retain"* and that *"this would be a view shared by the majority of residents in the greater Cessnock area."*
Airport interaction with Communities	Council has approved the formation of an airport consultative committee to monitor noise complaints; Complaints are not large in number and are focused on circuit training noise. Another committee monitors conditions related to the use of nearby Hope Estate as a parachute landing area.

3.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-3 Newcastle, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010.* Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. http://www.avondale.edu.au/divisions::Vocational_Education::Aviation/ http://www.cessnock.nsw.gov.au/ http://www.hva.com.au/ http://en.wikipedia.org/wiki/Cessnock_Airport ALC letter dated 27th July 2010 entitled *"Airport Infrastructure in the Sydney Region – Cessnock"*

Sydney (Kingsford Smith) Airport

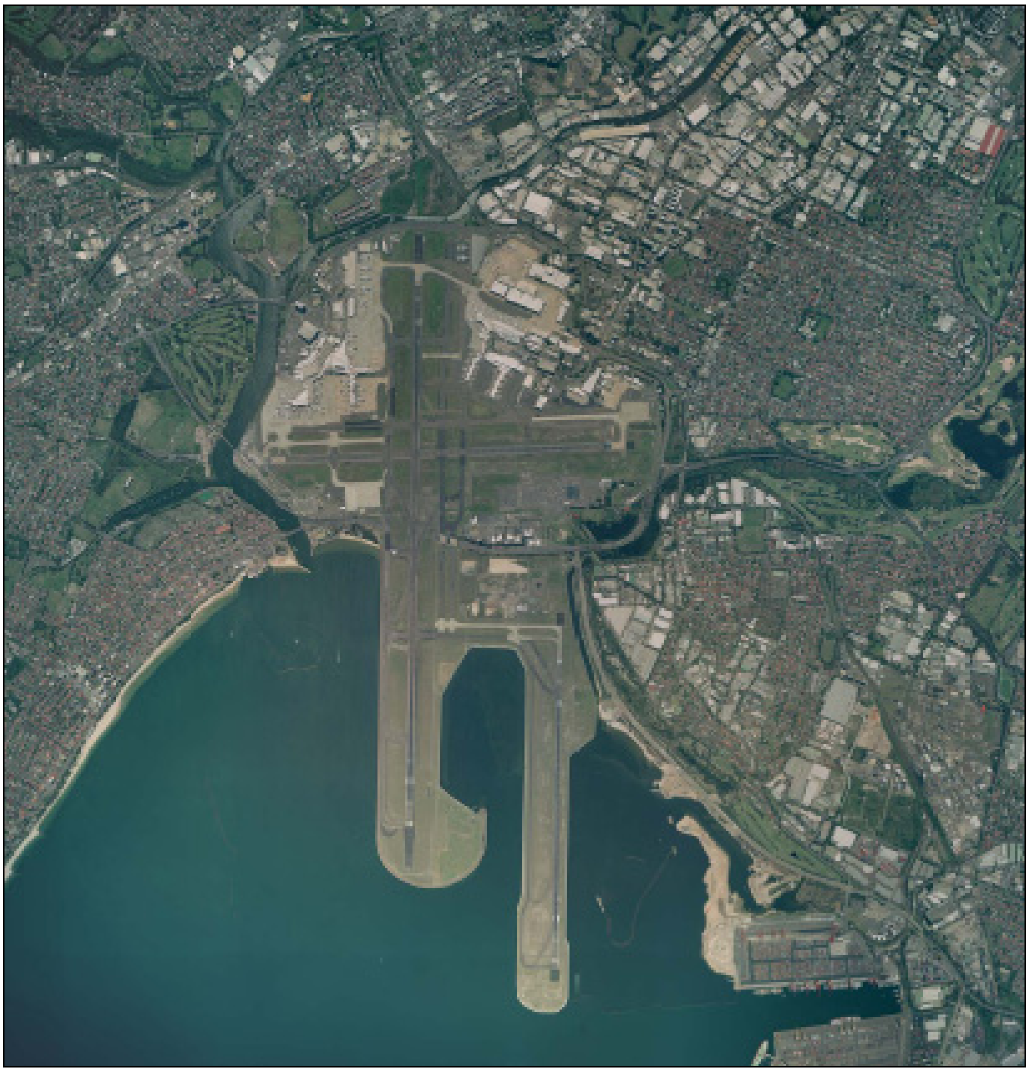
CONTENTS

4 SYDNEY (KINGSFORD-SMITH) AIRPORT

4.1 Introduction

Sydney (Kingsford Smith) Airport is located approximately 8km south[1] of the Sydney CBD and is bounded by the suburbs of Tempe, Mascot, Botany and Kyeemagh. It is accessed from O'Riordan Street and Joyce Drive from the north and Airport Drive/Marsh Street from the west. **Figures 1 to 4** depict aerial images of the airport site.

Figure 1 – Aerial Image (Overall)



Source: Sydney Airport 2010

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image Domestic Precinct

Source: Sydney Airport 2010

Figure 3 – Aerial Image International Precinct

Source: Sydney Airport 2010

Figure 4 – Aerial Image South-West Sector Precinct

Source: Sydney Airport 2010

Sydney (Kingsford-Smith) Airport is one of the world's oldest continuously operating airports with the first flight occurring in 1919 and being officially opened in 1920.

Since that time, the airport has continually evolved and been upgraded, including military demands during World War II and civil demands in the post-war period. It is now the primary international gateway to Australia and is the main domestic and regional airport serving Sydney and the State of NSW.

The airport was the last of the major federal airports offered to the private sector in 2002 under long-term leasing arrangements. The airport lessee company is Sydney Airport Corporation Limited (SACL).

Note that the airport operations review detailed below addresses aviation related activity only. Sydney (Kingsford-Smith) Airport along with many other airports is providing for and anticipating additional non-aviation commercial development within its landholdings. Therefore, in assessing the airport's capability for enhanced aviation activity, it needs to be recognised that areas currently undeveloped may in fact already be leased and/or the subject of development proposals. If the sites have been allocated on the basis of interim uses the areas may still be available for longer term aviation uses.

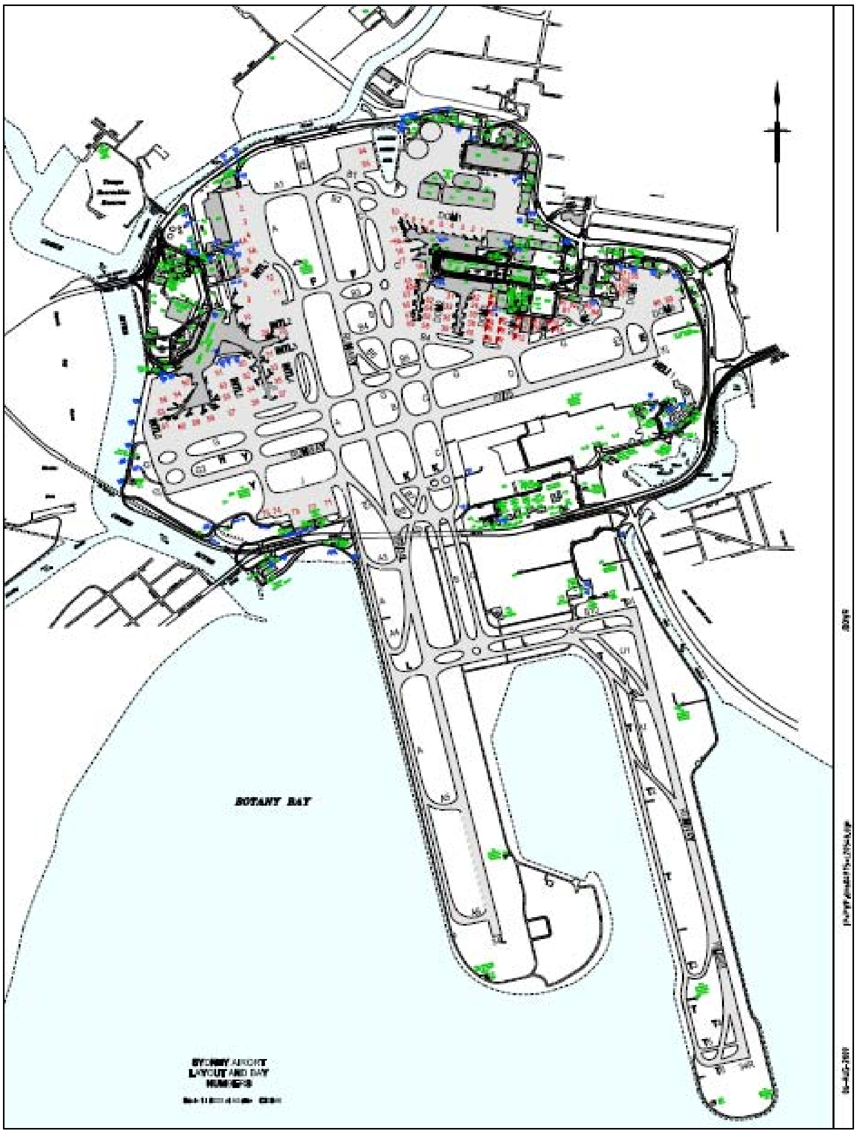
4.2 Current Site Attributes

Airport location	S 33 degrees 56.8 minutes E 151 degrees 10.6 minutes
LGA	City of Botany Bay Council LGA Rockdale City Council LGA Marrickville Council LGA
Ownership and management; lessee/operator	Sydney Airport Corporation Limited (SACL)
Aerodrome Category	Certified
Applicable regulatory regime	Airports Act 1996 Sydney Airport Curfew Act 1995 Sydney Airport Demand Management Act 1997 Civil Aviation Safety Regulations (CASR) Part 139 - Aerodromes
Site area and physical dimensions	907ha
Major centres of population, population growth	Sydney, the State of NSW and Australia generally
Elevation	21 feet
Surrounding topography	The airport is located on the former floodplain of the Cooks River and tributary creeks on the northern shore of Botany Bay.
Liability for flooding	SACL has completed several flooding studies for Sydney (Kingsford-Smith) Airport. Portions of the movement areas are affected by 1:100 year flood levels.
Atmospheric conditions	The airport experiences Cat I conditions 1.9% and Cat II/III 1.0% of the time on average. SACL is proposing to install Cat II ILS on runway 34L.

4.3 Airport Operations

<table>
<tr><td>Summary of main activities</td><td>
The airport is the primary international gateway to Australia and is the main domestic and regional airport serving Sydney and the State of NSW. It accommodates a wide range of air passenger and freight operations serving a number of overseas, interstate and intrastate destinations.
The Qantas Jet Base provides a range of maintenance services to airlines within Qantas Group and other customers.
Small scale general aviation (GA) activities mainly based around corporate business jets and helicopter operations are also undertaken.
Currently there are 37 international airlines flying into Sydney (Kingsford-Smith) Airport including the locally based Qantas, Jetstar, Pacific Blue and V Australia.
Scheduled domestic and regional services are provided by the following airlines:
Qantas
QantasLink
Jetstar
Virgin Blue
Tiger
Rex
Aeropelican
The Airport has:
42 bays for International movements;
41 bays for domestic movements
16 bays for Qantas regional movements.
</td></tr>
<tr><td>Current passenger numbers</td><td>
<u>2009</u>
International - 10.6 million
Domestic (including on-carriage) - 20.5 million
Regional - 2 million
Total - 33 million
</td></tr>
</table>

Current aircraft movement numbers	<u>2009</u> (indicative numbers) • International – 58,429 • Domestic – 161,189 • Regional – 46,123 • GA – 17,287 • Freight – 6,713 • Total – 289,741
Current freight throughput	<u>International (2008/09)</u> • Inbound – 224,306 tonnes • Outbound – 119,795 tonnes • Total – 344,101 tonnes • Mail Inbound – 15,129 tonnes • Mail Outbound – 7,102 tonnes • Total – 22,231 tonnes <u>Domestic</u> SACL estimates domestic freight at about 280,000 tonnes
Known sources of delay in airport and runway operations	• Delays can occur when weather conditions preclude use of the parallel runways, forcing all traffic onto the single Runway 07/25 eg strong westerly winds • Fog conditions can also cause delays at particular times of the year eg early autumn mornings
Movement/manoeuvring area details	
Runways	• 16R/34L – 3962m x 45m (Code4F) • 16L/34R – 2438m x 45m (Code 4E) • 07/25 – 2530m x 45m (Code 4F) There is a designated helicopter landing site (HLS) on the southern side of Runway 07/25 near the 25 end
Runway strips	• 16R/34L – 4143m x 300m (150m graded) • 16L/34R – 2588m x 300m (150m graded) • 07/25 – 2680m x300m (150m graded)

Taxiways	There is a comprehensive taxiway system supporting the airport including full length parallel taxiways, dual parallel taxiway sections and rapid exit taxiways to reduce runway occupancy times. **Figure 5** shows the runway and taxiway layout. **Figure 5 – Runway and Taxiway Layout**[2]  *Source: Sydney Airport 2010*

<table>
<tr>
<td>Aprons</td>
<td>
There is a comprehensive network of aprons serving each of the passenger terminals, freight, stand-off parking positions, Qantas Jet Base, GA and helicopter areas. **Figures 6** and **7** show the parking position layout and capability of the international and domestic aprons respectively.

The notional declared capacity is 42 bays for international operations.

Figure 6 – International Precinct Apron Parking Positions

Source: Sydney Airport 2010
</td>
</tr>
</table>

SACL recommended that these diagrams be regarded as indicative as bay numbers and numbering may not be totally up to date.

EXISTING INTERNATIONAL

Number	Bay	Code	Max Aircraft	Type	Current Identified use	Alternate/ Secondary	Type
1	1	E	744	Active	Bussed		
2	2	E	744	Active	Freight	Pax Aircraft	Bussed
3	3	E	744	Active	Freight	Pax Aircraft	Bussed
4	4A/4	F/E	388/744	Non Active/Active	Layover/Bussed	Code E	Bussed
5	5/5A + 5B/5A	F/E	388/A300+320/744	Non Active/Active	Layover/Bussed	Code E + Code C	Bussed
6	8	E	346	Active	Contact		
7	9	F	388	Active	Contact		
8	10	F	388	Active	Contact		
9	11	D	763	Active	Bussed		
10	12	C	320/737	Active	Bussed		
11	24	F	388	Active	Contact		
12	25	E	744	Active	Contact		
13	30	E	744	Active	Contact		
14	31	E	744	Active	Contact		
15	32	E	744	Active	Contact		
16	33	E	744	Active	Contact		
17	34	E	744	Active	Contact		
18	35	E	744	Active	Contact		
19	36	E	744	Active	Contact		
20	37	E	744	Active	Contact		
21	50	C	320/737	Active	Walkup		
22	51	E	744	Active	Contact		
23	53	E	77W	Active	Contact		
24	54	E	772	Active	Contact		
25	55	C	320/737	Active	Contact		
26	56	E	744	Active	Contact		
27	57	F	388	Active	Contact		
28	58	E	77W/A346	Active	Contact		
29	59	E	77W/346	Active	Contact		
30	60	E	77W/346	Active	Contact		
31	61	F	388	Active	Contact		
32	63	C	320/737	Active	Contact		
33	71	E	744	Layover	Layover		
34	72	F	388	Layover	Layover		
35	73	E	744	Layover	Layover	Potential Code E	Bussed
36	74	E	346	Layover	Layover		
37	75	E	744	Layover	Layover		
38	84	E	744	Layover	Bussed		
39	85	E	744	Layover	Bussed		
40	98A	C	A320/73H	Layover	Layover	Generally used by Domestic	
41	98	E	744	Layover	Layover		
42	99	E	77W	Layover	Layover		
43	93A	E	744	Layover	Layover	DOM4 Apron available generally 0700-1100 AM Peak	

For domestic parking positions there are at T2 40/41 bays and T3 16 bays (see apron detail). (Note Dom 6 is used by Internationals as primary – secondary positions are for domestic parking positions – see apron detail)

Figure 7 – Domestic Precinct - Apron Parking Positions

Source: Sydney Airport 2010

EXISTING T2 DOMESTIC

Apron	Bay No.	Code	Max Size	Active/Non Active	Currently Identified Use	Alternate/ Secondary
Pier A	31	C	73H	Active	Contact	
	32	C	73H	Active	Contact	
	33	C	73H	Active	Contact	
	34	C	321	Active	Contact	
	35	C	73H	Active	Contact	
	36	C	321	Active	Contact	
	38	C	321	Active	Contact	
	39	C	73H	Active	Contact	
	40	C	321	Active	Contact	
Pier B	49a	E	743	Active	Contact	
	52	C	73H	Active	Contact	
	53	D	763	Active	Contact	
	54	C	73H	Active	Contact	
	55	D	763	Active	Contact	
	56	C	73H	Active	Contact	
	57	C	320	Active	Contact	
	58	C	73H	Active	Walkup	
	59	C	73H	Active	Walkup	
Foxtrot Bays	F1	B	BEH	Active	Bussed	
	F2	B	BEH	Active	Bussed	
	F3	C	DH3	Active	Bussed	
	F4	C	737/A320	Active	Bussed	
	F5	C	737/A320	Active	Bussed	
	F6	C	DH3	Active	Bussed	
Dom 3A	F7	C	DH3	Active	Bussed	
	F8	C	DH3	Active	Bussed	
	F9	C	SFB	Active	Bussed	
	F10	C	SFB	Active	Bussed	
	F11	C	SFB	Active	Bussed	
	F12	C	SFB	Active	Bussed	
Dom 3B	F13a	C	DH3	Active	Bussed	F13b 737/A320
	F14	C	SFB	Active	Bussed	
	F15	C	DH3	Active	Bussed	F15c 737/A320
	F16	C	DH3	Active	Bussed	
DOM 4	90a	C	73W	Active	Bussed	
	91a	C	73H	Active	Bussed	
	92a	C	73H	Active	Bussed	
	93	C	73H	Active	Bussed	
	94	C	DH3	Active	Bussed	
H96	96	C	73H	Non Active	Layover	
DOM6	98a	C	73H	Non Active	Layover	

EXISTING T3 DOMESTIC

Apron	Bay No.	Code	Max Size	Active/Non Active	Currently Identified Use	Alternate/ Secondary
T3	1	C	737	Active	Contact	
T3	2	D	763	Active	Contact	
T3	3	D	763	Active	Contact	
T3	4	D	763	Active	Contact	
T3	5	D	763	Active	Contact	
T3	6	D	763	Active	Contact	
T3	7	C	737	Active	Contact	7A 744
T3	8	C	737	Active	Contact	
T3	9	C	737	Active	Contact	
T3	10	E	744	Active	Contact	
T3	11	E	A333	Active	Contact	
T3	13	D	763	Active	Contact	
T3	16	C	737	Active	Contact	
T3	17	D	763	Active	Contact	
T3	18	C	DH4	Active	Walk/Bus	
T3	19	C	DH4	Active	Walk/Bus	

Source: Sydney Airport 2010

Note: QantasLink stand-off bays at T3 not included

Airfield pavements

Runways

- Runway 16R/34L – 130a PCN67/F/A/1750 (254PSI)/U Grooved (eg A380-800)
- Runway 16L/34R – 130a PCN67/F/A/1750 (254PSI)/T Grooved (eg –B747 due taxiway geometry)
- Runway 07/25 – 130a PCN67/F/A/1750 (254PSI)/U Grooved (eg A380-800)

Taxiways

Generally, taxiways serving Runways 16R/34L and 07/25 are A380-800 capable with some turning exceptions as detailed in the En Route Supplement Australia (ERSA). Taxiways serving Runway 16L/34R are generally capable of Code E operations (eg B747), again with some turning exceptions as detailed in ERSA. Taxiway geometry may therefore be a more limiting feature than pavement strength as such.

Other taxiway restrictions are as follows:

3. TAXIWAY RESTRICTIONS

a. TWY B and TWY C, BTN RWY 07/25 and TWY B10 not AVBL to A380 ACFT due to weight limitations.
b. TWY B4 BTN TWY DOM2 and TWY G, T1 restricted to 52M MAX wingspan.
c. TWY B5 and B6 not AVBL to ACFT ABV 22,000KG MTOW. MAX tyre pressure 1,400KPA.
d. TWY C BTN TWY F and TWY B4 speed restriction MAX 20KTS applies to all ACFT ABV 52M wingspan.
e. TWY C BTN TWY F and TWY G, TWY B4 BTN TWY B and DOM2 restricted to 60.4M MAX wingspan.
f. TWY F west restrictions - B747/B767 type ACFT - TWY not AVBL for intersection DEP or taxiing towards RWY.
g. TWY T2, T3, T5, U, DOM2 and DOM3 restricted to 36M MAX wingspan.

Source: Airservices Australia 2010

Aprons

International

- Aprons associated with Code F A380-800 operations have pavements able to accommodate these aircraft. Other international aprons have B747 capable pavements and some may also be suitable for Code F A380-800 aircraft weights.

Domestic

- DOM 1 is at least B767 capable and also accommodates empty B747-400 and A380-800 aircraft to/from the Qantas Jet Base
- Northern end of apron opposite Taxiway C serving T3 is at least B747 400 capable
- Southern end of apron opposite Taxiway C serving T2 is at least B737 capable (747 operations can occur on T2 Bay 49a and B767 on Bays 53 and 55)
- DOM 2 and 3 are currently operating at 737/A321/A320, however there is some potential to operate up to A330-200 capable
- DOM 3A is Saab 340 capable and DOM 3B can accommodate B737/A320
- DOM 4 is at least B737 capable and on Bay 93A can accommodate B747
- DOM 5 is at least Gulfstream V capable and adjacent to Hangar 13

	can cater for B737/A320 • DOM 6 is at least B747 capable Note the above summary is pavement related only and does not take into account any aircraft geometric restrictions which might apply to the particular apron concerned.
Airfield operating restrictions	Civil airport open for public use, landing and access charges in accordance with the airport's general conditions of use
Airfield lighting and approach systems	• Runway 16R/34L - high intensity runway edge lighting - medium intensity runway lights - runway centreline 15m spacing lighting - runway visual range measuring capability - 16R CAT 1 high intensity approach lighting (HIAL) system - double-sided precision approach path indicator (PAPI) systems both ends • Runway 16L/34R - high intensity runway edge lighting - runway visual range measuring capability - 16L CAT 1 high intensity approach lighting (HIAL) system - double-sided precision approach path indicator (PAPI) systems both ends - 34R runway threshold identification lighting (RTIL) • Runway 07/25 - High intensity runway lights - medium intensity runway edge lighting - runway visual range measuring capability - double-sided precision approach path indicator (PAPI) systems both ends - 07 runway threshold identification lighting (RTIL) • Taxiway centreline green lighting • Runway guard lights at all runway/taxiway intersections
Visual navigation aids	• Runway, taxiway and apron markings and markers

	• Seven illuminated wind direction indicators (IWDI) • Movement Area Guidance Signs (MAGS)
Radio navigation aids	• Six Instrument Landing Systems (ILS) with associated Distance Measuring Equipment (DME), covering all six runway approaches • Very high Frequency Omni Range (VOR) co-sited with DME • Ground Based Augmentation System (GBAS)
Surveillance systems	• Terminal Area Radar (TAR) • Precision Runway Monitor (PRM) • Advanced Surface Movement Guidance Control System (A-SMGCS)
Operational procedures	• There is a range of complex operational procedures covering airfield operating restrictions, flight procedures, local Visual Flight Rules (VFR) aircraft and helicopter operations which are fully detailed in ERSA pages 4 to 18
Aviation fuel	Aviation fuel storage is accommodated at the Joint User Hydrant Installation (JUHI) located to the north of T1. JUHI has 5 tanks with a maximum capacity of 30ML, with a maximum (useable) capacity of approximately 21.2ML. JUHI is a consortium of a number of the major oil companies. Fuel is delivered to the JUHI facility via two underground pipelines owned by Shell and Caltex. The Shell pipeline capacity is 3.9ML (current utilization approximately 56%) and Caltex pipeline capacity of 5.0ML (ex Kurnell) or 7.9 ML (ex Vopak). Caltex announced on 5 May 2010 intentions to approximately double its capacity from Kurnell with expected completion by late 2012. Into-plane dispensing is mainly carried out from in-ground hydrants in the apron areas supported by mobile tankers. Companies providing the into-plane dispensing are: **HANDLING SERVICES AND FACILITIES** AIR BP - Air Refuel: MON-THUR 1800-0600; FRI 1800-1200; SAT 2000-0930; SUN 2000-1400. Phone 61 2 9313 4241 or 0418 619 365, FAX 61 2 9313 4538; AH 0411 131 098. VHF 129.9. AVGAS, F34, JET A1, O117, O125, MMX 45, S748. Air BP Carnet Card or Account only. AMPOL/BP/CALTEX/MOBIL - Airport Fuel Services: MON - SUN 1900 - 1300. Phone 61 2 9317 4988 (ADMIN) 61 2 9667 4141 (OPS), FAX 02 9317 3970. JET A1. CALTEX: 2000-1100 D, AH PN. Phone 02 9667 4141/9669 5291. F22,JET A1, O117, O123, O125, O128, O149, O156, OX-7, MMX45 ADI H515. SHELL - Zip Airport Services: MON-FRI H24, SAT 1900-1100, SUN 2000-1200. Phone 02 9667 1920, 9667 4044(Office), 0418 962 294 (Tanker Apron Phone), FAX 9317 4673. AEROJET, AVGAS, JET A1, ASO W100. Shell carnet card and Air Routing card (latter with prior approval). *Source: Airservices Australia 2010*

	Note above times are UTC. 10 hours need to be added to obtain EST.
Terminals and other major aviation support infrastructure elements	The airport has three passenger terminals as follows: • T1 – international, owned and operated by SACL • T2 – domestic/regional, owned and operated by SACL • T3 – domestic, owned and operated by Qantas <u>T1</u> T1 was originally opened in 1970 and has been significantly modified and enlarged since that time. The building is essentially a four level structure with ground floor arrivals, first floor departures and second floor administration etc. As of 2009, the total floor area was around 254,000m2 although further additions are currently underway. 24 aerobridges positions (some of which may have more than one bridge as there are 34 actual bridges) are currently provided to aircraft contact gates. Major functional elements include: • 192 departure check-in counters; • integrated outbound baggage handling and checked baggage screening equipment; • 38 departure passport control positions (now centralised); • 11 outbound passenger and hand baggage screening; • 49 traditional and 6 smart gate arrival passport control positions (27/3 on Pier B and 22/3 on Pier C) (note more smart gate being installed); • 12 baggage reclaim units; • 12 AQIS screening machines and approximately 84 search positions, 3 AQIS screening machines and approximately 37 search positions; and • extensive retail and related facilities. <u>T2</u> T2 was the original Ansett terminal subsequently purchased by SACL. It is a three level structure separating arriving and departing passengers. It accommodates the following airlines: • QantasLink • Jetstar • Virgin Blue • Tiger

	• Rex • Aeropelican The terminal supports a total of 18 contact gates of which 16 have aerobridges, as well as a number of stand-off bussed aircraft positions. <u>T3</u> T3 has been extensively modified and enlarged since its original incarnation as the TAA domestic terminal. It is a three level structure separating arriving and departing passengers. It accommodates all of Qantas' mainline domestic operations. Currently, the terminal serves 14 contact aircraft gates with aerobridges and several stand-off bussed positions. T2 and T3 are not physically connected at terminal level. Together the two terminals provide: • about 116,000m2 of floor space (T2 approximately 66,000m2 and T3 approximately 50,000m2) • 66 check-in counters (T2 has 38 check in counters) • 11 baggage reclaim units (T2 has 6 reclaim units) • T2 has 6 main and 1 regional passenger screening points – 6 to be shortly upgraded to 8). Major aviation supporting elements include international and domestic freight and mail handling facilities, the Qantas Jet Base, other aircraft maintenance and Fixed Base Operators located in the GA area, and the helicopter precinct in the south-east sector.
Security	Security Controlled Airport. Passenger, cabin and checked baggage screening undertaken for all scheduled passenger services.
Border Agencies	Customs, Immigration and Quarantine services provided
Air traffic management and airspace management arrangements	Class C ATC services are provided continuously within the Sydney Control Zone (CTR) and associated Control Areas (CTA) which extends generally in a series of concentric arcs to a distance of up to 70 nautical miles. The CTR is of 8.5 nautical miles radius to the north and east with truncated straight sides on the south and west, and operates from the surface to an altitude of 2,500 feet. The western boundary abuts the Bankstown CTR and Danger Area D539A (part of the Lane of Entry for Bankstown) which operates from the surface to an altitude of 2,000 feet and is active during daylight hours. D539A also abuts Danger Area

D539B (part of the Lane of Entry for Bankstown) which operates from the surface to an altitude of 2,500 feet and is active during daylight hours.

Restricted Areas R405A and R405B lies just within the CTR along its northern boundary. These operate from the surface to altitudes of 500 and 1,000 feet respectively and are active during daylight.

Restricted Area R473 lies just outside the north-eastern edge of the CTR and is activated by NOTAM as is its operating altitude. It is associated with firing.

A Visual Flight Rules (VFR) coastal route (Victor 1) operates between Narrabeen and Bundeena just outside the eastern CTR boundary. It requires aircraft to operate at either 500 feet altitude or between 500 feet and 1,000 feet altitude depending on track direction. It is available during daylight hours.

Restricted Area R521 overlays the south eastern corner of the CTR. It operates from the surface to an altitude of 2,000 feet and is active continuously. It is associated with research at the Lucas Heights nuclear facility.

Restricted Areas to the south-east are R555A which extends from the surface to an altitude of 1,500 feet and is active continuously and R555B which overlays R555A and extends from an altitude of 1,500 feet to a NOTAM altitude when active, which also occurs by NOTAM. Both of these areas are associated with firing. Restricted areas R555C and 555D abut R555A and 555B to the south-east. R555C extends from the surface to an altitude of 3,000 feet and is active between 0700-2100 hours local. R555D overlays R555C whose vertical limits are defined by NOTAM as is hours of operation. They are also associated with firing.

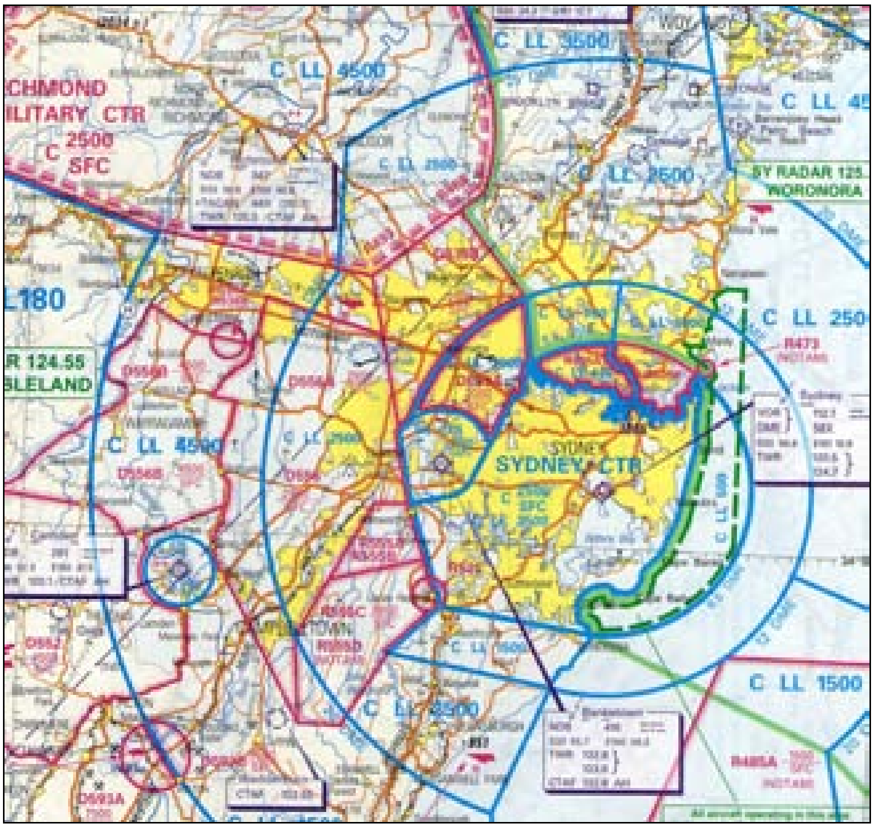
Danger Area D556A lies under the 2,500 feet CTA step to the west and operates from the surface to an altitude of 2,500 feet. It is associated with civil flying training and is active during daylight hours.

There are also established Sydney Harbour helicopter and seaplane routes within the northern part of the CTR and designated VFR scenic flight routes over Sydney Harbour.

Sydney (Kingsford-Smith) Airport's airspace is generally placed on the eastern edge in relation to the complex airspace arrangements within the Sydney Basin.

Figure 8 shows the airspace arrangements in the vicinity of the airport.

Figure 8 – Sydney (Kingsford-Smith) Airport Airspace Arrangements



Source: Airservices Australia 2010

Traffic utilising Sydney (Kingsford-Smith) Airport is primarily Instrument Flight Rules (IFR) aircraft. VFR traffic operates in accordance with the airspace arrangements discussed above. Flight tracks established in relation to aircraft operating under IFR are shown in **Figure 9**. IFR departure and approach procedures are promulgated in the relevant Departure and Approach Charts (DAP).

Figure 9 – Sydney (Kingsford-Smith) Airport IFR Flight Tracks

Source: Airservices Australia 2010

Other airports/aerodrome facilities as shown on aeronautical charts within 50km of Sydney (Kingsford-Smith) Airport are:

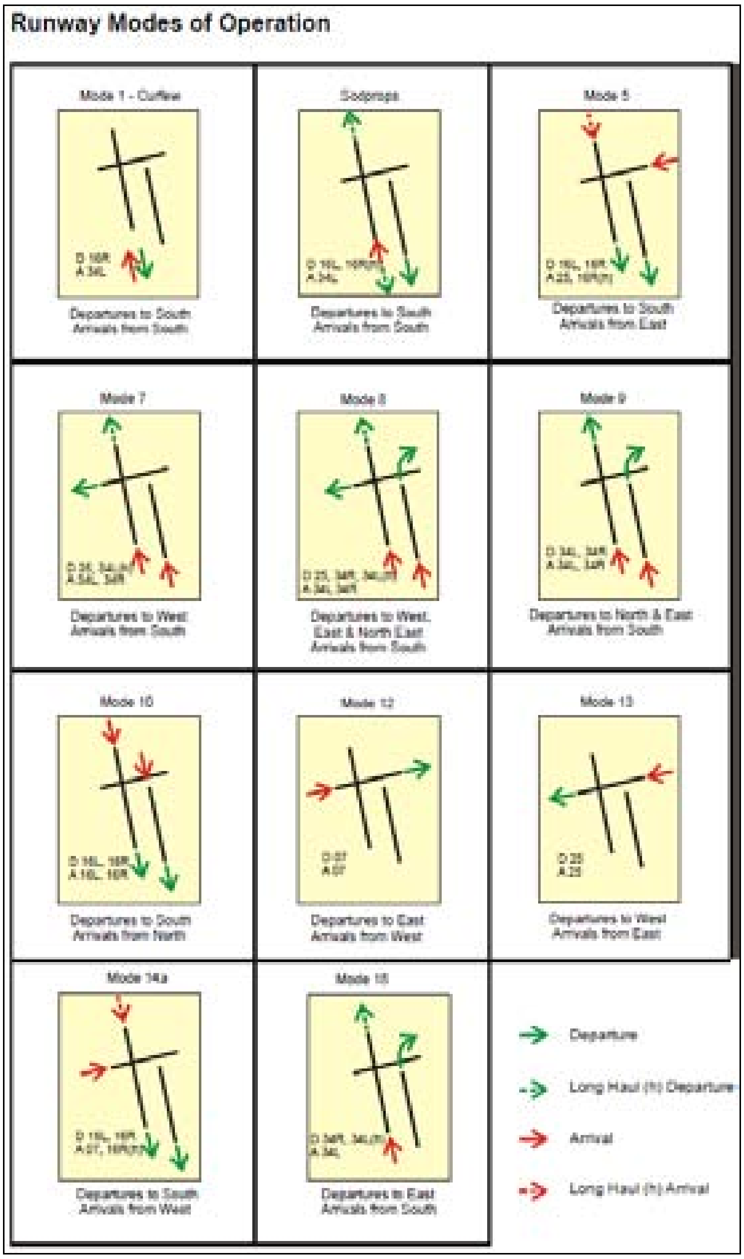
- Wedderburn Aerodrome approximately 44km to the south-west
- Holsworthy Airport approximately 21km to the south-west
- Camden Airport approximately 46km to the south-west
- Bankstown Airport approximately 17km to the north-west

Richmond RAAF Aerodrome is approximately 52 kms north east of Sydney (Kingsford-Smith) Airport.

Aerodrome Rescue and Fire Fighting Services (ARFFS)	• Category 10 0535-2205 hours daily • Category 9 2205-0535 hours daily • Water rescue service available 24 hours

<table>
<tr>
<td>Operating restrictions</td>
<td>Sydney (Kingsford-Smith) Airport is subject to a range of regulatory requirements relating to noise management measures. One of these relates to the Long Term Operating Plan for the Airport which has as its basis a policy of noise sharing. This is achieved by the use of runway modes of operation (RMO) as shown in Figure 10.

Figure 10 – Runway Modes of Operation



Source: Airservices Australia 2010</td>
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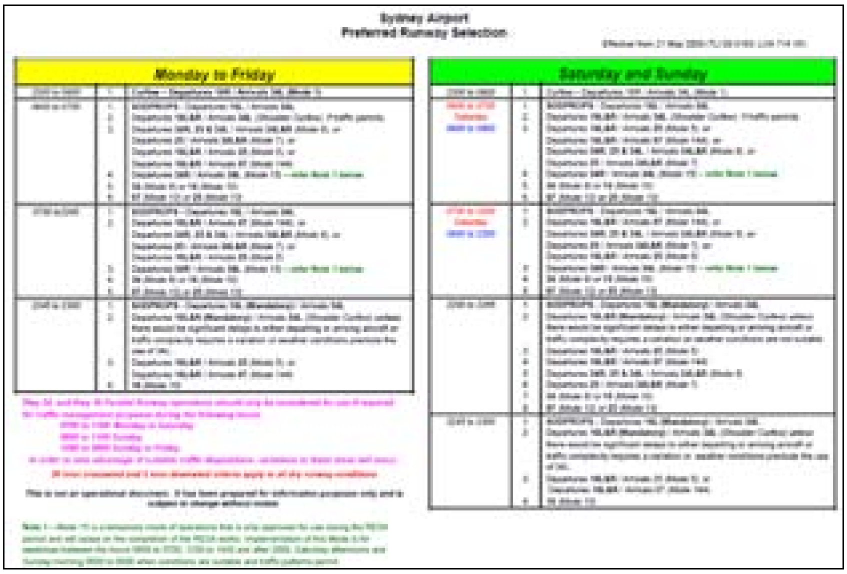
The preferred runway selection is shown in **Table 1**.

Table 1 – Preferred Runway Selection



Source: Airservices Australia 2010

Additionally, there are preferred flight paths for arriving and departing aircraft as detailed in ERSA.

Sydney (Kingsford-Smith) Airport is subject to the application of the Sydney Airport Demand Management Act 1997. This incorporates a 'maximum movement limit' (commonly known as a 'cap') of no more than 80 aircraft scheduled movements per hour and establishes a framework for the development and operation of slot management and slot compliance schemes to give effect to this movement cap.

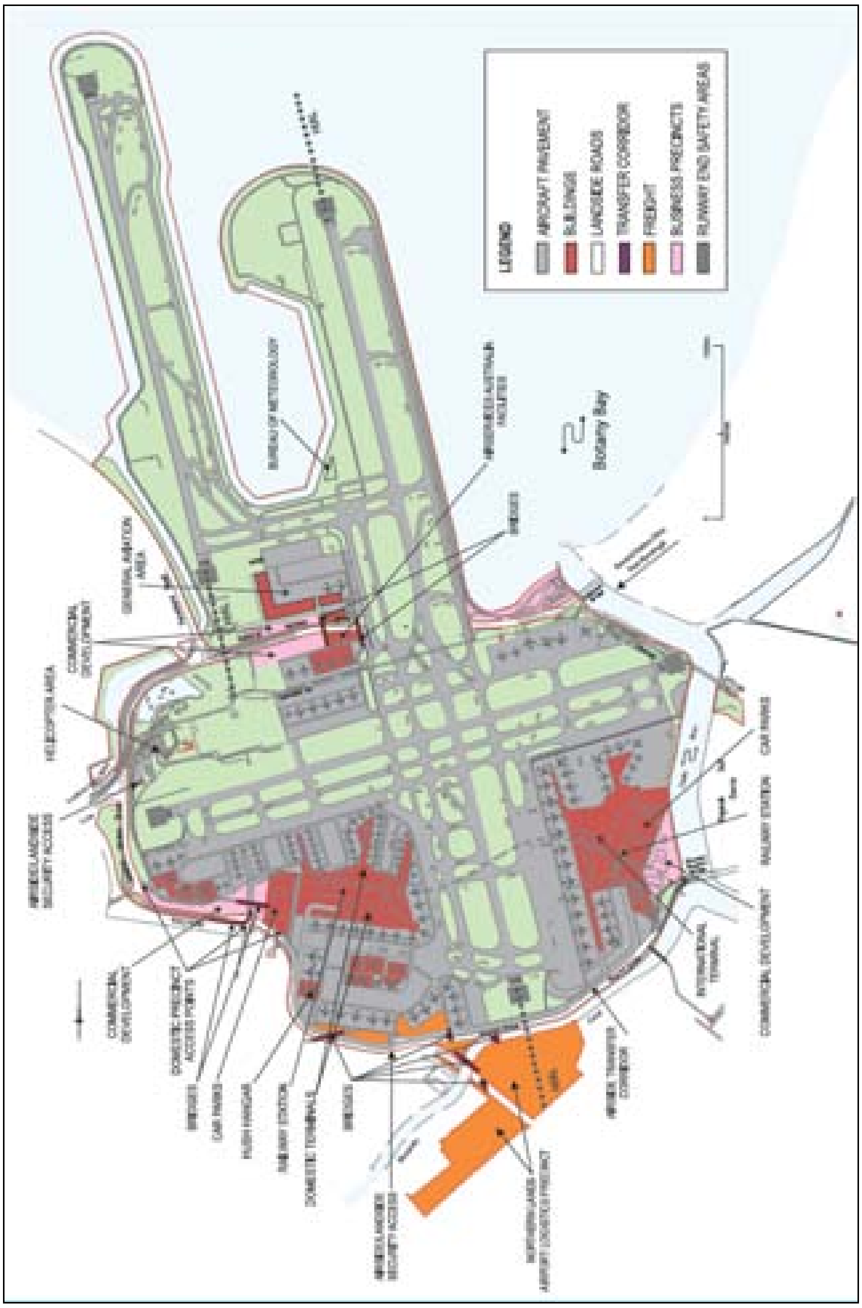
Airport Coordination Australia (ACA) is an independent company that manages the coordination and allocates slots at Sydney (Kingsford-Smith) Airport. ACA allocates planning slots at the Airport in accordance with the Demand Management Act and the Slot Management Scheme approved by the Minister for Infrastructure, Transport, Regional Development and Local Government. There are four-quarter hour checkpoints in each hour to avoid excessive peaking. All fixed wing commercial and private aircraft require a slot to land or take-off from Sydney (Kingsford-Smith) Airport. Military and emergency operations and helicopter movements are exempt from the Act and the Scheme.

As part of the Slot Management Scheme, rules have been implemented to guarantee access for aircraft movements which provide air services for NSW regional communities.

	Sydney (Kingsford-Smith) Airport is also subject to the application of the application of the Sydney Airport Curfew Act 1995. As set out in the accompanying regulations, the curfew restricts take-offs and landings in the curfew period to specific types of aircraft and operations as follows: • small noise-certified (less than 34,000kg) propeller driven aircraft and low noise jets (mostly business and small freight jets); • limited numbers of medium size freight jets meeting the most restrictive current noise emission standards; and • international passenger jet arrivals in the curfew shoulder period between 5am and 6am of no more than 24 movements per week (no more than five on any one day). Note that the Curfew Act also indicates between 5-6 am 35 per week and no more than 7 per day. The Regulations under the Act, however, amend this to 24 per week and no more than 5 per day. Similarly, the Act indicates for 11pm to midnight no more than 14 takeoff and landings for international passenger aircraft in a week and no more than 4 in a day. The Regulations change this to 0 and 0. During the curfew period, all aircraft must operate over Botany Bay - arrivals to the north on Runway 34L and take-offs to the south on Runway 16R. The curfew restrictions do not apply in cases of emergency and, in exceptional circumstances, the Minister for Infrastructure, Transport, Regional Development and Local Government may grant dispensations. The Curfew Act currently provides for fines of up to $550,000 for curfew breaches.
Known development capability and expansion planning	Sydney (Kingsford-Smith) Airport's current Master Plan was approved in June 2009. It has a planning period of 20 years ie to 2029. There are currently no major development plans (MDP) on public exhibition. Note that there are two MDPs approved for 2 office towers (1 of which has been built to date) and for 2 Multi storey car parks and 2 commercial buildings (1 multi storey car park built and 1 commercial building commencing shortly). Note that airport MDPs are different from DAs in that any approved development must be substantially completed after 5 years. Additionally, any form of development that results in traffic effects triggers an MDP. Key features of the Master Plan in relation to aviation related matters are as follows: • No changes to aircraft flight paths. • No changes to the curfew • No changes to the aircraft movement cap. • No new runways.

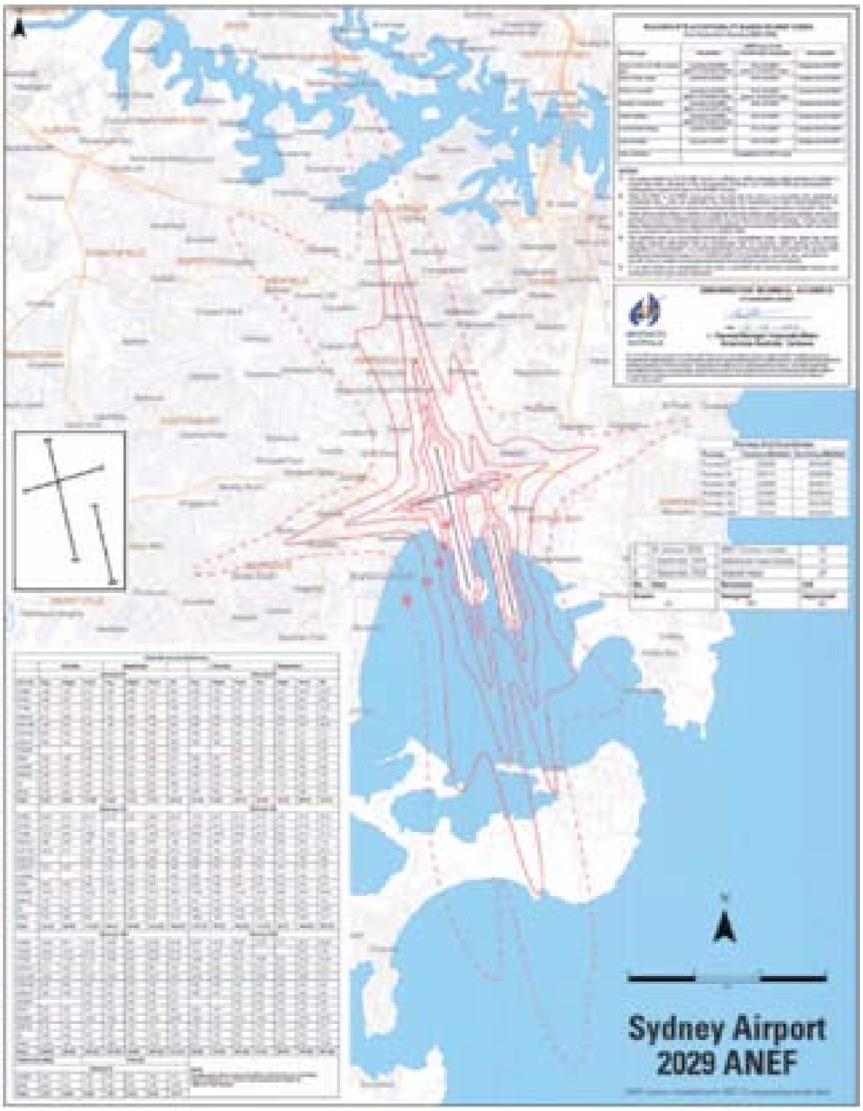
	• No change to access arrangements for regional airlines. The Master Plan 2009 details how SACL proposes to accommodate forecast growth in airline travel through: • airport facilities - including terminals, hangars, freight facilities, aircraft parking, airport roads and car parking - are proposed to be progressively upgraded over the next 20 years. • aviation technology is improving all the time: the new generation aircraft are quieter, cleaner, more efficient and they consume less fuel. • upgrades to the M4 and M5 motorways, along with new bus services and more frequent trains are also being considered by Governments. New infrastructure and public transport services will alleviate congestion, making it easier for people to travel to and from Sydney (Kingsford-Smith) Airport. **Figure 11** depicts the Master Plan development concept.
Known constraints on future capacity or ability to meet current and future demand	The Master Plan provides a detailed analysis of the forecast demand and the airport's proposals to meet this demand over the long term. However, it is noteworthy that in his approval of the Master Plan, the Minister noted: *"My approval of the Master Plan does not however indicate acceptance that the Airport can and should handle the projected growth in traffic, with the annual number of aircraft flying into and out of Sydney expected to rise to 427,000 by 2029."*

Figure 11- Development Concept



Source: SACL 2009

Aircraft noise contours and status	Sydney (Kingsford-Smith) Airport's endorsed 2029 Australian Noise Exposure Forecast (ANEF) is shown in **Figure 12.**



Source: SACL 2009

	Figure 13 shows a comparison between the 2029 ANEF and the previous 2023/24 ANEF.

Figure 13 ANEF Comparison

Source: SACL 2009

4.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related;

The Master plan reports that the following businesses are linked to the airport.

Table 4.1 Airport related business activity

Business Sector	Key Indicators
Airlines	44 passenger airlines operating at Sydney Airport
Other aircraft operators	25 General Aviation operators
Freight	At least 130 organisations involved in freight activities including transport companies, handlers and forwarders
Airport service providers	205 service providers including fuel, maintenance, flight catering and security organisations
Retailers	At least 157 on-airport retailers (some of which operate multiple outlets)
Hotels	Seven hotels in close proximity of Sydney Airport
Government	Six Australian and State Government departments and agencies
Car rental and parking	As many as 14 operators servicing the airport
Ground transport	At least 54 ground transport providers servicing the airport

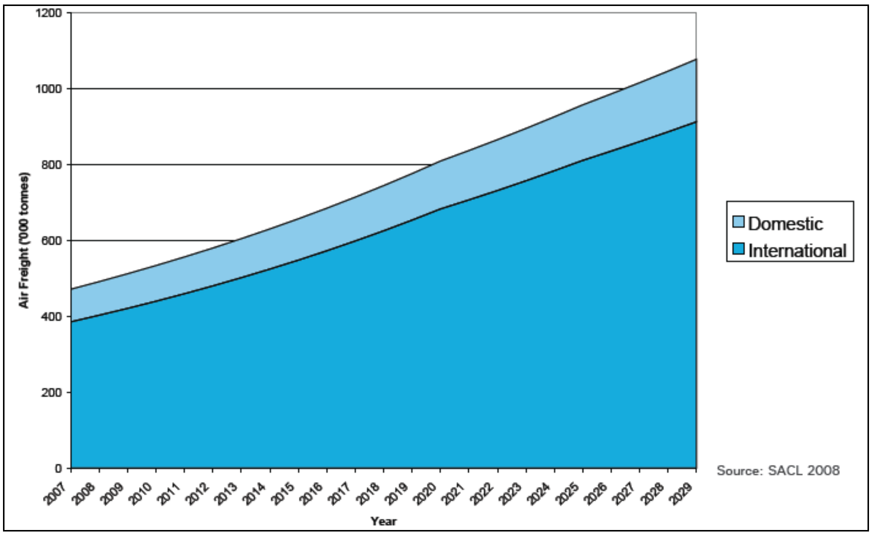
Source: URS 2008

Source: SACL 2009

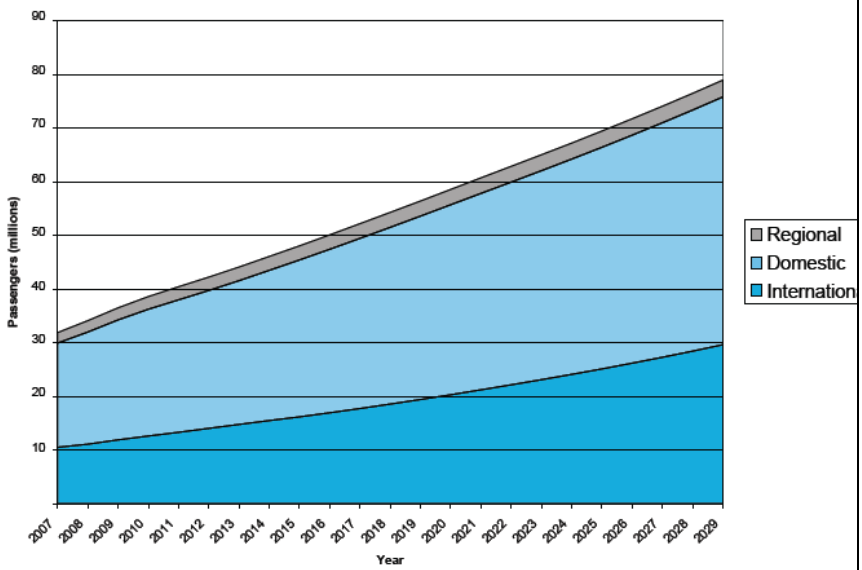
Freight forecasts;

Over 80% of freight is carried in the holds of passenger aircraft with the remainder transported in dedicated freight aircraft. Total freight is forecast to grow from 471,000 tonnes in 2007 to 1,077,000 tonnes in 2029. This represents an average annual growth of 3.8%. Forecasts of international and domestic freight tonnages are shown in **Figure 14**.

Figure 14 – Freight Forecasts



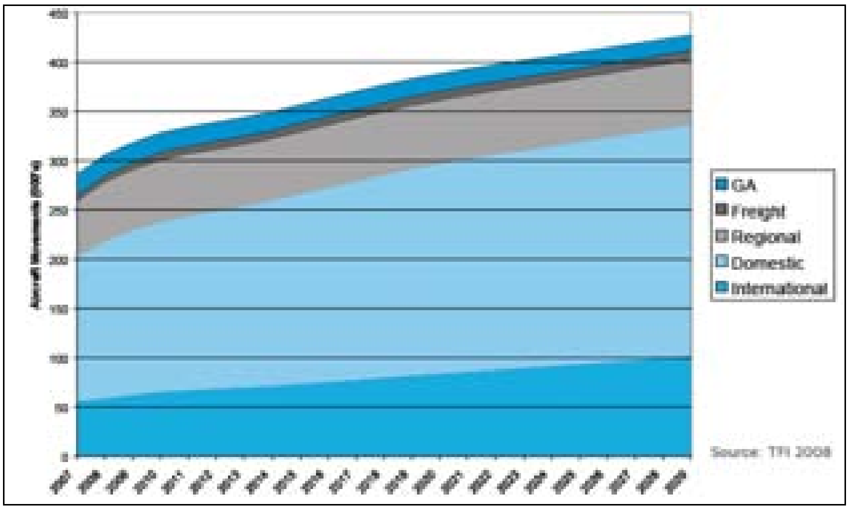
Source: SACL 2009

Plans to invest in upgrading;	As per Airport master plan
Passenger patronage forecasts;	The passenger forecasts indicate growth from 31.9 million passengers in 2007 to 78.9 million passengers in 2029. This represents annual average growth rates of 4.8 and 3.9% respectively for international and domestic passengers (which includes intrastate). Overall, this is an average annual growth of 4.2%. Annual regional passengers are forecast to grow from 1.9 million in 2007 to 3.1 million by 2029. This growth in passengers will be accompanied by a growth in the average number of passengers per movement from 35 in 2007 to around 48 in 2029. The forecast schedule anticipates that regional destinations will continue to be served predominately by turbo-prop aircraft. However, almost 20% of the movements to regional destinations are expected to be operated by jet services by 2029. **Figure 15** shows forecast passenger growth over the planning period to 2029. **Figure 15 – Passenger Forecasts**  Source: TFI 2008 *Source: SACL 2009*

Aircraft movements forecast by type;

Aircraft movement forecasts for scheduled passenger operations indicate growth from 258,700 movements in 2007 to 402,000 movements in 2029. This represents annual average growth rates of 2.8 and 1.8% for international and domestic services respectively. Overall, this represents an average annual growth of 2.0% for passenger aircraft movements. Fixed wing aircraft movement forecasts are shown in **Figure 16.**

Figure 16 – Fixed Wing Aircraft Movement Forecasts



Source: SACL 2009

SACL believes the lower rate of growth in aircraft movements relative to passengers, results from the assumptions that passenger load factors will continue to increase and that the average number of seats per aircraft movement (aircraft size) will also increase. The average number of passengers per flight over the planning period is projected to increase. **Figure 17** depicts the historical growth experienced over the last eight years and the projected increase to 2029. This increase in the average number of passengers per flight will be achieved through the use of larger capacity aircraft, including the Airbus A380 with a standard design capacity of 525 seats. In addition to the A380, for which 93 movements per day are projected in 2029, the forecasts assume a progressive up-scaling in aircraft size across the fleet.

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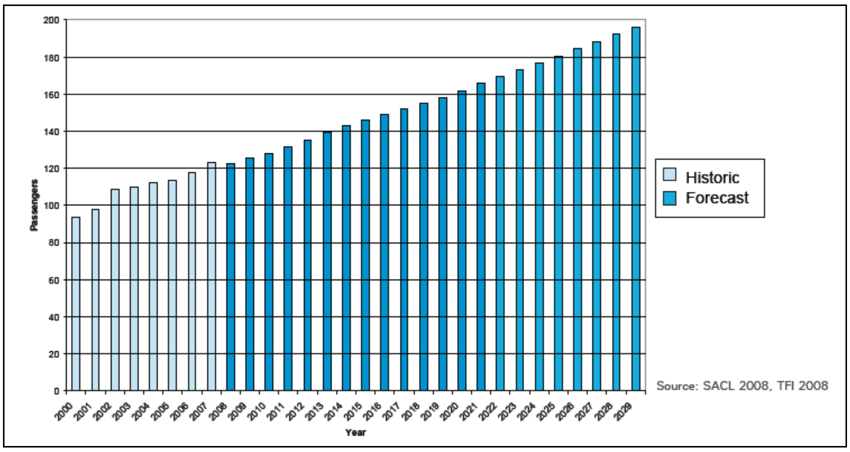
Figure 17 – Historic and Forecast Average Passengers per Flight



Source: SACL 2009

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<tr>
<td>Costs for upgrades</td>
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Not reported in Master Plan. However the CEO said on 11 July 2010:

"The upgrade is part of a $1.7 billion investment that Sydney Airport has made since 2002 with about $700 million invested in just the last two years. Passengers will continue to benefit from ongoing investment, with a further $1.0 billion in planned capital expenditure over the next five years"

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4.5 Accessibility and Surface Transport

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<td>Connections to Road</td>
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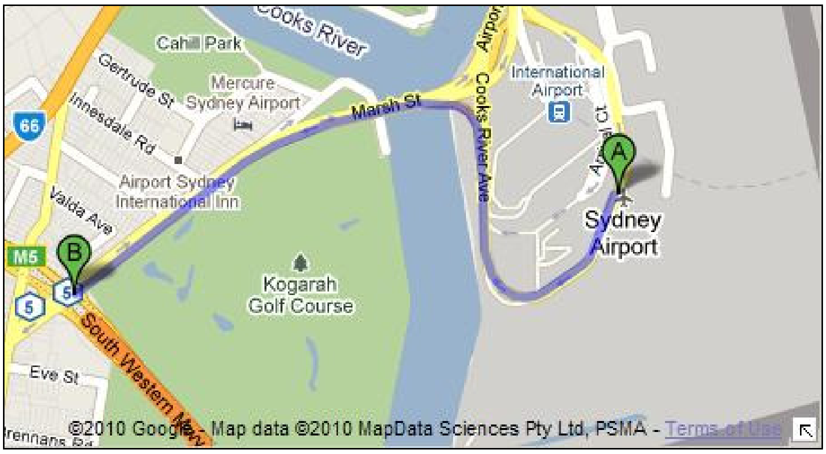
Nearest connection to the major road network is the aerodrome boundary with the Airport Drive. Thence, 1.7 km and 3 minutes to the South Western Motorway (M5) and Eastern Distributor. (**Figure 18**)

Distance to Sydney CBD: 11.7 km and travel time 15 minutes approximately from the entry to the domestic airport via the Eastern Distributor 16.9 kms and 17 minutes from the International Terminal.

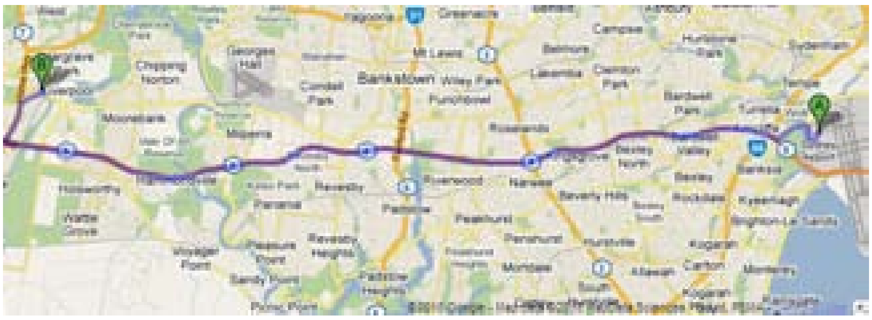
Figure 18 – Access to freeway system



Source: Google maps

Distance to Liverpool: 26.5 km and 26 minutes via F5 Freeway.

Figure 19 - Access to Liverpool



Source: Google maps

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Distance to Parramatta 30.0 km and 40 minutes approximately.

Figure 20 – Access to Parramatta

Source: Google maps

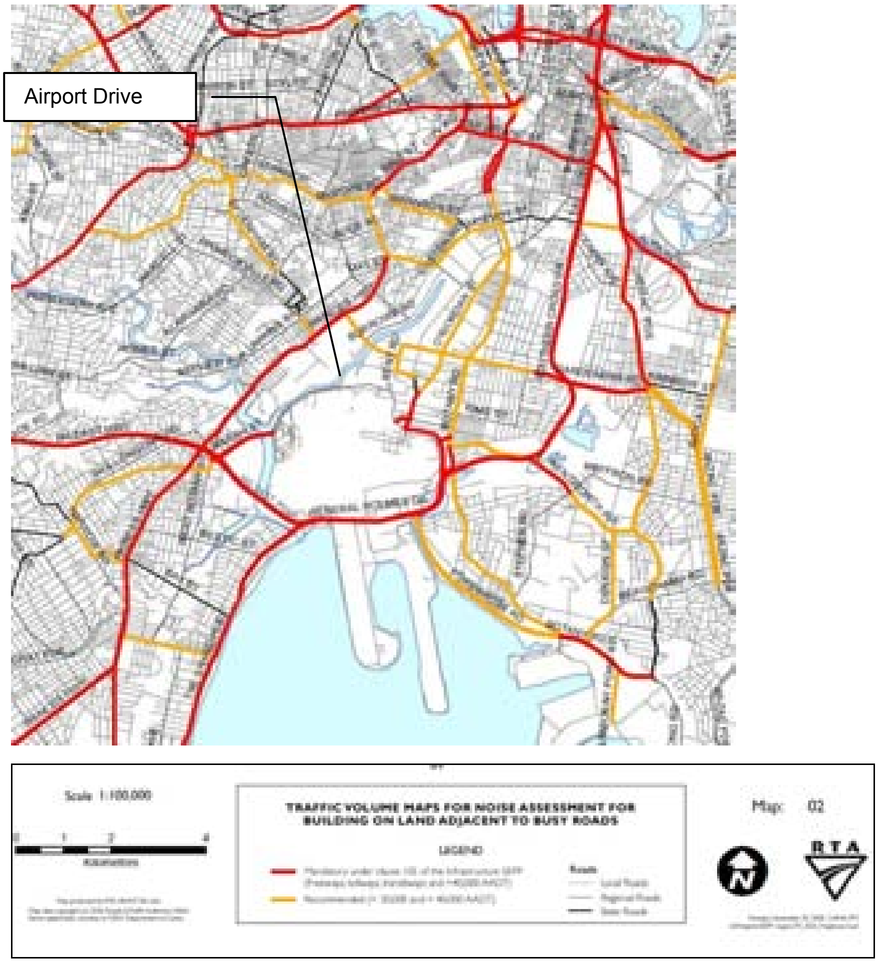
Traffic Volume

Figures 20 and **21** depict road conditions around the airport on the State Road system.

As can be seen the airport is ringed by a major road system though not clearly shown is that Airport drive which acts to connect the State road system around the north of the airport is in fact owned by SACL.

It can be seen from **Figure 21** that this road system operates at or in excess of capacity during peak periods not from airport related traffic but commuter and commercial traffic. This specifically impacts on the tunnel beneath Runway 16/34 and its taxi ways on General Holmes Drive and on Airport Drive.

Figure 21 – Major Road system



Source: RTA

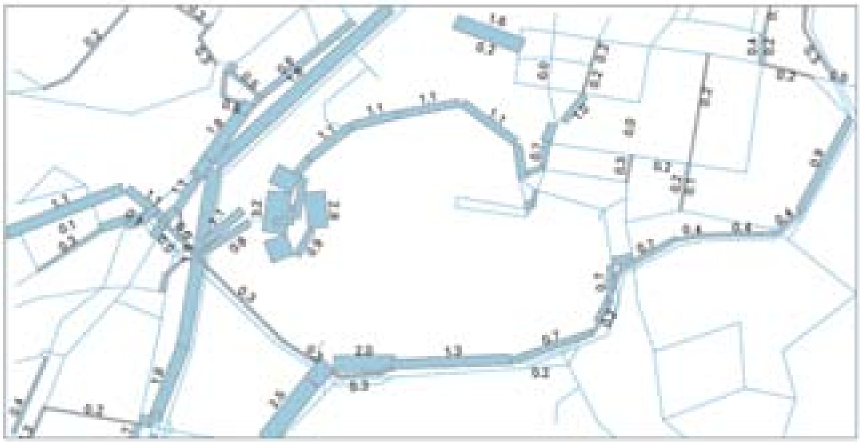
Figure 22 – Road congestion around Sydney (Kingsford-Smith) Airport

Source: Sydney Airport 2006 Airport Ground Travel Plan

In respect of road congestion, Sydney Airport Corporation Limited's 2006 Airport Ground Travel Plan states that:

"Road Capacity Needs

A strategic analysis and comparison of the link volumes in the vicinity of the airport subregion has identified that approach roads to and by the airport would suffer from poor service levels. This is primarily due to the

	high rate of expected residential and commercial growth around the airport subregion as outlined in the NSW Government's MetroStrategy. Notwithstanding this anticipated growth, there is no major road capacity augmentation projects planned in the vicinity of the airport. Figure 11 below shows the nominal additional lane requirements (in addition to road projects outlined in the Sydney Airport Master Plan 03/04) to service the through traffic volumes in 2024." **Figure 23 - Road Capacity Needs** Figure 11 – 2024 Unconstrained Road Network Enhancement Requirements  *Source: Sydney Airport 2006 Airport Ground Travel Plan*
Access to rail	**Domestic Airport Station:** Distance to nearest station: direct connection from the terminal. Domestic Airport Station to Central 6.7 km Time to Sydney Central Station: 10 minutes (Airport And East Hills Line or the South Line) Frequency of service: approximately every 10 minutes Cost: $15.00 one way **International Airport Station:** Distance to nearest station direct connection from the terminal. International Airport Station to Central 8.2 km Time to Sydney Central Station: 12 minutes (Airport And East Hills Line or the South Line) Frequency of service: every 10 minutes Cost: $15.00 one way

Airport Parking capacity - short term and long term	Approximately13,400 parking spaces in total: Domestic airport • Valet park • self park in a Multi-Storey Car Park • Long Term Car Park (1.5 km / 6 minutes from the airport - free shuttle available every 10 minutes). International Airport • Valet and self park in a Multi-Storey Car Park
Other transportation services available at airport	Bus – • Closest bus stop on Qantas Dr (1.5 km – approximately 20 mins walk – Some parts of this route are missing sidewalks or pedestrian paths. • Direct bus to Bondi Junction and Burwood (Route 400) • Operator: Sydney Buses Taxi – • Sheltered taxi rank at the terminals Rental cars – • Car rental desks at the terminals Shuttle services – • Available through booking
Walking and cycling	Walking to the airport is not practical because some streets and driveways are missing sidewalks or pedestrian paths. Cycling possible via road network. Bicycle racks are available at both domestic and international terminals.

4.6 Utilities and Services

Water and Sewer	Service Provider - Sydney Water At both Domestic and International Precincts, tanks and pumps provide pressure and capacity for domestic and fire services. Sydney Airport is currently reassessing the required potable water infrastructure upgrades in the light of changes to future development and the proposed recycled water supply. Options being investigated include upgrades to pumps and increased storage in both the International and Domestic precincts, potable ring main connections between sectors, and additional Sydney Water connection points. The

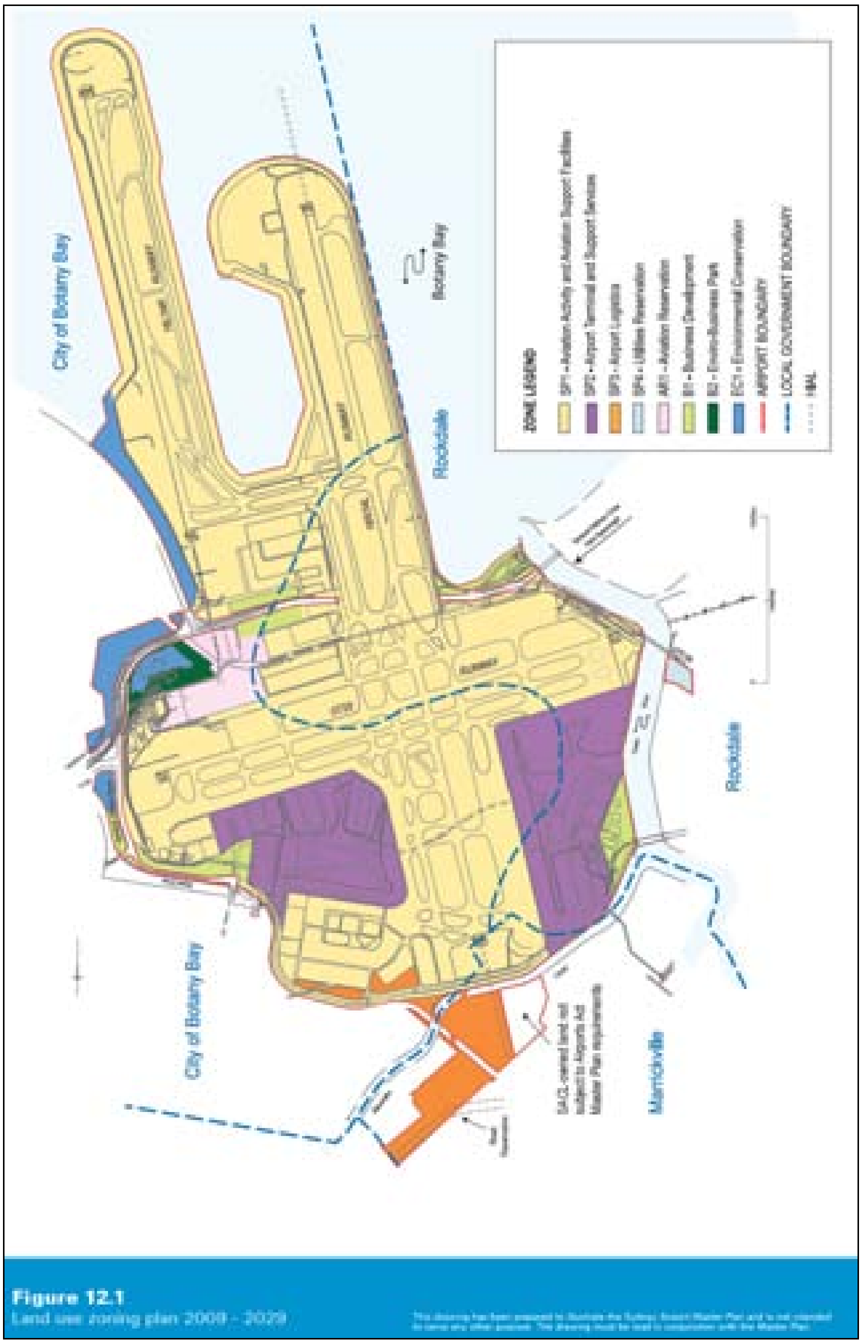
	potential ring main connections would improve security of supply to both the International precinct and the southern sectors. Two sewerage networks currently operate at Sydney (Kingsford-Smith) Airport in the Domestic and International precincts. These systems both involve gravity mains servicing the developed areas feeding into deep sewer pump stations. These pump stations feed into the SWSOOS, which traverses the site. As demand grows in these sectors, there will be a need to augment the existing gravity mains, and to increase the capacity of the existing sewer pump stations and rising mains. Analysis undertaken by SACL's consultants indicate that the SWSOOS will be able to accept the increased demand. Developments in the South-east and South South-east sectors require the installation of new sewerage infrastructure reticulation networks.
Gas	Service Provider - Jemena Gas South The airport is well supplied with a major high pressure gas main located along the perimeter.
Police, fire, ambulance, hospitals.	Police • Rockdale Police Station: (4.5 km - approximately 8 mins) Fire • Sydney Airport Fire Station: at the airport (Qantas Dr.) Hospitals • St George Hospital (5.8 km – approximately 11 mins)
Power	Service Provider - Energy Australia, Eastern and Energy Australia Southern Sydney (Kingsford-Smith) Airport is connected to the electricity grid by Energy Australia (EA) at two locations. From these supply locations, Sydney Airport Corporation Limited owns and maintains two 10.25kV medium voltage networks feeding the Domestic and International precincts respectively. Agreed supply capacity from EA to the Sydney (Kingsford-Smith) Airport medium voltage systems is 59.5MVA. The current capacity to supply emergency standby power for aviation facilities is 12MVA across the Airport.
Telecoms	Service Provider - Telstra, Kingsford Smith Optical fibre communications networks are installed across the airport. The external network facilitates the use of the Airport Management System, including critical operational and security functions.

	A second secure optical fibre network are installed to the airside of the Airport for airfield lighting control and monitoring, interfaces with operational equipment including transmissometers and security systems. Sydney Airport Corporation Limited manages the installation of telecommunications including cabling (voice, video, data), mobile telephone, wireless technology infrastructure across the Airport, and provides commercial access to third parties on the external network.

4.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for airport development	The key planning policy for Sydney (Kingsford-Smith) Airport is the Sydney Airport Master Plan 2009 (the Master Plan), prepared by Sydney Airport Corporation Limited and made under the *Airports Act 1996* (Cmth). As described in the Master Plan: *“The Master Plan is a key part of the Australian Government’s regulatory framework for airport lessee companies such as SACL under the Airports Act 1996 (the Act). Amendments to the Act in 2007 introduced new or revised requirements in relation to Master Plans.* *Master Plan 03/04, which covered the 20 year planning period to 2023/24, was approved on 22 March 2004. An updated draft Master Plan must be given to the Minister before the expiry of the current plan and, once approved, will replace the existing Master Plan 03/04. The 20 year planning period for Master Plan 2009 will cover the period to 2029.* *This Master Plan has been prepared in accordance with the Act as amended.*” Sydney (Kingsford-Smith) Airport is regulated by the Department of Infrastructure, Transport, Regional Development and Local Government. The Airport is not subject to the planning controls of the New South Wales Government or Botany Bay Council. As described in the Master Plan (p.199): *“Environmental Impact Assessment is regulated by the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), the Airport (Environment Protection) Regulations 1997 (AEPR) and the Sydney Airport Environment Strategy 2005-1010.”*

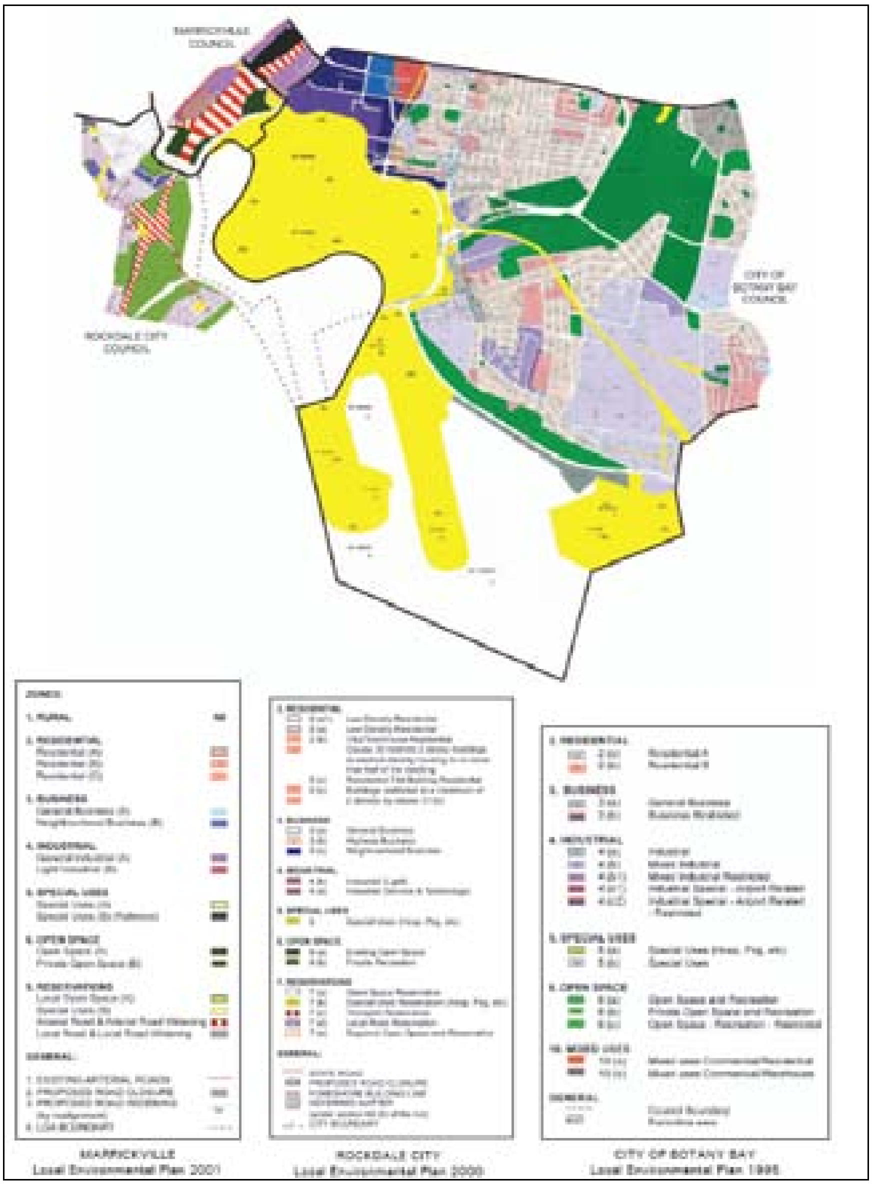
Figure 24 – Proposed Airport Masterplan Zonings.



Source: http://www.sydneyairport.com.au/SACL/Master-Plan.html

The boundaries of the City of Botany, Marrickville Council and the City of Rockdale run through the airport as can be seen in Figure 24.

Figure 25 – Surrounding LGA Land uses



Source: http://www.sydneyairport.com.au/SACL/Master-Plan.html

It is noted that the Airport is zoned *"5(a) Special Uses" under the Botany Local Environmental Plan 1995 (the Botany LEP). The primary objective of the "5(a) Special Uses"* zone is to *"to ensure the orderly use of land identified for Sydney (Kingsford-Smith) Airport, Port Botany and the Botany-Sydenham goods railway line…"*.

Clause 13 in the Botany LEP requires that *"The Council, in determining an application for consent to carry out any development in any area affected by aircraft noise (as advised by the Sydney Airport Corporation Limited (or any successor in title) in terms of ANEF contours) shall take*

	into consideration the guidelines provided in AS 2021". The Marrickville Local Environmental Plan 2001 contains a similar provision regarding aircraft noise.

4.8 Environmental Factors, Frameworks and Policies

Site characteristics	As described in the Master Plan (p.9): *"Sydney Airport is situated eight kilometres south of Sydney's Central Business District (CBD) on a 907 hectare site owned by the Australian Government and leased to Sydney Airport Corporation Limited (SACL), known as the airport lessee company (ALC) under the Airports Act 1996. The airport is strategically located on the northern shores of Botany Bay adjacent to Sydney's main shipping container port – Port Botany.* *The airport is bordered in part by major roads including General Holmes Drive, the M5 East Motorway and Southern Cross Drive and is served by two on-airport railway stations which link into Sydney's CityRail passenger network. The boundaries of the local government areas of the City of Botany Bay, Marrickville Council and the City of Rockdale run through the airport."* According to the Master Plan, the following Ministerial Directions issued under Section 117 of the *Environmental Planning and Assessment Act 1979*, do not apply to the Master Plan and the Airport site: • 4.3 Flood prone Land • 4.4 Planning for Bushfire Protection Given the location of the site in an urban area, it is not anticipated that the Airport is bushfire prone.

Surrounding land uses and land characteristics

Adjacent land use - planning controls

Type, spatial extent and proximity of land uses

Incompatible developments planned or approved

Threatened or endangered species

Designated environmental management areas

Existing environmental assets

Heritage scientific and aesthetic qualities/issues

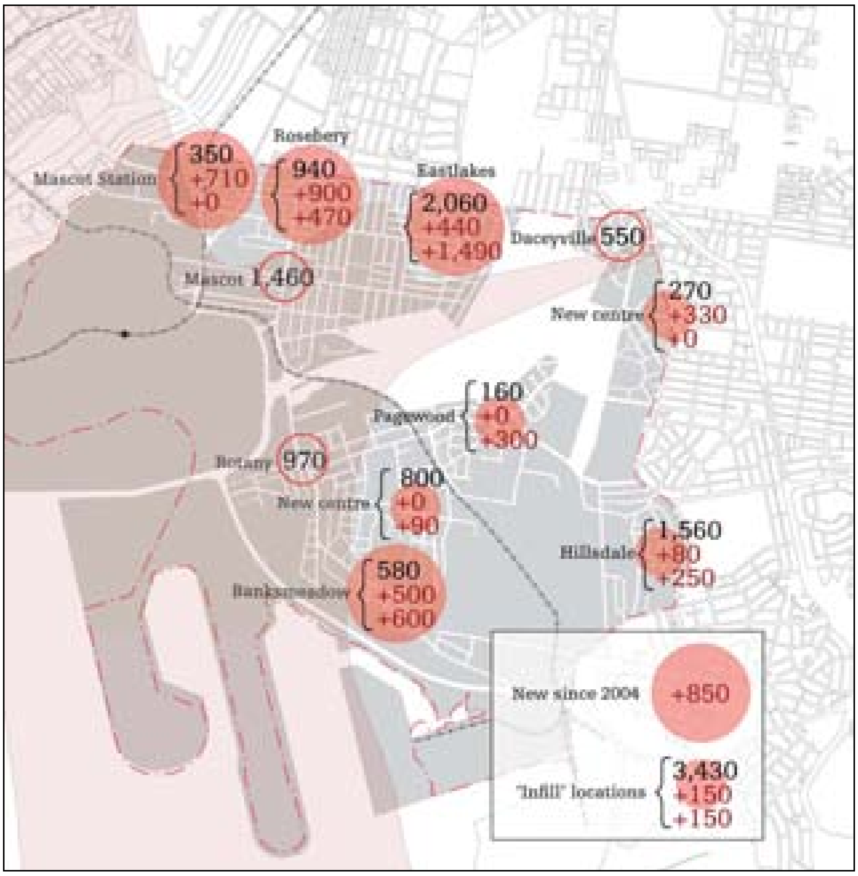
Wetlands and other sources of bird hazard

Sydney (Kingsford-Smith) Airport is in the immediate vicinity of a range of urban and industrial areas. Botany Bay adjoins the Airport to the south and Foreshore Drive, General Holmes Drive Southern Cross Drive and the M5 East Motorway adjoins it to the north.

Beyond major roads that adjoin Sydney (Kingsford-Smith) Airport, and within the immediate vicinity of the airport, are the suburbs of Banksmeadow, Botany and Mascot and land zoned:

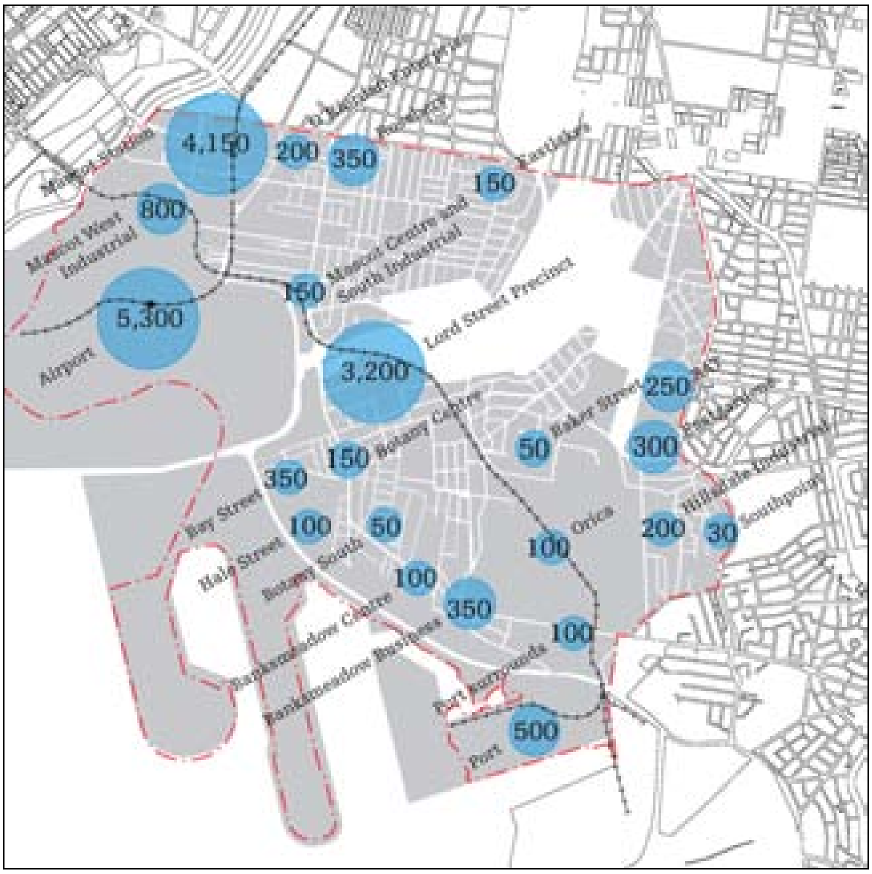
- Residential - 2(a) and 2(b);
- Industrial - 4(a), 4(b), 4(c1) and 4(c2);
- 5(a) Special Uses; and
- 6(a) Open Space and Recreation.

Figure 26 – Proposed residential development in vicinity of KSA



Source: Botany Bay Planning Strategy 2031 City of Botany Bay 2009 Figure 11: 2031 Dwelling Distribution

Figure 27 – Proposed employment development in vicinity of KSA



Source: Botany Bay Planning Strategy 2031 City of Botany Bay 2009 Figure 14: 2006 - 2031 Distribution of Additional Employment

There are several wetlands and other sources of bird hazard within the Airport site or proximate to the airport as described in the Airport's Fact Sheet entitled "*Sydney Airport Wetlands".*

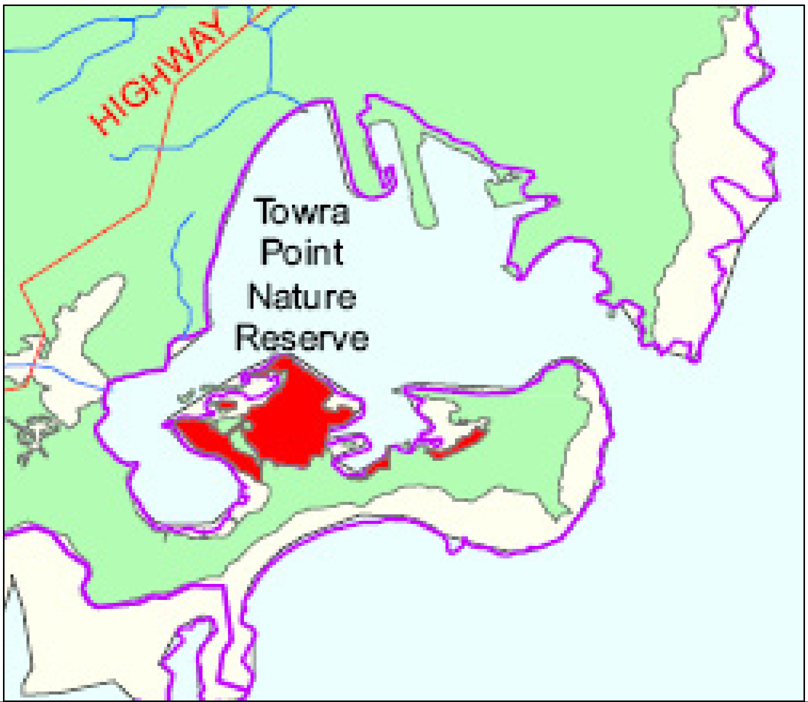
Figure 28 – Sydney (Kingsford-Smith) Airport Wetlands

The Fact Sheet states that:

"The wetlands cover an area of 58 hectares, consist of 11 interconnected ponds and stretch over 4 kilometres. They are listed on the NSW State Heritage Register and are classified as significant in the Directory of Important Wetlands in Australia. Sydney Airport manages the section of the Botany Wetlands known as the Mill Pond, East and West Engine Ponds and the Mill Stream. Collectively, these are known as the Sydney Airport Wetlands. Despite the airport and its immediate surroundings having been highly modified over the last century or more, the wetlands are still considered to be an environmentally significant area, providing important habitat for a range of native flora and fauna species including reptiles, fish and birds. A number of migratory birds protected under international conservation agreements can also be found there."

The other important site is the Towra Point nature reserve on the southern side of Botany Bay but close to or under some flights paths. As shown in Figure 27, these are designated as RAMSAR wetlands. The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

Figure 29 RAMSAR Wetlands



Towns Watercourse Ramsar wetlands AWRC Drainage Basins Roads	Source:http://www.environment.gov.au/water/policy-programs/nwqms/wqip/nsw/pubs/botany-bay.pdf

According to the Airport's Environment Strategy and Airport Master Plan there are several items of heritage significance as listed in the following table and shown in Figure 28.

Environmentally Significant Areas

Section 116(2)(b) of the *Airports Act 1996* requires that the Strategy must identify any environmentally significant areas on the airport site, in consultation with State and Federal conservation bodies. For Sydney Airport, this includes the NSW Department of Environment, Climate Change and Water (DECCW), the NSW Department of Planning (DoP), the Federal Department of Environment, Water, Heritage and the Arts (DEWHA) and the Australian Heritage Council (AHC).

The environmentally significant areas identified in this Strategy are listed in **Table 1.1** and shown in **Figure 1.4**.

Table 1.1: Environmentally Significant Areas

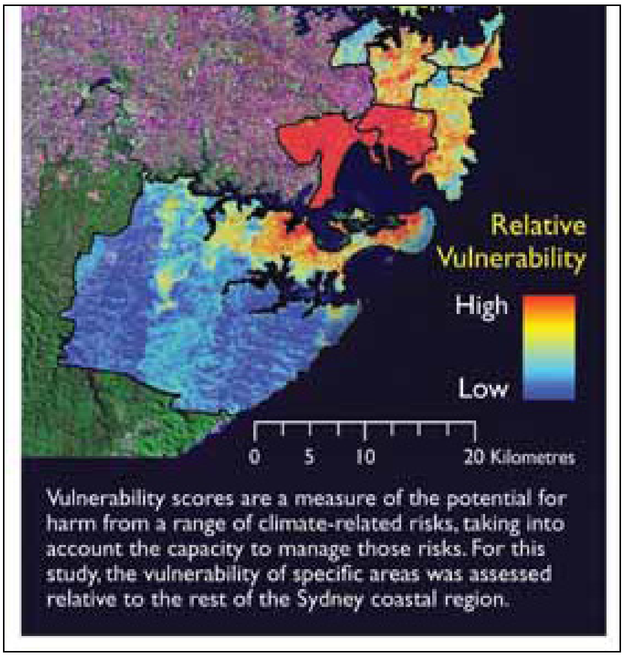
Site	Significance	Applicable Registers
Sydney Airport Wetlands (incorporating the Engine Ponds East and West, Mill Pond and Mill Stream).	Heritage / Biodiversity	Register of the National Estate (Indicative Place) NSW State Heritage Register Sydney Water Heritage Inventory Heritage Management Plan for Sydney Airport (2009)
Main north-south and east-west runways (location and function)	Heritage	Heritage Management Plan for Sydney Airport (2009)
Keith Smith Avenue (location and form).	Heritage	Heritage Management Plan for Sydney Airport (2009)

Figure 30 – Sydney (Kingsford-Smith) Airport Heritage Items

Source: http://www.sydneyairport.com.au/SACL/Master-Plan.html

Sydney (Kingsford-Smith) Airport's low lying location on Botany Bay makes it potentially vulnerable to the effect of sea level change which may be associated with climate changes. A report entitled "*Climate Change Risks to Australia's Coast"* found that:

"A sea-level rise of 1.1 metres, combined with a storm surge, would inundate parts of the northern runways and taxiways and damage critical safety equipment." and that *"The combined effects of sea-level rise, storm surge and tidal action resulting in significant inundation … could effectively close the airport,"* This is illustrated in the following Figure which is from that report.

	Figure 31 Effect of Climate change on inundation of Sydney Airport  *Source: http://www.climatechange.gov.au*
Existing Environmental Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	Sydney Airport Corporation Limited has prepared an Environment Strategy 2010 – 2015 which states that: *"The Strategy has been prepared in accordance with the environmental principles outlined in SACL's Environment Policy, the requirements of the Airports Act 1996 and Airports (Environment Protection) Regulations 1997 and is consistent with the Australian Government's Guidance Material for the Preparation of Airport Environment Strategies by Airport Lessee Companies."* *and that:* *"The Sydney Airport Environment Strategy 2010 – 2015 (the Strategy) provides the strategic direction for the environmental management of Sydney Airport for the five year period between 2010 and 2015. This is the third Environment Strategy prepared by Sydney Airport Corporation Limited (SACL). It updates and replaces the Sydney Airport Environment Strategy 2005 – 2010 (the previous Strategy)."* *The Strategy* covers all ground-based environmental aspects associated with the operation of Sydney (Kingsford-Smith) Airport including: • Environmental Management and Community Engagement • Climate Change and Energy Management • Water Management (stormwater quality, groundwater quality and water conservation)

	• Air Quality • Ground Transport • Ground-Based Noise • Biodiversity and Conservation Management • Heritage • Waste and Resource Management • Soil and Land Management • Spills Response The Environmental Management Framework of Sydney (Kingsford-Smith) Airport is also described in detail in Section 14 of the Master Plan. Examples of some issues dealt with in the Strategy are illustrated by this extract from public submissions to SACL's EMP. "*Agreement with SACL's proposal to identify those areas listed in the Heritage Management Plan (HMP) as having exceptional heritage value as being environmentally significant for the purposes of the Airports Act 1996. NSW Government Department of Environment, Climate Change and Water (DECCW)* *DECCW believes that the Sydney Airport Wetlands are part of the Sydney Freshwater Wetlands Endangered Ecological Community (SFWEEC), which is listed under the NSW Threatened Species Conservation Act 1995. SACL will ensure that the updated ecological assessment for Sydney Airport includes an assessment of whether or not the assemblage of species that make up the SFWEEC are present in the wetland area. SACL also notes that the wetlands are already proposed to be identified as an area of environmental significance. • DECCW advises that the parallel runways provide important habitat for a range of non-flocking birds which are protected under state and national legislation. In particular, the Double-banded Plover has been recorded on the airport and that, where appropriate, preservation and management of foraging and roosting sites are considered critical for the long term conservation of this species at Botany Bay. SACL will ensure that the updated ecological assessment for Sydney Airport addresses this issue. • DECCW advises that the fig trees provide foraging habitat for the threatened Grey-headed Flying Fox. SACL will ensure that the proposed plan of management for the fig trees addresses this issue. Department of Planning (DoP) • DoP recommends that all items on the NSW State Heritage Register (or which are included within a larger State Heritage Register listing) should be identified as areas having*

	exceptional heritage value in the HMP for Sydney Airport (with the exception of Alexandra Canal). In response, SACL notes that these items have already been identified in the HMP as having high or moderate heritage value. SACL also notes that the Botany Water Pumping Station and Chimney Ruins and the Sewage Pumping Station No.38 is managed by Sydney Water having regard to its heritage management inventory. SACL proposes to prepare a plan of management for the fig trees to ensure they are appropriately managed having regard to their heritage significance as described by DoP. SACL believes that these measures will collectively ensure the heritage values of these items are protected under the Airports Act 1996" Sydney Airport Corporation Limited has developed strategic level Environmental Action Plans (EAPs) prepared to address these environmental aspects and impacts associated with the operation of Sydney (Kingsford-Smith) Airport. These EAPs are considered the key reference tools for guiding environmental initiatives on Sydney (Kingsford-Smith) Airport for the next five years. The Strategy lists the environmental goals for each issue and achievements of past strategies. Reference should be made to the source documents given the extensive nature of these achievements.
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	With regard to accommodating growth, the Masterplan states (p.1): *"This updated Master Plan demonstrates that Sydney Airport can sustainably accommodate forecast growth in airline travel. To achieve this there will be improvements to a range of facilities including the international and domestic terminals, taxiways, and ground transport and commercial areas."* As can be seen from Figure 13 while Sydney (Kingsford-Smith) Airport is a relatively small site by comparison with other airports performing a similar function, its influence on the urban part of Sydney is considerably larger. The following extract from the Masterplan summarizes the Airport's relationships with its surrounding Local government areas with regard to developments. No comment appears to be made to suggest that Sydney (Kingsford-Smith) Airport cannot develop to the degree envisaged in its Masterplan by any external development.

Table 4.2 Land use and planning relationships between Sydney Airport and nearby local government areas

Local government area	Land use and planning relationship with Sydney Airport
City of Sydney	Following the development of the Eastern Distributor and the Airport Rail Link to link the CBD with the Airport, the southern section of the LGA closest to the Airport is undergoing a major transformation to a mixed residential, light industrial and commercial hub, particularly around Green Square which is identified as a Planned Major Centre.
City of Botany Bay	Qantas is a major land user in the western sector of the LGA, with administrative, operational and stores facilities located adjacent to the Mascot Railway Station. Zoning initiatives have further encouraged commercial development in this area. This zoning flexibility has allowed airport-related industries such as freight forwarders, catering facilities and car rental/parking facilities to be established in close proximity to the airport. Port Botany is a dominant land use within the LGA. Like Sydney Airport, Port Botany is a specialised centre and is linked by significant road and rail corridors.
Marrickville	Due to access limitations, few airport-related industries are located within Marrickville. Future motorway developments may facilitate development of airport-related industries on remnant road reservations.
	Sydney Airport owns approximately 31ha of land in the Marrickville LGA which may be developed for freight, logistics and other opportunities and is contiguous to the former Tempe Tip site owned by Marrickville Council.
Rockdale City	The suburbs of Rockdale are located immediately to the west of the airport and separated from the airport by the Cooks River. The area is characterised by a diverse range of commercial, residential, industrial and natural landscapes such as Botany Bay. As with other parts of inner Sydney, growth is being driven by increasing residential densities in existing and new development areas. Due to access limitations, few airport-related industries are located within Rockdale. Future developments may facilitate establishment of airport-related industries within Cook Cove.

Further, the Masterplan states that:

"For the preparation of this Master Plan, contact was made with each of the LGAs concerned to obtain an understanding of potential future zoning amendments proposed for the adjoining lands. Each of the councils indicated that no significant zoning amendments were proposed for the land adjoining or adjacent to Sydney Airport. More specifically, Marrickville Council advised that the 'Northern Lands' (which is zoned as the 'Airport Logistics' zone under the Master Plan) will remain industrial zoned land. City of Botany Bay advised that the zones in the vicinity of Sydney Airport will essentially remain unchanged. As shown on Figure 12.2, the land use zones for Sydney Airport on the periphery of the airport site took into consideration the future zones likely to be implemented in the adjoining LGAs in order to offer a degree of consistency between the zones and land uses on Sydney Airport with those of the surrounding lands."

4.9 Community and Public Amenity Factors

Community attitudes to airport	Sydney Airport frequently engages at all levels of the organisation with numerous stakeholders, including federal, NSW and local governments, airlines, airport tenants/operators and other business partners. This occurs formally and informally, at all levels of the company and covers a wide range of airport-related issues. SACL also holds Community Open Days when preparing master plans, major development plans or environment strategies. These give local residents living in communities around the airport an opportunity to meet directly with Sydney Airport representatives, raise issues of concern, exchange information and seek further information about airport-related matters. This process will be extended in the near future. Such engagement enables feedback to be received from the community and their representatives. Representatives of SACL are also active participants in and contributors to various industry, business and tourism-related organisations such as the Sydney Business Chamber, NSW Business Chamber, Infrastructure Partnerships Australia, Tourism & Transport Forum, Board of Tourism NSW, Property Council, Botany Enterprise Centre and the Committee for the Economic Development of Australia. An Airport Environment Forum has been established to foster communication and cooperation between SACL and airport tenants on environmental matters. SACL is also actively involved in the local communities surrounding the airport and has established community investment programs and supports local sports and schools. SACL also receives direct feedback from members of the public through its website and responds to issues of concern or complaints accordingly. A key standing body through which the Airport interacts with the community is the Sydney Airport Community Forum whose Membership includes 10 members of the Australian Parliament, 4 members of the NSW Parliament, the Mayors of 6 councils, 4 members of the community from areas around the airport and 3 members from the aviation industry.Regular attendance at SACF meetings provides an effective way of receiving and responding to community feedback.
Airport interaction with Communities	The Master Plan 2009 reports in Chapter 2 that: *"Sydney Airport is committed to effective and genuine consultation with all key stakeholders. During the development of this Master Plan, Sydney Airport consulted extensively with a wide range of key stakeholders, including the Australian and NSW Governments, Members of Parliament, local councils, the aviation and freight industries, business*

	and community groups as well as the broader public. Consultation enabled and encouraged stakeholders to provide input to the Airport's proposals for future land use, planning and development." Examples of the way in which the Airport interacted and communicated with the public are reported to have included: • *"published regular Community Updates in English speaking and community language newspapers;* • *held nine Community Open Days in areas in close proximity to the airport at which Sydney Airport representatives were available to answer questions – the date, time and location of these Community Open days was advertised in advance in local newspapers and on the Sydney Airport website;* • *set up a 1300 Community Information Line and dedicated Master Plan email service to facilitate information exchange; and* • *distributed the PDMP[3] and supporting documents to all local councils and Members of the Australian and NSW Parliaments in the Sydney metropolitan area."* During preparation of the master plan Sydney airport conducted: *"70 separate meetings and discussions with airlines and other airport stakeholders, Australian and NSW Government agencies, the Sydney Airport Community Forum, business and tourism groups and local government."*

4.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, En Route Supplement Australia (ERSA), *effective 3 June 2010*. Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. Sydney Airport Corporation Limited 2009, *Key Highlights 2009, Sydney Airport.*

[3] PDMP – Preliminary Draft Master Plan

	Sydney Airport Master Plan 2009 Aviation Support Facilities and Utilities –Master Plan Concept *http://www.google.com.au/search?sourceid=navclient&ie=UTF-8&rlz=1T4GGLL_enAU318AU318&q=community+attitudes+sydney+airport* http://www.sydneyairport.com.au/SACL/Environment--Environment-Strategy.html http://www.airservicesaustralia.com http://www.climatechange.gov.au/publications/coastline/climate-change-risks-to-australias-coasts.aspx http://www.climatechange.gov.au/publications/coastline/~/media/publications/coastline/5bsection513NSW.ashx www.btre.gov.au/info.aspx?NodeId=49 http://www.sydneyairport.com.au/Sacl/

RAAF Base Richmond

CONTENTS

5 RAAF BASE RICHMOND

5.1 Introduction

RAAF Base Richmond[1] is located approximately 48 km north-west[2] of the Sydney CBD and is accessed from Percival Street off Richmond Road. The towns of Windsor and Richmond lie to the immediate east and west of the aerodrome respectively. It is the RAAF's only operational air base in the Sydney Basin. **Figures 1** and **2** depict aerial images of the aerodrome site.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

[1] As appropriate, referred to as "Richmond"

[2] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Area)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

RAAF Base Richmond was the first Air Force base to be established in NSW and the second within Australia. In 1925 the first Air Force element in New South Wales, No3 Squadron, was formed at Richmond.

During World War 2, Richmond developed into a base of major importance to Australia's defence, and has since evolved from a combat centre to become the home of most of the Air Force's air transport fleet. As such, the base is now the hub of logistics support for the Australian Defence Forces. Richmond is a home for the Air Force’s transport aircraft. It has been a gateway for Defence personnel deploying to operational theatre, including war zones and humanitarian disaster scenes.

Richmond needs to be seen within the broad context of military logistics operations forming one key element of the supply chain from storage facilities such as at Moorebank and at Orchard Hills through to wherever Australian Defence personnel are operating either internally or internationally, although some C17 aircraft operations are being undertaken through Amberley Air base in Queensland.

The aerodrome is not generally available to civil operators with some exceptions discussed below.

5.2 Current Site Attributes

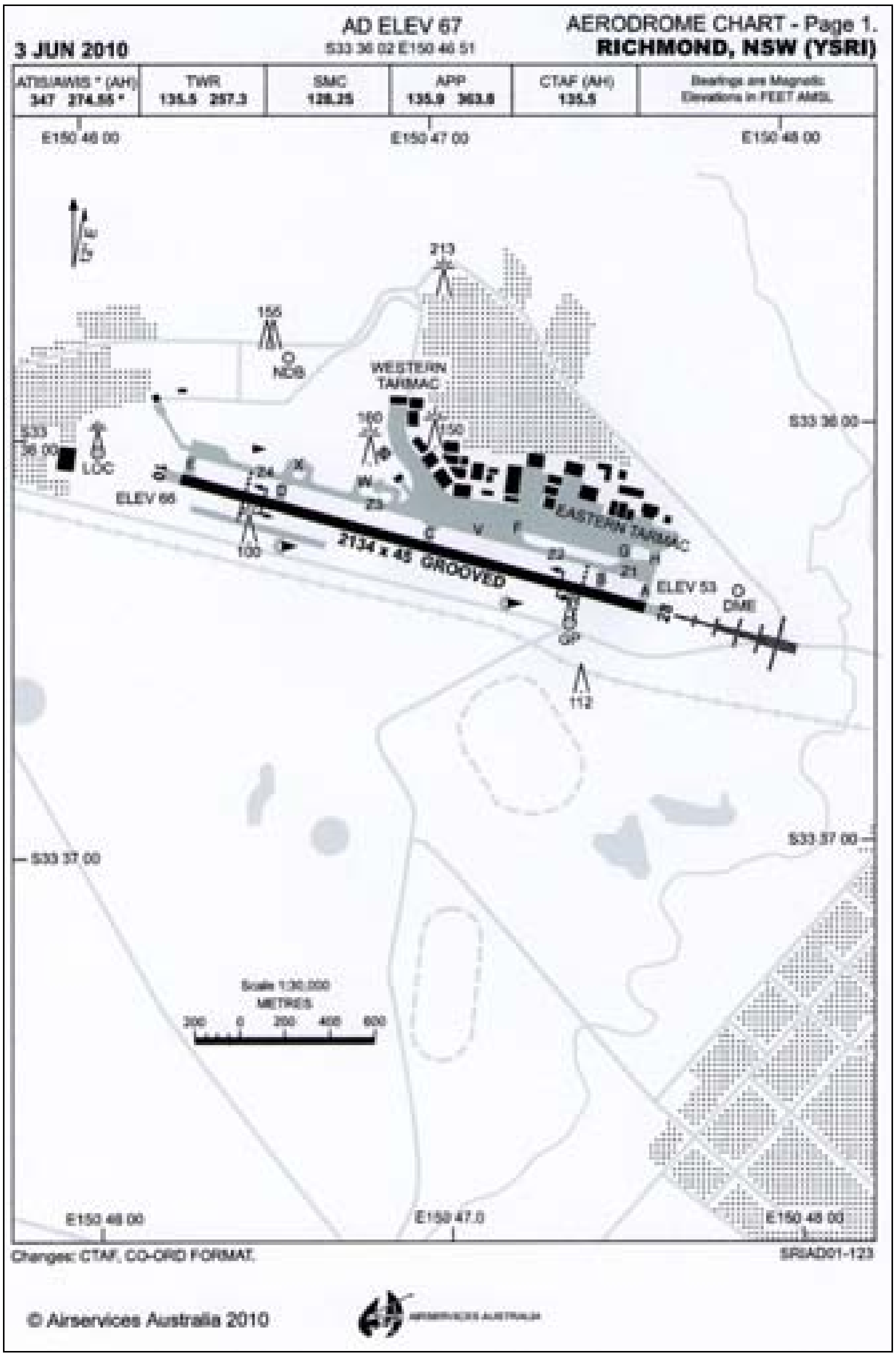
Aerodrome location and LGA	S 33 degrees 36.0 minutes E 150 degrees 46.8 minutes City of Hawkesbury LGA
Ownership and management; lessee/operator	Department of Defence (RAAF).
Aerodrome Category	Military
Applicable regulatory regime	ADFP 602 and MOS 139
Site area and physical dimensions	Approximately 277.5ha, comprising the main base area of 202ha and leased land of 77.2 ha. The Londonderry Drop Zone is an attached property of 63ha located about 10km from the base. (Note: the handout material provided by RAAF, Richmond is quoted as being 626 hectares – this may include the Londonderry parachute drop zone – however the remaining discrepancy has not been resolved)
Major centres of population, population growth	Historic townships of Windsor and Richmond, Parramatta, Penrith.
Elevation	67 feet
Surrounding topography	High terrain of the Blue Mountains escarpment to the west: floodplain to the north.
Liability for flooding	RAAF Base Richmond Air base lies within the flood plain of the Hawkesbury Nepean river system. Most of the base is above the 1:100 year event but is predicted to be fully inundated by the probable maximum flood event. Access roads to the aerodrome are liable to be impassable by floods of lesser magnitude.
Atmospheric conditions	The aerodrome is affected by fogs on an average of 70 days pa, varying from 40 to 100. The months of May to August are the worst, with about one in three days affected.

5.3 Aerodrome Operations

Summary of main activities	Currently, the only flying squadron is 37SQN operating the C-130H/J Hercules. These aircraft provide a vital air mobility capability for the Australian Defence Force. RAAF Base Richmond is also home to Headquarters Air Lift Group, which is responsible for the Australian Defence Force's air mobility aircraft. The base also accommodates a further number of support units including the Air Mobility Control Centre which is the central tasking agency for airlift operations across the Australian Defence Force (ADF). Other transport assets of the RAAF such as the C-17, BBJ, Challenger and forthcoming KC-30A multi role tanker transport (MRTT) use the base as required as do other ADF elements including fast jets. The base also supports air drop and parachute training as well as itinerant foreign military aircraft operations and USAF. The base is commonly used for: • Transit of explosive ordnance from Defence Establishment Orchard Hills; • A point of exit for air medical evacuation (AME), disaster relief and combat forces; • A point of delivery for repatriation for wounded or deceased personnel; • A divert for fighter aircraft from Williamtown. Industry is an important part of the RAAF Base Richmond community. Amongst the private industry partners at the base are Australian Aerospace and Qantas Defence Services, who both provide aircraft maintenance services for Defence, as well as contracted partners Serco, Sodexo, Defence Maintenance Management, Childcare Centre, Frontline (Australian Commercial Catering), Lockheed Martin, Standard Aero and Jacobs Australia. Note that the corrosion control facility is not used subject to upgrading to meet current standards. Civil operations are not undertaken on a regular basis although the following activities occur: • RAAF Richmond Gliding Club which operates on weekends and public holidays. • An active Aeroclub flying on weekends; • Use of the Instrument Landing System (ILS) for flying training purposes.
Current passenger numbers	Not applicable

Current aircraft movement numbers	Note: these figures relate to movements thought the Richmond airspace and not necessarily take offs and landings. 2009 Military: 5,318 movements - Note that there are helicopter transits between Holsworthy and Richmond. Richmond acts as an overflow for Holsworthy's Kiowa Helicopters. Civil: 7,513 including the total number of civil transits within the Richmond airspace. In November and December 2009 there was a period of bushfires and higher volumes of civil transits. There are a number of helicopter operations within Richmond Airspace. The air space is also transited by helicopters undertaking pipeline and power line inspections.
Current freight throughput	Richmond is a major logistics hub for Defence associated with Moorebank and Orchard Hills Depot and therefore there is military freight of unknown tonneages transiting the base. Nil civil freight.
Known sources of delay in aerodrome and runway operations	Richmond is regularly fog-bound during the cooler winter months, with both in-flight visibility and the cloud base often deteriorating below the required minima for the extant instrument approaches. Explosives Ordnance is stored at the aerodrome and loaded onto aircraft at ordnance loading aprons. The safety templates associated with the explosives extend across the runway and taxiways. The presence of ordnance represents a major constraint to potential civil operations.
Movement/manoeuvring area details	
Runway	• 10/28 – 2134m x 45m (Code 4E – civil equivalent) • A short parallel grass runway is located on the southern side of Runway 10/28 and is used for civilian gliding operations
Runway strip	• 2254m x 154m
Taxiways	There is a comprehensive taxiway system supporting the RAAF operational areas including a full length parallel taxiway on the northern side of Runway 10/28. This taxiway's centreline to centreline separation with the runway is 122m (which means it would meet only up to Code C civil requirements based on a non-precision instrument approach (150m wide runway strip)). Note Runway 28 is equipped with a CAT 1 precision approach instrument landing system (ILS) that nominally requires a 300m wide runway strip for full usability and increased taxiway centreline to centreline separation with the runway, based on the applicable aircraft Code for civil operations. **Figure 3** shows the runway and taxiway layout.

Figure 3 – Runway and Taxiway Layout



Source: Airservices Australia 2010

Aprons	There are comprehensive heavy aircraft aprons supporting the RAAF operational areas. Apron areas at the eastern end infringe part of the main parallel taxiway based on RAAF clearance requirements. The aprons have 34 aircraft parking positions, mostly for C130H/J aircraft.
Airfield pavements	Runway 10/28 - 70a PCN 47/F/C/1750 (245 PSI)/T (eg B737-800) Bitumen surface grooved Permanent pavement concessions for KC10/C5/C17 aircraft Taxiways Taxiway B not available to aircraft above 20,000kg - As for runway Aprons - As for runway.
Airfield operating restrictions	Civil operations require approval. With limited land availability, there is a lack of alternatives for the relocation of the current ordnance loading area from within the only free tract of land parcel. There does not appear to be any suitable areas on RAAF Base Richmond that could accommodate an ordnance loading area and provide the distances necessary from other infrastructure to meet explosive ordnance (EO) safety criteria. There are also a small number of EO storage facilities, but these could probably be relocated. For those activities associated with EO, the Base routinely supports ordnance movements from a Defence facility near Penrith, which entails the enforcement of clearance zones that cover the entire runway as well as land to the south of the runway. The necessity of having to impose these zones, because of mandatory requirements related to the movement of ordnance, has implications for regular passenger transport operations. In the absence of newly constructed and separate civilian apron areas, Defence's operational needs will severely limit available hardstand space and may completely preclude civilian aircraft operations on little or no notice for the conduct of military activities such as EO handling, use of Operational Readiness Platforms, ceremonial activities (repatriations) and the like.
Airfield lighting and approach systems	• High intensity runway edge lighting • Taxiway centreline green lighting • High Intensity Approach Lighting (HIAL) system 28 approach • Double sided Precision Approach Path Indicator (PAPI) system 10 and 28 approaches

Visual navigation aids	• Runway, taxiway and apron markings and markers • Two illuminated wind direction indicators (IWDI) • Runway distance to run markers
Radio navigation aids	• Tactical Air Navigation System (TACAN) • ILS with marker beacons Runway 28 • Non-Directional Beacon (NDB) Note the NDB is probably to be disposed of at the end of the year
Surveillance systems	The Sydney Airport Terminal Area Radar (TAR) and Mount Boyce Route Surveillance Radar (RSR) would provide coverage of Richmond airspace within their line of sight constraints.
Operational procedures	Civil instrument approach training subject to ATC approval, military aircraft have priority
Aviation fuel	F34 (military JET A-1) for Defence use. The Base fuel farm stores approximately 4.7 million litres of fuel, which may be insufficient to supply Defence's operations as well as significant civilian aviation activity. The fuel supply lines are currently the subject of an investigation by Defence Support engineering contractors. The two north and south underground fuel lines remain in a functional state, but their continued serviceability may be of concern. An indication of the overall deterioration was the forced closure of the central line in October 2008. While still subject to assessment, current indications are that this line cannot be re-commissioned other than through total replacement with new equipment. There are about 2 road tanker fuel deliveries per day from Clyde and usage of about 50,000 to 60,000l/day. The existing fuel reticulation system is non-compliant and there is a proposal for a $300million upgrade of underground services at RAAF Base Richmond.
Terminals and other major aviation support infrastructure elements	As a major military transport hub, the RAAF provides a terminal facility at the base The existing RAAF terminal caters for about 150 people ie equivalent to B707 which formerly operated. There is also a cargo facility next door to the terminal. Hangars are capable of accommodating up to civil Code 4D aircraft eg B767. A large number of facilities on base are affected by the Heritage Plan, restricting what can be done with the buildings.

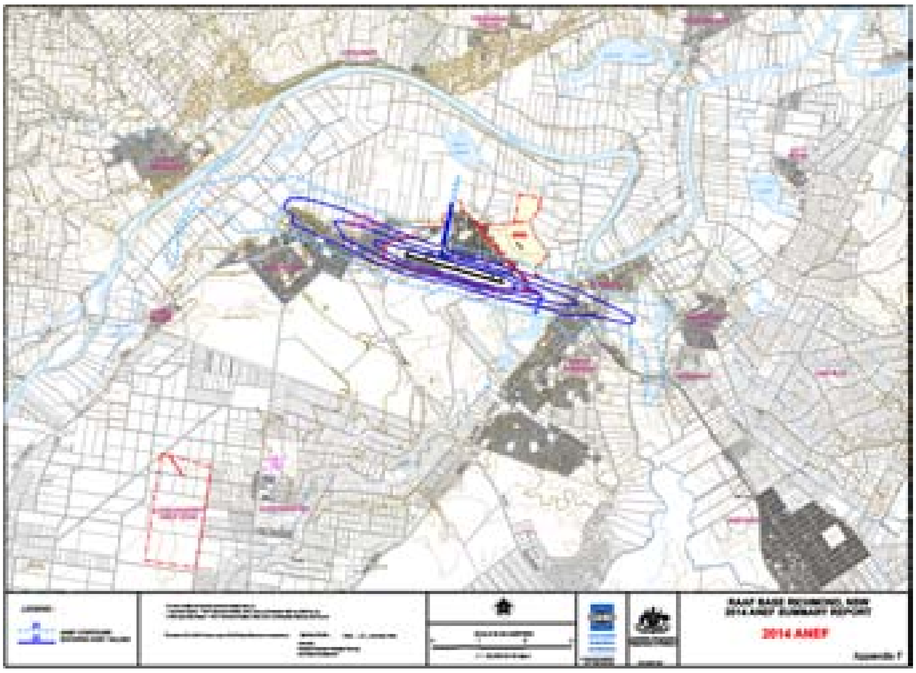
Security	Security Controlled Aerodrome – RAAF Base Richmond is a Closed Defence Base. Base security has recently been upgraded. Segregation is required from any civilian operations, preferably by distance and separation by runway. Security issues include concerns with the potential for observation of base activity from civilian terminals etc overlooking military areas.
Border Agencies	Customs and Immigration available during specified hours/days
Air traffic management and airspace management arrangements	Military Air Traffic Control (ATC) is applicable within the Richmond Control Zone (CTR) which is a trapezoidal shaped area extending approximately 16 nautical miles to the north-west and 20 nautical miles to the south-east. It extends from the surface to an altitude of 2,500 feet and is active during the tower's hours of operation which are 0800-2300 hours local. The tower may be vacated and the CTR deactivated during these hours when long breaks between scheduled movements occur. Outside of tower operations hours, the airspace reverts to Class G and Common Traffic Area Frequency (CTAF) procedures apply. Overlying the CTR are Restricted Areas R468 and R493 which operate from an altitude of 2,500 feet and 4,500 feet respectively to 4,500 feet and Flight Level 280 respectively. R468 is active during specified hours or by NOTAM and R493 is activated by NOTAM. Note that from August 2010 all airspace will be activated only by NOTAM. The immediate vicinity airspace is also used to support airdrop operations into Rickaby's Creek Drop Zone, located east of the runway, and the leased Londonderry Drop Zone, which is roughly south-west. Given the proximity of these Restricted Areas and zones to the airfield at RAAF Base Richmond, training and airdrop activity may conflict with civil arrival and departure traffic. The military/civil traffic mix can be expected to add a level of complexity to air traffic management in the immediate vicinity of the aerodrome. The CTR boundaries abut a range of controls associated with the complex airspace arrangements within the Sydney Basin including the Sydney Control Areas (CTA), Danger Areas associated with civil flying training, and transit (Lane of Entry) activity associated with Bankstown Airport. Note that the lane of entry is outside of and abutting RAAF airspace. Restricted Areas R536A and 536B are located approximately 4 nautical miles to the south of the CTR. These are associated with explosives demolition at Orchard Hills and operate from the surface to an altitude of 1,500 feet and 4,500 respectively. R536A is active during daylight hours and R536B is active at other specified times. Restricted areas will be activated by NOTAM from August 2010. **Figure 4** shows the airspace arrangements in the vicinity of the aerodrome.

Figure 4 – RAAF Base Richmond Airspace Arrangements

Source: Airservices Australia 2010

The majority of traffic utilising RAAF Base Richmond or transiting Richmond airspace is assumed to be operating under Instrument Flight Rules (IFR). Flight tracks established in relation to aircraft operating under IFR are shown in **Figure 5**. IFR departure and approach procedures are promulgated in the relevant Departure and Approach Charts (DAP). Helicopters fly VFR frequently, but have lower impacts than IFR traffic.

	Figure 5 –RAAF Base Richmond IFR Flight Tracks  *Source: Airservices Australia 2010* Other aerodromes within 50km of RAAF Base Richmond are: • Bankstown Airport approximately 40km to the south-east; • Holsworthy Aerodrome approximately 47km to the south-east (military); • Camden Airport approximately 49km to the south.
Aerodrome Rescue and Fire Fighting Services (ARFFS)	Category 6 Mon-Thu between 0700-2300 hours local and Fri between 0700-1700 hours local. Category 4 other times Sat, Sun and public holidays. Note that coverage may change to suit military operations (eg if tower required during weekends, the coverage during the week may be reduced). ARFF vehicles carry water and foam but no significant quantities of complementary agents recommended by the International Civil Aviation Organization (ICAO).
Operating restrictions	Noise abatement procedures in force as follows: • Visual departures Runway 10 to avoid Windsor township • Visual departures Runway 28 to avoid Richmond township • Helicopter arrivals from south to remain clear of the racecourse and associated stables • Except in emergency aircraft not to fly below 1,000 feet when operating

	south of Runway 10/28 within 1 nautical mile • Propeller aircraft below 25,000kg operating on Runway 28 may turn left within the aerodrome boundary providing a minimum height of 300 feet above ground has been reached • All low level circuits to be conducted to the north
Known development capability and expansion planning	No current master plan for RAAF Base Richmond. In 2002/04 $25 million was spent mostly on reactive works to fix infrastructure problems. Planning for 2016/17 is for $300 million for unspecified reactive infrastructure maintenance works.
Known constraints on future capacity or ability to meet current and future demand	Unknown but unlikely given numbers of operational squadrons/aircraft have reduced over time. This is a strategic planning issue requiring inputs from Deputy Chief of the Air Force.
Aircraft noise contours and status	**Figure 6** shows the 2014 Australian Noise Exposure Forecast. It was endorsed by Defence in December 2004. **Figure 6 – 2014 ANEF**  *Source* *http://www.defence.gov.au/id/2025_anef.htm*

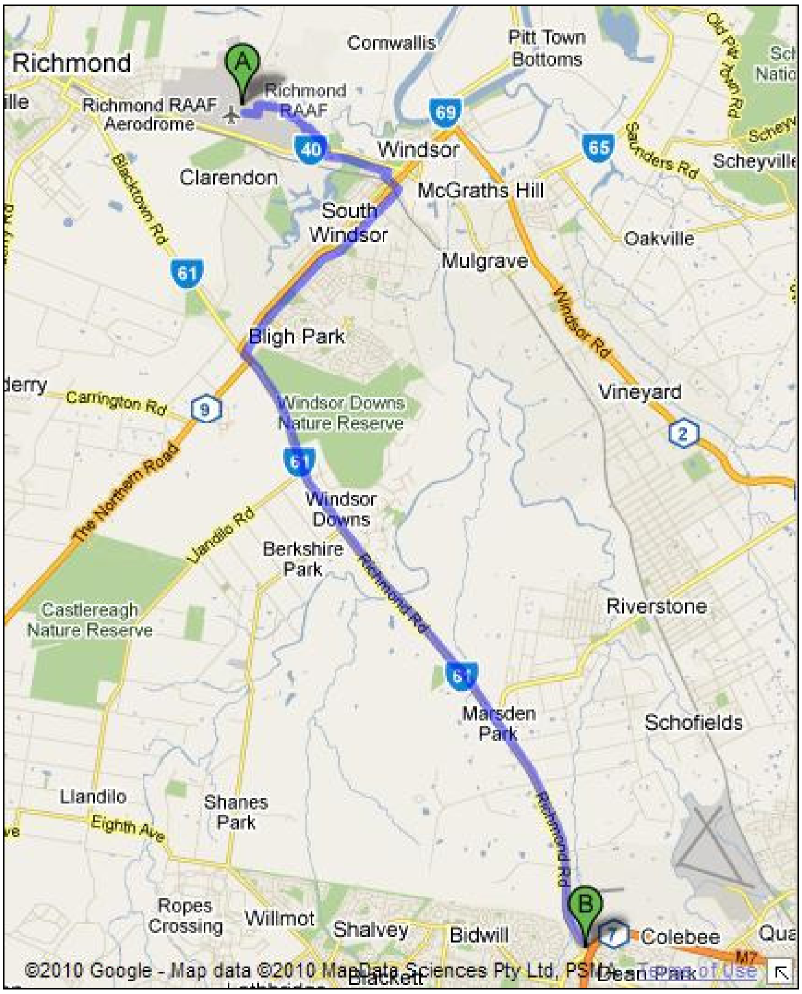
5.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related;	Enterprises with operations on the Base supporting the RAAF include: • Australian Aerospace; • Qantas Defence Services, • Serco, • Sodexo, • Defence Maintenance Management, • Childcare Centre, • Frontline (Australian Commercial Catering), • Lockheed Martin, • Standard Aero and • Jacobs Australia.
Freight forecasts	Not applicable for Defence base.
Plans to invest in upgrading	Planning for 2016/17 is for $300 million for unspecified infrastructure maintenance works.
Passenger patronage forecasts	Not applicable – no current RPT operations
Aircraft movements forecast by type	Unknown but would be contained in Defence's ANEF Report. Note that very noisy B707s may have been in the fleet mix used for this ANEF. The B707's have now been withdrawn & current/future noise contours could now be different. RAAF have been requested to check and advise.
Costs for upgrades	$300 million for unspecified infrastructure maintenance works.

5.5 Accessibility and Surface Transport

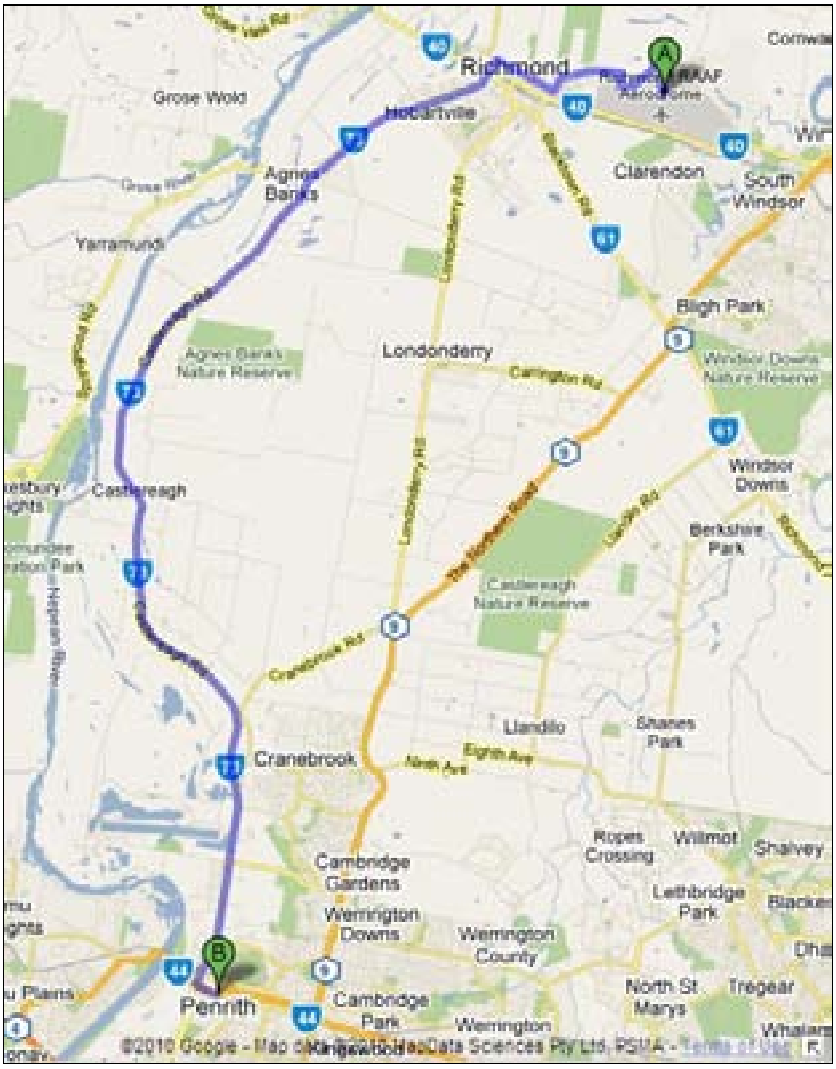
Connections to Road	Nearest connection to the major road network is the aerodrome boundary with the Windsor Richmond Road. Thence, 19.8 km and 29 minutes to the Westlink Motorway (M7). Distance to Sydney CBD: 65 km and travel time 1hour 5 minutes approximately.

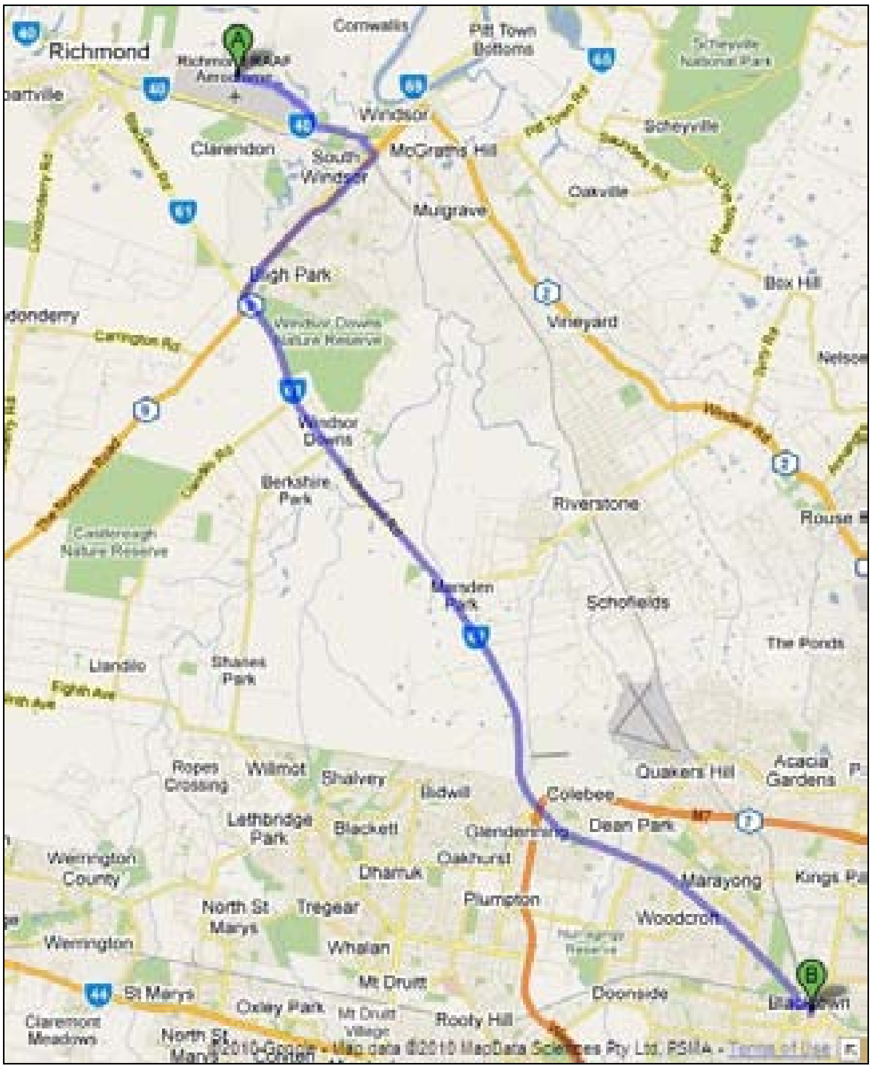
Figure 7 – Access to Freeway



Distance to Penrith: 27 km and 39 minutes

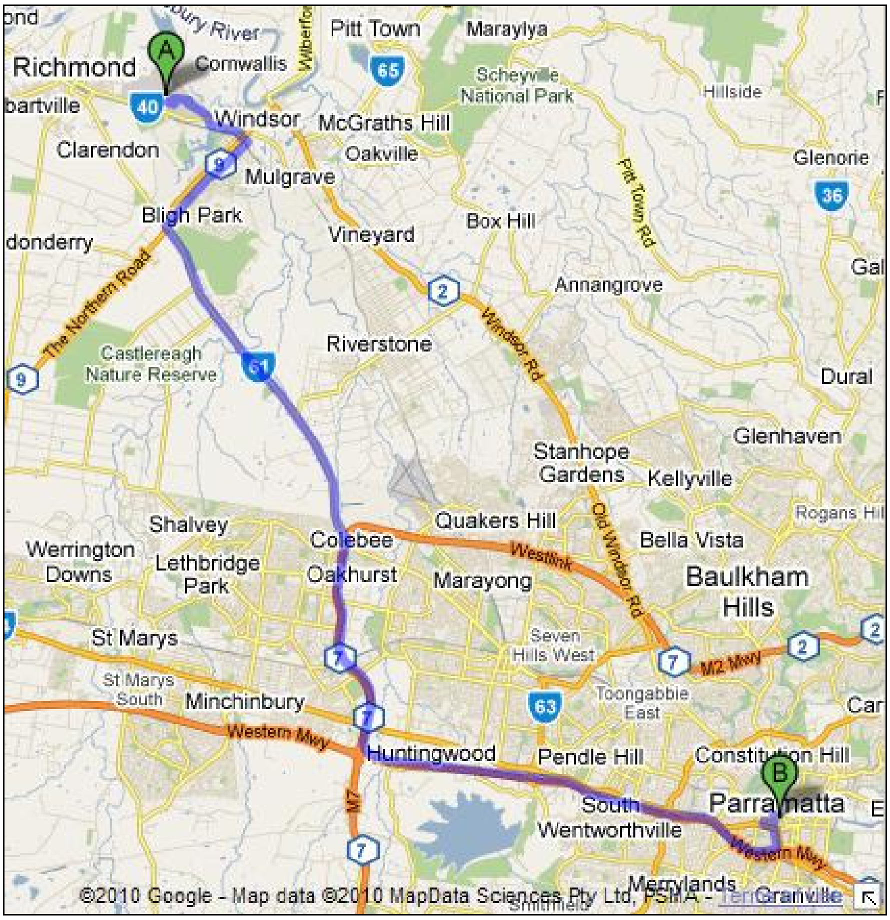
Figure 8 – Access to Penrith



	Distance to Blacktown: 27.1 kms and 44 minutes **Figure 9 – Access to Blacktown** 

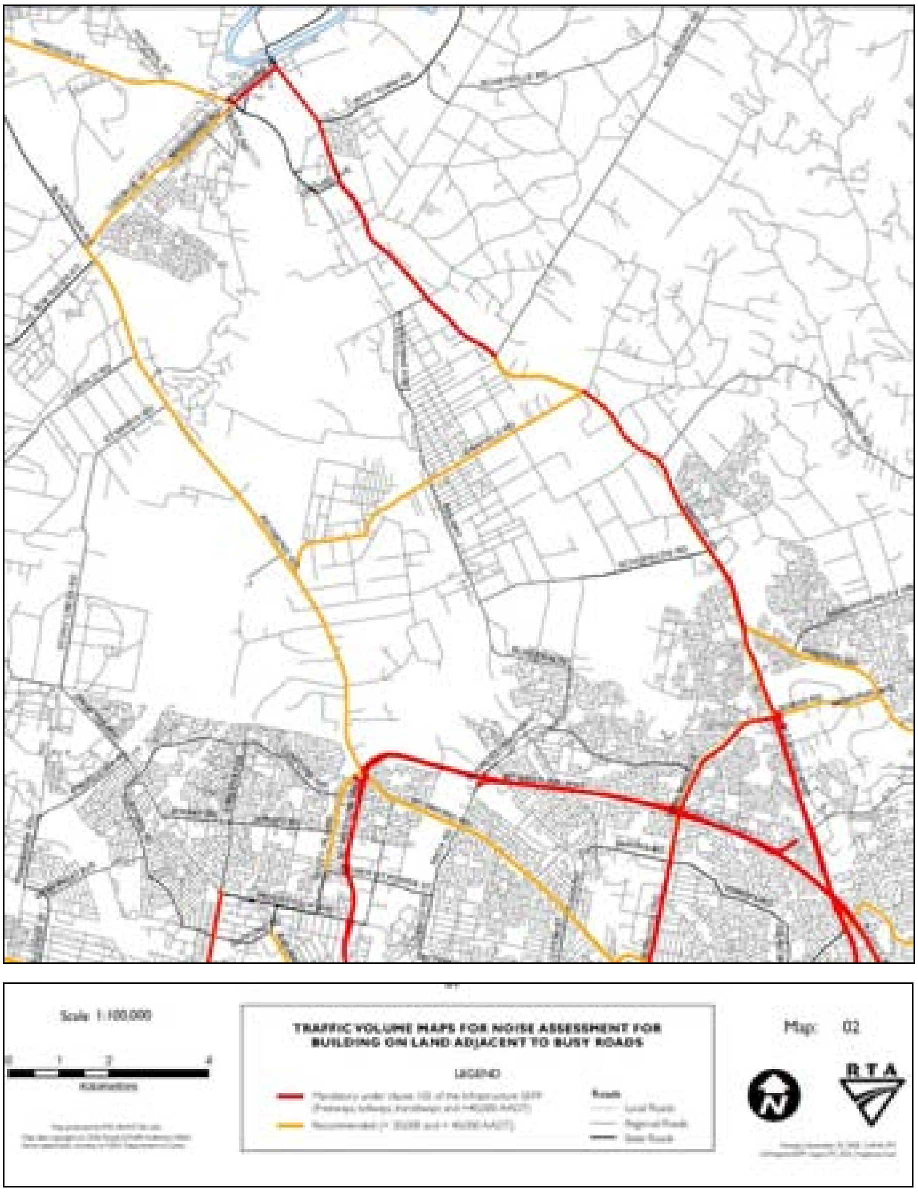
Distance to Parramatta 44 km and 52 minutes approximately.

Figure 10 – Access to Parramatta



Traffic Volume

Figure 11 – Major Road System



Access to the Base from the M2/M7 tollways is along State Roads - Richmond and /or Windsor Road - both of which can become congested during peak periods in the vicinity of major employment centres such as Norwest Business Park. Access from Hawkesbury Valley Way to and from Percival St can be difficult due to congestion on Hawkesbury Valley Way

Access to rail

Clarendon Station:

Distance to nearest station (Clarendon) 800 m and travel time 11 minutes walk approximately if direct connection provided.

Clarendon to Central 58 km

Time to Sydney Central Station: Clarendon to Central 1 hour and 20 minutes (Western Line)

Frequency of service: approximately every half hour

Cost: $6.00 one way

Figure 12 – Access to Rail - Clarendon

Richmond Station:

Distance to Richmond station 4.4 km and travel time 10 minutes approximately.

Richmond to Central 61 km

Time to Sydney Central Station: Clarendon to Central 1 hour and 26 minutes (North Shore Line)

Frequency of service: approximately every half hour

Cost: $6.00 one way

Figure 13 – Access to Rail - RAAF Base Richmond

Aerodrome Parking capacity - short term and long term	Parking is at a premium within the secure portion of the base with there being secure additional parking along Percival St.
Other transportation services available at aerodrome	Bus – • Closest bus stop on Percival St (500 m – approximately 6 mins walk) • Direct bus to Richmond Station (Route 675) • Operator: WestBus Taxi – • available on call from Richmond or Windsor Rental cars – • Not available at the aerodrome. Closest available 4.1 km. Shuttle services – • Nil
Walking and cycling	Walking not practical. Cycling possible via road network.

5.6 Utilities and Services

Water and sewer	Service provider is Sydney Water. The Three Towns sewer system upgrade passes the Base. RAAF is looking into the possibility of linking into this system. The trade waste treatment plant on Base is shut and trade waste is now carried off aerodrome.
Gas	Service provider is Jemena Gas West.

Police, fire, ambulance, hospitals	Police • Hawkesbury LAC Office: (3.9 km - approximately 9 mins) Fire • Richmond Fire Station: (4.0 km - approximately 10 mins) • ARFFS on aerodrome Hospitals • Hawkesbury Hospital Corner of Macquarie and Day streets, Windsor (4.5 km – approximately 10 mins)
Integral Energy	Service provider is Integral Energy - When the weather is warm in summer power on the base is marginal – supply can be upgraded at a cost.
Telecoms	Service provider is Telstra, Richmond.

5.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for aerodrome development	The key planning and environmental legislation and planning policies which are responsible for guiding the development of the land surrounding the RAAF Base Richmond site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979 • Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Hawkesbury Local Environmental Plan 1989 • Draft Hawkesbury Local Environmental Plan 2009 The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales. *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a state statutory policy that aims to “facilitate the effective delivery of infrastructure across the State”. This infrastructure includes “airports” and the provisions which specifically relate to airports are contained in Part 3, Division 1 “Air transport facilities”. ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent.

The *Hawkesbury Local Environmental Plan 1989* (the 1989 LEP) is the local statutory planning instrument that guides development in the Hawkesbury Local Government Area (LGA). The aerodrome is zoned “5(a) Aerodrome” under the 1989 LEP.

The *Draft Hawkesbury Local Environmental Plan 2009* (the draft 2009 LEP) is currently being prepared and will supersede the 1989 LEP. RAAF Base Richmond Aerodrome is proposed to be zoned “SP1 Aerodrome/Defence Services” under the draft 2009 LEP. The draft 2009 LEP written instrument, which is available at Hawkesbury City Council’s website, does not include any specific provisions that relate to airports, or development within the vicinity of airports.

Figure 14– Zoning

Extract of the Hawkesbury draft 2009 LEP Zoning Map

Source: www.hawkesbury.nsw.gov.au

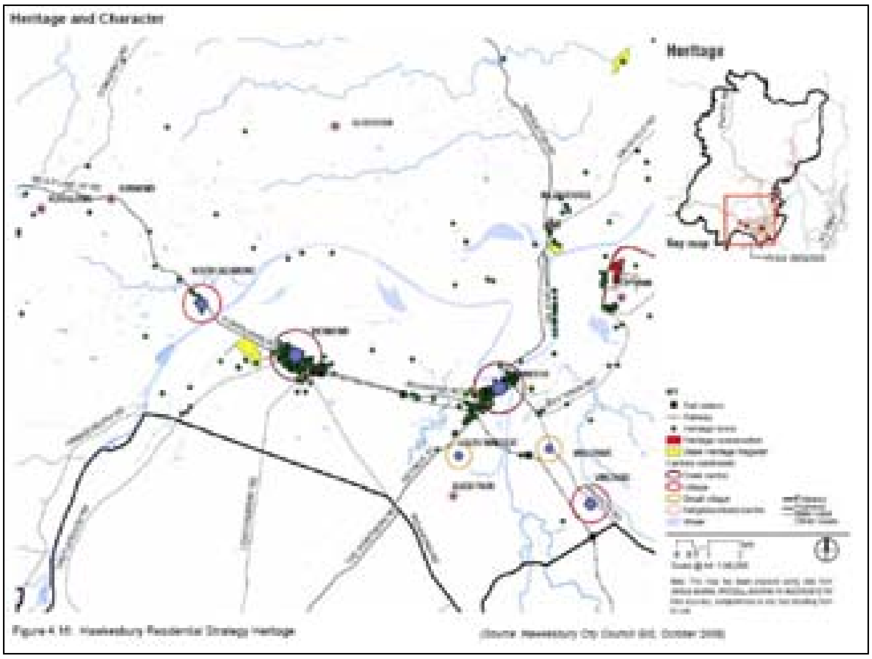
5.8 Environmental Factors, Frameworks and Policies

Site characteristics	As stated above, RAAF Base Richmond Aerodrome is zoned 5(a) Aerodrome” under the 1989 LEP and is proposed to be zoned “SP1 Aerodrome/Defence Services” under the draft 2009 LEP. It is located between two historic towns with aircraft operations over both towns. While relatively elevated, it is still flood prone being within the greater flood plain of the Hawkesbury Nepean river system.

Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangers species Designated environmental management areas Existing environmental assets Heritage scientific and aesthetic qualities/issues Wetlands and other sources of bird hazard	The aerodrome is located approximately 3km to the east of Richmond and 1.5km to the west of Windsor. There are a number of heritage items in the immediate vicinity of the site. The Hawkesbury River is located to the north of the Aerodrome and, as stated above, much of the aerodrome and surrounding areas are flood affected. **Figure 15– Heritage**  Extract of the Hawkesbury draft 2009 LEP Heritage Map Source: www.hawkesbury.nsw.gov.au **Figure 16 – Building height restrictions**  Extract of the Hawkesbury draft 2009 LEP Height of Buildings Map Source: www.hawkesbury.nsw.gov.au

Building Heights around the aerodrome have been controlled through the LEP.

Figure 17 – Items of Heritage



The aerodrome is adjoined by the following proposed land use zones under the draft 2009 LEP:

- SP1 Education;
- RU2 Rural landscape;
- R2 Low density residential;
- SP1 Special Activities;
- SP2 Infrastructure (Classified road);
- IN2 Light Industrial; and
- RE1 Public Recreation.

Other classifications are in close proximity, including SP2 Infrastructure Electricity Generating Works on the southern side of Richmond Road and pockets of land zoned E2 Environmental Conservation to the east of the site. It is unclear why is significant about the land zoned E2 Environmental Conservation.

As illustrated below in the draft 2009 LEP's Biodiversity Protection Map, there area number of areas which have been identified as "Significant Vegetation" or "Areas connecting significant vegetation" within the vicinity of the aerodrome.

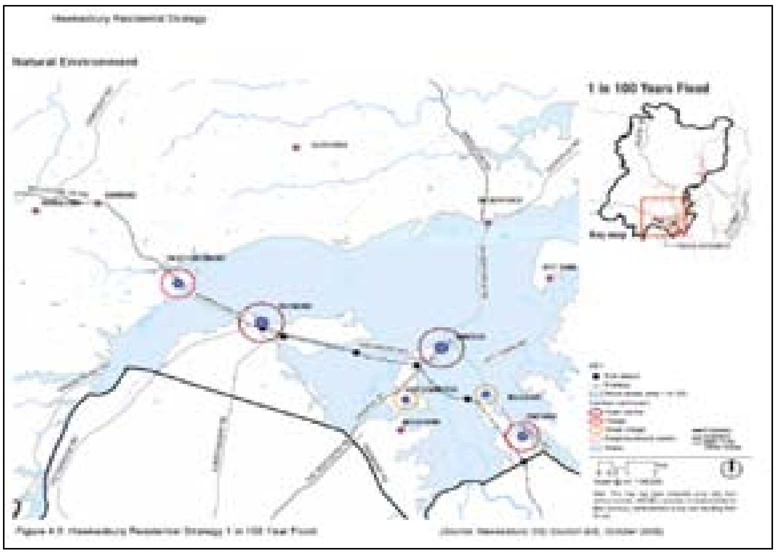
Figure 18 - Biodiversity Protection

Extract of the Hawkesbury draft 2009 LEP Biodiversity Protection Map

Source: www.hawkesbury.nsw.gov.au

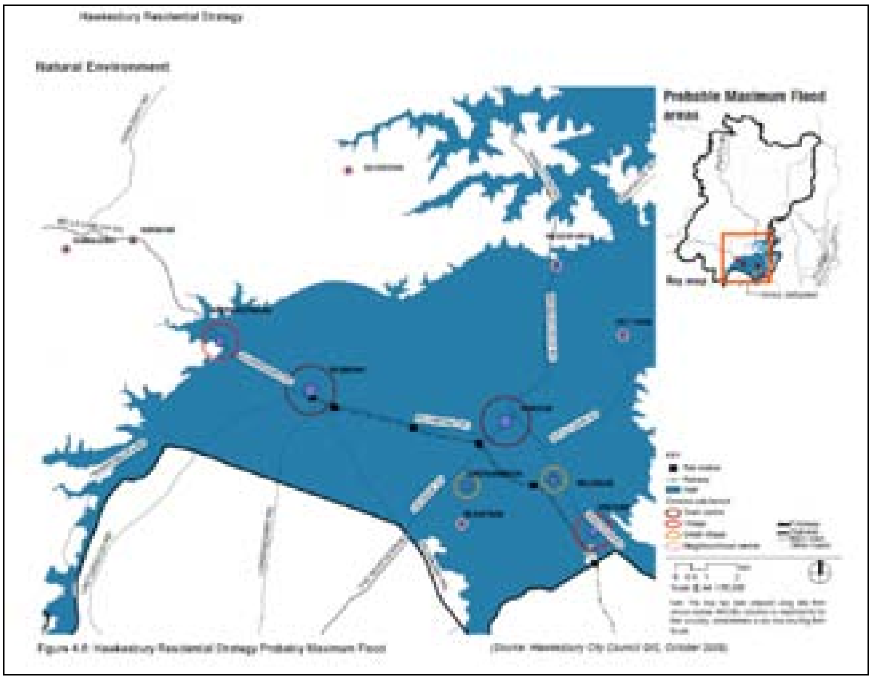
With regard to flood affectation, the aerodrome is mostly above 1 in 100 year flood event, but is totally submerged under PMF event. Transport links to and from the aerodrome are flooded for both flooding events

Figure 19 – 1:100 year Flood



Source: www.hawkesbury.nsw.gov.au

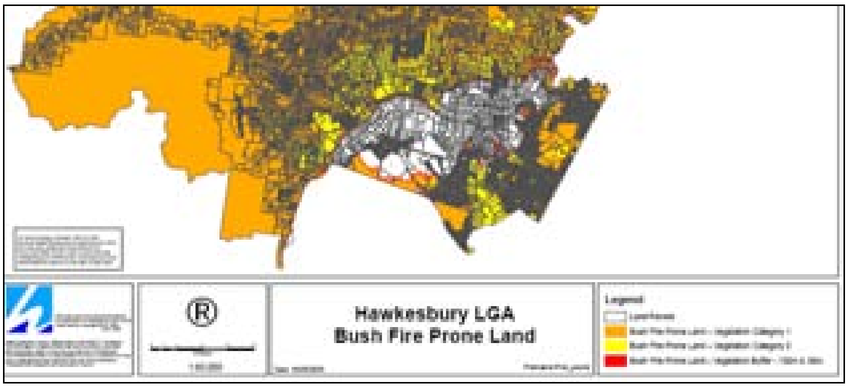
Figure 20 – Probable Maximum Flood



Source: www.hawkesbury.nsw.gov.au

The aerodrome appears not to be considered fire prone based on the following extract from council's LEP and remote from land that is rated as fire prone.

Figure 21 – Bush Fire prone land



Hawkesbury LGA Bushfire Prone Land Map

Source: www.hawkesbury.nsw.gov.au

Existing Environmental Management - Factors, Frameworks and Policies Aerodrome's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Aerodrome	RAAF Base Richmond has prepared an environmental plan for the base although this has not yet been provided. Management policies have not been sighted. RAAF have been requested to provide copies of Heritage Plan and Environmental management plans Known environmental issues include: • Contamination – improved water quality levels as a result of addressing hydrant line issues (in progress), water quality monitoring across site has indicated limited low risk requiring nil remediation and a Canberra led whole of site contamination investigation currently underway. • Heritage – the base has been entered on the Commonwealth Heritage Lost and includes Richmond House, Base cinema and Sergeant's Mess Precinct.
Challenges to expansion / sensitive adjacent land uses	The aerodrome is in close proximity to the townships of Richmond and Windsor and it is considered that this may constrain the potential for the aerodrome to expand usage for either Defence or civil operations. Key issues for the Base in the event of a civil operation starting up include: • Explosive Arcs – unavailability of runway or airspace for civil operations; • Physical separation of civil and Defence facilities and activities eg by a runway as at Williamtown; • Relative proximity of Hawkesbury Valley Way on south boundary; • Poor intersection of Percival St and Hawkesbury Valley Way; • Lack of rental property in the area for single personnel;

5.9 Community and Public Amenity Factors

Community attitudes to aerodrome	Noise complaints largely arise due to fast jet diversions from RAAF Williamstown and at the exercise training area at Londonderry (not RAAF Base Richmond).In general however, the relationship between the base and the community and Hawkesbury City Council is very good.
Aerodrome interaction with Communities	RAAF has membership on various Council Committees (Floodplain) and local emergency services. There is a low rate of effort in aircraft use at the Base. Active measures include not to overfly residential areas. Most of the military operations occur during the day (up to 8 pm). For upcoming events such as intensive operations by F18 – Hornets and the

	like there is a full time engagement with the Council and community. The ADF has about 1772 service personnel with about 300 living on the Base and the rest living locally. In addition there are about 700 Defence contractors and 268 public servants who also live locally (between Penrith and Rouse Hill etc). RAAF has a public Engagement Strategy and uses its publicity officers to get relevant messages out to the community via the local media

5.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010*. Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Australian Aviation 2010, *Airlift Effects Inside the RAAF's Air Mobility Control Centre, June 2010.* Defence Airfield Table, and, provided by Department of Infrastructure, Transport, Regional Development and Local Government 2010. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. http://www.raaf.gov.au/Bases/Richmond.aspx http://www.defence.gov.au/id/2025_anef.htm www.hawkesbury.nsw.gov.au

Bankstown Airport

CONTENTS

6 BANKSTOWN AIRPORT

6.1 Introduction

Bankstown Airport is located approximately 4km west[1] of the Bankstown CBD and is accessed from Marion Street from the north and Henry Lawson Drive from the south-west. **Figures 1, 2 and 3** depict aerial images of the airport site.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Area North)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

Figure 3 – Aerial Image (Building Area West)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

Bankstown Airport was first identified as an airport site by the (then) Department of Civil Aviation (DCA). The intention of the DCA was to develop the site as a second or training aerodrome for Sydney. No activity occurred at the site until 1940 when an area of 255ha was acquired to establish a RAAF aerodrome. An important reason for locating the RAAF aerodrome on the Bankstown site was its close proximity to the Clyde Engineering Works at Granville where aircraft manufacturing was being conducted. In 1942 a de Havilland (now Boeing) facility was established to produce Mosquito aircraft. During the war years the airport was first a RAAF station, then a US Army Air Corps base and then a Royal Naval Fleet Air Arm Station (HMS Nabberly).

In 1945, Bankstown Airport as well as other sites was investigated as the possible location for Sydney's International Airport. The Bankstown site was considered unsuitable because of runway approach limitations but the airport was considered suitable to act as a reliever airport. As a result of the Commonwealth Government's Cabinet approval to develop the Mascot site as the main international airport, control of the airport passed to the DCA in November 1948.

Significant aviation infrastructure was added to the airport between 1952 and the mid-1970s including new runways and taxiways, airfield lighting, a new control tower and briefing office (which now functions as a small terminal) and a number of private hangar developments.

In 1988, the airport ownership was transferred to the Federal Airports Corporation (FAC). In 1998, ownership of Bankstown Airport was transferred, along with Camden and Hoxton Park Airports from the FAC to Sydney Airports Corporation Limited (SACL), as part of the winding-up of the FAC following the privatisation of its non-Sydney Basin airports. In 2003, the airport lessee company was sold to the BaCH Consortium.

Today, the airport lessee company is Bankstown Airport Limited (BAL) which is one of the two trading entities of BAC Airports Pty Limited, the other being Camden Airport Limited (CAL). They operate as Sydney Metro Airports. Collectively, these accommodate the bulk of general aviation (GA) operations in the Sydney Basin. BAC Airports is a privately held company.

Note that the airport operations review detailed below addresses aviation related activity only. BAL along with many other airports is providing for and anticipating additional non-aviation commercial development within its landholdings. Therefore, in assessing the airport's capability for enhanced aviation activity, it needs to be recognised that areas currently undeveloped may in fact already be leased and/or the subject of development proposals.

6.2 Current Site Attributes

Airport location and LGA	S 33 degrees 55.5 minutes E 150 degrees 59.3 minutes Bankstown City Council LGA
Ownership and management; lessee/operator	Bankstown Airport Limited (operator and airport lessee company) with a lease until 2097
Aerodrome Category	Certified
Applicable regulatory regime	• Airports Act 1996 • Civil Aviation Safety Regulations (CASR) Part 139 - Aerodromes

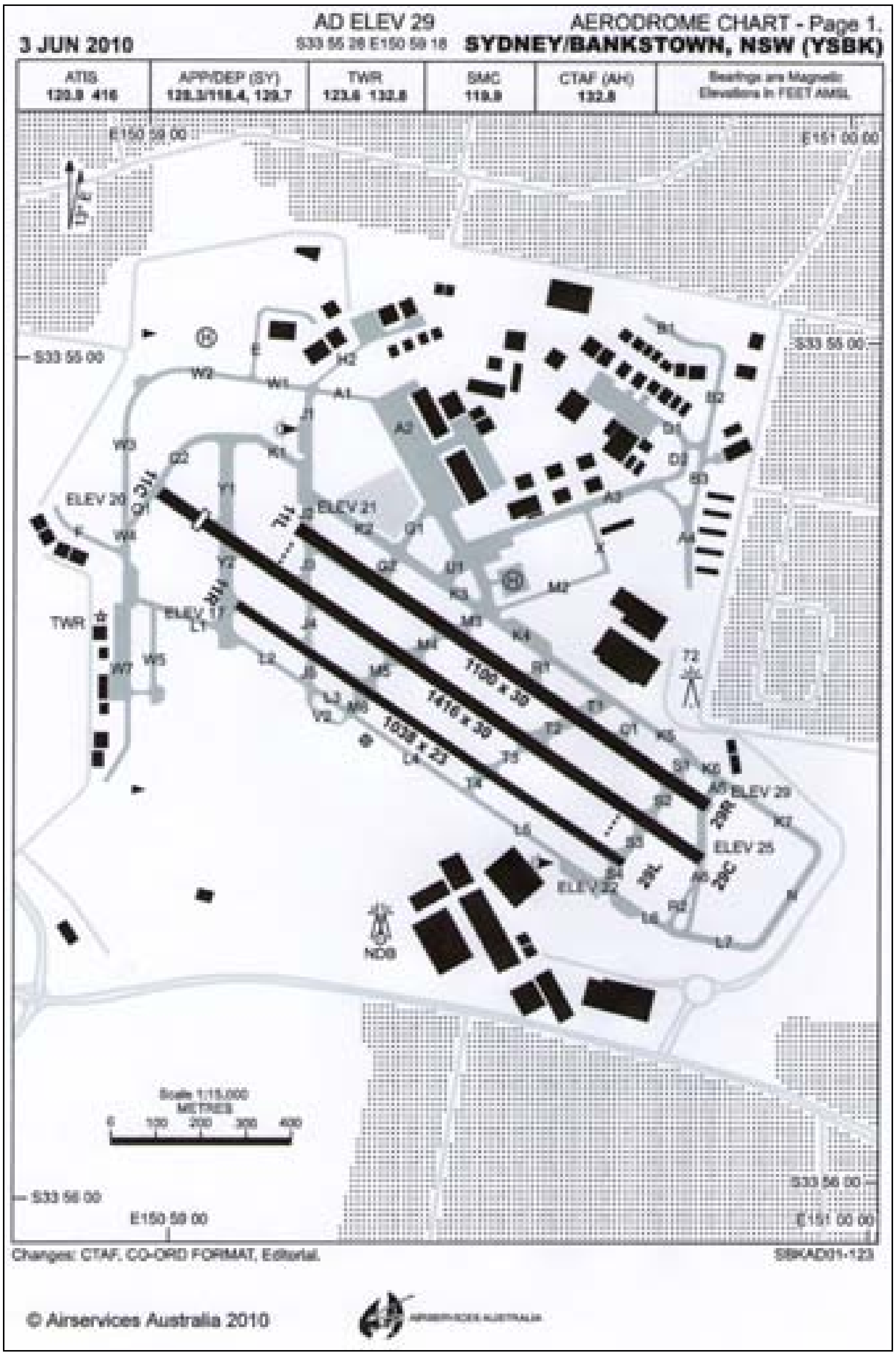
Site area and physical dimensions	313ha
Major centres of population, population growth	Bankstown Airport is located in southwest metropolitan Sydney in the City of Bankstown LGA. The City of Liverpool LGA is immediately to the west and that of Fairfield is immediately to the northwest
Elevation	29 feet
Surrounding topography	Bankstown Airport is located on the floodplain of the Georges River and its tributary creeks. Parallel to its runway system and to the north east there is rising ground on which the main airport building development is located.
Liability for flooding	The airport is liable to flooding from the Georges River and its tributary creeks. Refer to Section 6.8
Atmospheric Conditions	The airport can affected by fog several days each year

6.3 Airport Operations

Summary of main activities	The airport functions as the primary general aviation (GA) airport for the Sydney Basin and the State of NSW. Along with Perth's Jandakot Airport which fills a similar role in WA, these two airports consistently rank and either the busiest or second busiest airports in Australia in terms of aircraft movements. The movement numbers achieved are very significant on a world scale, even when compared to large GA airports in the US. The airport accommodates a wide range of GA (fixed and rotary wing) operations including intensive flying training, charter, aerial work, private, fire fighting, charter and recreational. The airport also provides for a significant number of businesses supporting GA operations including aircraft maintenance, avionics, engine and propeller shops, aircraft interiors, paint workshops and aircraft hangars etc. There are a number of agencies that operate at the airport including Air Wing, Air Ambulance, RFDS and NPWS There are currently no operators providing scheduled passenger services although the airport is technically capable of accommodating up to Code 3C medium jet aircraft such as the BAe-146 (albeit with possible pavement and/or payload limitations). Currently there are some 180 tenants (aviation and non-aviation), in excess of 100,000m² of airport owned buildings and over 123ha of leased areas (aviation and non-aviation). In the last three years, $31 million has been

	spent on development.
Current passenger numbers	Not applicable – No current RT operations
Current aircraft movement numbers	370,842 (2008/09 as estimated by BAL) The number of operations has fallen for 2009/10 and is estimated by BAL to be around 300,000.
Current freight throughput	The airport provides for air freight services (largely parcel services) and there are larger scale road based freight businesses which may have operational linkages with air freight activities. BAL claims that it is the largest parcel freight airport in Australia moving 40 to 80 tonnes per day. There is only one substantial, dedicated freight operator (Toll). BAL estimates that the combination of this freight operator and other smaller freight related activity currently accounts for around 9,500 movements per annum. This represents around 2.6% of the total number of aircraft movements. The majority of this traffic uses Metroliner aircraft and other relatively small aircraft, operating for banks in the late evening and early morning. Convairs and ATR 42 aircraft also operate 4 nights/week each.
Known sources of delay in airport and	Anecdotal evidence suggests ground delays can occur during busy periods, noting the intensive flying training undertaken at the airport.

runway operations	It is probably too soon to speculate on whether the introduction of Class D Air Traffic Control (ATC) procedures on 3 June 2010 will have any delay implications in the future.
Movement/manoeuvring area details	
Runways	• 11L/29R – 1100m x 30m (Code 2) • 11C/29C – 1416m x 30m (Code 3) • 11R/29L – 1038m x 23m (Code 2) • There are two designated helicopter landing sites (HLS), one on the northern side of Runway 11L/29R and one on the northern side of Taxiway W2.
Runway strips	• 11L/29R – 1220 m x 90m • 11C/29C - 1536m x 90m • 11R/29L – 1185m x 90m

Taxiways	There is an extensive complex of sealed taxiways. **Figure 4** shows the runway and taxiway layout. **Figure 4 – Runway and Taxiway Layout**  *Source: Airservices Australia 2010*

Aprons	There are extensive sealed apron areas, primarily associated with the overall hangar layout as well as natural surface aircraft parking areas. These latter areas cover an estimated 45,000m² of designated grass tie-down area accommodating an estimated 90 small aircraft parking positions. The existing designated grass tie-down areas are only lightly used, although there are numerous aircraft parked informally on grass at various locations around the airport. In addition to grass parking and tie-downs, there is currently 70,600m² of aircraft apron of which an estimated 63,700m² is available for home-based and transient aircraft parking. It is anticipated that this level of apron parking is more than adequate to accommodate forecast traffic levels.
Airfield pavements	Runways • Runway 11L/29R – 36a 16000/1050(152PSI) eg aircraft up to say DHC8-100/200 (DASH 8 100/200)) • Runway 11C/29C – 46a 20000/1050(152PSI) (eg aircraft up to say DHC8-300 (DASH 8 300)) • Runway 11R/29L – 34a 5700/580(84PSI) (eg aircraft up to say Metro II) • Pavement concessions are available for aircraft above 20,000kg Maximum Take-Off Weight (MTOW) with 24 hour prior notice. Taxiways • Taxiways Y, A3, A4, B, and J2 available for aircraft up to 16,000kg • Taxiways Q2, K, G1, U1, A2, A5, A6 and S available for aircraft up to 20,000kg Aprons No information is available.
Airfield operating restrictions	Open for public use, charges apply to all aircraft.
Airfield lighting and approach systems	• Runways 11L/29R and 11C/29C – low intensity edge lighting • Runway 11C/29C – Precision Approach Path Indicator (PAPI) system • Runway 11C/29C – Runway Threshold Identification Lights (RTIL) • Taxiway centreline green and side line blue lighting
Visual navigation	• Runway, taxiway and apron markings and markers

aids	• Two illuminated wind direction indicator (IWDI) and one wind direction indicator (WDI)
Radio navigation aids	Non-Directional Beacon (NDB).
Surveillance systems	Nil on site although the Sydney Airport Terminal Area Radar (TAR) would provide coverage over the Bankstown airspace within its line of sight constraints.
Operational procedures	• Circuit altitude is 1,000 feet for fixed wing and 700 feet for helicopters (by day) • Circuit operations are to be confined within a radius of 2 nautical miles of the Aerodrome Reference Point (ARP) • Contra-rotating circuits operate ie 11L/11C left circuit and 11R right circuit or 29R/29C right circuit and 29L left circuit • Helicopters overly the runways midfield at 500 feet altitude • Helicopter circuit directions conform to that of the active runway and are conducted within the fixed wing circuit • Practice instrument approaches may be approved by ATC
Aviation fuel	• Air BP (John Betts Aviation Fuel Service Pty Ltd) AVGAS, F34 (military JET A-1) and JET A-1 available during nominated hours • Clamback and Hennessy AVGAS available during nominated hours • Mobil AVGAS and JET A-1 available during nominated hours • Aeroshell (Skyfuel Australia Pty Ltd) AVGAS, JET A-1 and JET A-1 Plus available during nominated hours Fuel is supplied by road tanker. Storage is provided by the fuel supplier but the airport was unable to advise the volumes on site.
Terminals and other major aviation support infrastructure elements	A small single level terminal (around 715m^2) is available. Passenger throughput charges apply. Studies suggest the terminal has a passenger processing capacity of 170 departing passengers and 150 arriving passengers at International Air Transport Association (IATA) Level of Service (LOS) Category “C”. There are 90 separate hangar structures at Bankstown, 26 of which are owned by the Airport. Not all hangars are used for aircraft storage.

	Additional activities taking place within the hangar buildings include aircraft maintenance, flying schools, executive flight operations, and air freight. Most of the hangars have annexes or space for supporting ancillary activities such as offices, classrooms, storage, workshops, toilets and kitchens.
Security	Security Controlled Airport
Border Agencies	Not applicable can be supplied from Richmond if required.
Air traffic management and airspace management arrangements	Class D ATC services are provided during specified hours within the Bankstown Control Zone (CTR). These are 0600-2130 hours local weekdays and 0600-2030 hours local weekends. The CTR is of 3 nautical miles radius to the north with truncated sides to the east, south and west, and operates from the surface to an altitude of 1,500 feet. Outside of tower operations hours, the airspace reverts to Class G and Common Traffic Area Frequency (CTAF) procedures apply. The Bankstown CTR on the eastern and southern sides abuts the Sydney CTR, with the Sydney Control Area (CTA) overlying the Bankstown CTR above 1,500 feet altitude. Danger Area D539A abuts the northern CTR boundary and forms part of the Lane of Entry for Bankstown. It operates from the surface to an altitude of 2,000 feet and is active during daylight hours. D539B abuts D539A to the north-west and forms the other part of the Lane of Entry for Bankstown. It operates from the surface to an altitude of 2,500 feet and is active during daylight hours. Restricted Areas to the south are R555A which extends from the surface to an altitude of 1,500 feet and is active continuously and R555B which overlays R555A and extends from an altitude of 1,500 feet to a NOTAM altitude when active, which also occurs by NOTAM. Both of these areas are associated with firing. Restricted areas R555C and 555D abut R555A and 555B to the south. R555C extends from the surface to an altitude of 3,000 feet and is active between 0700-2100 hours local. R555D overlays R555C whose vertical limits are defined by NOTAM as is hours of operation. They are also associated with firing. Danger Area D556A abuts the western boundary of the CTR and operates from the surface to an altitude of 2,500 feet. It is associated with civil flying training and is active during daylight hours. Bankstown Airport's airspace is approximately centrally placed in relation to the complex airspace arrangements within the Sydney Basin. **Figure 5** shows the airspace arrangements in the vicinity of the airport.

Figure 5 – Bankstown Airport Airspace Arrangements

Source: Airservices Australia 2010

The majority of traffic utilising Bankstown Airport operates under Visual Flight Rules (VFR) and entry/exit procedures to/from the CTR are promulgated in the En-route Supplement Australia (ERSA). Flight tracks established in relation to aircraft operating under Instrument Flight Rules (IFR) are shown in **Figure 6**. IFR departure and approach procedures are promulgated in the relevant Departure and Approach Charts (DAP).

Figure 6 – Bankstown Airport IFR Flight Tracks

Source: Airservices Australia 2010

Other airports within 50km of Bankstown are:

- Sydney Airport approximately 17km to the south-east;
- Holsworthy Aerodrome approximately 9km to the south-west;
- Camden Airport approximately 30km to the south-west;
- Wedderburn Aerodrome approximately 33km to the south-west;
- Wilton Aerodrome approximately 44km to the south-west;
- The Oaks aerodrome approximately 44km to the south-west
- RAAF Base Richmond approximately 40km to the north-west.

Aerodrome Rescue and Fire Fighting Services (ARFFS)	Not available on Airport
Operating restrictions	Noise abatement procedures in force as follows: • Preferred runway direction is 29 • Circuit training permitted: • 0600-2300 hours local Mon-Fri • 0600-last light hours local Sat-Sun • Operations between first light and 0700 hours local: • Operations in the 29 direction confined to Runway 29L, except that Runway 29C may be used if operationally required • Operations in the 11 direction confined to Runway 11R, except that Runway 29C may be used if operationally required • Between 1900 hours local or last light, whichever is earlier, to 0700 hours local, right hand circuits are mandatory when operating in the 11 direction and left hand circuits are mandatory when operating in the 29 direction • Between the hours of 2100-2300 hours local, aircraft departing Runway 11 (except circuit traffic) must turn left • Helicopters: • Low level helicopter training (other than circuit training) is only permitted between 0600–1900 hours local or last light (whichever is earlier) from Mon-Fri and between 0800-1800 hours local or last light (whichever is earlier) Sat-Sun
Known development capability and expansion planning	Bankstown Airport's current Master Plan was approved in 2005 and a Minor Variation approved in 2008. A new Preliminary Draft Master Plan (PDMP) was placed on public exhibition in late 2009 and has yet to receive Ministerial approval. The following information is based on the as yet unapproved PDMP. The PDMP proposes an extension of Runway 11C/29C of 220m to 1,636m with associated pavement strengthening to be able to facilitate Code 3C aircraft (eg Embraer 170) operating up to 50 tonne (MTOW). The proposed

runway extension would not make the airport capable of accommodating Code 4C aircraft such as the B737/A320. Supporting infrastructure such as taxiways/aprons etc is proposed to be upgraded to support the larger Code 3C operations.

The PDMP also makes provision for enhanced terminal facilities through the designation of an enlarged zone for future terminal development.

As traffic grows, demand for aircraft parking and storage facilities for both home-based and transient aircraft will also grow. It is anticipated that the number of grass and light aircraft tie-down facilities will be adequate to accommodate forecast traffic levels.

Based on the traffic forecast, it is estimated that an allowance needs to be made for an additional 20 new hangars (together with associated apron, taxiway and landside access areas) of various sizes and a substantial expansion of area set aside for freight operations, requiring in total an additional 7-8ha of land.

Figure 7 shows the 2029/30 aviation development concept from the PDMP.

Figure 7 – 2029/30 Aviation Development Concept

Source: BAL 2009

Figure 8 shows the 2029/30 Development Concept Land Use Zones. It contains provision for aviation, non-aviation and other land uses.

<table>
<tr>
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Figure 8 – 2029/30 Development Concept Land Use Zones

Source: BAL 2009

</td>
</tr>
<tr>
<td>Known constraints on future capacity or ability to meet current and future demand</td>
<td>

The forecasts shown below project in excess of 450,000 aircraft movements by 2029/30. Bankstown Airport has previously recorded a high of almost 500,000 movements in 1989/90 (the year of the domestic pilot's strike).

These movements were achieved under General Aviation Aerodrome Procedures (GAAP) and current ATC procedures now reflect Class D requirements. It is probably too soon to speculate on whether the introduction of Class D procedures on 3 June 2010, will have any capacity implications in the future.

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<tr>
<td>Aircraft noise contours and status</td>
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Figure 9 shows the proposed 2008/09 Australian Noise Exposure Index (ANEI) depicted in the 2009 PDMP.

Figure 9 – Proposed ANEI

Source: BAL 2009

Figure 10 shows a comparison between the currently endorsed 2024/25 Australian Noise Exposure Forecast (ANEF) and the proposed 2029/30 ANEF depicted in the 2009 PDMP.

BAL advised that the ANEI/ANEF have been endorsed by Airservices Australia.

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Figure 10 – 2024/25 and 2029/30 ANEF Comparison

Source: BAL 2009

6.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related	There are 180 tenants on the airport site both aviation and non aviation related. There is 108,404 sq. m. of Airport owned building and 1,234,247 sq. m. of airport subleases. The airport creates direct or indirect employment for over 6000 people. The Airport Environment Strategy reports that the airport is home to, inter alia, the following major tenants: *"Boeing Aerostructures Australia (BAA), formerly known as Boeing-Hawker de Havilland, is located in the southern precinct of the Airport (see Figure 5). BAA manufactures aircraft parts for a wide range of major aircraft manufacturers and generates significant export earnings.* *Toll Priority and Toll Ipec, in the north-east of the airfield, have relocated their Sydney airfreight logistics operations to Bankstown Airport. This terminal provides national small parcel handling services for the greater Sydney area.* *Turbomeca Australasia, located in the east of the Airport, is a subsidiary to the International Safran group, one of the world's leading aerospace corporations, specialised in propulsion, equipment and associated services.* *Bunnings, located in the southern precinct of the Airport, is a national hardware and home improvement products supplier owned by the Wesfarmers Group.*

<table>
<tr><td></td><td>Pickles (Airport Auctions), located in the south-eastern precinct of the Airport procures and auctions commercial and private motor vehicles. Pickles occupies in excess of 6 (six) hectares of land under the eastern runway approaches for the storage and sale of these vehicles”</td></tr>
<tr><td>Freight forecasts</td><td>BAL is seeking to continue to attract high value niche freight activity due to the airport’s operating efficiencies, availability of land for development of facilities and proximity to major transport routes (eg M5/M7).

In the PDMP it is estimated that freight related activity will grow to around 15,000 movements by 2029/30. This represents an overall growth rate of 57.9% between 2008/09 and 2029/30 and an annual compound growth rate of 2.2% over this period. This growth rate is slightly higher than the overall forecast traffic growth over the planning period. This reflects the growing relative importance of Bankstown as a freight hub. BAL anticipates that the pattern of freight activity will remain similar to the current pattern. While some allowance has been made for the utilisation of larger aircraft for freight operations, the majority of traffic is expected to utilise similar aircraft to those currently operating. It is estimated that the contribution of freight traffic to total traffic will rise slightly to 3.3% from the current 2.6%.</td></tr>
<tr><td>Plans to invest in upgrading</td><td>The PMDP provides a 5 year vision for the airport which will be followed where commercially viable.</td></tr>
<tr><td>Passenger patronage forecasts</td><td>The PDMP is not based on any assumption that the airport will become a major passenger transport airport or act as a surrogate second airport for Sydney. Rather, it is assumed that Bankstown Airport may accommodate low capacity/low frequency niche start-up operations by small regional or inter-state carriers.

The passenger forecast has been developed assuming such operations would utilise regional jet aircraft such as the Embraer E170 in addition to the Dash 8 and Saab 340 aircraft types. The Embraer E170, which is the Design Aircraft, has a maximum seating capacity of around 78 passengers. Approximately equal proportions of operations by each aircraft type are anticipated, with average load factors of 60%. Indicative projections are shown in Table 1. There may be opportunities for niche operators of even Code 3B (35-37 seat) aircraft.

BAL indicate that currently available apron space for RPT would become unavailable beyond 32 aircraft movements per day

Table 1 – Passenger Forecasts
<table>
<tr><th>Year</th><th>No. of Passengers</th></tr>
<tr><td>09/10</td><td>186,368 (Note 1)</td></tr>
<tr><td>10/11</td><td>279,552</td></tr>
<tr><td>11/12</td><td>372,736</td></tr>
<tr><td>12/13</td><td>372,736</td></tr>
<tr><td>13/14</td><td>372,736</td></tr>
</table></td></tr>
</table>

14/15	372,736
15/16	372,736
16/17	372,736
17/18	372,736
18/19	372,736
19/20	372,736
20/21	372,736
21/22	372,736
22/23	372,736
23/24	372,736
24/25	372,736
25/26	372,736
26/27	372,736
27/28	372,736
28/29	372,736
29/30	372,736

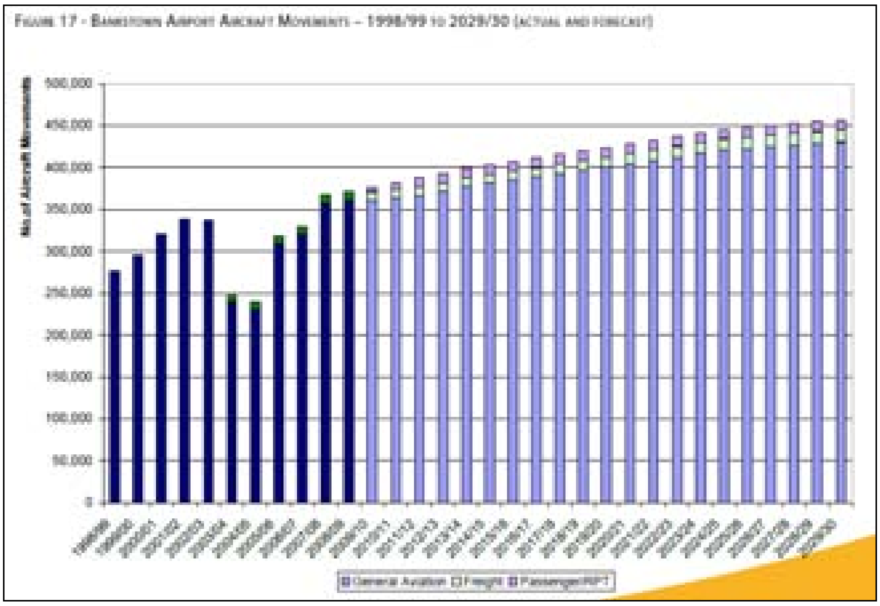
Source: BAL 2009

Note 1: as at June 2010 there were no scheduled passenger operations at the airport and as noted in the PDMP, any services will be driven by market demand.

Aircraft movements forecast by type

The 2009 PDMP contains aircraft movement forecasts to 2029/30 which are shown in **Figure 11**. The forecasts take into account such things as the runway extension and the start-up of niche passenger operations as well as continuing growth of the existing fleet mix.

Figure 11 – Aircraft Movement Forecasts



Source: BAL 2009

Table 2 shows a break-down of the projections for scheduled passenger aircraft movements which are reflected in **Figure 8** and **Table 3** shows the Integrated Noise Model (INM) aircraft categories adopted for the proposed 2029/30 ANEF.

Table 2 – Daily Passenger Aircraft Movement Forecasts

When	Aircraft	Regional Airline			Daily Total Movements
		Interstate Melbourne Brisbane	Intrastate Tamworth Coffs Harbour	Regional Dubbo Wagga Wagga	
Start-Up 2009/10	3 Embraer 170 3 Dash 8 2 Saab 340	6	6	4	16
Initial Growth		8	8	8	24
Ultimate Growth		10	10	12	32

Note: These are either a landing or a take-off. 16 movements over a 16 hour day may mean an average of 1 arrival or 1 departure on any day.

Source: BAL 2009

Table 3 – INM Fleet Mix Forecasts

TABLE 11 - DISTRIBUTION OF AIRCRAFT MOVEMENTS INTO AIRCRAFT TYPE CATEGORIES

Aircraft Type Category	Typical Aircraft in Category	% of Total Movements
Regional (interstate)	E170 DHC-8 Saab 340	2.7%
Regional (intrastate)	DHC6 Beech 1900D SA-226 Metro	2.3%
Business, Corporate and Charter	Cessna 441 Beech 200 Cessna 500 IA1125 Douglas DC3	4.3%
General Aviation	BEC58P GASEPV GASEPF	31.3%
Training	BEC58P GASEPV GASEPF	48.5%
Helicopter	Robinson R22 EC130	5.7%
Helicopter Training	Robinson R22	5.2%
Total		100%

Source: BAL 2009

Note:

- GASEPF represents a low performance single engine aircraft such as a Cessna 172
- GASEPV represents a high performance single engine piston aircraft such as a Beech Bonanza
- BEC58P represents a conventional twin engine aircraft such as a Piper Seneca

Costs for upgrades	BAL advise that $2.5 million is required for runway pavement resheeting

6.5 Accessibility and Surface Transport

<table>
<tr>
<td>Connections to Road</td>
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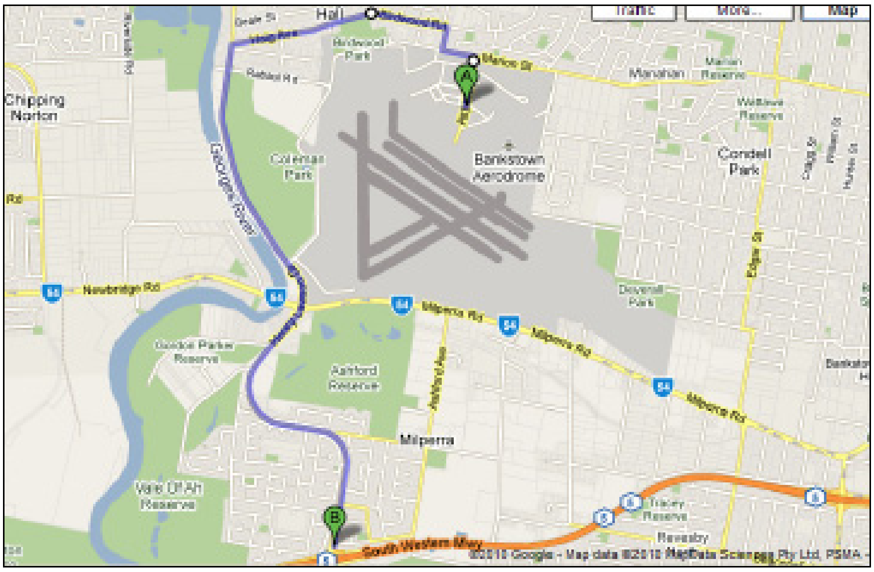
Nearest connection to the major road network is through Airport Ave and Marion St to Haig Avenue connection with Henry Lawson Drive. Thence, 6.1 km and 13 minutes to the South Western Motorway (M5)

Distance to Sydney CBD: 37.5 km and travel time 41 minutes approximately via the M5 and Eastern Distributor.

Figure 12 – Access to freeway



Distance to Liverpool 9.4 km and 20 minutes

Figure 13 – Access to Liverpool

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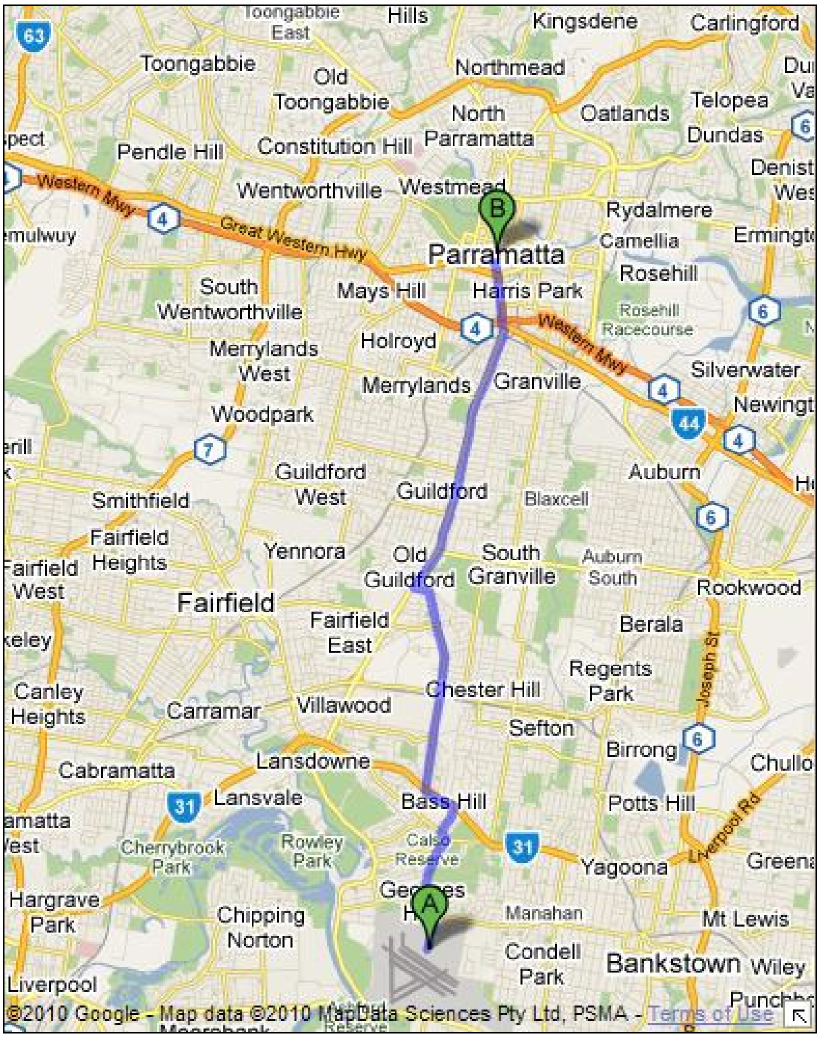
Distance to Parramatta 14.4 km and 32 minutes approximately

Figure 14 – Access to Parramatta



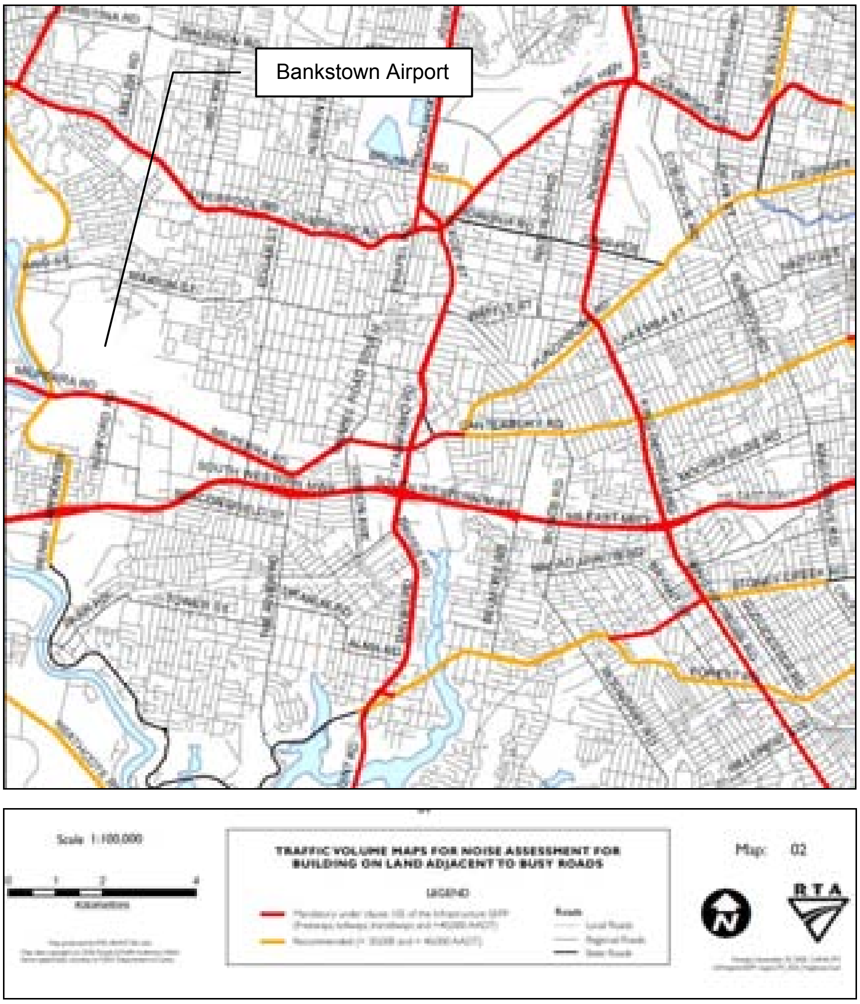
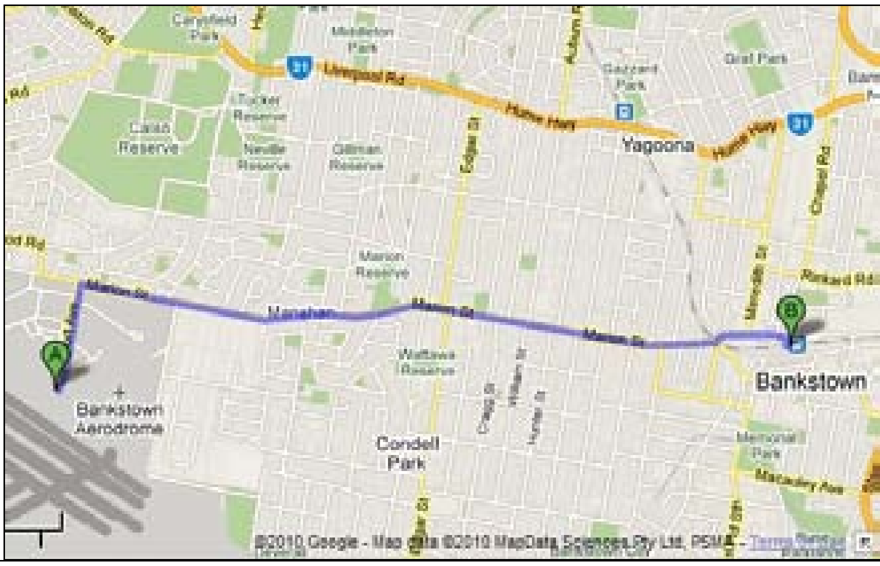
Traffic Volumes	**Figure 15 – Major Road network**  As can be seen in this figure Bankstown Airport is close to high capacity State roads being bounded by Milperra Road to the south and Henry Lawson Drive to the west and with the M5 tollway in close proximity to the south as well. Anecdotally, however, the M5 is heavily congested in peak periods as are local roads accessing it.
Access to rail	Bankstown Station: • Distance to nearest station (Bankstown) 4.7 km and travel time 11 minutes drive and 55 minutes walk approximately. • Bankstown Station to Central 19 km • Time to Sydney Central Station: Bankstown to Central 36 minutes (Bankstown Line) • Frequency of service: approximately 15 minutes • Cost: $4.00 one way

	Figure 16 – Access to Rail 
Airport Parking capacity - short term and long term	The site has ample at grade and on road parking for current operations and there is sufficient space to develop a dedicated parking area to support future RPT operations
Other transportation services available at airport	Bus – ○ Closest bus stop on Marion Street (500 m – approximately 6 mins walk) ○ Direct bus to Bankstown (Route 905) ○ Operator: Veolia operate services (Region 13) which depart form the airport ○ There are also charter bus services and extensive competition to supply similar services. Taxi – ○ available on call from Bankstown Station Rental cars - ○ Not available at the airport. Closest available 5.4 km. Shuttle services – ○ Nil
Walking and cycling	Walking is possible but not practical. Cycling possible via road network and via cycling tracks linking Liverpool, Cooks River, Canada Bay and Olympic Park to the airport.

6.6 Utilities and Services

Water and Sewer	Sydney Water provides trunk main services – at present there are no known capacity issues. The airport has 4 sewage pumping stations on site and 6000 metres of piping. There is 8000 metres of water piping.
Gas	Jemena Gas West is the service provider – not currently available on airport but available in Marion St adjacent.
Police, fire, ambulance hospitals.	Police ○ LAC Bankstown Police Station : (4.2km - approximately 9 mins) ○ Police Air wing based at the Airport Fire ○ Bankstown Fire Station: (5.9 km - approximately 13 mins) ○ RFDS have a office on site as do NPWS; Hospitals ○ Bankstown-Lidcombe Hospital: (5.2 km – approximately 12 mins) as well as Liverpool and Westmead The Air Ambulance service is also stationed on the airport
Power	Energy Australia Southern is the service provider – the airport has two HV feeders one from Bass Hill and one from Milperra and there are no current supply capacity issues.
Telecoms	Telstra – Liverpool is the service provider. No capacity issues are reported.

6.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for airport development	The key planning and environmental legislation and planning policies which are responsible for guiding the development of land around the Bankstown Airport site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979; • Environmental Planning and Assessment Regulations 2000; • State Environmental Planning Policy (Infrastructure) 2007; • Bankstown Local Environmental Plan 2001. However these do not regulate development on the airport itself which is via the airport master planning process as laid down in the Airports Act 1996 and the Airports (Environment Protection) Regulations 1997.Nevertheless, BAL has a Memorandum of Understanding with Bankstown City Council to provide information to council on proposed developments on the airport site and in addition the Masterplan itself has been developed to try to be consistent with the LEP.

The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales.

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) is a state statutory policy that aims to "facilitate the effective delivery of infrastructure across the State". This infrastructure includes "airports" and the provisions which specifically relate to airports are contained in Part 3, Division 1 "Air transport facilities". ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent.

The *Bankstown Local Environmental Plan 2001* (the LEP) is the local statutory planning instrument that guides development in the Bankstown Local Government Area (LGA). The airport is zoned 5 Special Uses "Aerodrome" under the Bankstown LEP 2001.

Figures 17 & 18 - Zoning

Extract of the Bankstown LEP zoning maps

Source: http://www.bankstown.nsw.gov.au.htm

The LEP includes provisions that are specifically relevant to the airport:-

- Clause 24 “Airports” states:

(1) In determining an application for consent to development on land in the vicinity of Bankstown Airport, the consent authority must consider:

(a) the impact of the airport on the development to which the application relates in terms of Australian noise exposure forecasts, and

(b) the obstacle limitation surface plan for the airport completed by the operator of the airport.

(2) In regard to Bankstown Airport:

(a) a dwelling (other than a dwelling house) may be erected on land in the vicinity of the airport where the ANEF is between 20 and 25 only if the dwelling meets Australian Standard AS 2021—2000, Acoustics—Aircraft noise intrusion—Building siting and construction regarding interior noise levels, and

(b) a dwelling house or housing for older people or people with a disability must not be erected on land in the vicinity of the airport where the ANEF exceeds 25 unless the Council is satisfied that the nature of occupation or internal noise attenuation measures enable reasonable amenity for the occupants, and

(c) development for the purpose of dual occupancy, villas or rowhouses is prohibited on land in the vicinity of the airport where the ANEF exceeds 25, and

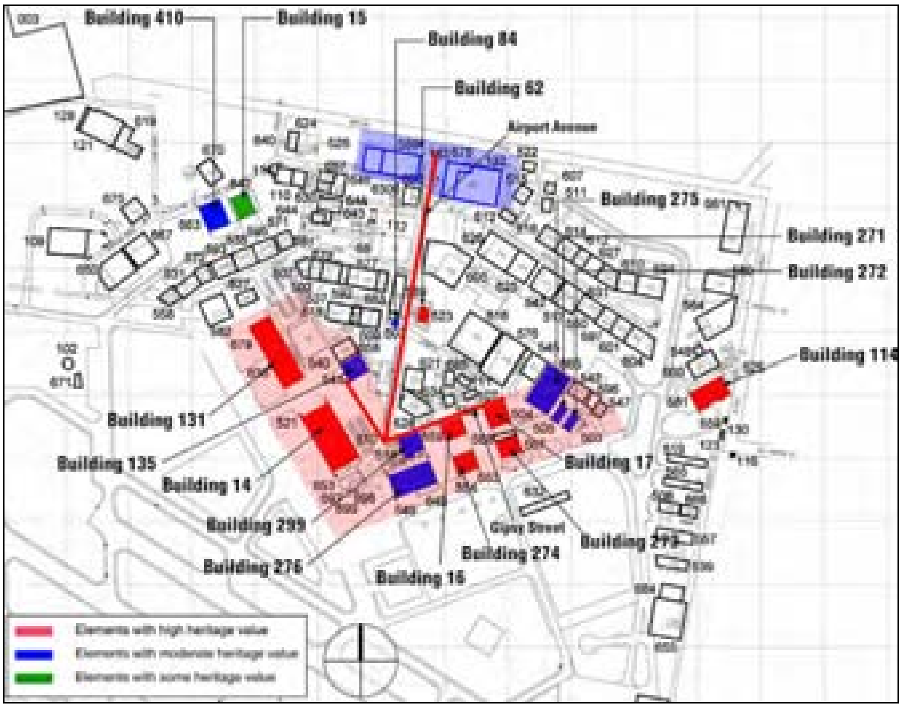
	(d) a hotel, motel, office premises or a public building may be erected on land where the ANEF for the airport is above 25 only if the building meets Australian Standard AS 2021—2000, Acoustics-Aircraft noise intrusion—Building siting and construction regarding interior noise levels.

6.8 Environmental Factors, Frameworks and Policies

Site characteristics	As stated above, Bankstown Airport is zoned 5 Special Uses "Aerodrome" under the LEP. The site is relatively flat and the majority of Airport subject to Low Risk flooding with SW quadrant liable to Medium to High Risk Flooding as would be Milperra Road and Henry Lawson Drive (refer to the Figures below). The south-western boundary of the site, along Milperra Road, is classified as a bushfire buffer zone. The airport is either bounded by or has in close proximity urban and industrial development.
Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangers species Designated environmental management areas Existing environmental assets Heritage scientific and aesthetic qualities/issues Wetlands and other	The site is surrounded by urban land, including residential, commercial, industrial and open space areas. The major population centres of Bankstown, Liverpool, Fairfield and Parramatta are located within an approximate 20 minute drive of the site. The Airport is adjoined by the following land use zones: • 2(a) Residential; • 6(a) Open Space; • 5 Special Uses "Educational and community Purposes"; • 6b Private Recreation; • 4a General industrial; and • 4b Light Industrial. The Airport Environment Strategy 2010 identifies two sites which are considered by BAL to be "environmentally significant". These are: • that area of the north-west precinct of the Airport populated by Hibbertia glabrescens MS, a species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* as "critically endangered"; and • that area adjacent to the stormwater drains in the north-east precinct of the Airport populated by Acacia pubescens, a species listed under both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the *NSW Threatened Species Conservation*

sources of bird hazard	*Act 1995* as "vulnerable." Both of these areas have been identified in Figure 5 – Bankstown Airport Landuse Zones 2029-30. **Figure 19 – On airport Zonings**  Additionally, BAL has *"identified the bushland located on the eastern side of the Airport adjacent to the Deverall Park recreation area (Refer Figure 5) as having environmental values. This area contains Cooks River/Castlereagh Ironbark Forest and Sydney Coastal River Flat Forest, both of which are listed as an "Endangered Ecological Community (EEC)" under the NSW Threatened Species Conservation Act 1995. The bushland which is also considered to be of local value or interest has been identified by BAL as an Environment Protection Zone."* In respect of Non-indigenous Cultural Heritage, the AES reports that: *"The Airport has historical significance as the location of an RAAF station from the 1940s to the 1960s. The Bankstown Airport Heritage Management Strategy 2005 identified elements having heritage significance relating to their use at this time and provided for the conservation of those buildings of particular heritage significance and the chevron ('V') shaped alignment of hangars at the southern end of Airport Avenue, on the northern part of the site."*

Figure 20 - Heritage



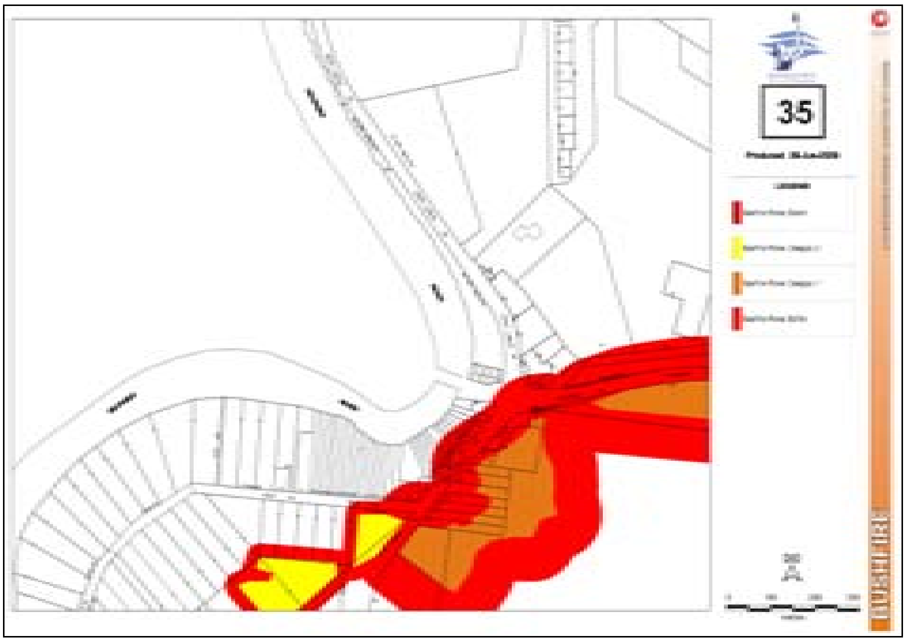
Source: Figure 5.2 Heritage Values – Bankstown Airport Heritage Strategy 2005

Bankstown Airport is listed for heritage purposes on the Register of the National Estate (RNE) as an "indicative place".

There are no known indigenous sites of significance.

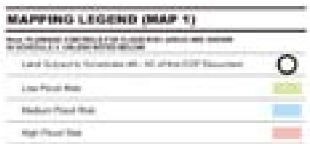
Bushfire affectation does not appear to be a significant issue within the vicinity of the site, although in the southwest corner of the site some land is rated as a buffer zone to areas of category 1 vegetation

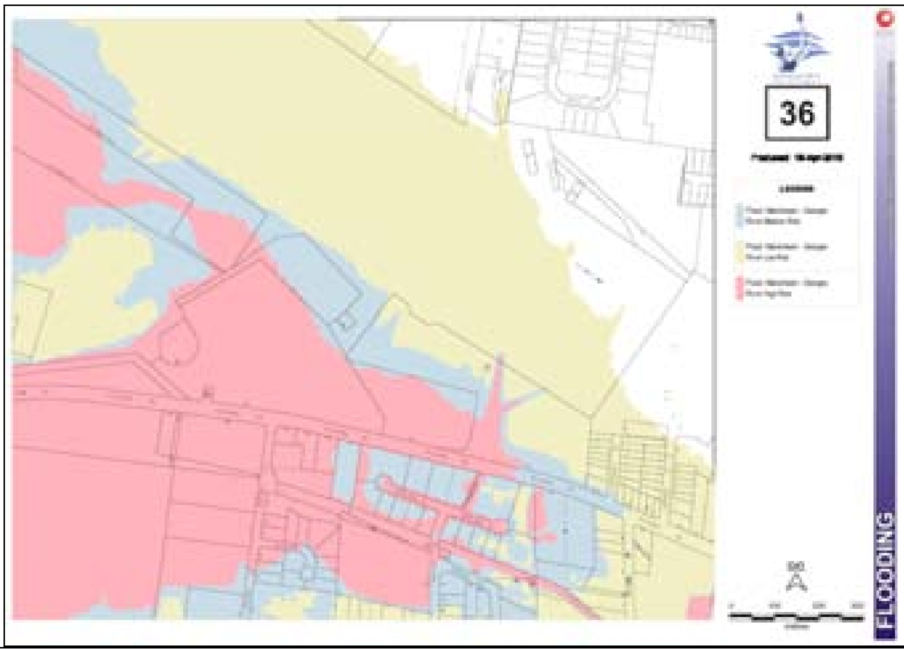
Figure 21 –Bush fire prone land



The Georges River is located approximately 500m to the west of the site. As the following figures show the airport is liable to varying degrees of inundation by flooding depending of the severity of the flood but with the worse affects concentrated in the southwest corner. Recent development in the area has been on raised mounding to mitigate this issue.

Figures 22, 23 & 24–Flood prone land





	
Existing Environmental Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	The Minister for Infrastructure Transport Regional Development and Local Government recently approved the Airport Environment Strategy 2010 for Bankstown Airport. Stated on the Airport's web site: *"The purpose of the Airport Environment Strategy is to meet the Airport's obligations under the Airports Act 1996 and the Airports (Environment Protection) Regulations 1997.* *The Airport Environment Strategy identifies the Airport Lessee Company's (ALC's) objectives for environmental management of the Airport, sources of environmental impact associated with airport operations and outlines the environmental management strategies and actions that will be implemented at the Airport over the five years of the Strategy. It forms the central management tool that is used to ensure integrated management of ground-based activities at the Airport, in order to minimise the impacts of activities at the Airport on the environment of the Airport and its surroundings."* And *"The Airport Environment Strategy is reviewed at least every five years. Public consultation is undertaken in the course of the review."* Topics addressed in the AES include: • air quality; • water quality;

	• soil quality; • noise; • flora and fauna; • heritage; • waste; • climate change and resource use; and • social and community. The Airport Environment Strategy 2010 outlines the way in which these issues have been addressed in an operating airport environment. Bankstown Airport has a Noise Management Plan called "Fly Neighbourly". According to the Bankstown Airport website, Fly Neighbourly aims to educate pilots and aviation businesses to consider the noise impacts they generate and advises how best to minimise noise.
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	It is considered that Bankstown Airport is heavily constrained by existing surrounding urban development which is likely to constrain expansion. A particular example is the possibility of residential development on a golf course site to the southwest. While this would not impact on the OLS, it could place additional pressure on flying operations for further forms of noise mitigation. Land on the airport in north northeast corner of the site is being rezoned to "*mixed use*" through the master planning process but is yet to be approved. The basis for rezoning to "*mixed use*" is that realistically this part of the site has some long term aviation leases attached and it is unlikely that it can be fully turned over to a business zone in relative short period of time. Having it classified as "*mixed use*" will allow BAL to progressively introduce commercial activity on Marion Street across the road from residents. This is intended to create better amenity and potentially assist in reducing aircraft noise for residents. Furthermore, the Airport is challenged financially since General Aviation is stagnant, flying schools are closing, RPT services are not operating; charter fleets are getting out of date. This places pressure to generate revenue from non aeronautical sources such as commercial development.

6.9 Community and Public Amenity Factors

Community attitudes to airport	BAL regard attitudes to the airport as generally favourable notwithstanding that from time to time there are issues of concern expressed by Bankstown

	City Council such as: • increasing the passenger flights to 12-32 passenger flights per day, seven days a week due to noise expansion and traffic congestion affecting up to 1000 additional properties; • concerns about inappropriate land uses still being allowed such as schools on airport land; • increasing development on airport land without upgrading of all the regional roads and intersections such as those at Birdwood Road and Haig Avenue; • closure of Tower Road, a wholly on airport road but which was used as a public thoroughfare by non airport traffic. BAL regards these not reflective of the normal standard of relationship with Council.
Airport interaction with Communities	The following extract from the Airport Environmental Strategy outlines the approach adopted by the Airport in interacting with the community. *"Table 9 Community Impact Management Objectives, Targets and Management Measures* *Objectives:* *1. Act as a good neighbour and to undertake reasonable and practicable actions to prevent or minimise impacts from the Airport.* *2. Be open and frank with stakeholders and the community regarding Airport operations.* *3. Maintain a consultative network that conveys Airport information to BAL's stakeholders and the community.* *4. To be, and be perceived as, responsible managers of environmental issues.* *Targets:* *1. Production of environmental information on the Bankstown Airport website for the community.* *2. Production of quarterly community newsletters.* *3. Biannual meetings of the BACCF.* *Actions: BAL will:* *1. Produce and maintain environmental information on the Bankstown Airport website for the community (Annually).*

	2. Produce and distribute community newsletters to a minimum 15000 households (Quarterly). *3. Organise meetings of the BACCF (Quarterly).* *4. Continue the tenant Newsletter (Monthly).* *5. Engage with Bankstown City council to rehabilitate and regenerate the Environment Protection Zone on the Airport with the view to making it suitable for general public access as a nature conservation zone and nature walk within 10 years."*

6.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010*. Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. http://www.airservicesaustralia.com/ http://www.bankstownairport.com.au/Home/Home.aspx http://www.bankstownairport.com.au/Environment/Environment_Strategy/Airport_Environment_Strategy_2010/Bankstown_Airport_Environment_Strategy_2010.aspx http://www.bankstown.nsw.gov.au.htm

Camden Airport

CONTENTS

7 CAMDEN AIRPORT

7.1 Introduction

Camden Airport is located approximately 2km from the town of Camden[1] and is accessed from Macquarie Grove Road. **Figures 1 and 2** depict aerial images of the airport site.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Area)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

Camden Airport is historically linked to the Macarthur-Onslow family, descendants of John Macarthur, a man widely regarded as the "father" of the Australian Wool industry and linked to the airport's role during World War II. Camden Airport was constructed in 1935 on the Macarthur-Onslow family property and was initially used as a private aerodrome.

The onset of World War II resulted in the Federal Government purchasing the site. Camden Airport was home to at least seven squadrons that undertook training, anti-submarine, convoy escort, reconnaissance, general air and meteorological roles. A large US Army Air Corp was based and barracked at the airport.

In 1946, the Department of Civil Aviation assumed ownership of the airport and new aviation infrastructure was added in subsequent years. In 1988, the airport ownership was transferred to the Federal Airports Corporation (FAC). In 1998, ownership of Camden Airport was transferred, along with Bankstown and Hoxton Park Airports from the FAC to Sydney Airport Corporation Limited (SACL), as part of the winding-up of the FAC following the privatisation of its non-Sydney Basin airports. In 2003, the airport lessee company was sold to the BaCH Consortium.

Today, the airport lessee company is Camden Airport Limited (CAL) which is one of the two trading entities of BAC Airports Pty Limited, the other being Bankstown Airport Limited (BAL). They operate as Sydney Metro Airports. Collectively, these accommodate the bulk of general aviation (GA) operations in the Sydney Basin. BAC Airports is a privately held company.

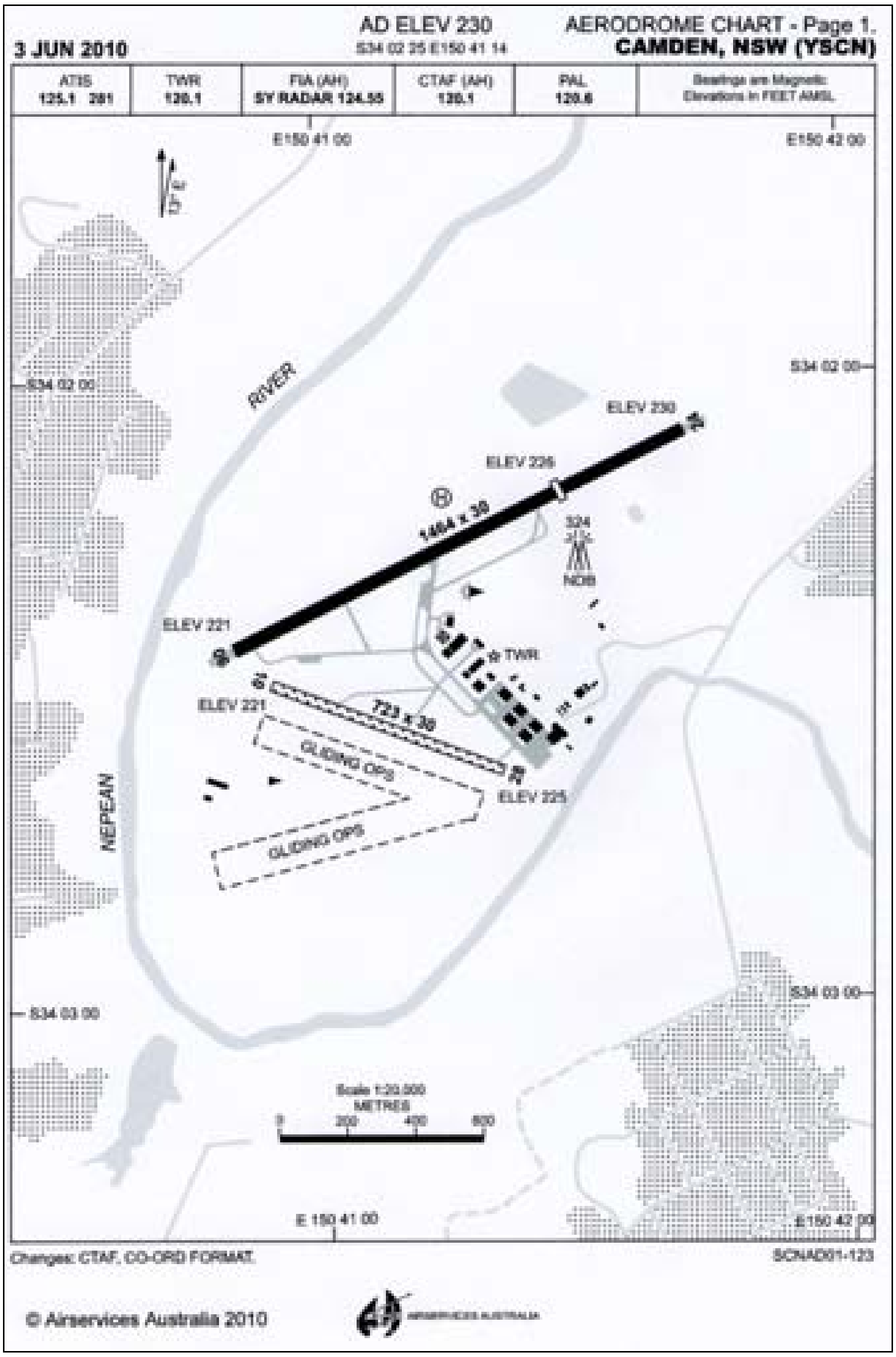
Note that the airport operations review detailed below addresses aviation related activity only. CAL along with many other airports may be providing for and anticipating additional non-aviation commercial development within its landholdings. Therefore, in assessing the airport's capability for enhanced aviation activity, it needs to be recognised that areas currently undeveloped may in fact already be leased and/or the subject of development proposals.

7.2 Current Site Attributes

Airport location and LGA	S 34 degrees 2.4 minutes E 150 degrees 41.2 minutes Camden Council LGA
Ownership and management; lessee/operator	Camden Airport Limited (operator and airport lessee company) (CAL)
Aerodrome Category	Registered
Applicable regulatory regime	• Airports Act 1996 • Civil Aviation Safety Regulations (CASR) Part 139 - Aerodromes
Site area and physical dimensions	196ha
Major centres of population, and population growth	Camden, Narellan, Campbelltown and the South-western urban growth area of Sydney generally
Elevation	230 feet
Surrounding topography	Camden Airport lies within a loop of the Nepean River with rising ground towards the north east and under the approach to runway 24
Liability for flooding	Camden Airport lies within the flood plain of the Nepean River and is liable to major flooding over much of the site. Anecdotally, the flood water dissipates quickly.
Atmospheric conditions	The airport can affected by fog several days each year

7.3 Airport Operations

Summary of main activities	The airport accommodates activities (fixed wind and helicopters) supporting commercial, private, sports/recreational aircraft and flying training. Aircraft size tends towards the smaller end of the GA spectrum. The airport is also the major gliding centre for the Sydney Basin. Instrument flight training is undertaken. Camden is the only Non-Directional (NDB) aerodrome in the Sydney Basin available for training.
Current passenger numbers	Not applicable – No RPT Operations
Current aircraft movement numbers	63,390 (2008/09 as estimated by CAL)
Current freight throughput	Not applicable – No Commercial freight operations
Known sources of delay in airport and runway operations	It is probably too soon to speculate on whether the introduction of Class D Air Traffic Control (ATC) procedures on 3 June 2010 will have any delay implications in the future.
Movement/manoeuvring area details	
Runways	• 06/24 – 1464m x 30m (Code 2) • 10/28 – 723m x 30m (Code 1) • Two grassed gliding strips, one near parallel to Runway 06/24 and one parallel to Runway 10/28 • There is a designated helicopter landing site (HLS) on the northern side of Runway 06/24
Runway strips	• 06/24 - 1584m x 90m • 10/28 – 783m x 90m
Taxiways	There are a number of sealed and natural surface taxiways serving both runways including a section of dual parallel taxiways between the building area and Runway 06/24. There are sealed aircraft run-up bays near the mid-point of Runway 06/24 and 06 and 10 runway ends. **Figure 3** shows the runway and taxiway layout.

	Figure 3 – Runway and Taxiway Layout  *Source: Airservices Australia 2010*
Aprons	The hangar areas are supported by sealed apron areas and there are natural surface aircraft parking areas external to the main hangar areas.

Airfield pavements	Runways • Runway 06/24 – 48a 5700/580(84PSI) sealed (eg aircraft up to say Metro II) • Runway 10/28 – 24c 5700/580(84PSI) grassed brown silt clay (eg aircraft up to say Beech Kingair – 5,700kg Maximum Take-Off Weight (MTOW) version) Taxiways – no designations • 5,700kgs Aprons • 5,700kgs
Airfield operating restrictions	Open for public use, charges apply to all aircraft.
Airfield lighting and approach systems	• Runway 06/24 – low intensity edge lighting • Taxiway centreline green lighting
Visual navigation aids	• Runway, taxiway and apron markings and markers • One illuminated wind direction indicator (IWDI) and one wind direction indicator (WDI)
Radio navigation aids	Non-Directional Beacon (NDB)
Surveillance systems	Nil
Operational procedures	• Right hand circuits required for powered aircraft operating Runways 24 and 28 • Right hand circuits required for gliders/tugs operating on the glider strips 06 and 10 • Simultaneous operations from parallel glider strips. Contra circuits in operation. There is no dead side with contra circuits. • Glider/tug circuits to the south or south-east, all other aircraft circuits to the north or north-west • Helicopters conduct low level operations in the south west corner of the

	aerodrome • During the summer months fire fighting aircraft may operate and other aircraft should give priority to these aircraft
Aviation fuel	• Air BP (Skyfuel Australia Pty Ltd) AVGAS 24 hours • Mobil (Camden Aviation) AVGAS and JET A-1
Terminals and other major aviation support infrastructure elements	No terminal: Currently, there are 18 hangar buildings. In addition to aircraft storage, the hangars provide space for a variety of aviation-related activities including maintenance, flying schools, corporate aircraft / executive aviation facilities and freight operations. **Table 1** summarises the main facilities.

Table 1 – Summary of Main Facilities

Activities	Number
Flying Schools and Flight Training	5
Flying Clubs	2 (Gliders)
Airport Hangar Storage Facilities	17
Aircraft Hire	1
Air Charter Operations	4

Note 1: Businesses providing more than one service are counted separately in each service category

Note 2: Excludes 15 individual glider storage units

Source: CAL 2010

Security	Not a Security Controlled Airport
Border Agencies	Not applicable
Air traffic management and airspace management arrangements	Class D ATC services are provided Mon-Sun 0800-1800 hours local within the Camden Control Zone (CTR). The CTR is of 2 nautical miles radius and operates from the surface to an altitude of 2,000 feet. Outside of tower operations hours, the airspace reverts to Class G and Common Traffic Area Frequency (CTAF) procedures apply. Danger Area D552 abuts the CTR to the west and south west and operates from the surface to an altitude of 4,500 feet. It is associated with civil flying training and is active during daylight hours. Danger Area D556B lies to the north of the CTR and operates from the surface to an altitude of 4,500 feet. It is associated with civil flying training and is active during daylight hours.

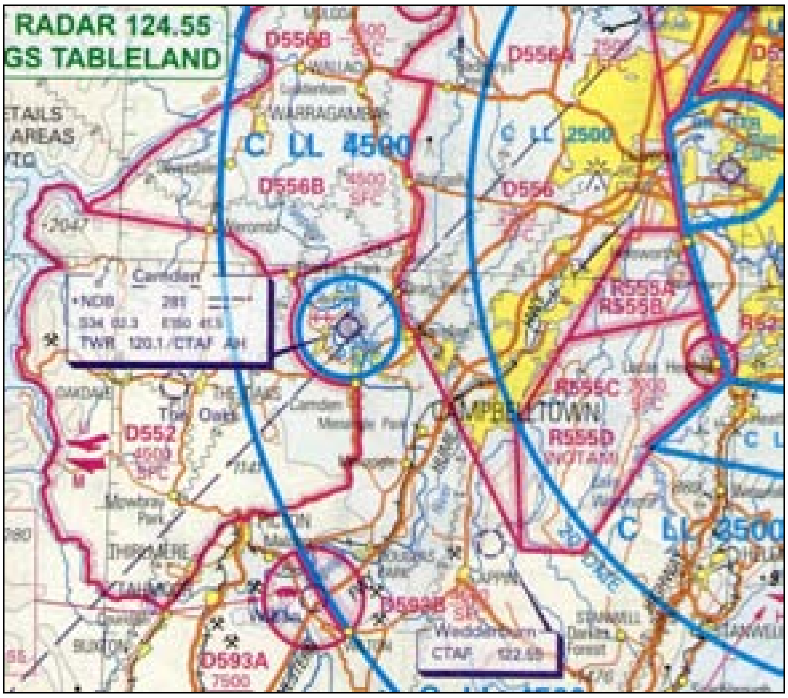
Danger Area D556A lies to the north-east of the CTR and operates from the surface to an altitude of 2,500 feet. It is associated with civil flying training and is active during daylight hours. Restricted Areas to the east are

Restricted Area R555A which extends from the surface to an altitude of 1,500 feet and is active continuously and R555B which overlays R555A and extends from an altitude of 1,500 feet to a NOTAM altitude when active, which also occurs by NOTAM. Both of these areas are associated with firing. Restricted areas R555C and 555D abut R555A and 555B to the south. R555C extends from the surface to an altitude of 3,000 feet and is active between 0700-2100 hours local. R555D overlays R555C whose vertical limits are defined by NOTAM as is hours of operation. They are also associated with firing.

Camden Airport's airspace lies towards the south-western corner of the complex airspace arrangements within the Sydney Basin.

Figure 4 shows the airspace arrangements in the vicinity of the airport.

Figure 4 – Camden Airport Airspace Arrangements



Source: Airservices Australia 2010

The majority of traffic utilising Camden Airport operates under Visual Flight Rules (VFR) and entry/exit procedures to/from the CTR are promulgated in the En-route Supplement Australia (ERSA). Flight tracks established in relation to aircraft operating under Instrument Flight Rules (IFR) are shown in **Figure 5**. IFR approach procedures are promulgated in the relevant

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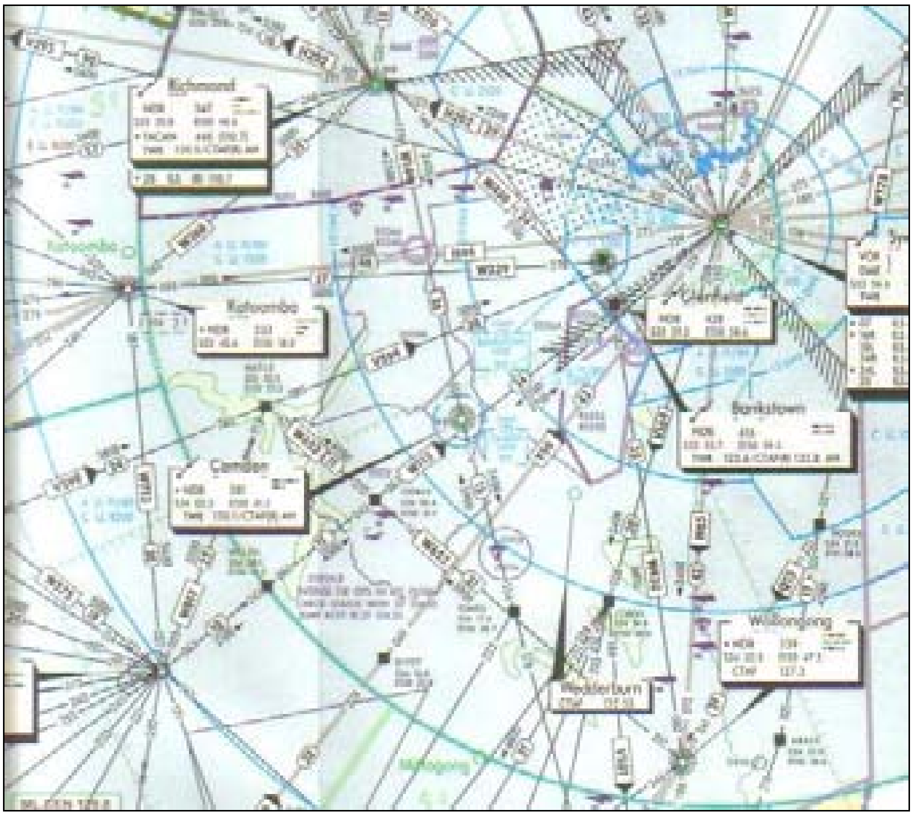
Departure and Approach Charts (DAP).

Figure 5 –Camden Airport IFR Flight Tracks



Source: Airservices Australia 2010

Other airports within 50km of Camden are:

- Bankstown Airport approximately 30km to the north-east
- Sydney (Kingsford-Smith) Airport approximately 46km to the north-east
- Holsworthy Aerodrome approximately 25km to the east (military)
- RAAF Base Richmond approximately 49km to the north (military)
- The Oaks aerodrome approximately 14km to the south-west (private)
- Wilton Aerodrome approximately 20km to the south (private)
- Wedderburn Aerodrome approximately 19km to the south east (private)
</td>
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<tr>
<td>Aerodrome Rescue and Fire Fighting Services (ARFFS)</td>
<td>Not applicable – Not available on site.</td>
</tr>
</table>

Operating restrictions	Noise abatement procedures in force as follows: • Runway 06 preferred • Practice instrument approaches are not permitted on the Camden NDB or GPS procedures between 2300-0600 hours local • Circuit training permitted between 0615-2300 hours local Mon-Fri and between 0615-2000 hours local Sat-Sun • Parachute operations not permitted within the lateral limits of the CTR outside of tower hours of operation • For glider operations, aircraft other than gliders or tugs must not infringe the glider circuit below 2,300 feet and by day aircraft conducting practice instrument procedures must not descend below 2,300 feet
Known development capability and expansion planning	Camden Airport's current Master Plan was approved in 2005. A new Preliminary Draft Master Plan (PDMP) was placed on public exhibition in late 2009 and has yet to receive Ministerial approval. The following information is based on the as yet unapproved PDMP. **Figure 6** shows the 2029/30 development concept from the PDMP. It contains provision for aviation, aviation support and other land uses. There are no plans for significant movement area infrastructure upgrading such as runway lengthening etc.

	Figure 6 – 2029/30 Development Concept  *Source: CAL 2009*
Known constraints on future capacity or ability to meet current and future demand	The forecasts shown below project around 145,000 aircraft movements by 2029/30. Camden Airport has previously recorded a high of approximately 135,000 movements in 1975/76. Although ATC procedures now reflect Class D requirements in lieu of the previous General Aviation Aerodrome Procedures (GAAP), it is unlikely there would be an inability to accommodate the aircraft movements projected for 2029/30.
Aircraft noise contours and status	**Figure 7** shows a comparison between the currently endorsed 2024/25 Australian Noise Exposure Forecast (ANEF) and the proposed 2029/30 ANEF depicted in the 2009 PDMP.

Figure 7 – 2024/25 and 2029/30 ANEF Comparison

Source: CAL 2009

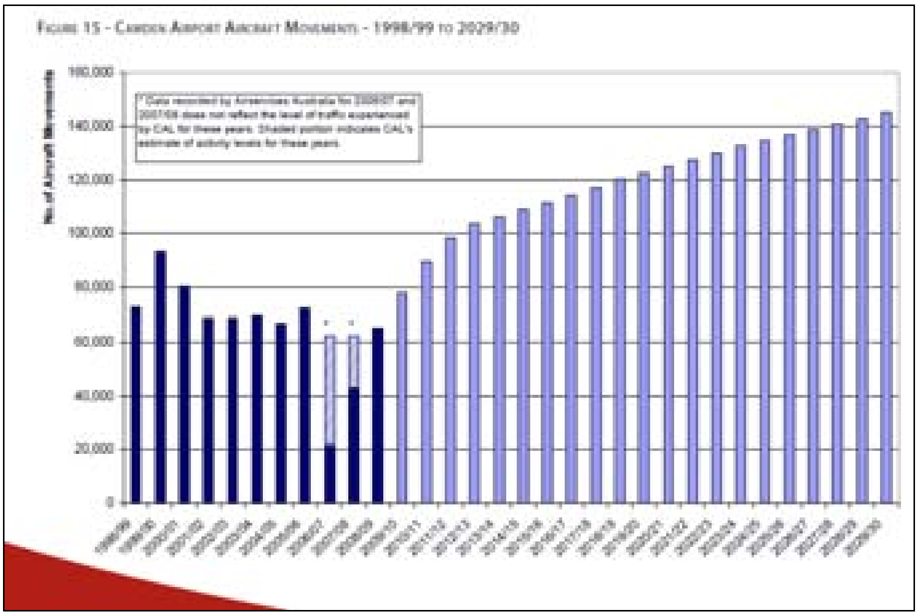
7.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related;	There are approximately 40 tenants at Camden Airport carrying out a limited range of aviation and non-aviation activities. Glider manufacture, fuel sales, flying training schools and aircraft maintenance are some of the aviation related activities. Communications equipment manufacture, carbon fibre engineering and upholstery are some of the non-aviation related activities. With the exception of glider storage hangers, the tenants are clustered in the eastern part of the site.
Freight forecasts;	Not applicable
Plans to invest in upgrading;	There are no investment plans currently for Camden Airport although the there is scope for developing a new hanger complex. CAL intends to maintain the status quo at the present time.
Passenger patronage forecasts;	Not applicable
Aircraft movements	The 2009 PDMP contains aircraft movement forecasts to 2029/30 which are

forecast by type;

shown in **Figure 8**. As there are no major movement area changes proposed or changes to the design aircraft, types could be expected continue to reflect the current fleet mix. **Table 2** shows the Integrated Noise Model (INM) aircraft categories adopted for the proposed 2029/30 ANEF.

Figure 8 – Aircraft Movement Forecasts



Source: CAL 2009

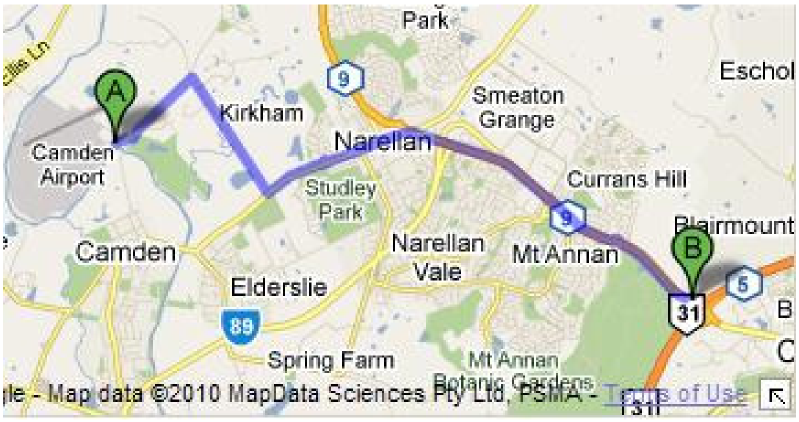
Table 2 – INM Fleet Mix Forecasts

Aircraft Type Category	Typical Aircraft in Category	% of Total Movements Year 1
General Aviation	BECP58 GASEPV GASEPF	37.4%
Fixed Wing Training	BEC58P GASEPV GASEPF	54.2%
Gliding	GASEPV GASEPF	5.90%
Helicopter	HELICO	2.50%
Total		100%

Source: CAL 2009

	Note: • GASEPV represents a low performance single engine aircraft such as a Cessna 172 • GASEPV represents a high performance single engine piston aircraft such as a Beech Bonanza • BEC58P represents a conventional twin engine aircraft such as a Piper Seneca • HELICO represents a conventional single engine turbine helicopter such as the Eurocopter EC130
Costs for upgrades	No investment planned

7.5 Accessibility and Surface Transport

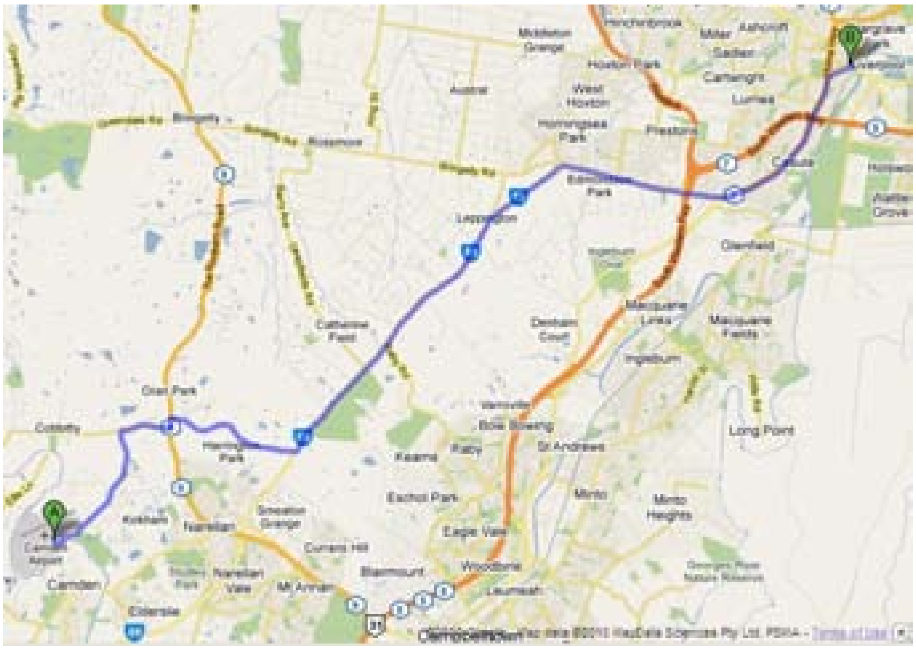
Connections to Road	Nearest connection to the major road network is the aerodrome boundary with the Macquarie Grove Rd. Thence, 11.9 km and 23 minutes to the South Western Motorway (M5). Distance to Sydney CBD: 66 km and travel time 1hour 8minutes approximately. **Figure 9 – Access to Freeway** 

Distance to Parramatta 55 km and 61 minutes approximately.

Figure 10 – Access to Parramatta

Distance to Liverpool: 30.3 km and43 minutes

Figure 11 – Access to Liverpool



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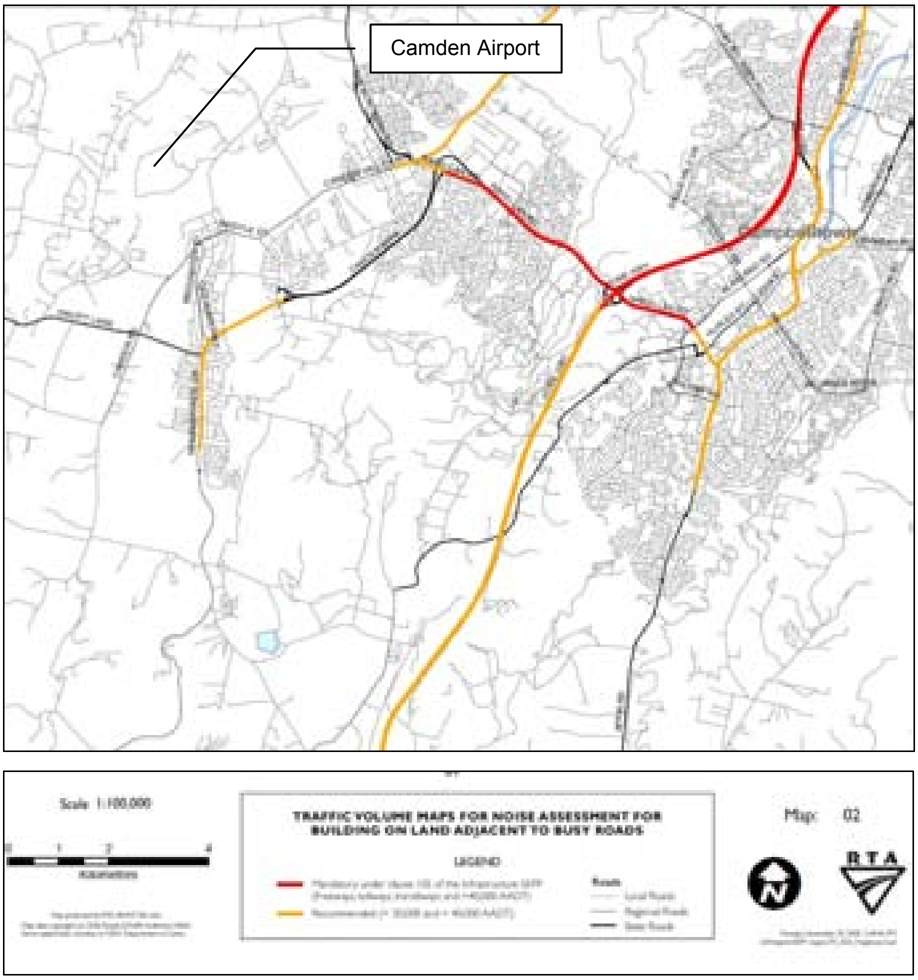
<tr><td>Traffic Volumes</td><td>

Figure 12 – Major Road System



Camden Airport is located in a quasi rural location some kilometres from the major road network. While the road network at the airport boundary is probably adequate for existing levels of usage, congestion can occur on the major road network on roads such as Camden valley way through Narellan and on Narellan Road which links to the M5 Freeway.

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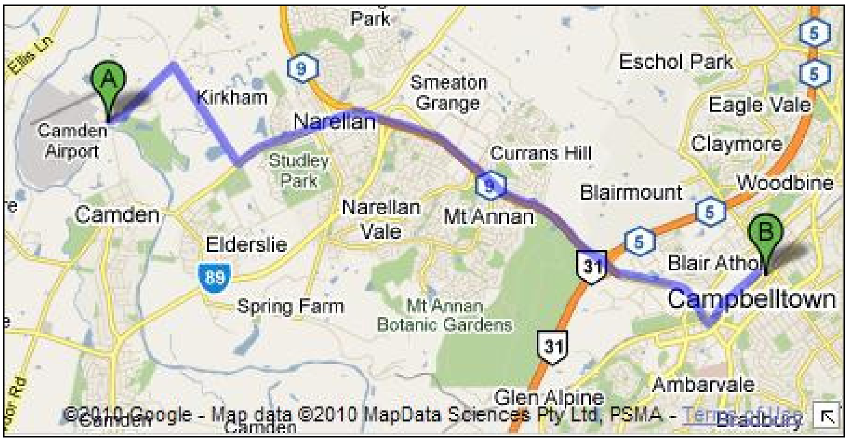
Access to rail	Campbelltown Station: Distance to Campbelltown station 15 km and travel time 30 minutes drive approximately. Campbelltown to Central 46 km Time to Sydney Central Station: Campbelltown to Central 1 hour (East Hills Line) Frequency of service: approximately every 20 minutes Cost: $6.00 one way **Figure 13 - Access to rail** 
Airport Parking capacity - short term and long term	There is capacity for1800 at grade parking spaces on the airport site which is sufficient to address current and future needs.
Other transportation services available at airport	Bus – • Closest bus stop on Argyle St (1500 m – approximately 15 mins walk) • Direct bus to Campbelltown • Operator: Busways (Region 15) Taxi – • available on call from Campbelltown Rental cars – • Not available at the airport. Closest available in 9 km. Shuttle services – • Nil

Walking and cycling	Walking - not practical. Cycling - possible via road network.

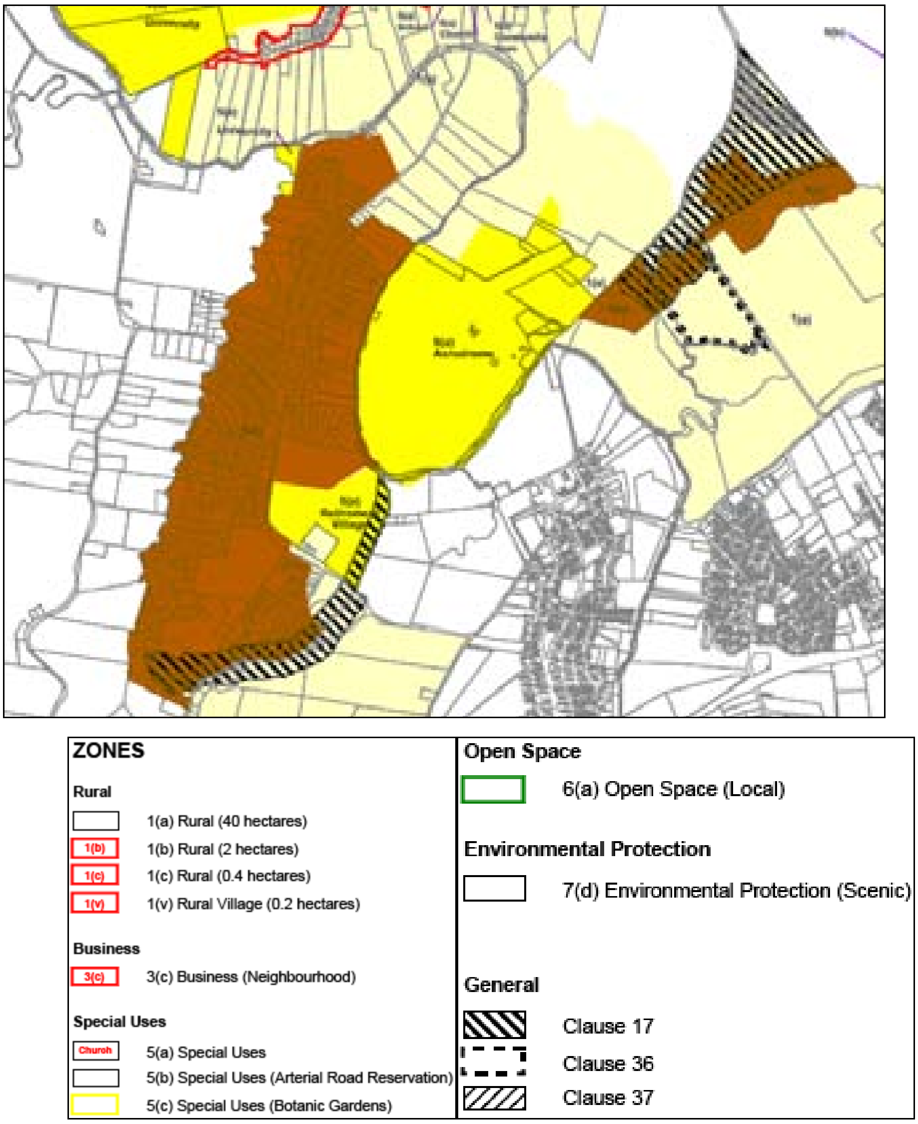
7.6 Utilities and Services

Water and Sewer	Sydney Water The current water main at Camden Airport is approximately 30 years old. There are capacity issues with the current water supply. Water supply is via a Sydney Water main running along Macquarie Grove Road. The existing network reticulates water throughout the airport.
Gas	Jemena Gas West Gas is currently not available to this site. The closest high capacity feeder main is located along Cawdor Road and Camden and Sheathers Lane, Grasmere. There is also a secondary main along Argyle Street, Camden approximately 2.2km away from the Airport.
Police, fire, ambulance, hospitals.	Police • Camden Police Station: (2.6km - approximately 5 mins) Fire • Camden Fire Station: (4.7 km - approximately 10 mins) Hospitals • Camden Hospital (3.5 km – approximately 7 mins)
Power	Integral Energy The existing network consisting of an 11kVA feeder, located in Macquarie Grove Road with a spur branching off into Aerodrome Road that terminates at a 200kVA substation. This substation supplies Camden Airport. This substation is currently loaded at 160kVA.
Telecoms	Telstra, Macarthur (s) Telstra's existing network extends to the corner of Macquarie Grove Road and Aerodrome Road. The network includes a Multiplexer and spare optical fibre cable.

7.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for airport development	The key planning and environmental legislation and planning policies which are responsible for guiding the development around the Camden Airport site and surrounds are listed below: • Environmental Planning and Assessment Act 1979 • Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Camden Local Environmental Plan No. 48 – Rural Areas • Draft Camden Local Environmental Local Environmental Plan 2009 The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales. *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a state statutory policy that aims to "facilitate the effective delivery of infrastructure across the State". This infrastructure includes "airports" and the provisions which specifically relate to airports are contained in Part 3, Division 1 "Air transport facilities". ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent. The *Camden Local Environmental Plan No. 48* (LEP No. 48) is the local statutory planning instrument that guides development in the rural areas of the Camden Local Government Area (LGA). The *Draft Camden Local Environmental Plan 2009* (the draft LEP) is currently being prepared and will supersede the LEP No. 48 as well as all other existing Camden Local Environmental Plans. The airport is currently zoned 5(a) Special Uses "Aerodrome" under LEP No. 48.

Figure 14 - Zoning



Extract of the Camden LEP No. 48 zoning map

Source: http://www.camden.nsw.gov.au/files/lep/lep_maps/lep_48_-_map.pdf

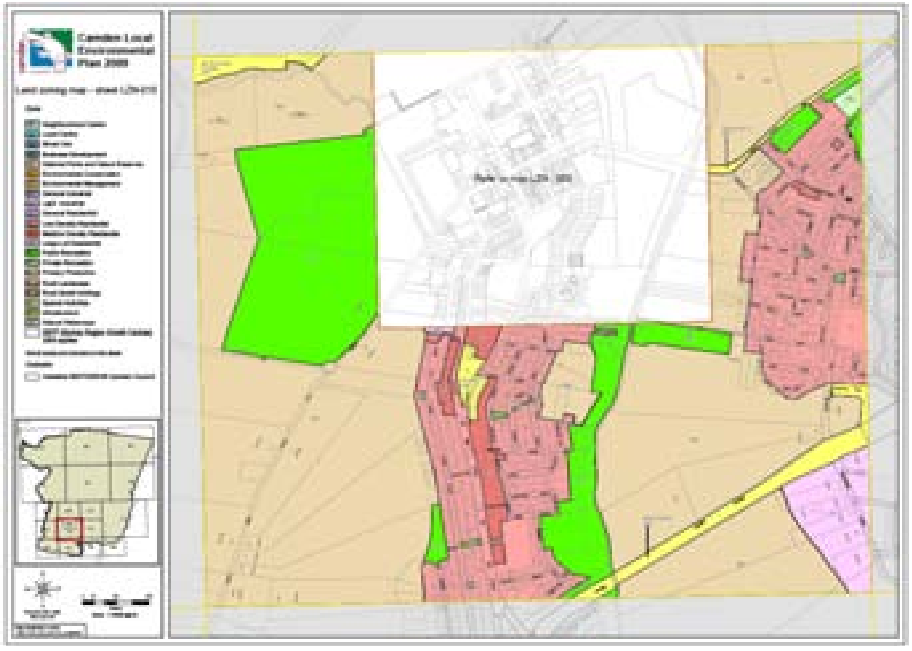
LEP No. 48 includes provisions that are specifically relevant to the airport:

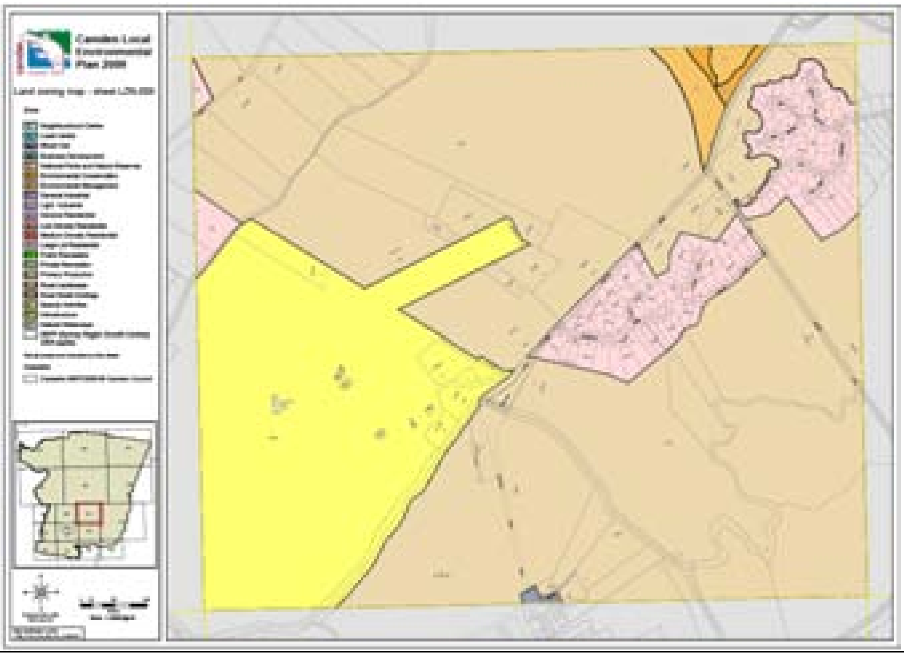
- Clause 23 "Airport noise exposure and building height restrictions" applies to land that "should, in the opinion of the Council, be subject to aircraft noise and building height restrictions attributable to the operation of Camden Airport. (2) In determining any application for consent to carry out development on land to which this clause applies, the Council shall take into consideration the advice contained in the Commonwealth Department of Aviation's publication entitled *"Land Use Compatibility for*

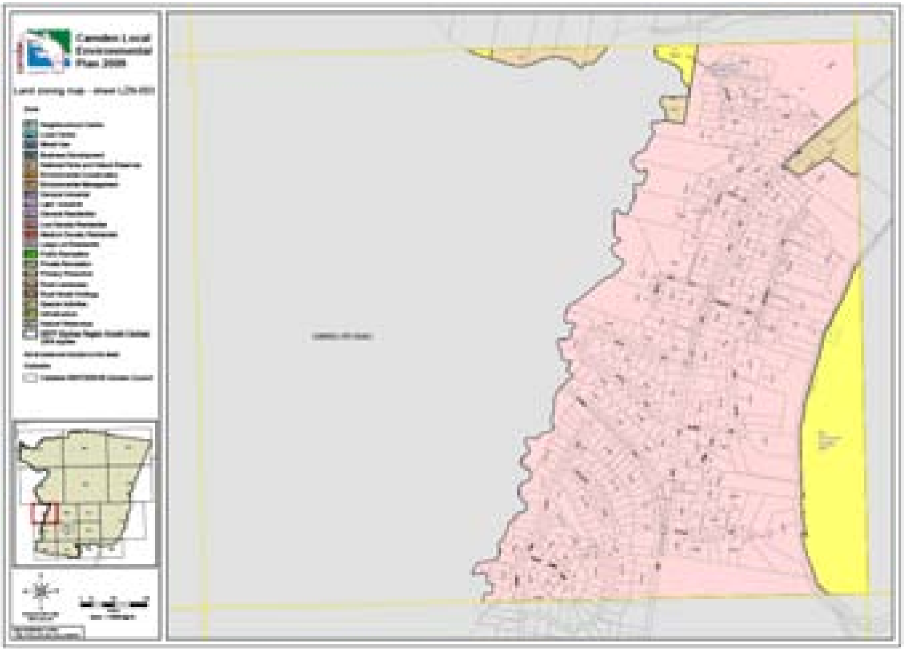
Areas in the Vicinity of Australian Airports" and any representations made to it by that Department."

The draft LEP written instrument, which is available at Camden Council's website, does not include any specific provisions that relate to airports, or development within the vicinity of airports. Camden Airport is proposed to be zoned "SP2 Infrastructure – Air Transport Facility" under the draft LEP.

Figures 15,16 & 17 - Extracts of the Camden Draft LEP 2009 zoning map







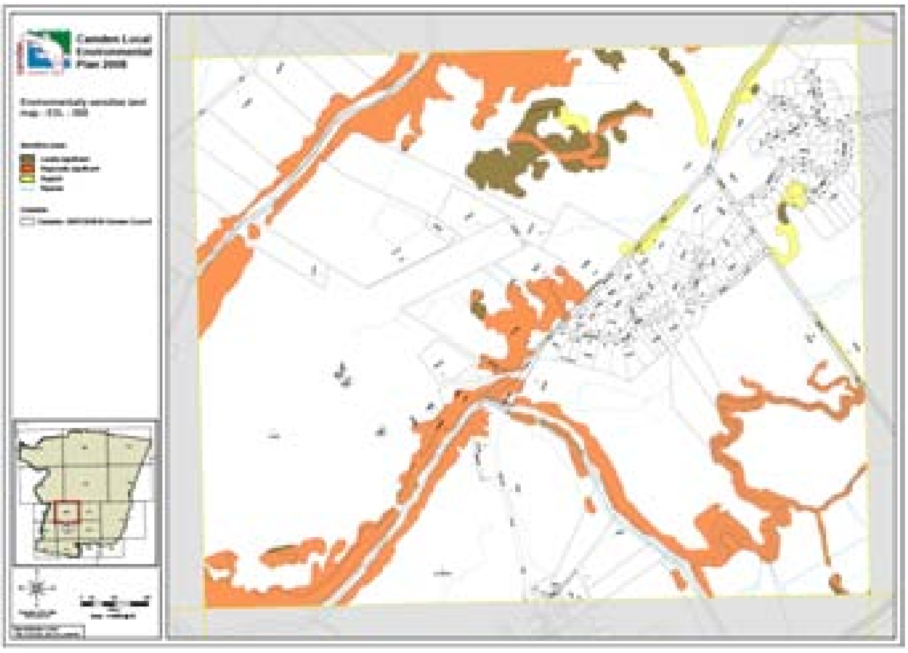
Extract of the Camden Draft LEP 2009 zoning map

Source: http://www.camden.nsw.gov.au

7.8 Environmental Factors, Frameworks and Policies

Site characteristics	As stated above, Camden Airport is zoned 5(a) Special Uses “Aerodrome” under LEP No. 48 and is proposed to be zoned “SP2 Infrastructure – Air Transport Facility” under the draft LEP. The airport site is affected by flooding. The runways are entirely covered by PMF event and significantly covered by 1 in 100 year event. Part of the site, adjacent to the Nepean River, is classified as “Regionally Significant Environmentally Sensitive Land” in the draft LEP maps. The site is also identified as an Item of Heritage under the LEP.
Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangers species Designated environmental management areas Existing environmental assets Heritage scientific and aesthetic qualities/issues Wetlands and other sources of bird hazard	The site is surrounded by rural land to the east and the Nepean River to the west. On the western side of the Nepean River is the Ellis Lane large lot subdivision and to the south is the Camden township. The Camden town centre is a heritage conservation area. The University of Sydney Vetinarary Centre is located approximately 1km to the north-west of the site. Under the Draft LEP 2009, the Airport is in the immediate vicinity of the following land use zones: • R1 General Residential; • R5 Large lot Residential; and • RU1 Primary Production. The urban release area “Mater Dei” is proposed to be located adjacent to the airport to the north-east of the site and under flight paths. The banks of Nepean River are classified as “Regionally Significant Environmentally Sensitive Land” in the draft LEP maps.

Figure 18, 19 & 20– Environmentally sensitive land



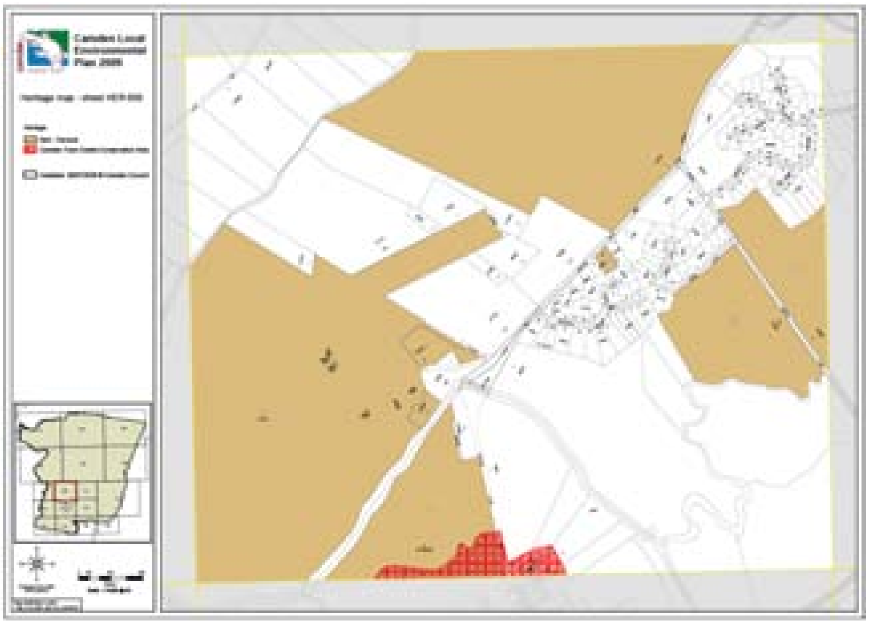
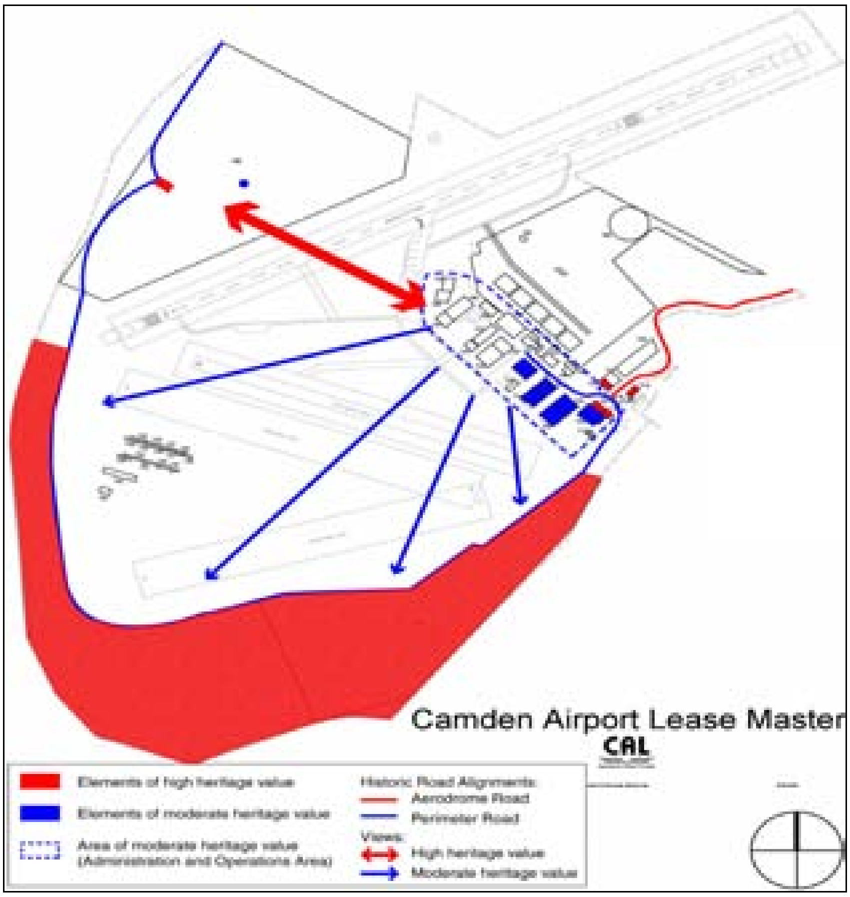


Figure 21 – Heritage



Within the airport site several buildings and locations have been identified as being of high heritage value as shown in this figure.

According to the AES 2010:

"Based on current information the only site on the Airport considered by CAL to be "environmentally significant" is the remnant of River Flat Forest which is on the banks of the Nepean River, (this area is shown in green and marked ENV on Figure 7 – Airport Development Concept).

The River Flat Forest is an endangered ecological community which has been listed under the NSW Threatened Species Conservation Act 1995 and is known to contain a couple of species that are listed as vulnerable under the Environment Protection and Biodiversity Conservation Act 1999.

Figure 22 – Development Concept

Artefacts which evidence indigenous occupation of the site have been found within the riparian Environmental Protection Zone but no specific site of significance has been identified on the airport site.

It is unknown whether or not the site or parts thereof is specifically rated bushfire prone. However, the heavily timbered environmental protection zone around the airport boundary is similar to other bushland that is rated as bushfire prone elsewhere.

Existing Environmental Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	The Minister for Infrastructure Transport Regional Development and Local Government has recently approved the Airport Environment Strategy 2010 for Camden Airport. As stated on the Airport website: *"Sydney Metro Airport Camden is committed to implementing and maintaining environmental management initiatives that promote sound environmental management policies and practices in all airport activities. The Environment Strategy has a 5 year timeframe and outlines management plans for specific ground-based environmental issues."* According to the Airport Environment Strategy 2010: *"A range of actions is proposed by CAL to manage the environment at the Airport as detailed in Section 4 of this AES. The environmental management issues addressed in Section 4 include:* • *air quality;* • *water quality;* • *soil quality;* • *noise;* • *flora and fauna;* • *heritage;* • *waste;* • *climate change and resource use; and* • *social and community.* *Each management issue is discussed in terms of the following:* • *background to environmental issues at the Airport;* • *environmental achievements during the life of the 2005 AES; and* • *objectives, targets and management measures.*
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	It is considered that Camden Airport is becoming increasingly constrained by urban development such as has already been permitted at Ellis Lane which lies directly under the flights paths of several runways and by planned future urban development within the immediate vicinity of the airport, such as the "Mater Dei" urban release area which also is directly under the airport's main flight path.

Figure 23 – Incompatible land uses

Camden Airport operates as overflow for Bankstown Airport, is attracting operations form Bankstown due to lower prices and has already attracted more users from the closure of Hoxton Park Aerodrome. Camden LGA is a high growth area for population and aircraft noise is likely to become an increasing issue.

Camden is financially challenged due to low level of aeronautical related revenues and low levels of commercial revenues but with fixed costs of operations which are similar to that of a larger airport.

7.9 Community and Public Amenity Factors

Community attitudes to airport	As one indicator of community attitude towards the Airport Camden Council provide the following list of enterprises which are located at the airport. (http://www.camden.nsw.gov.au/page/aviation.html): • Aerowasp Helicopter Flights • Air Training Corps • Airborne Aviation • Air Combat Australia • Australian Air League • Balloon Aloft • Camden Airport • Camden Aviation • Camden Museum of Aviation • Curtis Aviation • Dent Aviation • Dynamic Helicopters • Gostner Aviation • Scout Association of NSW Air Activities Centre • Southern Cross Gliding Club • United Aero Helicopters However, as with other similar airports, there is public debate about noise from aircraft operations particularly from circuit training and anecdotally from helicopter training especially when hovering. Apparently much of the complaints come from residents of new urban release areas which are under flight paths or training circuits. On the other hand current users of the airport are reported to wish it to remain as is and would prefer not to see it developed further.
Airport interaction with Communities;	As stated in its Environmental Management Strategy, Section 4.9 Social and Community: *"CAL is committed to good Airport neighbour relationships and engagement with the local community on a number of issues, including the environment. CAL issues monthly tenant newsletters to inform tenants of issues at the*

	Airport and actively liaises with the local media to insert small articles in the local newspapers that inform the community of Airport operations including environmental issues. *CAL continues to liaise with Camden Council on environmental matters relevant to Council.* *CAL will establish a Planning Coordination Forum with Camden Council and the NSW Government to meet quarterly on Airport development activities. In addition CAL will consult on development through the CACCF and the communication network already established. CAL will display development applications on its website.* *CAL will also identify other stakeholders who may be impacted by environmental matters associated with proposed development and consult with these stakeholders / notify these stakeholders prior to deciding whether to grant development approval.* At this stage CAL has not established an MOU with Camden Council as its sister company BAL has with Bankstown in terms of mutual consultation on zoning. CAL was apparently not consulted on the "Mater Dei" urban release area. However CAL is starting a Community Advisory Committee in July 2011 and as well a planning focus committee will also start up. CAL provided publicly available information about the Airport through its website and through publications such as Metro flyer newsletter as well as convening stakeholder meetings every 6 months.

7.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010*. Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. http://www.airservicesaustralia.com/

	http://www.bankstownairport.com.au/ http://www.camdenairport.com.au/Home/Home_1.aspx http://www.camden.nsw.gov.au http://www.camdenairport.com.au/Environment/Environment_Strategy/Airport_Environment_Strategy_2010/Camden_Airport_Environment_Strategy_2010.aspx http://www.camdenadvertiser.com.au/news/local/news/general/plane-silly-to-buy-under-camden-airport-flight-path/1765863.aspx

Holsworthy Army Air Base

CONTENTS

8 HOLSWORTHY ARMY AIR BASE

8.1 Introduction

Holsworthy Army Air Base is located approximately 28 km south-west[1] of the Sydney CBD within the large Holsworthy Military Reserve and is accessed from Old Illawarra Road. The nearest major urban centre is Liverpool about 8km north of the base.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Area)

Source: Google Earth Pro 2010 (Imagery Date January 2007)

Holsworthy Barracks including the air base is located in the outer south-western Sydney suburb of Holsworthy. It is part of the Holsworthy military reserve, which has been a training area and artillery range for the Australian Army since World War I. Following World War II it became a major base for the permanent component of the army in New South Wales. Following the movement of many units of the Regular Army to Darwin in the late 1990s, many Army Reserve units were moved from other depots to Holsworthy Barracks, including the Headquarters of the 5th Brigade.

The base is currently home to 17 Signals Regiment, 3rd Battalion, Royal Australian Regiment (3RAR), 2nd Commando Regiment (2 Cdo Regt), 171st Aviation Squadron and the 1st Health Support Battalion (1HSB).

Access to the aerodrome is only with specific authorisation from both a 6 Aviation Regiment Officer and the Holsworthy Range Control Officer. The airspace around Holsworthy is restricted as Holsworthy is a live firing area.

Holsworthy (not necessarily the existing aerodrome location) was one of the sites investigated for the Second Sydney Airport (SSA) through an EIS process in 1999. It was subsequently abandoned as a possible site for a number of reasons, including issues related to unexploded ordnance as well as many technical challenges.

8.2 Current Site Attributes

Aerodrome location and LGA	S 33 degrees 59.7 minutes E 150 degrees 57.1 minutes Liverpool City Council LGA
Ownership and management; lessee/operator	Department of Defence (Army).
Aerodrome Category	Military
Applicable regulatory regime	ADFP 602 and MOS 139
Site area and physical dimensions	Approximately 53ha
Major centres of population, population growth	LGAs of Campbelltown, Bankstown, Liverpool, Sutherland.
Elevation	250 feet
Surrounding topography	Holsworthy Army Air Base lies on top a ridge in the Holsworthy Military Reserve with deep gorges to the east and west typical of the Sydney Basin
Liability for flooding	Not known but the base lies well above the Georges River and its tributaries.
Atmospheric conditions	Not Known

8.3 Airport Operations

Summary of main activities	The air base is home to 171 Aviation Squadron operating the S70A Blackhawk helicopter and provides support to Special Operations Command. The Squadron is currently based at Holsworthy Barracks near Sydney and forms part of the 6th Aviation Regiment.
Current passenger numbers	Not applicable
Current aircraft movement numbers	Unknown
Current freight throughput	Not applicable

Known sources of delay in airport and runway operations	Unknown
Movement/manoeuvring area details	
Runway	11/29 – 670m x 30m (approximately) (potentially Code 1 – civil equivalent)
Runway strip	Unknown
Taxiways	Sealed taxiways provide access from the building area to the runway in a number of locations. There is no Airservices Australia published runway and taxiway layout.
Aprons	Sealed aprons associated with helicopter hangars/shelters within the building area.
Airfield pavements	Sealed strengths unknown
Airfield operating restrictions	Access to the air base is restricted to operations specifically authorised by both 6 Aviation Regiment Officer and Holsworthy Range Control Officer. Note that the airfield appears exclusively related to helicopter operations as Army no longer operates fixed wing aircraft. In any event the existing runway length available would limit fixed wing operations to very small aircraft.
Airfield lighting and approach systems	Unknown
Visual navigation aids	Runway, taxiway and apron markings One wind direction indicator (WDI) *(maybe illuminated)*
Radio navigation aids	Nil published
Surveillance systems	Unknown
Operational procedures	Right hand circuits Runway 29 CH47 ground taxi only on manoeuvring area Aprons and taxiways available only for military aircraft.
Aviation fuel	Unknown
Terminals and other major aviation support infrastructure elements	Not Applicable
Security	Airfield is located within a secured army base

Border Agencies	Not applicable
Air traffic management and airspace management arrangements	Non towered airfield situated within Restricted Area R555A which extends from the surface to an altitude of 1,500 feet and is active continuously. R555B overlays R555A and extends from an altitude of 1,500 feet to a NOTAM altitude when active, which also occurs by NOTAM. Both of these areas are associated with firing. Along the north-eastern boundary both areas abut the Sydney and Bankstown Control Zones (CTR). Restricted areas R555C and 555D abut R555A and 555B to the south. R555C extends from the surface to an altitude of 3,000 feet and is active between 0700-2100 hours local. R555D overlays R555C whose vertical limits are defined by NOTAM as is hours of operation. They are also associated with firing. All the Holsworthy restricted areas abut Danger Area D556 along their western edge. D556 is associated with civil flying training. The Holsworthy restricted areas are part of the complex airspace arrangements within the Sydney Basin. **Figure 3** shows the airspace arrangements in the vicinity of the airport. **Figure 3 – Holsworthy Aerodrome Airspace Arrangements**  *Source: Airservices Australia 2010*

There are no published Instrument Flight Rules (IFR) procedures for the aerodrome, however, there are designated IFR tracks in the airspace areas over the aerodrome as shown in **Figure 4.**

Figure 4 – Holsworthy Aerodrome Overhead IFR Flight Tracks

Source: Airservices Australia 2010

Other aerodromes within 50km of Holsworthy are:

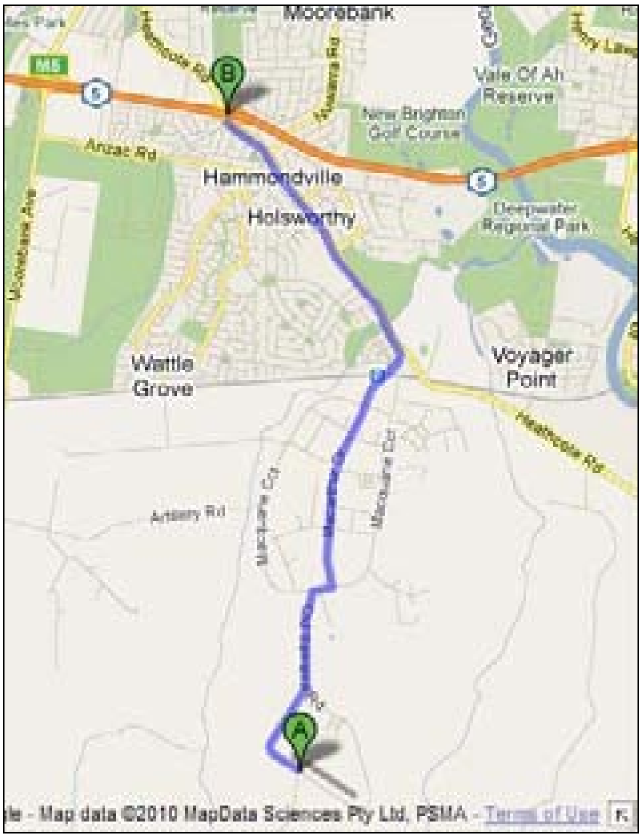
- Bankstown Airport approximately 8km to the north
- Sydney Airport approximately 21km to the east
- Wedderburn Aerodrome approximately 24km to the south-west
- Wilton Aerodrome approximately 36km to the south-west
- Camden Airport approximately 25km to the west
- The Oaks Aerodrome approximately 38km to the west
- RAAF Base Richmond approximately 46km to the north-west

Aerodrome Rescue and Fire Fighting Services (ARFFS)	Up to Category 4 for designated operations only.
Operating restrictions	Helicopter training operations not to be conducted in the vicinity of buildings without approval of Manager Base services.
Known development capability and expansion planning	Unknown however the S70A Blackhawk is being superseded in service by the MRH-90 and this may result in the need for additional infrastructure etc.
Known constraints on future capacity or ability to meet current and future demand	Unknown
Aircraft noise contours and status	Unknown

8.4 Future Patronage, Freight, Investment and Business Attributes

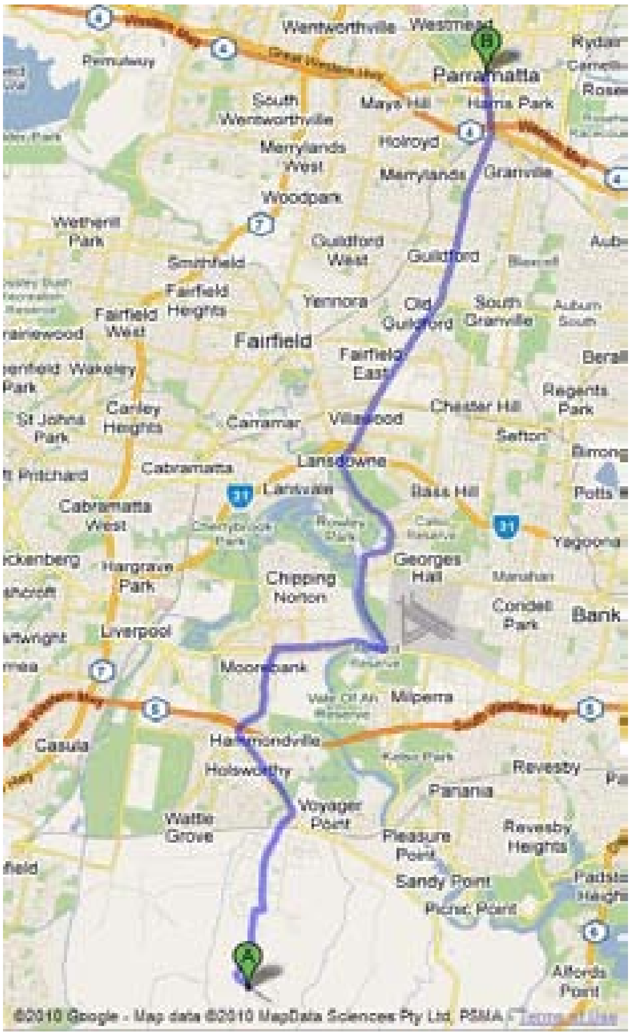
Business enterprises present or related;	Not applicable
Freight forecasts;	Not applicable
Plans to invest in upgrading;	Unknown
Passenger patronage forecasts;	Not applicable
Aircraft movements forecast by type;	Unknown
Costs for upgrades	Unknown

8.5 Accessibility and Surface transport

Connections to Road	Nearest connection to the major road network is the aerodrome boundary with the Old Illawarra Rd. Thence, 7.1 km and 14 minutes to the South Western Motorway (M5) Distance to Sydney CBD: 44.1 km and travel time 48 minutes approximately **Figure 5 - Access to Freeway**  .

Distance to Parramatta 28 km and 50 minutes approximately.

Figure 6 - Access to Parramatta

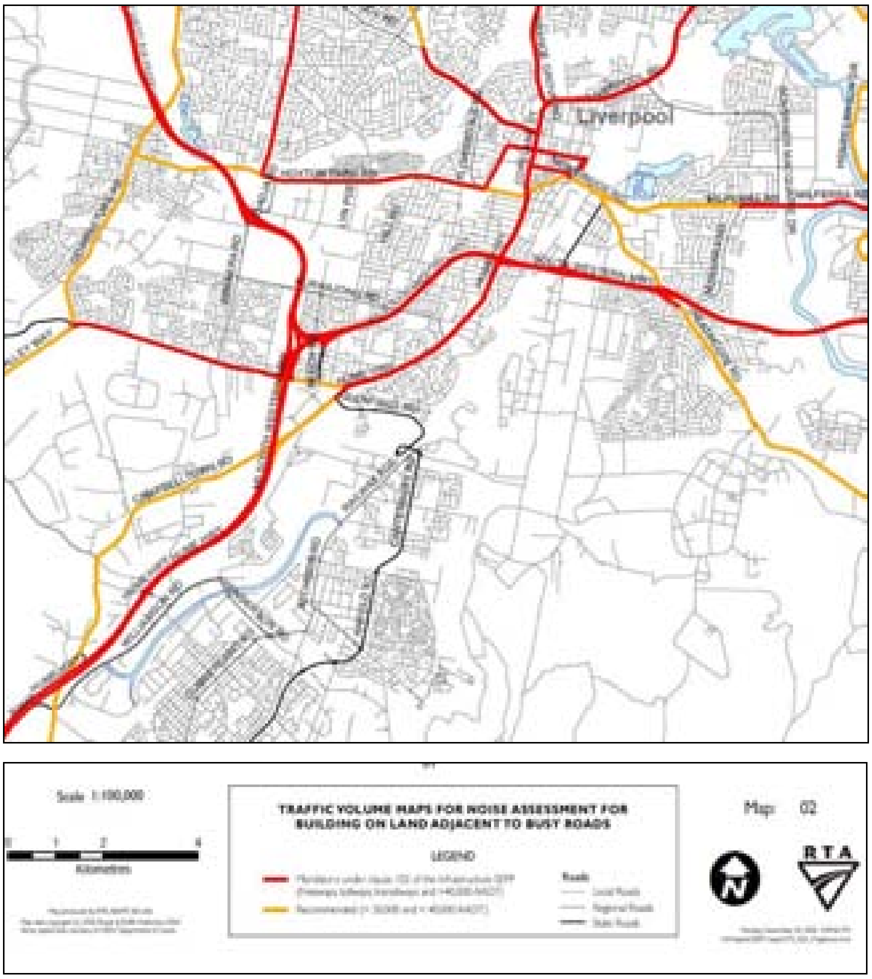


Distance to Liverpool: 10.4 km and 21 minutes

Figure 7 – Access to Liverpool

<table>
<tr>
<td>Traffic Volume</td>
<td>

Figure 8 - Proximity of major road system



</td>
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<tr>
<td>Access to rail</td>
<td>

Holsworthy Station:

Distance to nearest station (Holsworthy) 4 km and travel time 7minutes drive and 46 minutes walk approximately.

Holsworthy to Central 27 km

Time to Sydney Central Station: Holsworthy to Central 40 minutes (East Hills Line train Line)

Frequency of service: approximately every 20 minutes

Cost: $4.6 one way

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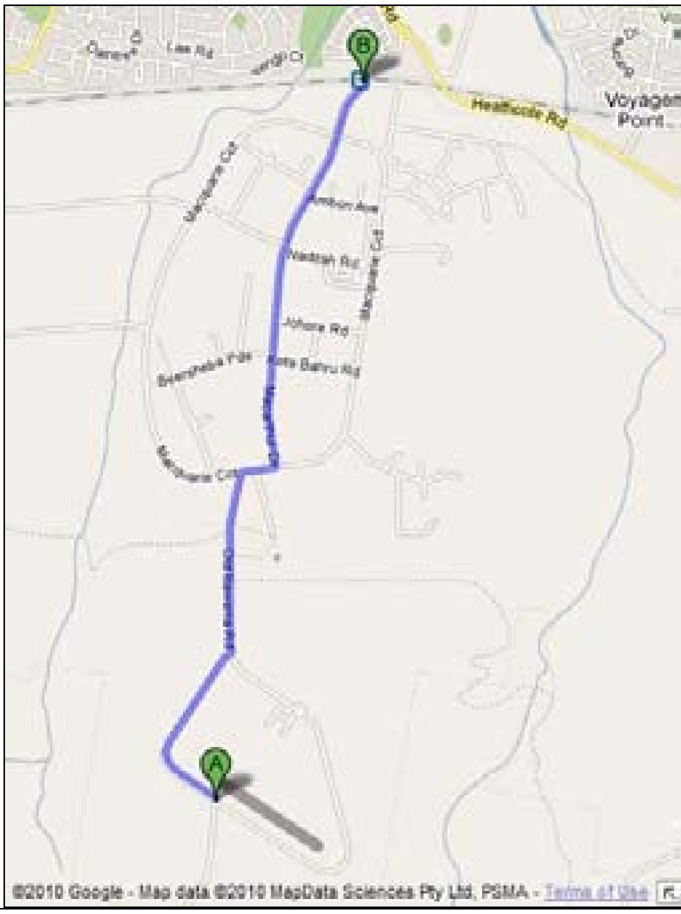
</table>

	Figure 9 – Access to Rail 
Airport Parking capacity - short term and long term	Adequate for current usage
Other transportation services available at airport	Bus – • Closest bus stop on Holsworthy Station (4 km and travel time 7 minutes drive and 46 minutes walk approximately) • Direct bus to Liverpool (Route 901/902) • Operator: Veolia Transport Taxi – • Taxi rank available at Holsworthy Station Rental cars – • Not available at the airport. Closest available 14 km.

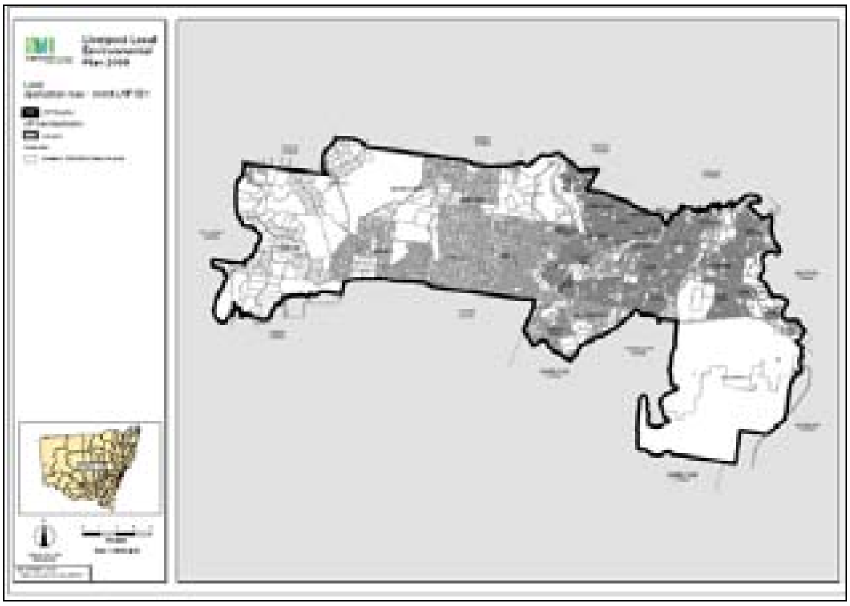
	Shuttle services – • Nil
Walking and cycling	Walking not practical. Cycling possible via road network.

8.6 Utilities and services

Water and Sewer	Provider Sydney Water
Gas	Not known
Police, fire, ambulance, hospitals.	Police • Liverpool Police Station (10.8km - approximately 22 mins) Fire • Liverpool Fire Station: (8 km - approximately 16 mins) Hospitals • Liverpool Hospital (10.7 km – approximately 22 mins)
Power	Provider Integral Energy
Telecoms	Provider Telstra, Liverpool

8.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for airport development	The key planning and environmental legislation and planning policies which are responsible for guiding the development of the Holsworthy Aerodrome site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979 • Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Liverpool Local Environmental Plan 2008 The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales. *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a state statutory policy that aims to "facilitate the effective delivery of infrastructure across the State". This infrastructure includes "airports" and the provisions which specifically relate to airports are contained in Part 3, Division 1 "Air transport facilities". ISEPP allows for a range of

	airport-related developments to be permitted without consent or permitted with consent. The *Liverpool Local Environmental Plan 2008* (the LEP) is the local statutory planning instrument that guides development in the Liverpool Local Government Area (LGA). The airport is zoned "SP2 Infrastructure – Defence" under the LEP. **Figure 10 – Zoning Context**  *Source: Liverpool LEP*

8.8 Environmental Factors, Frameworks and Policies

Site characteristics	Holsworthy Military Reserve is bounded to the east by Heathcote Road; to the north by the East Hills Railway and to the west by the Georges River. As stated above, Holsworthy Aerodrome is zoned "SP2 Infrastructure – Defence" under the LEP. **Figure 11 - Zoning**

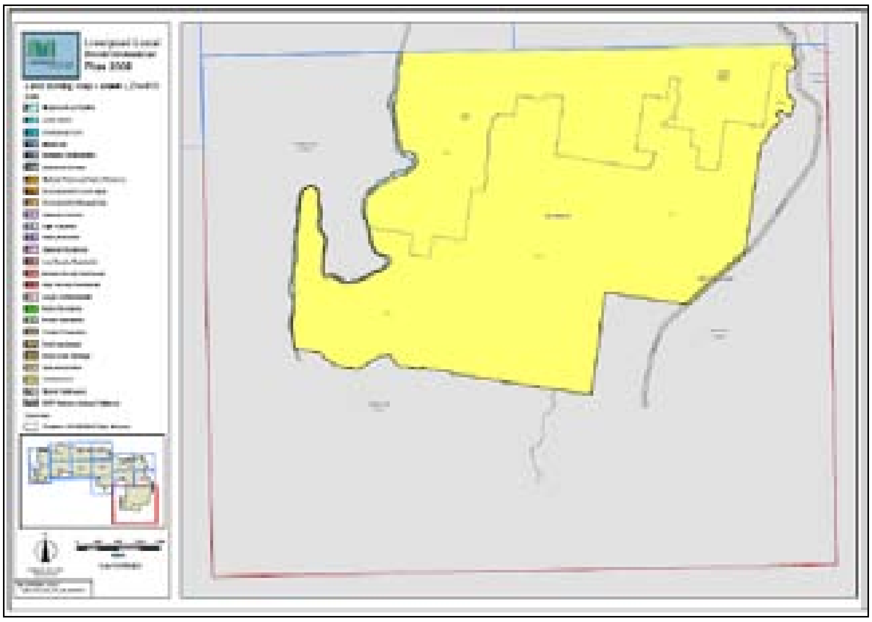
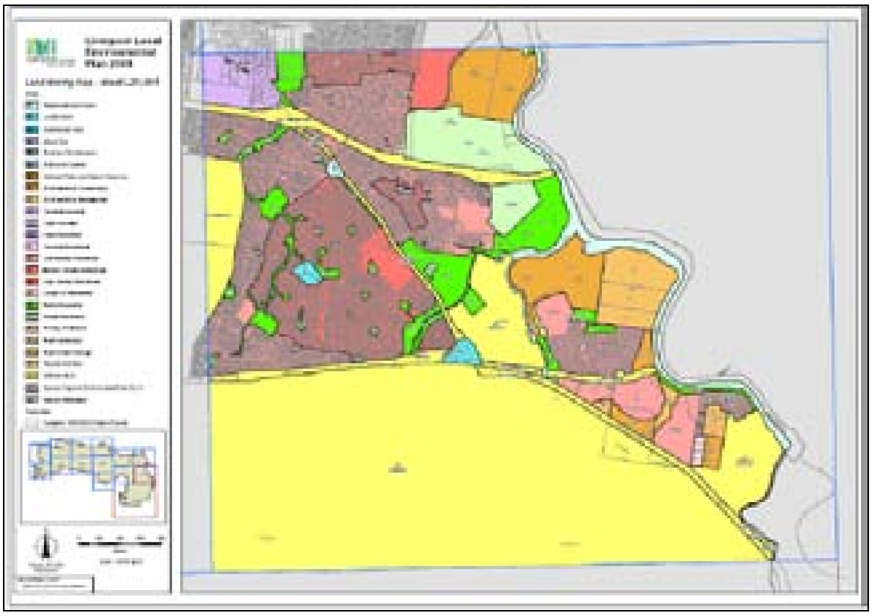


Figure 12 - Zoning



The aerodrome is 230 feet above sea level and is not affected by major flooding. The whole of the site is surrounded by vegetation which is categorised as "environmentally significant". With regard to bushfire affectation, the site is surrounded by Vegetation Category 1. It is noted that Holsworthy is an Army Live Firing Range with unexploded ordnance. The site is also identified as an Item of Heritage under the LEP.

Figure 13 – Bush fire prone land

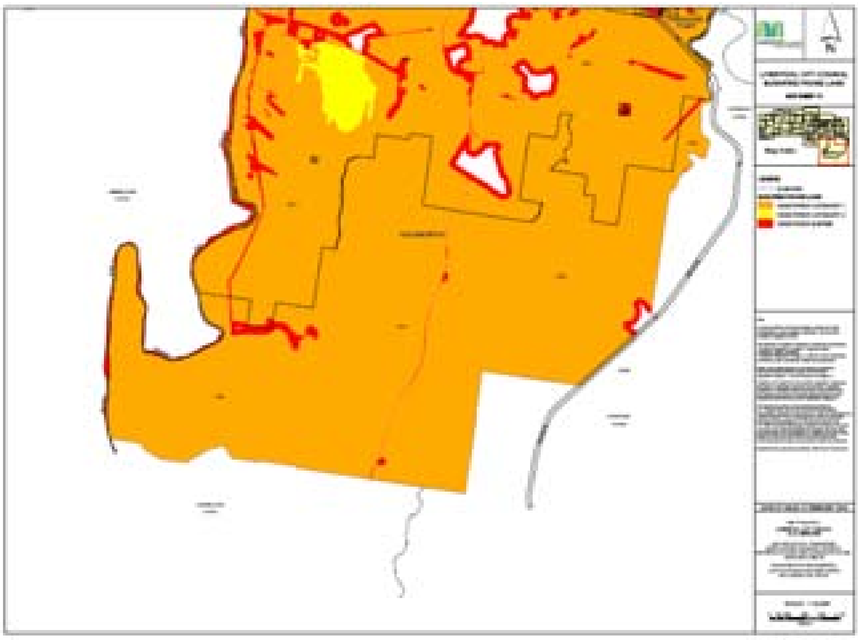
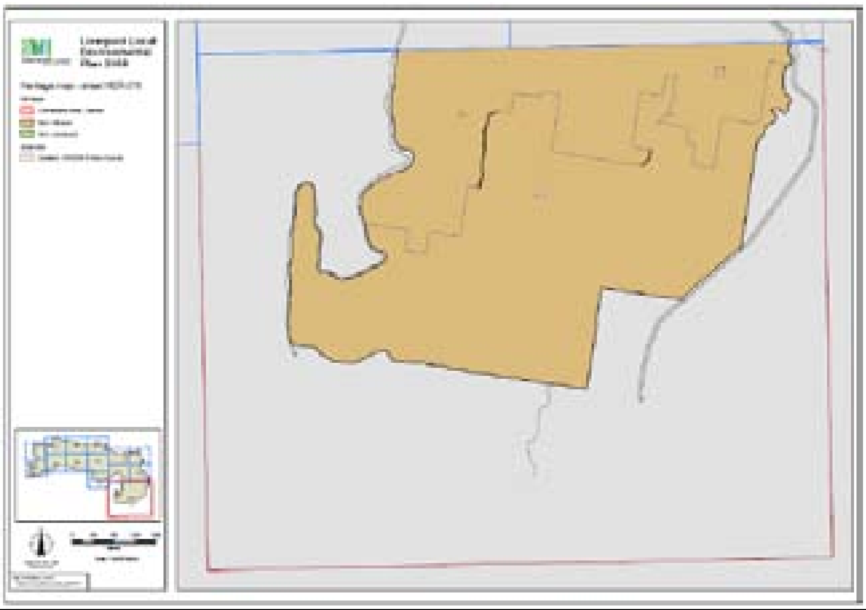


Figure 14 – Environmentally sensitive land

Figure 15 – Heritage

	
Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangers species Designated environmental management areas Existing environmental assets Heritage scientific and aesthetic qualities/issues Wetlands and other sources of bird hazard	The nearest major urban centre is Liverpool which is about 8km north of the base. As stated above, the aerodrome is surrounded by extensive areas of vegetation which is categorized as Vegetation Category 1 and is "environmentally significant". The surrounding land does not appear to be affected by flooding. The Holsworthy Military Reserve is also identified as an Item of Heritage under the LEP.
Existing Environmental	No environmental management policies for the airport were located.

Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	No sensitive land uses have been identified within the immediate vicinity of the site which would be incompatible with regard to expanding Holsworthy aerodrome.

8.9 Community and Public Amenity Factors

Community attitudes to airport;	Not known
Airport interaction with Communities;	Not known

8.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010*. Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. http://en.wikipedia.org/wiki/171st_Aviation_Squadron_(Australia) http://www.liverpool.nsw.gov.au/LCC/INTERNET/me.get?site.sectionshow&PAGE2021

Illawarra Regional Airport

CONTENTS

9 ILLAWARRA REGIONAL AIRPORT

9.1 Introduction

Illawarra Regional Airport (also colloquially known as and referred to herein as Wollongong Airport) is located approximately 18km south[1] of the Wollongong CBD and is accessed from the Princes Highway. **Figures 1** and **2** depict aerial images of the airport site.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date February 2008)

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Area)

Source: Google Earth Pro 2010 (Imagery Date February 2008)

The airport was constructed as an RAAF pilot training facility during World War II. Initially, Trans Australian and Australian National Airlines ran services through Albion Park Airport to Canberra and Melbourne however these services were withdrawn in 1950. Low-key general aviation (GA) operations continued including civilian pilot training.

In 1960, Shellharbour Municipal Council was granted permissive occupancy of the aerodrome and in 1962 the ownership was transferred under the Commonwealth Aerodrome Local Ownership Plan (ALOP). Included in the ownership was the responsibility on Council to operate and maintain the aerodrome in compliance with CASA standards and that the aerodrome remain open to public use and permit open, unrestricted and non-discriminatory access by airline and aircraft operators.

Various charter and RPT flight services as well as training and maintenance facilities operated from the 1970's to the 1990's. The National Safety Council and later the NSW Health Department operated helicopter rescue operations from Illawarra Regional Airport.

The Commonwealth Government withdrew from the local ownership plan in 1990 leaving Council with the full responsibility for care and control of the airport. Council became solely responsible for developing, operating and maintaining the aerodrome, resulting in the annual maintenance and operational costs effectively doubling for Council through this arrangement, as financial subsidies were no longer received.

In 1998, infrastructure development was carried out at the airport, which included construction of the current Terminal Building, improvement to roads and utility services and navigational aids. In 2000 the Historical Aircraft Restoration Society (HARS) commenced development of their hangar and museum. RPT services were operated by Impulse Airlines to and from Illawarra Regional Airport and Melbourne and Newcastle, up until August 2000.

In 2005, an upgrade to the main runway was undertaken to allow aircraft up to 25 tonnes to Code 2C standards. Works included the reconstruction of the 1800m long main runway, strengthening taxiways, replacement and upgrading of the runway/taxiway lighting and line marking and aircraft approach path indicator systems. An upgrade of the existing terminal building was also carried out, which included the provision of an 80 seat alfresco dining area.

Also in 2005, then Prime Minister of Australia, John Howard officially opened Shellharbour City's $1.3 million Light Aeronautics Industry Cluster at the airport. Mr Howard unveiled five hangars, which will form the region's first aeronautics business park.

Qantas Link commenced an RPT service to and from Melbourne using Dash-8 aircraft in June 2008. Qantas Link withdrew this service later in 2008 as they believed it was unviable due to the increase in fuel costs.

9.2 Current Site Attributes

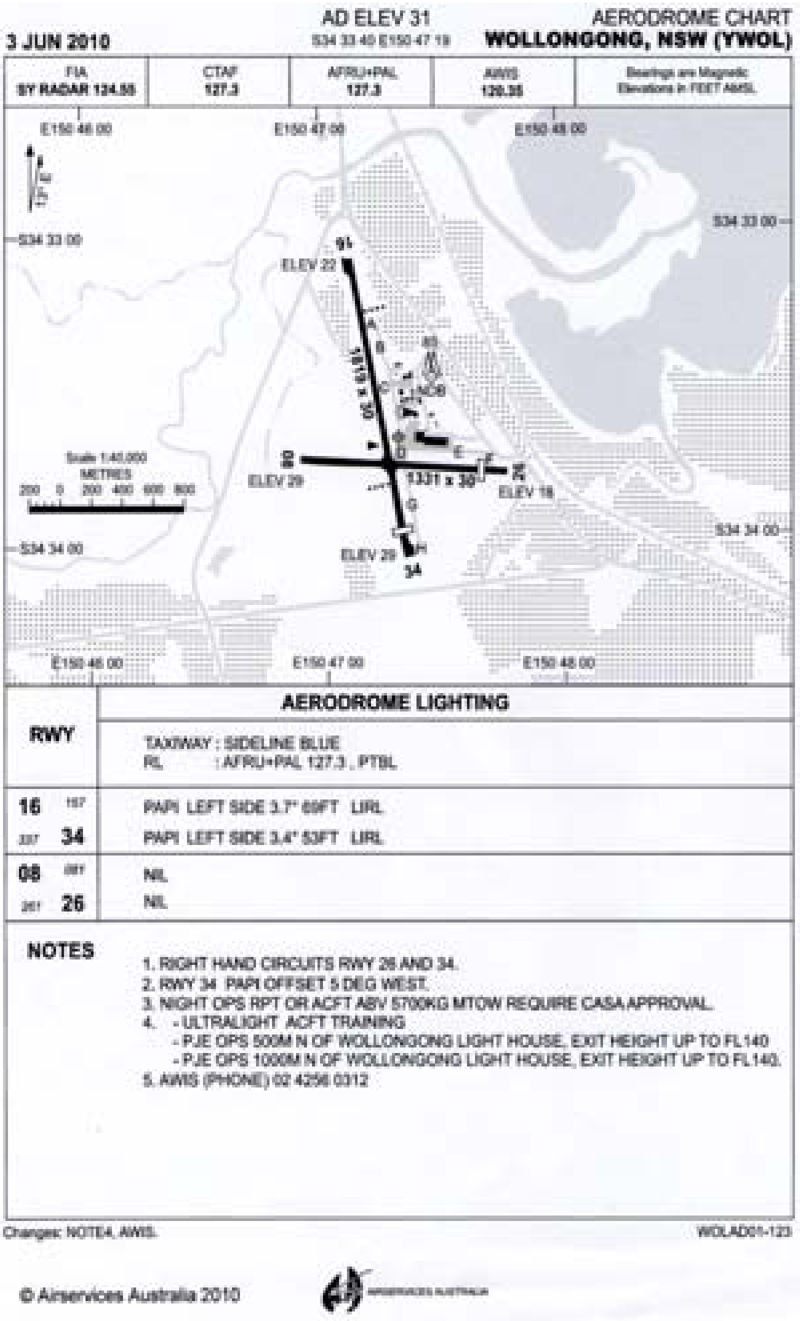
Airport location and LGA	S 34 degrees 33.7 minutes E 150 degrees 47.3 minutes Shellharbour City Council LGA
Ownership and management; lessee/operator	Shellharbour City Council owner and operator
Aerodrome Category	Certified / Licensed
Applicable regulatory regime	Civil Aviation Safety Regulations (CASR) Part 139 - Aerodromes
Site area and physical dimensions	104.8 ha
Major centres of population, population growth	Shellharbour LGA and City of Wollongong in immediate proximity and Kiama and Nowra further south.
Elevation	31 feet
Surrounding topography	Illawarra Regional Airport is located on the floodplains of creeks which flow into Lake Illawarra; the dominant topographic feature is the Illawarra Escarpment which lies to the northwest and west of the

	airport. To the north and south of the main runway there are low hills.
Liability for flooding	Although located on land which is potentially flood prone recent flood mitigation works have reduced the potential for flooding.
Atmospheric conditions	Anecdotally, the airport has never been closed due to fog although when Qantas Link was operating services were forced to divert due to low cloud cover. The airport has also acted to as diversion airport for Dash 8 aircraft when Sydney Airport has been closed.

9.3 Airport Operations

Summary of main activities	Illawarra Regional Airport currently caters to commercial (including flying training) and private GA operations. The airport also accommodates HARS who operate a museum and a range of airworthy historical civil and ex-military aircraft. The Air Ambulance Rescue Service which is a 24/7 operation and the RFDS operate from the airport. There is also a range of businesses providing aviation support activities such as aircraft maintenance, avionics workshop and the like. Non-aviation activities include Regional Rural Fire Service Control Centre the NSW Fire Brigade Training Centre.
Current passenger numbers	Not applicable – no current RPT services
Current aircraft movement numbers	26,600 movements (2008/09) as estimated by CASA
Current freight throughput	Not applicable – no current freight operator.
Known sources of delay in airport and runway operations	The airport does not suffer from congestion delays or from atmospheric conditions.
Movement/manoeuvring area details	
Runways	• 16/34 – 1819m x 30m (Code 2) • 08/26 – 1331m x 30m (Code 2)
Runway strips	• 16/34 – 1939m x 90m • 08/26 – 1451m x 90m
Taxiways	There is a sealed taxiway leading from the runway intersection to the main apron. This is supported by a number of partial parallel sealed taxiways serving the runways. **Figure 3** shows the runway and taxiway layout.

Figure 3 – Runway and Taxiway Layout



Source: Airservices Australia 2010

Aprons	The main apron is sealed and is marked with a single free-moving parking position for aircraft up to DHC8-100/200 (DASH8 100/200) turbo-prop aircraft. The large HARS sealed apron is contiguous with part of the main apron. There are other sealed aprons supporting the

	various hangar areas and grassed parking areas in other locations.
Airfield pavements	Runways • Runway 16/34 – 60a PCN 23/F/C/1000 (145PSI)/T (eg aircraft up to say DHC8-100/200 (DASH8 100/200) • Runway 08/26 – Unrated, (used mainly by light single and twin engine aircraft) Taxiways Not specifically rated – however aircraft such as Dash–8s and HARS large aircraft such as the Super Constellation L1049G "Connie" only operate on the runways. Aprons Terminal Apron rated for Dash–8 aircraft.
Airfield operating restrictions	• Open for public use, charges apply to all aircraft.
Airfield lighting and approach systems	• Runway 16/34 – low intensity edge lighting • Runway 16/34 – Precision Approach Path Indicator System (PAPI), offset 5 degrees west for 34 approach • Taxiway sideline blue lighting
Visual navigation aids	• Runway, taxiway and apron markings and markers • One illuminated wind direction indicator (IWDI) and one wind direction indicator (WDI)
Radio navigation aids	Non-Directional Beacon (NDB) situated within building area
Surveillance systems	Nil

Operational procedures	• Right hand circuits Runways 26 and 34
	• Night operations for RPT and aircraft above 5,700kg require CASA approval
	• Night operations restricted to Visual Flight Rules (VFR) aircraft up to 7,500kg maximum take-off weight (MTOW)
	• Runway 08/26
	  – Practice touch and go landings to be avoided
	  – Simulated engine failure to be avoided
	  – Full runway length to be used for take-off
	• Ultralight aircraft training undertaken
	• Parachute operations undertaken to north of aerodrome

Aviation fuel	• Shell AVGAS bowser and JET A-1 from self service bowser 24

	hours • 3 mobile tankers - 2 JET A-1 and 1 AVGAS; • CI 3 gasoline 55,000 litres storage and JET A-1 55,000 litres
Terminals and other major aviation support infrastructure elements	The former terminal has been reconfigured internally to function as a high quality restaurant. As a terminal, it was previously able to handle RPT aircraft of up to 36 seats. Including the restaurant and Shell refuelling facility there are some 15 aviation related organisations/businesses based at the airport as shown in **Figure 4**. **Figure 4 – Building Area Business Details**  *Source: SCC 2010*
Security	Security Controlled Airport
Border Agencies	Not applicable
Air traffic management and airspace management arrangements	Non-towered aerodrome in Class G airspace and being certified requires mandatory carriage of radio. Common Traffic Area Frequency (CTAF) procedures apply. Part of the Sydney Control Area (CTA) overlays Wollongong's airspace with effect from an altitude of 7,500 feet. Danger Area D456 which operates from the surface to an altitude of 500 feet is located approximately 5 nautical miles to the south east. It is active Mon-Sat during daylight hours and is associated with quarry blasting.

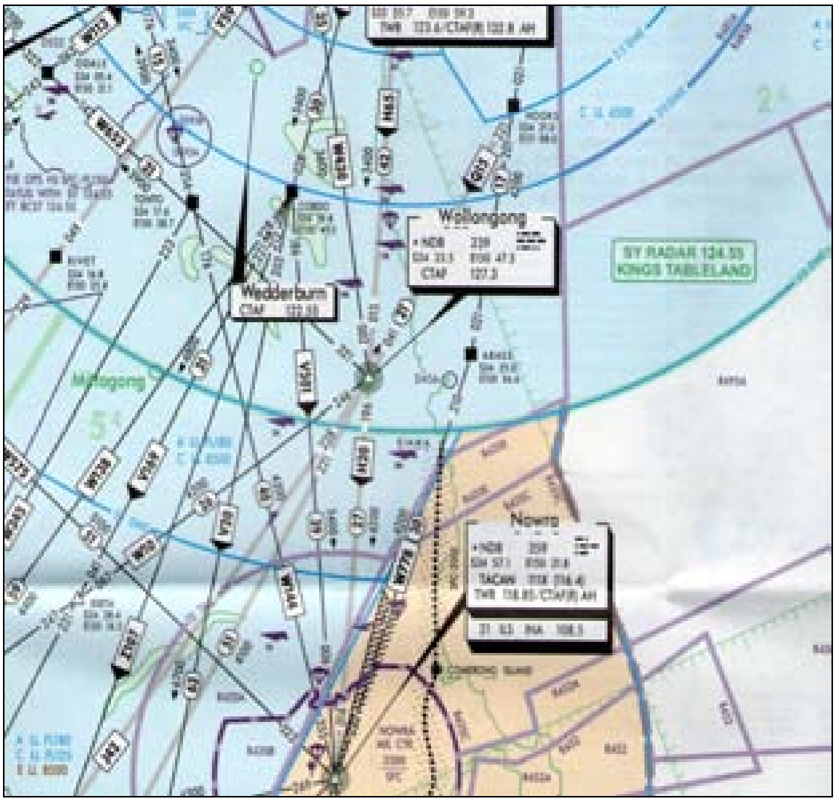
Restricted Area R420E lies approximately 6 nautical miles to the south and is the nearest section of restricted airspace associated with military operations at HMAS Albatross at Nowra. R420E operates from an altitude of 1,500 feet to Flight Level 125 and is activated by NOTAM. It is associated with military flying training. Restricted Areas R420A, R420C and R420F abut this airspace and operate variously from the surface up to Flight Level 30. These are activated by NOTAM and are associated with military flying training. **Figure 5** shows the airspace arrangements in the vicinity of the airport.

Figure 5 – Wollongong Airport Airspace Arrangements

Source: Airservices Australia 2010

CASA assessment of traffic levels undertaken in 2010 suggests about 96% of flights operate under VFR and 4% under Instrument Flight Rules (IFR). VFR and entry/exit procedures are flown in accordance with the Aeronautical Information Publication (AIP) and related advisory material.

Flight tracks established in relation to aircraft operating under IFR are shown in **Figure 6**. IFR approach procedures are promulgated in the

	relevant Departure and Approach Charts (DAP). **Figure 6 –Wollongong Airport IFR Flight Tracks**  *Source: Airservices Australia 2010* Other airports/aerodrome facilities as shown on aeronautical charts within 50km of Wollongong Airport are: • Wedderburn airfield approximately 42km to the north • HMAS Albatross (Nowra Airport) approximately 49km to the south • Mittagong airfield approximately 29km to the north-west
Aerodrome Rescue and Fire Fighting Services (ARFFS)	Not applicable – however NSW Fire Brigade and Ambulance are available 24/7 on site.
Operating restrictions	Noise abatement procedures in force are: • Avoid take-off Runway 08 and landing Runway 26 unless operationally necessary • At night avoid Take-off Runway 16 unless operationally necessary • Circuit training not permitted after 2200 hours local

	These procedures are complemented by the following additional fly neighbourly policies • Helicopters are not allowed to overfly the residential area to the east of the airport at an altitude less than 1000 feet. • Night training restricted to north/south runway with Runway 34 preferred.
Known development capability and expansion planning	Council currently has a Consultant's study in progress[2] which is assessing the operational potential of the airport to accommodate higher order passenger operations than have previously been possible ie utilising Code3C aircraft such as Embraer 170 and Code 4C such as B737/A320. Critical issues include the ability to achieve a 150m wide runway strip for Runway 16/34 and addressing obstacle clearance issues to both the north and south of the airport. This study (a draft copy of which was been made available to the Department of Infrastructure, Transport, Regional Development and Local Government) is approaching finalisation. Council intends the study to be a precursor to the preparation of a new Master Plan for the airport.
Known constraints on future capacity or ability to meet current and future demand	Current levels of activity would suggest the airport is underutilised. Higher order operations as outlined above will depend on the outcomes from the current consultant's study.

[2] This study was not available at the time of preparation of this report but, to the extent these were made known, possible issues now raised in that report are noted herein. The full report now available at http://www.shellharbour.nsw.gov.au/default.aspx?WebPage=959

Council's website states *"The original and current airport masterplan was prepared in 1990. The development works identified on this plan have been substantially completed and a new masterplan is required to take the airport into the future.*

There has been considerable change in the aviation industry during this period, particularly with the major airlines introducing a low cost business model, which has created significant growth in passenger numbers. This model has been highly successful in both international and interstate travel and, together with strong competition between the airline operators, has also created a more competitive pricing structure.

More recently, airlines are focusing on the larger regional areas to encourage passenger growth. Smaller aircraft, capable of seating 70-100 passengers and able to operate off the shorter runways that exist at regional airports, are being purchased by airline operators to provide services between regional areas and popular destinations."

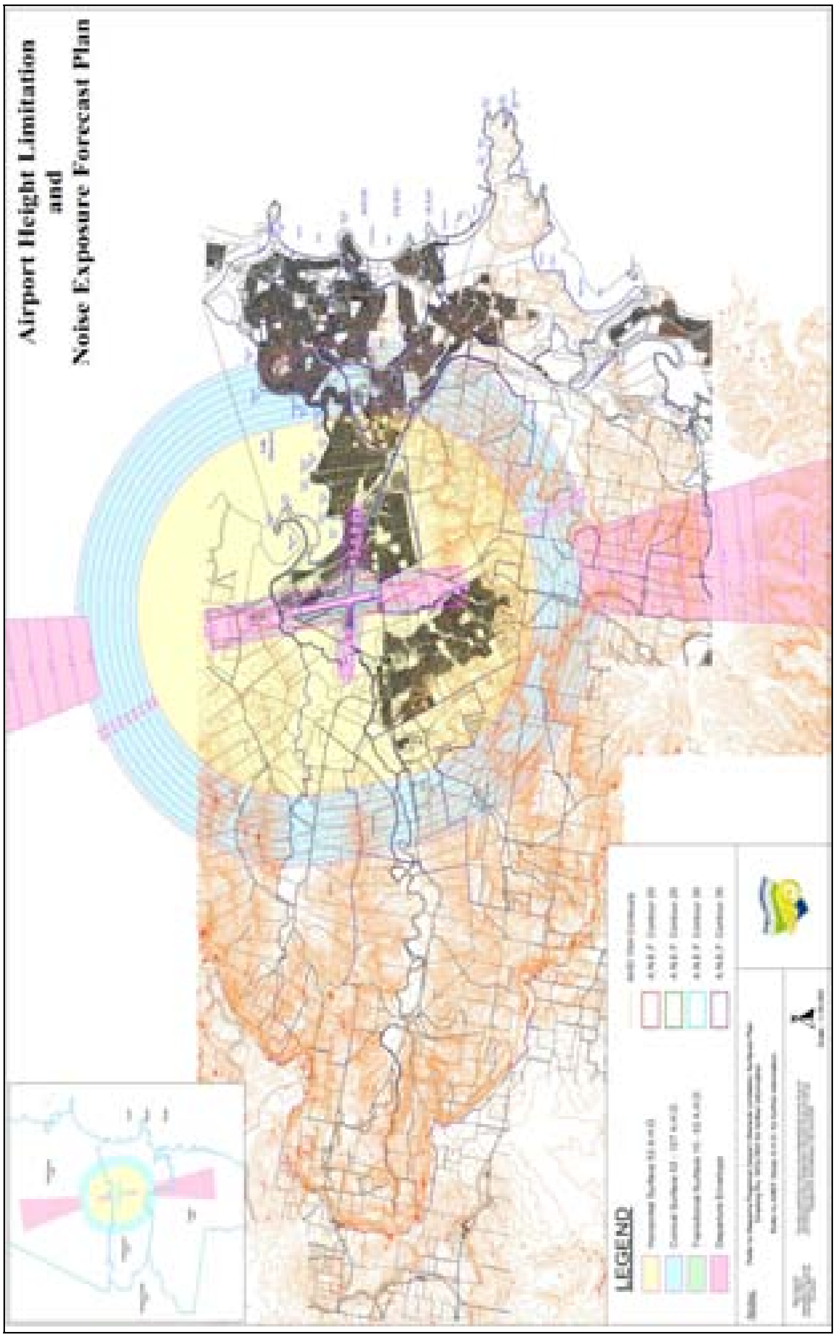
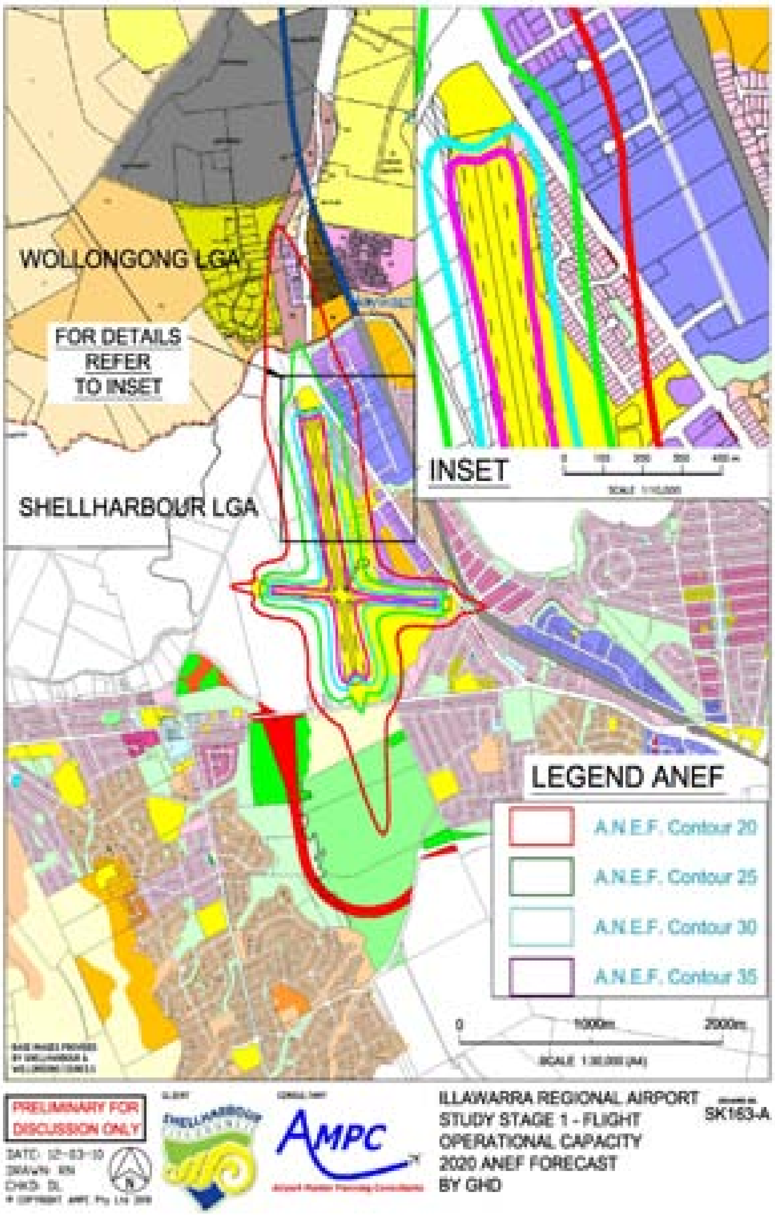
Aircraft noise contours and status	The 2009 Australian Noise Exposure Forecast (ANEF) plan (combined with the obstacle limitation surfaces) is shown on **Figure 7** while an updated ANEF for 2010 is shown in **Figure 8**. **Figure 7 – 2009 ANEF and Obstacle limitation Surface**  *Source: SCC 2009*

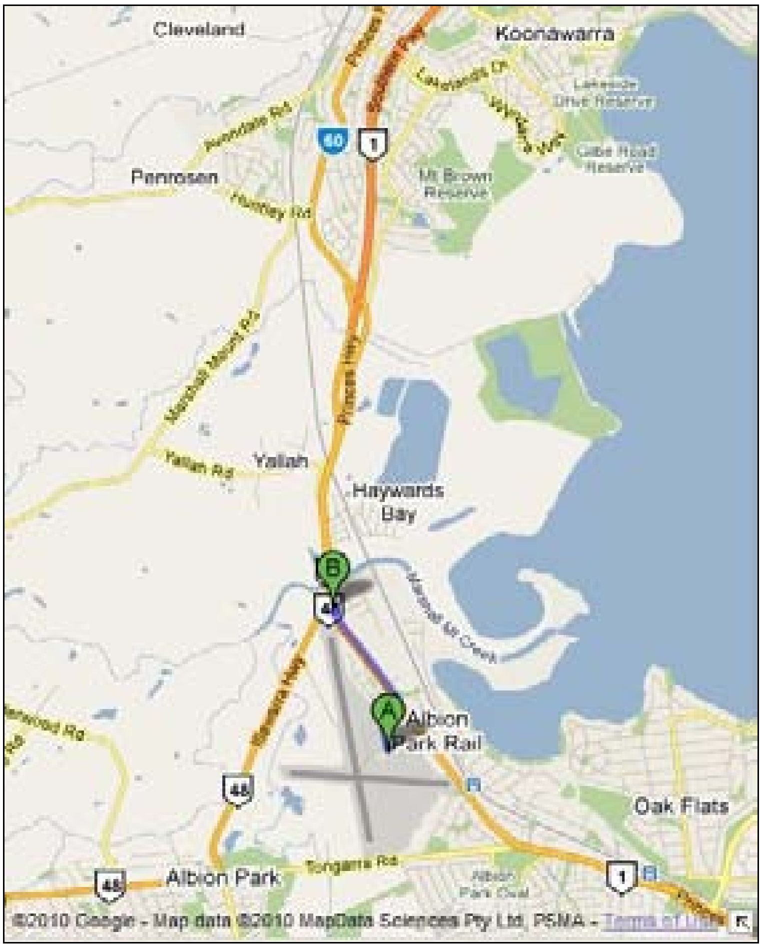
	Figure 8 – 2010 ANEF and Obstacle limitation Surface
	
	Source: SCC 2010

9.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related	Illawarra Regional Airport is home to the following aviation related businesses • Aero V Australia - Manufacture and Maintenance of Light Sport Aircraft • Airag - Aircraft repairs & sheetmetal work • Aircraft Maintenance Centre - Aircraft Maintenance • Air Safety Solutions - Manufactures and maintains textile engineered products for the aviation industry • Australian Aerial Patrol - Search & Rescue / Beach Patrol / Aerial Surveillance • The Aviator Lounge - Café style restaurant • Capital Aircraft Services - Aircraft instrument, electrical and radio installations and maintenance. Aircraft maintenance and modifications • EliteJet - Business Jet Management and Business Jet Charter • Historical Aircraft Restoration Society (HARS) - Historical Aircraft Restoration and Public Museum • NSW Air - Flying training, joyflights & charter operations • Shell Aviation - Fuel Services • Skydive the Beach - Tandem Skydiving • Sydney Microlight Centre - Approved microlight training facility and seller and service of microlights and parts • Total Aerospace Solutions - Mission specific modifications to aircraft Touchdown Helicopters - Joyflights/Charter • Emergency Services - The Illawarra Regional Airport is home to the NSW Fire Brigade Training Centre, the NSW Ambulance Helicopter Service (CHC Helicopters) and the new Illawarra Regional Control Centre for the NSW Rural Fire Service.
Freight forecasts	Not applicable – no known likely freight operator at present
Plans to invest in upgrading	Will depend on decisions taken following the outcomes from the current consultant's study.
Passenger patronage forecasts	Will depend on decisions taken following the outcomes from the current consultant's study.

Aircraft movements forecast by type	Will depend on decisions taken following the outcomes from the current consultant's study.
Costs for upgrades	Will depend on decisions taken following the outcomes from the current consultant's study.

9.5 Accessibility and Surface Transport

Connections to Road	Nearest connection to the major road network is the airport road connection to the Princes Highway to which the airport has direct access. Thence, 4.2 km and 5 minutes to the Southern Freeway. Distance to Sydney CBD: 103 km and travel time 1 hour 36 minutes approximately. **Figure 9 – Access to freeway** 

Distance to Canberra 211 km and 2 Hours and 48 minutes approximately.

Figure 10 – Access to Canberra

Distance to Wollongong 22 km and 24 minutes approximately.

Figure 11 – Access to Wollongong

Traffic Volumes

Illawarra Regional Airport is located with direct access to the State Road network with connections to locations to the south and north and to Wollongong CBSD and to Port Kembla. In the future the F3 freeway is expected to be extended around the airport to the west to link with major road upgrades already constructed.

	Figure 12 – Major road system 
Access to rail	Albion Park Station: Distance to nearest station (Albion Park Station) 900 m and travel time 10 minutes **<u>walk</u>** approximately. However, the route may be missing sidewalks or pedestrian paths. Albion Park Station to Central 104 km Time to Sydney Central Station: Albion Park Station to Central 1 hour

	and 56 minutes (South Coast Line train) Frequency of service: approximately 11 trains a day Cost: $7.80 one way Alternatively passengers can use bus services to Wollongong and take the train from there. **Figure 13 – Access to rail** 
Airport Parking capacity - short term and long term	The airport has unlimited at grade parking for current and likely future levels of parking need. A 25 space secure car park was established for use by passengers when the RPT service was operating and still exists.

Other transportation services available at airport	Bus – ○ Closest bus stop on Princes Hwy (520 m – approximately 8 mins walk) ○ Direct bus to Wollongong (Route 57) ○ Operator: Premier Illawarra Taxi – ○ available on call Rental cars – ○ Not available at the airport currently. However, both Avis and Thrifty operated rental desks when the RPT service was operating Shuttle services – ○ Nil currently

9.6 Utilities and Services

Water	Service Provider Sydney Water – the airport is connected to the trunk main and this has been recently upgraded. No capacity issues with either water or sewer. New connections would need to be established should the airport proceed with a new terminal development in the south east quadrant.
Gas	Jemena Gas South is reticulated along the Princes Highway but not as yet onto the Airport site.
Police, fire, ambulance, hospitals.	Police ○ LAC Police established at Oak Flats Station ○ Dapto Police Station: (7km - approximately 9 mins) Fire ○ Albion Park Fire Station: (on the airport) Hospitals ○ Shellharbour Public Hospital (8.4 km – approximately 14 mins)
Power	Service Provider Integral Energy – no capacity issues as all substations and internal reticulation recently upgraded.
Telecoms	Service provider Telstra, Wollongong – the airport has ADSL availability and all communications connections have been upgraded recently.

9.7 Land Planning Policies and Frameworks

Statutory and Policy	The key planning and environmental legislation and planning policies which are responsible for guiding the development of the Illawarra

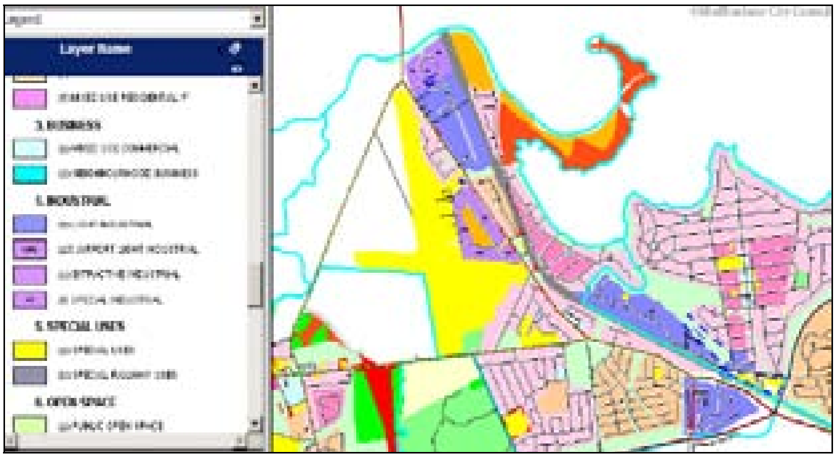
Framework National, State and local Planning Policies and Instruments Provisions for airport development	Airport site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979 • Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Shellharbour Local Environmental Plan 2000 • Shellharbour Rural Local Environmental Plan 2004 • Albion Park Aerodrome Buffer Area Development Control Plan • Industrial Development Control Plan The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales. *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a state statutory policy that aims to “facilitate the effective delivery of infrastructure across the State”. This infrastructure includes “airports” and the provisions which specifically relate to airports are contained in Part 3, Division 1 “Air transport facilities”. ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent. The *Shellharbour Local Environmental Plan 2000* (LEP 2000) is the local statutory planning instrument that guides development in the urban areas of the Shellharbour Local Government Area (LGA). LEP 2000 includes provisions that are specifically relevant to the airport:- • Clause 31, Zone 4(a3) (the Airport Light Industrial zone) - Zone 4(a3) (the Airport Light Industrial zone) applies to the industrial area located adjacent to the Illawarra airport. The objective of the 4(a3) Zone is to “provide for a wide variety of light industrial uses that are generally compatible with nearby residential neighbourhoods” and “where appropriate, to encourage the development of industries that are airport-related and, as a result, to diversify the industrial base of Shellharbour in a manner compatible with use of the adjacent Illawarra Regional Airport”. • Clause 38, Zone 5(a) (the Special Uses zone) – The Illawarra Airport is zoned 5(a) and lettered “Airport”. The objective of the zone is to “maintain land for certain community facilities and services”.

	• Clause 84 "Development in the vicinity of Illawarra Regional Airport" states that: "Despite any other provision of this plan, consent must not be granted to development on land affected by restrictions as indicated in the plan titled *Airport Height Limitation and Noise Exposure Forecast Plan*" dated 17 April 1998 and held in the office of the Council unless: (a) the consent authority determines the proposal is acceptable in relation to building height, noise exposure, lighting and bird hazard management, and (b) where a proposal does not comply with that plan, the Civil Aviation Safety Authority has been given notice of the proposal and any comments made by it to the consent authority within 28 days of its being notified have been taken into consideration by the consent authority. The *Shellharbour Rural Local Environmental Plan 2004* (LEP 2004) is the local statutory planning instrument that guides development in the rural areas of the Shellharbour LGA. LEP 2004 includes provisions that are specifically relevant to the airport:- • Clause 61 "Development in the vicinity of Illawarra Regional Airport" – states that: "Despite any other provision of this plan, consent must not be granted to development on land affected by restrictions as indicated in the plan titled *Airport Height Limitation and Noise Exposure Forecast Plan* dated 17 April 1998 and held in the office of the Council unless: (a) the consent authority is satisfied that the proposal is acceptable in relation to building height, noise exposure, lighting and bird hazard management, and (b) where a proposal does not comply with that plan, the Civil Aviation Safety Authority has been given notice of the proposal and any comments made by it to the consent authority within 28 days of its being notified have been taken into consideration by the consent authority. In addition to the statutory instruments that apply to the Shellharbour LGA, the "Albion Park Aerodrome Buffer Area DCP" and "Industrial Development Control Plan", non-statutory planning policies, include provisions that will affect development within the vicinity of the airport:- • The "Albion Park Aerodrome Buffer Area DCP" applies to the residential zoned land which is in the immediate vicinity of the airport to the east of the site. The Albion Park Aerodrome Buffer Area DCP aims to "minimize the potential for incompatible land use adjacent to, or within the proximity of the Albion park aerodrome [also known as Illawarra Airport], by limiting the

number of residential dwellings permitted on those residential allotments".

- The "Industrial Development Control Plan" includes specific provisions for the land zoned 4(a3) Airport Light Industrial Zone. The relevant provisions within the Industrial DCP primarily relate to the protection of an Endangered Ecological Community which is surrounded by the land zoned 4(a3) (Airport Light Industrial).

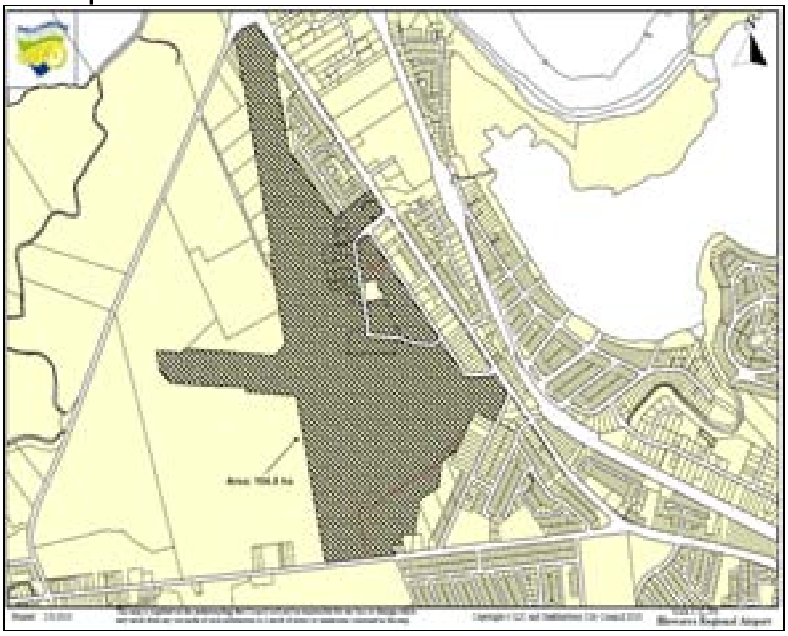
Figure 14 – Zoning map



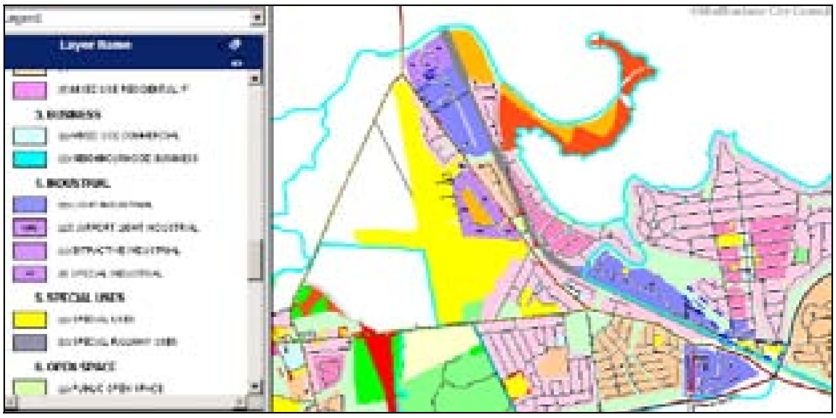
Extract of the *Shellharbour Local Environmental Plan 2000* zoning map

Source: http://exponare.shellharbour.nsw.gov.au/

Note: Shellharbour is exhibiting a 2000 LEP however this does not show zoning around the airport as clearly as does the 2000 LEP. Therefore caution may be required if further consideration of this airport is undertaken.

	Figure 15 – Cadastral Boundaries of Property in the Vicinity of the Airport  *Source: SCC 2010*

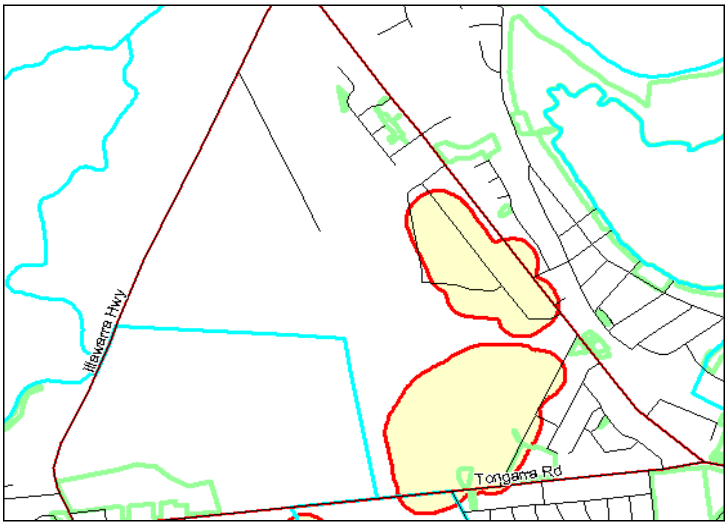
9.8 Environmental Factors, Frameworks and Policies

Site characteristics	The Illawarra Airport is zoned "Special Uses". Adjacent the airport site is an industrial area zoned 4(a3) (the Airport Light Industrial zone). **Figure 16 – Zoning map**  Extract of the *Shellharbour Local Environmental Plan 2000* zoning map Source: http://exponare.shellharbour.nsw.gov.au/

The land zoned 4(a3) (Airport Light Industrial) surrounds an area of remnant vegetation.

According to the Industrial Development Control Plan (see above), the area of remnant vegetation is "a significant stand of remnant vegetation" which has been "identified as being an important Endangered Ecological Community with high conservation value and is representative of a once diverse plant community surrounding Lake Illawarra (Illawarra Lowlands Grassy Woodlands). This remnant stand has been zoned environmental protection (Scenic) 7(d)".

Figure 17 – Bush Fire Prone land



Extract of the Shellharbour bushfire affectation map

Source: http://exponare.shellharbour.nsw.gov.au/

The area of Endangered Ecological Community (see above) and also the land located adjacent to the southern boundary of the airport site is identified as bushfire prone land.

The following figure shows the extent of the airport which may be liable to flood.

According to Council's engineers *"It is recommended that the current flood levels for the DELMO and HYUNDAI sites be taken as the most accurate flood levels to date. DELMO's Flood Study 2007 shows 1% flood levels ~6.5m AHD. The runway's low point is 6.22m AHD. Based on existing levels & on-site observation, approx 70m of runway would be inundated when water levels are at 6.5m AHD."*

	Figure 18 – Flood potential 
Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangered species Designated environmental management areas Existing environmental	The Illawarra Airport is located bounded by the Princes Highway to the east, the Illawarra Highway to the west and Tongarra Road to the south. The Wollongong LGA boundary is located approximately 500m to the north.

assets Heritage scientific and aesthetic qualities/issues Wetlands and other sources of bird hazard	**Figure 19 – Property**  This photo shows an overlay of cadastral boundaries of property in the vicinity of the Airport. Source: SCC 2010 The airport is located between three townships on the NSW south coast. Haywards Bay is located less than approximately 500m to the north, Albion Park is located approximately 1km to the south-west and Oak Flats is located approximately 1.5km to the east and south-east. Immediately adjacent Oak Flats to the east is the Shellharbour City Centre and a significant urban area. The Shellharbour City Centre is located approximately 3.5km to the east of the airport. A number of residences to the east are located within 100m of the landing strip. The Albion Park Railway station is less than 150m to the east of the site. The land to the west is zoned “1(a) Agricultural”. Lake Illawarra, a large natural waterbody, is located to the north-east of the airport site. Parts of the perimeter of Lake Illawarra appear to be zoned “Environmental Protection (Wetlands)”. These areas are less than 500m to the east of the airport. Approximately 500m to the south-west of the site is more land that appears to be zoned “Environmental protection (Wetlands)”.

Existing Environmental Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	According to the Illawarra Regional Airport website, Shellharbour City Council and the Airport Operators have an agreed fly neighbourly policy which states that: • Pilots use runway 08 (to the east) only when operationally necessary (due to wind direction). • Helicopters are not allowed to overfly the residential area to the east of the airport at an altitude less than 1000ft (300m). • Air Ambulance helicopter pilot familiarisation training is restricted to practice approach and departures. • Night training restricted to north/south runway with runway 34 preferred. • Night circuit training to cease at 10pm local time.
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	The Illawarra airport site is in very close proximity to a range of sensitive neighbouring land uses, specifically residential uses and the Shellharbour Town Centre, that may limit the expansion of the airport. Shellharbour Council has taken steps to rezone land immediately adjunct to the Airport to encourage development and business use which would be compatible with the Airport. One difficulty is that the northern approaches to the Airport are over land within the City of Wollongong and some development has occurred which may not be compatible with airport operations in the future. However Wollongong City Council does refer development applications to the Airport management for consideration and advice. Illawarra Regional Airport has identified a site within the airport in which to develop an RPT terminal and apron should the economics of this be proven. Immediately to the south of the airport and south of Tongarra Road is a site which Council tried to acquire but was unable to. However the use of land will be controlled to be compatible with expanded airport development. Land adjacent to the Airport's south western quadrant is also proposes to be developed for industrial uses. They have also successfully developed commercial hangars and have space to develop more.

9.9 Community and Public Amenity Factors

Community attitudes to airport	Community attitudes are considered to be generally favourable, with particular support coming from WIN TV. The airport is recognized as a source of employment and serving several community interests eg Fire fighting, rescue and the like.
Airport interaction with Communities	The following forms of interaction are current: • Airport Management Advisory Committee on which the City of Wollongong is represented; • Airport working party with all airport businesses and two community representatives, provided that these are not registered objectors to the airport; Meets twice a year; • In the event of noise complaints these are recorded and mapped – if there is an issue then the Airport implements its Fly Neighbourly program. • The Airport holds an open day each year – last year 30,000 people attended.

9.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010*. Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Civil Aviation Safety Authority 2009, *Airspace Review of Wollongong*. Civil Aviation Safety Authority 2010, *CASA comment and final recommendations on the Hyder Airspace Review of Wollongong dated August 2009.* Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. http://www.illawarraregionalairport.com.au/default.aspx?WebPage=1 http://www.airservicesaustralia.com/ http://exponare.shellharbour.nsw.gov.au/

HMAS Albatross Naval Air Station

CONTENTS

10 HMAS ALBATROSS NAVAL AIR STATION

10.1 Introduction

HMAS Albatross Naval Air Station (HMAS Albatross) is located approximately 9km south[1] of Nowra and is accessed from BTU Road off the Princes Highway. **Figures 1 and 2** depict aerial images of the aerodrome site.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date August 2006)

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Area)

Source: Google Earth Pro 2010 (Imagery Date August 2006)

The decision to build an airfield on the land now occupied by the Naval Air Station was taken soon after WWII was declared in 1939. The RAAF occupied the new base in 1942 and was soon followed by the US Army Air Corps and the Royal Netherlands East Indies Air Force.

In 1944, the British Admiralty directed forces to the South-West Pacific necessitating shore base establishments in Australia to support the Royal Navy and its Fleet Air Arm. RAAF Base Nowra was considered ideal because of its proximity to Jervis Bay, which was large enough to accommodate the entire British Pacific Fleet. The Royal Navy's Fleet Air Arm began operations at Nowra in late 1944, and the base was renamed HMS Nabbington. In 1946, the base reverted to RAAF control "to be retained but not maintained".

In 1947, the Commonwealth Defence Council approved the formation of a Fleet Air Arm which would be controlled and operated by the RAN. The initial planning included purchase of two aircraft carriers, aircraft, and establishment of shore facilities. The carriers were named HMA Ships Sydney and Melbourne, and the shore facilities were at Nowra.

HMAS *Albatross* was commissioned in 1948 and the 20th Carrier Air Group, comprising Sea Fury and Firefly aircraft, was brought from England to Australia by HMAS Sydney.

HMAS *Albatross* has been expanding ever since. As more capable aircraft have been acquired, so ground support facilities have had to be built. In 1955, Sea Venoms and Gannets arrived, requiring radar workshops and test facilities. More aircraft necessitated stricter standards of air traffic control and a new control tower was built in 1958. In 1964, the introduction of Wessex helicopters, with a dunking sonar capability, required a further expansion of services.

In 1965, it was decided to buy American aircraft to replace the ageing British Gannets and Sea Venoms. McDonnell Douglas Skyhawks and Grumman Trackers were chosen and additional avionics facilities were built to service the complex equipment they carried.

In recent years significant redevelopment has taken place, continuing the operation of HMAS *Albatross* and recognising its strategic importance as the sole Royal Australian Navy Air Station. Navy now solely operates rotary wing aircraft although the range of fixed wing RAAF aircraft also utilise the Base.

The Base also accommodates the Fleet Air Arm museum and RAN Historic Flight. The museum is open to the public.

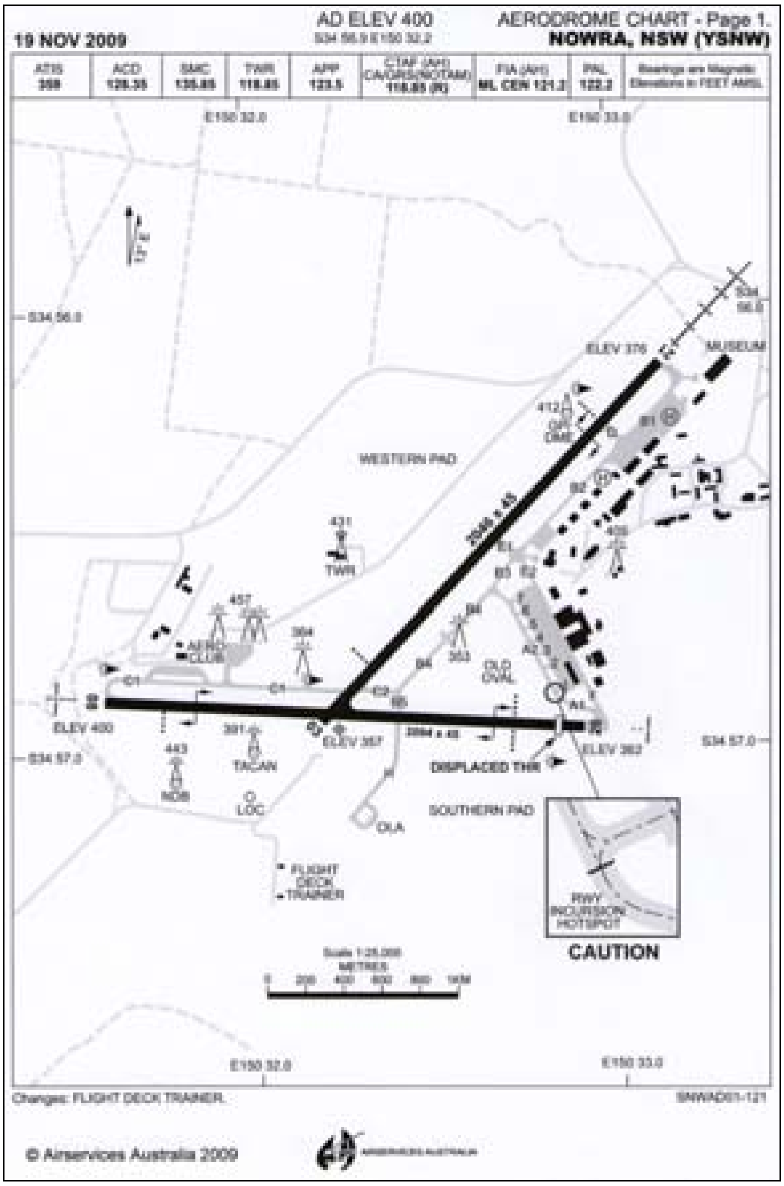
10.2 Current Site Attributes

Aerodrome location	S34 56.9 E 150 32.2
LGA	City of Shoalhaven
Ownership and management; lessee/operator	Department of Defence (Navy)
Aerodrome Category	Military
Applicable regulatory regime	ADFP 602 and MOS 139

Site area and physical dimensions	876ha
Major centres of population, population growth and distances	Nowra, Wollongong
Elevation	400
Surrounding topography	Dissected topography with ridges and gullies becomes increasingly elevated and rugged to the west of the aerodrome.
Liability for flooding	The aerodrome is located on a hilltop
Atmospheric conditions	No Known

10.3 Aerodrome Operations

Summary of main activities	The primary task of HMAS Albatross is to support the three Naval Air Squadrons, which provide air support to the fleet. These are: • 723 Squadron with AS350 Squirrel helicopters • 816 Squadron with S-70B Seahawk helicopters • 817 Squadron with SK50 Westland Sea King helicopters (to be replaced by the MRH-90 in 2011) Other military operations include the Army's Parachute Training School which is responsible for all ADF parachute training and supports airborne activities around the country. Civilian fleet support aircraft (eg Learjet) are used for target towing and weapons simulation. Although the aerodrome is not open for public use the Albatross Aeroclub has a facility on the northern side of Runway 08/26.This area has previously been used for small scale civil operations. Civil navigation aid training may be available subject to 24 hour prior approval.
Current passenger numbers	Not applicable
Current aircraft movement numbers	2009 • Military: 34,692 arrivals/departures, 510 transit • Civil: 797 arrivals/departures, 2501 transit
Current freight throughput	Not applicable
Known sources of delay in aerodrome and runway operations	Unknown

Movement/manoeuvring area details	
Runways	• 03/21 – 2046m x 45m (Code 4 – civil equivalent) • 08/26 – 2094m x 45m (Code 4 – civil equivalent)
Runway strips	• 03/21 - 2166m x 230m • 08/26 – 2454m x 150m
Taxiways	There is a comprehensive taxiway system supporting the RAN operational areas including a full length parallel taxiway on the southern side of Runway 03/21 and a partial parallel taxiway on the northern side of Runway 08/26. **Figure 3** shows the runway and taxiway layout.
	Figure 3 – Runway and Taxiway Layout  *Source: Airservices Australia 2010*

Aprons	There is a comprehensive paved apron complex supporting individual hangars within the building area as well as the smaller former civil apron on the northern side of Runway 08/26. There is a visiting military apron adjacent to the former civil apron and an ordnance loading area (OLA) south of Runway 08/26.
Airfield pavements	Runway 03/21 - 67a PCN 43/F/C/2000 (290 PSI)/T (eg B737-700/A320) Runway 08/26 – 69a PCN 43/F/C/2000 (290 PSI)/T (eg B737-700/A320) Taxiways Unknown Aprons Bitumen aprons suitable only for aircraft below 5,700kg and helicopters Concrete aprons unknown
Airfield operating restrictions	Aerodrome is not open to public use.
Airfield lighting and approach systems	• High intensity runway edge lighting (both runways) • Taxiway centreline green lighting • High Intensity Approach Lighting (HIAL) 21 approach • Precision Approach Path Indicator (PAPI) system 03, 21, 08 and 26 approaches (double sided on 26 approach)
Visual navigation aids	• Runway, taxiway and apron markings and markers • Four illuminated wind direction indicators (IWDI) • Runway distance to run markers (both sides of both runways)
Radio navigation aids	• Tactical Air Navigation System (TACAN) • Instrument Landing System (ILS) with outer marker beacon Runway 21, Distance Measuring Equipment (DME) co-located with Glide Path (GP). Note an ILS nominally requires a 300m wide runway strip for full civil usability (Codes 3 and 4) in lieu of the 230m military standard currently provided. • Non-Directional Beacon (NDB)
Surveillance systems	Radar - Type Unknown
Operational procedures	• Civil navigation aid training may be available subject to 24 hour prior approval • Parachute operation 24 hours • Fixed wing circuit altitude is 1,500 feet

	• Military helicopter circuits to West Pad, South Pad and Flight Deck Procedures Trainer not above 2,000 feet. Other helicopter circuits 1,200 feet altitude • Military helicopters may take-off/land on Old Oval • Runways 08 and 21 right hand circuits • Military helicopters may operate simultaneous contra-rotating circuit to runways 24 hours • Low strength bitumen areas outside taxiway sidelines not available for taxi • Parking areas and buildings adjacent to Taxiways A and B infringe taxiway strips. Aircraft up to C130 size will have a 5m wingtip clearance if taxiway centreline is maintained. • Taxiways B and C infringe the runway strips. Concurrent operations may occur on runways and adjacent taxiways at ATC discretion. Minimum 53m wingtip clearance between C130 on Runway 03/21 and C130 on Taxiway B. Minimum 23m wingtip clearance between C130 on Runway 08/26 and C130 on Taxiway C.
Aviation fuel	AVGAS and F44 (AVCAT 48), not available for visiting civil aircraft. *(Note with withdrawal of last piston engine aircraft in RAAF service – (Caribou) at the end of 2009 there may no longer be a requirement for AVGAS)* Storage capacity unknown
Terminals and other major aviation support infrastructure elements	Not applicable - aero club building may have functioned as a terminal at some stage. Large number of hangars and supporting infrastructure.
Security	As per Department of Defence requirements
Border Agencies	Not applicable
Air traffic management and airspace management arrangements	Military Air Traffic Control (ATC) is applicable within the Nowra Control Zone (CTR) which is a semi-circular shaped area extending 9 nautical miles to the south and truncated to the north with the boundary based on geographical features. It extends from the surface to an altitude of 2,500 feet and is active during the tower's hours of operation which are 0800-2300 hours local Mon-Thu, and 0800-1230 Fri, public holidays excluded. Outside of tower operations hours, the airspace reverts to Class G and Common Traffic Area Frequency (CTAF) procedures apply.

Overlying the CTR and extending in an arc of 15 nautical miles to the north-west and 23 nautical miles to the south east are a series of Restricted Areas associated with military flying training. These Restricted Areas, (R420A, R420B, R420C, R420D, R420E and R420F) operate variously from the surface or higher and up to Flight Level 300 or lower, and are all activated by NOTAM.

Restricted Areas R452 and R453A abut the CTR to the east and are associated with firing and bomb tracking radar respectively. They are both activated by NOTAM as are their vertical limits.

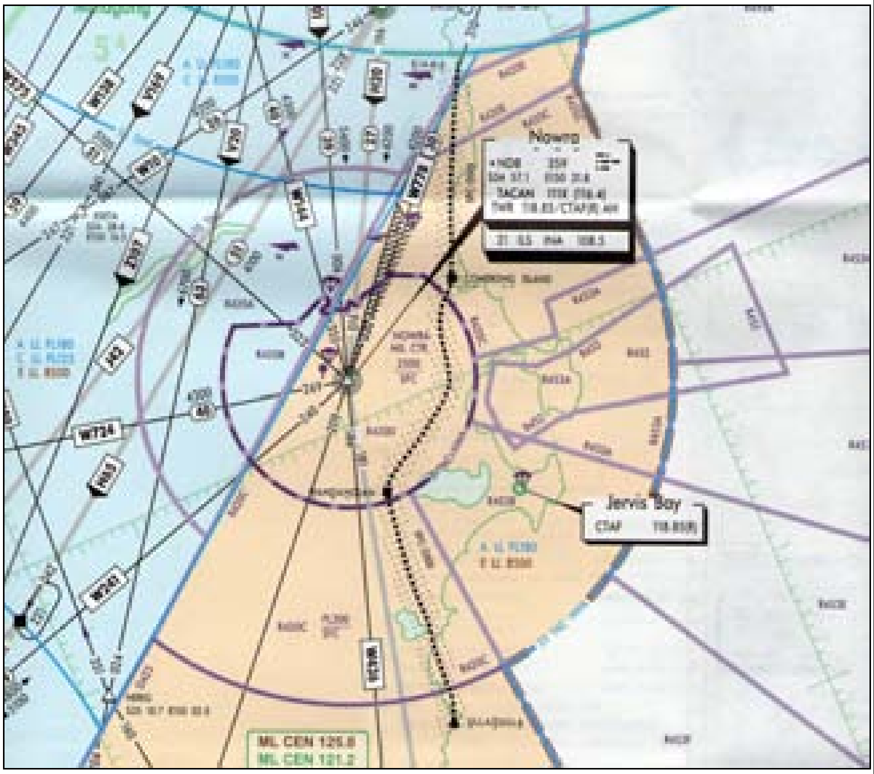
A general aviation (GA) transit lane is established for Visual Flight Rules Aircraft (VFR) through the CTR and R420.

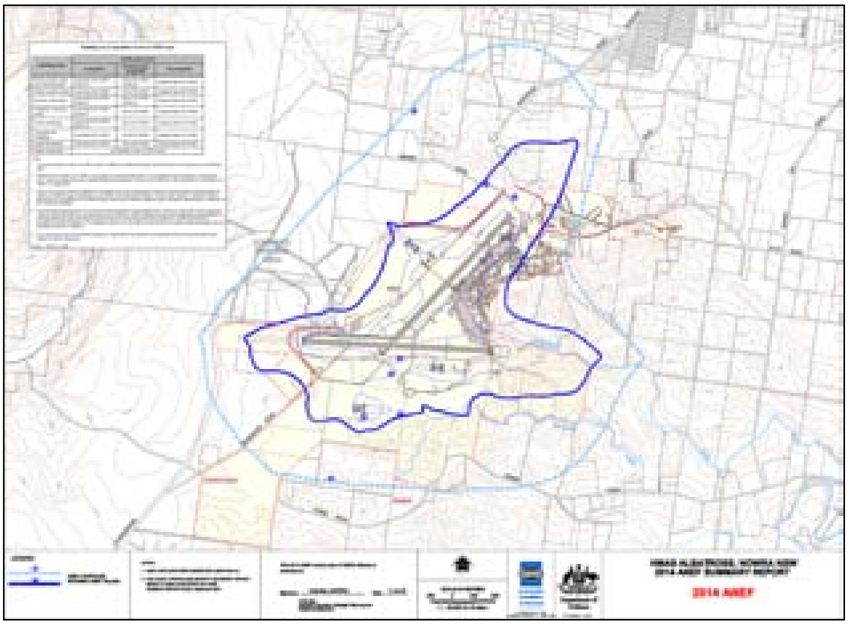
Figure 4 shows the airspace arrangements in the vicinity of the aerodrome.

Figure 4 – HMAS Albatross Aerodrome Airspace Arrangements

Source: Airservices Australia 2010

The majority of traffic utilising HMAS Albatross Aerodrome or transiting HMAS Albatross airspace is assumed to be operating under Instrument Flight Rules (IFR) other than GA VFR using the transit lane above. Flight tracks established in relation to aircraft operating under IFR are shown in **Figure 5**. IFR departure and approach procedures are promulgated in the relevant Departure and Approach Charts (DAP).

	Figure 5 – HMAS Albatross Aerodrome IFR Flight Tracks  *Source: Airservices Australia 2010* Other airports/aerodrome facilities as shown on aeronautical charts within 50km of HMAS Albatross Aerodrome are: • Cambewarra airfield approximately 14km to the north • Wollongong Airport approximately 49km to the north-east • Jervis Bay Aerodrome (Nowra satellite airfield) approximately 27km to the south-east • Yalwal airfield approximately 14km to the west
Aerodrome Rescue and Fire Fighting Services (ARFFS)	Category 6 available 0800-2300 hours local Mon-Thu, and 0800-1230 Fri, public holidays excluded, or for scheduled military flights. Outside of tower hours and when FAC unmanned, Category 4 available with response time 4 minutes
Operating restrictions	Noise abatement procedures in force as follows: • Noise sensitive area: aircraft are to avoid flying an area of 1 nautical mile radius centred on Nowra township below 1,500 feet altitude • Fast jet/turbo-prop departures Runway 21

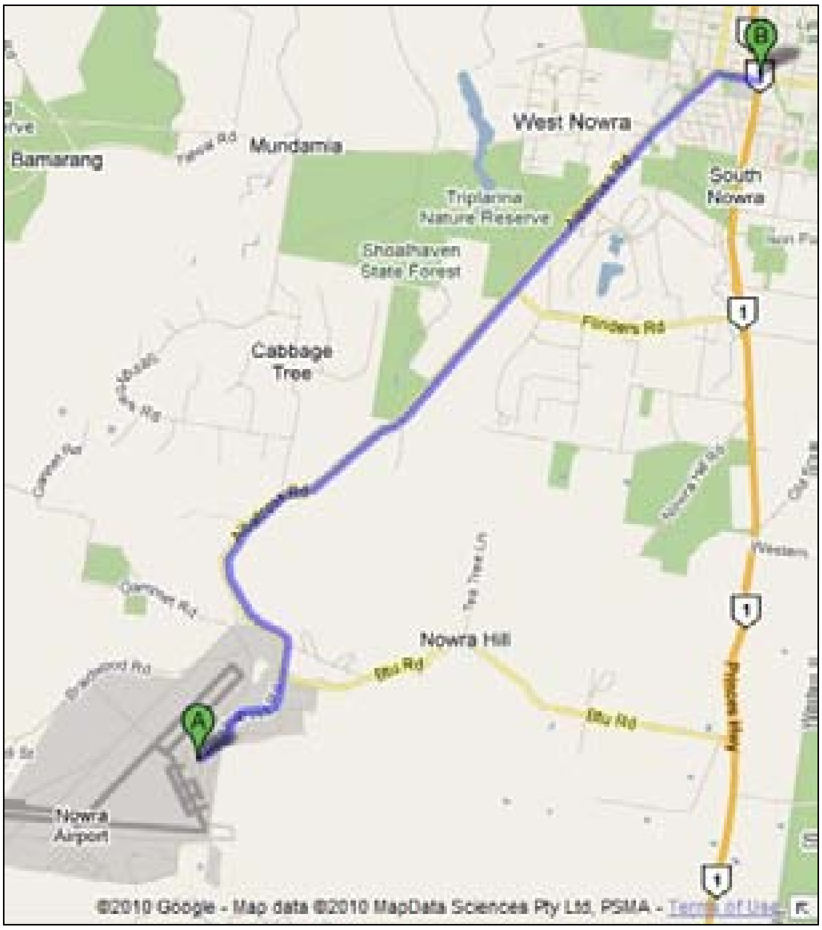
	• For noise abatement climb to 1,300 feet on runway heading before commencing a turn onto track
Known development capability and expansion planning	See Plans to invest in upgrading below
Known constraints on future capacity or ability to meet current and future demand	Flight paths are long established and no changes are anticipated in the foreseeable future. Further urbanisation to the south of Nowra will see increased conflict resulting for the arrival and departure of aircraft particularly for Runway 03/21. Departures off Runway 03 may be able to effect an early heading change for noise abatement, if operations permit. However, arrivals to Runway 21 are problematic due to this runway having the only ILS. Removal of this aid would not be contemplated by Defence due to the extreme limitations this would place on Defence operations. Such a change would significantly impact on Defence operations and would therefore not be in the national interest.
Aircraft noise contours and status	**Figure 6** shows the 2014 Australian Noise Exposure Forecast (ANEF) which appears to be unendorsed. **Figure 6 – 2014 ANEF** 

10.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related;	In 2006 the Shoalhaven City Council Office of Economic development reported that: *"Many internationally recognised defence contractors operate in the Shoalhaven, including Kaman Aerospace International, BAE Systems, Raytheon, Tenix, Computer Sciences Corporation, Scientific Management Associates, and Air Affairs."* *"Albatross Aviation Technology Park* *This estate provides a specific location from which existing and new aviation technology enterprises can service domestic and export markets as well as meet the needs of defence operations at HMAS Albatross. Having direct access to the airfield facilities, opportunities exist for businesses with aircraft maintenance and operational contracts to establish facilities on freehold sites. Over 1,000 employment opportunities are anticipated at full development of the currently planned 37 lots.* *The Department of Defence has re-affirmed that HMAS Albatross will remain the focus for Naval aviation operations and training for the future."*  *source: http://www.shoalhaven.nsw.gov.au/region/econodev/econodev.htm,*
Freight forecasts;	Not applicable
Plans to invest in upgrading;	A Defence redevelopment project has been identified and is in the initial planning stages. The project aims to upgrade and refurbish existing facilities and infrastructure for the command, training, maintenance, operational support and administrative functions to met projected Base operational and support capabilities for at least the next 20-30 years.

Passenger patronage forecasts;	Not applicable
Aircraft movements forecast by type;	Unknown but would be contained in Defence's ANEF Report.
Costs for upgrades	Navy development project as outlined above approximately $123 million

10.5 Accessibility and Surface transport

Connections to Road	Nearest connection to the major road network is through BTU Road but most direct access to Nowra is through Albatross Road. 9.3 km and 12 minutes to the Princes Highway. Distance to Sydney CBD: 171 km and travel time 2 hour 42 minutes approximately. **Figure 7 – Access to Princes Highway** 

Distance to Wollongong 89.9 km and 1 hour and 34 minutes approximately.

Figure 8 – Access to Wollongong

	Distance to Canberra 227 km and 3 hour and 10 minutes approximately. **Figure 9 - Distance to Canberra** 
Traffic Volume	Nil
Access to rail	Bomaderry (Nowra) Station: Distance to nearest station (Bomaderry) 13.6 m and travel time 20 minutes drive, approximately. Bomaderry (Nowra) Station to Central 153.37 km Time to Sydney Central Station: Bomaderry to Central 3 hour and 30 minutes approximately (South Coast Line) Frequency of service: approximately 14 trains a day from Bomaderry (Nowra) Station to Central Cost: $7.80 one way

	Figure 10 – Access to Rail 
Aerodrome Parking capacity - short term and long term	Unlimited capacity relative to current usage.
Other transportation services available at aerodrome	Bus – • Closest bus stop on corner of Kinghorn & Kalandar Streets (8.1 km – approximately 10 mins drive) • Direct bus to Bomaderry (Nowra) Station (Route 724) • Operator: Nowra Coaches Taxi – • available on call from Nowra Radio Taxi (10.7 km) Rental cars – • Not available at the aerodrome. Closest available at Culburra Beach 28.3 km. Shuttle services – • Nil
Walking and cycling	Walking not practical. Cycling possible via road network.

10.6 Utilities and services

Water and Sewer	Water Service provider: Shoalhaven Water Sewerage: Onsite treatment - The sewerage treatment plant at HMAS Albatross located at Nowra Hill provides treated effluent that is reused for irrigation purposes on the Naval Base.
Gas	Service provider Jemena Gas Nowra
Police, fire, ambulance, hospitals.	Police • Nowra Police Station (12.4 km – approximately 17 mins) Fire • Nowra Fire Station (11 km – approximately 15 mins) Hospitals • Shoalhaven hospital (10.5 km – approximately 15 mins)
Power	Service provider Integral Energy
Telecoms	Service provider Telstra, South Coast (s)

10.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for aerodrome development	The key planning and environmental legislation and planning policies which are responsible for guiding the development of the HMAS Albatross Aerodrome site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979 • Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Shoalhaven Local Environmental Plan 1985 The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales. *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a state statutory policy that aims to “facilitate the effective delivery of infrastructure across the State”. This infrastructure includes “airports” and the provisions which specifically relate to airports are contained in Part 3, Division 1 “Air transport facilities”. ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent.

	The *Shoalhaven Local Environmental Plan 1985* (the LEP) is the local statutory planning instrument that guides development in the urban areas of the Shoalhaven Local Government Area (LGA). The LEP includes provisions that are specifically relevant to the airport:- *"Clause 53 "Residential development within RANAS Nowra airport buffer area" (note that it is understood that HMAS Albatross is also known as "RANAS Nowra airport" and "Nowra airport") – applies to "the land situated in the vicinity of the naval air base known as RANAS Nowra and shown edged heavy black on the map marked "City of Shoalhaven Local Environmental Plan 1985 (Amendment No 126)—Sheet 1"". Clause 53(2) states that "the Council must not consent to subdivision of land to which this clause applies for residential purposes if the Council is satisfied that the subdivision would result in more dwellings being situated on that land than were on that land on 18 April 1997 (the day on which City of Shoalhaven Local Environmental Plan 1985 (Amendment No 126) commenced)". Subclause 53(3) states that "the Council must not consent to development for residential purposes on land to which this clause applies unless it has taken into consideration an assessment of the effect on the proposed development of noise from aircraft using RANAS Nowra".*

10.8 Environmental Factors, Frameworks and Policies

Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangers species Designated environmental management areas Existing environmental assets	The site is located approximately 8km to the south-east of the Nowra urban area and is zoned "Special Uses". Residential areas are also located along the east coast of Australia, approximately 15km to the east of the site along the coast. The aerodrome site appears to be zoned "Special Uses" and is surrounded by land which is zoned "Rural".

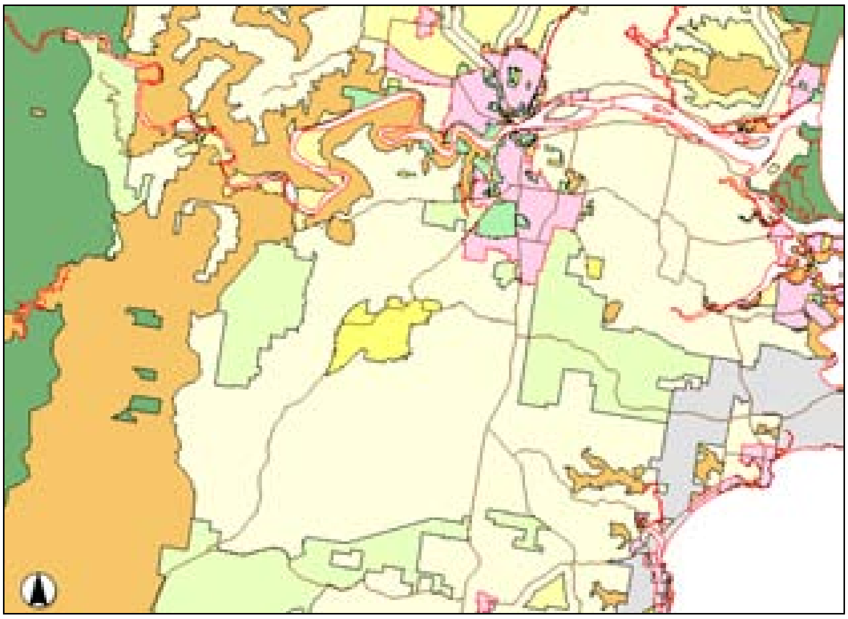
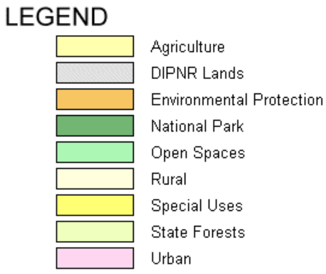
Heritage scientific and aesthetic qualities/issues Wetlands and other sources of bird hazard	**Figure 11 – Land Zoning**  Extract of the Shoalhaven zoning map and legend Source: http://www.shoalhaven.nsw.gov.au/council/Mapping.htm  Land zoned “State Forest” is located approximately 2km to the west, 5km to the east and 10km to the south. There is also a large area of land zoned “Environmental Protection” located 4km to the west of the site and land zoned “National Park” approximately 10km to the west. It appears that the site is within the vicinity of “Scribbly Gum-Silvertop Ash Forest/Woodland” and “Spotted Gum Forest” which may also occur within the aerodrome site (unclear due to the scale of mapping). Part of the aerodrome site is categorized at “Class 4” and “Class 6” land capability. It appears that the entire aerodrome site and a large proportion of the land surrounding the aerodrome have been identified as “bushfire prone properties”. The western part of the aerodrome site is identified as “Vegetation Category 1” as is much of the land to the west.

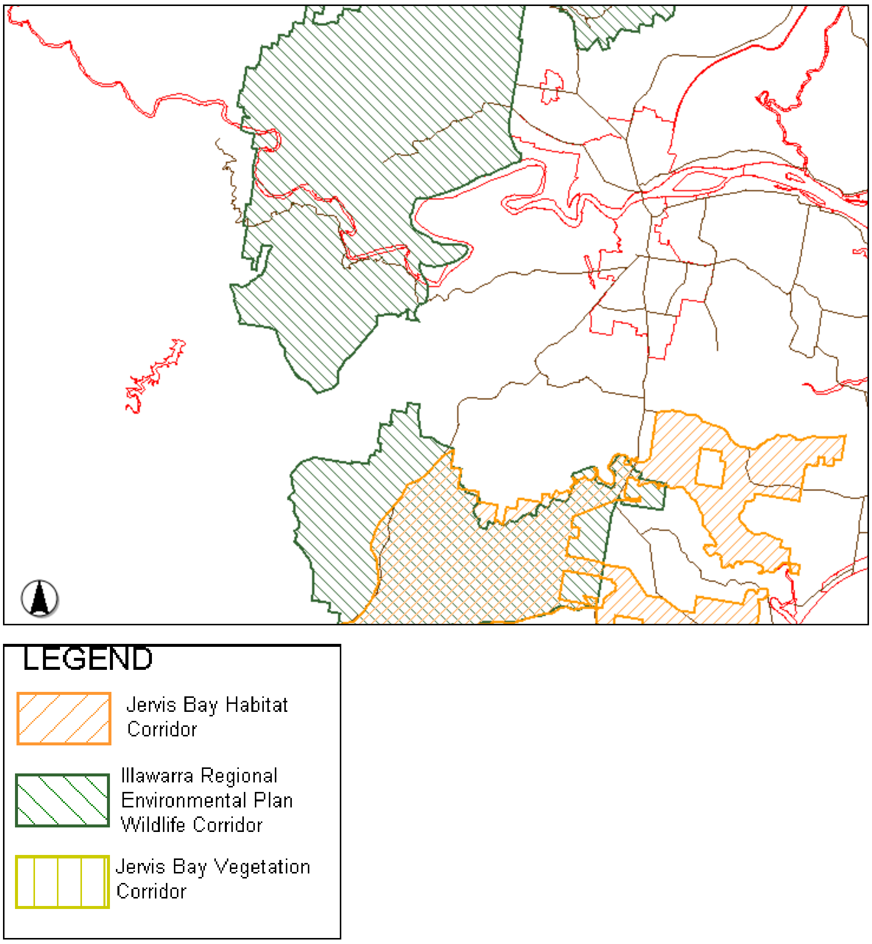
Figure 12 – Bushfire prone land

Extract of the Shoalhaven Bushfire Vegetation map

Source: http://www.shoalhaven.nsw.gov.au/council/Mapping.htm

It appears that the Jervis Bay Habitat Corridor and the Illawarra Regional Environmental Plan Wildlife Corridor are located in the immediate vicinity of the site to the south, west and east.

Figure 13 – Wildlife Corridors



Extract of the Shoalhaven Habitat/Wildlife Corridor map and legend

Source: http://www.shoalhaven.nsw.gov.au/council/Mapping.htm

The aerodrome is not within the Coastal Zone and is at least 12km from any Coastal Areas or Sensitive Coastal Locations and there do not appear to be any wetland areas within the immediate vicinity of the site. The site and surrounds are not affected by acid sulphate soils.

Existing Environmental Management - Factors, Frameworks and Policies Aerodrome's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Aerodrome	No existing environmental management policies were located.
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded aerodrome usage	As the site is surrounded by rural land uses, and Nowra, which is the nearest settlement, is located 8km to the north, it appears that there are no urban development related constraints to the expansion of HMAS Albatross. It is unclear if the nearby Jervis Bay Habitat Corridor and the Illawarra Regional Environmental Plan Wildlife Corridor, the bushfire affectation of the site or the flooding affectation of the site would limit the expansion of the aerodrome.

10.9 Community and Public Amenity Factors

Community attitudes to aerodrome;	Not known
Aerodrome interaction with Communities;	Not known – although the Museum is open to the public

10.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010*.

	Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Defence Airfield Table, nd, provided by Department of Infrastructure, Transport, Regional Development and Local Government 2010. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. http://www.defence.gov.au/news/armynews/editions/1064/features/feature01.htm http://www.navy.gov.au/HMAS_Albatross http://www.defence.gov.au/id/2025_anef.htm http://www.shoalhaven.nsw.gov.au/council/Mapping.htm

Goulburn Airport

CONTENTS

11 GOULBURN AIRPORT

11.1 Introduction

Goulburn Airport is located approximately 6km south east[1] from the city of Goulburn and is accessed from Windellama Road. **Figures 1 and 2** depict aerial images of the airport site.

Figure 1 – Aerial Image (Overall)

Source: Google Earth Pro 2010 (Imagery Date October 2006)

[1] Actual road or rail distances are discussed elsewhere herein

Figure 2 – Aerial Image (Building Area)

Source: Google Earth Pro 2010 (Imagery Date October 2006)

Goulburn Airport has been operating on land off Windellama Road since the 1920s. The land from which the airport operates was originally privately owned. The land then came under the ownership of the Federal Government.

A major improvement to the airport was carried out in 1966 when the then Goulburn City Council entered into the Aerodrome Local Ownership Plan (ALOP) with the Federal Government. Under this arrangement, Council operated the facility while the Federal Government retained ownership. At this time, a bitumen runway was constructed and fuel tanks were installed. An air service operator (Masling) commenced operation in 1968 and in the same year the non-directional beacon navigational aid and runway lighting were installed.

In 1975, the runway lighting was upgraded to Pilot Activated Lighting. The bitumen runway has been resealed a number of times including 1968, 1982, 1994 and 2009.

In 1992 the Federal Government withdrew from the ALOP. A grant was received to finance 50% of the outstanding maintenance works. This grant funding was expended on various works including a new bridge on the access road and resealing the runway. Under the terms of a Deed (the Transfer Deed) with the Federal Government, Council then became the sole owner/operator of the airport and fully responsible for its operation, maintenance, safety and funding.

As detailed below, Council has been attempting for some time to dispose of the airport either by sale or lease.

11.2 Current Site Attributes

Airport location and LGA	S 34 degrees 48.6 minutes E 149 degrees 43.6 minutes Goulburn Mulwaree Council LGA
Ownership and management; lessee/operator	Goulburn Mulwaree Council owner and operator
Aerodrome Category	Registered
Applicable regulatory regime	Civil Aviation Safety Regulations (CASR) Part 139 - Aerodromes
Site area and physical dimensions	63ha (excludes two areas on airport which have airside access/frontage which have previously been sold)
Major centres of population, population growth	Goulburn and Canberra.
Elevation	2141 feet
Surrounding topography	Goulburn Airport is located in open undulating grazing land with no major terrain obstacles
Liability for flooding	Not identified as flood prone land in the LEP maps
Atmospheric conditions	The airport operator estimated that the airport is affected by fog on about 20 days per year.

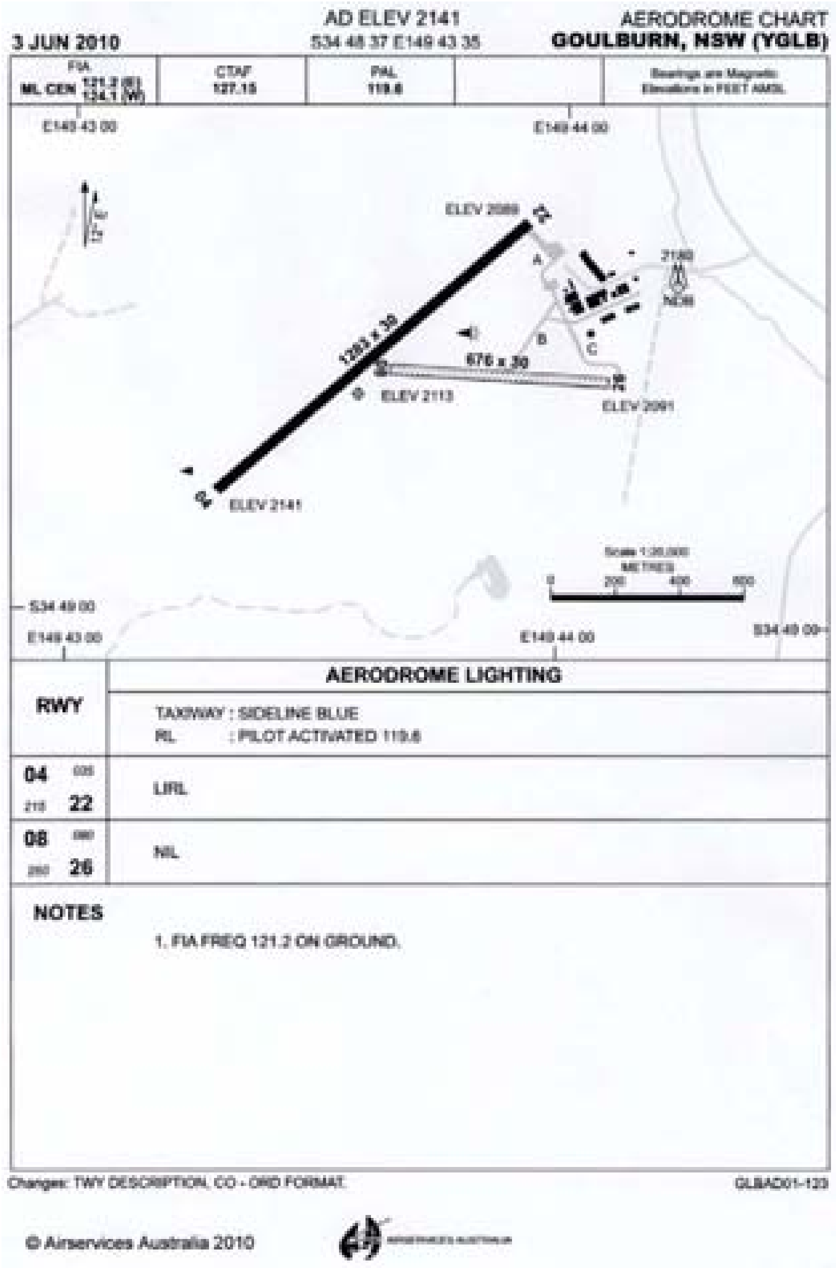
11.3 Airport Operations

Summary of main activities	Goulburn Airport currently caters to relatively low levels of general aviation (GA) operations of both a commercial and recreational nature. An aircraft maintenance company has established a facility there as costs are lower than at Canberra airport. Non-aviation usage of the airport is by a vehicle compliance testing company which hires the runway for several days per year and casual

	runway hire for filming and the like.
Current passenger numbers	Not applicable
Current aircraft movement numbers	11,000 movements per annum (approximately)as estimated by Council
Current freight throughput	Not applicable
Known sources of delay in airport and runway operations	Unknown but unlikely other than the potential for fog
Movement/manoeuvring area details	
Runways	• 04/22 – 1283m x 30m (Code 3) • 08/26 – 676m x 30m (Code 1)
Runway strips	• 04/22 - 1403m x 90m • 08/26 – 796m x 90m
Taxiways	There is a single sealed taxiway leading from the Runway 22 end to the main apron. Another sealed taxiway from the main apron leads to a secondary apron and sealed taxiway servicing the hangar area. **Figure 3** shows the runway and taxiway layout.
Aprons	The main and secondary aprons are both sealed and there are other grassed formal and informal aircraft parking areas.
Airfield pavements	Runways • Runway 04/22 – 42a PCN 17/F/A/700 (102PSI)/T (eg aircraft up to say DHC8-300 (DASH8-300)) • Runway 08/26 – Unrated, grassed red clay Taxiways Unknown but some are grass (unrated). Aprons

	Unknown but some are natural surface. Main and secondary aprons are sealed.

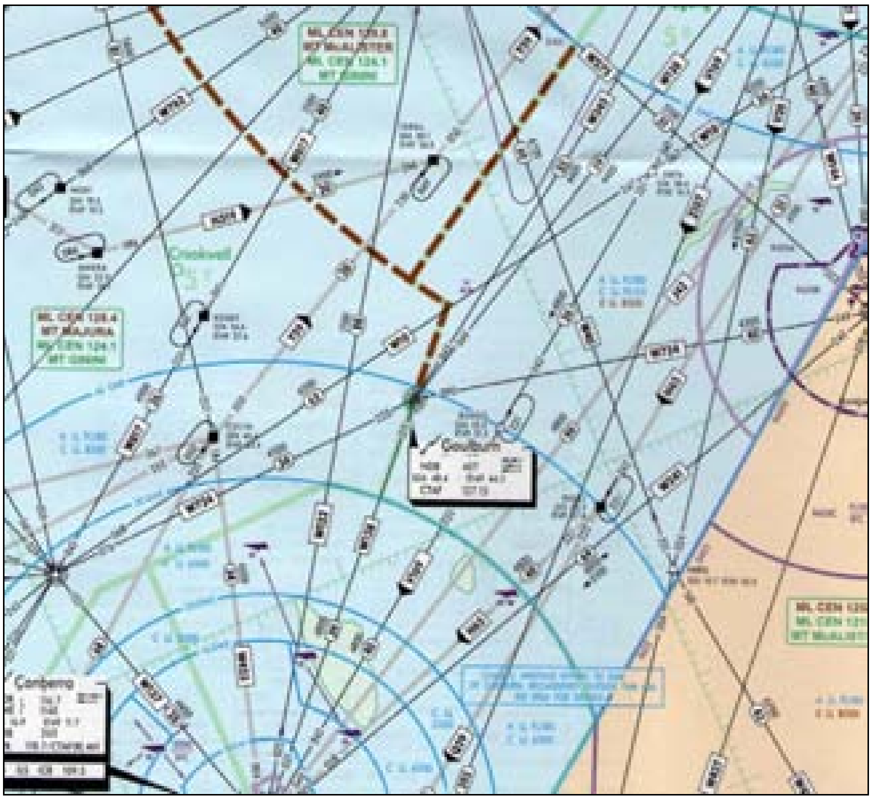
Figure 3 – Runway and Taxiway Layout



Source: Airservices Australia 2010

Airfield operating restrictions	Open for public use, charges apply to all aircraft.
Airfield lighting and approach systems	• Runway 04/22 – low intensity edge lighting • Taxiway sideline blue lighting
Visual navigation aids	• Runway, taxiway and apron markings and markers • One illuminated wind direction indicator (IWDI) and one wind direction indicator (WDI)
Radio navigation aids	Non-Directional Beacon (NDB) situated just off airport on land owned by Airservices Australia
Surveillance systems	Nil
Operational procedures	• Ultralight training in vicinity of aerodrome
Aviation fuel	• AVGAS 24 hours (Aero Refuellers card only) • JET A-1 from tanker 24 hours, call out fee applies
Terminals and other major aviation support infrastructure elements	There is a small former terminal building comprising clubhouse, public amenities, passenger lounge, kitchen, clubroom, flight centre and sleeping quarters which fronts the main apron and was sold, along with other parts of the airport in 1993-94. Other features and services consist of: • Aircraft fuelling facilities (leased) • Amenities block • Electrical power supply and street lighting • On-site disposal sewerage system • Sealed public road • Fully fenced boundaries Other privately owned structures on land adjacent to the Airport consist of the following: • Numerous hangars • A motel under construction (commenced in 1993 and still

	unfinished) • Approved 26 lot Aero Park subdivision
Security	Not a Security Controlled Airport
Border Agencies	Not applicable
Air traffic management and airspace management arrangements	Non-towered aerodrome in Class G airspace and being registered requires mandatory carriage of radio. Common Traffic Area Frequency (CTAF) procedures apply. Goulburn lies within the lateral limits of the Canberra Control Area (CTA) which is applicable above an altitude of 8,500 feet. **Figure 4** shows the airspace arrangements in the vicinity of the airport. **Figure 4 – Goulburn Airport Airspace Arrangements**  *Source: Airservices Australia 2010* The majority of traffic utilising Goulburn Airport would probably operate under Visual Flight Rules (VFR) and entry/exit procedures are flown in accordance with the Aeronautical Information Publication (AIP) and related advisory material.

	Flight tracks established in relation to aircraft operating under Instrument Flight Rules (IFR) are shown in **Figure 5**. IFR approach procedures are promulgated in the relevant Departure and Approach Charts (DAP). **Figure 5 – Goulburn Airport IFR Flight Tracks**  *Source: Airservices Australia 2010* The only airport within 50km of Goulburn is Crookwell approximately 43km to the north-west;
Aerodrome Rescue and Fire Fighting Services (ARFFS)	Not applicable
Operating restrictions	Nil
Known development capability and expansion planning	Council has been attempting to dispose of the airport by way of sale or lease since at least September 2007 as it considers that the private sector is better equipped with the necessary business acumen to deliver a maintenance and development program and has more experience at operating an airport than Council.

Offers for the most recent attempt closed on 2 June 2010. It would appear from the minutes (not yet confirmed) of Council's meeting of 15 June 2010 that two expressions of interest were lodged and the following resolved:

- An updated market valuation for the airport be obtained from the Department of Land and Property Management Authority – Special Valuations Branch.
- A further report be provided to Council following the receipt of the valuation report.
- A closed briefing session be organised with both submitters of Expressions of Interest.

Figure 6 shows (red outline) the extent of the area offered for sale or lease. Note the areas excluded from sale/lease include the central hangar complex and the complex of buildings fronting the main apron which includes the former terminal.

Figure 6 – Goulburn Airport Area Offered for Sale or Lease

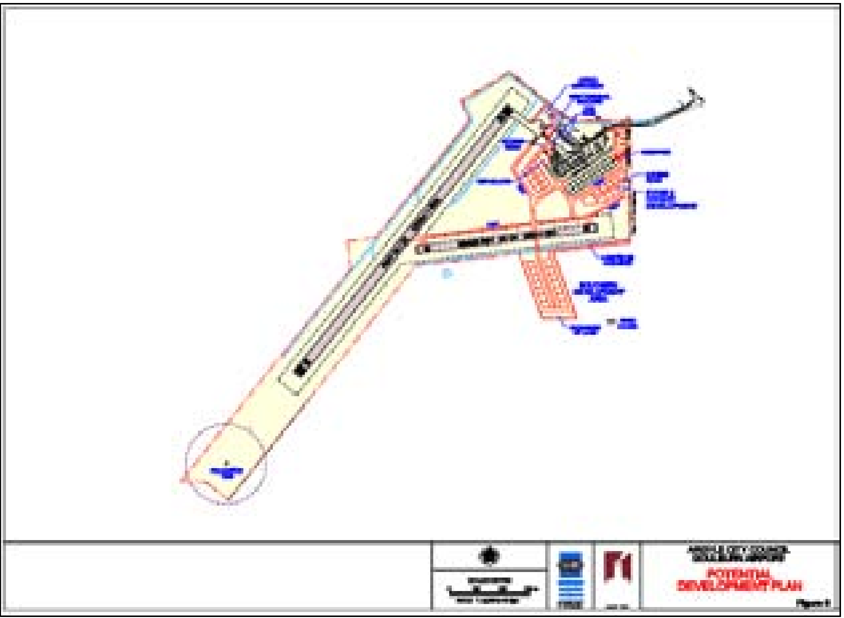
Source: Colliers International 2010

This latest expression of interest appears to have followed a failed sale in late 2009 in which the proposed owner was reported as planning to extend the main runway to 1,600m with the aim of targetting freight and pilot training organisations which are under pressure in the Sydney basin area. Press reports of the time indicate a freight hub concept had conceptual approval from the NSW State Government.

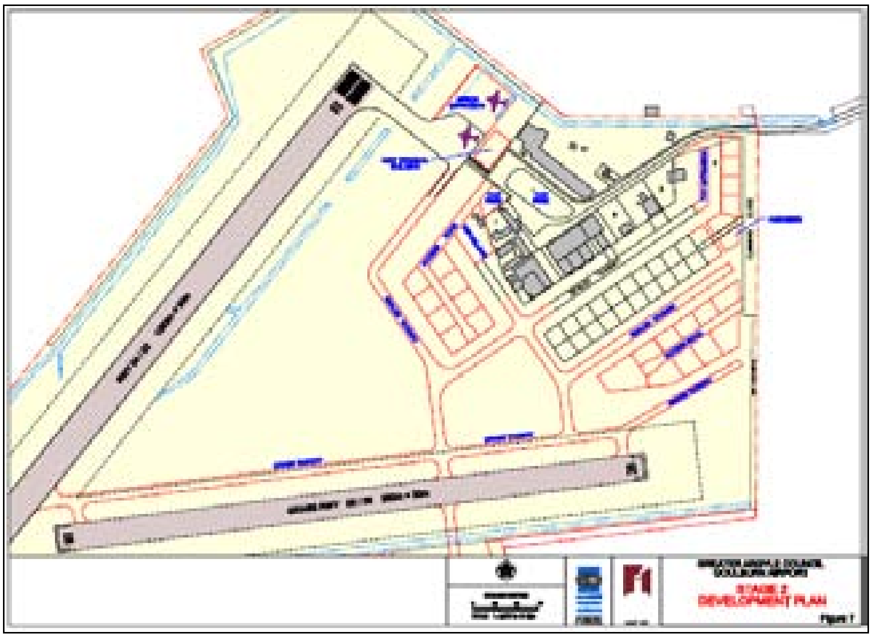
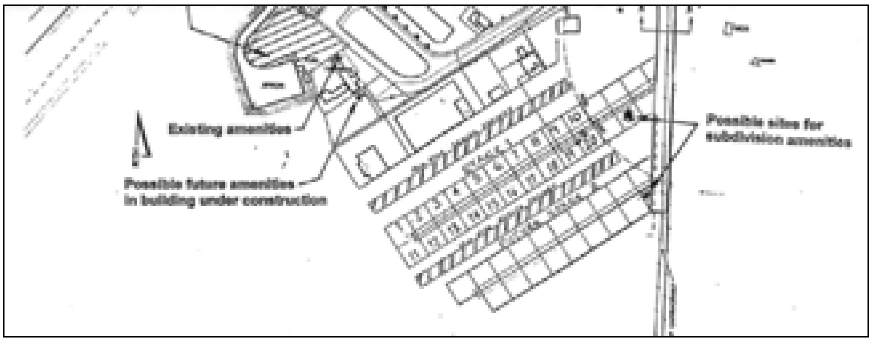
Prior to the recent sale activities, Council's development plans were outlined in its 2001 Plan of Management and resulted in the subdivision of the existing tenanted hangars and terminal building, followed by their sale to the tenants. Council also sold a number of hangar sites to existing lessees as freehold title in 1994.

In response to a demand for more hangar sites, Council carried out a 20-lot hangar site subdivision in 1999, as Stage 1 of a three-stage development. All lots in Stage 1 have been sold but not necessarily developed. **Figure 7** (three figures) shows the Stage 1 and proposed Stage 2 development.

Figures 7, 8 , 9 – Stage 1 and 2 Development Concept



Source: Greater Argyle Council Goulburn Airport Development Strategy Report Aug 2004

	 *Source: Greater Argyle Council Goulburn Airport Development Strategy Report Aug 2004*  *Source: GCC 2001*
Known constraints on future capacity or ability to meet current and future demand	The airport is currently significantly underutilised and would be capable of handing much larger volumes of smaller GA traffic. A runway extension to 1,600m as was planned would enable the airport to handle larger Code 3C aircraft than currently, ignoring aspects such as pavement strength and obstacle limitation surface (OLS) considerations. The sale of the terminal and contiguous areas may impact on the airport's ability to facilitate higher order traffic within the existing building area confines, although development elsewhere may be possible.
Aircraft noise contours and status	Unknown but noted that the airport is essentially situated in an extensive rural setting.

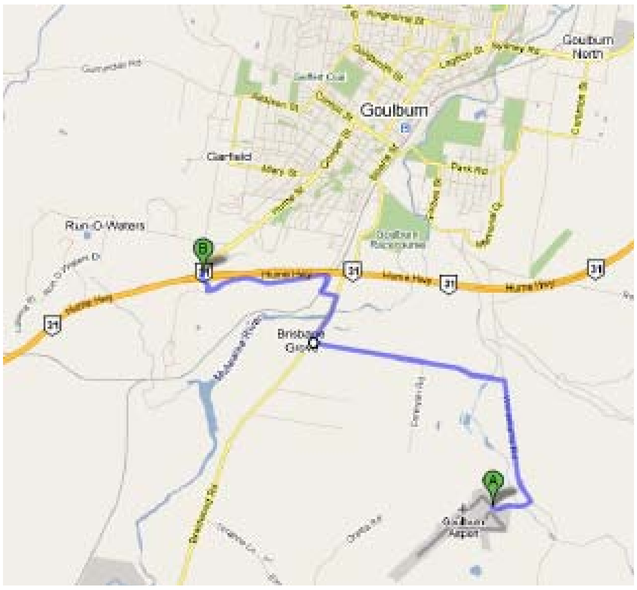
11.4 Future Patronage, Freight, Investment and Business Attributes

Business enterprises present or related	As noted previously
Freight forecasts	Not applicable
Plans to invest in upgrading	Unknown but will largely be determined from the outcomes of the current sale process.
Passenger patronage forecasts	Not applicable
Aircraft movements forecast by type	Unknown
Costs for upgrades	Unknown but will largely be determined from the outcomes of the current sale process.

11.5 Accessibility and Surface Transport

Connections to Road	Nearest connection to the major road network is through Airport Rd to Windellama Road. Thence, 8.8 km and 15 minutes to the Hume Highway. Distance to Sydney CBD: 201 km and travel time 2 hour 42 minutes approximately.

Figure 10 - Access to Freeway

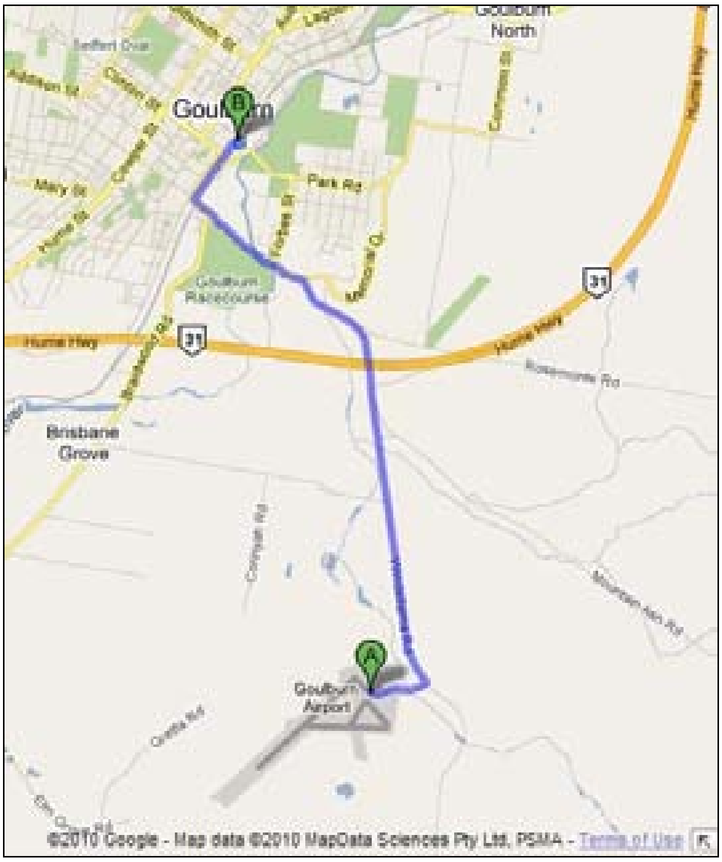


Source: Google maps 2010

Distance to Wollongong 145 km and 2 Hours and 11 minutes approximately.

Figure 11 – Access to Wollongong

	Distance to Canberra 94 km and 1 hour and 17 minutes approximately. **Figure 12 – Access to Canberra** 
Traffic Volumes	The airport is located some distance from Goulburn on rural two lane road with unlimited capacity for its likely usage.
Access to rail	Goulburn Station: Distance to nearest station (Goulburn) 7.1 m and travel time 14 minutes drive approximately. Goulburn to Central 216.8 km Time to Sydney Central Station: Goulburn to Central 3 hour and 50 minutes (Southern Highlands Line + South Line) Frequency of service: approximately 5 trains per day Cost: $7.80 one way

	Figure 13 – Access to rail 
Airport Parking capacity - short term and long term	Unlimited on site parking for current and future levels of operations.
Other transportation services available at airport	Bus – • Closest bus stop on Eastgrove (5.9 km – approximately 10 mins drive) • Direct bus to Goulburn Station (Route 825) • Operator: PBC Goulburn Taxi – • available on call from Goulburn Radio Cabs Rental cars – • Not available at the airport. Closest available 7.7 km in Goulburn Shuttle services –

	• Nil
Walking and cycling	Walking not practical. Cycling possible via road network.

11.6 Utilities and Services

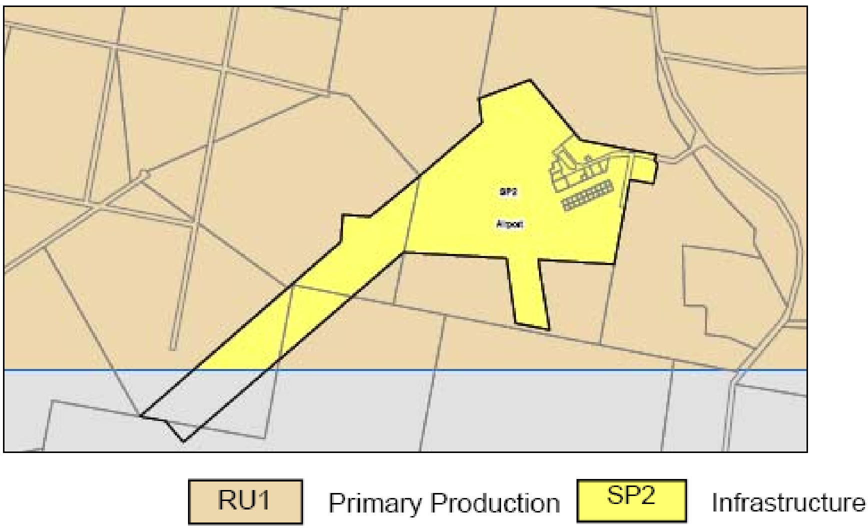
Water and sewer	Existing water supply facilities rely on three sources: • Roof water - this source is used by the existing hangar owners. The motel stores roof water in extensive underground tanks and pumps to a water tower for gravity feed to the motel. • Bore water - only used for the amenities in the terminal building. This water is unsuitable to drink. • Gundary Creek water - this is the water source for the fire brigade and rural fire service in the event of an emergency. The building area is serviced by a sewage evaporative system.
Gas	Not available on Site
Police, fire, ambulance, hospitals	Police • Goulburn Police Station (7.7 km – approximately 14 mins) Fire • Goulburn Fire Station (8.2 km – approximately 16 mins) Hospitals • Goulburn Base Hospital (8.8 km – approximately 18 mins)
Power	Country Energy, NSW
Telecoms	Telstra, Goulburn-Monaro (s) / Soul Australia Communication

11.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and	The key planning and environmental legislation and planning policies which are responsible for guiding the development of the Goulburn Airport site and surrounds are listed below:- • Environmental Planning and Assessment Act 1979

Instruments Provisions for airport development International treaties	• Environmental Planning and Assessment Regulations 2000 • State Environmental Planning Policy (Infrastructure) 2007 • Goulburn Mulwaree Local Environmental Plan 2009 The *Environmental Planning and Assessment Act 1979* (the Act) and the *Environmental Planning and Assessment Regulations 2000* (the Regulations) provide the framework for environmental planning and assessment in New South Wales. *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is a state statutory policy that aims to "facilitate the effective delivery of infrastructure across the State". This infrastructure includes "airports" and the provisions which specifically relate to airports are contained in Part 3, Division 1 "Air transport facilities". ISEPP allows for a range of airport-related developments to be permitted without consent or permitted with consent. The *Goulburn Mulwaree Local Environmental Plan 2009* (the LEP) is the local statutory planning instrument that guides development in the Goulburn Mulwaree Local Government Area (LGA). The LEP does not include any provisions that specifically relate to the operation of Goulburn Airport.

11.8 Environmental Factors, Frameworks and Policies

Site characteristics	The airport is zoned SP2 Infrastructure under the Goulburn Mulwaree Local Environmental Plan 2009. **Figure 14 - Zoning**  *Extract of the Goulburn Mulwaree LEP 2009 "Land Zoning Map – Sheet LZN-006"*

The “Goulburn Airport Plan of Management”, dated 11 December 2001 and prepared by Goulburn City Council and “Background Paper Goulburn Airport” dated December 2009 and prepared by Goulburn Mulwaree City Council, describe the site as follows:

> *“Goulburn Airport is located on the Goulburn to Windellama Road in the Mulwaree Shire and is 7 kilometres by road from the city centre. The site of the airport is adjacent to the Gundary Plains and the Gundary Creek flows across the access road to the airport, Airport Road, in times of high flow. The topography is suitably flat with minor rises.”*

A large proportion of the site is identified as “Environmentally Sensitive Land – Biodiversity” in the LEP maps.

Figure 15 - Environmentally sensitive land

Natural Resources Sensitivity Land - Biodiversity

Environmentally Sensitive Land - Biodiversity

Extract of the Goulburn Mulwaree LEP 2009 “Natural Resources Sensitivity Map – Biodiversity – Sheet BCV-001”

Source: http://www.legislation.nsw.gov.au

Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangered species Designated environmental management areas Existing environmental assets Heritage scientific and aesthetic qualities/issues Wetlands and other sources of bird hazard	The airport is located approximately 5km to the south of Goulburn. There are some existing small land holdings, which are possibly recent subdivisions, which are located approximately 1 to 1.5km to the north and north-west of the site. The airport is surrounding by land zoned "RU1 Primary Production" under the LEP. The airport is surrounded by land zoned 100-ha lot size. The site is not identified as "Flood Planning Land" in the LEP maps, although it is in close proximity to Gundary Creek. It is unknown whether the site is affected by bushfire.
Existing Environmental Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	The airport has a Plan of Management, dated 2001. Section 4.10 "Environmental Considerations" states: *It is understood that the airport will be scrutinised in the near future for its environmental impact.* *Such items as listed below will be monitored:* • *Aircraft wash down* • *Commercial and domestic waste disposal* • *Fuel spills and the refuelling facilities in general* • *Surface drainage from the bitumen runway* • *Sedimentation and erosion control* • *Asbestos based materials* • *Effluent disposal and lack of reticulated sewerage system* • *Noise control*

	• *Air pollution* Documentation of such scrutiny has not been sighted or made available at this stage.
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	Council's background paper in relation to the airport sale provides the following comment on restrictions as to usage: *"Covenants* *It is Council's intention to ensure that for as long as it is practicable and viable to do so, the Airport remains in use as an airport. Council is also under an obligation to ensure this under the terms of the Transfer Deed. To ensure this, the Airport's title has been encumbered with two forms of covenant, a restrictive one to ensure that the Airport may not be used for any purpose other than an airport and a positive covenant to ensure that the Airport must be used as an airport. This satisfies the requirements of the Federal Government in relation to the continued operation of this facility."* As the site is surrounded by rural land uses, and Goulburn, which is the nearest settlement, is located approximately 5km to the north, it appears that there are no urban development related constraints to the expansion of Goulburn Airport. It is unclear if the classification as "Environmentally Sensitive Land – Biodiversity" would limit the expansion of the airport. It is noted that Clause 7.2(4) of the LEP applies to land identified as "Environmentally Sensitive Land – Biodiversity" and states that: *(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development is consistent with the objectives of this clause and:* *(a) the development is designed, sited and managed to avoid the potential adverse environmental impact, or* *(b) if a potential adverse impact cannot be avoided, the development:* *(i) is designed and sited so as to have minimum adverse impact, and* *(ii) incorporates effective measures so as to have minimal adverse impact, and* *(iii) mitigates any residual adverse impact through the restoration of any existing disturbed or modified area on the site.*

11.9 Community and Public Amenity Factors

Community attitudes to airport	The airport is in a rural setting and is utilised by light aircraft.
Airport interaction with Communities	Council is engaged in a process to sell the airport.

11.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, *En Route Supplement Australia (ERSA), effective 3 June 2010*. Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. Goulburn City Council 2001, *Goulburn Airport Plan of Management*, a plan adopted by Goulburn City Council December 2001. Goulburn Mulwaree Council 2009, *Background Paper Goulburn Airport*, a paper prepared by Manager of Economic Development and Administration. http://www.goulburn.nsw.gov.au/ http://www.airservicesaustralia.com/

Canberra Airport

CONTENTS

12 CANBERRA AIRPORT

12.1 Introduction

The airport was one of the federal airports offered to the private sector in 1998 under long-term leasing arrangements. The airport lessee company is Capital Airport Group (Canberra Airport Pty Ltd). The RAAF area was sub-leased back to the RAAF and accommodates 34SQN which provides VIP air transport services for the Federal Government. Canberra Airport was built up from an old airstrip that was first laid down in the 1920s, not long after the National Capital site was decided. In 1939 it was taken over by the RAAF, with an area leased out for civil aviation. The military side of the airport was named RAAF Base Fairbairn in 1962, after a Minister for Air and Civil Aviation who was killed in an aircraft accident in 1940.

Canberra Airport is located approximately 6km south-east[1] of the Canberra CBD. The industrial area of Fyshwick is situated immediately to the south-west. It is the primary airport serving the national capital, the ACT and south-west NSW region. **Figures 1, 2 and 3** depict aerial images of the airport site and its major airside precincts.

[1] Actual road or rail distances are discussed elsewhere herein

Figure 1 – Aerial Image (Overall)

Figure 2 – Aerial Image (Main Terminal Building Areas)

Figure 3 – Aerial Image (RAAF Fairbairn Precinct)

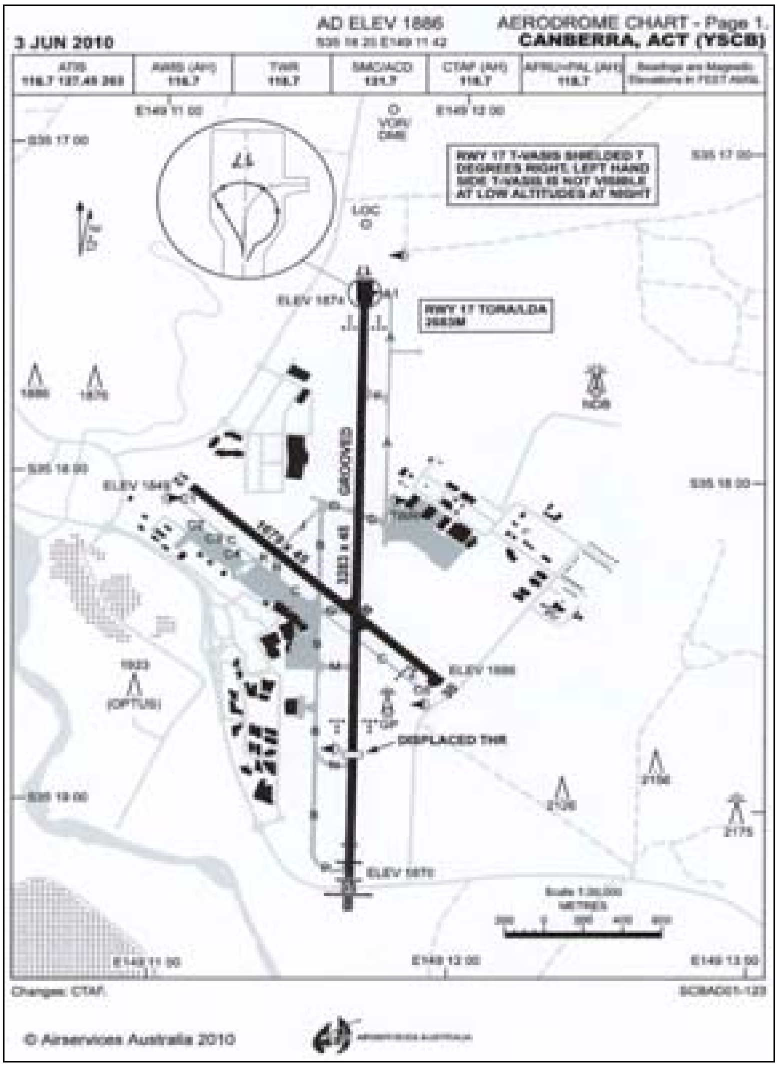
Note that the airport operations review detailed below addresses aviation related activity only. Canberra Airport along with many other airports is providing for and anticipating additional non-aviation commercial development within its landholdings. Therefore, in assessing the airport's capability for enhanced aviation activity, it needs to be recognised that areas currently undeveloped may in fact already be leased and/or the subject of development proposals.

12.2 Current Site Attributes

Airport location	S 35 degrees 18.4 minutes E 149 degrees 11.7 minutes
LGA	N/A
Ownership and management; lessee/operator	Capital Airport Group: • Canberra Airport Pty Limited – airport lessee company; and • Capital Airport Group Pty Limited – airport management company, under the Airports Act.
Aerodrome Category	Certified Cat I (refer later re Cat II)
Applicable regulatory regime	Airports Act 1996 Civil Aviation Safety Regulations (CASR) Part 139 - Aerodromes
Site area and physical dimensions	Irregular shaped site of 440ha
Major centres of population, population growth and distances	Canberra and region 450,000 growing at 1.25% p.a. Catchment is expanding though to include passengers from as far north as the Southern Highlands and as far south as Albury.
Elevation	595 metres / 1,886 feet
Surrounding topography	Mainly rising land to North, East and West. Sloping gently down to the Molonglo River Corridor to South and South West.
Liability for flooding	Upstream detention basin works have been constructed to mitigate 1:100 year + events. Flood mitigation of the Molonglo River via Scrivener Dam on Lake Burley Griffin reduces any likely river back flow surge.
Atmospheric conditions	Fog has a minimal impact on operations - the lower minima decision height on arrival has significantly reduced any delays. Canberra Airport has ongoing proposals with Airservices Australia, CASA and the Airlines to upgrade the Airport Navigation System to Cat II by 2012.

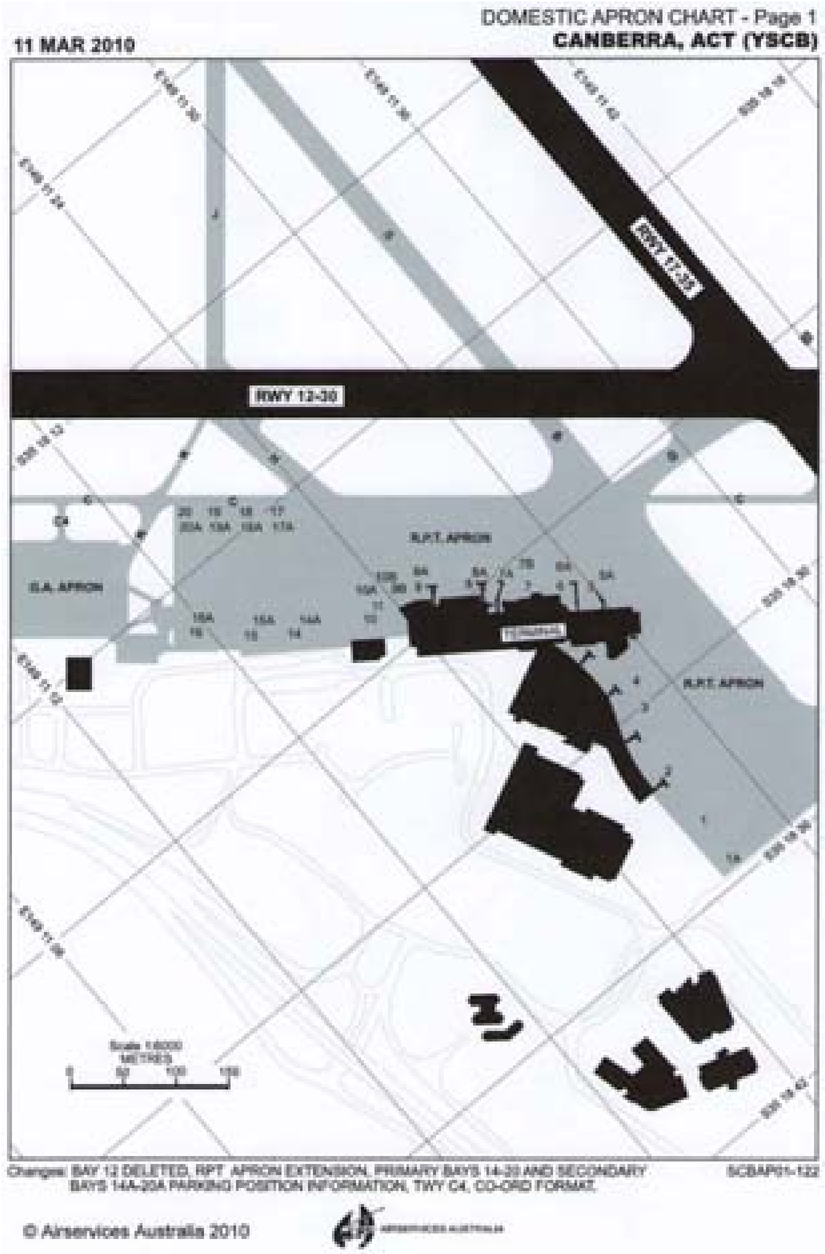
12.3 Airport Operations

Summary of main activities	The airport supports a wide range of air passenger transport services to a number of destinations within Australia, including every State and Territory capital city. It also accommodates general aviation (GA) operations by fixed and rotary wing aircraft. 34SQN RAAF is accommodated at the airport and operates BBJ and Challenger aircraft supporting the Federal Government's VIP transport requirements. Scheduled direct services are provided by the following airlines: • Qantas to Perth, Darwin, Brisbane, Sydney, Melbourne, Adelaide • QantasLink to Sydney • Virgin Blue to Townsville, Brisbane, Sydney, Gold Coast, Melbourne, Hobart and Adelaide • Tiger to Melbourne • Brindabella to Albury and Newcastle
Current passenger numbers	• 3,251,000 in 09/10
Current aircraft movement numbers	• 84,756 (2008/09) – approximately about 30% of Practical Ultimate Capacity • 44,125 by passenger aircraft
Current freight throughput	As of November 2008 there are four scheduled turbo-prop freight movements to and from Melbourne and Sydney.
Known sources of delay in airport and runway operations	Fog has a minimal impact on operations - the lower minima decision height on arrival has significantly reduced any delays. Canberra Airport has ongoing proposals with Airservices Australia, CASA and the Airlines to upgrade the Airport Navigation System to Cat II by 2012. This upgrade includes relocation of ILS to Runway 35 and Public RNP to 17/35.
Movement/manoeuvring area details	
Runways	• 17/35 – 3283m x 45m (Code 4E with Blast Shoulders with Code4F capability) • 12/30 – 1679m x 45m (Code 3C), note 45m width treated as 30m for operational purposes

Runway strips	• 17/35 - 3351m x 150m • 12/30 – 1799m x 90m
Taxiways	There is a comprehensive taxiway system supporting the airport including partial parallel taxiways covering the northern and southern sections of Runway 17/35. This requires a runway crossing for full length departures on Runway 17 and may require a crossing by some landing aircraft on Runway 35 where they are unable to exit left at Taxiway D. **Figure 4** shows the runway and taxiway layout. Extension of Taxiway B to Runway 17 threshold has environmental and MDP approvals and is planned for construction by mid 2012. **Figure 4 – Runway and Taxiway Layout**  *Source: Airservices Australia 2010*

Aprons	There is a comprehensive apron system serving the passenger terminal and GA areas, and a separate apron serving the Fairbairn and SPA area on the eastern side of the airport. **Figures 4 to 7** show the parking position capability for the main passenger apron, Fairbairn apron and GA apron respectively.

Figure 5 – Main Passenger Apron Parking Positions



Source: Airservices Australia 2010

Figure 6 – Main Passenger Apron Parking Position Restrictions

DOMESTIC APRON CHART - Page 2
11 MAR 2010 CANBERRA, ACT (YSCB)

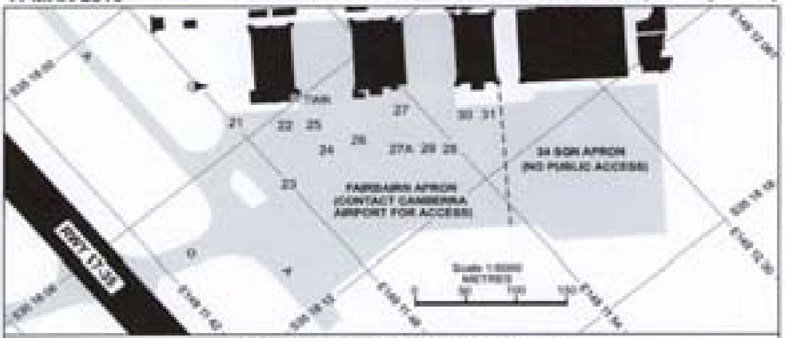
PARKING POSITION INFORMATION

STAND	CO-ORDINATES	ELEV (ft)	CAPACITY	NOSE-IN GUIDANCE	HYDRANT FUEL
1A	S35 18 35 E149 11 27	1860	A321-200	MARSHALLED	NIL
1	S35 18 34 E149 11 28	1860	A321-200	MARSHALLED	NIL
2	S35 18 32 E149 11 28	1860	A321-200	MARSHALLED	NIL
3	S35 18 30 E149 11 28	1860	A321-200	MARSHALLED	NIL
4	S35 18 29 E149 11 29	1860	A321-200	MARSHALLED	NIL
5	S35 18 28 E149 11 30	1862	A320-200	CENTRELINE+SIDEMARKER	NIL
5A	S35 18 26 E149 11 31	1863	SF34	MARSHALLED	NIL
6	S35 18 26 E149 11 29	1862	B738	CENTRELINE+SIDEMARKER	NIL
6A	S35 18 25 E149 11 30	1862	UP TO 26.0m WS	MARSHALLED	NIL
7	S35 18 25 E149 11 28	1860	B738	MARSHALLED	NIL
7A	S35 18 25 E149 11 28	1860	B738	DGS	NIL
7B	S35 18 24 E149 11 28	1861	DH8C	MARSHALLED	NIL
8	S35 18 24 E149 11 27	1859	B738	CENTRELINE+SIDEMARKER	NIL
8A	S35 18 24 E149 11 27	1859	DH8C	MARSHALLED	NIL
9	S35 18 23 E149 11 25	1858	B738	CENTRELINE+SIDEMARKER	NIL
9A	S35 18 22 E149 11 25	1858	DH8C	MARSHALLED	NIL
9B	S35 18 23 E149 11 24	1857	DH8C	MARSHALLED	NIL
10	S35 18 23 E149 11 23	1856	B763	MARSHALLED	NIL
10A	S35 18 22 E149 11 24	1857	B738	MARSHALLED	NIL
10B	S35 18 22 E149 11 24	1857	B737	MARSHALLED	NIL
11	S35 18 23 E149 11 23	1857	B737	MARSHALLED	NIL
14	S35 18 21 E149 11 21	1855	B738	MARSHALLED	NIL
14A	S35 18 22 E149 11 21	1855	DH8D	MARSHALLED	NIL
15	S35 18 20 E149 11 19	1855	B738	MARSHALLED	NIL
15A	S35 18 20 E149 11 19	1855	DH8D	MARSHALLED	NIL
16	S35 18 19 E149 11 18	1855	B738	MARSHALLED	NIL
16A	S35 18 19 E149 11 18	1855	DH8D	MARSHALLED	NIL
17	S35 18 18 E149 11 22	1856	BAEJ41	MARSHALLED	NIL
17A	S35 18 19 E149 11 22	1855	BAEJ41	MARSHALLED	NIL
18	S35 18 18 E149 11 21	1856	BAEJ41	MARSHALLED	NIL
18A	S35 18 18 E149 11 21	1855	BAEJ41	MARSHALLED	NIL
19	S35 18 17 E149 11 20	1855	BAEJ41	MARSHALLED	NIL
19A	S35 18 17 E149 11 20	1855	BAEJ41	MARSHALLED	NIL
20	S35 18 17 E149 11 20	1855	BAEJ41	MARSHALLED	NIL
20A	S35 18 17 E149 11 19	1855	BAEJ41	MARSHALLED	NIL

Source: Airservices Australia 2010

Figure 7 – Fairbairn and 34SQN Parking Positions

FAIRBAIRN AND 34 SQN APRON CHART
11 MAR 2010 CANBERRA, ACT (YSCB)

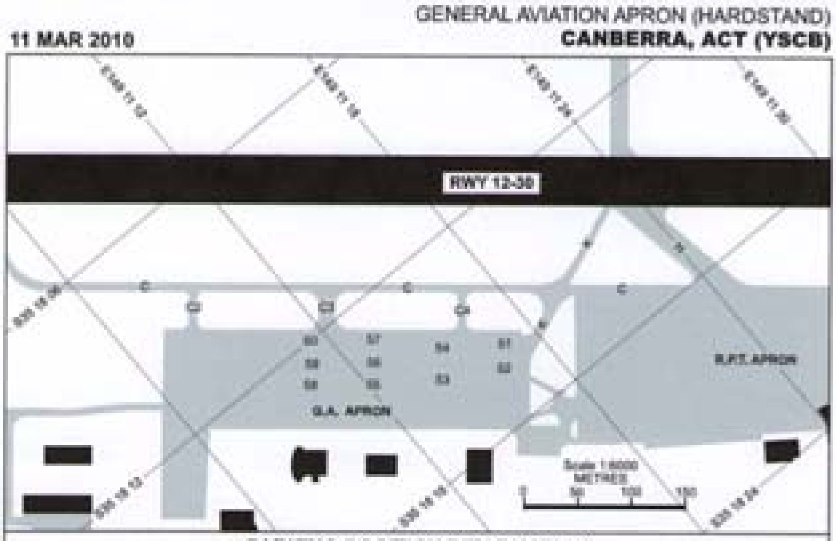


PARKING POSITION INFORMATION

STAND	CO-ORDINATES	ELEV (ft)	CAPACITY	HYDRANT FUEL
21	S35 18 05 E149 11 48		B146	NIL
22	S35 18 06 E149 11 48		B737	NIL
23	S35 18 08 E149 11 48		B767	NIL
24	S35 18 09 E149 11 50		B737	NIL
25	S35 18 07 E149 11 50		B747	NIL
26	S35 18 08 E149 11 51		B737	NIL
27	S35 18 08 E149 11 53		B747	NIL
27A	S35 18 09 E149 11 52		B727	NIL
28	S35 18 10 E149 11 54		B737	NIL
29	S35 18 09 E149 11 53		A380	NIL
30	S35 18 10 E149 11 55		B747	NIL
31	S35 18 10 E149 11 56		B737	NIL

Source: Airservices Australia 2010

	Figure 8 – GA Parking Positions



PARKING POSITION INFORMATION

STAND	CO-ORDINATES	ELEV (ft)	CAPACITY (MAX WINGSPAN)	HYDRANT FUEL
S1	S35 18 15 E149 11 16	1851	24m	NIL
S2	S35 18 16 E149 11 15	1852	24m	NIL
S3	S35 18 15 E149 11 13	1850	19m	NIL
S4	S35 18 14 E149 11 14	1850	19m	NIL
S5	S35 18 14 E149 11 12	1848	18m	NIL
S6	S35 18 13 E149 11 12	1849	18m	NIL
S7	S35 18 13 E149 11 13	1848	15m	NIL
S8	S35 18 13 E149 11 10	1847	18m	NIL
S9	S35 18 12 E149 11 11	1847	18m	NIL
S10	S35 18 12 E149 11 11	1848	15m	NIL

Source: Airservices Australia 2010

There is also a grassed GA parking area to the north-west of the sealed GA apron shown above.

Airfield pavements	Runways • Runway 17/35 – 88a PCN 62/F/B/1500 (PSI218)T Grooved, 7.5m shoulders sealed (eg B747-400) • Runway 12/30 – 55a PCN 12/F/C/1050 (152PSI)/T (eg DHC8-300 (DASH8-300)) Taxiways • Taxiway C suitable for Code A aircraft operating at a ramp weight below 5,700kg and maximum wingspan less than 15m except: • Taxiway C suitable for aircraft with maximum wingspan 18.42m between Taxiway H and K; and • Taxiway C suitable for aircraft up to Code D adjacent to the RPT

	apron east of Taxiway H. All aircraft with wingspan from 18.42m to 24m must enter and exit GA apron by Taxiway K and cross and or backtrack Runway 12/30. • Taxiway K is suitable for aircraft with wingspan less than 24m. • Taxi along Runway 12/30 not available for aircraft larger than DASH8. • Taxiway B outboard engines on four-engine heavy aircraft to be operated on low power to prevent erosion and engine ingestion. Aprons: • on completion of Stage 1 of the Terminal in September 2010: - 12 x narrow body parking positions; • on completion of Stage 2 of the Terminal in June 2012 : - 14 positions, including 3 large wide body positions. Fairbairn – in addition to SPA Apron – 5 mixed narrow / wide body aircraft bays.
Airfield operating restrictions	Civil airport open for public use, landing and access charges in accordance with the airport's general conditions of use
Airfield lighting and approach systems	• Runway 17/35 high intensity runway edge lighting • Runway 12/30 medium intensity runway edge lighting • Runway 17/35 T-Visual Approach Slope Indicator System (T-VASIS) • Runway 35 ILS • Runway 30 Precision Approach Path Indicator (PAPI) left hand side (not available for jet aircraft) • High Intensity Approach Lighting (HIAL) 35 approach • Taxiway centreline green and sideline blue lighting
Visual navigation aids	• Runway, taxiway and apron markings and markers • Four illuminated wind direction indicators (IWDI) • MAGS are also provided.
Radio navigation aids	• Instrument Landing System (ILS) with marker beacons Runway 35 • Very high Frequency Omni Range (VOR) co-sited with Distance

	Measuring Equipment (DME) located North and off airport • Non-Directional Beacon (NDB)
Surveillance systems	Terminal Area Radar (TAR) (located off-airport)
Operational procedures	• Full length departures from Runway 35 • Helicopters operating in circuit are parallel to and in close proximity to runway final. • Various training flight restrictions and procedures. • Published scenic flight procedures City Flight One and Two. • Supplementary published military procedures.
Aviation fuel	• Brindabella Airlines JET A-1 and AVGAS available 0500-2200 hour's local daily. • Canberra Airport Fuel Facility Caltex JET A-1, Shell JET A-1, AVGAS (tanker), Aerorefuellers, AVGAS (bowser and tanker). • Corporate Air JET A-1 and AVGAS available 0500-2200 hours local weekdays, other times prior notice required. • Storage volumes as follows: - Jet A1 – 660,000L - AVGAS – 110,000L - with capacity for growth as required.
Terminals and other major aviation support infrastructure elements	The current terminal building has a common-user end, owned by Canberra Airport, with the northern end currently owned by Qantas on leased land. Five gates are equipped with aerobridges. Construction of a new Southern Terminal Concourse has commenced over previous car parking areas south of the existing terminal, with the planned construction of the Western Terminal Concourse over the existing Qantas terminal building to follow. When completed the new terminal will be a multi-level structure, with an elevated roadway arrangement and multi-level car parks. As construction is already underway with the opening of the initial southern concourse planned for September 2010, the following information relates to the new terminal complex.

Key features of the new terminal are:

- Development over three stages with each stage independent of each other and development dependant upon and subject to commercial agreements with airline operators, and the willingness of debt providers to fund the project. Total capital cost is estimated is $350 million.
- Separated departures and arrivals levels with direct road access and access to carparks.
- Up to two multi-deck car parks with direct access to the arrivals and departures levels.
- Up to 44 check-in counters.
- Up to six baggage collection carousels.
- 12 initially but up to 18 contact aerobridges for aircraft (with additional non-aerobridge gate facilities) including for wide body domestic and international aircraft.
- International processing facilities including border agency facilities and dedicated baggage system.
- Covered, heated taxi waiting area.
- Significant retail and food and beverage outlets.
- Airline club lounges on a separate level.

Capacity for 10 million passengers with expansion areas.

It is noted that this list is indicative and some changes to the listed amenities may result from final design, commercial and economic considerations. **Figure 8** shows an artist's impression of the new terminal.

Figure 9 – New Terminal

Source: Canberra Airport 2010

Canberra Airport provides for a significant range of other aviation-related activities and infrastructure. The GA apron area currently provides parking and hangar access for light aircraft and smaller business jets and the Fairbairn apron area provides parking for military, Visiting

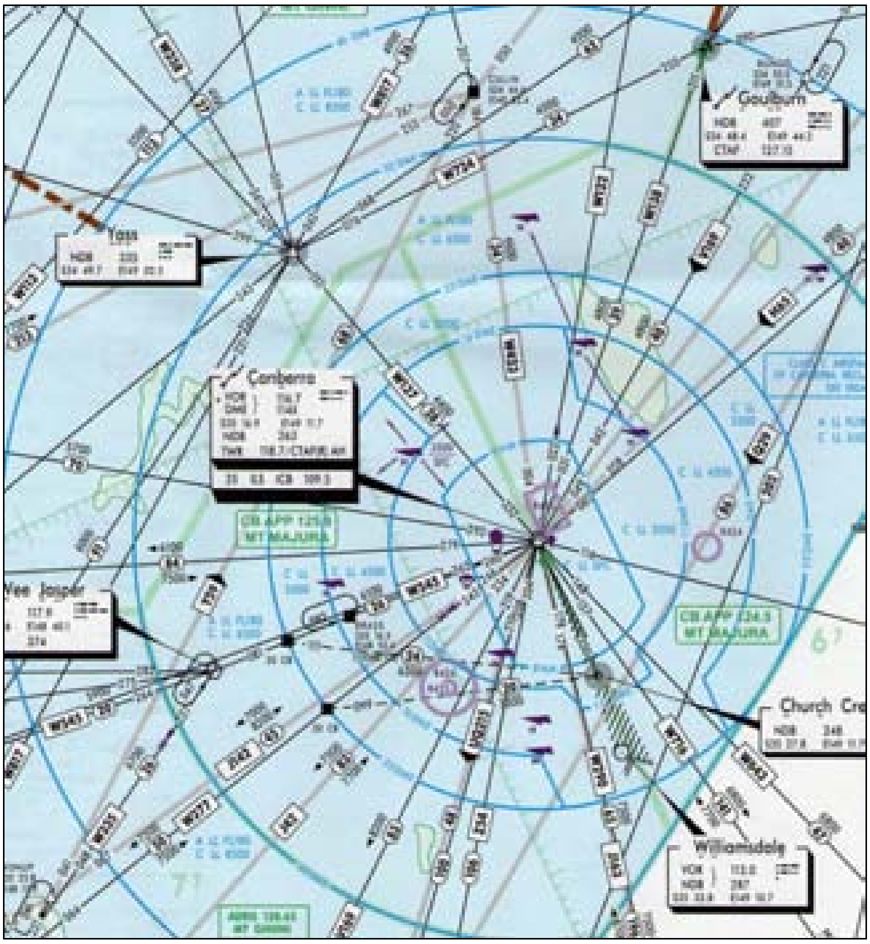
	Diplomats (including B747s) freight, large commercial, GA, and other operations including some larger aircraft. In the event of multiple aircraft diversions from Sydney or Melbourne, the Fairbairn apron is used for international flights as well as any domestic flights not able to be accommodated on the RPT apron. The GA area also accommodates a range of facilities and businesses, including the new Airport fuel farm, a modern high-security underground facility that replaces the several above-ground facilities previously in use. The GA area is currently approaching capacity and with terminal and other associated facilities encroaching into this area, future expansion will be accommodated in other precincts.
Security	Security Controlled Airport. Passenger, cabin and checked baggage screening undertaken.
Border Agencies	Fixed Base Operators (FBO) Aerocare and Corporate Air both offer civil and military facilitation including Customs/AQIS with prior notice.
Air traffic management and airspace management arrangements	Class C ATC services are provided between 0600-2300 hours local daily within the Canberra Control Zone (CTR) and associated Control Areas (CTA) which extend generally in a series of concentric arcs to a distance of 40 nautical miles. The CTR is of 9 nautical miles radius to the north and 8 nautical miles to the south with truncated straight sides on the east and west, and operates from the surface to an altitude of 3,500 feet. Outside of tower operations hours, Class C airspace within 30 nautical miles of Canberra at an altitude of 8,500 feet and below, reverts to Class G and Common Traffic Area Frequency (CTAF) procedures apply. Restricted Area R455 lies within the CTR to the north and operates from the surface to an altitude of 2,700 feet. It is active between 0630-2300 hours local Mon-Thu. At other times it is active between 0630-2230 hours local as advised by NOTAM. It is associated with firing. Restricted Area R424 is located approximately 24km to the south-east within the CTA and operates from the surface to an altitude of 3,500 feet. It is active continuously and is associated with radio telescope activities. Restricted Areas R425 and R426 are located approximately 22km to the south-west and operate from the surface to an altitude of 3,600 feet and Flight Level 120 respectively. R425 is active continuously and R426 is activated by NOTAM. The restricted areas are associated with radiation and space tracking. **Figure 10** shows the airspace arrangements in the vicinity of the airport.

Figure 10 – Canberra Airport Airspace Arrangements

Source: Airservices Australia 2010

Traffic utilising Canberra Airport is a mixture of Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) aircraft. VFR traffic operates in accordance with Class C entry/exit procedures to/from the CTR and via designated VFR approach points. Flight tracks established in relation to aircraft operating under IFR are shown in **Figure 10**. IFR departure and approach procedures are promulgated in the relevant Departure and Approach Charts (DAP).

Figure 11 –Canberra Airport IFR Flight Tracks



Source: Airservices Australia 2010

Other airports/aerodrome facilities as shown on aeronautical charts within 50km of Canberra Airport are:

- Winderadeen airfield approximately 48km to the north-east
- Tralee airfield approximately 11km to the south

It is also noted that press reports indicate the recently-formed Canberra Region Aviators Association is seeking to establish a GA airfield close to Canberra to provide a smaller, more friendly and non-competing destination. A site at Williamsdale (about 37km south of Canberra Airport) has been identified and it is understood the ACT Government has allocated $50,000 in funding for a formal study related to demand for an airfield, and to gauge the level of probable interest among Canberra residents.

Aerodrome Rescue and Fire Fighting Services (ARFFS)	Category 7 (operating hours as per current NOTAM)
Operating restrictions	Noise abatement procedures apply as follows: **Preferred Runways** ***Landing*** Between 0700-2000 hours local 1. Runways 35, 17 and 30 2. Runway 12 Between 2000-0700 hours local 1. Runway 17 2. Runways 35 and 30 3. Runway 12 ***Take-Off*** 1. Runway 35 2. Runway 17 3. Runways 30 and 12 The above priorities are used to ensure that the majority of movements occur on the most preferred runway and the above priorities do not dictate the mandatory use of opposite direction or crossing runways. **Preferred Flight Paths** A Noise Abatement Area applies to most areas of Canberra and Queanbeyan. Aircraft will be routed to remain clear of these areas. Where this is not practical overflight of these areas is subject to minimum altitude restrictions. Standard Terminal Arrival Routes (STARs) and Standard Instrument Departure (SIDs) procedures have concentrated arrival and departure flight paths. **Arriving Aircraft During ATC Hours of Operation** Landing Runway 35 • By night aircraft will be radar vectored to be established on final no closer than the Church Creek NDB. Landing Runway 17 • In Visual Meteorological Conditions (VMC), aircraft on right base will be radar vectored to intercept final no closer than 4 nautical miles to the Canberra DME.

	Landing Runway 30 • No specific procedures apply. Landing Runway 12 • Only available when operationally required. • In VMC, aircraft will be radar vectored to remain clear of the Noise Abatement Areas until established on final. **Arriving Aircraft Outside ATC Hours of Operation** Landing Runways 35 or 17 • All IFR aircraft are required to conduct a straight-in instrument approach. • Aircraft may track via a DME arc to intercept the final approach track. Landing Runway 30 • No specific procedures apply. Landing Runway 12 • Only available when operationally required. **Departing Aircraft During ATC Hours of Operation** • ATC will route departing aircraft (including below 5,700kg MTOW in some situations) over less noise sensitive areas. Departing Runway 35 • Jet aircraft departing shall normally be assigned a heading of 350 degrees. • Jet aircraft, turning right, are required to reach 4,500 feet prior to the commencement of a turn. • Jet aircraft, turning left, must pass abeam Mt Majura prior to the commencement of a turn. Departing Runway 17 • Aircraft shall normally be assigned a heading of 180 degrees until clear of the Noise Abatement Area. Departing Runway 30 • Only available when operationally required. • By day when the aircraft can be flown in VMC below 4,500 feet,

	aircraft shall normally be assigned runway heading until clear of the Noise Abatement Area. Departing Runway 12 • Only available when operationally required. **Departing Aircraft Outside ATC Hours of Operation** Departing Runway 35 (all aircraft over 5,700kg MTOW) • Track 335 degrees (initial track) • At or above 5,000 feet turn left or right to intercept flight plan route. Departing Runway 17 (all aircraft over 5,700kg MTOW) • Track 186 degrees (initial track) • At or above 5,000 feet turn left or right to intercept flight plan route. Departing Runway 30 or 12 • Only available when operationally required.
Known development capability and expansion planning	Canberra Airport's current Master Plan was approved in August 2009 and a Major Development Plan for the Western Concourse Terminal Expansion was approved in February 2010. The Master Plan outlines a number of aviation-related and other development proposals as follows: Short-term • movement of Runway 35 threshold by up to 450m to the south, including the movement of runway approach lighting and components of the ILS glideslope and other navigational aids; • extension of takeoff and landing length on Runway 17; • construction of blast fence(s) or similar device at end of Runway 35; • construction of an integrated international and domestic multi-user airline terminal, including the provision of Commonwealth funded customs, immigration and quarantine services; • construction of additional airline apron capacity to both the south and north-west of the terminal including the strengthening and upgrade of the GA apron; • extension of Taxiway Bravo to the northern Runway 17/35 threshold;

	• construction of one or more additional taxiway fillets linking the existing and extended Taxiway Bravo to Runway 17/35 that may include one or more high-speed exit taxiways; • construction of additional aprons at Fairbairn, including to the south of the existing apron and to the north along Taxiway Alpha, with additional access taxiways; • development of aviation facilities along the east side of Taxiway Alpha with associated taxi lanes and aprons; • upgrade and/or relocation of the run-up bay; • widening and strengthening of Taxiways Charlie, Kilo and Juliet; • upgrades to tarmacs in all precincts; • construction of a turning node on Runway 17/35 to facilitate additional runway length for arrivals and departures on Runway 17; • expansion of fuel farm and aviation fuel transfer facilities and possible secondary fuel storage facility at Fairbairn; • development of new General Aviation facilities in Glenora or Fairbairn precincts; • expansion of terminal roads and car park, and expansion of parking facilities for specific users such as taxis, buses, and rental cars; • introduction of freight hub facilities including but not limited to aircraft taxiways and parking apron, warehousing facilities; • movement of GA and light aircraft to another precinct; • development of light aviation airline support and commercial facilities; • development of APV on Runways 17 and 35 to provide improved approach guidance; • new precision and non-precision instrument approaches (including offset) to all runways, including possible ILS on Runway 17; • installation of Runway Visual Range (RVR) measuring devices such as transmissometers on all runways; • precision landing systems including GPS-based instrument approaches on all runways including possible additional (second) landing threshold for Runway 35 to facilitate new GPS technology, subject to regulations;

	• provision of a GPS ground station; • Category II ILS/GPS on Runways 17 and 35; • upgrade of runway, taxiway and approach lighting, including possible new HIAL for Runway 17; • taxiway upgrading and expansion in the GA area; • provision of an additional Airport entrance to the Brindabella Business Park, Terminal and Pialligo precincts from Pialligo Avenue; • construction of an access road across northern end of the Airport linking Majura Road to the Fairbairn precinct; • upgrading of landside and airside roads; • construction of a hotel in the terminal precinct Medium-term • a correctly aligned and widened Taxiway Alpha along the full length of Runway 17/35; • relocation and construction of a new Canberra Air Traffic Control Tower and possible relocation of the Airport Fire Station; • extension of Runway 12/30 to the east and the associated realignment of Glenora Drive, and/or alternative Fairbairn precinct access to the east; • upgrade to Category III ILS/GPS on Runways 17 and 35; • further expansion of aviation capacity including runway, taxiway and apron works; • further expansion of the passenger terminal; • additional structured car park for terminal; • additional aviation support facilities; • further extension of Runway 17/35 to north and/or south; • relocation or lowering of Pialligo Avenue to support Runway 17/35 operations and extension; • possible construction of high speed rail link and rail terminus (on-Airport or off Airport). Long-term • refurbishment and/or expansion of the rail/airline terminal;

- additional aviation support facilities; and
- upgrade of internal road system in terminal precinct to accommodate high speed rail and
- other multi-modal facilities.

Figure 12 depicts the aviation-related development concept proposals in the Master Plan

Figure 12- Aviation-Related Development Concept

Source: Canberra Airport Master Plan 2009

	Figure 13 shows the development concept for the terminal precinct. **Figure 13 – Terminal Precinct Development Concept**  *Source: Canberra Airport Master Plan 2009* It is anticipated that in the 20-year planning period of this Master Plan, Canberra Airport may also develop a dedicated low-cost carrier terminal by either constructing a new facility or utilising an existing building. Any such facility may not necessarily be located in or adjacent to the terminal precinct, with potential options in the Majura Precinct or at Fairbairn.
Known constraints on future capacity or ability to meet current and future demand	The Master Plan provides a detailed analysis of the forecast demand and the airport's proposals to meet this demand over the long term. Providing the necessary approvals, land acquisition etc are forthcoming and commercial viability of the various elements are established, it would appear future demand will be able to be accommodated. Canberra Airport believes it has the infrastructure to play a role in the solution for the current capacity constraints of Sydney (Kingsford-Smith) Airport. .
Aircraft noise contours and status	Canberra Airport's endorsed Australian Noise Exposure Forecast (ANEF) Is shown in **Figure 13.** The ANEF is based on the practical capacity of the airport rather than the more often used 20 year planning period associated with the associated Master Plan. The Master Plan also provides significant additional noise impact information and outlines further possible noise mitigation options which seek to make use of new

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navigation technologies.

The airport, the ACT Government, Airlines, aviation industry participants and others have been vigorously opposing a proposed residential development at Tralee south of the airport, on noise grounds for several years.

Figure 14 – Approved ANEF

Source: Canberra Airport 2008
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12.4 Future Patronage, Freight, Investment and Business Attributes

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<td>Business enterprises present or related</td>
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Canberra Airport is home to significant number of businesses including:

Qantas (including maintenance operations), Virgin Blue, Tiger and Brindabella Airlines (their headquarters and maintenance base)
All of the major car rent companies – Thrifty, Budget, Europcar, Avis and Hertz
Limousine businesses
A large number of retail operators including – a Supabarn supermarket, multiple cafes and restaurants, hairdressers, dentists, newsagents, ATMs, service stations, Brand Depot as well as an Australia Post Office
Freight operators – including Toll and Australian Air Express
Consultancy firms - such as Accenture, Orima, Wisdom Learning and CITAM

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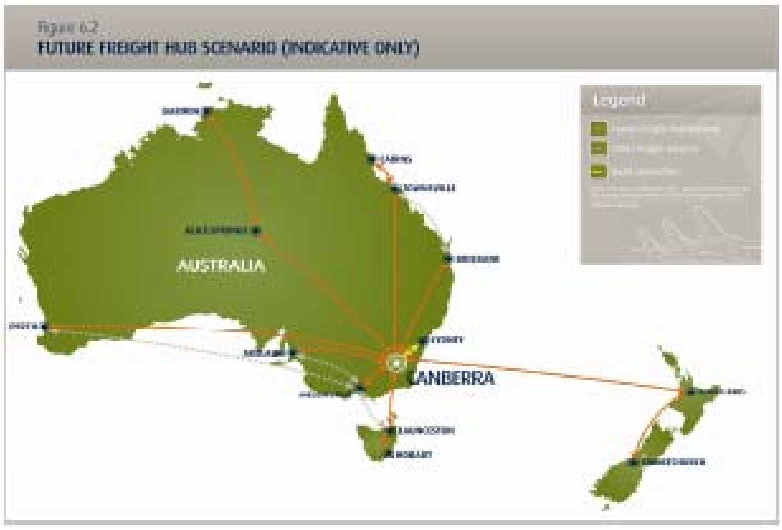
	• Accountancy and financial services firms – including KPMG, Deloittes and Civic Financial Planning • Engineering firms – such as Kellogg Brown Root • Commonwealth Government Departments and agencies – including the Department of Defence, the Department of Education, Employment and Workplace Relations, the AFP, the RAAF VIP facility, DSTO and the Australian Research Council • ACT Government Agencies – including ACT Tourism as well as the headquarters and operational base for the ACT Emergency Services Authority • The Cancer Council • The Australian Medical Council • Defence Industry participants – such as Raytheon Australia and General Dynamics • Information Technology businesses such as – Viasat, NetApp and NextGen • In all – approximately 10,000 people now work at the Airport Site, 500 -600 people work directly on the new terminal site and the Airport utilises more than 200 suppliers for various services.
Freight forecasts;	Canberra Airport is pursuing a strategy to establish a freight hub as shown in the following figure. Express overnight freight operations at the Airport would be expected to grow in the life of the Master Plan. The growth of the overnight airfreight hub beyond the initial stages may occur in any or all of the following ways over the next 20 years: • More direct services to domestic destinations, such as the de-linking of Tasmanian services from Melbourne services, and services to Alice Springs/Darwin and north Queensland. This would be expected to add a further three nightly aircraft operations to the freight hub network, most likely with smaller jet freight aircraft;

Figure 15 – Freight Hub Strategy



Source: Canberra Airport 2010

- Addition of direct overnight trans-Tasman to Auckland, with possible future additional connection to Christchurch, involving one to two additional jet services per night;
- Turboprop and piston-engine freighter services to regional NSW/Victorian destinations replacing services that currently operate directly into Sydney and/or Bankstown Airport. Based on the current regional network operated by one express freight operator from Bankstown, this could involve up to three additional flights per night;
- The commencement of a parallel freight hub by a second major national overnight freight operator, running approximately parallel schedules. This would be likely to initially involve approximately 3-5 aircraft per night; and
- Commencement of direct international freight services to Canberra to link in with overnight express freight services. Additional flights associated with the growth of the freight hub would be expected.

Table 1 provides a summary of estimated growth in overnight airfreight movements as outlined in the Master Plan, along with additional B-double (or equivalent) truck movements, including one additional aviation fuel delivery vehicle. Note that these figures are estimates based on number of return flights per weeknight and that the 20 year scenario assumes all of the growth scenarios listed above have occurred.

Table 1 – Projected Growth in Air Freight Movements

Timeframe	Jet aircraft	Turboprop/piston aircraft	Additional trucks (incl. aviation fuel)
Current	0	10	0
5 years	10	6	4
20 years	30	20	40

Note that an arrival and departure of an aircraft constitutes 2 movements

Source: Canberra Airport 2009

The following Figure 16 shows the road transport linkages to the airport

Figure 16 Road linkages

Source: Canberra Airport 2010

Plans to invest in upgrading;

See previous discussions concerning the New Terminal, the new aprons and taxiways and the provision of CAT II services.

Passenger patronage forecasts;

The Master Plan adopts a low-medium-high range approach to the passenger forecasts. The mid-range projections assume a 4.2% growth for regional and domestic passengers. International services are projected to be introduced from 2011/12. **Table 2** presents the passenger forecasts.

Table 2 – Passenger Forecasts to 2029/30

		2007/08 (actual)	2011/12	2016/17	2021/22	2027/28	2029/
LOW RANGE	Domestic/Regional	2,850,016	3,215,348	3,893,191	4,713,933	5,930,301	6,401,
	International	0	94,349	146,765	213,158	279,552	305,
	Total	2,850,016	3,309,697	4,039,956	4,927,092	6,209,853	6,707,
MID RANGE	Domestic/Regional	2,850,016	3,271,455	4,018,645	4,936,489	6,318,653	6,860,
	International	0	117,936	183,456	266,448	349,440	382,
	Total	**2,850,016**	**3,389,391**	**4,202,101**	**5,202,937**	**6,668,093**	**7,243,**
HIGH RANGE	Domestic/Regional	2,850,016	3,386,120	4,280,641	5,411,469	7,461,566	8,304,
	International	0	153,317	238,493	346,382	454,272	497,
	Total	2,850,016	3,539,437	4,519,134	5,757,852	7,915,838	8,802,

Source: Canberra Airport Master Plan 2009

Domestic/regional passenger busy hour projections have also been prepared as shown in **Table 3.**

Table 3 – Domestic/Regional Passenger Busy Hour Projections

Year	Arrivals	Departures	Annual Growth
2005-06	762	743	
2011-12	975	951	4.2%
2016-17	1,198	1,168	4.2%
2021-22	1,472	1,435	4.2%
2026-27	1,808	1,763	4.2%
2029-30	2,046	1,995	4.2%

Source: Canberra Airport Master Plan 2009

Aircraft movements forecast by type;

The Master Plan also adopts a low-medium-high range approach to the aircraft movement forecasts. The mid-range projections assume a 3.4% growth for regional and domestic aircraft movements. International services are projected to be introduced from 2011/12. **Table 4** presents the aircraft movement forecasts.

Table 4 – Aircraft Movement Forecasts to 2029/30

		2007/08 (Actual)	2011/12	2016/17	2021/22	2027/28	2029/
LOW RANGE	Domestic/Regional RPT	39,629	44,603	51,707	59,942	69,490	75,
	International RPT	0*	312	730	1,095	1,460	1,
	Other	48,947	54,028	59,652	62,694	64,278	65,
	Total	88,576	98,943	112,088	123,732	135,227	142,
MID RANGE	**Domestic/Regional RPT**	**39,629**	**45,300**	**53,542**	**63,285**	**74,800**	**82,**
	International RPT	0*	728	1,248	1,768	2,184	2,
	Other	48,947	54,877	63,309	66,538	69,932	72,
	Total	**88,576**	**100,904**	**118,099**	**131,591**	**146,917**	**157,**
HIGH RANGE	Domestic/Regional RPT	39,629	46,718	57,388	70,495	86,596	97,
	International RPT	0*	1,092	1,820	2,548	3,640	4,
	Other	48,947	57,261	69,667	76,918	82,862	86,
	Total	88,576	105,071	128,875	149,961	173,099	188,

Source: Canberra Airport Master Plan 2009

Note that a limited number of international VIP, charter, and business jet flights operated in 2007/08.

Projections of RPT aircraft peak parking demand have been prepared and are shown in **Table 5.**

Table 5 – RPT Aircraft Peak Parking Demand

Code	Typical Aircraft	2008/09 (actual)	2014/15	2019/20	2024/25	2029/3
International						
E	787/A350	0	0	1	1	1
C	737/A320	0	1	1	1	2
Total		**0**	**1**	**2**	**2**	**3**
Domestic						
E	787/A350	0	2	3	4	5
C	737/A320	11	11	11	12	12
B*	B1900/J41	2	2	2	1	1
Total		**13**	**15**	**16**	**17**	**18**

** Note Code B aircraft are able to be parked and operated from the adjacent GA apron if required*

Source: Canberra Airport Master Plan 2009

Costs for upgrades	$750M invested to date and $350M currently been invested in new terminal.

12.5 Accessibility and Surface transport

Connections to Road	The Airport connects directly onto Pialligo Avenue which leads straight into the Canberra CBD and Parliament House, as shown in Figure 16. The aerodrome boundary also connects with the Majura Road. Thence, 1.9 km and 4 minutes to the Monaro Highway. The distance to Sydney CBD is about 289 km and travel time 3 hours approximately.

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Figure 17 – Access to road network

Source: Google maps

Distance to Canberra CBD 7.9 km and 16 minutes approximately.

Figure 18 - Access to Canberra CBD

Source: Google maps

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<tr>
<td>Traffic Volumes in Vicinity of Airport</td>
<td>

Figure 19 show the road network around the airport and linkages to the interstate road system.

Road congestion has occurred in the vicinity of the airport as is acknowledged in recent study for the Airport.

"The road network in the vicinity of Monaro Highway / Pialligo Ave / Morshead Drive currently experiences considerable congestion at peak

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</table>

periods, although congestion is more pronounced in the AM peak. The congestion is mainly due to conflict between a major north-south movement (Monaro Highway-Majura Road) and a major east-west movement (Pialligo Ave-Morshead Drive)."

Source: Arup, 2008

However it has been acknowledged by the ACT government that much of the problem is due to non airport traffic and the configuration of the intersections.

Figure 19 - Road Network

Source: Canberra Airport 2009 Masterplan.

- *The proposed upgrading to alleviate such congestion is outlined in the following table and shown in* **Figure 20**.

Table 3 Assumed Road Network Improvements

By Year 2012	By Year 2021
Mid-block	**Mid-block**
• Fairbairn Ave duplication between Morshead Drive and Pialligo Ave • Upgrade of Morshead Drive • Pialligo Ave duplication between Ulinga Place and Dairy Road • Clarrie Hermes Drive extension to Barton Highway • Fairbairn Northern Road	• Majura Parkway – Monaro Highway to Fairbairn Northern Road • Horse Park Drive – complete link between Federal Highway and Barton Highway with duplication in some sections
Intersection	**Intersection**
• Majura Road / Fairbairn Ave – additional turn lanes at signalised intersection • Pialligo Ave / Fairbairn Ave – traffic signals • Pialligo Ave / Morshead Drive – traffic signals • Morshead Drive / Fairbairn Ave – additional turn lanes • Morshead Drive / Dairy Road – roundabout improvements • Pialligo Ave / Ulinga Pl – grade-separation • Majura Precinct left turn exit to Majura Road	• Morshead Drive / Dairy Road – traffic signals

Source: Arup, 2008

Figure 20 - Road Upgrading Proposals

Source: Arup, 2008

	It is noted that the Airport has already funded the construction of a grade separated entry and exit at the Airport on Pialligo Drive, which can be seen in **Figure 1**.
Access to rail	Canberra Railway Station: Distance to nearest station (Canberra Railway Station) 6.5 km and travel time 14 minutes drive approximately. Canberra Railway Station to Central ~326km Time to Sydney Central Station: 4 hours and 20 minutes (CountryLink) Frequency of service: Up to 3 services a day Cost: $ 39.54 one way **Figure 21 – Access to Rail Station**  *Source: Google maps*
Airport Parking capacity - short term and long term	Both undercover and open-air parking are available (total 2,400). New multi-storey car park with 1200 cars capacity x 2 plus open air car parks 2 x 460 cars. (Total 3,320) on completion of Terminal.
Other transportation services available at airport	Bus – • Closest bus stop on *the airport* • Direct bus to Canberra city interchange • Operator: AirLiner bus service

	Taxi – • available at the airport also available through booking Rental cars – • Rental car desks are located inside the central terminal area Shuttle services – • AirLiner bus service
Walking and cycling	Walking not practical. Cycling possible via road and bike path networks.

12.6 Utilities and Services

Water and Sewer	Potable water is supplied by ActewAGL. Canberra Airport has invested heavily in water recycling infrastructure for the airport and surrounding precincts. There is also rain water recycling tank capacity of approximately 2.5 million litres Sewage services are also provided by ActewAGL. There are no known or anticipated constraints on the provision or development of these services.
Gas and Electricity	Gas and Electricity are provided by ActewAGL and by TruEnergy. There are no known or anticipated constraints on the provision or development of these services. Indeed, considerable work on this infrastructure has already been undertaken in the development of the new Canberra Airport terminal and associated infrastructure.
Police, fire, ambulance, hospitals.	Police • AFP facilities on Airport station for Aviation and Airport Community patrols and immediate response; Fire • ARFF on Airport – First Response • Fyshwick ACT Station (4km – approximately 7 minutes) • Queanbeyan Fire Station (6 km - approximately 10 mins)

	Hospitals • ARFF Paramedics first response; • Canberra Hospital 12km, 15mins;
Power	ActewAGL
Telecoms	Telstra, Optus, Transact, ICON

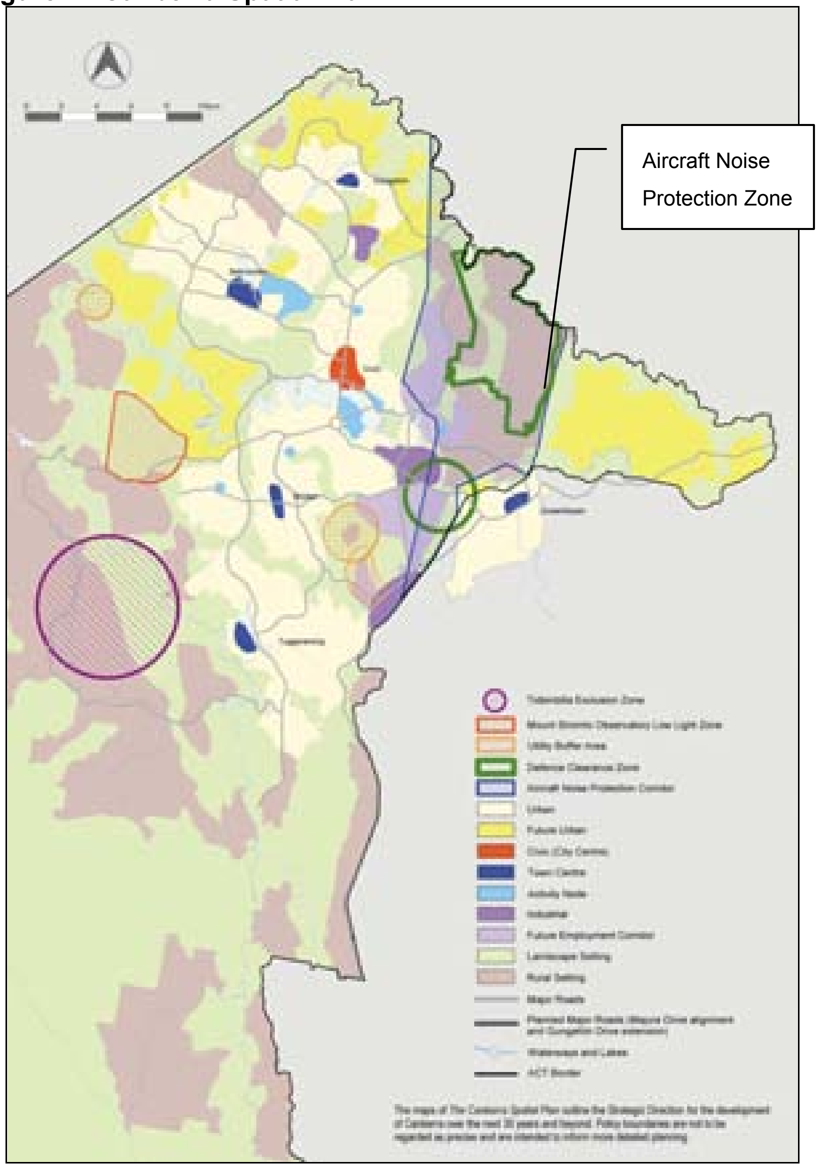
12.7 Land Planning Policies and Frameworks

Statutory and Policy Framework National, State and local Planning Policies and Instruments Provisions for airport development	The key planning policy for Canberra airport is the Canberra Airport 2009 Master Plan (the Master Plan), approved on 28 August 2009 and prepared by Canberra Airport Pty Ltd and made under the *Airports Act 1996* (Cmth). As described in the Master Plan: *"The Airport Master Plan is the primary planning document for the Airport and outlines 'a range of issues, including the development proposals for the airport and the proposed land uses on the airport'. The Master Plan has a timeframe of 20 years and beyond and must be revised every five years."* The privately managed airport is regulated by the Department of Infrastructure, Transport, Regional Development and Local Government in terms of the planning and building activities that may be undertaken there. The Airport itself is not subject to the planning controls of the National Capital Authority (NCA) or the ACT Planning and Land Authority (ACTPLA). However, land use around the airport is subject to the planning controls of the National Capital Authority (NCA) and the ACT Planning and Land Authority (ACTPLA). Additionally, land beneath the southern approaches to Canberra airport is under the control of Queanbeyan Shire Council and NSW Planning control as for other airports within NSW.

12.8 Environmental Factors, Frameworks and Policies

Site characteristics	The airport is located in the Majura Valley, to the east of the Canberra CBD. The valley runs from a high ground in the north to the broad Molonglo River Valley in the south. The major topographical feature is Mt Majura to the northwest of the Airport which forms one side of the valley. From the Airport northwards to the Federal Highway the valley is either grazing land or natural bushland. As illustrated in the Figure 21 below, according to the Canberra Spatial Plan, the Airport: • Lies within the boundary of the ACT Bushfire Abatement Zone and to the north-east lies a Future Bushfire Abatement Zone. • Is part of a *"Future Employment Corridor*" as identified in The Canberra Spatial Plan – Priority 1 Development – Short Term • Is designated as an Activity Node • Is within the Aircraft Noise Protection Corridor

Figure 22 Canberra Spatial Plan



Surrounding land uses and land characteristics Adjacent land use - planning controls Type, spatial extent and proximity of land uses Incompatible developments planned or approved Threatened or endangered species Designated environmental management areas Existing environmental assets Heritage scientific and aesthetic qualities/issues Wetlands and other sources of bird hazard	Majura Valley also contains significant Defence and Australian Federal Police Training Facilities including Majura Military Training Area, ADFA, RMC & AFP national and international training centre. These facilities have major expansion plans. There are a number of threatened or endangered species that occur on the surrounding land and habitat protection is an important issue. Notwithstanding this, all relevant environmental approvals have been obtained for relevant development to the airport infrastructure. According to the Master Plan, the following threatened flora and fauna are found on the site (p. 237-240): • Natural temperate grasslands – listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Cmth) (EPBC ACT); • Grasslands Earless Dragon – listed as endangered under the EPBC Act; • Golden Sun Moth – listed as critically endangered under the EPBC Act; and • Perguna Grasshopper – listed as vulnerable under the EPBC Act. • Environmental Approval obtained EPBC 2008/4170 and 2009/4748 for taxiway and associated works. There are also floodplain issues which affect the surrounding land – but in this regard significant mitigation works have been undertaken by Canberra Airport. The images below are taken from The Airport Master Plan and the Canberra Spatial Plan and illustrate the context of the airport with regard to the surrounding land uses. Figure 22 shows the structure of Canberra with respect to employment zones and transportation corridors. As can be seen Canberra Airport is a activity node in this network.

Figure 23 Employment Location

Figure 24 shows the proposed improvements to infrastructure in the region surrounding the Airport.

Figure 24 Infrastructure Upgrading

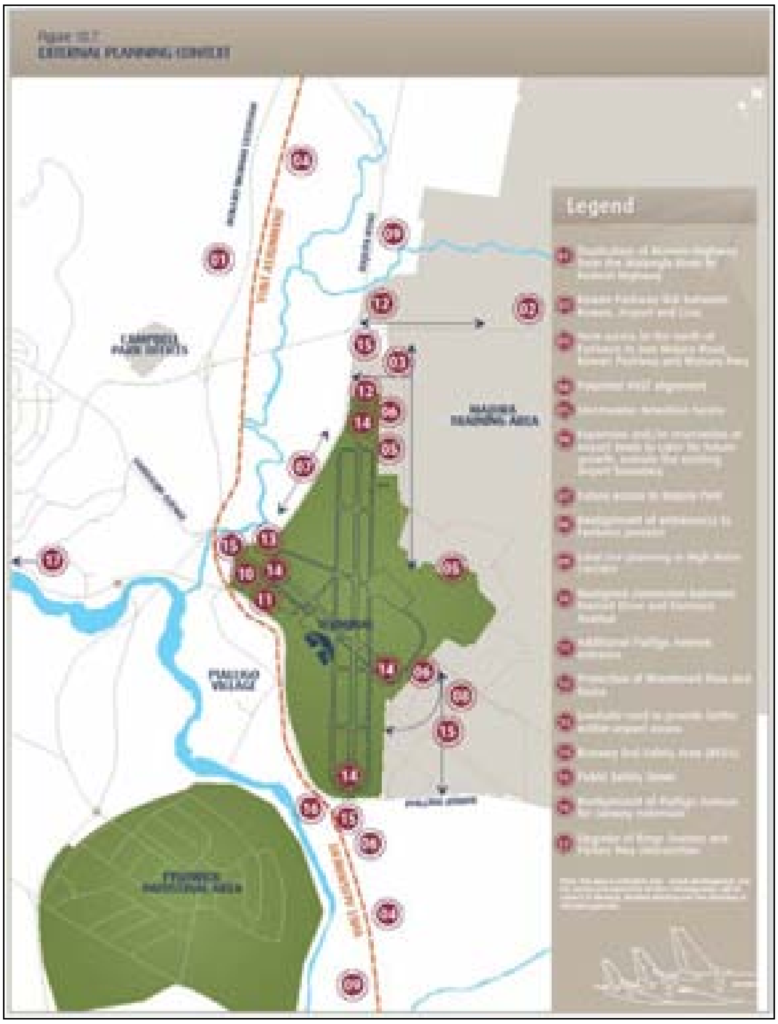


Figure 25 maps the major natural features of the ACT environment indicating wild life corridors either side of the airport through the Majura Valley.

Figure 25 – ACT environment

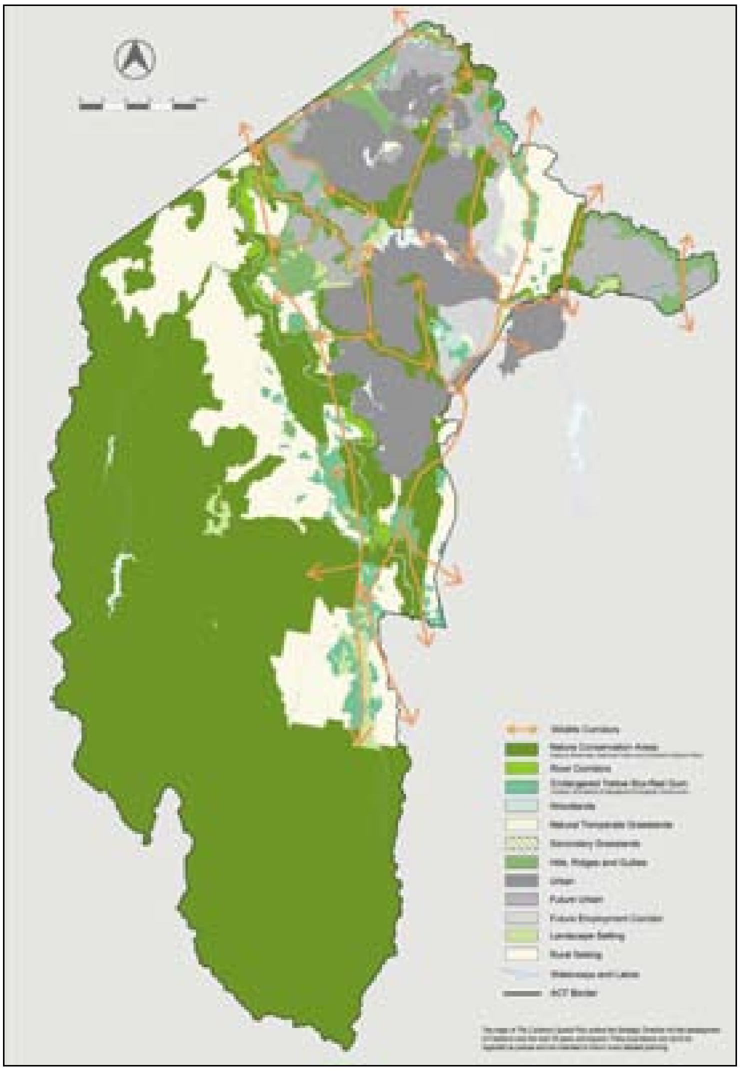
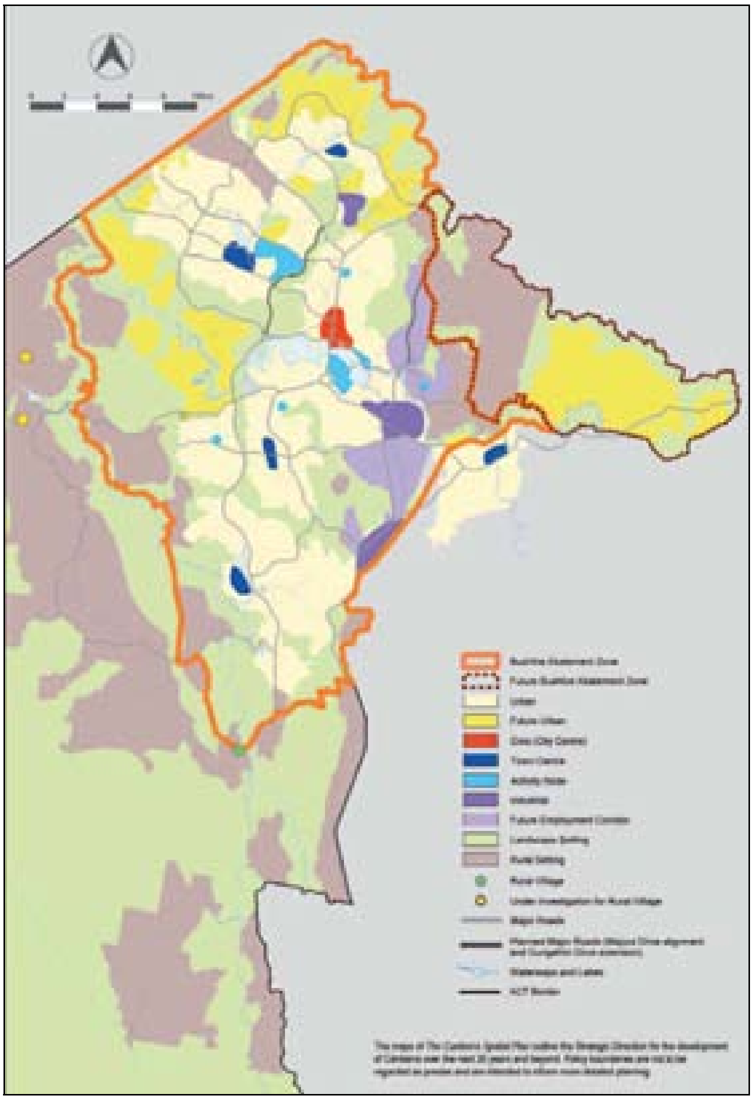


Figure 26 shows that the airport is located with in the ACT bushfire abatement zone.

Figure 26 Bushfire Abatement



Existing Environmental Management - Factors, Frameworks and Policies Airport's environmental management plan Management of sources of pollution - air, water, noise Environmental management policies for Airport	The Master Plan states (p. 232): *"The Environmental Management at an Airport is subject to the Airports (Environment Protection) Regulations 1997 which require the operator of an Airport to prepare an Environment Strategy, addressing the Airport's environmental objectives and the developments within the Master Plan, to be approved by the Minister for Infrastructure, Transport, Regional Development and Local Government every five years.* *The Airport must ensure that all reasonable and practicable measures are in place to prevent or minimise the generation of pollution from the undertaking of the Airport. In addition, the Airport is required to monitor and report the state of the environment at the Airport to the Airport Environment Officer and to the Department of Infrastructure, Transport, Regional Development and Local Government in the form of Annual Environment Report."* The Airport has prepared a Preliminary Draft Environmental Strategy which sets out the actions which the airport has undertaken to manage its environment. It lists its achievements as being: • National leading sustainable development; • Membership of Greenhouse Challenge Plus; • Implementation of waste water recycling; • Installation of gas-powered tri-generation plants; • On-site utilisation and recharge of groundwater; • safe management of the Grassland Earless Dragon and contribution to further research on the species; • Mapping of on Airport grasses; • Water Management Plan; • Development of a comprehensive regime of stormwater monitoring which measures water quality entering and leaving the Airport; • Participation in Molonglo River Sustainable Water Action Management; • planting of over 3,000 trees and over 10,000 shrubs; • groundwater quality monitoring; • Development of standard safety, security and environmental procedures; • Improved environmental awareness by contractors and tenants;

	• incremental implementation of the ACT Government's "No Waste by 2010" policy; • implementation of the Green Star accreditation programme; • Development of aircraft ground running guidelines.
Challenges to expansion / sensitive adjacent land uses Proximity of incompatible land use - for existing and any possible expanded airport usage	The most significant threat to Canberra airport is in the form of potential residential development in NSW under the southern flight path to and from the Airport. According to the Canberra Airport website: *"In Canberra, far-sighted planners in the 1960s and 1970s ensured that a north/south corridor was maintained free from residential development on the main departure and approach routes to and from Canberra Airport... These measures mean that 99.5% of the region's residents are currently protected from high levels of aircraft noise. This means* that a curfew is not necessary now or in the future. *These historical planning measures are now under serious threat. The NSW Government has approved a proposal for thousands of homes under the Canberra Airport flight paths at Tralee and Environa. If these residential developments are allowed to proceed, Canberra Airport has been advised by the Commonwealth Government's experts that it may be highly likely that Canberra and Queanbeyan residents who currently do not experience aircraft overflight will do so in the future as they experience the effects of noise sharing … [that is] complaints from future Tralee/Environa/Poplars residents will mean that the aircraft noise protection offered to residents of Canberra and Queanbeyan will be at risk."* **Figures 27** and **28** show the location of these proposed developments in relation to noise on tours for single event B737 and B747 movements.

Figure 27 - Single event B737

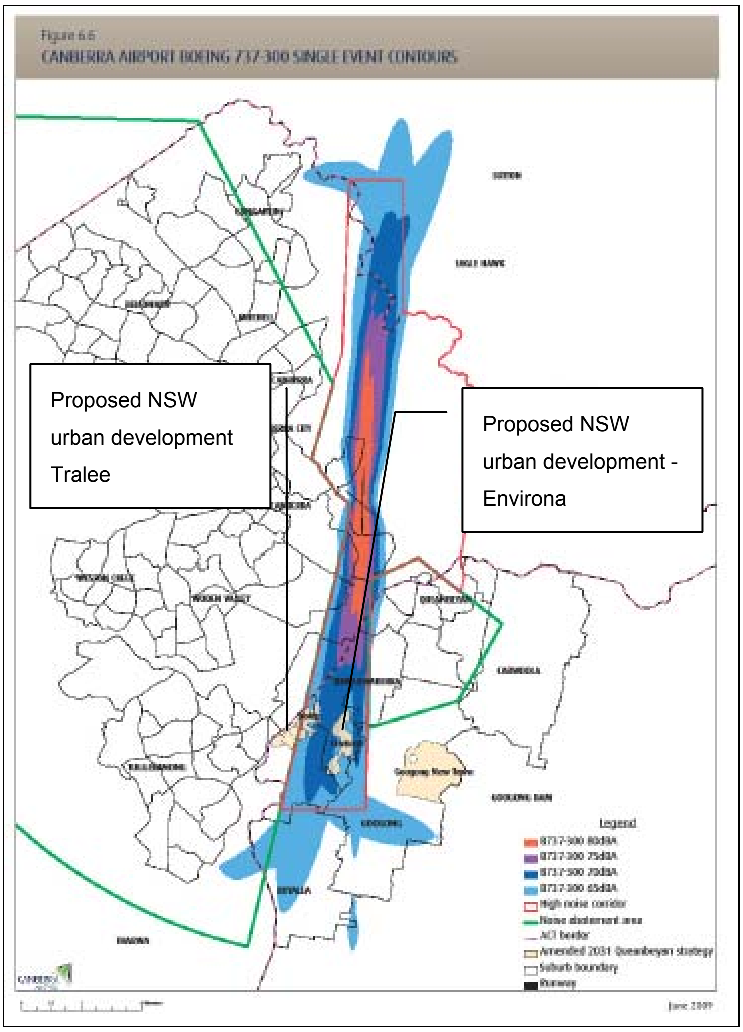
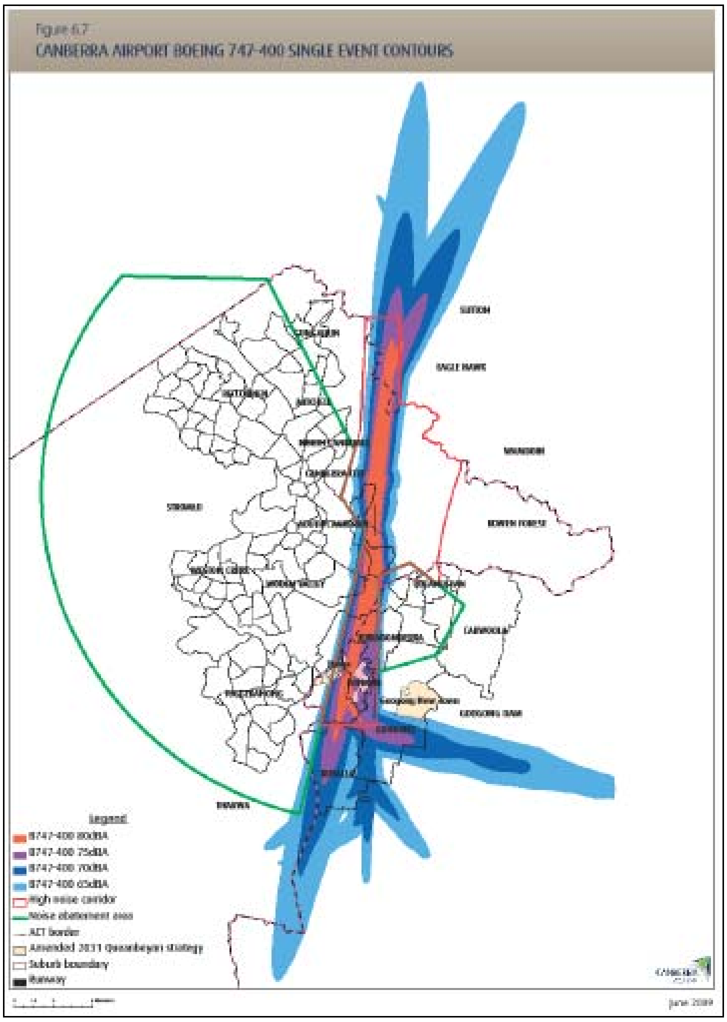


	Figure 28 - Single event B737 

12.9 Community and Public Amenity Factors

Community attitudes to airport	In a recent survey of community perceptions of the airport the following main points came through: • The airport was seen and appreciated as a critical piece of infrastructure for the ACT and surrounding region • There was overwhelming support for the development of the new Canberra Airport terminal • A significant majority of respondents were “happy” with Canberra Airport Many of this issues raised through the survey – such as access to parking,

	roads and congestion – will all be resolved with the completion of the new Canberra Airport terminal
Airport interaction with Communities	The Airport master plan describes the following ways in which it interacts with the community. *"Aside from the formal Master Planning public consultation process, Canberra Airport is committed to regularly consulting with the community in the ACT and surrounding region. This is manifested through regular presentations by Airport management to meetings of peak community organisations (such as the North Canberra Community Council and Tuggeranong Community Council) and other community and professional groups such as local Rotary and Lions Clubs and the Institute of Engineers.* *Major Airport developments are also subject to a formal public consultation process under the Airports Act Major Development Plan provisions, as well as any minor variations to the Master Plan or any Major Development Plan.* *Canberra Airport also recently voluntarily conducted a separate and broad public consultation process as part of the development of its endorsed Ultimate Practical Capacity ANEF, provided at Chapter 14. This had never been undertaken before by an airport nor by Airservices Australia, but was valuable in understanding community and other stakeholder perspectives on the aviation growth of Canberra Airport to its ultimate capacity.* *Ongoing consultation with the community on all relevant airport-related issues (not simply aircraft noise) is conducted through the Canberra Airport Aircraft Noise Consultative Forum, with meetings held three times a year. It is noted that a revamped Canberra Airport Consultative Forum will replace this body and meet quarterly. All peak community groups are represented, as well as a resident's representative from neighbouring Pialligo.* *Community organisations represented at Forum meetings are as follows:* • *Pialligo Residents Association;* • *Jerrabomberra Residents Association;* • *Ridgeway Community Group;* • *North Canberra Community Council;* • *Gungahlin Community Council;* • *Tuggeranong Community Council;* • *Woden Valley Community Council; and* • *Weston Creek Community Council.* *Belconnen Community Council, Curfew 4 Canberra and the Fernleigh Park*

	Community Association will also be invited to participate as a consequence of the community consultation on this Master Plan. Peak business and tourism groups are also being invited." Source: http://www.canberraairport.com.au/PDF/masterplan/approved/3_ConsultationProcess.pdf Also described are the consultation processes with various forms and levels of Commonwealth, State and local Government.

12.10 Information Sources

	Airservices Australia 2010, *Visual Navigation Chart, VNC-2 Sydney, effective 3 June 2010.* Airservices Australia 2010, *DAP 123 Aerodrome and Procedure Charts (DAP), effective 3 June 2010*. Airservices Australia 2010, En Route Supplement Australia (ERSA), *effective 3 June 2010*. Airservices Australia 2010, *Terminal Area Chart, TAC-5, effective 3 June 2010*. Department of Infrastructure, Transport, Regional Development and Local Government 2010, *Agency Input 150610*. Arup - Canberra International Airport- Majura Park Precinct - Updated Traffic Impact Assessment - April 2008 for *Canberra International Airport Pty Ltd.* Canberra Airport Environmental Strategy Preliminary Draft September 2009. http://www.airservicesaustralia.com/ http://www.aviationadvertiser.com.au/ www.btre.gov.au/info.aspx?NodeId=49 http://www.canberraairport.com.au/ http://www.craa.org.au/ http://en.wikipedia.org/wiki/Canberra_International_Airport http://apps.actpla.act.gov.au/spatialplan/maps/index.htm http://www.canberraairport.com.au/air_noise/noise_planning.cfm

E

GIS Model of Sydney Region Airports

GIS Model of Sydney Region Airports

E. GIS MODEL OF SYDNEY REGION AIRPORTS

E.1 What is Sydney Airports *waterRIDE*?

Sydney Airports *waterRIDE* is a software package based on geo-referenced aerial photos of NSW east coast used to view the impact of the 12 airports/airfields surrounding the Sydney region. The software contains information regarding the size, operations, topography and noise contours to help determine the sociological and ecological impact that each airport has on its surrounds.

Included in the software is the following information:

- Airport operations;
- Site attributes;
- Road and Rail transport options;
- Airport study plan derived upgrade options;
- Department of Planning LEP data.

Note: the electronic version of this help file can be found at:

D:HTML\help.html

where D: is the drive in which the disc is inserted

E.2 System Requirements for *waterRIDE*

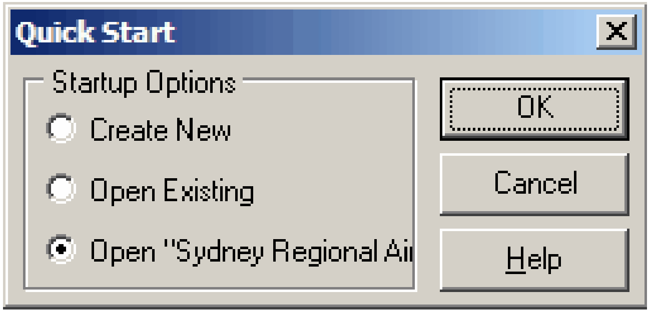
waterRIDE can be installed on any Windows operating system later than Windows 2000. A CPU operating at 1GHz with 1GB of memory is suggested as the minimum system requirement; however typical projects with extensive GIS layers (e.g. cadastre) and large model results will require a faster computer to ensure adequate application speed. A more optimal configuration would include a 2GHz CPU with 2 GB of memory and a 128Mb video card.

To ensure a reasonable display of photos or other raster images, a display setting of High Colour (16 bit) or True Colour (32 bit) is required. Also, because of the detail information being presented, an XGA or WXGA display setting is recommended. If multimedia files are to be linked then the computer should have a sound card installed.

E.3 The Main Screen Interface

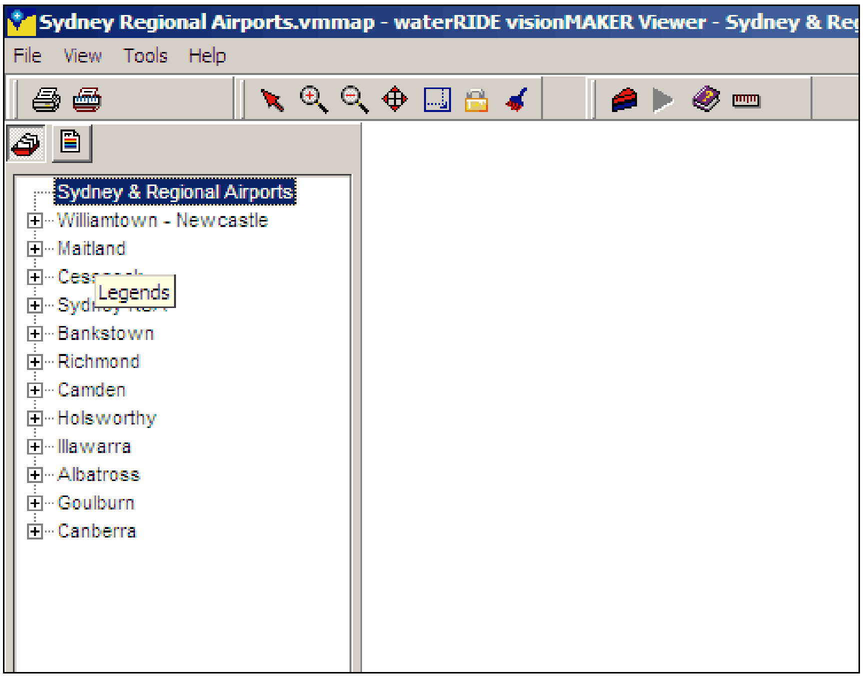
Begin by placing the DVD in the DVD drive. Open up the executable file: D:/Software/wR_vMviewer.exe

Once the program is started up, a quick-start dialogue box will open, allowing the user to either start a new project, open an existing project, or open the previous project *(Note: When the program is run for the first time, there will not be an option to open the previous project)*.



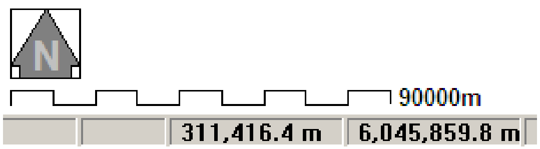
To select an option, click on the corresponding radio button then click OK. The file path will be located in D:/Consolidated/Sydney Regional Airports.vmmap

Once you have selected an option and clicked OK, the upper left hand corner of the screen will show the following menu and buttons.



waterRIDE Editor Main Screen – Window Mode

There is a *Toolbar* at the top below the *Menu System*, the panel on the left contains the project's *Table of Contents*, and the *main map screen* will show the spatial layers. This main screen will be seen by users in both the editor and viewer modes (more tools will be available in the *Editor Mode*). The *Editor Tools* buttons provide access to layer and view management tools.

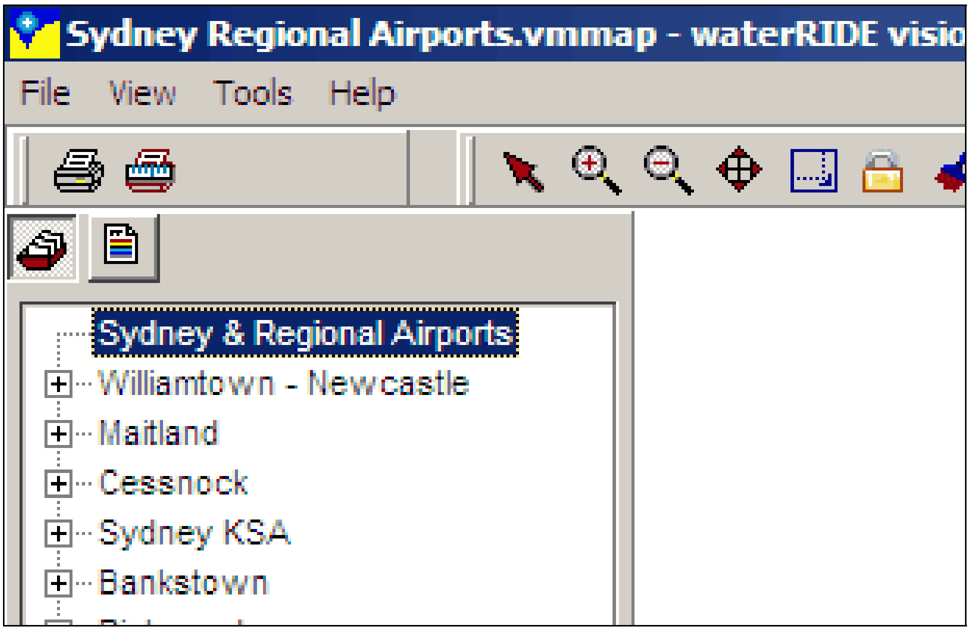


The *Status Bar* at the bottom of the window displays the current cursor location (in the views coordinate system) as well as the value of any active surface or GIS layer at the current cursor position. For the purposes of this project, the coordinate projection is in MGA zone 56 system. Just above the status bar is the views scale and north indicator.

E.4 Operations

E.4.1 The Main Menu

The *Main Menu* usually consists of four sub-menus.



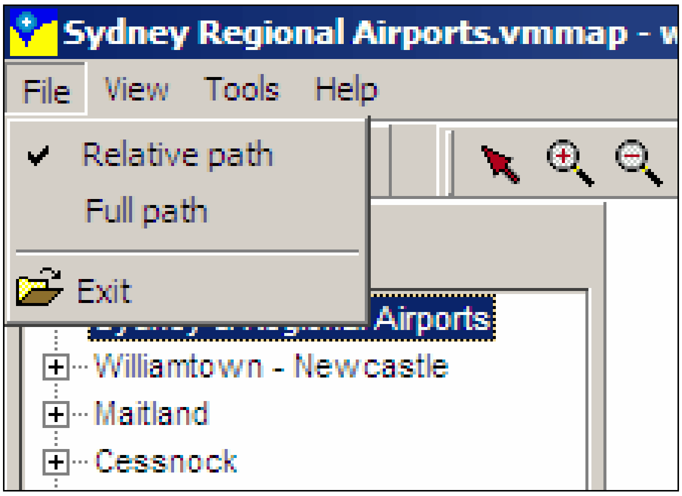
File Menu: Creating, loading and saving project files *(see File Menu for more details)*.

View Menu: Adjust project viewing tools such as zooming and panning or the visibility of various entities such as the table of contents and links windows *(see View Menu for more details)*.

Tools Menu: Provide different tools that can be used to export files or assist in analysing the different layers *(see Tools Menu for more details)*.

Help Menu: Provides access to the help manual, tutorial and specific program information

E.4.2 File Menu

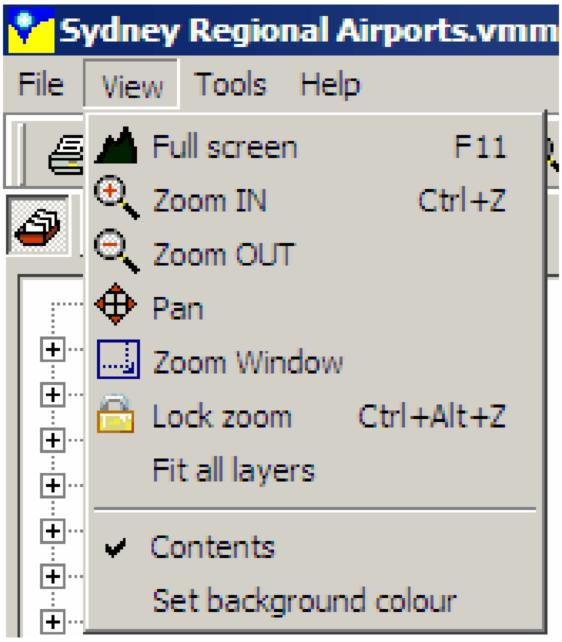


Relative Path: (saving option) Record the location of the files relative to the directory of the project file. This is useful when all files in the project are within the folder containing the *waterRIDE* project file *(*.vmmap*) or in sub-folders of the project folder. A relative path setting will allow the project to be copied to other users or to CD.

Full Path: (saving option) Record the actual location of the files relative to the computer. This is useful when a static network project is to be established and source files reside in a variety of locations on a network.

Exit: Quit the program.

E.4.3 View Menu



Full screen: Flip screen to full view or presentation mode. This removes the header, menu and bottom status bar. Use the shortcut F11 to return to normal mode.

Zoom-In: Increase the magnification. The centre view will be on the clicked location and the scale of the zoom can be dynamically adjusted with the mouse wheel.

Zoom-Out: Reduce the magnification. The centre view will be on the clicked location.

Pan view: Left-click to grab and drag view.

Zoom window: Left-click and drag – zoom to window extents.

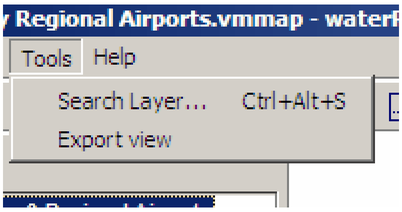
Lock Zoom: Locks the coordinates and the scale of the main map screen so that when switching between different views, the screen will remain at the current zoom level and position.

Fit all Layers: Zoom either in or out so that all the different layers which have been included in the current view can be seen on the screen.

Table of Contents: Toggle the contents panel either on or off (also F10 button).

Set Background Colour: Changes the background colour.

E.4.4 Tools Menu



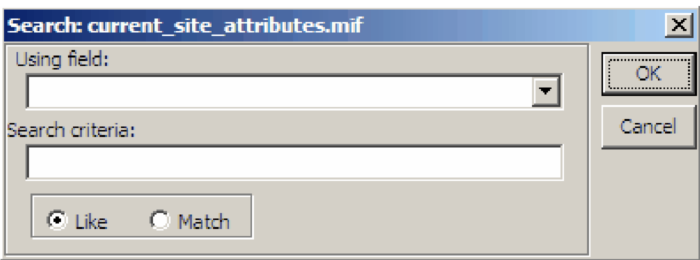
Search Layer: *Search a selected GIS layer* and a selected field for specified criteria. This function can also be accessed by using Ctrl Alt S as a shortcut (to search the active layer).

Export: Transfer data from the *waterRIDE* environment to other compatible files which can be used in other programs. The basic functionality available is *Export View,* where the map view can be exported as an image of either bmp, jpg or wmf format, including scale and thematic legend. This is useful for creating figures in reports and larger images can be created by specifying the image size. Application specific export outlines are discussed in later sections.

E.4.5 Search GIS Layer

The search tool allows a user to search for a record containing a specific text string in a GIS layer. The user can select to search any GIS layer in the current view or only the active layer.

The user can enter all or part of string to search for in a particular field. If multiple records are found, the user can select which record to go to. The screen will then centre on the GIS entity containing the search string in the relevant field.



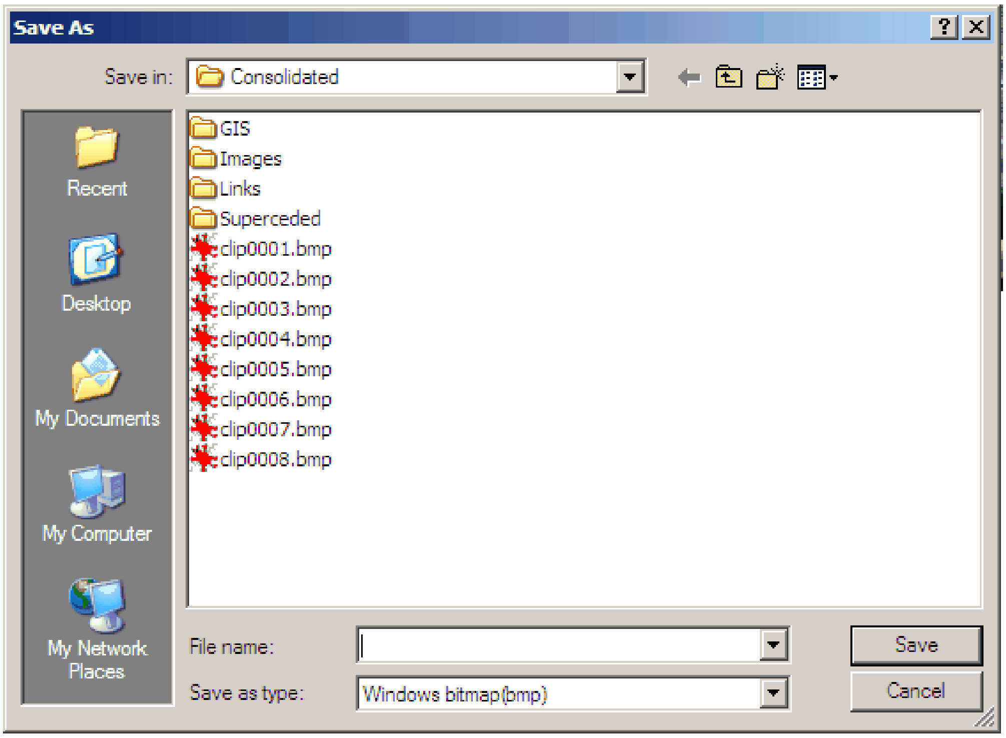
Notes:

1) The string can be a partial string (eg 'wat' for 'water').

2) The search dialog can be opened for any active GIS layer by pressing F3.

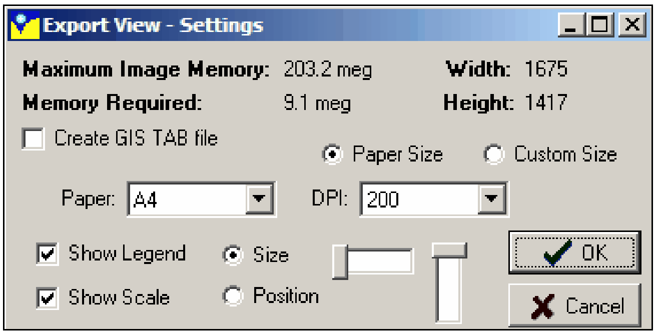
E.4.6 Screenshot Exports from *waterRIDE*

waterRIDE allows the user to export the main map window to a picture file, using the *Export View* tool. This tool saves the image on the main window to either a windows meta file *(.wmf),* bitmap image file *(.bmp),* or JPEG *(.jpg)* ready for use in external applications.



When the export view tool is selected a standard "Save As" window appears allowing you to select the format that you would prefer the picture to be saved as, and the location of where the file will be stored.

By selecting the fourth option "Custom Image Size", you can specify the desired size of your exported image. This allows the user to export the image at a different resolution to the default screen resolution. Selecting this option brings up the following form.



Method:

Create GIS TAB file: When exporting the image, save GIS registration detail in a *.tab file suitable use in GIS applications.

Custom Size: Use the scrollbar to adjust the size of your image.

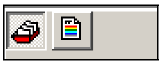
Paper Size: Specify the output paper size and desired print resolution (Dots per Inch (DPI)).

The legend and scale visibility and size can be set using the relevant controls.

The memory required for an uncompressed (bitmap) image is displayed at the top of the form, along with the image dimensions. *waterRIDE* automatically calculates the maximum allowable size of the image for your system configuration.

E.4.7 Editor Tools for Creating and Manipulating a View

As you begin to create a project, the following tools will appear below the primary tool bar *at various stages* during the editing process. They are discussed in more detail elsewhere in this help file.



Project contents: Show the panel on the left of the screen with the project's *Table of Contents (see also Project Contents)*.

Show Legend: Show the legend for a layer that has been made ***thematic*** *(see also Show Legend)*. Note: the *Show Legend* tool button is *only* visible if a layer within the view has been made ***thematic***.

E.5 Using Sydney Airports *waterRIDE*

E.5.1 The Toolbars

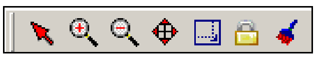
The basic toolbars consist of shortcuts to the most commonly used tools which execute a variety of basic functions. The toolbars and their corresponding functions include:

E.5.2 Files Toolbar

Print the on-screen view and any selected links

Print to scale: Select a paper size, orientation and scale, then locate the print rectangle on the view to clip that portion for printing.

Zoom Toolbar



Object Info: This mode allows a user to select an active object *(from an active layer)* which becomes highlighted. Information for that the object is displayed in the Information Bar on the panel at the top of the *waterRIDE* interface.

Zoom-IN (CTRL-Z): Increase the magnification and also centre the view on clicked location. Some applications will also provide an adjustable zoom rectangle which can be adjusted using the wheel on your mouse. Pressing SHIFT will toggle between Zoom-In and Zoom-Out modes.

Zoom-OUT: Reduce the magnification and also centre the view on clicked location

Pan view: Left-click to grab and drag view.

Zoom window: Left-click and drag – zoom to window extents.

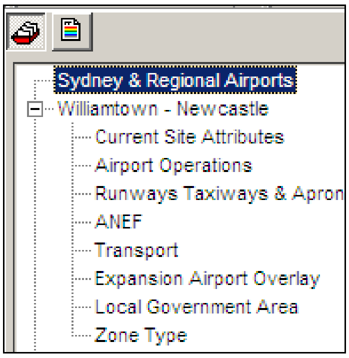
Zoom Lock: Lock the current level of zoom when switching between views.

Refresh View: Reload the default view.

Miscellaneous Toolbar

The miscellaneous toolbar is not used for this project.

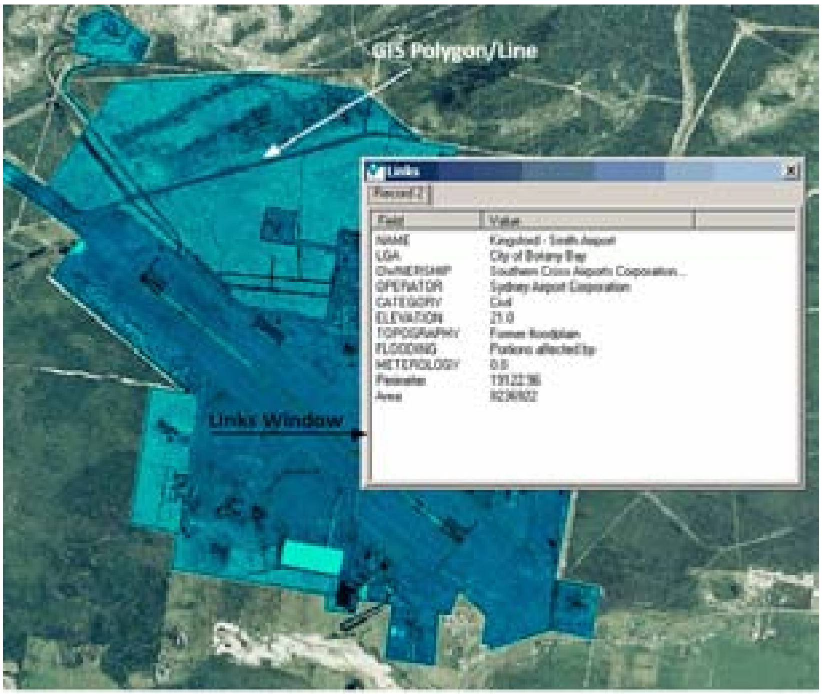
E.5.3 Project Contents



When the Project Contents toolbar is selected, all 12 airports are displayed in the contents tree.

Expanding any of the airports brings up a sub- branch containing 7 options listed below. Each option brings up a view which is colour coded. Clicking the legends tab will bring up the colour coding for each sub - branch.

DEPARTMENT OF INFRASTRUCTURE AND TRANSPORT



Clicking on a GIS polygon or line, using the *Object Info* selector, will display various associated info, as can be seen above.

Current Site Attributes

Brings to view the currently selected airport. This option provides a brief detail about the airport in question

Airport Operations

This option provides a more in depth detail about the airport currently selected.

Runways, Taxiways & Aprons

This brings to view a colour coded outline of the relevant features of the selected airport.

ANEF

Where available, this presents an overlayed image of the current ANEF contours of the airport

Transport

This option details the relevant transport options to and from the airport; either by road or rail

Expansion Airport Overlay

When selected, the ANEF contours of a greatly expanded airport are displayed over the current airport. This is used to determine the sound impact that an expanded airport will have on the surrounding localities. The contours were modelled using Adelaide Airport.

DEPARTMENT OF INFRASTRUCTURE AND TRANSPORT

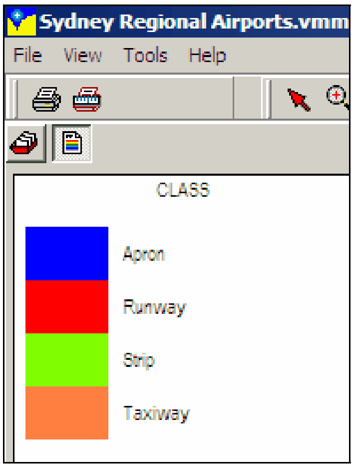
Local Government Area

This option displays the LEP overlay, colour coded according to local government area.

Zone Type

This option displays the LEP overlay, colour coded according to zone type.

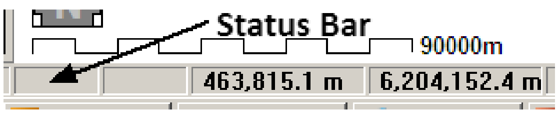
E.5.4 The 'Show Legend' Tab



The 'Show Legend' button' is the last of the 'Editor Tools' buttons, and is only selectable if a layer in the project has been made active and thematically mapped. Clicking this button displays the legend for the active layer in the top display panel and the basic symbology for all other layers. There is a splitter between the panels to change their sizes. When appropriate, a small legend appears in the *Project Contents* window.

E.5.5 Checklist for Operations

- The following steps need to be performed in order to ensure proper operation of the program:
- Ensure all other programs are closed to free up disk space.
- Check the *Zoom Lock* button is disabled
- Check the *Object Info* button is selected before choosing another airport to view.
- Close any *Links window* before selecting another GIS layer to view.
- Once an airport sub branch has been selected, wait for the progress bar to finish loading (see image below).



- Select the required GIS layer to view the relevant information in the Link Window

Aviation users: profile of aviation users in the Sydney region

A2

Australian Government
Department of Infrastructure and Transport
Bureau of Infrastructure, Transport and Regional Economics

Brief

Aviation Users: Profile of aviation users in the Sydney region

The following profile of aviation users in the Sydney region brings together results from:

- Tourism Research Australia's *National Visitor Survey* (NVS) data on outbound travel (2004 to 2009) and domestic day and overnight travel (2005 to 2009)
- Tourism Research Australia's *International Visitor Survey* (IVS) from 2005 to 2008
- Frequent flyer data from major airlines
- Australian Bureau of Statistics (ABS) 2006 Census of Population and Housing
- Specially commissioned surveys of Sydney residents and airport users undertaken by Colmar Brunton on behalf of the Sydney Aviation Capacity Study in 2010
- Sydney Airport 2006 Ground Travel Plan
- BITRE Airport Traffic Statistics (ATS) for 2005 to 2010.

This analysis is largely focused on passengers, although some consideration is also given to other types of users, such as airport staff and meeters/greeters, where data permits. The focus is on the Sydney Greater Metropolitan Area, which covers Sydney, the Lower Hunter and the Illawarra—Box 1 provides further information on the geographical concepts used in the analysis.

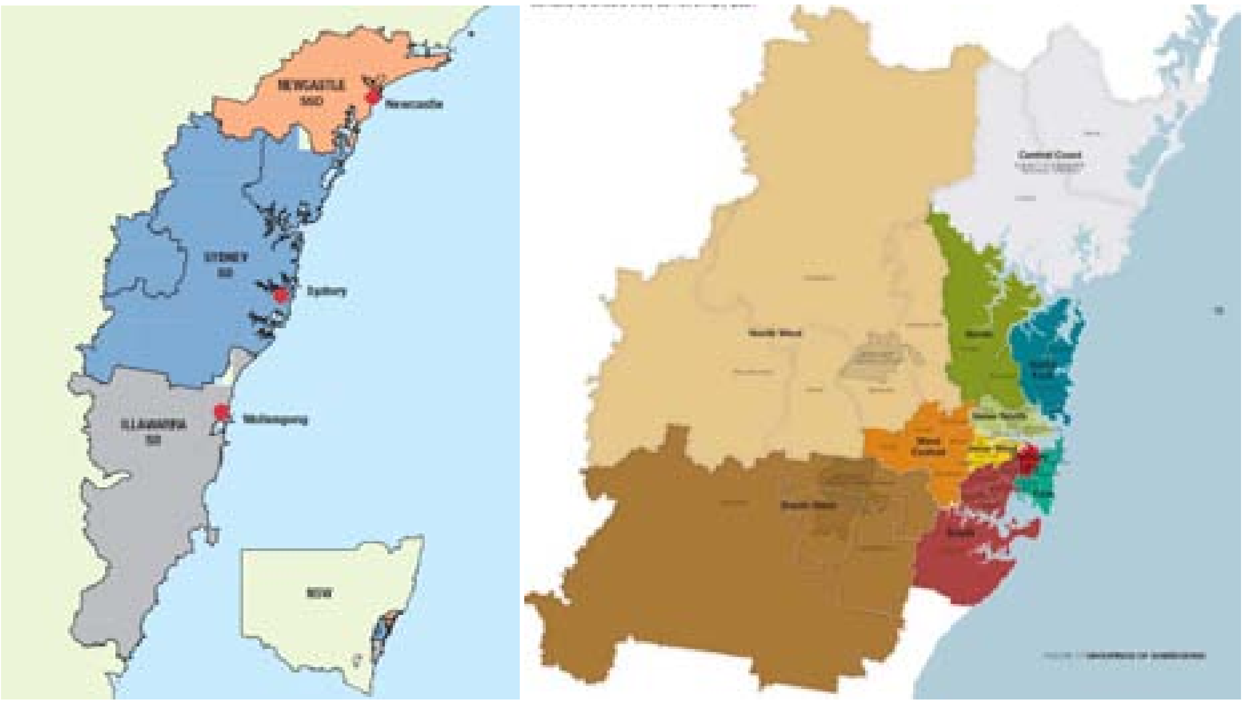
Box 1 Geographical concepts

The analysis relates to the Sydney Greater Metropolitan Area (GMA), which is illustrated in Map 1 and encompasses the Sydney Statistical Division (including the Central Coast and the Blue Mountains), the Illawarra Statistical Division (SD) and the Newcastle (or Lower Hunter) Statistical Subdivision. All analysis is based on the ABS' Australian Standard Geographical Classification (ASGC) boundaries as of 2006.

Spatial variation within the Sydney GMA is analysed using two different geographical classifications:

- Planning subregions, based on NSW Department of Planning definitions (see Figure 3)
- Statistical Local Areas (SLAs), which are the smallest spatial unit for which ABS data is available outside of census years—the SLAs can be aggregated to match Local Government Area (LGA) boundaries (see Maps 2, 3 and 4).

Map 1 Greater Metropolitan Area and planning subregions



Source: NSW Bureau of Transport Statistics and Department of Planning 2005, based on 2006 ABS ASGC boundaries.

Overview of passenger users of airports in Sydney region

BITRE Airport Traffic Statistics (ATS) show an average of 31.2 million passenger movements annually at Kingsford Smith Airport (KSA) between 2004–05 and 2009–10 and a further 1.0 million annual movements at Williamtown Airport near Newcastle. A further 0.3 million passengers use KSA on a domestic leg of an international flight. The two visitor surveys—the NVS and IVS—collect detailed information on the entire journey of each traveller which can be used to identify and build profiles of passenger users of airports in the Sydney Greater Metropolitan Area (GMA). These visitor surveys capture around three-quarters of passenger movements through GMA airports, but they do not capture transfer passengers nor passengers under 15 years.

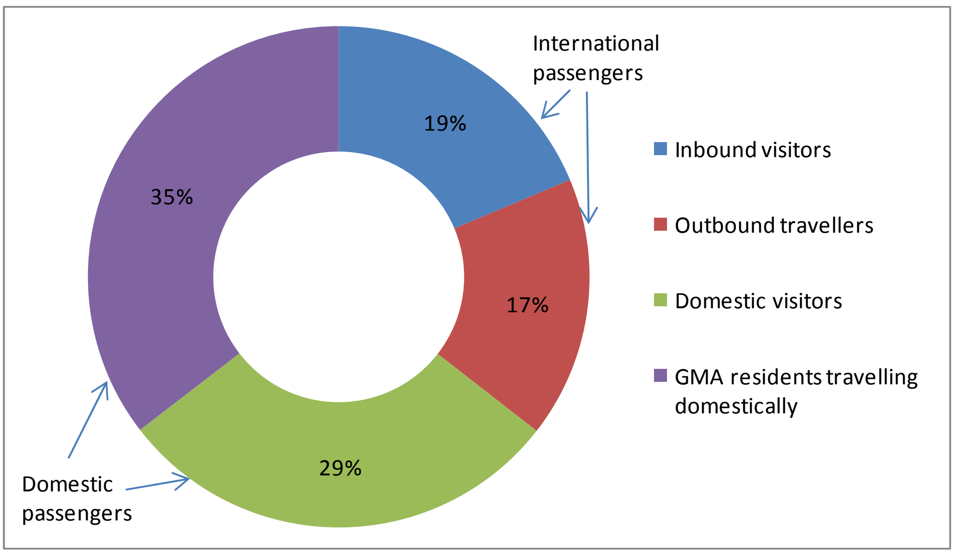
Table 1 identifies the different types of passengers captured by the visitor surveys and introduces the terminology which will be used to profile passengers. Note that while the visitor surveys provide information on the specific airport used for inbound visitors and outbound travellers, no such information is available for domestic passengers. As can be seen in Figure 1, domestic passengers account for just under two-thirds of airport use, with Sydney GMA residents travelling domestically tending to outnumber domestic visitors from elsewhere in Australia. Inbound visitors and outbound travellers each make a similar contribution to overall passenger use.

Table 1 Different category of passenger users

Passenger category	Description
Inbound visitors	International visitors whose point of arrival in Australia is KSA.
Outbound travellers	Australians whose point of departure when travelling to an overseas destination is KSA. The majority of these outbound travellers live in Sydney (68%).
Domestic visitors	Australians who live outside the Sydney GMA^ and travel by air to visit a destination within the GMA, either on a day or overnight trip.[#]
GMA residents travelling domestically	Residents of the Sydney GMA^ who travel by air to a destination anywhere in Australia on either a day or overnight trip.[#]
International passengers	Refers to the combination of inbound visitors and outbound travellers.
Domestic passengers	Refers to the combination of domestic visitors and GMA residents travelling domestically.
All passengers*	Refers to the combination of inbound visitors, outbound travellers, domestic visitors and GMA residents travelling domestically.

Notes: *All passengers captured through IVS and NVS. These surveys do not enable transfer passengers to be identified and those aged under 15 are excluded from the scope of the surveys. The number of trips involving air travel are identified through the IVS and NVS—not the number of flights.
^ The GMA covers the Sydney and Illawarra Statistical Divisions and the Newcastle (or Lower Hunter) Statistical Subdivision.
# A small proportion of these trips may have been through Williamtown Airport at Newcastle (perhaps 3 per cent) or other nearby airports (e.g. Canberra). The NVS does not provide information on which airport was used.

Figure 1 Relative importance of different types of passenger users of Sydney GMA airports

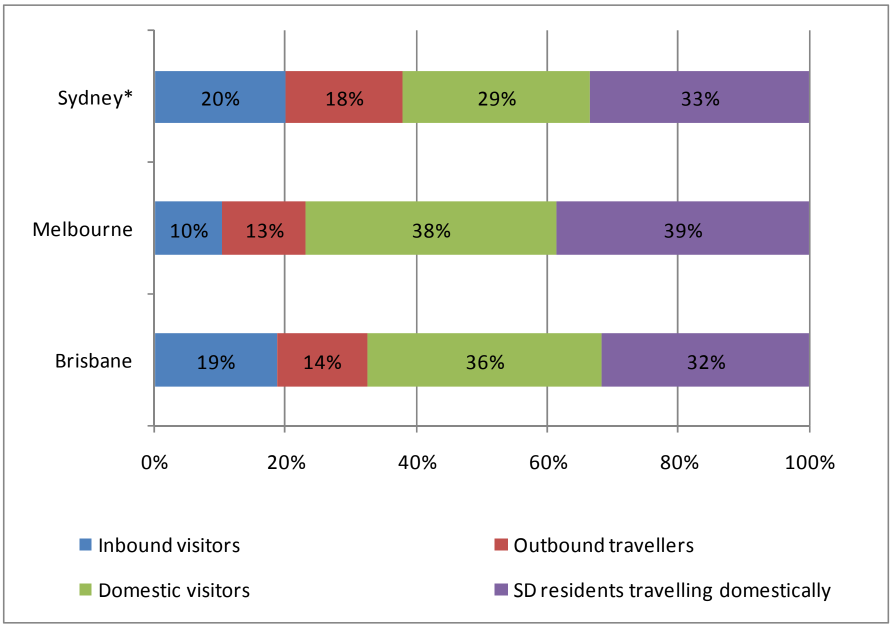


Notes: Excludes transfer passengers and those aged under 15.

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

Figure 2 compares the mix of passenger types in Sydney to that of Melbourne and Brisbane. The main feature is the greater contribution of international passengers for Sydney, particularly in comparison to Melbourne. This is also evident in BITRE ATS for 2004–05 to 2009–10 which reveal that while 33 per cent of passenger movements at KSA were on international airlines, the corresponding figures were 20 per cent for Melbourne and 22 per cent for Brisbane. Figure 2 suggests that KSA captures a relatively large share of both international visitors and Australians travelling overseas. The majority of Melbourne passengers are domestic passengers, with a roughly even split between visitors and residents. In contrast, visitor passengers outnumber resident passengers for Brisbane.

Figure 2 Relative importance of different passenger types at Sydney, Melbourne and Brisbane airports



Notes: Excludes transfer passengers and those aged under 15.
* Domestic passenger data relates to those who reside in or visit the relevant capital city statistical division, while international passengers are identified through their use of the relevant capital city international airport. While this focus on statistical divisions enables valid comparisons to be made between Sydney, Melbourne and Brisbane, it causes the Sydney percentage shares in Figure 2 to differ slightly from those presented in Figure 1 which relate to the Sydney GMA.
Source: BITRE analysis of NVS and IVS data for 2004 to 2009 (Tourism Research Australia).

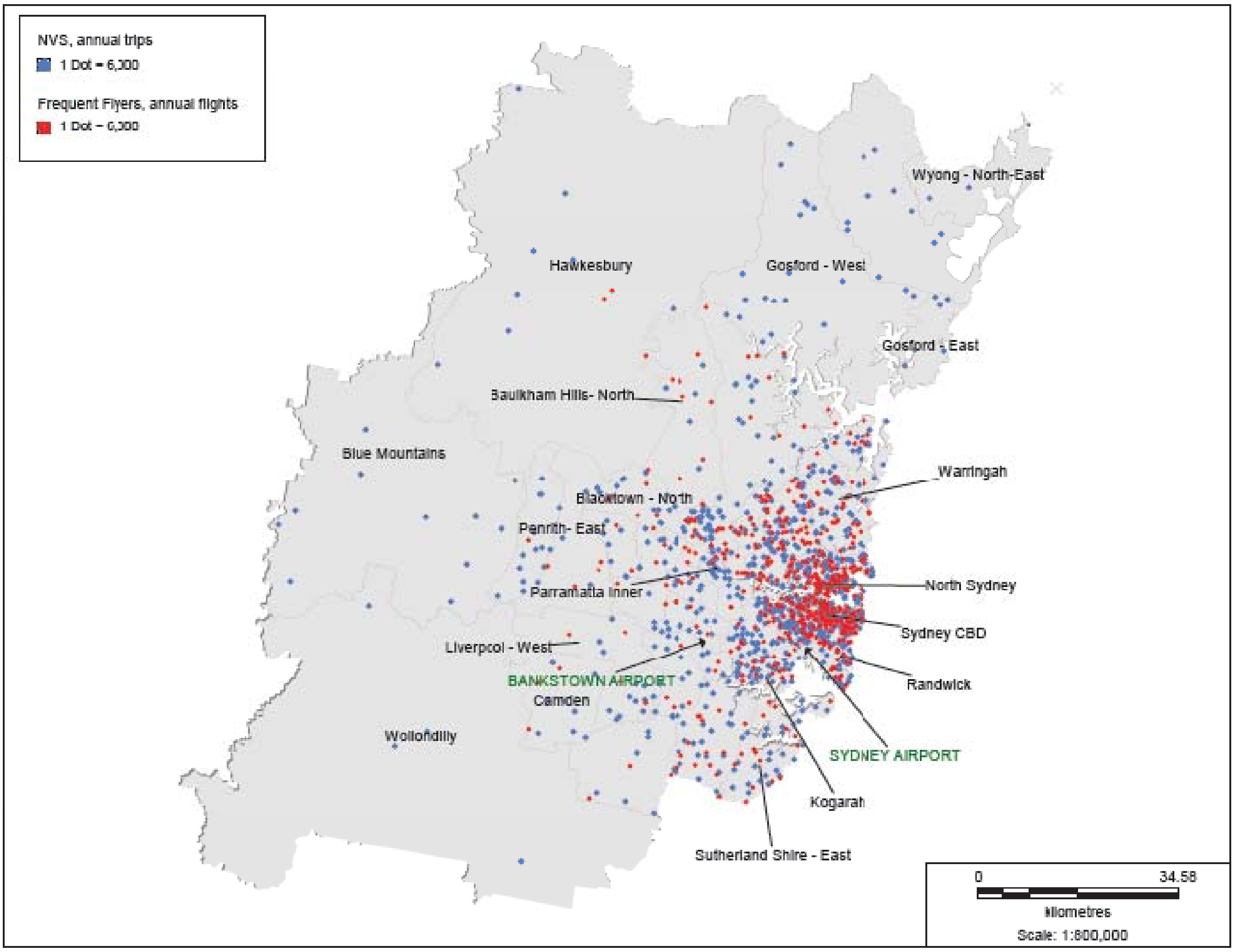
BITRE ATS reveal that the number of passengers using KSA has been growing strongly in recent years, averaging 3.5 per cent growth annually between 2004–05 and 2009–10. Of the four categories of passenger listed in Table 1, the visitor surveys indicate that outbound travellers have been growing most rapidly. While there was moderate growth in both types of domestic passenger between 2005 and 2008, there was a decline in 2009, reflecting the impact of the global financial crisis.

Where are aviation users concentrated in the Sydney region?

Trips by residents of Sydney

The NVS and frequent flyer data for major airlines have been used to build a picture of the spatial distribution of air travel by residents of Sydney (see Map 2). Areas for which residents have a very high number of trips by air include Warringah, Ku-ring-gai, Randwick, North Sydney, Sutherland Shire West and Baulkham Hills Central. In contrast, Fairfield West, Bankstown North-West, Parramatta South and Wollondilly are examples of areas with relatively few trips. The frequent flyer and NVS data present a very consistent picture of the spatial patterns in demand for air travel by Sydney residents, as shown by the similar distribution of the red and blue dots in Map 2.

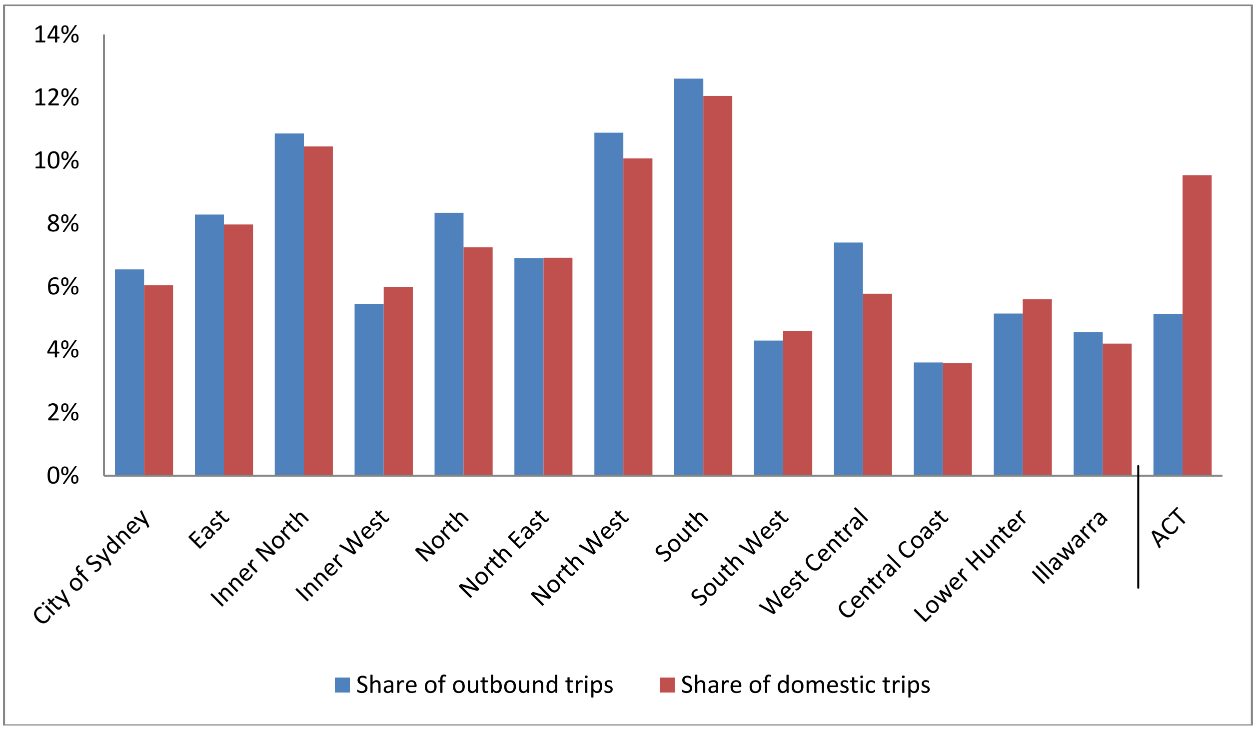
Map 2 Air trips by Statistical Local Area of residence, Sydney



Note: Frequent flyer data was missing/incomplete for Blue Mountains, Wyong and Gosford LGAs.
Source: BITRE analysis of NVS, 2005-2009 pooled data (Tourism Research Australia), converted to annual trips, and frequent flyer data from major airlines.

The market shares at the more aggregated sectoral scale are very similar for domestic and outbound trips (see Figure 3). For this analysis the figures for the Sydney GMA and the ACT were combined. The residents of the South (including Sutherland East and West, and Marrickville) had the largest share at 13 and 12 per cent each of domestic and outbound trips, followed by the residents of Inner North (including North Sydney and Ryde) and the North West which each contribute 10 per cent of domestic trips and 11 per cent of outbound trips. Illawarra and Lower Hunter accounted for between 4 and 6 per cent of each type of trip. Residents of the ACT had a higher share of domestic trips (10 per cent) than outbound trips (5 per cent).

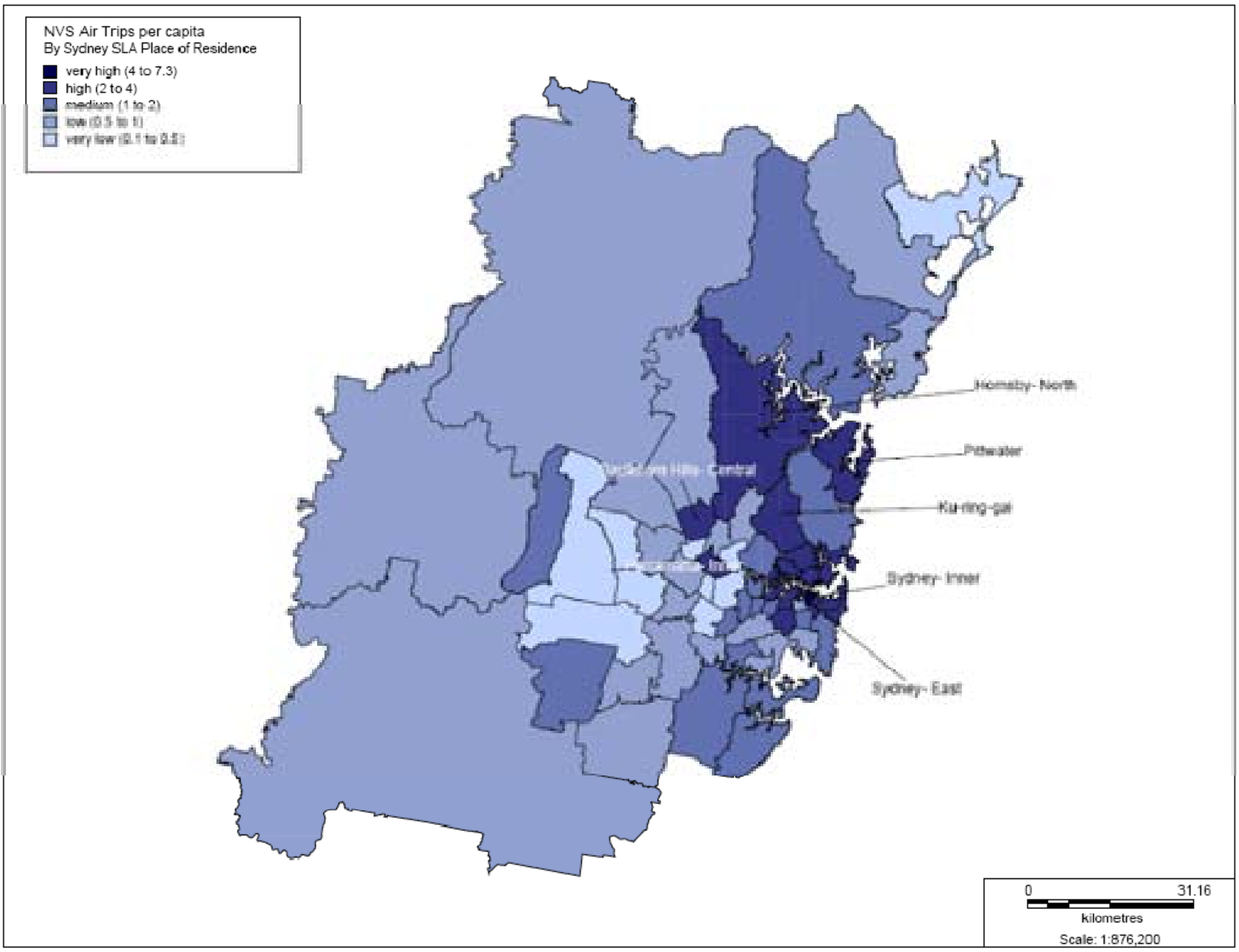
Figure 3 Market share by sector of residence, Sydney GMA and the ACT



Source: BITRE analysis of NVS, 2005-2009 pooled data (Tourism Research Australia) and validated with frequent flyer data from major airlines.

The picture presented in Map 2 is heavily influenced by the distribution of population throughout Sydney. Map 3 presents the air trips information for Statistical Local Areas (SLAs) on a per capita basis. It highlights significant spatial differences in the propensities of residents of different areas to undertake air travel. The areas with a particularly high incidence of air trips include Sydney Inner, North Sydney, Manly and Mosman, where residents average more than 4 air trips each year. In contrast, Fairfield East, Fairfield West and Liverpool West are examples of SLAs with a low propensity to undertake air travel (less than 0.5 trips per year, on average). Generally an individual's propensity to travel by air tends to rise with income (as is illustrated in Figure 12), so high income areas can be expected to have higher propensities for air travel.

Map 3 Air trips per capita by Statistical Local Area of residence, Sydney



Source: BITRE analysis of NVS, 2005-2009 pooled data (Tourism Research Australia) and validated with frequent flyer data from major airlines.

Trips by visitors to Sydney

Limited evidence is available on the destinations of domestic and inbound visitors to the Sydney GMA. The visitor surveys and the KSA intercept survey both suggest that by far the most important destination is the City of Sydney Local Government Area (LGA), attracting 40 per cent or more of visitors. The East and Inner North sectors were the next most common destinations but with a relatively low share of visitors. Over 90 per cent of visitors had a destination within the Sydney Statistical Division (SD).

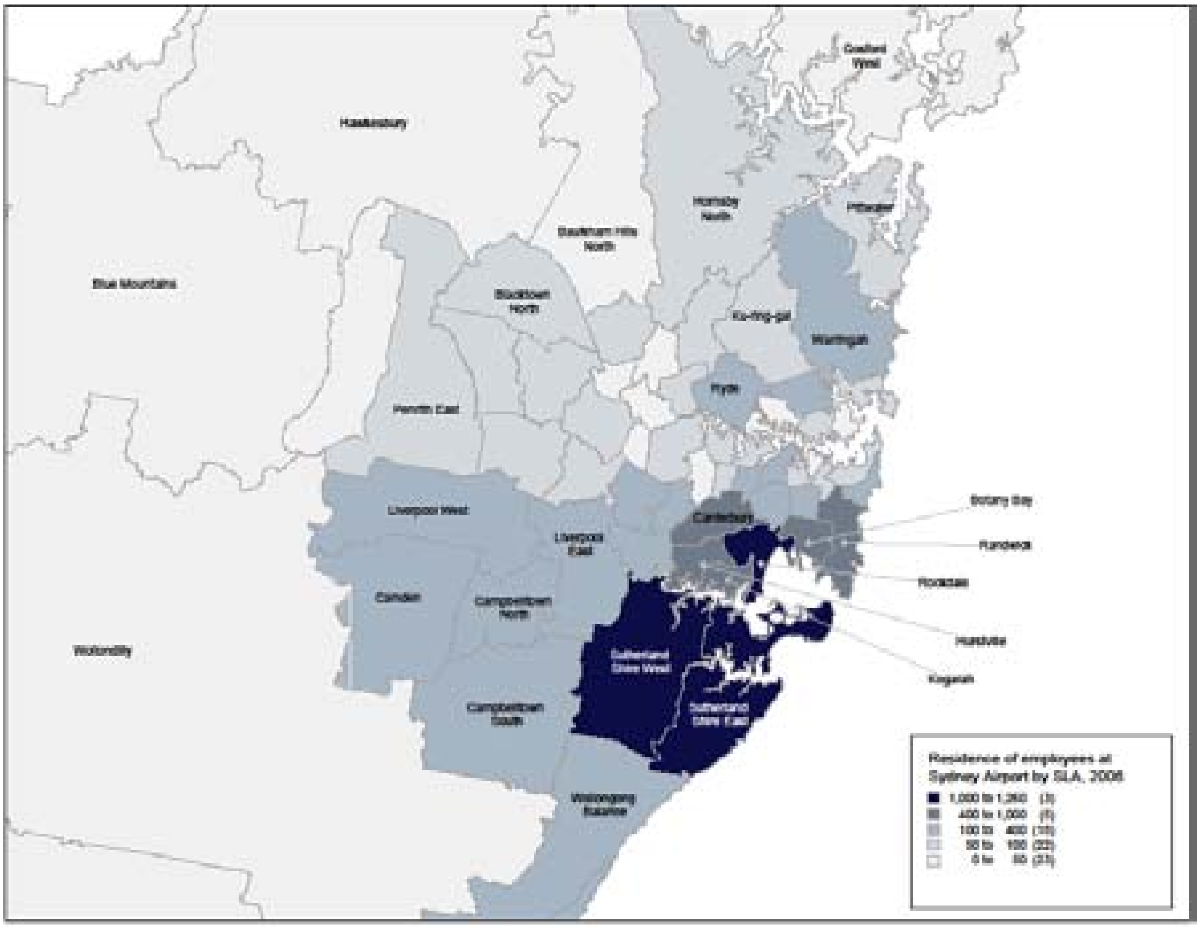
Employees

The ABS 2006 *Census of Population and Housing* provides information on the place of residence of those who work at KSA. The NSW Bureau of Transport Statistics (BTS) estimates that the census captured around 80 per cent of the 14 732 people employed at KSA in 2006, and forecasts an 11 per cent increase in employment between 2006 and 2011. This suggests the total number of employees has not increased markedly in recent years, and since the spatial distribution of Sydney's population is gradually evolving, the distribution of workers by place of residence can be expected to have remained reasonably stable between 2006 and 2011.

The majority of KSA employees (74 per cent) live in four key planning subregions of the Sydney GMA—South (which is dominant, contributing 45 per cent of employees), East (which contains KSA and contributes 12 per cent), West Central (9 per cent) and South West (7 per cent). The main SLAs of residence are illustrated in Map 4. A substantial proportion of Sydney Airport staff are sourced from just three SLAs—Rockdale, Sutherland Shire East and Sutherland Shire West—each of which contribute about 10 per cent of KSA employees and belong to the South subregion of Sydney.

Many airport-related jobs are located in Mascot, to the immediate north of the Airport. The place of residence distribution of those who work at Sydney Airport and Environs (i.e. KSA plus Mascot) proved to be very similar to that described above for KSA employees.

Map 4 KSA employees by Statistical Local Area of residence, Sydney



Note: Airport employees defined as those who had a place of work in travel zones 411, 415, 425 and 581. Excludes those who work at Mascot, as well as those who live in the Lower Hunter or outside the Sydney GMA.
Source: 2006 ABS Census of Population and Housing data, sourced from NSW BTS.

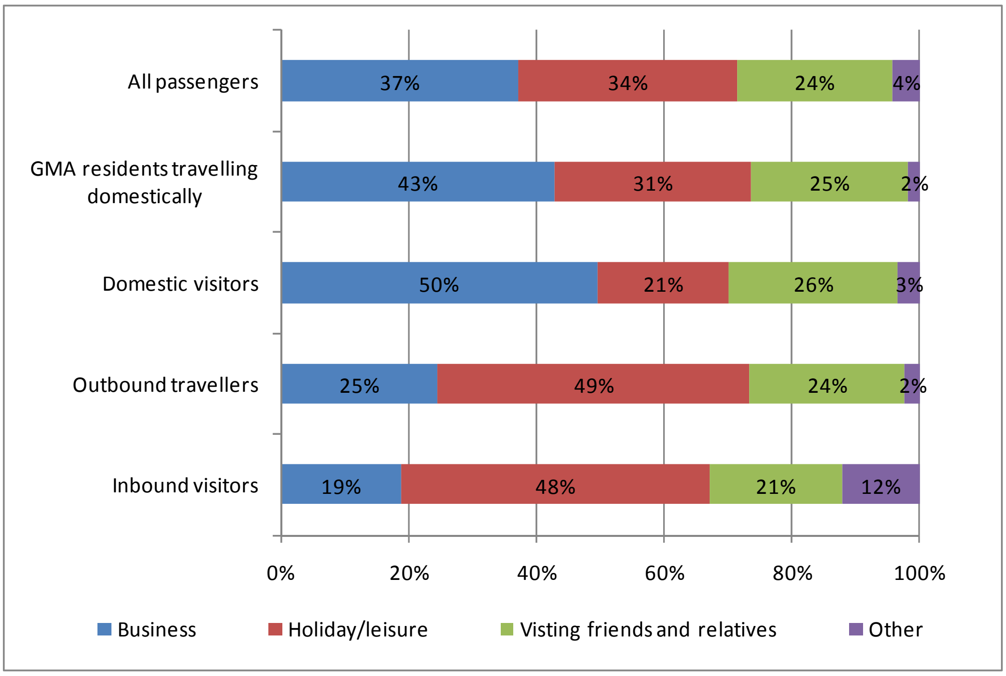
What are the travel choices of aviation users in the Sydney region?

This section describes the travel choices made by passenger users of Sydney GMA airports, focusing on three key characteristics—purpose of trip, day of travel and choice of airline.

Purpose of trip

From Figure 4 it is evident that, across all passengers, the most common trip purpose is business (37 per cent), followed by holiday/leisure (34 per cent) and visiting friends and relatives (24 per cent). The mix of purposes differs according to the type of passenger, with business purposes being very prominent amongst domestic visitors, but much less important for inbound visitors. Holiday and leisure purposes are very prominent for both categories of international travel (inbound visitors and outbound travellers). The significance of 'other' purpose for inbound visitors reflects the influence of international students.

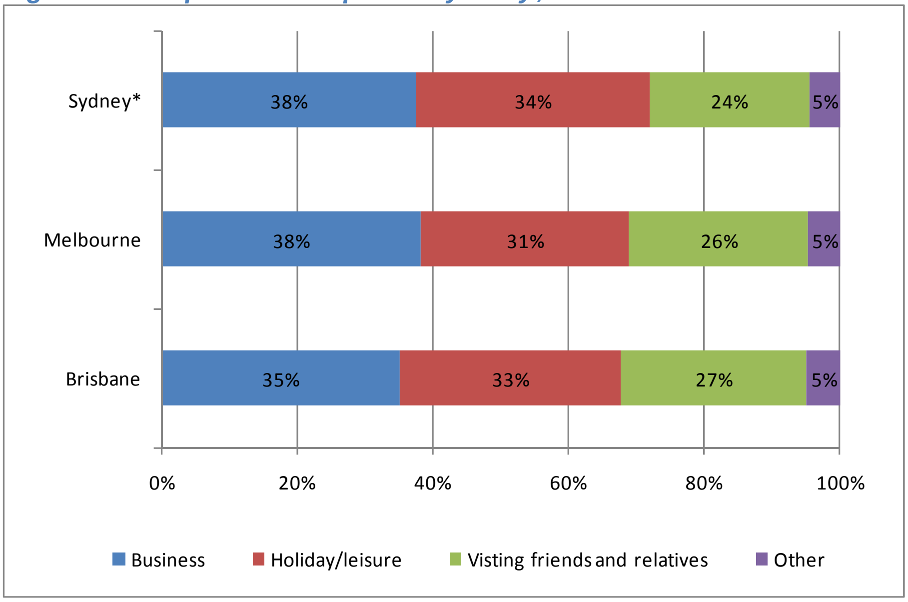
Figure 4 Purpose of trip by passenger type for Sydney GMA airports



Note: Educational and employment purposes are classified to 'other'. Conference and convention purposes are classified to 'business'.
Source: BITRE analysis of NVS and IVS data for 2004 to 2009 (Tourism Research Australia).

Figure 5 presents a comparison of trip purpose for Sydney passengers to that in Melbourne and Brisbane. All three cities have a very similar mix of trip purposes for air passengers. Business trips play a slightly less significant role in Brisbane than in the two larger cities. While the differences involved are minor, in comparison to Melbourne and Brisbane, Sydney has a slightly larger share of travel for holiday/leisure purposes and a slightly smaller share of travel for the purposes of visiting friends and relatives.

Figure 5 Purpose of trip for Sydney, Melbourne and Brisbane airport passengers

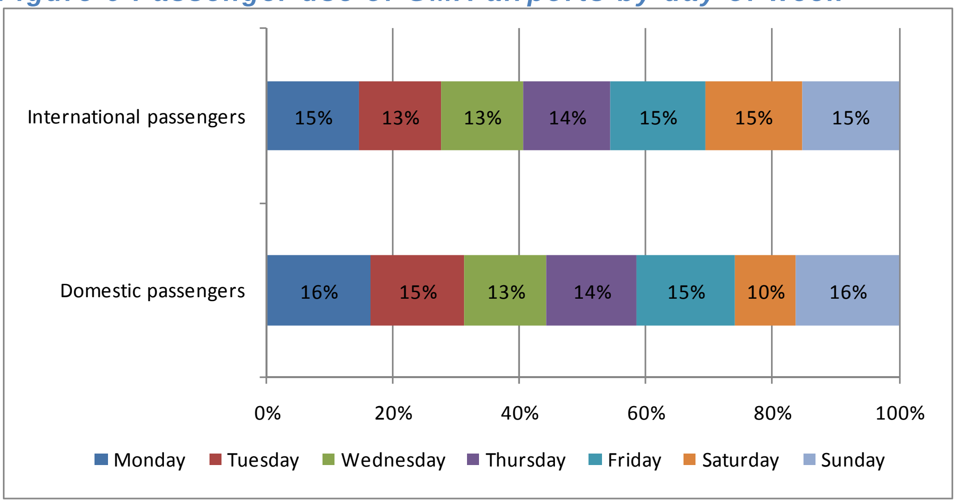


Notes: * Domestic passenger data relates to those who reside in or visit the relevant capital city statistical division, while international passengers are identified through their use of the relevant capital city international airport. While this focus on statistical divisions enables valid comparisons to be made between Sydney, Melbourne and Brisbane, it causes the Sydney percentage shares in Figure 5 to differ slightly from those presented in Figure 4 which relate to the Sydney GMA.
Educational and employment purposes are classified to 'other'. Conference and convention purposes are classified to 'business'.
Source: BITRE analysis of NVS and IVS data for 2004 to 2009 (Tourism Research Australia).

Day of the week

Figure 6 presents the day of week breakdown of passenger travel at GMA airports. Domestic passenger travel is most concentrated on Sundays and Mondays, which each contribute 16 per cent of activity, while relatively little domestic travel occurs on a Saturday (10 per cent). International passenger activity is more evenly spread across the different days of the week, but is a little lower on Tuesday and Wednesday than on other days.

Figure 6 Passenger use of GMA airports by day of week



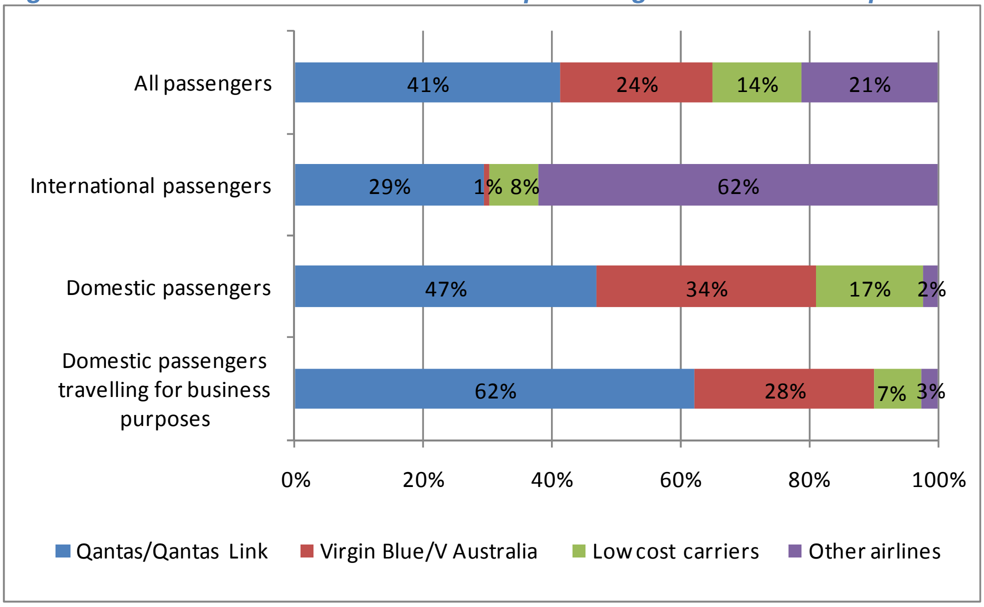
Note: The domestic passenger data relates to May 2011 and covers only Qantas, Jetstar, Tiger and Eastern. The international passenger data relates to the 2010 calendar year.
Source: BITRE Airport Traffic Statistics data for KSA and Newcastle airports.

Airline choice

This discussion of airline choice considers market shares and recent trends in airline choice, focusing on Qantas/QantasLink, Virgin Australia (formerly Virgin Blue) and the low cost carriers. Only two domestic airlines have been categorised as low cost carriers—Jetstar and Tiger. The international airlines classified as low cost carriers are Jetstar, Pacific Blue, Polynesian Blue and Freedom Air International.

Figure 7 shows that Qantas (including QantasLink) accounts for the largest proportion of passengers at GMA airports (41 per cent), followed by Virgin Australia/V Australia (24 per cent). The low cost carriers account for a relatively small share of passengers (14 per cent) but their market share has risen markedly in recent years. Strong growth in market share was evident for both domestic passengers (from 14 per cent in 2006 to 19 per cent in 2009 according to the NVS) and international passengers (from 2 per cent in 2005 to 9 per cent in 2010 according to ATS). As can be seen from Figure 5, the low cost carriers captured only a very small share of domestic air trips for business purposes at GMA airports (7 per cent), with Qantas dominating the market (62 per cent).

Figure 7 Airline market shares for passengers at GMA airports



Note: Airline market shares for domestic passengers sourced from NVS, based on principal nominated airline and excluding trips with an unknown airline. NVS and ATS produce almost identical estimates of airline market share for domestic passengers. Airline market shares for international passengers based on ATS data for Sydney and Newcastle airports.
Source: BITRE Airport Traffic Statistics 2006 to 2009 and Tourism Research Australia NVS data for 2006 to 2009.

What are the demographic and socio-economic characteristics of aviation users?

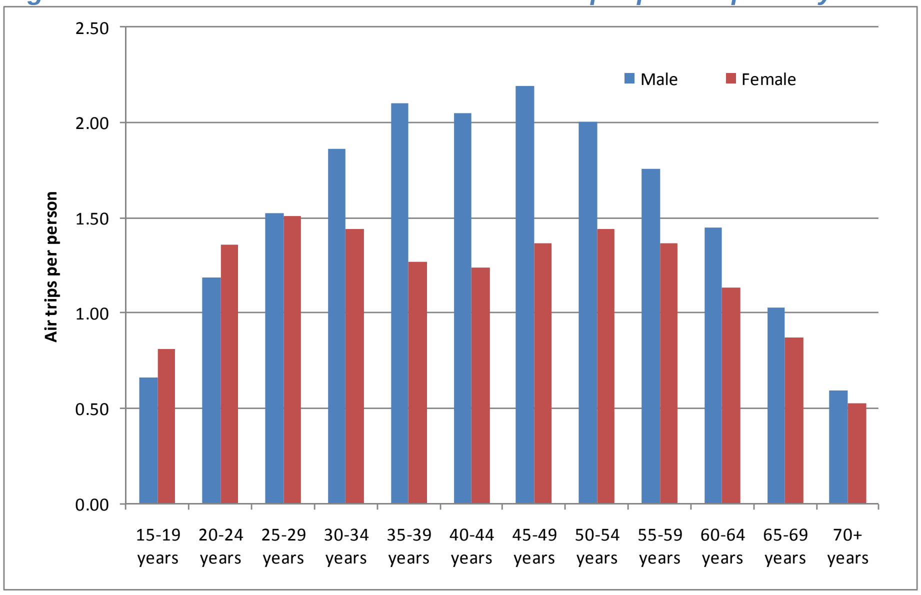
The incidence of air travel varies a great deal across the different demographic and socio-economic groups, with the most extreme variation evident across household income categories. Business travel varies more widely across demographic groups than does non-business travel. The relativities across the different demographic groups—which are explored throughout this section—tend to remain fairly stable over the medium term (5 to 10 years).

Regression analysis confirms that age, labour force status, educational attainment, household income and household type are all significant influences on air travel, but gender was found to have limited value as a predictor of air travel in its own right, once other socio-economic factors such as labour force status were taken into account. Regression analysis also shows that age, labour force status, educational attainment, household income, household type and gender are all significant influences on meeters/greeters use of KSA. The remainder of this section describes airport users in terms of these fundamental demographic and socio-economic characteristics.

Age and gender

The age of a person is an important influence on their likelihood of travelling by air, with Australians aged 15 to 19 and those over 65 having the lowest air travel per capita, while males aged between 35 and 54 are the most prolific air travellers. The gender and age differences apparent in Figure 8 largely reflect greater business travel by males, particularly in the 35 to 54 year old age group. Men take three times as many business air trips per capita as females, but fewer non-business trips. As a result, while males and females have similar usage of low cost carriers, males have much higher per capita usage of full service carriers (particularly in the 35 to 49 age group).

Figure 8 Domestic and outbound air trips per capita by Australian males and females

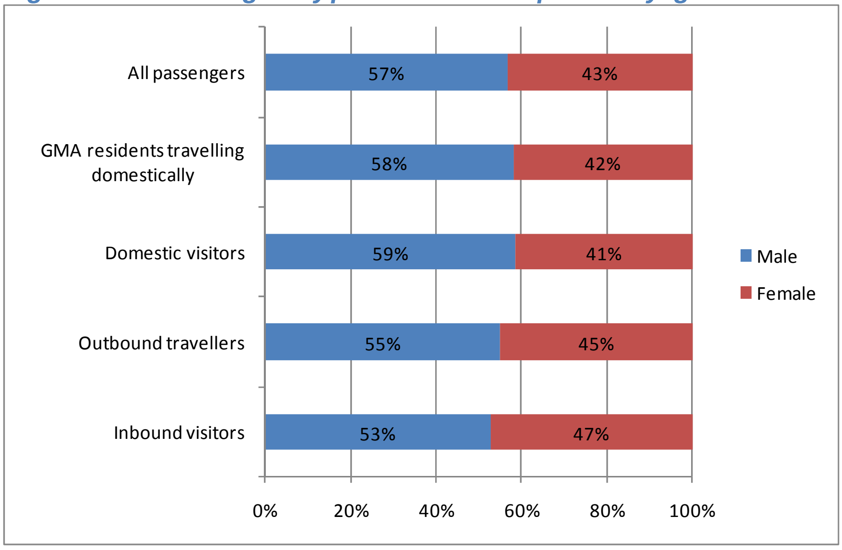


Note: This chart relates to the national NVS data: it is not specific to the Sydney GMA.
Source: Tourism Research Australia NVS data 2005 to 2009.

Figure 9 shows that males account for 57 per cent of all passenger use of GMA airports. Figure 10 reveals that 25 to 44 year olds account for 44 per cent of passenger users, while those aged between 45 and 64 contribute a further 36 per cent. Young people aged 15 to 24 are more prominent amongst inbound visitors (17 per cent) than they are amongst all passengers (13 per cent). The over 65s represent just 7 per cent of passenger users of GMA airports.

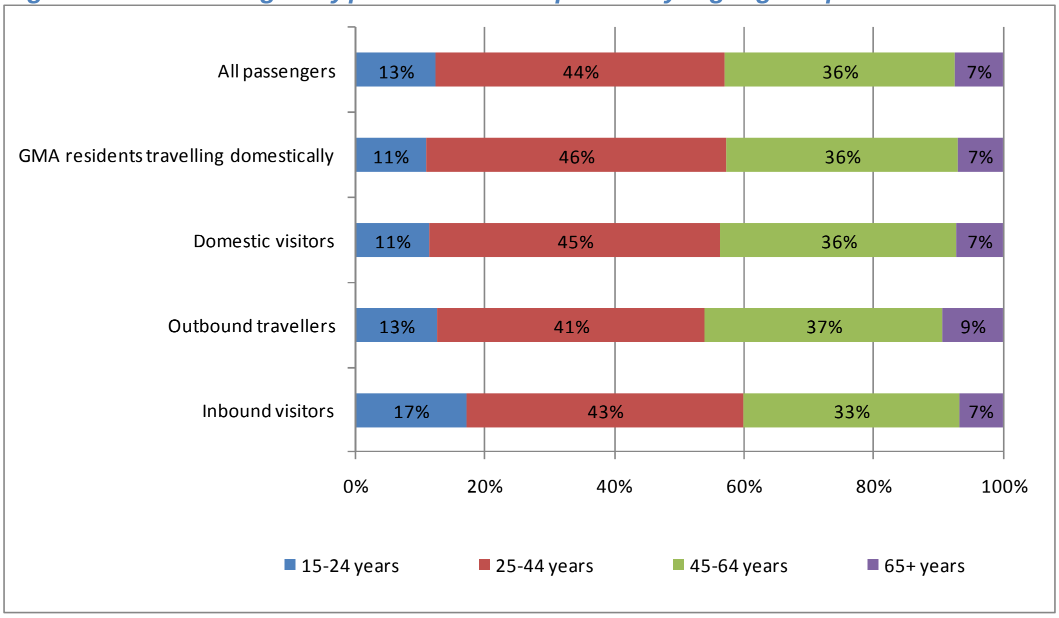
Meeter/greeter usage of KSA was less prevalent amongst the over 65s than amongst the other age groups. General aviation users were captured through an intercept survey at Bankstown Airport, which recorded very high usage by 18 to 24 year old males.

Figure 9 Passenger type at GMA airports by gender



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

Figure 10 Passenger type at GMA airports by age group



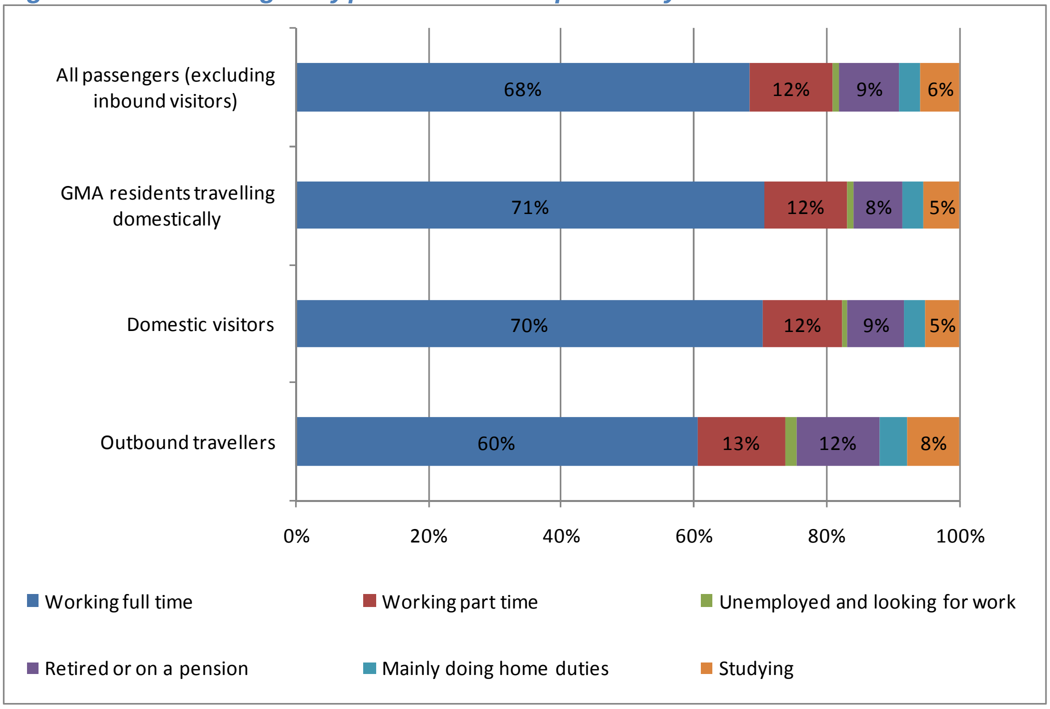
Source: BITRE analysis of NVS and IVS data for 2004 to 2009 (Tourism Research Australia).

Labour force status

Australians who are employed full-time take an average of 2.0 air trips per year, compared to 1.1 for the part time employed, 0.9 for students and 0.7 for the unemployed, those on home duties and retirees. This pattern reflects the fact that business travel is dominated by the full-time employed.

Figure 11 shows that the full-time employed account for over two-thirds of passenger use of GMA airports by Australian residents, while 80 per cent of passenger use is due to employed people. The dominant role of the full-time employed is less pronounced for outbound travel than domestic travel.

Figure 11 Passenger type at GMA airports by labour force status



Note: Employment status information was not available for international visitors. Other employment status and refused employment status (2% of visitors) excluded from chart.
Source: BITRE analysis of NVS data for 2004 to 2009 (Tourism Research Australia).

Education

A telephone survey of residents of the Sydney GMA and ACT in 2010 revealed that the probability of being a KSA user tends to rise with educational attainment—41 per cent of those with Year 11 or lower education use KSA as a passenger, rising to 62 per cent for those with a bachelor degree or postgraduate qualification. Similarly, those with no more than a Year 11 education are less likely to use KSA as meeters/greeters, than those with higher educational attainment. Highly educated travellers represent a large proportion of airport users who reside in the GMA or ACT, with 42 per cent of passenger users and 40 per cent of meeters and greeters having a bachelor degree or postgraduate qualification.

Household income

The relationship between air travel and income has been explored using NVS data for 2004 to 2009. The 11 NVS income ranges have been aggregated to form three broad income categories, informed by ABS *Survey of Income and Housing* (SIH) gross weekly household income data for 2007–08 converted to annual totals:

- Low income—defined as gross household income of less than $52000 annually, with about 40 per cent of Australian households falling into this category in 2007–08.
- Middle income—defined as gross household income of between $52000 and $104000 per year and encompassing the 2007–08 median household income of $66845.
- High income—defined as gross household income of $104000 or more, with around 28 per cent of Australian households falling into this category in 2007–08.

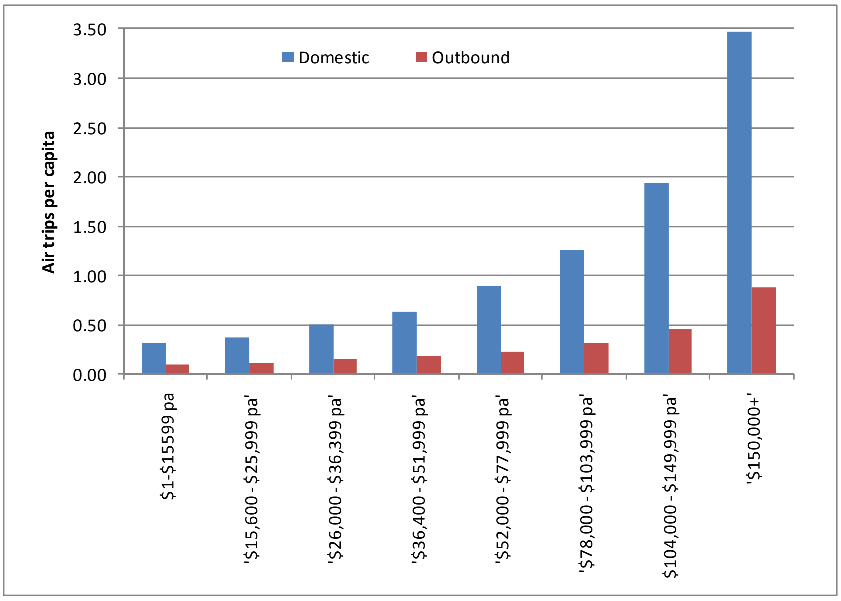
The extent to which Australians travel by air rises strongly across household income categories, as illustrated in Figure 12. People in high income households take 5 times as many air trips per capita as people in low income households. The extent of meeter/greeter usage of KSA also rises across household income categories, but this income effect is much more subtle for meeters and greeters than for passengers.

Figure 13 illustrates the strong dependence of passenger use of GMA airports on income. The SIH 2007–08 and NVS 2008 both indicate that around 28 per cent of Australian households earned more than $104000 per annum, but this group of high income earners accounted for a disproportionately high share of air passengers resident in

Australia (57 per cent). In contrast, only 14 per cent of passengers belonged to low income households, compared to 25 per cent of meeters/greeters and 40 per cent of the population.

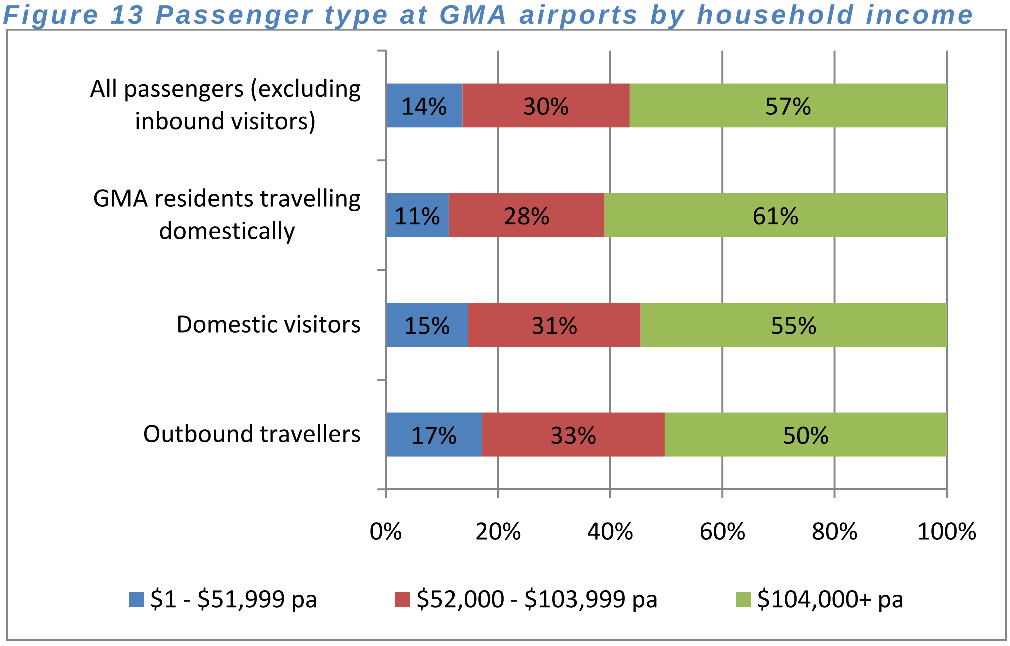
High income earners dominate business travel, with 71 per cent of passengers travelling for business purposes having a household income of more than $104000 per annum. This high income category is also over-represented amongst passengers travelling for non-business purposes, with a 46 per cent market share. The trend towards increased outbound travel by Australians between 2005 and 2009 was, however, largely driven by middle income households taking outbound trips for leisure purposes.

Figure 12 Domestic and outbound air trips per capita by household income category, Australia



Note: This chart relates to the national NVS data: it is not specific to Sydney.
Source: Tourism Research Australia NVS data 2005 to 2009.

Figure 13 Passenger type at GMA airports by household income



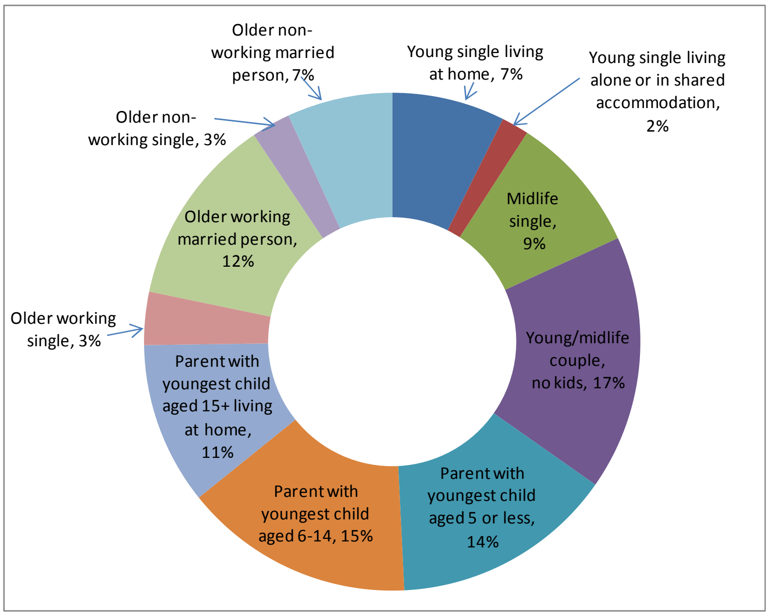
Note: Income information was not available for international visitors. Don't know and refused responses to the income question (18% of visitors) were excluded from chart.
Source: BITRE analysis of NVS data for 2004 to 2009 (Tourism Research Australia).

Household type

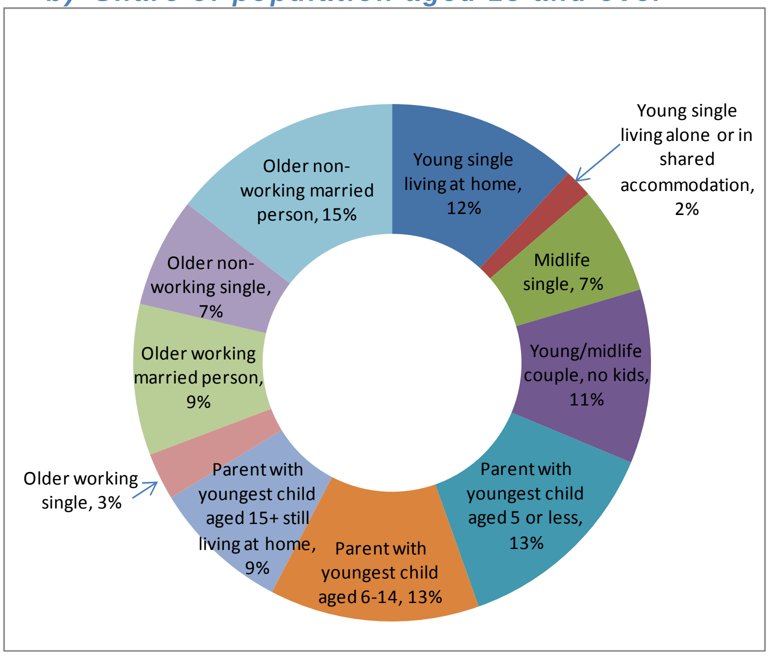
Young or midlife couples with no kids are the most significant household type category amongst Australian resident passengers at GMA airports, contributing 17 per cent of the overall market (see Figure 14), compared to 11 per cent of the population. Other significant categories of household include parents with a youngest child aged 6 to 14 (15 per cent) and parents with a youngest child aged 5 or less (14 per cent). Older non-working singles and couples, and young singles living at home, travel by air relatively infrequently and each has a smaller market share than might be expected given their population shares. Single people without children are also under-represented amongst KSA meeters and greeters.

Figure 14 Population and passengers by lifecycle group

a) Share of passengers (excluding inbound visitors) at GMA airports



b) Share of population aged 15 and over



Note: Lifecycle group information was not available for international visitors.
Source: BITRE analysis of NVS data for 2004 to 2009 (Tourism Research Australia).

Low cost carriers and demographic characteristics

The use of low cost carriers generally follows the same broad patterns across demographic categories as overall airline usage, but typically displays less variation. For example, NVS data for 2006 to 2009 reveals that, for Australia as a whole, the number of domestic trips per capita on low cost carriers tends to rise strongly with household income. The propensity of Australians to use low cost carriers for domestic travel does not vary with gender and showed only modest variation with respect to age.

Due to limited penetration of the business travel market, low cost carriers capture a relatively small proportion of high income domestic air travellers (14 per cent of those earning over $104000 per annum) and the full-time employed (15 per cent), and a much higher share of students travelling domestically by air (27 per cent).

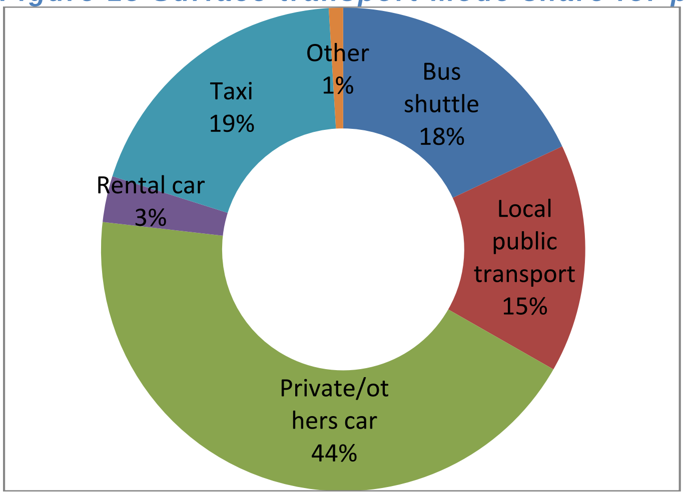
How do aviation users travel to and from the airport?

Airport accessibility, at both the points of departure and arrival, plays a significant role in a passenger's decision to use the airport. Accessibility takes into account the movement from the airport terminal to the person reaching their destination (a hotel, office, a home of relatives and friends) and, conversely, the movement from place of residence to the airport.

Passenger mode usage

Figure 15 presents BITRE's indicative estimates of the surface transport mode split for passenger access to KSA, which were developed by combining mode share data from various sources and time periods. It indicates that 44 per cent of ground access to the airport is by car. Around 19 per cent of passengers took a taxi (or chauffer driven hire car) and 18 per cent took a shuttle bus (including mini and charter bus), while around 15 per cent used public transport and 3 per cent drove a rental car. Results from Sydney Airport Corporation Limited (2006) point to a higher mode share for taxi and lower mode shares for shuttle bus and private car.

Figure 15 Surface transport mode share for passenger access to/from Sydney KSA



Notes: The estimate for passengers is a weighted average of mode share data from the IVS for 2005 to 2008 (on inbound visitors), the 2010 CATI survey (on GMA residents) and two intercept surveys conducted at KSA in 2010 (covering visitors), with the weights reflecting the contribution of each passenger type as described in Figure 1. Given the mix of data sources and time periods, the mode share results should be treated as indicative.
Source: BITRE analysis of Tourism Research Australia 2005-2009 NVS, IVS and Colmar Brunton (2010) CATI and Intercept Surveys.

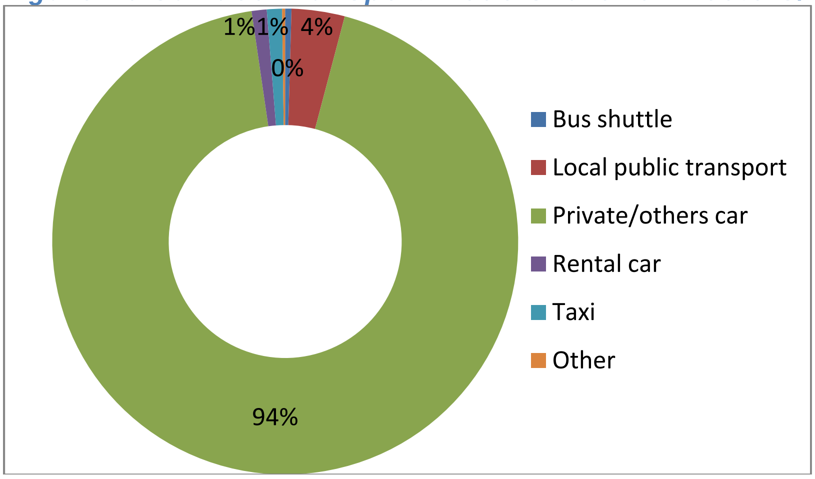
Mode split varies across different types of passengers. According to IVS data, only 32 per cent of international visitors to Australia use private or company cars to travel from KSA to their first destination (hotel, relatives and friend's residence, or an office). Another 27 per cent used a taxi or were driven in a hire car and 3 per cent used a rental car. About 21 per cent used a chartered or hotel shuttle bus and another 12 per cent used public transport. In contrast, the majority of GMA resident passengers accessed the airport using either their own car or a friends or relatives car. For international visitors to Sydney, there is evidence of an increase in public transport and taxi use between 2005 and 2008.

In comparison to international visitors to Melbourne and Brisbane, international visitors to Sydney were less likely to travel by private or company car, or rental car, from KSA to their first overnight stopover in Sydney. They were more likely to use a hotel or motel shuttle bus. Taking a taxi or chauffer driven hire car from the airport was much more common for international visitors to Sydney and Melbourne than it was for Brisbane visitors.

Meeters and greeters mode usage

Figure 16 shows that meeters and greeters, who are the residents dropping off or collecting friends or relatives at KSA, overwhelmingly used their own car to access the airport (94 per cent). The only other significant transport mode for meeters and greeters was public transport (4 per cent).

Figure 16 Surface Transport Mode Share for Meeters/Greeters



Notes: Mode share for access to Sydney airport for meeters/greeters who live in Sydney GMA.
Source: BITRE analysis of Colmar Brunton CATI Survey.

Access to KSA by passengers and meeters/greeters

A telephone survey of GMA and ACT residents conducted in 2010 provides a range of information on access to the airport, covering GMA residents who use the airport either as a passenger or as a meeter/greeter. It reveals some significant differences in surface transport mode share across demographic groups, including:

- The over 65s were significantly less likely to drive their own car to the airport than other age groups.
- People from high income households were less likely to access the airport by public transport, while those from low income households were less likely to travel by taxi than other respondents.
- People with a child aged under 12 were particularly likely to use their own car to get to the airport.

Two-thirds of airport users who responded to this survey identified reliability of transport as the most (or equal most) important consideration in choosing their surface transport mode to or from the airport. Other important considerations were personal security and safety, how easy it was to access the transport from home, and the time taken to get to the airport.

Travel time to the airport was lowest for residents of Metropolitan[1] Sydney, and somewhat longer for residents of Western Sydney and Wollongong-Shoalhaven. Those who travelled by train had a significantly longer travel time than those who used their own car (20 minutes longer), while those who were dropped off in a friends or relatives car had a significantly shorter travel time (15 minutes less).

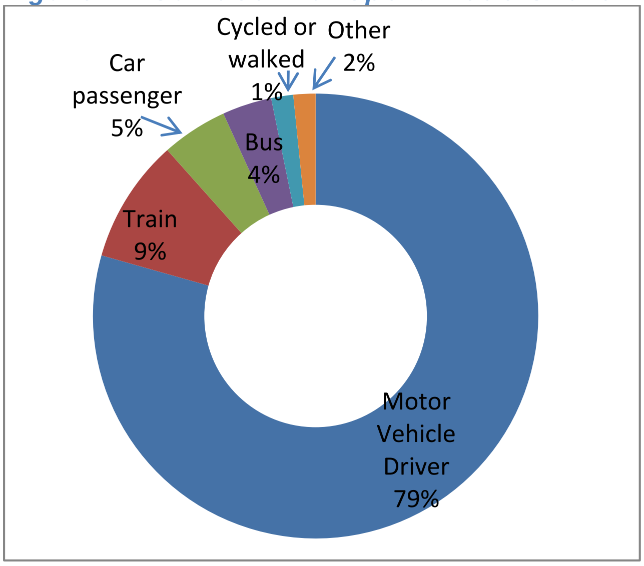
The median cost of travel to KSA (borne personally) was about $20 per person. Residents of Metropolitan Sydney paid less than residents of more distant regions to get to the airport. Those who travelled by train saved money per person compared to those who used their own car, although their trip took considerably longer. People who travelled by taxi also faced a lower travel cost than those who used their own car, while driving a rental car was a comparatively expensive way to access the airport. A key influence on the per person travel cost is party size, with multi-person travel parties facing a much lower per person cost than those travelling alone.

Airport staff

Information from the ABS 2006 *Census of Population and Housing* has been used to build a profile of the transport mode used by KSA employees to journey to work on the day of the census. As can be seen from Figure 17, the dominant mode of transportation is motor vehicle driving (79 per cent), while a further 5 per cent journey to work as a car passenger. Only about 13 per cent of KSA employees go to work by public transport, with 9 per cent travelling by train and 4 per cent by bus. Over 80 per cent of KSA employees work in roles which involve shifts, and this work pattern may limit the surface transport choices available to staff (Sydney Airport Corporation Limited 2006).

[1] Includes Central (Inner North, East, Inner West, City), North East, North and North West, South and South West and West Central planning regions.

Figure 17 Surface Transport Mode Share for KSA employees



Notes: Airport employees defined as those who had a place of work in travel zones 411, 415, 425 and 581. Excludes those who work at Mascot. Mode share calculation excludes 2082 employees who did not go to work and 159 employees who did not state their transport mode. Motor vehicle driver includes a small number of motorbike and truck drivers. Train includes train combined with one or two other modes. Bus includes bus combined with one or two other modes (apart from train).
Source: 2006 ABS Census of Population and Housing data, sourced from NSW BTS.

The BTS' *Household Travel Survey* reports that, for Sydney as a whole, public transport experienced a 2 percentage point increase in mode share for the purpose of commuting between 2005–06 and 2008–09. Given this recent shift towards public transport usage, driven in part by rising petrol prices, the 2006 census data could be expected to understate the current public transport mode shares for KSA staff.

Information from the NSW BTS has been used to derive average commuting distances for KSA staff, based on 2006 commuting patterns. Airport staff tend to travel relatively long distances to access their workplace, with those who commute by road travelling an average distance of 23km to their place of work at KSA, compared to the Sydney SD average of 15km.

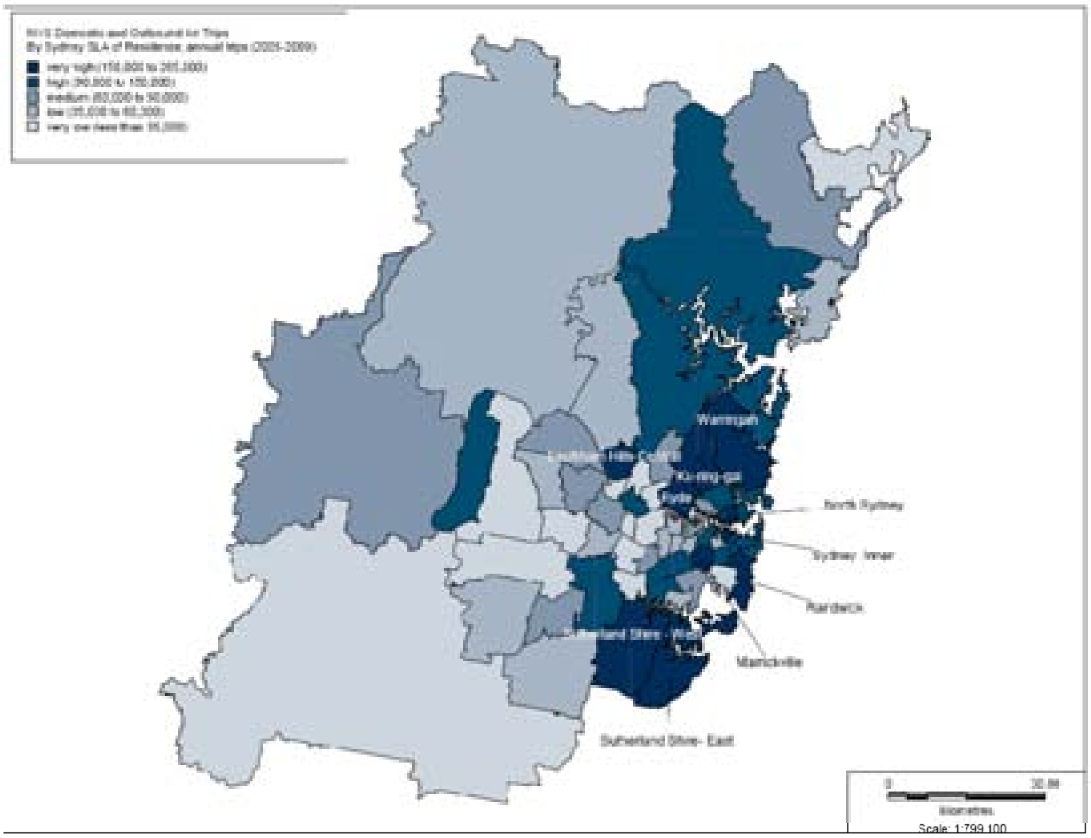
Attachment

This attachment contains several alternative versions of the information presented in Map 2.

Map A1 was included in the previous version of this document (see brief dated 15 July). In BITRE's view, this is the map which best conveys the spatial differences in aggregate air travel demand within Sydney. Map A2 contains the same information as Map A1 presented in dot density form, with each dot representing 6000 trips.

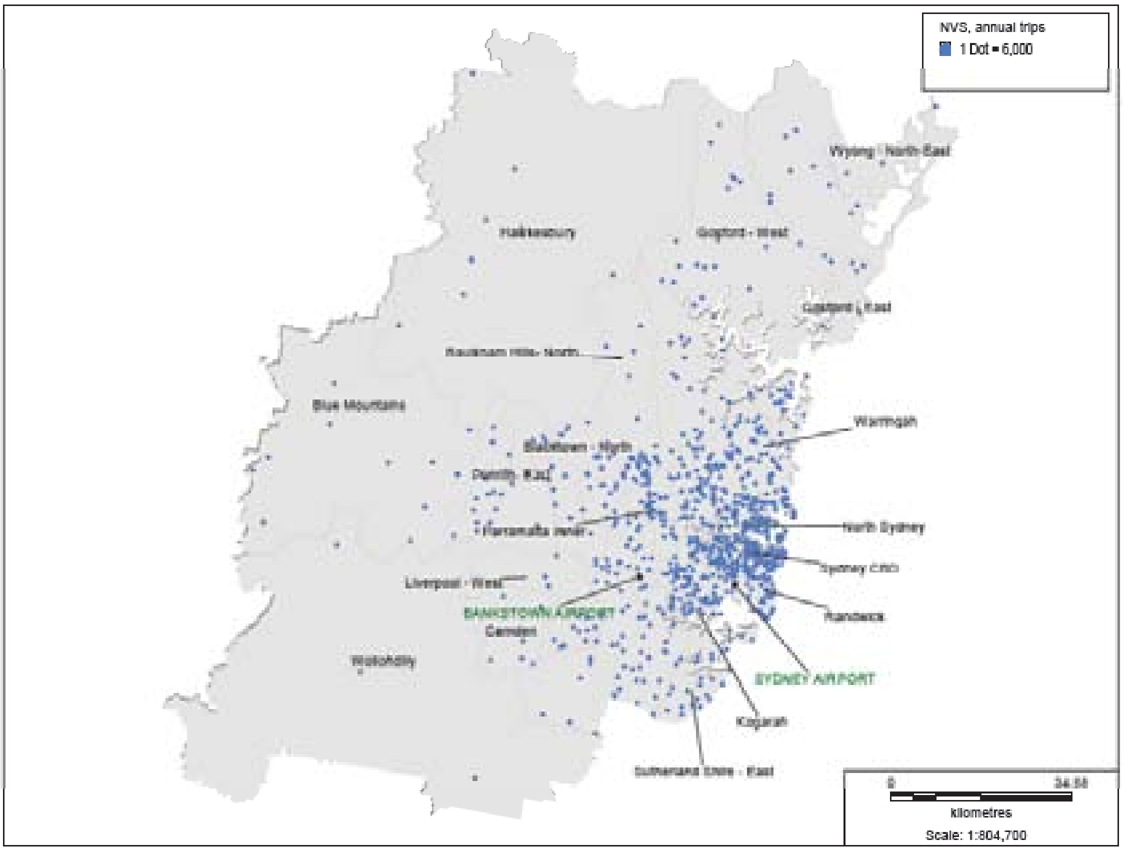
Maps A2 and A3 represent separately the two layers of Map 2 in the main document. Like Map 2, Map A3 presents a small risk of exposing commercial in confidence information received from major airlines.

Map A1 Air trips by Statistical Local Area of residence, Sydney



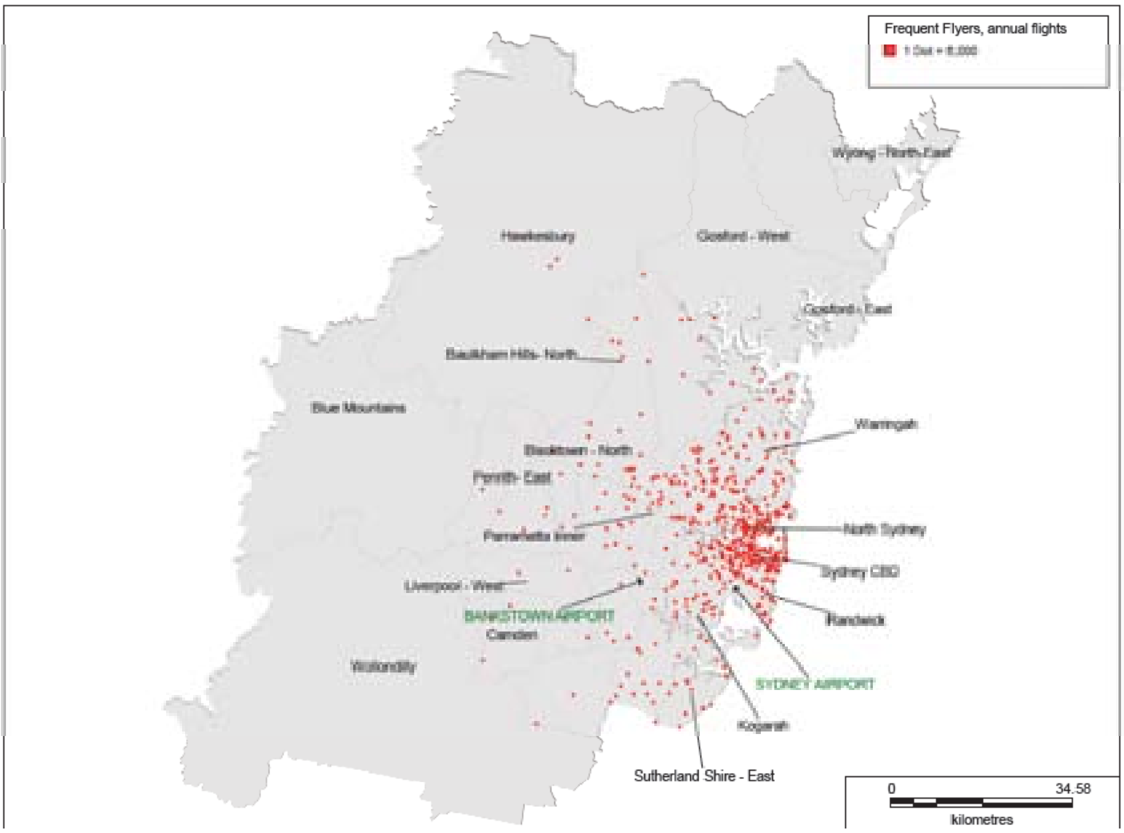
Source: BITRE analysis of NVS, 2005-2009 pooled data (Tourism Research Australia), converted to annual trips.

Map A2 Air trips by Statistical Local Area of residence, Sydney



Source: BITRE analysis of NVS, 2005-2009 pooled data (Tourism Research Australia), converted to annual trips.

Map A3 Flights by Statistical Local Area of residence, Sydney



Source: BITRE analysis of major airlines Frequent Flyer datasets. SLAs with fewer than 6000 flights do not receive a dot.

Forecast growth estimates for aviation activity in the Sydney region

A3

booz&co.

FINAL REPORT

Joint Study on Aviation Capacity for the Sydney Region

Forecast growth estimates for aviation activity in the Sydney region

Canberra

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Important Note

Booz & Company has devoted its best professional efforts to this assignment and our findings represent our best judgment based on the information available.

In preparing our traffic forecasts for the Sydney region, we have relied upon the information provided by all entities. While we have checked our sources of information, data and assumptions, we will not assume responsibility for the accuracy of such data, information and assumptions received from any entity.

Any airport traffic forecast is subject to uncertainties. Inevitably, some assumptions used to develop the forecasts will not be realised and unanticipated events and circumstances may occur. Therefore Booz & Company cannot provide any form of assurance that the forecasts documented in this report will be achieved. The actual traffic outcome will vary from that forecast and the variations may be material.

Specifically, the following factors could result in an actual outcome outside the forecast range:

- Lower than assumed economic growth rates in Australia and/or those countries expected to provide a significant source of inbound international air passengers
- Shifts in Government policy which directly, or indirectly, impact on Sydney region aviation activity
- Adverse impacts for Sydney region aviation activity associated with aviation industry developments
- 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 are passed on by way of significantly higher air fares
- External factors, including, but not limited to, natural disasters, political unrest, acts of terrorism and associated security concerns and labour disputes

This report was prepared for the exclusive use of the Department of Infrastructure and Transport, in advising the Steering Committee on the Joint Study on Aviation Capacity in the Sydney Region and in their advice to Government. The Report may be relied upon solely by Department of Infrastructure and Transport, Booz & Company disclaims all liability to any persons other than Department of Infrastructure and Transport for all costs, loss, damage and liability that the third party may suffer or incur arising from or relating to or in any way connected with the provision of the Report to a third party. You have agreed that you will not amend the Report without prior written approval from Booz & Company. If any person, company or Government Department or Agency, other than the Department of Infrastructure and Transport chooses to rely on the Report in any way, they do so entirely at their own risk.

Executive Summary

Booz & Company was engaged by the Department of Infrastructure and Transport to assess existing long-term forecast growth estimates and develop new estimates for aviation activity for the Sydney region[1].

This report sets out results and key findings from the traffic model, developed to forecast growth estimates for aviation activity in the Sydney region, which used actual 2010 data as the base and 2011 data to June to reflect current growth rates across markets for 2011.

The aviation demand analysis and forecasts presented in this report reflect expected long-term 'organic' growth tied to existing primary airport infrastructure in the Sydney region. Key factors considered when developing the forecast were economic growth; changes in real air fares due to the emergence of Low Cost Carriers (LCCs); oil prices and carbon prices; exchange rates; tourism trends; the regulatory environment including policy settings on curfews and aircraft movement caps at Sydney (Kingsford-Smith) Airport; airline fleet development; airport competition and the airport network; and congestion issues.

The forecasts do not specifically allow for additional supply-led growth supported by additional airport infrastructure. However, the forecasts do allow for:

- Peak spreading at Sydney (Kingsford-Smith) Airport at progressively higher levels of demand; and
- Progressive loss of transfer/transit passengers to other major Australian airports associated with the strengthening of the international and domestic networks in terms of both city pairs served and associated frequencies.

Total passengers at Sydney region airports are forecast to grow from 40.1 million in 2010 to 76.1 million in 2030, representing an average annual growth rate of 3.3 per cent. Growth in the long term typically slows due to market maturation; however, the policy settings limiting aircraft movements at Sydney (Kingsford-Smith) Airport slows growth further. A growth rate of 2.0 per cent per annum is forecast between 2010 and 2060, consistent with total passengers reaching 110.4 million[2] at Sydney region airports by 2060. The constrained base case passenger forecasts are summarised in Table 1.

[1] *Airports identified for consideration were Sydney (Kingsford-Smith) Airport, Canberra Airport, Newcastle Airport, Bankstown Airport, Camden Airport, RAAF Base Richmond, Cessnock Aerodrome, Maitland Aerodrome and Goulburn Airport.*

[2] *Please note this figure refers to the Base Case with policy settings*

Table 1 – Constrained Base Case (With Policy Settings) – Sydney Region Passengers, Selected Years, 2010 to 2060 (Millions)

Forecast	International	Domestic & Regional	Total
2010	11.5	28.7	40.1
2015	14.9	33.9	48.8
2020	18.4	39.1	57.5
2030	26.0	50.1	76.1
2060	39.7	70.7	110.4
CAGR			
2010 to 2015	5.4%	3.4%	4.0%
2010 to 2020	4.8%	3.1%	3.7%
2010 to 2030	4.2%	2.8%	3.3%
2010 to 2060	2.5%	1.8%	2.0%

Source: Booz & Company estimates; CAGR represents compound annual growth rate.

If it were assumed that no policy settings were imposed, total passengers at Sydney region airports would be forecast to grow from 40.1 million in 2010 to 76.5 million in 2030, representing an average annual growth rate of 3.3 per cent. A growth rate of 2.9 per cent per annum is forecast between 2010 and 2060 under the unconstrained case compared with 2.0 per cent per annum for the constrained base case with policy settings. If policy settings were not in place, passenger demand is forecast to reach 164.6 million in 2060 compared to 110.4 million for the base case with policy settings. The unconstrained base case passenger forecasts are summarised in Table 2.

Table 2 – Unconstrained Base Case (Without Policy Settings) – Sydney Region Passengers, Selected Years, 2010 to 2060 (Millions)

Forecast	International	Domestic & Regional	Total
2010	11.5	28.7	40.1
2015	14.9	33.9	48.8
2020	18.4	39.2	57.6
2030	26.1	50.4	76.5
2060	64.4	100.2	164.6
CAGR			
2010 to 2015	5.4%	3.4%	4.0%
2010 to 2020	4.9%	3.2%	3.7%
2010 to 2030	4.2%	2.9%	3.3%
2010 to 2060	3.5%	2.5%	2.9%

Source: Booz & Company estimates

Total aircraft movements at Sydney region airports are forecast to grow from 815,300 in 2010 to approximately 1,105,100 in 2030, representing an average annual growth rate of 1.5 per cent. Growth is then forecast to slow due to policy settings limiting aircraft movements at Sydney (Kingsford-Smith) Airport, with a growth rate of 0.9 per cent per annum forecast between 2010 and 2060 (i.e. total movements reach an estimated 1,284,400 by 2060). Constrained base case aircraft movement forecasts are summarised in Table 3. Aircraft movements are forecast to grow more slowly compared to passenger movements due to a continuation of the historical trend of fleet up gauging. The policy environment is likely to speed up this process in order to accommodate more passengers.

Table 3 – Constrained Base Case (With Policy Settings) – Sydney Region Aircraft Movements, Selected Years, 2010 to 2060 (Thousands)

Forecast	International	Domestic & Regional	Dedicated Freighters	GA	Military	Total
2010	62.5	282.0	12.6	424.1	34.2	815.3
2015	73.0	313.5	14.0	456.8	34.2	891.5
2020	80.5	340.7	16.7	492.1	52.1	982.2
2030	92.9	393.6	23.0	543.6	52.1	1,105.1
2060	116.9	444.8	39.2	631.3	52.1	1,284.4
CAGR						
2010 to 2015	3.2%	2.1%	2.2%	1.5%	0.0%	1.8%
2010 to 2020	2.6%	1.9%	2.9%	1.5%	4.3%	1.9%
2010 to 2030	2.0%	1.7%	3.1%	1.2%	2.1%	1.5%
2010 to 2060	1.3%	0.9%	2.3%	0.8%	0.8%	0.9%

Source: Booz & Company estimates

Not taking into account hourly aircraft movements prescribed by policy settings at Sydney (Kingsford-Smith) Airport, total aircraft movements (RPT, GA, dedicated freight, military) at Sydney region airports would be forecast to grow from 815,300 in 2010 to approximately1,105,100 in 2030 in line with the base case, with aircraft movements forecast to reach 1,532,100 by 2060. Total aircraft movements are forecast to grow at an average annual rate of 1.3 per cent between 2010 and 2060 compared to the base case with policy settings of 0.9 per cent per annum. Forecast aircraft movements for the Sydney region for the unconstrained base case without policy settings are set out in Table 4.

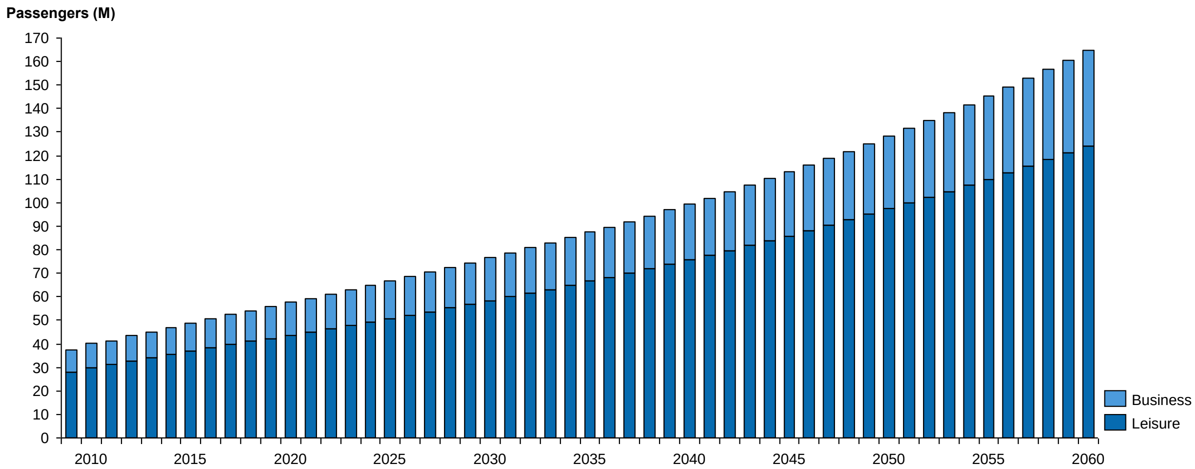
Table 4 – Unconstrained Base Case (Without Policy Settings) – Sydney Region Aircraft Movements, Selected Years, 2010 to 2060 (Thousands)

Forecast	International	Domestic & Regional	Dedicated Freighters	GA	Military	Total
2010	62.5	282.0	12.6	424.1	34.2	815.3
2015	73.0	313.5	14.0	456.8	34.2	891.5
2020	80.5	340.7	16.7	492.1	52.1	982.2
2030	92.9	393.6	23.0	543.6	52.1	1,105.1
2060	187.1	613.6	47.9	631.3	52.1	1,532.1
CAGR						
2010 to 2015	3.2%	2.1%	2.2%	1.5%	0.0%	1.8%
2010 to 2020	2.6%	1.9%	2.9%	1.5%	4.3%	1.9%
2010 to 2030	2.0%	1.7%	3.1%	1.2%	2.1%	1.5%
2010 to 2060	2.2%	1.6%	2.7%	0.8%	0.8%	1.3%

Source: Booz & Company estimates

Figure 1 shows forecast total passengers at Sydney region airports by purpose of travel[3] without any policy settings (i.e. the unconstrained case). Business traffic is forecast to decrease marginally from a share of 25.2 per cent in 2010 to an estimated share of 24.6 per cent in 2060.

Figure 1 - Total Sydney Region Passengers by Purpose of Travel, without Policy Settings 2010 to 2060



Source: Booz & Company estimates

Taking policy settings into account, the FSC (Full Service Carrier) and LCC (Low Cost Carrier) operations at Sydney (Kingsford-Smith) Airport are anticipated to not keep pace with

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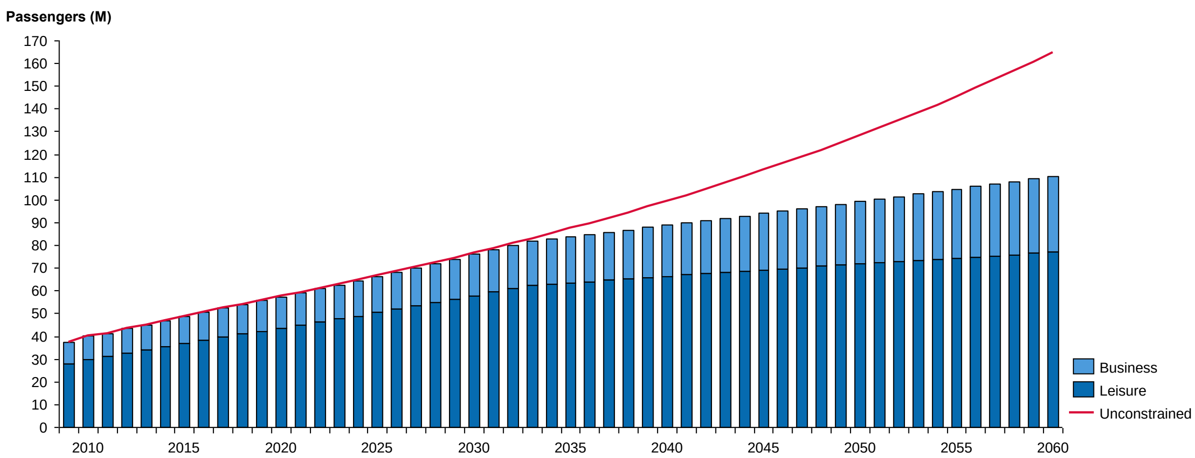
[3] *Purpose of travel definitions (as per Tourism Australia definitions):*
- *Business - passengers travelling for work, to attend conferences, exhibitions or conventions, or as part of employed research, or for work related training.*
- *Leisure – passengers travelling to visit friends and relatives, for holiday, leisure or relaxation, for entertainment, for sport, to shop, attending special events, as an incentive reward provided by an employer, or accompanying someone attending a conference.*

growth in demand. Under the constrained scenario it is possible that higher yielding FSC services, with a higher proportion of business passengers, are likely to be prioritised over LCC operations targeted more towards leisure travel. It is therefore expected that Sydney (Kingsford-Smith) Airport would cater for a higher proportion of business traffic under a constrained scenario. With policy settings, business traffic at airports in the Sydney region is forecast to increase from 25.2 per cent in 2010 to an estimated 30.1 per cent in 2060.

The maximum peak hour movements at Sydney (Kingsford-Smith) Airport were recorded at 74 movements per hour for the planning day[4] and are expected to grow to 80 movements per hour by 2015. It is expected that peak spreading will occur and allow continued growth in aircraft movements to 2033[5]. Once the critical threshold[6] has been reached for aircraft movements, it is assumed that limited growth in passengers can be achieved through aircraft up gauging and increased load factors. Since peak spreading implies redistribution of flights outside the peaks, a small amount of passenger suppression (1-2 per cent of passengers) is assumed prior to reaching the critical threshold. Figure 2 illustrates total Sydney region passengers by purpose of travel with and without policy settings.

Figure 2 - Total Sydney Region Passengers by Purpose of Travel, with and without Policy Settings, 2010 to 2060



Source: Booz & Company estimates

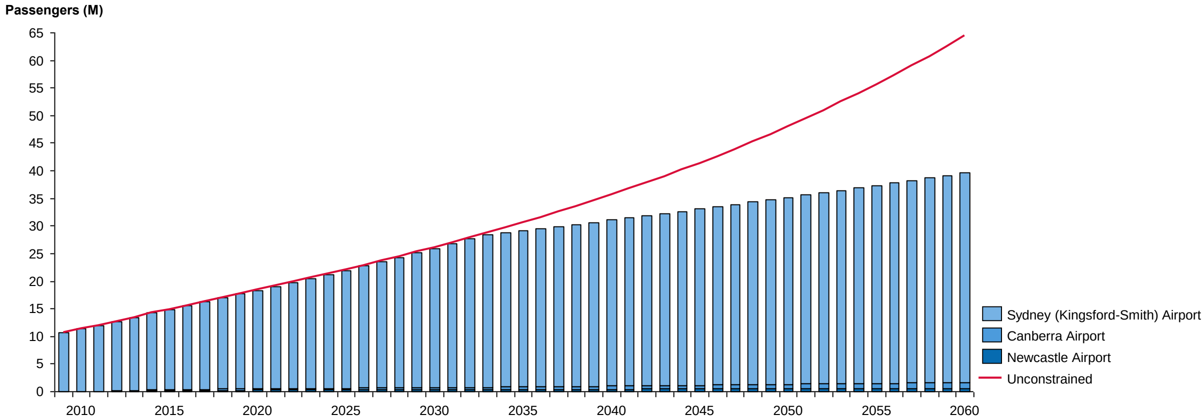
As shown in Figure 3, Sydney (Kingsford-Smith) Airport is assumed to continue to handle the vast majority of international traffic in the region. However, it is assumed that both Canberra and Newcastle commence international operations on a limited scale.

[4] A typical busy day used for planning purposes. The 30th busy day methodology was used to identify the planning day. The day chosen for the 2010 planning day for Sydney (Kingsford-Smith) Airport was Friday 12th November.

[5] The maximum level of peak spreading has been based on analysis of peak hour to annual ratios for 66 airports in the Asia Pacific and European regions. This analysis implies that even highly constrained airports do not operate at 100% of stated capacity throughout the entire operating day.

[6] The critical threshold is the point at which aircraft movements become constrained due to policy settings.

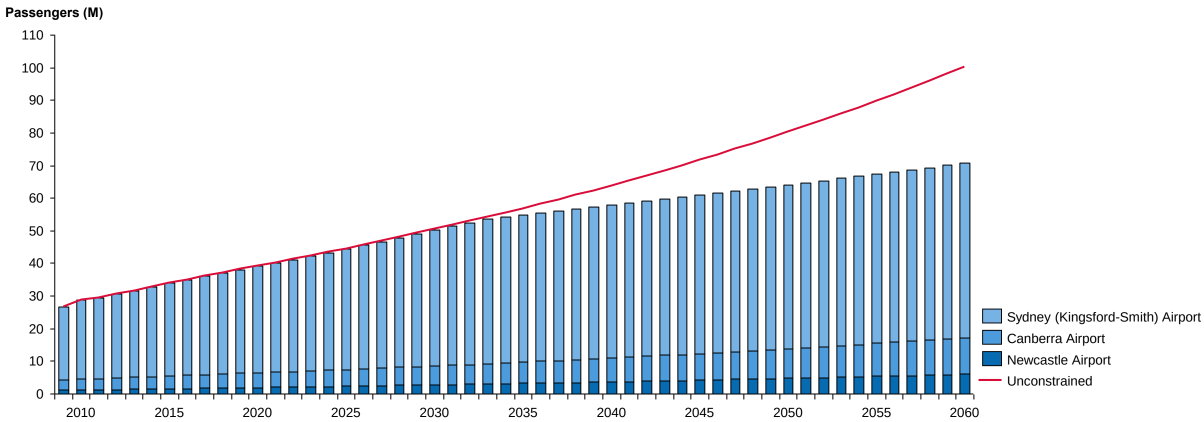
Figure 3 - Base Case Forecast – International Passengers by Airport, 2010 to 2060



Source: Booz & Company estimates

Sydney (Kingsford-Smith) Airport's market share of international traffic in the Sydney region is forecast to decrease from 100 per cent to 96 per cent as international services are assumed to commence at Newcastle and Canberra Airports in the short term. Given policy settings at Sydney (Kingsford-Smith) Airport, growth is expected to slow in the long term, with some traffic expected to be diverted to other Australian international gateways such as Melbourne, Brisbane, Perth, Adelaide, Gold Coast and Darwin as more international point to point services become available and transferring through Sydney is not required. Figure 4 illustrates the domestic and regional passenger forecasts for the Sydney region by airport.

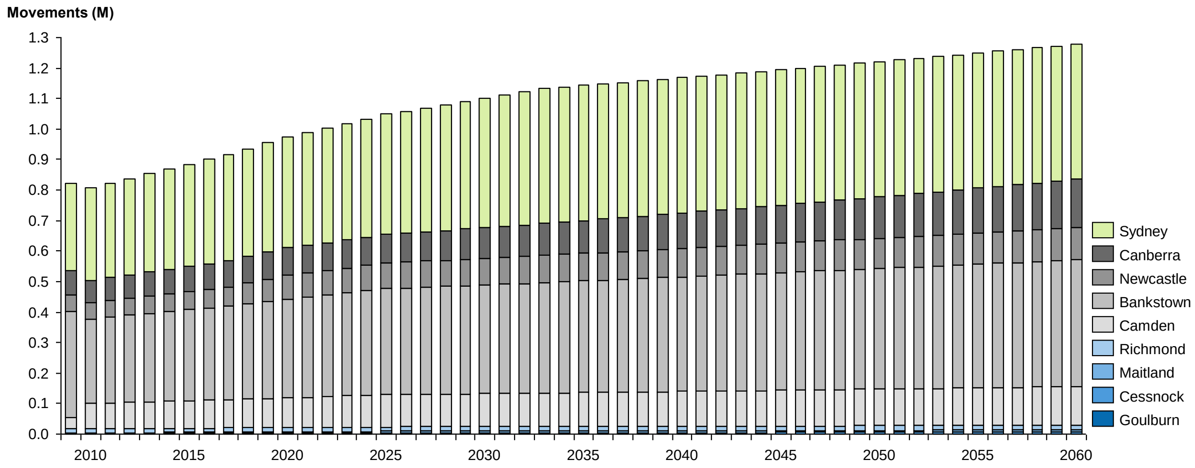
Figure 4 - Base Case Forecast – Domestic and Regional Passengers by Airport, 2010 to 2060



Source: Booz & Company estimates

Total aircraft movement forecasts by airport are shown in Figure 5. Load factors declined in 2008 and 2009 due to the economic downturn, it was assumed these would recover in the short term, which will lead to slower aircraft movement growth.

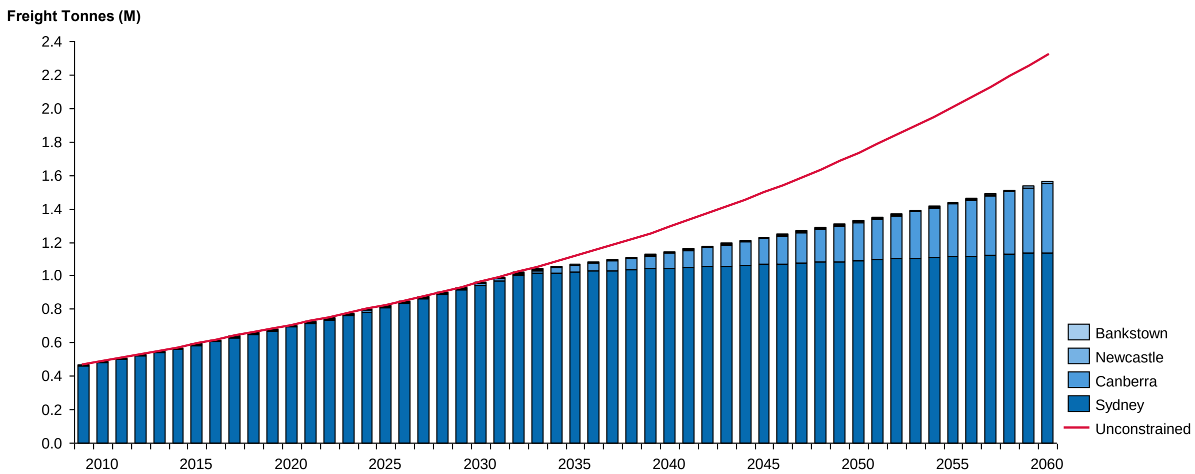
Figure 5 - Base Case Forecast – Total Aircraft Movements by Airport[1)], 2010 to 2060



1) Total aircraft movements include: International, Domestic, Regional, GA, Military and Dedicated Freighters movements
Source: Booz & Company estimates

Total freight tonnes are summarised in Figure 6. Sydney is expected to continue to be the dominant freight hub for the region; however, Canberra is forecast to capture some additional freight in the longer term. Freight demand is assumed to remain within the region and therefore unmet demand not redistributed within the region is assumed to be suppressed. Since the majority of freight is belly hold, where passenger movements are constrained by policy settings, freight is also assumed to be constrained. The critical threshold for freight is therefore also 2033.

Figure 6 - Base Case Forecast – Total Freight Tonnes by Airport, 2010 to 2060



Source: Booz & Company estimates

It is assumed that Sydney (Kingsford-Smith) Airport will continue to service predominantly FSCs and there will be a progressive shift away from transfer traffic to more origin and destination traffic. It is estimated that currently around 20 per cent[7] of domestic passengers

[7] *Booz & Company analysis of Sabre GDS data*

at Sydney (Kingsford-Smith) Airport are transfer passengers. If Sydney (Kingsford-Smith) Airport shifted focus to serve primarily Sydney origin-destination (O-D) traffic, other Australian gateways such as Brisbane and Melbourne and to a lesser extent Canberra, would be able to capture additional transfer traffic that would have originally been routed through Sydney (Kingsford-Smith) Airport had there been sufficient capacity.

1. Introduction

1.1 Study Scope

Booz & Company was engaged by the Department of Infrastructure and Transport to assess existing long-term forecast growth estimates and develop new estimates for aviation activity in the Sydney region in the short term (i.e. 5 years), medium term (i.e. 10 years), long term (i.e. 20 years) and beyond to 2060 (50 years). Figure 7 shows the airports covered in the traffic study.

Figure 7 – Airports Covered in the Scope of the Traffic Study

Note: Locations are approximate
Source: Booz & Company

1.2 Approach

The development of the traffic forecasts was progressed in four stages:

- Stage one comprised a high level review of existing aviation activity forecasts for the region. The timeframe, purpose, methodology and assumptions for each of the forecasts were reviewed to assess their relevance to this study;
- Stage two involved the development and calibration of a short-, medium- and long-term demand driven forecasting model for airports in the Sydney region;
- Stage three involved an overlay of market intelligence and industry-specific factors which may impact future traffic demand. This was based on desktop research and stakeholder consultation; and
- Stage four involved scenario and sensitivity testing of key assumptions and drivers of traffic growth.

1.3 Key Assumptions

A number of assumptions were made in developing the baseline forecasts. These assumptions are outlined in Section 4.

1.4 Data Sources

To analyse historical trends, establish the base market and develop forecasts, data was drawn from the following sources:

- Bureau of Infrastructure, Transport and Regional Economics (BITRE) Aviation Statistics;
- Australian Bureau of Statistics (ABS);
- Tourism Research Australia (TRA) statistics;
- Boeing Current Market Outlook (2011);
- Airbus Global Market Forecast (2011);
- International Air Transport Association (IATA) Airline Industry Forecast;
- Australian Government National Aviation Policy White Paper;
- SRS analyser database[8];
- Approved Master Plans for Sydney (Kingsford-Smith) Airport (2009), Canberra Airport (2009)and Bankstown Airport (2005);
- Newcastle Airport Master Plan (2007);
- Energy Information Administration (EIA) Fuel Prices;
- Bloomberg Jet Fuel Prices;
- Consensus Economics GDP Forecasts;
- Global Insight GDP Forecasts; and
- Interviews with Airports.

A number of data limitations were identified including:

- Availability of domestic freight data is limited for Australian airports. Estimates were made based on belly hold capacity and scheduled dedicated freighter capacity at the airports and calibrated to the Sydney (Kingsford-Smith) Airport 2009 Master Plan base freight tonnage figures; and
- Data for aircraft movements at general aviation and military airports from Airservices Australia is not consistent with information provided by some airports. Where airport data was not available, Airservices Australia data has been used.

1.5 Report Structure

The balance of the report is structured as follows:

- Section 2 provides a review of relevant existing aviation forecasts for the region;
- Section 3 provides a commentary on recent trends for the international, domestic and general aviation markets;
- Section 4 presents the modelling approach and model calibration;
- Section 5 provides an overview of detailed assumptions and factors affecting demand including economic conditions, regulatory environment, airline fare and service levels, airport competition and capacity constraints;
- Section 6 details the forecast annual passengers, aircraft movements and freight;

[8] *SRS analyser is an online tool allowing access to IATA"s Schedule Reference Service (SRS). SRS is a neutral source of schedule data that collects, validates, consolidates and distributes airline flight schedules and related data for over 900 airlines worldwide.*

- Section 7 assesses various scenarios and tests sensitivity of drivers on forecast results; and
- Section 8 provides a discussion of the forecasts and concluding remarks.

2. Review of Existing Forecast

To inform the forecasts, nine relevant, pre-existing sets of forecasts were reviewed. These forecasts were prepared by a range of different parties encompassing individual airports to industry organisations. The timeframe, purpose, methodology and assumptions for each of the forecasts were reviewed to assess their relevance to this study.

Forecast medium to long-term growth rates for the Australasian international market range from 3.5 per cent to 5.1 per cent per annum. Domestically, Sydney (Kingsford-Smith) Airport forecast growth rates for total traffic range from 3.9 per cent to 4.2 per cent per annum and Canberra Airport's forecast growth rates range from 3.3 per cent to 4.3 per cent per annum. Newcastle Airport is forecast to grow rapidly over the 20 years between 2004/05 to 2024/25 at an average annual rate of around 5.0 per cent. Bankstown Airport aircraft movements are forecast to grow slowly at an average rate of 1.5 per cent per annum over the period from 2008/09 to 2024/25. Table 5 summarises key forecast figures.

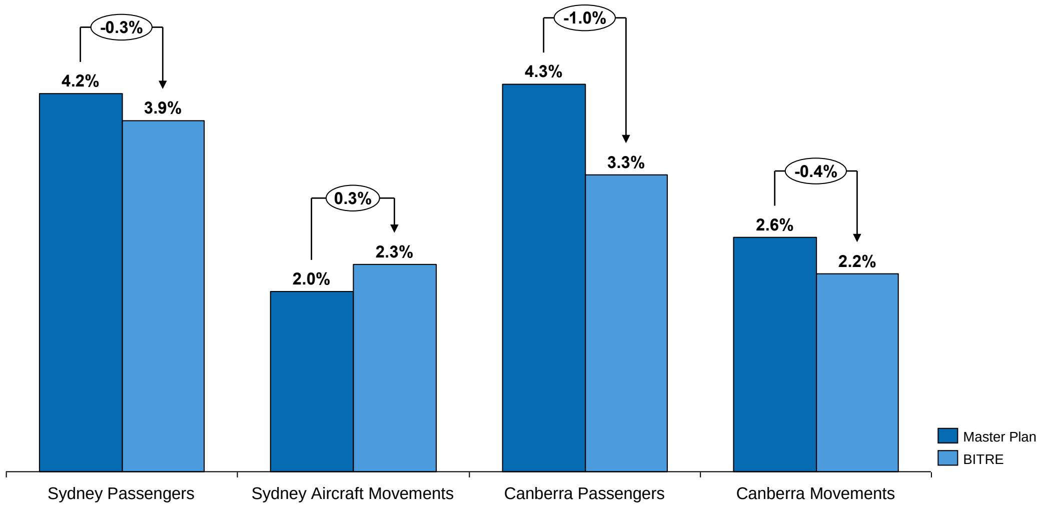
Table 5 – Summary of Forecast Aviation Activity

Market	Units	CAGR	Time Period	Source
Australasia	RPK	5.1%	2008-2028	Boeing (2009)
Australasia	RPK	3.3-7.3%	2008-2028	Airbus (2009)
Australia	International Visitors	3.5%	2008-2018	TRA (2009)
Australia International	Passenger	3.8%	2008-2013	IATA (2009)
Australia Domestic	Passenger	3.3%	2008-2013	IATA (2009)
Sydney (Kingsford-Smith) Airport Total	Passenger	4.2%	2007-2029	Master Plan (2009)
Sydney (Kingsford-Smith) Airport Total	Passenger	3.9%	FY09-FY30	BITRE (2010)
Canberra Airport Total	Passenger	4.3%	FY08-FY30	Master Plan (2009)
Canberra Airport Total	Passenger	3.3%	FY09-FY30	BITRE (2010)
Newcastle Airport Total	Passenger	5.0%[1)]	FY05-FY25	Master Plan (2007)
Bankstown Airport	Aircraft Movements	1.5%[2)]	FY04-FY25	Master Plan (2005)

1) *Estimated based on 2007 Master Plan charts.*
2) The forecast growth rate for Bankstown Airport is not based on actual services but includes the planned introduction of RPT services from 2004 to 2025
Source: Various

The variation in long term growth rates are illustrated in Figure 8. There is a small variation in forecast growth rates for Sydney (Kingsford-Smith) Airport between BITRE and the Sydney (Kingsford-Smith) Airport 2009 Master Plan. Long term aircraft movement growth is lower in the Sydney (Kingsford-Smith) Airport 2009 Master Plan, which is reflective of more aggressive fleet up gauging assumptions. The Canberra Airport 2009 Master Plan is more optimistic about traffic growth at the airport compared to BITRE's forecast.

Figure 8 – Comparison of Long Term Forecast Growth Rates – Sydney and Canberra Airports



Note: Canberra Airport 2009 Master Plan average growth rates are for 2007/08 to 2029/30, Sydney (Kingsford-Smith) Airport 2009 Master Plan average growth rates are for 2007 to 2029, BITRE average growth rates are for 2008/09 to 2029/30
Source: BITRE, Canberra Airport 2009 Master Plan, Sydney (Kingsford-Smith) Airport 2009 Master Plan

Analysis of these sources were used to inform and provide a base for Booz & Company's forecasts for the Sydney region airports for the short term (5 years), medium term (10 years) and long term (20 years).

Forecasts prepared prior to the Global Financial Crisis (GFC) are likely to have higher projected growth rates in comparison to those prepared following the GFC. With the exception of the BITRE forecast, all forecasts mentioned in Table 5 were prepared prior to the downturn associated with the GFC. Airbus and Boeing tend to be optimistic by providing unconstrained forecasts. These are high level forecasts carried out at a global level that do not take into account the individual airport constraints and market nuances. These can be used to inform assumptions on which international markets are forecast to grow more rapidly than others; however, these have limited use at an airport level due to the aggregate nature of the forecasts.

International Air Transport Association (IATA) forecasts cover the key international markets to and from Australia for passengers and freight for the short term. The IATA forecasts were prepared using the Delphi technique, which differs from the econometric techniques used in the preparation of other source's forecasts. The IATA forecasts can be used to inform short term international growth rates for the Australia wide market.

The Master Plan and BITRE forecasts are the most appropriate forecasts to advise the forecasts in this study since these are the most relevant in terms of purpose, assumptions and time frames. The air traffic forecasts for the 2009 Master Plans for both Sydney (Kingsford-Smith) and Canberra Airports were prepared in 2008 prior to the downturn in global air traffic due to the GFC. The BITRE forecasts prepared in early 2010 take into account the GFC and thus have lower traffic projections in 2029/30 compared to the Master Plans, as well as more moderate growth rate projections. The Canberra Airport 2009 Master Plan assumes the introduction of international air traffic in the short term, whereas the

BITRE forecasts do not assume international traffic at Canberra due to the lack of historical international activity.

Both BITRE and Master Plan forecasts for Canberra and Sydney (Kingsford-Smith) incorporate assumptions on fleet up-gauging and/or increased passenger load factors, allowing for more passengers to be served per aircraft movement. This is particularly relevant for Sydney (Kingsford-Smith) Airport, given regulations restricting more than 80 aircraft movements per hour. This may place further strain on Sydney (Kingsford-Smith) Airport's infrastructure and requires strong growth in passengers per movement to accommodate forecast passenger demand in the longer term.

The Sydney (Kingsford-Smith) Airport 2009 Master Plan indicates that passenger and freight forecasts at Sydney (Kingsford-Smith) Airport can be supported over the planning period (2009 – 2029). Long-term growth post the 2009 master planning period is likely to become even further constrained without additional aviation capacity in the area.

Details of this review can be found in Appendix A.

3. Base Market Analysis

This chapter provides analysis of historical aviation activity in the Sydney region. The analysis aims to identify historical trends to provide basis for future growth and segment the base market to develop the baseline for the forecast estimates.

3.1 Base Market

3.1.1 *Commercial Airline Activity*

Table 6 details commercial airline passengers and aircraft movements at Sydney region airports in 2010[9]. It shows that Sydney, Canberra and Newcastle combined handled 40.1 million passengers and 344,500 aircraft movements. Sydney (Kingsford-Smith) Airport handles the majority of the region's traffic with 35.7 million passengers and 286,600 aircraft movements. Of the three airports, Sydney is the only airport currently serving international traffic, with 11.5 million passengers and 62,500 aircraft movements in 2010.

Table 6 – Sydney, Canberra and Newcastle Airport Passenger and Commercial Aircraft Movements, 2010

Year	Passengers (Millions)				Aircraft Movement (000"s)			
	International	Domestic	Regional	Total	International	Domestic	Regional	Total
Sydney	11.5	22.2	2.0	35.7	62.5	159.6	64.4	286.6
Canberra	0.0	3.3	0.04	3.3	0.0	41.3	2.3	43.6
Newcastle	0.0	1.1	0.1	1.2	0.0	8.1	6.2	14.3
Total	11.5	26.5	2.2	40.1	62.5	209	73	344.5

Note: Figures may not add to total due to rounding
Source: BITRE

3.1.2 *General Aviation and Military Activity*

Aircraft movements for general aviation (GA) and military aircraft for 2010 are summarised in Table 7. Bankstown Airport has the largest GA aircraft movement activity with 274,200 movements in 2010. The RAAF Base Williamtown and RAAF Base Richmond are the main military airports with 25,000 and 7,500 movements in 2010 respectively.

[9] *The Sydney region includes Sydney (Kingsford-Smith), Canberra, Newcastle Airport (RAAF Base Willamtown), Bankstown, Camden, Goulburn airports, RAAF Base Richmond, and Maitland and Cessnock Aerodromes. Combined historical commercial passengers and movements are presented based on available BITRE data and include only Sydney (Kingsford-Smith), Canberra and Newcastle airports.*

Table 7 – Sydney Region Airports GA and Military Aircraft Movements (thousands), 2010

Airport	Year	Aircraft		
		GA	Military	Total
Sydney (Kingsford-Smith) Airport (SYD)	2010	17.2	0.4	17.7
Canberra Airport (CBR)	2010	24.3	1.2	25.5
Newcastle Airport (NTL)/ RAAF Base Williamtown	2010	14.4	25.0	39.4
Bankstown Airport (BWU)	2010	274.2	0.0	274.2
Camden Airport (CDU)	2010	84.1	0.0	84.1
RAAF Base Richmond (YSRI)	2010	5.4	7.5	12.9
Maitland (YMND)	2010	2.1	0.0	2.1
Cessnock (CES)	2010	1.4	0.0	1.4
Goulburn (GUL)	2010	1.0	0.0	1.0

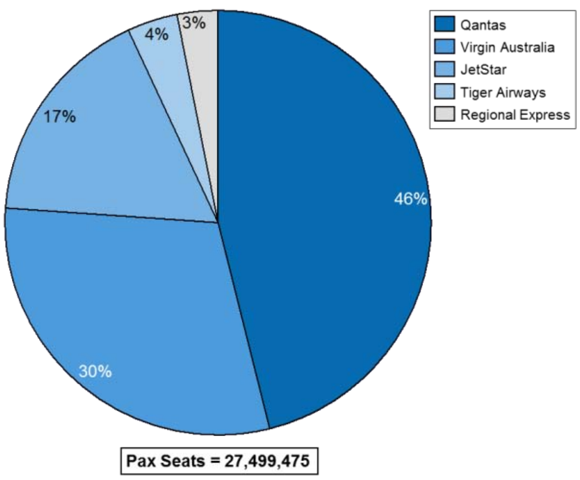
Note: Figures may not add to total due to rounding
Source: BITRE, Airservices Australia

3.2 Major Airlines

Analysis of major airlines provided an understanding of the market dynamics (such as the number of competitors and the mix of LCC and FSCs) at each of the Sydney region airports. This also allows us to identify which airline strategies (in terms of route development and fleet renewal/expansion) are likely to influence future growth in the region.

Figure 9 shows the share of scheduled domestic and regional seat capacity at Sydney (Kingsford-Smith) Airport in 2010. Qantas is the dominant airline with 46 per cent of capacity, followed by Virgin Australia with 30 per cent and Jetstar with 17 per cent.

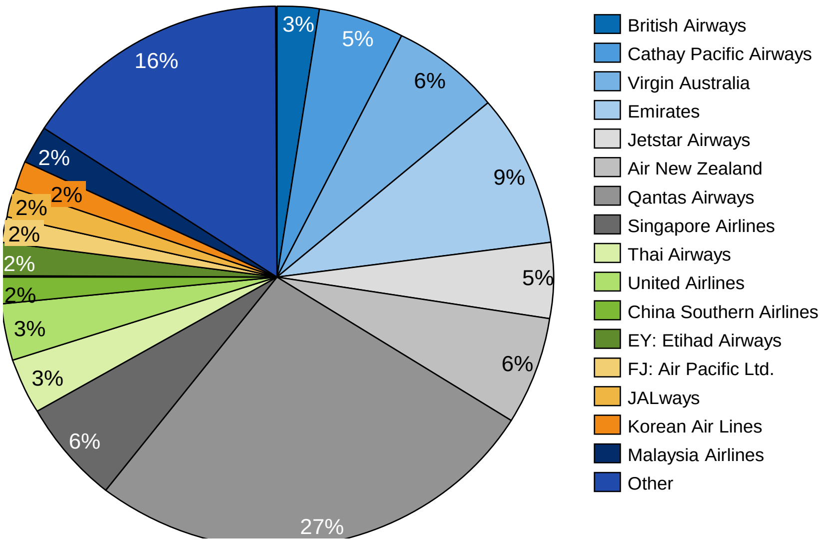
Figure 9 – Share of Scheduled Domestic and Regional Seat Capacity at Sydney (Kingsford-Smith) Airport by Airline (2010)



Source: SRS analyser

Figure 10 shows the share of scheduled international seat capacity at Sydney (Kingsford-Smith) Airport in 2010. Qantas is again the dominant airline with 27 per cent of capacity, followed by Air New Zealand with 6 per cent and Singapore Airlines with 6 per cent. Major international carriers operating at Sydney (Kingsford-Smith) Airport include Air New Zealand, Singapore Airlines, United Airlines, Cathay Pacific, British Airways and Emirates.

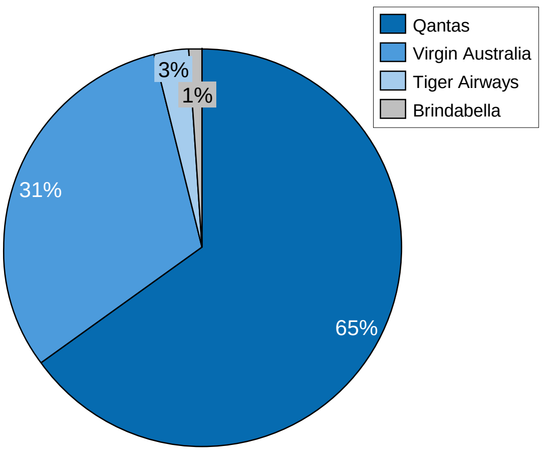
Figure 10 – Share of Scheduled International Seat Capacity at Sydney (Kingsford-Smith) Airport by Airline (2010)



Source: SRS analyser

Figure 11 shows the share of scheduled domestic and regional seat capacity at Canberra Airport in 2010. Qantas is the dominant airline with 65 per cent of capacity, followed by Virgin Australia with 31 per cent, Tiger Airways with 3 per cent and Brindabella with the remaining 1 per cent.

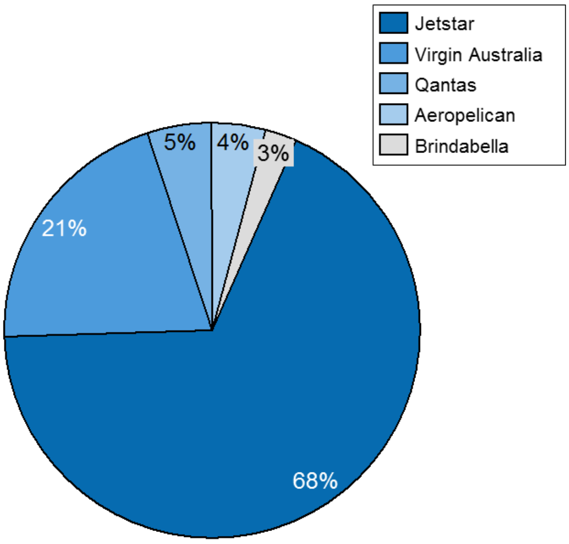
Figure 11 – Share of Scheduled Domestic and Regional Seat Capacity at Canberra Airport by Airline (2010)



Source: SRS analyser

Figure 12 shows the share of scheduled domestic and regional seat capacity at Newcastle Airport in 2010. Newcastle Airport is dominated by LCCs with Jetstar having the largest share of capacity at 68 per cent followed by Virgin Australia with 21 per cent. Qantas and Aeropelican both have a 5 per cent and 4 per cent share of traffic respectively.

Figure 12 – Share of Scheduled Domestic and Regional Seat Capacity at Newcastle Airport by Airline (2010)



Source: SRS analyser

3.2.1 Destinations Served

Table 8 summarises the number of domestic and international destinations served from Sydney, Canberra and Newcastle Airports. Sydney (Kingsford-Smith) Airport serves 84 destinations comprising 37 international destinations and 47 domestic and regional destinations. Canberra and Newcastle airports serve 12 and 7 destinations respectively.

Table 8 – Number of Destinations Served at Sydney (Kingsford-Smith), Canberra and Newcastle Airports

Market	Sydney	Canberra	Newcastle
International	37	0	0
Domestic	47	12	7
Total	84	12	7

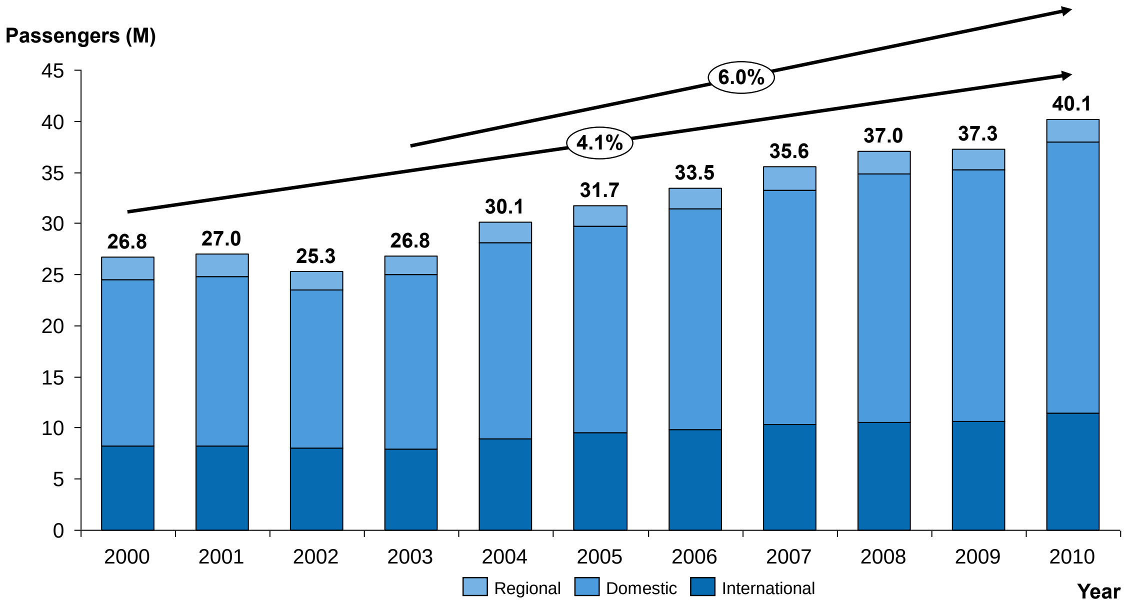
Source: SRS analyser, June 2011

3.3 Recent trends

3.3.1 Overview of Aviation Trends by Market

As depicted in Figure 13, Sydney region airports have experienced consistent passenger growth over the past ten years (i.e. 2000 – 2010), with the exception of 2002 following the events of September 11, 2001, the collapse of Ansett Australia in September 2001 and the GFC in 2008 and 2009. This was followed by a strong recovery in 2010. Total passenger movements for all Australian Airports have grown at an average annual rate of 4.1 per cent per annum since 2000, with stronger growth of 6.0 per cent per annum experienced since 2003 primarily due to the emergence of Australian LCCs such as Jetstar and Virgin Australia.

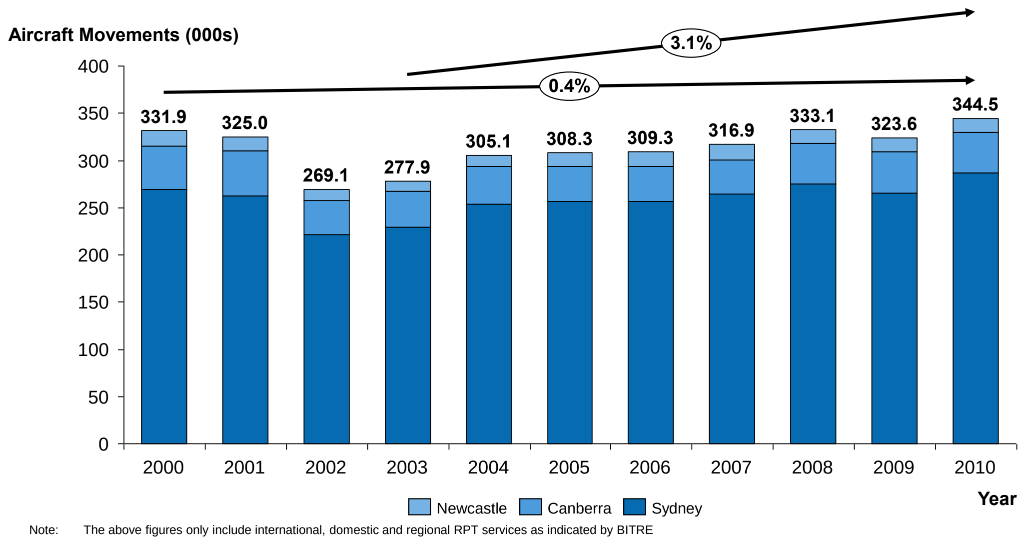
Figure 13 – Total Sydney Region Passengers by Market



Note: Includes Sydney (Kingsford-Smith) Airport, Canberra Airport and Newcastle Airport
Source: BITRE

As shown in Figure 14, aircraft movements at the Sydney region airports were essentially static between 2000 and 2010 (i.e. average annual growth of 0.4 per cent per annum). This indicates an increase in passengers per movement driven by increases in passenger load factors and a trend of airline fleet up gauging.

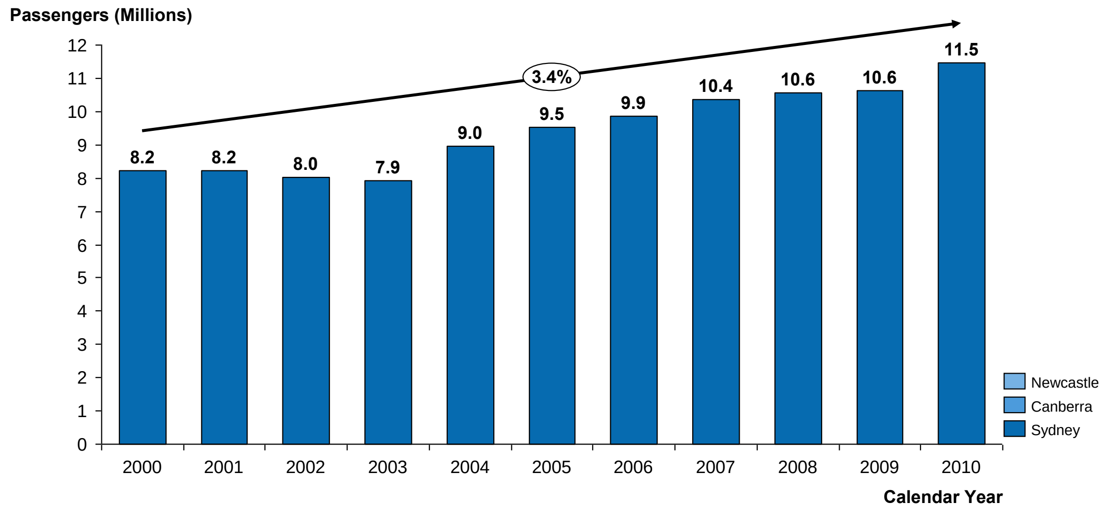
Figure 14 – Total Sydney Region Aircraft Movements by Airport



Note: Includes only RPT movements for Sydney (Kingsford-Smith), Canberra and Newcastle airports.
Source: BITRE

International passengers grew at an average annual rate of 3.4 per cent between 2000 and 2010 as shown in Figure 15. Over the last decade, Sydney (Kingsford-Smith) Airport has been the only gateway for international traffic for the region.

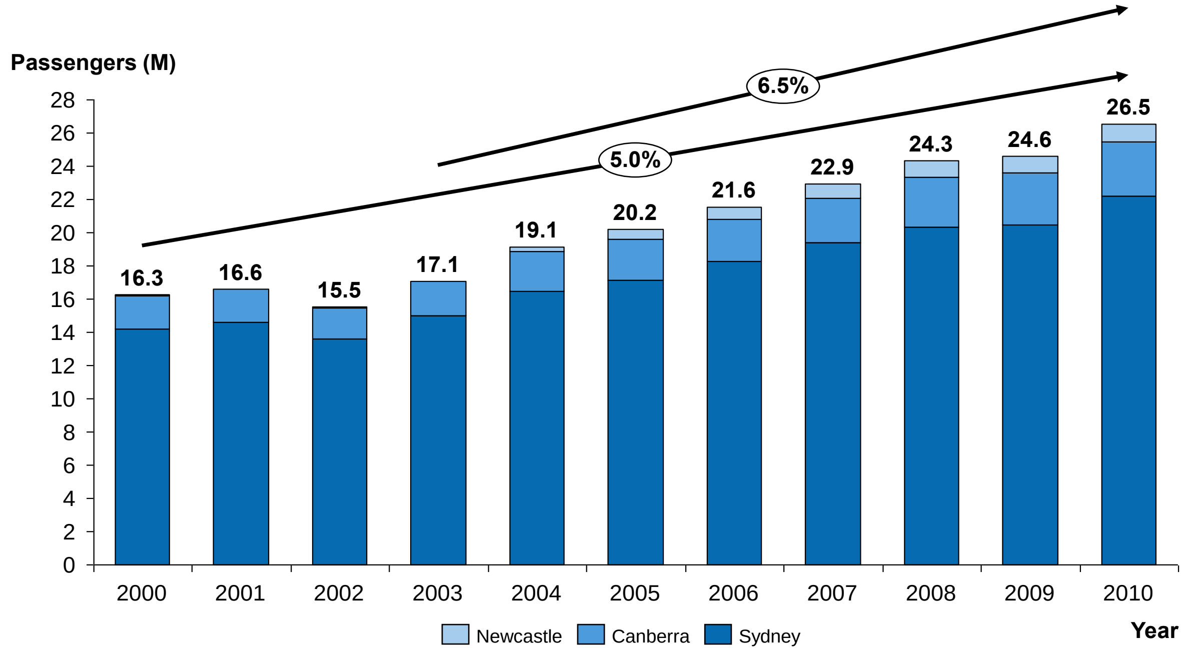
Figure 15 – Total Sydney Region International Passengers



Source: BITRE

Stronger growth has been observed in the domestic market with the emergence of Australian LCCs. As shown in Figure 16, the average annual growth of 5 per cent per annum has been observed over the period between 2000 and 2010.

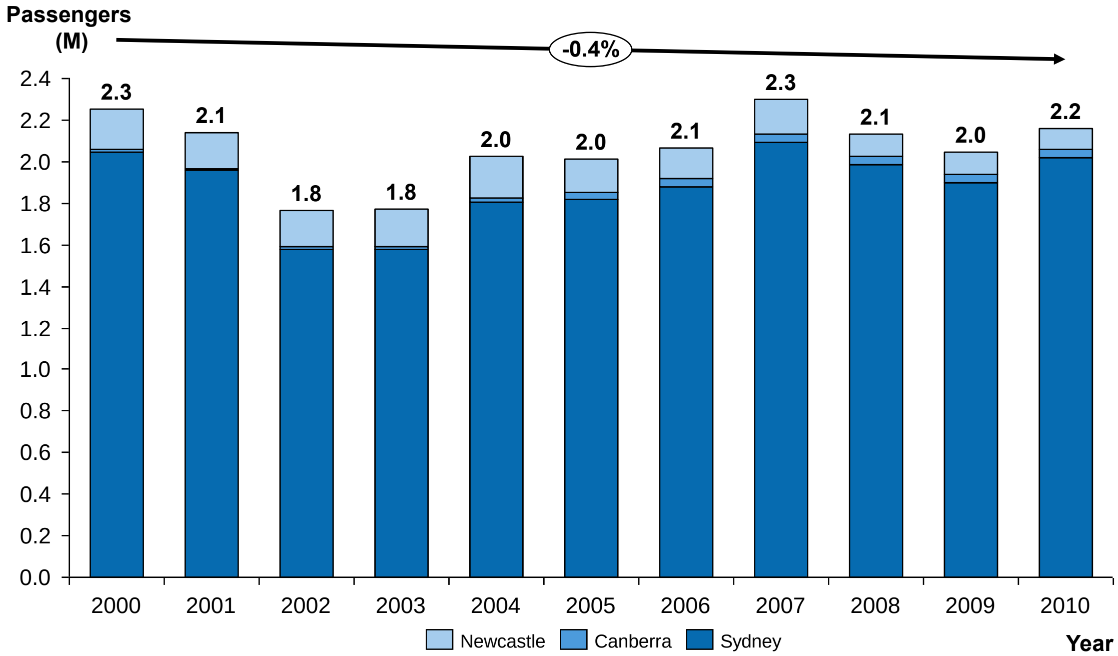
Figure 16 – Total Sydney Region Domestic Passengers



Source: BITRE

As shown in Figure 17, regional airline traffic has declined at an average annual rate of 0.4 per cent per annum from 2000 to 2010.

Figure 17 – Total Sydney Region Regional Passengers



Note: BITRE regional services represent routes to/from non-inter capital airports (i.e. excluding capital-capital routes) whereas the Booz & Company definition of regional is limited to intrastate services within NSW (including ACT to non-capital NSW).
Source: BITRE

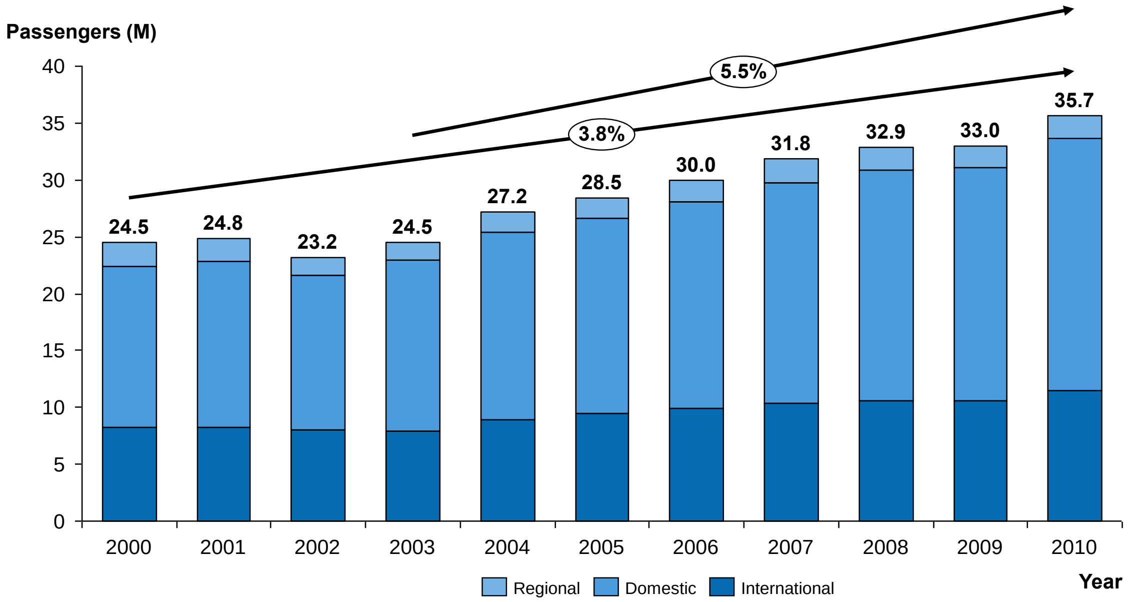
3.3.2 *Sydney (Kingsford-Smith) Airport*

3.3.2.1 Passengers

Sydney (Kingsford-Smith) Airport remains Australia's largest airport in terms of passenger numbers. As illustrated in Figure 18, from 2000 to 2010, average annual passenger growth (CAGR) at Sydney (Kingsford-Smith) Airport has been 3.8 per cent. The largest contributor to passenger growth at Sydney (Kingsford-Smith) Airport was domestic traffic growing at an average annual growth rate of 4.6 per cent.

Approximately 35.7 million passengers passed through Sydney (Kingsford-Smith) Airport in 2010, which included approximately 22.2 million domestic passengers.

Figure 18 – Sydney (Kingsford-Smith) Airport Passenger Breakdown (2000-2010)

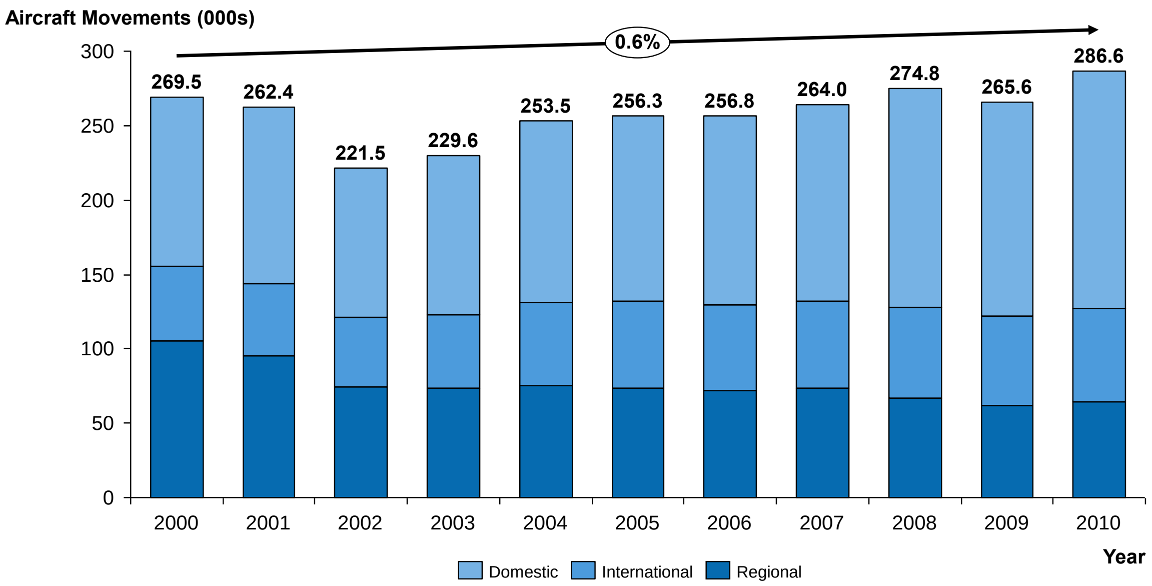


Source: BITRE

3.3.2.2 Aircraft Movements

Growth in aircraft movements at Sydney (Kingsford-Smith) Airport has been slower than that of passengers due to a continual increase in average seat capacity per aircraft (fleet up gauging). Total aircraft movements at Sydney (Kingsford-Smith) Airport experienced strong growth following the collapse of Ansett in September 2001. As shown in Figure 19, Sydney (Kingsford-Smith) Airport grew from 222,000 aircraft movements (excluding international and domestic dedicated freighters) in 2002 to 286,600 aircraft movements in 2010, reaching a peak in 2010. Domestic aircraft movements represent the majority of activity at Sydney (Kingsford-Smith) Airport.

Figure 19 – Sydney (Kingsford-Smith) Airport Aircraft Movement[1)] Breakdown (2000-2010)

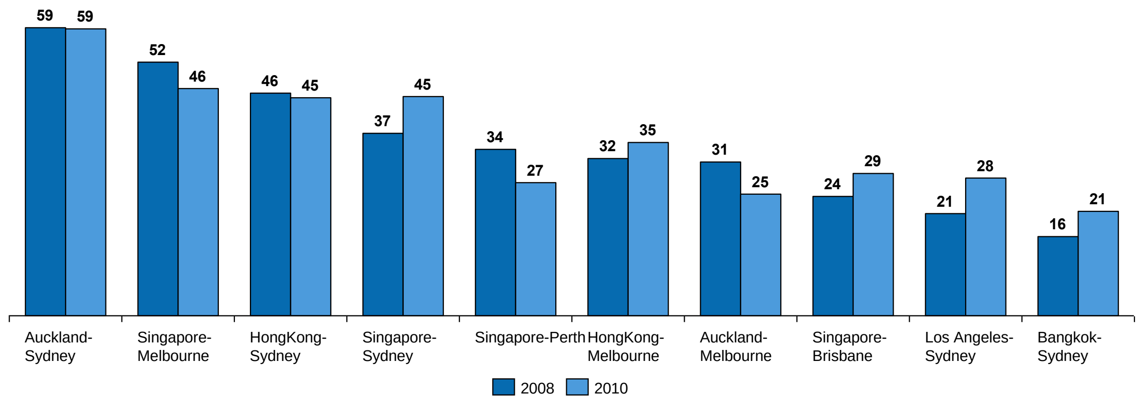


Note: (1) Only domestic, regional and international RPT services are included.
Source: BITRE

3.3.2.3 Cargo

Sydney (Kingsford-Smith) Airport is a key gateway for international air freight to and from Australia. Six of the top ten air cargo flows for Australia occur through Sydney (Kingsford-Smith) Airport as shown in Figure 20. Sydney (Kingsford-Smith) Airport plays a critical role for air freight flows from New Zealand to Asia and Europe, handling almost twice the volume of air freight from New Zealand being moved over Melbourne. This is due to the air freight capacity provided in wide body passenger aircraft between Auckland and Sydney.

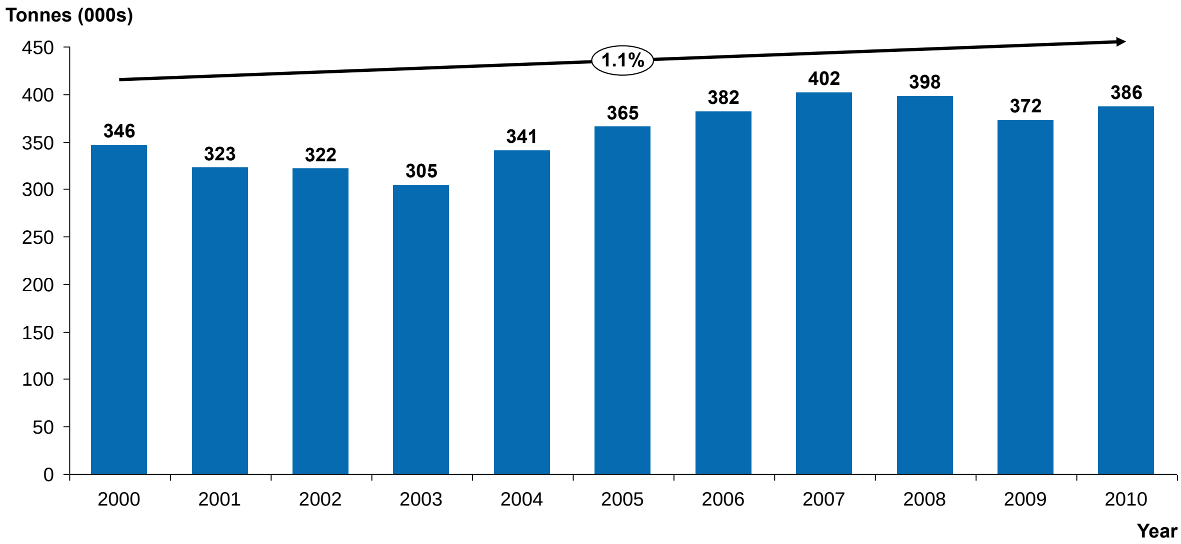
Figure 20: Top Ten Australian International Freight Routes, 2008 and 2010



Source: Booz & Company analysis of BITRE data

In 2010, it catered for a total of approximately 485,000 tonnes of air freight. International freight made up the majority of this with approximately 386,000 tonnes carried. Figure 21 shows that the growth in international freight tonnage over the last decade has been slow at 1.1 per cent per annum since 2000.

Figure 21 – Sydney (Kingsford-Smith) Airport International Freight Tonnage



Source: BITRE

It also provided for a total of approximately 100,000 tonnes of domestic freight in 2010. Melbourne and Brisbane are the key trunk routes regarding freight carriage to and from Sydney (Kingsford-Smith) Airport. It is estimated that an average of 19,000 and 12,000 tonnes of freight are carried between these locations per year respectively.[10]

As shown in Figure 22, the majority of cargo capacity is provided in the belly hold of passenger aircraft. At Sydney (Kingsford-Smith) Airport 72 per cent of air cargo capacity is provided as belly hold with the remaining 28 per cent of capacity provided by dedicated freighters. Dedicated freighter capacity contributes only 13 per cent of domestic airfreight capacity. Dedicated freighters make a much larger contribution to international airfreight, providing 38 per cent of international airfreight capacity. Approximately 21 per cent of air freight is carried on dedicated freighters at Sydney (Kingsford-Smith) Airport[11].

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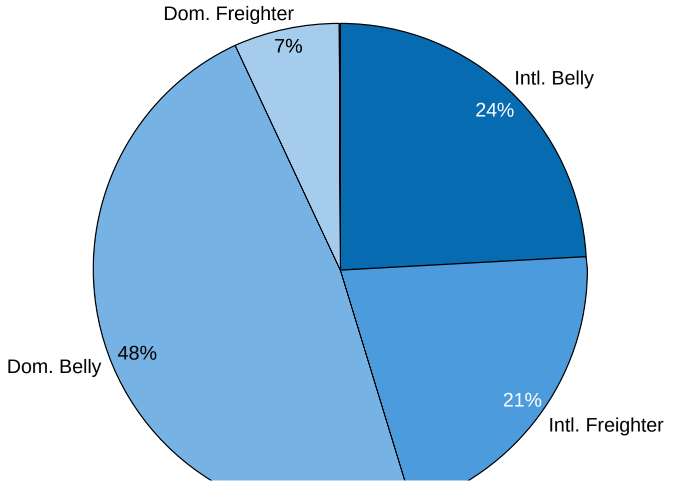
[10] *SACL Sydney Airport 2009 Master Plan estimates*

[11] *Sydney Airport Freight Master Plan Concept (SACL 2009)*

Figure 22 - Share of Potential Air Cargo Capacity by Type 2010



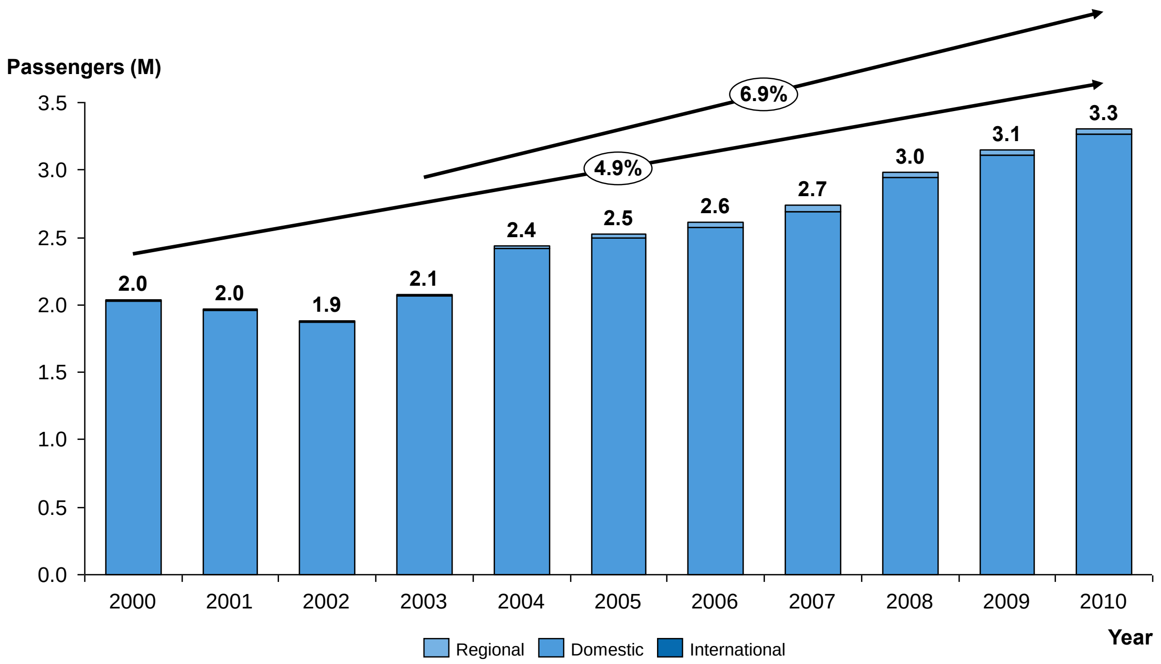
Source: Booz & Company demand forecasts for Sydney (Kingsford-Smith) Airport

3.3.3 Canberra Airport

3.3.3.1 Passengers

Canberra Airport provides direct passenger services to major domestic destinations. As illustrated in Figure 23, Canberra Airport does not currently have scheduled international passenger services. Since 2000 the number of passenger movements at Canberra Airport has increased by an average annual growth rate of 4.9 per cent.

Figure 23 – Canberra Airport Passenger Breakdown (2000-2010)

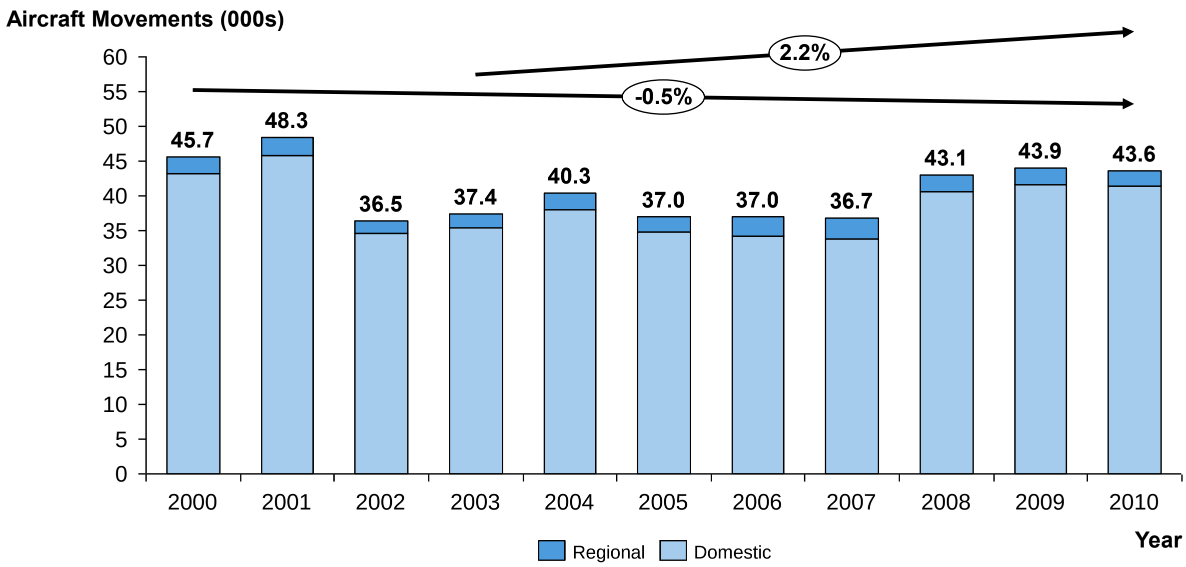


Source: BITRE

3.3.3.2 Aircraft Movements

Canberra Airport aircraft movements, which are dominated by domestic services, experienced a decline in growth between 2000 and 2010, as shown in Figure 24. The decline in the number of services is partly due to upgauging of aircraft on key routes such as Sydney and Melbourne. Noteworthy is the commencement of the LCC group Virgin Australia at the airport in 2003 and the growth in traffic recorded after 2007.

Figure 24 – Canberra Airport Aircraft Movement Breakdown (2000-2010)



Source: BITRE

3.3.3.3 Cargo

It is estimated that a total of around 2,700 tonnes of domestic air freight was carried to and from Canberra Airport in 2009. Melbourne and Brisbane are the key trunk routes regarding freight carriage to and from Canberra Airport. It is estimated that an average of 600 and 400 tonnes of freight were carried between these locations respectively in 2009.[12]

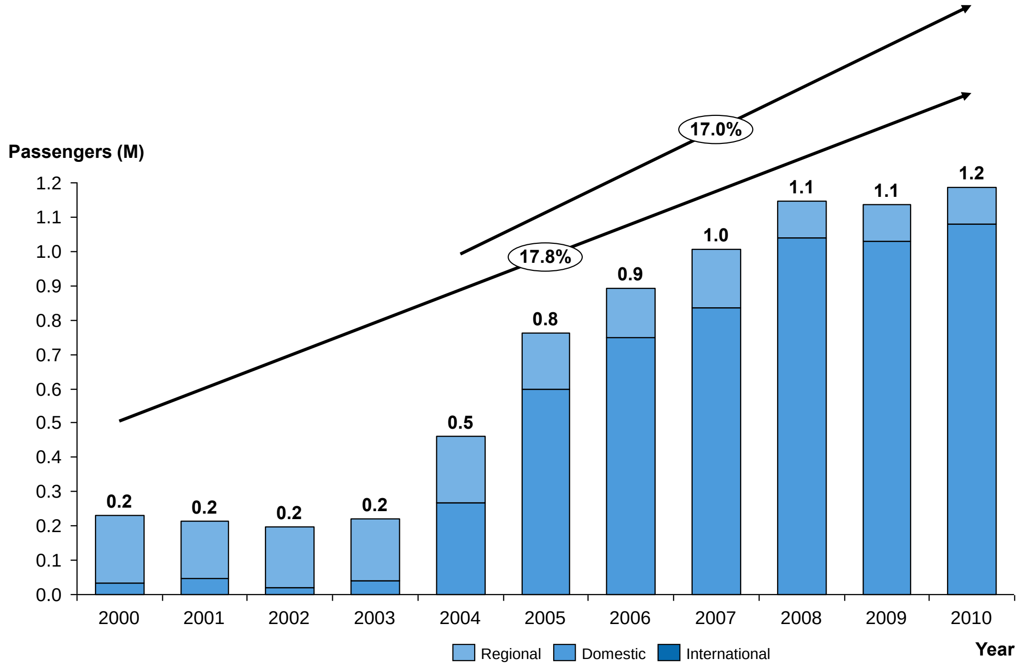
3.3.4 *Newcastle Airport*

3.3.4.1 Passengers

Newcastle Airport is New South Wales' second largest airport by passenger numbers which, as depicted in Figure 25, from 2000 to 2010 recorded an average annual growth of 17.8 per cent. A significant contributor to this growth has been from the domestic market which has experienced 41.9 per cent growth for the 2000-2010 time period. However, regional airline passengers have declined at an average annual rate of 6.1 per cent over the same period. Newcastle Airport currently does not have any international passenger services.

[12] *DOIT estimates*

Figure 25 – Newcastle Airport Passenger Breakdown (2000-2010)

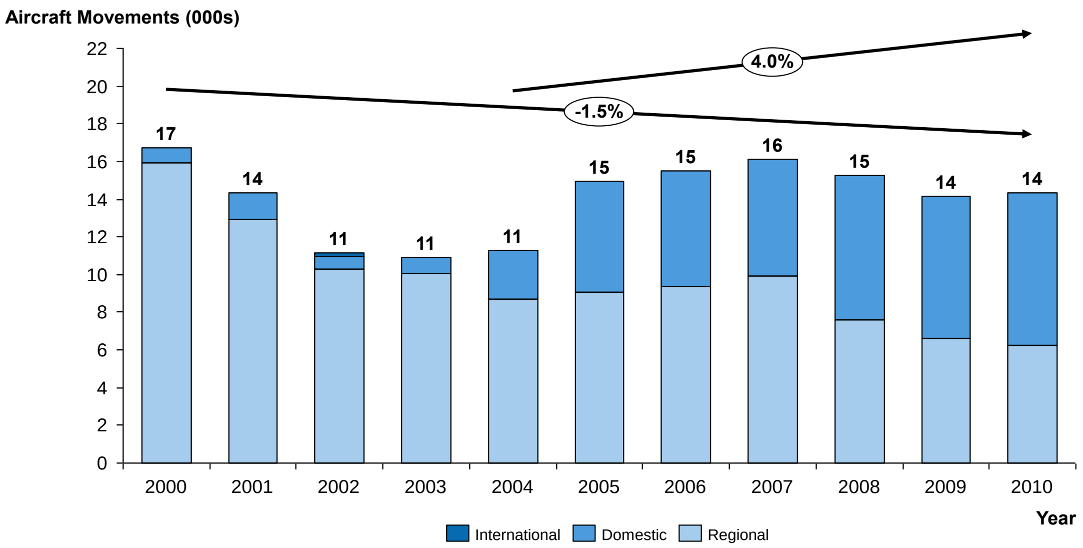


Source: BITRE

3.3.4.2 Aircraft Movements

Newcastle Airport experienced significant growth in aircraft activity in 2004, which coincided with the start-up of Jetstar. Aircraft movement activity between 2004 and 2010 increased at an average annual rate of 4.0 per cent. Prior to 2004, Newcastle Airport operated predominantly as a regional airport up until the commencement of Jetstar operations in 2004. In 2004, domestic aircraft activity took on significant growth at Newcastle Airport while regional aircraft movements experienced stagnant and negative growth figures as shown in Figure 26.

Figure 26 – Newcastle Airport Aircraft Movements Breakdown (2000-2010)



Source: BITRE

3.3.4.3 *Cargo*

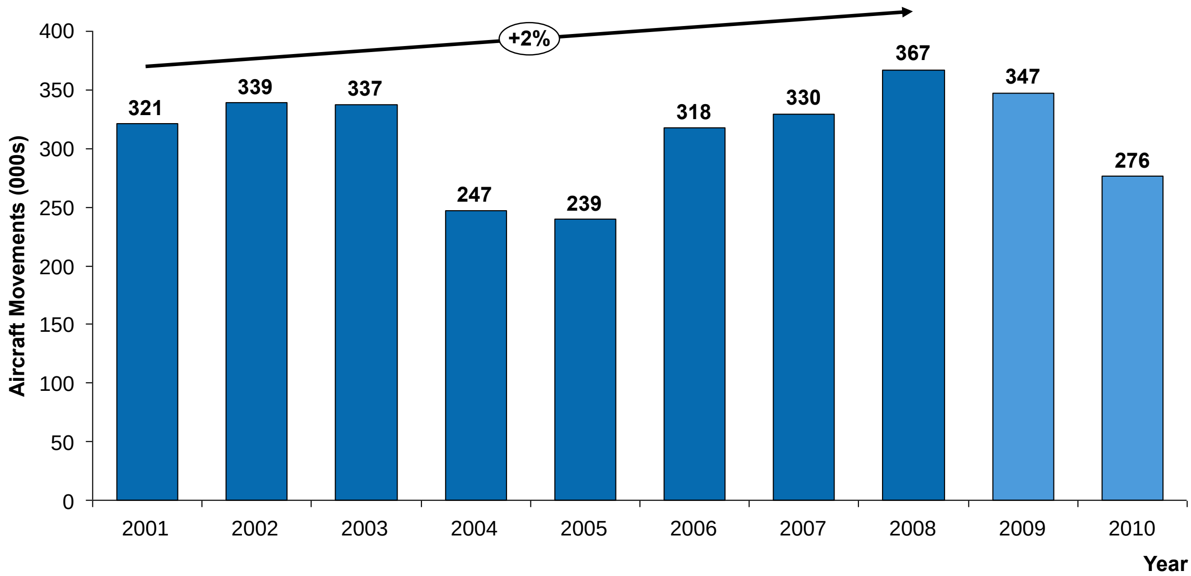
BITRE recorded approximately 1 tonne of freight at Newcastle Airport in 2009. In addition, the only route recorded was between Brisbane and Newcastle.[13]

3.3.5 *Bankstown Airport*

3.3.5.1 *General aviation, military and freighters movements*

As shown in Figure 27 Bankstown Airport recorded an average annual growth of 2 per cent from 2001 to 2008, with aircraft movements growing from approximately 321,000 to 367,000. A decrease in services was registered in 2010 as reported by Airservices Australia. The decline in movements has been attributed to the closing down of a number of flying schools.

Figure 27 – Bankstown Airport, Historical Aircraft Movements, 2001 to 2010



Source of 2001-2008 figures: Bankstown Airport 2010 Preliminary Draft Master Plan – Note: figures are for Financial Year
Source of 2009-2010 figures: Airservices Australia – Note: Figures are for Calendar Year

[13] *DOIT estimate*

4. Forecast Approach

4.1 International

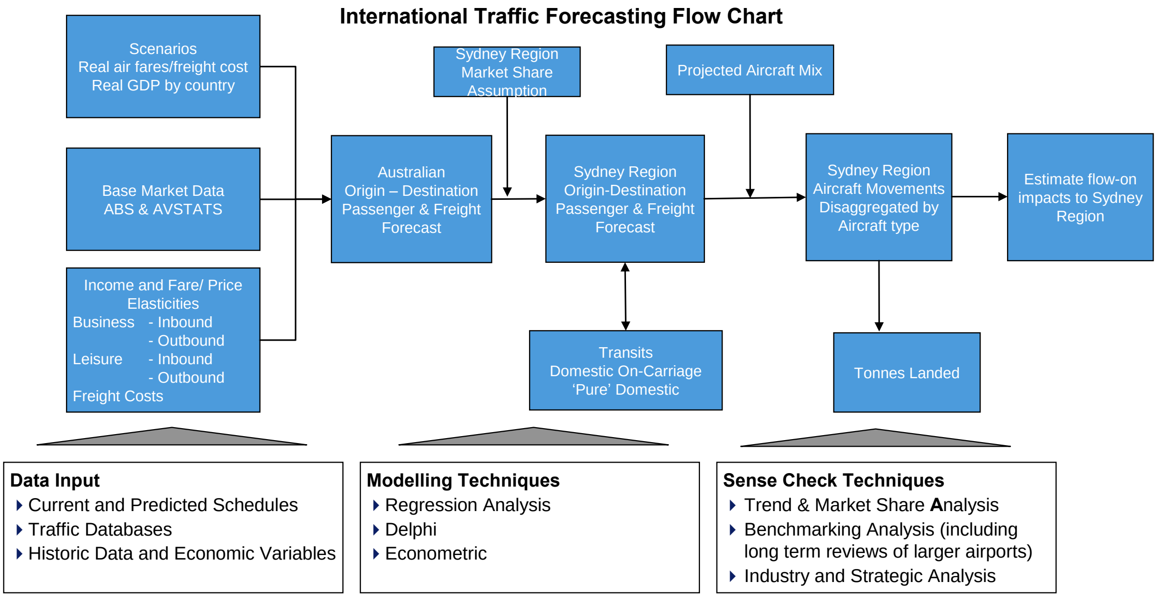
To prepare long term air traffic forecasts, an econometric model based on the relationships between aviation activity demand and key demand drivers was developed. The approach undertaken to develop the forecasts is derived from the empirical relationship that exists between demand for air travel and the following factors:

- Real income;
- Real air fares; and
- Real exchange rates (international travel).

However, given the impracticalities of forecasting exchange rates in the medium and long term, this parameter was excluded from forecasts in the international model. The approach adopted was based on the development of a long term, predominantly income driven econometric model of air passengers. As suggested, the domestic and international models are fundamentally based on modelling the empirical relationship between the demand for air services, and real income and real air fares respectively.

Figure 28 illustrates the modelling approach for international traffic. In essence, the forecasts were derived with reference to calibrated demand models (i.e. real income and fares) overlaid with an assessment of market conditions and other factors expected to impact on long term growth.

Figure 28 – Long Term Air Traffic Forecasting Flow Chart



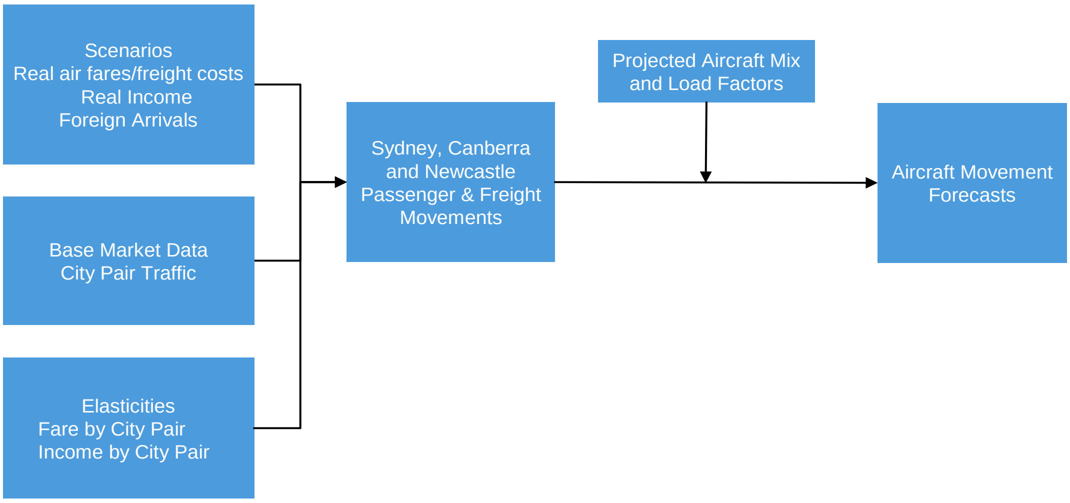
Source: Booz & Company

As Sydney is the only airport in the study region currently serving international traffic, this was the focus for international modelling. Canberra Airport's 2009 Master Plan and discussions with airport management indicate that international services are expected to be established within the next five years. Similarly, Newcastle Airport's 2007 Master Plan and discussions with airport management indicated the airport's plans for international services.

4.2 Domestic

Domestic passenger forecasts were developed using airport-specific calibrated demand models as shown in Figure 29.

Figure 29 – Domestic Air Traffic Forecasting Flow Chart



Source: Booz & Company

The econometric modelling was then overlaid with assumptions around policy settings, specifically the 80 aircraft movement hourly cap, curfew at Sydney (Kingsford-Smith) Airport, and Newcastle Airport cap of 6 arrivals per hour. Market trends such as the emergence of LCCs, fleet development and other key factors were taken into consideration in calibrating the models. Supply and demand side factors considered are illustrated in Figure 30. These factors and assumptions are discussed in detail in Section 5.

Figure 30 – Supply and Demand Side Factors Influencing Air Traffic Demand

Demand Side Factors	Supply Side Factors
▪ Growth in income	▪ LTOP noise sharing policy settings
▪ Change in air fares	▪ Route development / Route restructure
▪ Population distribution	▪ New business models
▪ Oil prices	▪ Regulatory and industry reform
▪ Carbon Pricing	▪ Alliances
▪ Change in exchange rates	▪ New technology i.e. aircraft
▪ Tourism trends	▪ Congestion and delays
▪ Underlying level of demand for services in normal market	▪ Levels of service provision
	▪ Near and long term changes in competitive intensity
▪ Prices / yields	▪ Market composition and size
▪ Barriers to entry	▪ Changes to barriers to entry

Source: Booz & Company

4.3 Base Traffic Data

Time-series historical international and domestic traffic data was collected for each of the airports and was sourced from BITRE.

International passengers, defined by Booz & Company as passengers travelling to/from destinations outside Australia, were split into inbound and outbound markets based on ABS data. The outbound market comprises Australian residents and was segmented based upon destination. The inbound market comprises visitors to Australia and was segmented based upon originating country. The inbound and outbound markets were segmented into 16 categories. These were the top 15 destinations for the outbound market and the top 15 originating countries for the inbound market. The final category combined the remainder of the markets into an 'other' category. The Australian inbound market segment proportions were then applied to Sydney (Kingsford-Smith) Airport international passenger traffic.

Time-series data was used to examine the growth rates in air traffic across these countries and ascertain the appropriate market segments for examination, as well as outbound Australian residents.

The international markets explicitly examined include:

Outbound:

- Australians by country (see inbound below); and

Inbound:

- New Zealand
- United Kingdom
- USA
- Indonesia
- China
- Singapore
- Japan
- Thailand
- Malaysia
- Hong Kong
- India
- Fiji
- Germany
- Canada
- South Korea
- Other.

These market segments were then split into leisure and business segments based on historical purpose of travel time series data as sourced from Tourism Australia. These proportions are presented in Figure 39 and Figure 40 in Section 5.5.

The domestic market, hereby defined as passengers travelling inter-state (i.e. outside NSW), looked at key routes for each airport. The routes analysed for Sydney (Kingsford-Smith) Airport included:

- Melbourne
- Brisbane
- Gold Coast
- Adelaide
- Perth
- Canberra
- Other.

The routes analysed for Canberra Airport included:

- Sydney
- Melbourne
- Brisbane
- Adelaide
- Other.

The routes analysed for Newcastle Airport included:

- Brisbane
- Melbourne
- Gold Coast
- Other.

The Booz & Company classification of regional market is passengers travelling intra-state (i.e. within NSW); non-inter-capital services within NSW and ACT are also defined as regional. To maintain consistency, passengers travelling from Canberra Airport (as one of the Sydney region airports) to/from NSW destinations is defined as regional.

Freight tonnage data was available for international markets from BITRE, with estimates made for the domestic market.

4.4 Base Demand Drivers

The base demand drivers used in the domestic and international modelling were real GDP and air fares. These assumptions are discussed in more detail in Sections 5.2.1 and 5.3.1 respectively.

4.5 Model Parameters

The key model parameters were income and air fare elasticities. These are detailed below.

4.5.1 Income Elasticities

Inbound and Outbound International Markets

Country-specific income elasticities were derived by destination for the outbound international market and by origin for the top 15 inbound Australian international air traffic markets. The remainder of the inbound and outbound international market was grouped into an 'other' category. These elasticities were used to estimate the relationship between the demand for international aviation travel to Australia and each country's level of growth.

Two sets of "starting year" elasticities were calculated for each international market segment and then compared. The most reasonable estimate was then used in the forecast. The two methods used to derive the income elasticities were:

- Time-series regression analysis of international visitors and freight to and from Australia from 1991 to 2010; and

- Implied income elasticities as per IATA forecast international passenger growth rates.

The selected starting elasticity ranges for the international and domestic market segments are presented in Table 9. These are assumed to decline over time in response to market maturation.

Table 9 – Estimated "Starting Year" Income Elasticities by Market

Market Segment	Starting Income Elasticity Values
International Passengers	0.3 to 2.9
Sydney Domestic Passengers	0.4 to 1.2
Canberra Domestic Passengers	0.4 to 2.0
Newcastle Domestic Passengers	2.0
Sydney International Freight	1.2

Note: Further detail of elasticity calculations and individual market results are provided in Appendix B.
Source: BITRE, IATA, Booz & Company analysis

4.5.2 *Air Fare Elasticities*

The air fare elasticities used for the international and domestic markets are shown in Table 10. Leisure traffic is typically more sensitive to changes in fare, therefore international leisure traffic and Newcastle traffic, which is predominantly low cost, are assumed to have larger fare elasticities.

Table 10 –Estimated Air Fare Elasticities

Market Segment	Elasticity
International Leisure	-1.0
International Business	-0.3
Sydney Domestic	-0.2
Canberra Domestic	-0.3
Newcastle Domestic	-1.3

Source: IATA, Literature Review, Booz & Company estimates

4.6 Passenger Forecasts

Unconstrained growth rates for Sydney (Kingsford-Smith) Airport market segments were calculated based upon GDP growth rates, income elasticities, air fare assumptions and air fare elasticities. Further detail of the growth rate calculations can be found in Appendix C.

4.7 Airport Level Aircraft Movement Forecasts

Fleet mix and aircraft load factors were applied to the passenger forecasts to estimate average passengers per movement to arrive at aircraft movement forecasts from the forecast passenger levels.

Given the existing curfew at Sydney (Kingsford-Smith) Airport, there are 6,205 (17 hours x 365 days) operating hours throughout the year at Sydney (Kingsford-Smith) Airport. Policy settings cap hourly aircraft movements for Sydney (Kingsford-Smith) Airport at 80 movements per hour, this implies a theoretical maximum aircraft movement capacity at Sydney (Kingsford-Smith) Airport of 496,400. This is discussed further in Section 5.8 and 5.13.

4.8 Freight Forecasts

Domestic freight forecasts were based on growth in capacity for belly hold freight and growth in movements for dedicated freight. Growth in domestic belly hold freight capacity is a function of forecast aircraft movement growth and forecast changes in fleet mix.

International freight was assumed to grow based on the derived elasticity of 1.2 and growth in the Australian and key inbound economies. Total forecast international freight was assumed to be shared between belly hold and dedicated freighters based on capacity in the 2010 base year. International belly hold freight was forecast to grow in line with belly hold capacity which was based on passenger movement forecasts and airline fleet up gauging assumptions. Dedicated freighters were assumed to cater for the difference between the total freight tonnage forecast and what could be catered for in the hold of passenger aircraft.

4.9 General Aviation Forecasts

Given the unpredictable and volatile nature of GA movement growth, GA was assumed to grow based on the 2005 Bankstown Master Plan forecast growth of 1.5 per cent to 2025, with growth slowing to 0.5 per cent in the longer term.

5. Modelling Assumptions

5.1 Introduction

A number of general assumptions were made in developing the baseline forecasts. These assumptions were developed drawing on individual airport master plans, airport consultation completed by Booz & Company and desktop research and analysis. These assumptions apply across the entire forecast period. Unless otherwise indicated, it is assumed that sufficient infrastructure is provided to accommodate the forecast demand for passenger and freight services.

The overarching Base Case assumptions are as follows:

- A capacity constraint at Sydney (Kingsford-Smith) Airport has been assumed based on the policy settings of 80 movements per hour; and a constraint on movements at Newcastle Airport has been assumed based on the cap agreed between the Department of Defence and Newcastle Airport. All other airports within the Sydney region are assumed to be able to cater for additional demand with infrastructure upgrades;
- There will be no significant change in the role of individual airports[14];
- Wherever possible, incremental expansion of existing facilities will be used to deliver new or enhanced capacity;
- Ground access to all airports will be sufficient to cater for demand;
- Airlines will continue to introduce larger aircraft replacing smaller capacity aircraft;
- The international and domestic markets remain stable (i.e. free of “shocks”); and
- There is a stable economy and operational market.

The key assumptions for Sydney (Kingsford-Smith) Airport are:

- Current curfew and related operational policies such as the Long Term Operating Plan (LTOP) continue to apply;
- Hourly cap on scheduled aircraft movements of 80 movements per hour (military and helicopters are exempt);
- Allocation and management of slots in accordance with slot management scheme and slot compliance scheme;
- Guaranteed peak slots for regional passenger services (at 2001 levels);
- As traffic becomes constrained at Sydney (Kingsford-Smith) Airport, priority is given to international, domestic and regional services, with general aviation and freight the first to transfer to other airports;
- International services restricted by “scheduling windows” and high yield international and domestic services are expected to be prioritised by airlines at a progressively constrained Sydney (Kingsford-Smith) Airport; and
- Some peak spreading is expected, although the majority of additional traffic accommodated at Sydney (Kingsford-Smith) Airport is anticipated to happen through fleet up gauging.

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[14] Canberra Airport is assumed to cater for additional freight traffic, Bankstown Airport is assumed to cater for a small number of passenger services, and international services are assumed to commence at Newcastle and Canberra Airports, however no fundamental changes to airport roles within the region have been assumed.

The key assumptions for Canberra Airport are:

- No curfew at Canberra Airport; and
- Military activity continues at current levels.

The key assumptions for Newcastle Airport are:

- Newcastle's commercial airline operations continue to be based at Royal Australian Air Force (RAAF) Base Williamtown;
- The current cap on arrivals of 6 per hour (i.e. implying 6 departures per hour to establish a constraint of 12 movements per hour due to NTL being primarily a military airport) and other operational restrictions are maintained;
- The airport is not privatised (remains under the ownership of councils); and
- The Department of Defence proceeds with its expected developments under the existing schedule (including the Joint Strike Fighter program) which will increase military activity from current levels of 25,000 to 43,000 between 2018 and 2020.

The key assumptions for Bankstown Airport are:

- Bankstown will not become a secondary passenger airport serving the Sydney region;
- Demand for flying training will be driven by growth in RPT traffic levels and new entrant LCCs in Australia and the Asia-Pacific Region (including training flying pilots from overseas); and
- Future GA traffic growth at Bankstown airport will be based on long-term historical growth patterns.

The key assumptions for RAAF Base Richmond are:

- RAAF Base Richmond does not cater for domestic or international commercial passenger services throughout the forecast period; and
- Military activity continues at current levels.

The key assumptions for General Aviation are:

- RAAF Base Richmond, Camden and Bankstown cater for the overflow of General Aviation traffic at Sydney (Kingsford-Smith) Airport; and
- Cessnock and Maitland aerodromes cater for the overflow of General Aviation traffic at Newcastle Airport.
- Future GA traffic growth will be based on long-term historical growth patterns.

There are a range of demand determinants that impact on traffic growth. Historically, economic growth and the associated growth in disposable incomes has been the key driver of the growth in demand for air travel at a global, regional and country-specific level. The development of long-term air travel forecasts therefore largely rests on understanding the historical relationship between these factors and the growth in air travel demand. However, a range of industry specific factors as well as shocks such as acts of terrorism, natural disasters and pandemics have all served to disrupt the orderly development of the air travel market.

Section 5.2 highlights the impact of economic growth as a key driver of demand for aviation services. It illustrates the importance of the economic health of the New South Wales and Australian economies as well as the economies of key inbound countries on traffic growth.

Section 5.3 discusses movements in the price of air travel and oil prices, the latter being a significant driver of air fare movements.

Section 5.4 looks at the impact exchange rates have on inbound and outbound international travel.

Section 5.5 addresses inbound and outbound tourism, although it should be recognised that this will primarily be driven by the level and distribution of real income growth in the Sydney area in the case of outbound tourism and the level of real income growth for key inbound countries in the case of inbound tourism.

Sections 5.6 to 5.9 discuss the regulatory environment, including Government policy settings and air service liberalisation, and the impacts on the ability to meet demand for aviation activity.

The development of passengers per movement due to passenger load factors and airline fleet development is discussed in Section 5.10.

Section 5.11 discusses the potential for new services, including the introduction of international air services at Canberra and Newcastle airports and commercial services at Bankstown airport.

Section 5.12 addresses the issue of airport competition. Traditionally, competition between airports was primarily an issue for the international market. However, with the emergence and proliferation of LCCs, competition between primary and secondary airports has become an increasingly important issue for some domestic airline markets.

Section 5.13 considers the impact of congestion and delays.

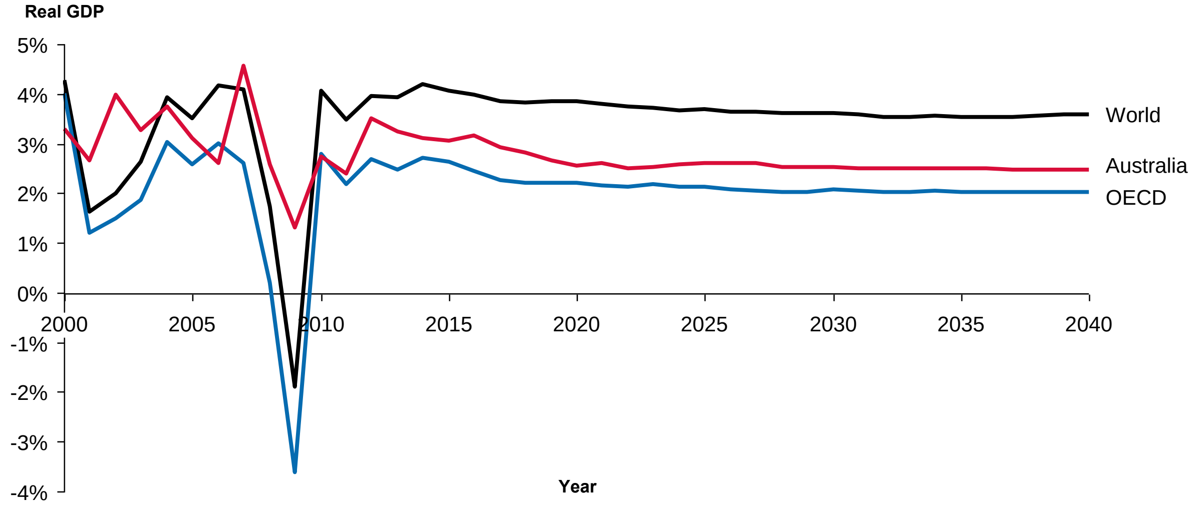
Finally Section 5.14 provides a summary of our Base Case assumptions.

5.2 Economic Growth

Real income growth is the key driver of demand for international and domestic aviation services. In particular, the performance of the Australian economy is of paramount importance.

Figure 31 shows that the Australian economy remained buoyant relative to OECD and global performance between 2007 and 2009. Australian Gross Domestic Product (GDP) was supported by the resources sector and the increased demand for raw materials and minerals from China and Japan. Australia boasts that it is the only industrial country not to enter a technical recession during the Global Financial Crisis (GFC). Figure 31 also shows that projected Australian GDP growth is expected to continue to recover post GFC. Significantly, Australia is expected to outperform OECD growth over the 30 year period to 2040.

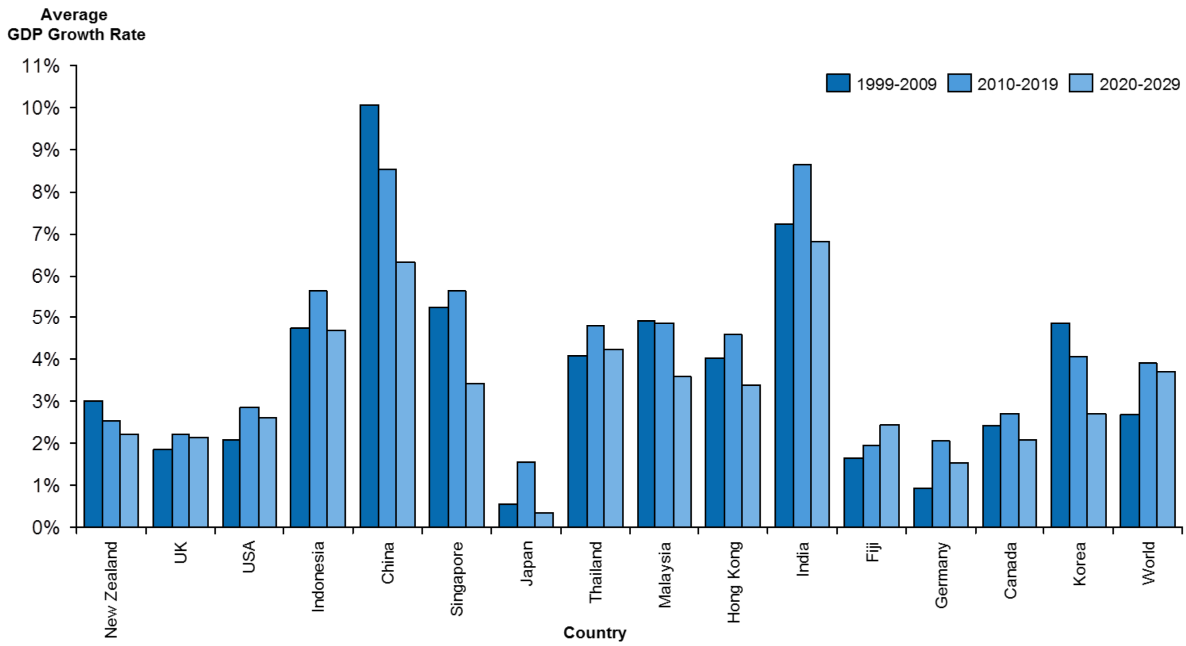
Figure 31 – Australian GDP Growth in relation to World and OECD figures, 2000-2040



Source: Global Insight World Overview 2011

Figure 32 shows average historical and forecast real GDP growth rates for key source economies for inbound travel to Australia. Strong growth has been experienced by a number of Asia-Pacific economies over the past 10 years and is expected to moderate over the next 20 years. More mature economies such as New Zealand, Europe, North America and Japan are expected to maintain levels of growth consistent with historic economic growth. However, key growth markets such as China, India and much of Asia are expected to drive strong growth in the international markets, especially given the trend towards air service liberalisation and an emerging middle class with strong travel aspirations.

Figure 32 – Key Inbound Market – Average Economic Growth (1999-2029)



Source: Global Insight World Overview 2011

5.2.1 Economic Growth Assumptions

5.2.1.1 Base Case

Inbound International Market

The income measure for the inbound international market was forecast real GDP growth by country. World GDP growth was used as the input for the inbound 'other' market. The GDP growth rates used in the forecasts are provided in Table 11. Forecast GDP growth rates by country were sourced from Global Insight for 2010 to 2040 with the 2040 GDP growth rate for each country then carried forward to 2060.

Outbound International and Domestic Market

Australian GDP growth rates were applied to the outbound international, domestic and regional markets. Average growth rates are shown in Table 11. Similar to the international inbound market segments, GDP growth rate forecasts ceased at 2040 at which point 2040 growth rates were carried forward to 2060.

Table 11 – Estimated GDP Growth Rates by Country, 2010 to 2060

Market	Country	Average Forecast Growth 2010 to 2040	2040 to 2060
Outbound	Australia	2.7	2.5
Inbound	New Zealand	2.3	2.0
	UK	2.1	1.9
	USA	2.6	2.5
	Indonesia	4.7	3.9
	China	6.6	5.0
	Singapore	4.0	2.8
	Japan	0.7	0.2
	Thailand	4.4	4.0
	Malaysia	4.0	2.9
	Hong Kong	3.5	2.5
	India	6.4	5.0
	Fiji	2.2	1.8
	Germany	1.5	1.3
	Canada	2.3	2.2
	South Korea	2.9	2.1
	Other (World GDP Growth)	3.6	3.6

Source: Global Insight World Overview 2011

5.2.1.2 Scenarios

Low and High Case scenarios for economic growth were tested. For the Low Case, it was assumed that economic growth will be 0.5 per cent below the Base Case for developed markets[15] and 1.0 per cent below the Base Case for developing markets[16]. For the High Case, it was assumed that economic growth will be 0.5 per cent above the Base Case for developed markets and 1.0 per cent above the Base Case for developing markets.

5.3 Air Fares

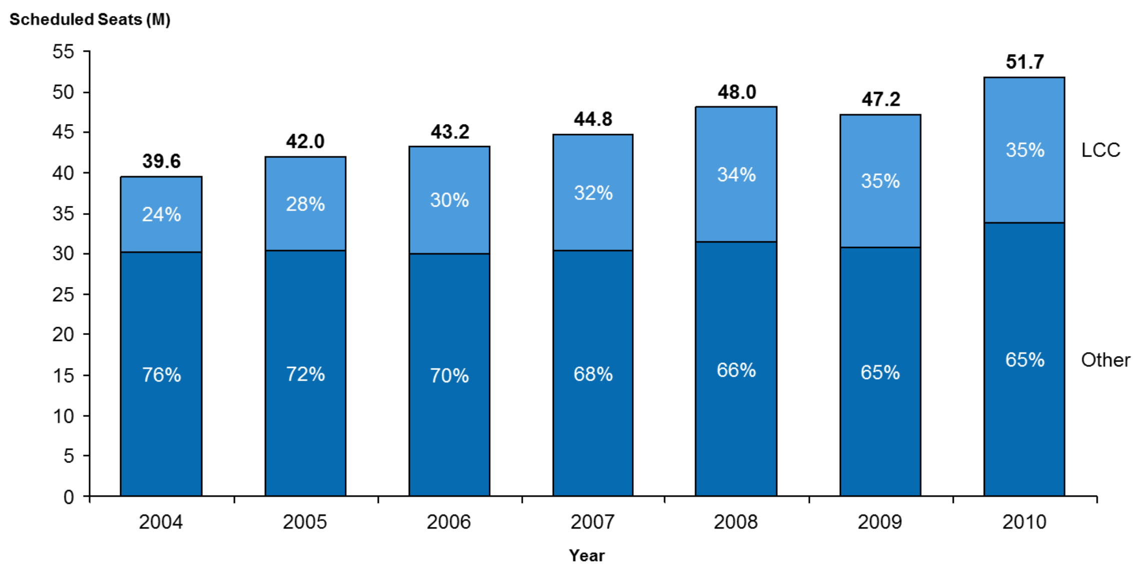
Air fares have become an increasingly important driver of air travel demand due to the emergence of LCCs making air travel more affordable to a market who would not have previously travelled. In Australia, the LCC model was initially pioneered by Virgin Australia (then Virgin Blue) and subsequently Jetstar, which have grown to be two of the largest and most successful carriers in Australasia. Since its inception into the aviation market in 2002-03, Virgin Australia and Jetstar have continued to grow, reaching across Australia and now taking a stronger foothold in markets abroad. The cost advantages enjoyed by LCCs over FSCs are significant and have been reflected in significant drops in airline yields on key routes across Australia.

Figure 33 shows that total scheduled seats at Sydney region airports increased from 39.6 million in 2004 to 51.7 million in 2010, equivalent to an increase of about 31 per cent. LCCs were clearly a strong driver of this growth, with the LCC market share at the Sydney region airports increasing from 24 per cent to 35 per cent over this period as illustrated in Figure 33.

[15] Developed economies include Australia, New Zealand, United Kingdom, United States, Singapore, Japan, Germany, Hong Kong and Canada.

[16] Developing economies include Indonesia, China, Thailand, Malaysia, India, Fiji, Korea and Other

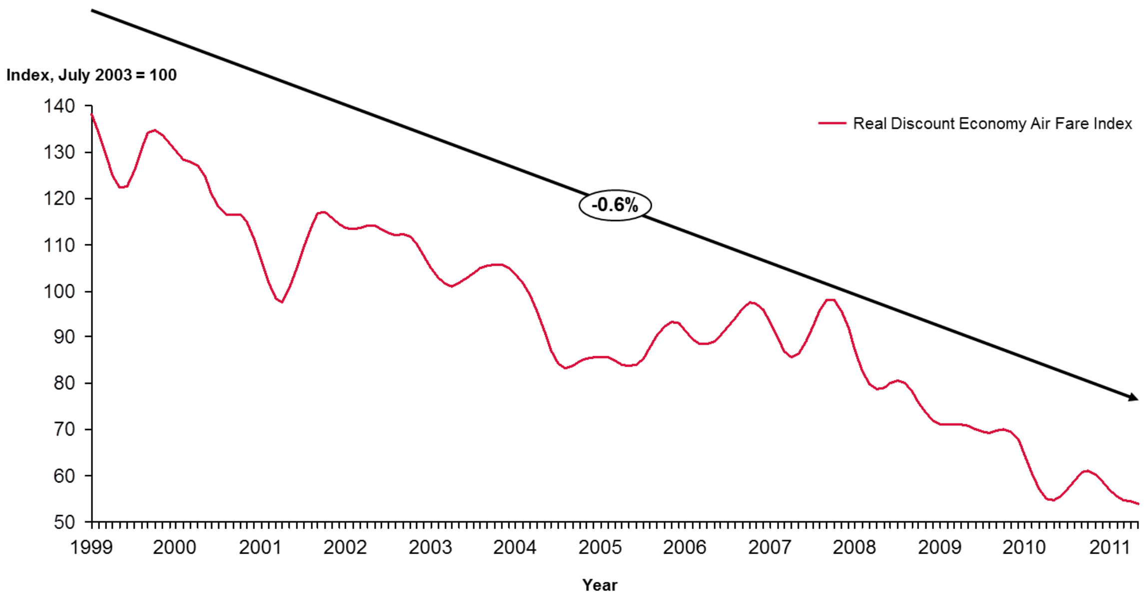
Figure 33 – LCC Share of Scheduled Seat Capacity at Sydney Region Airports, 2004 to 2010



Note: Includes schedule domestic, regional and international seat capacity at Sydney, Canberra and Newcastle airport. LCCs include Virgin Australia, which has evolved from a traditional LCC into a hybrid carrier in recent years.
Source: SRS analyser

Figure 34 illustrates the decline in real Australian domestic air fares since 1999. It shows that discount economy air fares have dropped by around 0.6 per cent per annum between 1999 and 2011.

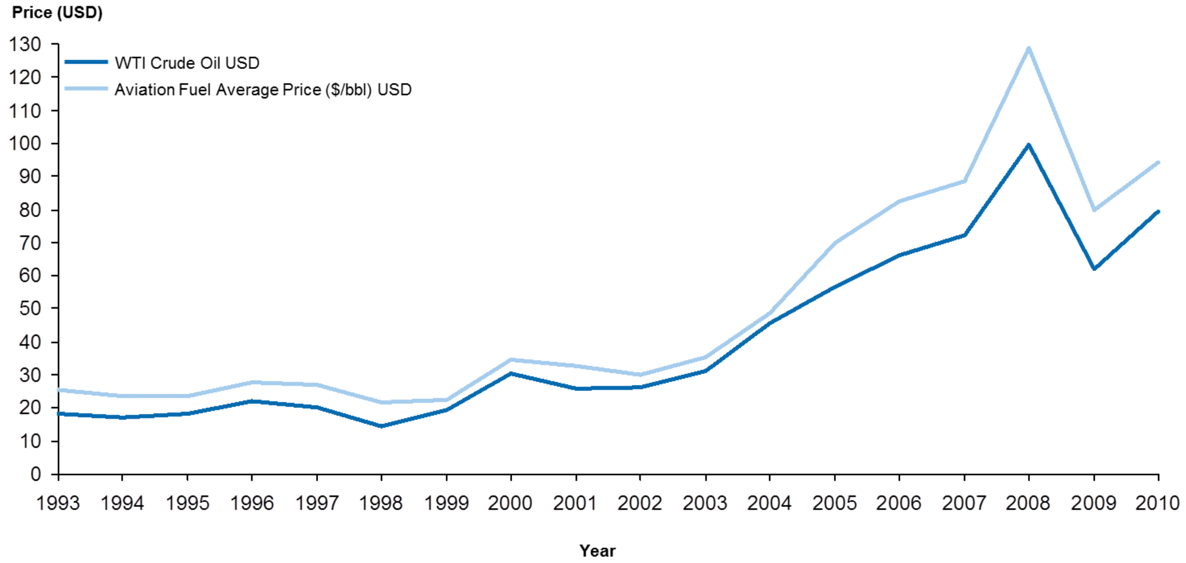
Figure 34 – Real Domestic Air Fare Index Real Discount Economy 13 Month Moving Average, 1999– 2011



Note: Discount economy index.
Source: BITRE

Air fares are expected to continue to decline given the continued increase in market share by LCCs and improvements in technology leading to more cost efficient aircraft. This trend in real air fares could be offset to some extent by increases in fuel prices. Fuel costs make up a significant proportion of airline operating costs, with fuel making up nearly a quarter of Qantas Group's expenditure[17]. Any increase in fuel prices puts additional pressure on airline profits, and airlines are likely to pass these costs onto passengers either through increasing air fares or imposing a fuel surcharge, which is likely to increase the cost of travel and therefore dampen demand for air travel. As shown in Figure 35, jet fuel prices increased steadily from 2003, peaking at close to USD130 per barrel in 2008. Prices dropped in 2009 but saw recovery in 2010 as demand for oil increased as economies emerged out of recessionary periods following the GFC.

Figure 35 – Annual Crude Oil and Jet Fuel Prices (bbl), 1993- 2010



Source: EIA, Bloomberg

5.3.1 Air Fare Assumptions

5.3.1.1 Base Case

Given the ongoing proliferation of LCCs and the long-term historical trend of declining real air fares, a 0.5 per cent decrease in domestic and international air fares was assumed to 2015. It was assumed that in the medium to long-term, a continued decline in real air fares will become unsustainable and therefore air fares will stabilise in real terms.

[17] *2010 Qantas Annual Report*

Table 12 – Real Air Fare Scenario, 2010 to 2060

Forecast Year	Percentage Change
2010	-0.5%
2011	-0.5%
2012	-0.5%
2013	-0.5%
2014	-0.5%
2015	-0.5%
2016 to 2060	0.0%

Source: Booz & Company estimates

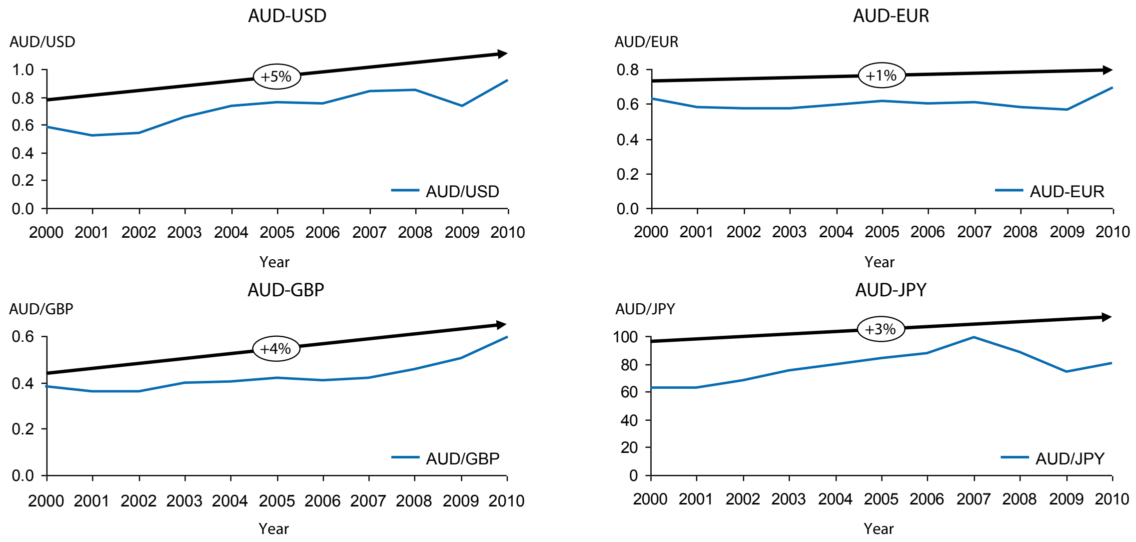
5.3.1.2 Scenarios

The low air fare scenario assumed that air fares continue to decrease more rapidly at -2.5 per cent per annum to 2015, before tapering off to 0.0 per cent by 2020. The high air fare scenario assumed that oil prices continue to increase, forcing airlines to either increase fares or increase prices on air fares thus increasing the cost of travel. This assumed that air fares increase at 2.5 per cent per annum to 2015, tapering off to 0.0 per cent over the 5 years to 2020 and remaining at that level in real terms thereafter.

5.4 Exchange Rates

Exchange rate movements impact on purchasing power for both international visitors to Australia and Australian residents travelling abroad. A strong Australian dollar will encourage outbound tourism, whilst a weak Australian dollar will encourage inbound tourism. As shown in Figure 36, the Australian dollar has appreciated against major currencies in nominal terms.

Figure 36 – Nominal Exchange Rates, Australian Dollar Versus Selected Currencies 2000 to 2010



Source: www.oanda.com

5.4.1 Exchange Rate Assumptions

Given the impracticalities of forecasting exchange rates in the medium and long-term, this parameter was excluded from the international forecasting model. This implicitly assumes that exchange rates remain constant in terms of purchasing power parity (PPP) over the forecast horizon.

5.5 Tourism

International tourism is a key driver of aviation demand and is a major contributor to the global economy.

5.5.1 International Tourism

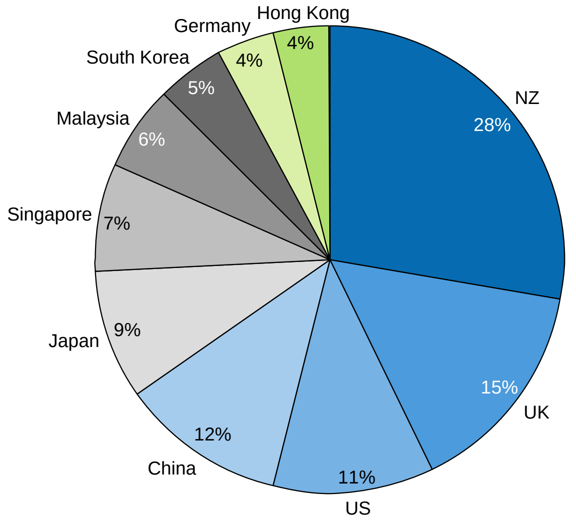
The Department of Resources, Energy and Tourism has identified the top 10 inbound markets, shown in Figure 37, for international travel into Australia, consisting of: New Zealand, United Kingdom, United States, China, Japan, Singapore, Malaysia, Indonesia, South Korea, Germany and Hong Kong.

Figure 37 – Top Ten International Visitor Markets to Australia, 2009

Source: Booz & Company

Figure 38 describes the origin of inbound visitors to Australia from May 2010 to April 2011. New Zealand was the dominant inbound market, accounting for 28 per cent of the total from the top 10 markets. In aggregate, New Zealand, United Kingdom and the United States accounted for over half (i.e. 54 per cent) of total inbound tourists from the top 10 markets.

Figure 38 - Top 10 International Visitor Markets by Origin, April 2011 YTD



Source: Tourism Research Australia

The top 10 international visitor markets remained vulnerable throughout much of the GFC. Visitors from Japan (-23 per cent), the UK (-4 per cent) and China (-5 per cent) fell in FY09 compared to the previous financial year. The fall in the UK visitor rate was very likely due to the GFC and unfavourable currency movements impacting on the purchasing power of the British pound.

There were strong FY11 passenger growth rates[18] from some markets in the top 10 inbound international visitors group. China (20.4 per cent), Malaysia (9.2 per cent), Hong Kong (7.9 per cent), Singapore (7.6 per cent) and New Zealand (5.0 per cent) all experienced strong annual growth. Inbound visitors from Japan (-17.1 per cent), South Korea (-8.2 per cent), United Kingdom (-3.6 per cent), Germany (-1.7 per cent) and the United States (-0.6 per cent) decreased in April 2011 compared to 12 months earlier.

Figure 39 shows that total inbound visitors increased from 4.5 million in 1999 to 5.9 million in 2010, representing an increase of 32 per cent or 2.6 per cent per annum on average. Figure 39 also shows that the share of inbound international travellers to Australia travelling for leisure purposes has edged slightly lower over the past decade. Conversely, business travel has seen a slight upward trend over the period, reaching peaks of 24 per cent in 2008 and 2010.

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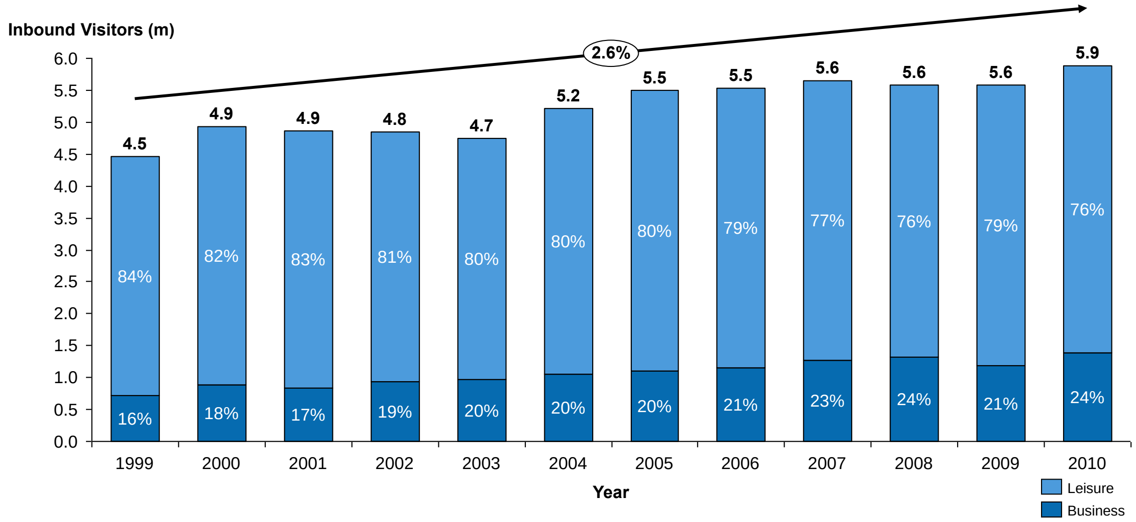
[18] *Tourism Australia, July 2011*

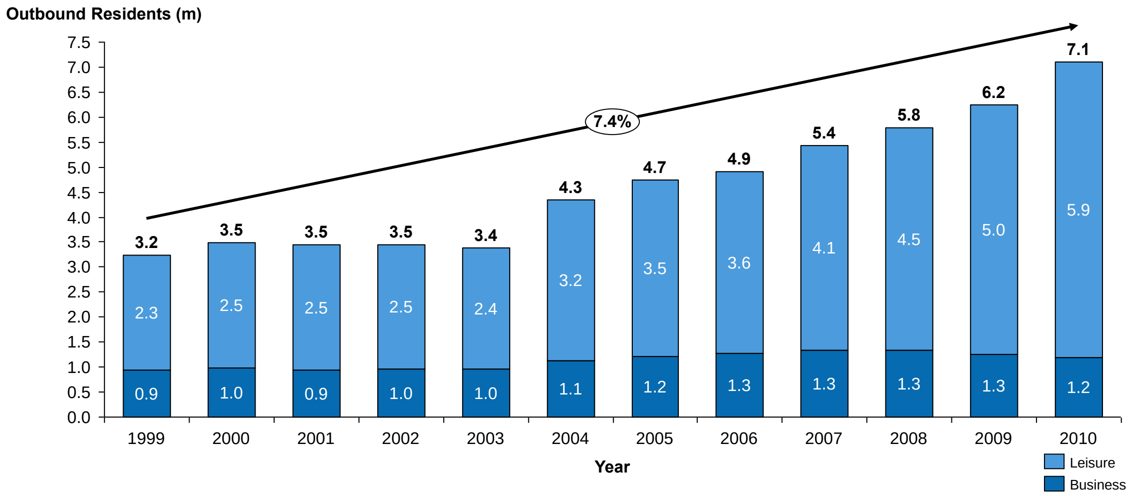
Figure 39 - International Visitors to Australia by Purpose of Travel[19], 1999- 2010



Source: Tourism NSW Data National and International Visitor Survey, 1999 to 2010

Total outbound travel by Australian residents has grown more rapidly compared to inbound visitors at an average annual rate of 7.4 per cent over the last decade from 3.2 million in 1999 to 7.1 million in 2010. The share of Australian residents travelling abroad for leisure purposes has increased in the 10-year period from 1999, hitting a high of 83 per cent in 2010 (see Figure 40).

Figure 40 - Outbound Australian Residents by Purpose of Travel, 1999- 2010



Source: Tourism NSW Data National and International Visitor Survey, 1999 to 2010

The largest source of arrivals by country in 2010 came from New Zealand (i.e. 1.2 million arrivals). This was 80 per cent higher than the next largest market, the United Kingdom (i.e.

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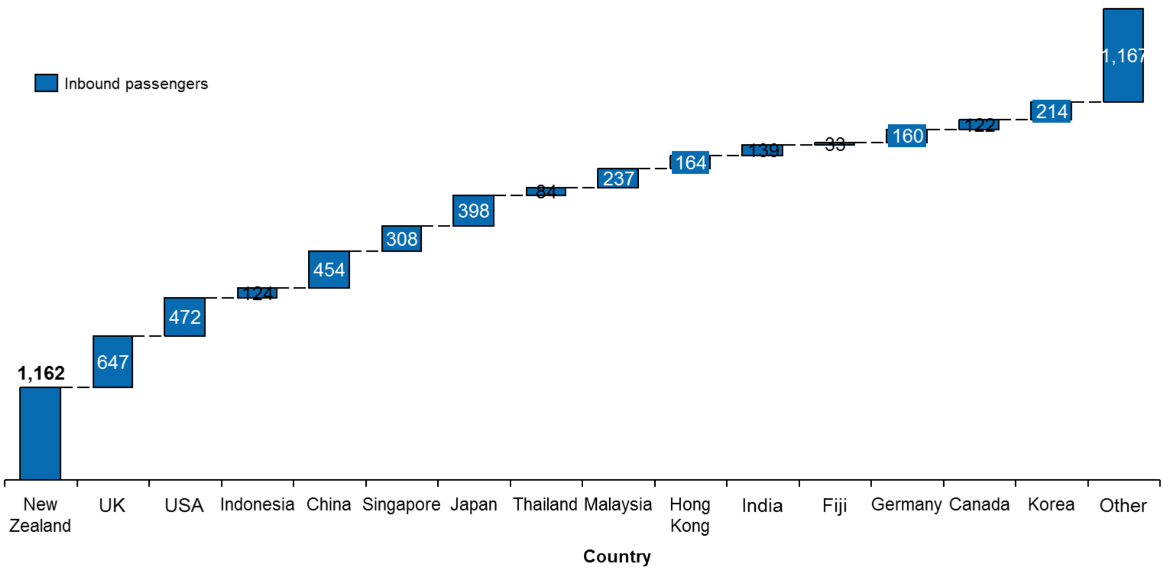
[19] *Purpose of travel definitions (as per Tourism Australia definitions):*

- *Business - passengers travelling for work, to attend conferences, exhibitions or conventions, or as part of employed research, or for work related training.*
- *Leisure – passengers travelling to visit friends and relatives, for holiday, leisure or relaxation, for entertainment, for sport, to shop, attending special events, as an incentive reward provided by an employer, or accompanying someone attending a conference.*

0.52 million arrivals). The breakdown of inbound visitors to Australia by country is shown in Figure 41.

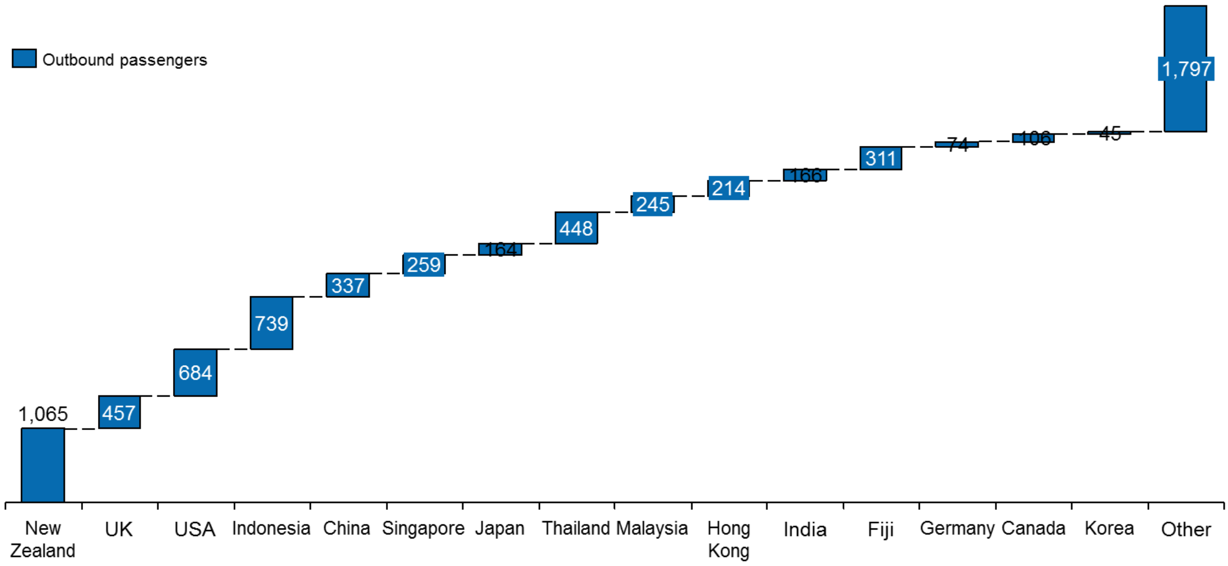
Figure 41 - Inbound Passengers to Australia by Country, 2010 (000s)



Source: ABS Data 3401.0 - Overseas Arrivals and Departures, Australia, 2011, Seasonally Adjusted - Calendar year

Figure 42 shows that the largest outbound destination for Australian residents is New Zealand (1.07 million or 15 per cent of the total) followed by the US (0.68 million or 10 per cent). The strong Australian dollar has offered favourable opportunities for Australians to travel to New Zealand from a purchasing power perspective. As illustrated in Figure 36, the Australian dollar has been appreciating against the US dollar over the past 10 years, which has enabled cheaper travel to the US. In addition, the start-up of Virgin Australia flying to the United States has provided increased services at more affordable prices. South East Asian countries such as Thailand, Singapore and Indonesia (Bali) have experienced an increase in visitor numbers from Australia due in part to LCC Jetstar expanding international operations.

Figure 42 - Outbound Passengers from Australia by Country, 2010 (000s)



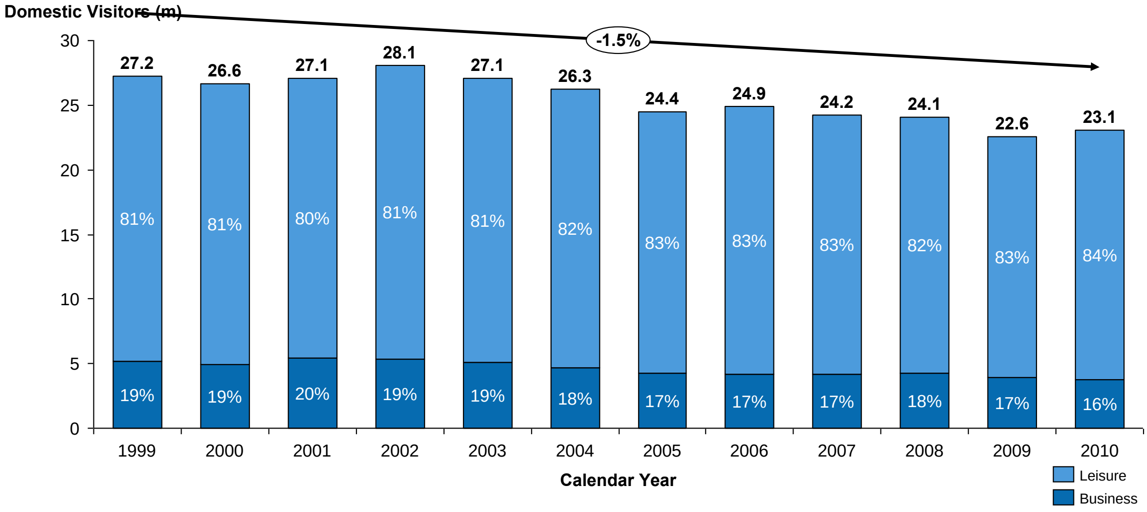
Source: ABS Data 3401.0 - Overseas Arrivals and Departures, Australia, 2011, Seasonally Adjusted - Calendar year

5.5.2 Domestic Tourism

Trends in domestic tourism for visitors to the Sydney region were evaluated to inform future growth forecasts by purpose of travel. Much of the data analysed is at the state level and includes all modes of transport, however an assumption has been made that the trends are representative of the Sydney region aviation activity. It is estimated that a higher proportion of domestic visitors travelling by air would be travelling for business purposes compared with those travelling by private vehicle, rail or other modes.

A decrease of approximately 3 per cent in the proportion of business trips is evident over the period 1999 to 2010 (see Figure 43). Total domestic visitors to NSW increased from 27.2 million in 1999 to 23.1 in 2010, representing an average annual decrease of 1.5 per cent.

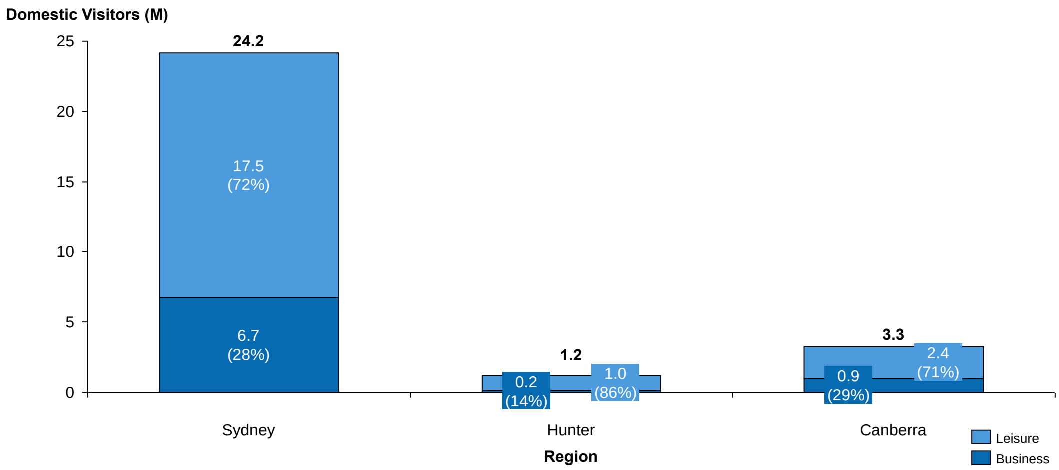
Figure 43 - Domestic Visitors to NSW by Trip Purpose, 1999 - 2010



Note: Includes all modes of transport. Air transport was used by 16.5 per cent of domestic visitors to NSW in 2009 with private vehicle dominating with 77.5 per cent.
Source: Tourism NSW

As illustrated in Figure 44, there are significantly more visitors to NSW/ACT for leisure rather than business purposes across all regions. Sydney has the most domestic visitors with 24.2 million, followed by Canberra with 3.3 million and then by the Hunter region with 1.2 million. Canberra and Sydney have a higher proportion of domestic visitors travelling for business purposes with 29 per cent and 28 per cent respectively, whilst the Hunter region has a much smaller proportion of visitors travelling for business purposes at 14 per cent.

Figure 44 - Domestic Visitors to NSW/ACT by Region and Purpose, 2010



Note: Includes all modes of transport
Source: Tourism NSW

5.5.3 Purpose of Travel Assumptions

5.5.3.1 Base Case Assumptions

It is likely that Sydney (Kingsford-Smith) Airport will continue to service predominantly full service carriers and favour higher yielding passengers, such as origin-destination business passengers. It is therefore assumed that as Sydney (Kingsford-Smith) Airport becomes more constrained, the share of business traffic increases relative to leisure. The share of business passengers was capped at a maximum of 35 per cent, which is based on the business share of passengers at London's constrained Heathrow Airport.[20]

5.6 Air Services Agreements

Australia currently has air services agreements/arrangements with 68 countries. Airlines operating international air services do so within capacity entitlements contained in air services arrangements.

In the aviation context, the concept of liberalisation fundamentally concerns the removal of quantitative limitations, pricing restrictions, barriers to market entry, investment in firms and co-operation between firms. These aspects are coupled with qualitative controls that will build consumer confidence in the air transport product and encourage and protect fair and open competition.

5.6.1 Air Services Agreement Assumptions

It was assumed that the required liberalisation is progressively achieved in countries with limits on air services to and from Australia, allowing forecast demand to be achieved in these markets.

5.7 Policy Settings

There are a number of policy settings that minimise the impact of noise on the Sydney region surrounding Sydney (Kingsford-Smith) Airport. These include the Long Term Operating Plan (LTOP), the curfew and hourly aircraft movement caps. These are discussed further in the following sections.

5.7.1 Long Term Operating Plan (LTOP)

The LTOP was developed in the mid-1990s to share the noise generated by Sydney (Kingsford-Smith) Airport. The LTOP provides 10 different ways of using the Airport's three runways and associated flight paths. These are known as Runway Modes of Operation. Under the LTOP, when making runway selections each day, Airservices Australia must ensure that, subject to safety and weather conditions:

- as many flights as practical come and go using flight paths over water or non-residential areas where aircraft noise has the least impact on people;
- the rest of the air traffic is spread or shared over surrounding communities as fairly as possible; and
- runway modes change throughout the day so individual areas have some break (or respite) from aircraft noise on most days.

The LTOP has noise sharing targets for the amount of aircraft movement to the north, south, east and west of the Airport. The plan is designed to place as many flights as possible over

[20] *UK Civil Aviation Authority*

water) and for the remaining flights to be shared between the other three directions as equally as operationally feasible.

5.7.2 *Curfews*

Curfews balance airport commercial operations and safety requirements with the need to reduce night-time aircraft noise for nearby communities. A night-time curfew at Sydney (Kingsford-Smith) Airport restricts flights between 11pm and 6am.

The *Sydney (Kingsford-Smith) Airport Curfew Act 1995* does not preclude all aircraft movements overnight. It limits take-offs and landings at Sydney (Kingsford-Smith) Airport between 11pm and 6am by restricting:

- the types of aircraft that can operate;
- the runways they can use; and
- the number of flights allowed.

Generally, passenger jets are not allowed in and out of Sydney (Kingsford-Smith) Airport overnight.

Small propeller driven aircraft, 'low noise' jets that meet weight and noise requirements, and a limited number of freight aircraft can operate during the curfew. This allows movements of time-critical freight including mail and fresh food.

A small number of international passenger jet movements can be approved during the shoulder period between 5am and 6am. This is to cover time differences associated with the northern hemisphere summer scheduling season. During the curfew aircraft must operate over Botany Bay.

5.7.3 *Movement Cap*

The *Sydney (Kingsford-Smith) Airport Demand Management Act 1997* was enacted on 17 November 1997. The Act has a policy setting of 80 hourly movements[21] and establishes a framework for a slot management scheme. A slot allocated under the Scheme permits a specified aircraft movement at a specified time, on a specified day. All commercial and private aircraft require a 'slot' to land or take-off at Sydney (Kingsford-Smith) Airport.

Day-to-day administration of the Slot Scheme is undertaken by Airport Co-ordination Australia (ACA). Slot allocation is considered in further detail in Section 5.8.

5.7.4 *Access for Regional Services*

A number of slots are also protected for access by regional (intra-state NSW) services.

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[21] *The 80 movement per hour cap is based on a rolling clock.*

5.7.5 *Policy Setting Assumptions*

It was assumed that all existing policy settings relating to airport infrastructure in the Sydney region remain in place throughout the forecast period.

This implies that hourly movements at Sydney (Kingsford-Smith) Airport do not exceed 80 throughout the forecast period.

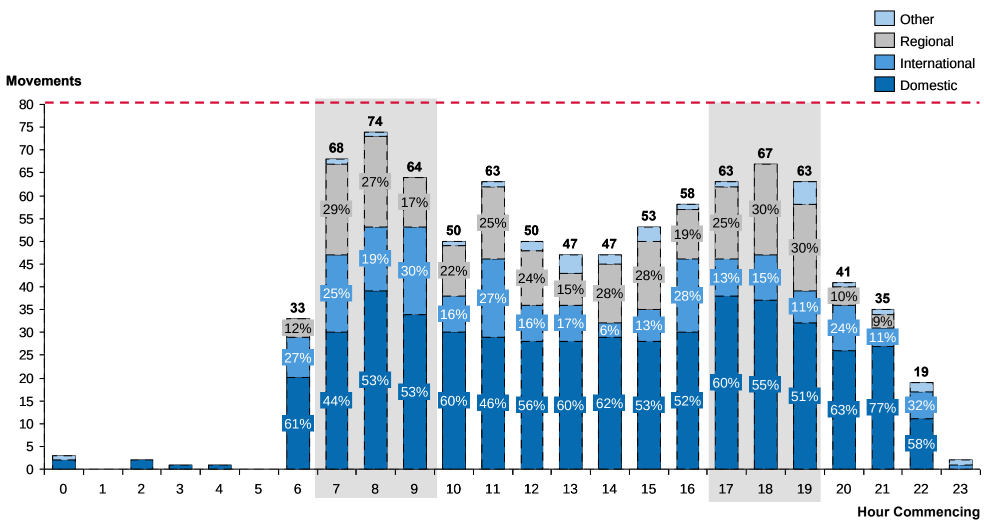
It is assumed that regional services are guaranteed slots and therefore services do not get pushed out by larger capacity domestic and international services even when capacity is constrained.

5.8 Slot Allocation

The legislation governing aircraft movement and slot allocation came into effect in March 1998.

The proportion of slots at Sydney (Kingsford-Smith) Airport dedicated to international and domestic services have been estimated based on planning day schedules[22]. As can be seen in Figure 45, the typical peak hour has been estimated as 74 movements, with 19 per cent of these (i.e. 14 movements) assumed to be international, 53 per cent (i.e. 39 movements) domestic and 27 per cent (i.e. 20 movements) regional.

Figure 45 – Planning Day Hourly Movements by Service Type, November 2010



Note: 12 November 2010
Source: Airservices Australia (hourly movements), SRS analyser (split by type of movement).

Table 13 shows the share of scheduled movements by service type and time of day. There are a higher proportion of regional movements during the peak hours compared with the share of movements throughout the entire day. This is consistent with demand for business travel, which increases in peak hours. The proportion of international movements is

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[22] The planning day, 12 November 2010, is based on the 30th busiest day between May 2010-April 2011. The difference between the allocation of slots and actual movements on the day has not been taken into account in this report. Relying on the number of allocated slots to develop our forecasts would be misleading, as often they do not correspond to the number of movements which occurred on day, For instance, on 12 November 2010 a total of 1,009 slots were allocated, however, only 904 movements were recorded on the day.

generally higher during the morning peak. International services are more constrained in terms of slot times and are more prominent during and around peak times than in the middle of the day. This may be due to slot constraints and timing issues at the origin/destination airport and the need for connectivity.

Table 13 – Share of Scheduled Movements by Service Type and Time of Day, 12 November 2010

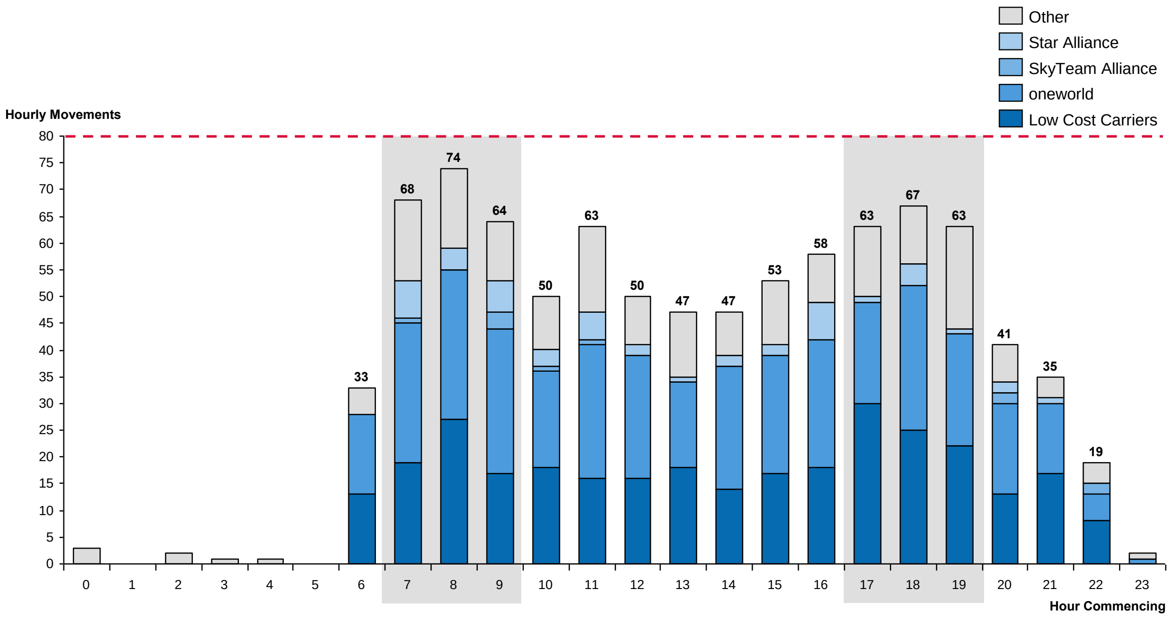
Share of Movements	Domestic	International	Regional	Total
During peak hours[1)]	52.6%	18.8%	26.6%	98.0%
Throughout the day[2)]	55.4%	19.1%	22.6%	97.1%
Peak premium/ (deficit)	(2.8%)	(0.3%)	4.0%	0.9%

1) Peak hours include 0700 – 0959 and 1700-1959

2) The full operational day exists between 0600-2259
Source: SRS analyser, 12 November 2010

Figure 46 illustrates planning day hourly movements by carrier type.

Figure 46 – Planning Day Hourly Movements by Carrier Type, November 2010



Note: Virgin Australia is included in LCC as per SRS analyser classification, however there has been a recent shift in focus towards business travellers.
Source: Airservices Australia (hourly movements), SRS Analyser (split by type of movement).

As summarised in Table 14, LCCs have a higher proportion of movements during the peak hours compared to the proportion of movements throughout the day.

Table 14 – Share of Scheduled Movements by Type of Carrier and Time-of-Day, November 2010

Share of Movements	LCCs	oneworld	SkyTeam Alliance	Star Alliance	Other	Total
During peak hours1)	35.1%	37.1%	1.0%	5.8%	21.1%	100.0%
Throughout the day2)	34.4%	39.0%	1.1%	5.4%	20.1%	100.0%
Peak premium /(deficit)	0.7%	(1.9%)	(0.1%)	0.4%	0.9%	0.0%

Note: Virgin Australia is included in LCC as per SRS analyser classification, however there has been a recent shift in focus towards business travellers.
1) Peak hours include 0700 – 0959 and 1700-1959
2) The full operational day exists between 0600-2259
Source: SRS analyser, 12 November 2010

5.8.1 Busy Hour Assumptions

5.8.1.1 Base Case

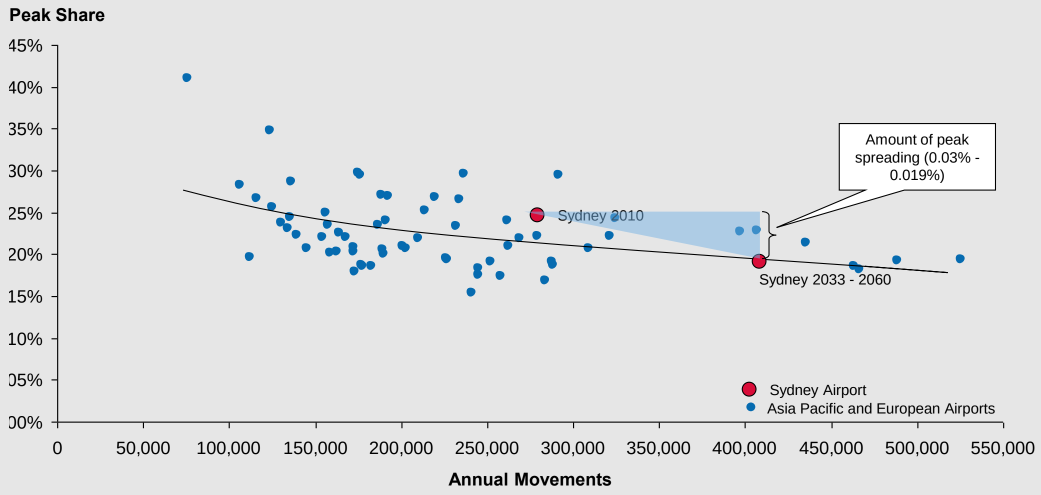
Based on current schedules, it was assumed that the 74 peak movements comprised of 39 domestic movements, 14 international movements, 20 regional movements and 1 other movements (GA).

It was assumed that growth in the busy hour could be achieved across all markets until a total of 80 movements was reached, at which point it was assumed that excess demand during the peak periods were redistributed until the peak spreading limit was reached.

As a result of Sydney (Kingsford-Smith) Airport nearing the hourly cap in the busy hour, peak spreading will be key to facilitating future aircraft movement growth at Sydney (Kingsford-Smith) Airport. Given curfew restrictions, the model assumed that Sydney (Kingsford-Smith) Airport operates 17 hours per day from 6am to 11pm thus enabling peak spreading to occur across these hours. It was assumed that a number of slots remain unused due to timing or turnaround times. However, the theoretical maximum daily movements based on 80 movements per hour, for 17 hours of operation is 1,360 movements per day or 496,400 movements per annum. In reality, the practical capacity will be somewhat less than this theoretical capacity (i.e. weather impacts, unused slots etc). Reference was therefore made to international benchmark data.

Figure 47 shows that as annual movements at an airport increase, the busy hour share of annual movements decreases. If it is assumed that peak spreading can continue to occur until the Sydney (Kingsford-Smith) Airport busy hour share decreases to a minimum of 0.019 per cent of annual RPT movements, this is consistent with an implied annual RPT movement cap of around 414,000 movements or around 443,000 inclusive of freight, GA and military movements.

Figure 47 – Assumed Busy Hour Share of Annual RPT Movements, Sydney



Note: Excludes dedicated freighters, GA and military movements Source: Booz & Company analysis of 66 Asia Pacific and European airports

Once movements start to become constrained at Sydney (Kingsford-Smith) Airport, it is assumed that regional services maintain the existing level of movements, which is consistent with the policy setting guaranteeing access for regional services. It is assumed that international services can continue to grow at the expense of domestic services as yields and aircraft capacity is higher, allowing more passengers and higher revenues.

An assumption was made that where movements were required to be redistributed then around 15 per cent of passengers would be suppressed due to there not being a flight available at the ideal time they wish to travel. As more services are required to be redistributed due to constraints, the more passengers are assumed to be suppressed.

Peak Spreading Assumptions for Newcastle Airport

Peak spreading assumptions were also applied to Newcastle Airport forecasts. The civil movement cap for Newcastle Airport is currently fixed at 6 arrivals per hour based on an agreement with the Department of Defence. It is assumed that any movements that exceed 6 arrivals or 6 departures per hour are redistributed to adjacent hours.

5.8.1.2 Scenarios

Two additional scenarios were modelled[23]:

- A low peak spreading scenario – it assumed that only minimal peak spreading can be achieved from the current level, with a peak spreading ratio of approximately 0.021 per cent. This assumes a maximum of approximately 382,000 annual RPT movements and 409,000 annual total movements (i.e. inclusive of RPT, dedicated freighters, GA and military movements).

- A high peak spreading scenario – it assumed a peak spreading ratio of approximately 0.018 per cent which corresponds to a maximum of around 451,000 annual RPT movements and 483,000 annual total movements (i.e. inclusive of RPT, dedicated freighters, GA and military).

5.9 Environmental Concerns

International aviation contributes to climate change through carbon dioxide and water emissions, 'aviation smog' and nitrogen oxides. It is estimated that aviation is responsible for 2 per cent of global human-induced carbon dioxide emissions[24]. Although the air transport industry has made improvements to aircraft technology and efficiency, reductions in greenhouse gas emissions (GHG) made from such capital investments have not been sufficient to compensate for the rapid growth of global air traffic (i.e. 50 per cent over the last decade). Furthermore, air travel is expected to be the fastest-growing transport mode in the future resulting in an increasing level of energy use and emissions; aviation emissions are expected to grow by 130 per cent by 2012 (compared with 2005 levels).

The Kyoto Protocol requires developed countries to pursue the limitation or reduction of emissions of greenhouse gases from aviation by working through the International Civil Aviation Organisation (ICAO). ICAO has agreed to the following initiatives:

- Targeted 2 per cent per annum improvement in fuel efficiency globally until 2050 (IATA has set a similar target of improving fuel efficiency by 1.5 per cent annually by 2020, carbon neutral growth from 2020 and a 50 per cent reduction in carbon emissions by 2050 as against 2005 levels);

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[23] *It should be noted that the low and high peak spreading scenarios presented in this report differ from the scenarios presented in the report "Sydney (Kingsford-Smith) Airport Planning Day Peak Spreading". This is due to the nature of the analysis undertaken, which was based on the 30th busiest day rather than an average day.*

[24] *Intergovernmental Panel on Climate Change*

- Global carbon dioxide standard for aircraft;
- Framework for market-based measures in international aviation;
- Measures to assist developing states and to facilitate access to financial resources, technology transfer and capacity-building; and
- Continued further work on the development of sustainable alternative fuels for aviation worldwide.

However, an issue is that most non-scheduled operators and LCCs, currently representing about 18 per cent of revenue tonne kilometres (RTKs) and increasing, are not party to the industry targets.

5.9.1 Australian Carbon Price Proposal

The recent proposal by the Australian Government to introduce a carbon price starting 1 July 2012, assumes that the carbon price will start at $23 and be fixed for the first three years. It has been estimated that the price is likely to represent 1.5 to 2.4 per cent of average domestic and international air fares, respectively[25].

The analysis to obtain our percentage range was based on the following assumptions:

- The announced carbon price of $23 per tonne of CO2;
- Average CO2 per passenger km of 0.1122, as per DEFRA (UK);
- Average kms per domestic and international route (as derived from scheduled services); and
- Average fare per domestic and international route (as per MIDT data).

The implied increase in fare was applied as a once off step change in 2012.

In addition, the impact of the UK air passenger duty and existing airline surcharges on average fares were analysed to create a range of scenarios around carbon pricing.

5.9.2 UK Air Passenger Duty Case Study

The Air Passenger Duty (APD) came into effect on November 1994 and is a levy on airline passengers. All chargeable operators from UK airports must register for APD. It is a per-passenger charge with the amount based on the band that the operator qualifies into. Previously there were four bands representing miles travelled and passenger class. Table 15 describes the eight bands coming into effect from November 2009 as an extension to passenger class and miles travelled.

[25] Based on share of existing average air fares to/from Australia and an estimate for available seat kilometres and the contribution to emissions

Table 15 – UK Air Passenger Duty - Standard and Reduced

Band	Range (Miles)	Tax
Standard Rates		
Band A	(0 – 2,000)	£22
Band B	(2,001 – 4,000)	£90
Band C	(4,001 – 6,000)	£100
Band D	> 6,000	£110
Reduced Rates		
Band A	(0 – 2,000)	£11
Band B	(2,001 – 4,000)	£45
Band C	(4,001 – 6,000)	£50
Band D	> 6,000	£55

Source: UK HM Revenue and Customs

The increase in Air Passenger Duty is expected to lead to a decline in carbon emissions. In the June 2010 Emergency Budget, the coalition government proposed a replacement of the APD with a new 'per plane' levy on commercial flights. This initiative is aimed to reduce the number of aircraft by encouraging airlines to operate fuller planes to minimise additional aircraft movements. This measure is due to come into effect in 2012. Table 16 shows the proportion of Air Passenger Duty included in fares on a selection of one-way British Airways flights.

Table 16 - Sample One-Way BA Fares and Proportion of Air Passenger Duty

Route	Distance (miles)	BA cheapest fare for 31 July (one way)	APD Band	% of one way flight
LHR-DXB	3,500	£1,600	B (£90)	6%
LHR-HKG	6,000	£1,000	C (£100)	11%
LHR-LAX	5,500	£900	C (£100)	11%
LHR-JFK	3,500	£650	B (£90)	14%
LHR-IST	1,600	£650	A (£22)	3%
LHR-FCO	900	£300	A (£22)	7%
LHR-LED	1,300	£600	A (£22)	4%
LHR-SIN	6,800	£850	D (£110)	13%
LHR-SYD	11,000	£1,200	D (£110)	9%
Average	4,500	£860	B (£90)	10%

Note: Based on one-way economy fare for British Airways, booked 2 weeks in advance. July 2010.
Source: BA website, great circle mapper, Booz & Company analysis

From the sample of flights analysed, the Air Passenger Duty as a proportion of the estimated fare averages 10 per cent across a range of destinations.

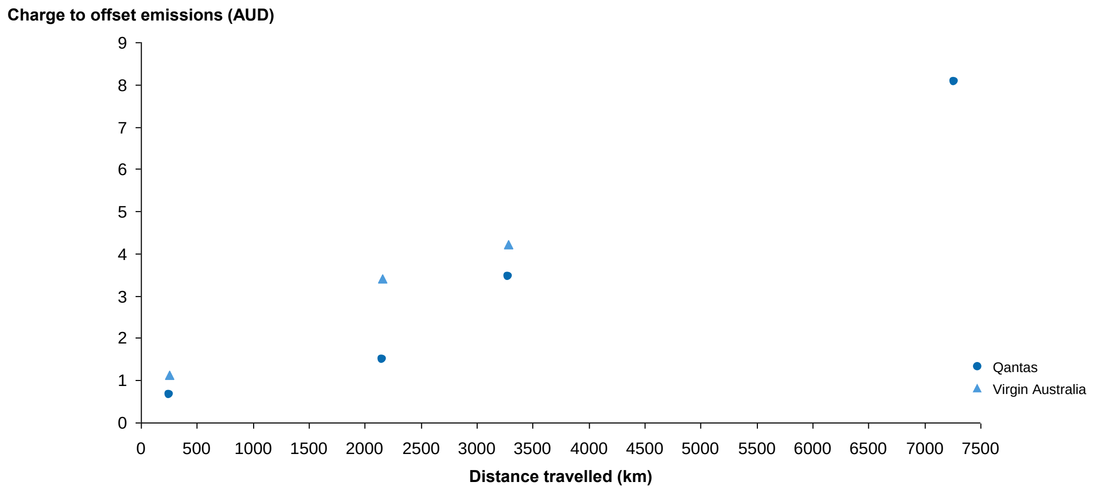
5.9.3 Airlines

Airlines such as Qantas and Virgin Australia have previously given passengers the option to 'fly carbon neutral' by incurring a small charge on top of their ticket price. The fee, paid when the ticket is purchased, offsets the per passenger carbon emissions that the flight will clock up on route. The aim is to help minimise the effects of carbon emissions on the environment, with the total contribution going towards climate change and environmental projects.

The carbon charge remains fixed for a specific route. However, its proportion of the total fare varies because the flight price is dependent on how far in advance the passenger books before departure. The emissions charge as a percentage of the total fare is likely to be higher for passengers who book their flight one month in advance versus a passenger who books a flight one week in advance because their ticket price is likely to be lower. The carbon charge usually stays below 1.5 per cent of the total fare for regional, domestic, short and long haul international flights.

Figure 48 illustrates the relationship between the carbon charge paid by passenger and the distances travelled.

Figure 48 – Passenger Carbon Charge Relative to Distance Travelled from Sydney



Source: Airline websites and Booz & Company analysis

5.9.4 Carbon Pricing Assumptions

5.9.4.1 Base Case

Under the Base Case, it was assumed that the introduction of a carbon pricing scheme does not have a material impact on passenger demand.

5.9.4.2 Scenarios

Scenarios were tested to determine the impact of a carbon price of 1.5 per cent as a proportion of the air fare paid (i.e. based on Australian airline carbon offset amounts) and

10.0 per cent of the air fare paid (i.e. based on the UK Air Passenger Duty) being introduced in 2012.

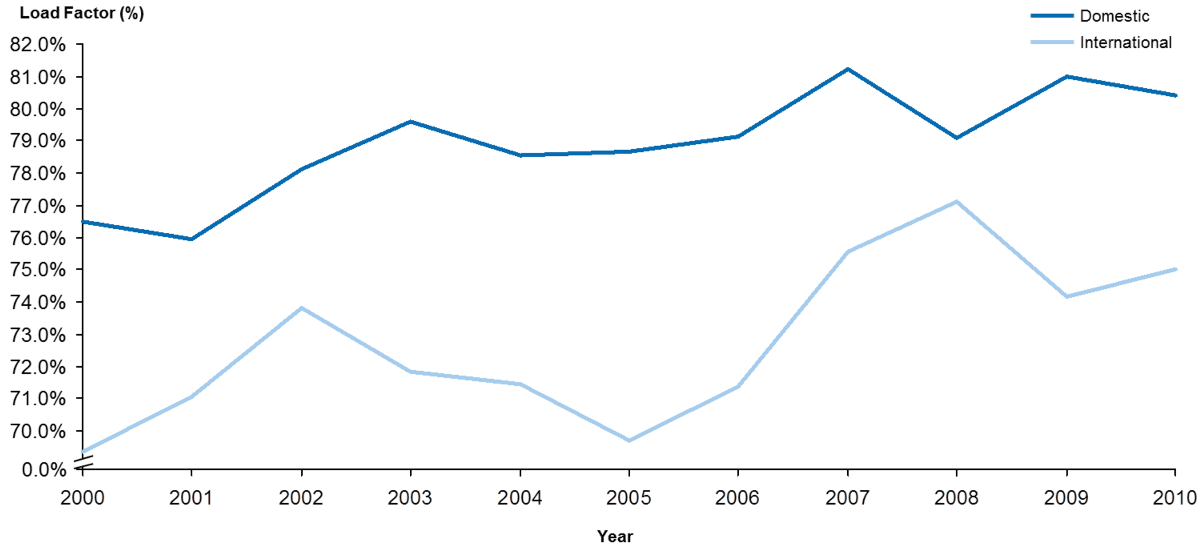
5.10 Average Passengers per Movement

Average passengers per movement were calculated using passenger seat load factor and fleet mix assumptions.

5.10.1 Load Factors

As shown in Figure 49, airline passenger seat load factors have been increasing in both the domestic and international markets at Australian airports. The average domestic passenger seat load factor has increased from approximately 77 per cent in 2000 to 80 per cent in 2010 and the average international load factor has increased from 69 per cent in 2000 to 75 per cent in 2010, after peaking at 76 per cent in 2008.

Figure 49 – Airline Load Factors at Australian Airports, 2000 to 2010



Source: BITRE

5.10.2 Load Factor Assumptions

Table 17 presents current (i.e. 2010) and projected passenger seat load factors used in the constrained and unconstrained forecasts. Given the impact of the global financial crisis on the air traffic industry in 2009, current load factors could be considered relatively low for most of the markets, in particular for the international market. As Sydney (Kingsford-Smith) Airport also nears capacity based on current aircraft movement caps, passenger seat load factors could be expected to increase.

Table 17 – Estimated Domestic, Regional and International Passenger Seat Load Factors (%), Selected Years 2010 to 2060 (1)

Market	2010	2015	2020	2030	2060
Domestic					
Sydney Domestic	80.4	80.4	80.4	80.4	80.4
Sydney Regional	69.0	69.0	69.0	69.0	69.0
Canberra	66.2	68.7	71.2	75.0	75.0
Newcastle	79.2	80.0	80.0	80.0	80.0
Bankstown	66.0	68.0	70.0	70.0	70.0
International	64.0	69.0	74.0	85.0	85.0

Note: (1) Bankstown Airport Load Factors were determined through the analysis of forecast data and aircraft seat capacity presented in the Bankstown Airport Master Plan 2005. Canberra & Newcastle Airports Load Factors apply to both domestic and regional traffic.

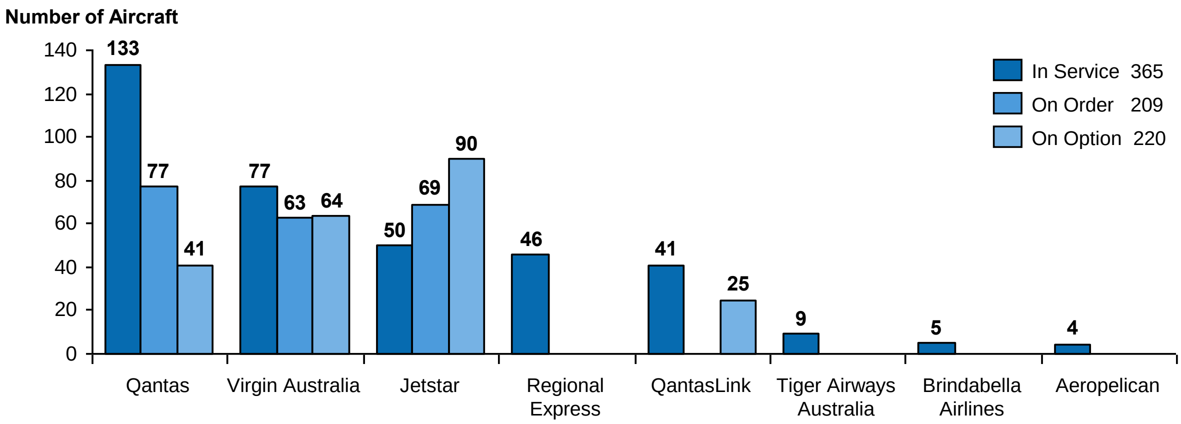
Source: BITRE, Booz & Company analysis

5.10.3 Fleet Development

Airline fleet capacity will impact on supply of air services as well as the type of destinations that can be served. A shift towards larger aircraft implies that more passengers can be accommodated with fewer aircraft movements and airlines can gain efficiencies through minimising fixed costs.

Figure 50 shows the number of aircraft Australia's airlines have on order. Of the airlines calling at the selected airports, there are 365 aircraft currently in service on both domestic and international routes. There are 429 aircraft on order and under option; more than are currently in service. Airlines under the Qantas banner including Qantas, Jetstar and QantasLink make up the majority of aircraft in Australia, with Virgin Australia the second largest stand-alone carrier. The smaller regional carriers generally have no aircraft under order or under option.

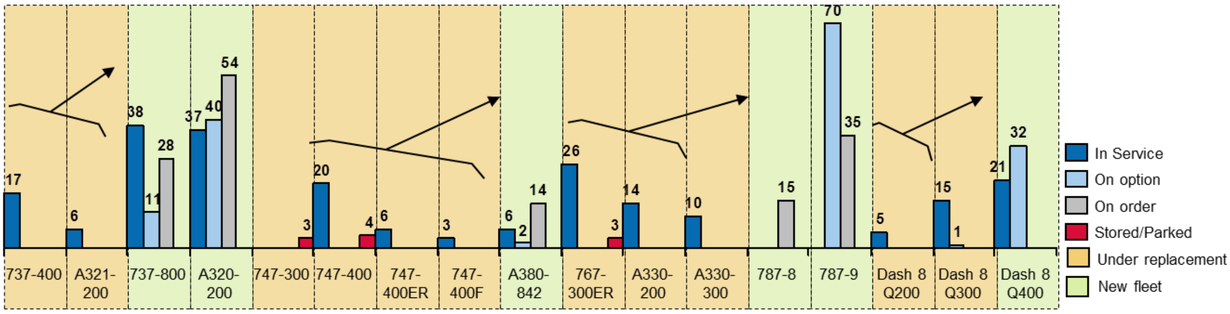
Figure 50 - Australian Carriers‟ Aircraft Fleet and Order Book



Note: As at July 2010
Source: ACAS

Qantas and its affiliate airlines have an asset replacement program underway with the number of aircraft being consolidated down to one or two core models within each class. As illustrated in Figure 51, the 737-400 series and A321 series are due to be replaced in the long term with the 737-800 and A320 series aircraft, while the 747 series aircraft are in the process of being replaced by the A380.

Figure 51 - Qantas, Jetstar and QantasLink Fleet Replacement Plans (1)

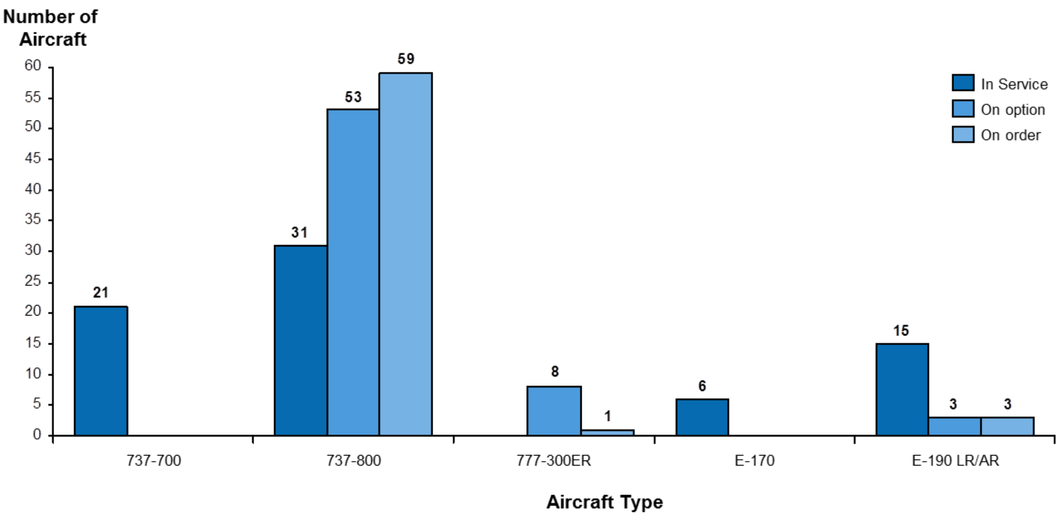


Note: (1) The fleet replacement plans illustrated in Figure 51 are accurate as at November 2010. Therefore, they do not take into account the fleet changes announced by Qantas Group in June 2011. The long term forecasts are based on aircraft manufacturer forecasts and are not reliant on changes in the short term of airlines rearranging fleet orders.

Source: ACAS, Booz & Company analysis

Like Qantas, Virgin Australia has a large number of 737-800 aircraft on order, as shown in Figure 52, which forms the majority of the airline's fleet. Many of the 737-700 aircraft were built within the last decade and have a reasonable life left before being considered for replacement. Virgin has a small number of Embraer 190 series aircraft on order which are similar size and capacity to the 737-700.

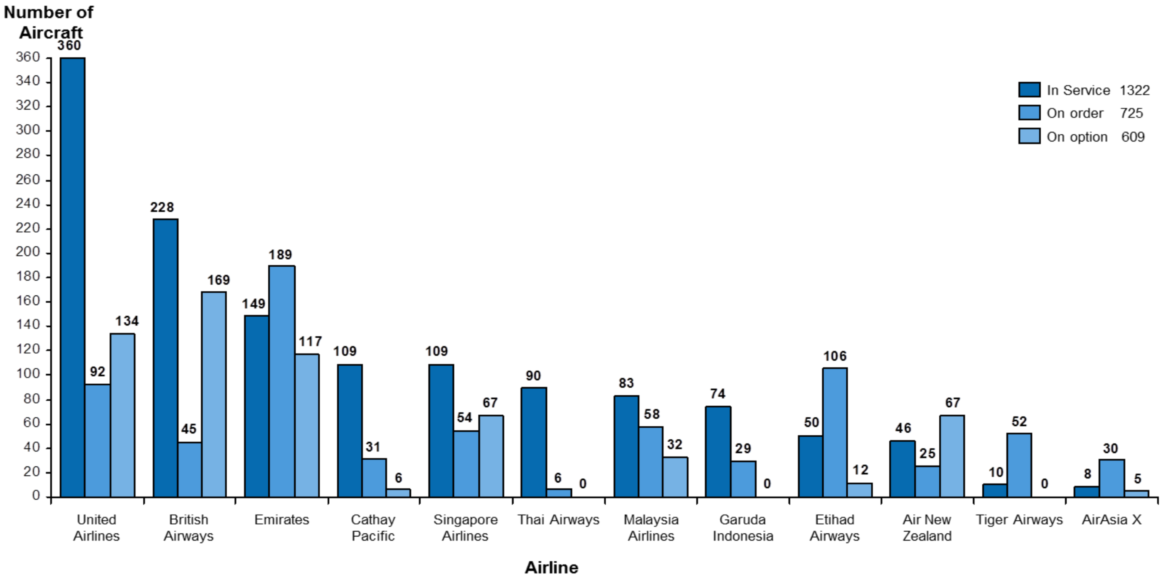
Figure 52 - Virgin Australia Fleet Replacement Plans (1)



Note: (1) Virgin Australia fleet replacement plan as illustrated in Figure 52 is accurate as at November 2010. Recent fleet change announcements have not been taken into consideration. Since the above analysis was done Virgin Australia have taken delivery of the 3 E190s and it appears they have cancelled their options. Similarly for the 737-800, they now have taken delivery of 40 with 56 on order and 52 on option. The long term forecasts are based on aircraft manufacturer forecasts and are not reliant on changes in the short term of airlines rearranging fleet orders. Source: Virgin Australia

As shown in Figure 53, of the international carriers which call at Sydney (Kingsford-Smith) Airport, United Airlines and British Airlines are the largest carriers overall. The size of the order book compared with the size of the fleet varies across each airline. A pronounced gap between new and existing aircraft is evident for United Airlines, Thai Airlines and Cathay Pacific indicating a downsizing in fleet capacity. In contrast Emirates, British Airways and Singapore Airlines have a strong pipeline of aircraft on order and are likely to increase their net fleet size as a result.

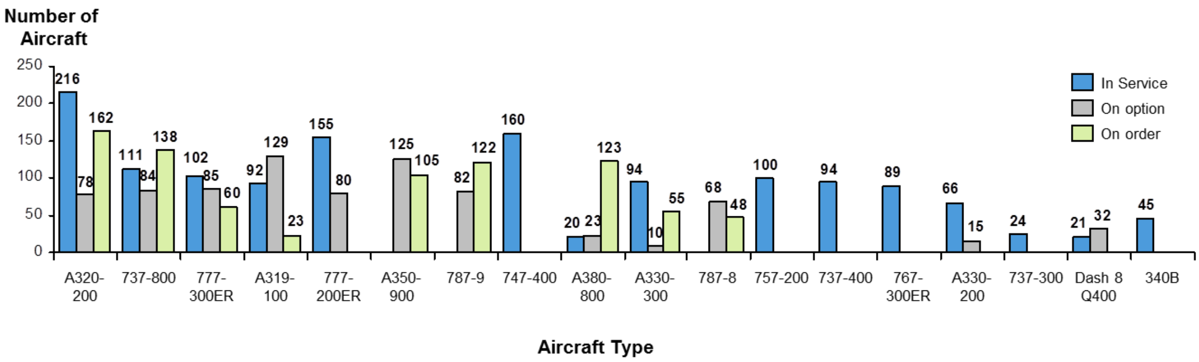
Figure 53 - International Carriers Fleet and Order Book



Source: ACAS

Figure 54 shows the most common types of aircraft utilised by key airlines flying to and from Australia. Key aircraft types used in the market are the A320 and the B737-800. Despite being discontinued from production, the 747-400 remains a common model of aircraft with 160 still being utilised at an average age of 16 years.

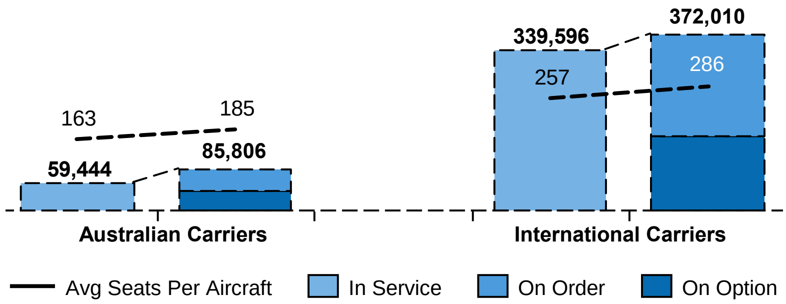
Figure 54 - Top 20 Aircraft Types for Key Airlines Flying to Australia



Source: ACAS

The average seat capacity of aircraft on order and under option is higher than the total seat capacity of aircraft currently in service for both Australian and international carriers as shown in Figure 55. The trend for new aircraft on order is for a higher number of seats, reflecting the movement toward larger and more modern aircraft. New generation aircraft are quieter, reducing noise pollution and also are more fuel efficient.

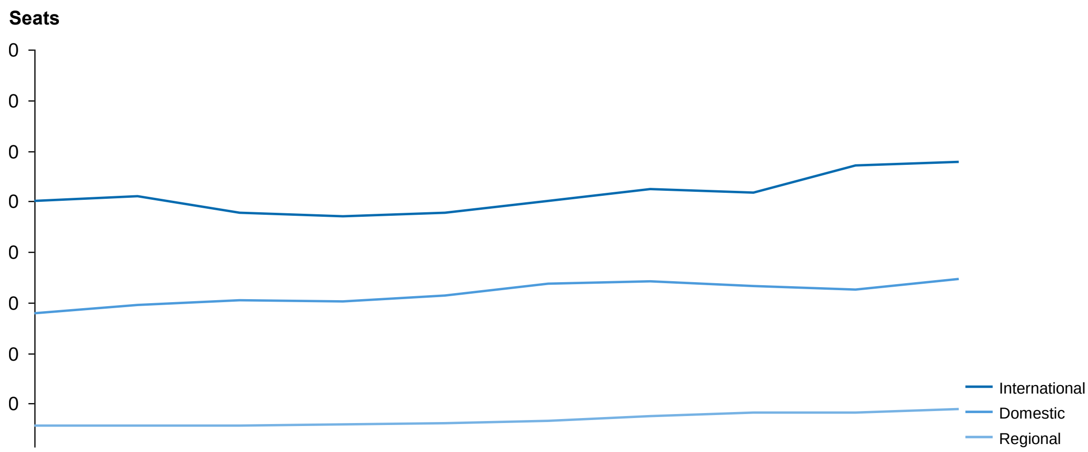
Figure 55 – Current and Projected Seat Capacity & Average Seats per Aircraft



Source: ACAS, Booz & Company analysis

Historically, there has been a move towards fleet up gauging with average seats per movement at Sydney (Kingsford-Smith) Airport increasing across all markets over the past nine years. As shown in Figure 56, international seats at Sydney (Kingsford-Smith) Airport increased from 250 to 289 per movement, domestic seats increased from 138 to 173 per movement and regional airline seats increased from 28 to 45 seats per movement over the period.

Figure 56 – Average Seats per Movement at Sydney (Kingsford-Smith) Airport 2001 - 2010



Source: BITRE

5.10.4 Fleet Mix Assumptions

Over the long-term, airlines around the world have generally moved to 'up gauge' their respective fleets in response to:

- Airport capacity (i.e. 'slot') constraints; and
- Larger carrying capacity of new generation aircraft.

Airbus reported that in less than a decade average aircraft capacity per flight has increased by 3 per cent.[26] It also reported that from 1972 to 2008 average aircraft capacity per flight for the Asia-Pacific region had increased by 34 per cent.

[26] Airbus, Global Market Forecast 2009-2028, pp.61-62.

Current aircraft orders for Australian airlines and key international airlines operating in the Australian market include large orders for aircraft such as the Boeing 787 and Airbus A380, as well as higher capacity narrow body aircraft to replace aging narrow body aircraft. Therefore, increases in average seating capacity per aircraft movement were incorporated into both the domestic and international forecasts as presented in Table 18 for the unconstrained case.

Table 18 – Estimated Average Aircraft Seating Capacity – Unconstrained, Selected Years 2010 to 2060

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	116	128	166
International	289	301	314	339	414

Average seat capacity at Sydney region airports is representative of all Australian airports and up-gauging assumptions are based on long-term trends and fleet orders for major airlines operating to the Sydney region airports (and also to all Australian airports).

Source: BITRE, Booz & Company analysis

As Sydney (Kingsford-Smith) Airport becomes capacity constrained, it was assumed that airlines up gauge their fleet at a more rapid rate to cater for more passengers without requiring additional slots. Average seat per movement assumptions for the Base Case are summarised in Table 19.

Table 19 – Estimated Average Aircraft Seating Capacity – Base Case, Selected Years 2010 to 2060

Market	2010	2015	2020	2030	2060
Domestic					
Sydney Domestic	173	180	188	203	258
Sydney Regional	45	50	55	65	108
Canberra	109	114	119	129	159
Newcastle	103	110	116	128	166
International	289	301	314	339	418

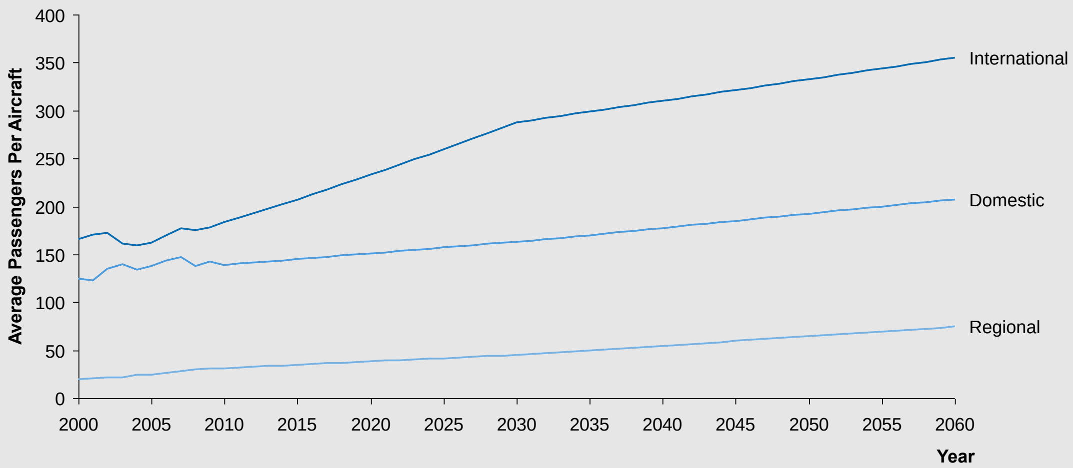
Source: BITRE, Booz & Company analysis

Sydney domestic long term seat capacity estimates imply a mix of larger code C aircraft and code D aircraft (B787 or similar) operating the trunk routes to Brisbane and Melbourne. Sydney regional, Canberra and Newcastle markets assume an increase in seats per movement based on historical trends. The increase in international seat capacity assumes a move towards higher capacity wide body aircraft such as the Airbus A380. In the longer term, it was assumed that higher capacity aircraft are introduced, being able to cater for upwards of 500 passengers per movement.

5.10.5 *Average Passenger per Movement Assumptions*

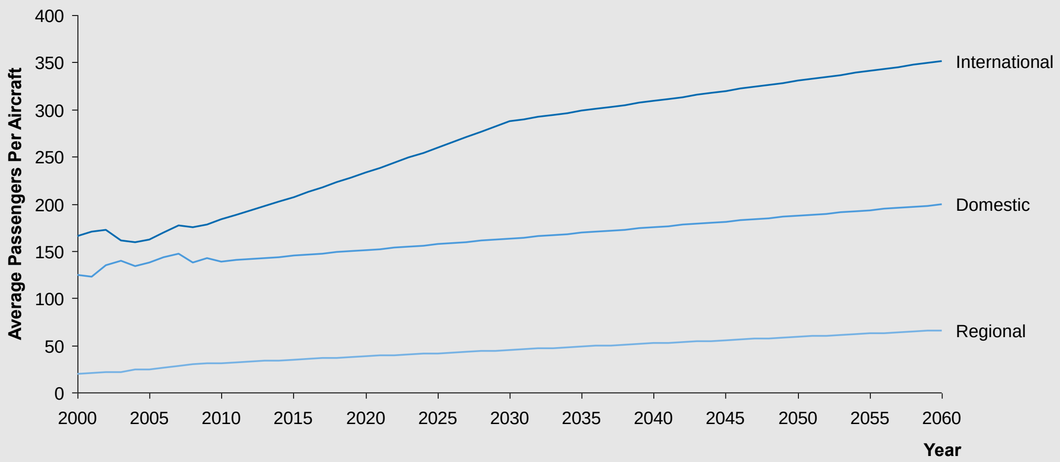
The forecast assumptions for passenger seat load factors and fleet mix drives changes in the estimated average passengers per movement. The assumptions for the Base Case and unconstrained forecast are shown in Figure 57 and Figure 58 respectively. Due to a combination of increased load factors and fleet up gauging, passengers per movement are assumed to increase across all markets. Where slots become more constrained at Sydney (Kingsford-Smith) Airport with policy settings, it was assumed that aircraft are up gauged at a slightly higher rate compared to the unconstrained scenario.

Figure 57 – Average Passengers per Movement, With Policy Settings, 2000 to 2060



Source: Booz & Company estimates.

Figure 58 – Average Passengers per Movement, Unconstrained, 2000 to 2060



Source: Booz & Company estimates.

5.11 New Services

The Master Plans for Canberra (2009), Newcastle (2007) and Bankstown (2005) discuss the potential for new services in the short to medium-term. Based on Canberra Airport's 2009 Master Plan, it is planned that international flights will include flights to New Zealand and one major Asian hub such as Singapore or Hong Kong.

International flights are expected to use a mix of narrow body (i.e. B737 and A320) and medium wide-body aircraft (i.e. B767, A330) with an average of six to seven movements per day over the next 30 years. It is also assumed that Trans-Tasman flights will schedule to operate three to five times per week with a narrow-body aircraft, growing to daily services within 30 years. Similarly for Newcastle Airport, it was assumed that Trans-Tasman Services commence in the short-term, with the potential for an Asian destination in the medium to long-term[27].

There has been some RPT aircraft operations at Bankstown Airport in the past (i.e. early 1990s) as well as occasional regional jet charter operations. There are currently no scheduled or RPT passenger aircraft operations at Bankstown Airport. There has been a history of very limited passenger aircraft operations due to the inability of Bankstown's infrastructure to accommodate large scale activity by the larger passenger jet aircraft (e.g. B737). The commencement of any passenger aircraft services at the airport will be driven by market demand and commercial realities associated with operating at Bankstown (i.e. aircraft type and approved movement levels). The 2005 Master Plan forecast was based on a start-up commercial service operation of 4 daily movements six days per week in 06/07[28], ramping up to 12 daily movements six days per week in 09/10, remaining at this level for the remainder of the period. For the purpose of this analysis, it has been assumed that the number of RPT services operating from Bankstown Airport from 2011 will be of 12 movements per day, six days a week.

5.11.1 Assumptions of New Services

5.11.1.1Base Case Assumptions

Given that infrastructure is under construction at Canberra Airport to cater for international passenger and freight traffic, the Base Case assumes that half of the Master Plan international forecast is likely to be achieved, which includes Canberra catering for some spillover from Sydney (Kingsford-Smith) Airport. It was assumed that 30 per cent of Canberra's international traffic will be diverted from Sydney (Kingsford-Smith) Airport and the remainder will be generated. For the Base Case, these services are assumed to be introduced in the short term (2012). International freight is forecast to coincide with international passenger services, with predominantly belly hold freight and a small number of dedicated freighters.

It was assumed that services commence at Newcastle Airport to New Zealand and Singapore in the short-term as per the Master Plan. In the second half of 2012, 4 return flights per week to New Zealand were redistributed from Sydney to Newcastle. The service increased in frequency so that by 2015, 7 return services to NZ operated from Newcastle. In 2014, 4 return services per week to Singapore were reallocated from Sydney to Newcastle. The Singapore route was up gauged at Newcastle by one additional return movement per year so that by 2017, 7 return services operated to Singapore from Newcastle. Both routes (i.e. the New Zealand and Singapore services) assumed a load factor of 80 per cent using

[27] The realisation of the forecast will be subject to a variety of factors such as the provision of customs, immigration and quarantine services and the capacity provided under Air Services agreements.

[28] The 2005 Bankstown Master Plan anticipated commencement of passenger related activity in 06/07, however, as of 2011 this has still to be implemented.

aircraft with an average capacity of 150 seats for the NZ movement and 300 seats for the SIN movement.

5.11.1.2Scenarios

The following scenarios were modelled around Canberra international services:

1. It was assumed that Canberra does not commence international passenger or freight services throughout the forecast period.

2. International destinations and volumes as per the Base Case introduced over various time periods: medium term (2020) and long term (2030). International freight is forecast to coincide with international passenger services, with predominantly belly hold freight and some dedicated freighter movements, with 50 per cent of the assumed excess of freight from Sydney (Kingsford-Smith) Airport being catered for at Canberra Airport.

3. The Master Plan international forecast is assumed to be achieved, with Canberra catering for some excess services from Sydney (Kingsford-Smith) Airport. It was assumed that 30 per cent of Canberra's international traffic will be diverted from Sydney (Kingsford-Smith) Airport and the remainder will be generated. These services are assumed to be introduced under different time frames, short-term (2012), medium-term (2020) and long-term (2030). International freight is forecast to coincide with international passenger services, with belly hold freight and some dedicated freighter movements, with over spill of freight from Sydney (Kingsford-Smith) Airport being catered for at Canberra Airport.

The following scenarios were modelled around Newcastle Airport international services:

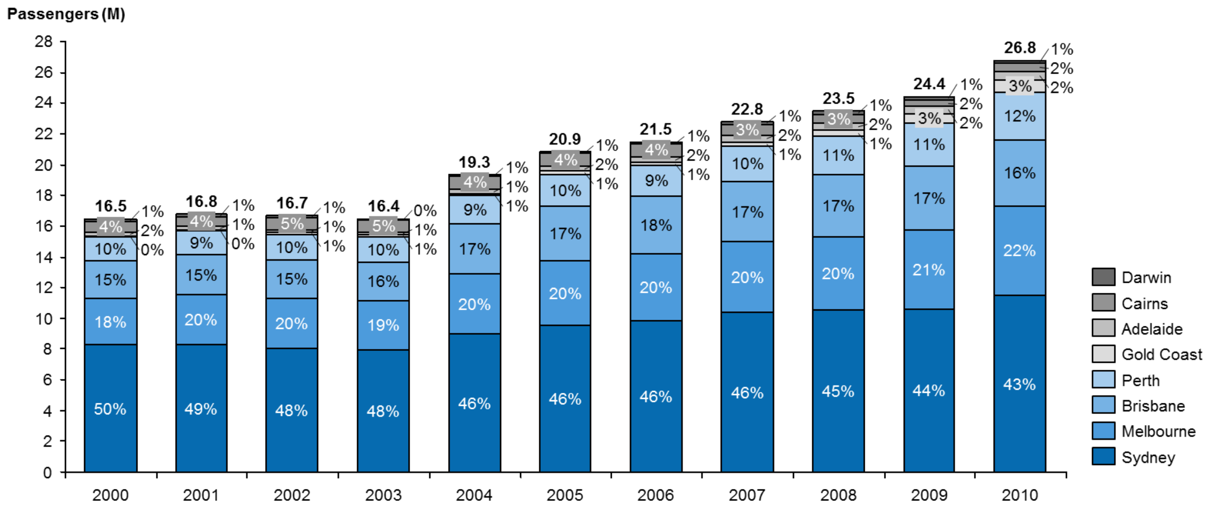
1. A low case scenario was modelled where only trans-Tasman services are introduced at various time frames: short-term (2012), medium-term (2020) and long-term (2030). It was assumed that 30 per cent of Newcastle's international traffic will be diverted from Sydney (Kingsford-Smith) Airport and the remainder will be generated.

2. Scenarios around timing of the introduction of forecast Base Case international services: short-term (2012), medium-term (2020) and long-term (2030). It was assumed that 30 per cent of Newcastle's international traffic will be diverted from Sydney (Kingsford-Smith) Airport and the remainder will be generated.

5.12 Airport Competition

With the increase in point-to-point traffic, secondary international airports have been increasing market share of international passengers. As shown in Figure 59, whilst international passenger volumes are increasing at Sydney (Kingsford-Smith) Airport, the share of international traffic has been declining compared to other international airports.

Figure 59 –Share of International Passengers by Australian Airport
(2000-2010)



Source: BITRE

5.12.1 Airport Market Share Assumptions

5.12.1.1Base Case

The airports considered in the study continue to grow at the underlying rate without any explicit assumption that market share will be lost to other Australian gateways.

5.12.1.2Scenarios

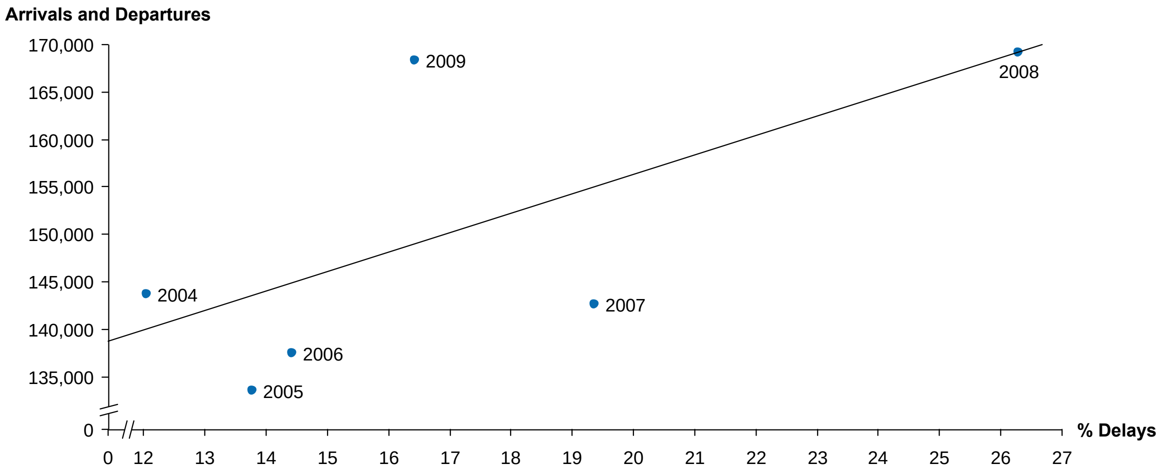
Sydney (Kingsford-Smith) Airport loses market share at a rate of 0.3 per cent per annum and 0.4 per cent per annum over the forecast period.

5.13 Delays and Congestion Issues

Airlines are likely to directly address congestion issues by increasing aircraft capacity and lengthening required check-in times to allow for delays and minimise missed flights due to passenger processing times as well as potential delays in reaching the airport. Weather is the major cause of delays at Sydney (Kingsford-Smith) Airport and causes significant disruption.

Figure 60 shows the proportion of delays at Sydney (Kingsford-Smith) Airport corresponding to annual aircraft movement activity. With the exception of 2009, the proportion of delays at Sydney (Kingsford-Smith) Airport has increased as the annual operations increase. This indicates that as the airport continues to grow, congestion will remain an issue. This operational impact on travel in and out of Sydney (Kingsford-Smith) Airport filters throughout the rest of the Australian airport network as flights must be rerouted around Sydney, or connections held at destination airports or gate holds on flights arriving at Sydney (Kingsford-Smith) Airport. These delays, both on the arrival and departure side of the equation, then affect flights across the country. As Sydney (Kingsford-Smith) Airport becomes more congested, the airport could potentially lose market share to other Australian airports due to delays and unavailability of slots at Sydney (Kingsford-Smith) Airport.

Figure 60 - Proportion of Delays vs. Number of Arrivals and Departures Sydney (Kingsford-Smith) Airport Domestic Operations



Note: 2009 does not include all routes that were included in the data for the previous years.
Source: BITRE

5.13.1 Assumptions on Impact of Delays and Congestion

It was assumed that there is no additional impact of delays that has not already been incorporated into the peak spreading and capacity assumptions.

5.14 Summary of Base Case Assumptions

Table 20 details how these factors have been considered in our modelling approach.

Table 20 - Factors Affecting Demand and Associated Modelling Assumptions

Factors Affecting Demand	Modelling Assumptions
Airport Infrastructure ▪ Competition from other Domestic, Regional and International Airports ▪ Future infrastructural development	▪ Scenario testing examined a low and high case of Sydney (Kingsford-Smith) Airport international traffic market share loss (redistribution) to other international gateways (0.3% and 0.4% per annum over the forecast period) as capacity approaches, congestion and delays increase and peak hour slots are filled. See Section 5.12. ▪ Canberra and Newcastle international passenger traffic forecast estimates were assumed to incorporate 30% of diverted Sydney (Kingsford-Smith) Airport traffic over the entire forecast period while international services were assumed to commence at Canberra and Newcastle Airports in 2012. Delays to initiation of international services were tested in the scenarios (i.e. 2020 and 2030) ▪ It was assumed that 50% of unmet demand for international and domestic freight at Sydney (Kingsford-Smith) Airport was diverted to CBR ▪ Wherever possible, incremental expansion of existing facilities will be used to deliver new or enhanced capacity.
Airline Industry ▪ Sustainability of Airfare reductions ▪ International fleet capacity ▪ Domestic fleet capacity ▪ Development of current international point-to-point aircraft movement ▪ Development of new routes by carriers both international and domestic ▪ Airline aircraft current capacity and order	▪ 0.5% decrease in international and domestic air fares from 2010 to 2015 incorporated to account for the ongoing impact LCCs have had on the industry in pushing air fares down. See Sections 5.3. ▪ International fleet up gauging at 0.8% per annum until Sydney (Kingsford-Smith) Airport reaches aircraft movement capacity. Average fleet capacity then increases at 0.7% per annum. See Section 5.10. ▪ Domestic fleet up gauging at 0.8 per cent. See Section 5.10. ▪ Regional fleet up gauging at 1.8 % per annum until Sydney (Kingsford-Smith) Airport reaches aircraft movement capacity. Average fleet capacity then increases at 1.7% per annum. See Section 5.10. ▪ Average fleet size for domestic and regional traffic at Canberra Airport was assumed to increase at around 0.8% per annum and at Newcastle Airport at 1.0% per annum over the forecast period. See Section 5.10.
Exogenous Factors ▪ Economic Indicators: International visitor markets including domestic ▪ Oil and Aviation Fuel determinants	▪ The short-term GFC recovery is incorporated as GDP growth rates pick up as do passenger seat load factors over the next five years. International passenger seat load factors were increased from 68% to 72% by 2015. See Section 5.2 and Section 5.10.1. ▪ Different market segments accounted for using relevant income elasticities including the top 15 international inbound markets, international outbound markets by the top 15 destinations, business and leisure segments and key domestic and regional routes (i.e. 2010 to 2060). See Section 4.5. ▪ Variation in economic growth for the top 15 inbound markets was incorporated using market-specific elasticities and country GDP growth forecast estimates from 2010 to 2060. See Section 5.2 ▪ Scenario testing observed the impact of low and high variations to forecast economic growth estimates, recognising that developed countries tend to be less sensitive to shocks than developing countries (±1% for developing countries; ± 0.5% for developed countries). See Section 5.2 ▪ Different levels of travel demand and reactions to price and income shocks for the business and leisure incorporated by applying fare and income elasticities relevant to the International leisure and business segments. See Section 4.5. Scenario testing examined the potential impact of an increase in oil prices and air fares as a result (i.e. 2.5% moderating to 0% from 2010 to 2019). See Section 5.3.

Factors Affecting Demand	Modelling Assumptions
Other Factors ▪ Government Policy ▪ Taxes and Charges ▪ Aviation Agreements	▪ Sydney (Kingsford-Smith) Airport hourly cap (i.e. 80 movements per hour) and curfew incorporated into the modelling with peak spreading occurring once the cap is reached during the busy hour. See Section 5.8. ▪ Introduction of a carbon pricing scheme in 2012 is tested with two scenarios: 1.5% and 10% increase in airfares. See Section 5.9. ▪ Implicit assumption that Air Services Agreements (ASAs) are renegotiated as demand reaches stated capacity between Australia and international markets. See Section 5.6.

Source: Booz & Company assumptions

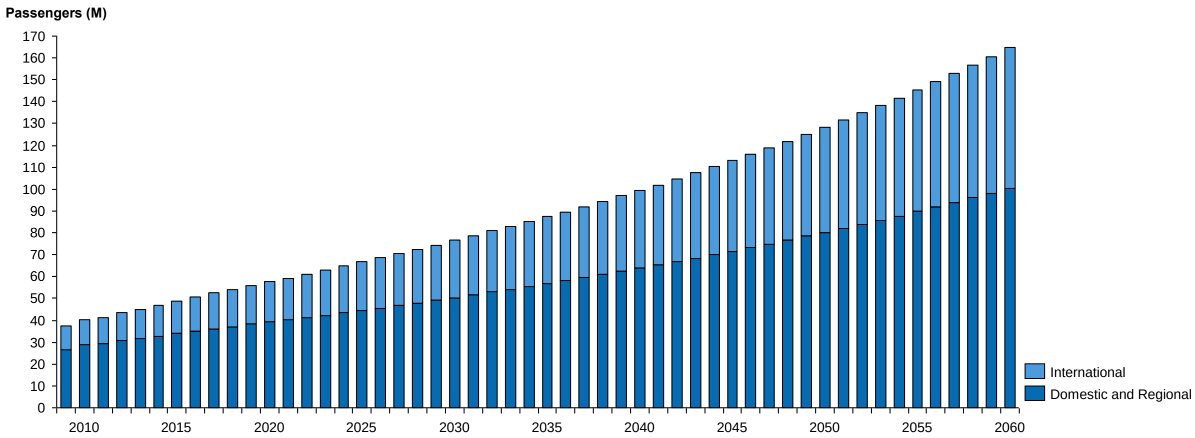
6. Aviation Activity Forecasts

Passenger traffic, aircraft movement and freight forecasts for the Constrained Base Case (with policy settings) and the Unconstrained Base Case (without any policy settings) are presented below.

6.1 Passenger Forecasts – Unconstrained Base Case

Total unconstrained passenger forecast for the Sydney Region[29], not subjected to any policy settings (e.g. the movement cap at Sydney (Kingsford-Smith) Airport), is shown below in Figure 61.

Figure 61 - Estimated Total International Passenger Traffic Forecast for Sydney Region without Policy Settings, 2010 – 2060



Source: Booz & Company estimates

In 2010, approximately 40.1 million passengers were estimated travelling to and from airports in the Sydney region. It is forecasted that by 2060 unconstrained demand for the region will be of 164.6 million passengers, representing an annual average growth rate of 2.9 per cent.

Table 21 shows the estimated passenger forecasts for the Sydney region by market type, and the corresponding annual average growth rates.

[29] The Sydney region covers: Sydney (Kingsford-Smith) Airport, Canberra Airport, Newcastle Airport, Bankstown Airport, Camden Airport, RAAF Base Richmond, Cessnock Aerodrome, Maitland Aerodrome and Goulburn Airport

Table 21 – Estimated Sydney Region Passenger Forecasts, Unconstrained (without Policy Settings), Selected Years, 2010 to 2060 **(millions)**

Forecast	Timeframe	International	Domestic & Regional	Total Passengers
2010	-	11.5	28.7	40.1
2015	5 Years	14.9	33.9	48.8
2020	10 Years	18.4	39.2	57.6
2030	20 Years	26.1	50.4	76.5
2060	50 Years	64.4	100.2	164.6
CAGR		**%**	**%**	**%**
2010 to 2015	5 Years	5.4%	3.4%	4.0%
2010 to 2020	10 Years	4.9%	3.2%	3.7%
2010 to 2030	20 Years	4.2%	2.9%	3.3%
2010 to 2060	50 Years	3.5%	2.5%	2.9%

Source: Booz & Company estimates

6.2 Passenger Forecasts–Base Case

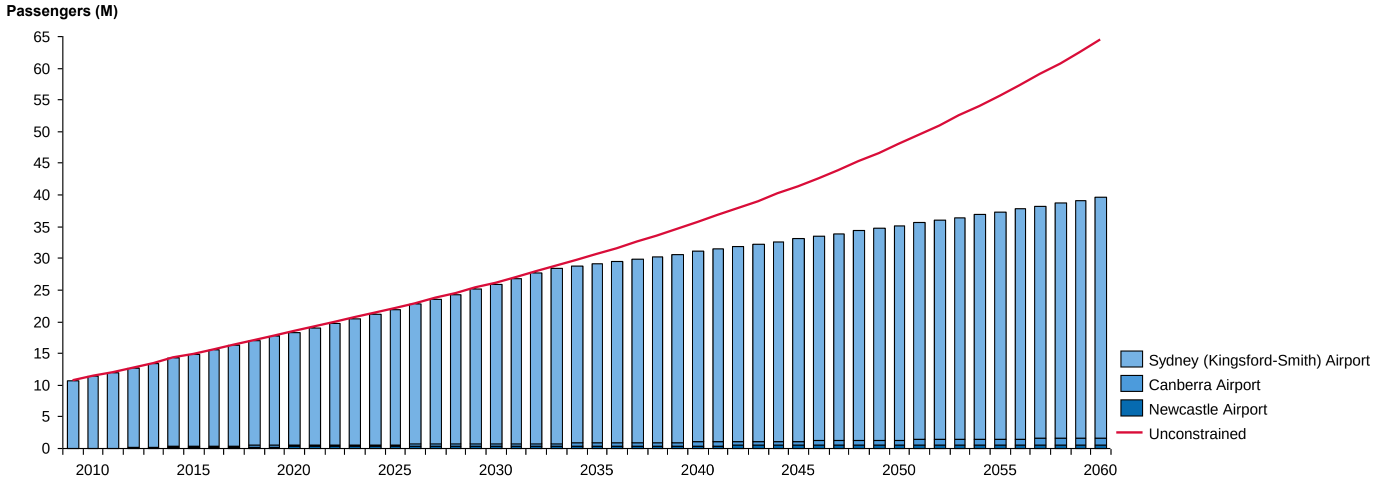
Passenger traffic, aircraft movement and freight forecasts for the Constrained Base Case (i.e. with policy settings in place) and the Unconstrained Base Case (i.e. without any policy settings) are presented below.

6.2.1 *International Passenger Forecasts*

Total international passenger traffic forecasts for the Sydney region with and without constraints due to policy settings (e.g. hourly cap and curfew) are presented in Figure 62 and Table 22.

The international passenger traffic is estimated to grow by 4.2 per cent from 2010 to 2030. Results show that growth slows from 2033, beyond which growth is largely dependent on aircraft upgauging. The planned start of international services at Canberra and Newcastle airports, assumed to be from 2012 has also been captured in Figure 62.

Figure 62 – Estimated Total International Passenger Traffic Forecast for Sydney Region, with and without Policy Settings, 2010 – 2060



Source: Booz & Company estimates

Table 22 – Estimated Sydney Region International Passenger Forecasts
2010 to 2060

CAGR	Timeframe	Constrained	Unconstrained
2010 to 2015	5 Years	5.4%	5.4%
2010 to 2020	10 Years	4.8%	4.9%
2010 to 2030	20 Years	4.2%	4.2%
2010 to 2060	50 Years	2.5%	3.5%

Source: Booz & Company estimates

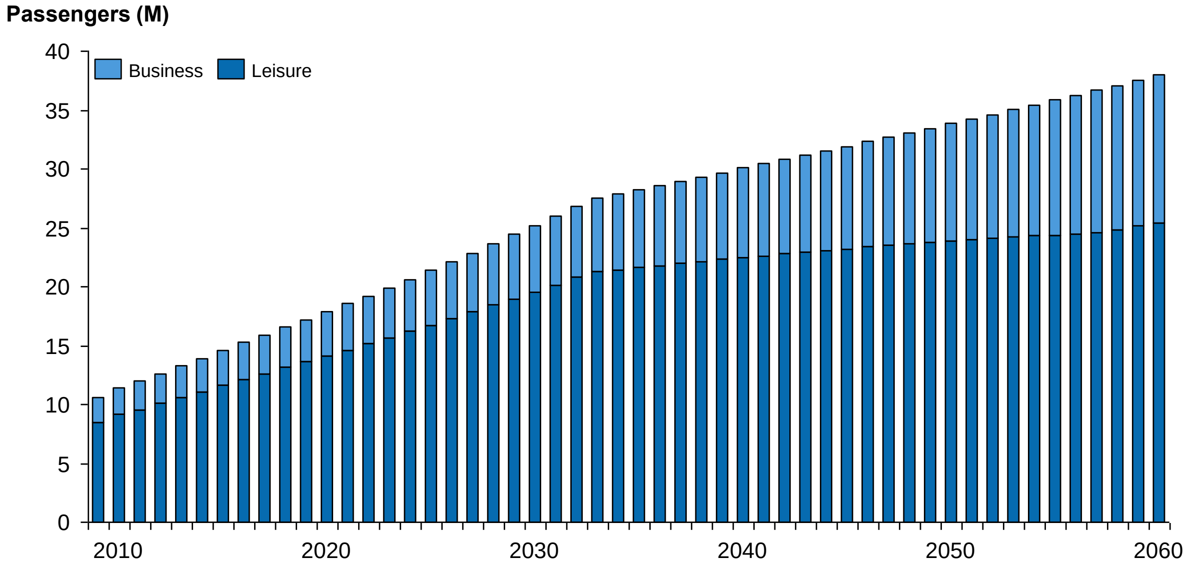
Sydney (Kingsford-Smith) Airport

Sydney (Kingsford-Smith) Airport international passenger forecasts for the Constrained Base Case are summarised in Figure 63 and Table 23. International passenger numbers are forecast to increase from 11.5 million in 2010 to 38 million in 2060 at an average annual rate of 2.4 per cent. With the 80 aircraft movement cap per hour at Sydney (Kingsford-Smith) Airport, peak spreading will enable passenger growth to continue for the next 20 years. The annual growth rate is relatively strong until 2033 (4.0 per cent).

Once Sydney (Kingsford-Smith) Airport reaches international market capacity under the existing policy settings, little growth in international aircraft movements can occur (after 2033). Therefore passenger growth at Sydney (Kingsford-Smith) Airport is expected to rely on up gauging. From 2034 to 2060 the international passenger growth rate drops to 1.2 per cent per annum on average, reflecting the estimated growth in average aircraft capacity and increases in load factors.

As shown in Figure 63, international passengers at Sydney (Kingsford-Smith) Airport become constrained, reaching a critical threshold in 2033 due to policy settings.

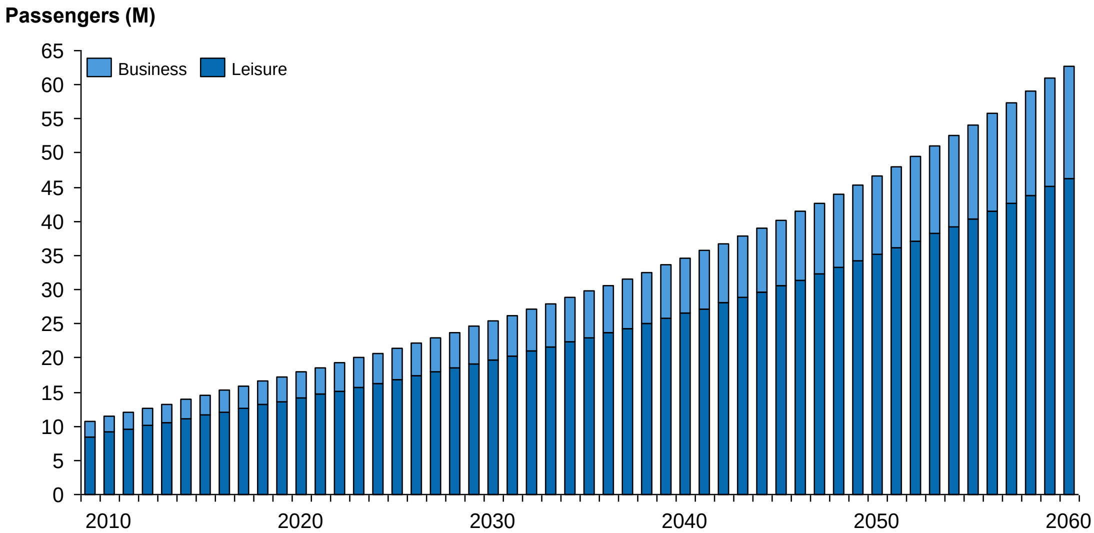
Figure 63 – Sydney (Kingsford-Smith) Airport International Passenger by Business and Leisure Split, with Policy Settings,
2005 to 2060



Source: Booz & Company analysis

Figure 64 shows the forecasted growth of international passengers at Sydney (Kingsford-Smith) Airport under the Unconstrained Case. In the absence of policy settings, international passengers could be expected to continue growing by approximately 3 per cent annually between 2034 and 2060 to 62.7 million passengers by 2060. This would correspond to an average annual growth rate of 3.5 per cent between 2010 and 2060.

Figure 64 - Sydney (Kingsford-Smith) Airport International Passenger by Business and Leisure Split, without Policy Settings, 2005 to 2060



Source: Booz & Company Analysis

The Sydney (Kingsford-Smith) Airport passenger profile for international passengers is represented in Table 23 for the Constrained Base Case and Table 24 for the Unconstrained Base Case. Dominance in favour of leisure passengers is clearly visible. Since higher yielding business traffic is likely to be prioritised at Sydney (Kingsford-Smith) Airport, it is assumed that business passengers' growth exceeds leisure passengers' growth.

Forecast international passengers at Sydney (Kingsford-Smith) Airport by purpose of travel for the constrained and unconstrained cases are summarised by purpose in Table 23 and Table 24.

Under the constrained case, international passengers travelling for business purposes are forecast to grow at 4.7 per cent per annum between 2010 and 2030 compared to 3.9 per cent per annum for passengers travelling for leisure purposes. For 2010 to 2060, growth in business passengers is forecast at 3.5 per cent per annum compared to 2.1 per cent per annum for leisure passengers, as once the market is constrained, it is assumed that business passengers can continue to grow at a higher rate relative to leisure passengers. For the unconstrained case, business passengers are forecast to grow at 4.0 per cent per annum between 2010 and 2060 (compared to 3.5 per cent for the constrained case), whereas leisure passengers are forecast to grow at 3.3 per cent per annum compared to 2.1 per cent for the constrained case.

Table 23 – Sydney (Kingsford-Smith) Airport International Passenger by Business and Leisure Split (thousands), Constrained

2010 to 2060

Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2010	-	2,270	9,187	11,457
2015	5 Years	2,953	11,615	14,568
2020	10 Years	3,748	14,121	17,869
2030	20 Years	5,637	19,581	25,218
2060	50 Years	12,526	25,432	37,959
CAGR		**%**	**%**	**%**
2010 to 2015	5 Years	5.4%	4.8%	4.9%
2010 to 2020	10 Years	5.1%	4.4%	4.5%
2010 to 2030	20 Years	4.7%	3.9%	4.0%
2010 to 2060	50 Years	3.5%	2.1%	2.4%

Note: Rounded to the nearest thousand

Source: Booz & Company estimates

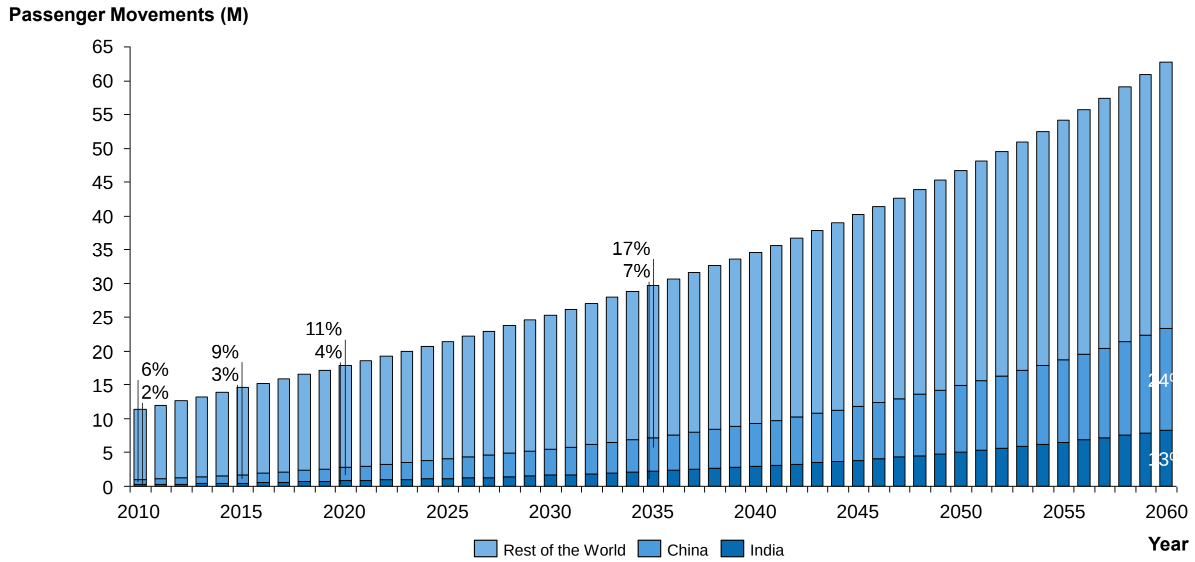
Table 24 - Sydney (Kingsford-Smith) Airport International Passenger by Business and Leisure Split, Unconstrained (thousands)
2010 to 2060

Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2010	-	2,270	9,187	11,457
2015	5 Years	2,953	11,615	14,568
2020	10 Years	3,751	14,147	17,898
2030	20 Years	5,656	19,735	25,391
2060	50 Years	16,417	46,300	62,716
CAGR		**%**	**%**	**%**
2010 to 2015	5 Years	5.4%	4.8%	4.9%
2010 to 2020	10 Years	5.2%	4.4%	4.6%
2010 to 2030	20 Years	4.7%	3.9%	4.1%
2010 to 2060	50 Years	4.0%	3.3%	3.5%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

Amongst the emerging markets at Sydney (Kingsford-Smith) Airport, China and India have been identified as important markets which are estimated to significantly increase their share of forecasted passenger traffic. Their share of the market is anticipated to increase from 6 per cent and 2 per cent in 2010 to 24 per cent and 13 per cent by 2060, respectively (see Figure 65 below).

Figure 65 - Sydney (Kingsford-Smith) Airport International Passenger Forecast - China and India markets, without policy settings, 2010-2060



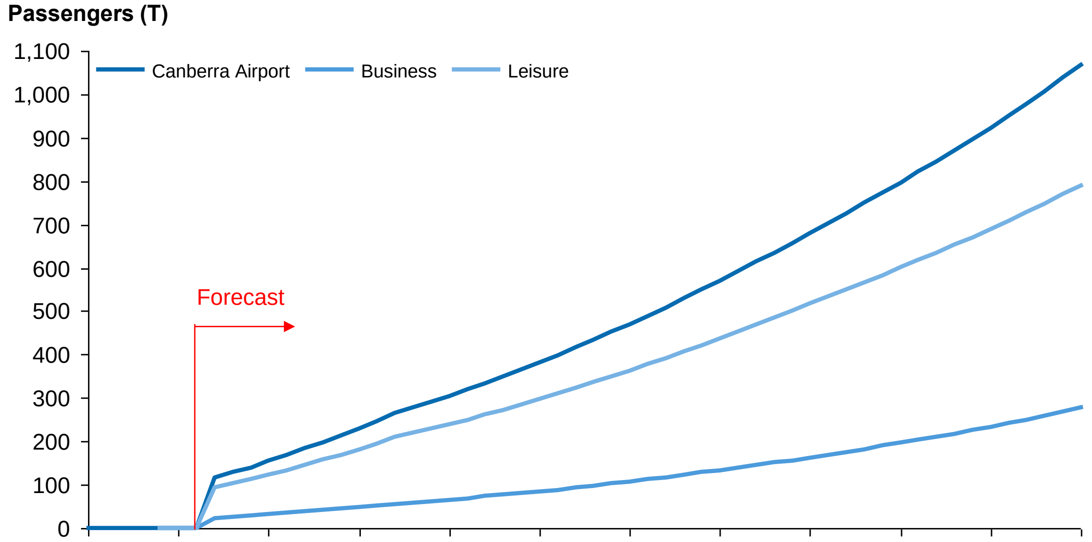
Source: Booz & Company estimates

Canberra Airport

Canberra Airport international passenger forecasts are summarised in Figure 66 and

Table 25. Based on the Master Plan, international services to New Zealand are assumed to begin in 2012 using B737 aircraft or similar with seating capacity of approximately 148 (please refer to Section 5.11.1). Around 30 per cent of the traffic is expected to be diverted from Sydney (Kingsford-Smith) Airport international traffic. The average annual growth rate over the entire forecast period is estimated to be approximately 6.7 per cent to 2030 and 4.7 per cent to 2060.

Figure 66 – Canberra Airport International Passenger by Business and Leisure Split
2005 to 2060



Source: Booz & Company analysis of Canberra Airport Master Plan

Under the Constrained Base Case, it is assumed that international operations commence in 2012.

Table 25 shows Canberra Airport's strong international passenger growth across the two passenger groups analysed. Total international passengers at Canberra Airport are forecast to grow from 118,000 in 2012 to approximately 1.1 million in 2060. This represents an annual growth rate of 4.7 per cent. International business passengers are forecast to grow strongly at Canberra Airport with a forecast growth rate of 5.3 per cent to 2060, compared with 4.5 per cent for leisure passengers over the same period.

Table 25 – Canberra Airport International Passenger by Business and Leisure Split (Thousands)
2012 to 2060

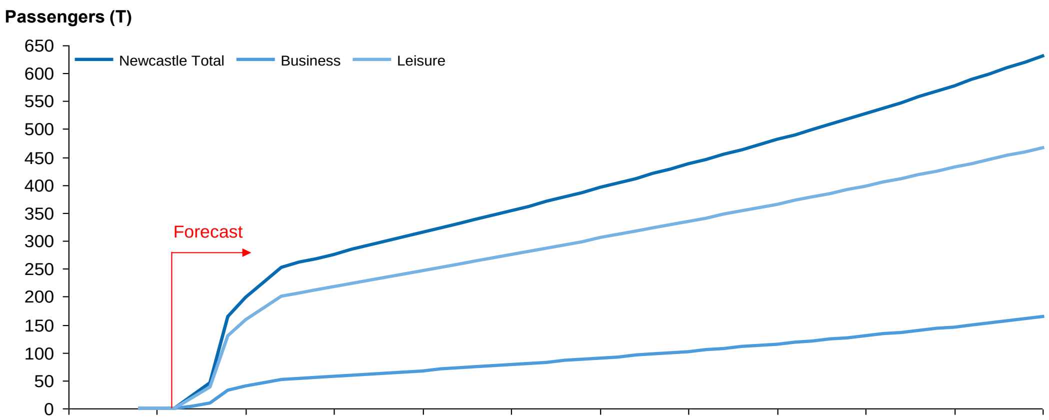
Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2012	-	24	94	118
2015	3 Years	31	123	154
2020	8 Years	48	181	229
2030	18 Years	85	297	382
2060	48 Years	279	788	1,068
CAGR		**%**	**%**	**%**
2012 to 2015	3 Years	9.8%	9.1%	9.2%
2012 to 2020	8 Years	9.3%	8.5%	8.7%
2012 to 2030	18 Years	7.4%	6.6%	6.7%
2012 to 2060	48 Years	5.3%	4.5%	4.7%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

Newcastle Airport

Newcastle Airport international passenger traffic forecasts are summarised in Figure 67 and Table 26. International services are assumed to begin in 2012 (please refer to Section 5.11.1). The average annual growth rate over the entire forecast period is estimated to be approximately 16.3 per cent to 2030 and 7.1 per cent to 2060.

Figure 67 – Newcastle Airport International Passenger Forecasts by Business and Leisure Split (2005-2060)



Source: Booz & Company analysis of Newcastle Airport Masterplan

Newcastle Airport's international Base Case passenger forecast is shown in Table 26. The forecast indicates strong business passenger growth with the commencement of international operations projected in 2012. The introduction of the New Zealand route (in the second half of 2012) and Singapore route (in 2014) accelerates growth in the short-medium term, with growth moderating to some extent in the longer term.

Table 26 – Newcastle Airport International Passenger Forecasts (Thousands),
2012 - 2060

Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2012	-	5	19	23
2015	3 Years	40	159	199
2020	8 Years	58	218	276
2030	18 Years	79	275	354
2060	48 Years	165	465	630
CAGR		**%**	**%**	**%**
2012 to 2015	3 Years	105.1%	103.8%	104.1%
2012 to 2020	8 Years	37%	35.9%	36.1%
2012 to 2030	18 Years	17%	16.1%	16.3%
2012 to 2060	48 Years	7.7%	6.9%	7.1%

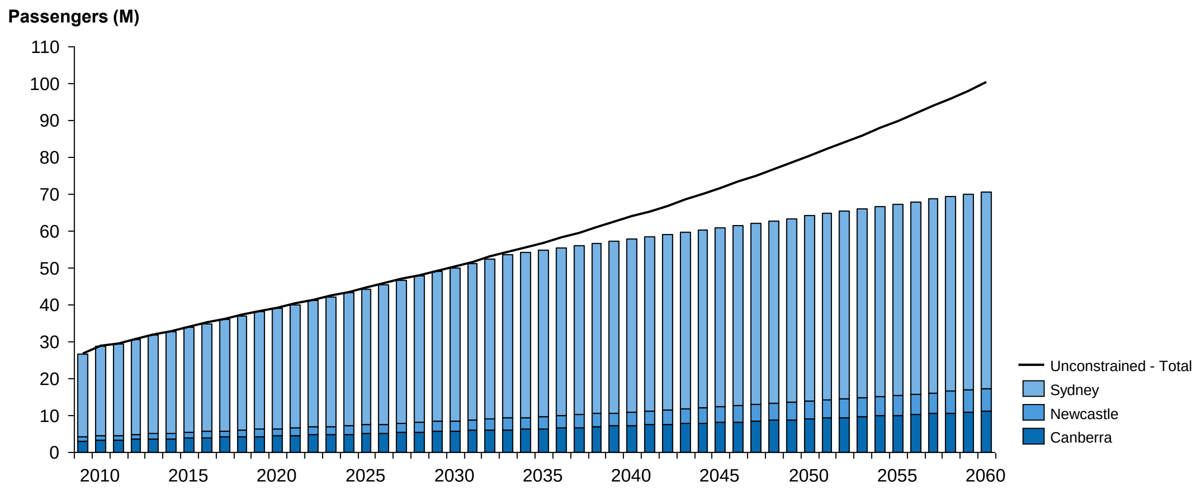
Note: Rounded to the nearest thousand
Source: Booz & Company estimates

6.2.2 Domestic and Regional Passenger Forecasts

Total domestic and regional passenger traffic forecasts for the Sydney region with and without the policy settings (hourly cap and curfew) are presented in Figure 68 and Table 27.

Given fleet up gauging, increasing load factor assumptions and peak spreading, domestic and regional passengers can continue to grow despite aircraft movements being constrained. Without any policy settings in place, the demand for domestic and regional passenger traffic could be expected to grow at a rate of 2.5 per cent per annum from 2010 to 2060 to a level of 100.2 million annual passengers in 2060. However, as the policy settings are assumed to remain in place, the average growth rate from 2010 to 2060 is estimated to be 1.8 per cent per annum, amounting to 70.7 million passengers in 2060.

Figure 68 – Estimated Total Domestic and Regional Passenger Traffic Forecast for the Sydney Region, Constrained and Unconstrained



Source: Booz & Company estimates

Table 27 – Estimated Sydney Region Domestic and Regional Passenger Forecasts, Constrained and Unconstrained,
2010 to 2060

CAGR	Timeframe	Constrained	Unconstrained
2010 to 2015	5 Years	3.4%	3.4%
2010 to 2020	10 Years	3.1%	3.2%
2010 to 2030	20 Years	2.8%	2.9%
2010 to 2060	50 Years	1.8%	2.5%

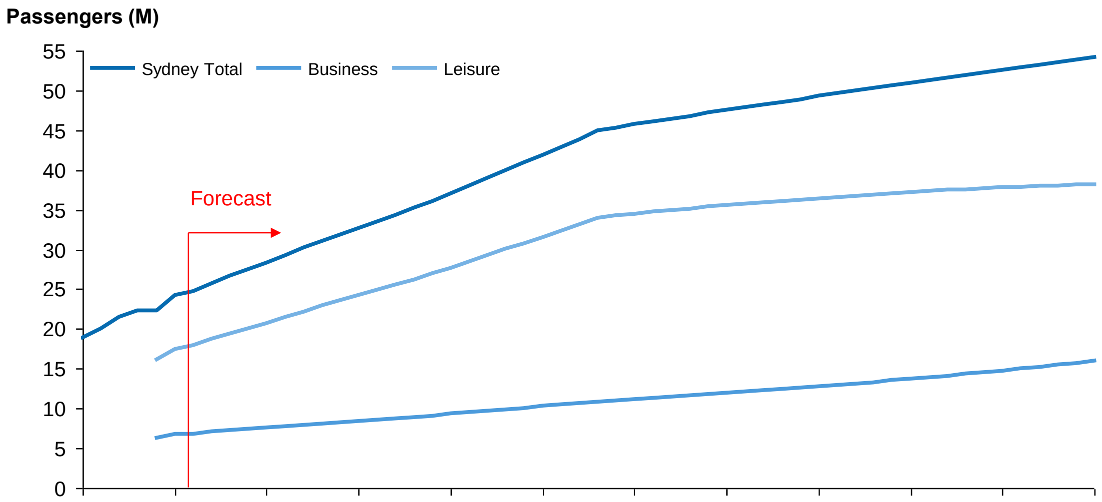
Source: Booz & Company estimates

Sydney (Kingsford-Smith) Airport

Sydney (Kingsford-Smith) Airport domestic and regional passenger baseline forecasts for the Constrained Base Case are summarised in Figure 69, Table 28 and Table 30. Figure 70, Table 29 and Table 31 show the forecasts for the Unconstrained Case.

Domestic and regional passenger numbers at Sydney (Kingsford-Smith) Airport are forecast to increase from 24.2 million in 2010 to 41.6 million in 2030 and 53.4 million by 2060. This represents a 20-year CAGR of 2.7 per cent to 2030 and a long term CAGR of 1.8 per cent to 2060. Without any policy settings in place at Sydney (Kingsford-Smith) Airport, the forecasted number of domestic and regional passengers is estimated to reach approximately 82.9 million by 2060. This is illustrated in Figure 70.

Figure 69 – Sydney (Kingsford-Smith) Airport Domestic and Regional Passenger Forecasts, Constrained, 2005 to 2060



Source: Booz & Company estimates

Figure 70 - Sydney (Kingsford-Smith) Airport Domestic and Regional Passenger Forecasts, Unconstrained, 2005 to 2060

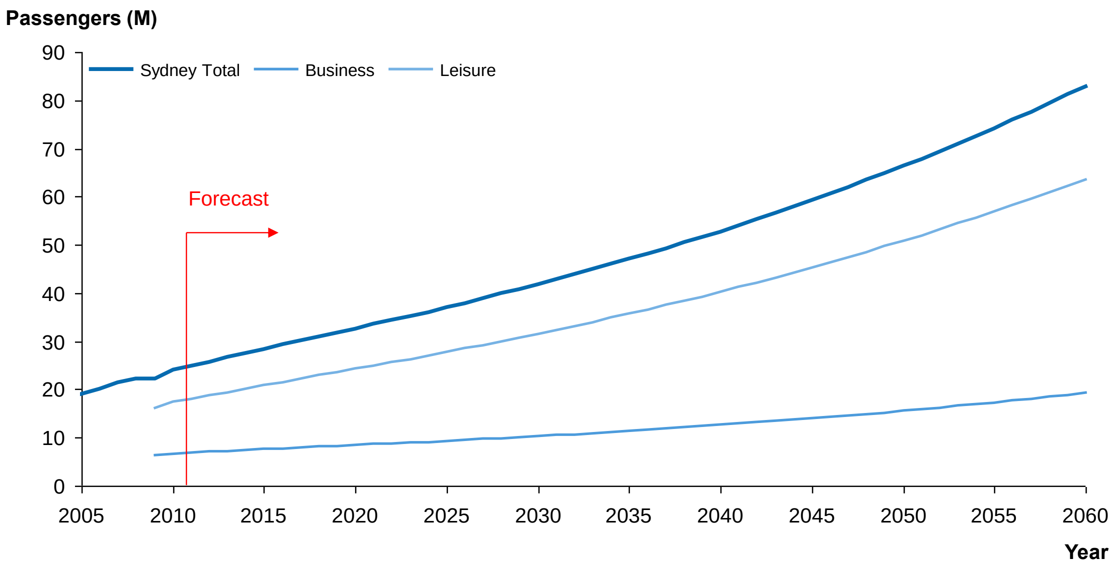


Table 28 shows the purpose of travel breakdown for Sydney (Kingsford-Smith) Airport domestic passengers between 2010 and 2060 for the Constrained Case. Leisure passengers continue to grow more strongly than business passengers with a growth rate of 3.0 per cent per annum forecast from 2010 to 2030 compared to business passenger growth of 2.2 per cent per annum over the same period. Total Sydney (Kingsford-Smith) Airport domestic passengers are forecast to grow from 22.2 million in 2010 to 48.2 million in 2060, representing 1.6 per cent annual average growth.

Table 28 – Sydney (Kingsford-Smith) Airport Domestic Passenger Forecasts including Business/Leisure Split (Thousands), Constrained Case
2010 to 2060

Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2010	-	6,180	15,997	22,177
2015	5 Years	6,984	19,111	26,094
2020	10 Years	7,770	22,295	30,065
2030	20 Years	9,480	28,969	38,449
2060	50 Years	14,609	33,591	48,200
CAGR		**%**	**%**	**%**
2010 to 2015	5 Years	2.5%	3.6%	3.3%
2010 to 2020	10 Years	2.3%	3.4%	3.1%
2010 to 2030	20 Years	2.2%	3.0%	2.8%
2010 to 2060	50 Years	1.7%	1.5%	1.6%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

A similar trend in the split between leisure and business can be observed in Table 29, which shows that in the absence of policy settings at Sydney (Kingsford-Smith) Airport the number of forecast domestic passengers could reach 77.2 million, corresponding to an annual growth rate of 2.5 per cent from 2010 to 2060.

Table 29 - Sydney (Kingsford-Smith) Airport Domestic Passenger Forecasts including Business/Leisure Split (Thousands), Unconstrained Case
2010 to 2060

Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2010	-	6,180	15,997	22,177
2015	5 Years	6,984	19,111	26,094
2020	10 Years	7,776	22,338	30,115
2030	20 Years	9,513	29,201	38,713
2060	50 Years	17,991	59,251	77,242
CAGR		**%**	**%**	**%**
2010 to 2015	5 Years	2.5%	3.6%	3.3%
2010 to 2020	10 Years	2.3%	3.4%	3.1%
2010 to 2030	20 Years	2.2%	3.1%	2.8%
2010 to 2060	50 Years	2.2%	2.7%	2.5%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

Under the constrained case, Sydney regional passengers are expected to grow moderately at 2.2 per cent per annum from 2010 to 2030 and 1.9 per cent per annum from 2010 to 2060. Passengers are estimated to increase from 2.0 million in 2010 to 3.1 million in 2030 and 5.2 million in 2060. This is based on the assumption that access to regional services will be maintained at a minimum of 2001 levels of operations. This compares to an unconstrained annual growth of 2.1 per cent from 2010 to 2060 as shown in Table 31.

Table 30 shows the regional passenger forecasts for Sydney (Kingsford-Smith) Airport for the Constrained Case. Business passengers are forecasted to grow more slowly at an average annual rate of 1.6 per cent per annum from 2010 to 2030. Growth is strongest in the leisure passenger market, which is expected to grow at an average rate of 2.5 per cent over the next 20 years.

Table 30 – Sydney (Kingsford-Smith) Airport Regional Passenger Forecasts including Business/Leisure Split (Thousands), with Policy Settings,
2010 to 2060

Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2010	-	562	1,456	2,018
2015	5 Years	612	1,676	2,288
2020	10 Years	661	1,899	2,560
2030	20 Years	771	2,366	3,137
2060	50 Years	1,274	3,965	5,239
CAGR		**%**	**%**	**%**
2010 to 2015	5 Years	1.7%	2.9%	2.5%
2010 to 2020	10 Years	1.6%	2.7%	2.4%
2010 to 2030	20 Years	1.6%	2.5%	2.2%
2010 to 2060	50 Years	1.6%	2.0%	1.9%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

Table 31 shows the passenger forecasts by travel purpose for the Unconstrained Base Case.

Table 31 - Sydney (Kingsford-Smith) Airport Regional Passenger Forecasts including Business/Leisure Split (Thousands), without Policy Settings,
2010 to 2060

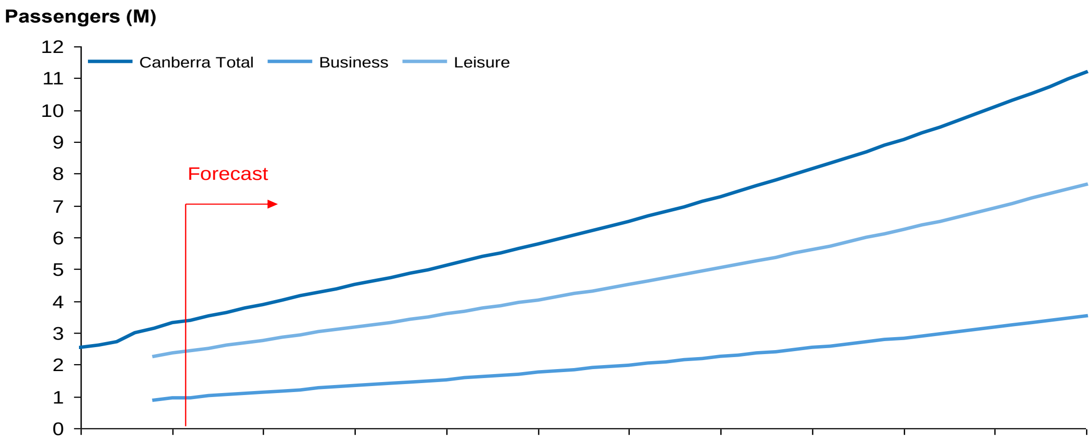
Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2010	-	562	1,456	2,018
2015	5 Years	612	1,676	2,288
2020	10 Years	661	1,899	2,560
2030	20 Years	771	2,366	3,137
2060	50 Years	1,328	4,375	5,703
CAGR		**%**	**%**	**%**
2010 to 2015	5 Years	1.7%	2.9%	2.5%
2010 to 2020	10 Years	1.6%	2.7%	2.4%
2010 to 2030	20 Years	1.6%	2.5%	2.2%
2010 to 2060	50 Years	1.7%	2.2%	2.1%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

Canberra Airport

Canberra Airport domestic and regional passenger forecasts are shown in Figure 71 and Table 32. Canberra domestic and regional passengers are forecast to increase from 3.3 million in 2010 to 5.8 million in 2030 to 11.2 million by 2060. This represents an average annual growth rate of 2.8 per cent from 2010 to 2030 and 2.5 per cent from 2010 to 2060.

Figure 71 – Canberra Airport Domestic and Regional Passenger Forecast including Business/Leisure Split



Source: Booz & Company estimates

Table 32 shows the passenger breakdown for Canberra airport regarding domestic and regional travel, which is forecast to grow at a compounded annual growth rate of 2.5 per cent between 2010 and 2060.

Table 32 – Canberra Airport Domestic and Regional Passenger Forecasts including Business/Leisure Split (Thousands)
2010 to 2060

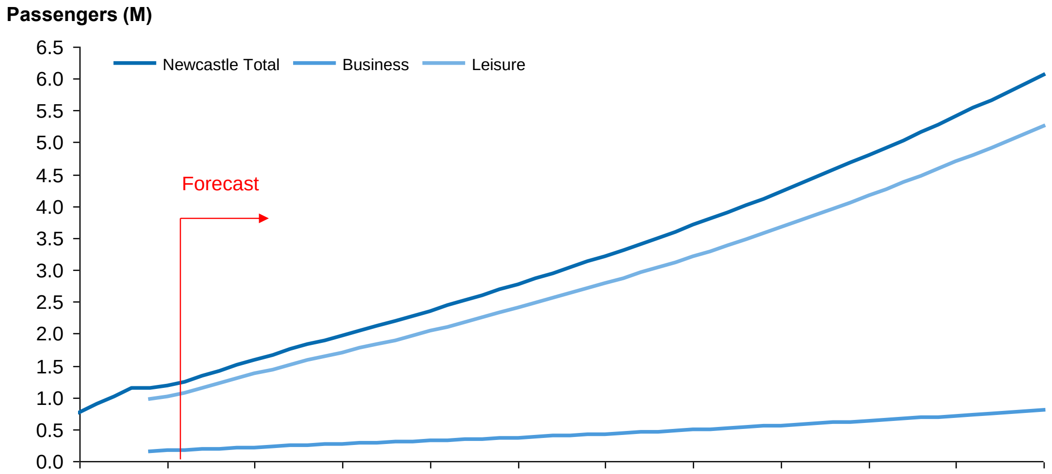
Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2010	-	943	2,361	3,304
2015	5 Years	1,131	2,767	3,898
2020	10 Years	1,330	3,176	4,505
2030	20 Years	1,752	4,035	5,787
2060	50 Years	3,516	7,676	11,192
CAGR		%	%	%
2010 to 2015	5 Years	3.7%	3.2%	3.4%
2010 to 2015	10 Years	3.5%	3.0%	3.1%
2010 to 2030	20 Years	3.1%	2.7%	2.8%
2010 to 2060	50 Years	2.7%	2.4%	2.5%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

Newcastle Airport

Newcastle Airport domestic and regional passenger forecasts are shown in Figure 72 and Table 33. Newcastle domestic and regional passengers are forecast to increase from 1.2 million in 2010 to 2.8 million in 2030 to 6.1 million in 2060. This represents an average annual growth rate of 4.3 per cent from 2010 to 2030 and 3.3 per cent from 2010 to 2060. It is assumed that the current commercial movement restriction imposed by the Department of Defence allowing a maximum of 6 arrivals per hour remains in place throughout the forecast period. This is likely to cause growth to slow once this level of activity is reached, which is towards the end of the projection period.

Figure 72 – Newcastle Airport Domestic and Regional Passenger Forecast including Business/Leisure Split



Source: Booz & Company estimates

Table 33 shows the passenger forecast for Newcastle domestic and regional passengers by type of passenger. Leisure passengers are expected to represent the majority of this growth with a rapid short term growth rate of 6.1 per cent over the 2010 – 2015 period compared to 5.5 per cent from business passengers. This is representative of the rapid growth attributable to low cost carriers predominantly serving leisure traffic.

Table 33 – Newcastle Airport Domestic and Regional Passenger Forecasts including Business/Leisure Split (Thousands)
2010 to 2060

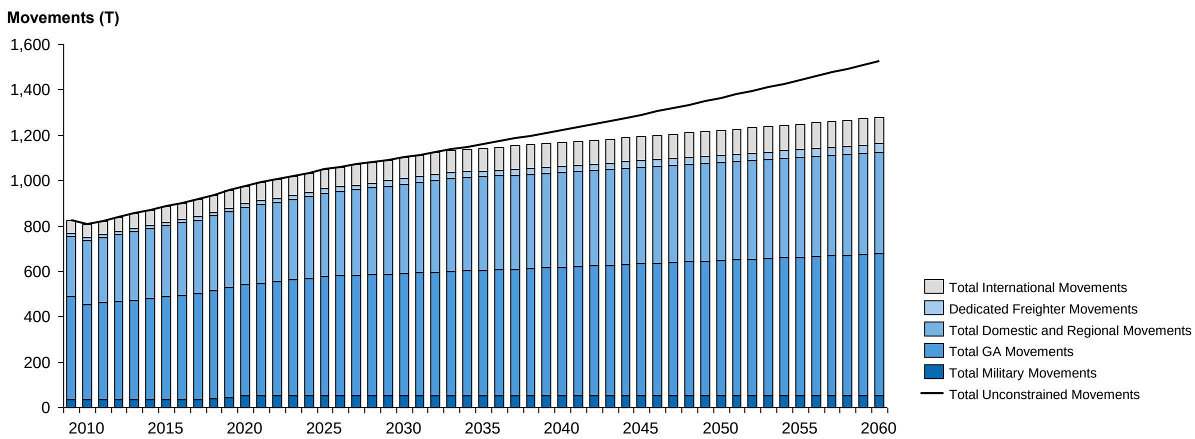
Forecast	Timeframe	Business Passengers	Leisure Passengers	Total Passengers
2010	-	167	1,019	1,186
2015	5 Years	219	1,369	1,587
2020	10 Years	268	1,706	1,974
2030	20 Years	372	2,404	2,776
2060	50 Years	800	5,266	6,066
CAGR		**%**	**%**	**%**
2010 to 2015	5 Years	5.5%	6.1%	6.0%
2010 to 2020	10 Years	4.8%	5.3%	5.2%
2010 to 2030	20 Years	4.1%	4.4%	4.3%
2010 to 2060	50 Years	3.2%	3.3%	3.3%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

6.3 Aircraft Movement Forecasts

Total forecasted aircraft movements at Sydney region airports are shown in Figure 73.

Figure 73 – Total Sydney Region Estimated Aircraft Movements, Constrained and Unconstrained,
2010-2060



Source: Booz & Company estimates

In 2010, approximately 815,300 aircraft movements were registered. It is estimated that by 2060 the number of movements could grow by 0.9 per cent per year to 1.3 million movements under the constrained case and at 1.3 per cent per annum to over 1.5 million movements for the unconstrained case. Aircraft movements are forecast to grow more slowly than passenger movements due to a continuation of the historical trend of fleet up-gauging. For the constrained case, the policy environment is likely to speed up this process in order to accommodate more passengers.

Table 34 shows the growth rates and estimated aircraft movements forecasts for selected years, for the constrained case.

Table 34 – Sydney Region Estimated Aircraft Movements, Constrained, Selected Years (Thousands), 2010 to 2060

Forecast	International	Domestic & Regional	Dedicated Freighters	GA	Military	Total
2010	62.5	282.0	12.6	424.1	34.2	815.3
2015	73.0	313.5	14.0	456.8	34.2	891.5
2020	80.5	340.7	16.7	492.1	52.1	982.2
2030	92.9	393.6	23.0	543.6	52.1	1,105.1
2060	116.9	444.8	39.2	631.3	52.1	1,284.4
CAGR						
2010 to 2015	3.2%	2.1%	2.2%	1.5%	0.0%	1.8%
2010 to 2020	2.6%	1.9%	2.9%	1.5%	4.3%	1.9%
2010 to 2030	2.0%	1.7%	3.1%	1.2%	2.1%	1.5%
2010 to 2060	1.3%	0.9%	2.3%	0.8%	0.8%	0.9%

Source: Booz & Company estimates

Table 35 shows the growth rates and estimated aircraft movements forecasts for selected years, for the unconstrained case.

Table 35 – Sydney Region Estimated Aircraft Movements, Unconstrained, Selected Years (Thousands), 2010 to 2060

Forecast	International	Domestic & Regional	Dedicated Freighters	GA	Military	Total
2010	62.5	282.0	12.6	424.1	34.2	815.3
2015	73.0	313.5	14.0	456.8	34.2	891.5
2020	80.5	340.7	16.7	492.1	52.1	982.2
2030	92.9	393.6	23.0	543.6	52.1	1,105.1
2060	187.1	613.6	47.9	631.3	52.1	1,532.1
CAGR						
2010 to 2015	3.2%	2.1%	2.2%	1.5%	0.0%	1.8%
2010 to 2020	2.6%	1.9%	2.9%	1.5%	4.3%	1.9%
2010 to 2030	2.0%	1.7%	3.1%	1.2%	2.1%	1.5%
2010 to 2060	2.2%	1.6%	2.7%	0.8%	0.8%	1.3%

Source: Booz & Company estimates

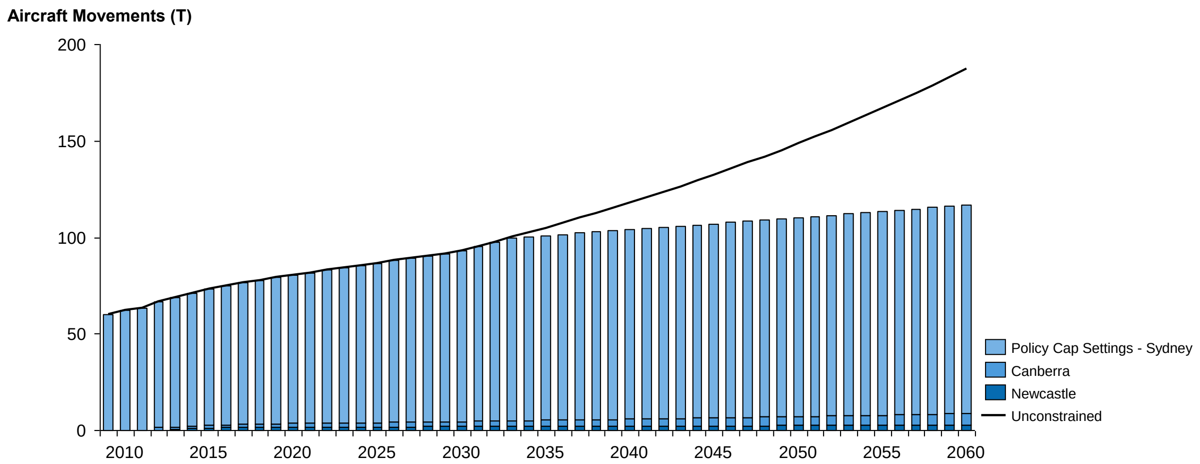
The following sections summarise the aircraft movement forecasts for the Sydney region by market type and airport.

6.3.1 *International Aircraft Movement Forecasts*

International aircraft movement forecasts for the Sydney region are presented in Figure 74 and Table 36. International aircraft movements are expected to grow at a rate of 2.0 per cent per annum on average until 2030. In 2033, the critical threshold based on policy settings at Sydney (Kingsford-Smith) Airport is forecast to be reached. Some international aircraft movement growth is expected to occur at Canberra and Newcastle airports, between 2030 to 2060.

Given the policy settings, international aircraft movements are expected to grow at an average of 1.3 per cent per annum over the entire forecast period in the Sydney region for the constrained case compared with 2.2 per cent for the unconstrained case.

Figure 74 – Total International Aircraft Movement Forecast for Sydney Region, Constrained and Unconstrained, 2010 to 2060



Source: Booz & Company estimates

Table 36 – Sydney Region International Aircraft Movement Forecast, Constrained and Unconstrained, 2010 to 2060

CAGR	Timeframe	Constrained	Unconstrained
2010 to 2015	5 Years	3.2%	3.2%
2010 to 2020	10 Years	2.6%	2.6%
2010 to 2030	20 Years	2.0%	2.0%
2010 to 2060	50 Years	1.3%	2.2%

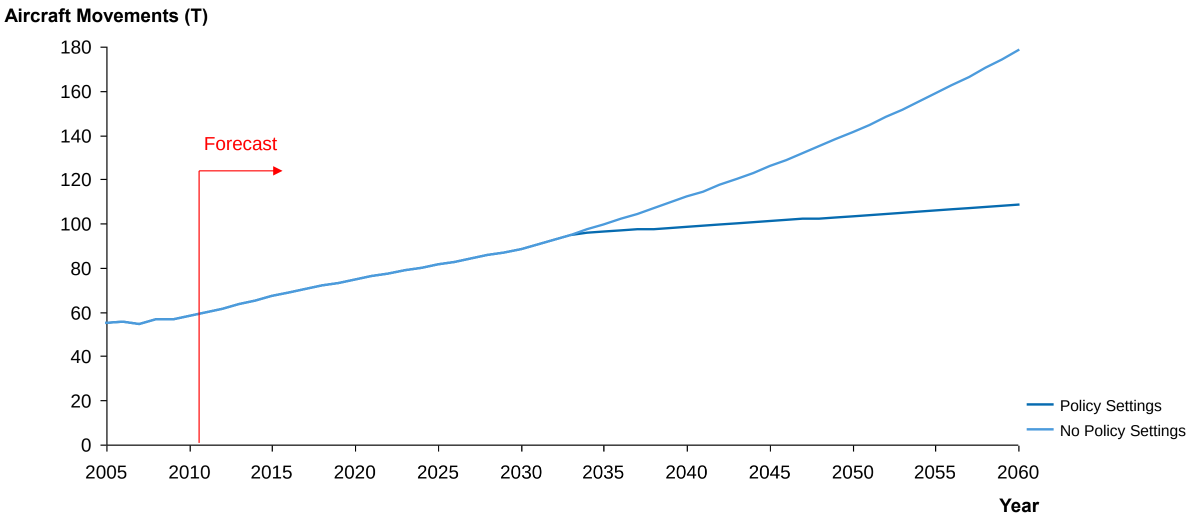
Source: Booz & Company estimates

Sydney (Kingsford-Smith) Airport

Sydney (Kingsford-Smith) Airport international aircraft movement forecasts are summarised in Figure 75 and Table 37.

International aircraft movements at Sydney (Kingsford-Smith) Airport are expected to grow at an average annual rate of 1.7 per cent from 2010 to 2030. It is forecast that the 80 aircraft movement per hour cap at Sydney (Kingsford-Smith) Airport cap will reached by 2033. At this point, the annual growth rate for international aircraft movements will be lower for the remainder of the forecast and is forecast to grow at 0.7 per cent between 2030 and 2060. However, in the absence of policy settings at Sydney (Kingsford-Smith) Airport, international aircraft movements could be expected to continue growing at an average annual growth rate of 2.4 per cent between 2030 and 2060.

Figure 75 – Sydney (Kingsford-Smith) Airport International Aircraft Movement Forecasts, Constrained and Unconstrained, 2005 to 2060



Source: Booz & Company analysis

Table 37 – Sydney (Kingsford-Smith) Airport International Aircraft Movement Forecasts, Constrained and Unconstrained (thousands), 2010 to 2060

Forecast	Timeframe	Constrained	Unconstrained
2010	-	62.5	62.5
2015	5 Years	70.2	70.2
2020	10 Years	76.9	76.9
2030	20 Years	88.2	88.2
2060	50 Years	108.2	178.4
CAGR		**%**	**%**
2010 to 2015	5 Years	2.4%	2.4%
2010 to 2020	10 Years	2.1%	2.1%
2010 to 2030	20 Years	1.7%	1.7%
2010 to 2060	50 Years	1.1%	2.1%

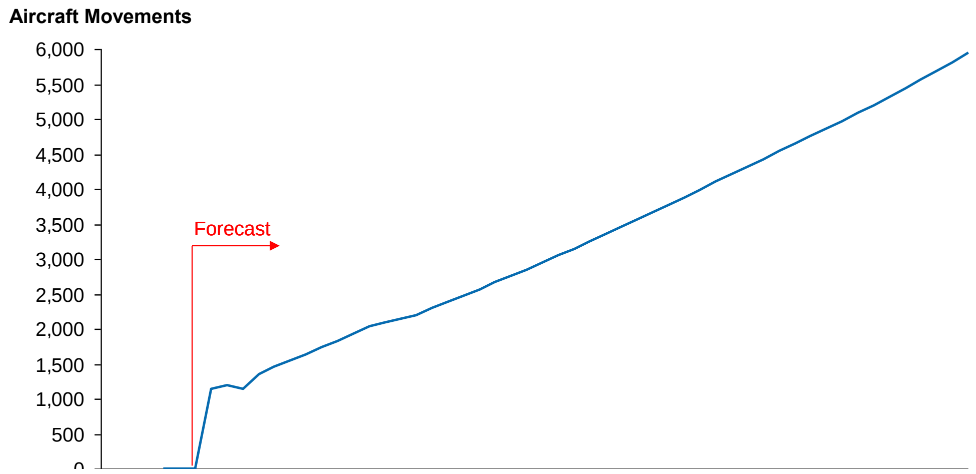
Note: Rounded to the nearest hundred
Source: Booz & Company estimates

Canberra Airport

Canberra Airport international annual aircraft movements are presented in Figure 76 and Table 38.

International traffic is expected to begin in 2012 and international aircraft movements are forecast to grow at an average annual rate of 4.5 per cent between 2012 and 2030.

Figure 76 – Canberra Airport International Aircraft Movement Forecasts
2005 to 2060



Source: Booz & Company analysis

Table 38 – Canberra Airport International Aircraft Movement Forecasts
2012 to 2060

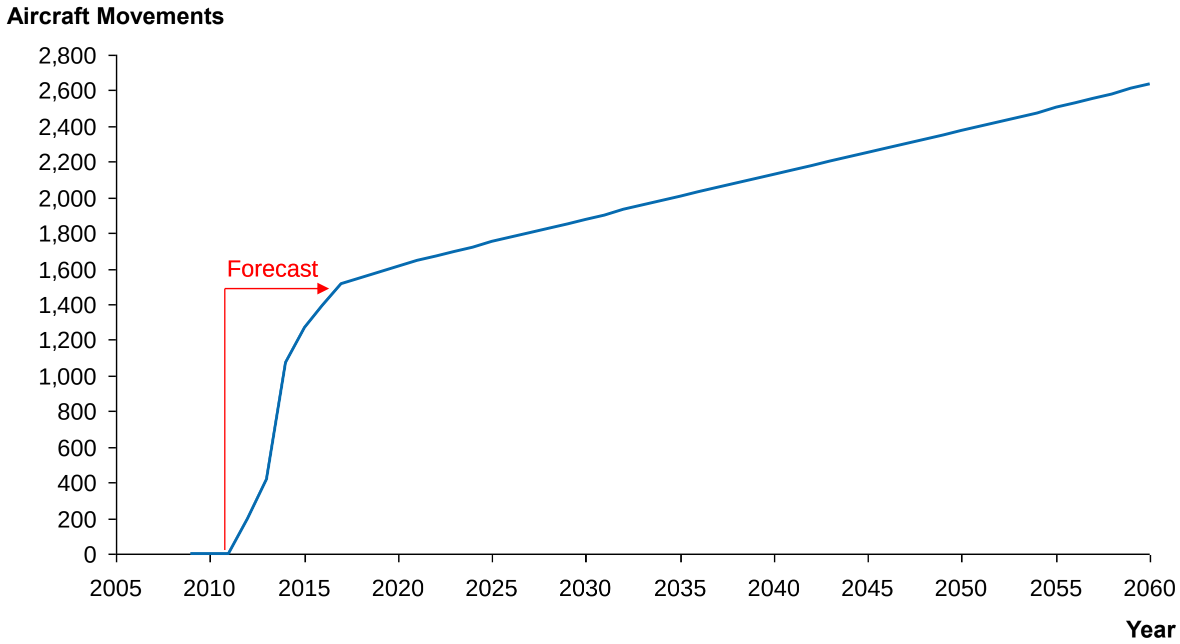
Forecast	Timeframe	Movements
2012	-	1,200
2015	3 Years	1,400
2020	8 Years	1,900
2030	18 Years	2,700
2060	48 Years	5,900
CAGR		**%**
2012 to 2015	3 Years	5.4%
2012 to 2020	8 Years	5.6%
2012 to 2030	18 Years	4.5%
2012 to 2060	48 Years	3.4%

Note: Rounded to the nearest hundred
Source: Booz & Company estimates

Newcastle Airport

A possible profile of Newcastle Airport international aircraft movements are presented in Figure 77 and Table 39. International traffic is planned to begin in 2012. International aircraft movements are expected to grow at an average annual rate of 5.7 per cent between 2012 and 2060.

Figure 77 – Newcastle Airport International Aircraft Movement Forecasts
2005 to 2060



Source: Booz & Company Analysis

Table 39 - Newcastle Airport International Aircraft Movement Forecasts
2012 to 2060

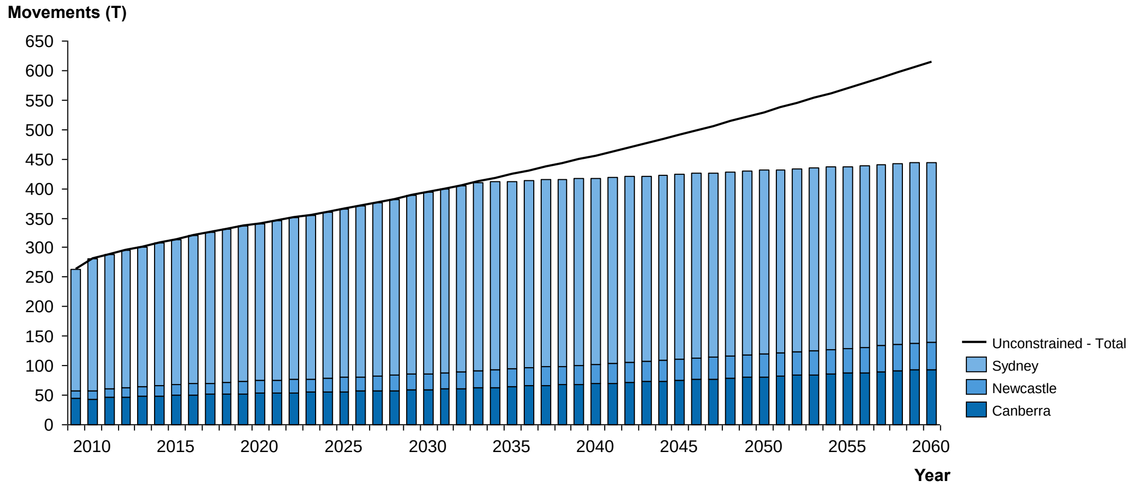
Forecast	Timeframe	Movements
2012	-	200
2015	3 Years	1,300
2020	8 Years	1,700
2030	18 Years	2,000
2060	48 Years	2,800
CAGR		**%**
2012 to 2015	3 Years	89.2%
2012 to 2020	8 Years	30.9%
2012 to 2030	18 Years	13.7%
2012 to 2060	48 Years	5.7%

Note: Rounded to the nearest hundred
Source: Booz & Company estimates

6.3.2 Domestic and Regional Aircraft Movements

Domestic and regional aircraft movement forecasts for the Sydney region are presented in Figure 78 and Table 40. Domestic and regional aircraft movements are expected to grow at a rate of 1.7 per cent per annum on average until 2030. By 2033, the maximum number of annual domestic and regional movements at Sydney (Kingsford-Smith) Airport is expected to be reached and growth is expected to slow to 0.4 per cent per annum in the long term between 2030 and 2060.

Figure 78 - Total Domestic and Regional Aircraft Movement Forecast for Sydney Region Constrained and Unconstrained, 2010 to 2060



Source: Booz & Company estimates

Table 40 – Sydney Region Domestic and Regional Aircraft Movement Forecast Constrained and Unconstrained
2010 to 2060

CAGR	Timeframe	Constrained	Unconstrained
2010 to 2015	5 Years	2.1%	2.1%
2010 to 2020	10 Years	1.9%	1.9%
2010 to 2030	20 Years	1.7%	1.7%
2010 to 2060	50 Years	0.9%	1.6%

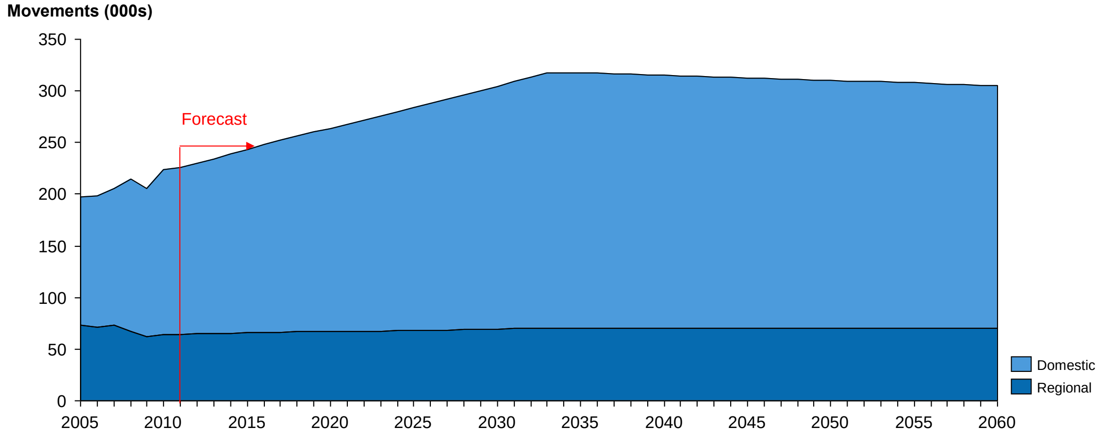
Source: Booz & Company estimates

Sydney (Kingsford-Smith) Airport

Domestic and regional aircraft movement forecasts for Sydney (Kingsford-Smith) Airport are illustrated in

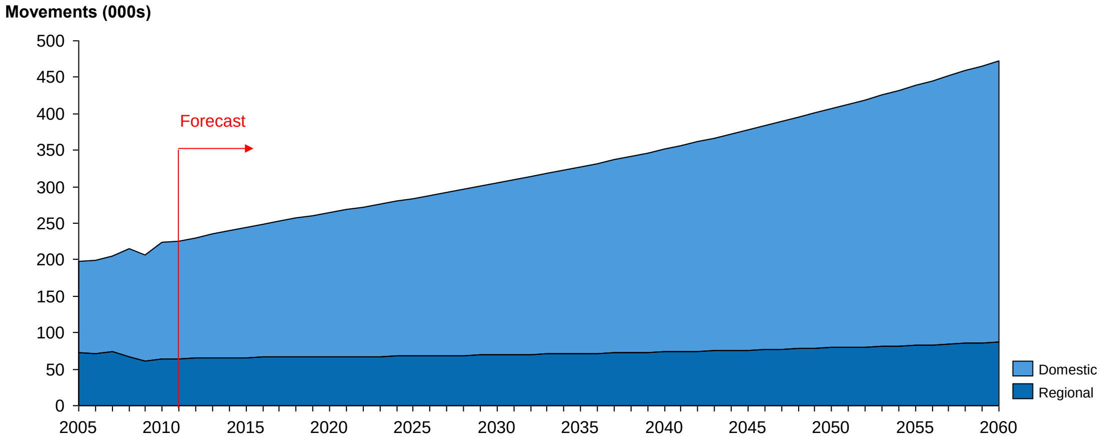
Figure 79, Figure 80. Table 41 and Table 42 summarise aircraft movement forecasts for the domestic and regional traffic, respectively.

Figure 79 – Sydney (Kingsford-Smith) Airport Domestic and Regional Aircraft Movement Forecast, Constrained



Source: Booz & Company estimates

Figure 80 - Sydney (Kingsford-Smith) Airport Domestic and Regional Aircraft Movement Forecast, Unconstrained



Source: Booz & Company estimates

Domestic aircraft movements at Sydney (Kingsford-Smith) Airport, with the current policy settings in place, are estimated to grow from 160,000 in 2010 to 235,000 by 2060, representing an average annual growth rate of 0.8 per cent. Movements are forecast to grow until the critical threshold is reached, which is assumed to be in 2033. Following this, it is assumed that international movements can continue to grow, albeit at a slower rate than prior to the critical threshold, at the expense of domestic services since these services are higher capacity and higher yielding. Therefore, a small decrease in domestic movements is expected between 2033 and 2060. Under the Unconstrained Case, growth is forecast at 1.8 per cent per annum over the forecast period between 2010 to 2060, this would translate to an additional 153,000 movements by 2060 compared with the constrained case.

Table 41 – Sydney (Kingsford-Smith) Airport Domestic Aircraft Movement Forecasts, Constrained and Unconstrained, 2010 to 2060

Forecast	Timeframe	Constrained	Unconstrained
2010	-	160,000	160,000
2015	5 Years	180,000	180,000
2020	10 Years	199,000	199,000
2030	20 Years	237,000	237,000
2060	50 Years	235,000	388,000
CAGR		**%**	**%**
2010 to 2015	5 Years	2.4%	2.4%
2010 to 2020	10 Years	2.3%	2.3%
2010 to 2030	20 Years	2.0%	2.0%
2010 to 2060	50 Years	0.8%	1.8%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

A small increase in regional aircraft movements at Sydney (Kingsford-Smith) Airport to 70,000 is forecast in the long term under the constrained base case. If growth was not constrained by the current policy settings at Sydney (Kingsford-Smith) Airport, it is forecast that 87,000 movements could be reached by 2060.

Table 42 – Sydney (Kingsford-Smith) Airport Regional Aircraft Movement Forecasts, Constrained and Unconstrained, 2010 to 2060

Forecast	Timeframe	Constrained	Unconstrained
2010	-	64,000	64,000
2015	5 Years	66,000	66,000
2020	10 Years	67,000	67,000
2030	20 Years	70,000	70,000
2060	50 Years	70,000	87,000
CAGR		**%**	**%**
2010 to 2015	5 Years	0.4%	0.4%
2010 to 2020	10 Years	0.4%	0.4%
2010 to 2030	20 Years	0.4%	0.4%
2010 to 2060	50 Years	0.2%	0.6%

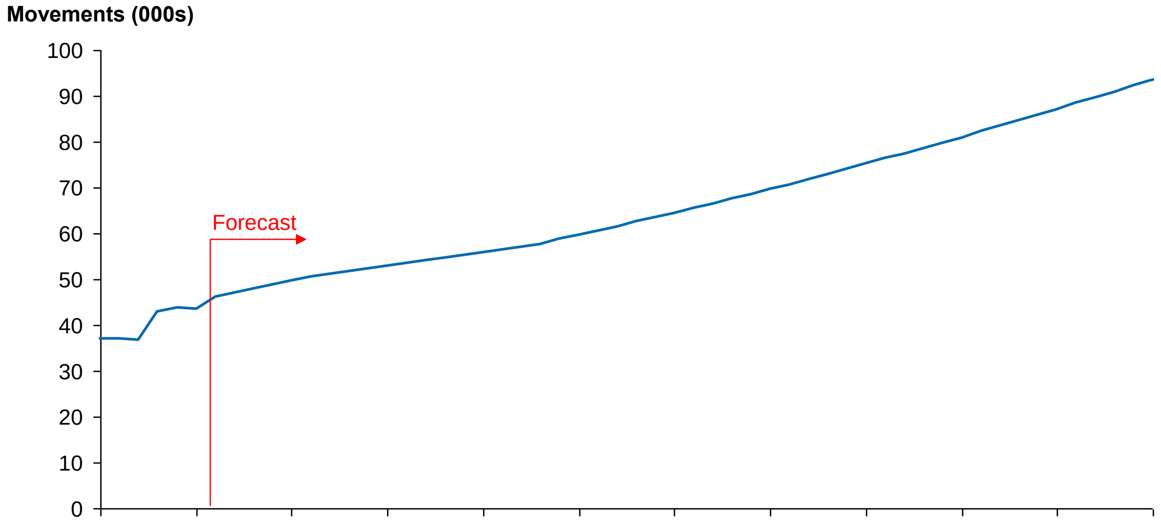
Note: Rounded to the nearest thousand
Source: Booz & Company estimates

Canberra Airport

Domestic and regional aircraft movement forecasts for Canberra Airport are presented in Figure 81 and Table 43.

Domestic and regional aircraft movements at Canberra Airport are forecast to grow at 1.6 per cent per annum between 2010 and 2030 and remains around this average growth rate (1.5 per cent) in the long term between 2030 and 2060.

Figure 81 – Canberra Airport Domestic and Regional Aircraft Movement Forecast



Source: Booz & Company estimates

Table 43 – Canberra Airport Domestic and Regional Aircraft Movement Forecasts
2010 to 2060

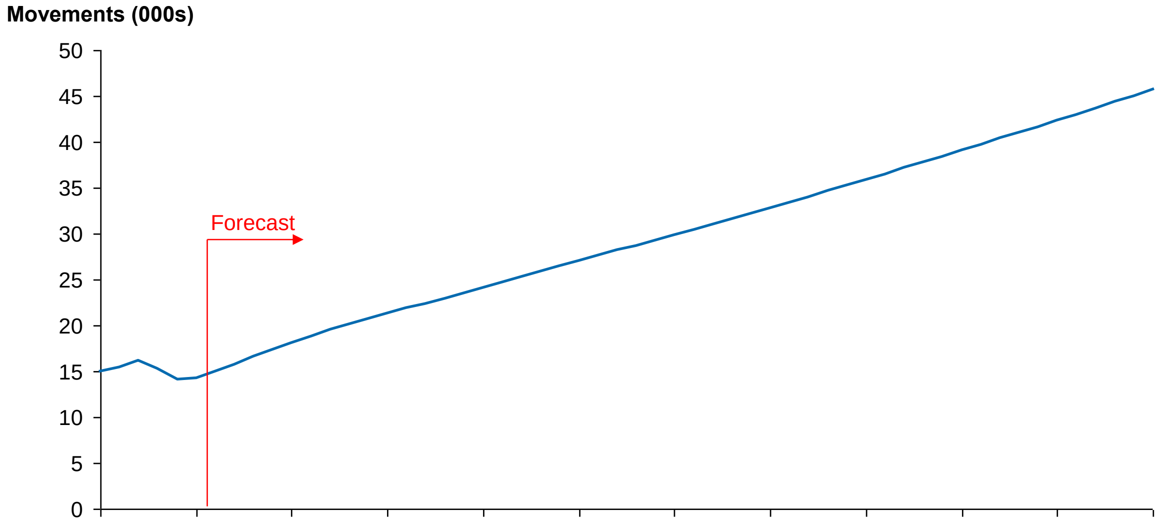
Forecast	Timeframe	Movements
2010	-	44,000
2015	5 Years	50,000
2020	10 Years	53,000
2030	20 Years	60,000
2060	50 Years	94,000
CAGR		**%**
2010 to 2015	5 Years	2.6%
2010 to 2020	10 Years	2.0%
2010 to 2030	20 Years	1.6%
2010 to 2060	50 Years	1.5%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

Newcastle Airport

Domestic and regional aircraft movement forecasts for Newcastle Airport are presented in Figure 82 and Table 44. Domestic and regional aircraft movements at Newcastle Airport are forecast to grow at 3.2 per cent per annum between 2010 and 2030 and slow to 1.8 per cent per annum between 2030 and 2060.

Figure 82 – Newcastle Airport Domestic and Regional Aircraft Movement Forecast



Source: Booz & Company estimates

Table 44 – Newcastle Airport Domestic and Regional Aircraft Movement Forecasts
2010 to 2060

Forecast	Timeframe	Movements
2010	-	14,000
2015	5 Years	18,000
2020	10 Years	21,000
2030	20 Years	27,000
2060	50 Years	46,000
CAGR		**%**
2010 to 2015	5 Years	4.8%
2010 to 2020	10 Years	4.0%
2010 to 2030	20 Years	3.2%
2010 to 2060	50 Years	2.3%

Note: Rounded to the nearest thousand
Source: Booz & Company estimates

6.3.3 General Aviation Movements

General Aviation movements are shown in Table 45. GA movements at Bankstown Airport were approximately 274,000 in 2010 and are expected to grow at an average rate of 1.3 per cent between 2010 and 2030 and 0.5 per cent per annum between 2030 and 2060 to a level of 416,000 annual movements. GA movements at Sydney (Kingsford-Smith) Airport are forecast to decrease from around 17,200 in 2010 to 15,000 movements by 2030 and remain at that level thereafter in order to make way for larger aircraft at Sydney (Kingsford-Smith)

Airport as the airport becomes constrained[30]. The GA movements from Sydney are likely to shift to Bankstown, Camden and the RAAF Base Richmond.

Table 45 – General Aviation Aircraft Movement Forecasts - Sydney
2010 to 2060

Year	Timeframe	Bankstown	Camden	Sydney	Richmond
2010	-	274,000	84,100	17,200	5,400
2015	5 Years	296,800	91,000	16,600	5,800
2020	10 Years	321,000	98,600	16,100	6,300
2030	20 Years	357,000	109,476	15,000	7,000
2060	50 Years	416,000	127,706	15,000	8,200
CAGR		%	%	%	%
2010 to 2015	5 Years	1.6%	1.6%	-0.7%	1.6%
2010 to 2020	10 Years	1.6%	1.6%	-0.7%	1.6%
2010 to 2030	20 Years	1.3%	1.3%	-0.7%	1.3%
2010 to 2060	50 Years	0.8%	0.8%	-0.3%	0.8%

Source: Booz & Company estimates

As shown in Table 46 and Table 47, GA movements at Newcastle are forecast to remain constant since operations such as light aircraft training are considered by Defence as incompatible to the RAAF base operations. Maitland and Cessnock are expected to cater for additional demand in the region with an average annual growth rate of 4.5 per cent per annum to 2030, which slows to 1.2 per cent per annum from 2030 to 2060.

Table 46 – General Aviation Aircraft Movement Forecasts - Newcastle
2010 to 2060

Year	Timeframe	Newcastle	Maitland	Cessnock
2010	-	14,400	2,100	1,400
2015	5 Years	14,400	2,900	2,000
2020	10 Years	14,400	3,800	2,600
2030	20 Years	14,400	5,100	3,500
2060	50 Years	14,400	7,300	5,000
CAGR		%	%	%
2010 to 2015	5 Years	0.0%	6.8%	6.8%
2010 to 2020	10 Years	0.0%	6.1%	6.1%
2010 to 2030	20 Years	0.0%	4.5%	4.5%
2010 to 2060	50 Years	0.0%	2.5%	2.5%

Source: Booz & Company estimates

The remaining airports in the Canberra region are forecast to grow modestly in line with historical trends. Movements at Goulburn are forecast to grow at 1.2 per cent per annum to 2030 and slow to 0.5 per cent per annum from 2030 to 2060.

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[30] *Based on the approved 2009 Sydney Airport Master Plan*

Table 47 – General Aviation Aircraft Movement Forecasts - Canberra 2010 to 2060

Year	Timeframe	Canberra	Goulburn
2010	-	24,300	1,000
2015	5 Years	26,200	1,000
2020	10 Years	28,200	1,100
2030	20 Years	31,200	1,200
2060	50 Years	36,200	1,400
CAGR		%	%
2010 to 2015	5 Years	1.5%	1.5%
2010 to 2020	10 Years	1.5%	1.5%
2010 to 2030	20 Years	1.2%	1.2%
2010 to 2060	50 Years	0.8%	0.8%

Source: Booz & Company estimates

6.3.4 *Military Aircraft Movements*

With the exception of RAAF Base Williamtown, military movements are forecast to remain constant over the forecast period. RAAF Base Williamtown military movements are assumed to ramp up between 2018 and 2020 due to the introduction of the Joint Strike Fighter (JSF) programme based at the RAAF Base Williamtown. This is estimated to increase annual military movements from 25,000 to 43,000 (from 2017-2020).

Table 48 – Military Aircraft Movement Forecasts

Year	2010	2015	2020	2030	2010-2020	2010-2030
Timeframe	-	5 Years	10 Years	20 Years	10 Years	20 Years
Bankstown	2	2	2	2	0.0%	0.0%
Camden	2	2	2	2	0.0%	0.0%
Sydney	442	442	442	442	0.0%	0.0%
Richmond	7,461	7,461	7,461	7,461	0.0%	0.0%
Williamtown	25,033	25,033	43,000	43,000	5.6%	2.7%
Goulburn	2	2	2	2	0.0%	0.0%
Maitland	8	8	8	8	0.0%	0.0%
Canberra	1,204	1,204	1,204	1,204	0.0%	0.0%
Cessnock	-	-	-	-	-	-
Total	34,154	34,154	52,121	52,121	4.3%	2.1%

Source: Booz & Company estimates

6.4 Freight Forecasts

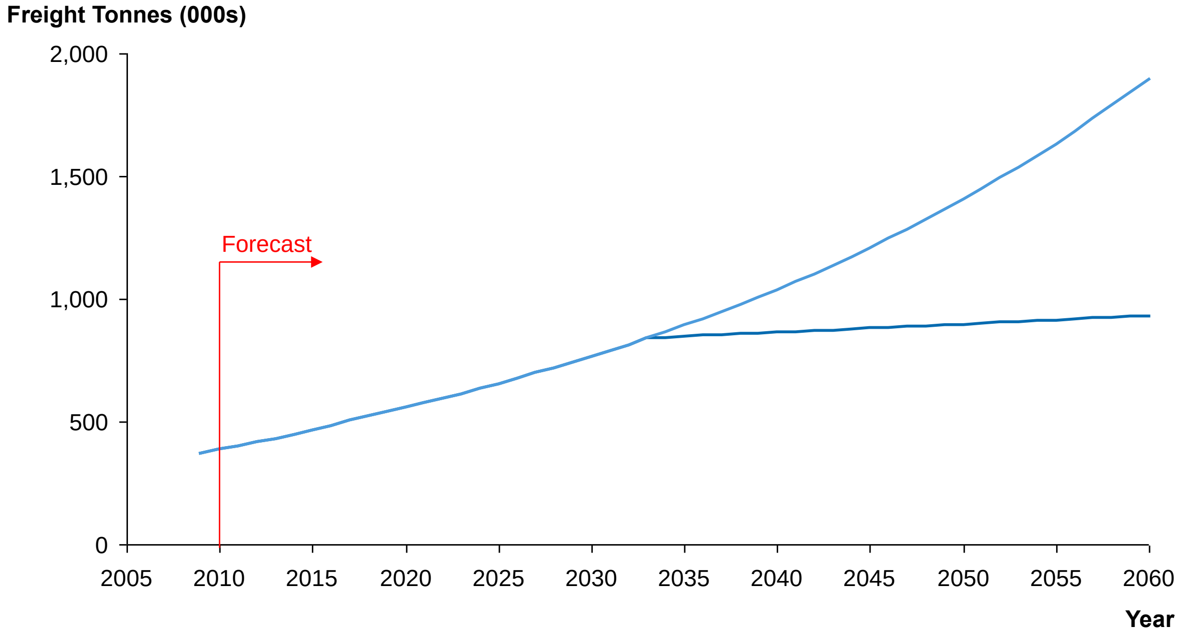
6.4.1 *International Freight Forecasts*

International freight forecasts for Sydney and Canberra Airports are summarised below.

Sydney (Kingsford-Smith) Airport

Sydney (Kingsford-Smith) Airport international freight is expected to grow at an annual average of 3.5 per cent to 2030. From 2030 growth is expected to slow significantly to 0.6 per cent per annum until 2060, facilitated by expected increases in dedicated freighter capacity. Some international freight is expected to be diverted to Canberra Airport and other Australian international airport gateways. Over the entire forecast period the annual average growth rate for the Constrained Case is expected to be 1.7 per cent. Under the Unconstrained Case, growth over the forecast period (i.e. from 2010 to 2060), is projected to be at 3.2 per cent per annum.

Figure 83 – Sydney (Kingsford-Smith) Airport International Freight Volume Forecast, Constrained and Unconstrained, 2005 to 2060



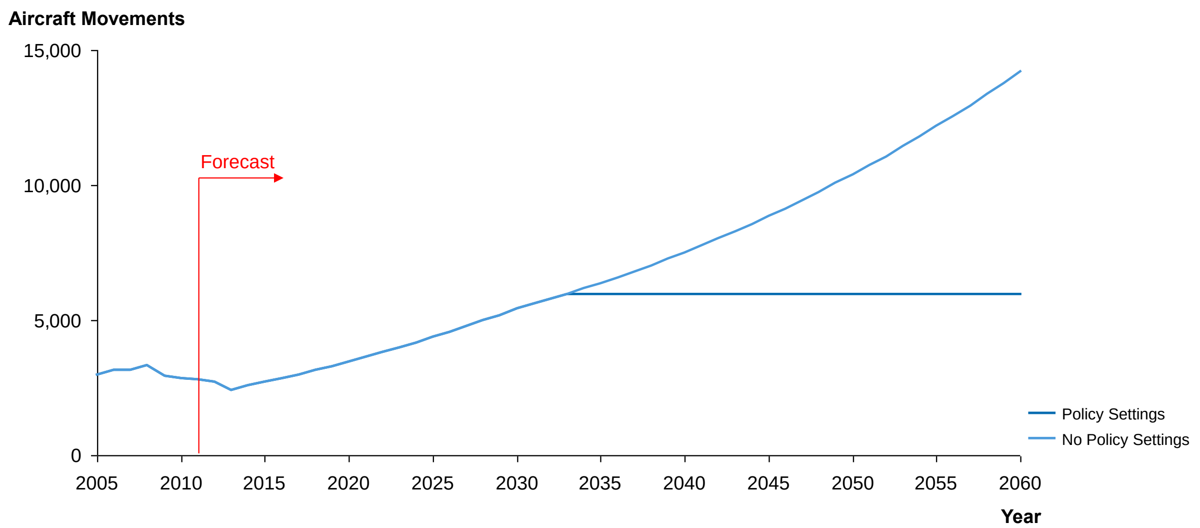
Source: Booz & Company preliminary estimates

Table 49 – Sydney (Kingsford-Smith) Airport International Freight Volume Forecasts, with and without Policy Settings,
2010 to 2060

Forecast	Timeframe	Freight (Tonnes) - Policy Settings	Freight (Tonnes) – No Policy Settings
2010	-	386,000	386,000
2015	5 Years	467,000	467,000
2020	10 Years	557,000	557,000
2030	20 Years	766,000	766,000
2060	50 Years	915,000	1,896,000
CAGR		**%**	**%**
2010 to 2015	5 Years	3.9%	3.9%
2010 to 2020	10 Years	3.7%	3.7%
2010 to 2030	20 Years	3.5%	3.5%
2010 to 2060	50 Years	1.7%	3.2%

Note: Rounded to the nearest thousand
Source: Booz & Company preliminary estimates

Figure 84 – Sydney (Kingsford-Smith) Airport International Dedicated Freighter Aircraft Movement Forecasts, with and without Policy Settings
2005 to 2060



Source: Booz & Company preliminary estimates

Table 50 – Sydney (Kingsford-Smith) Airport International Dedicated Freighter Movement Forecasts
2010 to 2060

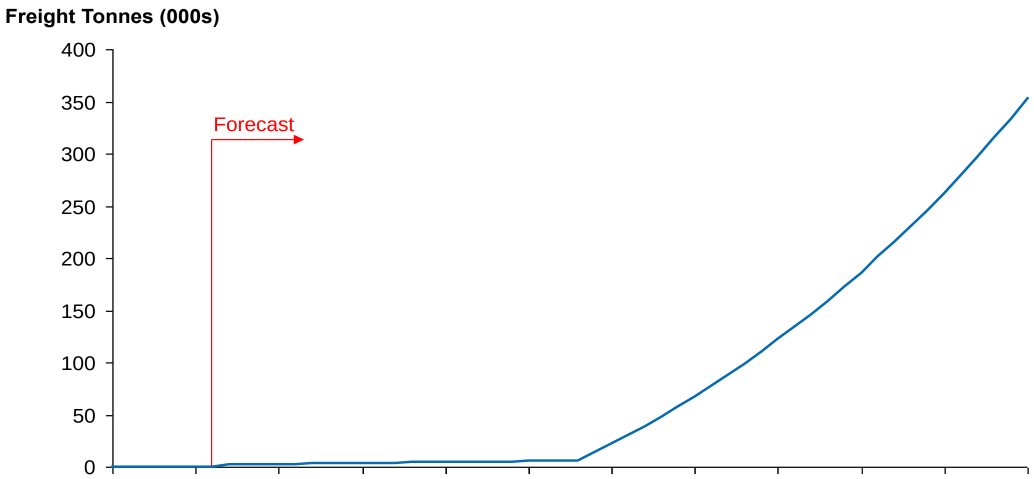
Forecast	Timeframe	Freighter Movements - Policy Settings	Freighter Movements - No Policy Settings
2010	-	2,900	2,900
2015	5 Years	2,500	2,500
2020	10 Years	3,300	3,300
2030	20 Years	5,400	5,400
2060	50 Years	5,800	14,200
CAGR		**%**	**%**
2010 to 2015	5 Years	-2.5%	-2.5%
2010 to 2020	10 Years	1.6%	1.6%
2010 to 2030	20 Years	3.2%	3.2%
2010 to 2060	50 Years	1.4%	3.3%

Note: Rounded to the nearest hundred
Source: Booz & Company preliminary estimates

Canberra Airport

Canberra Airport has announced its plan to become a freight hub, with international freight at the airport expected to begin in 2012. In the Base Case one dedicated freighter is forecast to operate one return service per week. This will comprise Trans-Tasman belly hold freight in addition to one dedicated freighter service[31]. Forecasts freight traffic at Canberra Airport are summarised in the following chart and table.

Figure 85 – Canberra Airport International Freight Volume Forecasts,
2005 to 2060



Source: Booz & Company analysis

31 It could be expected that as Sydney Airport nears capacity dedicated freighters will be diverted to Canberra Airport. At this point the Base Case has been modelled to reflect one return dedicated freighter service over the forecast period.

Table 51 – Canberra Airport International Freight Volume Forecasts
2012 to 2060

Forecast	Timeframe	Freight (Tonnes)
2012	-	2,300
2015	3 Years	2,800
2020	8 Years	3,800
2030	18 Years	5,300
2060	48 Years	360,400
CAGR		**%**
2012 to 2015	3 Years	7.7%
2012 to 2020	8 Years	6.5%
2012 to 2030	18 Years	4.8%
2012 to 2060	48 Years	11.1%

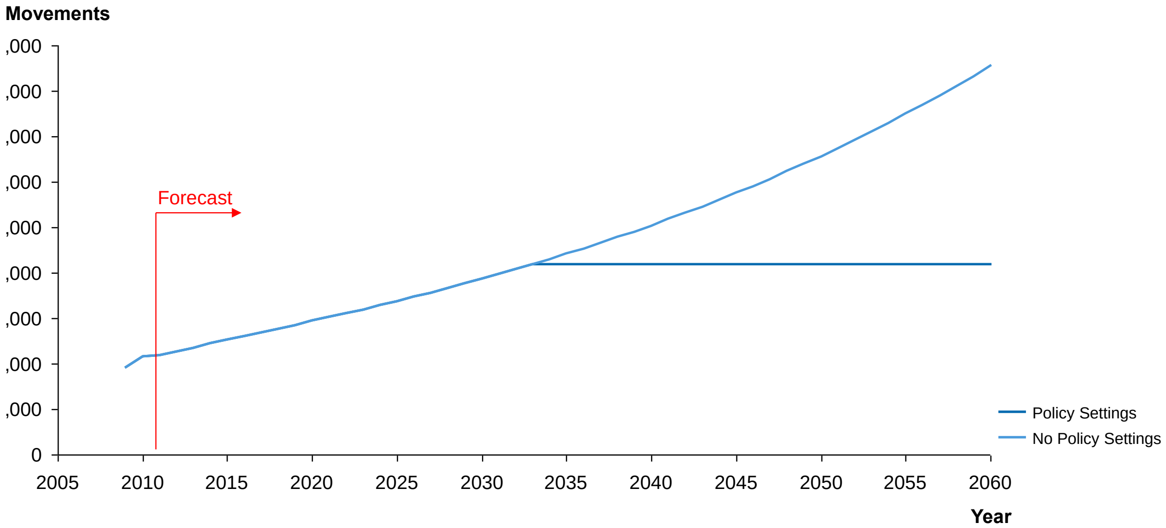
Note: Rounded to the nearest hundred
Source: Booz & Company estimates

6.4.2 Domestic Freight Forecasts

Domestic freight forecasts are summarised in the charts and tables below. The majority of freight is assumed to be carried in the hold of passenger aircraft, however some dedicated freighters are assumed to operate at Sydney and Canberra Airports and commence operating in the future at Newcastle Airport. Note that there is limited data on domestic freight and therefore estimates for the base traffic are based on the Airport Master Plan's, belly hold freight capacity and scheduled dedicated freighter capacity.

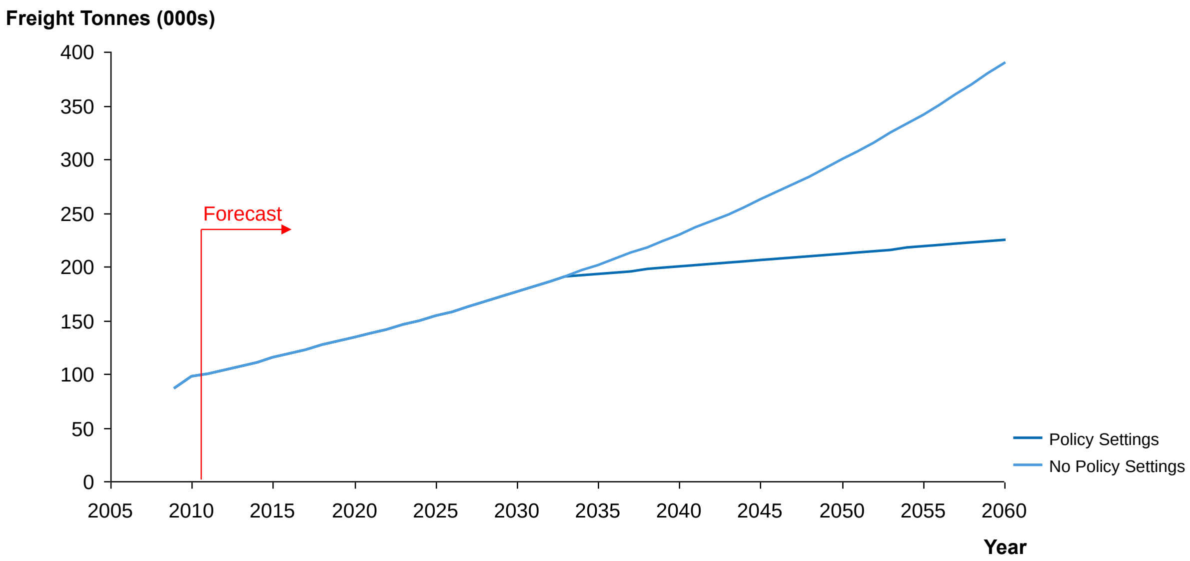
Sydney (Kingsford-Smith) Airport

Figure 86 – Sydney (Kingsford-Smith) Airport Domestic Dedicated Freighter Movement Forecast, Constrained and Unconstrained



Source: Booz & Company preliminary estimates

Figure 87 – Sydney (Kingsford-Smith) Airport Domestic Freight Volume Forecast, with and without Policy Settings



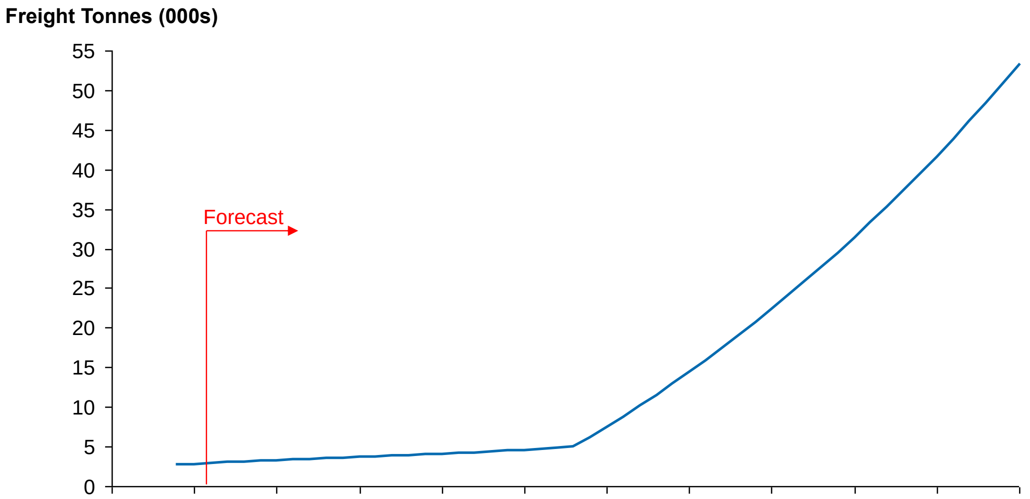
Source: Booz & Company preliminary estimates

Table 52 – Sydney (Kingsford-Smith) Airport Domestic Freight Volume Forecasts, Constrained and Unconstrained, 2010 to 2060

Forecast	Timeframe	Constrained	Unconstrained
2010	-	98,000	98,000
2015	5 Years	116,100	116,100
2020	10 Years	135,200	135,200
2030	20 Years	177,800	177,800
2060	50 Years	223,800	391,300,
CAGR		**%**	**%**
2010 to 2015	5 Years	3.5%	3.5%
2010 to 2020	10 Years	3.3%	3.3%
2010 to 2030	20 Years	3.0%	3.0%
2010 to 2060	50 Years	1.7%	2.8%

Note: Rounded to the nearest hundred
Source: Booz & Company preliminary estimates

Figure 88 – Canberra Airport Domestic Freight Forecasts



Source: Booz & Company preliminary estimates

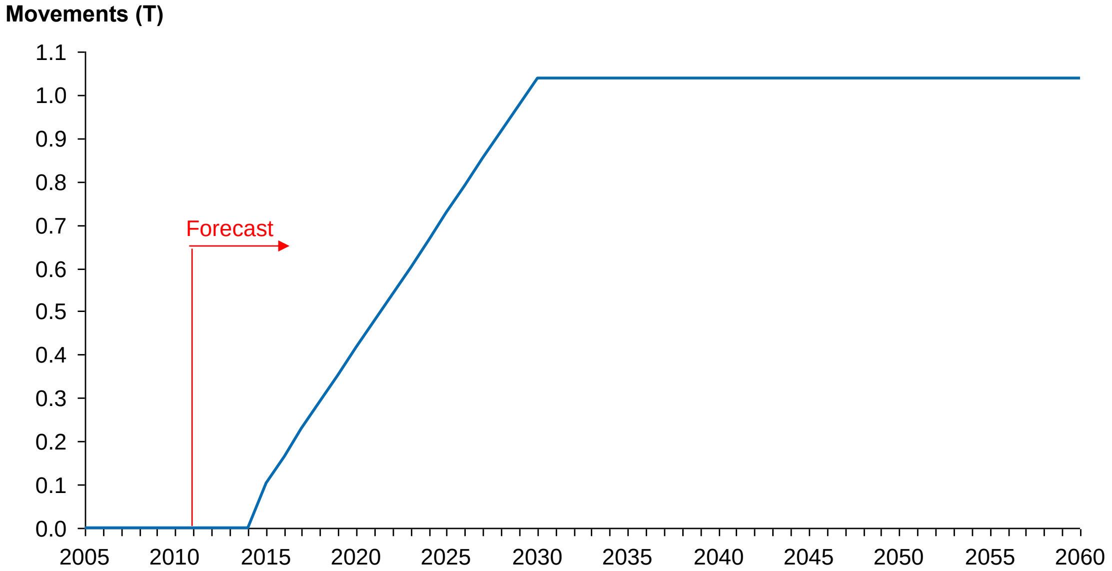
Table 53 – Canberra Airport Domestic Freight Forecasts
2010 to 2060

Forecast	Timeframe	Freight (Tonnes)
2010	-	2,700
2015	5 Years	3,300
2020	10 Years	3,700
2030	20 Years	4,600
2060	50 Years	54,300
CAGR		**%**
2010 to 2015	5 Years	3.6%
2010 to 2020	10 Years	3.0%
2010 to 2030	20 Years	2.6%
2010 to 2060	50 Years	6.2%

Note: Rounded to the nearest hundred
Source: Booz & Company preliminary estimates

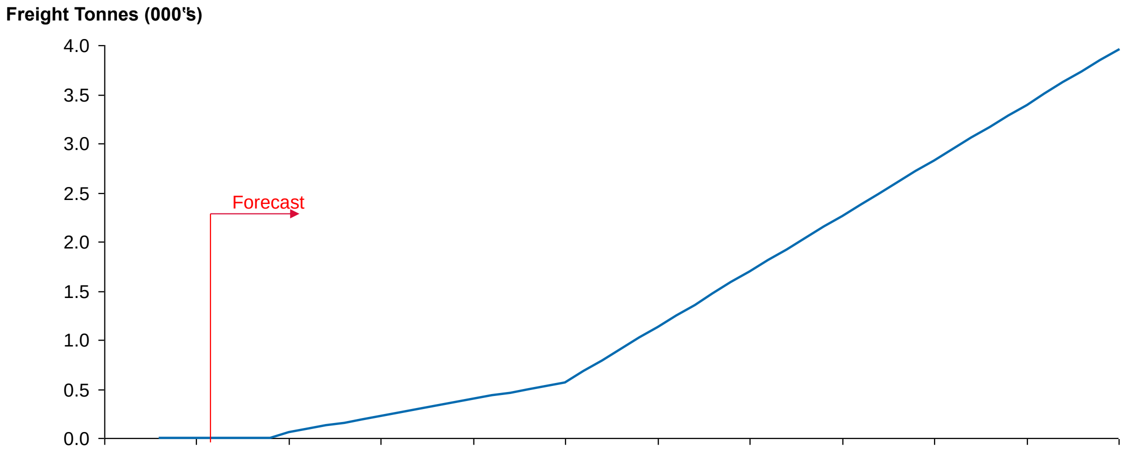
Newcastle Airport

Figure 89 – Newcastle Airport Domestic Dedicated Freighter Movement Forecast



Source: Booz & Company preliminary estimates

Figure 90 – Newcastle Airport Domestic Freight Forecasts



Source: Booz & Company preliminary estimates

Table 54 – Newcastle Airport Domestic Freight Forecasts
2015 to 2060

Forecast	Timeframe	Freight (Tonnes)
2015	-	60
2020	5 Years	230
2025	10 Years	400
2035	20 Years	1,130
2060	45 Years	3,960
CAGR		**%**
2015 to 2020	5 Years	32.0%
2015 to 2025	10 Years	21.5%
2015 to 2035	20 Years	16.2%
2015 to 2060	45 Years	9.9%

Note: Rounded to the nearest hundred
Source: Booz & Company preliminary estimates

Bankstown Airport

Table 55 – Bankstown Airport Domestic Freight Forecasts
2010 to 2060

Forecast	Timeframe	Freight (Tonnes)
2010	-	2,400
2015	5 Years	2,700
2020	10 Years	3,000
2030	20 Years	3,700
2060	50 Years	4,400
CAGR		**%**
2010 to 2015	5 Years	2.2%
2010 to 2020	10 Years	2.2%
2010 to 2030	20 Years	2.2%
2010 to 2060	50 Years	1.2%

Note: Rounded to the nearest hundred
Source: Booz & Company preliminary estimates

6.5 Comparison to Existing Forecasts

A comparison of the Booz & Company forecasts to other available estimates is provided in the following section.

6.5.1 *International Forecasts*

A comparison of Sydney (Kingsford-Smith) Airport international passengers is provided in Table 56. Comparison forecasts are provided to 2029. Booz & Company Sydney (Kingsford-Smith) Airport international passenger forecasts are comparatively conservative. This is largely because the hourly cap and curfew are key inputs into the model. Growth is limited after 2029 because Sydney (Kingsford-Smith) Airport reaches its critical threshold in 2033, where the movement constraint impacts growth. Booz & Company forecasts estimate that growth with policy settings would be 4.2 per cent on average to 2029.

Table 56 – Comparison of Sydney (Kingsford-Smith) Airport International Passenger Growth Rate Forecasts

Market	To 2014	2009 to 2019	2009 to 2029	2009 to 2060
BITRE 2009 Forecasts	5.1%	5.3%	4.7%	N/A
Sydney Airport Master Plan 2009	N/A	N/A	4.8%	N/A
TFI Forecasts February 2008				
Macro International	5.8%	5.2%	4.8%	N/A
Micro International	6.3%	5.4%	4.7%	N/A
Booz & Company	5.5%	4.9%	4.2%	2.5%

Source: BITRE, TFI, Sydney Master Plan, TFI and Booz & Company analysis

Note: TFI forecasts are provided by financial year and begin from FY2007. A 2009 base year was interpolated using the growth rate to 2014; the base year for 2009 Sydney (Kingsford-Smith) Airport Master Plan CAGRs is 2007.

International aircraft movements at Sydney (Kingsford-Smith) Airport are presented in Table 57. Similar to the international passenger growth forecasts, Booz & Company international aircraft movement forecasts are lower compared to other estimates in the medium-long term partly due to base traffic data that incorporates the impact of the global financial crisis. In the short-term, aircraft movement growth is expected to be limited as the industry rebounds and pre-crisis load factors are achieved.

In the medium term, as a result of Sydney (Kingsford-Smith) Airport constraints on international movement capacity within the next twenty years there will be significant up gauging on Sydney international routes in the lead up. However it has also been assumed that international movements will be accommodated in most time slots, and at times at the expense of additional domestic movements.

Table 57 – Comparison of Sydney (Kingsford-Smith) Airport International Aircraft Movement Growth Rate Forecasts

Market	To 2014	2009 to 2019	2009 to 2029	2009 to 2060
BITRE 2009 Forecasts	3.1%	3.7%	3.4%	N/A
Sydney Master Plan 2009	N/A	N/A	2.3%	N/A
TFI Forecasts February 2008	4.1%	3.3%	2.8%	N/A
Booz & Company	2.8%	2.4%	1.9%	1.2%

Source: BITRE (2009), TFI, Sydney Airport Master Plan 2009, TFI and Booz & Company analysis

Note: TFI forecasts are provided by financial year and begin from FY2007. A 2009 base year was interpolated using the growth rate to 2014; the base year for 2009 Sydney (Kingsford-Smith) Airport Master Plan CAGRs is 2007; BITRE forecasts are provided by financial year.

International freight forecasts are presented in Table 58. The 2009 to 2029 CAGR has been revised downwards by Booz & Company to incorporate the impact of the policy settings on international movement capacity at Sydney (Kingsford-Smith) Airport.

Table 58 – Comparison of Sydney (Kingsford-Smith) Airport International Freight Forecast Growth Rates

Market	To 2014	2009 to 2019	2009 to 2029	2009 to 2060
Sydney Master Plan 2009	N/A	N/A	3.8%	N/A
Booz & Company	4.1%	3.8%	3.5%	1.8%

Source: BITRE (2009), TFI, Sydney Airport Master Plan 2009, TFI and Booz & Company analysis

Note: the base year for the 2009 Sydney (Kingsford-Smith) Airport Master Plan CAGR and is for international and domestic freight.

Booz & Company passenger and aircraft movement forecasts for Canberra Airport took a more conservative view compared to the Canberra Airport Mater Plan 2009 in movement growth. Booz & Company estimates halved the base year Canberra Airport Master Plan 2009 passenger numbers and then applied a growth rate in line with estimated Sydney (Kingsford-Smith) Airport international passenger growth without policy settings.

Table 59 – Comparison of Canberra Airport International Forecast Growth Rates

Market	Base Year 2012	2012 to 2029	2012 to 2060
International Passengers			
Canberra Airport Master Plan 2009	117,936	6.8%	N/A
Booz & Company	117,936	6.9%	4.7%
International Aircraft Movements			
Canberra Airport Master Plan 2009	728	7.1%	N/A
Booz & Company	1,214	4.5%	3.4%

Source: BITRE, TFI, Sydney Airport Master Plan 2009, Canberra Airport Master Plan 2009, Booz & Company analysis

6.6 Sydney (Kingsford-Smith) Airport Domestic and Regional Forecasts

A comparison of Sydney (Kingsford-Smith) Airport domestic and regional forecasts are provided in Table 60. Similar to the international forecasts, Booz & Company domestic and regional passenger growth rate estimates are more conservative than other forecasts. Booz & Company estimates domestic and regional passenger traffic to grow at 3.0 per cent per annum on average from 2009 to 2029. BITRE (2009) estimated the growth rate to be 3.6 per cent per annum to 2029. These forecasts were published in December 2009 and are slightly lower than TFI and Sydney Airport Master Plan 2009 estimates, which were published in February 2008. Forecasts conducted prior to or at the beginning of the global financial crisis are slightly more optimistic. Booz & Company estimates have been able to incorporate 2010 calendar year post-crisis base traffic data and year-to-date annual growth rates up to April 2011.

Table 60 – Comparison of Sydney (Kingsford-Smith) Airport Domestic Passenger Forecast Growth Rates

Market	To 2014	2009 to 2019	2009 to 2029	2009 to 2060
BITRE 2009 Forecasts				
Domestic Passengers	5.3%	5.0%	3.8%	N/A
Regional Passengers	3.5%	3.8%	3.1%	N/A
Total	4.8%	4.6%	3.6%	N/A
Sydney Master Plan				
Domestic and Regional	N/A	N/A	3.9%	N/A
TFI Forecasts				
Domestic and Regional	5.3%	4.6%	3.7%	N/A
Booz & Company				
Domestic Passengers	4.3%	3.7%	3.1%	1.7%
Regional Passengers	3.3%	2.8%	2.4%	2.0%
Total	4.2%	3.6%	3.0%	1.7%

Source: BITRE (2009), TFI, Sydney Airport Master Plan 2009 and Booz & Company analysis

Note: Base year for Sydney Airport Master Plan 2009 estimates is 2007

7. Scenario Testing

7.1 Overview

This section discusses scenarios which may impact on growth at airports in the Sydney region, as well as the airport network.

Key factors which may influence future include, but are not limited to:

- Economic growth;
- Population growth and distribution;
- Policy Settings (i.e. curfew and 80 movement cap) at Sydney (Kingsford-Smith) Airport;
- Peak Spreading;
- Air traffic management (ATM) technology;
- Airport access (e.g. the potential for high speed rail connections between Sydney and Canberra and Newcastle Airport and Sydney CBD and suburbs);
- Aircraft technology and fleet development;
- Government policy on carbon pricing;
- Liberalisation;
- Cost of travel – exchange rates, air fares;
- Emergence of domestic and international low cost carriers; and
- Department of Defence policy on Civil and Military airports.

7.2 Scenarios tested

Based on factors affecting demand and associated assumptions discussed in Section 4, twenty-two scenarios have been run to determine the impact of individual factors on forecast passengers and therefore the economy. Each factor is tested in isolation, i.e. all other assumptions remain as per the Base Case.

Table 61 – Sydney (Kingsford-Smith) Airport International Passenger Traffic Scenarios

Scenario	Factor	Description
1	Base Case	Assumptions as discussed in Sections 4 and 5.
2	Low Economic Growth	Economic growth 0.5% below Base Case each year of the forecast
3	High Economic Growth	Economic growth 0.5% above Base Case each year of the forecast
4	Low Air Fares	-2.5% dropping to 0% change in real air fares between 2010 and 2020 based on a continued growth in low cost carriers[32]
5	High Air Fares	+2.5% increase over the next 10 years representing oil prices increasing back to 2008 levels[33]
6	Carbon Pricing (1.5%)	Carbon pricing of 1.5% imposed in 2012 based on level of

[32] See Section 5.3 Air Fares

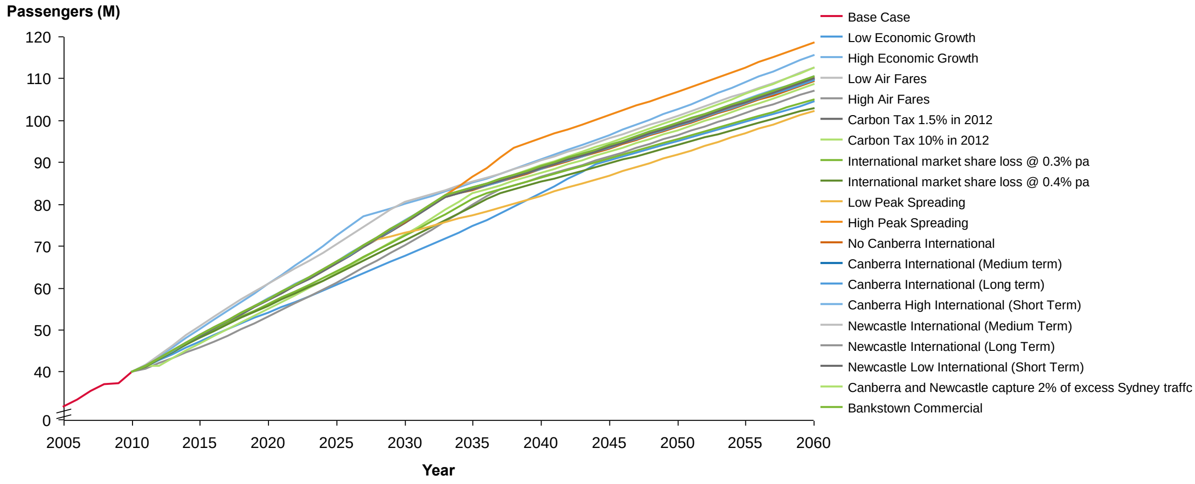
[33] *See Section 5.3 Air Fares*

Scenario	Factor	Description
		carbon offset charged by Australian airlines
7	Carbon Pricing (10%)	Carbon pricing of 10% imposed in 2012 based on approximate level of air passenger duty imposed in the UK
8	Market Share Loss to Other Australian International Gateways (0.3% per annum)	Total Australia international passenger traffic market share loss to other international gateways at a rate of 0.3% per annum (based on Sydney (Kingsford-Smith) Airport's average annual market share loss from 1991 to 2009)
9	Market Share Loss to Other Australian International Gateways (0.4% per annum)	Accelerated market share loss to other international gateways due to congestion experienced at Sydney (Kingsford-Smith) Airport
10	Low Peak Spreading	Only a very small amount of peak spreading is achieved at Sydney (Kingsford-Smith) Airport as traffic grows
11	High Peak Spreading	Assumes that services can be spread to reach nearly 80 hourly movements across the entire operating day at Sydney (Kingsford-Smith) Airport
12	No impact of business/leisure split at Sydney (Kingsford-Smith) Airport with policy settings	With policy settings, leisure and business split of passengers at Sydney (Kingsford-Smith) Airport is as per the scenario with no policy settings
13	No constraints on business passengers at Sydney (Kingsford-Smith) Airport	With policy settings, business passengers at Sydney (Kingsford-Smith) Airport continue to grow as per the case with no policy settings
14	No Canberra international traffic	Assumes no international traffic at Canberra Airport
15	Canberra international traffic in the medium term	International passenger and freight traffic commences in 2020 at half of the expected traffic under the master plan.
16	Canberra international traffic in the long term	International passenger and freight traffic commences in 2030 at half of the expected traffic under the master plan.
17	Canberra high international traffic in the short term	International passenger and freight traffic commences in 2012 at the expected traffic under the master plan (Canberra Airport picks up the overspill of international freight from Sydney (Kingsford-Smith) Airport)
18	Newcastle international traffic (medium term)	International traffic is not assumed to occur until 2020 (as opposed to 2012 under the Base Case)
19	Newcastle international traffic (long term)	International traffic is not assumed to occur until 2030 (as opposed to 2012 under the Base Case)
20	Newcastle low international traffic (short term)	Only Trans-Tasman traffic at Newcastle, commencing in 2012.
21	Canberra and Newcastle capture 2% of suppressed Sydney traffic	Canberra Airport and Newcastle Airport capture 2% of suppressed Sydney (Kingsford-Smith) Airport traffic from the critical threshold year
22	Bankstown Airport Commercial Services	12 daily commercial services commence at Bankstown Airport in 2011, capturing a small amount of traffic from Sydney (Kingsford-Smith) Airport

7.3 Aggregate Results

The impact of each of the 21 scenarios on total passenger traffic for Sydney region airports is shown in Figure 91.

Figure 91 – Impact of 21 Scenarios on Total Sydney Region Passengers



Source: Booz & Company estimates

Key factors influencing critical thresholds include peak spreading, economic growth and loss of international market share. The impact of each scenario on critical thresholds at Sydney (Kingsford-Smith) Airport are summarised in Table 62.

Table 62 – Critical Thresholds for Sydney (Kingsford-Smith) Airport Traffic

Scenario	Description	Year
1	Base Case	2033
2	Low Economic Growth	2044
3	High Economic Growth	2027
4	Low Air Fares	2030
5	High Air Fares	2037
6	Carbon Pricing (1.5%)[34]	2033
7	Carbon Pricing (10%)	2035
8	Market Share Loss to Other Australian International Gateways (0.3% per annum)	2035
9	Market Share Loss to Other Australian International Gateways (0.4% per annum)	2037
10	Low Peak Spreading	2028
11	High Peak Spreading	2039
y612	No impact of business/leisure split at Sydney (Kingsford-Smith) Airport with policy settings	2033
13	No constraints on business passengers at Sydney (Kingsford-Smith) Airport	2033
14	No Canberra International Traffic	2033
15	Canberra international traffic in the medium term	2033
16	Canberra international traffic in the long term	2033

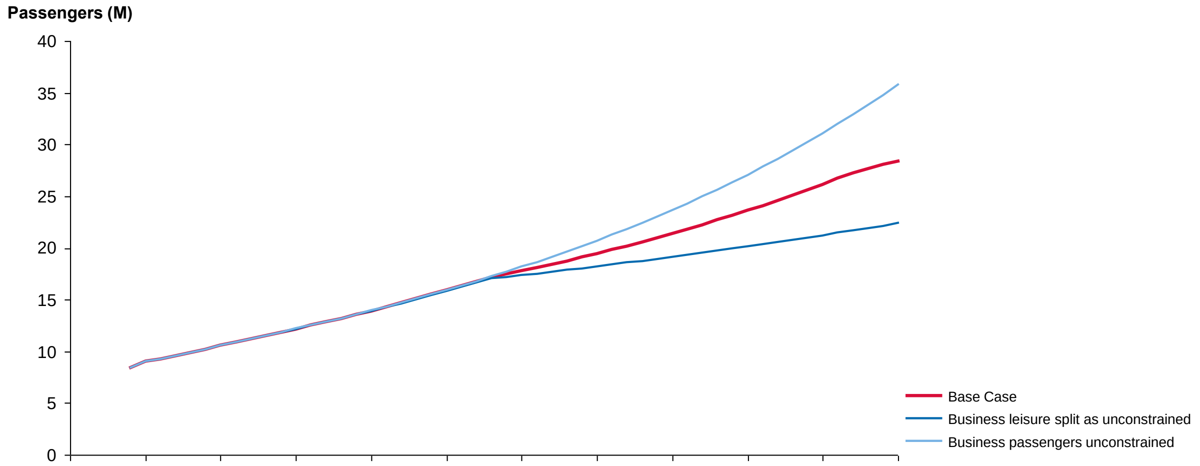
[34] The impact of the proposed carbon pricing scheme, as estimated on the basis of recent announcements by the Government, is anticipated to fall within the 1.5 and 10 per cent scenarios

Scenario	Description	Year
17	Canberra high international traffic in the short term	2033
18	Newcastle international traffic (medium term)	2033
19	Newcastle international traffic (long term)	2033
20	Newcastle low international traffic (short term)	2033
21	Canberra and Newcastle capture 2% of suppressed Sydney traffic	2033
22	Bankstown Commercial Services	2033

Source: Booz & Company analysis.

Scenarios 12 and 13 impact on the split of passengers by purpose rather than absolute passenger volumes. As the airport becomes constrained by policy settings, it is likely that priority will be given to higher yielding business passengers over leisure. These two scenarios explore the two extreme scenarios for purpose of travel with scenario 12 having no impact on share of business and leisure due to constraints and scenario 13 placing no constraint on business passengers, with leisure passenger share reducing once constraints start impacting passenger volumes. The share of business passengers at Sydney (Kingsford-Smith) Airport for the Base Case compared to these two scenarios are shown in Figure 92.

Figure 92 – Business Passengers at Sydney (Kingsford-Smith) Airport



Source: Booz & Company estimates.

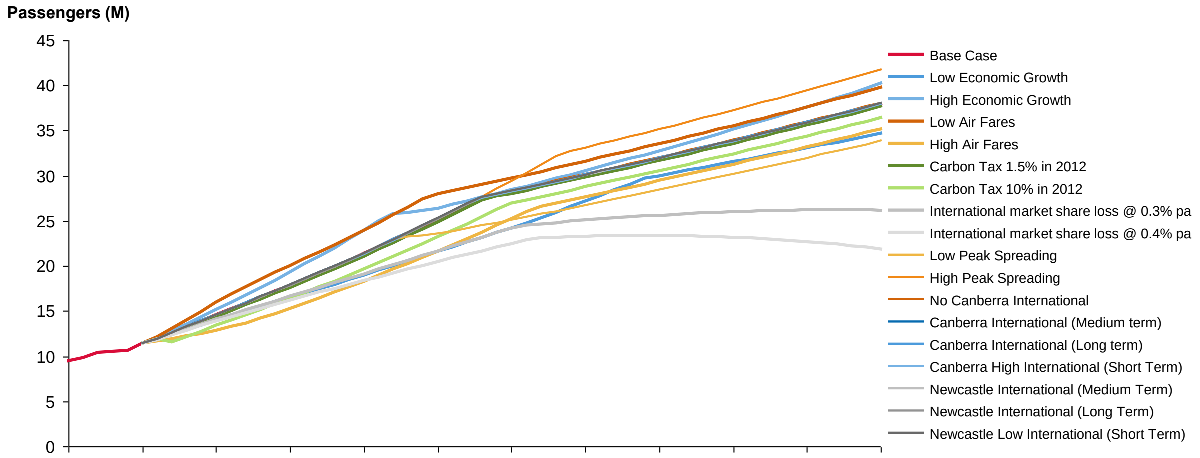
7.4 International Results

The policy settings at Sydney (Kingsford-Smith) Airport create opportunity for other international gateways to capture international traffic, both in the Sydney region, as well as other major interstate airports. As Sydney (Kingsford-Smith) Airport becomes more constrained, it is likely that there will be a shift towards origin-destination traffic and away from transfer traffic. Airports such as Melbourne, Brisbane, Gold Coast and Perth may capture some of the international traffic which would have alternatively hubbed through Sydney. This also creates opportunity for Canberra and Newcastle Airports to capture some of the overflow from Sydney (Kingsford-Smith) Airport as well as serve their current catchment, thus developing a critical mass to commence international services to major destinations such as New Zealand and Southeast Asia (which also allows connections on to Europe). For this reason, international passenger traffic scenario testing was conducted for Sydney, Canberra and Newcastle airports.

Figure 93 presents the results of the international passenger traffic scenario testing for Sydney (Kingsford-Smith) Airport. The most significant impact in the long term is based on variations on peak spreading assumptions and the ultimate capacity of Sydney (Kingsford-Smith) Airport. Low fares and high economic growth scenarios show that Sydney (Kingsford-Smith) Airport international aircraft movement capacity would be reached earlier than estimated in the Base Case (between 3 to 5 years earlier). The low economic growth scenario indicates that the same level of capacity would not be reached for another 11 years compared to the Base Case. A 1.5 per cent increase in travel cost due to carbon pricing would have minimal impact while a 10 per cent increase in travel costs due to carbon pricing would have some impact on growth.

An accelerated level of market share diversion (0.4 per cent of the Australian international passenger traffic per annum) to other international gateways is estimated to cause a delay of 4 years to the critical threshold point for international passenger growth at Sydney (Kingsford-Smith) Airport. Over the past eighteen years Sydney (Kingsford-Smith) Airport's market share has declined approximately 0.3 per cent per annum on average. This might be expected to increase as congestion at Sydney (Kingsford-Smith) Airport causes delays, peak hour slots are reached and traffic is diverted to other Australian gateways such as Melbourne or Brisbane. Currently, Sydney (Kingsford-Smith) Airport's market share of total international passenger traffic is approximately 44 per cent. In the Base Case this is estimated to drop to 24.7 per cent by 2060 as a result of aircraft movement capacity levels being reached. In the accelerated market share loss case it is estimated to drop to 21.8 per cent by 2060.

Figure 93 – Sydney (Kingsford-Smith) Airport International Passenger Traffic Scenarios

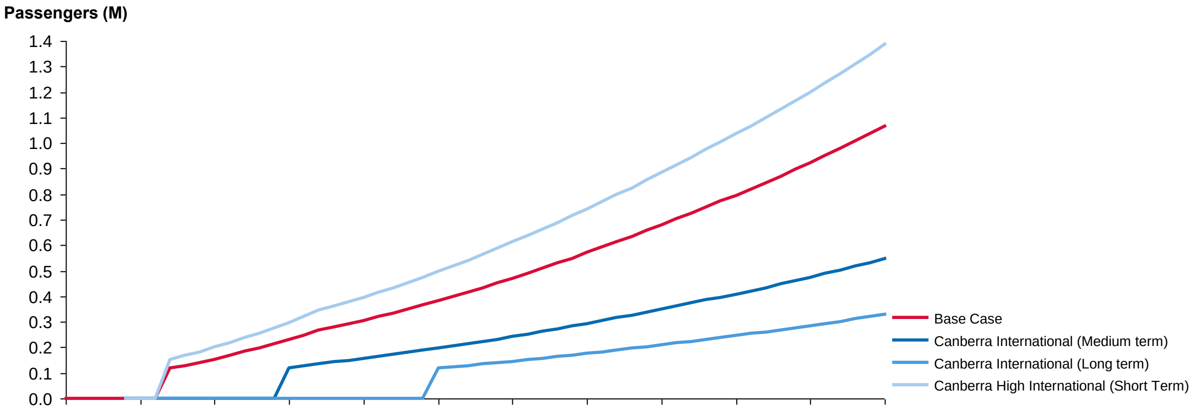


Source: Booz & Company estimates

Figure 94 presents the results of the international passenger traffic scenario testing for Canberra Airport. Canberra Airport expects Trans-Tasman services to begin in the second half of 2012. However, the impact of medium term and long term delays to the initiation of international services were tested. Sydney (Kingsford-Smith) Airport Base Case passenger growth estimates were then applied.

In the scenario tests it was assumed that 30 per cent of Canberra Airport international passenger traffic was diverted from Sydney (Kingsford-Smith) Airport. For the short term High Case by 2060 this represents approximately 1.1 per cent of total Sydney (Kingsford-Smith) Airport international passenger traffic. Based on these numbers and combined with excess demand for Sydney (Kingsford-Smith) Airport capacity between 2035 and 2060, it is expected that Canberra Airport will not have an impact on Sydney (Kingsford-Smith) Airport's international passenger traffic between these years.

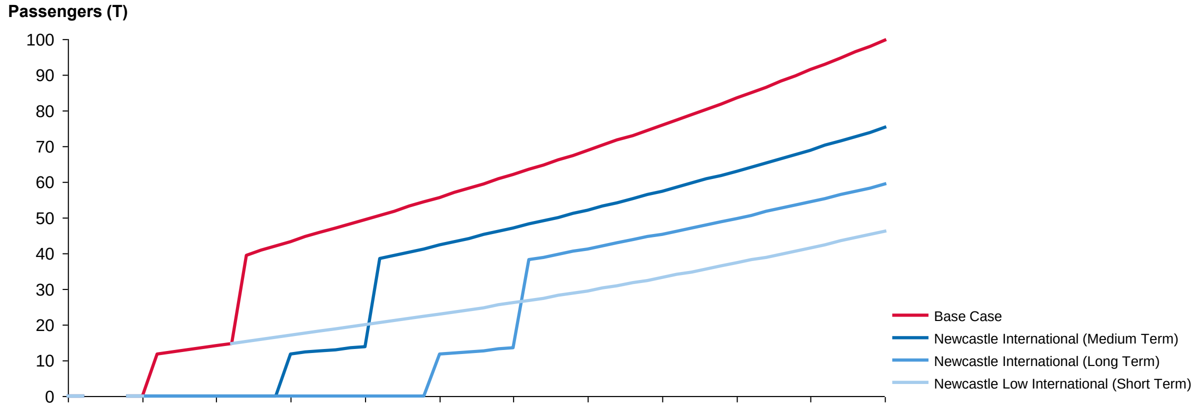
Figure 94 – Canberra Airport International Passenger Traffic Scenarios



Source: Booz & Company estimates

Figure 95 presents the results of the international passenger traffic scenario testing for Newcastle Airport. Three scenarios were tested against the Base Case. The first two scenarios test the impact of delays to the beginning of international services. As per the Newcastle Airport Master Plan, traffic consists of Trans-Tasman and Singapore international passenger traffic. Newcastle Airport anticipates 4 return services to New Zealand introduced in 2012. Four return services per week to Singapore are then expected to begin in 2014, representing the second step change in the Base Case and first two scenarios. Base year numbers were then grown at Sydney (Kingsford-Smith) Airport Base Case passenger growth estimates for the New Zealand and Singapore market segments. The third scenario assumes Trans-Tasman international passenger traffic only.

Figure 95 – Newcastle Airport International Passenger Traffic Scenarios



Source: Booz & Company estimates

7.5 Domestic Results

Newcastle, Sydney and Canberra are seen as discrete domestic and regional markets, so a shift of Origin-Destination domestic traffic between these airports is unlikely, however there may be the opportunity to capture some of the transfer traffic currently transferring at Sydney (Kingsford-Smith) Airport, however transfer traffic is more likely to shift to larger hub airports such as Melbourne and Brisbane.

Charter and niche traffic is likely to shift once capacity becomes an issue at the larger airports. This traffic is likely to shift from Sydney to Bankstown or Camden Airports.

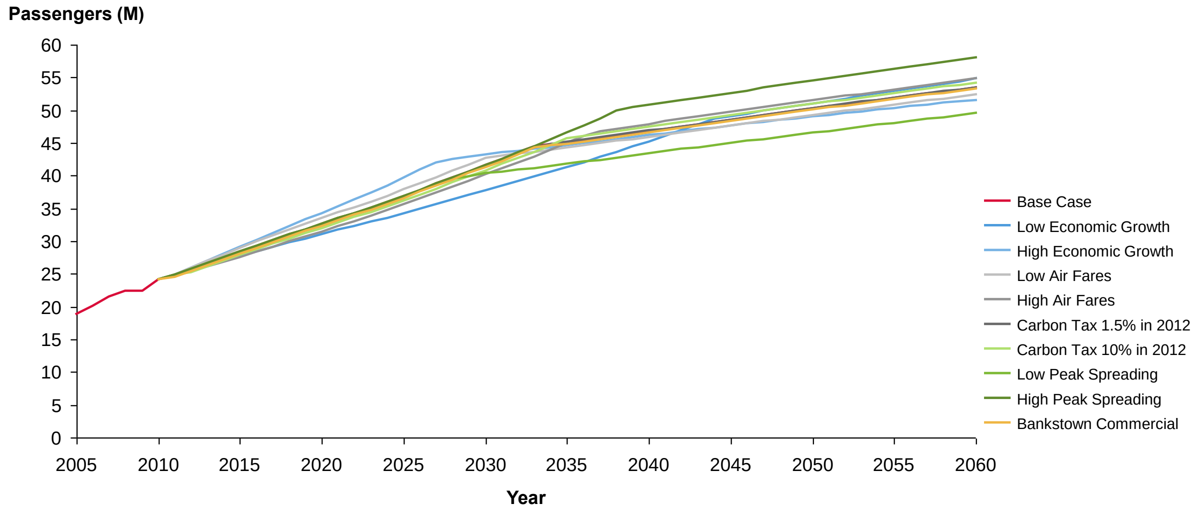
General aviation is likely to be the most flexible traffic type and the first in line to shift given capacity constraints. GA traffic at Sydney could shift to Bankstown, Camden or Richmond, traffic at Canberra could shift to Goulburn and traffic at Newcastle could shift to Maitland or Cessnock. Some GA traffic, such as emergency services, is unlikely to shift.

Military traffic is assumed to remain at Richmond and Williamtown RAAF bases and unlikely to shift between airports.

In addition to various traffic scenarios a mix of other factors were also tested. These included high and low economic growth, changes in air fares and carbon pricing variations.

Figure 96 presents the results of the Sydney (Kingsford-Smith) Airport domestic and regional passenger traffic scenario testing. As per the international scenarios, low fares and high economic growth scenarios show that Sydney (Kingsford-Smith) Airport domestic aircraft movement capacity would be reached earlier than estimated in the Base Case (between 3-5 years earlier). The low economic growth scenario indicates that the same level of capacity would not be reached for another 11 years compared to the Base Case. A 1.5 per cent carbon pricing would have minimal impact while a 10 per cent carbon pricing would have some impact on growth.

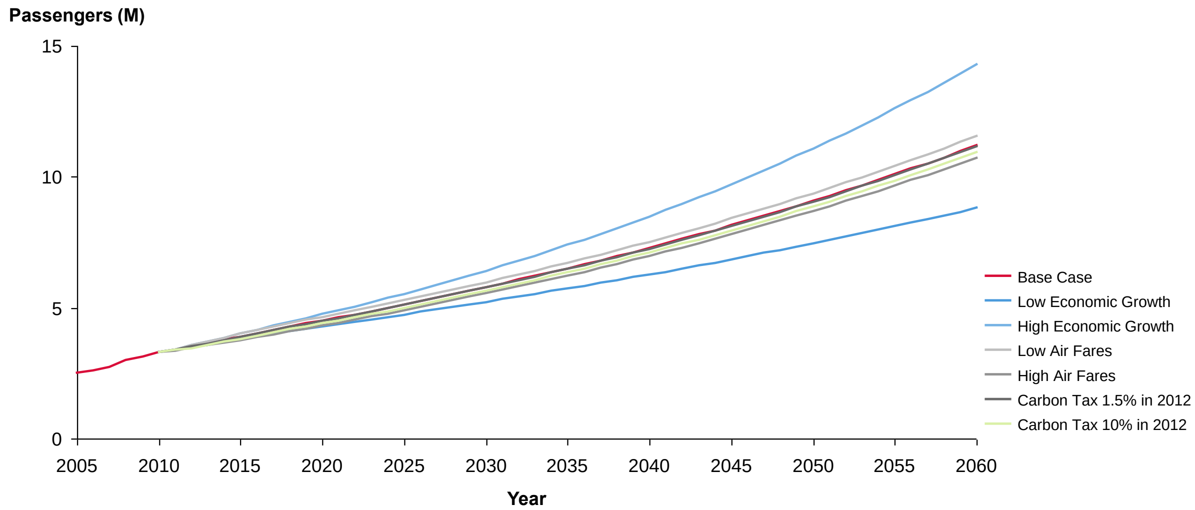
Figure 96 – Sydney (Kingsford-Smith) Airport Domestic and Regional Passenger Traffic Scenarios



Source: Booz & Company estimates

Figure 97 presents the results of the Canberra Airport domestic and regional scenario testing. The economic growth and air fare scenarios have a strong impact on forecast passengers. Carbon pricing scenarios cause a small drop in passengers in the year it is introduced, but due to the low air fare elasticity this impact is not likely to have a significant impact on traffic in the long term.

Figure 97 – Canberra Airport Domestic Passenger Traffic Scenarios

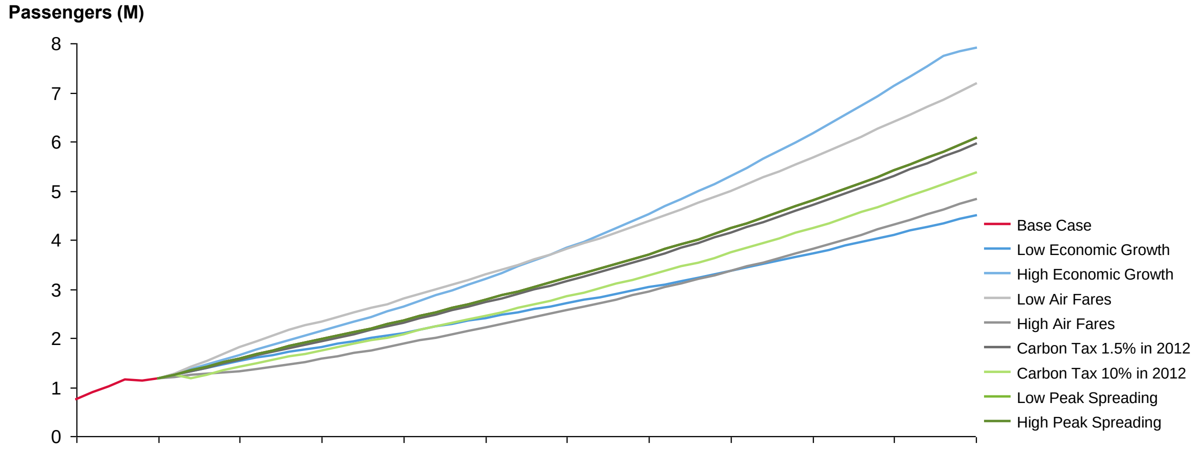


Source: Booz & Company estimates

Figure 98 presents the results of the Newcastle Airport domestic and regional scenario testing. Due to high income elasticities and high air fare elasticities at Newcastle airport, the impact of changes in economic growth and air fares is likely to have a more profound impact on traffic growth relative to Sydney (Kingsford-Smith) Airport and Canberra Airport.

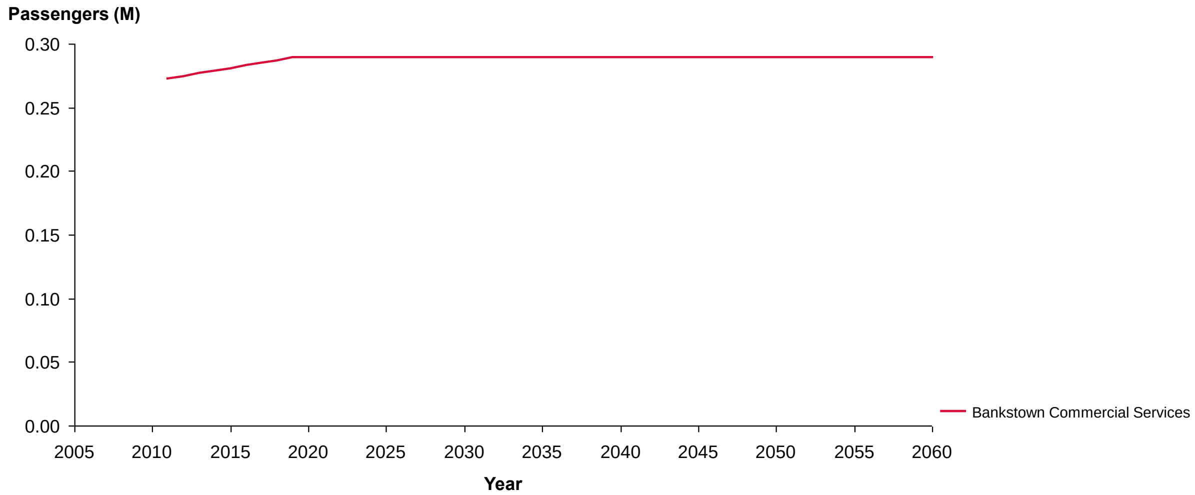
Newcastle airport's traffic is predominantly low cost, which is much more sensitive to changes in fare.

Figure 98 – Newcastle Airport Domestic Passenger Traffic Scenarios



Source: Booz & Company estimates

Figure 99 – Bankstown Airport Domestic Passenger Traffic Scenarios



Source: Booz & Company estimates

8. Discussion and Conclusions

This report provides a suite of long-term forecasts for airports in the Sydney region including Sydney (Kingsford-Smith) Airport, Canberra Airport, Newcastle Airport/RAAF Base Williamtown, Bankstown Airport, Camden Airport, RAAF Base Richmond, Cessnock Aerodrome, Maitland Aerodrome and Goulburn Airport.

The aviation demand analysis and forecasts presented in this report reflect expected long-term 'organic' growth tied to existing primary airport infrastructure in the Sydney region (i.e. Sydney (Kingsford-Smith) Airport). Key factors considered when developing the forecast were economic growth; changes in air fares due to the emergence of LCCs, oil prices and carbon prices; exchange rates; tourism trends; the regulatory environment including policy settings on curfews and aircraft movement caps at Sydney (Kingsford-Smith) Airport; airline fleet development; airport competition and the airport network; and congestion issues.

The development of these forecasts reflected international best practice (i.e. the development and calibration of econometric model driven primarily by forecast economic growth in Australia and those countries providing a significant share of inbound traffic). The forecasts developed from the econometric modelling process were overlaid with a consideration of a range of factors potentially impacting on long-term demand. The following factors have the potential to materially affect both the absolute level of traffic in the region and its distribution:

- changes in air fares due to the emergence of LCCs, oil prices and carbon prices;
- exchange rates;
- tourism trends;
- the regulatory environment including policy settings on curfews and aircraft movement caps at Sydney (Kingsford-Smith) Airport;
- peak spreading;
- airline fleet development;
- airport competition and the airport network;
- intermodal competition; and
- congestion issues.

Of the factors modelled, the most significant impact in forecast traffic outcomes were driven by policy settings and capacity constraints at Sydney (Kingsford-Smith) Airport, the extent to which peak spreading can occur at Sydney (Kingsford-Smith) Airport and the health of the Australian economy and key source economies for inbound international traffic.

The resilience of the Australian aviation industry has again been demonstrated over the past decade. The decade commenced with the 9-11 terrorist attacks in the United States and the collapse of Ansett Australia, before ending with the Global Financial Crisis and a period of exceptionally high oil prices. Despite these shocks impacting directly on the aviation sector, all major passenger markets recorded strong growth, which was a reflection of the overall expansion in Australian economic activity and regional and broader international economic growth. On that basis, while future shocks impacting on the sector are seemingly inevitable, it is unlikely to materially impact on longer-term traffic expectations. As a means of illustrating this point, we note that the Sydney (Kingsford-Smith) Airport Corporation remains committed to its long-term traffic forecasts prepared pre-GFC.

The long-term prospects for both the international and domestic aviation sectors is positive – based largely around expectations of strong, sustained economic performance. From an international perspective, emerging inbound markets such as China and India will continue to augment growth from mature inbound markets such as NZ, UK and the US. For the outbound international market and domestic market, strong Australian economic performance, coupled with the ongoing expansion of LCC operations and the associated expectation of the maintenance of a low fare environment, will continue to support growth.

The forecasts have been developed to reflect the current policy framework that will underpin the development and operation of airports in the region. This encompasses both environmental considerations (i.e. cap, curfew and noise sharing at Sydney), together with the special characteristics at Newcastle, given that the airport is a fully functional RAAF strike fighter base.

From a passenger perspective, this is the reflection of a number of factors. Firstly, there will continue to be a trend towards larger aircraft, although we acknowledge that the policy framework as it applies to Sydney, is likely to drive higher levels of fleet 'up gauging' than might otherwise have been the case. This is expected to be complemented by changes to the seating configuration in larger aircraft such as the Airbus A380 (i.e. increasing the number of seats) and potentially the introduction of a 'New Large Aircraft'. Secondly, the proliferation of the LCC sector, both internationally and domestically, is continuing to move the Australian market towards 'point to point' flying, thereby reducing the number of transfer passengers at Sydney.

Canberra will offer a long term alternative to Sydney for both domestic and international freight – with freight destined for Sydney being trucked in the early hours of the morning.

General Aviation traffic could be expected to progressively cascade to alternative air fields (e.g. Cessnock, Maitland), with airport pricing potentially playing a role in driving this outcome.

Appendices

Appendix A - Review of Existing Forecasts

Introduction

To inform the forecasts, nine relevant, pre-existing sets of forecasts have been reviewed. These forecasts have been conducted by a range of different parties ranging from individual airports to industry organisations. Timeframe, purpose, methodology and assumptions for each of the forecasts were reviewed in order to assess applicability to this study.

Sources

The following forecasts were reviewed to inform Booz & Company estimates:

- IATA, Boeing and Airbus 2009 forecasts for the Australasian international and domestic air traffic market;
- Tourism Research Australia forecasts for inbound, outbound and domestic tourism for 2009 – 2018;
- BITRE's 2010 publication 'Aircraft Movements through Capital City Airports to 2029/30' which covers aircraft movement forecasts for Sydney (Kingsford-Smith) Airport and Canberra Airport;
- Sydney (Kingsford-Smith) and Canberra airports' 2009 Master Plan 20-year aviation traffic projections;
- Newcastle Airport's 2007 Master Plan forecasts; and
- Bankstown 2005 Master Plan forecasts.

The purpose, methodology, key assumptions and results for each of the forecasts are summarised below.

Note that forecasts prepared prior to the GFC are of lesser value compared to those incorporating the impact of the GFC prepared post 2009. The Newcastle Airport's forecasts were prepared with a base year of 2004/05 and therefore are out-dated. The Bankstown Airport's forecasts were prepared with 2003/04 as the base year and therefore are also out-dated. The 2009 Sydney Master Plan forecasts were prepared in early 2008 and therefore would not incorporate the downturn in air traffic following the GFC.

Aggregate Level Forecasts

IATA

Methodology

Each year IATA's Business Intelligence Services (BIS) surveys the world's major airlines, civil aviation authorities, airport authorities and aircraft manufacturers for their views on the air transport industry outlook. The survey results are provided in an annual five-year traffic forecast, *Airline Industry Forecast,* a convergent view of the aviation industry's leading forecasting and strategic planning experts. This methodology is called the "Delphi Technique".

The latest edition of Airline Industry Forecast, covering the period 2009-2013, was released in October 2009 and was compiled from data provided by a total of 65 participants (i.e. 61 airlines and four civil aviation authorities). For each of the countries in which they operate, participants were asked to provide 2008 base year passenger numbers and/or freight tonnages (for the total market) in addition to projections of annual growth rates over the five-year forecast period (i.e. 2009-2013).

The survey covered 2,511 million passengers, which is representative of 97 per cent of total world scheduled passengers based upon IATA estimates. Freight was also highly representative, covering 22,598 million tonnes, which is around 80 per cent of total international world freight based on IATA estimates.

The following approach was used by IATA to project traffic by country-pair:

- Base projections were provided by participants;
- Some participants were then asked to clarify the rationale behind their projections if:
  - there were significant differences with projections provided in the previous year
  - forecasts varied significantly with other sources; or
  - the figures provided by the participants simply needed clarification;
- An arithmetic average of the projected rates of growth was produced for each country-pair;
- Averages for each country-pair were then compared:
  - to historical trends in traffic development covering the past five years
  - to growth rates for 2008 compared to 2007 from various sources, e.g. SRS, PaxIS, CargoIS.
  - to projected average growth figures for the 2009-2013 period as produced in the year prior (2008) to check for consistency and identify important changes;
- A five-year compound annual growth rate (2009-2013 CAGR) based upon 2008 values was then calculated using the formula: $(2013\ \text{Value}/2008\ \text{Value})^{(1/5)}-1$; and
- Adjustments were then made to the projected rates of growth where required to reflect, as much as possible, the latest trends in capacity development and airline traffic results for the first half of the year.

Passenger Forecasts

IATA's 2009 forecast was downgraded from its 2008 forecast since the survey for the 2008 edition was conducted prior to the onset of the GFC. The drop in traffic in 2009 is expected to rebound strongly over the period to 2013 despite comparatively weak economic growth projections. In 2009, IATA forecast average annual growth of 3.3 per cent in the Australian domestic passenger market between 2008 and 2013, with international passengers to and from Australia forecast to grow more rapidly at 3.9 per cent per annum over the same period. Mature markets such as New Zealand, United Kingdom and Japan are forecast to grow modestly, whilst strong growth is projected for rapidly expanding markets such as the United

Arab Emirates (UAE), China, India, Republic of Korea, South America and much of Southeast Asia.

Table 63 – IATA 2008 – 2013 Passenger Forecast

Market	2008 Passengers (000s)	2013 Passengers (000s)	CAGR (2008-2013)
Australian Domestic	51,924	61,192	3.3%
Australian International	23,165	27,971	3.8%
New Zealand	5,212	5,905	2.5%
Singapore	4,238	5,107	3.8%
Hong Kong SAR,PRC	2,024	2,461	4.0%
Japan	1,646	1,710	0.8%
United States of America	1,503	1,804	3.7%
Thailand	1,502	1,722	2.8%
United Arab Emirates	1,251	1,731	6.7%
Malaysia	1,161	1,528	5.6%
Indonesia	846	1,148	6.3%
United Kingdom	732	811	2.1%
China,	723	1,051	7.8%
Republic of Korea	486	652	6.1%
South Africa	317	400	4.8%
Vietnam	257	326	4.9%
Philippines	242	302	4.5%
Chinese Taipei	236	337	7.4%
Brunei Darussalam	207	260	4.6%
Canada	168	206	4.2%
Germany	122	136	2.1%
Chile	93	119	5.1%
Mauritius	74	75	0.2%
India	70	101	7.7%
Argentina	56	80	7.5%

Source: IATA

Freight Forecasts

IATA forecast little growth in international freight tonnage to and from Australia with a rate of 0.1 per cent forecast for 2008 to 2013. Key markets such as Singapore, New Zealand and the US are expected to contract, with some markets such as China, Thailand, Republic of Korea and the UAE expected to grow modestly.

Typically air freight levels pick up strongly during the early stages of economic recovery as business restocks inventory and international trade gathers momentum. Airlines surveyed for the 2009 IATA forecast do not reflect this in their projections despite stronger growth forecast for world trade over the same period. This indicates there is an expectation that air freight will lose market share to the generally less expensive, slower modes such as sea freight.

Table 64 – IATA 2008 – 2013 Freight Forecast

Market	2008 Freight Tonnes (000s)	2013 Freight Tonnes (000s)	CAGR (2008-2013)
Australian International	773,160	777,528	0.1%
Singapore	156,395	144,993	-1.5%
New Zealand	129,060	123,712	-0.8%
United States of America	87,491	76,587	-2.6%
Hong Kong SAR, PRC	86,804	94,815	1.8%
Malaysia	57,937	57,402	-0.2%
Japan	55,261	55,199	0.0%
Thailand	41,506	46,170	2.2%
China	40,341	51,193	4.9%
United Arab Emirates	37,447	41,403	2.0%
Republic of Korea	23,243	26,544	2.7%
United Kingdom	22,429	23,267	0.7%
Germany	16,998	17,897	1.0%
Netherlands	8,269	8,421	0.4%
Chinese Taipei	8,254	8,091	-0.4%
Mauritius	1,725	1,833	1.2%

Source: IATA

Boeing

Boeing produces "The Boeing Current Market Outlook" that describes the company's long-term forecast for global air transport by region, including Oceania. The most recent report covers the 20-year period from 2009 – 2028. Each year, Boeing begins with the latest economic and market conditions, then projects ahead 20 years to forecast how airlines and markets will adjust to emerging trends. Key factors that Boeing consider include economic growth, fuel price, the environment, market liberalisation, market evolution, aircraft technology, infrastructure, emerging markets, airline strategies and business models.

The resilience of air transport is reflected in forecasts that Boeing have published over the past 45 years. Over the past 20 years, the industry experienced several economic downturns. Despite this, traffic still grew by an average of around 5 per cent per year demonstrating air transport's intrinsic value to society. Boeing expects that the continued worldwide dependence on timely, reliable and efficient air transport will result in a similar growth trend over the next 20 years.

The rise of new airline business models and rapid growth of air travel in the world's emerging economies are maintaining worldwide demand for aircraft. Manufacturer backlogs continue to hold up well, despite recent market conditions. New, fuel-efficient airplanes are a natural hedge against jet fuel price volatility, and their lower emissions help airlines meet their environmental performance goals.

As the future freighter fleet also shifts toward larger and new, more efficient aircraft, air cargo transport will continue to be competitively priced. Air cargo traffic is forecast to grow at an average of 5.4 per cent per annum, driven by rising world GDP and the reliance of global industry on fast delivery for international production and delivery systems.

For the Australasian market, Boeing has outlined key indicators for future air traffic growth as outlined in Table 65.

Table 65 – Boeing Oceania Key Indicators, 2008 to 2028

Growth Measures Australasia	CAGR (%)
Economy (GDP)	2.9%
Traffic (RPK)	5.1%
Cargo (RTK)	6.1%
Aircraft Fleet	3.8%
RPK/GDP Ratio	1.8%

Source: Boeing Current Market Outlook 2009 to 2028

Boeing's forecast growth rates between 2008 and 2028 are presented in Table 66. Of the five Oceania market segments, revenue passenger kilometres (RPKs) in the Oceania – China market are forecast to grow fastest with a forecast average annual rate of 5.9 per cent over the 20 years to 2028. This is followed closely by 5.7 per cent for the North America – Oceania market, 5.3 per cent for the Oceania – Southeast Asia market and 5.2 per cent for the Northeast Asia – Oceania market. Intra Oceania traffic is forecast to grow at 4.4 per cent over the same period.

Table 66 – Forecast RPK Growth Rates by Market, 2008 to 2028

Market	2008	2028	CAGR (%)
China – Oceania	22.4	71.1	5.9%
North America – Oceania	29.5	89.3	5.7%
Northeast Asia – Oceania	20.9	57.3	5.2%
Oceania – Oceania	78.2	184.3	4.4%
Oceania – Southeast Asia	65.7	183.3	5.3%

Source: Boeing Current Market Outlook 2009 to 2028

The majority of Boeing aircraft orders for the Australasian market are single aisle jets (i.e. 737 family) comprising 63 per cent of orders, followed by twin-aisle jets making up 30 per cent of orders. Only 6 per cent of aircraft orders are for large aircraft [35] and 1 per cent for regional jets.

[35] Large aircraft refers to Boeing 747 equivalent and above.

Table 67 – Australasian New Aircraft Markets 2008 - 2028

New Aircraft Australasia	New Aircraft	Share by size (%)
Large	40	6%
Twin Aisle	200	30%
Single Aisle	420	63%
Regional Jets	10	1%
Total	670	100%

Source: Boeing Current Market Outlook 2009 to 2028

The 670 forecast deliveries for the Australasia region have an estimated unit value of US$130 Million, implying a total market value of approximately US$90 Billion.

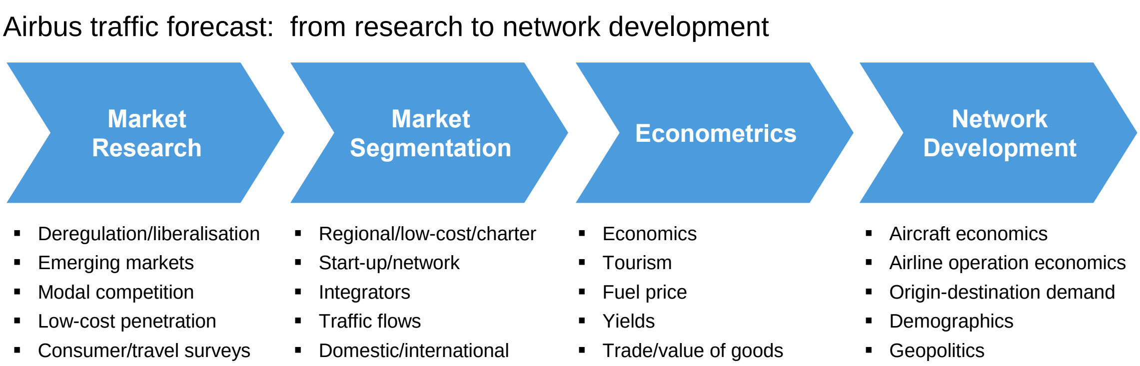
Airbus

Airbus produces an annual Global Market Forecast (GMF), with the most recent report being produced in 2009, covering the period from 2009 – 2029. Economic activity is assumed to be the key driver of forecast growth. Economic development is reflected in several macro-economic variables including GDP, exports, imports, unemployment rate, inflation, private consumption and disposable personal income. For each edition of the GMF and each traffic flow, the final permutation of independent variables selected follows the testing and statistical evaluation of numerous possible combinations. Most often for developing and matured markets, the statistical model that best fits the historical traffic is assumed to provide the best explanation of future trends and is, therefore, the one selected for use in Airbus' aircraft demand model. To understand the impact of variations in underlying factors, such as oil prices, a recession or accelerated market liberalisation, the forecast uses econometric or hybrid models to conduct sensitivity analysis around the baseline traffic forecast in a more systematic way.

Methodology

The Airbus traffic forecast process is based on four major building blocks as outlined in Figure 100.

Figure 100 - Airbus Forecast Methodology



Source: Airbus (2009)

The 2009 GMF analysed a total of 156 distinct domestic, regional and intercontinental passenger sub-markets, segmented according to their degree of maturity and specific characteristics over time. Airbus market research examines the fundamental drivers of transportation including economic activity, future consumer behaviour and expectations, the pace of liberalisation, modal competition, the growing importance of emerging markets and constraints, such as the influence of airport congestion.

The market is segmented by airline business model, region and traffic flow, which enables the precise circumstances and prevailing drivers for each segment to be fully considered. Econometric data is then used to quantify future air travel demand based on economic, operational and structural variables.

Forecast Growth

Airbus predicts the Asia/Pacific region to achieve 6.0 per cent regional traffic growth which compares to forecast world traffic growth of 4.7 per cent. The air transport industry directly employs more than 1.2 million people in the region and contributes more than US$60 billion to GDP making it more than seven times as productive as the economy as a whole and Asia/Pacific is expected to be the fastest growing region in the world of Air Transport.

Airbus has forecast strong growth between 2008 to 2028 across all major international markets to and from Australasia, with the strongest growth forecast for the Middle East, South America, China and the Pacific. Japan and Western Europe are forecast to grow at slower rates of 3.3 per cent and 3.5 per cent per annum respectively over the 20 year period.

Table 68 – Airbus projected passenger traffic forecast Average Annual Growth Rate (CAGR) 2008 – 2028

Sub Market - Australia / New Zealand	CAGR (%) 2008-2028
Canada	5.3%
Indian Subcontinent	5.0%
Japan	3.3%
Middle East	7.3%
China	6.6%
Pacific	5.9%
South Africa	5.7%
South America	6.8%
United States	5.3%
Western Europe	3.5%
Domestic	4.9%
Intra Australia/New Zealand	3.8%
Asia	4.8%

Source: Airbus

The strongest demand globally is for single aisle aircraft comprising nearly 60 per cent of forecast aircraft demand.

Table 69 – Airbus Aircraft Type and unit Demand 2008 - 2028

Aircraft Type	2008-2028 Demand (units)	Share %
Single Aisle Aircraft	4558	59.4%
Small Twin Aisle Aircraft	1618	21.1%
Intermediate Twin Aisle	785	10.2%
Very Large Aircraft	711	9.3%

Source: Airbus

Tourism Research Australia

The Tourism Forecasting Committee (TFC) within the Tourism Research Australia forecasting unit, produces forecasts for inbound, outbound and domestic travel. The latest report was produced in December 2009. The TRA forecasting unit uses an iterative process to project future levels of travel. In the first iteration, activity and expenditure are estimated using a combination of econometric and time series models. These models provide forecasts based on aviation capacity, price, income, seasonality as well as significant events affecting source markets. The second iteration involves a sub-committee made up of senior researchers and economists as well as independent advisors reviewing the model-based forecasts and applying qualitative adjustments. The final iteration involves industry and government experts making adjustments to the forecasts by consensus.

The TFC forecasts represent the most likely outcome given historical trends, current information and the impact of policy and industry changes. These are forecasts and not targets which are produced for business planning and performance management purposes.

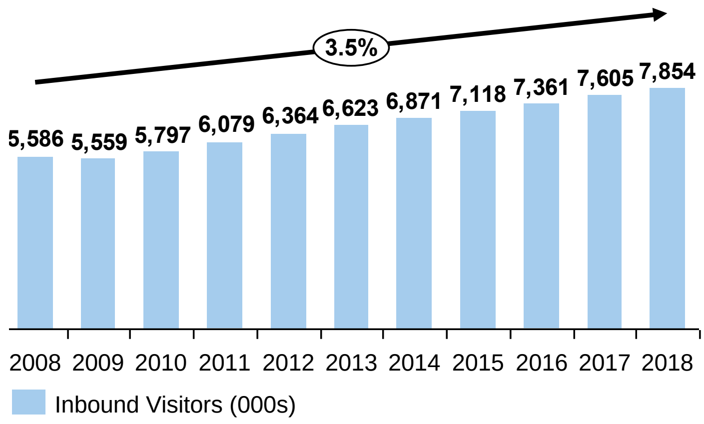
Tourism Research Australia cautions that there are many factors that influence the accuracy of tourism forecasts, including:

- Assumptions around future values of explanatory variables from external sources may not be accurate;
- Data limitations;
- Forecast models use historical information to estimate past relationships between the dependent variable (travel activity) and explanatory or independent variables (e.g. economic, seasonality, events). Such relationships between variables may not hold in the future. Further, external shocks to the industry can disrupt these relationships in the short term or lead to structural change;
- Changes in economic, political, aviation, marketing, health and social influences affecting tourism activity are difficult to foresee but their impact on tourism demand can be assessed; and
- Some figures in the forecasts are estimates derived from TRA surveys and are subject to sampling error.

Forecast Growth

Tourism Australia forecasts inbound international tourists to Australia to grow from 5.6 million in 2008 to 7.9 million in 2018, representing an average annual growth rate of 3.5 per cent.

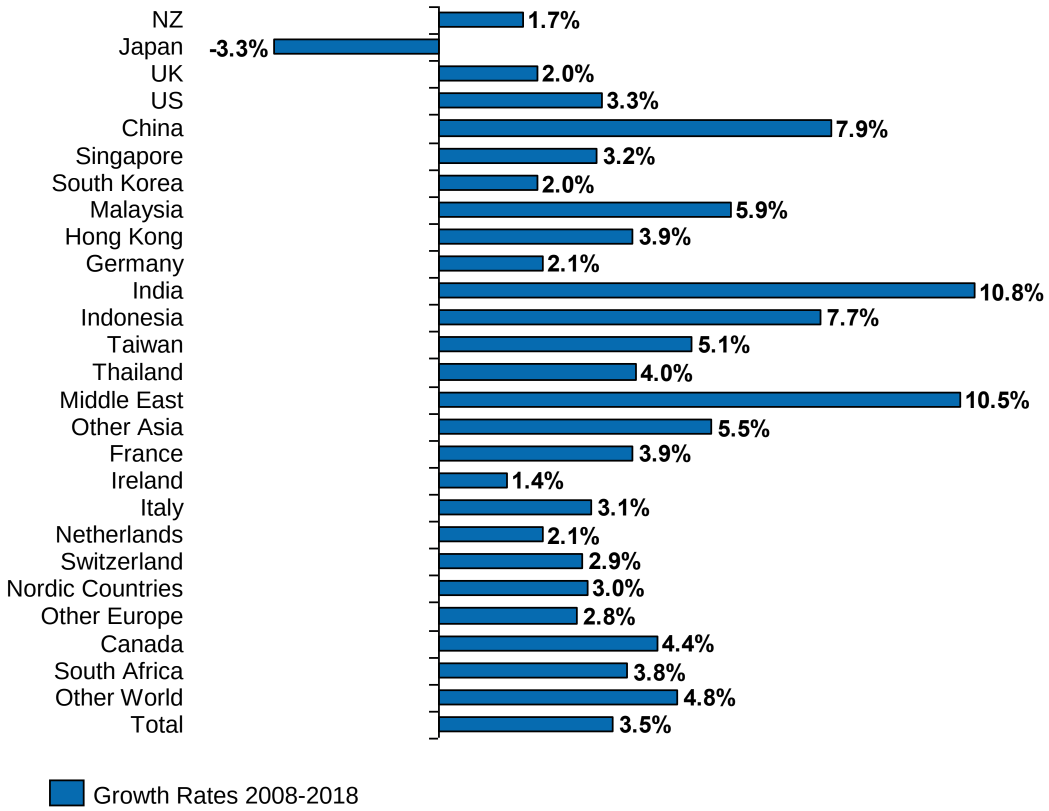
Figure 101 – Tourism Research Australia International Inbound Visitor Forecast 2008-2018 (000s)



Source: Tourism Research Australia (2009)

As shown in Figure 102, the strongest inbound growth markets for Australian tourism are expected to be India, the Middle East, China and Indonesia. Japan is the only market expected to decline following a period of negative growth in recent years.

Figure 102 - Forecast Australian International Inbound Tourism Growth CAGR 2008-2018



Source: Tourism Research Australia (2009)

Airport Level Forecasts

BITRE

The April 2010, BITRE air passenger forecasts projected the number of air passenger movements through Australian capital city airports to grow by 4.2 per cent per annum over the next 21 years, from 98.3 million in 2008-09 to 235 million in 2029-30. BITRE passenger forecasts are unconstrained and are prepared on the basis of estimated air passenger demand models and the most recent information on economic growth and passenger movements. This in turn enabled the calculation of average aircraft size and seat utilisation rates to forecast the number of aircraft movements through Australian capital city airports.

Passenger movements were calculated using single equation econometric modelling factoring in population, income, exchange rates, domestic air fares and the prices of domestic and overseas travel accommodation.

BITRE propose that passenger load factors will remain constant at the 2008-09 level over the entire forecast period as shown in Table 70.

Table 70 - Passenger Load Factor Assumptions (%), 2008/09 and 2029/30

Airport/Route	2008/09	2029/30
Sydney		
- International	75%	75%
- Intercity	80%	80%
- Regional	69%	69%
Canberra		
- Intercity	65%	65%
- Regional	61%	61%

Source: BITRE (2010)

BITRE has factored in the GFC impact. As a result, BITRE project 2009-10 and 2010-11 numbers to be much lower than originally anticipated in the previous forecasts. A key driver of forecast growth in Australia is the evolution of Low Cost Carriers (LCCs).

Sydney (Kingsford-Smith) Airport

BITRE forecast growth average annual growth of 3.9 per cent for the total passenger market from 2008/09 to 2029/30, consisting of growth of 4.7 per cent for international, 3.8 per cent for domestic and 3.1 per cent for regional over the 20 year period. The lower aircraft movement average forecast growth of 2.3 per cent per annum in comparison to passenger growth of 3.9 per cent per annum indicates an increase in average aircraft size assuming no material shift in passenger seat load factors. Table 71 outlines key forecast estimates for Sydney (Kingsford-Smith) Airport.

Table 71 –BITRE Passenger and Aircraft Movement Summary for Sydney (Kingsford-Smith) Airport, 2008/09 and 2029/30

Market	2008/09	2029/30	CAGR (%)
Passenger	32,346,000	72,879,000	3.9
- International	10,200,000	26,720,000	4.7
- Domestic	15,200,000	33,357,000	3.8
- Regional	6,810,000	12,802,000	3.1
Aircraft Movement	291,500	473,900	2.3

Note: Rounded to the nearest thousand
Source: BITRE (2009)

Canberra Airport

Overall passenger growth at Canberra Airport was forecast to grow at 3.3 per cent per annum on average between 2008/09 and 2029/30. Similar growth rates were forecast for domestic and regional traffic of 3.3 per cent and 3.2 per cent per annum over the 20 year period. Table 72 summarises forecast traffic for Canberra Airport.

Table 72 – Canberra Airport Passenger Movements and Aircraft Movements 2008/09-2029/30

Market	2008/09	2029/30	CAGR (%)
Passenger	3,188,000	6,324,000	3.3%
- International	n/a	n/a	n/a
- Domestic	3,100,000	6,154,000	3.3%
- Regional	87,000	170,000	3.2%
Aircraft Movement	41,600	65,100	2.2%

Note: Rounded to the nearest thousand
Source: BITRE (2010)

In this study, BITRE did not forecast international passenger movements through Canberra Airport as there is no international traffic at present and hence not growth was forecast for this market.

Sydney (Kingsford-Smith) Airport 2009 Master Plan

Sydney (Kingsford-Smith) Airport 2009 Master Plan Traffic Forecasts were prepared by Tourism Futures International (TFI). Additional forecasts for air freight volumes and helicopter movements were prepared by Sydney (Kingsford-Smith) Airport Corporation Limited (SACL).

Master Plan forecasts for Sydney (Kingsford-Smith) Airport have taken account of three main factors:

(i) Economic factors;

(ii) Population; and

(iii) Aviation factors.

Australia’s Tourism Forecasting Committee, BITRE and the Air Transport Association provide the foundation to Sydney’s forecasting factors.

Table 73 summarises the forecasts for Sydney (Kingsford-Smith) Airport as presented in the Master Plan. Master Plan passenger forecasts for Sydney (Kingsford-Smith) Airport indicate growth of 47 million passengers between 2007 and 2029 representing an average annual growth rate of 4.2 per cent.

The forecast growth across Sydney (Kingsford-Smith) Airport shows a decline in aircraft movements whilst an increase in passenger movements across both domestic and international markets. As a result, it can be expected that average seats per aircraft movement increase proportionally with the subsequent increase in annual passenger growth. Given the evolution of aeronautical engineering, it can be assumed that the increased average number of passenger seats is achieved through the design and implementation of larger capacity aircraft. At least 93 daily movements are forecast for the Airbus 380 (A380) by 2029. Annual regional passengers are forecast to grow from 1.9 million in 2007 to 3.1 million by 2029.

Air freight comprises 471,000 tonnes in 2007 and is expected to grow to 1,077,000 tonnes by 2029. Approximately 80 per cent of freight is carried in the holds of the passenger aircraft that operate through Sydney. Air freight aircraft movements are expected to grow to 10,400 aircraft in 2029, representing an annual growth rate of 1.2 per cent.

Aircraft movements at Sydney were 258,700 in 2007 and are expected to grow to 402,000 by 2029. For passenger aircraft movements this represents an average annual growth rate of 2 per cent.

General Aviation (GA) movements decreased from 25,709 to 19,590 in 2007; a 24 per cent reduction in aircraft movements. A further decline is expected over the 20 year forecast to 15,000 aircraft movements per annum to accommodate commercial aircraft as the airport becomes more constrained.

Table 73 – Sydney (Kingsford-Smith) Airport Master Plan Passenger and Aircraft Movement Summary, 2007 and 2029

Market	2007	2029	CAGR (%)
General Aviation	23,000	15,000	-1.9%
Helicopter	6,094	6,094	0.0%
Passenger	31.9 million	78.9 million	4.2%
Aircraft Movement	258,700	402,000	2.0%
Regional Passengers	1.9 million	3.1 million	2.3%
Air Freight (tonnes)	471,000	1,077,000	3.8%
Air Freight (Aircraft)	8,032	10,400	1.2%

Source: Sydney (Kingsford-Smith) Airport 2009 Master Plan

Canberra Airport 2009 Master Plan

Canberra Airport's 2009 Master Plan traffic forecasts were prepared by Airbiz. It is expected that strong passenger growth will continue at Canberra Airport. The past decade has witnessed a large increase in airline services especially LCCs operating at the airport. This has subsequently reduced the average fare to and from Canberra dramatically.

Table 74 summarises the passenger forecasts for Canberra Airport. In 2008/09 2.85 million passengers passed through Canberra Airport and this is expected to grow to 7.25 Million by 2029/30. This reflects average annual growth of 4.2 per cent for domestic and regional passengers.

This is a mid-range projection and does not take into account the potential for further passenger growth associated with relieving traffic at a potentially congested Sydney (Kingsford-Smith) Airport. Furthermore, this assumption does not take into account increased Virgin Australia and Qantas capacity or the commencement of Tiger Airways, which have been major growth drivers over the past year.

Table 74 – Canberra Airport passenger forecasts across Low, Medium and High range projection to 2029/30

Market	2007/08	2011/12	2016/17	2021/22	2027/28	2029/30
Domestic/Regional	2,850,000	3,271,000	4,017,000	4,936,000	6,319,000	6,861,000
International	0	118,000	183,000	266,000	349,000	382,000
Total	2,850,000	3,389,000	4,202,000	5,203,000	6,668,000	7,243,000

Note: Rounded to the nearest thousand.
Source: Airbiz (2007), Canberra Airport (2009)

There were 40,000 domestic and regional aircraft movements at Canberra Airport in 2007/08. Aircraft movements are expected to increase to 83,000 by the end of the forecast period. It is expected that aircraft movement growth will be below that of passenger growth (i.e. 3.4 per cent versus 4.2 per cent) implying an increase in the average size of aircraft, assuming no material shift in passenger seat load factors.

International aircraft movements are expected to increase to 2,500 by the year 2029/30. It is expected that international flights will include New Zealand and one major Asian hub such as Singapore or Hong Kong. International flights are expected to use a mix of narrow body (B737 and A320) and medium wide-body aircraft (B767, A330) with an average of six to seven movements per day by the end of the forecast period. Trans-Tasman flights will operate three to five times per week with a narrow-body aircraft and will grow to daily services by 2029/30.

Table 75 – Canberra Airport annual aircraft movement projection to 2029/30

Market	2007/08	2011/12	2016/17	2021/22	2027/28	2029/30
Domestic/Regional	40,000	45,000	54,000	63,000	75,000	83,000
International	-	1,000	1,000	2,000	2,000	2,500
Other	49,000	55,000	63,000	67,000	70,000	72,000
Total	89,000	101,000	118,000	132,000	147,000	157,000

Note: Rounded to the nearest thousand.
Source: Airbiz (2007), Canberra Airport (2009) – NB – „Other" represents, General Aviation, VIP and freight aircraft movements

Key factors that may enhance Canberra Airport potential as a regional and international airport:

- Sydney (Kingsford-Smith) Airport is expected to be at or near capacity within 20 years
- The absence of an airport capable of providing RTP to the Sydney region to relieve Sydney's air traffic congestion;
- Sydney curfew, Canberra Airport is the only 24 – hour B-747 and Airbus A-380 capable airport between Brisbane and Melbourne; and
- Improved surface access to the airport for the surrounding catchment population.

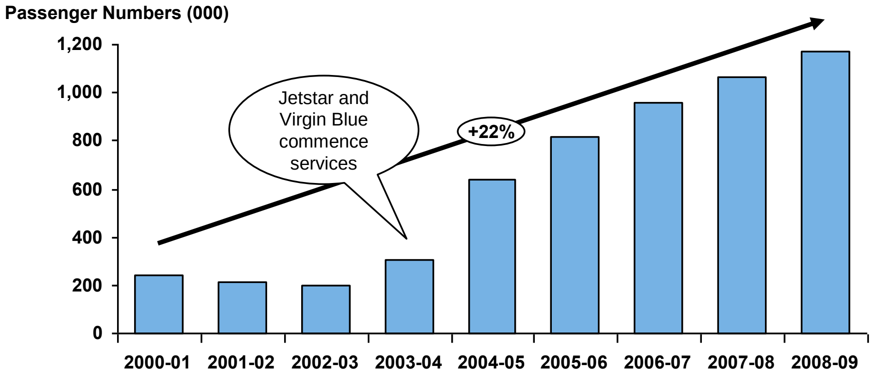
A key defining feature of Canberra Airport's operations is the ability for it to service aircraft 24-hours per day. This is expected to continue. The Airservices Australian Noise and Flight Path Monitoring System identified a total of 496 overnight aircraft movements (2300 – 0600). According to the Master Plan, it is projected that by 2029/30 overnight (2300 – 0600) aircraft movements will be 30 jet freight aircraft per night; eight passenger aircraft per night and 20 prop freight aircraft per night. Overnight aircraft movements will increase in total from an average of 5.4 in 2007/08 to 60 in 2029/30.

The Canberra Master Plan places significance on North American secondary airports for freight movement as an ideal model for Canberra's growing market. The current schedule consists of a network comprising of Sydney and Adelaide Airports driven to meet demand given curfews at Sydney and Adelaide Airports.

Newcastle Airport 2007 Master Plan

As illustrated in Figure 103, Newcastle Airport has shown strong growth since the introduction of major LCCs Virgin Australia and Jetstar to its market in November 2003 and May 2004 respectively.

Figure 103– Passenger Growth Represented Against Gross State Product (GSP) for Newcastle Airport, 2000/01 to 2008/09



Source: BITRE, NSW Government

Newcastle Airport and its respective airline operators have built a strong customer delivery strategy by focusing on and developing key service routes. Given urban sprawl and continued population growth in the northern suburbs of Sydney the immediate Newcastle area, Newcastle Airport can expect growing passenger numbers into the future. The Hunter region experienced 1.4 per cent and 1.1 per cent population growth for the years 2007 and

2008 respectively[36]. The NSW Department of State and Regional Development indicate that the Hunter represents Australia's largest regional population[37]. State wide economic developments and initiatives have contributed to regional growth in the Newcastle district.

Airlines operating out of Newcastle airport include Qantas link, Virgin Australia, Jetstar, Tiger Airways, Aeropelican and Brindabella Airlines. Low cost carriers Virgin Australia and Jetstar appear to be in a consolidation phase given their limited aircraft orders over the next 18 months.

Newcastle Airport proposes the resumption of Trans-Tasman services in the short term and a longer term scenario with the introduction of Asian route by as early as 2017/18 and to potentially provide capacity for an aircraft size similar to a B-787.

Passenger forecasts show strong growth in the short term from 2009/10 to 2014/15 as increased capacity comes on line.

Future aircraft movements must adhere to the prescribed arrival and departures guidelines outlined in the Head Operating Agreement (HOA) which restricts arrivals to six per hour, ten minutes apart, giving a maximum capacity of 78,080 movements per annum**.** To a large extent, the future growth of Newcastle Airport is currently restricted by aircraft type. The A-320/B-737 (Code C) currently dominates choice of aircraft for the large extent of LCCs based in Australia and New Zealand. Future aircraft to be implemented include the Dash9 – Q400 and the B-787-900 – based on these qualitative perspectives the projected growth of the average number of passengers per aircraft movement will exceed the 2007 Master Plan. Consequently, this is expected to impact on the growth of aircraft movements and reduce the total number of annual movements.

As with the case at Sydney (Kingsford-Smith) Airport, most freight is carried in the hold of passenger aircraft. Freight movements projected for the future have been forecast from 2015 as a benchmark. It is projected that from 2015 Newcastle Airport will capture between six to ten freight movements per day with three to five arrivals for every departure per day. 2015 will yield two to four movements per day; 2020 will see four to eight movements per day with a 2025 forecast estimating a capacity for six to ten movements per day.

The Newcastle Airport Master Plan forecasts growth of around five per cent per annum between 2005/06 and 2024/25. Passengers of around 1.7 million were forecast for 2024/25 from a level of 676,000 in 2005/06. These forecasts were produced during Newcastle Airport's period of strong growth. Passengers in 2008/09 have already reached 1.2 million.

Bankstown Airport 2005 Master Plan

The Bankstown Airport 2005 Master Plan traffic forecast took into account the following factors:

- Growth of the existing Bankstown Airport GA traffic, based on historical growth patterns;
- Current and projected economic conditions and industry-specific factors;

[36] Source: Australian Bureau of Statistics (ABS)

[37] Source: New South Wales Department of State and Regional Development

- Traffic that may transfer to Bankstown Airport due to the impending closure of Hoxton Park Airport;
- GA traffic that may transfer to Bankstown Airport from Sydney (Kingsford-Smith) Airport (e.g. helicopters, corporate charter and freight);
- Mainly private aircrafts and smaller operations traffic that may transfer from Bankstown Airport to other airports within the Sydney Basin and smaller, private airports such as Wedderburn and Warnervale;
- The potential for niche RPT operations commencing at Bankstown Airport;
- Interviews and discussions with key tenants; and
- A comprehensive survey of airport tenants and users which asked for short term (3 year) traffic forecasts.

Between 1969/70 and 1997/98 traffic at Bankstown grew at an average annual growth rate of 1.9 per cent. Bankstown experienced strong growth in traffic between 1998/99 and 2002/03 of around five per cent and between 2003/04 to 2008/09, traffic grew at an average annual growth rate of 5.5 per cent[38].

Over the 20 year period from 2003/04 to 2024/25, traffic was forecast to grow to around 424,129 movements from around movements in 247,398 in 2003/04.

Key aspects of the forecast include:

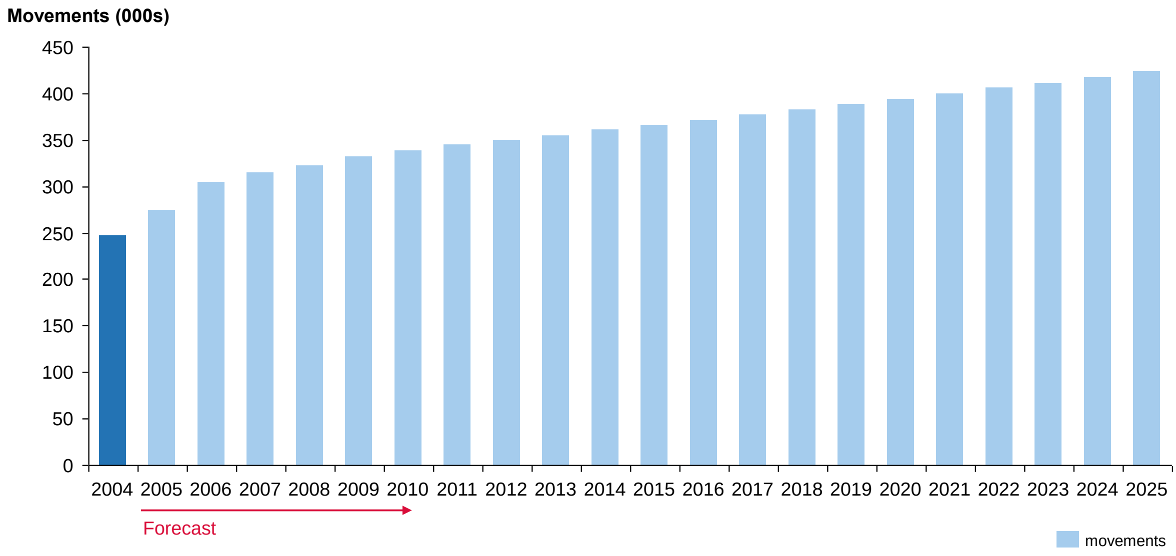
- Bankstown Airport's position as the premier GA airport in NSW and its continued proximity to a large population catchment area;
  - continued economic growth for the Australian and NSW economies; and
  - demand for pilots and flying training driven by growth in RPT traffic levels and new entrant LCCs in Australia and the Asia-Pacific region (except for training flying pilots from overseas, who are anticipated to take more training in their home countries);
- Reasonable growth of 2.5 per cent per annum over the five years to 2009/10. This is comprised of:
  - annual growth of 1.5 per cent for the base GA traffic at Bankstown Airport, based on long term historical industry growth rates;
  - gradual transfer of a proportion of traffic from Hoxton Park as the airport is wound-down and ultimately closed by 2008;
  - annual growth of 6.3 per cent in helicopter activity, driven by industry growth and Bankstown Airport specific growth considerations;
  - growth of 3.1 per cent in freight activity movements, driven by industry growth and Bankstown Airport specific growth considerations;
  - the introduction of niche passenger aircraft operations, based on industry growth and Bankstown Airport specific growth considerations;
- Long term growth of 1.5 per cent from 2011/12 to 2024/25; after 2011/12, the forecast anticipates a slowing in the growth rate, based on long term (30 year) averages;

[38] Bankstown Airport 2010 Preliminary Draft Master Plan

In terms of aircraft type, by 2024/25 the aircraft movements traffic forecast indicates that:

- 2.6 per cent of aircraft movements will be by typical regional (interstate and freight) aircraft such as e.g. Embraer 170, BAe 146, Saab 340 or DHC-8;
- 2.3 per cent of aircraft movements will be by typical regional (intrastate and freight) aircraft such as SA-226 Metro. Beech 1900 and DHC-6;
- 84.1 per cent of aircraft movements will be by typical GA aircraft that currently use Bankstown Airport, including single engine piston and twin engine piston aircraft. These are typically used for flying training, charter and other business activities; and
- 11.4 of aircraft movements will be by typical rotary aircraft that currently use Bankstown Airport. These are typically used for flying training, charter and business activities.

Figure 104 – Bankstown Airport Aircraft Movement Forecast, 2004 to 2025



Source: Bankstown Airport Master Plan 2005

Freight

There are no official statistics kept on air freight related activity at GA airports, however estimates were made for current freight activity at Bankstown Airport of approximately 8,500 movements per annum. This represents around 3.4 per cent of the total number of aircraft movements in 2003/04 (i.e. 247,398). The majority of this traffic uses Metroliner and other relatively small aircraft, operating for banks in the late evening and early morning.

It is estimated that freight activity will grow to around 13,400 movements by 2024/25, this represents an average annual growth rate of 2.2 per cent. This growth rate is higher than the overall aircraft movement growth rate reflecting the growing relative importance of Bankstown as a freight hub. While some allowance has been made for the utilisation of larger aircraft for freight operations over the planning period, the majority of traffic is expected to utilise similar aircraft to those currently operating.

Passengers

There has been some passenger aircraft operations at Bankstown Airport in the past (early 1990s) as well as the occasional regional jet charter operations. There are currently no scheduled or RPT passenger aircraft operations at Bankstown Airport. There has been a history of very limited passenger aircraft operations due to the inability of Bankstown's infrastructure to accommodate large scale activity by the larger passenger jet aircraft (e.g. B737). The commencement of any passenger aircraft services at the airport will be driven by market demand and capability of infrastructure.

The forecast has been developed based on the likely activity pattern and indicative timelines of a start-up, niche passenger operation. The forecast includes:

- Start-up with 4 movements per day, 6 days per week in 2006/07 – which represents a total of 1,248 aircraft movements per annum;
- Growth to 8 movements per day, six days per week in 2008/09– a total of 2,496 aircraft;
- Growth to 12 movements per day, 6 days per week in 2009/10, remaining at this level for the remainder of the planning period – a total of 3,744 aircraft movements per annum; and
- The forecast assumes that these operations would utilise regional jet aircraft such as the BAe 146-300 or the F100 with average seat capacity of around 128 with an assumed average load factor of 60 per cent.

The forecast of 3,744 passenger related aircraft movements represents just 0.9 per cent of the total forecast number of aircraft movements in 2024/2025 (424,129).

Summary and Conclusions

Approach

All sources followed a similar forecast methodology taking into account the following key drivers of aviation demand:

- Economic growth;
- Population;
- Air fares / oil prices;
- Tourism;
- Operating models (e.g. LCCs);
- Aircraft technology;
- Liberalisation; and
- Competition.

With the exception of IATA which follows the Delphi technique, income driven models formed the basis of forecasts across all sources.

Purpose

There are considerable differences between forecast growth rates depending across the sources due to different time frames, methodology and purpose of the forecast. The Airports

Act 1996 requires that core regulated airports[39] produce a 20-year master plan every five years. Airport master plans provide an outlook for infrastructure planning for public comment and approval by the Minister. The purposes of a master plan for an airport are:

(a) to establish the strategic direction for efficient and economic development at the airport over the planning period of the plan;

(b) to provide for the development of additional uses of the airport site;

(c) to indicate to the public the intended uses of the airport site; and

(d) to reduce potential conflicts between uses of the airport site, and to ensure that uses of the airport site are compatible with the areas surrounding the airport.

- The forecasts in the master plans were prepared prior to the GFC
- Individual airport Master Plans do not always take into account the impact of traffic growth on the airport network (e.g. impact on Sydney international traffic if Newcastle and Canberra commence international services).
- Boeing and Airbus forecast strong growth for the Australasian market. We should be wary of the purpose of these forecasts as it would be in the manufacturer's interest to be optimistic in terms of the future outlook of air traffic.
- BITRE follows a mechanistic, econometric approach.
- BITRE and the Sydney and Canberra Airport Master Plans were all produced recently and cover a 20-year time period. Growth rates, assumptions and methodology are comparable.

Forecasts - Australia

International traffic varies between source, with Airbus and IATA having more consistent growth across markets, whereas TRA forecasts vary significantly between markets. All sources consistently forecast the strongest markets to be India, Middle East and China and the weakest market to be Japan. Table 76 summarises the forecast annual average growth rates for the Australian International traffic.

39 Core regulated airports included in this study are Sydney Airport and Canberra Airport, although Newcastle airport and Bankstown airport also produce master plans.

Table 76 – Summary of Forecast AAGR for Australian International Traffic by Market

Market	Airbus 2008-2028	TRA 2008-2018	IATA 2008-2013
US	5.3%	3.3%	3.7%
India	5.0%	10.8%	7.7%
China	6.6%	7.9%	7.8%
Middle East	7.3%	10.5%	6.7%
Western Europe	3.5%	n/a	2.1%
New Zealand	3.8%	1.7%	2.5%
United Kingdom	n/a	2.0%	2.1%
Japan	3.3%	-3.3%	0.8%

Note: TRA forecasts are for international visitors, Airbus and IATA forecasts are for passenger traffic
Source: Airbus, Tourism Research Australia, IATA

Table 77 – Summary of Forecast Aggregate Australian Traffic

Source	Market	CAGR (%)	Period
TRA	International Visitors	3.6%	2008-2018
TRA	Domestic Visitor Nights	0.0%	2008-2018
IATA	International Passengers	3.8%	2008-2013
IATA	Domestic Passengers	3.3%	2008-2013
IATA	International Freight	0.1%	2008-2013
Boeing	International RPKs	5.1%	2008-2028
Boeing	International FTKs	6.1%	2008-2028
Airbus	International Passengers	3.3-7.3%	2008-2029
Airbus	Domestic Passengers	4.9%	2008-2030

Source: Airbus, Tourism Research Australia, IATA, Boeing

The forecast growth rates shown in Table 77 are not directly comparable due to differences in the type of traffic forecast and time period. Despite being over a longer time period aircraft manufacturers Boeing and Airbus, forecast stronger growth in traffic compared to TRA and IATA. IATA and TRA produced similar growth rates for International traffic, with TRA forecasting 3.6 per cent per annum for 2008-2018 and IATA forecasting 3.8 per cent for 2008-2013.

Forecast – Sydney (Kingsford-Smith) Airport

Forecast growth rates for total passengers are comparable between sources with the Master Plan forecast of 4.2 per cent per annum for 2007-2029 and BITRE forecast of 3.9 per cent for FY09-FY30 (see Table 78). The Master Plan aircraft movements are forecast at 2.0 per cent over the 2007-2029 period indicating significant fleet up-gauging. BITRE also forecasts fleet up-gauging with aircraft movement growth lagging passenger growth by an average rate of 1.6 per cent per annum. BITRE predicts stronger regional passenger growth compared to the Master Plan.

Table 78 – Summary of Forecast Sydney (Kingsford-Smith) Airport (SYD) Traffic

Source	Market	CAGR (%)	Period
BITRE	Total Passengers	3.9	FY09-FY30
	International Passengers	4.7	FY09-FY30
	Domestic Passengers	3.8	FY09-FY30
	Regional Passengers	3.1	FY09-FY30
	Aircraft Movements	2.3	FY09-FY30
Sydney (Kingsford-Smith) Airport 2009 Master Plan	General Aviation	-1.9	2007-2029
	Helicopter	0	2007-2029
	Total Passengers	4.2	2007-2029
	International Passengers	4.8	2007-2029
	Domestic Passengers	3.9	2007-2029
	Aircraft Movements	2	2007-2029
	Regional Passengers	2.3	2007-2029
	Air Freight (tonnes)	3.8	2007-2029
	Air Freight (Aircraft)	1.2	2007-2029

Source: Airbus, Tourism Research Australia, IATA, Boeing

Forecast – Canberra Airport

The Canberra Airport Master Plan has a more optimistic outlook for Canberra Airport's traffic. BITRE does not forecast international passengers due to an absence of historical traffic. The Master Plan assumes that international services commence at Canberra Airport within the next five years. The Master Plan's forecast aircraft movement growth rates to FY30 are slightly higher (2.6 per cent per annum) than BITRE's forecast of 2.2 per cent per annum the lag of aircraft movement growth rates behind passenger growth rates indicate significant fleet up-gauging for both the Master Plan and BITRE's assumptions (see Table 79).

Table 79 – Summary of Forecast Canberra Airport (CBR) Traffic

Source	Market	CAGR (%)	Period
BITRE	Total Passengers	3.3	FY09-FY30
	International Passengers	n/a	FY09-FY30
	Domestic Passengers	3.3	FY09-FY30
	Regional Passenger	3.2	FY09-FY30
	Aircraft Movements	2.2	FY09-FY30
Canberra Airport 2010 Master Plan	Domestic/Regional Passengers	4.1	FY08-FY30
	International Passengers	n/a	FY08-FY30
	Total Passengers	4.3	FY08-FY30
	Domestic/Regional Aircraft Movements	3.4	FY08-FY30
	International Aircraft Movements	n/a	FY08-FY30
	Other Aircraft Movements	1.8	FY09-FY30
	Total Aircraft Movements	2.6	FY09-FY30

Note: International CAGRs could not be calculated for international traffic forecasts since there is current no international traffic at Canberra Airport. Note that the mid-case scenario from the master plan forecasts have been presented in this table.

Source: Airbus, Tourism Research Australia, IATA, Boeing

Forecast – Bankstown and Newcastle Airports

Bankstown and Newcastle Airport Master Plans outline forecast growth for their respective airports. The Newcastle Master Plan was produced in 2007 and is therefore out-dated for the purposes of this study. The Bankstown Master Plan indicates average forecast growth of around 1.5% per cent per annum over the next 16 years. Table 80 shows a summary of the forecasted growths.

Table 80 – Summary of Forecast Bankstown (BWU) and Newcastle (NTL) Traffic

Source	Airport	Market	CAGR (%)	Period
Bankstown Airport Master Plan	Bankstown	Total Aircraft movements	1.5%	FY09-FY25
Newcastle Airport Master Plan	Newcastle[1)]	Total Passengers	5	FY06-FY25

1) Newcastle Growth rates are estimated based on charts in the Master Plan report.

Note that forecasts were unavailable for Camden, Richmond, Cessnock, Maitland and Goulburn

Source: Bankstown Airport Masterplan (2005), Newcastle Airport Master Plan (2007)

Conclusions

Analysis of the forecast air traffic studies described in this report can be used to inform and validate Booz & Company forecasts for the Sydney region airports for the short term (five years) and medium-long term (20 years).

Forecasts prepared prior to the GFC are likely to have higher projected growth rates in comparison to those prepared following the GFC. Both Sydney and Canberra 2009 Master Plan traffic forecasts were prepared in 2008 prior to the GFC, so these forecasts would need to be rebased for current level of activity. This is evident in forecasts for Sydney and Canberra since the 2009 Master Plans for both Sydney and Canberra airports were prepared in 2008 prior to the downturn in global air traffic due to the GFC. The BITRE forecasts prepared in early 2010 take into account the GFC and thus have lower traffic projections in 2029/30 compared to the Master Plans, as well as more moderate growth rate projections. The Canberra Airport Master Plan assumes the introduction of international air traffic in the short term, whereas the BITRE forecasts do not assume international traffic at Canberra due to the lack of historical international activity.

Both BITRE and Master Plan forecasts for Canberra and Sydney incorporate assumptions on fleet up-gauging and/or increased passenger load factors, allowing for more passengers to be served per aircraft movement. This is particularly relevant for Sydney (Kingsford-Smith) Airport, given regulations restricting more than 80 aircraft movements per hour. This places significant strain on Sydney (Kingsford-Smith) Airport's infrastructure and requires strong growth in passengers per movement in order to accommodate forecast passenger demand.

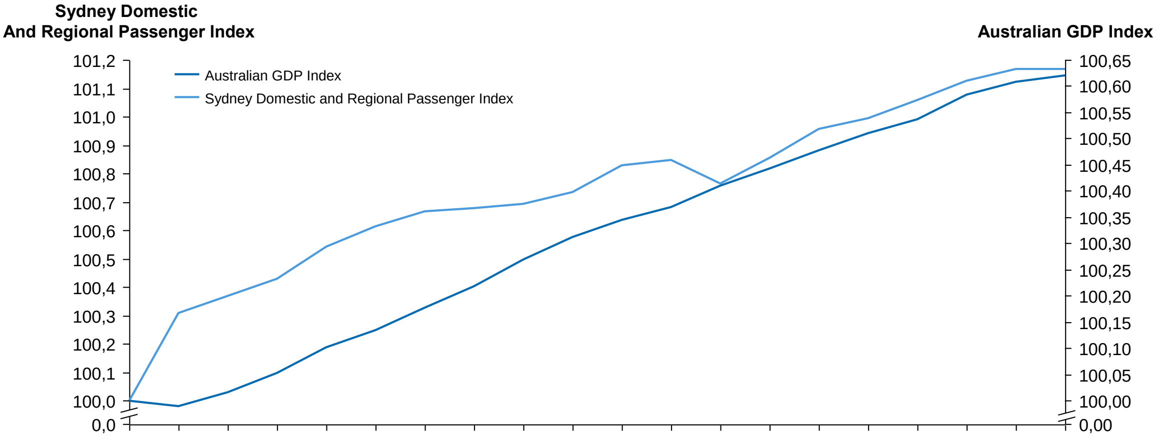
The Sydney (Kingsford-Smith) Airport 2009 Master Plan indicates that passenger and freight forecasts at Sydney (Kingsford-Smith) Airport can be supported over the next 20-years; however, as stated in the December 2009 Australian Government Aviation White Paper, the government noted in approving the Sydney (Kingsford-Smith) Airport's Master Plan, that it does not accept that the airport can, nor should, handle projected long-term growth in the region. Long-term growth post the 2009 master planning period is likely to become even further constrained without additional airport capacity in the area.

Appendix B - Derivation of Elasticities for Domestic and International Model

Domestic

Income elasticity is a measure of responsiveness of demand to a change in income. Historically there has been a strong relationship between GDP and air travel. Figure 105 (below) provides a graphical representation of the correlation between Australian GDP and passenger air travel for domestic and regional passengers for Sydney between the years 1999 and 2009.

Figure 105 – Relationship between Australian GDP and domestic air travel



Source: BITRE, Booz & Company Analysis

Income and airfare elasticities were derived by carrying out a time-series regression analysis of historical real GDP data, domestic real airfare index and historical air traffic for a variety of market segments. Domestic airfare is a key driver of aviation demand. Fares have been driven downwards by the emergence of LCC's, increased competition, causing growth in air traffic demand.

$$\ln(pax) = \alpha + \varepsilon_{GDP}\,(\ln_{\text{real GDP}}) + \varepsilon_{fare}\ \ln\,(_{\text{Real fare index}})$$

Regressions were run for aggregate traffic and also route level traffic to find the most appropriate and robust model. Where a long time series was available, in this context data was available from 1992, rolling elasticities were calculated over 9-year periods to understand how the elasticity has been changing over time.

Table 81 – Income and Fare Elasticities applied to Domestic Model

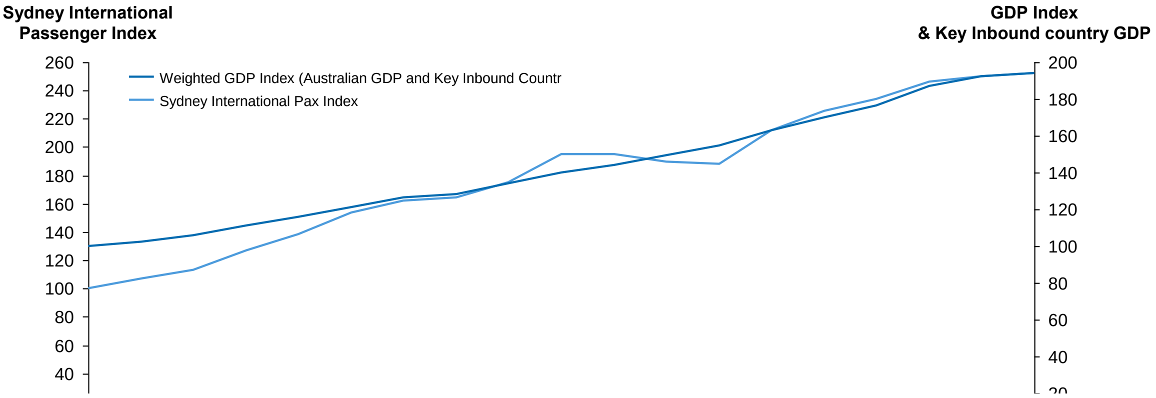
Description	Time Period	Income Elasticity	P-value	Fare Elasticity	P-Value	Dummy	P-Value	R sq
Sydney Domestic vs Australian GDP and Domestic Fares Index	2000-2009	1.34	0.00	-0.05	0.66	-0.10	0.02	0.976
Canberra Domestic and Regional vs Australian GDP and Domestic Fares Index	2000-2009	1.15	0.01	-0.32	0.07	-0.12	0.03	0.973
Newcastle Domestic and Regional vs Australian GDP and Domestic Fares Index	2000-2009	8.64	0.01	0.79	0.52	-0.25	0.46	0.909

Source: Booz & Company analysis

Due to exogenous shocks severely affecting the Australian aviation market, a *„dummy"* variable was added to the model run to calculate the elasticity effects as a direct consequence of the shock. Such exogenous shocks incorporated into the dummy analysis was the September 11th terrorist attacks and the collapse of Ansett Australia in 2001.

International

Figure 106 – Relationship between Australian GDP and domestic air travel



Source: BITRE, Booz & Company Analysis

International income and airfare elasticities were derived by carrying out a time-series regression analysis of historical real GDP. For outbound elasticities, data was extracted from Australian real GDP and applied to the passenger numbers to that respective country. For inbound elasticities, data was used from historic real GDP as of each respective country coming to Australia.

Table 82– Income Elasticities applied to international model - Outbound

Description	Time Period	Measure	Income Elasticity	P-Value
New Zealand	1991-2009	Australian GDP	1.92	0.00
United Kingdom	1991-2009	Australian GDP	0.99	0.00
United States	1991-2009	Australian GDP	0.74	0.00
Indonesia	1991-2009	Australian GDP	0.91	0.00
China	1991-2009	Australian GDP	4.43	0.00
Singapore	1991-2009	Australian GDP	1.47	0.00
Japan	1991-2009	Australian GDP	1.94	0.00
Thailand	1991-2009	Australian GDP	2.88	0.00
Malaysia	1991-2009	Australian GDP	1.54	0.00
Hong Kong	1991-2009	Australian GDP	0.59	0.00
India	1991-2009	Australian GDP	3.09	0.00
Fiji	1991-2009	Australian GDP	1.88	0.00
Germany	1991-2009	Australian GDP	1.19	0.00

Description	Time Period	Measure	Income Elasticity	P-Value
Canada	1991-2009	Australian GDP	1.99	0.00
Korea	1991-2009	Australian GDP	2.10	0.00
Other	1991-2009	Australian GDP	1.84	0.00

Source: Booz & Company analysis

Table 83 - Income Elasticities applied to international model - Outbound

Description	Time Period	Measure	Income Elasticity	P-Value
New Zealand	1991-2009	New Zealand GDP	1.66	0.00
United Kingdom	1991-2009	UK GDP	2.21	0.00
United States	1991-2009	US GDP	1.20	0.00
Indonesia	1991-2009	Indonesia GDP	0.70	0.06
China	1991-2009	China GDP	1.97	0.00
Singapore	1991-2009	Singapore GDP	0.83	0.00
Japan	1991-2009	Japan GDP	(1.19)	0.15
Thailand	1991-2009	Thailand GDP	1.25	0.00
Malaysia	1991-2009	Malaysia GDP	1.17	0.00
Hong Kong	1991-2009	Hong Kong GDP	0.90	0.00
India	1991-2009	India GDP	2.28	0.00
Fiji	1991-2009	Fiji GDP	1.44	0.00
Germany	1991-2009	Germany GDP	2.05	0.00
Canada	1991-2009	Canada GDP	1.80	0.00
Korea	1991-2009	Korea GDP	2.12	0.00
Other	1991-2009	World GDP	1.67	0.00

Appendix C – Growth Rate Calculations

Growth rates for the international and domestic market was calculated based on the following approach:

For each year j of the forecast horizon, the estimated growth in the demand for air services for market segment k is given by:

$$D_{jk} = D_{(j-1)k} \left[\left(\frac{GDP_{jk}}{GDP_{(j-1)k}} \right)^{GDP\varepsilon_{jk}} \left(\frac{Fare_{jk}}{Fare_{(j-1)k}} \right)^{Fare\varepsilon_{k}} \right]$$

Where:

D_{jk} = estimated passenger demand for air services in year j and market segment k

$Fare_{\varepsilon_k}$ = estimated fare elasticity for market k

$\frac{Fare_{jk}}{Fare_{(j-1)k}}$ = forecast change in real air fares for market k in year j from previous year

$GDP_{\varepsilon_{jk}}$ = estimated income elasticity for market k in year j

$\frac{GDP_{jk}}{GDP_{(j-1)k}}$ = forecast change in income for market k in year j.

- As the above formulae suggests, fare elasticities for a given market segment k are assumed to be fixed across the entire forecast horizon. Conversely, income elasticities are assumed to progressively decline across the forecast horizon in response to market maturation.

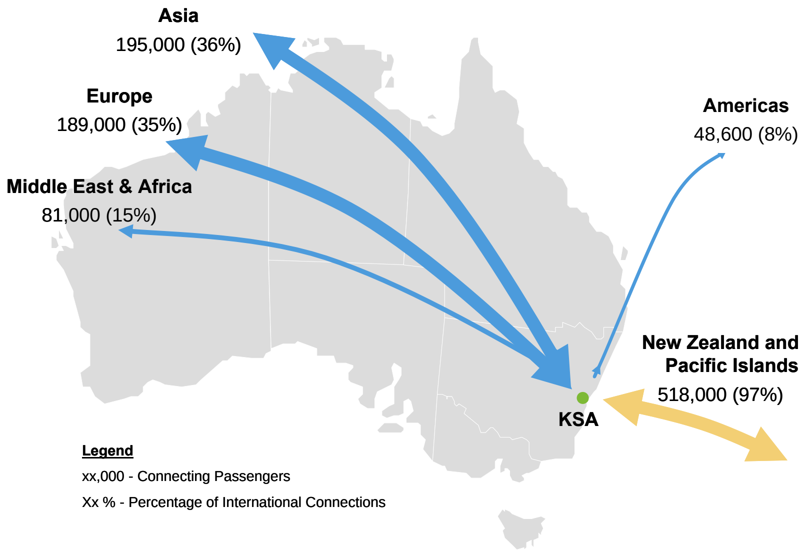
Appendix D – Analysis of MIDT data

Analysis of Connecting Passenger Movements at Sydney (Kingsford-Smith) Airport

International – International

The majority of International to International connections are between New Zealand (and Pacific Islands) and medium to long haul destination in Asia, Europe and the Middle East. Due to limited direct services from New Zealand cities to South East Asia, connecting over Sydney (Kingsford-Smith) Airport is an attractive proposition for travel to and from New Zealand. Passenger flows between Asia, Europe and Middle East, and New Zealand are shown in **Figure 107**.

Figure 107 - International - International Connections



Source: Booz & Company analysis of 2010 MIDT data

The shares of individual markets for international to international connections are shown in **Table 84**.

Table 84 - International – International Connection Breakdown

International O-D Pairs	% Total
NZ & Pac. - Europe	35%
NZ & Pac. - Asia	36%
NZ & Pac. - Africa	9%
NZ & Pac. - North America	8%
NZ & Pac. - Middle East	6%
NZ & Pac. - NZ & Pac.	2%
Other - Other	4%
Total Passengers	532,000

Source: Booz & Company analysis of 2010 MIDT data

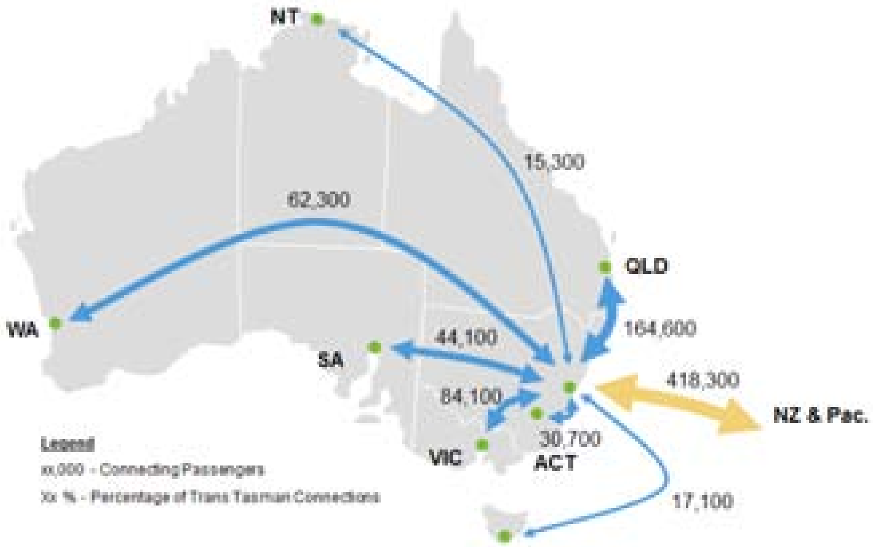
International – Domestic

The majority of the International - Domestic connections are made to Queensland and Victoria. Analysis also indicates the largest proportion of the international connecting passenger movements serve the Americas. The following sections describe the connecting passenger movements for the individual markets.

Trans-Tasman – Domestic

The largest proportion of trans-Tasman – Domestic connections is between New Zealand and Queensland (39 per cent) followed by Victoria (20 per cent) as illustrated below in **Figure 108** and **Table 85**. Queensland has a large number of secondary destinations which are currently not large enough to sustain direct services from New Zealand hence are fed via Brisbane and Sydney.

Figure 108 - Trans-Tasman – Domestic Connections



Source: Booz & Company analysis of 2010 MIDT data

Table 85 - Trans-Tasman – Domestic Connection Percentage Split

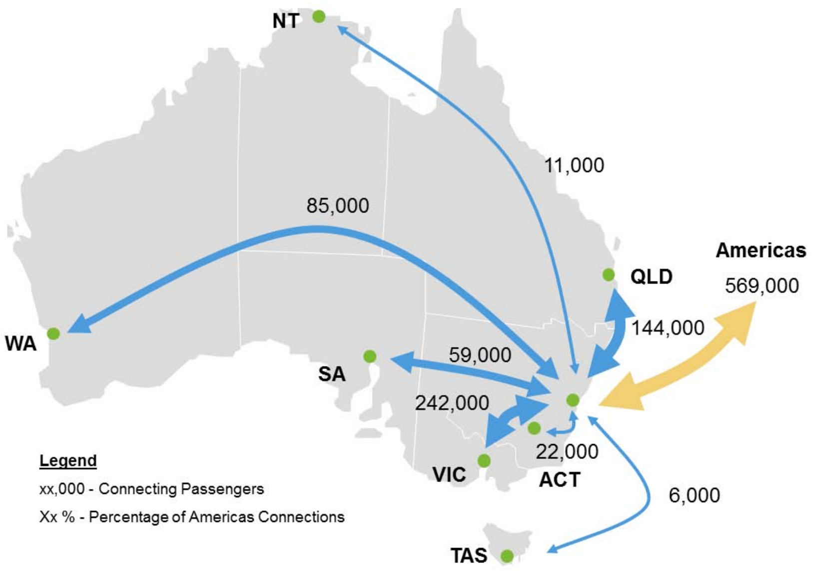
Domestic - Trans Tasman	% Total
QLD	39%
VIC	20%
WA	15%
SA	11%
ACT	7%
TAS	4%
NT	4%
Total Trans-Tasman	418,300
Total Domestic - International	1,608,353
Trans-Tasman / International	26%

Source: Booz & Company analysis of 2010 MIDT data

Americas – Domestic

Victoria (42 per cent) is the largest domestic connection to the Americas which is reflective of the bias for services from the Americas to use Sydney as a gateway. Historically passengers from Sydney have been more averse to connecting over Melbourne on long haul flights than passengers from Melbourne connecting over Sydney. The reallocation of Jetstar capacity from Melbourne – Honolulu to Sydney - Honolulu is evidence of this phenomenon. **Figure 109** and **Table 86** show the distribution of connections from the Americas.

Figure 109 - Americas – Domestic Connections



Source: Booz & Company analysis of 2010 MIDT data

Table 86 - Americas – Domestic Connection Percentage Split

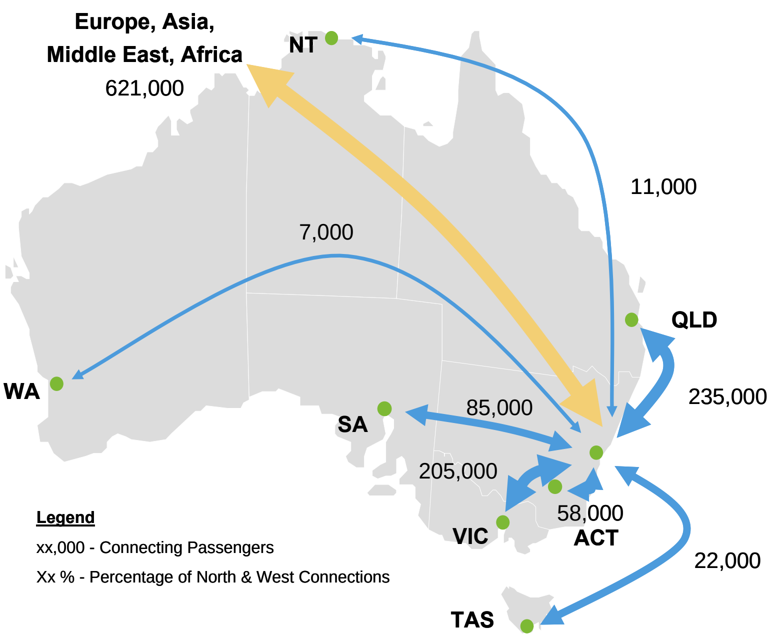
Domestic - Americas	% Total
QLD	25%
VIC	42%
WA	15%
SA	10%
ACT	4%
TAS	1%
NT	2%
Total Americas	569,000
Total Domestic - International	1,608,000
Americas / International	35%

Source: Booz & Company analysis of 2010 MIDT data

North & West – Domestic

The majority of connections to and from international services to Europe, Asia, Middle East and Africa and made from Queensland (38 per cent) and Victoria (33 per cent). This distribution reflects the relatively limited international services and more dispersed population of Queensland compared to Victoria. This is illustrated below in **Figure 110** and **Table 87**.

Figure 110 - Asia, Europe, Middle East and Africa – Domestic Connections



Source: Booz & Company analysis of 2010 MIDT data

Table 87 - North & West – Domestic Connection Percentage Split

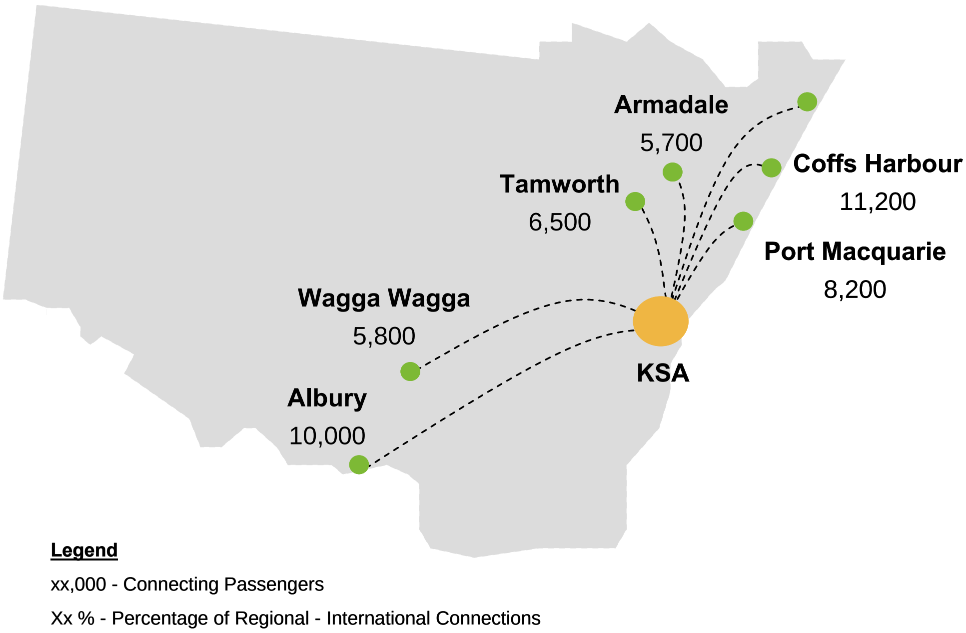
Domestic - North & West	% Total
QLD	38%
VIC	33%
WA	1%
SA	14%
ACT	9%
TAS	3%
NT	2%
Total North & West	621,000
Total Domestic - International	1,608,000
North & West / International	39%

Source: Booz & Company analysis of 2010 MIDT data

International – Regional

International connections to Regional NSW centres are dispersed across all centres reflecting the outbound nature of traffic for these connections. This is illustrated in **Figure 111** and **Table 88**.

Figure 111- International – Regional Connections



Source: Booz & Company analysis of 2010 MIDT data

Table 88 - International – Regional Connection Percentage Split

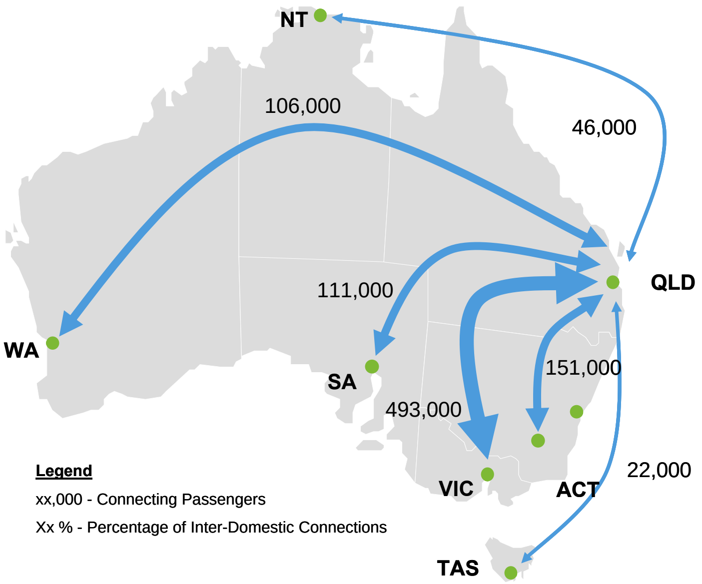
Regional - International	% Total
Coffs Harbour	18%
Albury	15%
Port Macquarie	13%
Tamworth	10%
Ballina	9%
Wagga-Wagga	9%
Armidale	9%
Others	17%
Total Regional - International	65,300

Source: Booz & Company analysis of 2010 MIDT data

Domestic – Domestic

The majority of domestic connections over Sydney (Kingsford-Smith) Airport start or end in Queensland. This is reflective of the number of secondary airports in Queensland which do not have direct services from Australian capital cities other than Brisbane and Sydney. Many of these markets have strong inbound leisure components and the share of flows represents the population sizes of the capital cities at the other end of the O-D. This is illustrated below in **Figure 112** and **Table 89**.

Figure 112 - Domestic – Domestic Connections



Source: Booz & Company analysis of 2010 MIDT data

Table 89 - Domestic – Domestic Connections Breakdown

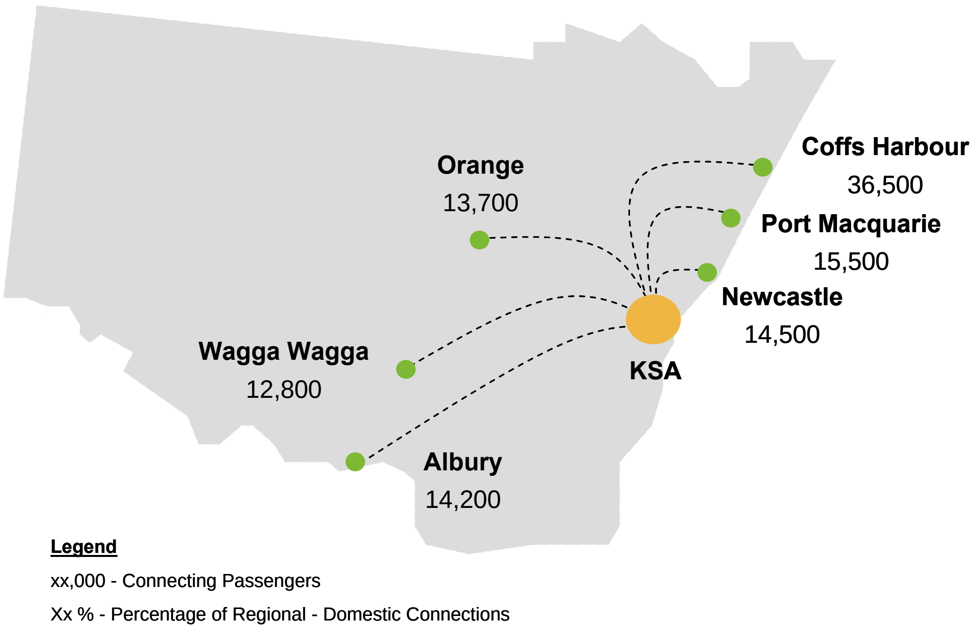
Domestic Sydney (Kingsford-	% Total
QLD - QLD	2%
QLD - VIC	42%
QLD - WA	9%
QLD - SA	10%
QLD - ACT	13%
QLD - TAS	2%
QLD - NT	4%
Other - Other	18%
Total Domestic - Domestic	1,167,000

Source: Booz & Company analysis of 2010 MIDT data

Domestic – Regional

Domestic to Regional connections are driven by population sizes and are small in scale. These services are driven more by outbound traffic from these regional centres. This is illustrated below in **Figure 113** and **Table 90**.

Figure 113 - Domestic – Regional Connections



Source: Booz & Company analysis of 2010 MIDT data

Table 90 - Domestic – Regional Connections Percentage Split

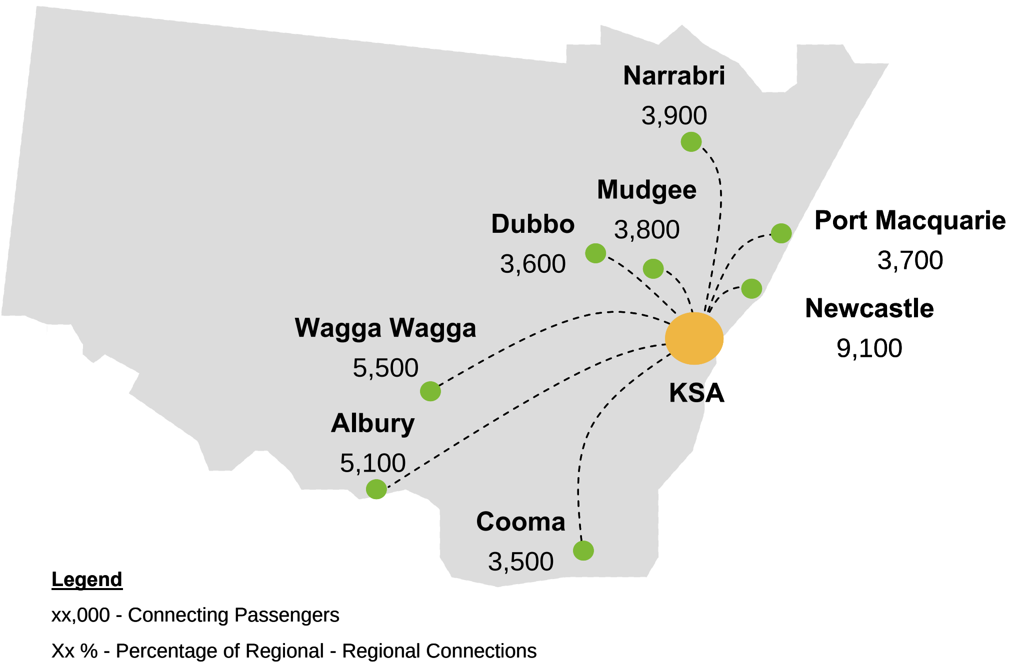
Regional - Domestic	% Total
QLD	23%
VIC	33%
WA	18%
SA	11%
ACT	9%
TAS	2%
NT	3%
Total Regional - Domestic	168,400

Source: Booz & Company analysis of 2010 MIDT data

Regional – Regional

Regional to Regional connections are reasonably dispersed across the regional centres. Newcastle is the exception with 15 per cent share of connecting movements. This is illustrated below in **Figure 114** and **Table 91**.

Figure 114 - Regional – Regional Connections



Source: Booz & Company analysis of 2010 MIDT data

Table 91 - Regional – Regional Connections Percentage Split

Regional - Regional	% Total
Newcastle	15%
Wagga-Wagga	9%
Albury	8%
Narrabri	6%
Mudgee	6%
Port Macquarie	6%
Dubbo	6%
Cooma	6%
Others	37%
Total Regional - Regional	61,100

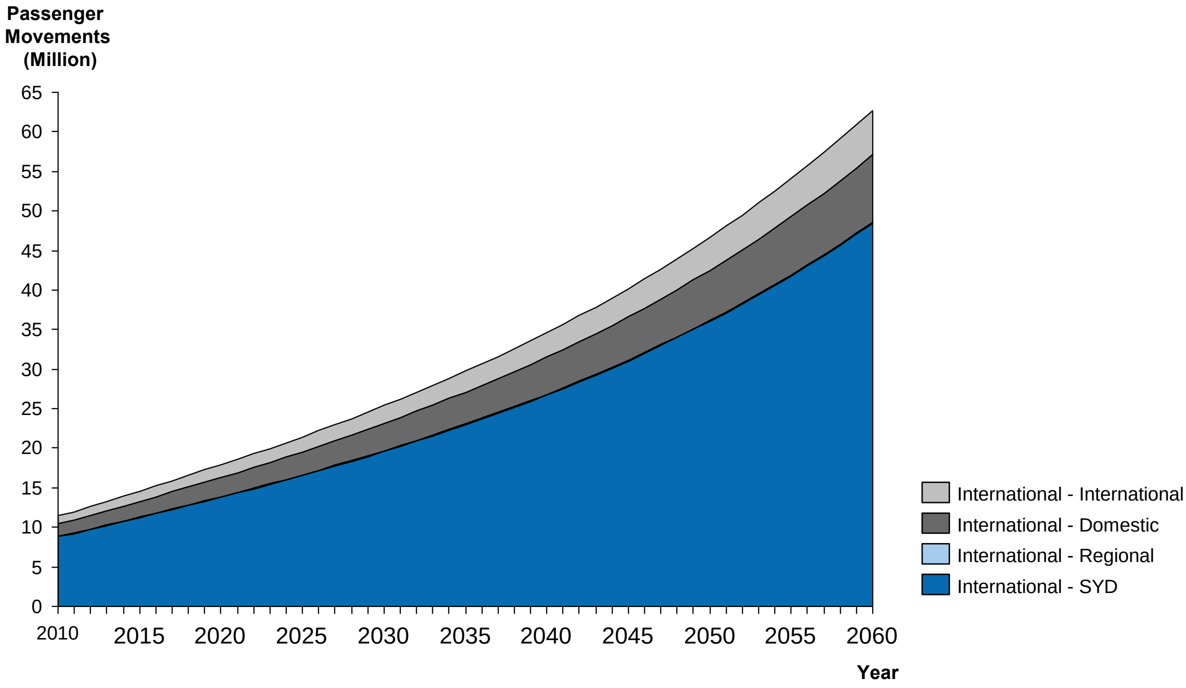
Source: Booz & Company analysis of 2010 MIDT data

Forecasted Growth in Connecting Passengers

Forecasted Growth in International Connecting Passengers

Forecast international connections at Sydney (Kingsford-Smith) Airport are estimated to reach 14.3 million passenger movements by 2060, which is approximately 24 per cent more than 2010 international passenger volumes. This is illustrated in **Figure 115** and **Table 92**.

Figure 115 - Forecasted International Passenger Connections at Sydney (Kingsford-Smith) Airport by O-D Market, 2010 to 2060



Source: Booz & Company analysis of 2010 MIDT data

Table 92 - Forecasted International Passenger Connections at Sydney (Kingsford-Smith) Airport by O-D Market, 2010 and 2060

Connection	2010 („000)	2010 (%)	2060 („000)	2060 (%)
Connecting INT - INT	1,025	9%	5,613	9%
Connecting INT - DOM	1,550	14%	8,482	14%
Connecting INT - REG	58	0%	164	0%
Sub - Total	2,633	23%	14,259	23%
INT - Sydney (Kingsford-Smith) Airport	8,824	77%	48,458	77%
Total	11,236	100%	62,716	100%

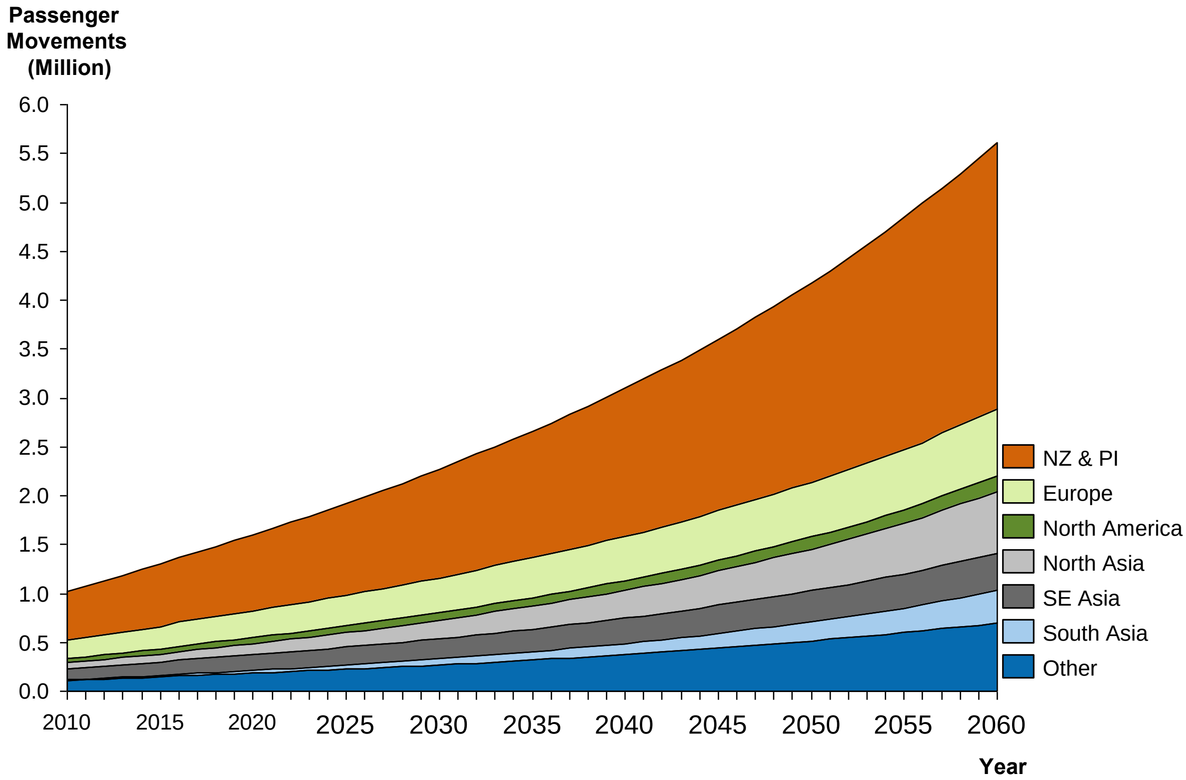
Source: Booz & Company analysis of 2010 MIDT data

International – International

New Zealand and Pacific Island passenger traffic accounts for 97 per cent of total International – International connecting passengers, highlighting the region's heavy reliance on Sydney (Kingsford-Smith) Airport for international services. Connecting passenger movements between NZ and other International regions is forecast to grow to 2.7 million passengers per annum by 2060.

The unconstrained forecast assumes the dependence of New Zealand and the Pacific Islands on Sydney (Kingsford-Smith) Airport for international connections continues and the percentage share of Sydney (Kingsford-Smith) Airport – New Zealand and the Pacific Islands traffic remains constant at 49 per cent. These connecting passenger flows are illustrated in **Figure 116** and **Table 93**.

Figure 116 - Forecast International - International Passenger Connections at Sydney (Kingsford-Smith) Airport by Region, 2010 to 2060



Source: Booz & Company analysis of 2010 MIDT data

Table 93 - Forecast International - International Passenger Connections at Sydney (Kingsford-Smith) Airport by Region, 2010 and 2060

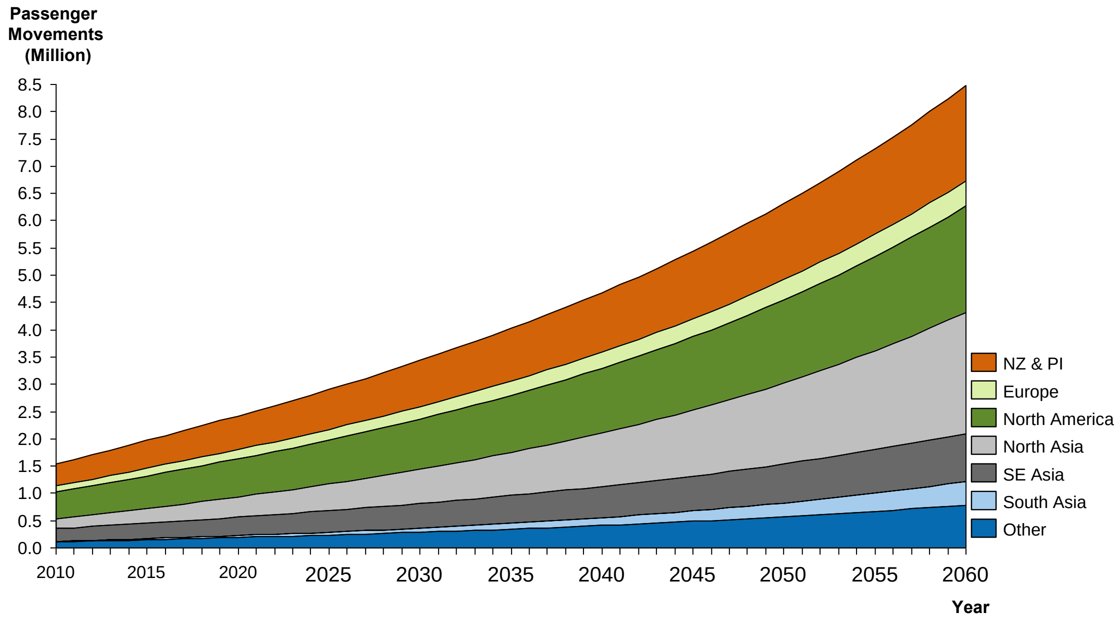
Destination	2010 („000)	2010 (%)	2060 („000)	2060 (%)
NZ & PI	503	49%	2,729	49%
Europe	188	18%	686	12%
N. America	44	4%	155	3%
N. Asia	59	6%	632	11%
SE Asia	112	11%	383	7%
South Asia	10	1%	332	6%
Other	110	11%	696	12%

Source: Booz & Company analysis of 2010 MIDT data

International – Domestic

Sydney (Kingsford-Smith) Airport plays a significant role in International – Domestic connections to New Zealand and the Pacific Islands and North America. Due to greater growth in Asia, the estimated share of connecting traffic to New Zealand and the Pacific Islands falls from 26 per cent to 21 per cent and the estimated North American share falls from 32 per cent to 23 per cent . North Asia surpasses North America to become the dominant region for International – Domestic connecting traffic with a significant estimated rise from 12 per cent to 26 per cent. This is illustrated in **Figure 117** and **Table 94.**

Figure 117 - Forecast International - Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport by Region, 2010 to 2060



Source: Booz & Company analysis of 2010 MIDT data

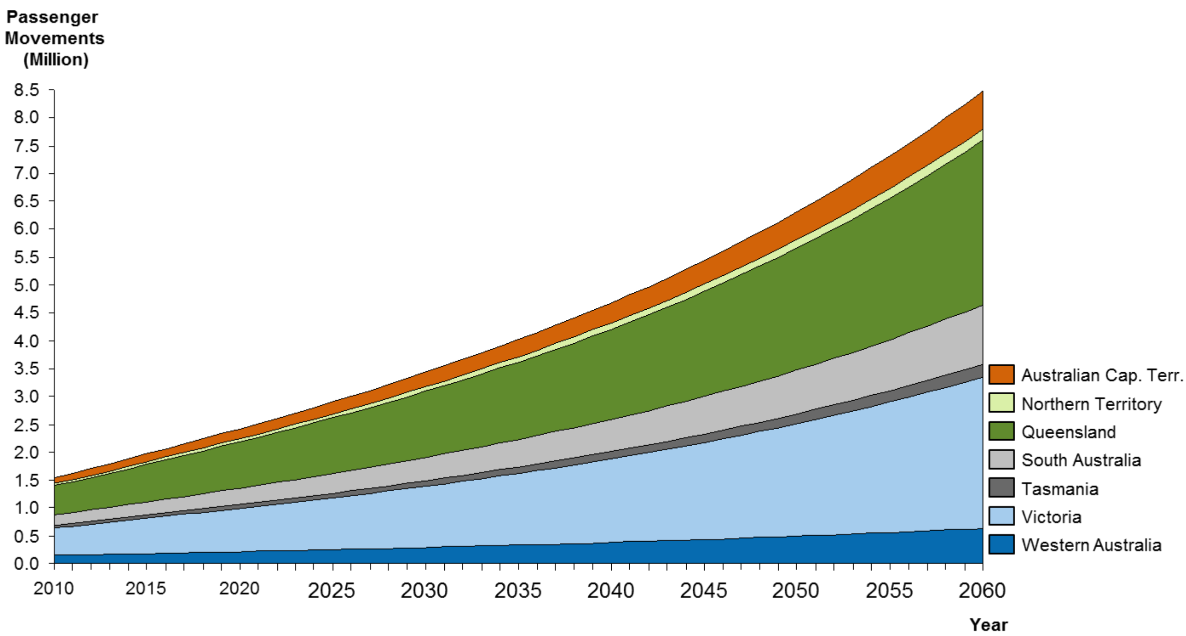
Table 94 - Forecast International - Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport by Region, 2010 and 2060

Destination	2010	2010	2060	2060
NZ & PI	403	26%	1,746	21%
Europe	114	7%	463	5%
North America	494	32%	1,948	23%
N. Asia	186	12%	2,226	26%
SE Asia	231	15%	882	10%
South Asia	11	1%	435	5%
Other	111	7%	782	9%

Source: Booz & Company analysis of 2010 MIDT data

Queensland and Victoria represent a third of estimated International – Domestic connecting traffic each. This is illustrated in **Figure 118** and **Table 95**. The growth in connecting passenger movements for Victoria and Queensland indicates the forecasted levels are likely to be sensitive to increases in direct international services with volumes around 3 million passengers per annum for each of these States.

Figure 118 - Forecast International - Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport by State, 2010 to 2060



Source: Booz & Company analysis of 2010 MIDT data

Table 95 - Forecast International - Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport by State, 2010 and 2060

State	2010 („000)	2010 (%)	2060 („000)	2060 (%)
ACT	111	7%	681	8%
NT	36	2%	202	2%
QLD	527	34%	2,951	35%
SA	185	12%	1,064	13%
TAS	45	3%	235	3%
VIC	501	32%	2,717	32%
WA	144	9%	632	7%

Source: Booz & Company analysis of 2010 MIDT data

Forecast volumes for State to specific International markets shows that there are potentially attractive markets for direct services. An annual flow of 200,000 passengers is equivalent to a daily service in a wide body aircraft. Based on this metric the 10 markets in **Table 96** could sustain at least a daily service by 2060.

Table 96 - Forecast International – Domestic Connecting Passengers for Top 10 O-D Pairs, 2010 and 2060

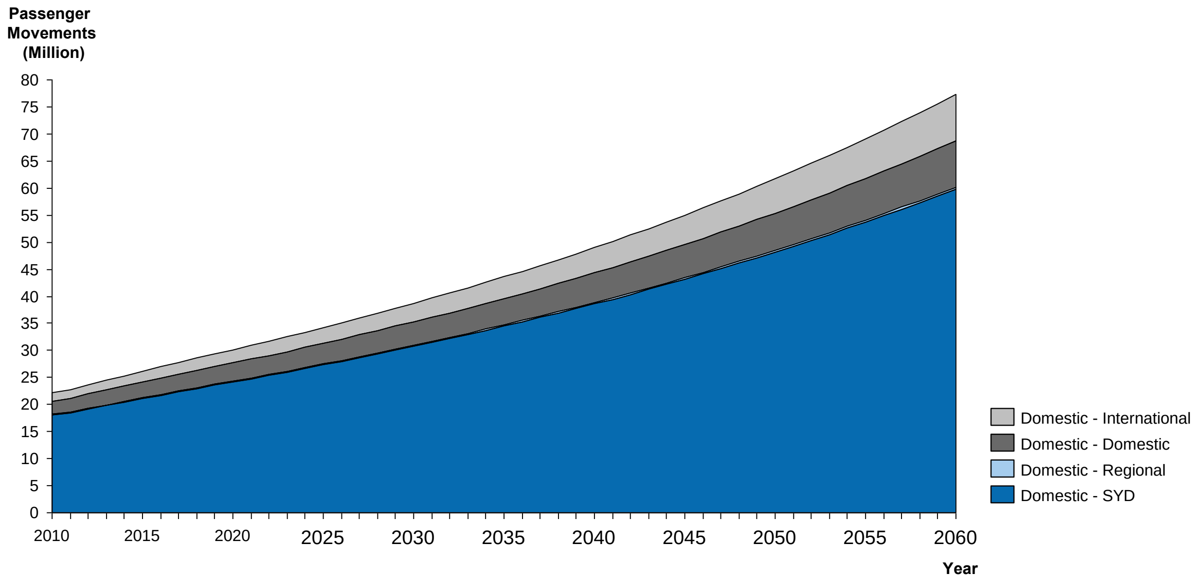
	2010 („000)	2010 (%)	2060 („000)	2060 (%)
North America - Victoria	210	14%	830	10%
Australasia - Queensland	159	10%	687	8%
North America - Queensland	123	8%	484	6%
SE Asia - Victoria	91	6%	347	4%
SE Asia - Queensland	81	5%	312	4%
Australasia - Victoria	81	5%	351	4%
North America - Western Australia	73	5%	288	3%
North Asia - Victoria	72	5%	863	10%
Australasia - Western Australia	60	4%	260	3%
North Asia - Queensland	56	4%	677	8%
Other	543	35%	3,383	40%

Source: Booz & Company analysis of 2010 MIDT data

Forecast Growth in Domestic Connecting Passengers

Domestic connections at Sydney (Kingsford-Smith) Airport are forecast to grow to 17.5 million passenger movements by 2060, similar to 2010 levels of direct O-D domestic passenger movements at Sydney (Kingsford-Smith) Airport. This is illustrated in **Figure 119** and **Table 97**.

Figure 119 - Forecast Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport by O-D Market, 2010 to 2060



Source: Booz & Company analysis of 2010 MIDT data

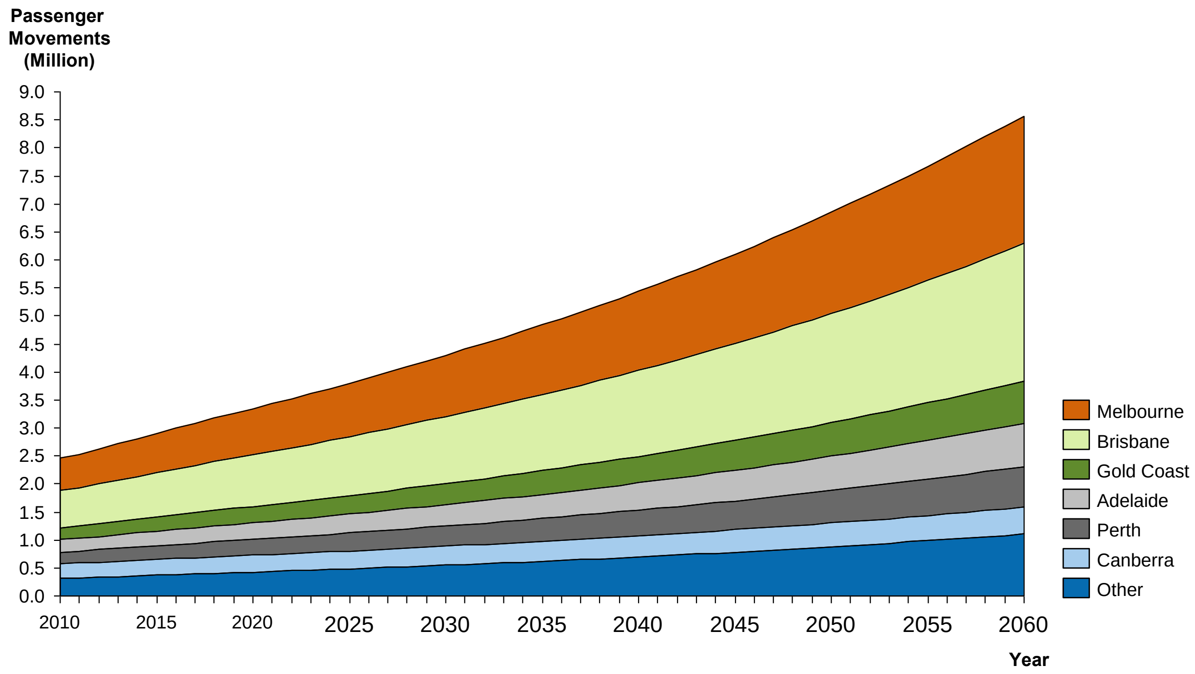
Table 97 - Forecast Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport by O-D Market, 2010 and 2060

	2010 („000)	2010 (%)	2060 („000)	2060 (%)
Connecting INT - DOM	1,550	7%	8,482	11%
Connecting DOM - DOM	2,461	11%	8,573	11%
Connecting REG - DOM	149	1%	420	1%
Sub - Total	4,160	19%	17,475	23%
DOM - Sydney (Kingsford-Smith) Airport	18,017	81%	59,767	77%
Total	22,177	100%	77,242	100%

Source: Booz & Company analysis of 2010 MIDT data

The majority of domestic passenger connections at Sydney (Kingsford-Smith) Airport is registered for Melbourne and Brisbane. This trend is estimated to continue with approximately over 4 million passengers forecasted to connect through Sydney (Kingsford-Smith) Airport for these two cities in 2060. This is illustrated in Figure 120 and Table 98.

Figure 120 - Forecast Domestic - Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport by Major Cities, 2010 to 2060



Source: Booz & Company analysis of 2010 MIDT data

Table 98 - Forecast Domestic – Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport by Major Cities, 2010 and 2060

	2010 („000)	2010 (%)	2060 („000)	2060 (%)
Melbourne	574	23%	2,283	27%
Brisbane	669	27%	2,452	29%
Gold Coast	214	9%	754	9%
Adelaide	220	9%	775	9%
Perth	207	8%	728	8%
Canberra	263	11%	473	6%
Other	314	13%	1,107	13%

Source: Booz & Company analysis of 2010 MIDT data

Forecast growth in the top 10 connecting passenger flows is shown in Table 99.

Table 99 - Forecast Domestic – Domestic Passenger Connections at Sydney (Kingsford-Smith) Airport for Top 10 O-D Pairs, 2010 and 2060

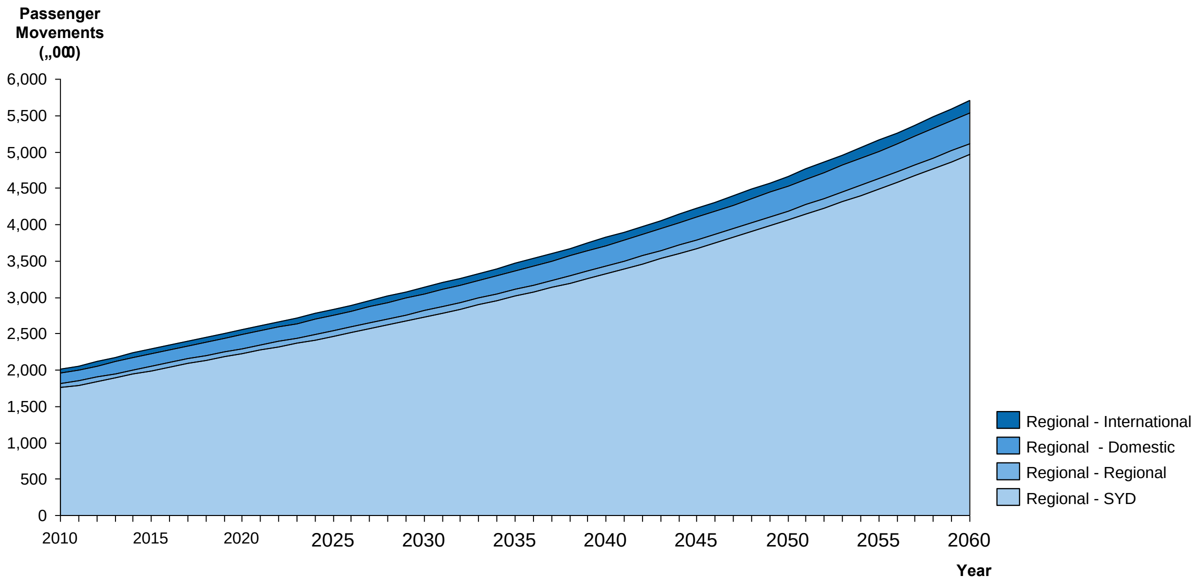
	2010 („000)	2010 (%)	2060 („000)	2060 (%)
Brisbane-Melbourne	574	23%	2,220	26%
Gold Coast-Melbourne	297	12%	1,124	13%
Brisbane-Canberra	280	11%	730	9%
Brisbane-Perth	187	8%	679	8%
Adelaide-Brisbane	175	7%	638	7%
Adelaide-Canberra	86	3%	219	3%
Melbourne-Sunshine Coast	67	3%	254	3%
Canberra-Perth	64	3%	113	1%
Adelaide-Perth	62	3%	222	3%
Cairns-Melbourne	58	2%	219	3%
Other	611	25%	2,154	25%

Source: Booz & Company analysis of 2010 MIDT data

Forecast Growth in Regional Connecting Passengers

Regional connecting passenger movements account for 13 per cent of total regional passenger movements. Regional connecting passenger movements are forecast to triple from 253,000 to 743,000 by 2060 as illustrated in Figure 121 and Table 100. Domestic - Regional passenger connections account for over 55 per cent of connecting passenger movements for regional markets. Individual connecting flows are shown in Table 101.

Figure 121 - Forecast Regional Passenger Connections at Sydney (Kingsford-Smith) Airport by O-D Market, 2010 and 2060



Source: Booz & Company analysis of 2010 MIDT data

Table 100 - Forecast Regional Passenger Connections at Sydney (Kingsford-Smith) Airport by O-D Market, 2010 and 2060

	2010 („000)	2010 (%)	2060 („000)	2060 (%)
Connecting INT - REG	58	3%	164	3%
Connecting DOM – REG	149	7%	420	7%
Connecting REG - REG	55	3%	156	3%
Sub - Total	253	13%	743	13%
REG - Sydney (Kingsford-Smith) Airport	1,756	87%	4,963	87%
Total	2,018	100%	5,703	100%

Source: Booz & Company analysis of 2010 MIDT data

Table 101 - Forecast Domestic – Regional Passenger Connections at Sydney (Kingsford-Smith) Airport by Top 10 O-D Pair, 2010 and 2060

	2010 („000)	2010 (%)	2060 („000)	2060 (%)
Coffs Harbour-Melbourne	20	13%	56	13%
Albury-Brisbane	6	4%	16	4%
Wagga-Wagga-Brisbane	5	3%	14	3%
Port Macquarie-Melbourne	5	3%	14	3%
Newcastle-Perth	4	3%	13	3%
Orange-Melbourne	4	3%	12	3%
Ballina-Melbourne	4	3%	11	3%
Tamworth-Melbourne	4	3%	11	3%
Coffs Harbour-Canberra	4	2%	10	2%
Port Macquarie-Canberra	3	2%	9	2%
Other	90	61%	255	61%

Source: Booz & Company analysis of 2010 MIDT data

Appendix E - References

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Variation in the realisation of identified capacity constraints

A4

FINAL REPORT

Joint Study on Aviation Capacity for the Sydney Region

Variation in the Realisation of Identified Capacity Constraints

Canberra

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Important Note

Booz & Company has devoted its best professional efforts to this assignment and our findings represent our best judgment based on the information available.

In preparing our traffic forecasts for the Sydney region, we have relied upon the information provided by all entities. While we have checked our sources of information, data and assumptions, we will not assume responsibility for the accuracy of such data, information and assumptions received from any entity.

Any airport traffic forecast is subject to uncertainties. Inevitably, some assumptions used to develop the forecasts will not be realised and unanticipated events and circumstances may occur. Therefore Booz & Company cannot provide any form of assurance that the forecasts documented in this report will be achieved. The actual traffic outcome will vary from that forecast and the variations may be material.

Specifically, the following factors could result in an actual outcome outside the forecast range:

- Lower than assumed economic growth rates in Australia and/or those countries expected to provide a significant source of inbound international air passengers
- Shifts in Government policy which directly, or indirectly, impact on Sydney region aviation activity
- Adverse impacts for Sydney region aviation activity associated with aviation industry developments
- 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 are passed on by way of significantly higher air fares
- External factors, including, but not limited to, natural disasters, political unrest, acts of terrorism and associated security concerns and labour disputes

This report was prepared for the exclusive use of the Department of Infrastructure and Transport, in advising the Steering Committee on the Joint Study on Aviation Capacity in the Sydney Region and in their advice to Government. The Report may be relied upon solely by Department of Infrastructure and Transport, Booz & Company disclaims all liability to any persons other than Department of Infrastructure and Transport for all costs, loss, damage and liability that the third party may suffer or incur arising from or relating to or in any way connected with the provision of the Report to a third party. You have agreed that you will not amend the Report without prior written approval from Booz & Company. If any person, company or Government Department or Agency, other than the Department of Infrastructure and Transport chooses to rely on the Report in any way, they do so entirely at their own risk.

Glossary

Expression	Definition
BITRE	Bureau of Infrastructure, Transport, and Regional Economics
RPT	Regular Public Transport (airline services)
CAGR	Compound Annual Growth Rate
Fare Elasticity	A measure to show the responsiveness of the level of demand given a change in fare or more specifically (the percentage change in passengers given a change in fare).
Income Elasticity	A measure to show the responsiveness of the level of demand given a change in level of income (the percentage change in demand given a percentage change in income).
Load Factor	The number of passengers divided by the number of seats for any given aircraft
Peak Spreading	Peak spreading is the tendency for services to become more spread out throughout the day as an airport becomes busier and more capacity constrained.
SACL	Sydney Airport Corporation Limited
Sydney Region	The catchment covered in this study, specifically, areas served by Sydney (Kingsford-Smith) Airport, Canberra Airport, Newcastle Airport / RAAF Base Williamtown, Bankstown Airport, RAAF Base Richmond, Goulburn Airport, Camden Airport, Maitland Aerodrome and Cessnock Aerodrome.
Up-gauging	The tendency for airlines to increase the average seat capacity of their fleet over time through the use of higher capacity aircraft.

1. Introduction

A range of publicly available forecasts exist for future passenger demand and aircraft movements at Sydney (Kingsford-Smith) Airport. Estimated passenger and aircraft movement growth varies significantly between these forecasts. Accordingly, an understanding of the implications of the different forecasts on the future timing of Sydney (Kingsford-Smith) Airport reaching capacity is required.

The understanding of forecast planning profiles and capacity constraints developed to inform the Joint Study for the Sydney Region was based on input assumptions and associated traffic models developed by Booz & Company. To investigate the potential materiality of any variation to forecast planning profiles and thresholds for reaching capacity at Sydney (Kingsford-Smith) Airport, a suite of alternative input assumptions derived with reference to selected third party sources were run through the Booz & Company model. Specifically, this included publicly available demand analysis and forecasts prepared by the:

- Bureau of Infrastructure, Transport and Regional Economics (BITRE), included in "Aircraft Movements Through Capital City Airports to 2029-30", Research Report 117, 2009, ACT, Australia; and

- Sydney Airport Corporation Limited (SACL), as reported in the approved Sydney Airport Master Plan 2009.

For the purpose of this analysis, given the timeframe of the forecasts included in BITRE (2009) "Working Paper 117" (i.e. financial year 2008/9 to 2029/30) and in the SACL Master Plan 2009 (i.e. 2007-2029), the years of 2009-2030[1] have been selected as the years for comparison.

Running the alternative scenarios through the Booz & Company model allowed the materiality of reasonable changes to key input assumptions on forecast aviation activity and threshold years to be explored in a systematic manner.

This analysis provides a clear understanding of:

- The assumptions behind alternative demand forecasts;

- The sensitivity of long-term forecasts for Sydney (Kingsford-Smith) Airport under BITRE and SACL assumptions normalised using the same calibrated long-term demand model developed by Booz & Company; and

- A range of time frames when Sydney (Kingsford-Smith) Airport is estimated to reach capacity based on alternative traffic growth projections.

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[1] *To extend the SACL forecast, growth assumptions from 2029 were applied to 2030.*

2. Approach

2.1 Overview

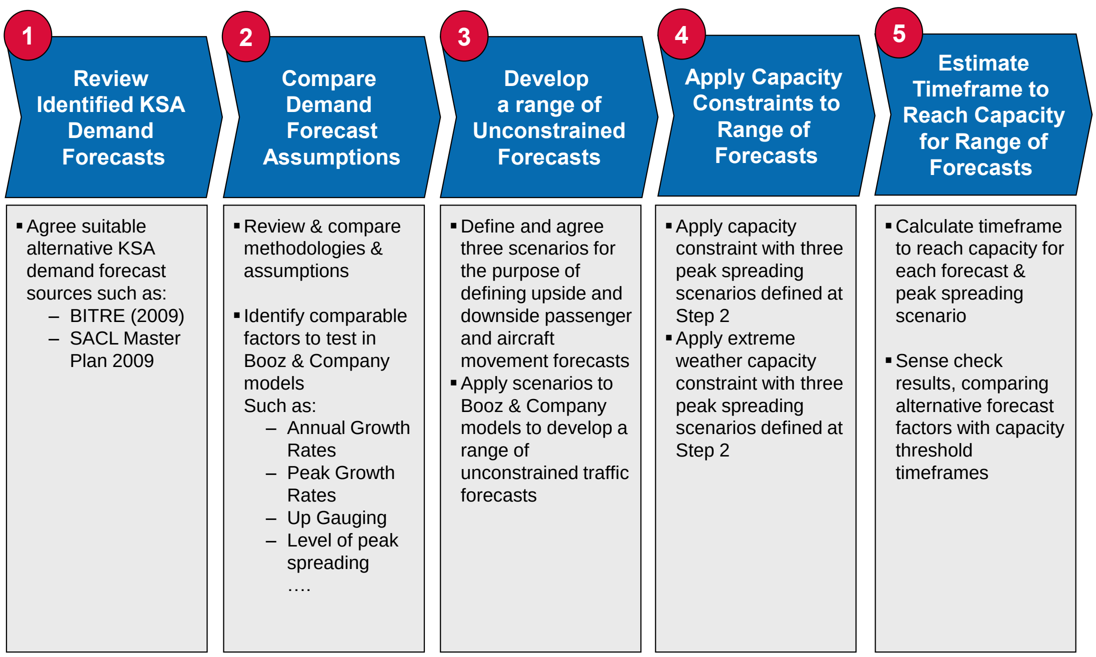
A five step process was applied to formulate alternative demand forecasts for Sydney (Kingsford-Smith) Airport as shown in Figure 1. Firstly, a review of alternative passenger and aircraft movement forecasts for Sydney (Kingsford-Smith) Airport was undertaken to understand the difference in assumptions and the impact on demand forecasts (Steps 1 and 2). Two methods were applied to run the assumptions through the same modelling process as the Booz & Company demand forecasts:

1. Apply capacity constraints to rebased third party passenger demand and aircraft movement forecasts; and

2. Apply underlying assumptions from other forecasts to the Booz & Company demand forecasting model.

The year at which demand and aircraft movements exceed capacity (assumed to be 80 movements per hour, and then taking into account different willingness to peak spread) was determined for each of the alternative scenarios.

Figure 1 - Overview of Approach



Source: Booz & Company

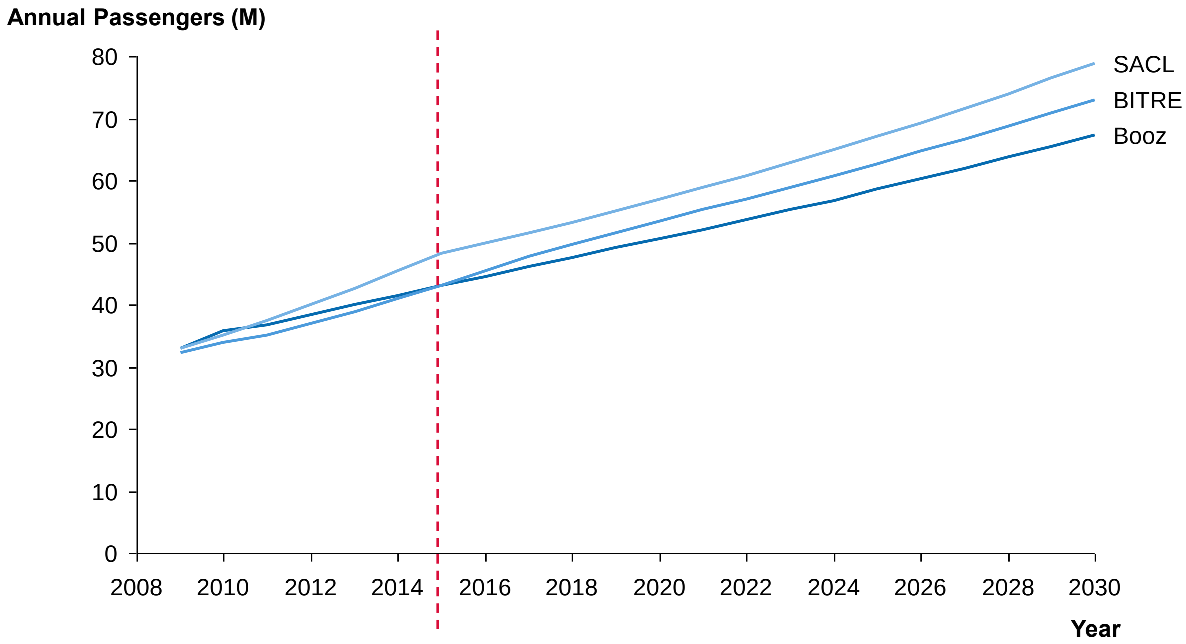
2.2 Rebasing to 2015

As it can be seen in Figure 2, the three unadjusted forecasts show significant variation by 2015:

- SACL (2009) forecasts are 12.5 per cent higher than Booz & Company forecasts; and

- BITRE[2] (2009) forecasts are 0.3 per cent higher than Booz & Company forecasts.

Figure 2 - Comparison of Baseline Passenger Demand Forecasts



Source: Booz & Company forecasts, BITRE Research Report 117, SACL- Sydney Airport Master Plan 2009

The Booz & Company forecast to 2015 was applied to all forecasts to provide a common starting point at 2015. The 2015 starting point was chosen to remove the impacts of varying base years and short term forecasting overlays, and to isolate the impacts of long term forecast assumptions[3].

Figure 3 shows the results of the rebasing to 2015 for passenger demand. By doing this, the three forecasts start from the same base point and any observed differences will be due to the differing underlying assumptions made for each forecast. The rebasing process was applied to both passenger demand and aircraft movements. Aircraft up-gauging assumptions from BITRE (2009) and SACL (2009) were applied from 2015 onwards.

The underlying assumptions from each of the three forecast sources (Booz & Company, BITRE and SACL) were applied over a longer time frame to understand the compounding effects of such assumptions. The forecasts to 2060 should only be used for this purpose as the assumptions have not been altered to account moderation of elasticities, fare changes, changes in policy settings, airline strategies and resulting growth beyond the 20 year forecast period of each source.

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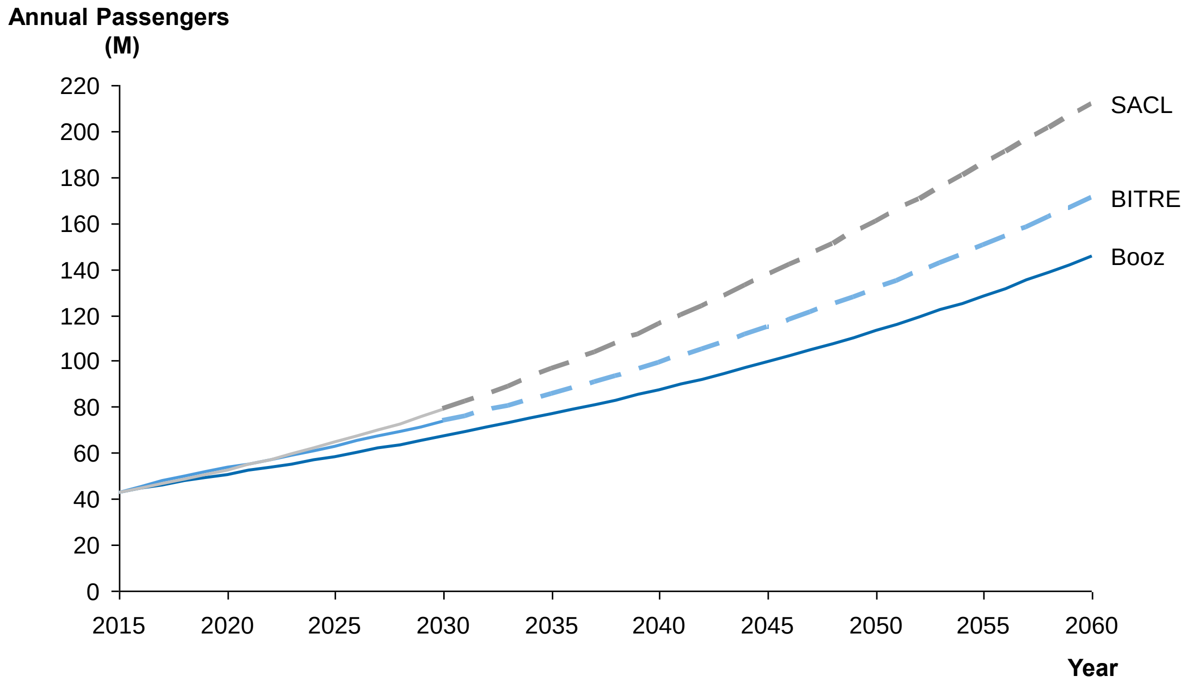
[2] *BITRE forecasts are in Financial Years (FY), whereas the Booz & Company and SACL forecasts are in Calendar Years*

[3] *The forecasts contained in this report have been generated by Booz & Company for the comparison of the impact of underlying assumptions and do not represent endorsed forecasts by either SACL or BITRE.*

Figure 3 – Comparison of Rebased Total Passenger Demand Forecasts



Note: The dotted lines represent extrapolation of SACL and BITRE forecasts
Source: Booz & Company forecasts, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

2.3 Alternative Forecasts

Seven passenger demand forecasts were developed to understand the potential range in estimated timings when Sydney (Kingsford-Smith) Airport reaches capacity. The scenarios are described in Table 1.

Table 1 – Alternative Forecast Scenarios

Scenario Name	Description
Booz	Unconstrained Booz & Company Base Case Forecast (1)
BITRE	Forecast passenger growth and up gauging assumptions from BITRE (2009) Working Paper 117
SACL	Forecast passenger growth and up gauging assumptions from SACL- Sydney Airport Master Plan 2009
Hybrid 1	Booz passenger growth and BITRE up gauging assumptions
Hybrid 2	Booz passenger growth and SACL up gauging assumptions
Hybrid 3	BITRE passenger growth and Booz up gauging assumptions
Hybrid 4	SACL passenger growth and Booz up gauging assumptions

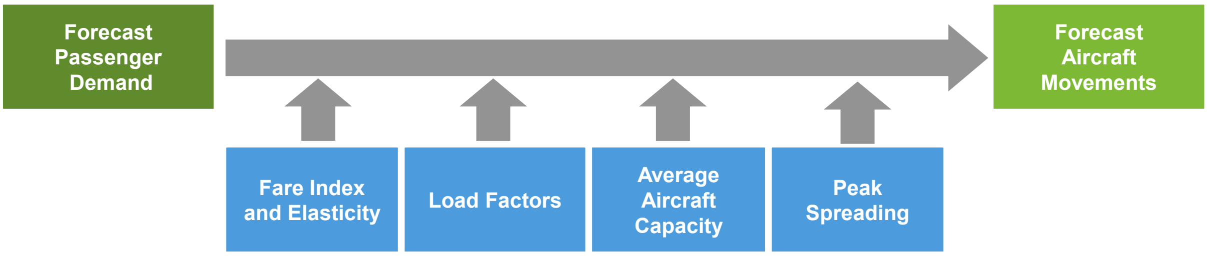
Source; (1) *DoIT (2011), "Forecast Growth Estimates for Aviation Activity in the Sydney Region", prepared by Booz & Company.*

All forecasts were applied to the 2015 baseline from the Booz & Company model. Since the SACL (2009) and BITRE (2009) forecasts were only extended to 2029 and 2029/30 respectively, the final year growth rates were assumed to moderate in the long term to 2060 as per the Booz & Company model assumptions to ensure long term growth rates are comparable.

3. Assumptions

Aircraft movement forecasts are driven by passenger demand forecasts and assumptions on average passengers per aircraft. The key assumptions impacting aircraft movement forecasts are shown in Figure 4. These assumptions were taken into consideration when building the alternative passenger and aircraft movement forecasts.

Figure 4 - Factors Contributing to Aircraft Movements to Meet Passenger Demand



The primary drivers of annual aircraft movements in the long run were assumed to be aircraft size and daily slot utilisation. Three peak spreading scenarios were applied to the demand forecasts to represent daily slot utilisation and to provide a range of estimated timings when Sydney (Kingsford-Smith) Airport reaches capacity.

Underlying assumptions behind the alternative passenger and aircraft movement forecasts were only available from BITRE (2009). The assumptions behind the SACL (2009) forecasts were not publicly available and hence were not analysed.

Table 2 compares the underlying assumptions from the Booz & Company forecasts and the BITRE (2009) forecasts.

Table 2 - Underlying Forecast Assumptions, Booz & Company and BITRE, 2009 to 2030

	Booz & Company (2009-2030)	BITRE (FY(1) 2009-2030)
Australia GDP	AUS: 2.8% CAGR	AUS: 2.9% CAGR NSW: 1.0% CAGR
Income Elasticity		
International	0.3 – 2.9	SYD Inbound: 1.6 SYD Outbound: 2.1
Domestic	0.4 – 1.2	SYD: 1.457
Real Fare Index		
International	-0.5% pa until 2015 0.0% pa Onwards	AUS:2.2% pa SYD:2.2% pa
Domestic	-0.5%pa until 2015 0.0% pa Onwards	AUS: 2.6% pa SYD: 2.5% pa
Fare elasticity		
International	Leisure: -1.0 Business: -0.3	SYD Inbound: -2.0 SYD Outbound: -0.5
Domestic	Leisure: -0.5 to -0.6 Business: -0.1 to -0.2	SYD: -0.393
Load Factor 2009 to 2030		
International	62% to 85%	75%
Domestic	80.4%	80%
Regional	69%	69%
Aircraft Size (defined as Average. Seat Capacity) 2009 to 2030		
International	287 to 339	230 to 298
Domestic	177 to 203	167 to 216
Regional(2)	45 to 65	105 to 136

Note: (1) FY stands for Financial Year (2) BITRE definition of regional services differs from that of Booz & Company forecasts
Source: Booz & Company forecasts, BITRE Research Report 117

Larger income elasticities mean that demand changes are larger in response to changes in income levels compared to forecasts with smaller income elasticity assumptions. Likewise, larger fares elasticities in absolute terms imply that demand changes more significantly in response to fare changes relative to forecasts with smaller fares elasticities in absolute terms.

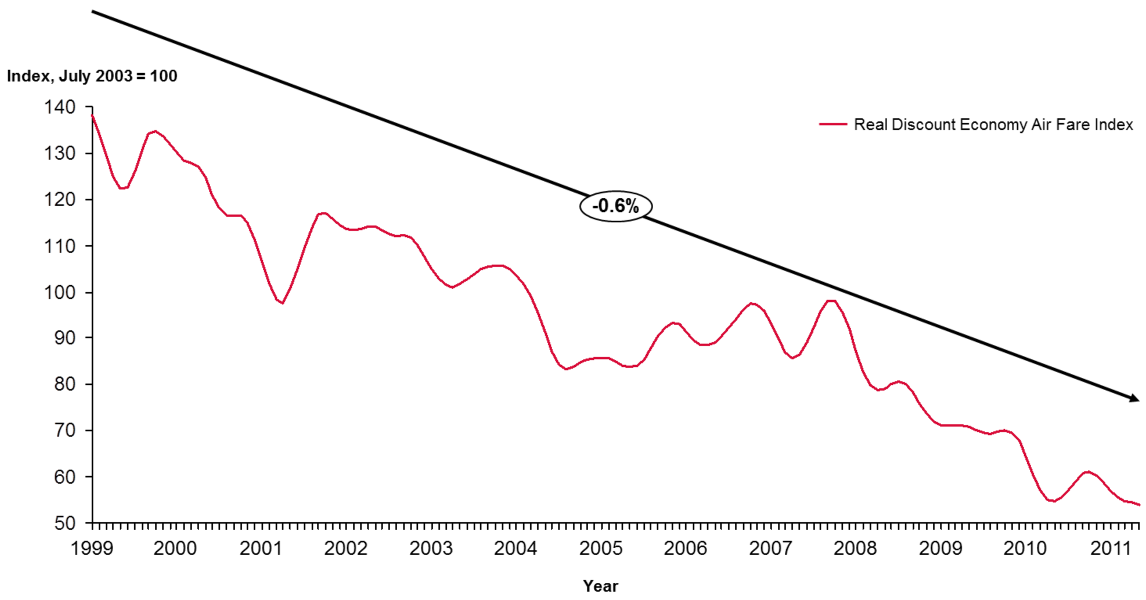
The key differences between the above assumptions are:

- BITRE (2009) assumes higher income elasticities for domestic travel and assumes global (based on OECD income) inbound and outbound elasticities for international travel to and from Sydney whereas the Booz & Company model considers a range of elasticities for individual markets.

The BITRE model assumes an annual increase in both domestic and international real air fares, whereas the Booz model assumes a modest short term decline in real fares, stabilising in the medium to long term. BITRE’s fare growth assumptions are based on historical data to 2006/07 at which point fares had experienced a small increase following a long period of decline leading to an assumption that fares would increase in real terms. Booz & Company’s forecasts are based on a longer term historical data set which shows an overall reduction in fares between 1999 and 2011. Thus our forecasts were based on an assumption that fares would continue to decline in the short term and remain flat in real terms in the medium to long term. In making this assumption, Booz & Company has taken into account the sustainability of air fare reductions and the ongoing impact LCCs have had on the industry in pushing air fares down. Therefore, it is assumed that a continued decline in real air fares will moderate in the medium to long term and that air fares will stabilise in real terms.

Therefore, when applying BITRE’s assumptions to Booz & Company’s base data, the projected forecast is lower than both the BITRE (2009) and Booz & Company forecasts as a result of the elasticity impacts. Historical real domestic fares are shown in Figure 5.

Figure 5 - Real Domestic Air Fare Index Real Discount Economy 13 Month Moving Average, 1999– 2011

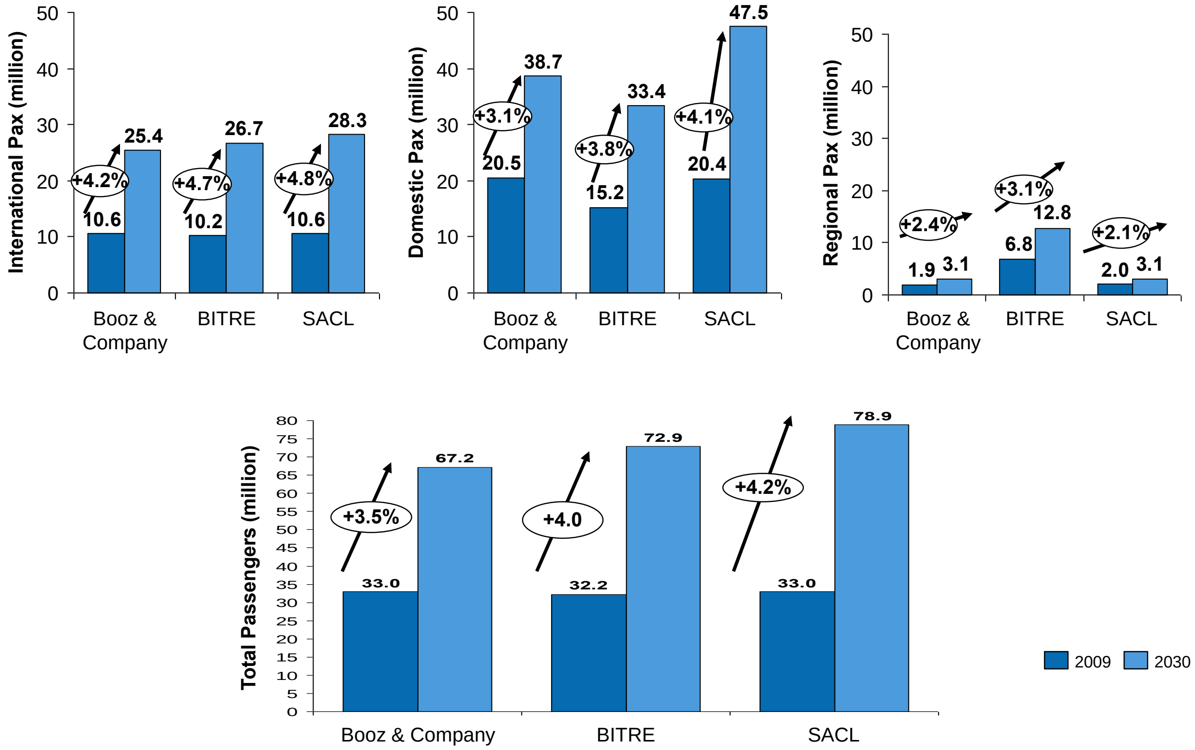


Note: Discount economy index.
Source: BITRE (2009)

BITRE and Booz & Company's fare elasticities also differ as a result of the variables used to derive them (e.g. real GDP, real air fares, exogenous shocks, and so on) and the weight that has been assigned to each of the variables The BITRE modelling uses an additional variable to account for other exogenous drivers not captured directly in their regression.

Figure 6 shows the three passenger forecasts.

Figure 6 - Comparison of Passenger Forecasts, 2009 and 2030

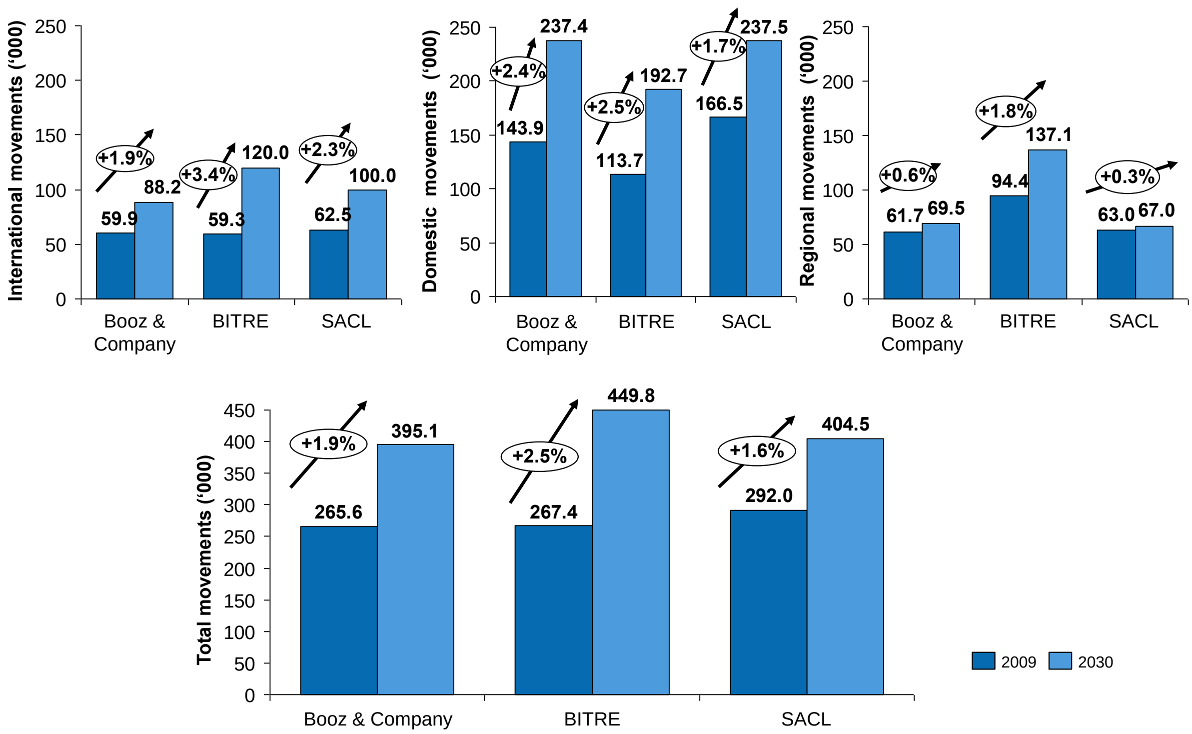


Source: Booz & Company forecasts, BITRE Research Report 117, SACL Master Plan

The greatest difference in the three passenger demand forecasts occurs in the short to medium term from 2009 to 2015 (Table 2). The Compound Annual Growth Rate (CAGR) for SACL (2009) is higher than BITRE (2009) and Booz & Company over this period. The difference in growth assumptions results in the SACL (2009) forecasts being 8.3 per cent higher than BITRE (2009) and 17.3 per cent higher than Booz & Company by 2030. BITRE (2009) demand forecasts are 8.5 per cent higher than Booz & Company forecasts by 2030.

Figure 7 shows the aircraft movement forecasts from the three sources.

Figure 7 - Comparison of Aircraft Movement Forecasts, 2009 and 2030

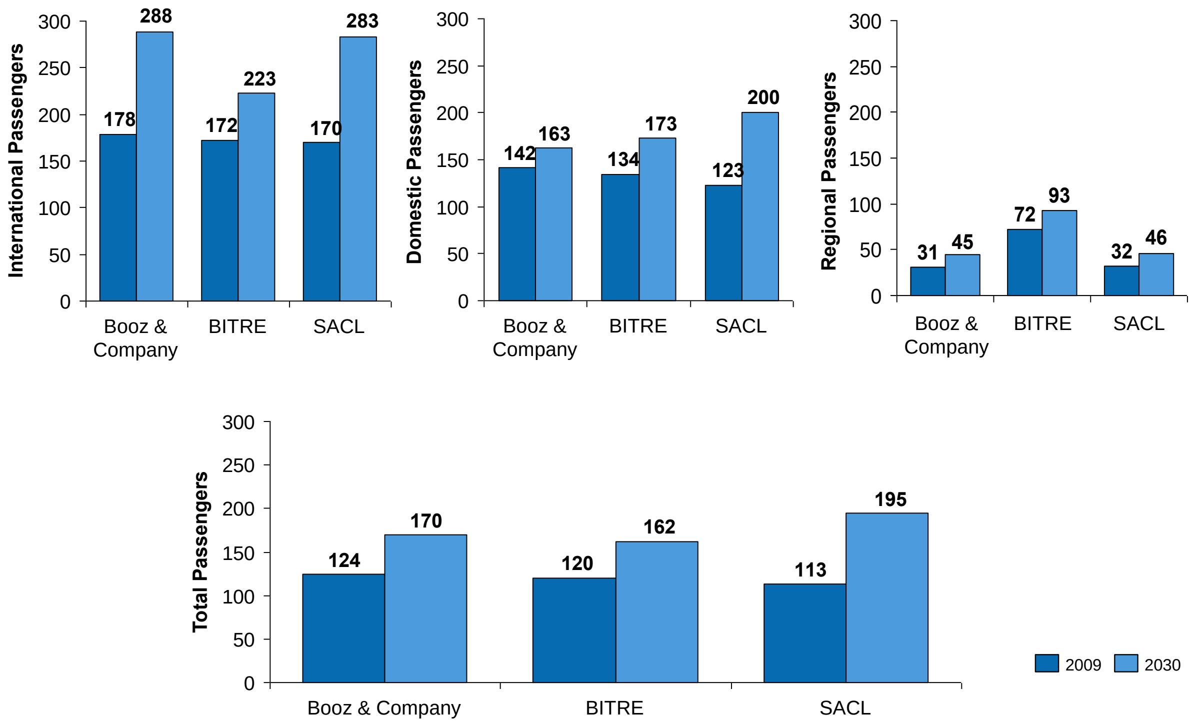


Source: Booz & Company forecasts, BITRE Research Report 117, SACL- Sydney Airport Master Plan 2009

The SACL (2009) aircraft movement forecasts start from a 10 per cent higher base in 2009 and end up at 2.4 per cent higher than the Booz & Company forecast by 2030. BITRE (2009) assumes the highest growth in aircraft movements across all three markets from 2009 to 2030.

Figure 8 below, shows the average number of passenger per aircraft movement, which is a close proxy for the average aircraft size measure in seat capacity.

Figure 8 - Comparison of Passengers per Aircraft Movement, 2009 and 2030



Source: Booz & Company forecasts, BITRE Research Report 117, SACL- Sydney Airport Master Plan 2009

The SACL (2009) assumptions on aircraft up gauging are more aggressive compared to Booz and BITRE (2009) assumptions, particularly for the domestic and international markets. The BITRE (2009) assumptions are similar to the Booz assumptions at an aggregate level, however, BITRE (2009) forecasts higher growth in domestic passengers per movement and lower growth in international passengers per movement relative to the Booz assumptions.

The regional aircraft assumptions for SACL and Booz cannot be readily compared to the BITRE[4] forecasts due to difference in the definition of regional services. BITRE regional services represent routes to/from domestic, non-capital airports (i.e. excluding capital-capital routes) whereas the Booz & Company and SACL definition of regional is limited to intrastate services within NSW (including ACT to non-capital NSW).

3.1 Passenger Growth Forecasts

The Booz & Company international passenger demand forecasts are lower than both the re-based BITRE (2009) and SACL (2009) international passenger movements. The average CAGR for the Booz & Company international passenger forecast for 2015 to 2060 is 3.3 per cent compared to 3.8 per cent for BITRE (2009) and 4.2 per cent for SACL (2009). Figure 9 shows the annual international passenger volumes from the three forecasts from 2015 to 2060.

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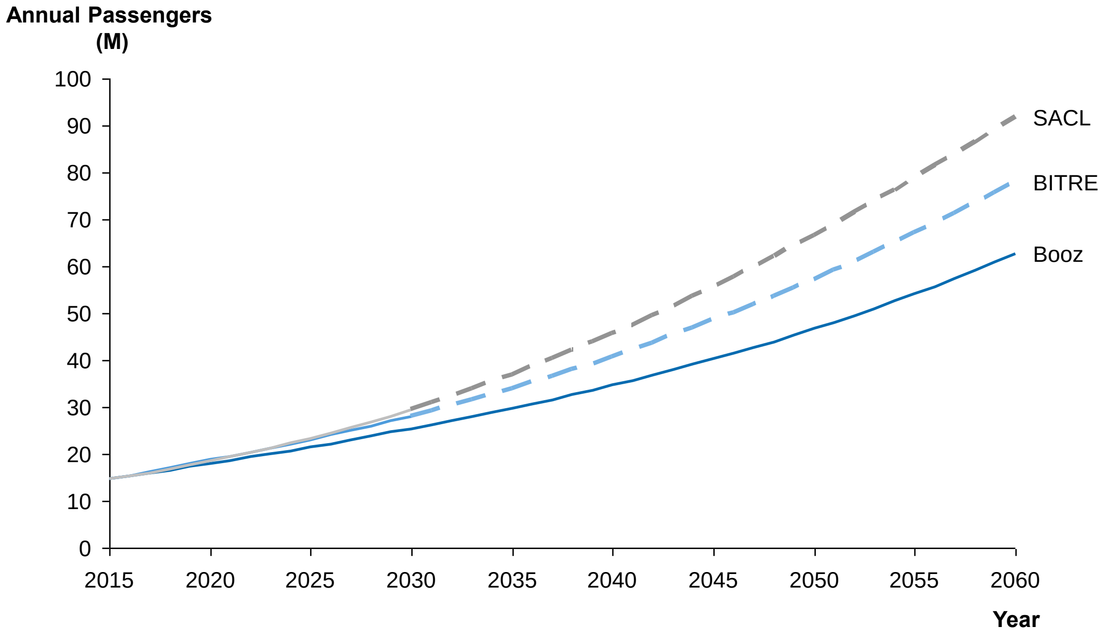
[4] *In Research Report 117(2009), BITRE defines regional traffic as all services within Australia to non-capital city airports. This includes a large percentage of larger A320 and B737 aircraft compared to the Booz & Company and SACL definitions.*

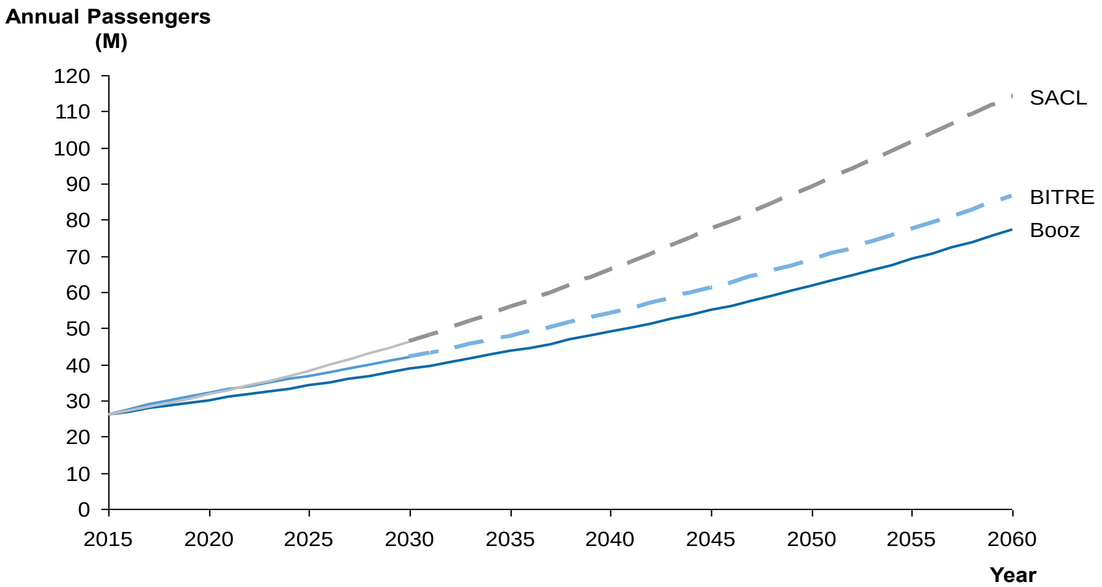
Figure 9 - Passenger Demand Forecasts – International, 2015 to 2060



Note: The dotted lines represent extrapolation of SACL and BITRE forecasts
Source: Booz & Company forecasts, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

Figure 10 shows the annual domestic passenger volumes from the three forecasts from 2015 to 2060.

Figure 10 - Passenger Demand Forecasts – Domestic, 2015 to 2060



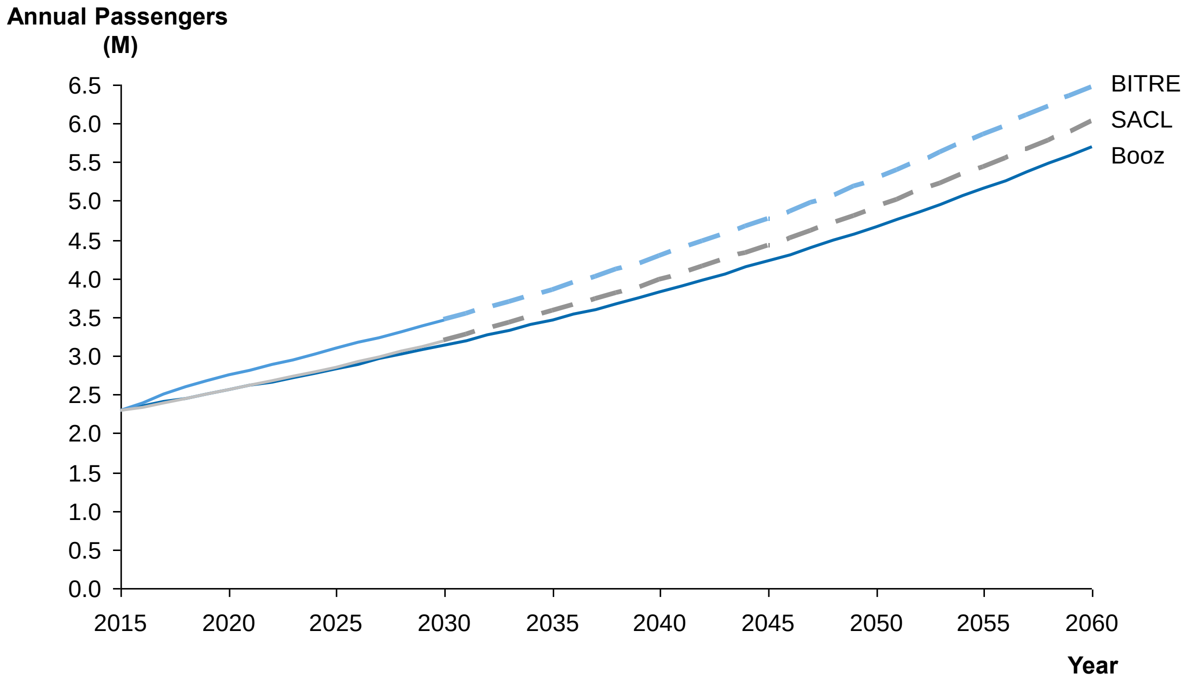
Note: The dotted lines represent extrapolation of SACL and BITRE forecasts
Source: Booz & Company forecasts, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

The Booz & Company domestic passenger demand forecasts are lower than both the re-based BITRE (2009) and SACL (2009) domestic passenger movements. The average

CAGR for the Booz & Company domestic passenger forecasts is 2.4 per cent compared to 2.7 per cent for BITRE and 3.3 per cent for SACL.

Figure 11 shows the annual regional passenger volumes from the three forecasts from 2015 to 2060.

Figure 11 - Passenger Demand Forecasts – Regional, 2015 to 2060

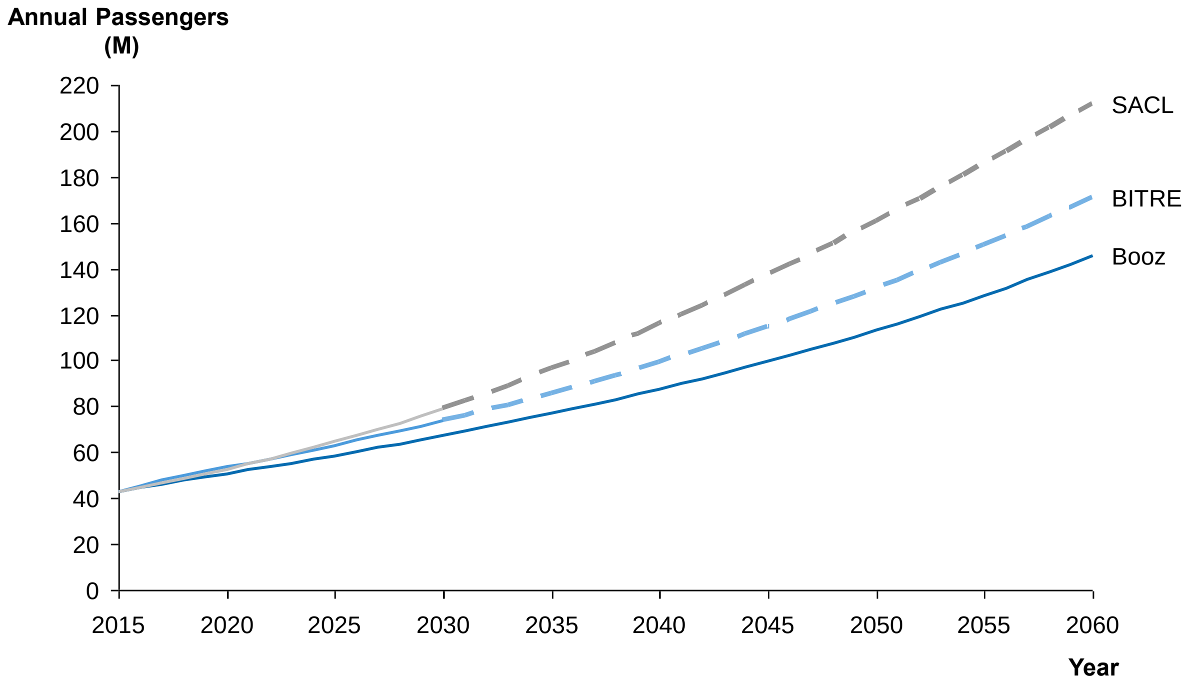


Note: The dotted lines represent Booz & Company extrapolation of SACL and BITRE forecasts
Source: Booz & Company forecasts, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

The Booz & Company regional passenger demand forecasts are lower than both the re-based BITRE (2009) and SACL (2009) regional passenger movements. The average CAGR for the Booz & Company regional passenger forecasts is 2.1 per cent compared to 2.3 per cent for BITRE (2009) and 2.2 per cent for SACL (2009). It should be noted that BITRE (2009) regional forecasts are higher due to the difference in classification of regional markets.

Figure 12 shows the annual total passenger volumes from the three forecasts from 2015 to 2060.

Figure 12 - Passenger Demand Forecasts – Total, 2015 to 2060



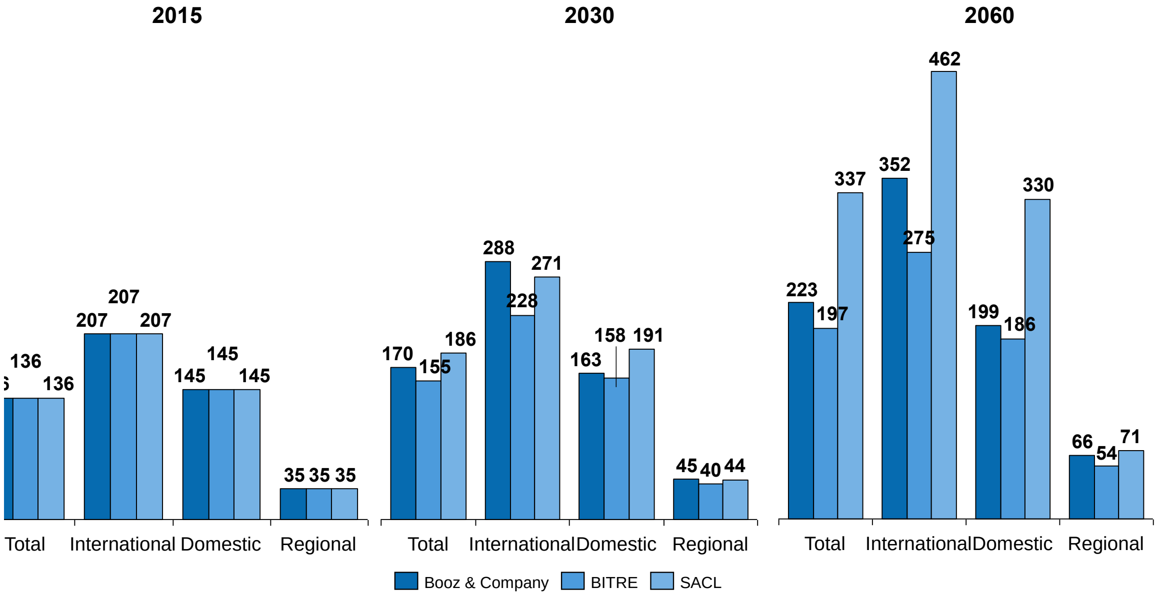
Note: The dotted lines represent Booz & Company extrapolation of SACL and BITRE forecasts
Source: Booz & Company forecasts, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

The Booz & Company total passenger demand forecasts are lower than both the re-based BITRE (2009) and SACL (2009) total passenger movements. The average CAGR for the Booz & Company forecasts is 2.8 per cent compared to 3.1 per cent for BITRE (2009) and 3.6 per cent for SACL (2009).

3.2 Up gauging and Passenger per Movement Forecasts

A key driver of the variation in aircraft movements compared to the passenger movements is average aircraft size and the rate at which airlines are assumed to up gauge their fleets. In this instance, the average number of passengers per movement for the three forecasts is used to show the variation in aircraft size from 2015 to 2060. Figure 13 shows the change in assumed average passengers per aircraft movement from 2015 to 2060, which is driven by load factors and average seat capacity.

Figure 13 – Average Passengers per Aircraft Movements – 2015, 2030 and 2060



Note: Booz & Company assumptions were taken for 2015. SACL (2009) and BITRE (2009) passenger per movement growth assumptions were applied from 2016 onwards. 2060 estimates are Booz & Company extrapolation of SACL and BITRE estimates.

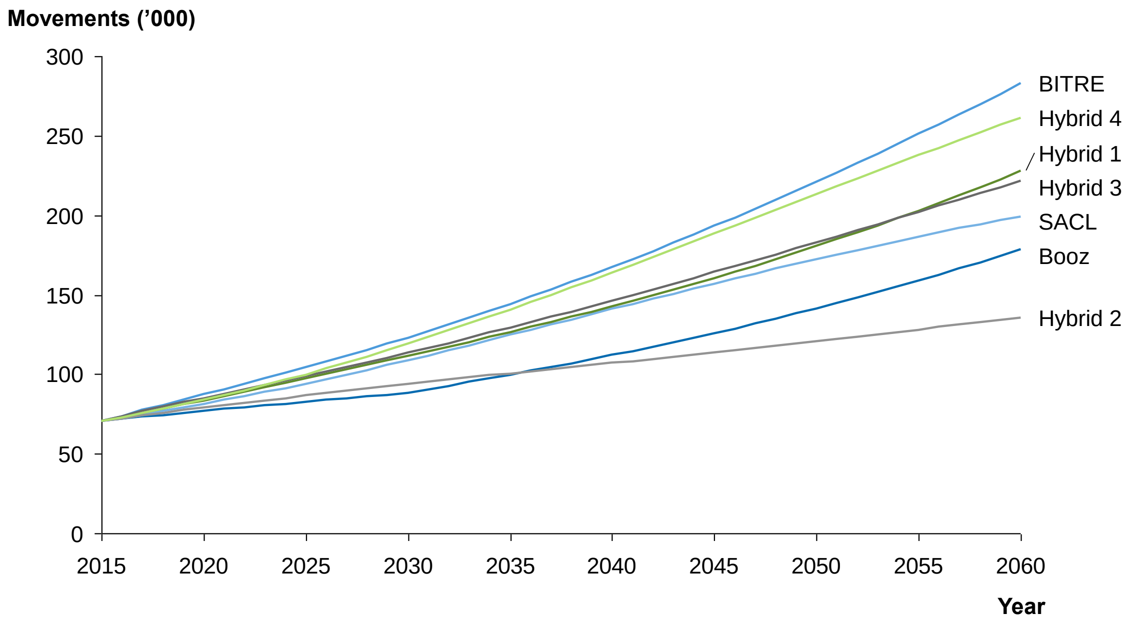
Source: Booz & Company forecasts, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

The modelling extrapolated the change in aircraft size shown in the unadjusted forecasts from BITRE (2009) and SACL (2009) from 2009 to 2030. This results in a very large average aircraft size for the SACL (2009) forecast by 2060. Whilst an average aircraft size of this magnitude may not be achievable, it highlights the greater rate of up gauging assumed in the SACL forecasts to 2030, compared to Booz & Company and BITRE (2009).

Figure 14 illustrates international aircraft movement forecasts for 2015 to 2060 for each of the seven scenarios outlined in Section 2.3. Different combinations of passenger forecasts and aircraft up gauging assumptions were used to generate a series of "Hybrid" scenarios as defined in Table 1. The SACL and Booz & Company forecasts converge greater increase in aircraft size of the SACL forecasts outweigh faster growth in passenger demand of the SACL forecasts.

The BITRE (2009) and Hybrid 4 scenarios result in the highest number of international movements, with Hybrid 2 resulting in the lowest forecast.

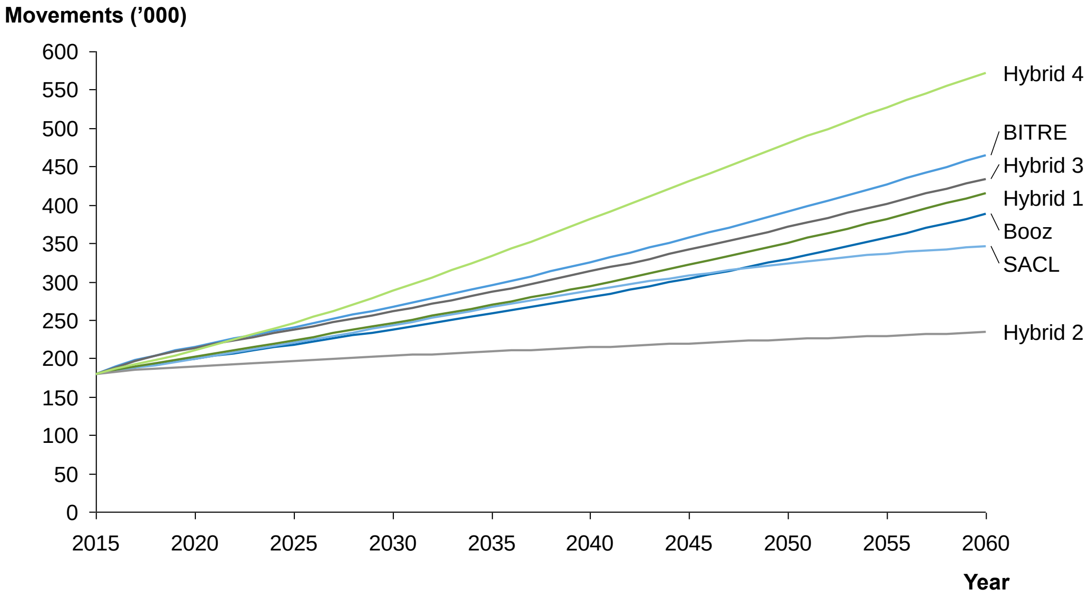
Figure 14 - Aircraft Movements – International, 2015 to 2060



Source: Booz & Company forecasts, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

Figure 15 shows the forecasted domestic aircraft movements from 2015 to 2060 for each of the seven scenarios. The Booz & Company forecasts are midway between the re-based SACL (2009) and BITRE (2009) domestic aircraft movement forecasts in 2020. The Hybrid 4 scenario shows the highest growth in domestic movements, with Hybrid 2 having the lowest growth. The Booz & Company forecasts fall mid-range.

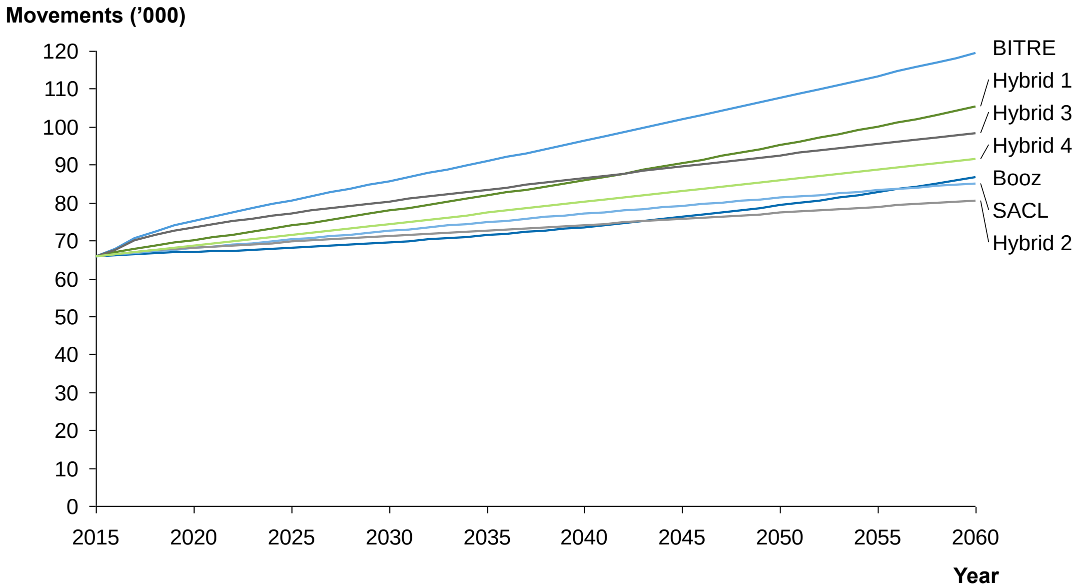
Figure 15 - Aircraft Movements – Domestic, 2015 to 2060



Source: Booz & Company forecasts (Technical Report X), BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

Figure 16 shows forecast regional aircraft movements for each of the 7 scenarios from 2015 to 2060. BITRE and Hybrid 1 scenarios result in the higher forecast, with SACL and Hybrid 2 being the lowest.

Figure 16 - Aircraft Movements – Regional, 2015 to 2060



Source: Booz & Company forecasts, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

3.3 Peak Spreading Scenarios

Three different scenarios for peak spreading were applied to the unconstrained demand forecasts based on previously undertaken analysis and benchmarking exercises[5]. This takes into account a possible capacity limit on aircraft movements resulting from the limitation of 80 movements per hour and the inclination of airlines and passengers to redistribute trips outside of peak times. The scenarios provide a range of annual aircraft movement capacities for Sydney (Kingsford-Smith) Airport based on the proportion of total traffic occurring in the peak hour of the day.

Table 3 lists the assumptions made to determine the critical thresholds for Sydney (Kingsford-Smith) Airport under the different scenarios.

Table 3 – Critical Sydney (Kingsford-Smith) Airport Thresholds for Low, Central and High Case Scenarios

Peak Spreading Scenarios	Peak Ratio	Daily Utilisation at Maximum Capacity	Maximum Aircraft Movements	Approx GA, Dedicated Freighter and Military Movements	Passenger Aircraft Movements
Low	0.021%	82%	409,000	27,000	382,000
Central	0.019%	89%	443,000	29,000	414,000
High	0.018%	97%	483,000	32,000	451,000

Source: Booz & Company analysis

Capacity thresholds for aircraft movements, derived in the "Forecast growth estimates for aviation activity in the Sydney region" report, were applied to the alternative forecasts. The thresholds were used to estimate the years in which Sydney (Kingsford-Smith) Airport would reach capacity under the different forecast assumptions. The thresholds were estimated by applying benchmark peak ratios[6] to annual movements.

The central (base) case has a peak spreading ratio of approximately 0.019%, which is in line with airports such as Frankfurt Airport and London Heathrow Airport, which currently have a similar volume of traffic to the maximum volume of aircraft movements projected for Sydney (Kingsford-Smith) Airport under the base case scenario. The central (base) case, assumes that aircraft movement growth can continue to be accommodated to a level of approximately 414,000, making provision for a small volume of GA, military and dedicated freighters activity, which has been excluded from the analysis. This was done in order to compare the levels of RPT activity and was based on the assumption that as the airport nears capacity passenger services will be given priority over GA, military and freighter services.

The daily utilisation at maximum capacity shown in Table 3 represents the utilisation of the total available daily capacity of 496,400 aircraft movements. The total available capacity assumes 80 slots per hour from 0600 to 2300 are available per day, for 365 days of the year. A low case of 382,000 annual RPT movements and a high case of 451,000 RPT movements

[5] *"Planning day peak spreading at Sydney (Kingsford-Smith) Airport", prepared by Booz & Company*

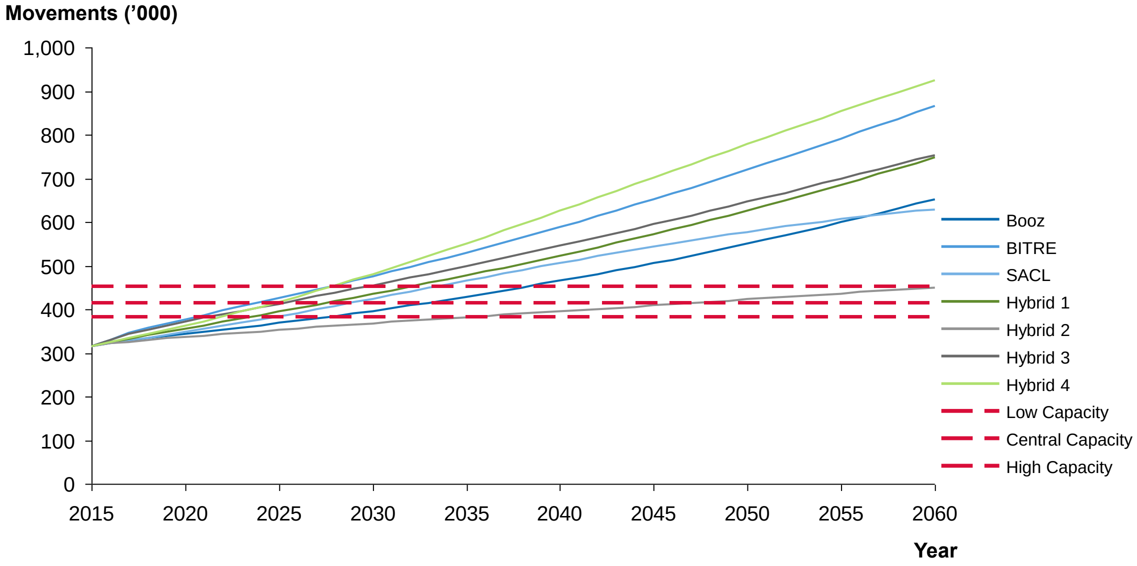
[6] *A review of international hub airports was undertaken to estimate a relationship between airport capacity and peak ratios. The review included 66 airports in the Asia Pacific and European regions.*

were also used as thresholds. If compared to the theoretical maximum capacity of 496,400 annual movements, the low and high cases would correspond to a utilisation of 82% and 97% respectively, whereas the central (base) case would equal to 89% utilisation.

3.4 Critical Thresholds

Figure 17 below shows the total aircraft movement forecasts for each of the scenarios with horizontal lines depicting movement caps under the three peak spreading scenarios.

Figure 17 - Aircraft Movement Scenarios – Total



Source: Booz & Company "Forecast Growth" report, BITRE Research Report 117, SACL – Sydney Airport Master Plan 2009

Table 4 shows the years at which Sydney (Kingsford-Smith) Airport is forecast to reach capacity for three different peak spreading scenarios and seven growth and up gauging scenarios.

Table 4 - Year Movement Capacity is Reached

	Peak Spreading Scenario		
Passenger Growth and Up gauging Scenario	**Low**	**Central**	**High**
Booz & Company	2028	2033	2039
BITRE (2009)	2021	2024	2028
SACL (2009)	2025	2029	2034
Hybrid 1 (Booz – BITRE)	2024	2028	2032
Hybrid 2 (Booz – SACL)	2036	2047	-1
Hybrid 3 (BITRE – Booz)	2022	2026	2030
Hybrid 4 (SACL – Booz)	2022	2025	2028

Source: Booz & Company analysis

Note: (1) Under the High Peak Spreading scenario for Hybrid 2 (Booz-SACL) the 80 movement cap is not yet reached in 2060

The results show Sydney (Kingsford-Smith) Airport reaching capacity earliest under the BITRE, Hybrid 4 and Hybrid 3 scenarios for the three peak spreading scenarios. Sydney (Kingsford-Smith) Airport is forecast to reach the cap latest under the Hybrid 2 scenario, resulting from lowest passenger growth from the Booz model and the most aggressive up gauging assumptions from the SACL model.

Appendix A - References

Aircraft Movements through Capital City Airports to 2029-30, Research Report 117, 2009, Bureau of Infrastructure, Transport, and Regional Economics, ACT, Australia.

Sydney Airport Master Plan 2009, Sydney Airport Corporation Limited, NSW, Australia.

'Forecast growth estimates for aviation activity in the Sydney region' Booz & Company for the Joint Study on Aviation Capacity in the Sydney Region, 2011