



COMMONWEALTH DEPARTMENT OF
**TRANSPORT AND REGIONAL
DEVELOPMENT**

13

Land Transport

Proposal for a Second Sydney Airport
at Badgerys Creek or Holsworthy Military Area

Technical Paper

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**TRANSPORT AND REGIONAL
DEVELOPMENT**

GPO Box 594
Canberra ACT 2601

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Prepared by:

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Environment & Infrastructure

ACN 078 004 798

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Part A

Introduction

Commonwealth between 1986 and 1991. A total of \$155 million has been spent on property acquisition and preparatory works.

Since 1986, planning for Sydney's second airport has been closely linked to the development of the third runway at Sydney Airport. In 1989 the Government announced its intention to construct a third runway. An EIS was undertaken and the decision to construct the runway was made in December 1991.

At the same time as investigations were being carried out on the third runway, detailed planning proceeded for the staged development of the second airport at Badgerys Creek. In 1991 it was announced that initial development at Badgerys Creek would be as a general aviation airport with an 1,800 metre runway.

The third runway at Sydney Airport was opened in November 1994. In March 1995, in response to public concern over the high levels of aircraft noise, the Commonwealth Senate established a committee in March 1995 to examine the problems of noise generated by aircraft using Sydney Airport and explore possible solutions. The committee's report, *Falling on Deaf Ears?*, containing several recommendations, was tabled in parliament in November 1995 (Senate Select Committee on Aircraft Noise, 1995).

During 1994 and 1995 the Government announced details of its proposed development of Badgerys Creek, and of funding commitments designed to ensure the new airport would be operational in time for the 2000 Olympics. This development included a 2,900 metre runway for use by major aircraft.

The decision to accelerate the development of the new airport triggered the environmental assessment procedures in the *Environment Protection (Impact of Proposals) Act 1974*. In January 1996 it was announced that an EIS would be prepared for the construction and operation of the new airport.

In May 1996, the present Commonwealth Government decided to broaden the environmental assessment process. It put forward a new proposal involving the consideration of 'the construction and operation of a second major international/domestic airport for Sydney at either Badgerys Creek or Holsworthy on a site large enough for future expansion of the airport if required' (Department of Transport and Regional Development, 1996). A major airport was defined as one 'capable of handling up to about 360,000 aircraft movements and 30 million passengers per year' (Department of Transport and Regional Development, 1996).

The Government also indicated that 'Badgerys Creek at this time remains the preferred site for Sydney's second major airport, subject to the favourable outcome of the EIS, while Holsworthy is an option to be considered as an

The assumptions made on how the Second Sydney Airport would operate and the master plans which set out the broad framework for future physical development of the airport are based on an operational limit of 30 million passengers a year. The main features include parallel runways, a cross wind runway and the provision of the majority of facilities between the parallel runways.

Consideration has also been given to how the airport may be expanded in the future and the subsequent environmental implications. Such an expansion could not proceed, however, unless a further detailed environmental assessment and decision making process were undertaken by the Government.

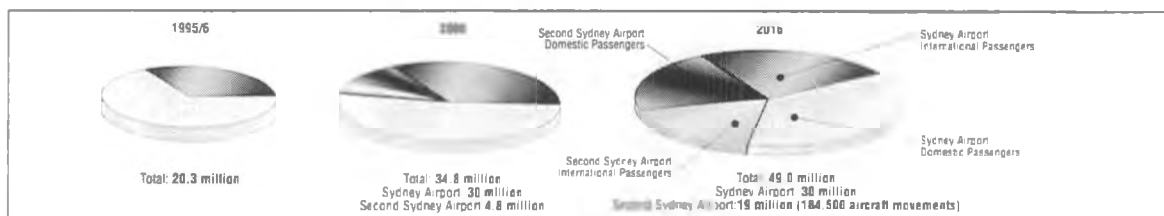
Five airport options are considered, as well as the implications of not proceeding with the proposal. Three of the airport options are located at Badgerys Creek and two are located within the Holsworthy Military Area. Generally, the airport options are:

- Badgerys Creek Option A which has been developed to be generally consistent with the planning for this site undertaken since 1986. The airport would be developed within land presently owned by the Commonwealth with two parallel runways constructed on an approximate north-east to south-west alignment;
- Badgerys Creek Option B would adopt an identical runway alignment to Option A, but provides an expanded land area and also a cross wind runway;
- Badgerys Creek Option C would provide two main parallel runways on an approximate north to south alignment in addition to a cross wind runway. Again the land area required would be significantly expanded from that which is presently owned by the Commonwealth;
- Holsworthy Option A would be located centrally within the Holsworthy Military Area and would have two main parallel runways on an approximate north to south alignment and a cross wind runway; and
- Holsworthy Option B would be located in the south of the Holsworthy Military Area and would have two main parallel runways on an approximate south-east to north-west alignment and a cross wind runway.

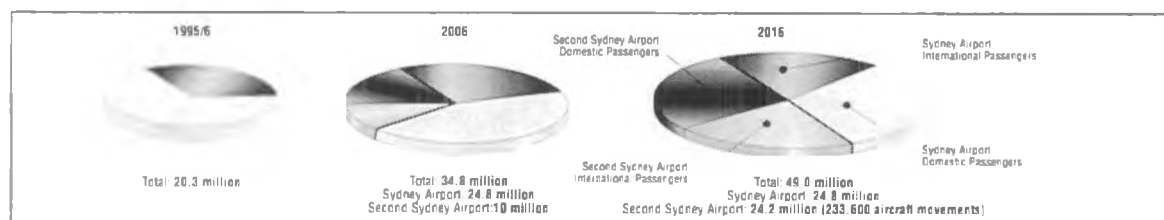
To ensure that the likely range of possible impacts of the airport options are identified a number of different assumptions about how the airport options would be developed and operate have been adopted. These different assumptions relate to the number and types of aircraft that may operate from the airport, the flight paths used and the direction of take offs and landings.



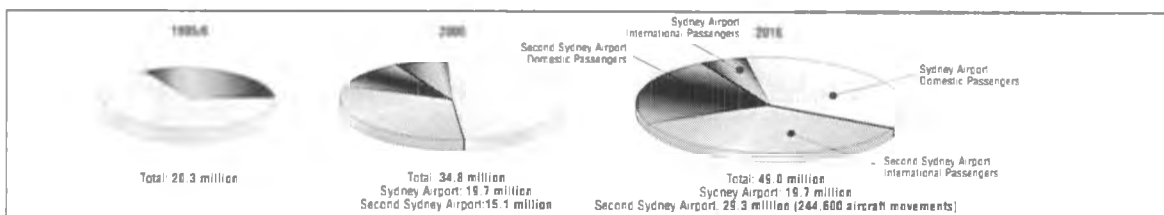
Figure 1.1
Potential Airport Sites Considered in the Draft EIS



Assumptions about Passenger Movements for Air Traffic Forecast 1



Assumptions about Passenger Movements for Air Traffic Forecast 2



Assumptions about Passenger Movements for Air Traffic Forecast 3

Figure 1.2
Summary of Passenger Movement Forecasts Used for Environmental Assessment

international and domestic air traffic is assumed to be similar at both airports;

- *Air Traffic Forecast 2* where the Second Sydney Airport would be developed to cater for 10 million passengers a year by 2006, with all further growth after this being directed to the second airport rather than Sydney Airport. The proportion of international and domestic traffic is also assumed to be similar at both airports; and
- *Air Traffic Forecast 3* which is similar to Forecast 2 but with more international flights being directed to the Second Sydney Airport. This would result in the larger and comparatively noisier aircraft being directed to the second airport. It would accommodate about 29.3 million passengers by 2016.

1.5 OPERATION OF THE AIRPORT OPTIONS

At any airport, aircraft operations are allocated to runways (which implies both the physical runway and the direction in which it is used) according to a combination of wind conditions and airport operating policy. The allocation is normally performed by Air Traffic Control personnel.

Standard airport operating procedures indicate that a runway may not be selected for either approach or departure if the wind has a downwind component greater than five knots, or a cross wind component greater than 25 knots. If the runway is wet, it would not normally be selected if there is any downwind component. This applies to all aircraft types, although larger aircraft would be capable of tolerating relatively higher wind speeds. Wind conditions at the airport site therefore limit the times when particular runways may be selected. However, there would be a substantial proportion of the time, under low wind conditions, when the choice of runways would be determined by airport operating policy.

For the environmental assessment, the maximum and minimum likely usage for each runway and runway direction was estimated and the noise impact of each case calculated. The actual impact would then lie between these values and would depend on the operating policy which is applicable at the time.

The three airport operation scenarios were adopted for the environmental assessment, namely:

- *Airport Operation 1* shown in *Figure 1.3*. Aircraft movements would occur on the parallel runways in one specified direction (arbitrarily chosen to be the direction closest to north), unless this is not possible

- Rail Access Corporation;
- NSW Department of Transport;
- NSW Taxi Council;
- Federal Airports Corporation; and
- NSW Department of Urban Affairs and Planning.

The background information has been used to prepare the Technical Paper. None of the agencies listed above, however, have yet reviewed the conclusions to the technical paper, nor could they be in any way responsible for them.

A model has been developed that simulates the road network for the Sydney region. The model includes assumptions about future land use developed from information obtained from the Department of Urban Affairs and Planning and local Councils. These assumptions have been modified to take account of the possibility of each of the five airports being developed. A detailed discussion of these land use assumptions can be found in *Technical Paper No. 2, Planning, Land Use and Social Impacts*.

The assessment also relied on consultations with various authorities as outlined in *Chapter 2*, and on published and other information including the following:

- traffic volumes (Roads and Traffic Authority and field counts);
- road and public transport strategies (NSW Department of Transport, 1995);
- existing and potential rail capacities and patronage (CityRail and field counts);
- EIS for M5 East Motorway (Manidis Roberts, 1994);
- EIS for the East Hills Line Amplification (Connell Wagner, 1996)
- EIS for the Upgrading of Elizabeth Drive (Rust PPK, 1996);
- draft EIS for Western Sydney Orbital, Prestons to Cecil Park (Rust PPK, unpublished);
- demand forecast for New Southern Railway (Kinhill, 1994);
- demographic analysis (Long Technical and refer *Technical Paper No. 2*);
- ground access study for Sydney Airport (Masson & Wilson, 1996a and 1996b); and
- Sydney West Airport Sub-region: Integrated Transport and Community Design Study (Symonds Travers Morgan, 1996).

3.2 LAND USE ASSUMPTIONS

Land use scenarios are used to present a picture of how Sydney might look in the future, in terms of the extent, timing and distribution of population, workforce and employment. It is necessary to develop these scenarios to obtain an understanding of the demands which may be placed on public transport services and the road network in the future.

- Land Use Four - based on Holsworthy Option A; and
- Land Use Five - based on Holsworthy Option B.

The projected population by local government area within the Sydney metropolitan area is included in *Appendix A. Table 3.1* summarises the population in local government areas surrounding the airports sites at 2006 and 2016 for the five land use scenarios. An estimate of the 1996 population is also included for comparison. The underlying assumptions for these scenarios (Land Use One to Land Use Five) are outlined in detail in *Technical Paper No. 2, Planning, Land Use and Social Impacts*.

It is anticipated that population within the 15 local government areas surrounding the airport options will increase by about 200,000 persons over the next 10 years, and a further 140,000 in the subsequent decade.

3.3 PUBLIC TRANSPORT

Sydney has a relatively high use of public transport compared to comparable cities. There would be a number of public transport options available to service the Second Sydney Airport including commuter trains, transit buses, coaches and taxis. The majority of these modes of public transport are road based and therefore share existing road infrastructure with private vehicles. Others, particularly trains, would have their own dedicated right-of-way.

The choice of public transport mode to obtain access to the Second Sydney Airport has been considered in an integrated manner. Rail has been considered as providing the potential for the highest number of public transport trips to the Second Sydney Airport, reflecting other examples in Sydney of a high modal split to the rail network. Improvements to the rail network were considered in principle to ensure that current infrastructure levels did not unduly constrain this assessment. International experience with rail access to airports was studied for employees, air passengers and meeters and greeters to establish likely ranges of passenger response. Forecast trip behaviour for Sydney Airport, once the New Southern Rail Line is functioning, is an important reference.

Once the role of rail to the airport was established, coaches were considered as the next public transport priority mode. The current role of tour coach operations at Sydney Airport was examined, with the potential for growth at the Second Sydney Airport due to a more remote location from major international tourist facilities. The role of coach travel at travel peaks was also studied.

TABLE 3.1 POPULATION IN SURROUNDING LOCAL GOVERNMENT AREAS

LGA	1996	2006 Land Use					2016 Land Use				
		1	2	3	4	5	1	2	3	4	5
Auburn	51,787	56,134	56,134	56,134	56,134	56,134	65,099	65,099	65,099	65,099	65,099
Bankstown	165,186	174,417	174,417	174,417	174,417	174,417	183,167	183,167	183,167	183,167	183,167
Blacktown	227,609	258,426	258,427	258,427	258,427	258,427	275,159	274,838	274,838	274,838	274,838
Blue Mountains	74,518	77,718	77,718	77,718	77,718	77,718	80,162	80,162	80,162	80,162	80,162
Camden	29,160	49,253	50,630	49,382	49,903	47,548	61,457	71,559	66,536	67,080	54,839
Campbelltown	148,330	160,736	160,181	160,384	160,510	161,912	170,181	166,852	167,591	168,326	176,942
Fairfield	190,698	204,481	204,430	204,449	204,460	204,471	212,752	212,590	212,636	212,673	212,696
Holroyd	82,660	86,209	86,209	86,209	86,209	86,209	89,951	89,951	89,951	89,951	89,951
Hurstville	68,230	71,493	71,493	71,493	71,493	71,493	74,623	74,623	74,623	74,623	74,623
Liverpool	112,009	153,830	154,196	154,808	154,833	155,537	173,793	178,513	180,657	181,261	183,852
Parramatta	138,557	144,390	144,390	144,390	144,390	144,390	149,898	149,898	149,898	149,898	149,898
Penrith	164,498	182,634	182,368	182,466	182,526	182,582	198,109	196,172	196,527	196,881	197,064
Sutherland	54,908	59,749	59,749	59,749	59,749	59,749	61,690	61,690	61,690	61,690	61,690
Wollondilly	34,162	40,222	40,223	40,223	40,223	40,223	43,539	43,539	43,539	43,539	43,539
Wollongong	254,600	274,000	274,000	274,000	274,000	274,000	295,800	295,800	295,800	295,800	295,800
Total	1,796,912	1,993,692	1,994,565	1,994,249	1,994,992	1,994,810	2,135,380	2,144,453	2,142,714	2,144,988	2,144,160

Source: Technical Paper No. 2 Planning, Land Use and Social Impacts.

Taxis will remain a significant mode for travellers at Sydney Airport. The implications and potential servicing of the Second Sydney Airport was discussed with the NSW Taxi Association.

Bus operations have been reviewed in the context of the *Integrated Transport Strategy for the Greater Metropolitan Region* (NSW Department of Transport, 1995). Bus services to Sydney Airport were also examined, although it is noted that these occur in a more densely populated catchment than would exist around any of the proposed airport options. Bus priority strategies may be implemented on the Western Sydney Orbital or arise from the development of the *Liverpool Council Bus Strategy* (TEC, 1995).

3.4 TRAFFIC MODELLING

3.4.1 APPROACH

Strategic traffic modelling for metropolitan Sydney was developed in two stages. Firstly the land use scenarios and a possible future Sydney road and rail networks were used to arrive at a range of estimates of future road travel in terms of numbers of vehicle trips between specific origins and destinations.

The second stage was to assign each of the forecast trips to its best route through the road network, allowing for the delaying effect of all the other traffic on the network. This process produces forecast traffic volumes and travel speeds on every link in the road network. These can be aggregated to provide estimates of overall network efficiency in terms of vehicle kilometres and hours of travel. They may also be used to estimate traffic noise, fuel consumption and air emissions.

The year 1996 was modelled to calibrate the existing road network so that the model could provide a sound basis for the modelling of future scenarios.

The estimation of the numbers of vehicle trips between specific origin and destination points was carried out by Long Technical using the EMME/2 software package, developed by INRO Consultants of Montreal, Canada. The estimation of vehicle trips is expressed as a trip table. This table is based on employment and population estimates for 700 travel zones in Sydney. The *employment* and *population* in each zone is then assumed to generate and attract a certain number of vehicle trips.

- the calibration target accuracy was for individual screen lines to be less than plus or minus 10 percent for volumes greater than 800, 20 percent for volumes between 800 and 500, 40 percent for volumes between 500 and 250 and 60 percent for less than 250;
- the target accuracy for a screen line total was to be within plus or minus five percent of count data;
- the AM peak trip table was then reversed to generally reflect the PM peak hour traffic conditions; and
- the 1996 PM peak model was run in an iterative process with select link volume data collected for each of the screen line links.

Where the screen line total is initially correct then calibration is only performed at the network level of link speeds, number of lanes etc. In this instance, the network is calibrated for the corridor by the adjustment of link speeds and/or node capacities or correction of the number of lanes to achieve an acceptable variation. A number of model runs were needed to achieve this network calibration.

To achieve the required calibration it was found necessary to create three new travel zones by splitting existing zones. This was essential at the Princes Highway, Waterfall, the Great Western Highway, Blaxland and Lucas Heights. The original Long Technical travel zones were found deficient at the Waterfall and Blaxland sites in the number of external trips entering and leaving the Metropolitan Area. The Lucas Heights development had not been included in the land use forecast.

Notwithstanding the above technique, if the screen line total variation was greater than five percent it meant that the trip table was deficient in the number of trips. To correct the trip table the select link data is used to factor the trip table for the required direction of travel. An option in NETANAL provides the facility for factoring of all zone pairs that pass through the select link by a factor automatically calculated to achieve the required volume. This provides the means to accurately adjust only those pairs that use the link by the correct amount to achieve the required volume.

In this assessment as in most assessments of major proposals it was found necessary to select link factor the trip table particularly in the contra peak direction. It was critical to calibrate for this direction as it affects intersection capacity which is required for the trip assignment phase.



Figure 3.1
Extent of Strategic Traffic Model



0km 10km 20km

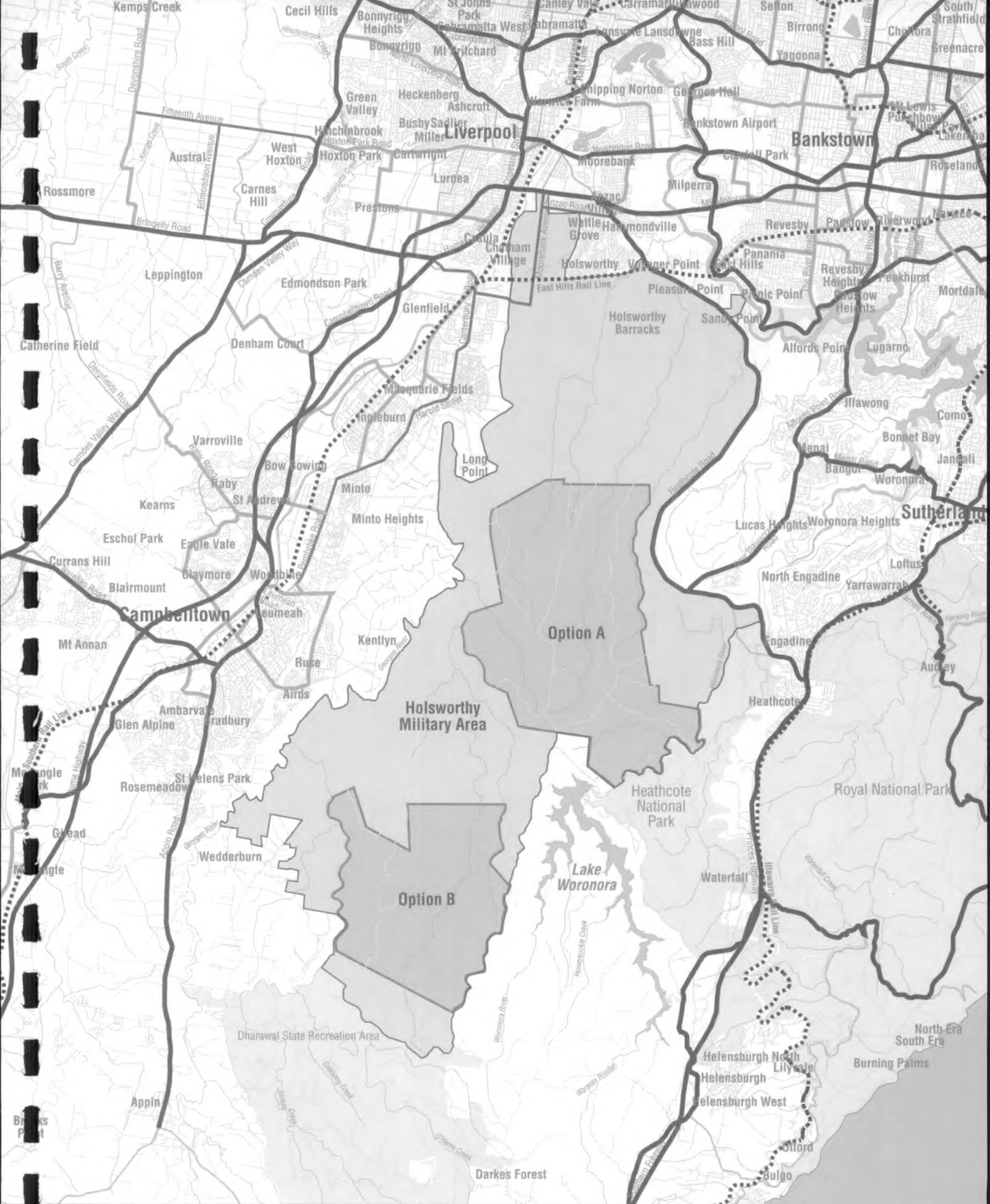


Figure 3.3
Existing Road and Rail Network Around
Holsworthy Military Area



In the first instance these models did not include a Second Sydney Airport. Trip tables for the morning peak hour period for different Second Sydney Airport forecast scenarios were developed by Long Technical based on the land use scenarios described in Section 3.2 above. The current road models developed by Sims Hardings were updated to incorporate the necessary modifications identified from discussions with the NSW Roads and Traffic Authority. Revised AM and PM peak models for each scenarios were thus finalised. A number of alternative airport highway access configurations were also modelled.

The trip generation/attraction, mode of travel and distribution of a potential Second Sydney Airport were then formulated. The resultant trip matrix for road traffic was then incorporated in the NETANAL models and assigned to the corresponding road networks. Trip matrices for passenger projections of 10 millions and 30 millions passenger per year in 2006 and 2016 respectively were developed.

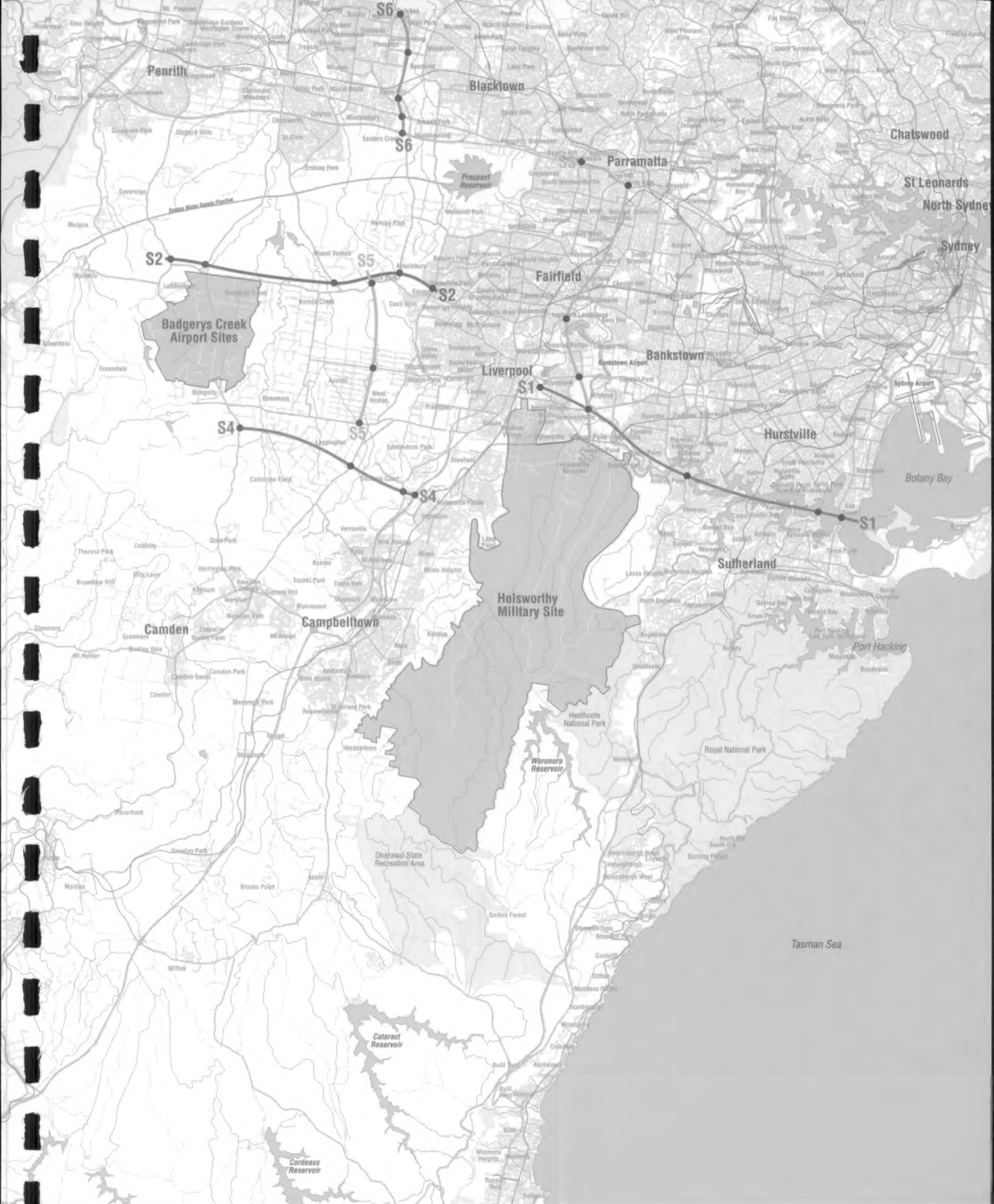
The following information was used for the development of the surface trip matrix for the proposed airport at either site:

- *Ground Access Study at Sydney Airport* (Masson & Wilson, 1996a);
- current and potential employment at Sydney Airport and Second Sydney Airport (*Technical Paper No. 15, Economics*); and
- journey to work information from the 1991 survey (Transport Data Centre).

Trip generation and distribution for airport employees, international travellers; domestic travellers and meeters and greeters were developed.

The existing mode of travel at Sydney Airport for employees, air passengers and meeters/greeters was derived from information supplied by Masson & Wilson, consultants to the Federal Airports Corporation, or included in the *New Southern Railway Environmental Impact Statement* (Kinhill, 1994).

Based on the above information, an analysis of alternative mode split scenarios (cars/coaches/bus/rail) for the Second Sydney Airport was carried out to look at the role public transport could play in delivering passengers and employees to the airport sites which maximises the mode share to public transport.









- Screenline 1 
- Screenline 2 
- Screenline 3 
- Screenline 4 
- Screenline 5 
- Screenline 6 

Figure 3.4
Screen lines for Road Model Calibration



Night work has been a definite part of the construction planning. The construction plan is based on six day work weeks and 20 hour work days for a portion of the construction works. For Badgerys Creek, approximately 20 percent of the work will be completed during the night hours. The proportion increases to 35 percent of the work at Holsworthy.

TABLE 3.3 CONSTRUCTION TIME FRAMES

Development Stage		Time (Years)
Badgerys Creek - Option A	Stage 1	4.5
	Master Plan	6
Badgerys Creek - Option B	Stage 1	5
	Master Plan	6
Badgerys Creek - Option C	Stage 1	4.5
	Master Plan	6
Holsworthy - Option A	Stage 1	6
	Master Plan	9
Holsworthy - Option B	Stage 1	6.5
	Master Plan	10

Source: Second Sydney Airport Planners, 1997.

The major concrete and asphaltic paving operations to the runways, taxiways and aprons may be undertaken 24 hours a day.

3.5.2 CONSTRUCTION WORKFORCE

The required workforce for the Second Sydney Airport site are shown in Table 3.4. At Badgerys Creek, there would be a steady build up of the site workforce peaking at around 2,080 on-site personnel.

At Holsworthy, at the peak of building and pavement works, it is anticipated that there would be a maximum of between 1,800 and 1,900 on site construction personnel for Option A and B respectively.

The anticipated traffic generation, at peak construction activities, for various options of the Second Sydney Airport site are shown in *Table 3.5*. For the Badgerys Creek airport options, the traffic generation could vary between 2,600 and 3,780 vehicle trips per day. For the Holsworthy airport options, the traffic generation could vary between 1,790 and 3,440 vehicle trips per day.

TABLE 3.5 CONSTRUCTION WORKFORCE TRAFFIC GENERATION¹

Staging	Number of Employees	Two-Way Daily Vehicles Trips	AM Peak		PM Peak	
			In	Out	In	Out
Badgerys Creek Option A						
Stage 1	1,430	2,600	728	182	182	728
Master Plan	1,850	3,364	942	235	235	942
Badgerys Creek Option B						
Stage 1	1,460	2,656	743	186	186	743
Master Plan	2,080	3,782	1,059	265	265	1,059
Badgerys Creek Option C						
Stage 1	1,460	2,656	743	186	186	743
Master Plan	2,080	3,782	1,059	265	265	1,059
Holsworthy North						
Stage 1	985	1,790	407	219	219	407
Master Plan	1,790	3,256	740	399	399	740
Holsworthy South						
Stage 1	1,050	1,910	434	234	234	434
Master Plan	1,890	3,436	782	421	421	782

Note: 1. Based on occupancy rate of 1.1 and 20 percent (Badgerys Creek) and 35 percent (Holsworthy) work during nights.

Construction Trucks

It is estimated that a maximum of 460,000 truck and trailer loads over the master plan period of construction will be required for the transport of materials (that is, cement, concrete aggregates) to the site. This is equivalent to about 790 truck movements per day. A further 20 to 40 and 40 to 60 truck movements per day for the deliveries of building materials and cement would also be required during the construction of the terminals. One daily delivery of pipes and culverts would also be made. The number of trucks delivering fuel would vary depending on the airport option as noted in *Table 3.6*.

Accordingly, there would be a total of about 710 and 900 truck movements per day to and from the Badgerys Creek site for stage one and master plan respectively. Similarly, about 720 and 920 truck movements per day to and from the Holsworthy sites for stage one and master plan respectively.

Based on other airports in Australia and discussion with Shell, the Joint User Hydrant Installation (JUHI) operator at Sydney (Kingsford Smith) Airport, fuel supply storage requirements for the Second Sydney Airport when servicing 30 millions passengers per year would be approximately 50 million litres. This is based on providing the Airport with a five to six day supply in the event of a pipeline or refinery breakdown/maintenance shutdown. For a first stage development of 10 million passenger per annum, fuel demand requirement would be approximately 15 million litres for a five to six day supply.

3.6.2 TRIP GENERATION

In the event a pipeline could not be provided at the opening of the new Airport, all fuel supply would have to be transported to the airport by either standard articulated tankers (40,000 litres) or B-Doubles (60,000 litres). The actual number of truck movements would depend on the ratio of articulated to B-double tankers as noted in *Table 3.7*.

This situation is being assessed to ensure the potential worst case traffic impacts are examined by the EIS. As previously stated, the development of a fuel pipeline would be desirable.

TABLE 3.7 FUEL SUPPLY TRAFFIC GENERATION VOLUMES

Scenarios	2006		
	50% Articulated 50% B-Double	All Articulated	All B-Double
<i>Daily Deliveries</i>			
Articulated	31	63	0
B-Double	21	0	42
Total	52	63	42
<i>Weekly Deliveries</i>			
Articulated	217	441	0
B-Double	147	0	294
Total	364	441	294
<i>Yearly Deliveries</i>			
Articulated	11,315	22,995	0
B-Double	7,665	0	15,330
Total	18,980	22,995	15,330

Source: Second Sydney Airport Planners, 1997.

Part B

Existing Environment

- establishment of effective management processes supporting the development of a co-ordinated and consistent approach to urban management consistent with the whole of Government approach established by the metropolitan strategy.

Development of a transport corridor framework is proposed in the *Integrated Transport Strategy* as shown in *Figure 4.1*, which identifies Parramatta as the primary centre in western Sydney and promotes sub-regional employment centres such as Blacktown, Campbelltown, Liverpool and Penrith. The corridors supporting Parramatta and western Sydney are:

- Macquarie-Parramatta-Castlereagh corridor;
- Parramatta-Hornsby corridor; and
- Hoxton Park-Parramatta corridor.

Corridors identified as supporting employment and economic efficiency objectives include:

- south-west (M5) link;
- Liverpool-Hornsby link (Corridor 8 on *Figure 4.1*);
- access to the potential airport site at Badgerys Creek (Corridor 9 on *Figure 4.1*); and
- inter-city corridors between Sydney and Canberra, Wollongong and Newcastle.

The *Integrated Transport Strategy* also identifies the transport corridor to the potential Badgerys Creek airport site as a strategic opportunity to support metropolitan employment and economic efficiency objectives (Department of Transport, 1995, p.82). In the case study on Transport Planning for Sydney West Airport (Department of Transport, 1995, p.32) there is a discussion about the need to provide road and rail corridors to the airport site at Badgerys Creek. The rail corridor is described as an extension of the East Hills Line via Glenfield Station. With the construction of the New Southern Railway to Sydney (Kingsford Smith) Airport, a direct connection by rail between the two airports would exist, as well as access to all communities served by Sydney's rail network.

In terms of a road link to the airport site at Badgerys Creek, the advantage of combining the construction of the 'missing link' of the National Highway between Liverpool and Hornsby plus airport access was identified by the *Integrated Transport Strategy*. It was also identified that a direct connection to the M5 Motorway and F3 Freeway was also an advantage, particularly if the M5 Motorway were to be extended east to Botany (Department of Transport, 1995).

Medium Term Strategies (beyond 2000)

Beyond the year 2000, CityRail's vision includes the expansion of the network into areas not currently served by rail. One of these visions includes the potential link to Badgerys Creek from Glenfield.

In conjunction with the New Southern Railway, the link would provide a direct connection between Sydney's two international airports and beyond to the central business district.

The link to Badgerys Creek would also offer opportunities for the development of 'urban villages' at selected station sites not effected by noise, maximising the potential for land use and transport integration.

4.1.3 EFFECT OF FAST TRAIN PROPOSALS

Several high speed rail proposals have been mooted for the Sydney - Canberra - Melbourne Corridor, and several are still under investigation. Any realisation of the schemes would be due to a combination of financial market and government initiatives, but all the proposals are likely to use the rail corridor from Sydney Terminal through Macarthur via East Hills Line.

All potential airport sites relate to the proposals in a very similar manner. The high speed rail proposals maintain their high speed through infrequent stops. If sufficient demand is generated from markets such as the Southern Highlands and Canberra, the most likely rail response would be to ensure connecting trains coordinate or shuttle buses link the high speed rail line's stop for Southern Sydney and the airport.

The impact of the fast train on vehicle traffic generation for the Second Sydney Airport would be small. Underlying models of demand for the airport assign very few trips to these outer areas. Current air travellers from these areas might now be expected to use the slower trains or coach services and divert from those modes rather than from private cars. There would be some diversion, but it is expected to be a relatively small number of the total attractions to the airport.

Furthermore, the proposed train is likely to only originate/terminate at Central and therefore would not provide direct access for airport travellers to other Sydney rail destinations.

The M5 Motorway and South Western Freeway are both four lane dual carriageways. Heathcote Road has been recently widened to provide several overtaking lanes along its length from Holsworthy to New Illawarra Road. The Heathcote Road section crossing the Woronora River to the Princes Highway traverses very steep terrain and the road has several very tight corners.

Access from the north would be via the Cumberland Highway and Hume Highway. The later would also be used by vehicles accessing Elizabeth Drive from The Northern Road, Mamre Road or Wallgrove Road.

The proposed Western Sydney Orbital link between Elizabeth Drive and the M5 Motorway would also provide access to the Holsworthy airport options.

4.2.2 EXISTING TRAFFIC CONDITIONS

Annual average daily traffic (AADT) and average daily traffic (ADT) volumes were obtained from the Roads and Traffic Authority published in 1993 and yet to be published 1996 volumes. It must be noted that AADT 1996 volumes are based on 10 month period and not a full year.

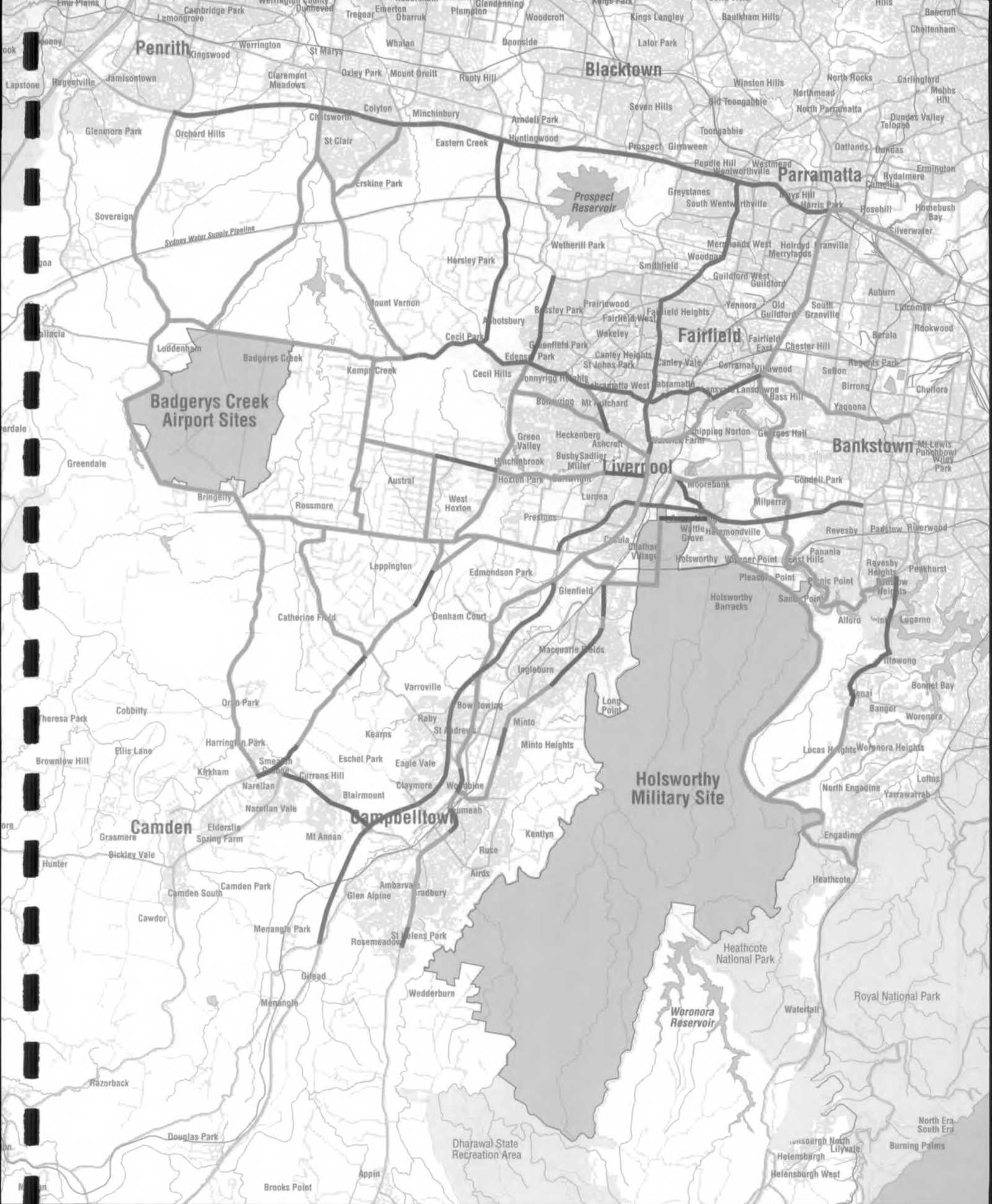
Peak Hour volumes used for calibrating the traffic model were also obtained from Sims Harding Pty Ltd. These were supplemented by volume counts commissioned specially for the study.

This information is summarised in *Table 4.1* and noted in *Figure 4.4*. A more detailed list is included as *Appendix F*.

4.3 ROAD BASED PUBLIC TRANSPORT

4.3.1 BUSES

Sydney bus services currently operate under business contract areas. The government operated Sydney Buses serve the Sydney central business district, Eastern Suburbs, Northern Beaches, Inner-western Suburbs and the Lower North Shore. The remaining areas within the Sydney metropolitan area are served by private bus operators. All of the proposed sites for the Second Sydney Airport are within contract areas under private bus operators.



- | | | | |
|----------------------|---|----------------------------|---|
| Six Lanes Divided |  | Three Lanes Divided |  |
| Five Lanes Divided |  | Two Lanes |  |
| Four Lanes Divided |  | Urban Areas |  |
| Four Lanes Undivided |  | (indicated by local roads) | |

Figure 4.2
Road Inventory



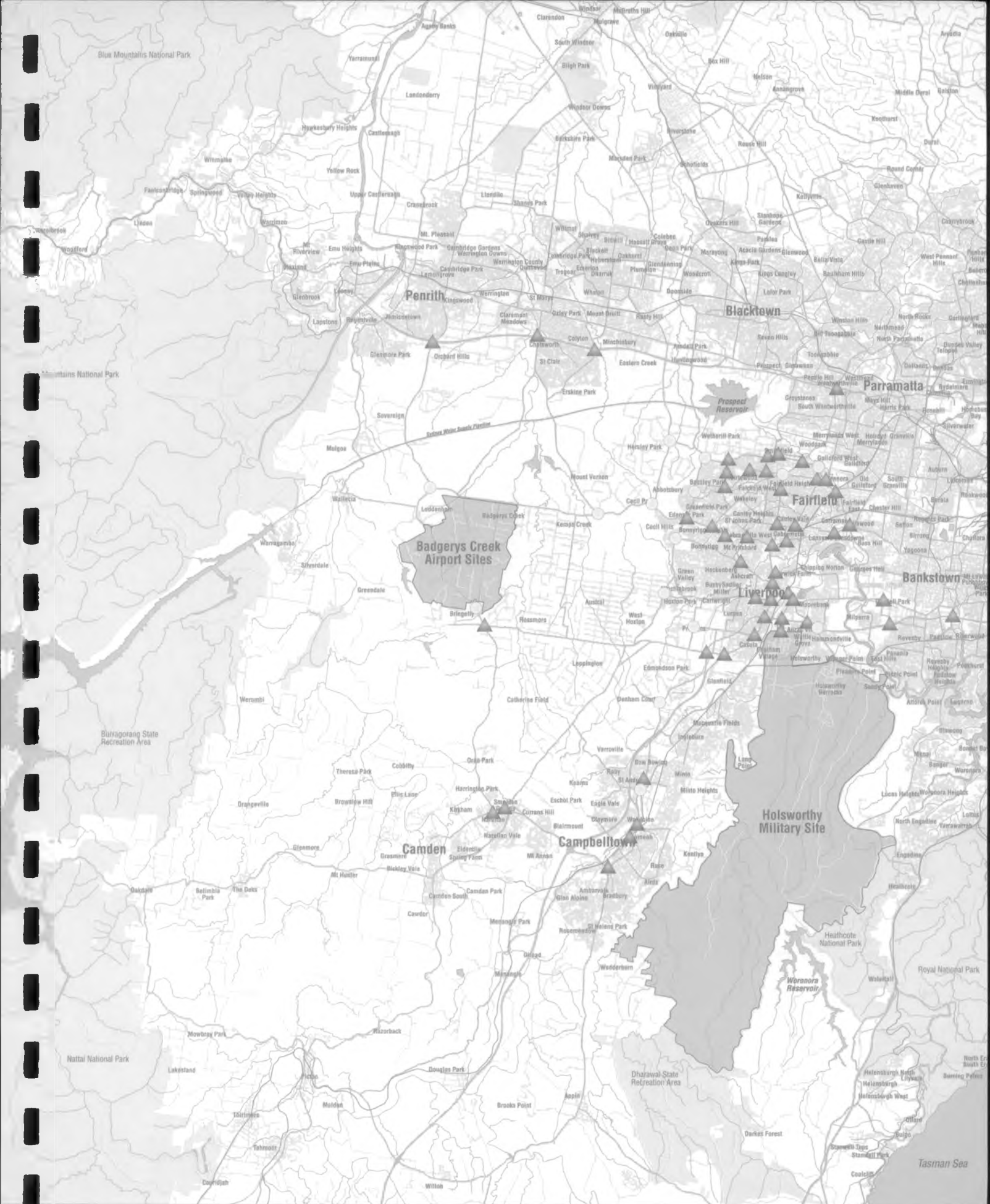
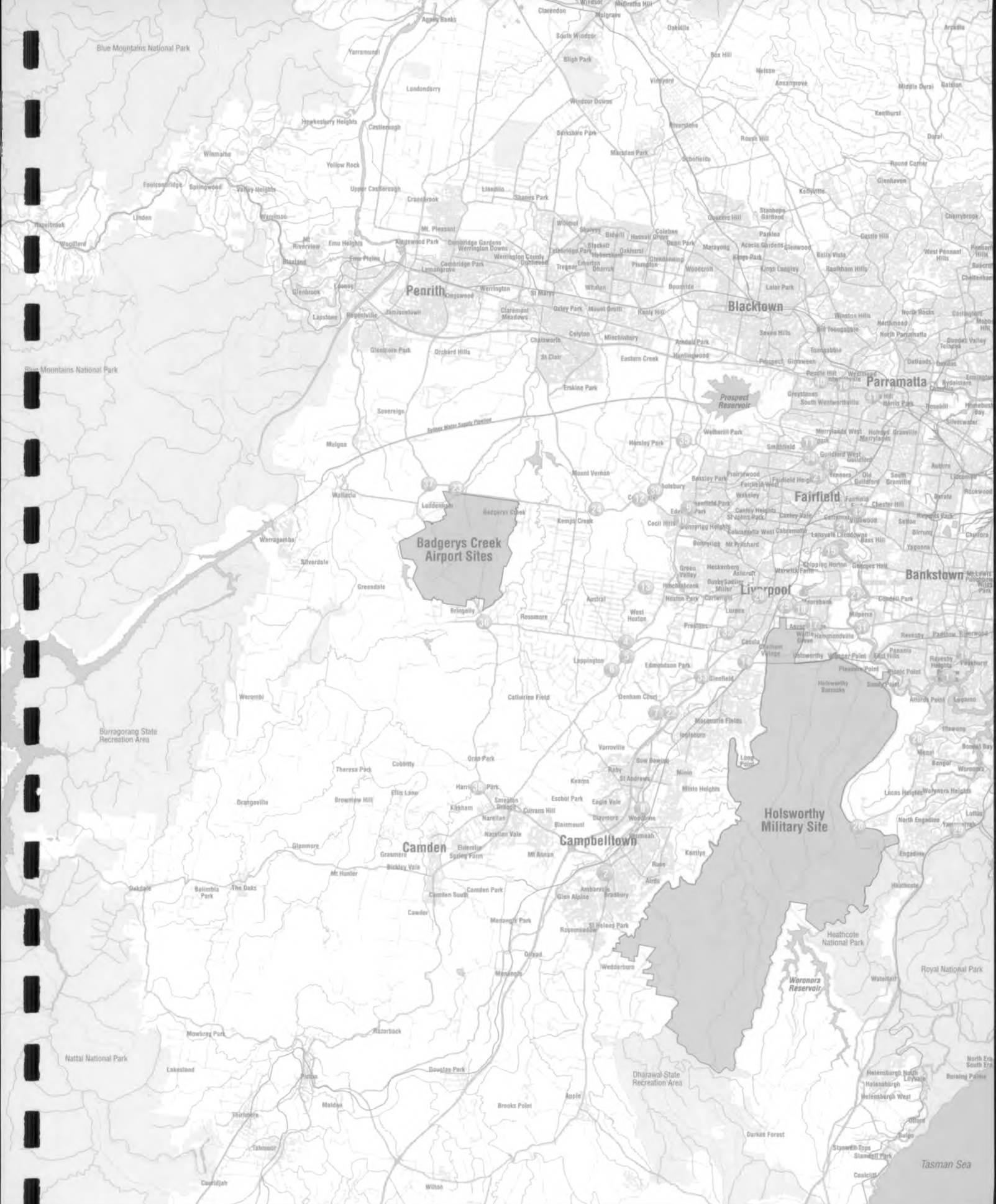


Figure 4.3
Traffic Control at Major Intersections

Signalised
Roundabout
Urban Areas
(indicated by local roads)





Location Number **11**

Urban Areas
(indicated by local roads)

Figure 4.4
Selected Traffic Count Locations



0Km 10Km

Badgerys Creek Airport Site

The major road access links to the Badgerys Creek airport sites have been identified as Elizabeth Drive, The Northern Road and Bringelly Road. The section of Elizabeth Drive serving the Badgerys Creek airport site would also provide a public transport route. Elizabeth Drive east of Meadows Road is currently an important public transport route, a role which will increase as residential development continues to expand into the western Liverpool Release Areas. Current planning has identified this eastern section of Elizabeth Drive as a transit priority corridor requiring priority measures to ensure bus service reliability.

Western Elizabeth Drive is presently used as a local bus route by Westbus. Two scheduled bus services run along Elizabeth Drive between Badgerys Creek Road and Wallgrove Road and continue to the east. Route 836 is the Liverpool to Badgerys Creek service. It runs seven times every weekday into Liverpool, and eight times every day into Badgerys Creek. The terminal points are Liverpool Railway Station and Badgerys Creek Post Office.

Route 835 is the Liverpool to Penrith service which runs along Elizabeth Drive between Mamre Road and Cowpasture Road. It runs five times every weekday into Liverpool, and six times every weekday into Penrith. It serves the Penrith and Liverpool railway stations giving the area interchange access to the Main Western and Main Southern Lines.

School bus services also operate to Kemps Creek Primary School and Badgerys Creek Primary School. School routes to other schools also pass through the area. The busiest point for bus services in the vicinity of the Badgerys Creek Airport site is at the intersection of Elizabeth Drive and Mamre Road where there are 35 scheduled movements per day with school buses.

This number is anticipated to increase due to:

- the new railway station at the Badgerys Creek airport options, which would act as a focus for feeder bus service from local residential areas;
- as the airport would be a catalyst for employment growth, increased bus service would be needed to connect the businesses to each other and the railway station;
- given the uncongested nature of an upgraded Elizabeth Drive, buses would be able to offer a very time competitive service with car for those locations not well served by rail; and

Bus services are the primary public transport mode serving the suburbs of Liverpool, particularly those to the west, due to the location of the rail line. Developed suburbs in the Liverpool area are well served by the bus network with respect to access to major commercial centres and rail stations. Because the bus route network has developed in an east-west alignment, and is focused on Liverpool Station, options for north-south travel through Liverpool are limited.

4.3.2 TAXIS

A number of taxi companies operate in the Sydney Metropolitan area. The area in which the taxi operators are allowed to operate is bounded by Emu Plains in the west, Palm Beach and the Hawkesbury River in the north and Helensburgh and Menangle in the south. Although most taxi companies are sub-regionally based throughout Sydney, there is no geographical limit within the above mentioned area which companies may operate.

The total fleet of taxis available to the Sydney Metropolitan area is approximately 4,500 cabs. The breakdown of taxi fleets can be seen in Table 4.2.

TABLE 4.2 SYDNEY METROPOLITAN TAXI FLEET

Company	Approximate Fleet Size
Taxis Combined	2,000
Premier	700
Legion	500
RSL	500
Cumberland	290
Manly-Warringah	230
ABC	150
St George	130
Total	4,500

Source: NSW Taxi Council, 1997

Although there appears to be a large number of independent taxi operators, the fleets of a number of the taxi companies operate through a common radio based booking system. Taxis Combined is one operator who allows other companies to utilise their radio network.

In consultation, the NSW Taxi Council indicated that the level of taxi presence whether the Second Sydney Airport is located at either Badgerys Creek or Holsworthy would be based primarily on demand due to the large number of independent taxi owners within the taxi industry.

The current rail transport task in the Sydney Metropolitan rail network translates into approximately 2000 services during an average weekday, using about 1,380 carriages (CityRail, 1992).

4.4.2 PATRONAGE INFORMATION

A total of approximately 770,000 passengers travel on the CityRail network on an average weekday. Of these trips, 70 percent are made during the morning and afternoon peak periods. Prior to the opening of the Harris Park Y-Link, the majority of trips were centred on the Sydney central business district, where the journey to work mode share for rail is 54 percent (CityRail, 1994) for arrivals in the city. With the Harris Park Y-Link now completed, trips to Parramatta are expected to increase in volume and rise as a percentage of all trips.

The number of passengers and frequency of trains travelling in the morning peak hour (arriving at Central between 7.30 am and 8.30 am) are shown in *Table 4.3*.

4.4.3 CAPACITY OF THE EXISTING RAIL NETWORK

The peak hour capacity of the Sydney Metropolitan Rail Network has been reached on most lines in recent years despite the introduction of a totally double deck fleet of rolling stock. A number of locations on the network have utilised this additional capacity with the greatest passenger growth being recorded in the west and south of the network.

Locations on the rail network identified by State Rail as requiring increased capacity include:

- Illawarra Line - between Sydenham and Erskineville;
- Main Western Line - between Lidcombe and Redfern;
- East Hills Line - between Riverwood and Wolli Creek Interchange;
- Richmond Line - between Riverstone and Blacktown;
- Main Northern Line - between Epping and Hornsby; and
- North Shore Line - between Hornsby and Chatswood.

A recently completed addition to rail infrastructure is the Harris Park Y-Link. This link was commissioned in November 1996, and influences the operation of the entire metropolitan rail network. The link provides a direct connection between Macarthur Line services and the Main Western Line, west of Harris Park. In the past, Macarthur passengers would be required to transfer at Granville to travel to Parramatta or Blacktown. Direct services between the sub-regional centres of Campbelltown, Liverpool, Parramatta and Blacktown are now possible.

Other railway projects which are in the feasibility stages include:

- Parramatta - Chatswood Rail Link; and
- Extension of the Eastern Suburbs Line to Bondi Beach.

Planning for the Second Sydney Airport has been premised on both road and rail access since the 1985 report on the Second Sydney Airport Site Selection Program (Kinhill Stearns, 1985). A proposal for an extension of the Sydney suburban rail network to a Sydney West Airport at Badgerys Creek from Glenfield appears in the draft State Rail Network Strategy 1994-2016, as a project for the medium to long term. This places the project for completion between 2000 and 2016.

Glenfield is a rail station with access to both the East Hills and Main Southern Lines. While the airport is shown as a terminus of the new rail link, the rail line will not serve only airport passengers. In noise affected areas, employment is expected to grow clustered around the airport. In areas where noise is not an issue, residential development is to be developed in a manner which resists car dependence in the expected in the catchment of rail stations.

While the final route has yet to be disclosed publicly, the extension will be approximately 20 kilometres in length from Glenfield to the airport. All rail options are for standard suburban rail infrastructure with operations integrated into existing services. There will remain a further possible extension of the route from the airport, north to the Main Western Line. This is to be considered in the State public works program for years post-2016. This proposal must be considered as being dependent on selection of Badgerys Creek as the preferred Second Sydney Airport site.

TABLE 5.2 TOTAL WORKFORCE AT SYDNEY AIRPORT IN 1995

	On-Site	Off-Site	Workforce
Major Airlines	17,415	4,354	21,769 ⁽¹⁾
General Aviation	666	166	832
Airport Government Services	1,408	352	1,760
Major support services	568	1,084	1,652
Airport Concessions and duty free	1,093	273	1,366
Transport companies and taxis	1,106	277	1,383
Accommodation	38	714	752
Freight forwarder and custom agents	200	3,795	3,995
Total	22,494	11,015	33,509

Source: ITS surveys, 1996.

Note: 1. Includes a large number of aircrew personnel

Attendance at Sydney Airport

The 70 percentile day was adopted for road design and traffic planning purposes associated with Sydney Airport (Masson & Wilson, 1996). This means that 70 percent of days would have less passengers than those indicated in Table 5.3. This planning criteria was used because constructing roads to meet peak demand is usually uneconomic. The number of daily passengers at each terminal on the design day in 1995 are summarised in Table 5.3.

TABLE 5.3 DAILY PASSENGERS AT SYDNEY AIRPORT FOR DESIGN PURPOSES (1996)¹

	International	Domestic	Total
Arrival	8,415	13,350	21,765
Departure	9,085	13,180	22,265
Total	17,500	26,530	44,030

Note: 1. 70 percentile day, and excludes transfer and transit passengers

The firm of Nelson English Loxton & Andrews (NELA) studied the road access and parking requirements of the International Terminal in 1984. This study included a survey of passengers, as well as meeters and greeters. In 1993, Long Technical derived generation rates for meeters and greeters as ratios to passenger numbers by adjusting the NELA survey information to reflect 1993 conditions. This information was updated once again by Masson & Wilson in conjunction with their latest ground access studies and requirements for the Olympics at Sydney Airport.

5.1.2 EXISTING TRAVEL DEMAND TO/FROM SYDNEY AIRPORT

Person Trips

In 1995, over 90,000 trips took place as persons came to and departed from Sydney Airport on the design day as shown in *Table 5.6*. Employees accounted for about 14,000 of these two-way trips.

TABLE 5.6 DAILY PERSON TRIPS TO AND FROM SYDNEY AIRPORT IN 1995

	International Terminal	Domestic Terminal	Freight	Total
Workforce	5,450	6,630	1,920	14,000
Passengers	17,500	26,530		44,030
Meeters/Greeters	18,000	14,845		32,845
Total	40,950	48,005	1,920	90,875

During the morning and afternoon peak hours, it has been estimated that over 10,000 person trips took place to and from Sydney Airport in 1995 as shown in *Table 5.7*.

Existing Travel Mode to and from Sydney Airport

The mode of travel of employees to Sydney Airport was obtained from the *Environmental Impact Statement prepared for the New Southern Railway* (Kinhill, 1994). The mode of travel reported in that survey was then adjusted to take into account those employees reported as travelling by rail had to change mode to get to the airport. The daily mode of travel of employees is included in *Table 5.8*.

The daily and peak hourly travel mode of passengers and meeter/greeters was derived from information used in the latest *Ground Access Study* (Masson & Wilson, 1996). The daily and peak hourly mode of travel of passengers and meeter greeters are included in *Table 5.9*. Peak hourly information for employees was also derived from this study and are included in *Table 5.8*.

TABLE 5.8 EXISTING EMPLOYEES MODE OF TRAVEL TO AND FROM SYDNEY AIRPORT (%)

Mode of Travel	Daily		AM Peak Hour		PM Peak Hour	
	Kinhill	Adjusted ¹	Arrival	Departure	Arrival	Departure
Car drivers ²	82	82	88	82	84	87
Car passengers	4	6	6	6	6	6
Taxis	4	4	4	3	4	4
Bus	3	8	2	9	6	3
Coaches	0	0	0	0	0	0
Walk and bicycle	1	0	0	0	0	0
Rail	6	0	0	0	0	0
Total	100	100	100	100	100	100

Source: Kinhill (1994) for Daily; and Masson & Wilson (1996) for Peak Hours.

Notes: 1. Adjusted to place bus/rail passengers in bus and car passenger categories

2. Includes motorcyclists

TABLE 5.9 EXISTING TRAVEL MODE OF AIR PASSENGERS AND MEETER-GREETERS TO AND FROM SYDNEY AIRPORT (%)

Mode of Travel	International Terminal					Domestic Terminal				
	Daily		AM		PM	Daily		AM		PM
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
Car drivers	26	33	29	34	24	32	36	36	38	34
Car passengers	42	46	47	47	35	30	34	35	35	32
Taxis	16	12	16	12	18	28	25	24	24	27
Bus	10	3	3	2	6	8	3	3	2	5
Coaches	6	6	5	5	17	2	2	2	1	2
Rail	0	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100

Existing Vehicle Trips to and from Sydney Airport

The number of daily and peak hourly vehicle trips generated by Sydney Airport in 1995 on a design day are summarised in Table 5.10. Vehicle movements totalled about 54,300 trips to and from Sydney Airport. During the morning and afternoon peak hour, some 6,710 and 6,900 vehicle trips to and from the Airport were generated respectively.

It has been found that about 70 percent of taxis who pick up passengers at the Airport also delivered passengers to the airport. This behaviour was taken into account when forecasting the number of taxis arriving and departing Sydney Airport. The number of buses serving the two terminals was obtained from the Sydney Buses' Timetables. From the information supplied by Masson & Wilson (1996), an estimate of the number of commercial vehicles, including trucks servicing the Sydney Airport in 1995, was made. They accounted for about 10 percent of all vehicles on top of the estimates for buses and coaches.

TABLE 5.10 DAILY AND PEAK HOURLY VEHICLE TRIPS AT SYDNEY AIRPORT IN 1995

		Employees				Passengers / Meeters and Greeters		Total Non- employees	Grand Total
		International	Domestic	Freight	Subtotal	International Subtotal	Domestic Subtotal		
Daily Trips (two-way)									
car		4,469	5,437	1,571	11,477	9,156	13,376	22,532	34,009
taxis		218	265	77	560	5,073	12,754	17,827	18,387
Service vehicles/trucks		289	364	617	1270	0	0	0	1,270
bus		28	28	28	84	177	184	361	445
coaches		0	0	0	0	126	38	164	164
Total	Two-way	5,004	6,094	2,293	13,391	14,532	26,352	40,884	54,275
AM Peak Arrival									
cars		474	1,164	185	1,823	592	729	1,321	3,144
taxis		21	51	8	80	206	549	755	835
Service vehicles/trucks		18	45	89	152	0	0	0	152
bus		2	1	0	3	3	3	6	9
coaches		0	0	0	0	6	2	8	8
Sub-total		515	1,261	282	2,058	807	1,283	2,090	4,148
AM peak Departure									
cars		78	190	118	386	547	703	1,250	1,636
taxis		3	8	5	16	277	522	799	815
Service vehicles/trucks		11	26	57	94	0	0	0	94
bus		2	1	0	3	3	3	6	9
coaches		0	0	0	0	6	2	8	8
Sub-total		94	225	180	499	833	1,230	2,063	2,562
Total		609	1,486	462	2,557	1,640	2,513	4,153	6,710
PM peak Arrival									
cars		156	381	82	619	768	1,220	1,988	2,607
taxis		7	17	4	28	246	867	1,113	1,141
Service vehicles/trucks		11	26	24	61	0	0	0	61
bus		2	1	0	3	3	3	6	9
coaches		0	0	0	0	6	2	8	8
Sub-total		176	425	110	711	1,023	2,092	3,115	3,826
PM peak Departure									
cars		379	924	211	1,514	147	557	704	2,218
taxis		17	41	9	67	106	499	605	672
Service vehicles/trucks		33	77	63	173	0	0	0	173
bus		2	1	0	3	2	4	6	9
coaches		0	0	0	0	6	2	8	8
Sub-total		431	1,043	283	1,757	261	1,062	1,323	3,080
Total		607	1,468	393	2,468	1,284	3,154	4,438	6,906

Existing Trip Distribution at Sydney Airport

The origin of work trips to Sydney Airport was derived from the journey to work information supplied by the Transport Data Centre of the NSW Department of Transport. Whilst this information underestimated the actual number of trips to the Airport, the distribution by home origin of the trips was considered reasonable. The distribution of trips by local government area of origin is included in *Appendix G*.

In the first instance, the home origin of air passengers included in *Table 5.11* was used to determine the origin and destination of air passengers to Sydney Airport. This information was then desegregated by local government area, based on the latest population estimates. Similar information for meeters and greeters was developed. The overall origins of both passengers and meeters and greeters are included in *Appendix H*.

TABLE 5.11 ORIGIN OF AIR PASSENGER TO SYDNEY AIRPORT (%)

	International Passengers			Domestic Passengers			Overall
	Business (20%)	Leisure (80%)	Both	Business (46%)	Leisure (54%)	Both	
Sydney CBD	30	34	33	26	26	26	28
Sydney Inner South	28	23	24	21	23	23	23
Sydney Inner North	14	11	12	16	11	12	13
Sydney Outer South	4	6	6	8	9	9	8
Sydney Outer North	21	18	19	24	20	21	21
Outer Sydney	67	58	60	69	63	64	65
Outside Sydney	3	8	7	5	11	10	7
Total	100	100	100	100	100	100	100

Source: New Southern Railway EIS (Kinhill, 1994)

5.1.3 FUTURE OPERATIONS AT SYDNEY AIRPORT

Planning of Sydney Airports

Air Traffic Forecasts for Sydney (Department of Transport and Regional Development, 1997) indicated that the expected number of air passengers will increase from 20.3 million in 1995/1996 to 40.4 million in 2009/2010 and to 63.2 million by 2025.

The assessment of the Second Sydney Airport was based on the examination of two separate years in the future, namely 2006 and 2016. These years have been used because 2006 would allow examination of the impacts of the proposed airport during the early years of its development and 2016 would demonstrate impacts when the operation of the airport may approach 30 million passengers a year.

TABLE 5.12 FUTURE DAILY ATTENDANCE AT SYDNEY AIRPORT AT FUNCTIONAL CAPACITY

	International Terminal	Domestic Terminal	Freight	Total
Employees	4,025	4,456	1,331	9,812
Air Passengers	28,513	35,846		64,359
Meeters/greeters	14,662	10,023		45,869
Total	47,200	50,325	1,331	98,856

Mode of Travel to and from Sydney Airport With a Railway Line

Present mode choice for persons travelling to the airports is shown in Table 5.8 for employees and Table 5.9 for Air Passengers and Meeters and Greeters. As well as changes in the road network serving the airport, major public transport infrastructure is also being added to the choice available for travellers. The New Southern Railway is expected to be opened in 2000. It integrates with the current City Circle service and the East Hills Lines, and includes within its direct catchment the CBD and some residential areas. Using information from the rail link's Environmental Impact Statement (Kinhill, 1994), diversion rates from existing mode of travel to the new Railway Line by employees and air passengers to Sydney Airport were forecast. The results are summarised in Table 5.13.

TABLE 5.13 DIVERSION RATES TO NEW SOUTHERN RAILWAY LINE (%)

	Airport Visitors						Employees	
	Car		Taxi		Bus		Car	Bus
	Business	Leisure	Business	Leisure	Business	Leisure		
Sydney CBD	17%	29%	17%	34%	77%	61%		
Outer Sydney	7%	5%	7%	8%	78%	55%		
Outside Sydney	10%	7%	13%	20%	87%	72%		
Overall	8%	7%	11%	21%	80%	61%	16%	50%

Source: New Southern Railway EIS (Kinhill, 1994)

Note: 1. Includes car passengers

The diversion is greatest, as a proportion, from existing public transport modes, particularly bus. It is worth remembering that a significant portion of those trips already had a rail component, so the New Southern Railway will allow those passengers to continue the trip on the train rather than interchange.

For car drivers, the diversion rates are the highest from the areas with the highest levels of access to rail service. Many outer areas will not perceive greater access to the airport with the opening of the train and will experience little diversion.

Future Vehicle Trips

Vehicle occupancies for cars and taxis were derived from the application of actual counts (Masson & Wilson, 1996) to the estimated person trips. The resulting estimates are summarised in *Table 5.16*. Bus occupancies were derived in a similar way. An average occupancy of 35 persons per coach was adopted.

TABLE 5.16 VEHICLE OCCUPANCIES

Occupancies	Employees	Air Passengers and Meeters/Greeters	
		International	Domestic
Car	1.07	2.64	1.94
Taxis	1	1.08 ¹	0.90 ¹
Buses	13.32	20.44	18.40
Coaches	n/a	35	35

Notes: 1. Averages over all taxi trips including vacant.

Vehicle trips were derived by the application of the appropriate vehicle occupancies included in *Table 5.16* to the predicted person trip totals in *Table 5.15*. The resulting daily and peak hourly number of vehicle trips by type, including the New Southern Railway, are summarised in *Table 5.17* and *5.18* respectively.

TABLE 5.17 FUTURE DAILY VEHICLE TRIPS AT SYDNEY AIRPORT WITH RAIL ACCESS

	Employees	Passengers and Meeter/greeters		Total
		International	Domestic	
Car drivers	13,517	12,534	15,431	41,482
Taxis	785	6,374	13,985	21,144
Bus	59	142	88	289
Coaches	0	206	50	256
Sub-Total	14,361	19,256	29,554	63,171
Service vehicles / trucks	1,787	0	0	1,787
Total	16,148	19,256	29,554	64,958

Road Improvements

Sydney Airport is a key centre of economic activity within the metropolitan region and a major generator of travel. The expected short and long term growth of the airport combined with residential and commercial growth in the surrounding area has established the need for development of transport infrastructure to maintain access to the area. The State Government's Integrated Transport Strategy for Greater Sydney (Department of Transport, 1995) identifies the Airport-Central Sydney Corridor as a key transport corridor. Among the declared benefits of increased infrastructure in the corridor is that it would greatly improve links to the Airport from both the City and the South/South West. The metropolitan transport strategy recognises the airport as both a major transport terminal, and an important employment centre.

The key short term road developments expected to be completed by the year 2000 as part of the State Road Network Strategy (Roads and Traffic Authority, 1994) are the M5 East and the Eastern Distributor.

The M5 East Motorway EIS (Manidis Roberts, 1994) identified Sydney Airport as part of a significant economic zone that also includes the Central Industrial Area of Sydney and Port Botany. The tendency for technology enterprises to locate near airports was highlighted as a major contributor to expected increased demands for access to the region. The EIS concluded that current traffic volumes are high and would be expected to increase significantly by 2011.

The high proportion of heavy commercial vehicles amongst this traffic, and their impact on amenity and quality of life in the surrounding residential areas, was identified as a key issue in establishing the need for transport improvements.

The EIS for the Eastern Distributor (Rust PPK, 1996a) placed a similar emphasis on Sydney Airport as a significant contributor to economic activity in the region and its expected expansion as a major component of the need for transport infrastructure improvements in the region.

At a regional level, the M5 East and Eastern Distributor will form part of the Sydney Orbital road system which forms a key part of the State Road Network Strategy.

Other projects in the vicinity of the airport under consideration by the Roads and Traffic Authority for completion by 2001 include the extension of Bourke Road from Gardeners Road to Coward Street and, for completion by 2006, the establishment of O'Riordan Street and Bourke Road as a one-way pair between Green Square and Robey Street.

5.1.5 LIMITATIONS ON LAND TRANSPORT AT SYDNEY AIRPORT

Air passenger demand would be constrained by remaining with a single facility at Sydney Airport. This constraint relates in part to the aircraft handling capacity of the site, but it also relates heavily to the land transport facilities that will give access to Sydney Airport in the future. These limitations include:

- a site which is enclosed within a road network subject to daily congestion peaks due to journey to work travel demands. The road works proposed by Masson & Wilson (1996) to the Federal Airport Corporation are to maintain the level of service, not to seek significant improvement. Their main objective is to try and isolate the airport from the other through and local traffic demands. This may be possible with the immediate access roads, but the major regional roads will continue to be shared with general urban traffic, and with no priority to airport users;
- many of the major road projects that have been identified and assumed to be in place in the traffic modelling are of a controversial nature and may be developed later than anticipated or in a different form;
- high value fresh produce that is suitable for air shipment has to be trucked across all of the metropolitan area to get from production areas to the airport;
- the new rail link is well integrated with the local train service, but that also leaves it subject to the overall priorities of the CityRail network. While some existing stations may receive more frequent service once the New Southern Railway opens, these benefits will be offset by the less frequent service to some other stations, and the need for skip stop service through less important stations to achieve timetables targets. The Macarthur and East Hills carriages are often full in peak periods, before they reach the new rail link, although capacity in the reverse commuter direction is good. The New Southern Railway does not so much add capacity to the rail network as add choice;
- with the rail link having a surcharge, and the airport being so close to the Sydney central business district, groups of two or more travelling to the airport may still prefer taxis. The diversion to public transport may not be as great when smaller time and cost savings are achieved; and
- the proximity of the two international ports, Sydney Airport and Port Botany, is of great benefit to goods movements between the two. Yet for unrelated goods movements, which is the larger quantity, the two major freight destinations conflict with each other.

5.3.1 POTENTIAL EXPANSION OF TRANSPORT SERVICES

Strategic planning for Sydney's rail network contains a series of infrastructure extensions. Recently, and since most of the base data for airport travel patterns was completed, the Harris Park Y-link was completed under the Building Better Cities Program. This enabled the Cumberland Line to commence operations between Campbelltown and Blacktown, improving service frequency throughout this growing area. A new line is under construction at Homebush Bay to serve Olympic Park, the venue of the 2000 Olympics, but also the site of the annual Royal Easter Show, Aquatic Centre and major sporting facilities with regularly scheduled major events.

Also under construction is the new Sydney Light Rail system which connects Sydney's major interchange, Central Station, with the Darling Harbour attractions, convention centre and Casino. The hotels and attractions on this line are an easy transfer from the New Southern Railway service to the airport.

Consideration by State Rail is also being given to major new links such as the Parramatta to Chatswood Rail link, the Warringah rail line between Chatswood and Mona Vale, and extension of the light rail to Lilyfield.

Changes in bus service are less infrastructure dependent. Cross regional services, that is bus routes that directly connect suburban centres without first serving the CBD, are being introduced through Sydney. To date the most successful has been the 400 service with termination points of Bondi Junction and Burwood. Passengers are not attracted for travel specifically between the termination points, but for the many destinations between them. This route serves the University of New South Wales, Sydney Airport, and several shopping centres. Passenger numbers have continued to grow and more services have been added. This pattern will continue as long as ridership grows. The special Airporter Bus service operated by Sydney Buses is expected to continue once the New Southern Rail line opens and will remain a transport option for travellers to the airport. Highway improvements such as the Eastern Distributor may add to its attractiveness.

5.3.2 NEW SOUTHERN RAILWAY LINE

In addition to other rail projects, the most directly related to the airport is the New Southern Railway. It is a shared infrastructure project developed by government and private sector funds and built by the private sector. It is currently under construction, and is due to start operating in 1999 or early 2000. The new railway will have a stop each for the international and domestic terminals at Sydney Airport. It will link to the City Circle Line inbound and to the East Hills Line outbound. Transfers can be made at Wynyard (North Shore), Town Hall (Eastern Suburbs) and Central

As a nominated activity centre, employment growth at Sydney Airport was to be specifically addressed through transport improvements. The mode share assumed in the base case for the various public transport modes of rail, bus, coach and taxi were based on present levels, forecasts for new facilities, and based on a continuing program of car constraint at the airport. Given the levels of growth in activity forecast, the proportions could not reasonably be increased beyond these levels.

5.4 ROAD AND TRAFFIC CONDITIONS IN THE FUTURE

5.4.1 SETTING A BASE CASE FOR FUTURE TRAFFIC VOLUMES

Basis of Trip Tables for 2006 and 2016

The Metropolitan Sydney strategic modelling involved two distinct stages. The first was to use the forecasts of future population (based on projections by the NSW Department of Urban Affairs and Planning) and employment distribution, together with forecast characteristics of the future Sydney rail and road transport system, to arrive at a range of estimates of future road travel in terms of numbers of vehicle trips between specific origin and destination points. The estimation of the numbers of vehicle trips between specific origin and destination points was carried out by Long Technical using the EMME/2 software package.

The output represents the morning peak hour. The afternoon peak hour trip table was assumed to be the reverse of the morning peak. Trip tables for 2006 and 2016 were thus developed.

Future Road Network Assumptions for Modelling

A set of projected roadworks included in *Appendix C*, were assumed for modelling purposes to indicate the minimum network improvements which would be required to alleviate congestion and meet the needs of metropolitan and economic growth of the Sydney region in 2006 and 2016.

The objective of modelling road traffic patterns without a Second Sydney Airport was to establish traffic conditions on the road network around the sites of the potential airport sites in the forecast years of 2006 and 2016 without the additional traffic associated with a second airport. This analysis allowed a distinction to be made between background traffic conditions, or Base Case and any additional traffic associated with a particular Second Sydney Airport option.

- western region including the Western Freeway (M4), links from Liverpool and Hoxton Park to the north, and roads in the vicinity of Badgerys Creek;
- links east of Liverpool including the Hume Highway, Newbridge Road and M5 Motorway; and
- southern region including sub-arterial roads in the Holsworthy region and links from Liverpool to Sutherland and Illawarra.

Traffic conditions outside these regions were not assessed and road network improvements not identified.

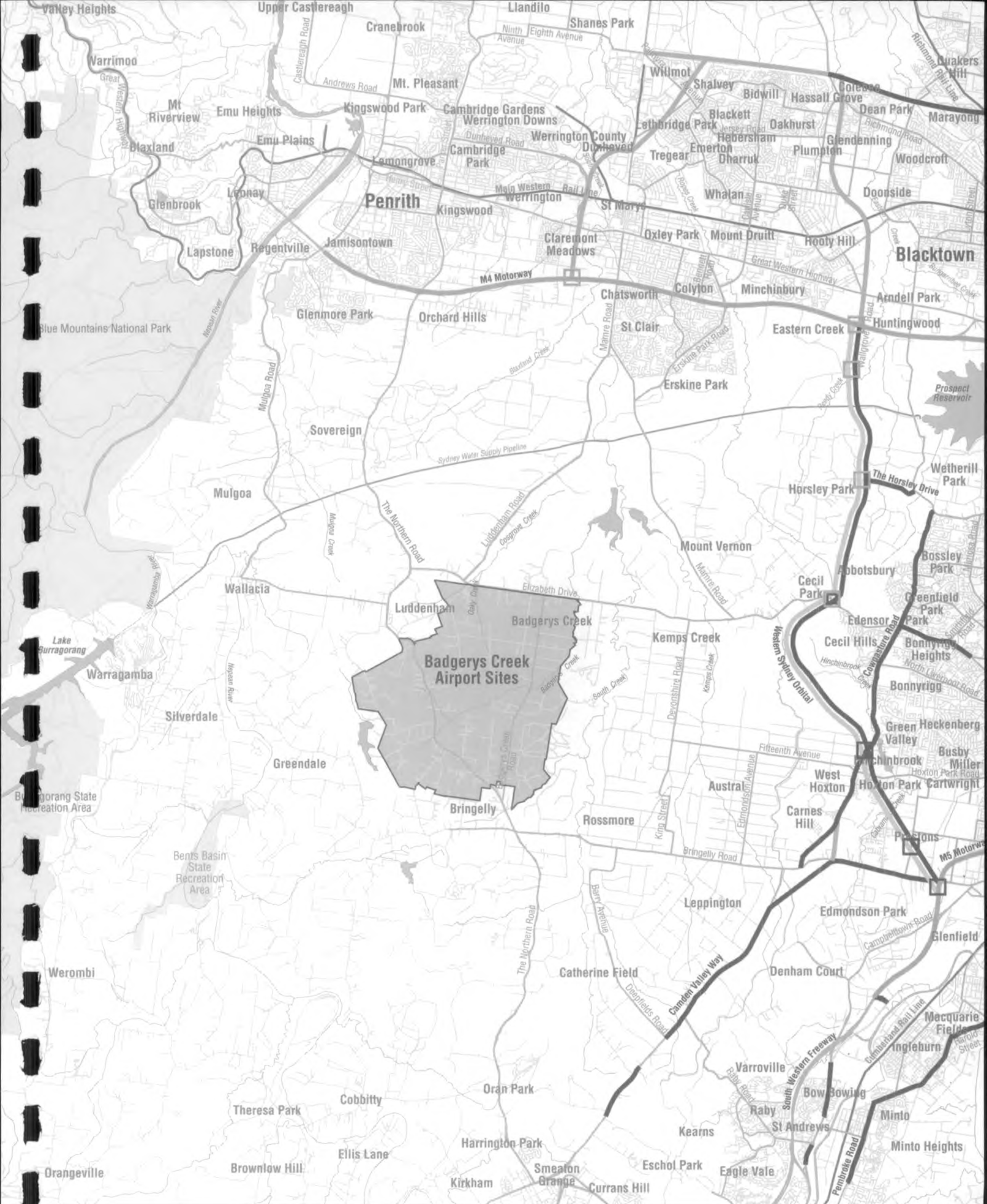
In discussing conditions predicted by the traffic model for 2006 and 2016, reference is also made to locations where recent traffic counts indicate that current (1996) level of service is poor, in the range E to F.

Daily volumes, and morning and afternoon peak hourly one-way volumes and Level of Service for all major roads in the study area are listed in *Appendix I*. Results are shown for existing traffic counts (1996), and results from the 2006 and 2016 model runs. A summary of daily volumes at selected locations is included in *Table 5.20*. Road network improvements necessary to accommodate the increased traffic in 2006 and 2016 are illustrated in *Figures 5.1* and *5.2*. All potential road improvements needed to accommodate predicted future background traffic would of course be subject to state and local government planning and policy consideration and separate environmental assessment procedures.

South West Corridor

The residential areas of the South West corridor are expected to experience strong growth through to the forecast years of 2006 and 2016 leading to significant increases in traffic demand along the South Western Freeway and the parallel routes of Campbelltown Road, Camden Valley Way and the Pembroke Road/Minto Road/Canterbury Road link between Campbelltown and Glenfield.

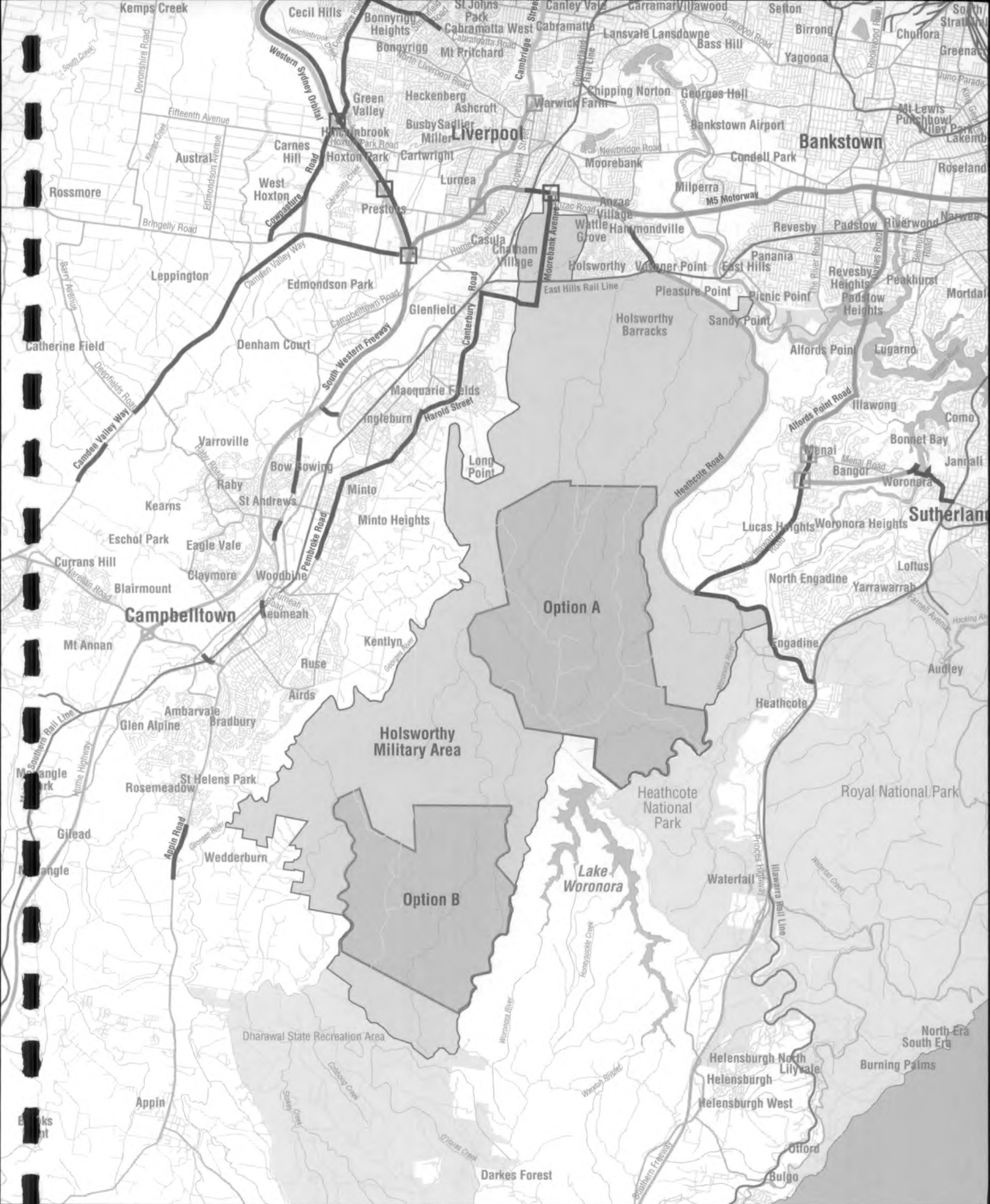
In *Appendix C* it was suggested that limited capacity improvements may be implemented in this corridor with only isolated capacity improvements on Campbelltown Road at Leumeah and climbing lanes on Camden Valley Way. The model suggests that as a consequence, traffic conditions will be at Level of Service E or F on many sections of these routes, particularly to the north of Campbelltown.



- Four Lanes by 2006
- Six Lanes by 2006
- Four Lanes by 2016
- Six Lanes by 2016
- Grade Separation by 2006
- Grade Separation by 2016

Figure 5.1
**Road Network Improvements Required for
 Background Traffic Around Badgerys Creek Airport Sites**





- Four Lanes by 2006
- Six Lanes by 2006
- Eight Lanes by 2006
- Four Lanes by 2016
- Six Lanes by 2016
- Grade Separation by 2006
- Grade Separation by 2016

Figure 5.2
**Road Network Improvements Required for
 Background Traffic Around Holsworthy Military Area**



0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000

Improvements that are likely to be necessary by 2006 in this area to achieve satisfactory level of service include:

- widening of South Western Freeway to six lanes from north of Brooks Road to Liverpool (start of M5 Motorway);
- widening of the following sections of Campbelltown Road to four lanes; railway crossing between Blaxland and Rudd Roads; two lane section immediately south of Raby Road; and between Ben Lomond Road and Williamson Road;
- widening of Brooks Road, Denham Court between Williamson Road and South Western Freeway to four lanes;
- widening of remaining two lane sections of Camden Valley Way to four lanes between Narellan Road and Hume Highway;
- establishment of a four lane route parallel to, and east of, the South Western Freeway between Campbelltown and Glenfield;
- widening of Narellan Road to four lanes over railway west of Appin Road;
- extension of four lane section of Appin Road south of Copperfield Drive to Mt Gilead.

The model results suggest that these improvements would be sufficient to cater for predicted 2016 demand.

Western Region

Strategic transport plans for Sydney have long recognised that a strong demand exists for travel between the South Western region of Sydney and the employment districts of Western and North Western Sydney including the Parramatta CBD. Currently road traffic demand is serviced by arterial links such as Wallgrove Road, Cowpasture Road and Cumberland Highway. This region will be the focus of considerable network improvements, and for the purposes of this study the projects listed below and included in *Appendix C* were incorporated into the model networks.

Projects assumed completed by 2006:

- construction of Western Sydney Orbital, Stage I from M5 Motorway to Elizabeth Drive of two lane freeway standard with grade separation at the M5 Motorway, Bernera Road, Cowpasture Road and Elizabeth Drive/Wallgrove Road;

The 2006 Base Case scenario predicts that Stage I of the Western Sydney Orbital would experience heavy congestion over its full length and that construction of a four lane facility would better match demand and be consistent with the Wallgrove Road duplication to the north. By 2016, volumes on the Orbital between the M4 and M5 Motorways are predicted to give Level of Service E to F indicating that widening to six lanes for this section may be appropriate.

Demand for travel along the Western Freeway (M4) is predicted to increase to the extent that even with widening to six lanes, volumes in 2006 will approach or exceed capacity east of Wallgrove Road. The seven lane facility assumed for the section of the Motorway, between Church Street and Coleman Street, west of Parramatta, will also experience volumes in excess of capacity.

Sections of the existing two lane Cowpasture Road currently operate close to capacity on a two lane facility. Upgrading to four lanes by 2006 in conjunction with the duplication of Wallgrove Road and the completion of the Western Sydney Orbital in 2016 would allow this facility to operate with acceptable level of service through to 2016.

Current conditions on the following roads around Badgerys Creek are at acceptable level of service, and in the Base Case scenarios are expected to remain so through to 2016:

- Mulgoa Road;
- The Northern Road;
- Elizabeth Drive between The Northern Road and Mamre Road;
- Luddenham Road; and
- Mamre Road.

Links East of Liverpool

Demand for travel across the Georges River east of Liverpool on Newbridge Road and the M5, and on the Hume Highway to the north, is currently such that these routes operate at level of service E to F in the morning and afternoon peak periods. The 2006 road network incorporates the completion of the M5 East Motorway, and the widening of the current two lane section between Fairford Road and King Georges Road to four lanes. However, no capacity improvements are incorporated for the M5 west of Fairford Road. By 2006, conditions are expected to be poor at level of service F east of Liverpool on the three routes identified above.

Traffic levels for Alfords Point bridge in the peak flow direction are predicted to exceed capacity in 2006, suggesting the need for widening to three lanes in the peak direction. Duplication of the Alfords Point bridge to attain two traffic lanes in each direction has been incorporated into the 2016 network, but this does not improve capacity for the peak flow direction. Capacity improvements to six lane divided carriageway standard would also be required to Davies and Fairford Roads connecting with the M5 Motorway. By 2016 grade separation would be required on Alfords Point Road at Menai Road/Old Illawarra Road and Bangor bypass/New Illawarra Road.

Further to the east, current volumes on the Princes Highway and Taren Point Road crossings of the Georges River, both currently six lane facilities, are at capacity and improvements will be required to accommodate expected increases in years 2006 and 2016.

In the Holsworthy region the Cambridge Avenue / Moorebank Avenue two lane link between Glenfield and Moorebank attracts large volumes of traffic bypassing the Hume Highway and South Western Freeway. Currently traffic is in excess of capacity and widening to four lanes would be required by 2006 even without any traffic associated with a second airport.

5.4.3 ASSESSMENT OF CRITICAL INTERSECTIONS

The capacity of the street system is largely dependant upon the capacity of critical intersections. All relevant intersections, including unsignalised, signalised and roundabout controlled intersections which may be directly affected by a Second Sydney Airport were analysed using a software package called INTANAL. The basis of this analysis is described in *Appendix E*.

Signalised intersections are assessed based on the average delay (seconds per vehicle) of all vehicles using the intersection within the peak hour. Unsignalised intersections and roundabouts are assessed based on the minor movement with the highest average delay in seconds per vehicle.

Assessments were carried out for 2006 and 2016. The intersection requirements were based on a requirement to achieve no worse than a projected level of service D (refer *Appendix E*).

The following intersections require upgrading in the future:

Wallgrove Road/Horsley Drive

By 2006, this intersection would need to be signalised and upgraded to provide more than two lanes on some approaches. This assumes that the Western Sydney Orbital would not be constructed by 2006. However, by 2016, a significant proportion of traffic using this intersection would travel

that passenger demand and employment levels will not grow at the same rate. Past trends in productivity for the air and space transport sector have been one to one point five per cent per annum. For this study, a one percent per annum productivity improvement was assumed over the 20 years to 2016 (Rust PPK, 1997b). The anticipated workforce for each Air Traffic Forecast scenarios at both Airports are given in *Table 6.2*.

TABLE 6.2 TOTAL WORKFORCE

	Air Traffic Forecast 1		Air Traffic Forecast 2		Air Traffic Forecast 3	
	2006	2016	2006	2016	2006	2016
Sydney Airport						
International	25,156	22,773	20,856	18,880	5,805	5,255
Domestic	18,870	17,082	15,570	14,095	17,529	15,869
Freight	3,368	3,049	2,784	2,520	2,211	2,002
Total	47,394	42,904	39,210	35,495	25,545	23,126
Second Sydney Airport						
International	4,085	16,934	8,385	20,827	23,436	34,452
Domestic	2,990	9,615	6,290	12,602	4,331	10,828
Freight	539	1931	1123	2459	1695	2978
Total	7,614	28,480	15,798	35,888	29,462	48,258

6.2 MODELLING SCENARIOS USED FOR ASSESSMENT

6.2.1 SCENARIOS USED IN ASSESSMENT

The following scenarios were adopted for the evaluation of the impact of a Second Sydney Airport, at either Badgerys Creek or Holsworthy, on the surface transport infrastructure:

- the first scenario is based on Air Traffic Forecast Two which assumes 10 million and 24.8 million air passengers at Second Sydney Airport and Sydney Airport respectively in 2006;
- the second scenario is based on Air Traffic Forecast Three which assumes about 30 million and 19 million air passengers at Second Sydney Airport and Sydney Airport respectively by 2016.

Travel demand for the other forecast scenarios have also been estimated and are included in the following sub-sections.

6.3.2 FUTURE SURFACE TRAVEL DEMAND

The estimated level of travel demand to and from the Sydney Airport and the Sydney Second Airport are detailed in *Appendix J* and summarised in *Table 6.4*.

TABLE 6.3 FUTURE ON-SITE DAILY ATTENDANCE (PERSONS)

	Air Traffic Forecast 1		Air Traffic Forecast 2		Air Traffic Forecast 3	
	2006	2016	2006	2016	2006	2016
Sydney Airport						
Employees	9,812	8,883	8,114	7,346	5,380	5,380
Air Passengers	43,175	43,175	33,646	33,646	9,966	9,966
Meeters/greeters	45,869	45,869	39,098	39,098	46,830	46,830
Total	98,856	97,927	80,858	80,090	62,176	62,176
Second Sydney Airport						
Employees	1,573	5,743	3,271	7,280	5,443	9,246
Air Passengers	7,012	32,108	14,393	39,094	40,227	62,057
Meeters/greeters	7,988	28,371	16,803	37,186	11,569	30,354
Total	16,573	66,222	34,467	83,560	57,239	101,657

TABLE 6.4 FUTURE SURFACE TRAVEL DEMAND

	Air Traffic Forecast 1		Air Traffic Forecast 2		Air Traffic Forecast 3	
	2006	2016	2006	2016	2006	2016
Daily Person Trips (Two-way)						
Sydney Airport	133,353	131,495	108,942	107,406	82,299	81,173
Second Sydney Airport	22,273	89,069	46,298	112,242	78,871	138,610
Peak Hourly Person Trips (Two-way)						
<i>AM Peak Hour</i>						
Sydney Airport	14,913	14,577	12,176	11,899	9,292	9,058
Second Sydney Airport	2,475	9,788	5,147	12,346	8,623	15,190
<i>PM Peak Hour</i>						
Sydney Airport	14,716	14,391	12,113	11,843	10,206	9,980
Second Sydney Airport	2,457	9,502	5,124	12,067	7,621	13,980

By 2016, with 30 million air passengers annually), about 150,000 trips are expected to take place to and from the Second Sydney Airport on the design day. This would lead to about 16,500 and 15,200 person trips during the morning and afternoon peak hours as shown in *Table 6.4*.

Assumptions for Level of Service of Rail to Second Sydney Airport

In order to estimate the mode share to rail, the following assumptions were made:

- all Second Sydney Airports are served by a station with easy access to all the terminal facilities;
- all airports will have a rail service of at least 15 minute frequency in the off-peak;
- fares would be of a nature expected to encourage use of the suburban rail system;
- some restrictions on car parking would be implemented on the site for passengers, employees and casual visitors; and
- residents and employees within a five kilometre catchment would have a direct feeder bus service to the station.

Mode of Travel to Second Sydney Airport

The mode choice for person travelling to the new airport are largely expected to be the same. Table 6.6 provides the mode choice, when rail is not available. For employees, the number using taxis is expected to decrease due to the longer average trip and consequent higher cost. Bus use also falls because of the more dispersed pattern of development around the airport. Using a bus for many workers will require more transfers with less frequent service. The employees then have a greater chance of driving or being passengers in cars.

A rail line has formed part of the transport strategy for the Badgerys Creek potential site for the Second Sydney Airport for some time, and is incorporated into both the State’s Integrated Transport Strategy and draft CityRail Strategic Plan.

TABLE 6.6 EXPECTED DAILY MODE OF TRAVEL TO SECOND SYDNEY AIRPORT

Mode of Travel	Employees		International ¹		Domestic ¹	
	No Rail	Rail	No Rail	Rail	No Rail	Rail
Car drivers	85%	72%	28%	25%	33%	30%
Car passengers	8%	5%	46%	40%	31%	28%
Taxis	2%	1%	15%	12%	28%	22%
Bus	5%	2%	5%	2%	6%	3%
Coaches	0%	0%	6%	6%	2%	2%
Rail	0%	20%	0%	15%	0%	15%
Total	100%	100%	100%	100%	100%	100%

Note: 1. Includes passengers and meeters/greeters

TABLE 6.7 FORECAST DAILY PERSON TRIPS - SECOND SYDNEY AIRPORT

Air Traffic Forecast 2 - 2006				
Without Rail				
Mode of Travel	Employees	International¹	Domestic¹	Total
Car drivers	5,600	5,400	6,800	17,700
Car passengers	500	8,900	6,300	15,700
Taxis	100	2,900	5,700	8,800
Bus	300	1,000	1,200	2,500
Coaches	0	1,200	400	1,600
Rail	0	0	0	0
Total	6,500	19,400	20,400	46,300
With Rail				
Mode of Travel	Employees	International¹	Domestic¹	Total
Car drivers	4,700	4,900	6,100	15,700
Car passengers	300	7,700	5,700	13,800
Taxis	100	2,300	4,500	6,900
Bus	100	400	600	1,100
Coaches	0	1,200	400	1,500
Rail	1,300	2,900	3,100	7,300
Total	6,500	19,400	20,400	46,300
Air Traffic Forecast 3 - 2016				
Without Rail				
Mode of Travel	Employees	International¹	Domestic¹	Total
Car drivers	15,700	23,300	12,200	51,200
Car passengers	1,500	38,200	11,500	51,200
Taxis	400	12,500	10,400	23,300
Bus	900	4,200	2,200	7,300
Coaches	0	5,000	700	5,700
Rail	0	0	0	0
Total	18,500	83,200	37,000	138,700
With Rail				
Mode of Travel	Employees	International¹	Domestic¹	Total
Car drivers	13,300	20,800	11,100	45,200
Car passengers	900	33,200	10,400	44,500
Taxis	200	10,000	8,100	18,300
Bus	400	1,700	1,100	3,200
Coaches	0	5,000	700	5,700
Rail	3,700	12,500	5,600	21,800
Total	18,500	83,200	37,000	138,700

Note: 1. Includes passengers and meeters/greeters. For every two international passengers, there will be a meeter and greeter trip to and from the airport, while for every four domestic air travellers, a meeter or greeter trip is generated.

6.3.5 TRIP DISTRIBUTION OF EMPLOYEES

Based on the existing distribution of Sydney Airport employees in the Sydney Basin, the ratio of airport employees to population within each local government area was calculated. Relationships between these rates and travel distances between each local government area and Sydney Airport were then developed to establish the effect of distance on home location of employees.

These relationships were then used to estimate the home origin by local government area of employees at each of the sites for a Second Sydney Airport, as described in detail in *Appendix M*.

6.3.6 TRIP DISTRIBUTION OF AIR PASSENGERS AND MEETER/GREETERS

The following methodology was used to establish the distribution of air passengers to and from the Second Sydney Airport. A similar trip distribution was adopted for the meeters and greeters.

- The ratio of existing international and domestic air passengers to existing population within each local government area was calculated.
- Each ratio was then applied to the corresponding local government area future population in 2006 and 2016 to establish the future number of international and domestic air passengers within each local government area.
- A gravity model based on travel time from each local government area to Sydney Airport and each Second Sydney Airport site was then developed to distribute the trips derived between the two airports. The rationale being that given a choice, and everything else being equal, air passengers would generally select the closest airport.
- The derived trip distribution for air travellers in 2006 and 2016 to Sydney Airport and the Second Sydney Airport were then calculated for each of the scenarios defined in *Table 6.10*.
- These distributions were also used for trips by meeters and greeters.

TABLE 6.11 AIRPORT RELATED EMPLOYMENT FORECAST

	Air Forecast 2 2006				Air Forecast 3 2016			
	On-site	Off Site	Catchment	Total	On-site	Off Site	Catchment	Total
SAA at Badgerys Creek Option C								
Airport Related	10,700	5,100		15,800	35,270	12,990		48,260
Ancillary		2,000	4,100	6,100		6,000	12,630	18,630
Total	10,700	7,100	4,100	21,900	35,270	18,990	12,630	56,890
SAA at Holsworthy Option A								
Airport Related	10,700	5,100		15,800	35,270	10,100	2,890	48,260
Ancillary		2,000	4,100	6,100			21,530	21,530
Total	10,700	7,100	6,500	21,900	35,270	10,100	24,420	69,790
SAA at Holsworthy Option B								
Airport Related	10,700	5,100		15,800	35,270	8,670	4,320	48,260
Ancillary		2,000	4,100	6,100			22,400	22,400
Total	10,700	7,100	4,100	21,900	35,270	8,670	26,720	70,660

Part C

Assessment of Impacts

Option B - Expanding the Original Proposal

Option B uses the original runway orientation developed in 1985, but provides greater separation between the parallel runways to allow a better layout for terminals and other facilities. The total area of the site would be about 2,900 hectares. All airport facilities would be located between the runways with an upgraded Elizabeth Drive again provided the main access to the terminal area and the Northern Road providing the main access to aircraft maintenance and general aviation areas.

Option C - North/South Alignment

The original proposal for the north-east to south-west runway alignment at Badgerys Creek was developed in the context of the flight paths that existed in Sydney at that time. Since then the way Sydney Airport operates and the volume of air traffic has changed.

Initial investigations suggest that some conflict may arise from future operations at Badgerys Creek using the original runway alignment and Sydney Airport. Due to these potential difficulties, a north-south runway alignment at Badgerys Creek is being considered in the EIS. The total area for Option C would be about 2,850 hectares.

7.1.2 BASIS OF ASSESSMENT AND EVALUATION

The three options for a Second Sydney Airport at Badgerys Creek reach an operating level of 30 million passengers per year. Furthermore, the surface access (road and rail) to all three options would be similar. Therefore, the three airport options would generally have the same impact of the road infrastructure.

Whilst the number of potential passengers on a new rail line to the airport would be the same for the three options under considerations, the route for Option C may be different than that for Options A or B as discussed later on in this chapter. Option A will necessitate a smaller workforce than Options B and C (refer *Table 3.4*), thus generating less traffic. Therefore, the later options were adopted for the assessment of construction activities on the road network.

The approach described in *Chapter 6.4.1* was used to establish the likely home origin of construction employees at a Second Sydney Airport at Badgerys Creek. The basis of this approach is the premise that the closer the local government area is to the airport, the larger the number of airport employees within it.

The construction truck traffic distribution along approach routes, however, was based on the likely origin and quantity of materials delivered to the site. It is understood that the majority of materials will reach the site by road from the south. Fuel for construction vehicles would be obtained from a refinery at Silverwater (Second Sydney Airport Planners, 1997).

The most likely approach routes to the airport site at Badgerys Creek have thus been identified for construction traffic with respect to both the workforce and the transport of construction materials as noted in *Table 7.2*.

TABLE 7.2 DAILY TWO-WAY CONSTRUCTION TRAFFIC ALONG MAJOR ROUTES TO BADGERYS CREEK SITE¹

Approach Routes	Cars		Trucks		Total	
	%	Volume	%	Volume	%	Volume
Wallgrove Road/Elizabeth Drive/ The Northern Road	21	812	1	10	18	822
Elizabeth Drive (east of Wallgrove Road)/ The Northern Road	39	1,484	0	0	32	1,484
Bringelly Road, east of The Northern Road	18	683	59	534	26	1,217
The Northern Road, south of Bringelly Road	7	276	20	178	10	454
The Northern Road, north of Elizabeth Drive	9	352	20	178	11	530
Mamre Road/Luddenham Road/ Elizabeth Drive/The Northern Road	5	175	0	0	3	175
Total	100	3,782	100	900	100	4,682

Note: 1. Assumes construction to master plan stage.

7.2.3 IMPACT ON ROAD NETWORK

Daily and peak hourly traffic volumes along the major approach routes to the site with and without construction activities are included in *Table O1* of *Appendix O*, and summarised in *Table 7.3*. The effect of construction traffic on the level of service of the major approach routes to the site have been assessed. The results of this analysis are also included in *Appendix O*. This analysis has been taken into account by conversion of all truck traffic to its equivalent passenger car units.

7.2.4 ROLE OF PUBLIC TRANSPORT IN CONSTRUCTION PHASE

Virtually all the traffic for the construction phase of the airport is assigned to the roads. Public transport is considered to have little or no role in the construction phase. The main reasons for this is that even if it is decided to construct an extension of the East Hills line to the Second Sydney Airport, it is not expected to be operating before the airport is opened. Local bus services, which interchanges with train services and Liverpool and Penrith stations are relatively infrequent, but may carry a few employees. The buses are included in the traffic numbers forecast for the surrounding road network.

7.2.5 IMPLICATION OF FUTURE RAIL PROPOSALS ON AIRPORT CONSTRUCTION

The proposal for a rail extension to Badgerys Creek does contain the potential for a later extension of the line to St Marys. This later stage would connect a loop between the East Hills and Main Western lines, which would potentially assist in rail operations by turning a spur line into a service loop. As well as enabling cross-suburban commuting, the rail link could have a freight role by providing an outer train path, away from the crowded commuter network of the inner city.

While this is a proposal only, it offers sufficient benefit to the rail network that it should not be built out by the airport proposal. It has been suggested in earlier documents for State Government that provision should allow for the train tunnel to the airport station to extend to the northern limit of the airport site so that any later rail works did not conflict with operations of the airport.

Construction traffic related to the building of the railway has not been added into the employment totals for the airport. On site rail works associated with the station will need to be carried out before major airport construction activity commences, so the impact is an extension of the construction period rather than an addition to the peak.

The employee and truck numbers are not expected to increase beyond the peaks discussed earlier. However, when the rail project is in final planning, the calculations should be carried out to ascertain the cumulative traffic impacts.

1985) identified a number of routes between Glenfield on the Main Southern Line and East Hills Line and the airport site at Badgerys Creek.

A number of rail route alignments have been investigated since the 1985 *Draft Environmental Impact Statement* by Kinhill Stearns. The *South Creek Valley Regional Environmental Study (1991)* incorporated a 'major transport route', which was not included in the *Integrated Transport Strategy for the Greater Metropolitan Region* (NSW Department of Transport, 1995). Neither current rail option follows this early proposed route, and it was abandoned officially in 1992.

In 1992, Kinhill Engineers recommended a transport route that followed Camden Valley Way/Bringelly Road/Badgerys Creek Road, with space for both road and rail in the right of way (Kinhill Engineers, 1992a). It did not proceed because there was little support for a rail link at the time on the airport site, the route "severed" communities, and it took the rail too directly to the airport without adequately serving centres in the South Creek release area. Later in 1992, a new preferred rail scheme, 'the southern option' was adopted by a state and local planning committee that served South Creek.

Kinhill Engineers carried out a detailed study which recommended the southern option (Kinhill, 1992b). While this corridor has never been reserved or adopted, it has formed the basis of all later rail planning. A 1993 NSW Government decision followed that preserved a route between Glenfield and Edmondson Park solely by deferring any local environmental plans that might affect the route, while proceeding with development adjacent to the route to enhance demand for the future train service. The NSW Government requested an economic appraisal.

The 1994 Travers Morgan economic appraisal looked at two options, both on the southern route (Travers Morgan, 1994). The first terminated the line at Bardia while the second continued to Edmondson Park. It also looked at three residential density scenarios for residential development within one kilometre of the stations (15 dwellings per hectare, 35 dwellings per hectare and 63 dwellings per hectare which yielded catchment populations of 32,400, 45,200 and 57,300 respectively). The major economic value of the rail projects were in reduced private vehicle operation costs. It concluded that the two stations rail project was viable if residential densities at Bardia were realised in the medium to high range.

The 1994 appraisal was augmented in 1995 by a financial and economic evaluation which examined the entire corridor to the airport (Travers Morgan, 1995). This study, in particular, carried disclaimers due to lack of land use plans, population projections, established route, and levels of service offered. Their results showed that project viability relied upon the variable of total travel time. The service had to be fast to attract passengers.

serve additional stations, but that would bring travel time penalties, as well as additional costs.

The rail access route alignment investigated by the Second Sydney Airport Planners (1997) incorporates the new runway configurations proposed in this EIS for Badgerys Creek. As stated earlier, Option C is being assessed in this section because it represents a 'worst case' for traffic impacts. The runway layout influences the alternative routes of the rail link as noise affected areas surrounding the airport would not be suitable for residential development. The higher use and realigned runways thus restrict the location of intermediate stations along the route.

The railway would be constructed at grade, except in the airport site itself where it would be placed underground to facilitate access to the airport and terminal area. Given the length of the route, a dual track system is envisaged. A single track arrangement would require passing loops along its length and contribute less to system operation than two tracks (Second Airport Planners, 1997).

Rail service would be completely integrated with other CityRail services. The line would connect to the East Hills Line that is being progressively duplicated to four tracks from Central to Riverwood. The New Southern Railway provides the additional two tracks between Central and Turrella, and new track amplification works are proposed between Turrella and Riverwood. These latter works are to provide additional train paths to serve the New Southern Railway, services to Campbelltown, and regional passenger services to Canberra, and the Southern Highlands. The amplification works have been subject to an EIS (Connell Wagner, 1996) but are not expected to be completed before the year 2000.

Further capacity has been added to this line by the construction of a grade separated junction where the East Hills Line crosses the Illawarra Line. By building a facility that allows the two lines to function independently as an extension of the New Southern Railway works, the ceiling on capacity in the future has been raised. A new station, North Arncliffe, will also allow passengers to transfer between the two rail lines, which is a great advantage for passengers travelling between Illawarra and the South Coast and the Airport.

Role of South Creek Residential Development

The rail extension from Glenfield was originally premised on serving the urban release areas of Ingleburn and South Creek. Public transport was to be provided to the areas so that the residential growth would result in controlled levels of additional traffic and pollution. These externalities of growth have contributed to the slower release of subdivided land in the area than earlier plans had anticipated.

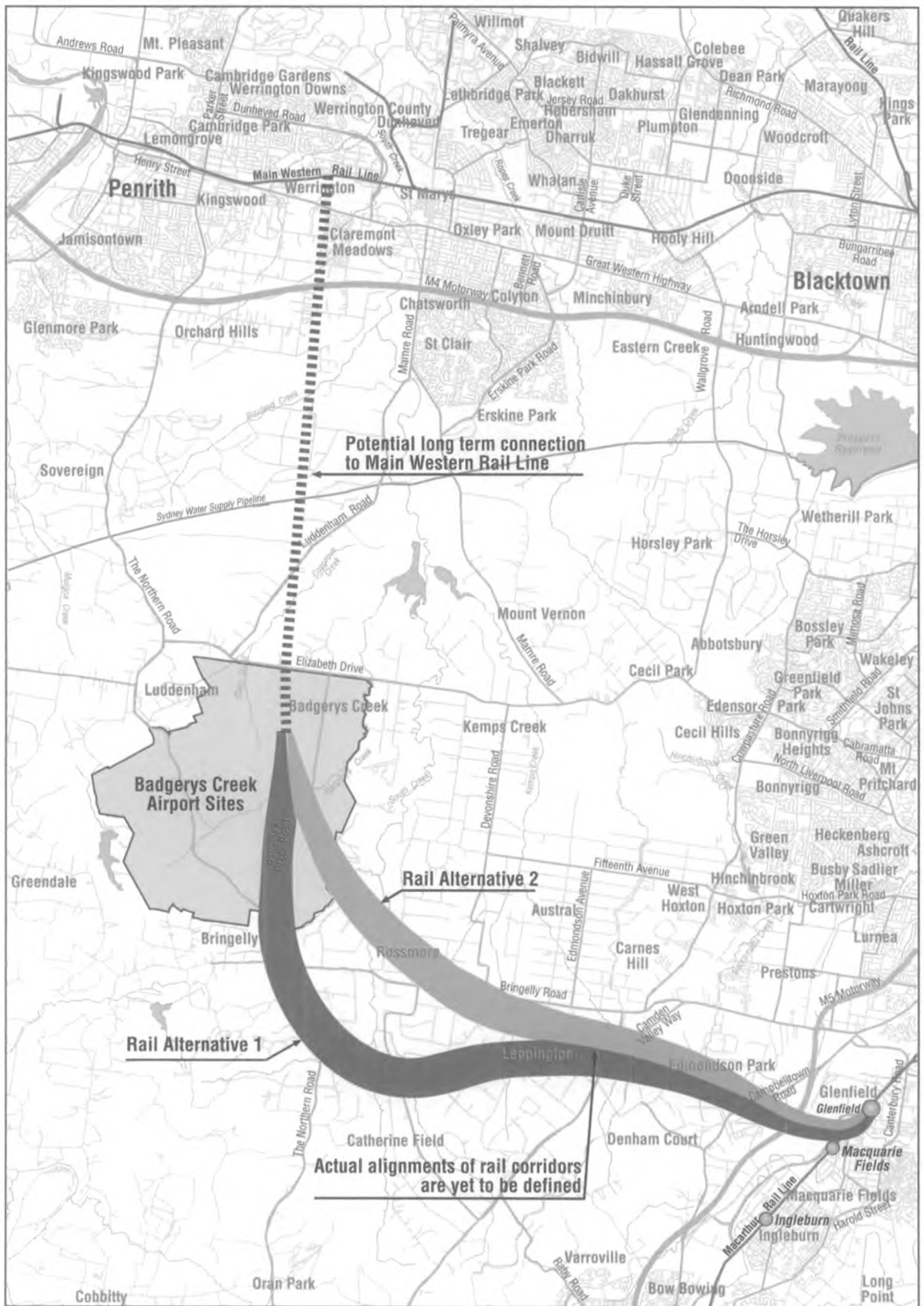


Figure 7.1
Potential Rail Access to Badgerys Creek Airport Sites

Source: Second Sydney Airport Planners, 1997c
 Note: Rail corridors are indicative only and not drawn to scale. Actual rail line would be narrower.

- skip-stop or express operations from Glenfield Station to North Arncliffe which allows for transfers but minimises travel time;
- restrictions on car parking on the airport site for casual users such as supply containment, time limits and fees; and
- fares which are competitive with other modes and do not offset the benefits of time savings.

Station Location and Accessibility Assumptions

As stated above, station accessibility is a key factor of rail mode selection, both for the Second Sydney Airport and other stations constructed on the extension. As well as the accessibility for passengers and meeters and greeters to the landside operations of the airport, accessibility and interchange must also be provided at the station for airport employees and for other employees in the catchment of the Badgerys Creek Station. As a frequent service station, there would emerge a demand for interchange with local feeder buses, long term parking, and pedestrian access to employment centres.

7.3.2 EXPECTED FUTURE AIRPORT RAIL PASSENGER DEMAND

Table 7.4 contains the combined forecasts for rail patronage on the entire extension from Glenfield to a new Airport at Badgerys Creek. Details on mode forecasting are in Chapter 6, as the behaviour of travellers to the Second Sydney Airport is anticipated to be the same for all the options.

TABLE 7.4 POTENTIAL DAILY RAIL PASSENGERS, GLENFIELD TO SECOND SYDNEY AIRPORT

	2006	2016
Employees	1,310	3,700
Passengers & Meeters/greeters	5,970	18,000
Non-Airport Employees	1,650	3,800
Residential	6,650	10,300
Total	15,580	35,800

Air Passengers and Meeters and Greeters

For airport passenger demand, forecasts are based upon the fixed number of passengers expected for stage one, and assuming that the propensity to use rail will be similar for this site as forecast for Sydney Airport. Meeter and greeter numbers are derived from the passenger numbers, but their propensity to use rail is less because they travel in larger groups, live locally and have baggage handling roles. The mode split for this category has been weighted for the two groups.

advantage in this regard. About 30 percent of rail trips by 2016 would be generated by the residential catchment along the proposed railway line.

7.3.3 IMPACT ON RAIL SYSTEM

The extension of CityRail services to a Badgerys Creek airport has long been studied and formed part of the draft State Rail Strategic Plan. Investigations had reached a relatively final position in terms of starting land acquisition when the final airport site selection was deferred. Physically, the extension of the East Hills Line has been demonstrated to be feasible. The extension can be accommodated within the operating plan of the rail network, although some circumstances have changed in the land use profile assumed in earlier studies.

By increasing the capacity of the Second Sydney Airport from 13 million to 30 million passengers annually, the airport contributes significantly more to the long term viability of the rail link. Through the multiplier of a larger airport, the likely employment attracted to the environs of the site is also increased. So will the traffic generated by these activities, which should act to improve the competitive characteristics of rail.

On the negative side, the larger airport or a realigned airport will potentially reduce some of the area suitable for residential development in the urban release area. However, if the larger airport resulted in more economic activity and more frequent train service, then a higher population density in the station catchments is more likely. The areas potentially affected were indicated for low density housing. In particular, the more direct Rail Alternative 2 would offer shorter travel times to potential rail passengers.

Some aspects of the rail service deserve further detailed analysis given the changed circumstances. With a larger airport, consideration should be given to:

- the advantages of a y junction at Glenfield to allow trains to travel to the Airport directly from Campbelltown and the southern regions of the State;
- whether the extension to the Main Western Line near St Marys should be accelerated; and
- re-examining the radii of curves of the new line to achieve faster travel times.

Not only the physical conditions of the service warrant more attention, but it will be necessary to examine the range of levels of service that could be offered to users of the rail line. While the Airport is a terminus, passengers loading at the Airport will generally have no difficulty obtaining a seat.

7.4.2 ROAD ACCESS FOR AVIATION FUEL

In the event that a pipeline could not initially be constructed between the refinery and the Airport site at Badgerys Creek, all fuel supply would be transported to the airport by either standard articulated tankers or B-Doubles. The routes to be followed would be approved B Double/Tanker routes as specified by the Roads and Traffic Authority. The source of fuel supply would be the Shell Refinery at Silverwater.

In 2006, the volume of traffic generated for the transportation of aircraft fuel is estimated to be between 40 (assuming all B-Doubles) to about 65 (assuming all articulated standard tankers) trucks a day or an mixed fleet of about 50 trucks per day. This would result in about 100 two-way trips per day along the routes between the refinery and the airport site.

The demand for AvGas for piston engined aircraft for general aviation and regional airlines is about 30,000 to 35,000 litres per day which is equivalent to one road tanker per day.

This level of truck traffic would be insignificant in comparison to the other traffic flow on the above roads and would not have any measurable impact on the level of service along the above selected routes.

The proposed routes for the transport of aviation fuel to the Badgerys Creek Airport Site would be Silverwater Road, M4 Motorway, Wallgrove Road, and Elizabeth Drive. The direct road access to the airport site would be via Elizabeth Drive.

Alternatively, road tankers transporting aviation fuel could travel along Silverwater Road, Great Western Highway, Wallgrove Road, and Elizabeth Drive.

The main feature of these routes would be to provide a most suitable access for the transport of aviation fuel to the airport site; with an emphasis being placed on public safety and environmental aspects of dangerous goods movements.

A relative risk assessment of the alternative routes would need to be undertaken to select a preferred route with the least risk factor for fuel supply to the airport site.

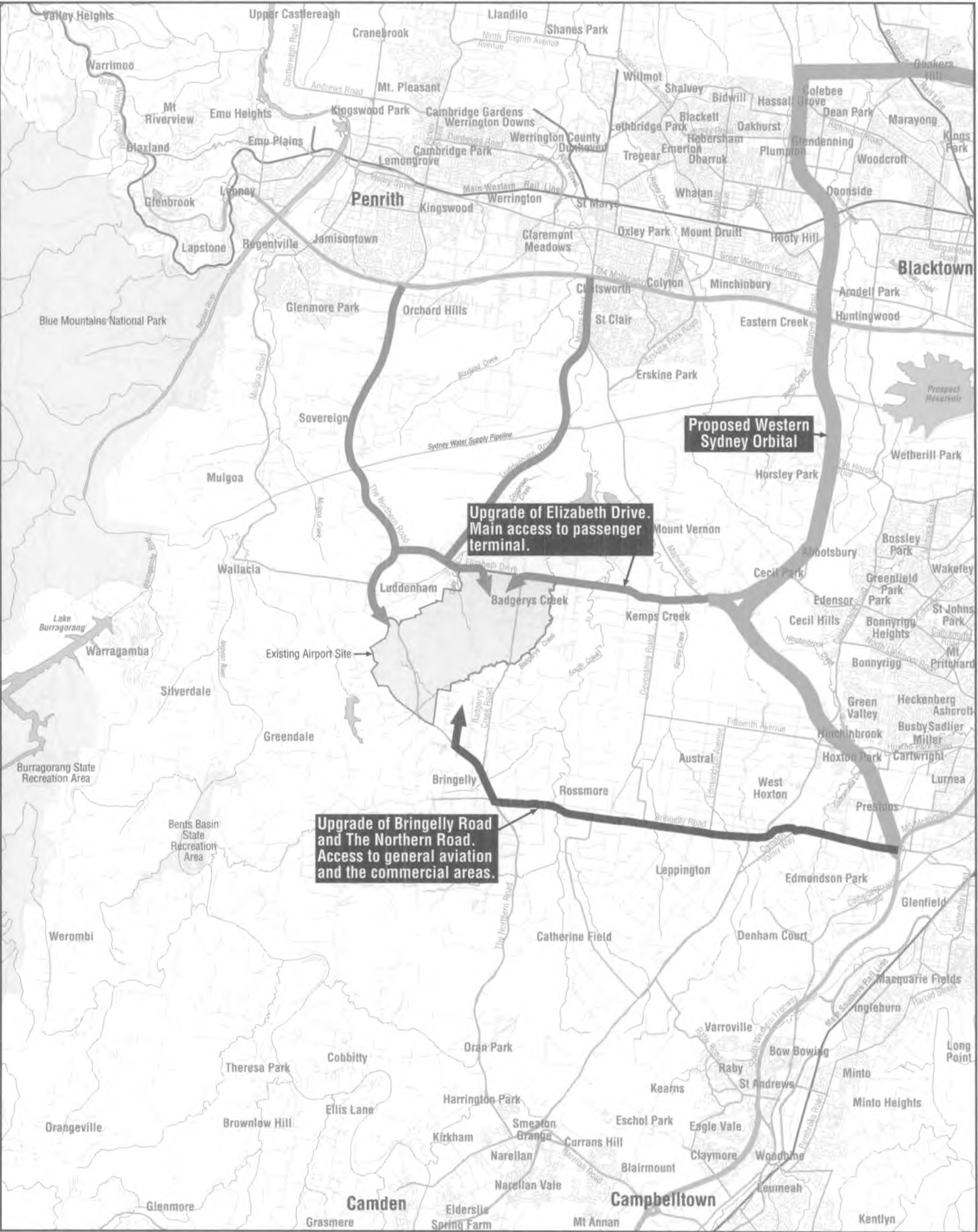


Figure 7.2
Badgerys Creek Airport Site Potential Road Access
(Note: Road corridors are indicative only and not drawn to scale. Actual roads would be narrower. Corridors are under consideration as part of the EIS process and may be subject to change.)



7.5 IMPACT ON ROAD NETWORK

7.5.1 FUTURE ROAD NETWORK ASSUMPTIONS FOR MODELLING

The projected road works listed in *Appendix C*, were assumed to indicate the most likely network improvements which would be required to alleviate congestion and meets the needs of the Sydney region in 2006 and 2016.

7.5.2 AIRPORT TRAFFIC GENERATION

Table 7.5 summarises the total airport traffic generation assumed in the model for the two forecast years. Volumes entering and leaving the airport in the AM and PM peak are shown separately. Peak traffic generation associated with the airport including ancillary on site development are included. In 2006, substantial traffic is generated by the airport itself with little associated with secondary development. By 2016, however, it is assumed that secondary development will contribute to a substantial volume of traffic in the peak hours.

TABLE 7.5 PEAK HOUR TRAFFIC GENERATION ASSOCIATED WITH BADGERYS CREEK AIRPORT

		Airport Terminals		Other On-site		Total		
		Arr	Dep	Arr	Dep	Arr	Dep	Total
2006	AM	1,640	1,080	1,920	30	3,560	1,110	4,670
	PM	1,290	1,260	30	1,920	1,320	3,180	4,500
2016	AM	4,360	3,070	3,120	30	7,480	3,100	10,580
	PM	3,690	2,970	30	3,120	3,720	6,090	9,810

7.5.3 TRAFFIC VOLUMES AND LEVEL OF SERVICE ON MAJOR APPROACH ROUTES

This section presents the results of the model runs in 2006 and 2016 that incorporated a second Sydney airport at Badgerys Creek with road access for the airport facilities to both Elizabeth Drive and Northern Road. The other major impact of the construction of a second airport at the Badgerys Creek site would be the closure of Badgerys Creek Road and the realignment of The Northern Road.

Detailed results from the two model runs in 2006 and 2016 are presented in *Appendix P* with summary results for key locations in *Table 7.6*. Of interest is the change in traffic volumes on the roads surrounding the airport site and identification of areas in the road network where the model indicates level of service will deteriorate to an unacceptable level requiring some form of road network improvement.

TABLE 7.6 FUTURE TRAFFIC VOLUMES ON MAJOR APPROACH ROUTES TO BADGERYS CREEK- AVERAGE DAILY TRAFFIC

Location Description			Base 2006	Air Traffic Forecast 2 2006	Increase	Base 2016	Air Traffic Forecast 3 2016	Increase
Badgerys Creek Airport	to	Elizabeth Drive	n/a	24,576		n/a	61,361	
Badgerys Creek Airport	to	The Northern Road	n/a	8,767		n/a	20,226	
Bringelly Road	East of	The Northern Road	6,193	15,362	148	6,370	29,456	362
Bringelly Road	West of	Cowpasture Road	23,179	29,169	26	18,711	31,755	70
Camden Valley Way	West of	South Western Freeway	18,781	22,705	21	19,808	29,666	50
Cowpasture Road	South of	Hoxton Park Road	15,268	16,229	6	14,421	21,642	50
Deepfields Road	West of	Camden Valley Way	4,767	6,083	28	5,448	8,380	54
Denham Court Road	East of	Camden Valley Way	7,427	9,596	29	9,755	15,683	61
Devonshire Road	South of	Elizabeth Drive	5,425	10,042	85	5,691	11,255	98
Elizabeth Drive	West of	Wallgrove Road	23,153	30,225	31	20,339	37,422	84
Elizabeth Drive	West of	Luddenham Road	13,275	18,561	40	13,009	18,838	45
Elizabeth Drive	West of	Mamre Road	14,440	26,561	84	17,511	43,598	149
Erskine Park Road	South of	M4 Motorway	21,251	22,775	7	22,209	26,826	21
Fifteenth Avenue	West of	Cowpasture Road	4,802	7,364	53	5,067	9,119	80
Luddenham Road	North of	Elizabeth Drive	7,076	24,529	247	4,583	55,003	1,100
M4 Motorway	at	Nepean River	71,429	72,121	1	80,882	82,787	2
M4 Motorway	East of	Erskine Park Road	125,860	140,226	11	123,600	160,967	30
M4 Motorway	East of	Wallgrove Road	127,953	141,600	11	131,171	160,027	22

TABLE 7.6 CONTINUED

Location Description			Base 2006	Air Traffic Forecast 2 2006	Increase	Base 2016	Air Traffic Forecast 3 2016	Increase
M4 Motorway	East of	Northern Road	70,182	69,489	-1	102,849	100,125	-3
M5 Motorway	East of	Moorebank Avenue	80,917	85,061	5	106,196	119,506	13
Mamre Road	South of	M4 Motorway	33,602	46,807	39	26,826	68,612	156
Mamre Road	North of	Elizabeth Drive	16,969	15,925	-6	9,944	8,745	-12
Mulgoa Road	North of	Park Avenue	6,853	7,036	3	8,779	11,609	32
Mulgoa Road	South of	M4 Motorway	4,675	5,067	8	6,591	6,441	-2
Raby Road	West of	Campbelltown Road	24,650	24,879	1	29,570	28,652	-3
The Northern Road	at	Lowes Creek	15,394	19,256	25	16,539	24,010	45
The Northern Road	North of	Bringelly Road	17,882	28,974	62	18,667	47,847	156
The Northern Road	South of	M4 Motorway	23,167	26,191	13	22,578	32,194	43
Wallgrove Road	South of	M4 Motorway	46,346	46,092	-1	(not in network)		
Western Sydney Orbital	South of	M4 Motorway		(not in network)		85,430	87,958	3
Western Sydney Orbital	South of	Elizabeth Drive	37,815	36,973	-2	70,875	75,365	6
Western Sydney Orbital	North of	Elizabeth Drive		(not in network)		67,181	65,923	-2

2016 model networks assume this section of Elizabeth Drive would be improved to a four lane divided carriageway. Peak traffic volumes are experienced on the section between the airport link and Wallgrove Road. In 2006, model volumes reach levels of 1,900 vehicles per hour in the peak direction which are within the capacity of the four lane roadway. However, by 2016 traffic levels are expected to reach as high as 2,800 vehicles per hour, which is above the capacity of a four lane roadway, but within that of a six lane roadway.

To the south of the airport site, access directly to The Northern Road from the airport facilities would lead to increased traffic on this road. For example, immediately north of Bringelly Road, traffic volumes are expected to increase from background levels of around 1,100 vehicles per hour to up to 3,000 vehicles per hour in the 2016 airport scenario. This level is substantially higher than the capacity of the current two lane roadway. This increase in traffic would occur on both The Northern Road south of Bringelly Road, and Bringelly Road itself.

In 2016 the model predicts volumes to be in excess of capacity for The Northern Road through to Camden, south of Bringelly Road. Other roads between the Badgerys Creek airport site and the Campbelltown/Camden area, such as Devonshire Road, Fifteenth Avenue and Edmondson Avenue are expected also to experience some increase in traffic while remaining at acceptable levels of service.

The model indicates that from a regional perspective the closure of Badgerys Creek Road will not require provision of a replacement link - adequate service between Elizabeth Drive and Bringelly Road would be provided by Devonshire Road and King Street.

7.5.4 INTERSECTION OPERATION ALONG APPROACH ROADS

The following intersections have been identified in need of upgrading in the future as a result of an Airport at Badgerys Creek.

Wallgrove Road/Elizabeth Drive

If the section of the Western Sydney Orbital, between Elizabeth Drive and the M4 Motorway, is not constructed by 2006, the existing roundabout would require additional capacity. The proposed grade separation between the Western Sydney Orbital and Elizabeth Drive (Rust PPK, 1996c) would resolve these problems.

Elizabeth Drive/Luddenham Road

This existing sign controlled intersection of Elizabeth Drive and Luddenham Road would need to be upgraded to traffic signals controls by 2006. By 2016, it is likely that the intersection would require to be further upgraded to possibly a grade separated arrangement.

Other Intersections

The following sign controlled intersections are expected to continue to operate satisfactorily by 2006. However, by 2016, all these intersections would require traffic signal controls.

- Camden Valley Way/Deepfields Road;
- Bringelly Road/King Street;
- Bringelly Road/Camden Valley Way;
- Bringelly Road/Edmondson Avenue;
- Bringelly Road/Cowpasture Road.

7.5.5 REQUIRED IMPROVEMENTS TO THE ROAD NETWORK

From the above discussion it is apparent that some substantial improvements to the road network surrounding the Badgerys Creek airport site would be required to achieve satisfactory access to the airport facilities and to maintain an acceptable level of service to existing land uses in the airport's vicinity. Various sets of road improvements could be implemented but it is expected that the minimum requirement, illustrated in *Figure 7.3*, would be required. These improvements are in addition to those previously identified in *Chapter 5* as being required to accommodate predicted background traffic and include the following:

- establishment of a direct access route from the airport site to the M4 Motorway of four lane divided carriageway standard by 2006. This could connect with the M4 Motorway (grade separated) at either Mamre Road, or at the site of the future Werrington Arterial (connecting the M2 Motorway to the M4 Motorway) to the west of Mamre Road;
- upgrade of Elizabeth Drive between The Northern Road and Cowpasture Road to four lane divided carriageway standard by 2006;
- upgrade of Elizabeth Drive between airport link and Western Sydney Orbital to six lanes by 2016 with grade separation at Luddenham Road, Airport Link, Kemps Creek Village, Devonshire Road and Mamre Road;

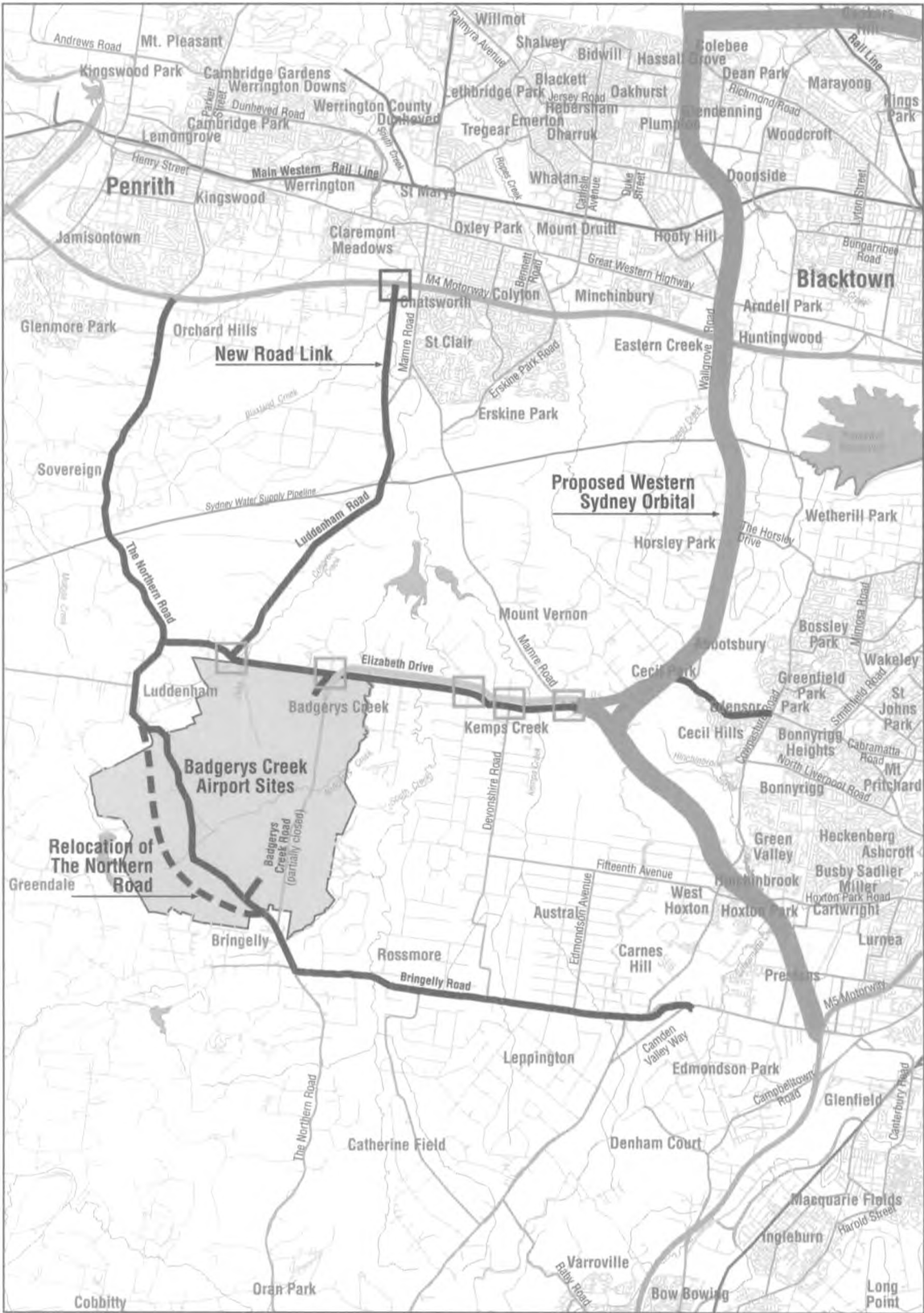


Figure 7.3
**Road Network Improvements Required for
 Badgerys Creek Airport Options**

Note: Road corridors are indicative only and not drawn to scale. Actual roads would be narrower.



7.6.2 PUBLIC TRANSPORT IMPLICATIONS

The implications of a second Sydney airport at Badgerys Creek for public transport services include:

- Improving the likelihood that a long planned rail extension would be implemented.
- More than doubling the anticipated contribution of airport passengers to the patronage potential of the rail link anticipated in earlier investigations of the project's financial and economic benefits. Estimates are that the rail link would obtain almost half its patronage from airport generated passengers.
- Improve the chances that the shorter, more direct Rail Alternative 2 would be the preferred route choice for the rail. This would reduce construction costs and rail passenger travel times.
- The rail line offers significant advantages to State Rail over options to serve an Airport at Holsworthy because it could be extended north to give a cross-regional link to the Main Western rail line. It also uses Glenfield as a transfer station so services added for the airport would provide additional capacity for the Macarthur rail line as well.
- Adding a major destination in a bus network focusing on Penrith and Liverpool which would improve operating viability and contribute greater interchanging patronage.
- An expanded airport could potentially reduce the land suitable for urban release and development, although the increased economic strength of the airport could partially offset the loss through encouraging residential and employment consolidation.
- Road access will continue to be a major factor in public transport service as the roles of coaches and taxis are expected to remain at significant levels (20% of passengers and meeters and greeters) even with the rail link.
- Because of the other development in residential and employment uses surrounding the Badgerys Creek site, the road based public transport may require priority treatment at key locations to achieve satisfactory performance from the road network.

TABLE 8.1 TRAFFIC GENERATION - HOLSWORTHY OPTION A

Staging	Daily Traffic ¹			AM Peak ²		PM Peak ²	
	Car	Truck	Total	In	Out	In	Out
Stage One	1,790	720	2,510	427	229	229	427
Master Plan	3,256	916	4,172	760	409	409	760

Note: 1. Two-way traffic volumes
2. Total cars and trucks

For the Holsworthy Option A, the peak traffic generation would be about 4,170 vehicle trips per day. Construction and fuel trucks would account for about 22 percent of all daily traffic generation.

8.2.2 MAJOR ACCESS ROUTES

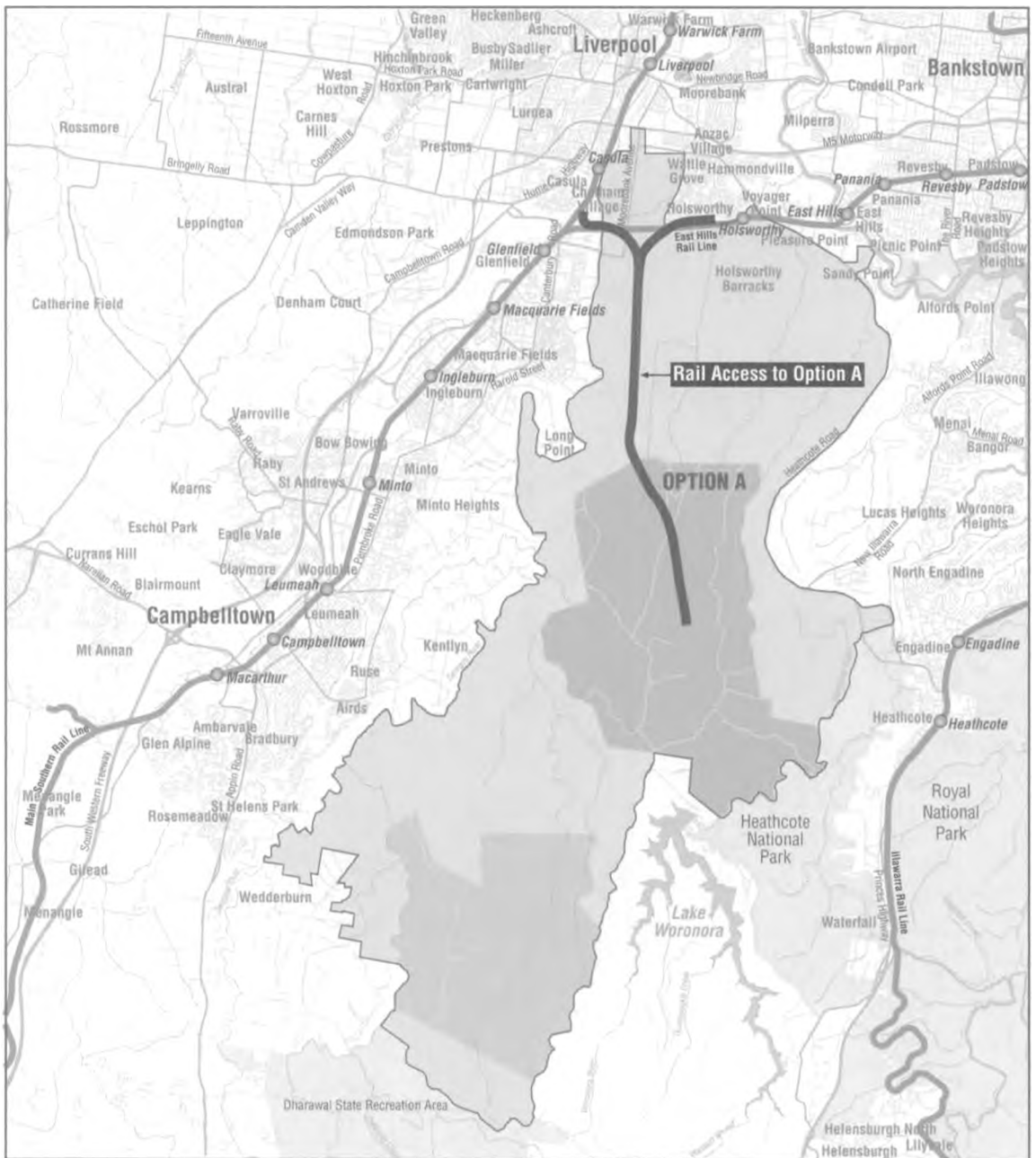
Second Sydney Airport Planners (1997) have suggested that road access to the airport site would be required initially to provide access for construction vehicles. It is envisaged that temporary roads will be established early during the construction period for construction traffic. It may be appropriate in some cases to establish these roads on the alignment of permanent roads.

Main roads within the airport will generally consist of four lanes. Temporary and permanent diversions of the existing military access roads in the Holsworthy Military Reserve, not necessarily within the designated airport site, may be needed to expedite deliveries and to separate construction traffic from military uses.

The approach described in Chapter 6.4.1 was used to establish the likely home origin of construction employees for a second Sydney airport at Holsworthy. The basis of this approach is the premise that the closer a local Government area is to the airport, the larger the number of airport employees within it.

The construction truck traffic distribution along approach routes, however, was based on the likely origin and quantity of materials delivered to the site. It is understood that the majority of materials would reach the site by road from the south and west. Fuel for construction vehicles would be obtained from a refinery at Silverwater (Second Sydney Airport Planners, 1997).

The most likely approach routes to Holsworthy Option A have thus been identified for construction traffic with respect to both the workforce and the transport of construction materials as noted in Table 8.2.



Potential rail access to Option A

Figure 8.1
**Potential Alternative Rail Access to
 Holsworthy Airport Option A**

Note: Rail corridors are indicative only and not drawn to scale. The actual rail line would be narrower.



TABLE 8.3 IMPACT OF CONSTRUCTION TRAFFIC¹ FOR HOLSWORTHY OPTION A

Major Approach Roads	Existing Traffic ²	Construction Traffic	During Construction	% Increase
Anzac Road, west of Heathcote Road	13,407	302	13,709	2%
Bringelly Road, west of Cowpasture Road	7,199	567	7,766	8%
Cambridge Road, east of Canterbury Road	16,886	4,493	21,379	27%
Camden Valley Way, north of Narellan Road	15,491	479	15,970	3%
Canterbury Road, south of Cambridge Road	7,245	446	7,691	6%
Cumberland Highway, south of Hume Highway	44,725	1,344	46,069	3%
Glenfield Road, north of Cambridge Avenue Bridge	11,045	4,047	15,092	37%
Heathcote Road, north of Macarthur Drive	18,304	302	18,606	2%
Hume Highway, east of Box Road	44,610	2,550	47,160	6%
Moorebank Avenue at East Hills Railway	15,098	1,047	16,145	7%
South Western Freeway (M5), south of Brooks Road	60,060	1,497	61,557	2%
Wallgrove Road, north of Elizabeth Drive	15,546	160	15,706	1%

Note:

1. From NSW Roads and Traffic Authority and commissioned counts.
2. In equivalent passenger car units. Assumes construction to master plan stage.

Glenfield Road and Cambridge Road would require upgrading to at least four lane undivided carriageway. Moorebank Road and Anzac Road which are currently operating with poor levels of service need upgrading. With construction activities at the airport this requirement would become critical.

8.2.4 ROLE OF PUBLIC TRANSPORT IN CONSTRUCTION PHASE

The relative isolation of the airport site from major traffic routes means that the contribution from public transport to solve some of the construction traffic issues will be very small. No train service will be available before the operation of the airport. The absence of established, paved routes or other customers would preclude a viable, scheduled bus route to the site.

If public transport is considered essential to ease the car numbers generated by construction, then a charter shuttle service will need to be set up by the construction manager to reach the worksite. This option is further complicated by the unresolved nature of the road that will be available to serve the worksite. Any charter route would need to relate to a frequent service train station, but the most appropriate station would be determined by the road alternative selected for construction access to the site.

to occupy the same corridor as the road access to the site. This would create some savings with regard to construction, although major earthworks and bridging of gullies would be required, as for the roadway (Second Sydney Airport Planners, 1997).

The airport station is expected to be a terminal for the train, as the cost of installing a loop is uneconomic given the limited potential for development along the route. The airport service would stop at either Holsworthy or Casula, then travel directly to the Airport. The distances are about the same, but the travelling time from the Main Southern Rail Line would be slower given the tighter curves. A single track is a possibility, with scope for an upgrade to dual track in the future. A passing loop may be necessary in a first stage if a single track compromise is selected (Second Sydney Airport Planners 1997).

Because the station would be a terminating station, a 200 metres track overrun past the end of the platform would be required by the State Rail Authority. A turnout/crossover would be located on the approach side of the station. Like the Badgerys Creek link, the railway would be constructed at grade except in the vicinity of the airport itself, where it would be placed underground to facilitate access to the airport and terminal area (Second Sydney Airport Planners (1997).

Level of Service Assumptions

The link to Holsworthy Option A is expected to be taken from the same line as the link to Badgerys Creek, the East Hills Line. Therefore, similar levels of service assumptions have been made which allow the passenger mode split for rail to remain the same as for the Badgerys Creek options. The actual travel time between the city and the airport would be less for this option because the distance is smaller and there will be fewer stops.

The estimated distance from Holsworthy Station to a new stop at an airport at Holsworthy Option A is 14 kilometres. The expected travel time from Holsworthy Station to the Airport Station would be nine minutes. Adding that to current express service times, the Airport Station would be 41 minutes from Central via the East Hills Line. The time from the Second Sydney Airport to Sydney Airport is estimated to be 34 minutes.

The distance from Casula Station to a Holsworthy Option A Station would be 13 kilometres or a travel time of nine minutes. If direct trains were to run between the Second Sydney Airport and Parramatta, they would take 36 minutes via the Cumberland Line on the present fastest running pattern.

Air Passengers and Meeters and Greeters

The distribution of the origins of future airport passengers is assumed to be constant, regardless of the location of the airport. The decision to travel by air versus car or other mode for a long distance is unlikely to be effected by the location differences of the options for a Second Sydney Airport. In terms of the proportion of those air passengers and their ancillary group, meeters and greeters, who might select rail for access to the airport, the differences between the airport location options is expected to be minimal because:

- all rail options would rely on the same existing lines for access to the airport, so constraints on capacity, frequency of service and rolling stock would be virtually the same;
- the boarding station would remain the same, and
- the relative advantages of car to rail to taxi would be constant.

This is premised on the assumption that there would be active funding and support on the part of government to offer an attractive rail service.

Additional Potential Patronage for Rail to Airport Site

Where the options significantly vary is in the potential passengers other than passengers/meeters and greeters, that are expected to use the new rail infrastructure. Airport employees are constant across the airport options because their numbers are directly related to the size of the airport, and their origins like the passengers are considered to be fixed without reference to the final airport site.

The real differences in potential passengers for this site and Badgerys Creek comes from the non-airport side of the demand. Compare *Table 8.4* which shows the estimated trip making at Holsworthy Option A with *Table 7.4* for Badgerys Creek. The same numbers of air passenger and airport employee trips are planned, but at Badgerys Creek in 2006 they represent 47 percent of the forecast rail patronage, compared with 82 percent for the same time at Holsworthy A. In 2016, or at the master plan stage of airport development, 61 percent of the Badgerys Creek Rail extension patronage would come from the airport directly, while it would be 92 percent at Holsworthy Option A.

The reason for the decline in alternative patronage is the constrained availability of land adjacent to the airport. The military and park/reserve land uses that surround the airport site preserved, and the catalyst role of the airport for increased employment would be highly constrained. No urban release areas are proposed that are suitable for residential land either. On this site, the urban development and economic multiplier aspects of airport investment and rail investment would be reduced.

- a rail spur between the East Hills Line and Holsworthy Option A;
- the nature of the junction between the East Hills Line and the airport link;
- a rail spur between the Main Southern Line and Holsworthy Option A;
- the nature of the junction between the Main Southern Line and the airport link; and
- any upgrading of Holsworthy or Casula Stations as transfer stations.

Level of Service Implications for Later Assessment

The assumptions on rail service are more difficult to support for Holsworthy Option A than for rail options to Badgerys Creek because this rail spur would exist solely to serve the airport and no other passengers. It would be much more difficult to justify the frequencies of service assumed because of the opportunities sacrificed of increased service to other high demand corridors, such as those to Campbelltown. Building the link to the Main Southern Line would improve transfer accessibility, but be even more difficult to serve because of the existing demands on that portion of rail infrastructure.

Building both junctions would be extremely expensive, offer no further development opportunities, but would improve the proportion of Sydney's population that would find the total travel time by rail attractive. By halving the frequency of train paths to the airport required of an individual line, service to the airport would be operationally more feasible, but then potential passengers would only perceive half the frequency of service, on the half hour rather than the quarter hour, from the non-airport station.

8.3.4 POTENTIAL SHUTTLE BUS SERVICE TO SITE

Given the apparent limited feasibility of operating a rail service to the site, greater consideration should be placed on upgrading an existing train station for shuttle bus operation into the airport site. The most attractive location for such a service would be Glenfield Station as it is served by the Macarthur and Cumberland lines.

Because service would be less convenient and add another transfer into the system, a mode share for bus/rail for employees is expected to drop to closer to 10 percent. This would be similar to the combined bus/rail service that is currently available at Sydney Airport (prior to the opening of the New Southern Railway), although the bus component would be a longer trip. At half the mode share, the combined patronage for the shuttle service is expected to be about 4,000 in 2006 and 12,000 in 2016.

It should be noted that with the exception of Road Alternative 3, the above road alternatives provide direct access to the South Western Freeway / M5 Motorway which in turn provide access to the Western Sydney Orbital. If sufficient capacity exists on these freeway facilities, arranging access in this manner should minimise impacts of airport traffic on surrounding surface streets.

8.4.2 ROAD ACCESS FOR AVIATION FUEL

In the event that a pipeline could not initially be provided between the refinery and the Airport site at Holsworthy, all fuel supply would be transported to the airport by either standard articulated tankers or B-Doubles. The routes to be followed would be approved B Double/Tanker routes as specified by the Roads and Traffic Authority. The source of fuel supply would be the Shell Refinery at Silverwater.

In 2006, the volume of traffic generated for the transportation of aircraft fuel is estimated to be between 40 (assuming all B-Doubles) to about 65 (assuming all articulated standard tankers) trucks a day or an mixed fleet of about 50 trucks per day. This would result in about 100 two-way trips per day along the routes between the refinery and the airport site.

The demand for AvGas for piston engined aircraft for general aviation and regional airlines is about 30,000 to 35,000 litres per day which is equivalent to one road tanker per day.

This level of truck traffic would be insignificant in comparison to the other traffic flow on the above roads and would not have any measurable impact on the level of service along the above selected routes.

The proposed routes for the transportation of aircraft fuel to the Holsworthy Option A Site could be via Silverwater Road, M4 Motorway, the Cumberland Highway, Hume Highway.

Alternatively, fuel supply could be transported by road tankers via Silverwater Road, Regional Motorway M4 (or Parramatta Road), Woodville Road and Hume Highway. A further alternative may include the use of the Wallgrove Road and the Western Sydney Orbital.

The immediate road access for the transportation of fuel supply to the airport site could be via Cambridge Avenue or Moorebank avenue with a road alternative road through Military Reserve.

The main feature of these routes would be to provide a most suitable access for the transport of aviation fuel to the airport site; with an emphasis being placed on public safety and environmental aspects of dangerous goods movements.

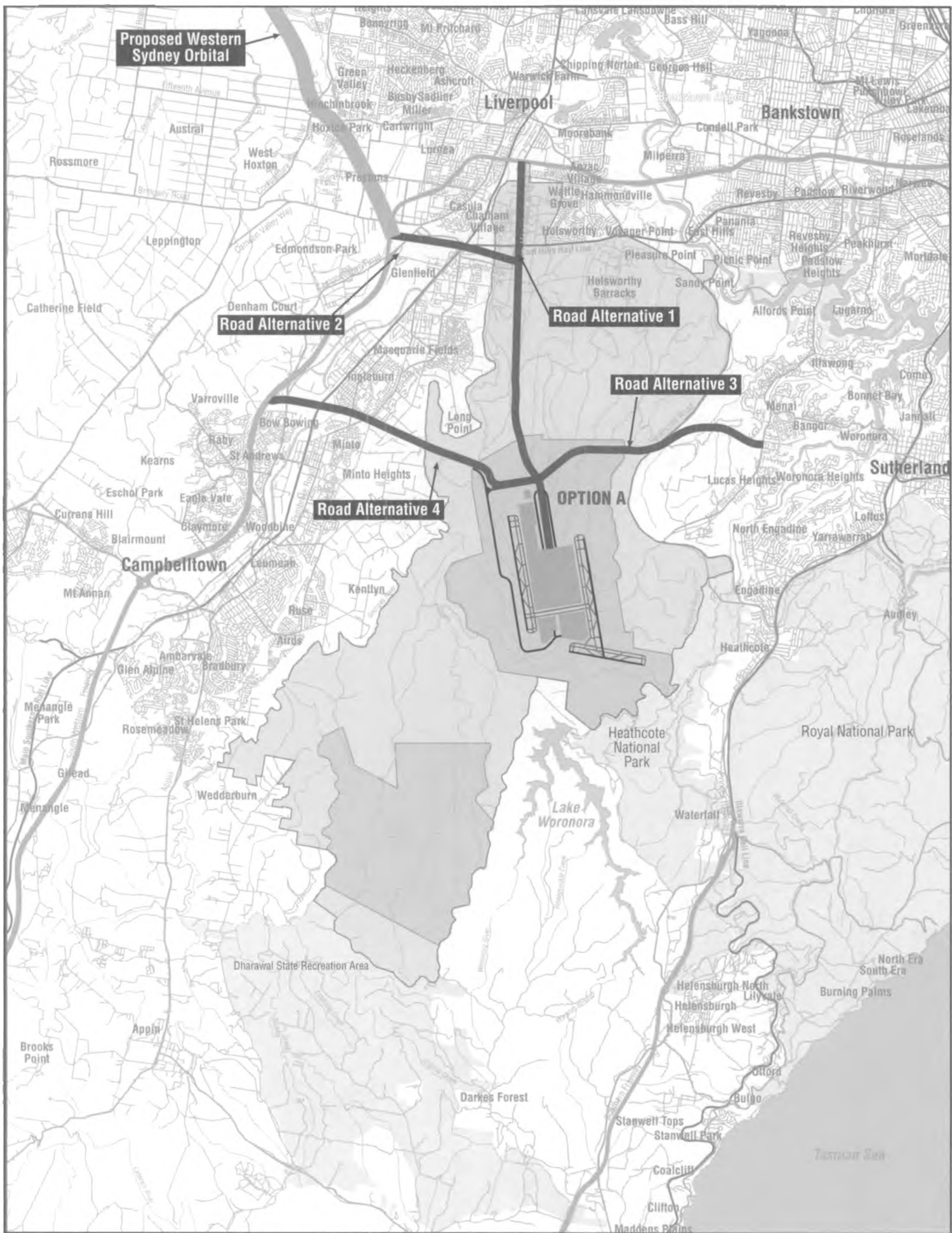


Figure 8.2

Potential Alternative Road Access to Holsworthy Airport Option A

(Note: Road corridors are indicative only and not drawn to scale. Actual roads would be narrower. Corridors are under consideration as part of the EIS process and may be subject to change.)



Taxis

Holsworthy Option A is the airport location that relates most closely with the population and employment centres of Sydney. Average trip lengths would be expected to be lowest among the options, so this location might best suit taxis of the range of location options. But it is an advantage that can be overthrown by congestion, as travel time is more important than distance. The level of service on access roads would be a major factor on the likely use of taxis. While the Holsworthy Option A site is closer to the bulk of population and tourism, it may prove to be unpopular with taxi drivers because of its isolated location and the absence of other travel destinations in the vicinity.

Taxis are an important mode for air passengers, although they do not serve much of the other markets for travel to the airport. Taxi users are paying a premium for speed of travel, so they will be very sensitive to any congestion or other delays. Even with a high quality rail service provided, however, a low diversion rate to rail from taxis is anticipated since many users are subsidised, are carrying luggage or wish to reach destinations not well served by the public transport network.

Given the likely origin of taxi trips to the airport, Road Alternatives 1 and 3 would be expected to favour the use of taxis by minimising the distance and costs involved.

8.5 IMPACT ON ROAD NETWORK

8.5.1 FUTURE ROAD NETWORK ASSUMPTIONS FOR MODELLING

The projected road works, included in *Appendix C*, were assumed for modelling purposes to indicate the most likely network improvements which would be required to alleviate congestion and meets the needs of metropolitan and economic growth of the Sydney region in 2006 and 2016.

8.5.2 AIRPORT TRAFFIC GENERATION

Table 8.5 summarises the total airport traffic generation assumed in the model for the two forecast years. Volumes entering and leaving the airport in the AM and PM peak are shown separately.

Volumes are moderate in the year 2006 with the maximum one-way hourly volume equal to 2,800 vehicles entering the airport site in the morning period. By 2016, however, this peak one-way volume has increased to over 6,000 vehicles per hour.

where possible through traffic was prevented from using the airport road alternatives. This applies to all Holsworthy Option A access scenarios with the exception of Road Alternative 1 which could be used by through traffic that currently uses Cambridge Avenue and Moorebank Avenue. The impact of through traffic on these road alternatives will be discussed in more detail below.

8.5.3 ASSESSMENT OF ALTERNATIVE ACCESS SCENARIOS

Peak traffic volumes, level of service and average daily traffic (ADT) results are provided in *Appendix Q* for base scenarios in 2006 and 2016 and the four airport scenarios described above (only scenario A1 was modelled in 2006). A summary of change in average daily traffic across all scenarios at key locations is provided in *Table 8.6*.

Access Scenario A1

This scenario involves the construction of a road alternative to the South Western Freeway from Cambridge Avenue and a substantial upgrading of Moorebank Avenue to the M5 Motorway. Runs were performed for this scenario in the years 2006 and 2016.

Airport Road Alternatives 1 and 2

The link directly north of the airport would carry all traffic and would need to be of four lane freeway standard by 2006 and eight lanes by 2016.

Currently, the Cambridge Avenue/Moorebank Avenue route is used by traffic from the Glenfield area and suburbs to the south to access the Holsworthy area and Heathcote Road. In Chapter 5, a requirement to upgrade this route to four lanes to accommodate background traffic was identified. Further upgrading of Moorebank Avenue for airport traffic would potentially make this route more attractive to through traffic.

The high one-way peak volumes likely to occur on both Cambridge and Moorebank Avenues would require that they be improved beyond the upgrade to four lanes identified as required to accommodate background traffic (see *Chapter 5*).

TABLE 8.6 FUTURE TRAFFIC VOLUMES ON MAJOR APPROACH ROUTES TO HOLSWORTHY OPTION A - AVERAGE DAILY TRAFFIC

Location Description			Base 2006	Scenario A1: 2006	% increase	Base 2016	Scenario A1: 2016	% increase	Scenario A2: 2016	% increase	Scenario A3: 2016	% increase	Scenario A4: 2016	% increase
Alfords Point Road	at	Georges River	53,048	52,472	-1	55,734	55,506	0	66,371	19	55,661	0	78,461	41
Anzac Road	West of	Heathcote Road	11,381	14,510	27	11,081	17,857	61	12,467	13	17,165	55	11,832	7
Cambridge Road	West of	Moorebank Avenue	18,123	35,051	93	19,773	53,218	169	55,405	180	29,587	50	21,689	10
Glenfield Road	East of	Old Glenfield Road	9,558	6,926	-28	11,278	10,620	-6	9,361	-17	48,770	332	13,113	16
Heathcote Road	at	Woronora River	24,114	25,072	4	20,581	25,279	23	22,463	9	25,268	23	21,713	5
Heathcote Road	South of	Anzac Road	47,084	49,578	5	56,527	61,271	8	60,370	7	61,086	8	67,204	19
Hume Highway	North of	M5 Motorway	82,799	87,866	6	69,928	81,563	17	79,324	13	85,950	23	77,512	11
M5 Motorway	West of	River Road	83,664	89,066	6	92,645	103,969	12	99,859	8	101,833	10	96,546	4
M5 Motorway	East of	Moorebank Avenue	80,917	88,639	10	106,196	124,331	17	119,298	12	121,860	15	111,425	5
M5 Motorway	West of	Moorebank Avenue	99,275	102,556	3	125,726	125,589	0	133,221	6	139,703	11	131,216	4
M5 Motorway	East of	Western Sydney Orbital	87,820	83,445	-5	100,021	97,493	-3	97,862	-2	100,760	1	97,262	-3
Menai Road	at	Woronora River	41,216	41,980	2	57,716	60,054	4	66,117	15	60,065	4	67,274	17
Moorebank Avenue	North of	M5 Motorway	32,044	40,382	26	33,167	49,360	49	39,468	19	39,655	20	32,143	-3
Narellan Road	West of	South Western Freeway	41,098	42,796	4	50,851	57,231	13	57,054	12	56,723	12	56,983	12
Narellan Road	East of	South Western Freeway	41,928	43,331	3	50,624	54,880	8	54,937	9	53,534	6	54,081	7
New Illawarra Road	North of	Heathcote Road	24,759	23,705	-4	30,630	30,830	1	9,322	-70	30,774	0	8,867	-71
Road Alternative 1	North of	Cambridge Avenue	16,213	39,171	142	17,700	64,643	265	45,987	133	33,265	68	19,404	10
Road Alternatives 1 and 2	North of	Airport	0	29,713	0	0	76,307	0	51,799	0	53,554	0	0	0
Road Alternative 2	East of	South Western Freeway	n/a	11,942		n/a	29,300		27,400		n/a		n/a	
Road Alternative 3	East of	Airport	n/a	n/a		n/a	n/a		24,508		n/a		43,853	
Road Alternative 4	West of	Airport	n/a	n/a		n/a	n/a		n/a		22,753		32,455	
South Western Freeway	North of	Brooks Road	88,282	87,831	-1	98,763	100,356	2	99,709	1	107,662	9	113,457	15
South Western Freeway	North of	Campbelltown-Raby Road	69,200	71,028	3	78,615	83,135	6	82,659	5	76,499	-3	80,280	2
Western Sydney Orbital	North of	M5 Motorway	43,818	51,228	17	66,673	87,947	32	86,481	30	85,454	28	79,105	19

Under the 2006 and 2016 A1 scenarios most of the traffic using Cambridge Avenue immediately west of Moorebank Avenue would be coming from Glenfield and areas immediately to the south rather than from the Road alternative two connection with the South Western Freeway. In 2006, a two lane facility for this connection with grade separation at the South Western Freeway would be sufficient to satisfy demand with upgrading to four lanes in 2016. If this road alternative was separated from Cambridge Avenue at its junction with Moorebank Avenue, then the upgrade of Cambridge Avenue to four lanes would be sufficient to accommodate predicted demand through to 2016.

Moorebank Avenue would require upgrading to four lane freeway standard by 2006 to the M5 Motorway and six lanes by 2016 with grade separation at Cambridge Avenue, Chatham Village and Anzac Road. Grade separation at Moorebank Avenue was identified as a base case improvement by 2006.

South West Corridor and Western Sydney Orbital

The extra traffic associated with the airport combined with the increased attractiveness of the Cambridge/Moorebank route leads to increased traffic volumes along the sub-arterial roads through Glenfield and Ingleburn to Campbelltown. In an assessment of the base scenarios it was determined that a four lane route parallel and east of the South Western Freeway would be required to accommodate predicted demand.

The airport would contribute to a further increase in the order of 400 to 500 vehicles per hour along such a route which would lead to total volumes still within the capacity of a four lane roadway.

Further to the south, large increases in peak direction traffic (500 to 600 vehicles per hour) are predicted for Narellan Road in the vicinity of the South Western Freeway by 2016. Upgrading of Camden Valley Way to four lanes over its full length, as identified in *Chapter 5*, would reduce volumes on Narellan Road.

As described earlier the main impact of airport traffic on the freeway system would be a substantial increase in contra-peak flow. This applies to the South Western Freeway, the M5 Motorway and the Western Sydney Orbital. These facilities are predicted to be at or exceeding capacity in the peak directions under the base conditions.

For the South Western Freeway between the connection with Road Alternative 2 and the Western Sydney Orbital, there is predicted to be minimal increase in traffic in the peak flow direction in the morning and afternoon peak periods in 2006. Volumes in the contra-peak direction will increase by amounts in the range 400 to 600 vehicles per hour. By 2016, however, traffic volumes are expected to increase by up to 2,000 vehicles

in the current non-peak direction (westbound in the morning, and eastbound in the afternoon) are predicted to reach volumes in the peak direction. Peak volumes will increase by only 100 vehicles per hour by 2006 but an increase of over 500 vehicles per hour is expected by 2016. This would result in total peak demand reaching 5700 vehicles per hour which is well beyond the capacity of the current four lane facility. Widening of the M5 Motorway to six lanes was identified as a requirement for satisfying background demand in 2006 and total 2016 demand will approach the capacity of such a facility. Only small increases in peak demand are predicted for Newbridge Road.

Substantial increases in traffic volumes are also predicted for the Hume Highway north of Liverpool. It is likely that improvements to both the M5 Motorway and the Western Sydney Orbital would minimise such impacts.

The model predicts that there would not be a major increase in traffic volumes along Anzac Road connecting Moorebank Avenue with Heathcote Road. By 2016, the airport is expected to only contribute an increase of 200 vehicles per hour to peak flow. Total flow would remain within the capacity of the current two lane road. Similarly, no major increases in peak flow are expected along Heathcote Road south of Holsworthy. The model also predicts that Nuwarra Avenue will not experience significant increases in traffic flow.

The road network improvements required to accommodate airport traffic associated with this scenario are summarised in *Figure 8.3*.

Access Scenario A2

Scenario A2 includes, in addition to Road Alternatives 1 and 2 to the north, Road Alternative 3 to the east connecting the airport with Heathcote Road and New Illawarra Road. This scenario was used to examine the benefits of providing this eastern road alternative as a supplement to the two northern road alternatives in the year 2016.

Table 8.7 summarises the distribution of traffic, as predicted by the traffic model, entering and leaving the airport site using the road alternatives to the north and east. Results are shown for morning and afternoon peak periods in 2016.

TABLE 8.7 TRAFFIC VOLUMES ON ACCESS ROADS SCENARIO A2

Access Direction	One-Way Traffic Volume, 2016			
	AM Peak		PM Peak	
	Arrival	Departure	Arrival	Departure
North (Road Alternatives 1/2)	4,494 (71%)	1,963 (62%)	2,282 (60%)	3,622 (73%)
East (Road Alternative 3)	1,827 (29%)	1,228 (38%)	1,531 (40%)	1,312 (27%)

along Menai Road of the order of 300 to 400 vehicles per hour in each direction.

The road network improvements required to accommodate airport traffic associated with this scenario are summarised in *Figure 8.4*.

Access Scenario A3

Scenario A3 is equivalent to scenario A1 with the exception that Road Alternative 2 to the north west is replaced by Road Alternative 4 to the west connecting with the South Western Freeway north of Minto. *Table 8.8* below shows the distribution of traffic over the two routes for traffic entering and leaving the airport in the morning and afternoon periods.

TABLE 8.8 TRAFFIC VOLUMES ON ACCESS ROADS SCENARIO A3

Access Direction	One-Way Traffic Volume, 2016			
	AM		PM	
	Arrival	Departure	Arrival	Departure
North (Road Alternative 1)	4,015	2,660	3,136	3,169
	(64%)	(83%)	(82%)	(64%)
West (Road Alternative 4)	2,306	530	677	1,760
	(36%)	(17%)	(18%)	(36%)

Utilisation of the western road alternative, as a proportion of total airport traffic, is higher for the peak flow directions (entering the airport in the morning and leaving the airport in the afternoon). Assuming that the majority of traffic using the western road alternative would also use the South Western Freeway to the north, the major use of the western road alternative by incoming traffic in the morning corresponds to the non-peak direction of flow on the South Western Freeway. This also applies to outgoing traffic in the afternoon period. Thus it appears that use of the western road alternative may be limited by capacity constraints on the South Western Freeway.

Implementing Road Alternative 4 would require the provision of capacity improvements north of the interchange with the South Western Freeway in the form of widening to six lanes. Airport traffic would require this widening between the interchange with Road Alternative 4 and Brooks Road - the widening of the South Western Freeway to six lanes north of Brooks Road was identified in *Chapter 5* as a requirement for accommodating background traffic.

Not providing a direct link to the north west between the airport and the South Western Freeway and the Western Sydney Orbital results in high traffic volumes in this scenario on the route along Cambridge Avenue, Glenfield Road, Campbelltown Road and Camden Valley Way to access the Western

8.5.4 INTERSECTION OPERATION ALONG APPROACH ROADS

The following junctions between the alternative access roads to the airport at Holsworthy Option A (illustrated in *Figure 8.2*) and existing roads would be needed to accommodate future traffic.

Junction	2006	2016
Road Alternative 1 (Moorebank Road) with Road Alternative 2	Grade separated	Grade separated
Road Alternative 1 with M5 Motorway	Grade separated (for background traffic)	Grade separated (for background traffic)
Road Alternative 2 with South Western Freeway	Grade separated	Grade separated
Road Alternative 3 with Heathcote Road	Traffic signals	Grade separated
Road Alternative 3 with New Illawarra Road	Traffic signals	Grade separated
Road Alternative 4 with South Western Freeway	Grade separated	Grade separated

The following existing intersections have also been identified in need of upgrading in the future as a result of an Airport at Holsworthy Option A.

Heathcote Road Road/Newbridge Road

This is currently a signalised intersection with four lanes on each of the three approaches. It is unlikely that additional approach lanes can be provided to increase the intersection capacity. If this is the case, the intersection may need to be grade separated by 2016 to provide the required additional capacity.

Heathcote Road/New Illawarra Road

This is presently a sign controlled intersection. By 2006 the intersection would need to be upgraded. The forecast traffic volumes seems to indicate a preference for a two-lane roundabout to traffic signals.

8.5.5 REQUIRED IMPROVEMENTS TO THE ROAD NETWORK

Appendix R provides a summary of travel statistics obtained from the model for each of the different airport runs. Measures include average speed, total vehicle hours, total vehicle kilometres travelled and total vehicle delay with values reported separately for the entire Sydney road network and for a cordoned area of Western Sydney. The figures in the table can be used to compare the four access scenarios for Holsworthy Option A in 2016.

8.6 SUMMARY OF LAND TRANSPORT IMPACTS OF A SECOND SYDNEY AIRPORT AT HOLSWORTHY OPTION A

8.6.1 COMPARATIVE TRAVEL TIMES

The comparative travel times for road and rail for the various road and rail access are provided below. Table 8.10 summarises the travel times from the airport site options to the central business district and to Parramatta. The morning peak was selected as the period for which the best information was available. Rail times are not subject to congestion costs beyond those already reflected in the timetable for November 1996 from which they were derived (CityRail, 1996). The road times assume that all widenings are in place to deliver an adequate level of service.

TABLE 8.10 COMPARATIVE FUTURE TRAVEL TIMES FOR HOLSWORTHY OPTION A IN MORNING PEAK IN MINUTES

	Travel time to Sydney CBD		Travel time to Parramatta CBD	
	From Airport	To Airport	From Airport	To Airport
By Road				
Road Alternative 1, M5 Motorway and Southern Cross Drive	61	49		
Road Alternative 3, Alford's Point Bridge, M5 Motorway and Southern Cross Drive	63	52		
Road Alternative 1, Cumberland Highway, M4 Motorway and Church Street			49	51
Road Alternative 4, Cumberland Highway, M4 Motorway and Church Street			56	57
By Rail	41	41	36	36

8.6.2 IMPACTS ON PUBLIC TRANSPORT

The implications on public transport of developing Holsworthy Option A as the Second Sydney Airport site include:

- the rail road alternative in this option is the closest to the city, and could be developed with the least travel time for most rail passengers of all the rail options for serving a Second Sydney Airport;

It was evident from modelling these scenarios that a strong demand would exist for access to the proposed Western Sydney Orbital and the M5 Motorway. The demand for access to and from the Western Sydney Orbital would be best served by a direct link to the north west connecting with the South Western Freeway or directly with the Western Sydney Orbital. Such a link should be arranged such that it is only used by airport traffic with through traffic and local airport traffic using Cambridge Avenue. The Road Alternative 4 that connects with the South Western Freeway further to the south would require widening of a section of the South Western Freeway to six lanes between the interchange with the road alternative and Brooks Road.

Providing a direct link to the north with the M5 Motorway would require the upgrading of Moorebank Avenue to six lanes through to Newbridge Road.

Implementation of an eastern connection (Road Alternative 3) is not expected to require improvements in the surrounding road network beyond those required to accommodate expected background traffic.

By 2016, the airport would contribute to moderate increases in peak direction traffic and large increases in non-peak direction traffic on the South Western Freeway, M5 Motorway, and the Western Sydney Orbital. Required capacity improvements for these roads to accommodate expected background demand will be sufficient to cater for airport traffic as well.

9.2.2 MAJOR ACCESS ROUTES

Second Sydney Airport Planners (1997) have suggested that road access to the airport site would be required initially to provide access for construction vehicles. It is envisaged that temporary roads would be established early during the construction period for construction traffic. It may be appropriate in some cases to establish these roads on the alignment of permanent roads.

Main roads within the airport would generally consist of four lanes. Temporary and permanent diversions of the existing military access roads in the Holsworthy Military Reserve, not necessarily within the designated airport site, may be needed to expedite deliveries and to separate construction traffic from military traffic.

The approach described in *Chapter 6.4.1* was used to establish the likely home origin of construction employees at a second Sydney airport at Holsworthy. The basis of this approach is the premise that the closer the local government area of residence is to the airport, the larger the number of airport employees within it.

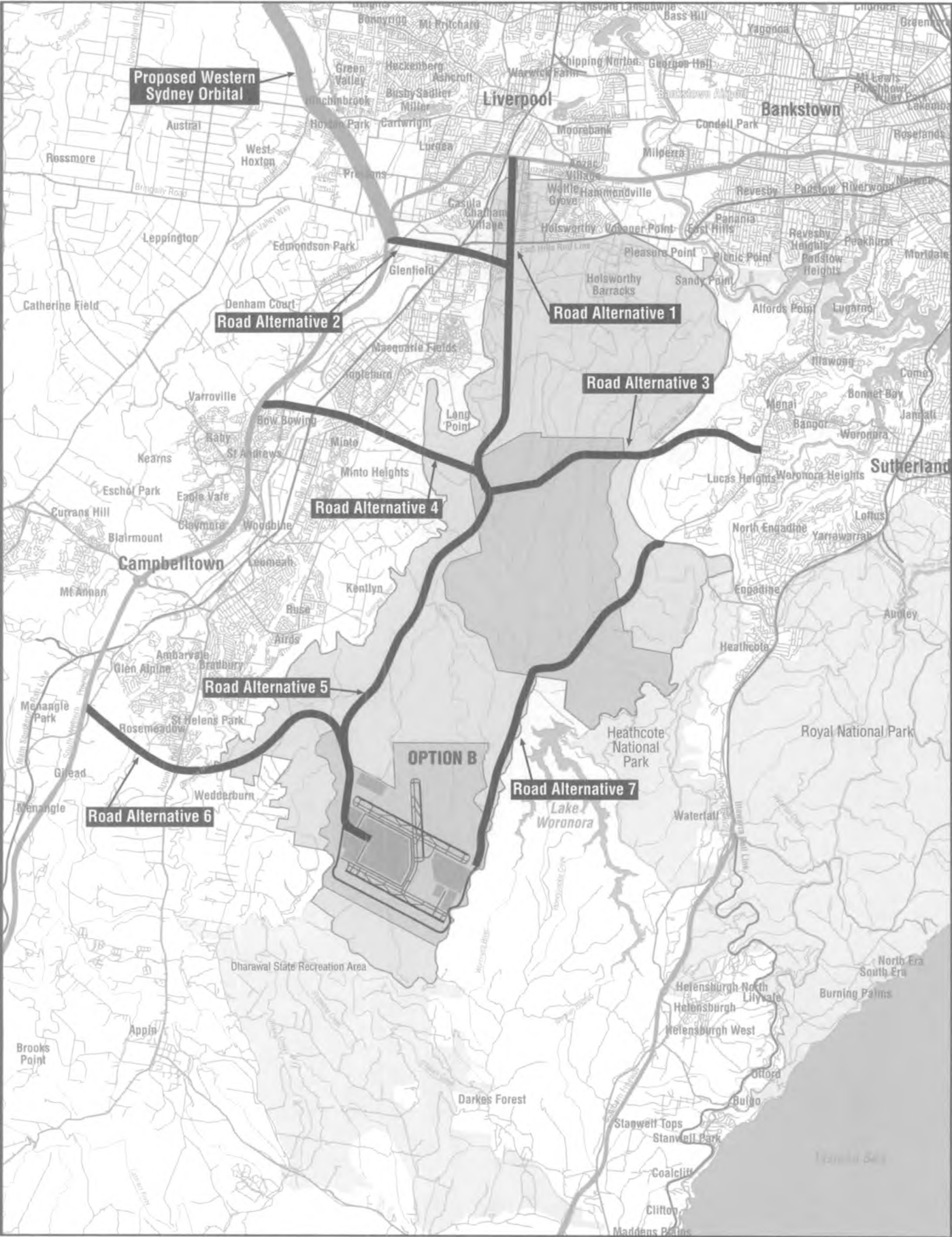
The construction truck traffic distribution along approach routes, however, was based on the likely origin and quantity of materials delivered to the site. It is understood that the majority of materials will reach the site by road from the south and west. Fuel for construction vehicles would be obtained from a refinery at Silverwater (Second Sydney Airport Planners, 1997).

In the event Cambridge Road and Moorebank Road provide the main access to the site during construction, then the impact would be similar to the those identified for Option A described in *Section 8.2 of Chapter 8*.

If however access it to be provided along the corridor noted as Road Alternative 6 in *Figure 9.2*, then the most likely approach routes for construction traffic with respect to both the workforce and the transport of construction materials to Holsworthy Option B would be via Appin Road. The most likely approach routes are noted in *Table 9.2*.

9.2.3 IMPACT ON ROAD NETWORK

Daily and peak hourly traffic volumes along the major approach routes to the site with and without construction activities are included in *Table O3 of Appendix O*, and summarised in *Table 9.3*. The impact of construction traffic on the level of service of the major approach routes to the site has been assessed. The results of this analysis are also included in *Appendix O*.



Potential road access to Option B
One or a combination of these access
corridors may be used

Figure 9.2
**Potential Road Access to
Holsworthy Airport Option B**

(Note: Road corridors are indicative only and not drawn to scale. Actual roads would be narrower. Corridors are under consideration as part of the EIS process and may be subject to change)

TABLE 9.3 IMPACT OF CONSTRUCTION TRAFFIC¹ FOR HOLSWORTHY OPTION B

Major Approach Roads	Daily Traffic Volumes			
	Existing Traffic ²	Construction Traffic	During Construction	% Increase
Appin Road south of Narellan Road	27,086	4,024	31,110	15%
Appin Road south of Copperfield Drive (north of Road Alternative 6)	11,726	4,024	15,750	34%
Appin Road south of Road Alternative 6	11,726	1,701	13,427	15%
Cumberland Highway south of Hume Highway	44,725	1,264	45,989	3%
Elizabeth Drive east of Smithfield Road	30,408	262	30,670	1%
Heathcote Road north of Macarthur Drive	18,304	406	18,710	2%
Hume Highway east of Box Road	44,610	2,376	46,986	5%
Hume Highway south of South Western Freeway (M5)	58,939	2,376	61,315	4%
Moore-Oxley Bypass north of Camden Road	27,737	232	27,969	1%
Narellan Road east of Menangle Road	17,671	3,792	21,463	21%
South Western Freeway (M5) south of Campbelltown Road	63,477	2,573	66,050	4%

Note: 1. From NSW Roads and Traffic Authority and commissioned counts.
2. In equivalent passenger car units. Assumes construction to master plan stage.

9.2.4 ROLE OF PUBLIC TRANSPORT IN CONSTRUCTION PHASE

The relative isolation of the airport site from major traffic routes means that the contribution from public transport to solve some of the construction traffic issues would be very small. No train service would be available before the operation of the airport. The absence of established, paved routes or other potential bus customers in the vicinity of the site would preclude a viable, scheduled bus route being offered by a private bus operator using usual business decision making.

If public transport is considered essential to ease the car numbers generated by construction, then a charter shuttle service would need to be set up by the construction manager to reach the worksite. This option is further complicated by the unresolved nature of the road access alternative that would be available to serve the worksite. Any charter route would need to relate to a frequent service train station, but the most appropriate station would be determined by the road alternative selected for construction access to the site.

In terms of the road alternatives shown in *Figure 9.2* for this site, Macarthur Station and Road Alternative 6 would appear to offer the most value for this purpose.

Because the station would be a terminating station, a 200 metre track overrun past the end of the platform is required by the SRA. A turnout/crossover would be located on the approach side of the station. As for the plans for Badgerys Creek link, the railway would be constructed at grade except in the vicinity of the airport itself where it would be placed underground to facilitate access to the airport and terminal area (Connell Wagner, 1997).

Level of Service Assumptions

There are two rail alternatives to serve this airport. If the link to Holsworthy Option B is taken from the same line as the link to Badgerys Creek, the East Hills Line, similar levels of service assumptions can be made which allow the passenger mode split for rail to remain the same for the two options. The actual travel time between the city and the airport would be less for this option than Badgerys Creek because there are fewer stops, but it would be greater than Holsworthy Option A because the distance is more.

For Rail Alternative 1, a link to the Main Southern Line between Menangle Park and Macarthur Stations, travel time would be longer than the average travel time from Central to Macarthur which ranges from 56 to 71 minutes (CityRail, 1996).

Assumptions on train service are that it is of a high quality and a focus of the traffic management strategy for the Second Sydney airport. To achieve the modal splits indicated for rail, the following characteristics are assumed:

- frequent service as a key station, which is defined by CityRail (State Rail Authority, 1994) as at least four services an hour during the peak;
- station location at the airport that would enable most passengers to walk easily to their air carrier;
- skip-stop or express operations from Glenfield or Holsworthy Station to North Arncliffe which allows for transfers but minimises travel time;
- restrictions on car parking on the airport site for casual users such as supply containment, time limits and fees; and
- fares which are competitive with other modes and do not offset the benefits of time savings.

The ability of Rail Alternative 1 to meet these assumptions is probably less than Rail Alternative 2 because Macarthur only receives three services an hour now during the peaks. Significant changes would be required to the Macarthur Line timetables to achieve the necessary service.

Rail travel forecasts for the two Holsworthy options are exactly the same. There was no basis to distinguish the forecasts on the site as they relate to most of Sydney's air travellers and airport employees. This is especially true if Rail Alternative 2 is selected because it practically reproduces the rail access proposed for Holsworthy Option A, except that is longer.

If Rail Alternative 1 is selected, then perhaps the modal share to rail could be expected to fall as travel times would increase for most air passengers and airport employees.

Additional Potential Patronage for Rail to Airport Site

Where the options significantly vary is in the potential passengers other than passengers/meeters and greeters, that are expected to use the new rail infrastructure. Airport employees are constant across the options because their numbers are directly related to the size of the airport, and their origins like the passengers are considered to be fixed without reference to the final airport site.

The real differences in potential passengers for this site and Badgerys Creek comes from the non-airport side of the demand. Compare *Table 9.4* which shows the estimated trip making at Holsworthy Option B with *Table 7.4* for Badgerys Creek. The same numbers of air passenger and airport employee trips are planned, but at Badgerys Creek in 2006 they represent 47 percent of the forecast rail patronage, compared with 82 percent for the same time at Holsworthy B. In 2016, or at the master plan stage of airport development, 61 percent of the Badgerys Creek Rail extension patronage would come from the airport directly, while it would be 93 percent at Holsworthy Option B.

The reason for the decline in alternative patronage is the constrained availability of land adjacent to the airport. The military and park/reserve land uses that surround the airport site preserved, and the catalyst role of the airport for increased employment is highly constrained. No urban release areas are proposed that are suitable for residential land either. On this site, the urban development and economic multiplier aspects of airport investment and rail investment are reduced.

There may be some scope for improved service by rail to residents in Rosemeadow if Rail Alternative 1 was selected, but the communities are largely completed and the prevailing urban design is not oriented toward mass transit at a station in the vicinity.

The contribution of non-airport employees in the stage one development of the airport is just 18 percent of daily passengers. This would decrease to seven percent under full master plan development. Most of these would be employed within walking distance of the station. If train timetables relate more to the primary demand group, air passengers, than to traditional

rail link. Both rail alternatives to Holsworthy Option B is significantly more expensive and less attractive than the Option A alternatives.

Infrastructure for Later Detailed Assessment

On this basis, detailed engineering cost, financial and economic appraisal would be required on the following rail capital work projects associated with a link to a Second Sydney Airport at Holsworthy Option B.

Infrastructure items requiring further analysis, in descending order of known elements:

- a rail spur between the East Hills Line and Holsworthy Option B;
- the nature of the junction between the East Hills Line and the airport link;
- a rail link extending the Macarthur line to Holsworthy Option B;
- the nature of the junction between the Main Southern Line and the airport link;
- a rail spur from the Macarthur Line between Casula and Glenfield to the airport,
- the nature of a junction between the Macarthur Line and the airport spur;
- modifications to the carriage marshalling and electric power at Macarthur Station;
- any potential stations to serve communities on the extension of the Macarthur Line; and
- any upgrading of Holsworthy Station as a transfer station.

Level of Service Implications for Later Assessment

Rail Alternative 1 to Holsworthy Option B is 17 kilometres from Macarthur Station and an indicative travel time of 12 minutes has been estimated for this line. With the difficult terrain, this could easily be longer in the final design. At the estimated travel time, travel to Central Station via the East Hills Line would take 74 minutes. Direct trains to Parramatta do not currently operate from Macarthur, so with a transfer, the in-train time of travel would be 48 minutes to Parramatta.

Because service would be less convenient and add another transfer into the system, for employees the projected mode share for bus/rail is expected to drop to closer to 10 percent. This would be similar to the combined bus/rail service that is available at Sydney Airport now, although the bus component would be a longer trip. At half the mode share, the combined patronage for the shuttle service is expected to be about 4,000 in 2006 and 12,000 in 2016. If buses were to meet every train service, a single bus should be sufficient for 2006, but by 2016, patronage would justify two buses for substantial parts of the day. Traffic movements per day in 2016 attributable to the shuttle service could increase to 400, or about 40 during the peak hour.

9.4 ROAD ACCESS TO AN AIRPORT AT HOLSWORTHY OPTION B

9.4.1 ROAD ACCESS TO SITE

Six different road access scenarios were considered for the Holsworthy Option A airport site consisting of different combinations of the following seven alternative roads, illustrated in *Figure 9.2*:

- Road Alternative 1: Northern connection to M5 Motorway consisting of substantial upgrading of Moorebank Avenue.
- Road Alternative 2: Western connection between Road Alternative 1 and the South Western Freeway and future Western Sydney Orbital along a corridor parallel to the Cambridge Avenue and Glenfield Road route. Access to and from the Freeway only.
- Road Alternative 3: Eastern connection to Heathcote and New Illawarra Roads.
- Road Alternative 4: Western connection to the South Western Freeway through Minto/Ingleburn with access to and from the later only.
- Road Alternative 5: Northern connection to Moorebank Road through the Military reserve.
- Road Alternative 6: Western connection to the South Western Freeway south of Rosemeadow.
- Road Alternative 7: Eastern connection to Heathcote and New Illawarra Roads.

This level of truck traffic would be insignificant in comparison to the other traffic flow on the above roads and would not have any measurable impact on the level of service along the above selected routes.

The proposed routes for the transportation of aircraft fuel to the site of Holsworthy Option B would be via Silverwater Road, M4 Motorway, Cumberland Highway, Hume Highway and South Western Freeway.

Alternatively, aviation fuel could be transported by road tankers via Silverwater Road, Parramatta Road, Woodville Road, Hume Highway and South Western Freeway.

The immediate road access for the transportation of fuel supply to Holsworthy Option B would be via new access roads to the north or west of the airport site.

The main feature of these routes would be to provide a most suitable access for the transport of aviation fuel to the airport site. Emphasis would be placed on public safety and environmental aspects of dangerous goods movements.

A relative risk assessment of the alternative routes would need to be undertaken to select a preferred route with the least risk factor for fuel to the airport site.

9.4.3 THE ROLE OF ROADS IN PUBLIC TRANSPORT PROVISION

Bus

The isolated development and likely limited integration into the road network of road access to the airport virtually preclude the airport becoming a destination included in local bus services. The most likely development of bus service would be if the shuttle bus option discussed as an alternative to a rail spur in the previous section on rail transport.

The access road to the airport would need to be monitored for congestion, especially if shuttle services were offered in lieu of rail service. The land that was under consideration for a rail line could be considerably reduced and still allow for dedicated road rights of way for the shuttle buses. The number of transit buses, even at master plan level full operation will be insufficient to justify the infrastructure. The justification will come from isolating buses from the road traffic bound for the airport.

Given the likely origin of taxi trips to the airport, Road Alternative 1 would be expected to favour the use of taxis by minimising the distance and costs involved. Sole development of Road Alternative 6 would be detrimental for efficient taxi operation.

9.5 IMPACT ON ROAD NETWORK

9.5.1 FUTURE ROAD NETWORK ASSUMPTIONS

The projected roadworks, included in *Appendix C*, were assumed for modelling purposes to indicate the most likely network improvements which would be required to alleviate congestion and meets the needs of metropolitan and economic growth of the Sydney region in 2006 and 2016.

9.5.2 AIRPORT TRAFFIC GENERATION

Table 9.5 summarises the total airport traffic generation assumed in the model for the two forecast years. Volumes entering and leaving the airport in the AM and PM peak are shown separately. Peak traffic generation associated with the airport including ancillary on-site development are included.

TABLE 9.5 PEAK HOUR TRAFFIC GENERATION ASSOCIATED WITH HOLSWORTHY OPTION B AIRPORT

		Airport Terminals		Other On-site		Total		
		Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Total
2006	AM	1,640	1,080	1,090	50	2,730	1,130	3,860
	PM	1,290	1,260	50	1,090	1,340	2,350	3,690
2016	AM	4,360	3,070	1,840	120	6,200	3,190	9,390
	PM	3,690	2,970	120	1,840	3,810	4,810	8,620

The overall traffic generation for Holsworthy Option B would be similar to those for Option A. It was concluded in the introduction to *Section 8.5.2* that the total traffic volumes generated by the airport in 2016, as summarised in *Table 8.5*, were sufficiently high to warrant more than a single access route into the airport site. With peak one-way volumes expected to exceed 6,000 vehicles per hour in 2016, connecting all airport traffic to a single point on the surrounding road network would lead to major concentrated impacts.

TABLE 9.6 FUTURE TRAFFIC VOLUMES ON MAJOR APPROACH ROUTES TO HOLSWORTHY OPTION B - AVERAGE DAILY TRAFFIC

Location Description			Base 2,006	Option B5 2,006	% increase	Base 2,016	Option B5 2,016	% increase	Option B6 2,016	% increase
Alfords Point Road	at	Georges River	53,048	52,801	0	55,734	56,438	1	73,764	32
Anzac Road	West of	Heathcote Road	11,381	11,497	1	11,081	13,482	22	10,377	-6
Cambridge Road	West of	Moorebank Avenue	18,123	18,734	3	19,773	33,175	68	21,493	9
Glenfield Road	East of	Old Glenfield Road	9,558	10,366	8	11,278	11,959	6	11,901	6
Heathcote Road	at	Woronora River	24,114	25,833	7	20,581	24,818	21	23,836	16
Heathcote Road	South of	Anzac Road	47,084	49,277	5	56,527	59,989	6	61,605	9
Hume Highway	North of	M5 Motorway	82,799	86,354	4	69,928	84,472	21	77,154	10
M5 Motorway	West of	River Road	83,664	87,358	4	92,645	100,298	8	97,412	5
M5 Motorway	East of	Moorebank Avenue	80,917	87,901	9	106,196	120,591	14	103,011	-3
M5 Motorway	West of	Moorebank Avenue	99,275	111,395	12	125,726	140,568	12	123,630	-2
M5 Motorway	East of	Western Sydney Orbital	87,820	93,580	7	100,021	102,214	2	99,802	0
Moorebank Avenue	North of	Cambridge Avenue	16,213	16,761	3	17,700	29,680	68	19,229	9
Moorebank Avenue	North of	M5 Motorway	32,044	36,901	15	33,167	40,052	21	34,236	3
Narellan Road	West of	South Western Freeway	41,098	43,515	6	50,851	61,948	22	57,679	13
Narellan Road	East of	South Western Freeway	41,928	38,732	-8	50,624	53,134	5	48,467	-4
New Illawarra Road	North of	Heathcote Road	24,759	24,116	-3	30,630	28,444	-7	51,905	69
Road Alternative 6	East of	Appin Road	n/a	29,328		n/a	75,642		36,631	
Road Alternative 6	West of	Appin Road	n/a	25,500		n/a	50,200		32,800	
Road Alternative 7	East of	Airport	n/a	n/a		n/a	n/a		39,011	
South Western Freeway	North of	Brooks Road	88,282	106,081	20	98,763	110,583	12	111,645	13
South Western Freeway	North of	Campbelltown-Raby Road	69,200	92,538	34	78,615	102,604	31	98,710	26
Western Sydney Orbital	North of	M5 Motorway	43,818	46,876	7	66,673	63,799	-4	77,454	16

Junction	2006	2016
Road Alternative 6 with South Western Freeway	Grade separated	Grade separated
Road Alternative 6 with Appin Road	Traffic signals	Traffic signals
(if only access)	Traffic signals	Grade separated
Road Alternative 7 with New Illawarra Road	Traffic signals	Grade separated

9.5.5 REQUIRED IMPROVEMENTS TO THE ROAD NETWORK

The comments made in the previous chapter regarding required network improvements for access scenarios that include road alternatives to the north and north west from Holsworthy Option A are equally valid for Holsworthy Option B.

The two additional scenarios considered here for Holsworthy Option B indicate:

- Providing only a single access link (Road Alternative 6) to the west would require substantial capacity improvements along extended sections of both the South Western Freeway and Campbelltown Road. Combining this road alternative with one to the east (Road Alternative 7) would require the widening of the South Western Freeway between the interchange with Road Alternative 6 and Brooks Road to six lanes.
- Implementation of Road Alternative 7 to the east would require widening of New Illawarra Road to six lanes.
- Provision of appropriate traffic controls at intersections identified above would be required.

The network improvements required under each scenario are summarised in *Figure 9.3* and *9.4* respectively.

9.6 SUMMARY OF LAND TRANSPORT IMPACTS OF A SECOND SYDNEY AIRPORT AT HOLSWORTHY OPTION B

9.6.1 COMPARATIVE TRAVEL TIMES

The comparative travel times for road and rail for the various road and rail access are provided below. *Table 9.8* summarises the travel times from the airport site options to the central business district and to Parramatta. The morning peak was selected as the period for which the best information was available. Rail times are not subject to congestion costs beyond those already reflected in the timetable for November 1996 from which they were

- the isolation of the site means that an airport station is unlikely to act as a catalyst for new local bus feeder route services to develop;
- Holsworthy Option B is better located for regional travel demand from southern New South Wales and Canberra, but future passenger forecasts indicated these are small contributors to overall air travel demand;
- if a rail link was not constructed in stage one or master plan stage of full development, then a high frequency shuttle bus service would need to connect the airport to the rail system. Glenfield Station would have the highest frequency train service of the nearby stations, while Macarthur would be closer to the airport;
- if a shuttle interchange was built at Glenfield, then Road Alternative 2 would best serve this option. If a shuttle interchange was to be developed at Macarthur, then Road Alternative 6 would have more merit;
- taxis, coaches and buses would be consider this option relatively similar to a site at Badgerys Creek in terms of average travel distance from the central business district as long as the most direct road alternatives were selected to the M5 and South Western Freeway. In terms of serving the entire metropolitan population, however, the site is less central; and
- the construction of Rail Alternative 1 would have a greater impact on future community integration than other rail options.

9.6.3 IMPACTS ON ROAD NETWORK

The road network impacts of a second airport at Holsworthy Option B are similar to those of Holsworthy Option A and the conclusions drawn in Chapter 8 with regards to access to the north and north west also apply here.

A road access scenario was considered for Holsworthy Option B where the only access to the airport would be from the west via a road alternative connecting with the South Western Freeway. It was concluded that expected traffic levels in 2016 would require more than a single access link.

Supplementing the western connection with an eastern connection would reduce the impact on traffic levels in the South West corridor - additional airport traffic could be accommodated by the widening of the South Western Freeway to six lanes between the interchange with the airport link and Brooks Road.

Part D

Environmental Management and Summary of Impacts

10.2.2 HOLSWORTHY OPTION A

Temporary and permanent diversions of the existing military access roads in the Holsworthy Military Reserve, not necessarily within the designated airport site, may be needed to expedite deliveries and to separate construction traffic from military uses.

The majority of construction traffic would need to travel along Glenfield and Cambridge Roads, and to a lesser extent Bringelly Road and Moorebank Avenue. Glenfield Road and Cambridge Road would require upgrading to at least four lane undivided carriageway. Moorebank Road and Anzac Road which are currently operating with poor levels of service need upgrading. With construction activities at the airport, this requirement would become critical.

If public transport is considered essential to ease the car numbers generated by construction, then a charter shuttle service would need to be set up by the construction manager to reach the worksite. This option is further complicated by the unresolved nature of the road that would be available to serve the worksite. Any charter route would need to relate to a frequent service train station, but the most appropriate station would be determined by the road alternative selected for construction access to the site.

10.2.3 HOLSWORTHY OPTION B

If Cambridge Road and Moorebank Avenue provide the main access to the site during construction, then the impact would be similar to the those identified for Option A. If access is not provided through Holsworthy Military Area, then the most likely approach route for construction traffic with respect to both the workforce and the transport of construction materials would be Appin Road.

The majority of construction traffic would need to travel along the South Western Freeway, Narellan Road and Appin Road. During the peak period, construction traffic would mostly be travelling in the opposite direction of peak background traffic. As a result, the current levels of service along most roads would remain unaffected. The two lane section of Appin Road, between Narellan Road and the access to the site would however require upgrading to a four lane divided carriageway.

The absence of established, paved routes or other potential bus customers in the vicinity of the site would preclude a viable, scheduled bus route being offered by a private bus operator using usual business decision making.

The comparative travel times for road and rail for the various road and rail access are provided below. *Table 10.1* summarises the travel times from the airport site options to the central business district and to Parramatta. The morning peak was selected as the period for which the best information was available. Rail times are not subject to congestion costs beyond those already reflected in the timetable for November 1996 from which they were derived (CityRail, 1996). The road times assume that all widenings are in place to deliver an adequate level of service.

TABLE 10.1 COMPARATIVE FUTURE TRAVEL TIMES FOR AIRPORT SITES IN MORNING PEAK IN MINUTES¹

	Sydney CBD			Parramatta CBD		
	To Airport by Road	Out of Airport by Road	Rail to and from Central Station	To Airport by Road	Out of Airport by Road	Rail to and from Parramatta via Cumberland Line ²
Badgerys Creek	60	74	45-48	38	42	30-33
Holsworthy A	49-52	61-63	41	51	49	36
Holsworthy B	61-70	70-82	49-66	62-71	59-69	42-58

- Notes:
1. A range is given when alternative routes are available.
 2. Only in-train times given, no time allowance for transfer, if required.

10.3.1 SUMMARY OF LAND TRANSPORT IMPACTS OF A SECOND SYDNEY AIRPORT AT BADGERYS CREEK

Impact on Public Transport

The implications of a Second Sydney Airport at Badgerys Creek for public transport services include:

- improving the likelihood that a long planned rail extension would be implemented;
- more than doubling the anticipated contribution of airport passengers to the patronage potential of the rail link anticipated in earlier investigations of the project's financial and economic benefits. Estimates are that the rail link would obtain almost half its patronage from airport generated passengers;
- improve the chances that the shorter, more direct Rail Alternative 2 would be the preferred route choice for the rail. This would reduce construction costs and rail passenger travel times;

- The Northern Road and Bringelly Road would initially be widened and realigned for four lanes. The initial upgrade would be needed for construction access. The development of urban commercial and industrial areas along the route would need to be assessed in conjunction with the road upgrade;
- an EIS for the upgrade of Elizabeth Drive for a 13 million passengers per annum airport (Rust PPK, 1995) made provision for grade separation at intersections at local road access. The need for grade separation would be multiplied by the expanded capacity of the airport and being considered in this Draft EIS; and
- increase in traffic levels on major freeways in the vicinity of the airport site including the M4 Motorway, the M5 Motorway and the Western Sydney Orbital. The major impact would be in the current non-peak directions with volumes predicted to match peak direction volumes at some locations in the future.

10.3.2 IMPACTS OF AN AIRPORT AT HOLSWORTHY OPTION A

Impact on Public Transport

The implications on public transport of developing Holsworthy Option A as the Second Sydney Airport site include:

- the rail road alternative in this option would be the closest to the city, and could be developed with the least travel time for most rail passengers of all the rail options for serving a Second Sydney Airport;
- while the planning for the Badgerys Creek extension has shown that there is capacity on the East Hills Line for service to an airport, detail feasibility has yet to be carried out to establish the specific parameters of creating a junction between Holsworthy Station and Glenfield, and the engineering task in building a rail access to the airport;
- no obvious or direct transfer station would be created for trips from the south and west. This is the role Glenfield would provide for the Badgerys Creek site. Instead there is the potential for developing a second rail junction with the Macarthur Line between Casula and Glenfield to allow services from the city to divert to the Airport instead of to Campbelltown;
- there is very limited opportunity for the rail alternative to serve any other trip purposes than the airport;
- the potential rail route offers no operational benefit to CityRail, and there appears to be nowhere for the rail to continue beyond the airport

- providing a direct link to the north with the M5 Motorway would require the upgrading of Moorebank Avenue to six lanes through to Newbridge Road;
- implementation of an eastern connection (Road Alternative 3) is not expected to require improvements to the surrounding road network beyond those required to accommodate expected background traffic; and
- by 2016, the airport would contribute to moderate increases in peak direction traffic and large increases in non-peak direction traffic on the South Western Freeway, M5 Motorway, and the Western Sydney Orbital. Required capacity improvements for these roads to accommodate expected background demand would be sufficient to cater for airport traffic.

10.3.3 IMPACTS OF HOLSWORTHY OPTION B

Impact on Public Transport

The impacts on public transport of placing the Second Sydney Airport on the Holsworthy Option B location include:

- the rail link for this site would be the most distant option from frequent urban services, and the most unlikely to be cost effective to develop;
- this site would require the greatest amount of preliminary feasibility assessment work on rail access to establish project scopes and viability;
- while Rail Access Alternative 1 is shorter than Rail Alternative 2, it would potentially be no cheaper to construct as it would cross many creeks and gullies while option 2 follows a ridge line;
- frequent service would be much harder to provide along Rail Alternative 1 because of how it would integrate into CityRail services;
- Rail Alternative 2 would require a track extension over 20 kilometres long, with no patronage source other than the airport;
- the isolation of the site means that an airport station is unlikely to act as a catalyst for new local bus feeder route services to develop;
- Holsworthy Option B is better located for regional travel demand from southern New South Wales and Canberra, but future passenger forecasts indicated these are small contributors to overall air travel demand;

- road improvements to the east of the airport such as the widening of Alfords Point Road, Menai Road and the construction of a Bangor bypass have previously been identified as necessary to satisfy background demand. These would be sufficient to accommodate additional airport traffic under scenarios that include an eastern connection.

10.4 ENVIRONMENTAL MANAGEMENT

Many aspects of environmental management as it relates to transport for the Second Sydney Airport would arise from programs to minimise impacts for other purposes. As a derived demand, transport behaviour and route selection are likely to be heavily influenced by macro changes surrounding the sites.

In regard to the issues raised in this chapter, management issues to be addressed are listed by topic below.

10.4.1 CONSTRUCTION IMPACTS

The construction of the Second Sydney Airport would be a massive project, but most consent authorities have extensive experience on how to manage the externalities of construction activity. The principles on dust abatement, vehicle cleaning, on site materials storage and security fencing would apply, even if the scale is greater than usual. Roads which appear unable to cope with the extra construction traffic have been identified. It should be noted in the construction programs that night work has been assumed at varying rates in the options.

10.4.2 FUEL SUPPLY

A fuel pipeline is assumed to be operating in 2016. It is preferred to be in place by 2006, but if it is not, then fuel would have to arrive by road. The report identifies potential routes that could be utilised for fuel haulage and recommends a risk assessment where alternative routes are possible. This is mainly to reduce the risks to safety for drivers and others, environmental damage and reductions in amenity. The greater reduction in risk and environmental impact would arise from the transportation of fuel via a pipeline.

10.4.3 VEHICLE MANAGEMENT

The development and use of the Second Sydney Airport would create considerable economic and employment opportunities within the metropolitan area. Throughout the consultation process, views were expressed that these opportunities should not be compromised or

The main corridor being considered passes through Edmondson Park and Bringelly. A further rail corridor direct from Rossmore to the airport site may be considered to service Badgerys Creek Option C.

Rail access to Holsworthy Option A would involve connecting to the East Hills Rail Line at a point between Holsworthy and Glenfield Stations with the provision of a Y-link between the East Hills Rail Line, the Cumberland Rail Line and the proposed rail line to the airport to provide maximum access to the airport site to both the city and major centres such as Liverpool, Parramatta and Blacktown. Option B could be linked directly to the Main Southern Rail Line south of Macarthur Station or be serviced by a rail line to the north which would link into the East Hills and Cumberland Rail Lines.

Under all the airport options considered, the major impact of vehicular traffic associated with the airport will be to increase flows on major freeways in the current off-peak direction. This would result in more effective utilisation of existing and future road network capacity and a minimisation of additional road infrastructure requirements. The level of road network improvements associated with each airport option would be small in comparison with likely Sydney-wide investment in road infrastructure arising from background increases in road demand.

The Badgerys Creek airport site is in a region currently characterised by low volume rural roads. The expected traffic volumes associated with the Second Sydney Airport would require substantial upgrading of these roads to provide access to the surrounding freeway system include the M4 Motorway, the Western Sydney Orbital and the M5 Motorway. The Badgerys Creek site is better suited to distributing traffic across a wider region to minimise impacts.

In comparison, Holsworthy Option A and Option B would require construction of new roads to link with the neighbouring South Western Freeway and M5 Motorway, as well as possible links to Heathcote Road and New Illawarra Roads to the east. The location of these Holsworthy sites, constrains traffic to using the South Western Freeway/M5 Motorway and roads crossing the Georges River to the east such as Alfords Point Road and the Princes Highway. All of these road links are expected to experience considerable congestion in the future even without additional airport related traffic. The road crossings of the Georges River to the north of the Sutherland Shire have limited opportunity for major capacity improvements.

All of the airport options would have significant impacts on Sydney's transport systems. The Badgerys Creek airport options, however, would have greater accessibility to Sydney's motorway network. Road access to the Holsworthy airport options would be severely constrained by the capacity of the M5 Motorway, Alfords Point Road and the major road crossings of the Georges River at Sylvania and Taren Point. Rail proposals to Badgerys Creek would also be better integrated into Sydney's overall rail system.

References

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Appendices

Appendix A

Population Projections

APPENDIX A POPULATION PROJECTIONS

SLA	POPULATION										
	Land Use 1		Land Use 2		Land Use 3		Land Use 4		Land Use 5		
	1,996	2006	2016	2006	2016	2006	2016	2006	2016	2006	2016
SYDNEY METROPOLITAN REGION											
Ashfield	41,766	42,253	42,685	42,253	42,685	42,253	42,685	42,253	42,685	42,253	42,685
Auburn	51,787	56,134	65,099	56,134	65,099	56,134	65,099	56,134	65,099	56,134	65,099
Banksstown	165,186	174,417	183,167	174,417	183,167	174,417	183,167	174,417	183,167	174,417	183,167
Baulkham Hills	125,507	155,067	171,753	155,067	171,753	155,067	171,753	155,067	171,753	155,067	171,753
Blacktown	227,609	258,426	275,159	258,427	274,838	258,427	274,838	258,427	274,838	258,427	274,838
Bolton	34,787	34,035	33,934	34,035	33,934	34,035	33,934	34,035	33,934	34,035	33,934
Burwood	29,559	30,714	31,686	30,714	31,686	30,714	31,686	30,714	31,686	30,714	31,686
Camden	29,160	49,253	61,457	50,630	71,559	49,382	66,536	49,903	67,080	47,548	54,839
Campbelltown	148,330	160,736	170,181	160,181	166,852	160,384	167,591	160,510	168,326	161,912	176,942
Canterbury	137,682	144,433	149,784	144,433	149,784	144,433	149,784	144,433	149,784	144,433	149,784
Concord	24,678	31,179	33,628	31,179	33,628	31,179	33,628	31,179	33,628	31,179	33,628
Drummoyne	31,709	32,457	32,657	32,457	32,657	32,457	32,657	32,457	32,657	32,457	32,657
Fairfield	190,698	204,481	212,752	204,430	212,590	204,449	212,636	204,460	212,673	204,471	212,696
Hawkesbury	56,464	59,162	62,055	59,162	61,924	59,162	61,924	59,162	61,924	59,162	61,924
Holroyd	82,660	86,209	89,951	86,209	89,951	86,209	89,951	86,209	89,951	86,209	89,951
Hornsby	141,023	149,147	157,280	149,147	155,904	149,147	156,118	149,147	156,409	149,147	156,530
Hunters Hill	12,672	13,092	13,767	13,092	13,767	13,092	13,767	13,092	13,767	13,092	13,767
Hurstville	68,230	71,493	74,623	71,493	74,623	71,493	74,623	71,493	74,623	71,493	74,623
Kogarah	49,321	51,483	53,391	51,483	53,391	51,483	53,391	51,483	53,391	51,483	53,391
Kuringai	106,481	107,698	109,158	107,698	109,158	107,698	109,158	107,698	109,158	107,698	109,158
Lane Cove	30,607	31,603	32,448	31,603	32,448	31,603	32,448	31,603	32,448	31,603	32,448
Leichhardt	60,806	64,775	65,489	64,775	65,489	64,775	65,489	64,775	65,489	64,775	65,489
Liverpool	112,009	153,830	173,793	154,196	178,513	154,808	180,657	154,833	181,261	155,537	183,852
Manly	36,232	36,360	36,649	36,360	36,649	36,360	36,649	36,360	36,649	36,360	36,649
Marrickville	79,032	78,776	79,285	78,776	79,285	78,776	79,285	78,776	79,285	78,776	79,285
Mosman	26,962	27,766	28,498	27,766	28,498	27,766	28,498	27,766	28,498	27,766	28,498
North Sydney	53,975	60,475	63,448	60,475	63,448	60,475	63,448	60,475	63,448	60,475	63,448
Parramatta	138,557	144,390	149,898	144,390	149,898	144,390	149,898	144,390	149,898	144,390	149,898
Penrith	164,498	182,634	198,109	182,368	196,172	182,466	196,527	182,526	196,881	182,582	197,064
Randwick	119,117	121,428	123,963	121,428	123,963	121,428	123,963	121,428	123,963	121,428	123,963
Rockdale	89,187	91,959	94,250	91,959	94,250	91,959	94,250	91,959	94,250	91,959	94,250
Ryde	96,482	100,808	104,027	100,808	104,027	100,808	104,027	100,808	104,027	100,808	104,027
South Sydney	71,754	80,967	87,350	80,967	87,350	80,967	87,350	80,967	87,350	80,967	87,350
Strathfield	27,457	29,152	30,594	29,152	30,594	29,152	30,594	29,152	30,594	29,152	30,594
Sutherland	200,552	212,822	221,846	212,822	220,747	212,822	220,918	211,861	216,893	211,861	216,893
Sydney	10,705	24,260	28,276	24,260	28,276	24,260	28,276	24,260	28,276	24,260	28,276
Warringah	182,867	185,836	197,704	184,960	192,918	185,280	194,012	185,480	195,072	185,662	195,631
Waverley	61,338	62,568	63,818	62,568	63,818	62,568	63,818	62,568	63,818	62,568	63,818
Willoughby	54,908	59,749	61,690	59,749	61,690	59,749	61,690	59,749	61,690	59,749	61,690
Woollahra	52,103	53,247	54,218	53,247	54,218	53,247	54,218	53,247	54,218	53,247	54,218
Sub-Total	3,424,457	3,715,274	3,919,520	3,715,270	3,921,201	3,715,274	3,920,941	3,715,256	3,920,541	3,715,256	3,920,393
SYDNEY OUTER REGION											
Blue Mts	74,518	77,718	80,162	77,718	80,162	77,718	80,162	77,718	80,162	77,718	80,162
Gosford	143,706	156,633	163,772	156,633	163,772	156,633	163,772	156,633	163,772	156,633	163,772
Wollondilly	34,162	40,222	43,539	40,223	43,539	40,223	43,539	40,223	43,539	40,223	43,539
Wyong	113,691	135,288	148,722	135,288	147,049	135,288	147,309	135,288	147,662	135,288	147,810
Sub-Total	366,077	409,861	436,195	409,862	434,522	409,862	434,782	409,862	435,135	409,862	435,283
TOTAL	3,790,534	4,125,135	4,355,715	4,125,132	4,355,723	4,125,136	4,355,723	4,125,118	4,355,676	4,125,118	4,355,676

Source: Long Technical

Appendix B

Screenlines Calibration

APPENDIX B
TABLE B2 SCREENLINE CALIBRATION FOR PM PEAK HOUR

No	Street Name	Location	Suburb	N/E Count Flow	N/E Model Flow	%	S/W Count Flow	S/W Model Flow	%
Screenline 1									
1	ALFORDS PT RD	AT ALFORDS PT BRIDGE	ALFORDS POINT	1,355	1,273	-6%	3,200	3,109	-3%
1	PRINCES HWY	AT GEORGES RIVER BRIDGE	SYLVANIA	1,600	1,621	1%	5,600	5,654	1%
1	ROCKY POINT RD / TAREN POINT RD	AT CAPTAIN COOK BRIDGE	TAREN POINT	1,200	1,203	0%	4,300	4,149	-4%
1	HEATHCOTE RD, MR512- SL4	NORTH OF SOUTH WESTERN FWY M5	MOOREBANK	753	866	15%	802	872	9%
Sub-total Screenline 1				4,908	4,963	1%	13,902	13,784	-1%
Screenline 2									
2	THE NOTHERN RD, MR 154	NORTH OF ELIZABETH DR	LUDDENHAM	300	266	-11%	300	290	-3%
2	LUDDENHAM RD	NORTH OF ELIZABETH DR	LUDDENHAM	90	74	-18%	200	163	-19%
2	MAMRE RD, MR535	NORTH OF ELIZABETH DR	KEMPS CREEK	900	787	-13%	350	379	8%
2	WALLGROVE RD, MR 515	NORTH OF MR 535, ELIZABETH DR	CECIL PARK	560	616	10%	683	751	10%
2	COWPASTURE RD, MR648	NORTH OF MR 515, ELIZABETH DR	EDENSOR PARK	646	704	9%	1,009	1,063	5%
Sub-total Screenline 2				2,496	2,447	-2%	2,542	2,646	4%
Screenline 3									
3	GREAT WESTERN HWY SH5-SL13	EAST OF SH 13, CUMBERLAND HWY	WENTWORTHV ILLE	986	900	-9%			
							2,865	2,880	1%
3	WESTERN FWY (M4 MOTORWAY SL11)	EAST OF PITT ST OVERPASS	MERRYLANDS	2,665	2,701	1%			
							5,150	5,325	3%
3	HUME HWY, SH2-SL4 (Liverpool Rd)	WEST OF WOODVILLE RD	WARWICK FARM	1,700	1,618	-5%			
							3,500	3,371	-4%
3	NEWBRIDGE RD	WEST OF HENRY LAWSON DRIVE	MILPERRA	2,239	2,200	-2%			
							3,400	3,376	-1%
3	SOUTH WESTERN FREEWAY (M5)	AT BRIDGE OVERPASS GEORGES RIVER	MOOREBANK	1,655	1,613	-3%	3,671	3,754	2%
Sub-total Screenline 3				9,245	9,032	-2%	18,586	18,706	1%
Screenline 4									
4	THE NOTHERN RD, MR 154	SOUTH OF LOWES CR	BRINGELLY	440	328	-25%	364	395	9%
4	CAMDEN VALLEY WAY, MR 620 (SL12)	SOUTH OF DENHAM COURT	LEPPINGTON	500	655	31%	1,150	1,221	6%
4	SOUTH WESTERN FWY (M5)	SOUTH OF BROOKS RD OVERBRIDGE	INGLEBURN	1,486	1,436	-3%	3,330	3,377	1%
4	CAMPBELLTOWN RD, MR177 (SL4)	SOUTH OF DENHAM COURT	DENHAM COURT	319	286	-10%	977	1,078	10%
Sub-total Screenline 4				2,745	2,705	-1%	5,821	6,071	4%
Screenline 5									
5	ELIZABETH DR, MR535	WEST OF MR 515, WALLGROVE RD.	CECIL PARK	508	499	-2%	1,098	1,169	6%
5	FIFTEENTH AVE	EAST OF DEVONSHIRE	KEMPS CREEK	200	185	-8%	140	133	-5%
5	BRINGELLY RD	WEST OF COWPASTURE RD	LEPPINGTON	200	207	4%	420	414	-1%
Sub-total Screenline 5				908	891	-2%	1,658	1,716	3%
Screenline 6									
	GARFIELD RD WEST	EAST OF RICHMOND RD	MARSDEN PARK	510	537	5%	500	437	-13%
	RICHMOND	EAST OF ROOTY HILL RD	DEAN PARK	800	747	-7%	1,700	1,654	-3%
	POWER ST	WEST OF KNOX RD	GLENDENNING	800	793	-1%	1,100	1,129	3%
	EASTERN RD	WEST OF ROOTY HILL RD	ROOTY HILL	250	172	-31%	560	530	-5%
	GREAT WESTERN HWY SH5-SL13	WEST OF ROOTY HILL RD SOUTH	MINCHINBURY	600	535	-11%	2,100	2,031	-3%
	WESTERN FWY (M4 MOTORWAY SL11)	WEST OF WALLGROVE RD	EASTERN CREEK	2,400	2,443	2%	4,200	4,281	2%
Sub-total Screenline 6				5,360	5,227	-2%	10,160	10,062	-1%
Total all Screenlines				25,662	25,265	-2%	52,669	52,985	1%

Appendix C

Modelled Assumed Future Roadworks

B. PROJECTS ASSUMED TO BE COMPLETED BY 2001:

1. Eastern Distributor (twin tunnels between William St to South Dowling St), (4 lanes). Including grade separation at South Dowling and Cleveland St Intersection.
2. Hume Hwy/Roberts Rd/Centenary Dve grade separation, Greenacre (including widening Roberts Rd to 6 lanes between Hume Hwy to Norfolk Road).
3. Southern Arterial to Green Square (Wyndham St/Botany Street as one way pair) including extension of Wyndham Street to O'Riordon Street (2 lanes each way).
4. Improvements to King Georges Rd/Stoney Creek Rd intersection at Beverly Hills. Extra right turn lane in Stoney Creek Rd east and additional through lane in King Georges Rd south (6 lanes/4 lanes).
5. Direct approaches from the north Giovanni Brunnetti Bridge (Kingsford Smith Airport) (4 lanes - 2 lanes each way).
6. M2 (North West Transport Link) - Old Windsor Rd Seven Hills to North Ryde (4 lanes).
7. M5 Duplication Heathcote Rod to Casula including Moorebank Avenue Grade separation (4 lanes/4 lanes plus 2 right turn lanes).
8. Some improvements to Pacific Highway through Chatswood (tidal flow and turn lanes) (6 lanes - 3 lanes each way).
9. Grade separation of Homebush Bay Dve/Underwood Rd/Australia Ave intersection at Homebush Bay (2 lanes at each approach).
10. City West Link Rd (4 lanes with turn bays) between Victoria Rd and Parramatta Road (Sections 3&5).
11. M5 East (Beverly Hills to General Holmes Dve, Kyeemagh - 4 lanes).
12. Old Windsor Road - Norwest Boulevard to Sunnyholt Rd (4 lanes).
13. M5 (Fairford Rd to King Georges Rd) - (additional 2 lanes for a total of 4 lanes).
14. Rockdale Bypass, ie Harrow Rd to West Botany St, Rockdale (2 lanes). In deviation skirting just around the buildings zoned retail/commercial on the northern side of the Southside Plaza shopping centre. Only for light vehicles.
15. Grade separation at Victoria Rd/Devlin St intersection, Top Ryde (6 lanes/6 lanes including 2 turn bays).
16. Stacey St extension to Rookwood Rd, Bankstown (4 lanes).

C. PROJECTS ASSUMED TO BE COMPLETED BY 2006:

1. Sunnyholt Rd (4 lanes throughout).
2. Extension of motorway south of Menai Rd to near Barden Rd, Lucas Heights (4 lanes).
3. Upgrading of Epping Rd through Lane Cove (several grade separations + 4 lane tunnel).
4. Several climbing lanes on Mona Vale Rd, Ingleside.
5. One way pair O'Riordan St southbound, Bourke Rd northbound, between Green Square and Robey St (6 lanes from 4 lanes).
6. Widening of King Georges Rd to 6 lanes between Stoney Creek Rd and Forest Rd.
7. Old Windsor Rd - Sunnyholt Road to Windsor Rd (4 lanes).
8. Upgrading of the Sydenham Rd route (Parramatta Rd to Princes Hwy).
9. Pennant Hills Rd, Mahers Rd to Marsden Rd (6 lanes).
10. Church Ln, M4 - Blacktown Rd (4 lanes).
11. Great Western Hwy, Lawson (4 lanes).
12. M2, Richmond Road to Old Windsor Road (4 lanes)
13. Western Sydney Orbital - Duplication of Wallgrove Road between Elizabeth Drive and M4 - 4 lanes.
14. Western Sydney Orbital (2 lanes) Prestons to Cecil Park plus Elizabeth Drive upgrade to Sydney West Airport.
15. Widening of Frederick Street, Ashfield (one unobstructed through lane in each direction from Thomas St to Parramatta Road) (4 lanes).
16. Northern Road, Penrith (Wentworth Road to Smith St) - (4 lanes)
17. Marsden Rd widened Stewart St to Terry Rd (provide turn lanes in addition to 2 lanes in each direction).
18. Warringah Fwy - Falcon St Ramps (2 lanes).
19. Woronora River Bridge at Woronora (New 2 lane bridge, with three lane approaches).
20. Bourke Rd Extension, Coward St to Gardeners Rd, Mascot (4 lanes).

E. PROJECTS ASSUMED TO BE COMPLETED BY 2016:

1. Cumberland Highway (6 lanes divided)
2. Prospect Arterial (2 lanes) - GWH to Horsley Drive
3. Hoxton Park Road (4 Lanes) Hume Highway to Cowpasture Road
4. Cowpasture Road deviation extension to Bringelly Road (4 lane)
5. Werrington Arterial (4 lanes) M2 to M4
6. M4 Kent Street - East Facing ramps to University of Western Sydney (1 lanes each way).
7. Mona Vale Road 4 lanes Pittwater - Terrey Hills
8. Brickmakers Creek - M5 to Cumberland Highway 4 lanes
9. Boundary St, Roseville intersections upgraded (3 lanes each way, with dual turn bays).
10. Pacific Highway Chatswood - grade separations at key intersections.

Appendix D

Concept of Carriageway Capacity and
Level of Service

TABLE D1
LEVEL OF SERVICE INTERRUPTED ¹ FLOW CONDITIONS ALONG URBAN ROADS
One Way Hourly Volumes

ROAD CLASS		TYPE	Description	LEVEL OF SERVICE					
Type	Description			A	B	C	D	E	F
U1	URBAN	2	2 Lanes Undivided	540	630	720	810	900	F O R C E D
U1	URBAN	4U	4 Lanes Undivided	900	1050	1200	1350	1500	
U1	URBAN	4UC	4 Lanes Undivided with Clearways	1080	1260	1440	1620	1800	
U1	URBAN	4D	4 Lanes Divided with Clearways	1140	1330	1520	1710	1900	
U1	URBAN	6U	6 Lanes Undivided	1440	1680	1920	2160	2400	F L O W
U1	URBAN	6D	6 Lanes Divided with Clearway	1740	2030	2320	2610	2900	

Note: 1 Interrupted flow facilities on which fixed elements asuch as traffic control signals, stop signs, or other types of control cause traffic to stop periodically, irrespective of the total amount of traffic

TABLE D2
LEVEL OF SERVICE UNINTERRUPTED ² FLOW CONDITIONS ALONG URBAN ROADS
One Way Hourly Volumes

ROAD CLASS		TYPE	Description	LEVEL OF SERVICE					
Type	Description			A	B	C	D	E	F
U2	URBAN	2	2 Lanes Undivided	760	880	1000	1130	1260	F
U2	URBAN	4U	4 Lanes Undivided	1260	1470	1680	1890	2100	O
U2	URBAN	4UC	4 Lanes Undivided with Clearways	1510	1760	2010	2270	2520	R
U2	URBAN	4D	4 Lanes Divided with Clearways	1600	1860	2130	2400	2660	C
U2	URBAN	6U	6 Lanes Undivided	2020	2350	2690	3020	3360	E
U2	URBAN	6D	6 Lanes Divided with Clearway	2440	2840	3250	3660	4060	D
	FREEWAY	4F	4 Lanes Divided with Clearways	1400	2200	3100	3700	4000	F L
	FREEWAY	6F	4 Lanes Divided with Clearways	2100	3300	4650	5550	6000	O
	FREEWAY	8F	6 Lanes Divided with Clearways	2800	4400	6200	7400	8000	W

Note: 2 Uninterrupted flow facilities on which traffic flow conditions are the result of interactions between vehicles in the traffic stream, and between vehicles and the geometric and environmental characteristics of the road. There are no fixed elements external to traffic stream such as traffic control signals, that cause interuptions to traffic flow.

Appendix E

Guidelines for Evaluation of
Intersection Capacity

Table E1
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 - 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, required other control mode

The figures in Table E1 are intended as a guide only. Any particular assessment should take into account site-specific factors including maximum queue lengths (and their effect on lane blocking), the influence of nearby intersections and the sensitivity of the location to delays. In many situations, a comparison of the current and future average delay provides a better appreciation of the impact of a proposal, and not simply the change in the level of service.

The intersection degree of saturation (DS) can also be used to measure the performance of isolated intersections. At intersections controlled by traffic signals, both queue length and delays increase rapidly as DS approaches 1.0. An upper limit of 0.9 is appropriate. When DS exceeds 0.8 - 0.85, overflow queues start to become a problem. Satisfactory intersection operation is generally achieved with a DS of about 0.7 - 0.8. (Note that these figures are based on isolated signalised intersections with cycle lengths of 120 seconds. In co-ordinated signal systems DS might be actively maximised at key intersections). Although in some situations additional traffic does not alter the level of service, particularly where the level of service is E or F, additional capacity may still be required. This is particularly appropriate for service level F, where small increases in flow can cause disproportionately greater increases in delay. In this situation, it is advisable to consider means of control to maintain the existing level of absolute delay. Suggested criteria for the evaluation of the capacity of signalised intersections based on the Degree of Saturation are summarised in Table E2.

TABLE E2
CRITERIA FOR EVALUATING CAPACITY OF SIGNALISED INTERSECTIONS*

LEVEL OF SERVICE	OPTIMUM CYCLE LENGTH (SECS) (CO)	VOLUME/SATURATION Y	INTERSECTION DEGREE OF SATURATION X
A/B Very good operation	< 90	< 0.70	< 0.80
C Satisfactory	90-120	0.70-0.80	0.80-0.85
D Poor but manageable	120-140	0.80-0.85	0.85-0.90
E/F Bad, extra capacity req'd	> 140	> 0.85	> 0.90

* Source: Traffic Authority (1985)

Appendix F

Existing Traffic Volumes on Major
Roads

APPENDIX F EXISTING TRAFFIC VOLUMES

				1995/1996 Actual Counts						
				AM PEAK			PM PEAK			
	STREET		SUBURB	ADT	N/E	S/W	Total	N/E	S/W	Total
1	ALFORDS PT RD	at Alfords Pt Br	ALFORDS POINT	37,403	3,436	657	4,093	1,355	3,200	4,555
2	ANZAC RD	west of Heathcote Rd	WATTLE GROVE		717	447	1,164	456	982	1,438
3	APPIN RD	south of Narellan Rd	CAMPBELLTOWN	27,086	1,169	593	1,762	775	1,596	2,371
4	APPIN RD	north of Copperfield Dr	ST HELENS PARK		927	338	1,265	541	653	1,194
5	APPIN RD	south of Copperfield Dr	ST HELENS PARK		741	277	1,018	410	437	847
6	ARGYLE ST	at Cowpasture Br	CAMDEN	16,163	497	939	1,436	543	1,040	1,583
7	BADGALLY RD	west of Blaxland Rd	CAMPBELLTOWN	12,189	625	490	1,115	387	620	1,007
8	BADGERYS CK RD	south of Elizabeth Dr	BADGERYS CREEK		148	78	226			
9	BELMORE RD	north of Henry Lawson Dr	PEAKHURST	14,076	952	394	1,346	432	983	1,415
10	BELMORE ST	west of Lawson St	PENRITH	15,519	760	409	1,169	902	483	1,385
11	BLACKTOWN RD	south of Wall Park Av	BLACKTOWN	22,380	1,004	663	1,667	873	820	1,693
12	BLAXLAND RD	north of Narellan Rd	CAMPBELLTOWN	24,117	1,045	910	1,955	904	1,128	2,032
13	BRINGELLY RD	east of King St	AUSTRAL		373	167	540			
14	BRINGELLY RD	west of King St	AUSTRAL		356	139	495			
15	BRINGELLY RD	east of Cowpasture Rd	AUSTRAL	14,367	856	450	1,306	299	918	1,217
16	BRINGELLY RD	east of The Northern Rd	BRINGELLY	4,959	298	152	450	178	261	439
17	BRINGELLY RD	west of Cowpasture Rd	LEPPINGTON		463	162	625	200	420	620
18	BROOKS RD	west of Williamson Rd	INGLEBURN	13,292	737	512	1,249	540	673	1,213
19	BROWN RD	east of Kinghorne Rd	BONNYRIGG		295	143	438	161	257	418
20	CABRAMATTA RD	east of Elizabeth Dr	BONNYRIGG	15,634	742	518	1,260	380	1,015	1,395
21	CAMDEN VALLEY WAY	north of Narellan Rd	CATHERINE FIELD	15,491	1,120	312	1,432	326	1,118	1,444
22	CAMDEN VALLEY WAY	north of Macarthur Rd	ELDERSLIE	13,675						
23	CAMDEN VALLEY WAY	south of Bringelly Rd	LEPPINGTON	10,605	966	174	1,140	230	800	1,030
24	CAMDEN VALLEY WAY	south of Denham Court Rd	LEPPINGTON		1,273	421	1,694	500	1,150	1,650
25	CAMPBELLTOWN RD	south of Denham Court Rd	DENHAM COURT		861	292	1,153	319	977	1,296
26	CAMPBELLTOWN RD	north of Glenfield Rd	GLENFIELD		1,679	1,564	3,243			
27	CAMPBELLTOWN RD	south of Glenfield Rd	GLENFIELD	31,599	1,026	1,244	2,270	348	2,739	3,087
28	CAMPBELLTOWN RD	south of Camden Valley Way	INGLEBURN		1,420	2,590	4,010			
29	CAMPBELLTOWN RD	south of Williamson Rd	INGLEBURN	22,723	1,412	838	2,250	371	1,646	2,017
30	CAMPBELLTOWN RD	south of Blaxland Rd	LEUMEAH		1,203	1,169	2,372	1,065	1,595	2,660
31	CAMPBELLTOWN RD	south of Leumeah Rd	LEUMEAH	34,569	1,420	1,263	2,683	1,335	1,615	2,950
32	CAMPBELLTOWN RD	south of Ben Lomond Rd	MINTO	20,796	1,150	494	1,644	703	1,098	1,801
33	CANLEY VALE RD	east of Box Rd	ST JOHNS PARK	11,752	641	394	1,035	674	533	1,207
34	CANLEY VALE RD	east of Smithfield Rd	WAKELEY		602	585	1,187	516	673	1,189
35	CARLISLE AV	at Railway overbridge	MOUNT DRUITT	32,423	1,371	775	2,146	1,611	1,189	2,800
36	CASTLE HILL RD	east of Old Northern Rd	ROGANS HILL	42,857	2,252	1,701	3,953	1,748	2,029	3,777

APPENDIX F EXISTING TRAFFIC VOLUMES

				1995/1996 Actual Counts						
				AM PEAK			PM PEAK			
STREET		SUBURB	ADT	N/E	S/W	Total	N/E	S/W	Total	
37	CASTLEREAGH RD	north of Great Western Hwy, Jane St	PENRITH	36,513	1,475	1,481	2,956	1,581	1,466	3,047
38	CHURCH ST	north of M4 Off ramp	GRANVILLE	52,666	1,937	1,571	3,508	1,646	2,099	3,745
39	COLLINS PR	south of Chester Rd	INGLEBURN	15,369	629	658	1,287	420	947	1,367
40	COPELAND ST	north of Campbell St	LIVERPOOL	63,676	3,170	1,547	4,717	1,705	3,244	4,949
41	COPPERFIELD DR	west of Appin Rd	ST HELENS PARK		77	119	196	114	171	285
42	CORNELIA RD	east of Cecilia St	TOONGABBIE	13,358	872	444	1,316	451	867	1,318
43	COWPASTURE RD	at Orphan School Ck	ABBOTSBURY	23,228	1,341	882	2,223	771	1,319	2,090
44	COWPASTURE RD	north of Bringelly Rd	AUSTRAL	13,453	835	373	1,208	440	688	1,128
45	COWPASTURE RD	south of The Horsely Dr	BOSSLEY PARK		1,218	589	1,807			
46	COWPASTURE RD	north of Elizabeth Dr	EDENSOR PARK	26,150	1,332	585	1,917	646	1,009	1,655
47	COWPASTURE RD	south of Elizabeth Dr	EDENSOR PARK	26,252	1,187	1,018	2,205	942	1,263	2,205
48	COWPASTURE RD	south of Green Valley Rd	GREEN VALLEY	18,363	1,008	552	1,560	646	1,009	1,655
49	COWPASTURE RD	north of Fifteenth Av	HINCHINBROOK		827	585	1,412			
50	COWPASTURE RD	south of Hoxton Park Rd	HOXTON PARK	10,778	785	348	1,133	363	315	678
51	CUMBERLAND HWY (Smithfield Rd)	at Orphan School Ck	PRAIRIFWOOD	17,431	827	419	1,246	442	886	1,328
52	CUMBERLAND HWY (Smithfield Rd)	north of Canley Vale Rd	SMITHFIELD		1,014	386	1,400	491	943	1,434
53	CUMBERLAND HWY (Smithfield Rd)	north of Victoria St	SMITHFIELD	56,450	2,363	1,976	4,339	1,961	2,610	4,571
54	DAVIES RD	at East Hills Railway	PADSTOW	27,116	1,640	648	2,288	770	1,436	2,206
55	DENHAM COURT RD	at Water Supply Channel	LEPPINGTON	5,065	211	235	446	211	260	471
56	DEVONSHIRE RD	south of Fifteenth Av	AUSTRAL		132	71	203			
57	DEVONSHIRE RD	south of Elizabeth Dr	KEMP'S CREEK		203	192	395			
58	DEVONSHIRE RD	north of Fifteenth Av	KEMP'S CREEK		193	218	411			
59	EDENSOR RD	east of Smithfield Rd	EDENSOR PARK	6,728	375	235	610	301	123	424
60	EDENSOR RD	east of Smithfield Rd	ST JOHNS PARK		626	597	1,223	443	508	951
61	ELIZABETH DR	east of Badgerys Ck Rd	BADGERYS CREEK		521	146	667			
62	ELIZABETH DR	west of Badgerys Ck Rd	BADGERYS CREEK		420	115	535			
63	ELIZABETH DR	east of Smithfield Rd	BONNYRIGG		959	1,681	2,640	1,581	879	2,460
64	ELIZABETH DR	west of Wallgrove Rd	CECIL PARK	17,391	1,402	403	1,805	508	1,098	1,606
65	ELIZABETH DR	east of Devonshire Rd	KEMPS CREEK		531	331	862			
66	ELIZABETH DR	west of Devonshire Rd	KEMPS CREEK		421	232	653			
67	ELIZABETH DR	east of Mamre Rd	KEMPS CREEK		1,163	319	1,482			
68	ELIZABETH DR	west of Mamre Rd	KEMPS CREEK		698	302	1,000			
69	ELIZABETH DR	east of Luddenham Rd	LUDDENHAM		400	154	554			
70	ELIZABETH DR	west of Luddenham Rd	LUDDENHAM		392	138	530			
71	ELIZABETH DR	east of The Northern Rd	LUDDENHAM		359	118	477			
72	FERRERS RD	north of Chandos Rd	HORSLEY PARK		523	898	1,421	988	467	1,455

APPENDIX F EXISTING TRAFFIC VOLUMES

				1995/1996 Actual Counts							
				ADT	AM PEAK			PM PEAK			Total
STREET			SUBURB		N/E	S/W	Total	N/E	S/W	Total	
73	FERRERS RD	at The Water Supply Line	HORSLEY PARK	12,218	497	845	1,342	778	468	1,246	
74	FIELDS RD	south of Bunbury Rd	MACQUARIE FIELDS	13,150	504	498	1,002	558	649	1,207	
75	FIFTEENTH AV	east of Devonshire Rd	KEMPS CREEK		318	151	469	200	140	340	
76	FIFTEENTH AV BR	between 28th and 27th Av	AUSTRAL		438	211	649				
77	FLOWERDALE RD	south of Elizabeth Dr	LIVERPOOL	14,664	637	649	1,286	862	537	1,399	
78	FRANCIS RD	north of Railway overbridge	ROOTY HILL	25,126	867	869	1,736	1,209	877	2,086	
79	GLENFIELD RD	north of Cambridge Av Br	GLENFIELD	11,045	706	317	1,023	365	583	948	
80	GLENFIELD RD	east of Old Glenfield Rd	GLENFIELD		340	630	970				
81	GOVERNOR MACQUARIE DR	at Georges River Br	WARWICK FARM	20,891	669	1,029	1,698	1,013	903	1,916	
82	GREAT WESTERN HWY	at Eastern Ck Br	EASTERN CREEK	29,607	2,487	472	2,959	741	2,081	2,822	
83	GREAT WESTERN HWY	at Nepean River	PENRITH	24,463	1,412	767	2,179	587	1,517	2,104	
84	GREAT WESTERN HWY	east of Cumberland Hwy	WENTWORTHVILLE	38,094	2,958	453	3,411	986	2,665	3,651	
85	GREYSTANES RD	south of Great Western Hwy	PROSPECT	22,824	951	1,447	2,398	1,199	889	2,088	
86	HAMILTON RD	at Orphan School Ck	FAIRFIELD WEST	10,917	689	373	1,062	326	531	857	
87	HEATHCOTE RD	north of Macarthur Dr	HAMMONDVILLE	18,304	1,142	1,188	2,330	943	940	1,883	
88	HEATHCOTE RD	east of New Illawara Rd	LUCAS HEIGHTS		666	1,337	2,003	1,257	529	1,786	
89	HEATHCOTE RD	west of New Illawara Rd	LUCAS HEIGHTS		486	828	1,314	676	403	1,079	
90	HEATHCOTE RD	east of Moorebank Av	MOOREBANK	16,918	696	854	1,550	802	753	1,555	
91	HEATHCOTE RD	north of South Western Fwy (M5)	MOOREBANK	17,338	1,259	477	1,736	753	802	1,555	
92	HEATHCOTE RD	north of Anzac Rd	WATTLE GROVE		2,064	1,146	3,210	1,153	2,050	3,203	
93	HEATHCOTE RD	south of Anzac Rd	WATTLE GROVE		1,756	1,108	2,864	1,023	1,394	2,417	
94	HEATHCOTE RD	south of Nuwarra Rd	WATTLE GROVE		2,181	1,165	3,346	1,290	2,113	3,403	
95	HEATHCOTE RD	north of Nuwarra Rd	WATTLE GROVE		1,472	1,188	2,660	1,434	1,705	3,139	
96	HECKENBERG RD	north of Cartwright Av	BUSBY		256	348	604	355	379	734	
97	HENRY LAWSON DR	north of Bass Hill Av	EAST HILLS	11,175	613	540	1,153	581	525	1,106	
98	HENRY LAWSON DR	south of Hume Hwy	LANSDOWNE	31,433	1,224	1,298	2,522	1,363	1,223	2,586	
99	HENRY LAWSON DR	west of Forest Rd	PEAKHURST	28,873	1,860	828	2,688	932	1,634	2,566	
100	HENRY LAWSON DR	at Salt Pan Ck Br	PEAKHURST	41,124	2,440	1,444	3,884	1,420	2,474	3,894	
101	HORSLEY RD	south of Great Western Hwy	EASTERN CREEK	13,572	377	1,113	1,490	924	400	1,324	
102	HOXTON PARK RD	east of Cartwright Av	ASHCROFT		1,362	997	2,359	1,079	2,086	3,165	
103	HOXTON PARK RD	west of Hume Hwy	LIVERPOOL	21,926	1,122	699	1,821	685	1,136	1,821	
104	HOXTON PARK RD	west of Hill Rd	LURNEA	30,821	1,342	1,077	2,419	1,132	1,444	2,576	
105	HUME HWY	east of Crossroads	CASULA		2,603	1,270	3,873				
106	HUME HWY	south of South Western Fwy (M5)	CASULA		3,613	1,504	5,117				
107	HUME HWY	east of Woodville Rd	LANSDOWNE	46,315	1,595	1,600	3,195	1,474	2,286	3,760	
108	HUME HWY	north of South Western Fwy (M5)	LIVERPOOL		3,853	1,791	5,644				

APPENDIX F EXISTING TRAFFIC VOLUMES

				1995/1996 Actual Counts						
STREET			SUBURB	ADT	AM PEAK			PM PEAK		
					N/E	S/W	Total	N/E	S/W	Total
109	HUME HWY (Liverpool Rd)	west of Woodville Rd	LANSDOWNE		3,775	1,609	5,384	1,700	3,500	5,200
110	JAMES RUSE DR	north of River Rd	CAMELLIA	59,786	2,247	3,192	5,439	3,022	2,279	5,301
111	KELLERMAN DR	east of Apping Rd	ST HELENS PARK		90	257	347	271	243	514
112	KING RD	at Orphan School Ck	WAKELEY	12,839	636	513	1,149	449	694	1,143
113	KING ST	north of Bringelly Rd	AUSTRAL		68	57	125			
114	KNOX RD	south of Cross St	DOONSIDE	20,721	488	1,139	1,627	1,151	709	1,860
115	KURRAJONG RD	east of Cedar Rd	LURNEA		433	240	673	369	384	753
116	LUDDENHAM RD	north of Elizabeth Dr	LUDDENHAM		101	73	174	90	200	290
117	MACDONALD RD	south of Campbelltown Rd	INGLEBURN		366	255	621			
118	MACDONALD RD	east of Hume Hwy	INGLEBURN	6,478	219	429	648	321	302	623
119	MAMRE RD	north of Elizabeth Dr	KEMP'S CREEK		328	776	1,104	900	350	1,250
120	MAXWELLS AV	east of Cartwright Av	ASHCROFT		314	272	586	350	436	786
121	MENAI RD	at Woronora Rv	WORONORA	20,527	1,244	530	1,774	1,224	596	1,820
122	MENAI RD	east of Old Illawara Rd	MENAI		1,311	1,861	3,172	1,989	1,493	3,482
123	MENANGLE RD	south of Narellan Rd	CAMPBELLTOWN	10,653	821	231	1,052	353	587	940
124	MILPERRA RD	east of Henry Lawson Dr	MILPERRA	50,381	2,926	1,229	4,155	1,481	2,490	3,971
125	MIMOSA RD	at Orphan School Ck	BOSSLEY PARK	14,945	566	589	1,155	513	632	1,145
126	MINTO RD	north of Pembroke Rd	MINTO	16,712	780	475	1,255	853	586	1,439
127	MOORE-OXLEY BYPASS	north of Camden Rd	CAMPBELLTOWN	27,737	1,194	774	1,968	875	1,502	2,377
128	MOORE-OXLEY BYPASS	south of Queen St	CAMPBELLTOWN	22,507	972	775	1,747	794	1,198	1,992
129	MOOREBANK AV	at East Hills Railway	CHATHAM VILLAGE	15,098	1,151	311	1,462	373	1,050	1,423
130	MOOREBANK AV	north of South Western Fwy (M5)	MOOREBANK	23,705	1,626	526	2,152	598	1,310	1,908
131	MULGOA RD	south of Preston St	JAMISONTOWN	33,886	1,502	877	2,379	1,136	1,550	2,686
132	NARELLAN RD	west of Gilchrist Dr	CAMPBELLTOWN	37,283	1,826	1,441	3,267	1,644	1,767	3,411
133	NARELLAN RD	east of Menangle Rd	CAMPBELLTOWN	17,671	861	466	1,327	755	757	1,512
134	NARELLAN RD	west of South Western Fwy (M5)	CAMPBELLTOWN	36,770	1,972	1,146	3,118	1,209	2,040	3,249
135	NEW ILLAWARA RD	north of Heathcote Rd	LUCAS HEIGHTS		793	464	1,257	380	835	1,215
136	NEWBRIDGE RD	at Georges Rv	LIVERPOOL	45,586	1,853	1,962	3,815	1,692	2,307	3,999
137	NEWBRIDGE RD	west of Henry Lawson Dr	MILPERRA	65,364	3,923	1,774	5,697	2,239	3,400	5,639
138	NEWBRIDGE RD	east of Bridges Rd	MOOREBANK	38,843	1,700	1,221	2,921	1,055	1,969	3,024
139	NORTH LIVERPOOL RD	east of Eucumbene Cr	BONNYRIGG		586	237	823	593	371	964
140	NUWARRA RD	east of Heathcote Rd	WATTLE GROVE		1,231	499	1,730	987	1,538	2,525
141	OLD HUME HWY	north of Camden Bypass	ELDERSLIE	11,328	620	400	1,020	528	568	1,096
142	OLD ILLAWARA RD	south/west of Menai Rd	MENAI		1,013	812	1,825	742	1,184	1,926
143	OLD ILLAWARA RD	west of Menai Rd	MENAI		1,538	2,289	3,827	2,514	1,576	4,090
144	PARRAMATTA RD	at Clyde Railway Crossing	CLYDE	54,935	1,861	1,369	3,230	1,675	1,840	3,515

APPENDIX F EXISTING TRAFFIC VOLUMES

				1995/1996 Actual Counts						
	STREET		SUBURB	ADT	AM PEAK			PM PEAK		
					N/E	S/W	Total	N/E	S/W	Total
145	PEMBROKE RD	north of Leumeah Rd	LEUMEAH	26,200	843	1,228	2,071	1,219	1,031	2,250
146	PHILLIP PKW	north of Railway overpass	ROOTY HILL	10,694	306	624	930	618	385	1,003
147	POLDING ST	east of Lily St	SMITHFIELD		1,113	699	1,812	774	1,058	1,832
148	PRINCES HWY	south of Heathcote Rd	HEATHCOTE	25,742	1,878	965	2,843	1,091	1,990	3,081
149	PRINCES HWY	south of Farnell Av	LOFTUS	52,750	3,098	1,210	4,308	1,631	3,155	4,786
150	PRINCES HWY	at Georges River Br	SYLVANIA	82,027	5,541	1,562	7,103	1,600	5,600	7,200
151	RABY RD	east of Camden Valley Way	CATHERINE FIELD	8,117	303	461	764	493	291	784
152	RABY RD	west of Campbelltown Rd	ST ANDREWS	21,234	1,256	410	1,666	814	1,133	1,947
153	RAILWAY PD	at Orphan School Ck	CANLEY VALE	19,485	732	563	1,295	629	984	1,613
154	ROCKY POINT RD / TAREN POINT RD	at Captain Cook Br	TAREN POINT	59,480	4,506	1,171	5,677	1,200	4,300	5,500
155	ROPER RD	north of Western Fwy North Off ramp	ST CLAIR	27,726	1,302	696	1,998	1,008	1,291	2,299
156	RUDD RD	north of O'Sullivan Rd	LEUMEAH	19,410	702	825	1,527	899	843	1,742
157	SEVEN HILLS RD	at Railway overbridge	SEVEN HILLS	34,138	1,259	1,638	2,897	1,503	1,737	3,240
158	SEVEN HILLS RD SOUTH	south of Wall Park Av	SEVEN HILLS	19,245	3,891	768	4,659	4,022	1,047	5,069
159	SEVENTEENTH AV BR	between 29th and 27th Av	AUSTRAL		6	3	9	5	7	12
160	SILVERWATER RD	at Silverwater Br	SILVERWATER	48,048	1,634	3,195	4,829	3,436	1,586	5,022
161	SOUTH LIVERPOOL RD	east of Rundle Road	BUSBY		173	411	584	454	261	715
162	SOUTH WESTERN FWY (M5)	east of Cedar Rd	CASULA		3,267	1,163	4,430	1,280	2,954	4,234
163	SOUTH WESTERN FWY (M5)	south of Campbelltown Rd	GLENFIELD		4,471	1,040	5,511			
164	SOUTH WESTERN FWY (M5)	south of Brooks Rd Overbridge	INGLEBURN	60,060	3,470	1,327	4,797	1,486	3,330	4,816
165	SOUTH WESTERN FWY (M5)	at Georges Rv	MOOREBANK	57,526	3,400	1,650	5,050	1,655	3,671	5,326
166	SOUTH WESTERN FWY (M5)	at Narellan Rd Off ramps	MOUNT ANNAN		0	416	416	0	177	177
167	SOUTH WESTERN FWY (M5)	at Narellan Rd On ramps	MOUNT ANNAN		132	0	132	349	0	349
168	SOUTH WESTERN FWY (M5)	north of Narellan Rd Off/On ramps	MOUNT ANNAN		887	510	1,397	592	746	1,338
169	SOUTH WESTERN FWY (M5)	south of Narellan Rd Off/On ramps	MOUNT ANNAN		1,303	642	1,945	769	1,095	1,864
170	SOUTH WESTERN FWY (M5)	at Queen St overpass	REVESBY	40,544	2,232	1,138	3,370	1,296	2,325	3,621
171	SOUTH WESTERN FWY (M5)	at River Rd	REVESBY		184	72	256	84	154	238
172	ST JOHNS RD	south of Hoddle Av	CAMPBELLTOWN	7,505	402	250	652	286	394	680
173	THE HORSLEY DR	at Fairfield Railway	FAIRFIELD	34,395	1,265	1,693	2,958	1,106	1,870	2,976
174	THE HORSLEY DR	west of Ferres Rd	HORSLEY PARK	19,363	1,295	484	1,779	478	1,483	1,961
175	THE HORSLEY DR	east of Wallgrove Rd	HORSLEY PARK		1,228	414	1,642			
176	THE HORSLEY DR	west of Wallgrove Rd	HORSLEY PARK		173	100	273			
177	THE HORSLEY DR	west of Justin St	SMITHFIELD	19,858	754	891	1,645	533	1,098	1,631
178	THE HORSLEY DR	east of Lily St	SMITHFIELD		1,127	627	1,754	679	1,293	1,972
179	THE HORSLEY DR	east of Smithfield Rd	SMITHFIELD	25,127	1,056	1,104	2,160	919	1,199	2,118
180	THE NORTHERN RD	north of Bringelly Rd	BRINGELLY	12,747	481	574	1,055	532	548	1,080

APPENDIX F
EXISTING TRAFFIC VOLUMES

				1995/1996 Actual Counts						
STREET			SUBURB	ADT	AM PEAK			PM PEAK		
					N/E	S/W	Total	N/E	S/W	Total
181	THE NORTHERN RD	south of Lowes Ck	BRINGELLY	9,852	357	377	734	440	364	804
182	THE NORTHERN RD	north of Elizabeth Dr	LUDDENHAM		416	343	759	300	300	600
183	THE NORTHERN RD	south of Elizabeth Dr	LUDDENHAM		407	343	750			
184	THE NORTHERN RD	west of Camden Valley Way	NARELLAN	10,051	306	419	725	392	394	786
185	THE PARKWAY	east of Appin Rd	CAMPBELLTOWN	7,237	184	258	442	553	205	758
186	THERRY RD	west of Appin Rd	AMBERVALE	16,708	555	732	1,287	796	665	1,461
187	VICTORIA RD	east of Elizabeth St	WETHERILL PARK		1,118	918	2,036	781	1,196	1,977
188	WALLGROVE RD	north of Elizabeth Dr	CECIL PARK	15,546	801	463	1,264	560	683	1,243
189	WALLGROVE RD	north of Chandos Rd	HORSLEY PARK		859	1,898	2,757	1,688	962	2,650
190	WESTERN FWY (M4)	at Roper Rd On/Off ramps	COLYTON	29,175	1,239	930	2,169	731	1,662	2,393
191	WESTERN FWY (M4)	at Horsley Rd underpass	EASTERN CREEK	74,730	3,303	2,107	5,410	2,205	3,533	5,738
192	WESTERN FWY (M4)	west of Homebush Bay Dr On/Off ramp	HOME BUSH	26,281	1,336	1,004	2,340	2,816	2,282	5,098
193	WESTERN FWY (M4)	at Salesyard Channel Br	HOME BUSH	69,799	3,521	2,083	5,604	2,832	2,792	5,624
194	WESTERN FWY (M4)	east of Pitt St overpass	MERRYLANDS	116,011	4,445	2,700	7,145	2,665	5,150	7,815
195	WESTERN FWY (M4)	east of Mulgoa Rd overpass	REGENTVILLE	44,929	2,741	963	3,704	1,357	2,401	3,758
196	WILLIAMSON RD	south of Benson Rd	INGLEBURN	11,818	625	409	1,034	469	571	1,040
197	WINDSOR RD	north of Showground Rd	KELLYVILLE	39,100	1,363	2,250	3,613	2,000	1,419	3,419
198	WOODVILLE RD	north of Hume Hwy	VILLAWOOD	40,015	1,915	1,439	3,354	1,483	1,841	3,324

Source: NSW Roads & Traffic Authority and Field Surveys

Appendix G

Existing Home Origins of Employees
to Sydney Airport

APPENDIX G
EXISTING EMPLOYMENT DISTRIBUTION AT SYDNEY AIRPORT

LGA	EMPLOYEES	%
ASHFIELD	350	1.04
AUBURN	183	0.55
BANKSTOWN	1663	4.96
BAULKHAM HILLS	440	1.31
BLACKTOWN	595	1.77
BLUE MOUNTAINS	86	0.26
BOTANY	1804	5.38
BURWOOD	189	0.56
CAMDEN	70	0.21
CAMPBELLTOWN	701	2.09
CANTERBURY	1772	5.29
CONCORD	189	0.56
DRUMMOYNE	350	1.04
FAIRFIELD	562	1.68
GOSFORD	229	0.68
HAWKESBURY	70	0.21
HOLROYD	269	0.80
HORNSBY	382	1.14
HUNTERS HILL	38	0.11
HURSTVILLE	1424	4.25
KIAMA	18	0.05
KOGARAH	1388	4.14
KU-RING-GAI	378	1.13
LAKE MACQUARIE	34	0.10
LANE COVE	175	0.52
LEICHHARDT	508	1.52
LIVERPOOL	546	1.63
MANLY	269	0.80
MARRICKVILLE	1199	3.58
MOSMAN	167	0.50
NEWCASTLE(REMAINDER)	6	0.02
NORTH SYDNEY	374	1.11
PARRAMATTA	516	1.54
PENRITH	337	1.01
PORT STEPHENS	6	0.02
RANDWICK	2517	7.51
ROCKDALE	3360	10.03
RYDE	410	1.22
SHELLHARBOUR	48	0.14
SHOALHAVEN	22	0.07
SOUTH SYDNEY	743	2.22
STRATHFIELD	127	0.38
SUTHERLAND	5743	17.14
SYDNEY(INNER)	18	0.05
SYDNEY(REMAINDER)	40	0.12
WARRINGAH	886	2.64
WAVERLEY	797	2.38
WILLOUGHBY	245	0.73
WINGECARRIBEE	64	0.19
WOLLONDILLY	70	0.21
WOLLONGONG	500	1.49
WOOLLAHRA	526	1.57
WYONG	106	0.32
TOTAL GREATER SYDNEY	33510	100.00

Source: NSW Department of Transport, Transport Data Centre

Appendix H

Existing Home Origins of Air
Passengers to Sydney Airport

APPENDIX H
EXISTING HOME ORIGIN OF AIR PASSENGERS AND MEETER/GREETERS TO SYDNEY AIRPORT

LGA	International Terminal %	Domestic Terminal %	Overall %
SYDNEY CBD			
SYDNEY(INNER)	13.11	11.88	12.37
SYDNEY(REMAINDER)	10.51	9.53	9.92
TOTAL SYDNEY CBD	23.62	21.41	22.28
OUTER SYDNEY			
SYDNEY - INNER NORTH			
HUNTERS HILL	0.54	0.57	0.56
LANE COVE	1.30	1.39	1.35
MANLY	1.54	1.64	1.60
MOSMAN	1.15	1.22	1.19
NORTH SYDNEY	2.29	2.44	2.39
RYDE	4.10	4.37	4.26
WILLOUGHBY	2.33	2.49	2.43
Sub-Total Sydney - Inner North	13.25	14.13	13.78
SYDNEY - INNER SOUTH			
ASHFIELD	1.11	0.95	1.01
AUBURN	1.38	1.18	1.26
BOTANY	0.93	0.79	0.84
BURWOOD	0.79	0.67	0.72
CANTERBURY	3.66	3.13	3.34
CONCORD	0.66	0.56	0.60
DRUMMOYNE	0.84	0.72	0.77
HURSTVILLE	1.82	1.55	1.66
KOGARAH	1.31	1.12	1.20
LEICHHARDT	1.62	1.38	1.48
MARRICKVILLE	2.10	1.80	1.92
RANDWICK	3.17	2.71	2.89
ROCKDALE	2.37	2.03	2.17
SOUTH SYDNEY	1.91	1.63	1.74
STRATHFIELD	0.73	0.62	0.67
WAVERLEY	1.63	1.40	1.49
WOOLLAHRA	1.39	1.19	1.27
Sub-Total Sydney - Inner South	27.42	23.45	25.02
SYDNEY - OUTER NORTH			
BAULKHAM HILLS	2.28	2.49	2.41
BLACKTOWN	4.14	4.52	4.37
HOLROYD	1.50	1.64	1.59
HORNSBY	2.56	2.80	2.71
KU-RING-GAI	1.94	2.11	2.04
PARRAMATTA	2.52	2.75	2.66
PENRITH	2.99	3.26	3.16
WARRINGAH	3.32	3.63	3.51
Sub-Total Sydney - Outer North	21.26	23.20	22.43
SYDNEY - OUTER SOUTH			
BANKSTOWN	1.25	1.77	1.57
CAMDEN	0.22	0.31	0.28
CAMPBELLTOWN	1.12	1.59	1.41
FAIRFIELD	1.45	2.04	1.81
LIVERPOOL	0.85	1.20	1.06
SUTHERLAND	1.52	2.15	1.90
Sub-Total Sydney - Outer South	6.41	9.07	8.02
TOTAL OUTER SYDNEY	68.35	69.84	69.25
OUTSIDE SYDNEY			
BLUE MOUNTAINS	0.51	0.56	0.54
GOSFORD	0.99	1.08	1.05
HAWKESBURY	0.39	0.42	0.41
KIAMA	0.13	0.14	0.13
LAKE MACQUARIE	1.22	1.33	1.29
NEWCASTLE(REMAINDER)	0.95	1.04	1.00
PORT STEPHENS	0.36	0.39	0.38
SHELLHARBOUR	0.35	0.38	0.37
SHOALHAVEN	0.56	0.61	0.59
WINGECARRIBEE	0.27	0.30	0.29
WOLLONDILLY	0.24	0.26	0.25
WOLLONGONG	1.27	1.39	1.34
WYONG	0.78	0.86	0.83
TOTAL OUTSIDE SYDNEY	8.03	8.75	8.47
TOTAL GREATER SYDNEY	100.00	100.00	100.00

Appendix I

Traffic Volumes for the Base Case
Scenarios

APPENDIX I
MODELLED TRAFFIC VOLUMES AND LEVELS OF SERVICE WITHOUT A SECOND SYDNEY AIRPORT

Location Description			1996						2006						2016					
			Type	AM Peak Flow	PM Peak Flow	AM LOS	PM LOS	ADT	Type	AM Peak Flow	PM Peak Flow	AM LOS	PM LOS	ADT	Type	AM Peak Flow	PM Peak Flow	AM LOS	PM LOS	ADT
Alfords Point Road	at	Georges River	4F	3,436	3,200	D	D	37,403	4F	4,575	4,728	F	F	53,048	4F	4,666	5,127	F	F	55,734
Anzac Road	West	Heathcote Road	2	717	982	A	C	13,436	2	762	717	B	A	11,381	2	732	628	A	A	11,081
Appin Road	Sout	Copperfield Drive	2	741	437	A	A	11,751	2	1,434	1,433	F	F	19,589	2	1,805	1,803	F	F	24,425
Badgerys Creek Road	Sout	Elizabeth Drive	2	148	231	A	A	2,609	2	186	176	A	A	4,029	2	210	198	A	A	4,583
Blaxland Road	East	Narellan Road	4UC	1,045	1,128	A	A	24,117	4UC	643	699	A	A	10,214	4UC	774	885	A	A	13,052
Bringelly Road	East	The Northern Road	2	298	261	A	A	4,959	2	339	374	A	A	6,193	2	357	398	A	A	6,370
Bringelly Road	East	King Street	2	373	422	A	A	6,233	2	296	319	A	A	6,810	2	304	324	A	A	6,914
Bringelly Road	West	King Street	2	356	331	A	A	5,714	2	339	374	A	A	6,487	2	357	398	A	A	6,672
Bringelly Road	East	Cowpasture Road	2	856	918	B	C	14,367	2	275	314	A	A	5,500	2	269	256	A	A	4,708
Bringelly Road	West	Cowpasture Road	2	463	420	A	A	7,214	2	1,463	1,355	F	F	23,179	2	1,031	866	D	B	18,711
Brooks Road	West	South Western Freew	2	655	420	A	A	8,692	2	562	536	A	A	7,780	2	560	534	A	A	7,422
Brooks Road	East	South Western Freew	2	737	673	A	A	13,292	2	1,328	1,135	F	E	18,868	2	1,434	1,162	F	E	20,316
Cambridge Road	West	Moorebank Avenue	2	1,332	1,263	F	F	16,968	2	1,429	1,401	F	F	18,123	2	1,530	1,559	F	F	19,773
Camden Valley Way	West	South Western Freew	4D	1,216	1,120	A	A	21,874	4D	1,060	829	A	A	18,781	4D	1,006	842	A	A	19,808
Camden Valley Way	North	Narellan Road	4UC	1,120	1,118	A	A	15,491	4UC	982	939	A	A	14,106	4UC	1,349	1,384	A	A	19,331
Camden Valley Way	Sout	Denham Court Road	2	1,273	1,150	F	E	19,554	2	1,819	1,767	F	F	26,838	2	2,008	2,117	G	G	30,647
Camden Valley Way	Sout	Bringelly Road	2	966	800	C	B	10,605	2	712	648	A	A	8,475	2	927	1,124	C	D	11,377
Campbelltown Road	North	Glenfield Road	6D	1,679	2,107	A	A	37,434	6D	2,821	3,224	B	C	47,165	6D	3,576	3,631	D	D	64,376
Campbelltown Road	Sout	Denham Court Road	2	861	977	B	C	13,309	2	2,050	2,101	G	G	26,076	2	2,219	2,192	G	G	29,954
Campbelltown Road	Sout	Ben Lomond Road	4D	1,150	1,098	A	A	20,796	4D	2,705	2,917	F	F	41,402	4D	3,019	3,556	F	F	46,386
Campbelltown Road	Sout	Williamson Road	4UC	1,412	1,646	A	B	22,723	4UC	2,452	2,646	E	F	32,509	4UC	2,645	2,762	F	F	36,741
Campbelltown Road	Sout	Blaxland Road	4UC	1,203	1,595	A	B	27,380	4UC	1,759	1,711	B	B	26,757	4UC	1,820	1,834	C	C	27,923
Campbelltown Road	Sout	Leumeah Road	4D	1,420	1,615	A	B	34,569	4D	2,282	2,424	D	E	48,613	4D	2,504	2,688	E	F	55,442
Cowpasture Road	North	Bringelly Drive	2	835	688	B	A	13,453	4D	1,237	1,087	A	A	17,874	4D	761	609	A	A	13,264
Cowpasture Road	Sout	Hoxton Park Road	2	785	363	B	A	10,778	4D	1,237	1,087	A	A	15,268	4D	1,050	789	A	A	14,421
Cowpasture Road	Sout	Elizabeth Drive	2	1,187	1,263	E	F	26,252	4D	2,177	2,174	D	D	29,931	4D	2,124	2,010	C	C	29,169
Cowpasture Road	North	Elizabeth Drive	2	1,332	1,009	F	D	26,150	4D	1,746	1,736	B	B	27,978	4D	1,775	1,778	B	B	29,096
Cowpasture Road	Sout	The Horsley Drive	2	1,218	1,749	E	F	20,858	4D	2,447	2,567	E	E	31,928	4D	2,425	2,508	E	E	31,293
Cumberland Highway	North	Victoria Street	4D	2,363	2,610	D	E	56,450	4D	2,152	2,214	D	D	47,785	6D	2,197	2,108	A	A	46,198
Cumberland Highway	North	Canley Vale Road	4D	1,014	943	A	A	16,160	4D	1,329	1,273	A	A	26,503	6D	1,516	1,377	A	A	28,442
Denham Court Road	East	Camden Valley Way	2	235	260	A	A	5,065	2	328	435	A	A	7,427	2	643	658	A	A	9,755
Devonshire Road	Sout	Elizabeth Drive	0	203	0	0	0	4,560	2	350	372	A	A	5,425	2	364	354	A	A	5,691
Elizabeth Drive	West	Wallgrove Road	4D	1,402	1,098	A	A	17,391	4D	1,668	1,703	B	B	23,153	4D	1,537	1,650	A	B	20,339
Elizabeth Drive	West	Ludenhams Road	2	392	350	A	A	6,118	2	862	793	B	B	13,275	2	818	765	B	B	13,009
Elizabeth Drive	West	Badgerys Creek Road	2	420	231	A	A	6,176	4D	619	576	A	A	10,354	4D	617	623	A	A	10,135
Elizabeth Drive	West	Devonshire Road	2	421	393	A	A	7,538	4D	686	645	A	A	10,446	4D	810	808	A	A	13,067
Elizabeth Drive	West	Mamre Road	2	698	637	A	A	11,543	4D	974	951	A	A	14,440	4D	1,120	1,108	A	A	17,511
Elizabeth Drive	East	Smithfield Road	4D	1,681	1,581	B	A	30,474	4D	1,140	1,078	A	A	22,578	4D	1,233	1,216	A	A	25,429

NOTE: 1. LOS = Level of Service

2. LOS G = volume/capacity > 1.5

3. ADT = Average Daily Traffic

4. * = ADT estimated from model

Location Description			Type	1996					ADT	*	2006					ADT	2016					ADT
				AM Peak Flow	PM Peak Flow	AM LOS	PM LOS	Type			AM Peak Flow	PM Peak Flow	AM LOS	PM LOS	Type		AM Peak Flow	PM Peak Flow	AM LOS	PM LOS		
Erskine Park Road	Sout	M4 Motorway	4D	1,562	1,120	A	A	23,121	*	4D	1,452	1,418	A	A	21,251	4D	1,476	1,418	A	A	22,209	
Ferrers Road	North	Chandos Road	0	898	988	0	0	16,403	*	2	599	478	A	A	11,993	2	580	502	A	A	8,854	
Fifteenth Avenue	West	Cowpasture Road	2	438		A	A	7,491		2	233	242	A	A	4,802	2	271	274	A	A	5,067	
Gipps Road	at	Channel	2	1,447	1,350	F	F	30,716	*	2	1,591	1,663	F	F	35,218	2	1,421	1,585	F	F	32,274	
Glenfield Road	East	Old Glenfield Road	2	630	626	A	A	11,197	*	2	606	513	A	A	9,558	2	671	583	A	A	11,278	
Great Western Highw	at	Nepean River	4UC	1,412	1,517	A	B	24,463		4UC	1,762	1,799	C	C	29,493	4UC	1,803	1,984	C	C	30,671	
Great Western Highw	East	Wallgrove Road	6D	2,487	2,081	B	A	29,607		6D	2,270	2,407	A	A	25,104	6D	2,131	2,492	A	B	26,725	
Great Western Highw	East	Cumberland Highway	6D	2,958	2,665	C	B	38,094		6D	2,363	2,022	A	A	29,204	6D	2,468	2,157	B	A	30,656	
Harold Street	Sout	Victoria Street	2	276	272	A	A	4,236	*	2	286	276	A	A	4,467	2	286	284	A	A	4,640	
Heathcote Road	at	Woronora River	2	1,337	1,257	F	E	23,121	*	2	1,474	1,593	F	F	24,114	2	1,147	1,336	E	F	20,581	
Heathcote Road	North	M5 Motorway	4UC	1,259	802	A	A	17,338		4UC	790	770	A	A	14,062	4UC	491	494	A	A	8,070	
Heathcote Road	North	Anzac Road	4UC	2,064	2,050	D	D	37,053	*	4UC	1,918	1,878	C	C	36,822	4UC	2,414	2,306	E	E	45,884	
Heathcote Road	Sout	Anzac Road	4UC	1,756	1,394	B	A	33,059	*	4UC	2,094	2,095	D	D	47,084	4UC	2,623	2,562	F	F	56,527	
Heathcote Road	North	New Illawarra Road	2	828	676	B	A	15,168	*	2	933	925	C	C	20,916	2	1,519	1,543	F	F	29,827	
Hoxton Park Road	West	Hume Highway	4UC	1,122	1,136	A	A	21,926		4UC	1,537	2,077	B	D	28,428	4UC	2,114	2,853	D	F	38,121	
Hume Highway	West	Woodville Road	6D	3,775	3,500	E	D	62,148	*	6D	4,126	4,093	F	F	67,308	6D	4,207	4,337	F	F	70,124	
Hume Highway	East	Woodville Road	6D	1,600	2,286	A	A	46,315		6D	1,934	1,945	A	A	41,038	6D	2,026	2,062	A	A	43,039	
Hume Highway	East	Crossroads	6D	2,603	2,107	B		44,706	*	6D	1,146	837	A	A	20,120	6D	1,112	1,337	A	A	25,245	
Hume Highway	North	M5 Motorway	6D	3,853	3,707	E	E	65,149	*	6D	5,181	4,209	F	F	82,799	6D	4,583	3,631	F	D	69,928	
Hume Highway	Sout	M5 Motorway	6D	3,613	3,544	D	D	59,066	*	6D	5,931	5,117	F	F	80,282	6D	5,854	5,035	F	F	79,463	
Kurrajong Road	East	Western Sydney Orbit	4U	433	384	A	A	7,769	*	4U	424	923	A	B	8,923	4U	550	1,265	A	D	12,501	
Luddenham Road	North	Elizabeth Drive	2	101	200	A	A	2,008	*	2	423	360	A	A	7,076	2	275	199	A	A	4,583	
M4 Motorway	at	Nepean River	4F	3,576	3,469	D	D	62,252	*	4F	4,050	4,004	F	F	71,429	4F	4,597	4,409	F	F	80,882	
M4 Motorway	East	Erskine Park Road	4F	1,239	1,662	A	B	29,175		6F	6,217	5,990	F	E	125,860	6F	5,642	5,663	E	E	123,600	
M4 Motorway	East	Wallgrove Road	4F	3,303	3,533	D	D	74,730		6F	6,042	5,981	F	E	127,953	6F	6,147	6,215	F	F	131,171	
M4 Motorway	West	Great Western Highw	4F	4,835	5,150	F	F	116,011		8F	8,857	8,994	F	F	168,248	8F	9,181	8,909	F	F	181,121	
M4 Motorway	East	Silverwater Road	6F	1,336	2,816	A	B	26,281		6F	6,320	6,826	F	F	123,947	6F	7,402	7,164	F	F	150,487	
M5 Motorway	West	River Road	4F	2,232	2,325	C	C	38,900	*	4F	4,528	4,608	F	F	83,664	4F	4,728	4,365	F	F	92,645	
M5 Motorway	East	River Road	4F	184	154	A	A	2,955	*	4F	7,186	6,833	G	G	128,994	4F	5,031	4,931	F	F	106,173	
M5 Motorway	East	Western Sydney Orbit	4F	3,267	2,954	D	C	51,136	*	4F	4,009	4,008	F	F	87,820	4F	4,369	4,417	F	F	100,021	
Mamre Road	Sout	M4 Motorway	4UC	1,019	1,042	A	A	20,270	*	4UC	1,883	1,810	C	C	33,602	4UC	1,607	1,445	B	A	26,826	
Mamre Road	North	Elizabeth Drive	2	776	900	B	C	12,252		2	883	953	C	C	16,969	2	568	695	A	A	9,944	
Menai Road	at	Woronora River	2	1,244	1,224	E	E	20,527		2	1,835	1,896	F	G	41,216	2	2,502	2,692	E	F	57,716	
Moorebank Avenue	North	Cambridge Avenue	2	1,151	1,050	E	D	15,098		2	1,429	1,402	F	F	16,213	2	1,531	1,560	F	F	17,700	
Moorebank Avenue	North	M5 Motorway	4D	1,626	1,310	B	A	23,705		4D	2,001	2,775	C	F	32,044	4D	1,981	2,523	C	E	33,167	
Moore-Oxley Bypass	North	Narellan Road	6D	1,194	1,502	A	A	27,737		4D	1,402	1,329	A	A	27,667	4D	1,594	1,534	A	A	31,810	
Moore-Oxley Bypass	Sout	Queen Street	6D	972	1,198	A	A	22,507		6D	1,080	1,235	A	A	17,070	6D	1,007	1,281	A	A	16,104	

NOTE: 1 LOS = Level of Service

2. LOS G = volume/capacity > 1.5

3. ADT = Average Daily Traffic

4. * = ADT estimated from model

Location Description		Type	1996					ADT	Type	2006					ADT	Type	2016					ADT
			AM Peak Flow	PM Peak Flow	AM LOS	PM LOS	AM Peak Flow			PM Peak Flow	AM LOS	PM LOS	AM Peak Flow	PM Peak Flow			AM LOS	PM LOS				
Mulgoa Road	North Park Avenue	2	347	328	A	A	6,473		2	388	375	A	A	6,853		2	474	478	A	A	8,779	
Narellan Road	West South Western Freew	4D	1,972	2,040	C	C	36,770		4D	2,286	2,320	D	D	41,098		4D	2,815	2,774	F	F	50,851	
Narellan Road	East South Western Freew	4D	1,826	1,767	B	B	37,283		4D	2,208	2,131	D	D	41,928		4D	2,860	2,798	F	F	50,624	
New Illawarra Road	North Heathcote Road	2	793	835	B	B	13,950		2	1,518	1,617	F	F	24,759		2	1,862	2,083	F	G	30,630	
Newbridge Road	West Henry Lawson Drive	6D	3,923	3,400	E	D	65,364		6D	5,111	5,169	F	F	88,208		6D	5,312	5,722	F	F	92,246	
Newbridge Road	West Heathcote Road	6D	1,962	2,307	A	A	45,586		6D	3,182	2,061	C	A	57,511		6D	3,115	2,574	C	B	53,628	
Nuwarra Road	North Heathcote Road	4U	1,231	1,538	A	C	19,200		4U	855	829	A	A	13,351		4U	948	908	B	B	14,561	
Old Illawarra Road	North Bangor Bypass	4UC	1,013	1,184	A	A	22,109		(not in network)						2	2,907	3,588	G	G	52,504		
Pembroke Road	North Leumeah Road	2	1,228	1,219	E	E	26,200		2	1,245	1,288	E	F	28,882		2	1,180	1,011	E	D	23,632	
Princes Highway	at Georges River	6D	5,541	5,600	F	F	82,027		6D	5,924	6,112	F	G	87,593		6D	6,310	5,429	G	F	92,825	
Princes Highway	Sout Heathcote Road	4D	1,878	1,990	C	C	25,742		4D	2,227	2,199	D	D	33,257		4D	2,379	2,351	D	D	35,657	
Princes Highway	Sout Farnell Avenue	4F	3,098	3,155	D	D	52,750		4F	3,338	3,207	D	D	53,558		4F	3,634	3,371	D	D	57,427	
Raby Road	West Campbelltown Road	2	1,256	1,133	E	E	21,234		2	1,602	1,399	F	F	24,650		2	1,972	1,599	G	F	29,570	
South Western Freew	North Campbelltown-Raby R	4F	3,470	3,330	D	D	60,060		4F	3,401	3,354	D	D	69,200		4F	3,671	3,462	D	D	78,615	
South Western Freew	North Narellan Road	4F	887	746	A	A	16,126	*	4F	1,384	1,651	A	B	29,850		4F	1,574	1,585	B	B	34,479	
Taren Point Road	at Georges River	6D	4,506	4,300	F	F	59,480		6D	4,471	4,089	F	F	61,261		6D	4,681	5,129	F	F	64,844	
The Horsley Drive	West Ferres Road	4UC	1,295	1,483	A	A	19,363		4UC	1,277	1,605	A	B	18,264		4UC	2,623	2,761	F	F	32,598	
The Horsley Drive	West Cumberland Highway	4UC	891	1,098	A	A	19,858		4UC	483	456	A	A	11,408		4UC	558	541	A	A	11,444	
The Horsley Drive	East Cumberland Highway	4UC	1,104	1,199	A	A	25,127		4UC	601	618	A	A	13,157		4UC	662	627	A	A	14,692	
The Northern Road	at Lowes Creek	4D	861	757	A	A	17,671		2	799	767	B	B	15,394		2	882	860	C	B	16,539	
The Northern Road	North Camden Valley Way	2	419	394	A	A	10,051		2	626	595	A	A	12,713		2	688	672	A	A	13,655	
The Northern Road	Sout Elizabeth Drive	2	407	412	A	A	8,657	*	2	592	604	A	A	9,927		2	485	545	A	A	8,623	
The Northern Road	North Elizabeth Drive	2	416	300	A	A	8,761	*	2	615	549	A	A	11,301		2	683	590	A	A	12,467	
The Northern Road	North Bringelly Road	2	574	548	A	A	12,747		2	1,045	1,051	D	D	17,882		2	1,128	1,147	D	E	18,667	
Wallgrove Road	Sout M4 Motorway	2	1,324	1,441	F	F	27,946	*	4D	2,436	2,217	E	D	46,346		(not in network)						
Wallgrove Road	North The Horsley Drive	4UC	1,898	1,688	C	B	31,824	*	4D	2,358	2,144	D	D	46,103		4D	346	310	A	A	7,618	
Wallgrove Road	North Elizabeth Drive	2	801	683	B	A	15,546		4D	2,282	2,161	D	D	39,418		4D	653	471	A	A	12,053	
Western Sydney Orbit	Sout M4 Motorway	(not in network)							(not in network)						4F	3,843	3,706	E	E	85,430		
Western Sydney Orbit	North M5 Motorway	(not in network)							2F	2,220	2,076	F	F	43,818		2F	3,598	3,477	D	D	66,673	
Western Sydney Orbit	Sout Elizabeth Drive	(not in network)							2F	1,805	1,650	F	E	37,815		2F	3,639	3,822	D	E	70,875	
Western Sydney Orbit	North Elizabeth Drive	(not in network)							(not in network)						0	3,809	4,047	E	F	67,181		
Western Sydney Orbit	orth The Horsley Drive	(not in network)							(not in network)						0	3433	3529	D	D	78065.93		
Williamson Road	Sout Brooks Road	4D	625	571	A	A	11,818		4D	609	649	A	A	6,995		4D	671	651	A	A	7,703	
Woodville Road	North Hume Highway	6D	1,915	1,841	A	A	40,015		6D	2,626	2,564	B	B	44,155		6D	2,639	2,711	B	B	45,587	

NOTE: 1. LOS = Level of Service

2. LOS G = volume/capacity > 1.5

3. ADT = Average Daily Traffic

4. * = ADT estimated from model

Appendix J

Forecast Scenarios

APPENDIX J
TABLE J1**AIR TRAFFIC FORECAST 1**

YEAR	2006		
PASSENGERS	International	Domestic	Total
Sydney Airport	11,700,000	18,300,000	30,000,000
Second Sydney Airport	1,900,000	2,900,000	4,800,000
Total Passenger	13,600,000	21,200,000	34,800,000

KSA AIRPORT

EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	25,156	18,870	3,368	47,394	ANNUAL			
Proportion on-site	20,125	9,294	2,689	32,108	Terminating/Originating Pass	10,533,510	15,555,000	26,088,510
Proportion off-site	5,031	9,576	679	15,286	Transfers & transit	1,166,490	2,745,000	3,911,490
					TOTAL	11,700,000	18,300,000	30,000,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
					Terminating/Originating Pass	28,513	35,057	63,570
					Meeter/Greeters	14,662	9,803	24,465
Employees ¹	4,025	4,458	1,331	9,812	Total	43,175	44,860	88,035
DAILY PERSON TRIPS (two-way)					DAILY PERSON TRIPS (two-way)			
					Terminating/Originating Pass	28,513	35,057	63,570
					Meeter/Greeters	29,324	19,606	48,930
Total	8,050	8,912	2,662	19,624	Total	57,837	54,663	112,500
PEAK HOUR PERSON TRIPS (two-way)					PEAK HOUR PERSON TRIPS (two-way)			
AM PEAK arrival	826	1,768	286	2,880	AM PEAK arrival	2,926	2,647	5,573
departure	173	309	182	664	departure	3,125	2,553	5,678
total	999	2,077	468	3,544	total	6,051	5,200	11,251
PM PEAK arrival	303	597	128	1,028	PM PEAK arrival	3,661	4,286	7,947
departure	671	1,410	326	2,407	departure	1,018	2,170	3,188
total	974	2,007	454	3,435	total	4,679	6,456	11,135

NOTE: 1 Includes 1% per annum productivity savings from 1996.

2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

SECOND SYDNEY AIRPORT

EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	4,085	2,990	539	7,614	ANNUAL			
Proportion on-site	3,268	1,473	430	5,171	Terminating/Originating Pass	1,710,570	2,465,000	4,175,570
Proportion off-site	817	1,517	109	2,443	Transfers & transit	189,430	435,000	624,430
					TOTAL PASSENGERS	1,900,000	2,900,000	4,800,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
					Terminating/Originating Pass	4,631	6,242	10,873
					Meeter/Greeters	2,381	1,746	4,127
Employees ¹	654	706	213	1,573	Total	7,012	7,988	15,000
DAILY PERSON TRIPS (two-way)					DAILY PERSON TRIPS (two-way)			
					Terminating/Originating Pass	4,631	6,242	10,873
					Meeter/Greeters	4,762	3,492	8,254
Total	1,308	1,412	426	3,146	Total	9,393	9,734	19,127
PEAK HOUR PERSON TRIPS (two-way)					PEAK HOUR PERSON TRIPS (two-way)			
AM PEAK arrival	134	280	46	460	AM PEAK arrival	475	471	946
departure	28	49	29	106	departure	508	455	963
total	162	329	75	566	total	983	926	1,909
PM PEAK arrival	49	95	20	164	PM PEAK arrival	595	763	1,358
departure	109	223	52	384	departure	165	386	551
total	158	318	72	548	total	760	1,149	1,909

NOTE: 1 Includes 1% per annum productivity savings from 1996.

2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

APPENDIX J
TABLE J2

AIR TRAFFIC FORECAST 1			
YEAR	2016		
PASSENGERS	International	Domestic	Total
Sydney Airport	11,700,000	18,300,000	30,000,000
Second Sydney Airport	8,700,000	10,300,000	19,000,000
Total Passenger	20,400,000	28,600,000	49,000,000

KSA AIRPORT

EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	22,773	17,082	3,049	42,904	ANNUAL			
Proportion on-site	18,218	8,414	2,434	29,066	Terminating/Originating Pass	10,533,510	15,555,000	26,088,510
Proportion off-site	4,555	8,668	615	13,838	Transfers & transit	1,166,490	2,745,000	3,911,490
					TOTAL	11,700,000	18,300,000	30,000,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
					Terminating/Originating Pass	28,513	35,057	63,570
					Meeter/Greeters	14,662	9,803	24,465
Employees ¹	3,644	4,034	1,205	8,883	Total	43,175	44,860	88,035
DAILY PERSON TRIPS (two-way)					DAILY PERSON TRIPS (two-way)			
					Terminating/Originating Pass	28,513	35,057	63,570
Total	7,288	8,068	2,410	17,766	Meeter/Greeters	29,324	19,606	48,930
					Total	57,837	54,663	112,500
PEAK HOUR PERSON TRIPS (two-way)					PEAK HOUR PERSON TRIPS (two-way)			
AM PEAK arrival	748	1,600	259	2,607	AM PEAK arrival	2,926	2,647	5,573
departure	156	280	165	601	departure	3,125	2,553	5,678
total	904	1,880	424	3,208	total	6,051	5,200	11,251
PM PEAK arrival	274	540	116	930	PM PEAK arrival	3,661	4,286	7,947
departure	607	1,277	296	2,180	departure	1,018	2,170	3,188
total	881	1,817	412	3,110	total	4,679	6,456	11,135

NOTE 1 Includes 1% per annum productivity savings from 1996

2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

SECOND SYDNEY AIRPORT

EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	16,934	9,615	1,931	28,480	ANNUAL			
Proportion on-site	13,547	4,736	1,542	19,825	Terminating/Originating Pass	7,832,610	8,755,000	16,587,610
Proportion off-site	3,387	4,879	389	8,655	Transfers & transit	867,390	1,545,000	2,412,390
					TOTAL PASSENGERS	8,700,000	10,300,000	19,000,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
					Terminating/Originating Pass	21,204	22,171	43,375
					Meeter/Greeters	10,904	6,200	17,104
Employees ¹	2,709	2,271	763	5,743	Total	32,108	28,371	60,479
DAILY PERSON TRIPS (two-way)					DAILY PERSON TRIPS (two-way)			
					Terminating/Originating Pass	21,204	22,171	43,375
Total	5,418	4,542	1,526	11,486	Meeter/Greeters	21,808	12,400	34,208
					Total	43,012	34,571	77,583
PEAK HOUR PERSON TRIPS (two-way)					PEAK HOUR PERSON TRIPS (two-way)			
AM PEAK arrival	556	901	164	1,621	AM PEAK arrival	2,176	1,674	3,850
departure	116	158	104	378	departure	2,324	1,615	3,939
total	672	1,059	268	1,999	total	4,500	3,289	7,789
PM PEAK arrival	204	304	73	581	PM PEAK arrival	2,723	2,711	5,434
departure	451	719	187	1,357	departure	757	1,373	2,130
total	655	1,023	260	1,938	total	3,480	4,084	7,564

NOTE 1 Includes 1% per annum productivity savings from 1996

2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

APPENDIX J
TABLE J3

AIR TRAFFIC FORECAST		2		
YEAR		2006		
PASSENGERS		International	Domestic	Total
Sydney Airport		9,700,000	15,100,000	24,800,000
Second Sydney Airport		3,900,000	6,100,000	10,000,000
Total Passenger		13,600,000	21,200,000	34,800,000

KSA AIRPORT

EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	20,856	15,570	2,784	39,210	ANNUAL			
Proportion on-site	16,684	7,669	2,223	26,576	Terminating/Originating Pass	8,732,910	12,835,000	21,567,910
Proportion off-site	4,172	7,901	561	12,634	Transfers & transit	967,090	2,265,000	3,232,090
					TOTAL	9,700,000	15,100,000	24,800,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
Employees ¹	3,337	3,677	1,100	8,114	Terminating/Originating Pass	22,220	30,554	52,774
DAILY PERSON TRIPS (two-way)					Meeter/Greeters	11,426	8,544	19,970
					Total	33,646	39,098	72,744
					DAILY PERSON TRIPS (two-way)			
Total	6,674	7,354	2,200	16,228	Terminating/Originating Pass	22,220	30,554	52,774
PEAK HOUR PERSON TRIPS (two-way)					Meeter/Greeters	22,852	17,088	39,940
AM PEAK arrival	685	1,459	237	2,381	Total	45,072	47,642	92,714
AM PEAK departure	143	255	150	548				108,942
AM PEAK total	828	1,714	387	2,929	PEAK HOUR PERSON TRIPS (two-way)			
PM PEAK arrival	251	492	106	849	AM PEAK arrival	2,280	2,307	4,587
PM PEAK departure	556	1,164	270	1,990	AM PEAK departure	2,435	2,225	4,660
PM PEAK total	807	1,656	376	2,839	AM PEAK total	4,715	4,532	9,247

NOTE: 1 Includes 1% per annum productivity savings from 1996
2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

SECOND SYDNEY AIRPORT

EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	8,385	6,290	1,123	15,798	ANNUAL			
Proportion on-site	6,708	3,098	896	10,702	Terminating/Originating Pass	3,511,170	5,185,000	8,696,170
Proportion off-site	1,677	3,192	227	5,096	Transfers & transit	388,830	915,000	1,303,830
					TOTAL PASSENGERS	3,900,000	6,100,000	10,000,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
Employees ¹	1,342	1,485	444	3,271	Terminating/Originating Pass	9,505	13,131	22,636
DAILY PERSON TRIPS (two-way)					Meeter/Greeters	4,888	3,672	8,560
					Total	14,393	16,803	31,196
Total	2,684	2,970	888	6,542	DAILY PERSON TRIPS (two-way)			
PEAK HOUR PERSON TRIPS (two-way)					Terminating/Originating Pass	9,505	13,131	22,636
AM PEAK arrival	275	589	95	959	Meeter/Greeters	9,776	7,344	17,120
AM PEAK departure	58	103	61	222	Total	19,281	20,475	39,756
AM PEAK total	333	692	156	1,181				46,298
PM PEAK arrival	101	199	43	343	PEAK HOUR PERSON TRIPS (two-way)			
PM PEAK departure	224	470	109	803	AM PEAK arrival	976	992	1,968
PM PEAK total	325	669	152	1,146	AM PEAK departure	1,042	956	1,998

NOTE: 1 Includes 1% per annum productivity savings from 1996
2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

APPENDIX J
TABLE J4

AIR TRAFFIC FORECAST		2		
YEAR	2016			
PASSENGERS	International	Domestic	Total	
Sydney Airport	9,700,000	15,100,000	24,800,000	
Second Sydney Airport	10,700,000	13,500,000	24,200,000	
Total Passenger	20,400,000	28,600,000	49,000,000	

KSA AIRPORT

EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	18,880	14,095	2,520	35,495	ANNUAL			
Proportion on-site	15,104	6,942	2,012	24,058	Terminating/Originating Pass	8,732,910	12,835,000	21,567,910
Proportion off-site	3,776	7,153	508	11,437	Transfers & transit	967,090	2,265,000	3,232,090
					TOTAL	9,700,000	15,100,000	24,800,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
					Terminating/Originating Pass	22,220	30,554	52,774
					Meeter/Greeters	11,426	8,544	19,970
Employees ¹	3,021	3,329	996	7,346	Total	33,646	39,098	72,744
DAILY PERSON TRIPS (two-way)					DAILY PERSON TRIPS (two-way)			
					Terminating/Originating Pass	22,220	30,554	52,774
					Meeter/Greeters	22,852	17,088	39,940
Total	6,042	6,658	1,992	14,692	Total	45,072	47,642	92,714
PEAK HOUR PERSON TRIPS (two-way)					PEAK HOUR PERSON TRIPS (two-way)			
AM PEAK arrival	620	1,321	214	2,155	AM PEAK arrival	2,280	2,307	4,587
departure	130	231	136	497	departure	2,435	2,225	4,660
total	750	1,552	350	2,652	total	4,715	4,532	9,247
PM PEAK arrival	227	446	96	769	PM PEAK arrival	2,853	3,736	6,589
departure	503	1,053	244	1,800	departure	794	1,891	2,685
total	730	1,499	340	2,569	total	3,647	5,627	9,274

NOTE 1 Includes 1% per annum productivity savings from 1996.

2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

SECOND SYDNEY AIRPORT

EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	20,827	12,602	2,459	35,888	ANNUAL			
Proportion on-site	16,661	6,207	1,963	24,831	Terminating/Originating Pass	9,633,210	11,475,000	21,108,210
Proportion off-site	4,166	6,395	496	11,057	Transfers & transit	1,066,790	2,025,000	3,091,790
					TOTAL PASSENGERS	10,700,000	13,500,000	24,200,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
					Terminating/Originating Pass	25,818	29,060	54,878
					Meeter/Greeters	13,276	8,126	21,402
Employees ¹	3,332	2,976	972	7,280	Total	39,094	37,186	76,280
DAILY PERSON TRIPS (two-way)					DAILY PERSON TRIPS (two-way)			
					Terminating/Originating Pass	25,818	29,060	54,878
					Meeter/Greeters	26,552	16,252	42,804
Total	6,664	5,952	1,944	14,560	Total	52,370	45,312	97,682
PEAK HOUR PERSON TRIPS (two-way)					PEAK HOUR PERSON TRIPS (two-way)			
AM PEAK arrival	684	1,181	209	2,074	AM PEAK arrival	2,650	2,194	4,844
departure	143	206	133	482	departure	2,830	2,116	4,946
total	827	1,387	342	2,556	total	5,480	4,310	9,790
PM PEAK arrival	251	399	93	743	PM PEAK arrival	3,315	3,553	6,868
departure	555	942	238	1,735	departure	922	1,799	2,721
total	806	1,341	331	2,478	total	4,237	5,352	9,589

NOTE 1 Includes 1% per annum productivity savings from 1996.

2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

APPENDIX J
TABLE J5

AIR TRAFFIC FORECAST 3			
YEAR		2006	
PASSENGERS		International	Domestic Total
Sydney Airport		2,700,000	17,000,000 19,700,000
Second Sydney Airport		10,900,000	4,200,000 15,100,000
Total Passenger		13,600,000	21,200,000 34,800,000

KSA AIRPORT				
EMPLOYEES				
	International	Domestic	Freight	TOTAL
TOTAL WORKFORCE 1	5,805	17,529	2,211	25,545
Proportion on-site	4,644	8,634	1,766	15,044
Proportion off-site	1,161	8,895	445	10,501
DAILY ATTENDANCE				
Employees 1	929	4,140	874	5,943
DAILY PERSON TRIPS (two-way)				
Total	1,858	8,280	1,748	11,886
PEAK HOUR PERSON TRIPS (two-way)				
AM PEAK arrival	191	1,642	188	2,021
departure	40	287	120	447
total	231	1,929	308	2,468
PM PEAK arrival	70	554	84	708
departure	155	1,310	214	1,679
total	225	1,864	298	2,387

NOTE 1 Includes 1% per annum productivity savings from 1996
2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

SECOND SYDNEY AIRPORT				
EMPLOYEES				
	International	Domestic	Freight	TOTAL
TOTAL WORKFORCE 1	23,436	4,331	1,695	29,462
Proportion on-site	18,748	2,133	1,353	22,234
Proportion off-site	4,688	2,198	342	7,228
DAILY ATTENDANCE				
Employees 1	3,750	1,023	670	5,443
DAILY PERSON TRIPS (two-way)				
Total	7,500	2,046	1,340	10,886
PEAK HOUR PERSON TRIPS (two-way)				
AM PEAK arrival	769	406	144	1,319
departure	161	71	92	324
total	930	477	236	1,643
PM PEAK arrival	282	137	64	483
departure	625	324	164	1,113
total	907	461	228	1,596

NOTE: 1 Includes 1% per annum productivity savings from 1996
2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

APPENDIX J
TABLE J6

AIR TRAFFIC FORECAST		3		
YEAR		2016		
PASSENGERS		International	Domestic	Total
Sydney Airport		2,700,000	17,000,000	19,700,000
Second Sydney Airport		17,700,000	11,600,000	29,300,000
Total Passenger		20,400,000	28,600,000	49,000,000

KSA AIRPORT								
EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	5,255	15,869	2,002	23,126	ANNUAL			
Proportion on-site	4,204	7,816	1,598	13,618	Terminating/Originating Pass	2,430,810	14,450,000	16,880,810
Proportion off-site	1,051	8,053	404	9,508	Transfers & transit	269,190	2,550,000	2,819,190
					TOTAL	2,700,000	17,000,000	19,700,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
					Terminating/Originating Pass	6,582	36,597	43,179
Employees ¹	841	3,748	791	5,380	Meeter/Greeters	3,384	10,233	13,617
DAILY PERSON TRIPS (two-way)					Total	9,966	46,830	56,796
								62,176
Total	1,682	7,496	1,582	10,760	DAILY PERSON TRIPS (two-way)			
					Terminating/Originating Pass	6,582	36,597	43,179
PEAK HOUR PERSON TRIPS (two-way)					Meeter/Greeters	6,768	20,466	27,234
AM PEAK arrival	173	1,487	170	1,830	Total	13,350	57,063	70,413
departure	36	260	108	404				81,173
total	209	1,747	278	2,234	PEAK HOUR PERSON TRIPS (two-way)			
PM PEAK arrival	63	502	76	641	AM PEAK arrival	675	2,763	3,438
departure	140	1,186	194	1,520	departure	721	2,665	3,386
total	203	1,688	270	2,161	total	1,396	5,428	6,824
					PM PEAK arrival	845	4,474	5,319
					departure	235	2,265	2,500
					total	1,080	6,739	7,819

NOTE: 1 Includes 1% per annum productivity savings from 1996
2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

SECOND SYDNEY AIRPORT								
EMPLOYEES					PASSENGERS			TOTAL
	International	Domestic	Freight	TOTAL		International	Domestic	TOTAL
TOTAL WORKFORCE ¹	34,452	10,828	2,978	48,258	ANNUAL			
Proportion on-site	27,561	5,333	2,377	35,271	Terminating/Originating Pass	15,935,310	9,860,000	25,795,310
Proportion off-site	6,891	5,495	601	12,987	Transfers & transit	1,764,690	1,740,000	3,504,690
					TOTAL PASSENGERS	17,700,000	11,600,000	29,300,000
DAILY ATTENDANCE					DAILY ATTENDANCE ²			
					Terminating/Originating Pass	40,983	23,721	64,704
Employees ¹	5,512	2,557	1,177	9,246	Meeter/Greeters	21,074	6,633	27,707
DAILY PERSON TRIPS (two-way)					Total	62,057	30,354	92,411
								101,657
Total	11,024	5,114	2,354	18,492	DAILY PERSON TRIPS (two-way)			
					Terminating/Originating Pass	40,983	23,721	64,704
PEAK HOUR PERSON TRIPS (two-way)					Meeter/Greeters	42,148	13,266	55,414
AM PEAK arrival	1,131	1,014	253	2,398	Total	83,131	36,987	120,118
departure	237	177	161	575				138,610
total	1,368	1,191	414	2,973	PEAK HOUR PERSON TRIPS (two-way)			
PM PEAK arrival	415	342	113	870	AM PEAK arrival	4,206	1,791	5,997
departure	918	809	289	2,016	departure	4,492	1,728	6,220
total	1,333	1,151	402	2,886	total	8,698	3,519	12,217
					PM PEAK arrival	5,262	2,900	8,162
					departure	1,464	1,468	2,932
					total	6,726	4,368	11,094

NOTE: 1 Includes 1% per annum productivity savings from 1996
2 Includes 1% per annum discount in daily passengers when Yearly Passengers in excess of 22 million

Appendix K

Mode of Travel (%) to Airports

APPENDIX K
MODE OF TRAVEL AT SYDNEY AIRPORT

EXISTING EMPLOYEES MODE OF TRAVEL TO SYDNEY AIRPORT

NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	82	88	81	83	87
car passengers	6	6	6	6	6
taxis	4	4	3	4	4
bus	8	2	10	7	3
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	100	100	100	100	100

EXISTING MODE OF TRAVEL OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

NO RAIL

Mode of Travel	International					Domestics				
	Daily two-way	AM		PM		Daily two-way	AM		PM	
		arr	dep	arr	dep		arr	dep	arr	dep
car drivers	26	33	29	34	24	32	36	36	38	34
car passengers	42	46	47	47	35	30	34	35	35	32
taxis	16	12	16	12	18	28	25	24	24	27
bus	10	3	3	2	6	8	3	3	2	5
coaches	6	6	5	5	17	2	2	2	1	2
Rail	0	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100

Source: Kinhill (1994) for Daily and Masson & Wilson (1996) for Peak Hours

EMPLOYEES MODE OF TRAVEL TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	69	65	68	68	65
car passengers	4	5	5	5	5
taxis	4	4	4	4	4
bus	4	1	3	1	1
coaches	0	0	0	0	0
Rail	19	25	20	22	25
Total	100	100	100	100	100

MODE OF TRAVEL OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily two-way	International				Daily two-way	Domestic			
		AM		PM			AM		PM	
		arr	dep	arr	dep		arr	dep	arr	dep
car drivers	22	26	24	28	18	28	31	31	32	29
car passengers	36	37	40	39	28	26	29	29	30	28
taxis	12	10	11	9	14	23	18	19	18	20
bus	5	2	1	1	3	3	1	1	1	2
coaches	6	6	6	5	17	2	2	2	1	2
Rail	19	19	18	18	20	18	19	18	18	19
Total	100	100	100	100	100	100	100	100	100	100

Source: Kinhill (1994) for Daily.

APPENDIX K
ASSUMED MODE OF TRAVEL AT SECOND SYDNEY AIRPORT

EMPLOYEES MODE OF TRAVEL TO SECOND SYDNEY AIRPORT

NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	85	86	84	85	87
car passengers	8	8	8	8	8
taxis	2	2	2	2	2
bus	5	4	6	5	3
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	100	100	100	100	100

MODE OF TRAVEL OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

NO RAIL

Mode of Travel	Daily	International				Domestics			
		AM		PM		AM		PM	
	two-way	arr	dep	arr	dep	arr	dep	arr	dep
car drivers	28	29	28	28	25	33	35	35	35
car passengers	46	49	49	49	37	31	32	32	33
taxis	15	13	15	14	17	28	30	30	29
bus	5	3	3	3	4	6	1	1	2
coaches	6	6	5	6	17	2	2	2	1
Rail	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100

EMPLOYEES MODE OF TRAVEL TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	72	67	71	72	68
car passengers	5	5	5	5	5
taxis	1	1	1	1	1
bus	2	2	3	2	2
coaches	0	0	0	0	0
Rail	20	25	20	20	24
Total	100	100	100	100	100

Assume:

- Train at least every 15 minutes off-peak
- Normal train fares
- Easily accessible station
- Some restrictions on employee parking, but not severe
- Increased bus catchment coverage

MODE OF TRAVEL OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	International				Domestics			
		AM		PM		AM		PM	
	two-way	arr	dep	arr	dep	arr	dep	arr	dep
car drivers	25	25	26	26	19	30	30	31	30
car passengers	40	40	41	40	31	28	29	29	29
taxis	12	12	12	13	13	22	22	23	22
bus	2	2	1	1	2	3	1	1	1
coaches	6	6	5	5	17	2	2	1	2
Rail	15	15	15	15	18	15	16	15	16
Total	100	100	100	100	100	100	100	100	100

Appendix L

Mode of Travel (Persons) to Airports

APPENDIX L
TRAVEL MODE PATRONAGE
1 2006

AIR TRAFFIC FORECAST

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	16,092	2,524	536	859	2,097
car passengers	1,178	176	36	61	148
taxis	785	111	22	39	93
bus	1,569	69	69	69	69
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	19,624	2,880	663	1,028	2,407

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	12,534	761	750	1,025	183	15,778	839	809	1,403	644
car passengers	20,707	1,083	1,250	1,428	285	14,615	785	757	1,315	621
taxis	6,897	293	375	329	143	12,817	487	496	789	444
bus	2,895	59	31	37	31	1,653	27	26	44	44
coaches	3,601	171	171	171	171	894	47	47	47	47
Rail	11,204	556	563	659	204	10,131	514	470	789	422
Total	57,838	2,923	3,140	3,649	1,017	55,888	2,699	2,605	4,387	2,222

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	2,674	396	89	139	334
car passengers	252	37	8	13	31
taxis	63	9	2	3	8
bus	157	18	6	8	12
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	3,146	460	105	163	385

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	2,630	138	142	167	41	3,212	165	137	267	135
car passengers	4,321	233	249	292	61	3,018	151	132	252	124
taxis	1,409	62	76	83	30	2,726	141	100	229	112
bus	470	14	15	18	5	584	5	5	8	8
coaches	564	29	25	36	28	195	9	9	8	8
Rail	0	0	0	0	0	0	0	73	0	0
Total	9,394	476	507	596	165	9,735	471	456	764	387

APPENDIX L

TRAVEL MODE PATRONAGE

AIR TRAFFIC FORECAST

1 2016

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	14,568	2,285	485	777	1,899
car passengers	1,066	159	33	55	134
taxis	711	100	20	35	84
bus	1,420	63	63	63	63
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	17,765	2,607	601	930	2,180

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	12,534	761	750	1,025	183	15,778	839	809	1,403	644
car passengers	20,707	1,083	1,250	1,428	285	14,615	785	757	1,315	621
taxis	6,897	293	375	329	143	12,817	487	496	789	444
bus	2,895	59	31	37	31	1,653	27	26	44	44
coaches	3,601	171	171	171	171	894	47	47	47	47
Rail	11,204	556	563	659	204	10,131	514	470	789	422
Total	57,838	2,923	3,140	3,649	1,017	55,888	2,699	2,605	4,387	2,222

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	9,763	1,394	318	494	1,181
car passengers	919	130	30	46	109
taxis	230	32	8	12	27
bus	574	65	23	29	41
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	11,486	1,621	379	581	1,358

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	12,043	631	651	762	189	11,408	586	485	949	481
car passengers	19,786	1,066	1,139	1,334	280	10,717	536	468	895	439
taxis	6,452	283	349	381	136	9,680	502	355	813	398
bus	2,151	65	70	82	23	2,074	17	16	27	27
coaches	2,581	131	116	163	129	691	33	32	27	27
Rail	0	0	0	0	0	0	0	258	0	0
Total	43,013	2,176	2,325	2,722	757	34,570	1,674	1,614	2,711	1,372

APPENDIX L
TRAVEL MODE PATRONAGE
2 2006

AIR TRAFFIC FORECAST

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	13,307	2,087	443	709	1,733
car passengers	974	145	30	50	123
taxis	649	92	18	32	77
bus	1,297	57	57	57	57
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	16,227	2,381	548	848	1,990

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	9,767	593	584	799	143	13,449	715	690	1,196	548
car passengers	16,137	844	974	1,113	222	12,458	669	645	1,121	529
taxis	5,374	228	292	257	111	10,925	415	423	672	378
bus	2,256	46	24	29	24	1,409	23	22	37	38
coaches	2,806	133	133	133	133	762	40	40	40	40
Rail	8,731	433	438	514	159	8,636	438	401	672	359
Total	45,071	2,277	2,445	2,845	792	47,639	2,300	2,221	3,738	1,892

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	5,561	825	186	292	699
car passengers	523	77	18	27	64
taxis	131	19	4	7	16
bus	327	38	13	17	24
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	6,542	959	221	343	803

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	5,399	283	292	342	85	6,757	347	287	562	285
car passengers	8,869	478	511	598	125	6,347	317	277	530	260
taxis	2,892	127	156	171	61	5,733	298	210	482	236
bus	964	29	31	37	10	1,229	10	10	16	16
coaches	1,157	59	52	73	58	410	20	19	16	16
Rail	0	0	0	0	0	0	0	153	0	0
Total	19,281	976	1,042	1,221	339	20,476	992	956	1,606	813

AIR TRAFFIC FORECAST

2

APPENDIX L
TRAVEL MODE PATRONAGE

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	12,048	1,889	401	642	1,568
car passengers	882	132	27	46	111
taxis	588	83	17	29	69
bus	1,175	52	52	52	52
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	14,693	2,156	497	769	1,800

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	International				Domestics				
		AM	PM		Daily	AM	PM		Daily	dep
	two-way	arr	dep	arr		arr	dep	arr		
car drivers	9,767	593	584	799	143	13,449	715	690	1,196	548
car passengers	16,137	844	974	1,113	222	12,458	669	645	1,121	529
taxis	5,374	228	292	257	111	10,925	415	423	672	378
bus	2,256	46	24	29	24	1,409	23	22	37	38
coaches	2,806	133	133	133	133	762	40	40	40	40
Rail	8,731	433	438	514	159	8,636	438	401	672	359
Total	45,071	2,277	2,445	2,845	792	47,639	2,300	2,221	3,738	1,892

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	12,376	1,784	405	632	1,509
car passengers	1,165	166	39	59	139
taxis	291	41	10	15	35
bus	728	83	29	37	52
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	14,560	2,074	483	743	1,735

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	International				Domestics				
		AM	PM		Daily	AM	PM		Daily	dep
	two-way	arr	dep	arr		arr	dep	arr		
car drivers	14,664	769	792	928	231	14,953	768	635	1,244	630
car passengers	24,090	1,299	1,387	1,624	341	14,047	702	614	1,172	576
taxis	7,856	345	425	464	166	12,687	658	466	1,066	522
bus	2,619	80	85	99	28	2,719	22	21	36	36
coaches	3,142	159	142	199	157	906	44	42	36	36
Rail	0	0	0	0	0	0	0	339	0	0
Total	52,371	2,652	2,831	3,314	923	45,312	2,194	2,117	3,554	1,800

APPENDIX L

TRAVEL MODE PATRONAGE

AIR TRAFFIC FORECAST

3 2006

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	9,747	1,771	361	591	1,463
car passengers	713	123	24	42	103
taxis	476	78	15	27	65
bus	950	49	47	48	48
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	11,886	2,021	447	708	1,679

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	2,893	176	173	237	42	16,109	857	826	1,432	657
car passengers	4,780	250	288	330	66	14,922	801	773	1,342	634
taxis	1,592	68	87	76	33	13,085	497	506	805	453
bus	668	14	7	8	7	1,688	28	27	45	45
coaches	831	39	39	39	39	913	48	48	48	48
Rail	2,586	128	130	152	47	10,344	525	480	805	430
Total	13,350	675	724	842	234	57,061	2,756	2,660	4,477	2,267

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	9,253	1,134	272	411	968
car passengers	871	106	26	39	89
taxis	218	26	6	10	22
bus	544	53	19	24	33
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	10,886	1,319	323	484	1,112

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	15,089	791	815	955	237	4,652	239	197	387	196
car passengers	24,788	1,336	1,427	1,671	351	4,370	219	191	365	179
taxis	8,083	355	437	478	171	3,947	205	145	332	162
bus	2,694	82	87	102	28	846	7	7	11	11
coaches	3,233	164	146	205	161	282	14	13	11	11
Rail	0	0	0	0	0	0	0	105	0	0
Total	53,887	2,728	2,912	3,411	948	14,097	684	658	1,106	559

AIR TRAFFIC FORECAST

3 2016

APPENDIX L
TRAVEL MODE PATRONAGE

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	8,823	1,604	326	535	1,324
car passengers	646	112	22	38	94
taxis	431	70	14	24	59
bus	860	44	42	43	44
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	10,760	1,830	404	640	1,521

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	2,893	176	173	237	42	16,109	857	826	1,432	657
car passengers	4,780	250	288	330	66	14,922	801	773	1,342	634
taxis	1,592	68	87	76	33	13,085	497	506	805	453
bus	668	14	7	8	7	1,688	28	27	45	45
coaches	831	39	39	39	39	913	48	48	48	48
Rail	2,586	128	130	152	47	10,344	525	480	805	430
Total	13,350	675	724	842	234	57,061	2,756	2,660	4,477	2,267

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	15,718	2,062	483	740	1,754
car passengers	1,479	192	46	70	161
taxis	370	48	12	17	40
bus	925	96	35	44	60
coaches	0	0	0	0	0
Rail	0	0	0	0	0
Total	18,492	2,398	576	871	2,015

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH NO RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	23,277	1,220	1,258	1,473	366	12,206	627	518	1,015	514
car passengers	38,240	2,061	2,201	2,578	542	11,466	573	501	957	470
taxis	12,470	547	674	737	264	10,356	537	380	870	426
bus	4,157	126	135	158	44	2,219	18	17	29	29
coaches	4,988	252	225	316	249	740	36	35	29	29
Rail	0	0	0	0	0	0	0	276	0	0
Total	83,132	4,206	4,493	5,262	1,465	36,987	1,791	1,727	2,900	1,468

APPENDIX L

TRAVEL MODE PATRONAGE

AIR TRAFFIC FORECAST

1 2006

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	13,517	1,872	452	699	1,565
car passengers	895	144	33	51	120
taxis	785	115	27	41	96
bus	785	29	20	10	24
coaches	0	0	0	0	0
Rail	3,642	720	133	226	602
Total	19,624	2,880	665	1,027	2,407

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	12,534	761	750	1,025	183	15,778	839	809	1,403	644
car passengers	20,707	1,083	1,250	1,428	285	14,615	785	757	1,315	621
taxis	6,897	293	375	329	143	12,817	487	496	789	444
bus	2,895	59	31	37	31	1,653	27	26	44	44
coaches	3,601	171	171	171	171	894	47	47	47	47
Rail	11,204	556	563	659	204	10,131	514	470	789	422
Total	57,838	2,923	3,140	3,649	1,017	55,888	2,699	2,605	4,387	2,222

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	2,265	308	75	118	261
car passengers	157	23	5	8	19
taxis	31	5	1	2	4
bus	63	9	3	3	8
coaches	0	0	0	0	0
Rail	629	115	21	33	92
Total	3,145	460	105	164	384

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International						Domestics			
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	2,348	119	132	155	31	2,920	141	137	237	116
car passengers	3,757	190	208	238	51	2,726	137	132	221	112
taxis	1,127	57	61	77	21	2,141	104	100	175	85
bus	188	10	5	6	3	292	5	5	8	4
coaches	564	29	25	30	28	195	9	9	8	8
Rail	1,409	71	76	89	30	1,460	75	73	114	62
Total	9,393	476	507	595	164	9,734	471	456	763	387

APPENDIX L

TRAVEL MODE PATRONAGE

AIR TRAFFIC FORECAST

1 2016

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	12,237	1,695	409	632	1,417
car passengers	810	130	30	47	109
taxis	711	104	24	37	87
bus	711	26	18	9	22
coaches	0	0	0	0	0
Rail	3,297	652	120	205	545
Total	17,766	2,607	601	930	2,180

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	12,534	761	750	1,025	183	15,778	839	809	1,403	644
car passengers	20,707	1,083	1,250	1,428	285	14,615	785	757	1,315	621
taxis	6,897	293	375	329	143	12,817	487	496	789	444
bus	2,895	59	31	37	31	1,653	27	26	44	44
coaches	3,601	171	171	171	171	894	47	47	47	47
Rail	11,204	556	563	659	204	10,131	514	470	789	422
Total	57,838	2,923	3,140	3,649	1,017	55,888	2,699	2,605	4,387	2,222

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	8,270	1,086	268	418	923
car passengers	574	81	19	29	68
taxis	115	16	4	6	14
bus	230	32	11	12	27
coaches	0	0	0	0	0
Rail	2,297	405	76	116	326
Total	11,486	1,620	378	581	1,358

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	10,753	544	604	708	144	10,371	502	485	840	412
car passengers	17,205	870	953	1,089	235	9,680	485	468	786	398
taxis	5,161	261	279	354	98	7,606	368	355	624	302
bus	860	44	23	27	15	1,037	17	16	27	14
coaches	2,581	131	116	136	129	691	33	32	27	27
Rail	6,452	326	349	408	136	5,186	268	258	407	220
Total	43,012	2,176	2,324	2,722	757	34,571	1,673	1,614	2,711	1,373

APPENDIX L

TRAVEL MODE PATRONAGE

AIR TRAFFIC FORECAST

2 2006

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	11,178	1,548	373	577	1,294
car passengers	740	119	27	42	100
taxis	649	95	22	34	80
bus	649	24	16	8	20
coaches	0	0	0	0	0
Rail	3,012	595	110	187	498
Total	16,228	2,381	548	848	1,992

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	9,767	593	584	799	143	13,449	715	690	1,196	548
car passengers	16,137	844	974	1,113	222	12,458	669	645	1,121	529
taxis	5,374	228	292	257	111	10,925	415	423	672	378
bus	2,256	46	24	29	24	1,409	23	22	37	38
coaches	2,806	133	133	133	133	762	40	40	40	40
Rail	8,731	433	438	514	159	8,636	438	401	672	359
Total	45,071	2,277	2,445	2,845	792	47,639	2,300	2,221	3,738	1,892

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	4,710	643	158	247	546
car passengers	327	48	11	17	40
taxis	65	10	2	3	8
bus	131	19	7	7	16
coaches	0	0	0	0	0
Rail	1,308	240	44	69	193
Total	6,541	960	222	343	803

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	4,820	244	271	317	64	6,143	298	287	498	244
car passengers	7,712	390	427	488	105	5,733	288	277	465	236
taxis	2,314	117	125	159	44	4,505	218	210	369	179
bus	386	20	10	12	7	614	10	10	16	8
coaches	1,157	59	52	61	58	410	20	19	16	16
Rail	2,892	146	156	183	61	3,071	159	153	241	130
Total	19,281	976	1,041	1,220	339	20,476	993	956	1,605	813

APPENDIX L

TRAVEL MODE PATRONAGE

AIR TRAFFIC FORECAST

2 2016

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	10,120	1,401	338	523	1,170
car passengers	670	108	25	38	90
taxis	588	86	20	31	72
bus	588	22	15	8	18
coaches	0	0	0	0	0
Rail	2,727	539	99	169	450
Total	14,693	2,156	497	769	1,800

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	9,767	593	584	799	143	13,449	715	690	1,196	548
car passengers	16,137	844	974	1,113	222	12,458	669	645	1,121	529
taxis	5,374	228	292	257	111	10,925	415	423	672	378
bus	2,256	46	24	29	24	1,409	23	22	37	38
coaches	2,806	133	133	133	133	762	40	40	40	40
Rail	8,731	433	438	514	159	8,636	438	401	672	359
Total	45,071	2,277	2,445	2,845	792	47,639	2,300	2,221	3,738	1,892

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	10,483	1,390	342	535	1,180
car passengers	728	104	24	37	87
taxis	146	21	5	7	17
bus	291	41	14	15	35
coaches	0	0	0	0	0
Rail	2,912	519	96	149	416
Total	14,560	2,075	481	743	1,735

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	13,093	663	736	862	175	13,594	658	635	1,101	540
car passengers	20,948	1,060	1,160	1,326	286	12,687	636	614	1,030	522
taxis	6,284	318	340	431	120	9,969	483	466	817	396
bus	1,047	53	28	33	18	1,359	22	21	36	18
coaches	3,142	159	142	166	157	906	44	42	36	36
Rail	7,856	398	425	497	166	6,797	351	339	533	288
Total	52,370	2,651	2,831	3,315	922	45,312	2,194	2,117	3,553	1,800

APPENDIX L

TRAVEL MODE PATRONAGE

AIR TRAFFIC FORECAST3 2006

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	8,187	1,314	304	481	1,091
car passengers	542	101	22	35	84
taxis	475	81	18	28	67
bus	475	20	13	7	17
coaches	0	0	0	0	0
Rail	2,206	505	89	156	420
Total	11,885	2,021	446	707	1,679

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	2,893	176	173	237	42	16,109	857	826	1,432	657
car passengers	4,780	250	288	330	66	14,922	801	773	1,342	634
taxis	1,592	68	87	76	33	13,085	497	506	805	453
bus	668	14	7	8	7	1,688	28	27	45	45
coaches	831	39	39	39	39	913	48	48	48	48
Rail	2,586	128	130	152	47	10,344	525	480	805	430
Total	13,350	675	724	842	234	57,061	2,756	2,660	4,477	2,267

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	7,838	884	230	348	757
car passengers	544	66	16	24	56
taxis	109	13	3	5	11
bus	218	26	10	10	22
coaches	0	0	0	0	0
Rail	2,177	330	65	97	267
Total	10,886	1,319	324	484	1,113

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily	AM		PM		Daily	AM		PM	
	two-way	arr	dep	arr	dep	two-way	arr	dep	arr	dep
car drivers	13,472	682	757	887	180	4,229	205	197	343	168
car passengers	21,555	1,091	1,194	1,364	294	3,947	198	191	320	162
taxis	6,467	327	349	443	123	3,101	150	145	254	123
bus	1,078	55	29	34	19	423	7	7	11	6
coaches	3,233	164	146	171	161	282	14	13	11	11
Rail	8,083	409	437	512	171	2,115	109	105	166	90
Total	53,888	2,728	2,912	3,411	948	14,097	683	658	1,105	560

APPENDIX L

TRAVEL MODE PATRONAGE

AIR TRAFFIC FORECAST3 2016

EMPLOYEES PERSON TRIPS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	7,411	1,190	275	436	988
car passengers	491	92	20	32	76
taxis	430	73	16	26	61
bus	430	18	12	6	15
coaches	0	0	0	0	0
Rail	1,997	458	81	141	380
Total	10,759	1,831	404	641	1,520

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily two-way	AM		PM		Daily two-way	AM		PM	
		arr	dep	arr	dep		arr	dep	arr	dep
car drivers	2,893	176	173	237	42	16,109	857	826	1,432	657
car passengers	4,780	250	288	330	66	14,922	801	773	1,342	634
taxis	1,592	68	87	76	33	13,085	497	506	805	453
bus	668	14	7	8	7	1,688	28	27	45	45
coaches	831	39	39	39	39	913	48	48	48	48
Rail	2,586	128	130	152	47	10,344	525	480	805	430
Total	13,350	675	724	842	234	57,061	2,756	2,660	4,477	2,267

EMPLOYEES PERSON TRIPS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	Daily	AM		PM	
		arr	dep	arr	dep
car drivers	13,314	1,607	408	626	1,371
car passengers	925	120	29	44	101
taxis	185	24	6	9	20
bus	370	48	17	17	40
coaches	0	0	0	0	0
Rail	3,698	600	115	174	484
Total	18,492	2,399	575	870	2,016

PERSON TRIPS OF PASSENGERS/MEETER-GREETERS TO SECOND SYDNEY AIRPORT

WITH RAIL

Mode of Travel	International					Domestics				
	Daily two-way	AM		PM		Daily two-way	AM		PM	
		arr	dep	arr	dep		arr	dep	arr	dep
car drivers	20,783	1,052	1,168	1,368	278	11,096	537	518	899	440
car passengers	33,252	1,682	1,842	2,105	454	10,356	519	501	841	426
taxis	9,976	505	539	684	190	8,137	394	380	667	323
bus	1,663	84	45	53	29	1,110	18	17	29	15
coaches	4,988	252	225	263	249	740	36	35	29	29
Rail	12,470	631	674	789	264	5,548	287	276	435	235
Total	83,132	4,206	4,493	5,262	1,464	36,987	1,791	1,727	2,900	1,468

Appendix M

Home Origin of Employees in the
Future

APPENDIX M
FUTURE EMPLOYMENT HOME ORIGIN DISTRIBUTION

Year GREATER SYDNEY LOCAL GOVERNMENT AREAS	NO SECOND AIRPORT		BADGERYS CREEK OPTION C				HOLSWORTHY OPTION A				HOLSWORTHY OPTION B			
	2006	2016	2006	2006	2016	2016	2006	2006	2016	2016	2006	2006	2016	2016
	Sydney Airport	Sydney Airport	Sydney Airport	Second Sydney Airport	Sydney Airport	Second Sydney Airport	Sydney Airport	Second Sydney Airport	Sydney Airport	Second Sydney Airport	Sydney Airport	Second Sydney Airport	Sydney Airport	Second Sydney Airport
ASHFIELD	1.80	1.75	1.80	0.82	1.75	0.78	1.80	0.97	1.75	0.93	1.80	0.88	1.75	0.84
BOTANY	3.67	3.51	3.67	0.56	3.51	0.52	3.67	0.73	3.52	0.69	3.67	0.69	3.51	0.65
DRUMMOYNE	1.12	1.08	1.12	0.62	1.08	0.58	1.12	0.68	1.08	0.64	1.12	0.63	1.08	0.60
LANE COVE	0.79	0.78	0.79	0.54	0.78	0.52	0.79	0.57	0.78	0.55	0.79	0.55	0.78	0.53
LEICHHARDT	2.47	2.40	2.47	0.00	2.40	0.00	2.47	1.31	2.40	1.25	2.47	1.23	2.40	1.18
MARRICKVILLE	6.47	6.25	6.47	1.43	6.25	1.34	6.47	1.80	6.25	1.71	6.47	1.64	6.25	1.56
MOSMAN	0.70	0.69	0.70	0.42	0.69	0.40	0.70	0.45	0.69	0.44	0.70	0.45	0.69	0.43
NORTH SYDNEY	1.63	1.64	1.63	0.97	1.64	0.96	1.63	1.03	1.64	1.03	1.63	1.04	1.64	1.03
RANDWICK	6.79	6.65	6.80	1.83	6.66	1.75	6.80	2.38	6.66	2.30	6.80	2.36	6.66	2.28
SOUTH SYDNEY	4.53	4.69	4.53	1.33	4.69	1.34	4.53	1.58	4.69	1.62	4.53	1.54	4.69	1.57
SYDNEY(INNER)	0.62	0.65	0.62	0.27	0.65	0.27	0.62	0.30	0.65	0.31	0.62	0.30	0.65	0.30
SYDNEY(REMAINDER)	0.31	0.38	0.31	0.13	0.38	0.16	0.31	0.15	0.38	0.18	0.31	0.14	0.38	0.18
WAVERLEY	1.97	1.93	1.97	0.90	1.93	0.87	1.97	1.07	1.93	1.04	1.97	1.07	1.93	1.03
WOOLLAHRA	1.55	1.51	1.55	0.77	1.51	0.74	1.55	0.89	1.51	0.86	1.55	0.89	1.51	0.86
AUBURN	1.32	1.47	1.32	1.35	1.47	1.47	1.32	1.33	1.47	1.46	1.32	1.23	1.47	1.35
BANKSTOWN	4.10	4.13	4.10	4.87	4.13	4.79	4.10	5.76	4.13	5.73	4.10	4.66	4.13	4.62
BURWOOD	1.17	1.16	1.17	0.65	1.16	0.63	1.17	0.73	1.16	0.71	1.17	0.65	1.16	0.64
CANTERBURY	6.15	6.12	6.16	3.16	6.12	3.07	6.16	3.98	6.13	3.91	6.16	3.52	6.13	3.45
CONCORD	0.90	0.94	0.90	0.64	0.94	0.65	0.90	0.67	0.94	0.68	0.90	0.64	0.94	0.65
HUNTERS HILL	0.35	0.36	0.35	0.24	0.36	0.24	0.35	0.25	0.36	0.25	0.35	0.25	0.36	0.24
HURSTVILLE	2.46	2.47	2.46	1.62	2.47	1.58	2.47	2.49	2.47	2.45	2.47	1.98	2.47	1.94
KOGARAH	2.49	2.48	2.49	1.03	2.48	1.00	2.49	1.62	2.48	1.59	2.49	1.38	2.48	1.35
KU-RING-GAI	1.62	1.58	1.62	1.81	1.58	1.72	1.62	1.60	1.58	1.54	1.62	1.65	1.58	1.58
MANLY	0.68	0.66	0.68	0.51	0.66	0.48	0.68	0.54	0.66	0.52	0.68	0.55	0.66	0.52
PARRAMATTA	2.58	2.57	2.58	3.61	2.57	3.50	2.58	3.09	2.58	3.04	2.58	2.87	2.58	2.82
ROCKDALE	9.92	9.76	9.92	1.75	9.76	1.68	9.92	2.34	9.76	2.27	9.92	2.12	9.76	2.06
RYDE	2.10	2.08	2.10	1.97	2.08	1.90	2.10	1.87	2.09	1.82	2.10	1.80	2.09	1.75
STRATHFIELD	0.85	0.85	0.85	0.66	0.85	0.65	0.85	0.72	0.85	0.71	0.85	0.64	0.85	0.64
WILLOUGHBY	1.32	1.31	1.32	0.96	1.31	0.93	1.32	0.97	1.31	0.95	1.32	0.98	1.31	0.96
BAULKHAM HILLS	1.31	1.40	1.31	2.66	1.40	2.76	1.31	1.90	1.40	2.00	1.31	2.02	1.40	2.11
BLACKTOWN	2.72	2.78	2.72	8.18	2.78	8.15	2.72	4.54	2.78	4.57	2.72	4.61	2.78	4.63
CAMDEN	0.44	0.52	0.44	2.46	0.56	3.11	0.44	1.65	0.57	2.10	0.42	1.86	0.47	2.03
CAMPBELLTOWN	1.79	1.82	1.78	4.86	1.79	4.76	1.79	13.64	1.80	13.55	1.80	13.54	1.89	13.96
FAIRFIELD	2.75	2.75	2.75	9.50	2.75	9.26	2.75	5.41	2.75	5.33	2.75	4.99	2.75	4.90
HAWKESBURY	0.29	0.29	0.29	0.66	0.29	0.65	0.29	0.48	0.29	0.47	0.29	0.54	0.29	0.53
HOLROYD	1.30	1.30	1.30	2.73	1.30	2.67	1.30	1.97	1.30	1.95	1.30	1.84	1.30	1.81
HORNSBY	1.42	1.43	1.42	2.20	1.42	2.16	1.42	1.80	1.43	1.79	1.42	1.89	1.43	1.87
LIVERPOOL	1.94	2.10	1.95	9.04	2.18	9.88	1.95	5.38	2.19	5.96	1.96	4.76	2.22	5.31
PENRITH	1.45	1.51	1.45	2.06	1.50	2.12	1.46	2.91	1.50	2.97	1.45	3.19	1.51	3.25
SUTHERLAND	5.72	5.73	5.72	4.15	5.70	4.04	5.70	8.23	5.60	7.98	5.70	6.73	5.60	6.51
WARRINGAH	2.34	2.39	2.33	2.53	2.34	2.48	2.33	2.36	2.36	2.35	2.34	2.45	2.36	2.44
GOSFORD	0.94	0.95	0.94	1.51	0.95	1.47	0.94	1.28	0.95	1.27	0.94	1.44	0.95	1.41
LAKE MACQUARIE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NEWCASTLE(REMAINDER)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORT STEPHENS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WYONG	0.64	0.68	0.64	1.03	0.67	1.05	0.64	0.00	0.68	0.00	0.64	0.00	0.67	0.00
KIAMA	0.08	0.08	0.08	0.16	0.08	0.15	0.08	0.19	0.08	0.18	0.08	0.28	0.08	0.26
SHELLHARBOUR	0.28	0.31	0.28	0.52	0.31	0.58	0.28	0.66	0.31	0.74	0.28	1.01	0.31	1.12
SHOALHAVEN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WOLLONGONG	1.30	1.26	1.30	2.59	1.26	2.46	1.30	3.82	1.26	3.66	1.30	2.11	1.26	6.78
WINGECARRIBEE	0.21	0.23	0.21	0.48	0.23	0.52	0.21	0.50	0.23	0.54	0.21	0.74	0.23	0.80
WOLLONDILLY	0.21	0.22	0.21	0.74	0.22	0.76	0.21	0.56	0.22	0.58	0.21	0.88	0.22	0.90
BLUE MOUNTAINS	0.41	0.40	0.41	1.52	0.40	1.46	0.41	0.86	0.41	0.85	0.41	1.79	0.40	1.75
TOTAL GREATER SYDNEY	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Appendix N

Home Origin of Air Passengers in the
Future

APPENDIX N
TABLE N1
FUTURE DISTRIBUTION OF HOME ORIGIN OF AIR PASSENGERS

NETANAL MODEL RUN ROAD NETWORK	NO SECOND SYDNEY AIRPORT				BADGERYS CREEK OPTION C							
	2	2	3	3	4	4	4	4	5	5	5	5
					B1	B1	B1	B1	B1	B1	B1	B1
	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic
	2006	2006	2016	2016	2006	2006	2006	2006	2016	2016	2016	2016
GREATER SYDNEY LOCAL GOVERNMENT AREAS	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Second Sydney Airport	Second Sydney Airport	Sydney Airport	Sydney Airport	Second Sydney Airport	Second Sydney Airport
SYDNEY CBD												
SYDNEY(INNER)	13.8	12.5	14.2	12.8	8.1	8.6	27.1	23.1	1.0	6.0	16.2	22.7
SYDNEY(REMAINDER)	6.9	6.2	8.4	7.5	9.7	8.4	0.5	0.3	25.8	12.3	5.7	0.7
TOTAL SYDNEY CBD	20.8	18.7	22.5	20.3	17.8	17.0	27.5	23.4	26.8	18.3	21.9	23.3
SYDNEY - INNER NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HUNTERS HILL	0.5	0.6	0.5	0.6	0.7	0.7	0.2	0.2	0.4	0.8	0.6	0.3
LANE COVE	1.3	1.4	1.2	1.3	1.7	1.8	0.3	0.3	1.4	1.9	1.2	0.4
MANLY	1.5	1.6	1.4	1.5	2.0	2.0	0.4	0.4	1.4	2.1	1.4	0.5
MOSMAN	1.1	1.2	1.1	1.2	1.5	1.6	0.2	0.2	1.6	1.8	1.0	0.3
NORTH SYDNEY	2.5	2.6	2.4	2.6	3.1	3.2	1.2	1.0	1.4	3.4	2.6	1.5
RYDE	4.2	4.4	4.0	4.2	4.7	5.1	3.0	2.6	1.5	4.8	4.4	3.4
WILLOUGHBY	2.5	2.6	2.4	2.5	3.3	3.4	0.5	0.4	3.4	3.8	2.2	0.6
Sub-Total Sydney - Inner North	13.6	14.4	13.1	13.9	17.0	17.8	5.8	4.9	11.0	18.6	13.4	7.0
SYDNEY - INNER SOUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ASHFIELD	1.1	0.9	1.0	0.9	1.4	1.2	0.3	0.2	1.0	1.2	1.0	0.3
ALBURN	1.4	1.2	1.6	1.3	1.5	1.3	1.4	1.0	0.4	1.3	1.7	1.4
BOTANY	0.9	0.7	0.8	0.7	1.3	1.0	0.0	0.0	4.8	1.2	0.2	0.0
BURWOOD	0.8	0.7	0.8	0.6	1.0	0.8	0.4	0.3	0.4	0.8	0.8	0.4
CANTERBURY	3.7	3.2	3.6	3.1	4.5	3.8	2.0	1.4	1.9	3.8	3.9	1.9
CONCORD	0.8	0.7	0.8	0.7	1.0	0.8	0.4	0.3	0.4	0.9	0.9	0.4
DRUMMOYNE	0.8	0.7	0.8	0.7	1.1	0.9	0.3	0.2	0.6	0.9	0.8	0.3
HURSTVILLE	1.8	1.6	1.8	1.5	2.3	2.0	0.7	0.5	1.3	2.1	1.9	0.7
KOGARAH	1.3	1.1	1.3	1.1	1.7	1.4	0.4	0.3	1.1	1.5	1.3	0.4
LEICHHARDT	1.7	1.4	1.6	1.3	2.2	1.8	0.5	0.3	1.6	1.9	1.6	0.5
MARRICKVILLE	2.0	1.7	1.9	1.6	2.9	2.3	0.1	0.1	5.8	2.6	1.3	0.1
RANDWICK	3.1	2.7	3.0	2.5	4.4	3.6	0.1	0.1	11.8	4.2	1.6	0.1
ROCKDALE	2.4	2.0	2.3	1.9	3.3	2.7	0.2	0.1	5.9	3.1	1.7	0.2
SOUTH SYDNEY	2.1	1.8	2.1	1.8	3.0	2.4	0.1	0.0	9.8	3.0	0.9	0.1
STRATHFIELD	0.8	0.6	0.7	0.6	0.9	0.8	0.5	0.3	0.3	0.8	0.8	0.4
WAVERLEY	1.6	1.4	1.5	1.3	2.3	1.8	0.1	0.1	4.3	2.1	1.1	0.1
WOOLLAHRA	1.4	1.2	1.3	1.1	1.9	1.6	0.1	0.1	3.0	1.8	1.0	0.1
Sub-Total Sydney - Inner South	27.8	23.6	26.8	22.8	36.5	30.3	7.8	5.3	54.4	33.2	22.6	7.7
SYDNEY - OUTER NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAULKHAM HILLS	2.7	3.0	2.8	3.1	1.8	2.3	4.9	4.9	0.3	1.7	3.2	5.1
BLACKTOWN	4.6	4.9	4.5	4.9	1.6	2.2	11.4	12.5	0.2	1.3	5.2	10.2
HOLROYD	1.5	1.6	1.5	1.6	0.7	0.9	3.4	3.6	0.1	0.6	1.7	3.1
HORNSBY	2.6	2.8	2.6	2.8	2.9	3.2	2.1	1.8	0.8	3.0	2.8	2.4
KU-RING-GAI	1.9	2.1	1.8	1.9	2.3	2.5	1.0	0.9	1.0	2.5	1.9	1.2
PARRAMATTA	2.5	2.8	2.5	2.7	2.2	2.6	3.3	3.1	0.4	2.1	2.8	3.5
PENRITH	3.2	3.5	3.3	3.5	1.1	1.5	8.1	9.0	0.1	0.9	3.7	7.4
WARRINGAH	3.3	3.5	3.2	3.5	4.0	4.3	1.7	1.4	1.8	4.4	3.4	2.1
Sub-Total Sydney - Outer North	22.4	24.2	22.2	24.0	16.5	19.5	35.8	37.3	4.6	16.3	24.8	35.0
SYDNEY - OUTER SOUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BANKSTOWN	1.3	1.8	1.3	1.8	1.2	1.8	1.5	1.8	0.2	1.5	1.4	2.1
CAMDEN	0.4	0.5	0.4	0.6	0.1	0.1	1.0	1.5	0.0	0.1	0.5	1.4
CAMPBELLTOWN	1.2	1.7	1.2	1.6	0.0	0.1	3.8	6.1	0.0	0.0	1.3	3.9
FAIRFIELD	1.5	2.1	1.5	2.0	0.6	1.1	3.5	4.9	0.1	0.7	1.7	4.1
LIVERPOOL	1.1	1.6	1.2	1.7	0.1	0.2	3.5	5.3	0.0	0.1	1.4	4.1
SUTHERLAND	1.6	2.2	1.5	2.1	1.8	2.6	1.0	1.2	0.6	2.5	1.7	1.6
Sub-Total Sydney - Outer South	7.0	9.9	7.0	9.9	3.9	5.9	14.3	20.7	1.0	4.9	8.0	17.2
TOTAL OUTER SYDNEY	70.7	72.1	69.1	70.6	73.9	73.5	63.6	68.2	70.9	73.1	68.8	67.0
OUTSIDE SYDNEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BLUE MOUNTAINS	0.5	0.6	0.5	0.5	0.2	0.2	1.3	1.5	0.0	0.1	0.6	1.2
GOSFORD	1.0	1.1	1.0	1.1	1.2	1.3	0.8	0.7	0.3	1.2	1.1	1.0
HAWKESBURY	0.4	0.4	0.4	0.4	0.4	0.5	0.3	0.3	0.1	0.5	0.4	0.4
KIAMA	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
LAKE MACQUARIE	1.3	1.4	1.2	1.3	1.4	1.5	1.0	0.9	0.4	1.4	1.3	1.1
NEWCASTLE(REMAINDER)	0.9	1.0	0.9	0.9	1.0	1.1	0.7	0.6	0.3	1.0	1.0	0.8
PORT STEPHENS	0.4	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.2	0.6	0.5	0.4
SHELLHARBOUR	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.1	0.4	0.5	0.3
SHOALHAVEN	0.6	0.7	0.6	0.7	0.6	0.7	0.6	0.6	0.2	0.7	0.7	0.7
WINGECARRIBEE	0.3	0.4	0.4	0.4	0.2	0.2	0.7	0.7	0.0	0.2	0.4	0.7
WOLLONDILLY	0.3	0.3	0.3	0.3	0.1	0.2	0.6	0.6	0.0	0.1	0.3	0.6
WOLLONGONG	1.3	1.4	1.2	1.3	1.3	1.5	1.3	1.1	0.3	1.2	1.3	1.4
WYONG	0.9	1.0	0.9	1.0	1.0	1.1	0.7	0.6	0.3	1.1	1.0	0.9
TOTAL OUTSIDE SYDNEY	8.5	9.2	8.4	9.1	8.4	9.5	8.8	8.4	2.3	8.7	9.3	9.7
TOTAL GREATER SYDNEY	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

APPENDIX A
TABLE A3
FUTURE DISTRIBUTION OF HOME ORIGIN OF AIR PASSENGERS

METROPOLITAN ROAD NETWORK	HOISWORTHY OPTION A																			
	6 N1	6 N1C	6 N1S	6 N1C	7 N1	7 N1C	7 N1S	8 N2	8 N2C	8 N2S	9 N3	9 N3C	9 N3S	10 N4	10 N4C	10 N4S	11 N5	11 N5C	11 N5S	12 N6
	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic
GREATER SYDNEY LOCAL GOVERNMENT AREAS	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport	Sydney Airport
SYDNEY CBD	18.9	17.1	2.5	1.9	10.0	19.7	11.7	7.1	23.0	18.8	12.0	4.0	30.0	19.7	11.7	2.7	21.0	18.8	12.0	4.0
SYDNEY REMAINING	9.5	8.6	1.1	0.9	10.7	11.7	6.8	5.1	20.0	11.7	6.6	1.8	18.7	11.7	6.6	1.5	20.0	11.7	6.6	1.5
TOTAL SYDNEY CBD	28.3	25.9	3.6	2.8	20.7	31.4	18.5	12.2	43.0	30.5	18.6	5.8	48.7	31.4	18.3	4.2	41.0	30.5	18.6	5.5
SYDNEY - INNER NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HUNTERS HILL	0.6	0.7	0.4	0.4	0.3	0.9	0.6	0.5	1.0	0.6	0.6	0.1	0.9	0.6	0.6	0.1	0.6	0.6	0.1	0.1
LANE COM	1.5	1.7	0.7	0.7	0.4	1.7	2.1	1.0	1.0	0.7	0.7	0.1	0.9	0.6	0.6	0.1	0.6	0.6	0.1	0.1
MANLY	1.7	1.9	1.0	0.9	0.9	1.0	1.1	0.8	1.0	0.7	0.7	0.1	0.9	0.6	0.6	0.1	0.6	0.6	0.1	0.1
MOSSMAN	1.4	1.5	0.5	0.5	1.0	1.0	1.1	0.8	1.0	0.7	0.7	0.1	0.9	0.6	0.6	0.1	0.6	0.6	0.1	0.1
NORTH SYDNEY	1.2	1.4	1.0	0.9	2.7	3.0	2.4	1.7	2.0	1.4	1.4	0.6	1.0	0.7	0.7	0.1	0.6	0.6	0.1	0.1
RYDE	3.7	4.2	5.1	4.9	1.1	1.6	1.4	1.2	1.3	1.0	0.9	0.1	1.1	0.6	0.6	0.1	0.6	0.6	0.1	0.1
WILLOUGHBY	3.1	3.3	1.1	1.0	2.3	2.4	2.4	1.7	2.0	1.4	1.4	0.6	1.0	0.7	0.7	0.1	0.6	0.6	0.1	0.1
Sub-Total Sydney - Inner North	15.2	16.7	9.8	9.3	9.1	10.4	11.2	8.8	10.3	7.1	7.1	2.1	10.2	11.7	10.3	2.6	10.3	10.3	2.6	2.1
SYDNEY - INNER SOUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ASHFIELD	1.2	1.1	0.8	0.6	0.6	1.0	1.1	0.7	0.6	1.0	1.1	0.7	0.6	1.0	1.1	0.7	0.6	1.0	1.1	0.7
ALBURN	1.0	0.9	2.5	2.0	0.8	1.0	1.0	0.7	0.6	1.0	1.1	0.7	0.6	1.0	1.1	0.7	0.6	1.0	1.1	0.7
BOTANY	1.3	1.1	0.0	0.0	1.9	1.1	1.0	0.7	0.6	1.0	1.1	0.7	0.6	1.0	1.1	0.7	0.6	1.0	1.1	0.7
BURWOOD	0.8	0.7	0.9	0.7	0.7	0.6	0.8	0.7	0.6	0.8	0.7	0.2	0.6	0.8	0.7	0.2	0.6	0.8	0.7	0.2
CANTERBURY	3.1	2.8	5.0	3.9	0.8	2.4	2.4	1.7	2.0	1.4	1.4	0.6	1.0	0.7	0.7	0.1	0.6	0.6	0.1	0.1
CONCORD	0.8	0.7	0.8	0.6	0.1	0.7	0.7	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.7	0.5
DURHAMVILLE	0.9	0.8	0.6	0.5	0.4	0.8	0.7	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.7	0.5
HURSTVILLE	1.8	1.6	1.9	1.5	0.6	1.5	1.4	0.9	0.7	1.5	1.4	0.9	0.7	1.5	1.4	0.9	0.7	1.5	1.4	0.9
KOGARAH	1.4	1.2	1.2	0.9	0.5	1.1	1.0	0.6	0.7	1.2	1.0	0.6	0.7	1.2	1.0	0.6	0.7	1.2	1.0	0.6
LEICHHARDT	2.0	1.7	1.0	0.7	1.1	1.7	1.6	0.9	1.2	1.7	1.6	0.9	1.2	1.7	1.6	0.9	1.2	1.7	1.6	0.9
MARRIKVILLE	2.7	2.4	0.4	0.3	1.5	1.6	1.2	0.8	1.1	1.6	1.6	0.9	1.2	1.7	1.6	0.9	1.2	1.7	1.6	0.9
RANDWICH	4.3	3.7	0.4	0.4	0.9	4.0	3.2	0.8	4.4	3.7	3.0	0.8	4.1	3.4	2.7	0.8	4.0	3.3	2.7	0.8
ROCKDALE	3.1	2.7	0.6	0.5	1.6	2.0	1.7	1.0	2.1	2.0	1.7	1.0	2.1	2.0	1.7	1.0	2.1	2.0	1.7	1.0
SOUTH SYDNEY	2.9	2.5	0.2	0.1	1.0	2.9	2.2	0.7	2.9	2.2	0.7	0.2	2.9	2.2	0.7	0.2	2.9	2.2	0.7	0.2
STRATHFIELD	0.6	0.6	1.0	0.8	0.2	0.5	0.5	0.3	0.5	0.5	0.3	0.2	0.5	0.5	0.3	0.2	0.5	0.5	0.3	0.2
WANDSWORTH	2.2	1.9	0.3	0.2	2.8	2.0	1.3	0.7	2.2	1.7	1.0	0.3	2.4	1.8	1.1	0.3	2.0	1.5	0.8	0.3
WOMATRA	1.0	1.4	0.4	0.1	2.0	1.6	1.0	0.5	2.0	1.6	1.0	0.5	2.0	1.6	1.0	0.5	2.0	1.6	1.0	0.5
Sub-Total Sydney - Inner South	32.1	28.0	18.1	13.9	16.3	20.0	15.3	9.1	23.3	18.6	13.7	3.1	28.0	23.3	18.6	3.1	23.3	18.6	3.1	3.1
SYDNEY - OUTER NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BALMAIN HILLS	1.6	1.9	5.2	5.3	0.1	1.6	1.6	0.9	1.6	1.6	0.9	0.1	1.6	1.6	0.9	0.1	1.6	1.6	0.9	0.1
BLACKTOWN	2.1	2.5	10.0	10.2	0.4	1.0	1.2	0.5	1.0	1.2	0.5	0.1	1.0	1.2	0.5	0.1	1.0	1.2	0.5	0.1
HOVEYD	0.6	0.7	3.7	3.8	0.1	0.5	0.7	0.3	0.5	0.7	0.3	0.1	0.5	0.7	0.3	0.1	0.5	0.7	0.3	0.1
HORSLEY	2.4	2.7	3.2	3.1	0.7	2.4	2.7	1.1	2.4	2.7	1.1	0.1	2.4	2.7	1.1	0.1	2.4	2.7	1.1	0.1
KILBING-GAI	1.9	2.2	1.8	1.8	0.7	1.9	2.0	0.8	1.9	2.0	0.8	0.1	1.9	2.0	0.8	0.1	1.9	2.0	0.8	0.1
PARRAMATTA	1.8	2.1	4.3	4.3	0.4	1.2	1.3	0.5	1.2	1.3	0.5	0.1	1.2	1.3	0.5	0.1	1.2	1.3	0.5	0.1
PENRITH	1.5	1.8	2.0	2.2	0.1	1.6	1.7	0.6	1.6	1.7	0.6	0.1	1.6	1.7	0.6	0.1	1.6	1.7	0.6	0.1
WARRINGAH	3.0	3.4	3.9	3.8	0.9	3.0	3.4	1.1	3.0	3.4	1.1	0.1	3.0	3.4	1.1	0.1	3.0	3.4	1.1	0.1
Sub-Total Sydney - Outer North	14.9	17.3	39.1	39.4	3.8	14.0	16.0	6.7	15.5	18.0	6.7	0.7	15.5	18.0	6.7	0.7	15.5	18.0	6.7	0.7
SYDNEY - OUTER SOUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BANKSTOWN	0.6	1.0	2.3	1.6	0.1	0.7	1.0	0.3	0.7	1.0	1.4	0.2	0.7	1.0	1.2	0.1	0.7	1.0	1.2	0.1
CAMDEN	0.1	0.2	0.9	1.1	0.0	0.2	0.5	0.2	0.2	0.5	0.9	0.0	0.2	0.5	1.4	0.0	0.2	0.5	1.4	0.0
CAMPBELLTOWN	0.0	0.0	3.8	5.3	0.0	0.0	0.5	0.2	0.0	0.5	1.0	0.0	0.1	0.0	1.5	0.0	0.1	0.0	1.5	0.0
FARMFIELD	1.0	1.5	2.7	3.5	0.2	1.2	1.7	0.6	1.2	1.7	0.6	0.1	1.2	1.7	0.6	0.1	1.2	1.7	0.6	0.1
ENFERPOOL	0.3	0.4	3.1	4.2	0.0	0.3	1.4	0.5	0.3	1.4	0.5	0.1	0.3	1.4	0.5	0.1	0.3	1.4	0.5	0.1
SOUTH BEACH	1.2	1.8	2.4	3.1	0.1	0.6	1.7	0.5	0.6	1.7	0.5	0.1	0.6	1.7	0.5	0.1	0.6	1.7	0.5	0.1
Sub-Total Sydney - Outer South	3.2	4.9	15.2	20.9	0.7	3.0	8.6	1.8	3.0	8.6	1.8	0.4	3.0	8.6	1.8	0.4	3.0	8.6	1.8	0.4
TOTAL OUTER SYDNEY	65.4	66.9	62.8	61.6	49.7	63.0	72.2	27.4	59.4	64.0	70.2	3.6	62.9	66.9	62.8	3.6	62.9	66.9	62.8	3.6
OUTSIDE SYDNEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BLUE MOUNTAINS	0.2	0.3	1.2	1.2	0.0	0.2	0.6	0.2	0.2	0.6	0.2	0.1	0.2	0.6	0.2	0.1	0.2	0.6	0.2	0.1
GOSFORD	0.9	1.1	1.3	1.3	0.3	0.9	1.1	0.4	0.9	1.1	0.4	0.1	0.9	1.1	0.4	0.1	0.9	1.1	0.4	0.1
HAWTHORNS	0.4	0.4	0.5	0.5	0.1	0.4	0.4	0.2	0.4	0.4	0.2	0.1	0.4	0.4	0.2	0.1	0.4	0.4	0.2	0.1
KEMARA	0.1	0.1	0.3	0.3	0.0	0.1	0.3	0.1	0.1	0.3	0.1	0.0	0.1	0.3	0.1	0.0	0.1	0.3	0.1	0.0
LAKE MACQUARIE	1.1	1.3	1.5	1.5	0.3	1.1	1.3	0.5	1.1	1.3	0.5	0.1	1.1	1.3	0.5	0.1	1.1	1.3	0.5	0.1
NEWCASTLE/REMAINING	0.8	0.9	1.1	1.1	0.3	0.8	1.0	0.4	0.8	1.0	0.4	0.1	0.8	1.0	0.4	0.1	0.8	1.0	0.4	0.1
PORT STEPHENS	0.4	0.4	0.5	0.5	0.1	0.4	0.5	0.2	0.4	0.5	0.2	0.1	0.4	0.5	0.2	0.1	0.4	0.5	0.2	0.1
SHELLHARBOUR	0.2	0.2	0.8	0.8	0.0	0.2	0.5	0.2	0.2	0.5	0.2	0.1	0.2	0.5	0.2	0.1	0.2	0.5	0.2	0.1
SIOGAHLEN	0.3	0.4	1.3	1.3	0.1	0.3	0.5	0.2	0.3	0.5	0.2	0.1	0.3	0.5						

APPENDIX N
TABLE N3
FUTURE DISTRIBUTION OF HOME ORIGIN OF AIR PASSENGERS

NETANAL MODEL RUN ROAD NETWORK	HOLSWORTHY OPTION B											
	11	11	11	11	12	12	12	12	13	13	13	13
	S2	S2	S2	S2	S2	S2	S2	S2	S3	S3	S3	S3
	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic	International	Domestic
GREATER SYDNEY LOCAL GOVERNMENT AREAS	2006 Sydney Airport	2006 Sydney Airport	2006 Second Sydney Airport	2006 Second Sydney Airport	2016 Sydney Airport	2016 Sydney Airport	2016 Second Sydney Airport	2016 Second Sydney Airport	2016 Sydney Airport	2016 Sydney Airport	2016 Second Sydney Airport	2016 Second Sydney Airport
SYDNEY CBD												
SYDNEY(INNER)	18.3	16.7	3.9	3.0	23.1	18.8	12.8	4.1	22.7	18.4	12.9	4.6
SYDNEY(REMAINDER)	9.5	8.6	1.2	0.9	20.2	11.7	6.5	1.5	20.2	11.6	6.5	1.7
TOTAL SYDNEY CBD	27.7	25.4	5.0	4.0	43.3	30.4	19.3	5.5	42.9	30.0	19.4	6.3
SYDNEY - INNER NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HUNTERS HILL	0.6	0.6	0.4	0.4	0.3	0.6	0.6	0.5	0.3	0.6	0.6	0.4
LANE COVE	1.5	1.7	0.8	0.8	0.9	1.6	1.3	0.9	1.1	1.7	1.3	0.8
MANLY	1.7	1.8	1.1	1.1	0.8	1.7	1.5	1.2	0.9	1.7	1.5	1.2
MOSMAN	1.4	1.6	0.5	0.4	1.2	1.6	1.1	0.5	1.1	1.5	1.1	0.7
NORTH SYDNEY	3.0	3.3	1.2	1.2	2.3	3.4	2.5	1.4	2.4	3.3	2.4	1.5
RYDE	3.7	4.1	5.2	5.0	1.2	3.6	4.4	5.2	1.5	3.8	4.4	4.9
WILLOUGHBY	3.1	3.4	1.0	0.9	2.8	3.5	2.3	1.1	2.4	3.3	2.4	1.4
Sub-Total Sydney - Inner North	15.1	16.5	10.2	9.7	9.6	16.0	13.6	10.8	9.7	15.8	13.6	11.0
SYDNEY - INNER SOUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ASHFIELD	1.2	1.1	0.7	0.6	0.7	1.0	1.1	0.6	0.9	1.1	1.1	0.6
AUBURN	1.1	1.0	2.3	1.8	0.3	0.9	1.8	2.0	0.4	1.0	1.7	1.9
BOTANY	1.3	1.1	0.0	0.0	4.1	1.1	0.3	0.0	3.9	1.1	0.3	0.0
BURWOOD	0.8	0.7	0.8	0.6	0.3	0.6	0.8	0.6	0.4	0.7	0.8	0.6
CANTERBURY	3.6	3.2	4.0	3.0	1.4	2.9	3.9	3.3	1.4	2.8	3.9	3.5
CONCORD	0.8	0.7	0.7	0.6	0.4	0.7	0.9	0.7	0.4	0.7	0.9	0.6
DRUMMOYNE	0.9	0.8	0.6	0.5	0.5	0.8	0.8	0.5	0.6	0.8	0.8	0.5
HURSTVILLE	2.0	1.7	1.6	1.2	0.9	1.6	1.9	1.4	0.8	1.5	1.9	1.6
KOGARAH	1.5	1.3	1.0	0.8	0.7	1.2	1.4	0.9	0.6	1.0	1.4	1.2
LEICHHARDT	2.0	1.7	1.0	0.7	1.2	1.7	1.6	0.9	1.5	1.7	1.6	0.8
MARRICKVILLE	2.8	2.4	0.4	0.3	4.2	2.5	1.6	0.4	4.5	2.5	1.5	0.4
RANDWICK	4.3	3.7	0.4	0.3	8.6	4.0	2.1	0.4	7.6	3.9	2.3	0.5
ROCKDALE	3.2	2.7	0.6	0.4	4.2	2.9	2.0	0.5	3.9	2.8	2.0	0.6
SOUTH SYDNEY	2.9	2.5	0.2	0.1	7.5	2.9	1.3	0.2	7.1	2.8	1.3	0.2
STRATHFIELD	0.7	0.6	0.9	0.7	0.2	0.5	0.8	0.7	0.3	0.6	0.8	0.7
WAVERLEY	2.2	1.9	0.4	0.3	3.0	2.0	1.3	0.3	2.7	1.9	1.4	0.4
WOOLLAHRA	1.8	1.6	0.4	0.3	2.0	1.6	1.2	0.4	1.8	1.6	1.2	0.5
Sub-Total Sydney - Inner South	33.0	28.8	16.0	12.2	40.3	29.1	24.8	13.7	38.8	28.5	25.0	14.6
SYDNEY - OUTER NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAULKHAM HILLS	1.4	1.7	5.7	5.8	0.3	1.4	3.2	5.5	0.5	1.7	3.2	5.0
BLACKTOWN	2.1	2.5	10.1	10.3	0.4	1.9	5.2	9.3	0.7	2.5	5.1	8.4
HOLROYD	0.7	0.9	3.3	3.4	0.1	0.6	1.7	3.0	0.2	0.8	1.7	2.7
HORNSBY	2.2	2.6	3.5	3.5	0.7	2.2	2.9	3.6	0.9	2.4	2.8	3.3
KU-RING-GAI	1.9	2.1	2.0	1.9	0.7	1.9	2.0	2.0	0.9	2.0	1.9	1.9
PARRAMATTA	1.9	2.2	4.0	4.0	0.5	1.8	2.8	4.0	0.7	2.0	2.7	3.6
PENRITH	1.1	1.3	8.1	8.4	0.2	0.9	3.7	7.3	0.4	1.6	3.7	6.4
WARRINGAH	3.1	3.6	3.6	3.5	1.2	3.3	3.5	3.8	1.4	3.4	3.5	3.6
Sub-Total Sydney - Outer North	14.5	16.8	40.2	40.7	4.1	14.0	24.9	38.5	5.7	16.5	24.6	34.9
SYDNEY - OUTER SOUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BANKSTOWN	0.8	1.3	2.3	3.0	0.2	1.0	1.4	2.9	0.2	1.1	1.4	2.8
CAMDEN	0.0	0.1	1.0	1.4	0.0	0.0	0.4	1.2	0.0	0.1	0.4	1.1
CAMPBELLTOWN	0.0	0.0	3.9	5.3	0.0	0.0	1.4	4.2	0.0	0.0	1.4	4.2
FAIRFIELD	1.2	1.8	2.1	2.7	0.4	1.6	1.6	2.8	0.6	1.9	1.6	2.3
LIVERPOOL	0.4	0.6	2.9	3.9	0.1	0.4	1.4	3.7	0.1	0.7	1.4	3.3
SUTHERLAND	1.3	1.9	2.2	2.8	0.4	1.6	1.7	2.8	0.1	0.4	1.7	4.5
Sub-Total Sydney - Outer South	3.7	5.6	14.4	19.2	1.0	4.7	8.0	17.6	1.1	4.2	8.0	18.2
TOTAL OUTER SYDNEY	66.3	67.7	80.8	81.8	55.0	63.7	71.2	80.6	55.3	65.0	71.2	78.8
OUTSIDE SYDNEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BLUE MOUNTAINS	0.2	0.2	1.3	1.4	0.0	0.1	0.6	1.1	0.1	0.2	0.6	1.0
GOSFORD	0.9	1.0	1.5	1.4	0.3	0.9	1.1	1.5	0.3	0.9	1.1	1.4
HAWKESBURY	0.3	0.4	0.5	0.5	0.1	0.3	0.4	0.6	0.1	0.4	0.4	0.5
KIAMA	0.1	0.1	0.2	0.2	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.3
LAKE MACQUARIE	1.0	1.2	1.7	1.7	0.3	1.0	1.3	1.7	0.4	1.1	1.3	1.6
NEWCASTLE(REMAINDER)	0.8	0.9	1.3	1.3	0.2	0.7	1.0	1.2	0.3	0.8	1.0	1.1
PORT STEPHENS	0.4	0.4	0.6	0.6	0.1	0.4	0.5	0.7	0.2	0.4	0.5	0.6
SHELLHARBOUR	0.3	0.3	0.7	0.7	0.1	0.3	0.5	0.7	0.0	0.0	0.5	1.1
SHOALHAVEN	0.4	0.5	1.1	1.1	0.1	0.4	0.7	1.1	0.0	0.1	0.7	1.6
WINGECARRIBEE	0.1	0.1	0.9	1.0	0.0	0.1	0.4	0.9	0.0	0.1	0.4	0.8
WOLLONDILLY	0.1	0.1	0.7	0.8	0.0	0.0	0.3	0.7	0.0	0.1	0.3	0.6
WOLLONGONG	0.8	1.0	2.2	2.3	0.2	0.8	1.4	2.1	0.0	0.1	1.4	3.0
WYONG	0.8	0.9	1.3	1.2	0.2	0.8	1.0	1.3	0.3	0.8	1.0	1.2
TOTAL OUTSIDE SYDNEY	6.0	6.9	14.1	14.2	1.7	5.9	9.4	13.8	1.8	5.1	9.4	15.0
TOTAL GREATER SYDNEY	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix O

Impact of Construction Traffic

APPENDIX O
TABLE O.1 Impact of Construction Traffic at Badgerys Creek (Options 'B' & 'C')

STREET			LOCATION			1995/1996 Actual Counts							TOTAL TRAFFIC WITH CONSTRUCTION ACTIVITY							LEVELS OF SERVICE			
						AM PEAK			PM PEAK			ADT	AM PEAK			PM PEAK			ADT Type @	Existing		Construction	
						N/E	S/W	Total	N/E	S/W	Total		N/E	S/W	Total	N/E	S/W	Total		AM Peak	PM Peak	AM Peak	PM Peak
BRINGELLY RD	east of	King St	373	167	540	208	422	630	6,220	419	359	778	400	468	868	7,168	2	A	A	A	A		
BRINGELLY RD	west of	King St	356	139	495	157	331	488	5,702	402	331	733	349	377	726	6,650	2	A	A	A	A		
BRINGELLY RD	east of	The Northern Rd	298	152	450	178	261	439	4,959	344	344	688	370	307	677	5,907	2	A	A	A	A		
BRINGELLY RD	west of	Cowpasture Rd	463	162	625	200	420	620	7,199	509	354	863	392	466	858	8,147	2	A	A	A	A		
BRINGELLY RD	east of	Cowpasture Rd	856	450	1,306	299	918	1,217	14,367	902	642	1,544	491	964	1,455	15,315	2	B	C	C	C		
ELIZABETH DR	east of	Badgery's Ck Rd	521	146	667	224	393	617	7,683	688	792	1,480	870	560	1,430	10,000	2	A	A	B	D		
ELIZABETH DR	west of	Badgery's Ck Rd	420	115	535	231	141	372	6,162	587	761	1,348	877	308	1,185	8,479	2	A	A	B	B		
ELIZABETH DR	east of	Smithfield Rd	959	1,681	2,640	1,581	879	2,460	30,408	1,064	2,095	3,159	1,995	984	2,979	31,890	4D	B	A	C	C		
ELIZABETH DR	west of	Wallgrove Rd	1,402	403	1,805	508	1,098	1,606	17,391	1,569	1,049	2,618	1,154	1,265	2,419	19,708	4D	A	A	A	A		
ELIZABETH DR	east of	Devonshire Rd	531	331	862	368	637	1,005	9,929	698	977	1,675	1,014	804	1,818	12,246	2	A	A	C	D		
ELIZABETH DR	west of	Devonshire Rd	421	232	653	224	393	617	7,521	588	878	1,466	870	560	1,430	9,838	2	A	A	B	B		
ELIZABETH DR	east of	Mamre Rd	1,163	319	1,482	498	1,191	1,689	17,070	1,330	965	2,295	1,144	1,358	2,502	19,387	4D	A	A	B	B		
ELIZABETH DR	west of	Mamre Rd	698	302	1,000	368	637	1,005	11,518	865	948	1,813	1,014	804	1,818	13,835	2	A	A	C	D		
ELIZABETH DR	east of	Luddenham Rd	400	154	554	141	231	372	6,381	567	800	1,367	787	398	1,185	8,698	2	A	A	B	B		
ELIZABETH DR	west of	Luddenham Rd	359	118	477	171	350	521	6,105	559	784	1,343	817	517	1,334	8,422	2	A	A	B	B		
ELIZABETH DR	east of	The Northern Rd	359	118	477	171	350	521	5,494	538	813	1,351	866	529	1,395	7,986	2	A	A	B	B		
LUDDENHAM RD	north of	Elizabeth Dr	101	73	174	90	200	290	2,004	113	122	235	139	212	351	2,179	2	A	A	A	A		
MAMRE RD	north of	Elizabeth Dr	328	776	1,104	900	350	1,250	12,716	340	825	1,165	949	362	1,311	12,891	2	B	C	B	C		
THE NORTHERN RD	north of	Bringelly Rd	481	574	1,055	532	548	1,080	12,747	794	682	1,475	640	861	1,500	15,486	2	A	A	B	B		
THE NORTHERN RD	north of	Elizabeth Dr	416	343	759	300	300	600	8,742	444	445	888	402	328	729	9,119	2	A	A	A	A		
THE NORTHERN RD	south of	Elizabeth Dr	407	343	750	216	412	628	8,639	614	1,140	1,754	1,013	619	1,631	11,928	2	A	A	E	D		
THE NORTHERN RD	west of	Camden Valley Way	306	419	725	392	394	786	10,051	427	481	907	454	515	968	11,842	2	A	A	A	A		
THE NORTHERN RD	south of	Lowes Ck (s of Bringell	357	377	734	440	364	804	9,852	376	455	831	518	383	901	11,643	2	A	A	A	A		
WALLGROVE RD	north of	Elizabeth Dr	801	463	1,264	560	683	1,243	15,546	863	695	1,558	792	745	1,537	16,381	2	B	A	B	B		

Note: N/E = northbound or eastbound S/W = southbound or westbound

@ = Refer Table D2 Appendix D

APPENDIX O
Table O.2 Impact of Construction Traffic at Holsworthy Site Option 'A'

STREET			LOCATION			1995/1996 Actual Counts							TOTAL TRAFFIC WITH CONSTRUCTION ACTIVITY										LEVELS OF SERVICE			
						AM PEAK			PM PEAK			ADT	AM PEAK			PM PEAK			Type	Existing		Construction				
						N/E	S/W	Total	N/E	S/W	Total		N/E	S/W	Total	N/E	S/W	Total		ADT	AM Peak	PM Peak	AM Peak	PM Peak		
ANZAC RD	west of	Healthcote Rd	717	447	1,164	456	982	1,438	13,407	755	516	1,271	525	1,020	1,545	13,709	2	A	C	A	D					
BRINGELLY RD	east of	The Northern Rd	298	152	450	178	261	439	4,959	329	170	498	196	292	487	5,526	2	A	A	A	A					
BRINGELLY RD	west of	Cowpasture Rd	463	162	625	200	420	620	7,199	494	180	673	218	451	668	7,766	2	A	A	A	A					
CAMBRIDGE RD	east of	Canterbury Rd	1,328	138	1,466	242	1,268	1,510	16,886	1,890	466	2,356	570	1,830	2,400	21,379	2	F	F	F	F					
CAMDEN VALLEY WAY	north of	Narellan Rd	1,120	312	1,432	326	1,118	1,444	15,491	1,131	319	1,449	333	1,129	1,461	15,970	4U	A	A	A	A					
CAMDEN VALLEY WAY	south of	Bringelly Rd	966	174	1,140	230	800	1,030	10,605	977	181	1,157	237	811	1,047	11,084	2	C	B	C	B					
CAMDEN VALLEY WAY	south of	Denham Court	1,273	421	1,694	500	1,150	1,650	19,512	1,284	428	1,711	507	1,161	1,667	19,991	2	F	E	F	E					
CANTERBURY RD	south of	Cambridge Rd	381	248	629	808	78	886	7,245	482	303	785	863	179	1,042	7,691	4U	A	A	A	A					
CUMBERLAND HWY	south of	Hume Hwy	1,951	1,932	3,883	2,145	1,600	3,745	44,725	2,113	2,231	4,344	2,444	1,762	4,206	46,069	4D	C	D	D	E					
COWPASTURE RD	south of	Elizabeth Dr	1,187	1,018	2,205	942	1,263	2,205	26,252	1,208	1,055	2,262	979	1,284	2,262	26,412	2	E	F	E	F					
COWPASTURE RD	north of	Bringelly Rd	835	373	1,208	440	688	1,128	13,453	856	410	1,265	477	709	1,185	13,613	2	B	A	B	A					
ELIZABETH DR	east of	Smithfield Rd	959	1,681	2,640	1,581	879	2,460	30,408	996	1,702	2,697	1,602	916	2,517	30,568	4D	B	A	B	B					
GLENFIELD RD	north of	Cambridge Av Br	706	317	1,023	365	583	948	11,045	1,167	590	1,757	638	1,044	1,682	15,092	2	A	A	E	D					
GLENFIELD RD	east of	Old Glenfield Rd	340	630	970	626	413	1,039	11,173	801	903	1,704	899	874	1,773	15,220	2	A	A	C	C					
HEATHCOTE RD	north of	Macarthur Dr	1,142	1,188	2,330	943	940	1,883	18,304	1,211	1,226	2,437	981	1,009	1,990	18,606	2	E	C	E	D					
HEATHCOTE RD	east of	New Illawarra Rd	666	1,337	2,003	1,257	529	1,786	23,071	735	1,375	2,110	1,295	598	1,893	23,373	2	F	E	F	F					
HEATHCOTE RD	south of	Anzac Rd	1,756	1,108	2,864	1,023	1,394	2,417	32,988	1,825	1,146	2,971	1,061	1,463	2,524	33,290	4U	B	A	D	R					
HUME HWY	east of	Box Rd	2,603	1,270	3,873	2,107	1,921	4,028	44,610	2,791	1,613	4,403	2,450	2,109	4,558	47,160	6D	B	A	B	B					
HUME HWY	south of	South Western Fwy (M5)	3,613	1,504	5,117	1,444	3,544	4,988	58,939	3,801	1,847	5,647	1,787	3,732	5,518	61,489	6D	D	D	E	E					
MOREBANK AV	at	East Hills Railway	1,151	311	1,462	373	1,050	1,423	15,098	1,281	550	1,831	612	1,180	1,792	16,145	2	E	D	F	E					
MOREBANK AV	north of	South Western Fwy (M5)	1,626	526	2,152	598	1,310	1,908	23,705	1,643	557	2,200	629	1,327	1,956	23,843	4D	B	A	B	A					
NEWBRIDGE RD	at	Georges Rv	1,853	1,962	3,815	1,692	2,307	3,999	45,586	1,870	1,993	3,863	1,723	2,324	4,047	45,724	6D	A	A	A	A					
NEWBRIDGE RD	west of	Henry Lawson Dr	3,923	1,774	5,697	2,239	3,400	5,639	65,364	3,940	1,805	5,745	2,270	3,417	5,687	65,502	6D	E	D	E	D					
NEWBRIDGE RD	east of	Bridges Rd	1,700	1,221	2,921	1,055	1,969	3,024	38,843	1,717	1,252	2,969	1,086	1,986	3,072	38,981	6D	A	A	A	A					
SOUTH WESTERN FWY	at	Cedar Rd	3,267	1,163	4,430	1,280	2,954	4,234	51,026	3,342	1,302	4,644	1,419	3,029	4,448	51,633	4F	D	C	D	C					
SOUTH WESTERN FWY	south of	Campbelltown Rd	4,471	1,040	5,511	2,001	4,368	6,369	63,477	4,556	1,108	5,663	2,069	4,453	6,521	64,974	4F	F	F	F	F					
SOUTH WESTERN FWY	south of	Brooks Rd Overbridge	3,470	1,327	4,797	1,486	3,330	4,816	60,060	3,555	1,395	4,949	1,554	3,415	4,968	61,557	4F	D	D	D	D					
SOUTH WESTERN FWY	at	Georges Rv	3,400	1,650	5,050	1,655	3,671	5,326	57,526	3,475	1,789	5,264	1,794	3,746	5,540	58,133	4F	D	D	D	E					
SOUTH WESTERN FWY	at	Queen St overpass	2,232	1,138	3,370	1,296	2,325	3,621	40,544	2,232	1,138	3,370	1,296	2,325	3,621	40,544	4F	C	C	C	C					
SOUTH WESTERN FWY	at	River Rd	184	72	256	84	154	238	2,949	259	211	470	223	229	452	3,556	4F	A	A	A	A					
WALLGROVE RD	north of	Elizabeth Dr	801	463	1,264	560	683	1,243	15,546	822	500	1,321	597	704	1,300	15,706	2	B	A	B	B					
WALLGROVE RD	north of	Chandos Rd	859	1,898	2,757	1,688	962	2,650	31,758	880	1,935	2,814	1,725	983	2,707	31,918	4UC	C	B	C	B					
CUMBERLAND HWY (S)	north of	Canley Vale Rd	1,014	386	1,400	491	943	1,434	16,126	1,111	565	1,676	670	1,040	1,710	16,919	4D	A	A	A	A					

Note: N/E = northbound or eastbound S/W = southbound or westbound
 @ = Refer Table D2 Appendix D

APPENDIX O

TABLE O.3 Impact of Construction Traffic at Holsworthy Site, Option 'B'

			1995/1996 Actual Counts							TOTAL TRAFFIC WITH CONSTRUCTION ACTIVITY							LEVELS OF SERVICE				
			AM PEAK			PM PEAK			ADT	AM PEAK			PM PEAK			Type @	Existing		Construction		
STREET		LOCATION	N/E	S/W	Total	N/E	S/W	Total		N/E	S/W	Total	N/E	S/W	Total		AM Peak	PM Peak	AM Peak	PM Peak	
APPIN RD	south of	Narellan Rd	1,169	593	1,762	775	1,596	2,371	27,086	1,557	1,313	2,869	1,168	2,311	3,478	31,110	6D	A	A	A	A
APPIN RD	north of	Copperfield Dr	927	338	1,265	541	653	1,194	14,571	1,315	1,058	2,372	934	1,368	2,301	18,595	4D	A	A	A	A
APPIN RD	north of	Link 6	741	277	1,018	410	437	847	11,726	1,129	997	2,125	803	1,152	1,954	15,750	2	A	A	D	E
APPIN RD	south of	Link 6	741	277	1,018	410	437	847	11,726	1,029	455	1,484	588	725	1,313	13,427	2	A	A	B	B
COWPASTURE RD	north of	Bringelly Rd	835	373	1,208	440	688	1,128	13,453	869	434	1,302	501	722	1,222	13,715	2	B	A	R	A
COWPASTURE RD	south of	The Horsely Dr	1,218	589	1,807	1,749	276	2,025	24,242	1,252	850	1,901	1,810	310	2,119	24,504	2	E	F	E	F
COWPASTURE RD	north of	Elizabeth Dr	1,332	585	1,917	646	1,009	1,655	26,150	1,366	646	2,011	707	1,043	1,749	26,412	2	F	D	F	D
COWPASTURE RD	south of	Elizabeth Dr	1,187	1,018	2,205	942	1,263	2,205	26,252	1,221	1,079	2,299	1,003	1,297	2,299	26,514	2	E	F	E	F
COWPASTURE RD	north of	Fifteenth Av	827	585	1,412	1,066	701	1,767	16,264	861	646	1,506	1,127	735	1,861	16,526	2	B	D	B	D
COWPASTURE RD	south of	Hoxton Park Rd	785	348	1,133	363	315	678	10,778	819	409	1,227	424	349	772	11,040	2	B	A	B	A
CUMBERLAND HWY	south of	Hume Hwy	1,951	1,932	3,883	2,145	1,600	3,745	44,725	2,102	2,214	4,316	2,427	1,751	4,178	45,989	4D	C	D	D	E
CUMBERLAND HWY	north of	Canley Vale Rd	1,014	386	1,400	491	943	1,434	16,126	1,103	555	1,658	660	1,032	1,692	16,863	4D	A	A	A	A
ELIZABETH DR	east	Smithfield Rd	959	1,681	2,640	1,581	879	2,460	30,408	1,020	1,715	2,734	1,615	940	2,554	30,670	4D	B	A	B	B
HEATHCOTE RD	north of	Macarthur Dr	1,142	1,188	2,330	943	940	1,883	18,304	1,235	1,238	2,473	993	1,033	2,026	18,710	2	E	C	E	D
HEATHCOTE RD	west of	New Illawara Rd	486	828	1,314	676	403	1,079	15,135	579	878	1,457	726	496	1,222	15,541	2	B	A	B	A
HEATHCOTE RD	north of	Anzac Rd	2,064	1,146	3,210	1,153	2,050	3,203	36,973	2,157	1,196	3,353	1,203	2,143	3,346	37,379	4UC	D	D	D	D
HEATHCOTE RD	south of	Anzac Rd	1,756	1,108	2,864	1,023	1,394	2,417	32,988	1,849	1,158	3,007	1,073	1,487	2,560	33,394	4U	B	A	D	C
HEATHCOTE RD	south of	Nuwarra Rd	2,181	1,165	3,346	1,290	2,113	3,403	38,540	2,274	1,215	3,489	1,340	2,206	3,546	38,946	4UC	D	D	E	D
HEATHCOTE RD	north of	Nuwarra Rd	1,472	1,188	2,660	1,434	1,705	3,139	30,638	1,565	1,238	2,803	1,484	1,798	3,282	31,044	4UC	A	B	B	C
HUME HWY	east of	Box Rd	2,603	1,270	3,873	2,107	1,921	4,028	44,610	2,891	1,806	4,697	2,643	2,209	4,852	46,986	6D	B	A	C	B
HUME HWY	south of	South Western Fwy (M5)	3,613	1,504	5,117	1,444	3,544	4,988	58,939	3,901	2,040	5,941	1,980	3,822	5,812	61,315	6D	D	D	E	E
HUME HWY	north of	South Western Fwy (M5)	3,853	1,791	5,644	3,707	2,819	6,526	65,009	4,020	2,102	6,122	4,018	2,986	7,004	66,401	6D	E	E	E	E
HUME HWY (Liverpool R	west of	Woodville Rd	3,775	1,609	5,384	1,700	3,500	5,200	62,014	3,837	1,722	5,559	1,813	3,562	5,375	62,541	6D	E	D	E	D
MENANGLE RD	south of	Narellan Rd	821	231	1,052	353	587	940	10,653	827	234	1,061	356	593	949	10,681	4U	A	A	A	A
MOORE-OXLEY BYPAS	north of	Camden Rd	1,194	774	1,968	875	1,502	2,377	27,737	1,223	827	2,050	928	1,531	2,459	27,969	6D	A	A	A	A
MOORE-OXLEY BYPAS	south of	Queen St	972	775	1,747	794	1,198	1,992	22,507	1,001	828	1,829	847	1,227	2,074	22,739	6D	A	A	A	A
NARELLAN RD	east of	Menangle Rd	861	466	1,327	755	757	1,512	17,671	1,523	830	2,352	1,119	1,419	2,537	21,463	4D	A	A	A	A
NARELLAN RD	west of	South Western Fwy (M5)	1,972	1,146	3,118	1,209	2,040	3,249	36,770	2,026	1,177	3,203	1,240	2,094	3,334	37,874	4D	C	C	C	C
NEWBRIDGE RD	at	Georges Rv	1,853	1,962	3,815	1,692	2,307	3,999	45,586	1,869	1,991	3,860	1,721	2,323	4,044	45,714	6D	A	A	A	A
NEWBRIDGE RD	west of	Henry Lawson Dr	3,923	1,774	5,697	2,239	3,400	5,639	65,364	3,939	1,803	5,742	2,268	3,416	5,684	65,492	6D	E	D	E	D
NEWBRIDGE RD	east of	Bridges Rd	1,700	1,221	2,921	1,055	1,969	3,024	38,843	1,716	1,250	2,966	1,084	1,985	3,069	38,971	6D	A	A	A	A
SOUTH WESTERN FW	east of	Cedar Rd	3,267	1,163	4,430	1,280	2,954	4,234	51,026	3,388	1,388	4,776	1,505	3,075	4,580	52,010	4F	D	C	D	C
SOUTH WESTERN FW	south of	Campbelltown Rd	4,471	1,040	5,511	2,001	4,368	6,369	63,477	4,793	1,637	6,429	2,598	4,690	7,287	66,050	4F	F	F	F	F
SOUTH WESTERN FW	at	Queen St overpass	2,232	1,138	3,370	1,296	2,325	3,621	40,544	2,232	1,138	3,370	1,296	2,325	3,621	40,544	4F	C	C	C	C
SOUTH WESTERN FW	at	River Rd	184	72	256	84	154	238	2,949	255	205	460	217	225	442	3,355	4F	A	A	A	A
WALLGROVE RD	north of	Elizabeth Dr	801	463	1,264	560	683	1,243	15,546	835	524	1,358	621	717	1,337	15,808	2	B	A	B	A

Note: N/E = northbound or eastbound S/W = southbound or westbound
 @ = Refer Table D2 Appendix D

Appendix P

Future Traffic Volumes and Levels of
Service for Badgerys Creek Options

APPENDIX P
FUTURE TRAFFIC VOLUMES AND LEVEL OF SERVICE ALONG MAJOR APPROACH ROUTES TO BADGERYS CREEK SITE

Location Description			2006 Base Case				Forecast 2 2006				2016 Base Case				Forecast 3 2016			
			Type @	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase	Type @	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase
Alfords Point Road	at	Georges River	4F	4,728	F	53,048	4,777	F	53,733	1	4F	5,127	F	55,734	5,255	F	58,311	5
Anzac Road	West of	Heathcote Road	2	762	B	11,381	752	A	11,324	-1	2	732	A	11,081	729	A	11,139	1
Appin Road	South of	Copperfield Drive	2	1,434	F	19,589	1,462	F	19,946	2	2	1,805	F	24,425	1,825	F	24,806	2
Badgerys Creek Airport	to	Elizabeth Drive	(not in network)				2,588	E	24,576		(not in network)				5,168	G	61,361	
Badgerys Creek Airport	to	The Northern Road	(not in network)				1,051	A	8,767		(not in network)				2,303	D	20,226	
Badgerys Creek Road	South of	Elizabeth Drive	2	186	A	4,029	(not in network)				2	210	A	4,583	(not in network)			
Blaxland Road	East of	Narellan Road	4UC	699	A	10,214	731	A	10,523	3	4UC	885	A	13,052	863	A	13,607	4
Bringelly Road	East of	The Northern Road	2	374	A	6,193	1,008	D	15,362	148	2	398	A	6,370	1,880	F	29,456	362
Bringelly Road	East of	King Street	2	319	A	6,810	846	B	14,994	120	2	324	A	6,914	1,614	F	28,304	309
Bringelly Road	West of	King Street	2	374	A	6,487	1,008	D	16,091	148	2	398	A	6,872	1,880	F	30,855	362
Bringelly Road	East of	Cowpasture Road	2	314	A	5,500	574	A	10,011	82	2	269	A	4,708	883	C	17,359	269
Bringelly Road	West of	Cowpasture Road	2	1,463	F	23,179	1,716	F	29,169	26	2	1,031	D	18,711	1,442	F	31,755	70
Brooks Road	West of	South Western Freeway	2	562	A	7,780	579	A	8,781	13	2	560	A	7,422	614	A	9,454	27
Brooks Road	East of	South Western Freeway	2	1,328	F	18,868	1,339	F	19,741	5	2	1,434	F	20,316	1,364	F	20,454	1
Cambridge Road	West of	Moorebank Avenue	2	1,429	F	18,123	1,424	F	18,019	-1	2	1,559	F	19,773	1,565	F	20,916	6
Camden Valley Way	West of	South Western Freeway (4D	1,060	A	18,781	1,225	A	22,705	21	4D	1,006	A	19,808	1,579	A	29,666	50
Camden Valley Way	North of	Narellan Road	4UC	982	A	14,106	916	A	13,803	-2	4UC	1,384	A	19,331	1,075	A	18,769	-3
Camden Valley Way	South of	Denham Court Road	2	1,819	F	26,838	1,779	F	26,826	0	2	2,117	G	30,647	1,756	F	31,490	3
Camden Valley Way	South of	Bringelly Road	2	712	A	8,475	686	A	8,251	-3	2	1,124	D	11,377	1,450	F	18,224	60
Campbelltown Road	North of	Glenfield Road	6D	3,224	C	47,165	3,146	C	46,946	0	6D	3,631	D	64,376	3,839	E	64,976	1
Campbelltown Road	South of	Denham Court Road	2	2,101	G	26,076	2,109	G	27,034	4	2	2,219	G	29,954	2,112	G	32,575	9
Campbelltown Road	South of	Ben Lomond Road	4D	2,917	F	41,402	2,864	F	40,618	-2	4D	3,556	F	46,386	3,285	F	45,058	-3
Campbelltown Road	South of	Williamson Road	4UC	2,646	F	32,509	2,590	F	32,428	0	4UC	2,762	F	36,741	2,529	F	35,933	-2
Campbelltown Road	South of	Blaxland Road	4UC	1,759	B	26,757	1,733	B	26,780	0	4UC	1,834	C	27,923	1,736	B	27,588	-1
Campbelltown Road	South of	Leumeah Road	4D	2,424	E	48,613	2,325	D	48,420	0	4D	2,688	F	55,442	2,399	D	56,601	2
Cowpasture Road	North of	Bringelly Drive	4D	1,237	A	17,874	1,310	A	18,999	6	4D	761	A	13,264	966	A	13,052	-2
Cowpasture Road	South of	Hoxton Park Road	4D	1,237	A	15,268	1,310	A	16,229	6	4D	1,050	A	14,421	1,666	B	21,642	50
Cowpasture Road	South of	Elizabeth Drive	4D	2,177	D	29,931	2,302	D	31,752	6	4D	2,124	C	29,169	2,496	E	33,991	17
Cowpasture Road	North of	Elizabeth Drive	4D	1,746	B	27,978	1,901	C	31,552	13	4D	1,778	B	29,096	2,015	C	34,389	18
Cowpasture Road	South of	The Horsley Drive	4D	2,567	E	31,928	2,623	E	34,144	7	4D	2,508	E	31,293	2,738	F	34,525	10
Cumberland Highway	North of	Victoria Street	4D	2,214	D	47,785	2,175	D	47,551	0	4D	2,197	D	46,198	2,196	D	46,471	1
Cumberland Highway	North of	Canley Vale Road	4D	1,329	A	26,503	1,377	A	27,172	3	4D	1,516	A	28,442	1,604	A	29,931	5
Denham Court Road	East of	Camden Valley Way	2	435	A	7,427	496	A	9,596	29	2	658	A	9,755	876	B	15,683	61
Devonshire Road	South of	Elizabeth Drive	2	372	A	5,425	675	A	10,042	85	2	364	A	5,691	763	B	11,255	98
Elizabeth Drive	West of	Wallgrove Road	4D	1,703	B	23,153	1,924	C	30,225	31	4D	1,650	B	20,339	2,508	E	37,422	84
Elizabeth Drive	West of	Ludenhams Road	2	862	B	13,275	1,279	F	18,561	40	2	818	B	13,009	1,329	F	18,838	45
Elizabeth Drive	West of	Badgerys Creek Road	4D	619	A	10,354	1,246	A	23,698	129	4D	623	A	10,135	2,362	D	41,890	313
Elizabeth Drive	West of	Devonshire Road	4D	686	A	10,446	1,393	A	24,391	133	4D	810	A	13,067	2,813	F	43,206	231
Elizabeth Drive	West of	Mamre Road	4D	974	A	14,440	1,297	A	26,561	84	4D	1,120	A	17,511	2,554	E	43,598	149
Elizabeth Drive	East of	Smithfield Road	4D	1,140	A	22,578	1,414	A	25,464	13	4D	1,233	A	25,429	1,740	B	31,443	24

NOTE: 1. LOS G = volume/capacity > 1.5

2. ADT = Average Daily Traffic

3. * = ADT estimated from model

4 Road types are described in Appendix D

			2006 Base Case				Forecast 2 2006				2016 Base Case				Forecast 3 2016			
Location Description			Type @	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase	Type @	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase
Erskine Park Road	South of	M4 Motorway	4D	1,452	A	21,251	1,537	A	22,775	7	4D	1,476	A	22,209	1,793	B	26,828	21
Ferrers Road	North of	Chandos Road	2	599	A	11,993	730	A	12,432	4	2	580	A	8,854	610	A	9,812	11
Fifteenth Avenue	West of	Cowpasture Road	2	242	A	4,802	407	A	7,364	53	2	274	A	5,067	528	A	9,119	80
Gipps Road	at	Channel	2	1,863	F	35,218	1,639	F	35,668	1	2	1,585	F	32,274	1,509	F	32,425	0
Glenfield Road	East of	Old Glenfield Road	2	606	A	9,558	610	A	9,708	2	2	671	A	11,278	706	A	11,924	6
Great Western Highway	at	Nepean River	4UC	1,799	C	29,493	1,799	C	29,526	0	4UC	1,984	C	30,671	2,016	D	31,064	1
Great Western Highway	East of	Wallgrove Road	6D	2,407	A	25,104	2,410	A	23,634	-8	6D	2,492	B	26,725	3,146	C	33,189	24
Great Western Highway	East of	Cumberland Highway	6D	2,363	A	29,204	2,264	A	28,188	-3	6D	2,468	B	30,656	2,659	B	33,113	8
Harold Street	South of	Victoria Street	2	286	A	4,467	280	A	4,409	-1	2	286	A	4,640	279	A	4,560	-2
Heathcote Road	at	Woronora River	2	1,593	F	24,114	1,651	F	25,199	5	2	1,336	F	20,581	1,471	F	24,898	21
Heathcote Road	North of	M5 Motorway	4UC	790	A	14,062	795	A	14,821	4	4UC	494	A	8,070	605	A	9,248	15
Heathcote Road	North of	Anzac Road	4UC	1,918	C	36,822	2,039	D	38,589	5	4UC	2,414	E	45,884	2,630	F	49,855	9
Heathcote Road	South of	Anzac Road	4UC	2,095	D	47,084	2,220	D	48,804	4	4UC	2,623	F	56,527	2,846	F	60,532	7
Heathcote Road	North of	New Illawarra Road	2	933	C	20,916	1,034	D	22,244	6	2	1,543	F	29,827	1,582	F	33,002	11
Hoxton Park Road	West of	Hume Highway	4UC	2,077	D	28,428	2,129	D	30,005	6	4UC	2,853	F	38,121	2,750	F	41,757	10
Hume Highway	West of	Woodville Road	6D	4,126	F	67,308	4,038	E	67,031	0	6D	4,337	F	70,124	4,239	F	71,256	2
Hume Highway	East of	Woodville Road	6D	1,945	A	41,038	1,878	A	40,893	0	6D	2,062	A	43,039	1,943	A	43,633	1
Hume Highway	East of	Crossroads	6D	1,146	A	20,120	1,227	A	19,473	-3	6D	1,337	A	25,245	1,414	A	31,213	24
Hume Highway	North of	M5 Motorway	6D	5,181	F	82,799	5,425	F	85,754	4	6D	4,583	F	69,928	5,078	F	75,284	8
Hume Highway	South of	M5 Motorway	6D	5,931	F	80,282	5,888	F	80,351	0	6D	5,854	F	79,463	6,096	G	94,919	19
Kurrajong Road	East of	Western Sydney Orbital	4U	923	B	8,923	989	B	6,822	-24	4U	1,265	D	12,501	1,060	C	16,126	29
Luddenham Road	North of	Elizabeth Drive	2	423	A	7,076	1,238	E	24,529	247	2	275	A	4,583	2,677	G	55,003	1100
M4 Motorway	at	Nepean River	4F	4,050	F	71,429	4,098	F	72,121	1	4F	4,597	F	80,882	4,716	F	82,787	2
M4 Motorway	East of	Erskine Park Road	6F	6,217	F	125,860	6,337	F	140,226	11	6F	5,663	E	123,600	6,128	F	160,967	30
M4 Motorway	East of	Wallgrove Road	6F	6,042	F	127,953	6,143	F	141,600	11	6F	6,215	F	131,171	6,242	F	160,027	22
M4 Motorway	West of	Great Western Highway	8F	8,994	F	168,248	8,929	F	173,695	3	8F	9,181	F	181,121	9,345	F	203,360	12
M4 Motorway	East of	Silverwater Road	6F	6,826	F	123,947	6,739	F	125,475	1	6F	7,402	F	150,487	7,393	F	158,787	6
M5 Motorway	West of	River Road	4F	4,808	F	83,664	4,726	F	86,689	4	4F	4,728	F	92,645	4,832	F	101,695	10
M5 Motorway	East of	River Road	4F	7,186	G	128,994	7,322	G	130,679	1	4F	5,031	F	106,173	5,053	F	110,617	4
M5 Motorway	East of	Western Sydney Orbital	4F	4,009	F	87,820	4,106	F	89,240	2	4F	4,417	F	100,021	4,684	F	103,911	4
Mamre Road	South of	M4 Motorway	4UC	1,883	C	33,602	2,167	D	46,807	39	4UC	1,607	B	26,826	3,016	F	68,612	156
Mamre Road	North of	Elizabeth Drive	2	953	C	16,969	922	C	15,925	-6	2	695	A	9,944	546	A	8,745	-12
Menai Road	at	Woronora River	2	1,896	G	41,216	1,945	G	42,014	2	2	2,692	F	57,716	2,911	F	60,192	4
Moorebank Avenue	North of	Cambridge Avenue	2	1,429	F	16,213	1,425	F	16,141	0	2	1,560	F	17,700	1,565	F	18,712	6
Moorebank Avenue	North of	M5 Motorway	4D	2,775	F	32,044	2,716	F	31,691	-1	4D	2,523	E	33,167	2,537	E	35,998	9
Moore-Oxley Bypass	North of	Narellan Road	4D	1,402	A	27,667	1,389	A	27,822	1	4D	1,594	A	31,810	1,489	A	31,148	-2
Moore-Oxley Bypass	South of	Queen Street	6D	1,235	A	17,070	1,263	A	17,057	0	6D	1,281	A	16,104	1,281	A	15,447	-4
Mulgoa Road	North of	Park Avenue	2	388	A	6,853	411	A	7,036	3	2	478	A	8,779	640	A	11,609	32
Narellan Road	West of	South Western Freeway	4D	2,320	D	41,098	2,289	D	42,548	4	4D	2,815	F	50,851	2,565	E	52,077	2
Narellan Road	East of	South Western Freeway	4D	2,208	D	41,928	2,188	D	43,229	3	4D	2,860	F	50,624	2,759	F	51,856	2
New Illawarra Road	North of	Heathcote Road	2	1,617	F	24,759	1,610	F	24,648	0	2	2,083	G	30,630	1,983	G	32,694	7
Newbridge Road	West of	Henry Lawson Drive	6D	5,169	F	88,208	4,926	F	86,808	-2	6D	5,722	F	92,246	5,709	F	95,482	4
Newbridge Road	West of	Heathcote Road	6D	3,182	C	57,511	3,069	C	57,846	1	6D	3,115	C	53,628	3,077	C	55,647	4

NOTE: 1. LOS G = volume/capacity > 1.5

2. ADT = Average Daily Traffic

3. * = ADT estimated from model

4. Road types are described in Appendix D

Location Description			2006 Base Case				Forecast 2 2006				2016 Base Case				Forecast 3 2016			
			Type @	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase	Type @	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase
Nuwarra Road	North of	Heathcote Road	4U	855	A	13,351	847	A	13,373	0	4U	948	B	14,561	903	B	14,250	-2
Old Illawarra Road	North of	Bangor Bypass	(not in network)				(not in network)				2	3,588	G	52,504	3,414	G	55,388	5
Pembroke Road	North of	Leumeah Road	2	1,288	F	28,882	1,296	F	28,971	0	2	1,180	E	23,632	1,111	D	23,442	-1
Princes Highway	at	Georges River	6D	6,112	G	87,593	6,131	G	79,151	-10	6D	6,310	G	92,825	5,581	F	84,558	-9
Princes Highway	South of	Heathcote Road	4D	2,227	D	33,257	2,257	D	33,719	1	4D	2,379	D	35,657	2,480	E	37,232	4
Princes Highway	South of	Farnell Avenue	4F	3,338	D	53,558	3,289	D	53,289	-1	4F	3,634	D	57,427	3,435	D	55,223	-4
Raby Road	West of	Campbelltown Road	2	1,602	F	24,650	1,571	F	24,879	1	2	1,972	G	29,570	1,792	F	28,852	-3
South Western Freeway	North of	Campbelltown-Raby Roa	4F	3,401	D	69,200	3,373	D	69,751	1	4F	3,671	D	78,615	3,481	D	80,881	3
South Western Freeway	North of	Narellan Road	4F	1,651	B	29,850	1,677	B	30,497	2	4F	1,585	B	34,479	1,815	B	36,188	5
Taren Point Road	at	Georges River	6D	4,471	F	61,261	5,085	F	68,260	11	6D	5,129	F	64,844	5,258	F	71,351	10
The Horsley Drive	West of	Ferres Road	4UC	1,605	B	18,264	1,567	B	19,309	6	4UC	2,761	F	32,598	2,441	E	31,096	-5
The Horsley Drive	West of	Cumberland Highway	4UC	483	A	11,408	487	A	11,758	3	4UC	558	A	11,444	597	A	12,820	12
The Horsley Drive	East of	Cumberland Highway	4UC	618	A	13,157	626	A	13,401	2	4UC	662	A	14,692	675	A	15,402	5
The Northern Road	at	Lowes Creek	2	799	B	15,394	1,085	D	19,256	25	2	882	C	16,539	1,401	F	24,010	45
The Northern Road	North of	Camden Valley Way	2	626	A	12,713	871	B	16,359	29	2	688	A	13,655	1,130	D	20,504	50
The Northern Road	South of	Elizabeth Drive	2	604	A	9,927	515	A	9,246	-7	2	545	A	8,623	459	A	9,627	12
The Northern Road	North of	Elizabeth Drive	2	615	A	11,301	1,120	D	17,534	55	2	683	A	12,467	1,396	F	21,943	76
The Northern Road	North of	Bringelly Road	2	1,051	D	17,882	1,869	F	28,974	62	2	1,147	E	18,667	3,033	G	47,847	156
Wallgrove Road	South of	M4 Motorway	4D	2,436	E	46,346	2,226	D	46,092	-1	(not in network)			(not in network)				
Wallgrove Road	North of	The Horsley Drive	4D	2,358	D	46,103	2,152	D	45,918	0	4D	346	A	7,618	666	A	6,753	-11
Wallgrove Road	North of	Elizabeth Drive	4D	2,282	D	39,418	2,137	D	37,045	-6	4D	653	A	12,053	747	A	13,775	14
Western Sydney Orbital	South of	M4 Motorway	(not in network)				(not in network)				4F	3,843	E	85,430	3,917	E	87,958	3
Western Sydney Orbital	North of	M5 Motorway	2F	2,220	F	43,818	2,133	F	44,579	0	2F	3,598	D	66,673	3,632	D	70,494	6
Western Sydney Orbital	South of	Elizabeth Drive	2F	1,805	F	37,815	1,823	F	36,973	0	2F	3,822	E	70,875	3,926	E	75,365	6
Western Sydney Orbital	North of	Elizabeth Drive	(not in network)				(not in network)				0	4,047	F	67,181	3,507	D	65,923	-2
Western Sydney Orbital	North of	The Horsley Drive	(not in network)				(not in network)				0	3,529	D	78,066	3,693	D	81,667	5
Williamson Road	South of	Brooks Road	4D	649	A	8,995	640	A	7,109	0	4D	671	A	7,703	615	A	6,526	-15
Woodville Road	North of	Hume Highway	6D	2,626	B	44,155	2,657	B	44,895	0	6D	2,711	B	45,587	2,802	B	47,138	3

@ = Refer Table D2 of Appendix D

NOTE: 1. LOS G = volume/capacity > 1.5

2 ADT = Average Daily Traffic

3. * = ADT estimated from model

4. Road types are described in Appendix D

Appendix Q

Future Traffic Volumes and Levels of
Service for Holsworthy Option A

APPENDIX Q
TABLE Q1 FUTURE TRAFFIC VOLUMES AND LEVEL OF SERVICE ALONG MAJOR APPROACH ROUTES TO HOLSWORTHY OPTION A

2006 Base						Access Scenario A1: 2006				
Location Description			Type #	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase
Alfords Point Road	at	Georges River	4F	4,728	F	53,048	4,773	F	52,472	-1
Anzac Road	West of	Heathcote Road	2	762	B	11,381	832	B	14,510	27
Appin Road	South of	Copperfield Drive	2	1,434	F	19,589	1,460	F	19,958	2
Atchison Road	North of	Saywell Road	2	1,220	E	16,807	1,624	F	22,244	32
Blaxland Road	East of	Narellan Road	4UC	699	A	10,214	694	A	10,979	7
Brooks Road	West of	South Western Freeway	2	562	A	7,780	517	A	7,330	-6
Brooks Road	East of	South Western Freeway	2	1,328	F	18,868	1,322	F	17,379	-8
Cambridge Road	West of	Moorebank Avenue	2	1,429	F	18,123	3,230	G	35,051	93
Camden Valley Way	West of	South Western Freeway (4D	1,060	A	18,781	1,200	A	21,032	12
Camden Valley Way	North of	Narellan Road	4UC	982	A	14,106	995	A	14,431	2
Camden Valley Way	South of	Denham Court Road	2	1,819	F	26,838	1,874	F	27,842	4
Camden Valley Way	South of	Brngelly Road	2	712	A	8,475	815	B	8,903	5
Campbelltown Road	North of	Glenfield Road	6D	3,224	C	47,165	2,710	B	48,123	2
Campbelltown Road	South of	Denham Court Road	2	2,101	G	26,076	1,887	F	24,587	-6
Campbelltown Road	South of	Ben Lomond Road	4D	2,917	F	41,402	2,728	F	39,517	-5
Campbelltown Road	South of	Williamson Road	4UC	2,646	F	32,509	2,390	E	31,267	-4
Campbelltown Road	South of	Blaxland Road	4UC	1,759	B	26,757	1,751	B	27,715	4
Campbelltown Road	South of	Leumeah Road	4D	2,424	E	48,613	2,279	D	49,605	2
Cowpasture Road	North of	Elizabeth Drive	4D	1,746	B	27,978	1,778	B	28,783	3
Cumberland Highway	North of	Victoria Street	4D	2,214	D	47,785	2,142	D	48,215	1
Cumberland Highway	North of	Canley Vale Road	4D	1,329	A	26,503	1,313	A	27,438	4
Deepfields Road	West of	Camden Valley Way	2	254	A	4,767	255	A	4,906	3
Denham Court Road	East of	Camden Valley Way	2	435	A	7,427	364	A	8,063	9
Glenfield Road	East of	Old Glenfield Road	2	606	A	9,558	428	A	6,926	-28
Harold Street	South of	Victoria Street	2	286	A	4,467	307	A	4,929	10
Heathcote Road	at	Woronora River	2	1,593	F	24,114	1,698	F	25,072	4
Heathcote Road	North of	M5 Motorway	4UC	790	A	14,062	811	A	13,673	-3
Heathcote Road	North of	Anzac Road	4UC	1,918	C	36,822	1,777	C	35,045	-5
Heathcote Road	South of	Anzac Road	4UC	2,095	D	47,084	2,210	D	49,578	5
Heathcote Road	North of	New Illawarra Road	2	933	C	20,916	1,119	D	22,901	9
Hume Highway	West of	Woodville Road	6D	4,126	F	67,308	4,039	E	67,123	0
Hume Highway	East of	Woodville Road	6D	1,945	A	41,038	1,933	A	40,908	0
Hume Highway	East of	Crossroads	6D	1,146	A	20,120	668	A	10,989	-45
Hume Highway	North of	M5 Motorway	6D	5,181	F	82,799	5,524	F	87,866	6
Hume Highway	South of	M5 Motorway	6D	5,931	F	80,282	4,744	F	66,488	-17
Kurrajong Road	East of	Western Sydney Orbital	4U	923	B	8,923	865	A	8,392	-6
M4 Motorway	East of	Wallgrove Road	6F	6,042	F	127,953	6,008	F	129,900	2
M5 Motorway	West of	River Road	4F	4,608	F	83,664	4,593	F	89,066	6
M5 Motorway	East of	River Road	4F	7,186	G	128,994	7,231	G	129,894	1
M5 Motorway	East of	Moorebank Avenue	4F	4,620	F	80,917	4,725	F	88,639	10
M5 Motorway	West of	Moorebank Avenue	4F	6,595	G	99,275	6,333	G	102,556	3
M5 Motorway	West of	Hume Highway	4F	4,009	F	87,820	4,259	F	83,445	-5
M5 Motorway	East of	Western Sydney Orbital	4F	4,009	F	87,820	4,259	F	83,445	-5
Menai Road	at	Woronora River	2	1,896	G	41,216	1,998	G	41,880	2
Moorebank Avenue	South of	M5 Motorway	2	2,033	G	39,766	3,122	G	64,711	63
Moorebank Avenue	North of	M5 Motorway	4D	2,775	F	32,044	2,860	F	40,382	26
Moore-Oxley Bypass	North of	Narellan Road	4D	1,402	A	27,667	1,427	A	28,019	1
Moore-Oxley Bypass	South of	Queen Street	6D	1,235	A	17,070	1,227	A	16,233	-5
Narellan Road	West of	South Western Freeway	4D	2,320	D	41,098	2,446	E	42,786	4
Narellan Road	East of	South Western Freeway	4D	2,208	D	41,928	2,314	D	43,331	3
New Illawarra Road	North of	Heathcote Road	2	1,617	F	24,759	1,562	F	23,705	-4
Newbridge Road	West of	Heathcote Road	6D	3,182	C	57,511	3,053	C	55,504	-3
Nuwarra Road	North of	Heathcote Road	4U	855	A	13,351	811	A	13,029	-2
Pembroke Road	North of	Leumeah Road	2	1,288	F	28,882	1,306	F	29,818	3
Princes Highway	at	Georges River	6D	6,112	G	87,593	5,940	F	83,459	-5
Princes Highway	South of	Heathcote Road	4D	2,227	D	33,257	2,269	D	33,909	2
Princes Highway	South of	Farnell Avenue	4F	3,338	D	53,558	3,325	D	53,534	0
Raby Road	West of	Campbelltown Road	2	1,602	F	24,650	1,584	F	24,344	-1
Road Alternative 1 (Moorebank Avenue)	North of	Cambridge Avenue	2	1,429	F	16,213	2,768	G	39171	142
Road Alternative 1/2	North of	Airport	(not in network)				2,800	B	29713	
Road Alternative 2	East of	South Western Freeway	(not in network)				1,177	A	11942	
South Western Freeway	North of	Brooks Road	4F	4,384	F	88,282	4,321	F	87,831	-1
South Western Freeway	North of	Campbelltown-Raby Roa	4F	3,401	D	69,200	3,516	D	71,028	3
South Western Freeway	North of	Narellan Road	4F	1,651	B	29,850	1,707	B	31,305	5
Taren Point Road	at	Georges River	6D	4,471	F	61,261	4,744	F	64,467	5
The Northern Road	at	Lowes Creek	2	799	B	15,394	790	B	15,580	1
Wallgrove Road	South of	M4 Motorway	4D	2,436	E	46,346	2,475	E	50,663	9
Wallgrove Road	North of	Elizabeth Drive	4D	2,282	D	39,418	2,315	D	44,018	12
Western Sydney Orbital	North of	M5 Motorway	2F	2,220	F	43,818	2,243	F	51,228	17
Western Sydney Orbital	South of	Elizabeth Drive	2F	1,805	F	37,815	2,013	F	44,452	18
Williamson Road	South of	Brooks Road	4D	649	A	6,995	681	A	7,692	10
Woodville Road	North of	Hume Highway	6D	2,626	B	44,155	2,572	B	44,596	1

@ = Refer Table D2 of Appendix D

APPENDIX Q
TABLE Q2 FUTURE TRAFFIC VOLUMES AND LEVEL OF SERVICE ALONG MAJOR APPROACH ROUTES TO HOLSWORTHY OPTION A

Location Description			Access Scenario A1: 2018				Access Scenario A3: 2018				Access Scenario A3: 2018				Access Scenario A4: 2018			
			Type #	Peak One Way Flo	Level of Service	ADT	Peak One Way Flo	Level of Service	ADT	% AD Increase	Peak One Way Flo	Level of Service	ADT	% AD Increase	Peak One Way Flo	Level of Service	ADT	% AD Increase
Adelaide Road	at	Georges Road	4F	5,127	F	56,734	5,012	F	56,508	0	5,212	F	66,371	19	5,004	F	55,661	5
Anzac Road	West of	Heathcote Road	2	732	A	11,081	938	C	17,857	61	831	B	12,487	13	855	B	17,165	55
Aggon Road	South of	Copperfield Drive	2	1,805	F	24,425	1,840	F	25,118	3	1,841	F	25,126	3	1,840	F	25,118	3
Aichison Road	North of	Saywell Road	2	1,332	F	16,838	1,625	F	24,698	32	1,841	G	28,188	38	930	C	14,248	24
Bassend Road	East of	Naxellan Road	4UC	885	A	13,652	829	A	15,149	18	829	A	15,136	18	827	A	15,173	18
Brooks Road	West of	South Western Freeway	2	560	A	7,422	544	A	7,584	2	545	A	7,595	2	709	A	9,386	27
Brooks Road	East of	South Western Freeway	2	1,434	F	20,318	1,427	F	18,358	-10	1,421	F	18,208	-10	1,310	F	18,080	-11
Cambridge Road	West of	Monabank Avenue	2	1,858	F	19,733	4,980	G	53,218	169	4,824	G	55,405	180	2,598	G	29,061	51
Camden Valley Way	West of	South Western Freeway	4D	1,006	A	18,808	1,257	A	22,882	18	1,318	A	23,444	18	1,271	A	22,823	16
Camden Valley Way	North of	Naxellan Road	4UC	1,384	A	18,331	1,817	B	21,192	10	1,588	B	22,328	16	1,484	A	23,118	20
Camden Valley Way	South of	Danham Court Road	2	2,117	G	30,847	2,084	G	32,575	8	2,257	G	35,103	15	2,218	G	37,284	22
Camden Valley Way	South of	Ringsfield Road	2	1,124	D	11,337	882	C	11,126	-2	890	C	11,488	1	1,105	D	14,577	28
Campbelltown Road	North of	Glenfield Road	6D	3,631	D	64,316	3,733	E	85,784	2	3,823	D	64,768	1	5,804	F	102,312	67
Campbelltown Road	South of	Danham Court Road	2	2,218	G	29,954	2,173	G	31,863	7	2,133	G	28,920	0	2,834	F	41,990	40
Campbelltown Road	South of	Ran Lomond Road	4D	3,558	F	48,388	3,481	F	47,380	2	3,436	F	46,753	1	3,588	F	50,991	14
Campbelltown Road	South of	Williamson Road	4UC	2,767	F	38,741	2,776	F	38,124	4	2,736	F	38,387	-1	3,188	F	47,052	28
Campbelltown Road	South of	Baxland Road	4UC	1,834	C	27,823	1,895	B	28,158	4	1,898	B	29,308	8	1,792	C	28,254	8
Campbelltown Road	South of	Leumash Road	4D	2,888	F	55,442	2,872	E	57,284	3	2,870	E	57,165	3	2,865	F	58,825	8
Campbelltown Road	North of	Elizabeth Drive	4D	1,778	B	26,098	2,078	C	32,452	12	2,074	C	32,884	12	2,055	C	34,678	17
Cumberland Highway	North of	Victoria Street	4D	2,197	D	48,158	2,215	D	48,111	4	2,148	D	47,866	4	2,282	D	47,382	3
Cumberland Highway	North of	Canley Vale Road	6D	1,518	A	28,442	1,807	A	30,982	9	1,898	A	32,268	14	1,854	A	30,081	0
Deepfields Road	West of	Camden Valley Way	2	303	A	8,448	320	A	9,068	10	320	A	9,910	8	322	A	9,958	9
Danham Court Road	East of	Camden Valley Way	2	858	A	8,755	915	C	13,571	39	840	C	13,673	40	731	A	8,888	-9
Darlington Road	East of	Old Glenfield Road	2	871	A	11,278	541	A	10,820	-8	485	A	9,381	-17	2,378	G	48,770	752
Harold Street	South of	Victoria Street	2	286	A	4,840	388	A	8,483	18	402	A	8,821	21	312	A	5,893	8
Heathcote Road	at	Wentworth River	2	1,338	F	20,581	1,552	F	25,278	23	1,440	F	22,483	8	1,555	F	25,286	23
Heathcote Road	North of	M5 Motorway	4UC	494	A	8,070	474	A	8,981	14	578	A	9,168	14	496	A	7,900	-2
Heathcote Road	North of	Anzac Road	4UC	2,414	E	45,884	2,143	D	43,390	-5	2,453	E	47,882	4	2,378	E	47,718	4
Heathcote Road	South of	Anzac Road	4UC	2,823	F	58,827	2,752	F	61,271	8	2,713	F	60,370	7	2,748	F	61,088	8
Heathcote Road	North of	New Illawarra Road	2	1,543	F	28,827	1,832	F	33,025	11	720	A	12,882	-57	1,828	F	32,868	80
Hume Highway	West of	Woodville Road	6D	4,337	F	70,124	4,385	F	72,791	4	4,303	F	70,883	1	4,408	F	73,208	4
Hume Highway	East of	Woodville Road	6D	2,082	A	43,038	2,090	A	44,242	3	2,014	A	42,097	-2	2,103	A	44,402	3
Hume Highway	East of	Crossroads	6D	1,337	A	25,245	934	A	18,457	-27	824	A	18,068	-25	1,888	A	38,783	94
Hume Highway	North of	M5 Motorway	6D	4,583	F	88,928	5,343	F	81,583	17	5,141	F	78,324	13	8,721	F	85,880	23
Hume Highway	South of	M5 Motorway	6D	5,854	F	78,483	5,573	F	77,918	-2	5,526	F	78,724	-1	8,750	G	102,548	28
Nurrung Road	East of	Western Sydney Circuit	4U	1,265	D	12,501	1,187	C	12,282	-2	1,108	C	12,420	-1	1,822	F	14,287	14

APPENDIX Q
TABLE Q3 FUTURE TRAFFIC VOLUMES AND LEVEL OF SERVICE ALONG MAJOR APPROACH ROUTES TO HOLSWORTHY OPTION A

Location Description		2018 Base				Access Scenario A1 2018				Access Scenario A2 2018				Access Scenario A3 2018				Access Scenario A4 2018			
		Type	Peak One Way Flo	Level of Service	ADT	Peak One Way Flo	Level of Service	ADT	% AD Increase	Peak One Way Flo	Level of Service	ADT	% AD Increase	Peak One Way Flo	Level of Service	ADT	% AD Increase	Peak One Way Flo	Level of Service	ADT	% AD Increase
M4 Motorway	East of	4F	8,215	F	131,171	8,326	F	140,095	7	8,262	F	136,752	4	8,343	F	141,255	8	8,292	F	137,361	5
M5 Motorway	West of	4F	4,724	F	92,645	4,589	F	103,989	12	4,818	F	99,859	8	4,557	F	101,833	10	4,873	F	98,548	4
M5 Motorway	East of	4F	5,021	F	108,173	5,135	F	113,792	7	4,978	F	111,933	8	5,134	F	113,249	7	5,081	F	111,853	8
M5 Motorway	East of	4F	8,104	F	108,198	5,865	F	124,331	17	8,435	F	118,298	13	5,727	F	121,860	15	5,886	F	111,425	8
M5 Motorway	West of	4F	8,711	G	125,728	6,714	G	125,589	0	7,014	G	133,221	8	7,475	G	139,703	11	7,460	G	131,216	4
M5 Motorway	West of	4F	4,388	F	100,794	4,531	F	100,321	8	4,824	F	102,978	2	4,480	F	87,862	2	4,573	F	100,780	1
M5 Motorway	East of	4F	4,417	F	100,021	4,414	F	97,493	4	4,480	F	87,862	2	2,892	F	60,085	4	3,138	F	67,274	17
Mensil Road	at	4D	2,892	F	57,718	2,890	F	60,054	4	3,007	F	68,113	18	2,892	F	60,085	4	3,138	F	67,274	17
Moorabank Avenue	North of	2	1,980	F	17,700	4,280	G	64,643	265	3,134	G	45,987	180	2,184	G	33,285	88	1,573	F	19,404	10
Moorabank Avenue	South of	2	2,377	G	42,317	4,568	G	99,363	135	3,447	G	78,585	81	2,959	G	63,037	49	2,204	G	44,660	8
Moorabank Avenue	North of	4D	2,923	E	33,187	3,280	F	49,360	48	3,740	F	39,468	18	2,472	E	38,855	20	2,271	D	32,143	-3
Moore-Oxley Bypass	North of	4D	1,964	A	31,810	1,651	B	32,360	2	1,862	B	32,444	2	1,649	B	32,501	2	1,850	B	32,529	2
Moore-Oxley Bypass	South of	4D	1,281	A	18,104	1,150	A	15,189	8	1,150	A	15,821	2	1,197	A	15,344	-5	1,157	A	15,125	8
Narellan Road	West of	4D	2,815	F	50,851	3,388	F	57,231	13	3,384	F	57,054	12	3,473	F	58,723	12	3,501	F	58,983	12
Narellan Road	East of	4D	2,886	F	50,824	3,347	F	54,880	8	3,363	F	54,837	8	3,228	F	53,534	8	3,227	F	54,081	7
New Hawkes Road	North of	2	2,063	G	30,630	1,773	F	30,830	1	779	B	9,322	70	1,768	F	30,774	0	888	A	8,867	11
Newbridge Road	West of	8D	3,115	C	53,678	3,126	C	55,157	3	3,112	C	55,874	4	3,815	E	64,286	20	3,057	C	54,787	2
Nowra Road	North of	4U	844	B	14,561	822	A	13,608	-7	843	A	13,773	6	827	A	14,561	0	899	A	15,549	7
Old Hawkes Road	North of	2	3,988	G	52,504	3,588	G	53,499	2	3,818	G	69,913	31	3,578	G	54,055	3	3,933	G	83,093	16
Pambroke Road	North of	2	1,180	E	23,832	1,141	E	22,822	-3	1,280	F	24,965	4	1,024	D	21,190	-10	1,208	E	23,748	8
Princes Highway	at	8D	8,310	G	92,825	8,172	G	92,109	-1	8,444	G	98,708	4	8,187	G	82,051	-1	8,008	F	88,055	-8
Princes Highway	South of	4D	2,379	D	35,857	2,507	E	37,649	8	2,508	E	37,649	0	2,507	E	37,649	0	2,508	E	37,649	0
Princes Highway	South of	4F	3,834	D	57,427	3,394	D	55,334	-4	3,504	D	58,521	2	3,394	D	55,309	-4	3,539	D	57,415	0
Raby Road	West of	2	1,072	G	28,570	2,122	G	31,609	7	2,087	G	31,125	5	2,188	G	33,062	12	2,152	G	33,268	19
Road Alternative 1/2	North of	(not in network)				8,322	F	78,307		4,484	C	51,709		4,015	C	53,554		(not in network)			
Road Alternative 2	East of	(not in network)				2,625	B	29,300		2,477	E	27,400		(not in network)				(not in network)			
Road Alternative 3	East of	(not in network)				(not in network)				2,785	B	24,508		(not in network)				(not in network)			
Road Alternative 4	West of	(not in network)				(not in network)				(not in network)				2,306	B	22,753		3,301	C	43,852	
South Western Freeway	North of	4F	4,588	F	98,783	4,683	F	100,356	2	4,881	F	99,709	1	4,785	F	107,682	8	5,071	F	113,457	15
South Western Freeway	North of	4F	3,871	D	78,815	3,813	E	83,135	6	3,782	E	82,859	8	3,973	E	78,495	-3	4,114	F	80,280	2
South Western Freeway	North of	4F	1,585	B	34,479	1,744	B	37,457	9	1,748	B	37,228	8	1,831	B	33,867	-2	1,819	B	33,498	-3
Taren Point Road	at	8D	8,129	F	64,844	4,375	F	62,644	-3	5,240	F	64,668	8	4,376	F	62,655	-3	5,633	F	78,558	18
The Northern Road	at	3	882	C	18,539	1,089	D	18,589	18	981	C	18,390	11	1,038	D	18,869	14	1,033	D	19,589	18
Wallgrove Road	North of	4D	653	A	12,053	936	A	18,407	38	893	A	15,989	33	852	A	16,890	38	874	A	15,657	30
Western Sydney Orbital	South of	4F	3,843	E	85,430	4,696	F	103,822	21	4,542	F	101,221	18	4,745	F	105,019	23	4,486	F	100,021	17
Western Sydney Orbital	North of	4F	3,588	D	86,873	3,959	E	87,947	32	3,878	E	88,481	30	3,781	E	85,454	28	3,430	D	79,105	19
Western Sydney Orbital	South of	4F	3,872	E	70,875	3,831	E	86,400	22	3,781	E	85,073	20	3,878	E	87,543	24	3,694	D	83,549	18
Western Sydney Orbital	North of	4F	4,847	F	87,181	3,802	E	81,378	21	3,745	E	79,188	18	3,878	E	82,187	22	3,707	E	78,181	16
Western Sydney Orbital	North of	4F	3,878	D	78,068	3,956	E	90,071	15	3,883	E	88,212	13	3,979	E	90,871	16	3,852	E	86,839	11
Williamson Road	South of	4D	871	A	7,703	708	A	7,968	3	708	A	8,092	5	737	A	8,400	17	739	A	8,366	17
Woodville Road	South of	8D	2,711	B	45,587	2,898	B	47,185	4	2,732	B	47,288	4	2,712	B	47,424	6	2,730	B	47,531	6

@ - Refer Table D2 Appendix D

Appendix R

Network Travel Parameters for Airport
Options

APPENDIX R **NETWORK TRAVEL PARAMETRES FOR AIRPORT OPTIONS**

Model Run No.	Second Airport Location	Scenario ¹	Year		SUMMARY FOR TOTAL NETWORK				SUMMARY FOR CORDON			
					Average speed in network	Total Vehicle Km	Total Vehicle Hours	Total Vehicle Hours delay in network	Average Speed in Cordon	Total Vehicle Km in Cordon	Total Vehicle Hours in Cordon	Total Vehicle/Hours delay in Cordon
1	No Second Airport	Base	1996	AM								
				PM								
2	No Second Airport	Base	2006	AM	27.7	6,642,000	240,000	67,000	30.6	3,183,000	104,000	27,000
				PM	27.6	6,639,000	241,000	68,000	30.3	3,185,000	105,000	28,000
3	No Second Airport	Base	2016	AM	27.1	7,281,000	269,000	76,000	30.7	3,537,000	115,000	30,000
				PM	26.9	7,298,000	271,000	77,000	30.2	3,554,000	118,000	31,000
4	Badgerys Creek	B1	2006	AM	27.9	6,755,000	242,000	67,000	30.7	3,297,000	108,000	28,000
				PM	27.7	6,745,000	243,000	68,000	30.4	3,296,000	109,000	29,000
5	Badgerys Creek	B1	2016	AM	26.8	7,695,000	288,000	82,000	29.6	3,906,000	132,000	35,000
				PM	26.7	7,675,000	288,000	83,000	29.3	3,888,000	133,000	36,000
6	Holsworthy Option A	N1	2006	AM	28.0	6,736,000	241,000	67,000	30.6	3,282,000	107,000	28,000
				PM	27.7	6,726,000	243,000	68,000	30.3	3,281,000	108,000	29,000
7	Holsworthy Option A	N1	2016	AM	26.8	7,651,000	285,000	81,000	29.6	3,865,000	130,000	34,000
				PM	26.7	7,633,000	286,000	82,000	29.4	3,853,000	131,000	35,000
8	Holsworthy Option A	N2	2016	AM	27.0	7,597,000	282,000	80,000	30.1	3,804,000	127,000	33,000
				PM	26.7	7,588,000	284,000	81,000	29.7	3,799,000	128,000	34,000
9	Holsworthy Option A	N3	2016	AM	26.6	7,663,000	288,000	82,000	29.2	3,877,000	133,000	35,000
				PM	26.6	7,643,000	288,000	83,000	29.0	3,864,000	133,000	36,000
10	Holsworthy Option A	N4	2016	AM	26.8	7,624,000	285,000	81,000	29.7	3,823,000	129,000	34,000
				PM	26.6	7,611,000	286,000	81,000	29.5	3,812,000	129,000	34,000
11	Holsworthy Option B	S2	2006	AM	27.9	6,807,000	244,000	68,000	30.6	3,346,000	109,000	29,000
				PM	27.5	6,799,000	247,000	69,000	30.2	3,340,000	111,000	29,000
12	Holsworthy Option B	S2	2016	AM	26.5	7,820,000	296,000	84,000	29.0	4,029,000	139,000	37,000
				PM	26.4	7,788,000	295,000	84,000	28.8	3,997,000	139,000	37,000
13	Holsworthy Option B	S3	2016	AM	26.9	7,736,000	288,000	81,000	30.2	3,924,000	130,000	34,000
				PM	26.7	7,712,000	289,000	82,000	29.8	3,902,000	131,000	34,000

Note: Refer to Figures 8.2 and 9.2 for the following scenarios

Scenario N1: Combination of road alternatives 1 and 2 providing access to the north and north west of the airport site;

Scenario N2: Combination of road alternatives 1, 2 and 3 providing access to the north, north west and east;

Scenario N3: Combination of road alternatives 1 and 4 providing access to the north and west;

Scenario N4: Combination of road alternatives 3 and 4 providing access to the east and west only.

Scenario S2: Single western road alternative 6 connecting airport to South Western Freeway at Menangle Park.

Scenario S3: Road alternative 6 with additional eastern link (road alternative 7) connecting with Heathcote Road at intersection with New Illawarra Road.

Appendix S

Future Traffic Volumes and Levels of
Service for Holsworthy Option B

APPENDIX S
FUTURE TRAFFIC VOLUMES AND LEVEL OF SERVICE ALONG MAJOR APPROACH ROUTES TO HOLSWORTHY OPTION B

			2008 Base				Access Scenario B5: 2008				2016 Base				Access Scenario B5: 2016				Access Scenario B6: 2016			
Location Description			Type	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase	Type	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase	Peak One Way Flow	Level of Service	ADT	% ADT Increase
Allards Point Road	at	Georges River	4F	4,728	F	53,048	4,885	F	52,801	0	4F	5,127	F	55,734	5,103	F	56,438	1	5,408	F	73,764	32
Anzac Road	West of	Heathcote Road	2	782	B	11,381	770	B	11,497	1	2	732	A	11,081	837	B	13,482	22	877	A	10,377	-6
Appin Road	South of	Copperfield Drive	2	1,434	F	19,589	1,771	F	27,830	42	2	1,805	F	24,425	3,039	G	64,838	165	2,197	G	36,430	49
Atchison Road	North of	Saywell Road	2	1,220	E	16,807	1,207	E	16,504	10	2	1,332	F	18,838	1,680	F	30,254	61	1,354	F	21,724	15
Blaxland Road	East of	Narellan Road	4UC	699	A	10,214	753	A	12,570	23	4UC	885	A	13,052	1,701	B	32,271	147	896	A	18,284	40
Brooks Road	West of	South Western Freeway	2	562	A	7,780	549	A	7,585	-2	2	560	A	7,422	392	A	5,584	-25	529	A	7,157	-4
Brooks Road	East of	South Western Freeway	2	1,328	F	18,868	1,142	E	15,697	-17	2	1,434	F	20,316	853	B	12,824	-37	1,149	E	15,644	-23
Cambridge Road	West of	Moorebank Avenue	2	1,429	F	18,123	1,460	F	18,734	3	2	1,559	F	19,773	1,963	G	33,175	68	1,550	F	21,493	9
Camden Valley Way	West of	South Western Freeway	4D	1,060	A	16,781	1,113	A	18,942	1	4D	1,006	A	16,808	1,006	A	18,607	-8	1,125	A	20,616	4
Camden Valley Way	North of	Narellan Road	4UC	982	A	14,106	1,008	A	15,588	11	4UC	1,384	A	19,331	1,382	A	24,243	25	1,223	A	21,830	13
Camden Valley Way	South of	Denham Court Road	2	1,819	F	26,838	1,954	G	30,093	12	2	2,117	G	30,647	2,134	G	45,503	48	2,044	G	36,822	20
Camden Valley Way	South of	Bringingly Road	2	712	A	8,475	787	B	9,303	10	2	1,124	D	11,377	1,206	E	21,508	89	975	C	12,466	10
Campbelltown Road	North of	Glenfield Road	6D	3,224	C	47,165	3,143	C	54,737	16	6D	3,631	D	64,376	5,627	F	98,209	53	3,839	E	72,478	13
Campbelltown Road	South of	Denham Court Road	2	2,101	G	26,076	2,226	G	32,263	24	2	2,219	G	29,954	3,289	G	56,596	89	2,118	G	38,716	29
Campbelltown Road	South of	Ben Lomond Road	4D	2,917	F	41,402	3,083	F	44,565	8	4D	3,556	F	46,386	4,510	G	79,819	72	3,427	F	53,418	15
Campbelltown Road	South of	Williamson Road	4UC	2,846	F	32,509	2,787	F	36,508	12	4UC	2,782	F	36,741	3,708	F	63,937	74	2,674	F	42,012	14
Campbelltown Road	South of	Blaxland Road	4UC	1,759	B	26,757	1,782	C	27,585	3	4UC	1,834	C	27,923	1,849	C	41,116	47	1,644	B	30,139	8
Campbelltown Road	South of	Leumeah Road	4D	2,424	E	48,613	2,556	E	51,074	5	4D	2,888	F	55,442	3,069	F	71,605	30	2,491	E	60,093	8
Cowpasture Road	North of	Elizabeth Drive	4D	1,746	B	27,978	1,892	C	30,597	9	4D	1,778	B	29,096	1,983	C	32,070	10	2,198	D	32,902	13
Cumberland Highway	North of	Victoria Street	4D	2,214	D	47,785	2,184	D	46,601	-2	4D	2,197	D	46,198	2,249	D	47,278	2	2,099	C	46,771	1
Cumberland Highway	North of	Canley Vale Road	6D	1,329	A	26,503	1,283	A	26,768	1	6D	1,516	A	28,442	1,546	A	29,643	4	1,562	A	30,266	6
Deepfields Road	West of	Camden Valley Way	2	254	A	4,767	252	A	4,848	2	2	303	A	5,448	343	A	5,979	10	307	A	5,818	7
Denham Court Road	East of	Camden Valley Way	2	435	A	7,427	370	A	7,950	7	2	658	A	9,755	597	A	9,755	0	811	B	12,356	27
Glenfield Road	East of	Old Glenfield Road	2	606	A	9,558	637	A	10,366	8	2	671	A	11,278	700	A	11,959	6	654	A	11,901	6
Harold Street	South of	Victoria Street	2	286	A	4,467	269	A	4,352	-3	2	286	A	4,640	530	A	8,415	61	261	A	4,363	-6
Heathcote Road	at	Woronora River	2	1,593	F	24,114	1,717	F	25,833	7	2	1,338	F	20,581	1,580	F	24,818	21	1,342	F	23,836	16
Heathcote Road	North of	M5 Motorway	4UC	790	A	14,062	803	A	14,172	1	4UC	494	A	8,070	555	A	8,579	6	548	A	8,629	7
Heathcote Road	North of	Anzac Road	4UC	1,918	C	38,822	2,045	D	38,854	6	4UC	2,414	E	45,884	2,436	E	47,073	3	2,386	E	51,164	12
Heathcote Road	South of	Anzac Road	4UC	2,065	D	47,084	2,224	D	49,277	5	4UC	2,623	F	56,527	2,742	F	59,989	6	2,768	F	61,605	9
Heathcote Road	North of	New Illawarra Road	2	933	C	20,916	1,096	D	22,544	8	2	1,543	F	29,827	1,467	F	31,501	6	1,575	F	32,655	6
Hume Highway	West of	Woodville Road	6D	4,126	F	67,308	4,101	F	67,458	0	6D	4,337	F	70,124	4,473	F	72,952	4	4,367	F	71,013	1
Hume Highway	East of	Woodville Road	6D	1,945	A	41,038	1,954	A	41,227	0	6D	2,082	A	43,039	2,114	A	44,418	3	2,077	A	42,838	0
Hume Highway	East of	Crossroads	6D	1,148	A	20,120	1,144	A	19,265	-4	6D	1,337	A	25,245	1,447	A	30,081	19	1,235	A	24,702	-2
Hume Highway	North of	M5 Motorway	6D	5,181	F	82,799	5,490	F	86,354	4	6D	4,583	F	69,828	5,542	F	84,472	21	4,681	F	77,154	10
Hume Highway	South of	M5 Motorway	6D	5,931	F	80,282	5,941	F	82,637	3	6D	5,854	F	79,463	6,537	G	103,495	30	5,626	F	84,138	6
Kurrajong Road	East of	Westem Sydney Orbital	4U	923	B	8,923	1,061	C	9,419	6	4U	1,265	D	12,501	1,149	C	16,622	33	1,105	C	13,032	4
M4 Motorway	East of	Wallgrove Road	6F	6,042	F	127,953	6,081	F	132,014	3	6F	6,215	F	131,171	6,248	F	143,203	9	6,306	F	139,141	6
M5 Motorway	West of	River Road	4F	4,608	F	63,664	4,556	F	67,358	4	4F	4,728	F	62,645	4,421	F	100,298	8	4,632	F	97,412	5
M5 Motorway	East of	River Road	4F	7,186	G	128,994	7,107	G	127,632	-1	4F	5,031	F	106,173	5,038	F	110,017	4	5,062	F	110,583	4
M5 Motorway	East of	Moorebank Avenue	4F	4,620	F	60,917	4,672	F	67,901	9	4F	5,104	F	106,196	5,573	F	120,591	14	5,192	F	103,011	-3
M5 Motorway	West of	Moorebank Avenue	4F	6,595	G	99,275	6,504	G	111,395	12	4F	6,711	G	125,726	7,187	G	140,568	12	6,873	G	123,630	-2
M5 Motorway	West of	Hume Highway	4F	4,009	F	67,820	4,279	F	93,560	7	4F	4,566	F	100,784	4,501	F	103,357	3	4,266	F	98,047	-3
M5 Motorway	East of	Westem Sydney Orbital	4F	4,009	F	67,820	4,279	F	93,560	7	4F	4,417	F	100,021	4,627	F	102,214	2	4,538	F	99,802	0
Mensai Road	at	Woronora River	4D	1,896	G	41,216	2,018	G	41,471	1	4D	2,662	F	57,716	2,835	F	58,711	2	2,831	F	60,690	5
Moorebank Avenue	North of	Cambridge Avenue	2	1,426	F	16,213	1,490	F	16,761	3	2	1,560	F	17,700	1,963	G	29,680	68	1,550	F	18,229	9

APPENDIX S
FUTURE TRAFFIC VOLUMES AND LEVEL OF SERVICE ALONG MAJOR APPROACH ROUTES TO HOLSWORTHY OPTION B

Location Description		2008 Base				Access Scenario B5- 2008				2010 Base				Access Scenario B5- 2010				Access Scenario B6- 2010			
		Type @	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase	Type @	Peak One Way Flow	Level of Service	ADT	Peak One Way Flow	Level of Service	ADT	% ADT Increase	Peak One Way Flow	Level of Service	ADT	% ADT Increase
Moorebank Avenue	South of M5 Motorway	2	2,033	G	39,768	2,117	G	40,170	1	2	2,277	G	42,317	2,475	G	52,440	24	2,222	G	44,883	8
Moorebank Avenue	North of M5 Motorway	4D	2,775	F	32,044	2,710	F	36,901	15	4D	2,523	E	33,187	2,541	F	40,052	21	2,420	E	34,236	3
Moore-Oxley Bypass	North of Narellan Road	4D	1,402	A	27,667	1,474	A	30,993	12	4D	1,594	A	31,810	2,218	D	34,965	10	1,732	B	34,714	9
Moore-Oxley Bypass	South of Queen Street	6D	1,235	A	17,070	1,332	A	17,135	0	6D	1,281	A	18,104	1,808	A	15,370	-5	1,243	A	15,499	-4
Narellan Road	West of South Western Freeway	4D	2,320	D	41,098	2,408	E	43,515	6	4D	2,815	F	50,851	3,308	F	61,948	22	3,107	F	57,879	13
Narellan Road	East of South Western Freeway	4D	2,208	D	41,928	2,253	D	38,732	-8	4D	2,860	F	50,624	2,918	F	53,134	5	3,128	F	48,487	-4
New Illawarra Road	North of Heathcote Road	2	1,817	F	24,759	1,578	F	24,116	-3	2	2,083	G	30,630	1,804	F	28,444	-7	2,370	G	51,905	69
Newbridge Road	West of Heathcote Road	6D	3,182	C	57,511	3,141	C	55,552	-3	6D	3,115	C	53,628	3,647	D	61,431	15	3,059	C	53,974	1
Nuwarra Road	North of Heathcote Road	4U	855	A	13,351	817	A	12,596	-3	4U	948	B	14,561	828	A	13,385	-8	885	B	15,793	8
Pembroke Road	North of Leumeah Road	2	1,288	F	28,882	1,577	F	32,399	12	2	1,180	E	23,832	1,600	F	36,265	54	1,093	D	25,466	8
Princes Highway	at Georges River	6D	6,112	G	87,583	5,811	F	87,374	0	6D	6,310	G	92,825	5,498	F	83,458	-10	6,126	G	89,903	-3
Princes Highway	South of Heathcote Road	4D	2,227	D	33,257	2,302	D	34,145	3	4D	2,379	D	35,857	2,583	E	38,174	7	2,583	E	38,174	7
Princes Highway	South of Farnell Avenue	4F	3,338	D	53,558	3,314	F	53,240	-1	4F	3,634	D	57,427	3,553	D	58,570	-1	4,114	F	63,097	10
Raby Road	West of Campbelltown Road	2	1,602	F	24,650	1,713	F	25,835	5	2	1,872	G	29,570	2,239	G	41,754	41	1,898	G	28,869	-2
Road Alternative 6	East of Appin Road	in network				2,726	B	29,238		(not in network)				6,197	F	75,642		3,276	B	38,831	
Road Alternative 6	West of Appin Road	in network				2,309	B	25,500		(not in network)				3,852	C	50,200		2,460	B	32,800	
Road Alternative 7	East of Airport	in network								(not in network)								2,920	B	39,011	
South Western Freeway	South of Western Sydney Orbital	4F	4,245	F	85,178	4,473	F	101,360	19	4F	4,569	F	92,091	4,910	F	105,908	15	4,745	F	105,192	14
South Western Freeway	North of Brooks Road	4F	4,384	F	88,282	4,717	F	106,081	20	4F	4,569	F	98,783	5,140	F	110,583	12	4,858	F	111,845	13
South Western Freeway	North of Campbelltown Raby Rd	4F	3,401	D	69,200	3,720	E	92,538	34	4F	3,871	D	78,615	4,398	F	102,604	31	3,944	E	98,710	26
South Western Freeway	North of Narellan Road	4F	1,851	B	29,850	3,020	C	55,061	84	4F	1,685	B	34,478	3,358	D	87,668	96	3,133	D	60,497	75
South Western Freeway	North of Link 6	4F	1,150	A	24,668	3,189	D	58,512	137	4F	1,238	A	26,341	4,450	F	91,560	248	3,389	D	69,813	165
South Western Freeway	South of Link 6	4F	1,150	A	24,668	1,159	A	26,134	6	4F	1,238	A	26,341	1,375	A	25,845	-2	1,701	B	31,443	18
Taren Point Road	at Georges River	6D	4,471	F	61,281	4,748	F	61,628	1	6D	5,128	F	64,844	5,352	F	72,032	11	5,841	F	78,276	21
The Northern Road	at Lowes Creek	2	769	B	15,394	909	C	19,242	25	2	882	C	16,538	1,271	F	30,308	83	1,022	D	22,638	37
Wallgrove Road	South of M4 Motorway	4D	2,438	E	46,346	2,427	E	50,743	9	(not in network)											
Wallgrove Road	North of Elizabeth Drive	4D	2,282	D	39,418	2,259	D	43,825	11	4D	653	A	12,053	1,047	A	17,760	47	941	A	16,488	37
Western Sydney Orbital	South of M4 Motorway	in network								4F	3,843	E	85,430	4,564	F	100,050	17	4,478	F	98,682	16
Western Sydney Orbital	North of M5 Motorway	4F	2,220	F	43,818	2,078	F	46,878	7	4F	3,588	D	66,873	2,962	C	63,799	-4	3,378	D	77,454	16
Western Sydney Orbital	South of Elizabeth Drive	4F	1,805	F	37,815	1,892	F	42,317	12	4F	3,822	E	70,875	3,497	D	78,968	11	3,586	D	80,328	13
Western Sydney Orbital	North of Elizabeth Drive	in network								4F	4,047	F	67,181	3,835	D	76,481	14	3,482	D	75,515	12
Western Sydney Orbital	North of The Horsley Drive	in network								4F	3,529	D	78,068	4,064	F	88,882	14	3,689	D	85,073	9
Williamson Road	South of Brooks Road	4D	649	A	8,995	673	A	5,669	-19	4D	671	A	7,703	1,239	A	14,264	85	649	A	5,578	-28
Woodville Road	North of Hume Highway	6D	2,826	B	44,155	2,558	B	44,405	1	6D	2,711	B	45,587	2,812	B	47,149	3	2,724	B	47,078	3

@ = Refer Table D2 of Appendix D