

## 4. Transport Context

### 4.1 Existing Transport

#### 4.1.1 Road Transport

There are increasing community concerns over the quality of life impacts of increasing transport demands and resulting congestion in the corridor.

The area surrounding the F6 reservation experiences demands for travel to major trip generators in the region and through traffic from the southern regions of Sydney and the Illawarra accessing the CBD, Eastern Sydney and the airport precinct.

The Metroad 1 route in this area follows the Princes Highway, President Avenue, The Grand Parade, and General Holmes Drive. Metroad 1 is the current route that has the most in common with the F6 alignment. Metroad 1 has the highest movement of vehicles within the corridor, with an Average Annual Daily Traffic (AADT) of over 87,000 in 2002 at the Tom Ugly's Bridge, which is a slight reduction from 1999 flows (approximately 900 vehicles). However, traffic has increased at this bridge by about 20% since 1991, while traffic at the Captain Cook Bridge has only grown by 7% (to around 59,800) over the same period. The most significant traffic change in the region has come as a result of the opening of the M5 East freeway which has seen traffic on General Holmes Drive, at the airport tunnel, grow by almost 53% to 133,400 (1999 to 2002). While there has been a significant increase at this point, the data shows that there has been a reduction in traffic flow on nearby north-south arteries. In particular, traffic on General Holmes Drive (at Brighton Le-Sands) has reduced by 4.5% since 1999 to 66,300 AADT and on the Princes Highway at Banksia by 3.5% to almost 36,800 AADT over the same period. These changes highlight the general shift in traffic patterns that would be expected with the introduction of such a major piece of transport infrastructure as the M5 East.

North of the Georges River two major north south arterials serve through trips which originate in Sutherland Shire and the Illawarra as well as those which originate locally. Heavy traffic flows are experienced on east-west streets, with a large proportion of these trips likely to be associated with vehicles (both local and through) seeking to use General Holmes Drive rather than the Princes Highway for north/south travel beyond the study area. It is noted that this study has not included traffic network modelling or the detailed examination of traffic flows, which may have provided a greater insight into vehicle trips and their origins and destinations.

In general terms, the geography of the area influences travel opportunities and impacts. In particular, the two major water crossings (the Georges and Cooks Rivers) significantly constrain north/south road capacity. While this study has not included traffic modelling of the road network in the region, it is clear that the major north/south arterial roads are subject to significant demands and are capacity constrained. Further increases in

demand for travel would further stress the system pointing to the need to consider the potential for public transport to take on a larger role in the overall transport task.

#### 4.1.2 Rail Transport

The Illawarra Line and the Eastern Suburbs Railway connects Waterfall in the South with Bondi Junction in the Eastern Suburbs of Sydney. The Illawarra Railway Line connects to the South Coast Rail Line at Waterfall, which continues to Wollongong and Bomaderry and to the Cronulla Branch Line at Sutherland.

The Illawarra Line runs parallel to and in the proximity of the F6 corridor. Carlton, Kogarah, Rockdale and Banksia Station catchments overlap with the catchment which would potentially be attributable to public transport in the F6 Corridor. The F6 Corridor crosses the Cronulla Line between Miranda and Gymea Stations.

#### Infrastructure

*Figure 4.1* shows the diagrammatic lay-out of the network between Waterfall and Sydenham. The diagram shows the Illawarra Line, the Cronulla Branch Line and the Airport Line complete with all junctions and stations. The following infrastructure features are relevant for the F6 transport corridor:

- there is no track junction between the Airport Line and the Illawarra Line: the Airport Line crosses the Illawarra Line at Wolli Creek and connects directly to the East Hills Line at Turrella;
- passenger interchange is possible between the Airport Line and the Illawarra Line at Wolli Creek Station;
- the Illawarra Line is dual track from Sutherland to Hurstville where it branches into quad track (Illawarra Main and Local Lines);
- from Hurstville to Erskineville Junction the Illawarra Line is quad-track (Locals and Mains);
- at Erskineville Junction, two lines (the Up and Down Illawarra Relief Lines) branch off to Bondi Junction to connect to the Eastern Suburbs Railway (shown in *Figure 4.1*) effectively providing six tracks (Locals, Mains and Reliefs);
- the dual-track East Hills Line joins the quad-track Illawarra Line at Wolli Creek; and
- the dual-track Bankstown Line joins the Illawarra Line at Sydenham.

#### Service Structure

The Illawarra Line accommodates trains in two generalised services<sup>1</sup>:

- South Coast inter-city services that originate south of Waterfall (Bomaderry, Dapto, Port Kembla) and run into the inter-city platforms at Sydney Terminal with the odd exception;

<sup>1</sup> *The Airport, South Coast and Illawarra Line timetables are complex with a wide variety of stopping patterns, and this discussion is not intended to be an exhaustive review of the timetable but to give the reader a general overview of the service structure.*



- Illawarra/ESR services that originate at Cronulla, Waterfall or Sutherland and generally (with the odd exception) run through to Bondi Junction.



▲ Not to Scale

Figure 4.1 DIAGRAMMATIC LAYOUT OF HEAVY RAIL LINE BETWEEN SYDENHAM AND WATERFALL

Between Sutherland and Hurstville the Illawarra Mains (dual track) accommodate demand from all the South Coast Services as well as the Illawarra/ESR services from Cronulla, Waterfall and Sutherland. North of Hurstville, the Illawarra Local lines are added to increase track capacity. However, demand is added at Wolli Creek (East Hills Line) and at Sydenham (Bankstown Line). Relief is provided at Erskineville Junction where the (aptly named) Illawarra Relief Lines Branch off to Bondi Junction with the bulk of the Illawarra/ESR services, leaving the South Coast, East Hills and Bankstown trains to continue along the Illawarra Mains and Locals to Sydney Central or Sydney Terminal (via the Illawarra Dives).

The Airport Line (New Southern Railway) is dual tracked and links to the City Circle at Central and to the East Hills Line at Wolli Creek. Services on the Airport Line are timetabled to and from Town Hall Station via the City Circle and stop at all City Circle stations as well as all stations on the Airport Line (Green Square, Domestic Terminal, International Terminal and Wolli Creek). Beyond Wolli Creek services via the Airport Line follow a complex stopping pattern on the East Hills Line and may terminate at Turrella, East Hills or MacArthur Stations.

With the possible exception of Wolli Creek Station, the current services on the Airport Line do not cater for demand from the F6 Corridor area as the line essentially crosses the corridor at right angles. Our discussion below of existing rail infrastructure and its constraint therefore focuses on the Illawarra Line and the demand relief that may be provided by a public transport service in the F6 Corridor.

### **Infrastructure Constraints**

The principal constraints on the Illawarra Line are:

- the dual-track section between Sutherland and Hurstville which carries the Illawarra/ESR and South Coast Services; and
- the quad-track section between Wolli Creek and Erskineville Junction where East Hills services as well as Bankstown services (Sydenham-Erskineville) are added to the Illawarra/ESR and South Coast trains.

Illawarra/ESR services now run at a peak frequency of around fourteen trains per hour (a train every four minutes or so) but are nevertheless unable to fully cope with passenger demand. Overcrowding is common and CityRail's target maximum load of 130% of seated capacity is often exceeded during the peak periods. More Illawarra/ESR services are needed, but amplifying the track capacity between Sutherland and Erskineville Junction in itself does not provide a solution as the ESR is also currently capacity constrained to fourteen trains per hour due to turnback arrangements. Consequently, StateRail had developed a programme of infrastructure enhancements that will progressively increase track capacity on the Illawarra Line and ESR. These works include:

- upgrading the turnback infrastructure at Bondi Junction to increase reliable capacity on the ESR to 20 trains per hour and scheduled for completion by 2005;
- progressive duplication of the Cronulla Branch Line, to be completed by 2008; and

- progressive track amplification between Sydenham and Erskineville Junction and south of Hurstville to eliminate bottlenecks (completion by 2009/10); along with
- ongoing improvements to junctions, signalling and stations.

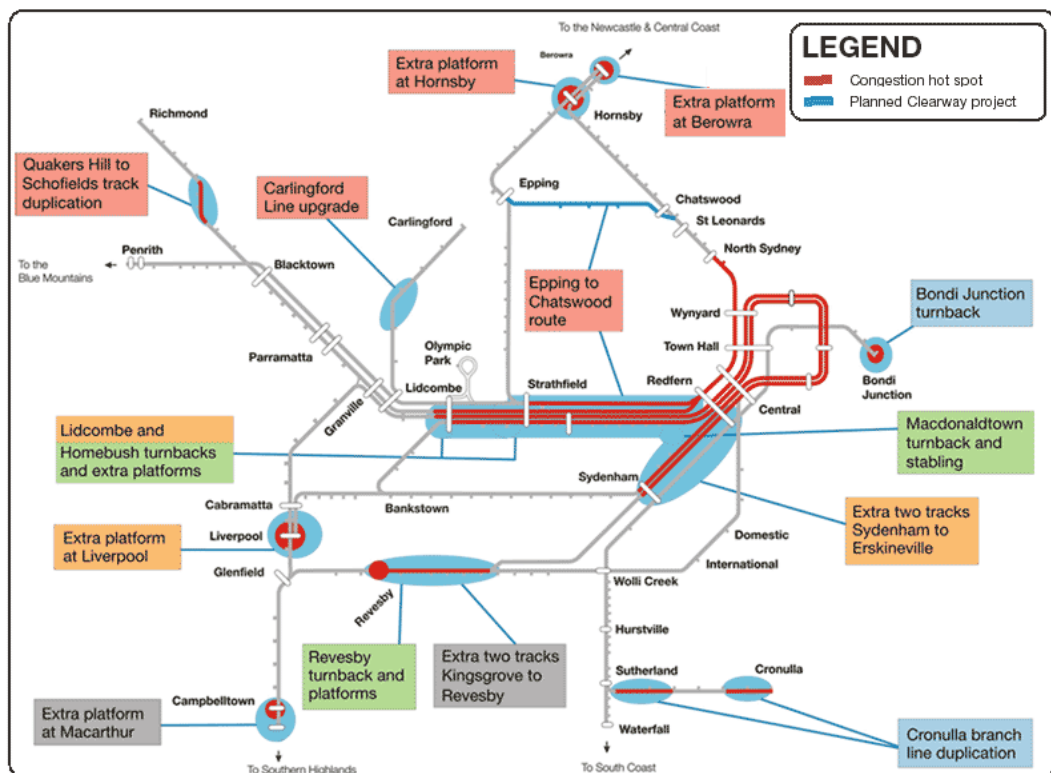
These infrastructure enhancements have, to a large extent, been incorporated in the NSW Government's "Rail Clearways" programme, publicly announced on 21 October 2004 by the Minister for Transport Services.

Capacity on the Airport Line is constrained by congestion on the City Circle and the East Hills Line. Adding any new rail services from a future heavy rail line in the F6 Corridor to the Airport Line will need to take these constraints into account.

### Rail Clearways Plan

According to the CityRail website (CityRail, 2004), "The NSW Government's Rail Clearways plan is a \$1 billion initiative of the NSW Government to improve capacity and reliability on CityRail's Sydney suburban network, presently recognised as one of the most complex in the world."

The website further states that "Due for completion in 2010, the Rail Clearways plan comprises 15 key projects that will separate the network's 14 metropolitan rail routes into five independent clearways. These projects will remove bottlenecks and junctions, reduce congestion and delays, and allow for simpler timetables for more reliable and frequent services." *Figure 4.2* below, obtained from the CityRail website, shows the proposed clearways projects. The media release announcing the clearways plan is contained in *Appendix A*.



**Figure 4.2: Proposed Rail Clearways Projects**

The Illawarra Line forms part of “Clearway 1 – Illawarra and ESR” and three of the 15 proposed Clearways projects, the Cronulla branch line duplication, two extra tracks between Sydenham and Erskineville and the Bondi Junction Turnback, directly affect capacity on this Clearway.

### **Rail in the Long Term**

The Christie Report tabled in the NSW Parliament in 2002 (but not endorsed by the State Government) includes plans beyond 2021 for a Cronulla – Miranda – Metro West – Dee Why line as a separate new operational sector. The first stage of this line is described as a possible section along the F6 corridor to Sydney Airport’s International Terminal Station, initially with light rail operation and later with heavy rail. The Miranda – Airport – City corridor could potentially provide relief for the Illawarra Line, which by then is likely to be severely capacity constrained.

### **4.1.3 Bus Services**

Connex and the State Transit Authority (STA) are the main services operators of local bus services along the F5 corridor. The STA runs a number of local bus services north of the Georges River. The private operator Connex also has a number of services within the corridor primarily servicing areas to the south and east from Hurstville rail station. The key destinations for bus routes in this area are Kogarah and Rockdale rail stations. Ramsgate and Sans Souci are well served by buses to Rockdale and Kogarah rail stations and Rockdale Plaza, both in frequency and coverage. frequent services operate between Brighton Le Sands and Rockdale rail station.

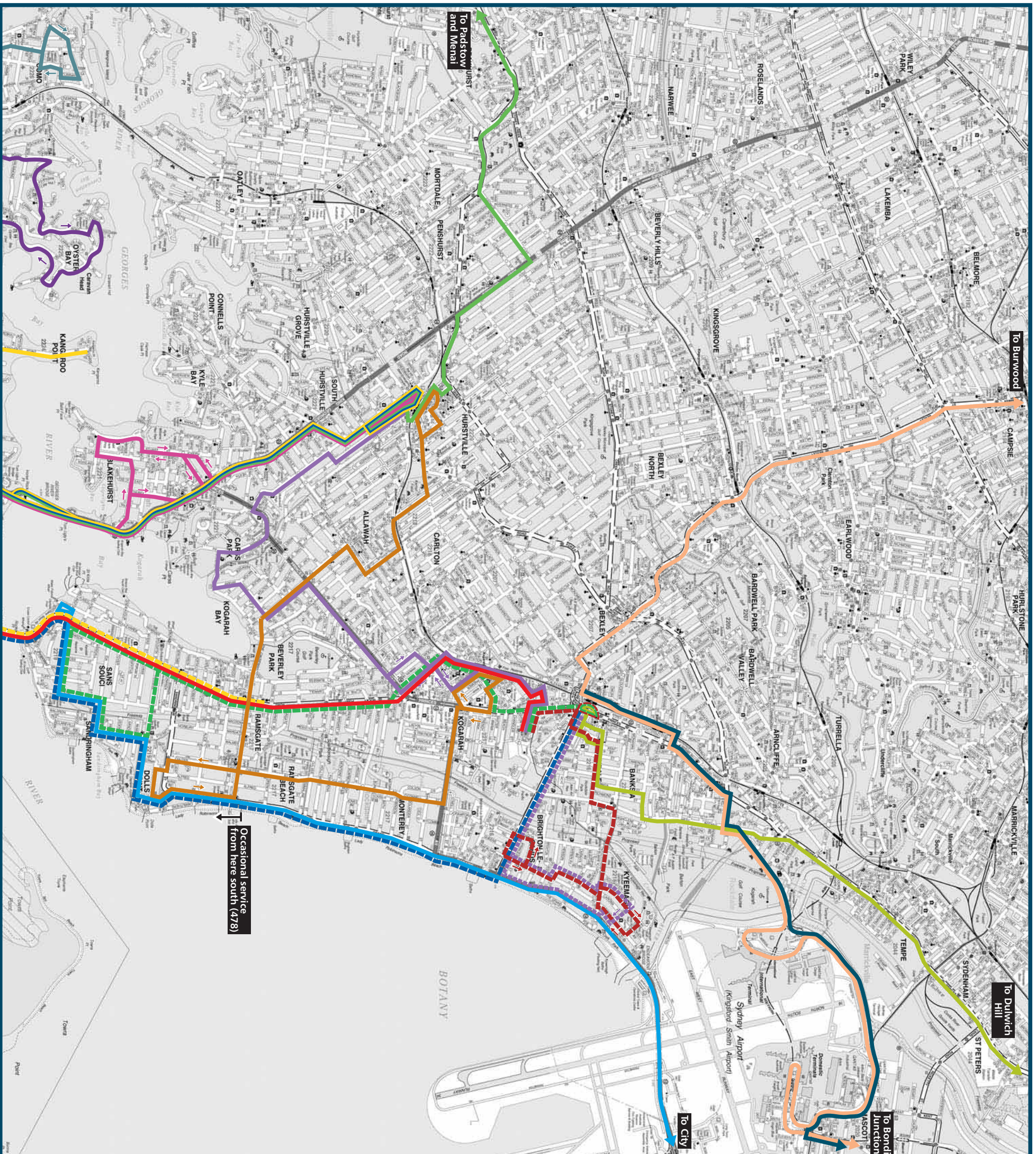
Private operators run the majority of local bus services south of the Georges River. The operators include Connex (which has the most services), Caringbah Bus Service, and Bus Link Crowthers. The key destinations for buses originating in this area are Miranda, Sutherland and Hurstville rail stations and shopping centres.

Cross-regional services currently operate between Miranda and Rockdale, Miranda and Hurstville, Burwood and Bondi Junction via Rockdale, Sans Souci and the CBD, Sutherland and Padstow. They provide key connections to the rail network and destinations between the major centres. There are currently no bus priority initiatives in the F6 Corridor. *Figure 4.3* and *4.4* show the current bus route structure for the study area. A summary of bus services is included in *Appendix E*.

On 17 March 2004 the Ministerial Review of Bus Services in New South Wales (the “Unsworth Report”) (Unsworth, 2004) was released. It recommended, inter alia, that “The Government should progressively implement, for Sydney, Wollongong, Newcastle and the Central Coast, a network of viable strategic corridors to provide fast, frequent, direct and convenient links to regional centres. The identification of suitable corridors should be finalised on the basis of patronage modelling results and stakeholder inputs”. The NSW Government, in its response, stated that “The concept of strategic corridors is supported. Those strategic corridors that will have the greatest patronage impact should be introduced first, subject to funding availability”. The Unsworth report further indicates that two of the proposed strategic corridors might make operate generally in close proximity to the F6 corridor:

- Route 21 from Miranda to the City;
- Route 29 Bondi Junction to Burwood; and
- Route 30 from Hurstville to Bondi Junction.

The map of proposed Sydney Metropolitan Bus Corridors is included as Figure 4.5.

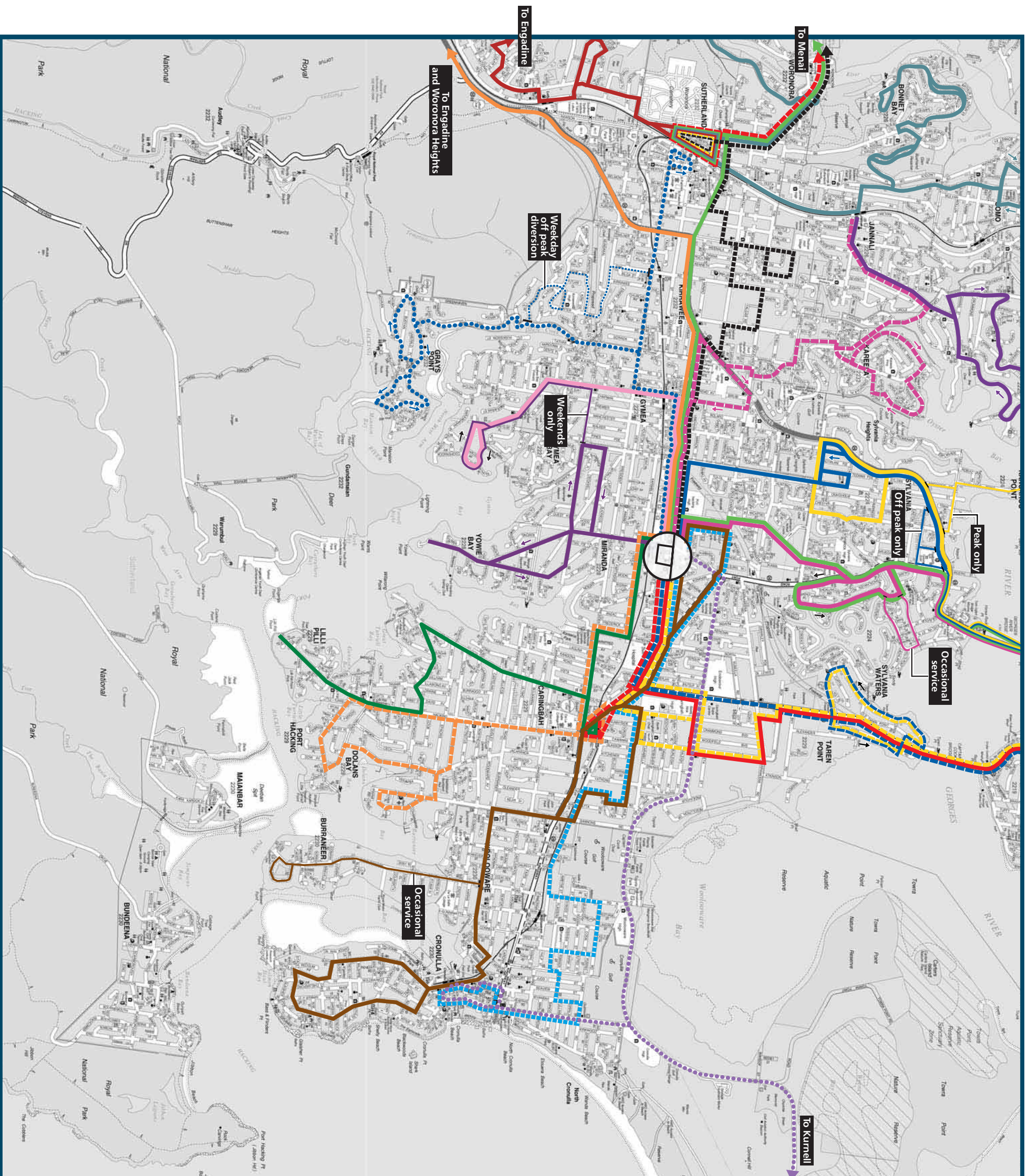


- Connector
- 972
- 971
- 958
- 947
- 479
- 478
- 477
- 476
- 475
- 474
- 470
- 425
- 410
- 400
- 303, X03

Note: Only bus routes relevant to the F6 Corridor are shown

Figure 4.3 EXISTING BUS ROUTES IN THE F6 CORRIDOR, NORTH OF GEORGES RIVER





- Connector
- 993
- 991
- 987
- 985
- 984
- 978
- 977
- 975
- 974
- 973
- 972
- 971
- 968
- 967
- 964
- 962
- 960
- 479
- 478
- 476
- 474
- 425

Note: Only bus routes relevant to the f6 Corridor are shown



Figure 4.4 EXISTING BUS ROUTES IN THE F6 CORRIDOR, SOUTH OF GEORGES RIVER

### Map 3: Sydney Metropolitan Strategic Bus Corridors

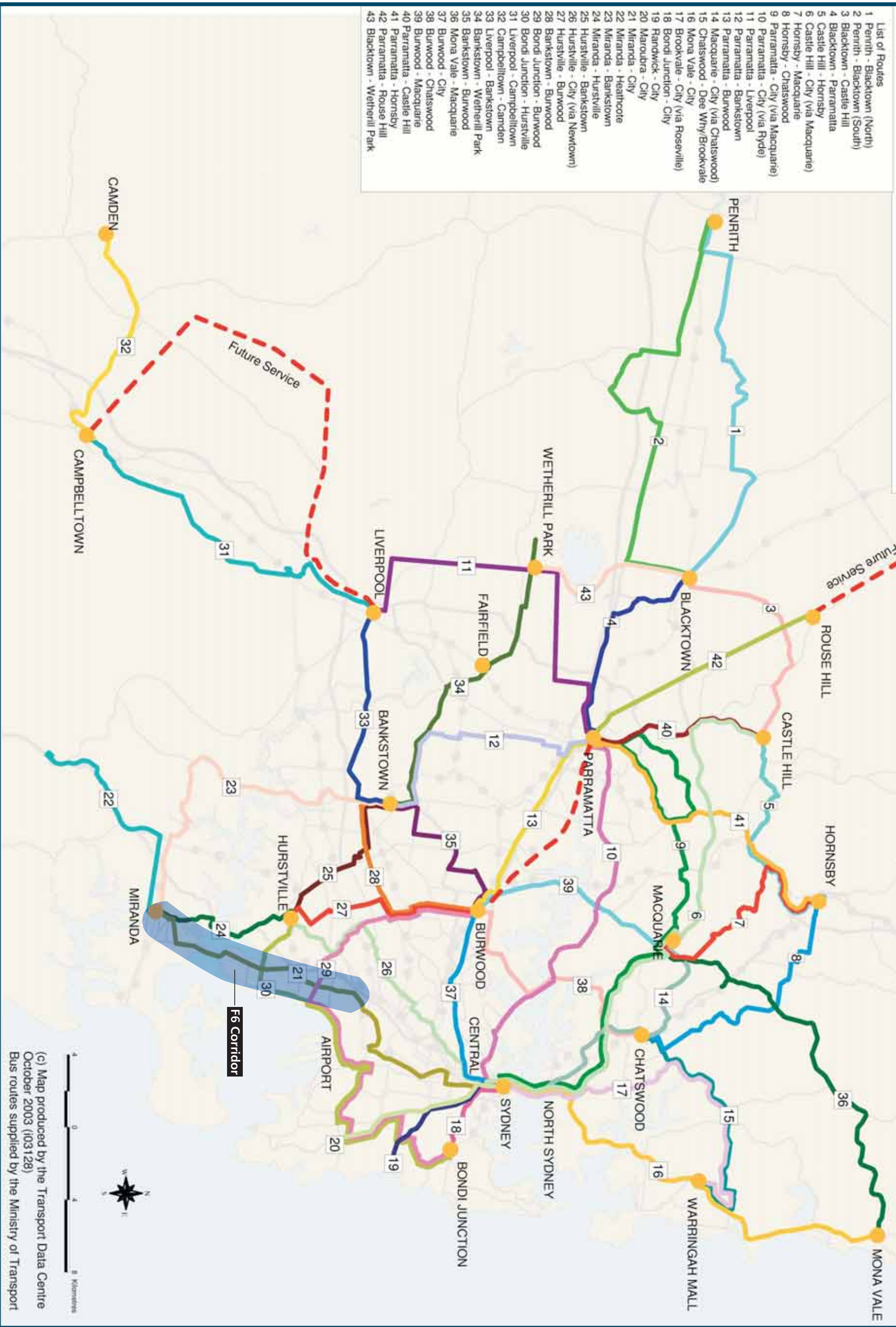


Figure 4.5 METROPOLITAN STRATEGIC BUS CORRIDORS

Map derived from Ministerial Review of Bus Services (Unsworth Report)

## 4.2 Travel from the Wollongong Region

### 4.2.1 Travel between Wollongong and Sydney

Table 4.1 shows that at the time of the 2001 census, 15 percent of Wollongong region's workforce (Wollongong, Kiama and Shellharbour LGAs) travel to Sydney for jobs - this represents about 15,700 trips.

**Table 4.1: Work Travel to Sydney from the Wollongong Region (2001)**

SLA	Workplace in Sydney SD	Total Workforce	% of Workforce in Sydney SD
Wollongong	13,361	72,417	18.5
Shellharbour	1,846	22,546	8.2
Kiama	481	7,762	6.2
TOTAL	15,688	102,725	15.3

Source: 2001 Journey to Work Data, TPDC.

Of these, the local government areas with the largest number of trips from Wollongong were Sutherland Shire (3 percent of total Wollongong work trips) Sydney Inner (1.9 percent), South Sydney (1 percent) Sydney Remainder (0.9 percent), Campbelltown (0.9 percent), Wollondilly (0.7 percent) and Bankstown (0.6 percent). Commuters are more likely to be public transport users than those travelling for other purposes. Of those Wollongong residents employed in Sydney, approximately 20 percent travelled by train, an estimated 3,400 trips.

Table 4.2 shows the choice of rail for commuting trips from Wollongong to Sydney varies considerably according to the actual destination. The main destinations and their mode shares to train are shown in the table below. The mode share to train is higher for those destinations with longer travel times from Wollongong and with strong parking controls.

**Table 4.2: Major Work destinations for Wollongong Commuters and Mode Share to Rail (2001 Census)**

Destination	Mode Share by Train of all Trips from Wollongong to Destination
Sydney Inner	76%
Sydney Remainder	63%
South Sydney	38%
North Sydney	61%
Hurstville	38%
Sutherland East	10%
Kogarah	25%
Rockdale	23%
Sutherland West	6%

Source: 2001 Journey to Work Data, TPDC.

## Existing and Future Rail Services

The Illawarra Rail Line is shared with the suburban trains to provide inter-urban services to Wollongong and the South Coast.

TMG International and PPK Environment and Infrastructure completed a Strategic Review of Rail Services from Sutherland to Wollongong for Rail Infrastructure Corporation in 2001. The review found a number of capacity constraints that limit operations to 15 trains per hour. The constraints would need to be addressed to allow an increase in demand for train paths from the South Coast. The constraints include:

- increasing the number of platforms and upgrading the freight refuges at Waterfall Station;
- relieving the capacity constraints between Sutherland and Hurstville;
- increasing capacity between Sydenham and Erskineville; and
- increasing the capacity of the turn-back at Bondi Junction.

These constraints were confirmed in an engineering assessment of the South Coast Railway Line by Connell Wagner in 2003. Three of these constraints are also recognised in the Government's Rail Clearways programme, previously discussed in *Section 4.1.2*.

## CityRail Patronage Estimates

There are currently three services per hour that start south of Waterfall Station to enter the Illawarra Rail line with forecasts indicating that this would need to increase to four trains an hour by 2016. Assuming CitiRail's prediction of a 50 percent increase on the Illawarra line over the next years, the peak passenger flows would increase to six trains per hour north of Waterfall.

Future patronage for rail services from Wollongong would be influenced by:

- proposed improvements to the South Coast Rail Line that may reduce overall travel times by rail;
- road improvements such as the Menai by-pass, King Georges road upgrades that may improve travel conditions for car users and reduce rail patronage;
- an increase in the population of the Wollongong region;
- lower than anticipated increase in employment opportunities in Wollongong region

CityRail, in its long-term planning, has estimated that interurban patronage could increase by 50 percent in the next 20 years based on projection of its patronage growth over the five years to 2002. PPK patronage forecasts completed for Rail Infrastructure Corporation in 2002 (PPK, 2002) indicated that the CityRail projections may overestimate demand but still forecast that additional services would have to be added to the current services originating in the Illawarra to accommodate demand for travel between the Illawarra and the Sydney region. These conclusions were supported by the outcomes of further patronage studies undertaken by Halcrow in 2003 (Halcrow Rail, 2003).

## **Key Issues & Findings**

The data previously summarised in *Table 4.1* and *Table 4.2* indicate that Wollongong residents that commute to Sydney have destinations across the metropolitan area but predominantly in the Sydney CBD, south and south-western Sydney. There is significant demand to major centres along the Illawarra line, including Sutherland, Hurstville and Rockdale. Consequently, it will be important that Wollongong trains continue to operate along the Illawarra Line in the long term. A public transport service from Wollongong through the F6 corridor would not add significantly to the quality of services to this region, as only a very small proportion of commuters have their destinations within the study area.

This conclusion suggests that even if a new rail line is developed in the F6 corridor, it is unlikely that there would be a requirement to connect it to the Illawarra line south of Sutherland to meet the needs of Wollongong travellers. However, one of the main advantages of developing public transport in the F6 corridor may well be the relief of capacity constraints on the Illawarra Line north of Sutherland, thereby freeing capacity to better serve the Wollongong region.

## **4.3 Road Network Proposals within the F6 Corridor**

### **4.3.1 St Peters Industrial Route (SPIR) Corridor**

A study establishing a future road corridor from Tempe to St Peters within the existing F6 County Road Corridor was completed by Kinhill for the RTA (Kinhill 1999). The new surface road is referred to as the St Peters Industrial Route or SPIRE, between Tempe and Campbell Road. The SPIRE connects the Princes Highway at Holbeach Avenue to Campbell Road at Euston Road and includes an upgrade of Campbell Road and a bridge structure across the Alexandra Canal with connections to Bourke Road and Gardeners Road.

The study identified a narrower road corridor and land within the F6 County Road reserve that was no longer required for road purposes and could be rezoned for other uses. The study was completed after the decision to relocate the M5 East Motorway via Arncliffe meant that the need to retain the Tempe County Road Corridor diminished. The local and State government agencies that own land within the corridor made representations to abandon the corridor. The study identified environmental and community issues relating to the design of a new road corridor and broadly identify relevant matters prior to further analysis and public exhibition phases as requiring when rezoning land. The study findings identified 14 hectares of land that would no longer be required for the road and would be available for rezoning.

Marrickville Council's preferred zoning for the 14 hectares of residual land is a balance of open space and viable industrial zoned land (Marrickville State of Environment Report, 2000).

The surplus F6 corridor land has not been rezoned in Council's current Local Environmental Plan and is currently zoned as a road reservation.

### **4.3.2 Miranda By-Pass**

Miranda is a major regional centre and a focus for retail, commercial and residential activity in the Sutherland Shire. The Kingsway is one of the major east-west routes across the Shire and carries over 25,000 AADT (2002) in the vicinity of Miranda.

The Kingsway is a primary access road serving the town centre, Miranda Rail Station and Westfield Shoppingtown. Sutherland Council has prepared a masterplan for the Kingsway with the objective of reducing the amount of through traffic on the Kingsway and improving the level of street amenity in Miranda town centre in the vicinity of Westfield. This is achieved through the provision of a by-pass road to remove through traffic from the centre. Council's surveys showed that through traffic constituted an average of just over 50% of traffic within the centre between 7am and 5pm. The removal of this traffic made it possible to improve pedestrian facilities and enhanced accessibility for public transport.

While the plan was put before the People's LEP Advisory Committee in Sept 2002 where it was endorsed for exhibition, this has not yet occurred and Council has not adopted the proposal.

The plans show a possible alignment for a by-pass road linking between The Kingsway and The Boulevarde within the F6 reservation. The concept includes 2 traffic and 2 bus lanes. This section of the F6 reservation varies in width from about 150 metres near The Kingsway to around 85 metres close to The Boulevarde and is currently used as open space and sports fields. On this basis there is ample room to accommodate both a public transport function and the by-pass road and therefore it is considered that the reservation should be retained in this area pending resolution of the by-pass plans. Additionally, planning and design of facilities in this section should ensure that both functions are preserved. It is noted that there is no current RTA proposal to develop this by-pass.

### **4.3.3 Brighton By-Pass**

During the course of this study it has become apparent that various proposals have emerged to develop a by-pass of Brighton-Le-Sands and the traffic congestion which develops around General Holmes Drive and Bay Street. In general terms, sections of the F6 corridor have been included in the by-pass proposals. There is no current RTA proposal to develop this by-pass.

## **4.4 A Road Reservation as a Public Transport Corridor**

The F6 road reservation is 20km long and varies between 60 metres to 150 metres wide. It was designated to allow for a major road connection between the South of Sydney to the CBD. The reservation is of adequate width to design a major freeway with safe and efficient conditions. A major road connection optimises the movement of vehicles along the main corridor minimising the interruptions to traffic flow. Major freeways are designed with a generally straight alignment, broad sweeping curves, limited vertical alignment changes to ensure safe sight distances. Traffic is generally separated from adjacent land uses, avoiding activity centres. Vehicles travelling in the opposite

direction and crossing traffic are typically separated, to facilitate higher speeds and increase safety.

A public transport corridor has different characteristics. In general, a public transport corridor can be designed to fit a much narrower width than a freeway or arterial road. Public transport infrastructure is designed to connect activity centres and maximise the accessibility of people along the corridor, integrating with surrounding land uses and traffic where appropriate. Public transport and vehicle access crossing the corridor are integrated to ensure increased connectivity and integration of services.

The characteristics of a major freeway and a public transport corridor are quite different. Therefore, careful consideration should be given to supportive land use, development, and integration issues if the development of the F6 reservation as a public transport corridor is pursued.

## **4.5 Summary of the Strategic Transport Context**

The review of the strategic planning context and traffic and transport issues indicates that:

- the F6 Corridor is in a strategic location connecting the southern suburbs of Sydney, particularly in the Sutherland Shire to the inner city;
- the reservation is adjacent to various land uses including open space, recreation space, residential, industrial and education facilities;
- the land use adjacent to the corridor has generally “turned its back” on the space, and a future change to public transport use would be expected to see significant land use change (i.e. residential and commercial development would have to be planned closer to the corridor) in future years;
- existing transport corridors serving these areas (road and rail) are congested during peak periods;
- Sutherland Council has considered a proposal for a by-pass of Miranda town centre using a section of the F6 reservation;
- additional pressures for urban consolidation will continue;
- the congestion on the Illawarra Rail Line is like to increase and a rail line in the F6 corridor may free up some capacity on the Illawarra Line;
- even if a new rail line is developed in the F6 corridor, it is unlikely that there would be a requirement to connect it to the Illawarra Line south of Sutherland to meet the needs of Wollongong travellers; and
- employment growth in the catchment will add to transport demand across all modes.