

# **Woollahra Municipal Council**

---

## **Woollahra Traffic & Transport Study**

---

### **Final Report**

---

**February 2000**

---

**Gutteridge Haskins & Davey Pty Ltd**

ACN 008 488 373

39 Regent Street, Railway Square Sydney NSW 2008 Australia

Telephone: 61 2 9690 7070 Facsimile: 61 2 9698 1780 E-mail: smack@ghd.com.au

**© Gutteridge Haskins & Davey Pty Ltd 2006**

This document is and shall remain the property of Gutteridge Haskins & Davey Pty Ltd. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

<b>Document Status</b>					
<b>Rev No.</b>	<b>Author</b>	<b>Reviewer</b>	<b>Approved for Issue</b>		
			<b>Name</b>	<b>Signature</b>	<b>Date</b>
0	S Mack	A Samsa	S Mack		July 99
1	S Mack	A Samsa	S Mack		Aug 99
2	S Mack	A Samsa	S Mack		Sep 99
3	A Samsa	S Mack	S Mack		Jan 00

---

# Contents

<b>Acknowledgements</b> .....	<b>i</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>iii</b>
<b>1. Introduction</b> .....	<b>1</b>
<b>1.1 Background</b> .....	<b>1</b>
<b>1.2 Scope of Study</b> .....	<b>1</b>
<b>2. Existing Conditions</b> .....	<b>3</b>
<b>2.1 Land Use and Development</b> .....	<b>3</b>
2.1.1 <i>Existing Land Use</i> .....	3
2.1.2 <i>Population and Dwelling Changes</i> .....	3
<b>2.2 Traffic Conditions and Network Performance</b> .....	<b>6</b>
2.2.1 <i>Classification of Road Network</i> .....	6
2.2.2 <i>Traffic Flows and Network Performance</i> .....	12
2.2.3 <i>Heavy Vehicle Movements</i> .....	16
<b>2.3 Parking Issues</b> .....	<b>16</b>
2.3.1 <i>Parking Inventory</i> .....	16
2.3.2 <i>Parking Utilisation</i> .....	18
2.3.3 <i>Major Issues Related to Commercial Centre Parking</i> .....	18
2.3.4 <i>Resident Parking Schemes</i> .....	20
2.3.5 <i>Commuter Parking</i> .....	21
2.3.6 <i>Parking for Visitors and Tourist Coaches</i> .....	23
<b>2.4 Public Transport Services</b> .....	<b>24</b>
2.4.1 <i>Rail Network</i> .....	24
2.4.2 <i>Bus Network</i> .....	25
2.4.3 <i>Bus / Rail Interchanges</i> .....	28
2.4.4 <i>Ferry Services</i> .....	29
<b>2.5 Impacts of Land Use and Infrastructure Development</b> .....	<b>31</b>
2.5.1 <i>Precinct 1 (Darling Point Area)</i> .....	31
2.5.2 <i>Precinct 2 (Paddington / Edgecliff Centre)</i> .....	34
2.5.3 <i>Precinct 3 (Double Bay)</i> .....	35
2.5.4 <i>Precinct 4 (Woollahra / Edgecliff / Double Bay / Bondi Junction)</i> .....	35
2.5.5 <i>Precinct 5 (Bellevue Hill)</i> .....	36
2.5.6 <i>Precinct 6 (Point Piper)</i> .....	36
2.5.7 <i>Precinct 7 (Rose Bay / Bellevue Hill)</i> .....	36
2.5.8 <i>Precinct 8 (Vaucluse / Watsons Bay)</i> .....	37
<b>2.6 External Impacts</b> .....	<b>38</b>
2.6.1 <i>Major Events</i> .....	38
2.6.2 <i>Visitor Traffic</i> .....	38
2.6.3 <i>School Traffic</i> .....	38

---

2.6.4 Recreation Traffic.....	39
<b>2.7 Major Issues Arising From Consultation Process</b>	<b>39</b>
2.7.1 Public Transport.....	39
2.7.2 Traffic Management Issues.....	41
2.7.3 Parking Issues.....	42
<b>3. Travel Demand &amp; Characteristics .....</b>	<b>43</b>
<b>3.1 Introduction</b>	<b>43</b>
<b>3.2 Geographic Distribution of Trips</b>	<b>43</b>
3.2.1 Journey To Work (JTW) Data .....	43
3.2.2 Average Weekday Trips.....	44
<b>3.3 Travel Purpose</b>	<b>45</b>
<b>3.4 Modal Distribution</b>	<b>46</b>
3.4.1 Journey To Work.....	46
3.4.2 Average Weekday Trips.....	48
<b>4. Future Scenarios &amp; Impacts .....</b>	<b>51</b>
<b>4.1 Future Land Use Growth and Control</b>	<b>51</b>
4.1.1 Residential .....	51
4.1.2 Retail and Commercial Development.....	53
<b>4.2 Population Increase and Changing Cultural Behaviour</b>	<b>54</b>
<b>4.3 Regional Impacts</b>	<b>57</b>
4.3.1 The Eastern Distributor .....	57
4.3.2 Green Square Development .....	57
4.3.3 Cross City Tunnel.....	58
4.3.4 Bondi Beach Rail Extension.....	59
4.3.5 Fox Movie Studios.....	60
<b>4.4 Public Transport Facilities and Impacts</b>	<b>60</b>
4.4.1 Effect of Population Growth .....	60
4.4.2 Effect of Increase in Mode Shift to Public Transport.....	61
4.4.3 Expected Benefits of Transit Lanes .....	61
<b>5. Strategy Development &amp; Recommendations .....</b>	<b>65</b>
<b>5.1 Introduction</b>	<b>65</b>
5.1.1 Strategic Framework .....	65
5.1.2 Objectives .....	65
<b>5.2 Travel Demand Management</b>	<b>66</b>
<b>5.3 Land Use Control Strategy</b>	<b>66</b>
5.3.1 Zoning Control.....	66
5.3.2 Development Application Requirements .....	67
5.3.3 Improved Amenity and Facilities .....	68
<b>5.4 Transport Service Strategy</b>	<b>68</b>
5.4.1 Overall Transport Objectives.....	68
5.4.2 State Transit Authority (STA) Bus Transport Strategy .....	69

---

5.4.3 Community (Local) Bus Service .....	70
5.4.4 Rail Service Improvements .....	73
5.4.5 Ferry Service Strategy .....	74
5.4.6 Tourist Coaches .....	75
5.4.7 Bicycle Travel Strategy .....	75
5.4.8 Pedestrian Strategies .....	76
5.4.9 Access Provisions for People With Disabilities .....	77
<b>5.5 Traffic Management Strategy</b> .....	<b>79</b>
5.5.1 Arterial Road Traffic Management .....	79
5.5.2 Local Traffic Management .....	80
5.5.3 Car Pooling .....	81
<b>5.6 Parking Strategy</b> .....	<b>82</b>
5.6.1 Pay Parking .....	82
5.6.2 Commercial Centre Parking .....	83
5.6.3 Local Strategies .....	85
5.6.4 Commuter Parking .....	88
5.6.5 Resident Parking .....	88
5.6.6 Bus and Coach Parking .....	89
5.6.7 Visitor Parking .....	90
<b>5.7 Community Transport Forum</b> .....	<b>91</b>
<b>5.8 Summary of Key Recommended Strategies</b> .....	<b>91</b>
5.8.1 Land Use .....	91
5.8.2 Transport Services .....	92
5.8.3 Road Network and Traffic Management .....	93
5.8.4 Parking Strategy .....	93

## **6. Action Plan .....** **95**

## **BIBLIOGRAPHY**

## **Appendices**

- A Working Paper No.1: Parking Issues**
- B Working Paper No.2: Public Transport**
- C Working Paper No.3: Traffic Operations**
- D Working Paper No.4: Land Use Assessment**
- E Working Paper No.5: Traffic Modelling**
- F Working Paper No.6: Community Consultation**

---

## **Acknowledgements**

In preparing this final report, the following organisations and individuals have been consulted. Their assistance and contributions are gratefully acknowledged:

- Woollahra Municipal Council  
Wayne Ryland  
Greg Stewart  
Chris Bluett  
Chris Dawson
- Roads and Traffic Authority  
Graham Richards  
Angelo Arul
- State Transit Authority  
Wendy Adam  
Stephen Trimble
- South Sydney City Council  
Peter Donky  
Joe Gomes  
John Hart
- Murray Coaches  
Gerry Cole
- Waverley Council  
Nick Karahlis  
Don Gennedes  
Angela Boniface
- State Rail Authority  
Peter Penklis
- Randwick Council  
John Stephens
- BikeEAST Bicycle NSW  
Adrian Boss
- The Paddington Society  
Bill Morrison  
Bruce Rankin
- City Rail Bondi Junction  
Fred Desiderio
- Vaocluse Progress  
Association  
Hylda Rolfe
- Rose Bay Residents  
Association  
Jennifer Turner
- Queen St and West  
Woollahra Society and Royal  
Motor Yacht Club NSW  
Ken Gresham
- Woollahra Access Committee  
Pip Parsonson  
Wendy Cohen
- Bus and Coach Association  
Richard Wheatley
- Double Bay Chamber of  
Commerce  
Georgie Brown
- Bellevue Hill Resident Action  
Group  
Fred Waring
- NSW Taxis Council  
Harry Ulman

- 
- Bellevue Hill Resident Action Group Fred Waring
  - Rose Bay Chamber of Commerce Malcolm Kofsky
  - Paddington Chamber of Commerce
  - NSW Department of Education
  - Bellevue Hill Resident Action Group
  - Double Bay Ward
  - d'Albora Marina

The study team comprises:

- Wayne Ryland: Project Coordinator, Woollahra Council
- Stan Mack: Study Manager, GHD
- Alan Samsa: Senior Traffic Engineer, GHD
- Sebastian Smyth: Transport Planner, GHD
- Glen Varley: Transport Modeller, Sims Varley Pty Ltd
- Amanda Raleigh: Consultation Planner, GHD
- Alessandra Pinzone: Consultation Planner, GHD
- Kathy Randell: Graphics Illustrator, GHD
- Ashley Simpson: Engineering Assistant, GHD

The study team has endeavoured to use plain English in compiling the text of this report. As this is a technical document, we do not apologise for using technical terms and expressions. Where possible, explanations of these terms and expressions have been included in the text.

---

# EXECUTIVE SUMMARY

## Background & Scope of Study

This study was commissioned by Woollahra Municipal Council with two main objectives:

- To analyse the performance of the existing traffic and transport system, and identify and investigate the impacts which affect Woollahra and the adjoining municipalities.
- To develop strategies which will improve the operation of the transport system and reduce the use of private cars in the long term.

The scope of this study includes the following tasks:

- Examine the operation of the existing transport network and identify issues related to traffic network operations, parking demand and provisions, public transport provisions and impacts of land use changes and external effects.
- Estimate future transport and travel demand based on trends of existing growth and projected changes in land use and demographic patterns.
- Conduct public consultation to seek input from stakeholders.
- Establish a traffic / transport model of the existing network and test the effects of changes in land use, changes in mode split, public transport improvement options, and traffic management options on the network operation.
- Develop integrated transport strategies to meet Council's transport objectives of reducing car use, improving the public transport system, improving accessible facilities, and encouraging alternative modes such as walking and cycling.

## Existing Conditions

### Land Use and Population Characteristics

Existing land use and potential developments are detailed in *Working Paper No.4* and summarised in *Chapter Two* of the main report (the Report)

Past census data indicates that there has been a cumulative decline of population of 19% in Woollahra since 1971, corresponding to an average of 1% per annum. Total number of private dwellings has also declined since 1976, but the number of occupied dwelling has slightly increased due to an increase in medium/high density housing.

Seventy five percent (75%) of the total occupied dwellings are medium to high density housing with 41% flats and apartments of three storeys or more.

---

## Road Network and Traffic Conditions

The existing road hierarchy is shown in *Figure 2.2* of the Report.

The major arterial road network consists of two spine roads: New South Head Road and Old South Head Road / Oxford Street, with major intersecting roads such as Ocean Street and O'Sullivan Road.

The study has also identified a number of major local roads with collector and major access functions. These roads are described in *Table 2.3* of the Report.

The arterial spine roads carry the bulk of the traffic generated in Woollahra which vary substantially between the eastern and western extremities of the corridors. Detailed traffic flow volumes and operational conditions are documented in *Tables 2.3* and *2.4* of *Working Paper No.3*.

Analysis of peak hour performance of major intersections in the road network has been undertaken and the results are shown in *Table 2.4* of the Report. The following intersections have been identified to be critical intersections that are approaching saturation in peak periods:

Ocean Street / Queen Street	Mainly due to right turns
Syd Einfeld Drive / Oxford Street / York Road	All movements
Old South Head Road / Victoria Road	All movements
Old South Head Road / O'Sullivan Road	All movements
New South Head Road / Ocean Street	Peak hour congestion
New South Head Road / New Beach Road	Peak hour congestion
Oxford Street / Queen Street	Peak hour congestion
Oxford Street / South Dowling Street	Peak hour congestion

## Parking Issues

A detailed study of Parking issues has been undertaken and the results are detailed in *Working Paper No.1*.

A parking inventory of existing off street parking provisions in major centres was made and detailed in *Table 2.5* of the Report.

Analysis of parking utilisation at major centres indicate that most car parks exceed 90% occupancy during the peak periods. *Table 2.6* of this report detailed the results of the survey.

On-street parking spaces at most centres are fully occupied in the peak periods, with little or no spare capacity. Analysis of parking issues related to each major centre is presented in *Section 2.3.3* of the Report.

Discussions on resident parking schemes, and on issues relating to commuter parking and tourist coach parking are detailed in *Working Paper No.1* and in *Sections 2.3.4, 2.3.5* and *2.3.6* of the Report.

---

## **Transport Services**

### ***Rail Network***

The Eastern Suburbs Line services the Woollahra municipality with two stations, Edgecliff and the Bondi Junction. The rail network accounts for 6% of all trips and 14% of journey to work trips (including joint bus-rail trips) generated in Woollahra. This rail line is one of the most patronised railway lines in Sydney, with some 37,000 passengers passing through the station at Bondi Junction daily in 1996/97. Currently the Central-Bondi Junction Service is operating at a frequency of approximately five minutes during the commuter peaks, with little spare seating capacity in the peak service.

The interchange at Bondi Junction is currently being upgraded by Cityrail and will remain one of the most important public transport interchanges in Sydney.

Edgecliff Station is carrying approximately 14,000 passengers daily. The station less effectively utilised possibly due to its location, smaller catchment area, and closer proximity to the Sydney CBD. Concern has been expressed by Woollahra residents regarding the safety aspects of using the station after hours. State Rail Authority is currently planning to upgrade the station facilities, with the first stage to improve the lighting at the station.

### ***Bus Network***

Sydney Buses operates all commercial services in Woollahra with a reasonably extensive network covering most parts of the municipality. Most services are operating along the east-west corridor with major destinations at Sydney CBD (Circular Quay) and Bondi Junction. Service frequencies are acceptable in the peak although punctuality and journey times are less desirable due to road network congestion and route efficiency. There is also a lack of an efficient north-south connectivity, servicing Woollahra and other Eastern Suburbs.

Details of Bus services are described in *Section 2.5* of this report.

### ***Ferry Services***

Currently weekday ferry services operate between Circular Quay Rose Bay, Double Bay and Darling Point in a circuit. Services run between 7.00 am and 7.30 pm, with 25 minute head way in the peak hour and 60 minutes off peak. Weekend services operate between (9:00 am and 6:00 pm).

All wharves are connected by scheduled STA buses with reasonable frequencies, although there is a need to improve the bus/ferry connection by reducing the interchange waiting time.

Journey To Work (JTW) data provided by Department of Transport indicate that ferries carry an insignificant percentage (less than 1 %) of total work trips generated in Woollahra. Discussions with STA supports the findings

---

that even if the existing patronage is doubled during the commuter peaks, the effect on the overall travel pattern is insignificant.

Despite its insignificance as a commuter service, Ferry services operating outside the commuter peaks are a significant contribution to the overall public transport facilities for Woollahra. This is indicated by the high level of patronage at lunch time services observed at the Watsons Bay wharf. Off-peak ferry services could be promoted as a major tourist attraction to reduce the amount of intrusion by tourist vehicles.

It is noted that STA is currently commissioning a specialist consultant to investigate the feasibility of upgrading and increasing frequencies of Sydney ferry services, including those in Woollahra.

### **Cycling Network**

There is very little or no bicycle travel facilities in the municipality at present. The recently prepared Woollahra Bike Plan is currently on exhibition. This document provides a proposed cycling network and associated facilities for the municipality. Major issues will be the topographic constraints of the area which, coupled with increasing vehicular traffic, are extremely hostile to bicycle travel.

### **Major Issues**

Major issues related to existing traffic and transport networks have been identified through the consultation process. These issues ranging from effects of through traffic in local precincts, parking problems to public service deficiencies, are detailed in *Working Paper No.5: Consultation* and summarised in *Section 2.7* of this report.

## **Travel Characteristics**

*Chapter 3* of this report documents the existing travel characteristics in Woollahra based on 1996 census data and JTW information provided by Department of Transport.

### **Geographic Distribution of Trips**

Thirty percent (30%) of the journey to work trips to Woollahra originated locally and 44% come from seven neighbouring municipalities.

The total work force in Woollahra generates some 27,000 journey to work trips of which 20% (or approximately 5,400 work trips) have their destinations within the municipality.

About 45% of Woollahra's work force travel to work either in Sydney CBD or in North Sydney.

Details of travel purpose and geographic distribution of JTW and Weekday trips are documented in *Sections 3.2.1* and *3.2.2* of this report.

## Mode Split

The modal distribution of JTW trips to and from Woollahra is shown in *Table ES.1* following.

**Table ES.1 - Percentage Mode Split  
(JTW From/To Woollahra)**

Modal Distribution of JTW from Woollahra to all SLA's (100% = 26,708 trips)		Modal Distribution of JTW to Woollahra from all SLA's (100% = 17,664 trips)	
Car as driver	42	Car as driver	46
Train	14	Train	11
Bus	10	Bus	8
Walking	7	Walking	8
Other*	27	Other*	27
<b>Total</b>	<b>100</b>	<b>Total</b>	<b>100</b>

Note: 'Other' modes include those who worked at home or did not go to work on the day of survey.

*Table ES.2* following, presents a comparison of JTW trips within Woollahra and those to Sydney CBD.

**Table ES.2 - Percentage Mode Split  
(JTW within Woollahra and to Sydney CBD)**

Woollahra to Woollahra		Woollahra to Sydney CBD	
Car as Driver	35	Car as Driver	25
Car as Passenger	4	Car as Passenger	7
Train	2	Train	29
Bus	4	Bus	20
Walking	18	Walking	3
Other*	37	Other*	16
<b>Total</b>	<b>100</b>	<b>Total</b>	<b>100</b>

Note: 'Other\*' modes include those who worked at home or did not go to work on the day of survey.

*Table ES.3* following, shows the modal distribution of weekdays trips (other than JTW trips) originated from Woollahra, compared with the Eastern Suburbs and Sydney Metropolitan area. It is noted that the ferry and bicycle trips did not appear to be significant, although it is suspected that these percentages would have been significantly increased since the data was taken in 1991.

**Table ES.3 - Modal Distribution, Weekday Trips**

Travel Mode	Woollahra #	Eastern Suburbs *	Sydney Metro *
Car Driver	46.4	35.2	45.2
Car passenger	20.1	13.1	25.2
Train	4.4	2.6	4.1
Bus	8.9	18.2	4.3
Ferry	0.5	-	0.2
Bicycle	0.4	1.7	0.7
Walk	16.9	28.3	19.5
Taxi	2.4	0.9	0.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

\* Source: Transport Study Group 'HIS Summary Results Report 94/6 May 1994'

# Source: Data Base from Home Interview Survey 1991.

## Future Scenarios and Impacts

### Land Use Changes

An estimate of the potential yield has been made in the *Working Paper No. 4: Land Use*, based on trend of current development and available stock of 2(b) zones. A maximum potential increase of some 6,355 dwellings was predicted in the working paper for the short and medium terms.

There is a limited potential for retail and commercial development in Woollahra, apart from Bondi Junction. The forecast for the foreseeable future indicates a maximum increase of retail and commercial space of approximately 24,300m<sup>2</sup>, including the proposed redevelopment (23,000m<sup>2</sup>) by Westfield Shopping Town in Bondi Junction. The long term potential for commercial development (over 20 years) in Bondi Junction, however, could be as high as 144,460m<sup>2</sup> floor space.

The short term increase in floor space of 1,300m<sup>2</sup> in centres other than Bondi Junction represents only approximately 1% of the total retail/commercial floor area in the rest of the municipality.

Traffic impacts on network operation due to land use developments and natural population growth has been assessed with the NETANAL traffic model and the results are summarised in *Working Paper No.5: Traffic Modelling* and illustrated in *Figures 4.1 and 4.2* of this report.

Generally, operations of the arterial roads will deteriorate for future networks due to natural population growth and land use development as can be seen by the rising Degree of Saturation (DS) values at critical intersections. This is based on the assumption that no improvements will be made to the arterial road system in Woollahra.

---

## **Mode Split Shift**

Effects of target modal shift of 20% JTW trips to public transport, (approximately 10% of all peak hour trips) has also been assessed in the model. Results are illustrated in *Figures 4.3* and *4.4* of this report.

The major effects of mode split shift are not apparent as shown in the figures, which show minimal changes in the DS values. However, as documented in *Working Paper No.5: Traffic Modelling*, the mode split shifts will cause a major change in traffic movement patterns in Woollahra. Most traffic presently using the local roads for shorter trips will be brought back to the arterial road system, optimising the performance of the total network.

## **Population Increase and Changing Behaviour**

The worst case scenario of estimated future population growth may amount to approximately 12,000 people, giving a total population of approximately 60,000 by 2,030. This brings the municipality back to its population level in the late 60's and early 70's.

Present traffic flow data within the network has indicated that there has been significant increases in traffic generation within the municipality, apart from impacts due to external pressure and through traffic. Such increases are mainly increases in number of car trips generated per household due to change in cultural behaviour and affluence of the society since the 60's.

If this car trip generation rate is allowed to continue, there will be significant increases in traffic in the road network and the impacts on the performance of major intersections are shown by the rising values of Degree of Saturation provided in *Working Paper No.5: Traffic Modelling*.

## **Regional Impacts**

### ***The Eastern Distributor***

Traffic modelling indicates that there will be significant reductions in peak traffic flows from southern and south eastern suburbs through Woollahra, and predicts that all access roads to the Eastern Distributor, such as Anzac parade, and Moore Park Road will experience in traffic increase during peak periods.

### ***Green Square Development***

This development is expected to generate significant AM peak traffic movements using the Distributor. Traffic modelling does not indicate any significant impact due to this development on the road network in Woollahra, but increases in traffic flows on the Eastern Distributor will indirectly reduce the benefit of the Distributor for Woollahra.

### ***Cross City Tunnel***

Traffic modelling indicates that there will be some significant AM peak traffic increases in Woollahra road network due to the Cross City Tunnel,

---

proposed to be constructed in 2006 under William Street and joining the Kings Cross Tunnel and the Western Distributor.

The projected impacts on the adjacent road network as a whole will be significantly less if the proposed Cross City Tunnel is located further south of the Sydney CBD.

#### ***Bondi Beach Rail Extension***

The current Eastern Suburbs Line is operating at capacity during the peak periods. The proposed Bondi Beach extension will provide an alternate mode choice for those who travel to Bondi Beach, and opportunities for increase in carrying capacity of the Eastern Suburbs Line. Traffic modelling does not show any significant impact on the road network operation due to this proposal.

#### ***Fox Movie Studios***

No significant impact on the operation of the road network in Woollahra is predicted due to the Fox Studios development. Changes to localised traffic management to provide efficient access will be required.

## **Strategy Development**

### **Strategy Framework and Objectives**

Sustainable development is now widely accepted by the general public as the future goal. Local governments can play a significant role in achieving this goal through efforts in working with various government agencies and the community. The strategies developed in this study are regarded as the beginning of a planning process to achieve the following objectives:

- To reduce the need to travel (particularly by car)
- To encourage travelling in more sustainable ways (modes of transport)
- To reduce external impacts on the transport network (land use)

### **Community Transport Forum**

It is suggested a Traffic and Transport Committee comprised of residents and commercial representatives be formed with the purpose of assisting Council in resolving traffic and transport issues, and reviewing and implementing Council policies. Through this committee, Council could undertake the following:

- work with local precinct representatives to provide options and marketing materials
- promote flexible working hours (starting from local base employment)
- encourage small business to work from home (in order to reduce the need for commuting)
- resolve issues relating to local transport needs

- 
- seek input and comments from the community on issues which may become controversial
  - continue and extend the consultation process for this study as a basis for on-going community participation

## **Summary of Key Recommendations**

### ***Land Use***

- Exert greater control on land use zoning with objectives to:
  - ⇒ establish a hierarchy of centres and increase the choice in land use such as mixed development (We understand that this objective has been achieved with the current business zoning contained in Woollahra LEP 95)
  - ⇒ finalise the development of appropriate densities in accordance with location proximity to public transport (currently being incorporated in the draft Residential DCP 99)
  - ⇒ extend existing, or create new mixed use zones for all centres
- Provide incentives and penalties in development control plans such as:
  - ⇒ requirement from commercial development to submit transport plans
  - ⇒ limits on parking provision
  - ⇒ provision for density bonuses and/or lower Section 94 contributions for developments located in convenient proximity to public transport access, and/or reduction in car parking provision
- Improve pedestrian amenity and facilities (including accessible facilities) through the following:
  - ⇒ develop standards and guidelines for the planning and design of pedestrian facilities towards better safety and amenity (it is understood that recent Centre DCP's prepared for Rose Bay and Double Bays have incorporated the necessary standards and guidelines)
  - ⇒ prepare pedestrian management plans to include a program of street improvements focused on pedestrian amenity in areas of pedestrian concentration

### ***Transport Services***

- Improve existing STA bus services through Council's lobbying for the following initiatives:
  - ⇒ investigating and providing bus priority measures (action by STA and RTA)

- 
- ⇒ installing new, and extending future Bus/Transit lanes on the major arterial roads in the municipality (action by STA/RTA)
  - ⇒ reviewing existing bus timetable and route strategies to improve operational frequency and punctuality (action by STA)
  - ⇒ investigating the need for provision of shelters, information displays and accessible facilities at bus stops and terminals (action by STA)
  - Improving access to/from major services centres
    - ⇒ conducting a study to investigate the feasibility of a shuttle bus service between major centres
  - Improve rail service and plan for future growth in patronage
    - ⇒ improve existing operation facilities at Edgecliff Station including accessible facilities (action by STA)
    - ⇒ initiate action to request Cityrail to review the plan for future extension of Eastern Suburbs Line to Bondi Beach, and increase frequency and capacity (action by SRA)
    - ⇒ Council to lobby investigation of the feasibility for reintroducing LRT service to the municipality as a long term strategy
  - Improve ferry services
    - ⇒ improve access to the ferry terminals with facilities for ‘kiss-n-ride’ and limited parking (action by STA)
    - ⇒ improve footpaths, cycling access and accessible facilities at ferry terminals (action by Council)
    - ⇒ investigate the feasibility of providing more direct and frequent services (action by STA)

### ***Road Network and Traffic Management***

- Council to adopt an accepted road hierarchy for Woollahra
- RTA to improve short term arterial road operation efficiency through a range of traffic management measures such as:
  - ⇒ optimising traffic signal operations with priority for bus movements where possible
  - ⇒ restricting right turns on major roads during peak hours
  - ⇒ introducing ‘left turn with care’ where feasible
  - ⇒ optimising bus stop locations
- RTA/STA to improve long term passenger carrying capacity of the arterial system rather than vehicle capacity, through improvement of

---

public transport services (eg. planning for future Bus/Transit lanes, mass transit service)

- Council to implement local traffic management strategy to include:
  - ⇒ implementation of 50 km/h speed limit zones, where considered beneficial after the initial trial
  - ⇒ review of current local traffic control philosophy
  - ⇒ improvement of urban design and pedestrian amenity in local areas as part of traffic calming strategy
  - ⇒ development of shared zones within local precincts
- Consider car pooling as an option of a traffic demand management strategy

### ***Parking Strategy***

- Introducing pay parking as a means of managing on-street parking to provide equitable use of available but scarce spaces.
- Rationalise on-street parking control in major centres such as the Double Bay commercial centre, in order to:
  - ⇒ reduce opportunities for long stay parking
  - ⇒ encourage short stay parking and high turnover
  - ⇒ encourage ‘shared parking’ after business hours
  - ⇒ consider permit parking schemes for business use
  - ⇒ limit parking provision for employees in the long term
  - ⇒ reduce parking provision rates for future developments
  - ⇒ provide density incentive for trade offs in reduction of parking spaces
- Reduction of commuter parking provisions at major transport nodes in the long term through gradual improvement in public transport interchange services. Short term provision may be considered to encourage change of modes to public transport.
- Phasing out resident parking schemes in the long term. Short term provisions should be rationalised in terms of eligibility and permit charge.
- Provision for tour bus and coach parking at designated locations
- Provision for adequate visitor parking in future developments

### ***Disability Access***

- Develop a fully integrated accessible traffic and transport system incorporating facilities at transport nodes to rail, bus and ferry services

- 
- Provide access facilities generally, for people with disabilities, including undertaking disabled access audits (action by Council)

***Bicycle Strategy***

- Provide facilities for improved bicycle travel by staging the implementation of the “Woollahra Bicycle Plan” (action by Council)

**Action Plan**

An action plan based on the recommended strategies has been developed. This plan, shown in *Table ES.4* following, provides a list of actions, both long term and short term, their priorities, and the extent of Council responsibility.

**Table ES.4 - Integrated Transport Strategy Action Plan**

Action		Strategy	Context (examples)	Extent of Council Responsibility	Other Agencies Involved	Current Council Commitments	Priority
<b>General</b>							
1.1	Establish 'Community Transport Forum'		-	Full		None	A
1.2	Adopt road hierarchy as a basis for planning and design			Major role	RTA	Current road hierarchy	A
1.3	On-going review of Council's Transport Strategy		-	Full		Consultation group	A
<b>Land Use</b>							
2.1	Review existing land use plan and zoning to favour desired transport modes at all planning levels	Establish principles and criteria for high density residential development to reduce car dependency	Bondi Junction; Edgecliff and Double Bay	Major role	DUAP	On-going	A
2.2	Review existing Development Control Plan and S94 plan	Provide incentives and penalties	Area wide	Major role	DUAP / RTA	On-going	A
2.3	Develop guidelines for pedestrian facilities planning and design incorporating accessible facilities	Improve pedestrian amenity	Area wide; Centre DCP's	Full	RTA	None	A
2.4	Prepare pedestrian management plans incorporating accessible facilities	Improve pedestrian amenity	Major centres and tourist areas; Centre DCP's	Full	RTA	None	A

Action	Strategy	Context (examples)	Extent of Council Responsibility	Other Agencies Involved	Current Council Commitments	Priority	
<b>Transport Services</b>							
3.1	Investigate and implement bus priority measures including Transit/Bus lanes and signal priority	Improve long term passenger carrying capacity	New South Head Road; Old South Head Rd and Oxford St	Council to initiate and lobby State Authorities	RTA / STA	On-going	<b>A / B</b>
3.2	Review bus operations, route strategy, frequencies and timetable and incorporate accessible facilities	Improve STA bus services	Area wide, particularly off peak services	Council to lobby STA	STA	None	<b>A / B</b>
3.3	Investigate need for bus shelters and information display incorporating accessible facilities	Improve STA bus services	Area wide	Council to lobby STA	STA	None	<b>A / B</b>
3.4	Investigate feasibility for community bus service incorporating accessible facilities	Improve access to major centres	Between major centres	As initiator and Coordinator	STA / private operators	None	<b>C</b>
3.5	Investigate operational and accessible performance of Edgecliff Interchange including disabled access	Improve rail service	Edgecliff centre	Advocacy	STA / Cityrail responsibility	None	<b>A / B</b>
3.6	Initiate action pertaining to improvements to the Eastern Suburbs Line incorporating accessible facilities	Increase capacity of Eastern Suburbs Line	Bondi Junction	As initiator	Cityrail	On-going	<b>B</b>
3.7	Initiate action to investigate LRT proposals as a long term strategy	Support LRT as a long term strategy	Along main spine road/s	Council to lobby State Government	DoT	None	<b>D</b>

Action	Strategy	Context (examples)	Extent of Council Responsibility	Other Agencies Involved	Current Council Commitments	Priority	
3.8	Improve access (including accessible facilities) to ferry terminals and operation of ferry service	Maintain and Improve Ferry services	All Ferry services	As initiator and coordinator	STA	None	<b>B</b>
3.9	Provide facilities for better bicycle travel (implement “Woollahra Bike Plan” in stages)	Support alternative travel modes	Area wide	Full	RTA	Project initiated	<b>A / B</b>
3.10	Undertake disabled access audits and make recommendations for accessible facilities generally (develop fully integrated accessible transport system)	Support equal access principles	Major centres	Full	STA/DoT/RTA	Established WAC	<b>A</b>
<b>Road Network and Traffic Management</b>							
4.1	Investigate improvements options for intersections currently operating at capacity with long delays	Improve short term arterial road operation efficiency	Intersections identified in Section 2.2 of report	As initiator	RTA	On-going	<b>A / B</b>
4.2	Prepare investigations and implementation plans for T2 Transit Lanes and transit priority signal system	Improve long term passenger carrying capacity (see 3.1)	(See 3.1)	Council to initiate and Lobby	RTA / STA	On-going	<b>A / B</b>
4.3	Introduce trial for 50 km/h speed limit in local areas	Improve road safety and amenity in local areas	Darling Point	Major role	RTA	Initiated	<b>A</b>
4.4	Implement local traffic calming strategy	Improve local amenity	Area wide	Full	RTA	On-going	<b>A / B</b>
4.5	Initiate action to investigate feasibility for car-pooling	Reduce peak hour commuter traffic		As initiator and coordinator	(Easy Share)	None	<b>C / D</b>

Action	Strategy	Context (examples)	Extent of Council Responsibility	Other Agencies Involved	Current Council Commitments	Priority	
4.6	Conduct an audit of all signs and line markings and prepare maintenance program	Improve amenity and safety	Area wide	Major	RTA	None	A
<b>Parking Strategy (Including Accessible Parking)</b>							
5.1	Implement pay parking schemes	Provide equitable use of available parking spaces	Major centre	Full	RTA	Initiated	A / B
5.2	Review on-street parking control limits including accessible parking provisions	Rationalise on-street parking control	Major Centre	Full	RTA	None	A / B
5.3	Review current parking code and develop long term strategy for reduction of parking provisions	Support long term reduction of parking provisions	Area wide	Full		None	B
5.4	Initiate action to provide parking facilities for tour buses and coaches	Rationalise parking control for tourist vehicles	Mainly Watsons Bay, Paddington; Double Bay	Full	B&CA	None	A
5.5	Review current Resident Parking Scheme and other permit schemes	rationalise the use and provision of resident parking	Area wide	Full	RTA	On-going	A / B
5.6	Develop staged Parking management implementation program	Rationalise parking control	Area wide	Full		None	A

Notes:

- 1 Priority Rating: A - Top Priority (within two years); B - As soon as practicable (2-5 years); C - When opportunity arises (5-10 years); D - Not urgent, but keep on agenda for review
- 2 Legend: Dot - NSW Department of Transport; STA - State Transit Authority; RTA - Roads & Traffic Authority; WAC - Woollahra Access Committee; B&CA - Bus and Coach Association

---

# 1. Introduction

## 1.1 Background

---

This study was commissioned by Woollahra Municipal Council with funding provided by the Roads and Traffic Authority (RTA).

The last major municipal wide transportation study was conducted in 1978, and is of limited use as a resource document. A number of localised traffic management studies have been carried out since. Each study examined the issues related to a local precinct with little or no considerations for the regional impact of traffic and parking issues on the municipality as a whole.

Significant changes to traffic patterns and transport demand have taken place in Woollahra, not so much due to changes in population (which has slightly declined) but more so to changes in socio-economic factors, such as demographic composition, increase in high income groups, land use type, and general life style changes of the residents.

The two main objectives of this study set by Council are:

- To analyse the performance of the existing traffic and transport system and identify and investigate the impacts which affect Woollahra and the adjoining council areas
- To develop strategies which will improve the operation of the transport system and in particular, reduce the use of the private cars within the system.

## 1.2 Scope of Study

---

Based on the Study Brief provided by Council, the scope of this study is divided into the following investigations:

1. Examine the operation conditions of the existing traffic/transport network, and identify issues related to traffic and parking demand, public transport provisions and impacts of existing land use changes, and external influences.
2. Estimate future transport and travel demand based on trends of existing growth and projected changes in land use and demographic patterns.
3. Conduct public consultation to seek input from stakeholders.
4. Establish a traffic / public transport model of the existing network and test the effects of changes in land use, changes in mode split, public transport improvement options, and traffic management options on the network operation.

- 
5. Develop fully integrated transport strategies to meet Council's transport objectives of reducing car use, improving the public transport system, integrating accessible facilities, and encouraging alternative modes such as walking and cycling.

---

## 2. Existing Conditions

### 2.1 Land Use and Development

---

#### 2.1.1 Existing Land Use

The predominant land use in the municipality is residential. The municipality is divided into a number of residential precincts, which vary in size and population density.

There are two residential zones within Woollahra: the 2(a) zone and the 2(b) zone. The 2(a) zone is essentially a low density zone in which only single dwelling houses are permissible under Woollahra LEP 1995. The 2(b) zone applies to areas characterised mainly by existing medium density buildings and areas where potential has been identified for increased medium residential development. The zone also includes those areas previously developed for high rise residential apartments. *Figure 2.1* following, shows areas zoned 2(b) by Council.

Within the municipality, there are five commercial/retail centres which are of importance in terms of transport and parking impacts. These centres are:

- Double Bay commercial centre
- Paddington retail area on Oxford Street (shared with South Sydney Council)
- Edgecliff commercial centre
- Bondi Junction commercial centre (shared with Waverley Council)
- Rose Bay retail areas

Due to its geographic location, Woollahra has a significant proportion of the foreshore land of Sydney Harbour, with excellent opportunities for water sports and numerous locations for recreation and tourist attractions.

Some of Sydney's major sporting venues such as the White City Tennis Complex (currently being downgraded), Royal Sydney Golf Club, East Rugby Club, Sydney Football Stadium, Sydney Cricket Ground, Moore Park and Centennial Park, and Fox Studios are either located in or adjacent to Woollahra.

Furthermore, there are a number of private schools and colleges which attract students from all over Sydney.

#### 2.1.2 Population and Dwelling Changes

Between the 1971 and 1996 Census years, there has been a cumulative decline in population of 19%, which corresponds to an average decline of

Fig 2.1



1% per annum. The most significant decline in population occurred between the 1971 and 1976 census years, when Woollahra lost some 6,700 people in five years. The 1996 population was 48,742, compared with approximately 60,000 in 1971.

There are currently some 24,500 private dwellings in Woollahra. As at the 1996 census, 10.8% of these were vacant. The reason for the high vacancy rate is not apparent but is considered due to a high proportion of investment properties and properties owned by overseas residents who may be absent on the day of the Census.

Despite the recent surge in the provision of high density dwellings in inner city suburbs, there has been a decrease of over 500 private dwellings in Woollahra between the 1986 and 1996 census. This trend may reverse since 1996, but not substantiated without the latest information on dwelling inventory data.

*Table 2.1* following, shows changes in population and number of private dwellings for the census years since 1966.

**Table 2.1 - Population and Dwelling Changes**

Year	Population	% Change From Previous Census	Total Private Dwellings	% Change From Previous Census
1966	62,653	-	NA	-
1971	59,953	-4.3	26,300	-
1976	53,259	-11.17	25,248	-4.0
1981	51,659	-3.0	25,053	-0.7
1986	51,057	-1.17	25,037	-0.6
1991	49,867	-2.33	24,738	-1.14
1996	48,742	-2.26	24,485	-1.03

Source: Australian Bureau of Statistics (ABS) Census - 1966, 1971, 1976, 1981, 1986, 1991, 1996

There has also been a shift in dwelling types. In general, there is a slight decline in occupied single dwellings, while the number of occupied multi-storey flats and apartment units have remained relatively static. The category of unstated dwelling type shows a significant increase. It is considered that the majority of the vacant dwellings would belong to the medium/high density housing group.

*Table 2.2* following, shows changes in dwelling types between the 1981 and 1996 census years.

---

**Table 2.2 - Changes In Occupied Dwelling Types (1981-1996)**

<b>Residential Type</b>	<b>1981</b>	<b>1986</b>	<b>1991</b>	<b>1996</b>
Single Detached House	5,323	5,400	5,164	4,925
Flats (3+ storeys)	5,002	6,034	9,020	8,985
Other	<u>10,893</u>	<u>9,773</u>	<u>6,801</u>	<u>6,770</u>
Total Medium/High Density Housing	15,895	15,807	15,821	15,755
Other types	309	300	344	338
Not Stated	683	761	496	811
<b>Total</b>	<b>22,210</b>	<b>22,268</b>	<b>21,825</b>	<b>21,845</b>

Note: "Medium/High Density Housing" includes semi-detached houses, town houses and row/terrace houses ,as well as high rise apartments.  
"Other types" include flats attached to houses, attics etc.

Significantly, *Table 2.2* indicates the following:

- The majority (73%) of the total occupied dwellings in Woollahra is medium-to-high density, with 41% (of total occupied dwellings) being flats and apartment of three stories or more.
- The total number of occupied dwellings has increased over the period between 1981 and 1996 despite an overall decrease in total number of dwellings.
- There is a 7% drop in the number of single detached houses and a 79% increase in multi-storey flats and apartments (three stories or more).
- 'Other' medium density housing, which includes semi-detached houses, town houses and row/terrace houses has decreased by 39% over the same period.

In terms of transport impacts, the past trends of population and housing changes should not have significantly contributed to the increase in transport demand. However, the increase in local traffic movements in the municipality may be attributed to an increase in the average number of daily trips each household makes, due to a change of life style and relative affluence of the community.

---

## **2.2 Traffic Conditions and Network Performance**

### **2.2.1 Classification of Road Network**

There are two main systems which are used to classify roads in New South Wales. These are

- Functional Classification

- 
- Administrative Classification (for road funding purpose)

### ***Functional Classification***

Based on the guidelines prepared by the RTA for the classification of roads, the functional classification system is based on the assessment of traffic volumes, composition and management. A four-tier road types are defined. They are arterial, sub-arterial, collector and local roads. The following guidelines are used in the functional classification of roads:

- Arterial Road - typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link.
- Sub-arterial Road - defined as secondary inter regional links typically carrying volumes between 5,000 and 20,000 vehicles per day.
- Collector Road - provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day. At volumes greater than 5,000 vehicles per day, residential amenity begins to deteriorate noticeably. Volumes greater than 5,000 vehicles per day may be reasonably carried by trunk collector and spine roads with limited property access. Collectors are classified within the local road system.
- Local Road - provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day.

Peak hour flows for these road types vary between eight to twelve percent of the daily flows.

### ***Administrative Classification***

The more recent administrative classification system classifies roads into:

- State Road - roads performing an important state function for which the RTA funds 100% of the maintenance cost. State roads are essentially arterial roads
- Regional Roads - roads performing a significant regional function for which the RTA and Council contribute 50% each towards the cost of maintenance. Regional Roads are mostly sub-arterial roads.
- Local roads - roads performing a local or collector function, for which Council contribute 100% towards the maintenance cost. Additional funding is available from the RTA for specific locations on grounds of urban amenity and road safety.

---

Based on the RTA's guidelines for *functional road classification* for Woollahra, the following are the classified main roads (either State or Regional Roads):

- Arterial Roads:**
- 1 New South Head Road
  - 2 Old South Head Road (South of New South Head Road)
  - 3 Syd Einfeld Drive
  - 4 Oxford Street (West of Ocean Street)
- Sub-Arterial Roads:**
- 1 Old South Head Road (North of New South Head Road)
  - 2 Ocean Street
  - 3 Boundary Street
  - 4 O'Sullivan Road
  - 5 Ocean Avenue / William Street (classified as a regional road, although its main function is to service the Double Bay Commercial Centre, with a subsidiary function of carrying through traffic between Ocean Street and New South Head Road)

In this study, we have also identified a number of major local roads which carry substantial volumes of traffic and play an important function in the road network. These major local roads are mainly collectors whose functions are described in *Table 2.3*.

The existing functional road hierarchy is shown in *Figure 2.2*.

**Table 2.3 - Major Local Roads**

Precinct	Major Local Road	Function
Paddington	Glenmore Road Brown Street / Neild Avenue Cascade Street / Hargrave Street Gurner Street Jersey Road Macdonald Street	Major collector roads providing access from Oxford Street, New South Head Road and Ocean Street to Paddington
Woollahra	Queen Street  Moncur Street  Trelawney Street / Edgecliff Road  Newland Street	Local link between Oxford Street and Ocean Street, and a major commercial street Important link between Hargrave Street and Queen Street Major collector for the Woollahra precinct and Bondi Junction Major connection between Edgecliff Road in Woollahra, and Bondi Junction
Darling Point	Darling Point Road New Beach Road / Thornton Street Mona Road Greenoaks Avenue	Main collectors for the Darling Point area  Main collector for the residential area.
Bellevue Hill	Bellevue Road Victoria Road Birriga Road	These are the major links between New South Head Road and Old South Head Road, and provide access to the Bellevue Hill area
Double Bay	Manning Road  Ocean Ave / William Street	Access road to Woollahra and Double Bay precincts  Collector for Double Bay commercial centre (See Main Road Classification)
Point Piper	Wolseley Road / Wyuna Road / Wunulla Road	Collector for Point Piper precinct
Rose Bay	Newcastle Street Dover Road Albemarle Ave	Strategic links between New South Head Road and Old South Head Road  A major link between Rose Bay centre and Old South Head Road
Vaucluse	Vaucluse Road / Hopetoun Avenue Towns Road Wentworth Rd/Fitzwilliam Rd	Both are collectors for Vaucluse area.  Main Collector for recreation traffic



---

Fig 2.2

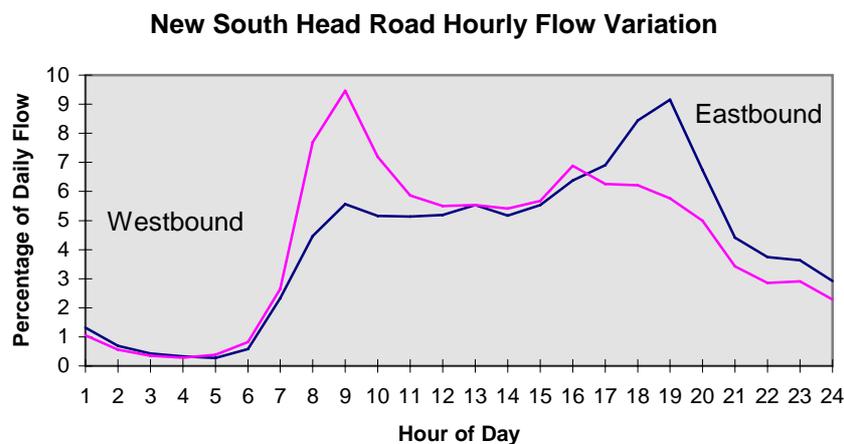
### 2.2.2 Traffic Flows and Network Performance

The average week day mid-block traffic flow volumes (AWT) on arterial roads varies substantially between 20,000 vehicles per day (vpd) and 63,000 vpd. The AWT for the identified major local roads varies between 3,200 vpd and 12,500 vpd. Generally roads closer to the Sydney CBD, carry substantially higher volumes than those within the eastern half of the peninsula. Details of traffic flow analysis are presented in *Working Paper No.3: "Traffic Operations"*.

In terms of network performance, most congestion occurs in the peak periods mainly at intersections on major roads within the western half of the municipality. Permanent traffic counters located at New South Head Road, Rushcutters Bay and Oxford Street, west of Ocean Street have recorded the city-bound peak flows of 9.16 % and 10% of the weekday total flows at the respective locations. Generally, the traffic modelling indicates the road network in Woollahra LGA operates at a level better than the average Sydney Metropolitan area during the peak hour periods.

The average hourly variation of traffic flows on New South Head Road is shown in *Figure 2.1* below:

**Figure 2.1**



Congestion also occurs at some parts of the road network during major events such as Sydney to Hobart Yacht Race, New Year Eve and major sporting events at the Sydney Cricket ground. (See *Section 2.6 External Impacts*)

The network performance is best described by the level of service (LOS) and the degree of saturation (DS) of its major intersections during peak hours. The criteria for interpreting results of traffic modelling analysis is described in *Table 2.4* following.

**Table 2.4 - Criteria for Interpreting Results of Traffic Modelling Analysis**

**1. Level of Service (LOS)**

LOS	Traffic Signals & Roundabouts	Give Way & Stop Signs
A	Good	Good
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but requires accident study
D	Operating near capacity	Near capacity and requires accident study
E	At capacity excessive delay; roundabout requires other control mode.	At capacity; requires other control mode
F	Unsatisfactory, requires other control mode or additional capacity	Unsatisfactory, requires other control mode

**2. Average Vehicle Delay (AVD)**

The AVD is a measure of operational performance of an intersection relating to its LOS. The average delay should be taken as a guide only for an average intersection. Longer delays may be tolerated at some intersections where delays are expected by motorists (e.g. those in inner city areas or on major arterial roads).

LOS	Average Delay / Vehicle (secs)	Traffic Signals & Roundabouts	Give Way & Stop Signs
A	less than 15	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 to 42	Satisfactory	Satisfactory, but accident study required
D	42 to 56	Operating near capacity	Near capacity, accident study required
E	56 to 70	At capacity, excessive delays; r/bout requires other control mode	At capacity; requires other control mode
F	Exceeding 70	Unsatisfactory; requires additional capacity	Unsatisfactory, requires other control mode

**3. Degree of Saturation (DS)**

The DS of an intersection is usually taken as the highest ratio of traffic volume on an approach to the intersection compared with its theoretical capacity, and is a measure of the utilisation of available green time. For intersections controlled by *traffic signals*<sup>1</sup>, both queue length and delay increase rapidly as DS approaches 1.0. An intersection operates satisfactorily when its DS is kept below 0.75. When DS exceeds 0.9, queues are expected.

<sup>1</sup> INTANAL gives DS of an intersection at maximum cycle time

Table 2.5 following, presents results of the analysis of the peak hour network intersection performance, using traffic flow data collected for this study. Some preliminary improvement strategies are suggested in the “Comments” column.

**Table 2.5 - Existing Intersection Performance**

Intersection	Peak	Delay (secs)	LOS	DS	Comments
Oxford St / South Dowling St / Victoria St / Barcom Ave	AM PM	26.0 25.9	B B	0.800 0.812	South Dowling / Victoria RT @ LOS C South Dowling and Victoria LT / RT @ LOS C
Oxford Street / Glenmore Road	AM PM	10.2 13.8	A A	0.445 0.494	Satisfactory operations Satisfactory operations
Oxford Street / Ocean Street	AM PM	27.4 18.8	B B	0.796 0.643	Oxford RT @ LOS C Satisfactory operations
Ocean Street / Queen Street	AM PM	40.5 33.9	C C	0.948 0.914	Ocean St southbound RT @ LOS F Ocean St southbound RT @ LOS D Requires a right turn bay or signal phase adjustment
Oxford Street / Syd Einfield Drive / York Road	AM PM	11.5 13.9	A A	0.776 0.862	Satisfactory operations Oxford Street RT @ LOS C
Oxford Street / York Road	AM PM	16.8 14.3	B A	0.830 0.920	Satisfactory operations Satisfactory operations
Syd Einfield Drive / Old South Head (OSH) Road / Bondi Road / Oxford Street	AM PM	201.4 82.8	F F	1.203 1.035	All movements struggle except LTs All movements struggle except LTs RTA currently investigating in conjunctin with Westfield proposal
OSH Road / Edgecliff Road	AM PM	8.6 12.6	A A	0.499 0.735	Satisfactory operations Satisfactory operations
OSH Road / Victoria Road	AM PM	69.3 145.1	E F	1.084 1.544	RTs @ LOS F - require storage bay on OSH Rd RTs @ LOS F - require storage bay on OSH Rd
Victoria Road / Bellevue Road	AM PM	16.3 16.7	B B	0.720 0.999	Bellevue Rd & Victoria Rd RT @ LOS C Bellevue Rd LT & Victoria Rd RT @ LOS C
OSH Road / Birriga Road / Curlewis Street / O'Sullivan Road	AM PM	201.1 181.8	F F	1.275 1.250	All movements suffer All movements suffer
OSH Road / Murriverie Road	AM PM	3.1 4.1	A A	0.581 0.603	Satisfactory operations Satisfactory operations
OSH Road / Newcastle Street	AM PM	1.3 1.5	A A	0.576 0.544	Satisfactory operations Satisfactory operations
OSH Road / Dover Road	AM PM	13.0 14.0	A A	0.653 0.771	Satisfactory operations Satisfactory operations

Intersection	Peak	Delay (secs)	LOS	DS	Comments
OSH Road / New South Head (NSH) Road	AM	11.7	A	0.217	Satisfactory operations
	PM	11.8	A	0.198	Satisfactory operations
OSH Road / Hopetoun Avenue / Robertson Place	AM	12.2	A	0.091	Satisfactory operations
	PM	11.4	A	0.109	Satisfactory operations
NSH Road / Hopetoun Avenue	AM	17.7	B	0.901	Hopetoun Ave RT @ LOS D (insufficient gap in AM peak) ; Satisfactory operations other times
	PM	7.0	A	0.441	
NSH Road / Vaucluse Road	AM	9.5	A	0.256	Satisfactory operations
	PM	9.6	A	0.497	Satisfactory operations
NSH Road / Newcastle Street	AM	11.5	A	0.511	Satisfactory operations
	PM	11.0	A	0.433	Satisfactory operations
NSH Road / O'Sullivan Road	AM	13.2	A	0.674	Satisfactory operations
	PM	8.4	A	0.468	Satisfactory operations
NSH Road / Wolseley Road	AM	5.4	A	0.679	Satisfactory operations
	PM	6.1	A	0.541	Wolseley Rd RT @ LOS E
NSH Road / Victoria Road	AM	5.9	A	0.561	All RTs @ LOS E - RT lane reqd in NSH Rd Victoria Rd RT @ LOS E
	PM	9.6	A	0.631	
NSH Road / William Street	AM	11.9	A	0.666	RTs @ LOS C - lengthen RT storage RTs @ LOS D - lengthen RT storage
	PM	18.3	B	0.872	
NSH Road / Bellevue Road / Cross Street / Kiaora Road	AM	27.4	B	0.869	NSH Rd eastbound RT & Kiaora Rd @ LOS D NSH Rd eastbound RT & Kiaora Rd @ LOS E, Cross Street & NSH Road westbound @ LOS D  Further investigations of peak operations required
	PM	43.2	D	0.947	
NSH Road / Ocean Street	AM	20.7	B	0.863	NSH Rd eastbound RT @ LOS C NSH Rd eastbound RT @ LOS D
	PM	23.7	B	0.947	
NSH Rd / Nield Ave / Craigend St / McLachlan Ave / Bayswater Rd	AM	8.3	A	0.730	Nield & McLachlan Ave @ LOS D McLachlan Ave @ LOS C - extend 'No Parking' zone along McLachlan
	PM	5.3	A	0.806	
Glenmore Road - Five Ways	AM	14.6	B	0.650	Satisfactory operations
	PM	15.0	B	0.638	Satisfactory operations
Jersey Road / Hargrave Street	AM	11.9	A	0.614	Satisfactory operations
	PM	12.6	A	0.369	Satisfactory operations
Edgecliff Road / Trelawney Street / Roslyndale Avenue	AM	8.3	A	0.235	Satisfactory operations
	PM	7.4	A	0.318	Satisfactory operations

Note: RT = Right Turn; LT = Left Turn

In addition, traffic network modelling has also identified a number of intersections with Degree of Saturation values exceeding 0.8, which are considered to be approaching the limit of optimum operation. These intersections are included in *Table 2.6* following.

**Table 2.6 - Intersections Approaching Peak Hour Saturation**

Intersection	Degree of Saturation (DS)	
	AM	PM
Oxford Street / Ocean Street / Syd Einfield Drv	0.83	NC
Oxford Street / Queen Street / Lang Road	1.0	1.1
Oxford Street / South Dowling St / Boundary St	0.96	NC
Bayswater Road / Nield Avenue (south)	0.96	NC
Bayswater Road / McLachlan Avenue (north)	NC	0.96
New South Head Road / New Beach Road	0.90	0.96
New South Head Road / Mona Road	0.90	1.1
New South Head Road / Ocean Avenue	1.1	1.1
Ocean Street / Queen Street	NC	0.83

Note: NC denotes DS value less than the critical 0.8

### 2.2.3 Heavy Vehicle Movements

Heavy vehicle movements in the network do not generally present major problems as there is no industrial areas within the municipality. Most heavy vehicle movements are associated with delivery of goods to major commercial and retail centre and with the construction sites. Generally the peak hour heavy vehicle component in the main road network in Woollahra (average approximately 10%) is significantly below that average in the Sydney Metropolitan network (average approximately 23%). Based on the modelled output, the AM peak heavy vehicle movements vary between 20 - 140 vehicles per hour eastbound and 174 - 306 vehicles per hour westbound. Modelled results of heavy vehicle movements are included in *Working Paper No 5: "Traffic Modelling"*.

## 2.3 Parking Issues

### 2.3.1 Parking Inventory

The critical commercial centres identified for review of parking conditions were Double Bay, Rose Bay, Edgecliff, Oxford Street, and Bondi Junction.

An inventory of existing parking supply at each of the previously mentioned commercial centres identified for this study, is shown in *Table 2.7* following.

Most off-street public car parks are ‘user pays’ with various charge rates set for individual car parks and grace periods for free parking. Details of car park operations are contained in *Working Paper No.1: “Parking Issues”*.

**Table 2.7 - Parking Inventory**

Centre (GFA)	Off-Street Car Parks	No. of Spaces	On-Street Parking	No. of Spaces	Total Off-Street Spaces per 100m <sup>2</sup> GFA			
Double Bay (48,000 m <sup>2</sup> )	Cross Street	406	¼ - ½ hour	114	<b>2.67</b>			
	Ritz Carlton	218	1 hour	134				
	Kiora Lane	110	2 hour	34				
	Anderson Street	40	Loading zone	33				
	Knox Street	168	No restrictions	25				
	<b>TOTAL</b>	<b>942</b>	<b>TOTAL</b>	<b>334</b>				
Rose Bay (16,000 m <sup>2</sup> )	Council Car Parks	132	Time restricted	51	<b>2.49</b>			
			No restrictions	205				
			Loading zone	10				
	<b>TOTAL</b>	<b>132</b>	<b>TOTAL</b>	<b>266</b>				
Edgecliff (19,070m <sup>2</sup> )*	Edgecliff Centre	250	½ hour	11	<b>2.70</b>			
	East Point	265	1 hour	41				
			Loading zone	2				
	<b>TOTAL</b>	<b>515</b>	<b>TOTAL</b>	<b>54</b>				
Paddington (Oxford St)	None	0	Loading zone	52	<b>1.87</b>			
			1 hour	50				
			2 hour	10				
			No restrictions	6				
			Special use	2				
			<b>TOTAL</b>	<b>TOTAL</b>		<b>120</b>		
Bondi Junction Westfield Street (96,900m <sup>2</sup> )* Bondi Carousel (11,780 m <sup>2</sup> )*	Grafton Street	170	Loading Zone	15	<b>1.87</b>			
	Bondi Junction Plaza**	1,810	½ hour	143				
	Bondi Carousel	Bondi Carousel	221	1 hour	877	<b>1.88</b>		
				2 hour	185			
				Grace Bros	250		No restrictions (on peripheral roads)	360
				Eastgate	956			
				Hollywood	178			
				Library	180			
<b>TOTAL</b>	<b>3,765</b>	<b>TOTAL</b>	<b>1,580</b>					

\* Figures converted from gross lettable areas. Source: Property Council of Australia, “Shopping Centre Directories”, 1998/99

\*\* Source: Christopher Hallam & Associates, “Traffic Impact Assessment of Proposed Development in Bondi Junction”, 1997

### 2.3.2 Parking Utilisation

Parking is very intensive at all commercial centres. Most on-street spaces are fully occupied during peak shopping times. Similar utilisation rates are recorded in off-street car parks. *Table 2.8* following, shows parking utilisation during peak periods in various centre car parks.

**Table 2.8 - Peak Parking Utilisation**

Car Park	Average Weekday		Saturday	
	Peak Time	% Occupancy	Peak Time	% Occupancy
<b>Double Bay</b>				
Cross Street	2 pm - 3 pm	64	2 pm - 3 pm	48
Kiaora Lane	1 pm - 5 pm	100	5 pm - 7 pm	100
Anderson Street	10 am - 4 pm	>95	10 am - 4 pm	>95
Knox Street - Lower Level - Upper Level	11 am - 2 pm 12 noon - 1 pm	100 75	NA	NA
<b>Rose Bay</b>				
Council Car Parks	Most times	>85	Most times	100
<b>Edgecliff</b>				
Edgecliff Centre	11 am - 3 pm	>90	NA	NA
East Point	11 am - 12 noon	70	NA	NA

### 2.3.3 Major Issues Related to Commercial Centre Parking

#### **Double Bay**

- Most on-street parking spaces are intensively utilised during the day, with a significant proportion of the parked vehicles exceeding their time limits.
- There is an unbalanced distribution of parking spaces in different precincts and an apparent lack of short term spaces in the centre, with significant number of spaces occupied by long stay users.
- Despite the intensive use of on-street spaces, there is spare capacity in some off-street car parks, notably the Cross Street car park and the Ritz Carlton car park.
- There are occasional parking violations observed, mainly short stays in “No Parking” or “No Standing” zones, and obstruction of driveways.

---

### **Rose Bay**

- Parking spaces within the centre are fully utilised during the peak shopping hours, with little or no spare capacity.
- There is some spill over parking of shopping vehicles onto residential streets adjacent to the centre.

### **Edgecliff Centre**

- There is no major issue with the operation of the centre parking, although comments were received from car park users regarding early closing of the carpark and the lack of commuter parking.

### **Paddington**

- The only public parking is on-street and is very intensively used. There is a demand for parking by vehicles associated with business and retail use.
- It appears a significantly high proportion of the parking spaces along Oxford Street are taken up as loading zones during the week day.
- Due to a shortage of on-street parking spaces to satisfy all parking demand, there is a need to rationalise priorities for parking among different users. This is particularly relevant for short term business use, and maintenance and emergency services.

### **Bondi Junction**

- Survey conducted in this study shows that there is a high demand for off-street public parking in Bondi Junction. Although there has not been a survey of on street parking utilisation, site observations confirmed the equally, if not more, intensified use of on-street spaces.. The demand for short stay parking during the day could be attributed to the deficiency in the local bus transport system which does not cater for frequent short trips. The demand for long stay arises from the needs of commuters who either work in Bondi Junction or transit at Bondi Junction to other parts of Sydney, mainly the Sydney CBD.
- There is a high parking turnover in most privately operated car parks due to the high charge rates after the first two hours of free parking. The car parks with two hour free parking appear to have higher occupancy rates. Observations indicated there is a great deal of movements between car parks, (people move from one car park to another), indicating a demand for medium term parking (eg. between 2 and 4 hours) by people who are reluctant to pay the high charges.
- Most commuters who transit at Bondi Junction would tend to park in Council car parks or where there is an 'early-bird' facility. Current redevelopment of the interchange has reduced the number of available spaces for transit commuters by almost 40%.

- 
- Observations show a significant number of users of on-street spaces in Bondi Junction within the Woollahra municipality tend to over-stay their parking limits. These spaces are more intensively used than those in Waverley Council area which are controlled with parking meters. Council is planning to conduct a detailed study to investigate the feasibility of pay parking in the Bondi Junction area.

#### **2.3.4 Resident Parking Schemes**

Resident parking is now regulated under *Section 91CA* of the “*Motor Traffic Regulations*”, which permits residents with a vehicle permit to park in allocated spaces marked “Authorised Residents Vehicles Excepted”. It allows Local Councils to issue resident parking permits in accordance with the RTA’s implementation manual, which is currently being reviewed. Current RTA Permit Parking Manual allows up to three parking permits for each household. Residents within the Resident Parking Scheme (RPS) are eligible to receive a parking permit provided the

- applicant establishes residential status within RPS to the satisfaction of the Council
- applicant has no on-site parking facilities and also has no unrestricted on-street parking spaces in front of or in vicinity of the applicants residence
- place of residence could not be reasonably modified to provide off-street parking space(s)
- nominated vehicle is registered in the name of the applicant, or proof from the registered owner that the vehicle is normally used by the applicant.

Under Woollahra’s resident parking schemes, each household within an area where a scheme is operating, is given, on application, a free resident parking permit for their car, if there is no off-street parking available. Each household in a residential parking zone may apply for a maximum of two parking permits, and an annual fee of \$50.00 is charged for the second permit. This charge rate has been reviewed by Council and it is expected that a charge will also be made for the first permit in the beginning of 2000.

The number of permits to be issued to each household is reduced by the number of available off-street parking spaces on site, eg. if a household has two off-street parking spaces, it will not be entitled to any parking permits. The permits are only issued to residents with proof of car ownership, and not necessarily to property owners.

Presently, resident parking schemes operate in many parts of the municipality, with the most intensive application in the Paddington, Darling Point, Woollahra (southern part), and Double Bay precincts. *Figure 2.3* following, shows where residential parking schemes operate in the municipality.

---

### **2.3.5 Commuter Parking**

Opportunities for commuter parking in Woollahra are very limited. In Bondi Junction, there are some provisions for off-street commuter parking (113 spaces in Einfeld Drive commuter carpark to replace the Grafton Carpark after the redevelopment of the Bus Interchange). There are approximately 150 spaces available for commuters who use the ferry in the Lyne Park Council car park adjacent to the Rose Bay Ferry Terminal.

‘Early-bird’ parking is offered in some commercial car parks (eg. Cross Street Car Park). Although ‘early bird’ parking is not supported as a long

---

fig 2.3

---

term strategy, it may be tolerated in the short term at locations where commuters park their vehicles to change to a public transport mode.

Moreover, some commuters find parking near bus stops in local streets, noticeably near Edgecliff centre, such as in New Beach Road etc.

At the time of the study, commuters occupied slightly over half the capacity of the Grafton Street car park at Bondi Junction, and generated over 80% of the total revenue. This car park is fully occupied during the middle part of the day, and is closed in the weekend. This car park is to be replaced by the Syd Einfeld Drive car park with a reduced number of spaces (113 spaces) after the completion of the new Bus Interchange.

The Lyne Park car park is over 80% occupied during most hours of the day with maximum occupancy of 95% at 1:30 pm. Commuters constitute approximately 20% of the total users, indicating that most of the patrons of the ferry service are either driven or walk to the ferry terminal. Currently parking in this car park is free. Council is contemplating introducing pay parking for this car park.

### **2.3.6 *Parking for Visitors and Tourist Coaches***

There is a demand for coach parking in major tourist destinations within Woollahra. This includes a demand for regular tourist buses as well as those associated with special events. Apart from tour buses and coaches, there is also a large number of weekend and holiday visitors who drive to tourist destinations such as Watsons Bay.

There is also a demand for parking by special buses chartered for major sports events held in, or adjacent to, the municipality.

Most recreational areas and sports venues provide off-street parking facilities. Council public parking facilities include car parks at Lyne Park (150 spaces) Cooper Park (30 spaces) and two car parks (80 spaces) at Watsons Bay.

Generally, there is adequate off-street parking for most sporting venues except during major events. At these times, there is some spill-over parking onto adjacent streets, which becomes a problem. To reduce demand for private vehicle parking, organisers of major events must ensure there is a provision of adequate and convenient public transport services. It is recognised that it would be difficult for Council to impose such conditions for major annual events such as the New Year Eve gathering and the Sydney-Hobart Yacht Race. However, action can still be taken by Council to require an adequate plan for public transport service and traffic management for one off sporting and concert events etc.

The major parking generators fall into two categories - those without major parking problems and those with significant parking problems.

---

Parking generators which either provide reasonably adequate off-street facilities, or generally without significant peak parking problems (e.g. due to infrequent usage) include:

- White City Tennis Complex (except during major tournaments - the complex has now been downgraded somewhat and will not hold major tennis tournaments in the future due to the development of the new Olympics-related Tennis Centre at Homebush Bay);
- Trumper Park Oval (no off street parking provided), and Palms Tennis Centre;
- Paddington Bowling Club;
- Lyne Park (except in Summer weekends)
- Royal Sydney Golf Club (except during major tournaments, such as the Australian Open)
- Vaucluse House;
- Cooper Park; and
- Woollahra Golf Club.

Parking generators with frequent parking problems include:

- Neilsen Park (mostly relies on on-street parking);
- Eastern Suburbs District Rugby Union and Football Club (inadequate on-street parking, with parking often spilling over into O’Sullivan Road, and surrounding streets), which also impacts on Woollahra Golf Club.
- Strickland House ‘Carrara’ (on-street parking only);
- Scots College and Cranbrook School (insufficient off-street parking, particularly on sports days and major school events); and
- Major sports stadiums adjacent Woollahra with spill-over parking into streets in Woollahra
- Paddington Markets, attracting weekend visitors from all over Sydney.

## **2.4 Public Transport Services**

---

The municipality is served both by rail and a bus network, as well as ferry services, with the main service corridor to and from the Sydney CBD.

### **2.4.1 Rail Network**

The Eastern Suburbs Line serves Woollahra Municipality with two stations: Edgecliff Station and Bondi Junction Station. Despite the stations being located at the western and southern extremities of the municipality, the Eastern Suburbs Line carries a significant proportion of total trips generated

---

in Woollahra. Statistics show that approximately 6% of all trips and up to 14% of journey to work (JTW) trips are carried by the railway.

The trip length between Bondi Junction and the Sydney CBD is approximately 7.3 km with a journey time of approximately 9 minutes. The morning peak hour service frequency is about five minutes.

The average daily patronage at Bondi Junction Station is approximately 18,500 passengers for the city-bound 'out' trip and a similar number for the 'in' trip (Total approximately 37,000 passengers daily) The 1996/7 State Rail Authority (SRA) statistics show that, during the AM peak period (6:30 to 9:30 am), 11,300 passengers pass through the turnstile at Bondi Junction Station. This compares with approximately 9,000 passengers at Chatswood Station. Unlike Chatswood Station, Bondi Junction is the terminus of the service line, with a very high incidence of interchanging.

Due to the short journey time between Bondi Junction and Sydney CBD, it is expected that peak hour services would account for at least 70% of the passengers carried between 6:30 and 9:30 in the morning.

Edgecliff Station carries a daily patronage of approximately 14,000 passengers ('in' and 'out'), which is approximately 38% of the volume carried by Bondi Junction Station. The corresponding peak figures are 2,800 passengers 'in' and 1,850 passengers 'out' of the station (total 4,650 passengers). This station serves areas where traffic congestion is most evident. There is a potential for this station to carry a much higher number of passengers generated by the surrounding areas

Although 'park'n'ride' facilities are limited, there are adequate provisions for bus/rail interchange facilities in both locations, as well as 'kiss'n'ride' areas. The facilities are well patronised during commuter peaks, but could be better utilised at other times (See also *Section 2.4.3 Bus/Rail Interchange*).

## **2.4.2 Bus Network**

### ***Existing Bus Operations***

Sydney Buses operates all fare collecting commercial services in Woollahra, including both scheduled public services and school buses.

The existing bus network is comprehensive and covers almost all areas, assuming a maximum walking distance of 400 metres. Services are provided between residential precincts and major commercial centres, both within the municipality and the neighbouring local government areas, as well as transport interchanges, including the Sydney CBD.

*Table 2.9* following, shows the various bus routes and their service characteristics. Details of the existing public transport network is provided in *Working Paper No.2: "Public Transport"*.

**Table 2.9 - Bus Routes Serving Woollahra**

Route Number	Description	Service Time	Frequency (Minutes)		
			Peak	Off-Peak	Weekend
<b>Bondi District</b>					
380	Dover Heights - Circular Quay via Bondi Beach	full time	5	10	7-15
382	Dover Heights-Circular Quay via Bondi Rd	in conjunction with 380	20	10-30	7-15
L82	Dover Heights Circular Quay via Oxford St	Limited Stop serviced	20	30	20
X84	Bondi Beach to Bondi Junction	AM peak express	10		
<b>Vaucluse District</b>					
<b>Circular Quay to Bondi Junction, Dover Heights, Watsons Bay</b>					
323	Dover Heights to Circular Quay via Old South Head Road	peak hours	20		-
324	Watsons Bay to Circular Quay	full time	8	20	20
L24	Watsons Bay to Circular Quay	peak hours	8	-	-
325	Watsons Bay to Circular Quay	full time	6-10	20	20
327	Bondi Junction to Circular Quay	day time	20	60	20-60
<b>Woollahra &amp; Bellevue Hill</b>					
<b>Edgecliff to Vaucluse via Old South Head Road</b>					
387		full time	10	15	15
<b>Rose Bay District</b>					
321	Rose Bay to Bondi Junction	daytime	50	60	60
322	Bondi Beach to Dover Heights	daytime	60	60	60
<b>Bellevue Hills District</b>					
330	Edgecliff I/C to Bondi Junction I/C via Bellevue Hill	daytime	20	30	30
365	Edgecliff I/C to Bondi Beach via Bellevue Hill	daytime	20	60	60
366	Edgecliff I/C to Bondi Beach via Bellevue Hill	night time		60	60
389	North Bondi to Circular Quay via Paddington	full time	10	10	10
X84	North Bond to Bondi Junction I/C	AM peak	10	-	-
X89	North Bond to Bondi Junction I/C	AM peak	10	-	-
<b>Elizabeth Bay</b>					
311	Circular Quay - Railway Square via Elizabeth Bay	full time	15	30	30
<b>Bondi Junction - Coogee</b>					
X13	Bondi Junction I/C to Coogee	peak hours	20	-	-

Route Number	Description	Service Time	Frequency (Minutes)		
			Peak	Off-Peak	Weekend
314	Bondi Junction I/C to Coogee (via Randwick)	full time	20	10-15	15
315	Bondi Junction I/C to Coogee (via Randwick)	day time	40	30	30-60
316	Bondi Junction I/C to Pagewood	day time	10-20	30	30-60
<b>Waverley District</b>					
329	Bondi Junction I/C to Clovelly	daytime	15	30	30
360	Bondi Junction I/C to Waverley	daytime	10	30	60
361	Bondi Junction I/C to South Bondi	daytime	20	30	60
<b>Bondi Junction - Newtown and Marrickville</b>					
048	Bondi Junction I/C to Alexandria	peak hours	30	-	-
355	Bondi Junction I/C to Newtown & Marrickville	daytime	30	30	30
<b>Eastern Suburbs X-regional</b>					
357	Bondi Junction I/C to Sydenham Station	peak hours	15	-	-
359	Bondi Junction I/C to Pagewood	daytime & evening	30	30	30
<b>Burwood - Bondi Junction</b>					
400	Burwood -Bondi Junction I/C	full time	20	20	20
	Pagewood - Bondi Junction I/C	full time	5	5	10

Note: bold type refers to information concerning the whole route, rather than each service  
Source: STA

### **Infrastructure Deficiency**

A number of existing service and infrastructure deficiencies have been identified through information submitted by participants at the study workshops. The following is a summary of major concerns:

- There is a general lack of customer (bus route and timetable) information at bus stops and at terminal stations. Improvement in this respect would greatly assist those who do not frequently use the bus service in this area (such as tourists) and helps to promote the use of bus transport.
- Despite efforts that have been made by STA in promoting integrated ticketing, the local residents considers that there should be a more flexible combined ticket for use of different modes without a fare penalty.
- The bus terminal podium at the Edgecliff Interchange requires a major overhaul as the existing provisions are not user friendly due to visual and lighting deficiencies as well as its remoteness from the retail shops.

---

### **2.4.3 Bus / Rail Interchanges**

Apart from the Watsons Bay bus terminus, there are two major inter-modal public transport interchanges serving Woollahra. Both are located along the Eastern Suburbs Railway Line, at Bondi Junction Station and at Edgecliff Station.

#### ***Watsons Bay Bus Terminus***

The terminal station in Watsons Bay serves Routes 324, 325 and L24 between Watsons Bay and Sydney CBD, and Route L82 via Dover Heights. Comments have been received from The Vacluse Progress Association regarding the lack of terminal facilities. The Association strongly objects to the recent desire by Woollahra Council to relocate the existing terminus in the commercial centre to a location adjoining the parking area serving the local hotel.

#### ***Bondi Junction Interchange***

The Bondi Junction interchange is the most utilised of the two. It has been developed as an efficient and well used bus-rail and bus-bus interchange, and also to serve the Bondi Junction shopping and commercial centre. It is soon to be upgraded as part of a new development on the existing site.

Most city bound bus services are routed to gather travellers from the peninsula and deposit them at Bondi Junction, where they transfer to trains for rapid delivery into the Sydney CBD and other Cityrail destinations.

Currently, the interchange has capacity for further expansion, and the reconstruction of the bus interchange as part of a redevelopment project will increase amenity for bus patrons. The reconstruction, however, has been designed to the existing capacity (largely outside the control of the STA) and it is difficult to estimate the increase of future capacity of the facility.

The current development by Meriton and the bus/rail interchange upgrade will affect the efficiency of the interchange operation until at least March, 2000.

#### ***Edgecliff Interchange***

The Edgecliff interchange is situated on the south-western corner of the intersection of New South Head Road and Ocean Street. The interchange provides transfers between bus and rail as well as a commercial centre. Currently Bus Routes 330, 365/366 and 387 terminate at this interchange, and Routes 200 and 327 pass through Edgecliff.

The bus interchange facility is currently under-utilised, with considerable spare capacity for service expansion or redevelopment. The bus stop waiting area on the top level of the platform could be more effectively utilised with improvements to access.

There are a number of speculative factors for the existing low level usage of this interchange:

- 
- Edgecliff commercial centre is smaller than the Bondi Junction centre
  - Edgecliff is closer to the city
  - Edgecliff station serves a smaller catchment area than Bondi Junction
  - Edgecliff is an intermediate station, serving locations within walking distance of it and a limited number of bus routes. Bondi Junction is the ‘end of the line’, serving all locations beyond.
  - Most city bound travellers from the municipality would travel through in one mode rather than change mode at say Edgecliff interchange.

Concern has been expressed by Woollahra residents regarding the safety aspects of using the station after hours. State Rail Authority is currently planning to upgrade the station facilities, with the first stage to improve the lighting at the station. The STA has advised that efforts are being made in their planning strategy to sustain and attract patronage to the Edgecliff interchange.

#### **2.4.4 Ferry Services**

1996 Journey to work (JTW) data obtained from Department of Transport’s data base indicates that 242 people travel by ferry to work from Woollahra, accounting for only 0.9% of the total JTW trips. Only 21 commuters (or 0.1% of the total) use the ferry to get to work in Woollahra.

Passenger loading in existing ferry operations varies from day to day. Most peak hour services are well patronised but still have capacity for more passengers.

Currently, the weekday ferries serving Woollahra, follow a loop travelling from Circular Quay to Milsons Point, McMahons Point, Cremorne, Rose Bay, Double Bay, Darling Point and back to Circular Quay. Services run from 7.00 am to 7.30 pm. During the middle of the day (between 11.30 am and 4.00 pm) services also run to Watsons Bay.

Peak hour services run at 25 minute intervals and off-peak services run at 60 minute intervals.

On weekends and public holidays, ferries run between 9.00 am and 6.00 pm from Circular Quay to Taronga Zoo, Double Bay, Rose Bay and Watsons Bay, and back again.

Currently, bus services that are considered “good” (peak hour headways less than 10 minutes, off peak headways less than 20 minutes) run close to Watsons Bay Wharf and Rose Bay Wharf. Double Bay Wharf is approximately 500 metres walking distance from New South Head Road bus services and served by a “fair” bus service (peak hour headways less than 20 minutes, off peak headways less than 40 minutes). Darling Point Wharf is situated almost 300 metres from a “fair” bus service (peak hour headways less than 20 minutes, off peak headways less than 60 minutes).

---

Most commuters prefer not to change mode in their JTW trips. Some may tolerate one change provided there is not a great deal of lost time between modes. The competition between the ferry service and other forms of public transport modes depends significantly on the accessibility of the service and the journey time.

The likelihood of Woollahra residents using the ferry is discussed as follows:

- For trips with origins within 500 m of ferry wharves in Woollahra and destinations within 500 m of Circular Quay or Milsons Point, there is a high probability of choosing the ferry as the preferred mode.
- For trips with origins close to bus routes serving ferry wharves in Woollahra (or ability to 'park'n'ride') and destinations within 500 metres of Circular Quay or Milsons Point, there is a moderate probability of choosing the ferry as the preferred mode.
- For trips with origin within 500 metres of ferry wharves in Woollahra and destinations close to bus routes serving the Sydney CBD, North Sydney CBD or Mosman / Cremorne, there is a moderate probability of choosing the ferry as the preferred mode.
- For trips with origins close to bus routes serving ferry wharves in Woollahra (or ability to 'park'n'ride') and destinations close to bus routes serving the Sydney CBD, North Sydney CBD or Mosman/ Cremorne, there is a low probability of choosing the ferry as the preferred mode.

Submissions were received from The Vacluse Progress Association (TVPA) regarding the conditions of existing ferry services and their suggested improvements. The following is a summary of their concerns:

- There is a concern of the infrequent services in the peak hours and the long journey times due to diversions of these services with intermediate stops. TVPA recommends a non-stop Rose Bay-City commuter service and a separate Double Bay - Darling Point commuter service without diversion of the long-distance ferry trip.
- The Rose Bay ferry service relies on patrons arriving from areas beyond the immediate walking distances. There is a concern of insufficient integration between bus-ferry interchange facilities. The Association recommends:

⇒ a combined ticketing system whereby commuter pays the same fare regardless their choice of travel mode.

⇒ a more direct bus-ferry connection through integration of peak hour timetable.

---

Discussions with the STA confirmed that even if the modal share was doubled, ferries would still only serve a small proportion of the total JTW trips. For this reason, while ferry services should be maintained and improved, they cannot be relied on to have a significant effect on overall travel patterns during the peaks.

As a commuter service, ferry transport may not be a major mode. However, it services operating outside the commuter peaks are a significant contribution to the overall public transport facilities for Woollahra. This is indicated by the high level of patronage at lunch time services observed at the Watsons Bay wharf. Off-peak ferry services could be promoted as a major tourist carrier to reduce the amount of intrusion by tourist vehicles.

## **2.5 Impacts of Land Use and Infrastructure Development**

---

In terms of transport impacts, Woollahra can be considered to be composed of eight local precincts. These precincts are shown in *Figure 2.4* following. They do not necessarily coincide with the administrative boundaries of the suburbs within Woollahra.

- **Precinct 1** - Darling Point area
- **Precinct 2** - mainly Paddington, including Edgecliff commercial centre
- **Precinct 3** - Double Bay, area north of New South Head Road
- **Precinct 4** - including Woollahra, parts of Bellevue Hill, Double bay and Bondi Junction
- **Precinct 5** - Part of Bellevue Hill between Bellevue Road and Victoria Road
- **Precinct 6** - Point Piper
- **Precinct 7** - Parts of Rose Bay and Bellevue Hill between Victoria Road and Newcastle Street
- **Precinct 8** - Parts of Vaucluse and Rose Bay and Watsons Bay

The major impacts of landuse and infrastructure development are described within each precinct as follows.

### **2.5.1 Precinct 1 (Darling Point Area)**

Major access roads to this precinct are New Beach Road, Mona Road, Darling Point Road, Mona Road and Greenoaks Avenue via Ocean Avenue. This precinct is predominantly residential with a mixture of high rise apartments, older style medium rise flats and single dwellings on large lots. Land values

are relatively high and the precinct is generally fully developed with little opportunities for further development. The precinct is mostly zoned 2(b) residential.

---

Mona Road, through its signalised intersection with New South Head Road and its link with Greenoaks Road, is increasingly being used as a through route between Double Bay and Bayswater Road as vehicle delay increases on New South head Road

Normally, traffic generated within the precinct is local traffic. However, there are significant intrusions of external traffic visiting the foreshore area during weekends and days when special events are held.

---

Fig 2.4

---

This precinct is served by Bus Route 327 between Circular Quay and Bondi Junction (through New Beach Road and Darling Point Road) with a 30 minute frequency during week days and 60 minute frequency on Sundays. Route 327 service is not available at night. The southern part of the precinct is within easy walking distance to Edgecliff Railway Station and bus services along New South Head Road.

This precinct is within close vicinity to the Double Bay and Edgecliff commercial centres. Opportunities for alternative transport services, such as walking and cycling, for the local residents, are available and should be explored, although topography is a major constraint.

### **2.5.2 Precinct 2 (Paddington / Edgecliff Centre)**

This precinct is characterised by the existence of a mixture of medium density terrace houses and single dwellings on small lots, with sporadic commercial development along some collector roads. Oxford Street on the southern boundary of the precinct is predominantly a retail and entertainment area, with a high demand for parking.

The precinct is serviced by Bus Route 389 between Circular Quay and North Bondi, which runs via Glenmore Road through to Bondi Junction. In addition, the precinct also benefits by bus services along Oxford Street and New South Head Road. There are no north-south bus routes through this precinct. Travelling by public transport between most areas in the precinct and other parts of Woollahra is difficult.

Traffic flows within the road network in the precinct are not unreasonably high, considering its proximity to the Sydney CBD, but the impact of traffic increases on local amenity is significantly high due to following reasons:

- Majority of the dwellings within the precinct do not have off-street parking, and many households have more than one vehicle which depends on on-street parking. Most streets in the precinct are narrow, and with the presence of on-street parking, their 'environmental' capacities for carrying traffic are significantly reduced.
- The major collector corridor through the area is effectively a two lane road which was not originally built as a traffic collector. Its limited capacity means traffic is diverted onto other roads.
- Due to geographic location of the precinct and limited access points onto the arterial system, local traffic has to travel via the local road network before emerging onto the arterial road system. This traffic has been regarded by affected residents as through traffic.
- Traffic noise is more prevalent and perceivable due to narrow streets with absence of trees and other landscape elements.
- Tourist buses visiting the area have brought complaints by local residents about the size of these vehicles through their local street system.

---

### **2.5.3 Precinct 3 (Double Bay)**

This precinct is predominantly commercial with a mixture of single and medium density residential developments in the peripheral streets.

Main access points to this area are through Ocean Avenue, Cross Street, bay Street, Knox Street and William Street, all of which intersect with New South Head Road.

Apart from buses along New South Head Road, the precinct is serviced by Bus Route 330 between Edgecliff, Woollahra and Bondi Junction with a 30 minute frequency on weekdays and 60 minute frequency on Sundays. Night service is provided by Route 366 to New South Head Road only. The nature of the land use in this precinct provides opportunities to improve the public transport service for local residents. Opportunities for encouraging cycling and walking for short trips are also available through local precinct planning.

This precinct suffers traffic congestion for most parts of the day and on-street parking becomes a main issue for both local residents and visitors (refer to *Working Paper No.1: "Parking Issues"*)

Because of its geographic position, vehicular access can only be gained to/from New South Head Road through a limited number of intersections which are often congested. City bound traffic often goes through the neighbouring precinct of Darling Point. This phenomenon is particularly noticeable during peak hours.

### **2.5.4 Precinct 4 (Woollahra / Edgecliff / Double Bay / Bondi Junction)**

This precinct includes part of Double Bay, Edgecliff and Bondi Junction. Apart from the portion of Double Bay along New South Head Road and Bondi Junction, where commercial land use predominates, the remainder of the precinct is mainly residential.

The area covers a substantial part of the municipality and the relatively steep topography dictates the construction of the road system. The north-south through traffic between Bondi Junction and Double Bay mainly use the tortuous route along Manning Road, Edward Street, Bathurst Street and Edgecliff Road.

Ocean Street forms the boundary between this precinct and Paddington and is one of the most congested roads in the municipality. It is used by most through traffic between the north-western part of the municipality, and the eastern suburbs beyond Bondi Junction..

Due to topography, public transport routes (buses) are confined to Edgecliff Road/Ocean Street and Bellevue Road. Routes 330 and 366 between Circular Quay and Bondi Junction/North Bondi traverse along a tortuous route via Manning Road, Suttie Road and Bellevue Road. Edgecliff Road / Ocean Street carry Routes 200, 327, and 387 between Bondi Junction and Chatswood (limited service), Circular Quay and South Head Cemetery

---

respectively. Because of the topography, many areas within the precinct are not within easy walking distance to the bus routes.

Apart from the main roads, traffic through the precinct is considered moderate. Speed and safety are the main issues that concern the local residents.

#### **2.5.5 Precinct 5 (Bellevue Hill)**

This is a narrow precinct consisting part of Bellevue Hill bounded by Bellevue Road in the west and Victoria Road in the east. The precinct is predominantly residential, apart from Cranbrook School and Scots College located in the north and Scots College Prep School, located adjacent to Victoria Road.

The precinct is served by bus routes along Manning Road - Bellevue Road, (Route 330, 366) Birriga Road (Route 321), and Victoria Road (Route 365). School buses also traverse along Victoria Road serving various schools.

A major cause of peak hour congestion is due to school related traffic. A significant proportion of school children are transported (driven) to/from school by their parents. This practice has caused major traffic and parking problems in peak hours, particularly on streets in the vicinity of Cranbrook School and Scots College.

Major congestion points are the intersections of Victoria Road and Old South Head Road, and Victoria Road near New South Head Road during school peaks.

#### **2.5.6 Precinct 6 (Point Piper)**

This precinct is a peninsula north of Bellevue Hill. Wolseley Road is the main access road to the precinct and intersects with New South Head Road at a traffic signal controlled intersection. Wunulla Road is the access road to the Royal Motor Yacht Club. The land use is predominantly prestige residential dwellings occupying large lots, most with spectacular water views onto Sydney Harbour.

Apart from the intrusion of the occasional visitor, traffic generated in this area is mainly local traffic.

The closest public transport route is New South Head Road, which serves areas between Circular Quay and Watsons Bay.

#### **2.5.7 Precinct 7 (Rose Bay / Bellevue Hill)**

This precinct is bounded by Victoria Road in the west and Newcastle Street in the east, with New South Head Road and Old South Head Road forming the northern and southern borders. The precinct is arbitrarily divided into two halves by O'Sullivan Road, which connects New South Head Road and Old South Head Road.

---

Half the precinct is residential with some retail uses in local shopping centres and the other half is occupied by the Royal Sydney Golf Club and Woollahra Golf Club. The northern side of the precinct bordering New South Head Road and the southern side of the precinct bordering Old South Head Road are zoned Residential 2(b), with a potential for increase in medium density housing in the future (refer to *Working Paper No.4: "Land Use"*).

This precinct is well served by bus, with Routes 321 and 322 serving between Bondi Beach and Bondi Junction/Dover Heights and Routes 323-5, between Circular Quay and Watsons Bay, on New South Head Road

#### **2.5.8 Precinct 8 (Vaucluse / Watsons Bay)**

This area, consisting the main part of Vaucluse and Watsons Bay, are characterised by their extensive coast lines which provide some of Sydney Harbour's best scenic bays and ocean views. Land use is predominantly residential, reserves and recreational parks. The HMAS military reserve is, however, located at the tip of the peninsula, which also forms part of the Sydney Harbour National Park.

The road system in this part of the municipality is winding, with Old South Head Road and New South Head Road joining at the boundary of Christison Park.

Apart from a small area near the Vaucluse High School, which is zoned Residential 2(b), the rest of the two precincts are exclusively single residential dwellings, very few of which are likely to be redeveloped into higher density dwellings in the foreseeable future due to their high property values.

Traffic flows in these precincts are normally generated locally except during special events and most Summer weekends when external traffic visits the area causing congestion and parking problems. Major concerns of the local residents are related to traffic intrusion by visitors from outside the municipality and tourist coaches.

Public transport serving the area consists of buses only with Routes 324 and 325 traversing New South Head Road and Hopetoun Road respectively. These bus routes connecting Watsons Bay with Circular Quay, have a 20 minute frequency during week days and are considered a reasonable service by the State Transit Authority (STA). In addition, Route 387, connecting with Bondi Junction, travels along Old South Head Road and terminates at the local shopping centre north of Vaucluse High School. This route could be extended to better serve Watsons Bay and the eastern part of Vaucluse.

---

## 2.6 External Impacts

---

As mentioned previously, external traffic impacts are due to the following:

- traffic visiting the Municipality during major events, especially those involving the use of the Harbour foreshores.
- intrusion due to tourists coaches and visitor vehicles, particularly during weekends and public holidays;
- school related traffic due to parents driving their children to/from school; and
- recreational traffic, visiting parks, sports grounds, etc.

### 2.6.1 Major Events

Traffic volumes have been recorded at specific locations during the Christmas period in 1998 which includes major events such as the start of the Sydney to Hobart boat race. General conclusions include the following:

- Both peak hour and average daily traffic on Old South Head Road during the Christmas week are significantly higher than the average normal week. Traffic on other major roads is similar to a normal week day.
- There is a time shift of the peak flows from the traditional morning peak period of 8 to 9 am, to periods which coincide with the major events.
- Parking appears to be a major problem during periods of special / major events.
- Due to prior traffic control arrangements by Council and the Police, traffic flows during the period of special events appears orderly and less congested than some peak hours during a normal week.

Other major events such as New Year Eve, and major sports events such as those at Sydney Cricket Club also create similar problems. These events, however, are known prior to their occurrence and Council is usually prepared for them.

### 2.6.2 Visitor Traffic

Impacts due to external visitors' traffic during holidays and weekends is mainly related to amenity issues when most local residents feel the presence of the intrusions. Parking has been identified as a major issue.

### 2.6.3 School Traffic

The impact of school traffic is evident during the peak periods when additional traffic is generated by parents driving their children to/from school. Issues are also related to parking, kiss'n'ride, and general congestion adjacent to schools during these periods.

It is difficult to identify the amount of peak hour traffic due to school traffic, but based on discussions with school principals, a significant proportion of

---

the school children, particularly the younger ones, is taxied to/from schools by their parents (usually the mother). Many of these school children reside outside the municipality. Given that most families in the eastern suburbs own more than one car, taking children to school in the family car is a common practice.

School traffic affects the network performance in the AM peak much more significantly than the PM peak, which occurs at a different period than the school peak. Apart from the weekday peaks, Saturday school traffic generated by parents carrying school children to go to sports is one of the factors contributing to the increasing traffic congestion outside commuter peaks.

#### **2.6.4 Recreation Traffic**

Similar problems to those associated with visitors' traffic are also evident pertaining to recreation traffic. Parking, again, is one of the major issues, apart from other traffic congestion and safety issues.

### **2.7 Major Issues Arising From Consultation Process**

---

The consultation working paper (refer to *Working Paper No.6: "Community Consultation"*) outlines the process undertaken and the issues and comments received from stakeholders. This section provides a summary of the major issues and/or deficiencies of the traffic and transport network in Woollahra, identified by the participants at the workshops.

#### **2.7.1 Public Transport**

Public transport issues are generally related to specific needs and service deficiencies. These are summarised as follows:

##### ***Routes***

The general feeling is that existing public transport routes (bus routes in particular) are indirect, resulting in a perceived longer time than necessary being required on some routes. The Rose Bay commuter ferry service was cited as another example.

Some combined routes should be separated such as City-Watsons Bay/Vaucluse bus routes which could be separated at Edgecliff into eastern and western routes so that it gives a better chance for buses to keep to their timetables.

Some members of the community suggest direct bus services in peak hours for the following:

1. between Rose Bay and Circular Quay
2. between Double Bay/Darling Point and Sydney CBD

##### ***Schedules***

---

Complaints have been received from bus patrons that buses rarely run on time at intermediate stops. In particular, routes 324, 325, and R24 to/from the City are generally held up due to city traffic and cannot run on time in peak periods.

### ***Ticketing***

Combined tickets for all public transport modes with a single fare, are being proposed by residents.

### ***Bus Schedule Information***

There is a general feeling of insufficient publicity of bus route and schedule information on local routes displayed at bus stops and/or major destinations.

### ***Amenity***

Apart from major termini such as Bondi Junction and Edgecliff, there is limited shelter at bus stop waiting areas, so that passengers can be protected from inclement / uncomfortable weather conditions.

Moreover, loading/unloading facilities at ferry wharves needs to be improved to attract passengers.

### ***Inter-Modal Links***

There was a great deal of complaints about inefficient inter-modal connections. Average waiting time between modes are generally considered higher than necessary. The off-peak and business hours are worse. The following examples of inefficient modal connections were cited:

- ⇒ There is no specific bus-ferry connection at the Rose Bay commuter ferry service. Bus connection relies on extended through routes (not originated from the ferry terminal).
- ⇒ Waiting time between train arrivals and east bound bus services is unacceptably long, partially due to delays occurring in the city.
- ⇒ Waiting time at the bus interchange at the Old South Head Road / New South Head Road roundabout between services to/from Watsons Bay/Vaucluse and those to/from Bondi Junction could be reduced to provide a better level of service to the public.

### ***Bus Lanes***

Submissions were received about the inappropriate location of the existing 'Bus Lane' recently installed on Old South Head Road by the RTA. It was alleged that not only does this 'Bus Lane' not improve bus operation, but it actually causes traffic congestion in the peak.

### ***Edgecliff Interchange***

---

Nothing has been done to improve the conditions of the Edgecliff interchange over the past few years. Problems include graffiti, vandalism, poor lighting, indirect access and a lack of bus timetable information.

### ***Ferry Services***

Complaints were received about the loss of the Nielsen Park wharf and the Vacluse Bay wharf. There is a general feeling that the ferry services in the area will gradually disappear.

## **2.7.2 Traffic Management Issues**

Traffic issues cover a large number of areas which vary in nature and significance depending on the location and land use of each precinct. The following summarises the major issues brought up in consultation workshops and submissions.

### ***Through Traffic ('rat-running')***

Apart from major bypass routes such as Ocean Street, a number of local bypass routes were identified by residents to be of concern. These include:

- ⇒ Eastbound through New South Head Road / New Beach Road / Yarranabbe Road / Greenoaks Avenue / Ocean Avenue / William Street / New South Head Road
- ⇒ Southbound along O'Sullivan Road through Latimer Road, Bundarra Road and Victoria Road (and the reverse direction northbound)
- ⇒ Use of Victoria Road / Birriga Road to bypass the congested section of Old South Head Road.
- ⇒ Use of Queen Street between Moore Park Road / Lang Road and Ocean Street to bypass Oxford Street
- ⇒ Some vehicles follow the Glenmore Road - Hargrave Street bus route to bypass Oxford Street

### ***Intersection and Pedestrian Safety***

The following intersections were identified by local residents to be hazardous:

- ⇒ Hopetoun Avenue / New South Head Road - perceived by local residents to be very hazardous even though very few accidents have been recorded there
- ⇒ Pedestrian crossing at New South Head Road from Lyne Park to bus stop at the corner of Manion Avenue
- ⇒ Old South Head Road / Newcastle Street - problem with pedestrian crossing has been cited at this intersection
- ⇒ Old South Head Road / Dover Road - right turn facilities on Dover Road were requested for this intersection

- 
- ⇒ New South Head Road / Newcastle Street - redesign of signal settings to accommodate pedestrian crossing was requested
  - ⇒ New South Head Road / Knox Street - problem with pedestrian accidents
  - ⇒ Right turn from Queen Street at Ocean Street / Queen Street intersection
  - ⇒ Excessive vehicle speeds in Cascade Street, Paddington

### ***Traffic Management Devices***

Similar numbers of residents preferred using traffic management devices to control speeds and bypass traffic, to those that oppose traffic management devices, depending on their own agenda. Generally, residents see the road safety value of some traffic control devices but object to using them if their own interests are threatened. Residents generally oppose 'speed humps' in areas close to residential properties.

### ***Signs and Lane Markings Maintenance***

General complaints were received about the lack of frequent maintenance and repair of traffic control devices and other related infrastructure.

#### **2.7.3 Parking Issues**

- Most people complained about the lack of parking provisions at shopping centres.
- Many residents, particularly Rose Bay residents, desire resident parking permits (schemes) extended to their areas ( no specific locations were mentioned).
- Parking facilities for drivers with disabilities are required (no specific locations were mentioned)
- There is a strong objection to using parkland for public parking, eg. Cliff Street car parks in Watsons Bay
- Paddington residents wanted their local streets free from parking by visitors, particularly parking demand caused by commercial strips along Oxford Street.
- Many residents complained about illegal on-street parking at weekends which causes access way blockage and denies local resident parking.
- Suggestions were made to increase parking for commuters at major interchanges.

---

## 3. Travel Demand & Characteristics

### 3.1 Introduction

---

This chapter provides a summary of existing travel demand and characteristics in the Woollahra municipality. A detailed analysis is provided in *Working Paper No.2: "Public Transport"*. The geographical distribution of generated trips, modal splits and the purpose of travel, are the main topics of discussion in this chapter.

The analyses carried out in this chapter are based on the 1996 ABS Census Journey To Work (JTW) Data and the 1991 Home Interview Survey (HIS) data, conducted by the NSW Department of Transport. This data is the most recent data available at the time of this study.

It should be noted that between the census years 1986 and 1996, traffic volumes may have increased on the road network, the population has remained more or less static (See *Table 2.1*), and it is considered that the travel pattern and mode splits would not have significantly changed. It is recommended, however, that analysis conducted for this chapter be reviewed when the latest statistical data becomes available.

### 3.2 Geographic Distribution of Trips

---

The fact that the Woollahra municipality is situated on a peninsula, suggests that much of the travel that takes place is locally generated, or generated in the adjacent Council areas. This is supported by analysis of the travel data.

#### 3.2.1 Journey To Work (JTW) Data

JTW data shows that 30% of people working in Woollahra come from the local government area (LGA) itself and 44% from the seven closest LGAs. Twenty percent of all work trips from the municipality actually had their destination within the municipality.

Over 50% of Woollahra's working population work in neighbouring or nearby LGAs.

*Table 3.1* following, summarises the geographic distribution of the JTW data.

**Table 3.1 - Journey To Work Statistics (Geographic Distribution)**

Origin (by SLA) of all JTW to Woollahra (100% = 17,664 trips)		Destination (by SLA) of all JTW from Woollahra (100% = 26,708 trips)	
Trip Origin	% of all trips	Trip Destination	% of all trips
Woollahra	30	Woollahra	20
Waverley	15	Sydney (inner)	22
Randwick	11	Sydney (remain)	5
South Sydney	8	South Sydney	13
Sutherland	3	North Sydney	5
Marrickville	3	Waverley	5
Rockdale	2	Randwick	3
Leichhardt	2	Botany	2
Other	26	Leichhardt	1
		Other	24
<b>TOTAL</b>	<b>100</b>	<b>TOTAL</b>	<b>100</b>

It is noted that some 5,200 JTW trips are internal trips, originated in Woollahra with destination in Woollahra. These internal trips account for 20 % of the total JTW trips generated from the municipality.

### 3.2.2 Average Weekday Trips

The Home Interview Survey (HIS) data used for this study grouped trip origins and destinations into five areas - city, north, south, east and west - and analysed them in relation to Woollahra. The 189,745 surveyed trips into the Woollahra SLA for all purposes (including work) came from the following regions:

- East to Woollahra: 67.5%
- City to Woollahra: 23.6%
- South to Woollahra: 1.8%
- West to Woollahra: 2.8%
- North to Woollahra: 4.2%

It should be noted that included in these trips are return trips made by Woollahra residents. Also, “East to Woollahra” trips also include Woollahra to Woollahra trips, which would make up a high percentage.

These Woollahra to Woollahra trips include a relatively high proportion of walking trips (approx 22% - HIS data), and a high proportion of car trips (in the order of 67%).

Based on the above data and other assumptions, a conservative estimate was made of car trips generated by Woollahra residents, as shown in *Table 3.2* following.

**Table 3.2 - Estimation of Proportion of Trips by Woollahra Residents**

Trips Origin	Total Trips (HIS data)	Car Trips (HIS data)	% of All Car Trips	% of All Trips by Woollahra Residents (estimate)	% of Car Trips by Woollahra Residents
	A	B	AxB	C	AxBxC
East to Woollahra	67.5%	67%	45.2%	85%	38%
City to Woollahra	23.6%	56%	13.2%	55%	7%
South to Woollahra	1.8%	39%	0.7%	40%	0%
West to Woollahra	2.8%	0%	0%	40%	0%
North to Woollahra	4.2%	71%	3.0%	40%	1%
<b>TOTAL</b>	<b>100%</b>		<b>62.1%</b>	<b>74%</b>	<b>46%</b>

*Table 3.2* shows that 62.1% of trips for all purposes into Woollahra were made by car (either as driver or passenger). Of this 62.1%, approximately 46% (slightly over 2/3) were car trips generated in Woollahra. This is based on an estimate that approximately 74% of all trips to Woollahra were made by local residents.

It should be understood that this analysis does not address the issue of through trips which would affect the western end of the LGA on arterial roads such as Oxford Street west of Bondi Junction, Ocean Street, and New South Head Road west of Ocean Street.

### 3.3 Travel Purpose

HIS data provides information on the purposes for making a trip. Broadly these are classified as:

- Home trips, which includes all home bound trips
- Work related trips, which include JTW and employment related business
- Shopping
- Social, includes all recreation and entertainment trips
- Other, includes all trips related to personal business and education, etc.

*Table 3.3* following, shows the trip purposes for travelling to and from Woollahra.

**Table 3.3 - Trip Purpose**

From Woollahra (100% = 187,486 trips)		To Woollahra (100% = 189,103 trips)	
Purpose	%	Purpose	%
Home	30	Home	33
Work Related	24	Work Related	18
Shopping	10	Shopping	13
Social	16	Social	14
Other	20	Other	21
<b>TOTAL</b>	<b>100</b>	<b>Total</b>	<b>100</b>

### 3.4 Modal Distribution

#### 3.4.1 Journey To Work

##### ***Trips Originating in Woollahra***

On the day of the 1996 census, 26,708 JTW trips had their origin in the Woollahra SLA. JTW data show that:

- Car (as driver) accounts for 42% of trips
- Car (as passenger) accounts for 5% of trips
- Train accounts for 14% of trips
- Bus accounts for 10% of trips

The remaining 29% of the JTW trips consists of walk and cycle modes and those who worked at home, those who did not go to work on the day of the survey

Note: if a trip involves a bus trip and a train trip, it is counted as a train trip

##### ***Trips Terminating in Woollahra***

On the day of the 1996 census, 17,664 JTW trips had their destinations in the Woollahra SLA. The difference between JTW trips into and out of Woollahra is expected, and confirms that the AM peak hour is the critical parameter from a transportation perspective. JTW data show that:

- Car (as driver) accounts for 46% of trips
- Car (as passenger) accounts for 5% of trips
- Train accounts for 11% of trips
- Bus accounts for 8% of trips

The remaining 30% of the trips consists of walk and cycle trips as well as those who worked at home and those who did not go to work on the day of the survey.

Table 3.4 following, shows the modal distribution for all journey to work trips to and from the Woollahra municipality.

**Table 3.4 - Percentage Mode Split (JTW To/From Woollahra)**

Modal Distribution of JTW to Woollahra from all SLA's (100% = 17,664 trips)		Modal Distribution of JTW from Woollahra to all SLA's (100% = 26,708 trips)	
Car (as driver)	46	Car (as driver)	42
Car (as Passenger)	5%	Car (as Passenger)	4%
Train	11	Train	14
Bus	8	Bus	10
Walking	8	Walking	7
Other	27	Other	27
<b>TOTAL</b>	<b>100</b>	<b>Total</b>	<b>100</b>

Note: "Other" modes include those who worked at home or did not go to work on the day of survey

The above analysis shows that the modal share for JTW trips into Woollahra by public transport is approximately 25% lower than for JTW out of Woollahra. Correspondingly, the share of car trips is 9% higher.

The modal split analysis of the closest SLAs (see Table 3.5 following) shows that compared to outbound JTW trips (from Woollahra) the share of inbound trips (to Woollahra) carried by public transport dropped by around 65%, while the instance of walking almost doubled and driving increased slightly.

**Table 3.5 - Modal Distribution of JTW Trips To/From Adjacent SLAs**

Mode	To Woollahra	From Woollahra
Train	6%	14%
Bus	9%	11%
Car (as driver)	43%	41%
Car (as passenger)	4%	3.5%
Walk only	15%	8%
Other	27%	26%

When interpreting these figures, it is generally accepted that JTW trips account for less than 30% of total travel, and the modal split of journey to

work travel is generally in favour of public transport. Less than half of people travelling to Woollahra to work, come by car as the driver.

Within Woollahra, the major mode is still the car as driver (35%) with a significant percentage increase in walk trips and work at home ‘trips’. JTW from Woollahra to Sydney CBD shows a distinctly different pattern, with 49% public transport trips, while car (as driver) trips account for only 25%.

Table 3.6 following, shows the modal distributions for JTW within Woollahra and to the Sydney CBD.

**Table 3.6 - Percentage Mode Split  
(JTW Within Woollahra and to Sydney CBD)**

Woollahra to Woollahra (%)		Woollahra to Sydney CBD (%)	
Car (as driver)	35	Car (as driver)	25
Car (as passenger)	4	Car (as passenger)	7
Train	2	Train	29
Bus	4	Bus	20
Walking	18	Walking	3
Other	37	Other	16
<b>TOTAL</b>	<b>100</b>	<b>TOTAL</b>	<b>100</b>

Note: “Other” modes include those who worked at home or did not go to work on the day of survey

It is evident that there is a much less percentage of JTW car trips within Woollahra and those to Sydney CBD, than those to/from other SLAs (compare Table 3.4 and Table 3.6). The following speculative conclusions can be drawn:

- Public transport services to/from Sydney CBD are of much better quality in terms of availability of choice and service frequency than the cross suburban services.
- Many local JTW trips are walk trips indicating a significant number of people are prepared to live close to where they work (or work close to, or at home).

### 3.4.2 Average Weekday Trips

The HIS data includes all trips made on an average weekday. These include work related trips, shopping trips, social trips, home trips and other trips.

Mode splits for all trips to and from Woollahra on an average weekday are:

- Car (as driver) increasing slightly to 47%
- Car (as passenger) increasing significantly to 20%
- Train accounting for only 4%

- Bus accounting for 8%

While some of the differences can be attributed to differences in survey methodology, it reflects the generally accepted circumstance that journey to work trips show a higher modal share towards public transport and a lower use of the car.

Table 3.7 following, shows the comparison of modes used for trips from home to shopping, personal, business (other than JTW), social welfare and medical purposes. Generally, there is a comparatively higher proportion of bus and train trips generated in Woollahra than in the Sydney metropolitan area as a whole. The car (driver) trips are slightly lower than the Sydney metropolitan average but significantly higher than the Eastern Suburbs average.

**Table 3.7 - Modal Distribution (Weekday Trips)**

Travel Mode	Woollahra (average %)	Eastern Suburbs (average %)	Sydney Metro (average %)
Car (driver)	41.5	35.2	45.2
Car (passenger)	8.7	13.1	25.2
Train	5.6	2.6	4.1
Bus	13.8	18.2	4.3
Ferry	Negligible	Negligible	0.2
Bicycle	Not recorded	1.7	0.7
Walk	28.5	28.3	19.5
Taxi	1.8	0.9	0.7
Other	Not recorded	Not recorded	0.1

The above table indicates the following important factors which have been taken into consideration when strategies on transport service were developed:

- The level of public transport service (particularly bus service) in the Eastern Suburbs is higher than the rest of the Sydney metropolitan area.
- People in Woollahra and in the Eastern Suburbs in general, recognise the value and convenience of the available public transport modes due to traffic congestions in the road network and lack of parking in major centres.
- The significantly high percentage of walk trips may be due to the proximity of essential services and the more closely integrated land use mix in the municipality, compared with many outer suburban areas in Sydney.

- 
- The evidence of a higher number of bicycle trips in the Eastern Suburbs is due to the availability of bicycle facilities and perhaps more short JTW trips (although Woollahra does not currently have a designated bicycle route network).
  - Despite there being a reasonable level of ferry service in Woollahra to meet peak demand, the percentage does not show up in weekday trips.

---

## 4. Future Scenarios & Impacts

### 4.1 Future Land Use Growth and Control

---

#### 4.1.1 Residential

The municipality is generally fully developed in terms of broad acre land release. Most future land use development will be either redevelopment of existing properties or medium/high density residential developments at locations which have been zoned for this purpose (ie. 2(b) zones).

Development densities in the Woollahra municipality are currently controlled by floor space ratios (FSR), setback and height controls under the Woollahra LEP 1995, and the Woollahra Residential Control Plan. Council have recently adopted a ‘building envelope approach’ to control all new developments. The new approach is likely to lead to an increase in potential yield in terms of effective FSR. This factor may encourage a more rapid take-up of existing medium density zoned areas and redevelopment in areas previously not considered viable.

The working paper on land use assessment and dwelling yield data (refer to *Working Paper No.4: “Land Use”*), has identified a number of locations (see *Figure 2.1*) where future medium to high density developments may occur under the existing land use control. *Table 4.1* following, describes the potential development yields of each of the 2(b) zones identified.

**Table 4.1 - Overview of 2(b) Zones, Woollahra LGA**

Plan Ref.	2(b) Zone/Area	Comment
1	Woollahra	Very small lots. Conservation areas. No significant development anticipated.
2(a) / 2(b)	Woollahra/Edgecliff	Mainly large prestigious homes. Potential for some infill development. No major yield anticipated.
3	Paddington	Already substantially developed.
4	Paddington	Already substantially developed.
5	Trumper Park	Some limited potential for further development (< 100 additional dwellings).
6	Edgecliff	Existing high rise residential. No significant development anticipated, apart from Statein redevelopment.
7	Darling Point / Rushcutters Bay	Mix of high rise and medium rise apartment development and single dwellings on large sites. High land value. Redevelopment may occur but there will be no significant increase in residential yields. Lower quality stock, and particularly those with views may be developed to high densities.
8	Double Bay	Mix of older stock on large sites. There has been recent activities in higher rise developments in this area. More moderate land value and lower quality stock suggest that there may be a potential of increase in dwelling yield.
9	Double Bay	Generally older stock, good quality dwellings with high land values. No significant increase in dwelling yield is expected.
10 / 10a	Point Piper	High value prestigious homes. No additional development is anticipated other than renovations to existing properties.
11	Rose Bay (west)	Redevelopment is occurring but significant yields in future are not anticipated.
12	Bellevue Hill	Mainly single dwellings on large sites. Significant redevelopments are occurring and may continue to occur. This area has been assessed for increase in development yield.
13	Rose Bay (east)	Mainly single dwellings on large sites. Redevelopment is occurring and is likely to continue. This area has been assessed for increase in development yield.
14	Cooper Park	Increase in development yield is likely in this area.
15	Vaucluse	There is a limited potential for increase in development yield in this area.

An estimate of the potential yield has been made in the working paper. This estimate is based on the trend of the current development / redevelopment rates, and the results of the analysis of each of the 2(b) zones described in *Table 4.1*, and represents an optimistic projection of the medium/long term

scenario. *Table 4.2* following, shows the projected dwelling yields in those 2(b) zones identified for potential future development/redevelopment.

A maximum potential increase of some 6,355 dwellings is predicted for the short and medium terms. Based on the existing take up rates, the maximum potential development may occur over a 20 to 30 year period. The likely impacts on traffic and transport demand are discussed later in this chapter.

**Table 4.2 - Potential Increase in Dwelling Yield**

Plan Ref.	Area	Short Term	Medium Term	Long Term (Unlikely)	Total Increase Short/Medium Term
8	Double Bay	1,415	315	-	1,730
11	Rose Bay (Balfour Road)	93	235	66	328
12 / 14	Bellevue Hill	2,157	249	-	2,406
13	Dover Heights (Rose Bay Precinct)	1,406	226	66	1,632
13	Dover Heights (Dover Road)	199	16	-	215
15	Vaucluse	44	-	-	44
				<b>TOTAL</b>	<b>6,355</b>

The above analysis does not include the recent development approval of the Meriton development (284 dwelling units), and the Dimension development (87 residential units), both in Bondi Junction.

#### **4.1.2 Retail and Commercial Development**

Potential for significant long term retail and commercial developments will depend on many factors including availability of land zoned for the purpose, and population growth to sustain their viability.

It is envisaged, however, that any significant commercial developments will occur in the regional centre of Bondi Junction rather than in other neighbourhood centres. Long term commercial/retail development potential (over 20 years) in Bondi Junction could be as high as 144,460 m<sup>2</sup>.

Significant short term developments within the foreseeable future include:

- Redevelopment and extension of the Bondi Junction Plaza and Grace Brothers by Westfield Shoppingtown. This proposal envisages an expansion of retail floor area of some 23,000 m<sup>2</sup>, and the construction of a cinema complex with 2,000 seats. The proposal also includes an expansion of existing car parking provision from 1,810 spaces to 2,925 spaces, an addition of 1,020 spaces.

- 
- Development application (DA) pending for 48 residential units and 2 commercial suites with 150 m<sup>2</sup> floor space and 106 parking spaces in Double Bay
  - Meriton development in Bondi Junction includes about 600 m<sup>2</sup> of retail floor space
  - DA approved for Royal Women's Hospital site includes 780 m<sup>2</sup> of retail floor space
  - DA approved for Oxford Street residential site (34 residential units) includes 200 m<sup>2</sup> of commercial floor space
  - Proposed development at 177 New South Head Rd., Edgecliff includes 547 m<sup>2</sup> of commercial floor space.

The short term increase in floor space of 1,300m<sup>2</sup> in centres other than Bondi Junction represents only approximately 1% of the total retail/commercial floor area in the rest of the municipality.

## 4.2 Population Increase and Changing Cultural Behaviour

---

Assuming the worst case scenario of future growth in residential dwellings of 6,355 within the next 20 to 30 year period, the corresponding growth in population in the municipality may amount to approximately 12,000 people, giving a total population of approximately 60,000 by 2,030. This brings the municipality back to its population level in the late 60's and early 70's.

Present traffic flow data within the network has indicated that there has been significant increases in traffic generation within the municipality, apart from impacts due to external pressure and through traffic. Such increases are mainly increases in number of car trips generated per household due to change in cultural behaviour and affluence of the society since the 60's.

The impact on traffic growth is approximately the same as the average projected growth of 1.7% per annum for the Sydney metropolitan area. If the predicted increase in household car trips is allowed to occur without any network improvement and/or modification in travel behaviour, the resulting impacts on the arterial roads in the network would be significant. These impacts are shown by the traffic modelling results illustrated in *Figures 4.1* and *4.2* following.

As can be seen by the rising DS (Degree of Saturation) values at critical intersections it is expected that the performance of the arterial roads will deteriorate due to natural population growth. This is based on the assumption that no improvement will be made to the future arterial system and no action taken to modify people's travel behaviour in Woollahra.

Details of future network analysis are provided in *Working Paper No.5: "Traffic Modelling"*.

---

Fig 4.1

---

fig 4.2

---

## 4.3 Regional Impacts

---

This chapter describes the potential impacts on the road network due to major projects currently being implemented and those being planned in Sydney, particularly those in the vicinity of the municipality. These projects include:

- Eastern Distributor
- Green Square development
- East-West Cross City Tunnel
- Bondi Beach Rail Extension
- Fox Movie Studios

### 4.3.1 *The Eastern Distributor*

The Eastern Distributor is scheduled to be completed in early 2000. Traffic modelling for this study has indicated a significant change in traffic patterns in Woollahra, characterised by the following effects:

- a significant reduction in both AM and PM peak volumes along William Street;
- no significant reduction in vehicle delays is anticipated at Ocean Street, Mona Road intersections with New South Head Road. (The modelling indicates that the benefit from the Eastern Distributor will be taken up by additional traffic attracted to the Ocean Street/New South Head Road);
- a significant reduction in peak hour north/south movements through Woollahra LGA, to new South Head Road and Oxford Street;
- increased movements on Cleveland Street, Dacey Street, Moore Park Road, Anzac Parade, and Todman Avenue to gain access into the Eastern Distributor;
- some city bound traffic from Woollahra may find it easier to access the city using part of the distributor via the Moore Park Road on-ramp and exit via the William Street off-ramp;
- a significant reduction of through traffic within the Paddington Precinct (in the order of 480 vph in the peak);
- congestion at William Street on-ramp is expected in the PM peak for those who wish to use the distributor for homeward bound journeys.

### 4.3.2 *Green Square Development*

The proposed re-development of the Alexandria, Zetland and Rosebery area surrounding the Green Square Railway Station along the recently completed Central-Airport Line, known as the Green Square Development, is anticipated to consist of residential, industrial and commercial

developments. This area is bounded by Cleveland Street in the north, South Dowling Street in the east, Gardeners Road in the south and Princes Highway in the west. It is expected to generate AM peak movements of 6,000 vehicles per hour in 2000 and 8,000 vehicles per hour in 2016. Traffic modelling undertaken for this study does not indicate significant adverse effect on Woollahra network, but will generate significant peak traffic along the Eastern Distributor and its access points, which will indirectly reduce the benefit of the distributor for Woollahra.

#### 4.3.3 Cross City Tunnel

The Cross City Tunnel connecting the Western Distributor and the Kings Cross Tunnel is currently under investigation by the RTA. This tunnel is proposed to cater for the east-west through movements and will not have facilities for access to the city centre. There will be access from the proposed tunnel to/from the Eastern Distributor. The current program indicates that this tunnel will be constructed by 2006.

Traffic modelling for this study indicates no significant increase or decrease in traffic flows through the Woollahra LGA cordon. There is a change in the AM peak traffic flow pattern on some key roads between the year 2006 models with and without the tunnel. The changes in traffic movements are illustrated in *Table 4.3* following.

**Table 4.3 - Effects of Proposed Cross City Tunnel**

Location	Peak	Change in AM Traffic Volumes Due to Tunnel (Vehicles / Hour)
Mclachlan Ave at Bayswater Road NB	AM	331
	PM	90
Neild Ave at Boundary Rd SB	AM	28
	PM	169
Glenmore Road at New South Head Road NB	AM	34
	PM	30
Ocean Street at New South Head Road NB	AM	85
	PM	102
Ocean Street at New South Head Road SB	AM	188
	PM	468
Edgecliff Road at Ocean Street EB	AM	133
	PM	283

Location	Peak	Change in AM Traffic Volumes Due to Tunnel (Vehicles / Hour)
Bayswater Road at Mclachlan Ave WB	AM	527
	PM	396
Bayswater Road at Mclachlan Ave EB	AM	408
	PM	406
Right Turn from NSH Road into Ocean Street	AM	216
	PM	385
Oxford Street at Glenmore Road WB	AM	- 432
	PM	- 214
Oxford Street at Glenmore Road EB	AM	- 86
	PM	- 51

The reduction of Oxford Street traffic will be matched by the expected traffic increase in Bayswater Road, due to easier access to both the Eastern Distributor and the Western Distributor.

Trip patterns from the south through Woollahra LGA show an increase in peak flows, particularly through Paddington, Woollahra along Ocean Street, Glenmore Road and McLachlan Avenue.

Traffic Modelling indicates that the Cross City Tunnel is better located in the southern side of the city as most through traffic along New South Head Road has a destination within Sydney CBD. Cross city traffic should be diverted from New South Head Road and Kings Cross Tunnel to avoid competition of road space between the city bound traffic and cross city traffic.

#### **4.3.4 Bondi Beach Rail Extension**

The proposed Eastern Suburbs Line extension to Bondi Beach is not expected to have significant effect on transport trips generated in Woollahra.

Currently, the frequency of the Eastern Suburbs Line during the peak hour has been dictated by the demand and operational requirement to provide the peak city bound service. By extending the line to Bondi Beach, every second or third train that arrives at Bondi Junction may continue to Bondi Beach. Depending on the demand, there will be opportunity to increase the peak frequency if required.

The impacts of the proposal are seen as :

- 
- It will provide an alternative mode choice for those who travel to Bondi Beach.
  - People who currently use Bus transport to travel to Sydney or Bondi Junction may use the train (particularly from Bondi Beach).
  - It may attract patronage of those who currently drive.
  - It will provide an opportunity to increase the carrying capacity if required.

Traffic modelling does not show any significant impact on the operation of the road traffic network in Woollahra as increase in rail patronage is not seen as a major effect of the proposed extension.

#### **4.3.5 Fox Movie Studios**

Apart from the intersection of Oxford Street/Queen Street/Lang Road, traffic generated by the Fox Movie Studios would not directly affect the road network in Woollahra. Most of the traffic generated by the Studios is expected to be outside the peak periods, although some traffic generation may be expected in the PM peak.

There will be some changes to traffic signal settings to down grade the use of Lang Road for access to the Studios.

By the end of this year, a car park with approximately 2,000 spaces will be provided within the Studios ground to accommodate the needs by the Studios when fully developed.

Traffic modelling does not indicate any significant impact on Woollahra LGA road network.

## **4.4 Public Transport Facilities and Impacts**

---

### **4.4.1 Effect of Population Growth**

The 1996 Census Data indicated a total population of 48,742 with a work force of 26,743, which gives a work force ratio of 0.55. The projection to a future population of 60,000 will give a work force of approximately 33,000 people, an increase of approximately 6,300.

Based on the existing JTW mode split of 24% to public transport (14% train and 10% bus), the potential additional public transport patronage would be approximately 1,510 (880 by train and 630 by bus based on existing split).

The increase in bus patronage based on the same mode split would therefore be approximately 24%. Based on the average current bus occupancy rate during peak hour (approximately 36 people per bus in the peak hour<sup>2</sup>), it is estimated that an additional 23 buses would be required to provide a similar service level to that existing.

---

<sup>2</sup> See assumptions made in the Modelling Working Paper

---

The projected increase in rail patronage of 880 people represents a 23% increase in patronage, which may be accommodated in the existing service, assuming the peak hour service at present has an average occupancy of less than 75%. As the existing peak hour service between Bondi Junction and the City runs at a 5 minute frequency, there is little scope for increasing the frequency significantly in the future, without major capital investment in upgrading the line capacity of the existing facility.

#### **4.4.2 Effect of Increase in Mode Shift to Public Transport**

The patronage of the existing bus service represents 10% of all JTW trips, and almost 14% of all weekday trips (other than JTW) generated in the Municipality. These percentages are much higher than the metropolitan average of 4-5 percent. The relative popularity and the acceptance of bus travel by the Woollahra residents shows encouragement for planning future improvements.

In theory, an increase in mode shift to public transport will reduce traffic congestion in the road network and its undesirable effects. In this study, we have targeted a 10% mode shift to bus travel in the long term future and examined the impacts on the transport network of this phenomenon, through scenarios testing of various modelled years.. Details of modelling are provided in *Working Paper No.5: "Traffic Modelling"*.

Impacts of mode split shifts on the arterial road operation are illustrated in *Figures 4.3 and 4.4* following.

The major effects of mode split shift are not apparent as shown in the figures, which show minimal change in the Degree of Saturation (DS) values at various intersections along New South Head Road.. However, as documented in the Traffic Modelling Working Paper, the mode split shifts will cause a major change in traffic movement patterns in Woollahra. Most traffic presently using the local roads for shorter trips will be brought back to the arterial roads due to a significant reduction in arterial road traffic, optimising the performance of the total network.

#### **4.4.3 Expected Benefits of Transit Lanes**

In order that the targeted mode shift can realistically take place, the modelling includes a proposal to implement initially T2 Lanes along New South Head Road between Double Bay and Bayswater Road and along Old South Head Road/Oxford Street between Rose Bay and Boundary Road. To further enhance the use of the transit lane, it is suggested that a 'Transit Priority' signal system be considered for all vehicles in the transit lane. The T2 Transit Lane should ultimately be replaced by Bus Lanes when increasing number of commuters begin to use the public transport system.

A study conducted by RTA<sup>3</sup> showed that, on average, the transit/bus lanes operating in Sydney account for approximately 49% of the person

---

<sup>3</sup> RTA, 'A Study of Sydney's Transit and Bus Lanes', 1994.

---

throughput of the road network on which priority schemes operate. Overall vehicle occupancies have also increased on the major roads where the Transit Lane scheme operate. The increases were recorded from 1.27 (persons/vehicle) to 1.45 on Victoria Road; and from 1.49 to 1.75 on Military Road. Similar increase in vehicle occupancy is expected on New South Head Road if Transit Lanes are introduced.

The negative effect of Transit Lanes is that they *may* reduce bus occupancy unless bus travel is made more attractive. It is therefore recommended that the proposed Transit Lanes scheme should ultimately be replaced by Bus Only Lanes.

---

Fig 4.3

---

fig 4.4

---

## 5. Strategy Development & Recommendations

### 5.1 Introduction

---

#### 5.1.1 *Strategic Framework*

Transport planning should be approached in such a way that considers it part of a complex system of physical, functional, political and social elements.

Sustainable development is now widely accepted as one of the fundamental goals we should strive for. The Federal and State Governments have been actively pursuing policies which would make more effective use of the existing transport infrastructure and better integrate land use and transport planning on the regional level. At the local level, many local governments have assumed a much broader scope in land use and transport planning, which include greater coordination and cooperation with adjacent municipalities and different departments within the local government, as well as forming stronger links between Local Councils and State and Federal Governments in planning matters.

It is important that the strategies developed in this study, resulting from a coordinated effort between Council's technical staff and their consultants, the RTA and community representatives, should be regarded as the beginning of a continuous process, whereby Council's goals, objectives and policies for future transport planning of the municipality are implemented and reviewed on an on-going basis. It is also essential that the community will be involved in future reviews and in Council's long term planning process.

#### 5.1.2 *Objectives*

Strategies are developed to incorporate the four main objectives:

- To reduce the need to travel (particularly by car)
- To encourage travelling in more sustainable ways (modes of transport)
- To reduce external impacts on the transport network (land use)
- To improve accessibility including disabled access (infrastructure for alternative modes)

This study has shown that vehicular traffic has significantly grown within the municipality despite a general trend of population decrease. This means that the average number of car trips made by the individual (person or household) has increased. Apart from reasons attributed to visitors' traffic generated outside the municipality, one of the major causes of traffic increase, is the increase in the number of daily trips generated by the

---

community. Given that there will be little or no opportunity to indefinitely increase the road network capacity, the strategy is to manage future travel demand and the existing infrastructure assets in a more effective and sustainable way.

## **5.2 Travel Demand Management**

---

Travel demand management is a general tool which combines a series of policies and actions to achieve the ultimate aim of a sustainable transport system. The main objectives are to reduce the total amount of travel, minimise the need for expanding the road system, and to increase the share of non-car based transport modes.

The main issues to address the causes of travel consist of:

- transport related actions to influence travel behaviour
- land use actions to minimise the need for travel

To develop strategies and actions to achieve the objectives, the Municipality of Woollahra will have to work together with the State Government authorities. The purpose of this integrated approach can lead to:

- development patterns which can support the investment of public transport infrastructure and provide a high level of service thus making public transport more attractive for people to use;
- public transport systems which support the existing development pattern and provide a better level of service;
- full integration of accessible facilities across all transport modes;
- modification of existing development patterns to provide a closer association between land use and public transport; and
- promotion of alternative travel modes such as walking and cycling.

## **5.3 Land Use Control Strategy**

---

Land use control is one of the most important elements in travel demand management, and is one in which Local Government can exert significant influence. The following outlines the practicality of some land use measures which Council may consider for further implementation development.

### **5.3.1 Zoning Control**

Woollahra is a highly developed municipality, and there is limited or no green field sites for any major development without demolishing and consolidating existing land use. Existing land use patterns will remain for a long time, even if Council rezones some areas for different uses. The

---

existing re-zoning procedure does not allow Council to rezone land easily without some objections from stakeholders with vested interests.

Council can, however, from time to time, review its land use plan to integrate land use and transport facilities to minimise the need for travel. Some of the measures to be considered in future land use plans should consider the following:

- Establishing a hierarchy of centres and increasing the choice in land use such as mixed development.
- Locating trip generating activities and developing appropriate densities in accordance with location proximity to public transport.
- Encouraging higher density developments in close proximity to public transport nodes.
- In Woollahra, there may be some opportunities to provide a more integrated mix of housing, employment, retailing, entertainment, and commercial uses. This may be achieved by creating new mixed use zones or extending existing ones.

(Note that the current draft *Woollahra Residential Development Control Plan 1999 - RDCP 1999* provides additional controls for mixed development in commercial and business land use zones introduced by Woollahra LEP 1995. These zones do not include Double Bay, Rose Bay (New South Head Road) or Bondi Junction commercial centres which are subject to their own Development Control Plans.)

### **5.3.2 Development Application Requirements**

Council should review their Development Control Plans periodically to include measures in the form of incentives and disincentives. The following measures could be considered:

- Requiring comprehensive transport plan submissions from commercial developments to cater for various transport needs including subsidies to employees for public transport travel in lieu of parking provisions, car pooling schemes or shuttle bus services, for example.
- Levying Section 94 contributions for improvements to public transport facilities, bicycle, accessible and pedestrian facilities.
- Limiting provision of car parking spaces for both commercial and residential developments through the use of the ‘shared parking’ concept (discussed in further detail in *Section 5.6 - Parking Strategy*)
- Providing density bonuses for employers and developers for developments located within convenient proximity of public transport access (e.g. within 200 metres).

---

(While the current *RDCP 1999* requires less parking provision for developments close to public transport facilities, no specific reference is made to building density)

- Providing incentives to developments with convenient access to public transport facilities with lower Section 94 contributions (or higher contributions for those with poor public transport access) to fund pedestrian, bicycle and public transport facilities.

### **5.3.3 Improved Amenity and Facilities**

Pedestrian amenity, particularly feelings of security and safety, have a significance on mode choice, and when and where people choose to walk. A pleasant walking environment often encourages a greater number and longer walk trips.

It is important that Council develop a pedestrian amenity improvement program and set objectives and targets to achieve that program (see also *Section 5.4.6 - Strategies for Pedestrians*).

## **5.4 Transport Service Strategy**

---

### **5.4.1 Overall Transport Objectives**

The implementation of transport service strategies requires cooperation between Council and State Government agencies. Council can, however, significantly influence the implementation of their policies by initiating an action program and commencing dialogues with relevant government bodies based on the strategy developed in this study.

Strategies developed in this study were based on two major objectives:

- To reduce the need to travel
- To travel in more sustainable ways

The following are the basic elements on which our transport services strategies were developed:

#### ***Favour Travel by Sustainable Modes***

In the planning, assessment, budgeting, design and implementation of transport infrastructure and elements impacting on the public domain, more sustainable travel modes should take precedence over less sustainable modes according to the following priority: walking, cycling, public transport and multiple occupancy of vehicles in lieu of single occupancy vehicles.

#### ***Road Space for Moving People Rather Than Vehicles***

---

Accepting that congestion is the natural state of urban arterial roads, our strategies should concentrate on moving *people* more efficiently rather than on trying to move *vehicles*.

### ***Transport, Fitness and Health***

Strategies should direct to encouraging a fitter, healthier society by redressing the current situation where people are often resistant to walking or cycling due to concerns arising from such factors as personal security, safety, pollution and amenity.

The transport service strategies proposed in this study are therefore based on the objective of providing a wider choice of public transport facilities as a service to the community, rather than being based on commercial considerations. The availability of transport service options will in turn provide better incentives for people to use them. All other strategies, whether using incentive or disincentive measures, are aimed at encouraging the change of car mode to available alternative transport modes.

The following strategies are recommended.

#### **5.4.2 State Transit Authority (STA) Bus Transport Strategy**

Bus operations need to be made immune to the constraints of general traffic.

This study supports that, bus lanes (in the long term) or transit lanes (interim) be provided along both New South Head Road (between Victoria Road Double bay and the city) and Old South Head Road (between Victoria Rd Bellevue Hill and the city). Transit lanes (such as T2, T3 or bus lanes) need to be established *in anticipation* of increases in traffic. They provide a range of benefits, including:

- the ability to implement bus priority measures in stages (eg T2 first, then replaced by T3 and finally by Bus Only), thus catering for current demand whilst facilitating the gradual modification of travel behaviour as pressure from travel demand increases
- ensuring that bus traffic is free of congestion caused by general traffic
- limiting the amount of road space allowed to support growth of travel by private vehicles
- guaranteeing that today's roads will be capable of serving future needs by ensuring that road space is used most efficiently

Together with bus lanes, it is also suggested that bus priority signals at major intersections be examined in conjunction with RTA to facilitate bus movements (the effects of this strategy have been examined in *Working Paper No.5: "Traffic Modelling"*).

In addition to bus priority measures, we also recommend that actions be initiated by Council to identify locations for provisions of shelters and associated facilities at bus stop waiting areas, in addition to suitable

---

accessible facilities. Key locations such as those adjacent to retail and commercial centres should receive priority treatment. The facilities will also provide opportunities for displaying bus route and timetable information, which is needed to encourage the use of bus transport.

Short term route planning is required to increase the efficiency of bus operations. Such planning includes introducing some shorter routes and increasing their turn-around frequency. Examples of route changes include the suggestion by a resident progress association that the Watsons Bay-CBD route could be divided into 'east' and 'west' routes at Edgecliff. Detailed planning should be conducted by STA in consultation with local residents. Council, however, should initiate this action through its normal channel with the state government.

Marketing of *improved* bus services will need to be more effectively carried out to encourage local residents to use the improved services.

#### **5.4.3 Community (Local) Bus Service**

There is a demand for a better inter-centre service between Double Bay and Bondi Junction. Some residents felt that the existing STA services do not provide a direct route between the centres and therefore require much longer travelling times which discourage potential users.

*Working Paper No.2: Public Transport* indicates that public opinion is weighted in favour of a shuttle or mini bus service as it is perceived to solve the bulk of transport issues with the least impact on the status quo. This study, however, does not support the view that community bus services can resolve local transport issues in the long term, despite other operational and administrative problems.

It is recommended, based on community demand that a study be initiated by Council to investigate the feasibility of a shuttle bus service between two or three major centres in Woollahra. This service could be either commercially operated or be run in conjunction with the STA to cater for this special requirement.

The routes need to be direct, with improved frequency and shorter journey times. The service could be provided under the 'fare-box' basis and/or subsidised initially by commercial establishments benefiting from the proposal. Accessible facilities should be incorporated into these services and a survey of the residents should be carried out to forecast the potential of patronage.

A preliminary concept was developed for discussion in the second Community Consultation Workshop session, which raised a great deal of interest and comments. The original concept has since been modified to avoid conflicts with existing STA bus routes. The modified concept is shown in *Figure 5.1* following, and is recommended for further review by the community.



---

Figure 5.1

---

#### **5.4.4 Rail Service Improvements**

Currently CityRail is undertaking major redevelopment of the Bondi Junction Station to improve its efficiency as a major public transport interchange. The Eastern Suburbs line presently benefits from a higher level of service than its patronage demands due to its role as a turning facility for others lines of the rail network.

##### ***Favour the Bondi Beach Rail Link***

While there are conflicting opinions on the short term potential for the proposed Bondi Beach Rail Link to divert a significant proportion of trips from cars to public transport, it cannot be denied that the proposed railway will increase the choice of modes and the *potential* to use public transport.

As travel demand increases and the modal shift diverts from car, it will be necessary to provide an efficient mass transit facility. The Bondi Rail Link could fill this role.

The proposed Bondi Beach Rail Link is included in the State Government's current rail network improvement plan<sup>4</sup>. The proposed railway line is to be fully funded by the private sector, with a new station being proposed at Bondi Beach. The station would be constructed underground with only access portals visible at ground level.

The link would bring much needed extra capacity to the Sydney rail network as currently train flows are limited by the time needed to turn trains at the existing Bondi Junction spur.

On the grounds of the issues raised above, Council is advised to support initiatives to construct the proposed Bondi Rail Link.

##### ***Light Rail***

Light rail transit (LRT) has been suggested by a resident progress association.

Working Paper 2 "Public Transportation" Preliminary indications suggest that a light rail line running through Woollahra warrants a process of further consideration and investigation. Decisions relating to the feasibility or alignment of such a line cannot be made without careful consideration of a range of associated issues.. Such a process should involve the Department of Transport, the Department of Urban Affairs and Planning, surrounding councils and the community and would need to consider:

- Route corridor and patronage catchments
- Effects on vehicle traffic
- Noise and other visual impacts
- costs of providing the infrastructure and financing mechanism

---

<sup>4</sup> See Action for Transport 2010

- 
- engineering requirements
  - competition of other transport modes in the same corridor.

Transport modelling indicates that it will require a considerable shift in mode split (at least 20%) before this option can be viably considered. We recommend that this strategy be considered only as a long term possible option.

Any public transport initiatives would gain significant weight through State Government policies such as increases in fuel levies, vehicle registration fees or increases in public transport subsidisation. Council should support moves for such pro-public transportation policies.

#### **5.4.5 Ferry Service Strategy**

Ferries currently carry only a small proportion of the total travel task and even if significant increases are made to its modal share, the net quantity of trips that will be served is relatively low. They do form a culturally important and pleasant public transport alternative for trips originating and terminating within walking distance of wharfs, and have strong potential to serve growing tourist traffic.

Ferry services should be improved in conjunction with and as part of wider moves to bring about a modal shift from cars to alternative modes of transport. Potential courses of action which could be promoted or pursued by Council include:

- Increasing the levels of service to wharfs in Woollahra
- Consideration of timetable modifications to investigate, for example, the potential of running peak hour express services to popular locations such as Rose Bay
- Improvements to pedestrian, accessible and bicycle links to ferry wharfs
- Promotion of integration of bus and ferry operations and improvements in the potential to transfer between the two modes (the concept of ‘feeder buses’)

It is to be expected that existing parking around ferry wharfs will serve as defacto ferry “park’n’ride” sites. While this should not necessarily be discouraged, expansion of such facilities is considered unsustainable and contrary to the aims of the transportation strategy and thus should not be pursued.

At the time of preparing this report, the study team was advised that the STA is taking action in commissioning consultants to investigate the feasibility of upgrading and improving the services of Sydney Ferry. The objective of the proposed study is to establish the patronage potential of ferry services within the broad catchment area relating to Sydney harbour and the Parramatta River, and review options to develop improvements and business opportunities.

---

#### **5.4.6 Tourist Coaches**

Tourist coaches have not been popular with Woollahra residents, particularly those whose streets are frequented by their presence. However, they bring many indirect and less perceivable benefits associated with tourism. Our strategy should be based on the needs of tourist operators and how to *manage* the effects of coach traffic. Management measures must be able to balance the requirement of tourist coach operations with the needs of residents. It is recommended that measures included in this strategy may include:

- restricting coaches to designated routes such as existing bus routes
- nominating dedicated coach parking areas while restricting it in other areas
- placing load limits on certain roads, thus concentrating heavy traffic on the most appropriate routes.
- establishing easy to understand operating guidelines for tourist coach operators

#### **5.4.7 Bicycle Travel Strategy**

Woollahra is very poorly served with bicycle facilities despite being in a location and having a structure that is well suited to their use.

Establishment of a designated bicycle network should be accompanied by overall improvements to the cycling environment within Woollahra. Implementation of a general 50 km/h speed limit in local precincts through legislation, design measures and enforcement would be a good first step towards such an improvement.

In addition it is recommended that Council:

- adopts the “Woollahra Bike Plan” as a base for implementing bicycle facilities throughout the municipality
- actively promotes cycling through the layout and design of facilities and the establishment of an attractive and amenable cycling environment.
- prepares an education/encouragement program to attract the end users.

#### **Woollahra Bike Plan**

Appropriate funds should be allocated by Council to start redressing past neglect of the bicycle network. Implementation of the Bike Plan recommendations should commence no later than January 2000, or as soon as funds become available. The Woollahra Bike Plan study has identified the following funding sources:

- NSW Roads and Traffic Authority, through their annual allocation of funds for regional and local cycle-ways

- 
- Corporate Contribution and Sponsorships can be sought to fund facilities at shopping centres etc
  - Department of Transport, which has made funding available for bicycle lockers at railways stations, bus terminals etc
  - Department of Public Works and Services, which should be approached for funding of bicycle parking facilities in schools etc
  - Section 94 Contributions, which can be established by Council to levy contributions from developers for funding bicycle facilities as part of the transport requirements generated by development.

### ***The Users of the Bicycle Network***

Bicycle facilities should not be designed to reflect present levels of bicycle traffic (as existing facilities are generally non-existent) but rather in such a way that attracts users and stimulates growth of bicycle traffic along them.

### ***Change Attitudes Towards Cycling***

In conjunction with the gradual implementation of a bicycle network in Woollahra, Council should undertake education and promotion programmes aimed at the whole community - whether they already cycle, would consider cycling, or will merely share public space with cyclists. These community programmes should:

- communicate the holistic and other benefits that cycling bring to the individual and broader community
- educate cyclists as to their responsibilities as a user of public space
- aim to promote cycling as an alternative mode of transport

#### **5.4.8 Pedestrian Strategies**

It has been shown that a significant proportion of JTW and other social trips are walking (pedestrian) trips (see *Tables 3.6 and 3.7*). These are obviously short trips and normally require no more than 30 minutes walking time or less than 2 km walking distance. It is essential that pedestrian facilities are adequately provided to encourage their use.

In general, existing pedestrian facilities in major commercial and activity centres are considered reasonable with the major deficiency being inconsistent standards, particularly in regards to equal access for people with mobility difficulties. In some residential areas, however, pedestrian facilities are less defined mainly due to narrow roadways and topographical constraints.

*Working Paper No.2: "Public Transport"*, makes reference to establishing a pedestrian environment in areas with high concentrations of pedestrians. The working paper recommends Council to:

- 
- develop policies, guidelines and assessment measures to ensure that the needs of pedestrians are considered when planning and designing elements that make up Woollahra's urban environment;
  - actively promote walking through design of facilities and the establishment of an attractive and amenable pedestrian environment; and
  - re-establish and reinforce the pedestrian scale within Woollahra.

It is beyond the scope of this study to provide a detailed study of pedestrian facilities. It is, recommended, however, that a detailed study be initiated by Council to investigate the needs of pedestrians and prepare pedestrian management plans in conjunction with the RTA for locations of high pedestrian activities as part of the overall strategy to encourage the use of alternate travel modes.

The pedestrian management plans should include considerations for the following:

- access needs of people with disabilities;
- security requirements in the walking environment;
- facilities such as seats and waste disposal in activity centres;
- general improvements to footpaths;
- safety aspects and priorities at controlled crossings; and
- links between activity centres and public transport nodes.

The following priority locations are suggested for the proposed development of pedestrian management plans:

- Double Bay commercial centre
- Rose Bay foreshore area
- Watsons Bay area
- Bondi Junction
- Edgecliff and the surrounding area
- Paddington

It is noted that references have been made to providing pedestrian management plans in Development Control Plans for Double Bay and Bondi Junctions.

#### **5.4.9 Access Provisions for People With Disabilities**

A commitment to provide a fully accessible transport service to people with disabilities is considered an important part of the overall transport strategy.

---

The objective is to provide equal opportunities to all members of the community for the right of travel and movement.

The proportion of residents with some form of disability is approaching 10% of the population, which is considered significant in terms of priority of service provision. In addition, there are visitors and tourists who may require equal access provisions in the municipality.

The Woollahra Disability Access Committee (WDAC) has made a submission to this study stressing the needs to provide adequate access facilities for people with disabilities. The submission is included in *Appendix C of Working Paper No.6: Community Consultation*. A summary of the concerns raised in the submission is given below:

1. Many bus stops in Woollahra are currently not accessible by people with disabilities. This deficiency includes non-standard kerb heights; insufficient “No Standing” clearances for buses to stop close to the kerb-side; interference with road side furniture; stops not suitable for new “kneeling” buses and in adequate weather protection at bus stops.
2. There is insufficient provisions for disabled parking. Concerns include insufficient parking bays in public car parks and on-street parking areas; insufficient design to allow wheelchair loading; insufficient allowance for disabled parking in residential areas. The WDAC also calls for tightening up of the eligibility criteria for disabled parking permits.
3. There is an urgent need to develop bicycle paths which would provide an alternative route for people who are dependent on wheelchairs or motorised scooters.
4. Concerns were raised over illegal parking across footpaths and inappropriate kerb ramps for disabled access. The Committee advocates the use of standard tactile surfaces on footpaths in shopping centres.
5. There is a need to review the current practice of providing consistent audio cues at traffic signal locations. The Committee recommends extra walk time be given to specific pedestrian crossings, particularly along New South Head Road, Edgecliff, to provide for the elderly and the physically handicapped.

Although it is beyond the scope of this strategic study to provide details of current deficiencies in equal access provisions, it is the recommendation of this study to commit Council to undertake a detailed investigation into the provision of adequate accessible facilities.

Our recommendation is for Council to initiate a study to provide an “Accessibility Plan” for the Municipality, similar to those undertaken by a number of other Councils, in which identifications are made of current facilities and deficiencies and future plan for provisions. Council should also lobby RTA and STA for funding in the provision of those facilities identified in this study. Our recommendation for a continuing Traffic/

---

Transport Working Committee is to ensure that the future works recommended in this strategic study are to be carried out and that a fully integrated accessible transport plan is developed and detailed.

## **5.5 Traffic Management Strategy**

---

Traffic management objectives and practices differ greatly between arterial roads and local streets. The need to adopt a functional road hierarchy is essential in the development of objectives and techniques applicable to the road network.

The functional hierarchy of the road system in Woollahra is identified in *Working Paper No.3: Traffic Operations*. An accepted road hierarchy must be adopted by Council as a plan for future development. It is essential that Council consult with the RTA and agree on the final road hierarchy plan upon which all traffic management strategies are based.

While most traffic management proposals provide measures to address short term safety and traffic congestion issues, the long term objective is to preserve and protect the local environment from traffic intrusion through a well considered demand management plan. The long term strategy may or may not appear to be feasible or practical in the short to medium term, and may need to be considered in conjunction with land use and parking control, and public transport initiatives.

### **5.5.1 Arterial Road Traffic Management**

A detailed description of traffic management opportunities for the arterial roads in Woollahra is provided in *Working Paper No.3: "Traffic Operations"*. Essentially, the philosophy for traffic flow improvement on arterial roads is not considered to be based on capacity improvement, which requires road widening, new bypass routes, grade separations and other capital investments. Rather, the long term objective is to reduce demand for car travel. The proposal for establishing 'Bus Lanes' along the major arterial spines is one of the alternative mode strategies aimed at achieving this long term objective.

Short term management strategies should aim at managing the existing assets and optimising the network performance as best as possible, while measures to discourage the unnecessary use of the private car are being implemented.

Short term measures include:

1. optimising traffic signal operations along the arterial corridors, with priority for bus movements where possible;
2. restricting right turns at un-signalised intersections during peak hours;
3. introducing 'left turn with care' at signalised locations where pedestrian crossing does not conflict the left turn movements; and

- 
4. optimising bus stop locations along New South Head Road, so that stops are located on the far side of major intersections rather than the near side to minimise lane changing by impatient drivers.
  5. considering right turn phasings at signalised locations where required (e.g. at Queen Street/Ocean Street intersection)
  6. A number of arterial Road intersections have been identified to be operating below the optimum performance level. These intersections should be further investigated by RTA for short term improvement where possible. These intersections include:
    - Oxford Street/Ocean Street/Syd Enfeld Drive
    - Oxford Street/Queen Street/Lang Road
    - Oxford Street/South Dowling Street/Boundary Street
    - Bayswater Road/Neild Avenue/
    - Bayswater Road/McLachlan Avenue
    - New South Head Road/New Beach Road
    - New South Head Road/Mona Road
    - Ocean Street/Queen Street
    - Old South Head Road/Birriga Road
    - Old South Road/Victoria Road

### **5.5.2 Local Traffic Management**

The primary objectives of local area traffic management are to provide safety for both road and non-road users of the local road network and to improve the amenity of the local area as perceived by the residents.

In principle, all through traffic should be carried by the arterial road system, and the local road network should be used for collecting traffic from the arterial/sub-arterial roads and distributing it to the local streets for access purposes. However, when vehicle delay becomes a problem in the arterial road system due to insufficient capacity or other operational problems, there invariably are increases in traffic flows in the local road system.

These increases are due to not only the longer distance through trips, but also traffic which finds it easier to traverse the local road network for short trips rather than using the arterial road system. This phenomenon is particularly noticeable within the Woollahra municipality as shown by the 1996 travel survey which indicated that over 70% of trips generated in Woollahra were local trips.

A number of local traffic studies have been carried out in Woollahra with recommendations for various traffic management measures. Most of these recommendations have not been implemented by Council. A review of the

---

operations in the local road network has been documented in *Working Paper No.3: Traffic Operations*.

The recommended strategies for local traffic management are as follows:

- During the trial implementation of the 50 km/h speed limit in Darling Point precincts, Council should conduct a 'before' and 'after' study of its effects. This will provide the basis for review of local traffic control proposals.
- Review the local traffic management plans previously prepared in view of the effects of introducing the new 50 km/h speed limit. The review of traffic control measures should be based on urban design and environmental considerations, (such as creating a local traffic environment so that people drive at speeds compatible with the environment) rather than blanket use of traffic signs and speed reduction devices.
- Facilities for alternative travel modes should be provided in the revised local traffic management plans as an integral part of the overall transport strategy.
- Local traffic management plans must be prepared precinct wide and should consider effects on neighbouring precincts, with emphasis on restraint of short trips which can be provided by more healthy and sustainable modes.
- The long term objective is to develop shared zones within each precinct when the public transport strategy achieves its set targets of mode shift.

### **5.5.3 Car Pooling**

Car pooling has been tried with a mixture of success and failure. The success rate depends on a number of factors as follows:

- Homogeneity of the work force in the local areas
- Car ownership patterns
- Available information of car pool users
- Management resources

For Woollahra, it is considered to be very difficult to maintain a car pooling scheme on a community basis. However, there may be opportunities for individual schemes which can be organised privately. Council may be able to assist with maintaining and supplying information for willing participants, whether as drivers and/or passengers, through feedback from local residents. A data base could be set up and be accessed through Council's Information Centre by interested parties.

Easy Share Australia, a commercial organisation which offered car pooling services by matching demand and supply through the computer, has previously written to all local councils in Sydney. Due to very poor

---

response, this organisation has recently suspended its operations in Sydney and has moved to Melbourne. Contact has been made with Mr Barry East of Easy Share Australia, P. O. Box 480, Camden, NSW during this study and further information can be obtained from this organisation regarding their operation.

## **5.6 Parking Strategy**

---

A well developed parking policy plays an important part in the overall transport objectives in Woollahra. The aim of a parking policy is to identify acceptable usage of available supply and to manage the supply and demand, with the main objective of minimising additional traffic generation.

Long term parking strategy is an important tool in influencing travel demand and car mobility. The parking control measures developed in *Working Paper No.1: Parking Issues*, generally aim at the long term objectives of traffic demand management. Because of the importance of parking control in influencing future travel demand, considerable effort has been given to the development of the parking strategy.

Generally the objectives of the parking strategies developed in this study are:

- to provide adequate parking to sustain business within commercial centres within the constraint of current transport practices;
- to address, on a location to location basis, the appropriate priority given to different user groups including the disabled; and
- to control future parking provision in accordance with the long term objective to reduce car use and dependency.

The following summarises the strategies related to various categories of parking developed in this study.

### **5.6.1 Pay Parking**

Council's proposal to introduce pay parking where required, is endorsed by this study. Previous studies have been carried out to examine the feasibility of introducing pay parking at the following centres:

- Paddington
- Double Bay
- Rose Bay

*Working Paper No.1: "Parking Issues"*, has also examined the requirements for pay parking in Bondi Junction.

The pay parking strategy is considered a short-to-medium term measure to control and manage on-street parking. This strategy, while generating revenue for Council to fund other transport facilities, should be regarded as

---

a measure to provide equitable use of available spaces so that priority be given to short term use in order to facilitate activities of the centres. The general principles applied to the pay parking strategy are as follows:

- Within walking distance of the retail core and essential services in an activity centre, the limit should be 1 to 2 hours with maximum charge rates to stimulate frequent turn over.
- Parking charges on-street should generally be higher than off-street parking to encourage the use of off-street car parks for long term parking.
- Council must ensure strict enforcement of parking regulations.

While it is argued that pay parking may have a detrimental effect on small business which do not have on-site parking, this effect may be insignificant compared with the effect due to the loss of on-street parking spaces to those who illegally overstay the parking limit. With pay parking there will be revenue for more frequent patrolling to ensure the turn over of spaces for legitimate users.

#### **5.6.2 Commercial Centre Parking**

The challenge of developing strategies for parking in commercial centres is to balance the short term needs in order to sustain the commercial viability of the centres and the long term objective of reducing car use.

Based on the short term needs and the long term objectives, general strategies for managing parking in commercial centres have been developed as follows:

- There should be adequate parking provision for visitors to commercial centres. However, the proposed strategy is to encourage long term (exceeding 1 hour) parking in public car parks provided.
- To minimise illegal parking and employee parking, pay parking should be considered for all on-street parking within the boundary of the commercial centres, as discussed previously.
- Provision of accessible parking to current Standards at relevant locations.
- On-street parking within short walking distance (say 200 metres) to the retail core should be reserved for short term parking (eg. 1 hour or less). This can be effected through time restriction and parking charges. For those streets closest to commercial services such as banks, newsagents, post offices, milk bars, or any shops where people do not normally spend a lot of time, the time restriction should be set to ½ hour or less to encourage turnover. The charge for short term parking spaces should be at a higher rate to encourage use of other modes, or making fewer short trips by car.
- Parking in public car parks for the first hour may be free of charge to encourage shoppers to use off-street parking (this could be done with/without shopping endorsement depending on how car park operators

---

recoup their costs). However, it is suggested that there should be a charge for parking less than half an hour, (consistent with charge for short term on-street parking) so that short car trips are discouraged in favour of other modes (it is recognised that this may not be practical to implement without the consent and cooperation of car park and commercial operators).

- All off-street public car parks should be open on weekends with a flat charge rate for evening parking (it should be noted some commercial centre car parks are presently open for free parking on Sundays - free parking may have previously been a commercial decision to entice weekend business).
- Private car parks of some commercial premises which are normally closed during non-office hours, could be made available for public parking during evenings and at weekends ('shared parking'). The concept of 'shared parking' could be implemented through development applications for land uses which require parking during non-office hours. Council could grant exemption of car parking required by the DCP if proof of consent or contractual agreement to utilise private parking facilities of nearby commercial premises can be shown.
- Council should use the provision of Section 94 of the Environmental and Planning Assessment Act 1979, to investigate opportunities for controlling future parking stocks.
- To ensure business viability and to ensure availability of parking spaces for business use, Council may wish to consider permit parking for business use in accordance with the RTA's recent proposal of a 'Permit Parking Scheme'. It should be noted Waverley Council has recently rejected the proposal of permit parking for business use.
- As a long term strategy for future developments and/or re-developments, Council should give consideration to the following (see also *Section 5.3 - Land Use Control Strategy*):
  - ⇒ limiting the provision of parking spaces for employees (particularly at locations where public transport is readily available);
  - ⇒ considering 'shared parking' with existing facilities which are not fully utilised, thus reducing the amount of parking spaces to be provided in accordance with Council's Parking Code requirements;
  - ⇒ provision of additional parking spaces should not generally be permitted for all commercial redevelopments at major transport nodes (eg. Bondi Junction); and
  - ⇒ reduction in number of parking spaces for all new residential developments in major centres close to public transport facilities (such as Double Bay and Bondi Junction) should be encouraged through some form of incentives (note that this strategy would only be

---

effective if on-street parking permits for residents were not available for these developments).

### **5.6.3 Local Strategies**

#### ***Double Bay***

- It is unlikely that there will be a significant increase in commercial/retail development in Double Bay. The existing centre is likely to remain a high quality specialised shopping precinct with the village atmosphere the local residents prefer. Future increases in parking demand are considered to be moderately low. Given that there is currently spare capacity in off-street car parks in the main part of the centre, a future strategy should be directed at improving management measures to effectively utilise the existing facilities.
- Introducing pay parking for all on-street spaces within the study area could have the effect of preventing the long stay parkers from using on-street spaces closest to the business/retail centre and encouraging them to use off-street car parks.
- Council may give consideration to implementing a permit parking scheme for business vehicles similar to resident parking schemes.
- Council should encourage shared use of parking facilities in future development applications through incentives such as permitting a reduced number of car parking spaces required by the DCP. Car parking provided for commercial developments can effectively be shared for use in the evening by visitors to the centre for entertainment purposes.
- On-street parking within short walking distance to the retail core (eg. 200 metres) should be restricted to short term parking of 1 hour or less.

#### ***Rose Bay***

- More frequent parking enforcement is required in areas where illegal parking often occurs. Introducing pay parking may help to regulate parking in the most intensively used areas, but the side effect may be shifting some problems to unrestricted parking areas. If pay parking is introduced on those streets currently close to the retail areas, time restrictions may be required for those streets further away from the pay parking areas. This restriction may affect the use by local residents without proper consideration of their needs.
- Problems with visitor parking at weekends and during major events in the area are difficult to resolve. This is particularly evident along New South Head Road near Lyne Park. Council has already introduced weekend resident parking in Manion Avenue, Elanora Street and Illuka Street to minimise the impact on resident parking. Council could consider extending the resident parking schemes if required (e.g. Kent Road, Norwich Road) to ensure the availability of adequate spaces for services

---

and local use during the weekend. A proposal to install parking metres in Lyne Park may reduce the instance of indiscriminate parking in the area.

- Plans to ensure an adequate public transport service should be included as a condition for obtaining permits for any special and major events to be held in the area. Considerations should be given to introduce a shuttle bus service to ferry people to and from railway stations, as a requirement for the planning of any major events. While STA may argue the regular bus services may be adequate to cater for any regular events, the above suggestion targets those irregular events such as major sports tournaments and concerts.

### ***Edgecliff***

Operators of Edgecliff's public car parks could be approached to consider the need to extend the operating hours, particularly at weekends. Private parking spaces attached to office and commercial buildings could be made available for public use after office hours. However, there is little incentive for commercial buildings to open their car parks for public use unless there is a resultant revenue. As mentioned earlier in the report, such a scheme would only be feasible if agreement could be reached with a developer who could guarantee some level of revenue to the owner of the car park concerned. Parking rates less than those in the city during weekends may entice people to change modes at Edgecliff.

### ***Paddington***

There is a strong evidence to support the introduction of pay parking on Oxford Street and on streets adjacent to Oxford Street. This measure, together with time restrictions on these streets will have the following effects:

- ⇒ long term parkers will disappear from these streets, because there will be little opportunity of finding parking spaces further away from the restricted areas (due to restrictions of the residents parking scheme), or more positively, they will be enticed to use public transport;
- ⇒ illegal parking will be minimised;
- ⇒ issue of parking for business use becomes more critical and may require Council to consider permit parking for other users besides residents; and
- ⇒ issue is raised whether the areas under the existing resident parking schemes would be affected if and when pay parking is introduced.

### ***Bondi Junction***

- Future developments should be permitted to provide fewer spaces than that required by the Council's DCP code. It is likely that traffic generation rates would be significantly reduced.

- 
- In most locations in Woollahra, where car ownership is significantly higher than the Sydney average, insufficient off-street provision will tend to increase demand for on-street parking. Adequate provision for off-street parking should therefore be the appropriate policy. In the Bondi Junction commercial centre, Waverley Council policy does not allow resident parking permits for on-street parking. This policy has the effect of reduced car ownership of residential premises within the centre, and should also be considered by Woollahra Council.
  - In areas other than the Bondi Junction commercial centre, experience shows that most residents of owner-occupied dwelling units and some rental premises do own vehicles even though they are not used for commuting purposes. Without adequate off-street parking provisions, vehicles will be parked on streets. An effective method to discourage car ownership for people occupying units with restricted parking facilities is to make on-street parking difficult and/or expensive. This strategy can only be applied in locations where public transport is convenient and where the housing market does not depend on car parking provisions.

Parking issues in Bondi Junction have been previously examined in a report by Colston Budd Hunt and Twiney Pty Ltd<sup>5</sup> (CBHT Report).

The following strategies, modified from the CBHT Report, are recommended to Council for further consideration:

- Rationalisation of parking controls on Oxford Street to eliminate the difference between the northern and southern sides.
- Increase the attractiveness of public transport use (this is being implemented by the State Government with recent initiatives in improving the terminal infrastructure and operational procedures). Conversely, reduce the supply of parking at the centre to discourage the use of private cars (recent Council initiatives to reduce the number of parking spaces below DCP requirements for new developments are considered an appropriate start).
- Provide common parking code requirements between Woollahra Council and Waverley Council. The CBHT report suggests details which should be reviewed by an inter-council committee.
- Reduction in supply of office parking, and encourage shared use of parking spaces between commercial use and other after-hour uses (incentives such as reduction in Council rates, compensation from other development uses could be considered).
- Retain the discretion of increasing short stay parking for retail and business uses.

---

<sup>5</sup> CBHT “Bondi Junction Traffic, Parking and Transport Study, Summary Report”, September 1993 - for Waverley and Woollahra Councils

- 
- Reduce parking space requirements for small restaurants, and those operating outside normal business hours.
  - Generally, on-site parking to code requirements for new residential developments should be provided, except those within the commercial centre and locations adjacent to public transport terminals where advantage could be taken to reduce the level of on-site provision.
  - Unrestricted on-street parking spaces within walking distance to a railway station tends to attract commuters. Subject to resident reaction to permitting commuter on-street parking, Council may impose time restrictions and pay parking on those on-street spaces within short walking distance to the Bondi Junction railway station (eg. in the areas between Edward Street and Edgecliff Road).

#### **5.6.4 Commuter Parking**

##### ***Parking At Major Transport Modes***

Generally, this study does not support long term provision of parking facilities at major transport modes such as railway stations, ferry terminals and major bus terminals. However, there is a need to consider short term provision for some commuter parking at these major terminals until such a time when improvements to public transport connections can be provided to make mode change more efficient. *Working Paper No.1: Parking Issues*, suggests the following short term measures:

- Council car parks (eg. at Bondi Junction) can be utilised to provide parking for commuters who continue their JTW trip by public transport
- ‘Early Bird’ parking be tolerated in the short term in locations (e.g Edgecliff) where traffic congestion is not significantly affected by such a practice
- Suitable accessible interchange / parking facilities

##### ***Employee Parking***

Available provision for employee parking at major centres is a factor in causing peak hour traffic congestion. The long term objective is to eliminate provision of employee parking at these centres. This can be gradually achieved through land use and development control strategies proposed in *Section 5.3*.

Short term strategies, however, should be directed at minimising employee parking by reducing opportunities for all day parking, particularly unrestricted on street parking.

#### **5.6.5 Resident Parking**

Resident parking schemes are considered detrimental to long term transport objectives in the sense that dwellings without off-street parking provisions should be occupied by those who prefer not to use a car as a transport mode.

---

It should not be a long term policy to maintain residential parking schemes indefinitely. Resident parking permits should gradually be phased out and not be issued to future residents of an area where an existing scheme applies.

Current resident parking schemes in Woollahra appear to have been accepted by the community, although the demand appears to be growing. In order to achieve the most effective and equitable utilisation of on-street parking spaces, strategies should be directed at the following:

- Resident parking should be rationalised in the long term. The number of permits should be limited to one per dwelling, and only limited to those without any opportunity for provision of off-street parking. Permits must not be renewed automatically, without proof of resident status and car ownership.
- A realistic charge for resident parking permits should be imposed. Such a charge should reflect the current cost to rent or provide a parking space in a similar area. Long term parking charges for an off-street space in suburban areas close to the Sydney CBD vary between \$100 and \$150 per month, depending on the location and proximity to activity centres.
- Residential re-developments in residential areas where existing developments do not have off-street parking provision should be stringently controlled in terms of floor/space ratios and provision of adequate off-street parking. The strategy should be to improve public transport facilities and to encourage their use. The residential parking scheme should not apply to all new developments or re-developments in these areas.
- Resident permit holders parking on those streets where pay parking applies may be exempted from fee paying, provided appropriate charges for the permit apply.
- Angle parking can be introduced on wider streets where demand for parking is justified. This could be done in conjunction with landscape/urban design features as a means of traffic calming.

#### **5.6.6 Bus and Coach Parking**

There will be a continuous and increasing demand for tourist coach parking in Woollahra with increases in tourism demand. There is a need to improve parking management for the privately operated buses and coaches.

The following strategies are recommended:

- Establishing a committee to draft a code of practice for private bus and coach operators is supported. The draft code of practice should contain the following elements:
  - ⇒ observing regulations relating to parking and other operational restrictions (eg. leaving motor running while parking);

- 
- ⇒ setting up routes and timetables to avoid large numbers of buses arriving at one particular location at the same time; (It is recognised that some timetables may not be strictly observed due to delays beyond the control of the tour operators)
  - ⇒ drafting a map of bus and coach parking facilities, including locations, type of facility, restrictions and access locations; and
  - ⇒ setting up a monitoring committee (may need to work with the Police) for enforcement purposes.
- Parking bays for private buses and coaches should be provided at appropriate locations. The availability of space for providing these parking bays is the critical issue. Preliminary investigations show that coach parking would best be located in, or close to existing parking areas (eg. at Robertson Park or Gap Park, Vaucluse Park, Lyne Park and Double Bay Park). These parking bays should be time restricted, and the restriction strictly policed. Parking bays should be located away from the immediate vicinity of scenic spots.
  - Bus lay-over areas may be required for special events, etc., and should be provided at suitable locations away from forecast congested areas.

#### **5.6.7 Visitor Parking**

The category of visitor parking includes all visitors from outside the municipality who visit the various attractions other than for normal business and shopping purposes. The demand for visitor parking mainly occurs during weekends and special events.

The following policy considerations relating to visitor parking are suggested for future investigation and implementation:

- All parking in public car parks should be time restricted and possibly charged.
- Future sporting and other entertainment venues must provide sufficient off-street parking in accordance with the requirements of RTA Guide to Traffic Generating Developments and Council's Development Control Plan (to be reviewed periodically).
- Future high density residential developments must provide sufficient on-site parking for visitors in accordance with the requirements of AMCORD Urban (ie. 1 space per 4 dwelling units), which may be incorporated in Council's Development Control Plan for car parking provisions.
- Approval for holding major sporting or entertainment events should not be considered unless there is a satisfactory plan for providing public transport and parking management.

---

## 5.7 Community Transport Forum

---

Through rates and service charges, Council can provide incentives and disincentives to encourage the use of the public transport system (assuming that the system is available). There should be a community awareness program through which the public can participate or be informed of Council's initiatives in promoting public transport usage, and making households aware of the options available to them and extending their options.

It is suggested a Traffic and Transport Committee comprised of resident representatives (eg. Councillors elected by the residents) and commercial representatives (eg. the Chamber of Commerce) be formed with the purpose of assisting Council in resolving traffic and transport issues, and reviewing and implementing Council policies. Through this committee, Council could undertake the following:

- work with local resident representatives to provide options and marketing materials
- promote flexible working hours (starting from local base employment)
- encourage small business to work at home (in order to reduce the need for commuting)
- resolve issues relating to local transport needs
- seek input and comments from the community on issues which may become controversial
- continue and extend the consultation process for this study as a basis for on-going community participation

## 5.8 Summary of Key Recommended Strategies

---

### 5.8.1 Land Use

- Exert greater control on land use zoning with objectives to:
  - ⇒ establish a hierarchy of centres and increase the choice in land use such as mixed development
  - ⇒ develop appropriate densities in accordance with location proximity to public transport
  - ⇒ encourage higher density developments in close proximity of public transport nodes
  - ⇒ extend existing, or create new mixed use zones at all centres
- Provide incentives and penalties in development control plans such as:

- 
- ⇒ requirement from commercial developments to submit transport plans in conjunction with their DA submission
  - ⇒ limits on parking provision
  - ⇒ provision for density bonuses and/or lower Section 94 contributions for developments located in convenient proximity to public transport access
  - Improve pedestrian amenity and facilities using the following:
    - ⇒ develop standards and guidelines for the planning and design of pedestrian facilities, including accessible facilities, towards better safety and amenity (note: this is already included in the Centre Development Control Plans)
    - ⇒ prepare pedestrian management plans to include a program of street improvements, including accessible facilities, focussed on pedestrian amenity in areas of pedestrian concentration

### **5.8.2 Transport Services**

- Improve existing STA bus services through the following initiatives:
  - ⇒ investigating and providing bus priority measures
  - ⇒ installing new, and extending future Bus/Transit lanes on the major arterial roads in the municipality in conjunction with STA and RTA
  - ⇒ in consultation with STA, reviewing existing bus timetable and route strategies to improve operational frequency and punctuality
  - ⇒ investigating the need for provision of shelters, accessible facilities and information displays at bus stops and terminals
- Improving access to/from major services centres
  - ⇒ conducting a study to investigate the feasibility of a shuttle bus service between major centres
- Improve rail service and plan for future growth in patronage
  - ⇒ improve existing operation facilities at Edgecliff Station including accessible facilities
  - ⇒ initiate action to request Cityrail to review the plan for future extension of the Eastern Suburbs Line to Bondi Beach, and improve frequency and capacity
  - ⇒ initiate action to request Department of Transport investigate feasibility for reintroducing LRT service to the municipality as a long term strategy
- Improve ferry services

- 
- ⇒ improve access to the ferry terminals with facilities for ‘kiss-n-ride’ and limited commuter parking facilities
  - ⇒ improve footpaths, cycling access and accessible facilities at ferry terminals
  - ⇒ investigate the feasibility of providing more direct and frequent services
  - Provide facilities for improved bicycle travel by staging the implementation of the “Woollahra Bicycle Plan”
  - Provide accessible facilities generally for people with disabilities to establish a fully integrated accessible transport system

### **5.8.3 Road Network and Traffic Management**

- Council to adopt an accepted road hierarchy for Woollahra
- Improve short term arterial road operation efficiency through a range of traffic management measures such as:
  - ⇒ optimising traffic signal operations with priority for bus movements where possible
  - ⇒ restricting right turns on major roads during peak hours
  - ⇒ introducing ‘left turn with care’ where feasible
  - ⇒ optimising bus stop locations
- Improve long term passenger carrying capacity of the arterial system rather than vehicle capacity, through improvement of public transport services (eg. planning for future Bus/Transit lanes, mass transit service)
- Local traffic management strategy to include:
  - ⇒ trial implementation of 50 km/h speed limit zones, and study the effects of the new speed limits on drivers behaviour before considering for full implementation.
  - ⇒ review of current local traffic control philosophy
  - ⇒ improvement of urban design and pedestrian amenity in local areas as part of traffic calming strategy
  - ⇒ development of shared zones within local precincts
- Consider car pooling as an option of a traffic demand management strategy

### **5.8.4 Parking Strategy**

- 
- Introducing pay parking as a means of managing on-street parking to provide equitable use of available but scarce spaces, at commercial centres and other locations where demand for parking is critical.
  - Rationalise on-street parking control in major centres such as the Double Bay commercial centre, in order to:
    - ⇒ reduce opportunities for long stay parking
    - ⇒ encourage short stay parking and high turnover
    - ⇒ encourage ‘shared parking’ after business hours
    - ⇒ consider permit parking schemes for business use
    - ⇒ limit parking provision for employees in the long term
    - ⇒ reduce parking provision rates for future developments
    - ⇒ provide density incentive for trade offs in reduction of parking spaces
    - ⇒ provide adequate accessible parking at relevant locations
  - Reduction of commuter parking provisions at major transport nodes in the long term through gradual improvement in public transport interchange services. Short term provision may be considered to encourage change of modes to public transport.
  - Phasing out resident parking schemes in the long term. Short term provisions should be rationalised in terms of eligibility and permit charge.
  - Provision for tour bus and coach parking at designated locations
  - Provision for adequate visitor parking in future developments

---

## 6. Action Plan

An action plan based on the recommended strategies has been developed. This plan, shown in *Table 6.1* following, provides a list of actions, both long term and short term, their priorities, and the extent of Council responsibility.

**Table 6.1 - Integrated Transport Strategy Action Plan**

Action	Strategy	Context (examples)	Extent of Council Responsibility	Other Agencies Involved	Current Council Commitments	Priority	
<b>General</b>							
1.1	Establish 'Community Transport Forum'	-	Full		None	A	
1.2	Adopt road hierarchy as a basis for planning and design		Major role	RTA	Current road hierarchy	A	
1.3	On-going review of Council's Transport Strategy	-	Full		Consultation group	A	
<b>Land Use</b>							
2.1	Review existing land use plan and zoning to favour desired transport modes at all planning levels	Establish principles and criteria for high density residential development to reduce car dependency	Bondi Junction; Edgecliff and Double Bay	Major role	DUAP	On-going	A
2.2	Review existing Development Control Plan and S94 plan	Provide incentives and penalties	Area wide	Major role	DUAP / RTA	On-going	A
2.3	Develop guidelines for pedestrian facilities planning and design incorporating accessible facilities	Improve pedestrian amenity	Area wide; Centre DCP's	Full	RTA	None	A
2.4	Prepare pedestrian management plans incorporating accessible facilities	Improve pedestrian amenity	Major centres and tourist areas; Centre DCP's	Full	RTA	None	A

Action	Strategy	Context (examples)	Extent of Council Responsibility	Other Agencies Involved	Current Council Commitments	Priority	
<b>Transport Services</b>							
3.1	Investigate and implement bus priority measures including Transit/Bus lanes and signal priority	Improve long term passenger carrying capacity	New South Head Road; Old South Head Rd and Oxford St	Council to initiate and lobby State Authorities	RTA / STA	On-going	<b>A / B</b>
3.2	Review bus operations, route strategy, frequencies and timetable and incorporate accessible facilities	Improve STA bus services	Area wide, particularly off peak services	Council to lobby STA	STA	None	<b>A / B</b>
3.3	Investigate need for bus shelters and information display incorporating accessible facilities	Improve STA bus services	Area wide	Council to lobby STA	STA	None	<b>A / B</b>
3.4	Investigate feasibility for community bus service incorporating accessible facilities	Improve access to major centres	Between major centres	As initiator and Coordinator	STA / private operators	None	<b>C</b>
3.5	Investigate operational and accessible performance of Edgecliff Interchange including disabled access	Improve rail service	Edgecliff centre	Advocacy	STA / Cityrail responsibility	None	<b>A / B</b>
3.6	Initiate action pertaining to improvements to the Eastern Suburbs Line incorporating accessible facilities	Increase capacity of Eastern Suburbs Line	Bondi Junction	As initiator	Cityrail	On-going	<b>B</b>
3.7	Initiate action to investigate LRT proposals as a long term strategy	Support LRT as a long term strategy	Along main spine road/s	Council to lobby State Government	DoT	None	<b>D</b>

Action	Strategy	Context (examples)	Extent of Council Responsibility	Other Agencies Involved	Current Council Commitments	Priority	
3.8	Improve access (including accessible facilities) to ferry terminals and operation of ferry service	Maintain and Improve Ferry services	All Ferry services	As initiator and coordinator	STA	None	<b>B</b>
3.9	Provide facilities for better bicycle travel (implement “Woollahra Bike Plan” in stages)	Support alternative travel modes	Area wide	Full	RTA	Project initiated	<b>A / B</b>
3.10	Undertake disabled access audits and make recommendations for accessible facilities generally (develop fully integrated accessible transport system)	Support equal access principles	Major centres	Full	STA/DoT/RTA	Established WAC	<b>A</b>
<b>Road Network and Traffic Management</b>							
4.1	Investigate improvements options for intersections currently operating at capacity with long delays	Improve short term arterial road operation efficiency	Intersections identified in Section 2.2 of report	As initiator	RTA	On-going	<b>A / B</b>
4.2	Prepare investigations and implementation plans for T2 Transit Lanes and transit priority signal system	Improve long term passenger carrying capacity (see 3.1)	(See 3.1)	Council to initiate and Lobby	RTA / STA	On-going	<b>A / B</b>
4.3	Introduce trial for 50 km/h speed limit in local areas	Improve road safety and amenity in local areas	Darling Point	Major role	RTA	Initiated	<b>A</b>
4.4	Implement local traffic calming strategy	Improve local amenity	Area wide	Full	RTA	On-going	<b>A / B</b>
4.5	Initiate action to investigate feasibility for car-pooling	Reduce peak hour commuter traffic		As initiator and coordinator	(Easy Share)	None	<b>C / D</b>

Action	Strategy	Context (examples)	Extent of Council Responsibility	Other Agencies Involved	Current Council Commitments	Priority	
4.6	Conduct an audit of all signs and line markings and prepare maintenance program	Improve amenity and safety	Area wide	Major	RTA	None	A
<b>Parking Strategy (Including Accessible Parking)</b>							
5.1	Implement pay parking schemes	Provide equitable use of available parking spaces	Major centre	Full	RTA	Initiated	A / B
5.2	Review on-street parking control limits including accessible parking provisions	Rationalise on-street parking control	Major Centre	Full	RTA	None	A / B
5.3	Review current parking code and develop long term strategy for reduction of parking provisions	Support long term reduction of parking provisions	Area wide	Full		None	B
5.4	Initiate action to provide parking facilities for tour buses and coaches	Rationalise parking control for tourist vehicles	Mainly Watsons Bay, Paddington; Double Bay	Full	B&CA	None	A
5.5	Review current Resident Parking Scheme and other permit schemes	rationalise the use and provision of resident parking	Area wide	Full	RTA	On-going	A / B
5.6	Develop staged Parking management implementation program	Rationalise parking control	Area wide	Full		None	A

Notes:

- 1 Priority Rating: A - Top Priority (within two years); B - As soon as practicable (2-5 years); C - When opportunity arises (5-10 years); D - Not urgent, but keep on agenda for review
- 2 Legend: Dot - NSW Department of Transport; STA - State Transit Authority; RTA - Roads & Traffic Authority; WAC - Woollahra Access Committee; B&CA - Bus and Coach Association

---

## **BIBLIOGRAPHY**

Arup Transportation Planning (1995), Bellevue Hill Traffic Management Study Report.

Arup-Geoplan (1999), Woollahra Bike Plan, Draft Final Report.

Colston Budd Hunt & Twiney (1993), Bondi Junction Traffic, Parking and Transport Study.

Colston Budd Hunt & Twiney (1989), Double Bay Car Parking nad Traffic Management Study.

Christopher Hallam & Associates (1997), Traffic Impact Assessment of Proposed Developments in Bondi Junction.

Fred Desiderio, Cityrail (1999) Case Study for Woollahra Traffic and Transport Study.

Masson Wilson Twuiney (1998), Rose Bay Traffic Study.

NSW Department of Urban Affairs and Planning (1995), The Journey To Work Working Paper.

NSW Department of Transport (1997), Public Transport Users in Sydney.

Nsw Department of Transport (1994), 1992 Home Interview Survey Data.

PPK Environment and Infrastructure (1999), Double Bay Commercial Centre Traffic and Parking Study, Draft Report No 2.

Property Council of Australia (1998), Directory of Shopping Centres NSW & ACT 1998/1999.

Roads and Traffic Authority (1996) Traffic Volume Data for Sydney Region, Volume 2.

Roads and Traffic Authority (1999), Traffic Management for Special Events.

Roads and Traffic Authority (1994), A Study of Sydney's Transit & Bus Lanes.

Sinclair Knight & Partners (1994), Paddington Area Traffic Management Study, Final Report.

South Sydney Council (1995), Strategy for A Sustainable City of South Sydney.

Sydney City Council (1995), Central Sydney Tourist Coach Study.

Taylor Thomson Whitting (1998), Pay Parking Study in Paddington Status Report.

Taylor Thomson Whitting (1998), Parking Study for Selected Areas in Woollahra Municipality.

---

Waverley Council (1998), Multi-unit Housing Development Control Plan No1.

Waverley Council (1998), DCP No 14 Bicycle and Car Parking.

Westerman H L (1998), Cities For Tomorrow - Integrating Land Use, Transport and the Environment

Woollahra Council, (1995) DCP for Off-street Car Parking Provisions and Servicing Facilities.

Woollahra and Waverley Councils (1998), Bondi Junction Commercial Centre Urban Design DCP.

Woollahra Council, Technical Services Division (1997), Watsons Bay Traffic Parking, and Transport Study.

---

**Appendix A**

**Working Paper No.1: Parking Issues**

---

**Appendix B**

**Working Paper No.2: Public Transport**

---

**Appendix C**

**Working Paper No.3: Traffic Operations**

---

**Appendix D**

**Working Paper No.4:  
Land Use Assessment**

---

---

Appendix E

# **Working Paper No.5: Traffic Modelling**

---

**Appendix F**

**Working Paper No.6:  
Community Consultation**

---