

PITTWATER COUNCIL

DEMOGRAPHIC AND FACILITY/
SERVICE NEEDS STUDIES,
INGLESIDE-WARRIEWOOD
URBAN RELEASE AREA



TRAVERS
MORGAN

DECEMBER 1994

PITTWATER COUNCIL

**DEMOGRAPHIC AND FACILITY/
SERVICE NEEDS STUDIES,
INGLESIDE-WARRIEWOOD
URBAN RELEASE AREA**

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EXECUTIVE SUMMARY

1. INTRODUCTION

This report has been prepared for Pittwater Council as part of a continuing series of investigations aimed at identifying and documenting future requirements for the urban development of the Ingleside-Warriewood area.

Ingleside-Warriewood comprises about 1,100 hectares on both sides of Mona Vale Road east of Terrey Hills. About 700 hectares has been identified as having urban development potential.

Following the inclusion of the area in the Urban Development Program in December 1991, Pittwater Council has initiated a number of investigations aimed at ensuring that future development is undertaken in an environmentally, socially and economically sustainable basis.

The investigations reported in this study relate to the preparation of a demographic model for the area together with sectoral studies of the requirements of future population scenarios for employment, traffic and transport facilities, retail/commercial and service facilities community facilities and open space and recreational facilities.

Summaries of the findings of the demographic model and each of the sectoral studies are set out below.

2. DEMOGRAPHIC MODEL

2.1 Development Scenarios

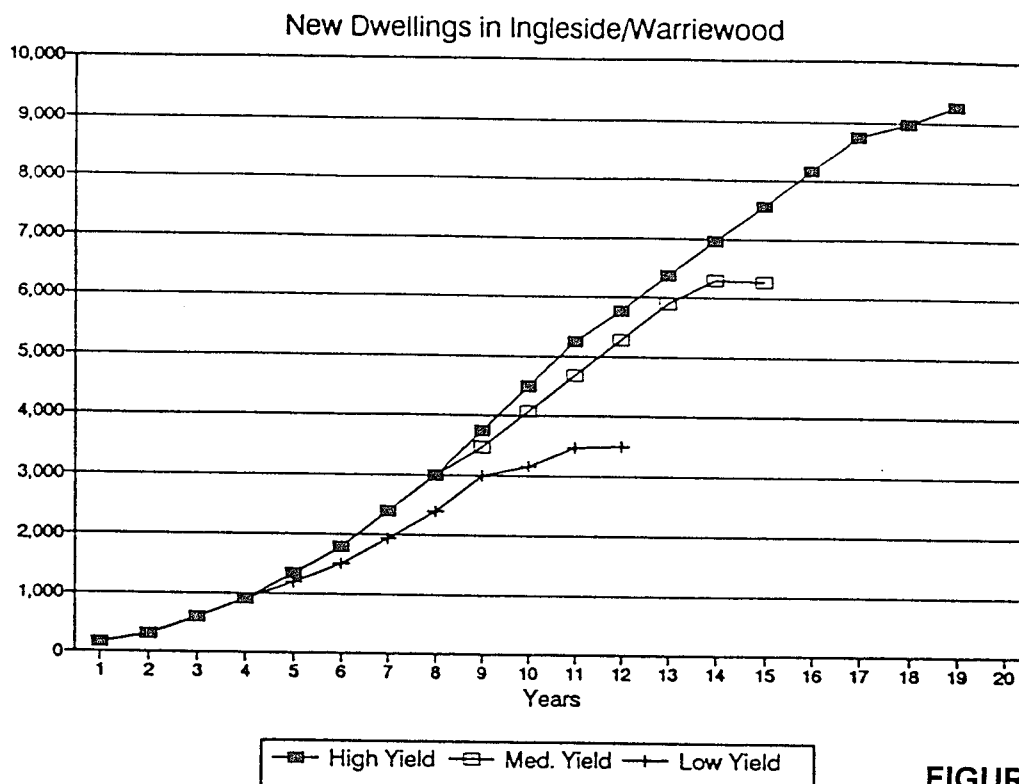
A demographic model has been prepared having regard to the population characteristics of other urban release areas at Cherrybrook, Glenhaven and Menai which are considered to have provided housing for a similar sub-market to the Ingleside-Warriewood area.

Three development scenarios were produced based on overall dwelling densities of 13, 9 and 5 dwellings per hectare. 20% of dwellings were assumed to be multi-unit dwellings.

The range of results is set out in Table 1.

TABLE 1: DEVELOPMENT SCENARIOS, INGLESIDE-WARRIEWOOD		
DENSITY	NUMBER OF DWELLINGS	ESTIMATED POPULATION
5 Dwellings per hectare	3,500	9,800
9 Dwellings per hectare	6,300	17,600
13 Dwellings per hectare	9,100	25,500

Figure 1 (Figure A3.1 in Main Report) illustrates the likely timing of development under each scenario based on a maximum production rate of 150 dwellings per year in each precinct with the starting date of development in each precinct staggered by two years.

**FIGURE 1**

The order of development of the precincts was adopted from discussions with Council as Warriewood Valley, followed by South Ingleside, North Ingleside, Chiltern Road and Wirreanda.

An occupancy rate of three persons per separate house and two persons per each multi-unit dwelling was adopted for the model.

Tables 3.1, 3.2 and 3.3 in Section A of the main report provide details of the model results for each scenario.

2.2 The Future Community

The demographic model concludes that under any scenario the release area population will have a significant representation of young families in addition to an above average representation of aged persons.

It is considered that a low percentage (3%) of households will be single parent households in comparison with 25% of households being lone person households.

Up to 65% of households are expected to comprise an adult couple with or without dependent children or an additional adult family member.

Up to 30% of households are expected to be in the highest income earning bracket (over \$60,000 per annum).

There is likely to be a high resident workforce with a high female participation rate.

Car ownership is likely to be an average of two cars per family with up to 70% of journeys to work involving private cars.

2.3 Employment Opportunities

While many new residents of Ingleside-Warriewood are likely to bring their jobs with them, there will also be a significant increase in demand for local jobs. In addition the increase in population will itself generate opportunities for employment prospects for local residents through the provision of new services and facilities.

The existing pattern of regional employment in the Manly-Warringah-Pittwater area exhibits a high degree of self-containment.

Opportunities for future employment in the sub-region include industrial (employment) lands of which there are 23 undeveloped hectares in Pittwater located adjoining Ingleside-Warriewood and 50 undeveloped hectares in Warringah at the Austlink Business Park at the intersection of Mona Vale Road and Forest Way.

Based on recent take up trends the Austlink land could represent 16 years of supply and the Pittwater land about 5 years supply.

Recent studies of employment density in industrial areas indicate that the zoned lands could support about 4,000 new jobs upon full development of all available sites.

In view of the limited scope to increase employment lands in the established areas of Sydney, it is considered prudent to reserve some additional land within the Ingleside-Warriewood area for small-scale industrial purposes. The report proposes that 10 hectares of land adjoining the existing Warriewood industrial area would best serve this purpose.

3. TRAFFIC AND TRANSPORT

3.1 Existing Status

Due to the wide geographical spread of trips to and from and within the study area the motor car is currently the predominant form of transport.

During peak periods existing main roads are operating at a level of service (LOS) in the C to E range reflecting the heavy traffic volumes, undulating country and in some cases absence of passing lanes. In the Levels of Service A represents little congestion whereas Level F is characterised by heavy congestion.

The principal intersections operating with a level of service in the C-F categories are:

- Pittwater Road/Mona Vale Road (LOS C)
- Pittwater Road/Wakehurst Parkway (LOS C/D)
- Mona Vale Road/Forest Way (LOS D/E)

Public transport services are restricted to bus operations which connect Mona Vale with the City, Manly, Chatswood, Pymble and Gordon.

3.2 Traffic Generation from Future Development

The study estimates the likely traffic generation for the study area under the three development scenarios and for two stages of development. Because of the relative lack of public transport

trip generation rates of one vehicle per dwelling in the morning peak hour and 0.777 vehicles per dwelling in the evening peak hour are used.

The impact of additional traffic generation is assessed on the existing road network's level of service without improvements.

The effects on the road system vary between the different development scenarios. However the most heavily affected roads in which a level of service E or F would be experienced during AM or PM peak hours are as follows:

Pittwater Road south of Barrenjoey Road	E - Medium and High Yields
Pittwater Road south of Mona Vale Road	E - All Yields
Pittwater Road south of Garden Street	E - Low Yield F - Medium and High Yields
Pittwater Road south of Wakehurst Parkway	E - Low and Medium Yields F - High Yield
Mona Vale Road west of Bungan Street	E - Low Yield E/F - Medium and High Yields
Mona Vale Road east of Powder Works Road	E - Low Yield E/F - Medium and High Yields
Mona Vale Road west of Wirreanda	E - Low Yield E/F - Medium and High Yields
Powder Works Road west of Alleyne Ave	E - Low Yield E/F - Medium and High Yields
Wakehurst Parkway west of Pittwater Road	E/F - All Yields

3.3 Recommended Strategies

The analysis of traffic generation from Ingleside-Warriewood indicates that the major constraints are along the major arterial roads such as Mona Vale Road and Pittwater Road and their intersections.

As there is a direct relationship between urban development and traffic generation there appear to be a number of options for consideration. These include:

- No limitation on development although this is likely to cause severe traffic congestion and delay unless major improvements are made to the arterial road system;
- Limitation on development pending funding for improvements to the road system to accommodate future traffic;
- Limitation on development to maintain traffic congestion at acceptable levels of service;
- Promotion of greater public transport use to shift the modal split from private cars to buses;
- Major network improvements to reduce traffic congestion.

The report identifies a number of road and intersection improvements for each development scenario. These are summarised as follows:

Mona Vale Road

An LOS F is expected to be reached with 50% development of the high yield or 75% of the medium yield scenarios.

A full 4-lane configuration is therefore required before completion of both development scenarios. In the interim construction of overtaking lanes would be needed for westbound traffic on the uphill sections. Various improvements are described in the report for intersections along Mona Vale Road.

Pittwater Road

There is little scope for improvements on Pittwater Road other than the introduction of clearway conditions.

Powder Works Road

An LOS F is anticipated with 60% of development of the high yield scenario or 80% of the medium yield development. Widening to 4 lanes would be desirable. If that is not feasible widening to 3 lanes with tidal flow should be considered.

Wakehurst Parkway

The Parkway is already operating at LOS D/E and would be at LOS F with the urban development. Uphill sections therefore need to be widened as well as local widening at intersections to accommodate right turn movements.

Local Roads

Recommendations are made to upgrade a number of local roads to collector or sub-arterial standard to accommodate additional traffic-generated by the urban development. These are described in Table 5.1 of the main report.

3.4 Improvement Costs

Estimated road/intersection improvement costs range from about \$20 million for the low yield scenario to about \$80 million for the medium and high yield scenarios.

3.5 Public Transport

Due to the cost implications of the high use of private cars in Pittwater and limited scope for road improvements to accommodate future traffic, there is a need for a much higher level of promotion of the use of public transport.

The Department of Transport has recently been considering a number of options for a Warringah Mass Transit Link. Most of the proposals terminate near Dee Why and would therefore have limited value for the release area. Preliminary estimates indicate that there could be a high level of demand, if the link were extended to the Pittwater area and further analyses are required based on the generation from the Ingleside-Warriewood development.

Bus services are likely to remain the principal means of public transport in the Pittwater area. Greater usage needs to be encouraged through:

- higher densities of development on frequent bus routes
- detailed network planning in conjunction with land use planning

- concentration of staging of development of the release area to optimise the use of buses and avoid "dead running"
- extension of existing services to early stages of development
- take account of bus routes in design of major road upgradings
- provide appropriate bus shelters and bus bays and avoid traffic calming devices likely to create passenger discomfort on bus routes
- implement transit lanes on arterial roads, especially Mona Vale Road and Pittwater Road
- give consideration to introduction of mini-bus services in extending bus patronage as the development area proceeds
- give consideration to demand responsive bus operation.

3.6 Bicycle and Pedestrian Plans

A well planned bicycle and pedestrian network can promote alternative transport use and increase public transport use. A number of strategies to be considered in the planning of Ingleside-Warriewood include:

- Adequate bike-parking at frequently used destinations, eg. major employment centres, schools, shopping centres.
- Formulation of a bicycle network to provide safe and convenient connections between residential areas and frequently used destinations.
- Provision of wider kerbside lanes to accommodate bicycle traffic.
- Implement LATM to reduce traffic speeds where bicycle routes are in effect.
- Link bicycle routes to provide transport system.
- Link open space/recreation areas with bikeways.
- Promote cycling through education.
- Improve pedestrian safety through improved crossings of major roads with signals, refuge islands etc.

4. RETAIL AND SERVICES FACILITIES

4.1 Existing Centres

This section of the report identifies a number of major and minor retail/service centres in close proximity to the Ingleside-Warriewood area. The major centres include:

Warringah Mall (9 kms to south)	90,000 m ²
Chatswood (15 kms to south west)	130,000 m ²
Warriewood Square (adjacent to east)	18,000 m ²
Mona Vale (east of boundary)	14,000 m ²
Newport (5 kms to north east)	15,000 m ²

A proposal for a 17,000 m² centre at the Austlink Business Park (5 kms to west) is under consideration by Warringah Council.

4.2 Estimated Turnover and Floor Space Demand

Based on the use of ABS Household Expenditure Surveys and the 1991 Retail and Services Census, it has been estimated that there would be an annual household expenditure of \$18,800 (\$ 1991). This would generate a total expenditure on full development ranging from \$65.8 to \$171.1 million for the low to high density scenarios.

Based on a turnover of \$3,300 per m² it is estimated that there would be a total floor space requirement of about 5,000-13,000 m² of floor space for local shops for the low to high density scenarios. The above figure assumes that 25% of total household expenditure would be spent in local shops. The remaining 75% of household expenditure would be attracted to the regional scale centres described above.

The study suggests that the demand for retail floor space can be accommodated in various ways including:

- the provision of additional floor space in existing centres which are accessible to future residents of Ingleside-Warriewood;
- small local centres could be encouraged in each or a number of the precincts at Ingleside-Warriewood, provided the high density scenario is developed;
- a single supermarket-dominated centre might be encouraged at a location central to the whole release area and with good accessibility and access to passing traffic.

4.3 Convenience Stores

A recent phenomenon of the Australian retailing scene has been the emergence of convenience stores in association with service stations. A general standard of about 240 m² of floor space has been adopted by many councils. The average merchandise sale is estimated at \$5.60 per customer, contributing up to 40% of non-petroleum sales.

There may be a positive role for convenience stores at Ingleside-Warriewood in terms of providing early retail outlets for convenience goods in appropriate locations in each of the development precincts where passing traffic can gain access.

Council may also wish to reserve land in conjunction with these sites to encourage expansion into local centres or the development of local community facilities.

5. COMMUNITY FACILITIES

5.1 Services In and Adjacent to Release Area

Community services are commonly delivered through an established facility such as a community or child care centre or to a resident's home, such as Meals on Wheels. Thus incoming residents to Ingleside-Warriewood are likely to use existing facilities in surrounding areas at Mona Vale, Warriewood, North Narrabeen, Elanora Heights and Terrey Hills. This is defined as the Local Service Area (LSA). Different target groups are likely to require different services and facilities as summarised below.

Children 0-4 years

Long day care services are provided by Council and the private sector. There are about 235 full-time places in the LSA, which are currently all at capacity.

Four pre-schools are located in the LSA with 121 places and all are at capacity.

An occasional care centre is located at Warriewood and in 1993 achieved a 95% occupancy rate.

School-aged children

There are four public primary schools adjacent to the release area plus one Catholic primary school. Other private schools are in the locality. There is considerable spare capacity in all of the public primary schools located at North Narrabeen, Mona Vale, Elanora Heights and Terrey Hills.

Youth

Two major public high schools are located adjacent to the area at Narrabeen Sports High and Pittwater High. Both have considerable spare capacity amounting to a total of more than 700 places in 1993.

In 1991 36% of Pittwater students attended private schools of which there are a considerable number in the Northern Beaches area.

Other youth counselling services and a youth refuge are located in the area.

Women

Services for women are limited the closest being located at Dee Why.

Aged 55+ years

Services for the aged include Meals on Wheels and the Narrabeen Seniors Club. Other programs include Community Transport and Home Care based at Dee Why. There is a concentration of resident funded retirement villages in the Pittwater area.

People with disability

There are many services for the disabled in the Northern Beaches including six group homes and four respite care homes. All services are at capacity.

5.2 Council and Government Facilities

Council currently owns 12 buildings in the LSA of Ingleside-Warriewood comprising six community centres, one centre for aged/disabled, one library, two early childhood health centres and two bushfire stations.

Other government services include two police stations, a one-bay Fire Station, four ambulance stations, a State Emergency Services station, five post offices and public phones at Mona Vale, Warriewood and on Pittwater Road.

5.3 Community Service Needs

Consultations with service providers and community representatives have identified a number of community service needs likely to be required by future residents of Ingleside-Warriewood. They include:

- transport and access needs, particularly public transport
- community facilities and services including meeting places, childcare facilities, youth facilities, affordable public transport, library services, walkways, etc.
- facilities and services provided early in staging of development
- Council co-ordination of new services.

5.4 Demand for Community Services

Based on the consultations and consideration of accepted standards the following service needs were identified.

Children's services 0-4 years

Due to capacity of existing services there will be a high demand from the future population for long day, occasional care and pre-schools. A considerable amount of this demand is likely to be met by the private sector with some opportunity for employer-sponsored long day care.

School aged 5-12 years children

The Department of School Education (DSE) has a planning standard of 1,600-2,200 new homes per primary school. Because of the large spare capacity in existing schools the strategy would be to use as much as possible particularly in early stages of development, including the use of demountables. In the low density scenario only one new primary school may be needed. Two may be needed for the medium density scenario and 3-4 for the high density scenario in addition to the use of existing schools.

Provision will also need to be made for outside school hours care for children of working parents.

Youth

As with primary schools the emphasis will be to make use of current spare capacity in the high schools. In the low scenario it is likely that a new high school will not be required. Under the medium and high density scenarios a new high school would be required after capacity in the existing high schools has been used up.

Access to good public transport is very important for youth as well as a range of youth services and facilities that will be accessible.

Women's services

Sole parents and lone older women are likely to be those most in need of women's services.

Aged 55+ years

As this release area is likely to have a high proportion of aged residents, there will be a greater need for aged services than most urban release areas. Existing services are at capacity requiring additional services to be provided.

Persons with disabilities

Persons with disabilities are likely to be attracted to the area due to its attractiveness and proximity to major disability service providers. Special consideration needs to be given to the needs of the disabled in design of transport, parks, community buildings and shopping areas.

General community services

The main sources identified are:

- Community Centre as an early development to act as a focal point for the new community for information about activities and for meetings;
- NSW Fire Brigades wishes to locate a new station in the area and close the existing station at Mona Vale;
- a Branch Library will be required in all of the scenarios;
- health services will continue to be provided at the Mona Vale Hospital. The higher density scenarios will require capital upgrading as well as staff increases.
- Additional demand for TAFE courses is likely to be met at the existing Brookvale college.

5.5 Funding Community Services

The report encourages the joint use of facilities where this is feasible and where the costs of providing a joint facility are less than for separate components.

Funding for community facilities is likely to come from a diverse range of sources including developer contributions, Council, State government and Federal government capital and recurrent funds and private user pay fees.

Three main community building types have been identified as being required for the new development area:

- **Child Care Centres**
Funded by Section 94, private and/or DHS&H under the National Childcare Strategy
Land requirements 1,600m²
Capital cost \$750,000
Recurrent funding through user pay and government subsidies.
- **Multi-Purpose Community Centre**
Funded by Section 94 developer contributions
Land requirements 1,600m²
Capital cost (650m² building) \$980,000
Recurrent cost from Council funding augmented by user pay fees from community.
- **Library**
Funded by Section 94 developer contributions, Council and possible State government grant
Land requirements 1,600m²
Capital cost \$1.25 million
Recurrent cost from Council funding.

5.6 Strategy Recommendations

A number of key recommendations include:

- Facilitate provision of child care facilities through government and private sector in co-ordination with DHS&H;
- Encourage joint provision of facilities through Department of School Education for outside school hours care and other joint community/public open space uses;
- Encourage early provision of facilities during initial phases of development;
- Use existing local service providers and community organisations to deliver services;
- Give priority to staffing of community facilities;
- Facilitate community involvement;
- Establish a Release Area Management Committee involving Council, Government Departments and local community;
- Monitor community needs as development proceeds.

6. OPEN SPACE AND RECREATION

6.1 Recreation Participation

Many outdoor recreation participation surveys undertaken Australia-wide and for specific Council areas have identified high levels of participation in the following outdoor activities:

- walking for pleasure or walking the dog
- driving for pleasure
- picnics/barbecues away from home
- visiting parks and gardens
- cycling
- bushwalking
- jogging/running
- swimming at beach or in public pool
- participation/spectator at sports.

Involvement in sporting activities varies considerably with age for different sports with high participation rates for young people in soccer, cricket, football, swimming, basketball, aerobics (females only) and touch football, and high participation rates for middle-aged adults in golf, lawn bowls, tennis, cycling, swimming and ten pin bowling.

Most favoured recreation settings include beaches and shorelines, bushland, parkland, outdoor sports facilities and playgrounds.

6.2 Open Space Requirements

Based on the likely needs of future residents the study proposed that 0.5 ha. of playgrounds/local reserves, 1.0 ha. of parkland/District reserves and 1.6 ha. of sporting grounds be provided for each 1,000 population at Ingleside-Warriewood. A minimum area for new facilities of 0.5 ha. for playgrounds, 3 ha. for parklands and 4 ha. for sportsfields is suggested. On that basis the number and area of open space areas required for each development scenario is indicated in Table 2.

TABLE 2: SUMMARY OF OPEN SPACE REQUIREMENTS							
Density Scenario	Children's Playgrounds 0.5 ha. per 1,000 persons		Informal Open Space 1.0 ha. per 1,000 persons		Active Sportsgrounds 1.6 ha. per 1,000 persons		Total 3.1 ha. per 1,000 persons
	Area	No.	Area	No.	Area	No.	Area
Low Density	4.90	10	9.80	3	15.69	4	30.39
Medium Density	8.82	18	17.63	6	28.22	7	54.67
High Density	12.74	25	25.48	8	40.77	12	78.99

The report identifies the number and type of sporting fields and facilities that would be needed for each development scenario.

Consultations with the existing community revealed that all existing sporting fields are heavily used and would not have capacity to accommodate additional demand from Ingleside-Warriewood. The suggestion was made that additional facilities should be provided in the release area to accommodate current shortages elsewhere in Pittwater.

The local community also stressed the need to conserve and bring environmentally sensitive areas into public ownership over time as part of a program of creating a linear park system between the escarpment and the coast. A basic structure is already in place in publicly owned lands.

6.3 Costs and Funding of Open Space/Recreation Facilities

The principal costs involved in creating an open space/recreation system are land acquisition, embellishment/facilities and maintenance.

Based on information from Pittwater and elsewhere the cost of providing recreational facilities is estimated to range from \$4 million for the low yield scenario to \$11.28 million for the high yield scenario. The only adequate source of funding for capital costs is through Section 94 developer contributions. There may be an opportunity for some small scale grant funds to be available from the State government.

In addition land acquisition would also need to be carried out through Section 94 Contributions Plan. There may be scope for some land exchanges to occur for the conservation of environmentally sensitive areas between government and private land owners, as significant parts of Ingleside-Warriewood are held as Crown land or are owned by the Department of Planning as a result of acquisitions in the "blue-hatched area".

Maintenance costs are likely to range from a low of \$190,000 to a high of \$525,000 per annum. These costs will need to be borne by Council with some funding from user pay fees. There may be some scope for private sector involvement in the provision of indoor sporting facilities and for sporting clubs to become more heavily involved in the maintenance of sporting grounds. These issues need to be looked at in the broader context of Pittwater as a whole rather than only the release area.

6.4 Open Space/Recreation Strategy

In planning for Ingleside-Warriewood consideration needs to be given to the following issues:

- optimising joint use opportunities with schools and community facilities;
- creation of an overall park system with linkages between open space areas using walkways and bikeways including linkages to other public use areas such as schools, community and retail centres;
- developing larger integrated parks including playgrounds, sportsfields and parklands rather than too many small scattered parks as a means to control maintenance costs;
- establishing parks with adequate car parking and accessibility to residential areas;
- establishing informal parks in areas where there is some topography to create interest and places for informal activity as well as passive purposes;

- explore opportunities to bring areas with high conservation value and environmental attributes into public ownership through possible land exchanges between private land owners and Department of Planning and Department of Conservation and Land Management.

7. CONCLUSIONS

The demographic analysis and sectoral reports included in this study and summarised above indicate that the Ingleside-Warriewood area is capable of being developed to accommodate a population of between 9,800 and 25,000 persons over a period ranging from 15 to 20 years at densities ranging from 5 to 13 dwellings per hectare.

The analyses of requirements in the study indicate that there are different needs and implications for the provision and costs of facilities under each of the three scenarios.

The principal needs and issues relating to the development of the area are summarised in the matrix in Table 3.

The study indicates that there are potential benefits and costs in the future development of the Ingleside-Warriewood area. The principal benefits derive from more efficient use of spare capacity currently available in both primary and secondary schools in the locality and the significant retail spending from future residents that will be available to existing sub-regional shopping centres. The principal public sector costs are likely to arise from the future need for community and open space/recreational facilities and major improvements required to the local and sub-regional road network.

Based on experiences elsewhere it is expected that most of the capital funds required for the development of community and open space/recreational facilities can be obtained from developer contributions as development proceeds.

Funding for road works will also need to be obtained in part from developer contributions augmented by State government funding to take account of the overall improvements that will occur from the works proposed in the study.

Of particular importance is the need to maintain effective co-ordination between government agencies at both State and local levels and the local community so that the future facilities are provided in accordance with the changing needs of the release area and in a timely fashion.

TABLE 3: SUMMARY OF PRINCIPAL FACILITY REQUIREMENTS AND COSTS, INGLESIDE-WARRIEWOOD RELEASE AREA			
FACILITIES	LOW DENSITY SCENARIO	MEDIUM DENSITY SCENARIO	HIGH DENSITY
1. TRAFFIC/TRANSPORT	<p>Level of Service E on Pittwater Road, Mona Vale Road, Powder Works Road and Wakehurst Parkway.</p> <p>Total road upgrading costs of \$20 million.</p> <p>Public transport less likely to be viable with low density.</p>	<p>Level of Service E/F on Pittwater Road, Mona Vale Road, Powder Works Road and Wakehurst Parkway.</p> <p>LOS F expected on Mona Vale Road with 75% development.</p> <p>LOS F expected on Powder Works Road with 80% development.</p> <p>Total road upgrading costs of \$80 million.</p> <p>Public transport viability increases with density on transport routes.</p>	<p>Level of Service E/F on Pittwater Road, Mona Vale Road, Powder Works Road and Wakehurst Parkway.</p> <p>LOS F expected on Mona Vale Road with 50% development.</p> <p>LOS F expected on Powder Works Road with 60% development.</p> <p>Total road upgrading costs of \$80 million.</p> <p>Public transport viability increases with density on transport routes.</p>
2. RETAIL AND SERVICES FACILITIES	<p>Total Annual Retail Expenditure of \$65.8 million.</p> <p>Local Floor Space requirement of 5,000m².</p> <p>Limited opportunity for local retail centre and added value to existing District/Regional Centres.</p>	<p>Total Annual Retail Expenditure of \$118.4 million.</p> <p>Local Floor Space requirement of 9,000m².</p> <p>Moderate opportunity for local retail centre and added value to existing District/Regional Centres.</p>	<p>Total Annual Retail Expenditure of \$171.1 million.</p> <p>Local Floor Space requirement of 13,000m².</p> <p>Good opportunity for one or more local retail centres and high added value to existing District/Regional Centres.</p>
3. COMMUNITY FACILITIES	<p>Demand for 153 long day care places.</p> <p>Existing capacity in primary schools at Nth Narrabeen and Mona Vale can be used.</p> <p>Unlikely need for any new primary schools.</p> <p>70 Outside School Hours Care places needed.</p> <p>Unlikely to justify need for new High School due to spare capacity at Pittwater and Narrabeen High Schools.</p>	<p>Demand for 281 long day care places.</p> <p>Two new primary schools required after existing capacity used.</p> <p>128 Outside School Hours Care places needed.</p> <p>One new high school required after existing capacity used.</p>	<p>Demand for 406 long day care places.</p> <p>3-4 new primary schools needed after existing capacity used.</p> <p>185 Outside School Hours Care places needed.</p> <p>One large or 2 small high schools required after existing capacity used.</p>
Services for Youth	-	-	Women's refuge may be required.
Services for Women	-	-	Additional aged services required.
Services for 55+ Years	Additional aged services required.	Additional aged services required.	Additional aged services required.

TABLE 3: SUMMARY OF PRINCIPAL FACILITY REQUIREMENTS AND COSTS, INGLESIDE-WARRIEWOOD RELEASE AREA (cont.)

FACILITIES	LOW DENSITY SCENARIO	MEDIUM DENSITY SCENARIO	HIGH DENSITY
Services for Disabled	Demand for services will increase.	Demand for services will increase.	Demand for services will increase.
Services for General Community	<p>Community Centres needed.</p> <p>New Fire Station required.</p> <p>Small branch library (294m²),</p> <p>Health - additional staff only.</p> <p>TAFE - existing Brookvale College adequate.</p> <p>Support Services - 1 community worker and 1 family worker need.</p>	<p>Community Centres needed.</p> <p>New Fire Station required.</p> <p>Branch library (528m²),</p> <p>Health - expansion to maternity, general wards.</p> <p>TAFE - existing college likely to be adequate.</p> <p>Support Services - 1 community coordinator, 1 family worker, 1 outreach worker and 1 youth worker.</p>	<p>Community Centres needed.</p> <p>New Fire Station required.</p> <p>Branch library (780m²),</p> <p>Health - significant increase in capital and recurrent services.</p> <p>TAFE - existing college likely to be adequate.</p> <p>Support Services - 1 community coordinator, 1 family worker, 1 outreach worker and 1 youth worker.</p>
4. OPEN SPACE/RECREATION	<p>Children's Playgrounds - 10 on 4.9 hectares</p> <p>Informal Open Space - 3 parks on 9.8 hectares</p> <p>Sportsgrounds - 4 on 15.7 hectares</p> <p>Sporting Fields - Baseball/Softball (1) Basketball (1) Bowling Green (3) Cricket (3) Rugby League (1) Soccer (4) Netball (5) Tennis (4)</p> <p>Park Embellishment Costs - \$4 million</p> <p>Park Maintenance Costs - \$190,000</p>	<p>Children's Playgrounds - 18 on 8.8 hectares</p> <p>Informal Open Space - 6 parks on 17.6 hectares</p> <p>Sportsgrounds - 7 on 28.2 hectares</p> <p>Sporting Fields - Baseball/Softball Basketball Bowling Green (5) Cricket (6) Rugby League (2) Soccer (7) Netball (9) Tennis (8) Hockey Golf</p> <p>Park Embellishment Costs - \$7.34 million</p> <p>Park Maintenance Costs - \$350,000</p>	<p>Children's Playgrounds - 25 on 12.7 hectares</p> <p>Informal Open Space - 8 parks on 25.5 hectares</p> <p>Sportsgrounds - 12 on 40.8 hectares</p> <p>Sporting Fields - Athletics Baseball/Softball(2) Basketball (2) Bowling Green (7) Cricket (8) Cycling Equestrian Arena League (3) Soccer (10) Golf Hockey Netball (13) Roller Skating Swimming Pool Tennis (11)</p> <p>Park Embellishment Costs - \$11.28 million</p> <p>Park Maintenance Costs - \$525,000</p>

FOREWORD

BACKGROUND

This report has been prepared for Pittwater Council by a team of consultants drawn from Travers Morgan Pty Ltd, Hirst Consulting Services Pty Ltd and Heather Nesbitt. It forms part of a continuing series of study reports aimed at identifying and documenting opportunities and future requirements relating to urban development at Ingleside-Warriewood. Ingleside-Warriewood is a 1,100-hectare area straddling Mona Vale Road as illustrated in Figure 1.

The Minister for Planning announced the State Government's decision to include the Ingleside-Warriewood area in its urban release program in December 1991. Since that time Pittwater Council has overseen a number of investigations aimed at ensuring that the future development area is capable of being managed and implemented in an environmentally, socially and economically sustainable basis.

Council has previously managed a series of studies aimed at identifying and describing the biophysical constraints and opportunities relating to the land.

These have included:

- Water Cycle Study
- Vegetation Conservation Study
- Fauna Conservation Study
- Land Capability Study
- Contaminated Lands Study
- Visual Impact Study
- Heritage Study
- Aboriginal Archaeology Study.

Following the receipt of findings from those studies, Council prepared Preliminary Development Scenarios (1993) for public distribution. The report identified specific areas having potential for development and provided a range of population expectations for each of the areas based on different densities of development.

These preliminary development scenarios suggested that the land with capability for urban development could support about 3,500 dwellings at a low density of 2.5 dwellings per hectare, about 6,200 dwellings at 7.5 dwellings per hectare or more than 9,000 dwellings at higher levels of density of 12.5 dwellings per hectare. A preliminary plan showing potential development areas and land classifications which accompanied that report is included in Figure 2.

PURPOSE AND FORMAT OF THE DEMOGRAPHIC STUDIES

The main purpose of the demographic studies is to ensure that future residents of the Ingleside-Warriewood area are provided with an appropriate level of transport and traffic facilities and infrastructure, retail and service facilities, community facilities and open space and recreational facilities throughout the development phase of the urban release and into the foreseeable future.

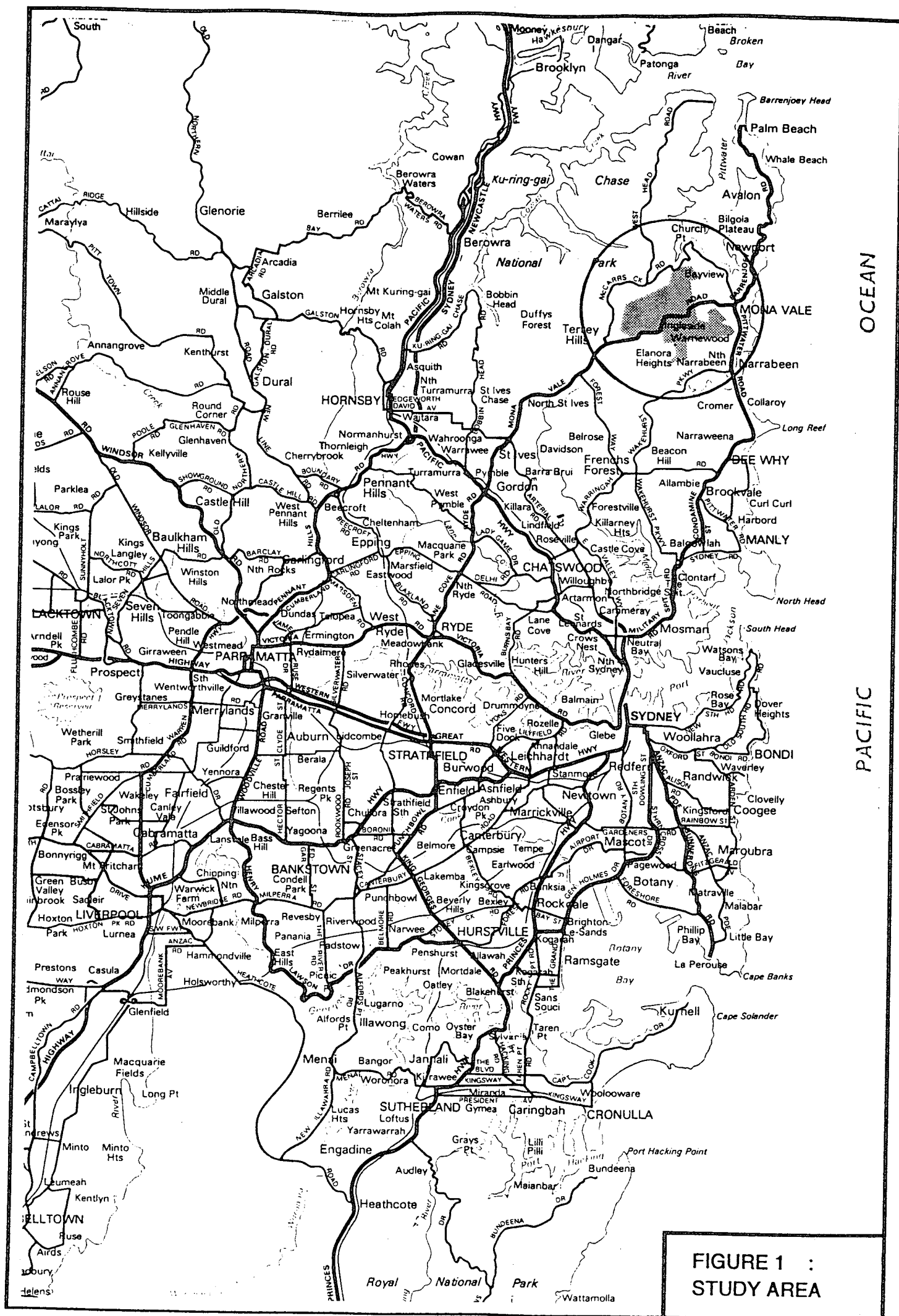
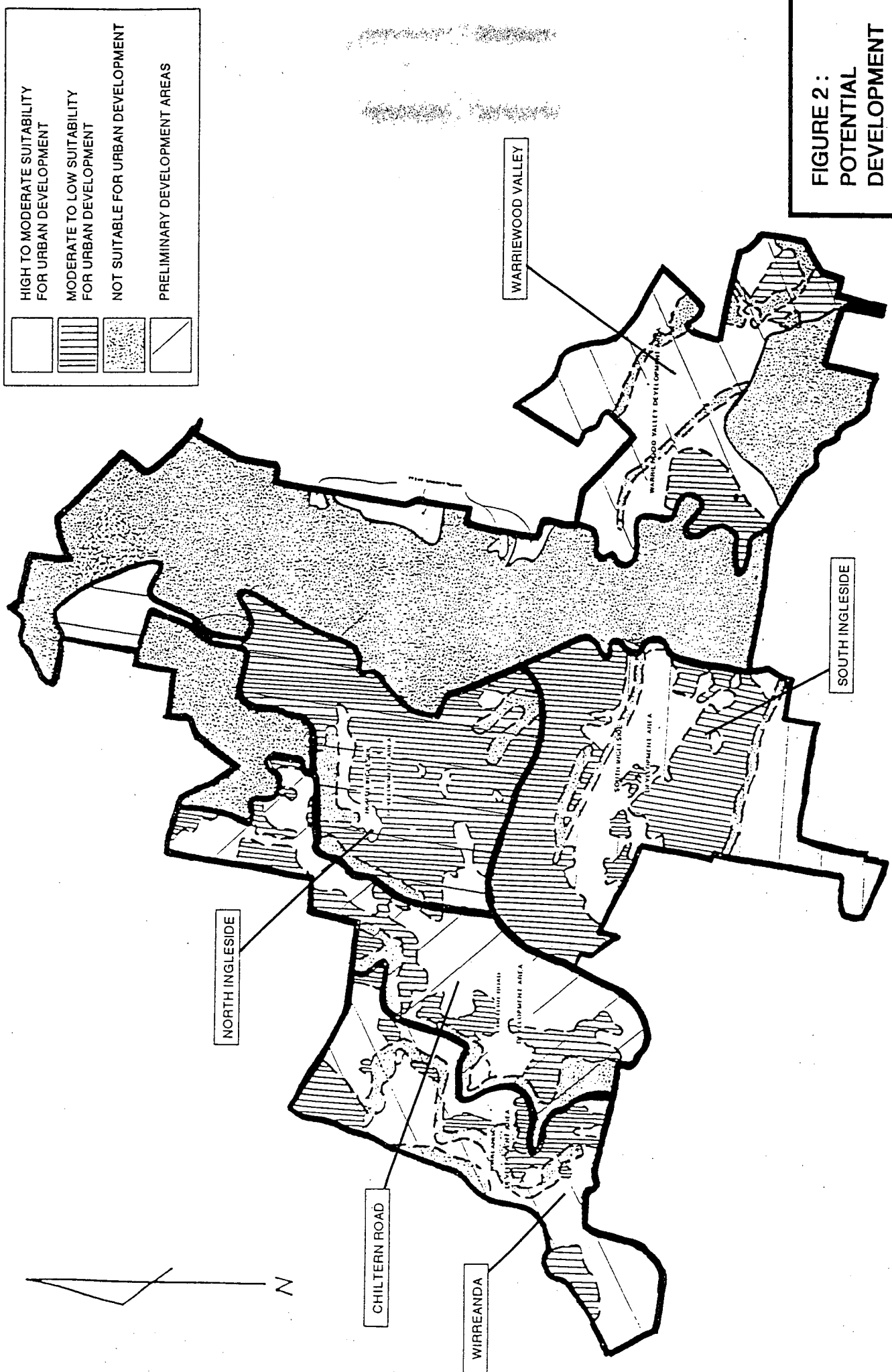


FIGURE 2:
POTENTIAL
DEVELOPMENT
AREA



A prerequisite for carrying out the various sectoral studies has been the preparation of a demographic model to establish alternative scenarios for the development of Ingleside-Warriewood and the demographic characteristics of the anticipated population. This information has formed the basis for assessing the future requirements and needs of the population for the particular services and facilities.

The format of the study has been set out in five further sections as follows:

- Section A provides a description of the alternative development scenarios for the release area and establishes the likely future housing and demographic characteristics of each scenario. It also assesses likely employment opportunities for the future population. This section has been prepared by Hirst Consulting Services.
- Section B describes the likely future requirements for traffic and transport based on the demographic study together with planning guidelines and management strategies for the provision of facilities and services for the anticipated urban development. This section has been prepared by Travers Morgan.
- Section C describes the likely future requirements for retail and commercial services based on the demographic study together with planning guidelines and management strategies for the provision of facilities and services for the anticipated urban development. This section has been prepared by Hirst Consulting Services.
- Section D describes the likely future requirements for community facilities based on the demographic study together with planning guidelines and management strategies for the provision of facilities and services for the anticipated urban development. This section has been prepared by Heather Nesbitt.
- Section E describes the likely future requirements for open space and recreation facilities based on the demographic study together with planning guidelines and management strategies for the provision of facilities and services for the anticipated urban development. This section has been prepared by Travers Morgan.

SECTION A

DEMOGRAPHIC ANALYSIS AND MODEL



1. INTRODUCTION

The goal of the demographic analysis is to establish the demographic characteristics of the anticipated population within the urban land release area of Ingleside-Warriewood, with particular regard to its requirements throughout the development period and into the future as regards transport and traffic facilities, retail and service facilities, community facilities, and recreation and open space facilities.

The demographic analysis provides the basis upon which considered projections can be prepared for the purpose of developing strategies to satisfy needs in each of the above elements of the future community.

The specific aim of **the demographic model** is, by building on the demographic analysis, to produce a profile of the anticipated release area population, and an estimate of the population itself, at full development of the area and at critical points during the development phase.

Pittwater Council has already derived potential development precincts within the release area, and specified the broad development potential of these precincts in terms of the area of developable land contained within each, having regard to identified constraints and opportunities.

A number of development scenarios have been agreed upon, and the demographic model applied to each in order to provide data on potential release area population under high, medium and low population forecasts, conditioned primarily by the range of possible residential densities.

This section of the report sets out the demographic analysis which has been undertaken to provide:

- information on the existing Ingleside-Warriewood community;
- information on the broader community of Pittwater;
- the implications of historic growth in some comparable urban release areas;
- the model methodology and results.

The section also presents an assessment of the possible population characteristics which can then be applied in other sections of the report to analyse demand for particular services and facilities.

The principal inputs to this analysis and demographic model are derived from the following sources:

- 1981, 1986 and 1991 Census Profiles, from the *Australian Bureau of Statistics*, for the Ingleside-Warriewood area, and the Pittwater local area;
- 1981, 1986 and 1991 Census Profiles, from the *Australian Bureau of Statistics*, for areas within selected other urban release areas in the Sydney Region Urban Development Program;

- Analyses carried out by the *Department of Planning* in 1991 on population and dwelling characteristics of release areas from the 1986 Census, and subsequent analyses by *Hirst Consulting Services* along similar lines based on the 1991 Census;
- Processes developed by *Census Applications Pty Ltd* as the CASAS suite of computer programs, as utilised by *Hirst Consulting Services*;
- Regional level results from the 1988/1989 Household Expenditure Survey from the *Australian Bureau of Statistics*;
- Processes within the DEMOGRAPH computer model for projecting population developed by *Proteus Consulting Limited* and adapted by *Census Applications Pty Ltd*, simulating projections based on cohort component analysis;
- Discussions with Planning staff of Pittwater Council, and advice from the Ingleside-Warriewood Residents Consultative Committee and the Ingleside-Warriewood Land Release Advisory Committee.

2. DEMOGRAPHIC ANALYSIS

2.1 THE EXISTING COMMUNITY

It is important to examine the existing local community of Ingleside- Warriewood as it is upon this base that the new community of release area residents will be developed. It is also important to examine the broader context of the existing Pittwater community, as it is within this context that the release area community of the future will function. The new community has the potential, depending on its ultimate size, to contribute significantly to overall population growth within the Pittwater local area.

2.1.1 The Ingleside-Warriewood Population

Based on an analysis of the 1991 Census results, we estimate that the existing resident population within the Ingleside-Warriewood release area is approximately 1,800 persons. This population has grown by one-third since 1981, when it was approximately 1,300 persons. A detailed table is included in Appendix AI to this report, indicating the changes which have occurred in the local population size and characteristics in the ten years between 1981 and 1991.

The 1991 population occupied some 580 dwellings, with most being separate detached dwellings. Only in the five years between 1986 and 1991 has the number of multi-unit dwellings in the release area increased by any significant amount.

By reference to the existing pattern of land subdivision indicated by Council's detailed maps for the area, we estimate that, in 1991, 340 dwellings (of the total 580 dwellings) were located within the 700 hectares of land which has been assessed by Council as developable. We further estimate that these 340 dwellings provided homes to approximately 1,000 persons in 1991.

In summary, the present population in the Ingleside-Warriewood release area is clearly low with the average density of dwellings in the developable lands being one dwelling per two hectares. There has been some significant population growth in the ten years to 1991, but the general profile of the community indicates a relatively stable population in terms of characteristics, except for the noted increase in the number of older people living in the area. Observations suggest that the aged population may well be concentrated in one or two particular developments in the area rather than being spread evenly throughout the existing community.

2.1.2 The Pittwater Population

The resident population of the local government area of Pittwater at the 1991 Census was approximately 49,500 persons. This population only increased by 6%, or 3,000 persons, in the ten years since 1981.

A detailed table of the population characteristics, comparing changes between 1981 to 1989 with those in the Sydney metropolitan area, is also included in Appendix AI to this report. Individual

tables illustrating particular elements of the Pittwater population are used as highlights in the following discussion.

The two graphs at Figure A2.1 page show the proportions of the respective populations in age groups in Pittwater and the Sydney metropolitan area (equivalent to the Sydney Statistical Division in Census terms). There have been a few significant changes in the disposition of Sydney's population by age groups between 1981 and 1991 - the proportion of the population in the youngest age groups declining marginally and that in the middle age groups increasing slightly, and the proportion of the population aged 75 years or more steadily increasing. Changes in the Pittwater population between 1981 and 1991 broadly follow the Sydney average, except that there have been notable declines in the proportion of the population aged between 25 years and 34 years, and the proportion of the population aged more than 75 years has dramatically increased so as to be well above the Sydney average in 1991.

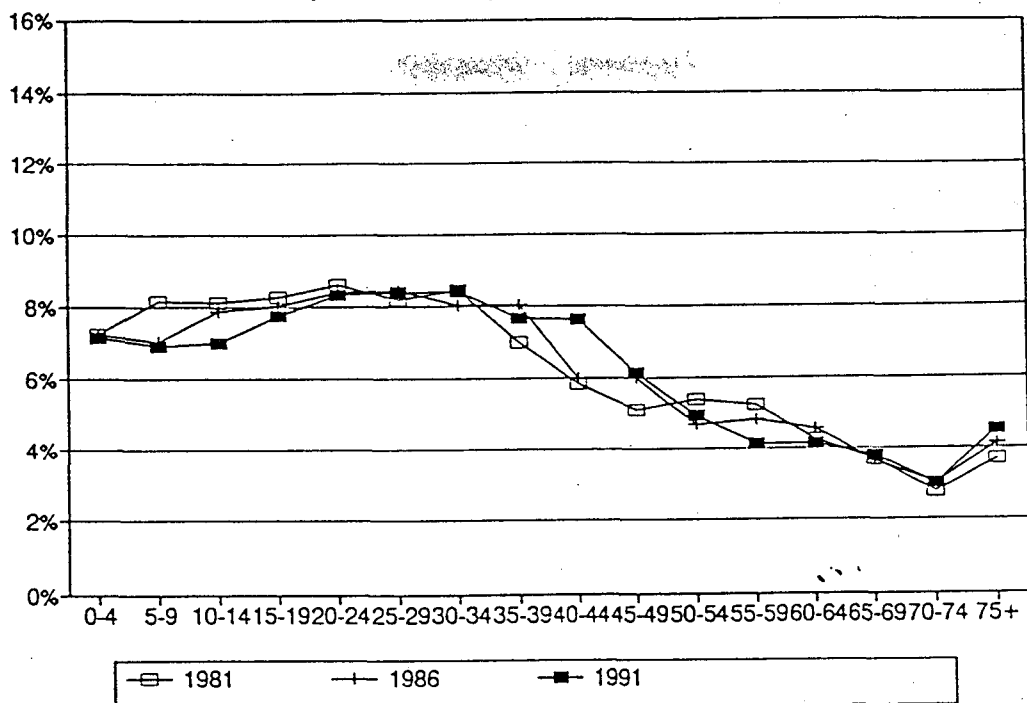
Both Pittwater and metropolitan Sydney therefore present general patterns of somewhat ageing populations, with this pattern more marked in Pittwater than in the metropolitan population. Nevertheless, the general curve of the graph describing the Pittwater population remains fairly close to the Sydney average.

Table 2.1 summarises population change in terms of numbers in the Pittwater Local Government Area.

TABLE 2.1: DEMOGRAPHIC SUMMARY - PITTWATER			
	1981	1986	1991
Males	23,119	24,293	24,515
Females	23,648	24,792	24,966
Persons	46,732	49,113	49,481
Aboriginal, TSI	42	74	109
Overseas Born - ESC	6,724	6,938	7,072
Overseas Born - NESC	3,940	3,973	4,042
Overseas Born - Total	10,664	10,911	11,114

Table 2.1 indicates that the Pittwater population in 1991 was approximately 49,480 persons. This is slightly less than the population already mentioned above as, although both figures are drawn from the 1991 Census results, they have been generated by applying two methods of statistical aggregation which result in minor differences to the aggregate population. These differences are not considered significant either in terms of population statistics or considering the purposes to which they are applied in this report.

Sydney Statistical Division Proportion of Population in Age Groups



Pittwater Proportion of Population in Age Groups

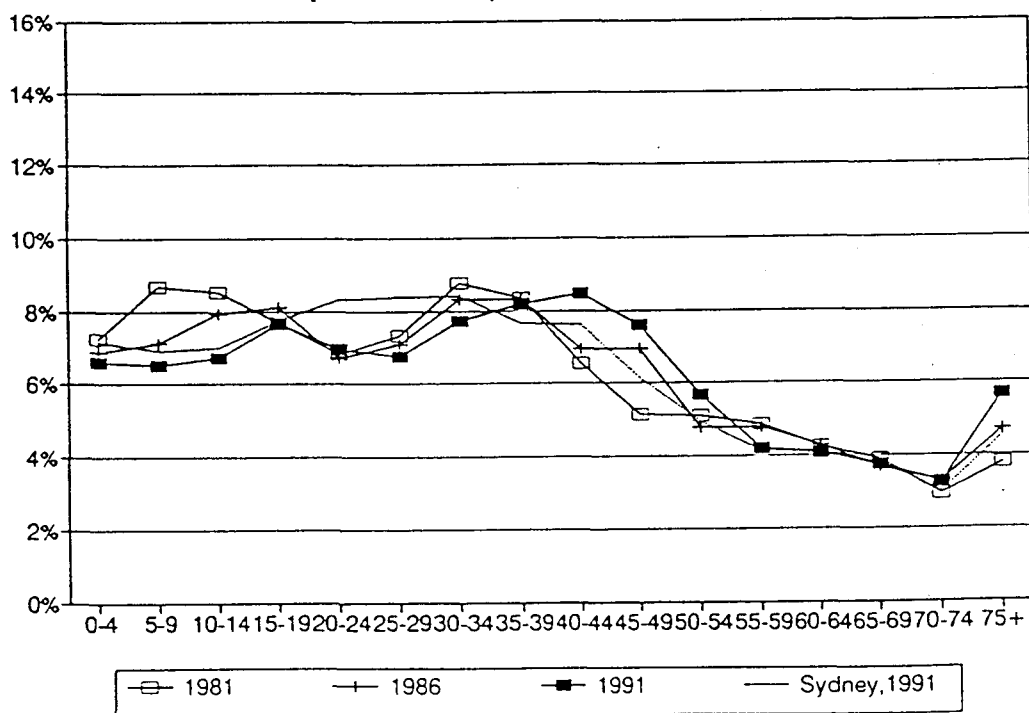


FIGURE A 2.1 :
POPULATION IN AGE GROUPS, SYDNEY
REGION AND PITTWATER, 1981 - 91

Pittwater has a historically low Aboriginal or Torres Strait Islander population, representing less than one-quarter of one percent of the total population. Pittwater has however had a consistently significant 22% of its population counted as overseas born persons in the three Census' since 1981.

Table 2.2 show the details of the numbers of persons in five year age groups in the Pittwater population, and is the data from which the Pittwater graph at Figure A2.1 has been derived.

TABLE 2.2: BROAD AGE STRUCTURE - PITTWATER			
	1981	1986	1991
Persons			
0-4	3,389	3,384	3,268
5-9	4,057	3,493	3,233
10-14	3,996	3,902	3,337
15-19	3,595	3,992	3,793
20-24	3,194	3,304	3,452
25-29	3,434	3,480	3,350
30-34	4,101	4,098	3,818
35-39	3,905	4,098	4,057
40-44	3,060	3,415	4,201
45-49	2,403	3,415	3,762
50-54	2,380	2,341	2,812
55-59	2,271	2,345	2,086
60-64	1,986	2,110	2,023
65-69	1,819	1,792	1,859
70-74	1,368	1,621	1,616
75+	1,774	2,323	2,814
TOTAL	46,732	49,113	49,481

2.1.3 Housing Characteristics - Pittwater

Table 2.3 shows the changes which have occurred in the numbers of dwellings of various kinds in the Pittwater area between 1981 and 1991.

TABLE 2.3: STRUCTURE OF DWELLINGS - PITTWATER			
	1981	1986	1991
	Number of Households		
Separate House	13,689	14,269	14,759
Semi-Detached, Row/Terrace	74	84	658
Flats 1-3 Storeys	1,648	1,891	1,418
Flats Over 3 Storeys	27	92	328
Other Dwellings	117	278	260
Not Stated	251	413	158
TOTAL	15,806	17,027	17,581

The development rate in the ten years in Pittwater has clearly not been as significant as the rate in other parts of Sydney, with fewer than 2,000 new dwellings being added to the dwelling stock since 1981. The two categories of "*flats 1-3 storeys*" and "*flats over 3 storeys*" should be read together as definitional changes between the three Census' have tended to confuse the distinction between residential flat buildings exaggerating the decline in the number of flats in 1-3 storey buildings and the increase in the number of flats in buildings over 3 storeys high.

The great bulk of Pittwater's dwelling stock remains as separate detached houses, with the most significant increase in the number of dwellings in other categories being the number of multi-unit dwellings characterised as "*semi-detached, row/terrace*".

Table 2.4 shows the proportion of total households by the type of dwelling tenure. Between 1981 and 1991, there was a significant increase in the proportion of households owning their own home, and a related decrease in the proportion purchasing same. This is indicative of the relatively established nature of the residential population in the Pittwater local area.

TABLE 2.4: NATURE of OCCUPANCY - PITTWATER			
	1981	1986	1991
	Households: Each Group as % of Total		
Owned	30.69%	38.04%	43.67%
Being Purchased	45.95%	37.34%	29.19%
Rented: Government	0.04%	0.23%	0.29%
Private & Other	16.62%	18.77%	19.56%
Other & Not Stated	6.69%	5.62%	7.29%
TOTAL	100.00%	100.00%	100.00%

The average size of a household in Pittwater has declined marginally from 3.12 persons in 1981 to 3 persons in 1991, as illustrated in Table 2.5.

TABLE 2.5: HOUSEHOLD SIZE - PITTWATER			
	1981	1986	1991
Persons in Household			
1 or 2	7,541	8,350	8,529
3 or 4	6,069	6,533	6,452
5 or more	2,196	2,143	2,008
Average Household Size	3.12	3.05	3.00

Contributing to this change has been the relatively greater growth in the number of one or two person households compared to the growth in the number of three or four person households, and the absolute decline in the number of households with five or more persons. Having regard to the earlier observation concerning the aging of the Pittwater population, it can be inferred that a significant proportion of the new one or two person households are made up of persons in the oldest age groups.

2.1.4 Motor Vehicle Ownership and Journey to Work - Pittwater

Table 2.6 shows changes which have occurred in the degree to which Pittwater households have access to motor vehicles. The most significant increases in household numbers are in those categories of households with two, three or more motor vehicles. The relative stability in the number of households having no motor vehicles or only one motor vehicle is particularly marked in Pittwater between 1981 and 1991.

TABLE 2.6: NUMBER OF MOTOR VEHICLES - PITTWATER			
	1981	1986	1991
Households: With the Following No. of Vehicles			
None	1,314	1,301	1,311
1	6,167	6,390	6,299
2	5,944	6,737	6,865
3 or more	1,770	2,084	2,541
Not Stated	607	538	541
Average	1.59	1.65	1.72

Allied to this pattern, the data in Table 2.7 shows the importance of different modes of transport used for work related journeys, and changes between 1981 and 1991.

Table 2.7 only shows the relative significance of these travel modes as the numbers show journeys or part journeys rather than reflecting the absolute number of workers. Clearly, the most significant increase between 1981 and 1991 is in the number of journeys undertaken in a car as a driver, while it is interesting to note that the number of journeys undertaken as a car passenger has in fact declined. After cars, the next most popular transport mode is the bus, reflecting the relative isolation of the Pittwater area from other transport networks such as the metropolitan rail system.

TABLE 2.7: METHOD OF TRAVEL TO WORK - PITTWATER			
	1981	1986	1991
	Persons		
Train	245	214	178
Bus	1,827	1,921	1,872
Ferry	233	214	93
Taxi	96	107	78
Car as Driver	13,405	14,634	14,751
Car as Passenger	1,912	1,847	1,745
Motor Bike/Scooter	217	176	94
Bicycle	140	193	195
Walked only	657	701	758
Worked at Home	N/Av	1,251	290
Did not go to Work	N/Av	2,045	1,567
Not Stated	N/Av	747	2,275

Note: Totals not given as multiple responses are allowed.

2.1.5 Education - Pittwater

The educational qualifications of the Pittwater population as recorded in the 1991 Census are compared with the Sydney averages in Table 2.8.

In general, the degrees of variance of Pittwater from the Sydney average are not significant, although the proportion of the Pittwater population (49%) who reported holding no qualifications is substantially below the Sydney average. Relatively, the Pittwater population is slightly better educated than the Sydney average with higher percentages holding Bachelor Degrees or Post Graduate Diplomas, Under-Graduate Diplomas or other skilled vocational qualifications.

TABLE 2.8: EDUCATION - HIGHEST QUALIFICATION IN 1991
(persons aged 15 years or more)

	PITTWATER		SYDNEY	
	Persons	%	Persons	%
Higher degree	535	1.3%	39,960	1.4%
Post graduate diploma	581	1.5%	29,419	1.1%
Bachelor degree	3,313	8.3%	197,811	7.1%
Undergraduate diploma	2,329	5.9%	105,456	3.8%
Associate diploma	679	1.7%	42,457	1.5%
Skilled vocational	4,802	12.1%	283,012	10.1%
Basic vocational	2,071	5.2%	111,158	4.0%
Inadequately described	616	1.5%	35,215	1.3%
Not qualified	19,476	49.0%	1,585,096	56.8%
Not stated	5,344	13.4%	362,333	13.0%
TOTAL	39,746	100.0%	2,791,917	100.0%

The 1991 Census also recorded that approximately 3,300 Pittwater residents aged 15 or more were then attending a tertiary educational institution. This represents 8.4% of the population aged 15+, and compares with the Sydney average of 9.7% of the equivalent population attending such institutions in 1991. Taking this data together with that reported in Table 2.8 above, suggests that it is predominantly the older Pittwater population who hold higher educational qualifications.

2.1.6 Employment - Pittwater

Tables 2.9 and 2.10 allow comparisons, from data collected in the 1991 Census, between the Pittwater population and the Sydney metropolitan population in terms of the industry types in which the respective workers are employed and in terms of the status of workers in relation to their employment.

TABLE 2.9: INDUSTRY SECTOR OF EMPLOYED PERSONS 1991

Percentages	Pittwater			Sydney		
	Males	Females	Persons	Males	Females	Persons
Commonwealth government	4.3%	3.3%	3.9%	7.9%	5.9%	7.0%
State/Territory government	7.6%	11.1%	9.2%	10.3%	14.4%	12.1%
Local government	1.9%	1.4%	1.7%	2.2%	1.1%	1.8%
Private Sector	80.7%	78.3%	79.6%	73.8%	72.5%	73.2%
Not Stated	5.4%	5.9%	5.6%	5.8%	6.0%	5.9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE 2.10: STATUS OF WORKER-EMPLOYED PERSONS - 1991						
Percentages	Pittwater			Sydney		
	Males	Females	Persons	Males	Females	Persons
Wage or salary earner	69.2%	82.8%	75.2%	81.6%	88.8%	84.7%
Self employed	16.9%	9.6%	13.7%	10.4%	6.1%	8.6%
Employer	13.5%	6.5%	10.4%	7.7%	4.1%	6.2%
Unpaid helper	0.5%	1.1%	0.8%	0.3%	0.9%	0.6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The Pittwater workforce is more likely to be employed in the private sector than in any government enterprises, and significantly more likely to be so employed than the Sydney workforce on average. This is equally true for both males and females. Further, significant differences between the Pittwater workforce and the Sydney workforce in general are evident in terms of the status of workers - much higher proportions of the Pittwater workforce are either self employed or are employers.

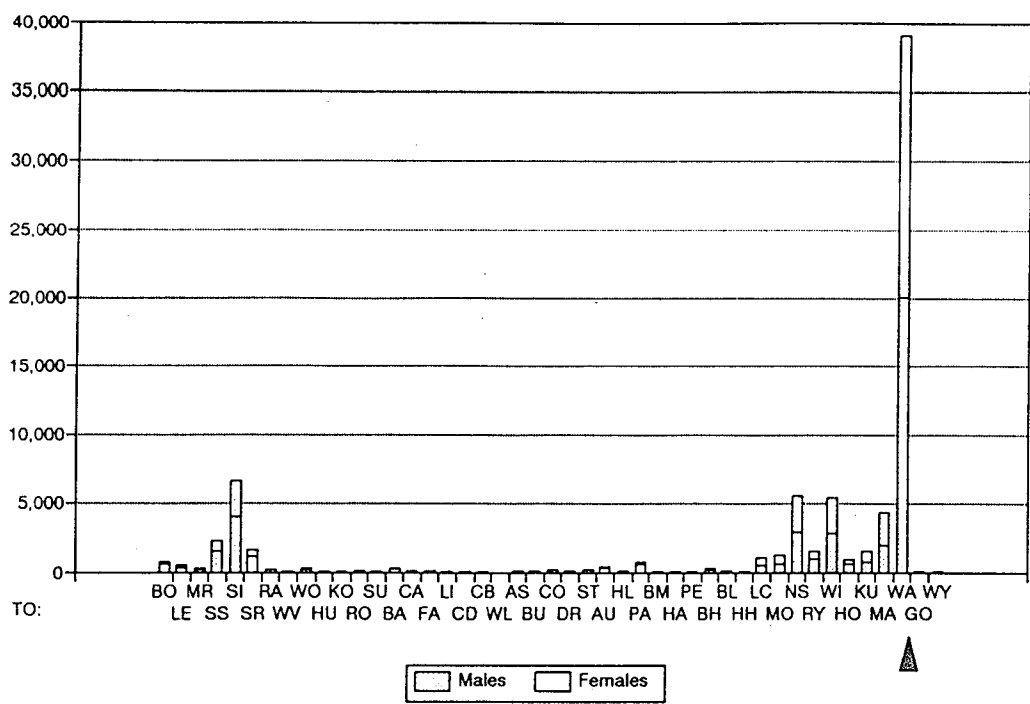
The two graphs at Figure A2.2 have been compiled from data collected at the 1991 Census in relation to journeys to work. These graphs show the results for the 1991 population for the then Shire of Warringah as a whole (now split between Warringah and Pittwater Local Government Areas) as no separate data at this level is available for the population of that area now within Pittwater.

The **first graph** illustrates dramatically the tendency for 1991 Warringah resident workers to either work in the immediate area or in select local government areas nearby, or to work in the Sydney CBD. Of the 85,900 resident workers in the whole of Warringah in 1991, 45% journey to work locations were within the Warringah peninsula.

The **second graph** at Figure A2.2 shows the origin, by local government area, of all workers working in Warringah in 1991. Again, the extent to which the local workforce accounted for local-based jobs is clearly evident. Of the 50,100 workers at work locations in the Warringah peninsula in 1991, 78% lived within the area.

Tables 2.11 and 2.12 provide some detailed data from the 1991 Census, enabling a comparison between the Pittwater resident workforce and that in the metropolitan area in terms of the industry categories in which persons were employed and the kind of occupation they held. Fewer Pittwater workers than average held manufacturing type jobs, and significantly higher proportions had jobs in service-type categories such as wholesale and retail and in business services. In parallel with this, Pittwater workers were more likely to be managers/administrators or professionals, or be engaged in personal services work than the Sydney average.

1991 Journey to Work from
WARRINGAH



BOTANY	BO
LEICHHARDT	LE
MARRICKVILLE	MR
SOUTH SYDNEY	SS
SYDNEY - INNER	SI
SYDNEY - REMAIN	SR
RANDWICK	RA
WAVERLEY	WV
WOollahra	WO
HURSTVILLE	HU
KOGARAH	KO
ROCKDALE	RO
SUTHERLAND	SU
BANKSTOWN	BA
CANTERBURY	CA
FAIRFIELD	FA
LIVERPOOL	LI
CAMDEN	CD
CAMPBELLTOWN	CB
WOLLONDILLY	WL
ASHFIELD	AS
BURWOOD	BU
CONCORD	CO
DRUMMOYNE	DR
STRATHFIELD	ST
AUBURN	AU
HOLROYD	HL
PARRAMATTA	PA
BLUE MOUNTAINS	BM
HAWKESBURY	HA
PENRITH	PE
BAULKHAM HILLS	BH
BLACKTOWN	BL
HUNTERS HILL	HH
LANE COVE	LC
MOSMAN	MO
NORTH SYDNEY	NS
RYDE	RY
WILLOUGHBY	WI
HORNSBY	HO
KU-RING-GAI	KU
MANLY	MA
WARRINGAH	WA
GOSFORD	GO
WYONG	WY

1991 Journey to Work in
WARRINGAH

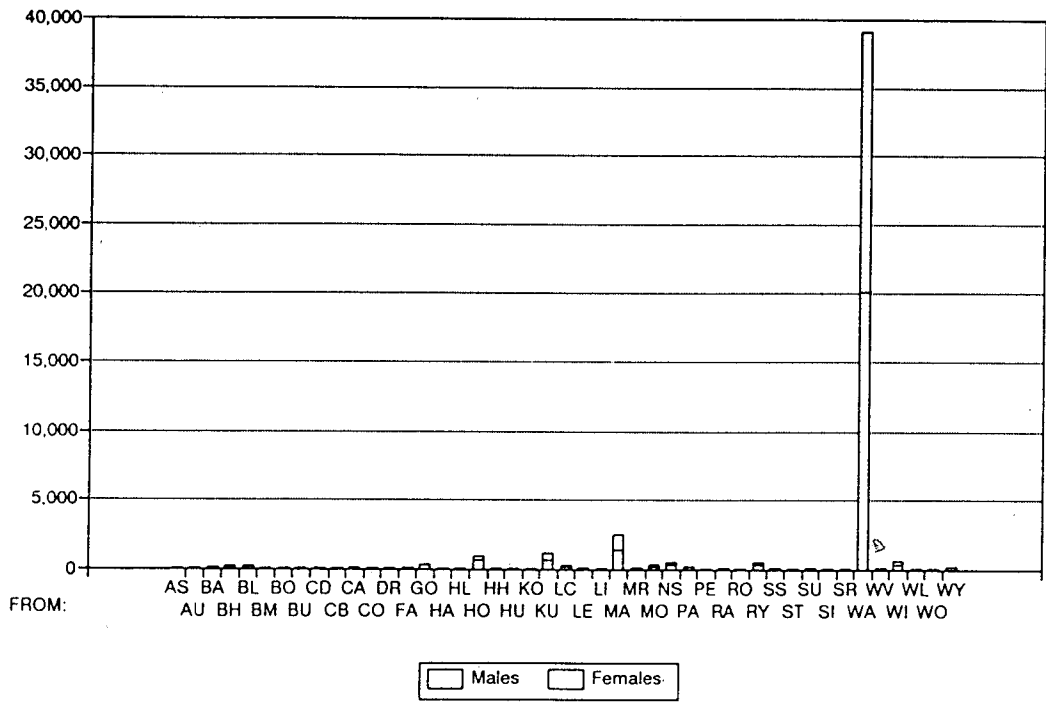


FIGURE A2.2

TABLE 2.11: EMPLOYED PERSONS BY OCCUPATION - 1991

	PITTSBURGH				SYDNEY			
	Total Persons	Prop% Males	Prop% Females	Prop% Total	Total Persons	Prop% Males	Prop% Females	Prop% Total
Managers and administrators	3,878	20.3%	9.2%	15.4%	170,332	14.0%	6.8%	10.9%
Professionals	3,946	15.8%	15.5%	15.7%	224,679	14.2%	14.6%	14.4%
Para-professionals	1,634	6.2%	6.8%	6.5%	104,223	6.4%	7.0%	6.7%
Trades persons	3,321	20.8%	3.6%	13.2%	201,248	20.4%	3.0%	12.9%
Clerks	3,964	4.6%	29.9%	15.7%	276,865	7.2%	31.5%	17.7%
Sales & personal service workers	4,150	12.8%	21.2%	16.5%	212,716	9.6%	18.9%	13.6%
Plant & machine operators & drivers	889	5.3%	1.3%	3.5%	99,237	9.2%	2.6%	6.4%
Labourers & related workers	1,844	8.0%	6.5%	7.3%	173,666	12.3%	9.5%	11.1%
Inadequately described	257	1.3%	0.6%	1.0%	19,323	1.6%	0.8%	1.2%
Not stated	1,293	5.0%	5.4%	5.1%	80,333	5.0%	5.3%	5.1%
TOTAL	25,176	100.0%	100.0%	100.0%	1,562,622	100.0%	100.0%	100.0%

TABLE 2.12: EMPLOYED PERSONS BY INDUSTRY - 1991

	PITTWATER				SYDNEY			
	Total Persons	Prop% Males	Prop% Females	Prop% Total	Total Persons	Prop% Males	Prop% Females	Prop% Total
Agriculture forestry, fish & hunt	160	0.7%	0.6%	0.6%	9,981	0.7%	0.6%	0.6%
Mining	36	0.2%	0.1%	0.1%	4,385	0.4%	0.1%	0.3%
Manufacturing	2,657	12.8%	7.9%	10.6%	219,016	17.0%	10.2%	14.0%
Electricity, gas & water	164	1.0%	0.2%	0.7%	19,010	1.8%	0.4%	1.2%
Construction	2,197	13.3%	3.1%	8.8%	94,672	9.2%	1.9%	6.1%
Wholesale & retail trade	5,519	21.4%	22.7%	22.0%	303,405	19.0%	19.9%	19.4%
Transport & storage	940	4.7%	2.5%	3.7%	84,815	7.1%	3.2%	5.4%
Communication	232	1.3%	0.5%	0.9%	29,477	2.4%	1.3%	1.9%
Finance, property & business services	4,316	17.2%	17.3%	17.2%	240,997	14.0%	17.3%	15.4%
Public administration & defence	698	3.2%	2.3%	2.8%	77,266	5.5%	4.2%	4.9%
Community services	4,107	9.6%	24.9%	16.4%	262,745	10.0%	25.7%	16.8%
Recreation, personal & other services	2,247	7.8%	10.4%	9.0%	109,376	6.0%	8.3%	7.0%
Not classifiable	117	0.4%	0.5%	0.5%	5,503	0.4%	0.3%	0.4%
Not stated	1,681	6.4%	7.0%	6.7%	102,453	6.5%	6.7%	6.6%
TOTAL	25,071	100.0%	100.0%	100.0%	1,563,101	100.0%	100.0%	100.0%

According to data collected at the 1991 Census, the average monthly housing loan repayment for private dwellings in Pittwater was \$929, significantly above the Sydney average of \$784. From the same source, average weekly rent for rented private dwellings in Pittwater in 1991 was \$213, significantly above the Sydney average of \$155.

In summary, whilst the composition of the Pittwater population in terms of age groups is not presently markedly different to the general Sydney metropolitan pattern, there are some significant differences in population characteristics between Pittwater and the metropolitan area, especially in terms of household composition, dwelling type, employment status and housing cost.

2.2 COMPARABLE RELEASE AREAS

The Sydney region has now experienced considerable growth, primarily on its edges, within designated urban release areas over the last twenty years. Whilst the Ingleside-Warriewood area is the first release of a significant size on the peninsula for some time, there are many examples elsewhere in Sydney of large scale urban-fringe areas which have been successfully transformed into residential developments. In this sense, such areas can be described as comparable to Ingleside-Warriewood.

It is difficult to find a "*surrogate*" release area elsewhere in Sydney which could **substitute** for the Ingleside-Warriewood area in terms of examining in detail its development pattern and lessons to be learnt therefrom. However, it is considered reasonable to examine several areas which could be described as **comparable** in order to discern the patterns of population and development, and relationships with existing urban areas, which are evident.

In selecting comparable areas, the following principles were employed:

- The area had to have been significantly developed in 1991 to ensure that detailed information from the 1991 Census could be used to provide a socio-economic profile of the new community. This would also permit the tracking of appropriate socio-economic indicators since at least 1981, as Sydney release areas have generally had extended development periods;
- The area should have a similar housing sub-market to that expected in Ingleside-Warriewood so that projections of the socio-economic profile of residents could be similar. Although housing sub-markets may be difficult to anticipate as economic conditions change rapidly, factors such as topography, proximity, housing expectations and access to transport were examined in choosing comparable areas;
- The areas should be of a similar population size to that expected in broad terms in Ingleside-Warriewood, therefore being able to reflect the scale of development and the range and size of services required in the future to satisfy community needs.

After checking the development history of many release areas in Sydney, three were chosen for some detailed examination based on their broad accord with the above. These areas are:

- the **Cherrybrook Release Area** in Hornsby, the first parts of which were developed in the early 1980s;
- the **Glenhaven Release Area** in Baulkham Hills, also first developed in the early 1980s;
- the **Menai Release Area** in Sutherland, the first parts of which were rezoned for residential development in 1971.

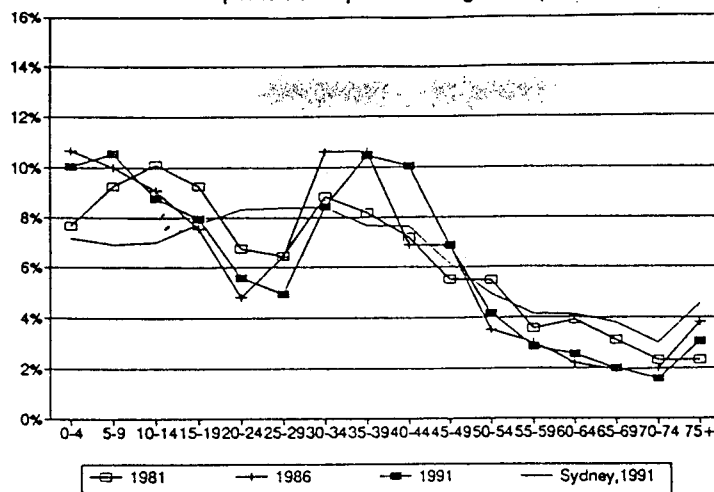
Each of these release areas is still being developed, with Glenhaven capable of supporting an additional 400 dwellings before completion (possibly at about 100 dwellings per year), the Cherrybrook area capable of 1,000 more dwellings (at up to 200 dwellings per year), and the Menai area with the potential for an additional 2,000 dwellings (could possibly develop up to 300 dwellings per year). Each of these release areas is in what has generally been regarded as the high price sub-market for housing. Each area enjoys superior locational advantages and has significant attractive topographic features. Each is partially set apart from existing urban development in the respective local government areas, and the residents of each have to rely primarily on road-based transportation systems for internal and external trips.

In addition, each of the areas had significant populations in 1991 (Cherrybrook = 15,000, Glenhaven = 5,000 and Menai = 22,000), reflecting the general range of population size expectations for the Ingleside-Warriewood area.

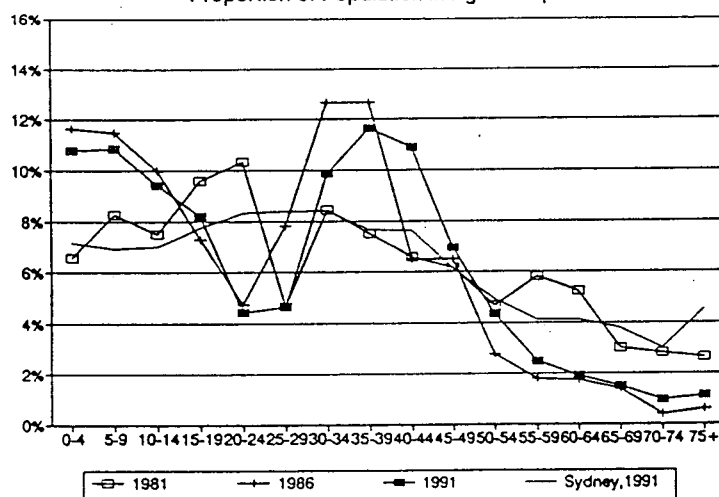
A detailed table is included as Appendix A2 to this report, summarising population characteristics, dwelling types etc. for these release areas in 1981, 1986 and 1991, and providing parallel details for Pittwater and the Sydney metropolitan area for reference purposes.

The most significant differences between release area populations and the population in more established parts of the Sydney metropolitan area are illustrated in the three graphs at Figure A2.3. Release areas are characterised by population profiles which alter in similar patterns over a 10 year period - all have relatively high proportions of their population in the youngest age groups and in the 25-40 year age groups. None of them has particularly marked concentrations of population aged 75 or more. Each of these graphs also contains the 1991 profile for the Sydney metropolitan area to enable comparisons, and it will be recalled that such a profile is broadly indicative of the present Pittwater population profile.

Cherrybrook
Proportion of Population in Age Groups



Glenhaven
Proportion of Population in Age Groups



Menai
Proportion of Population in Age Groups

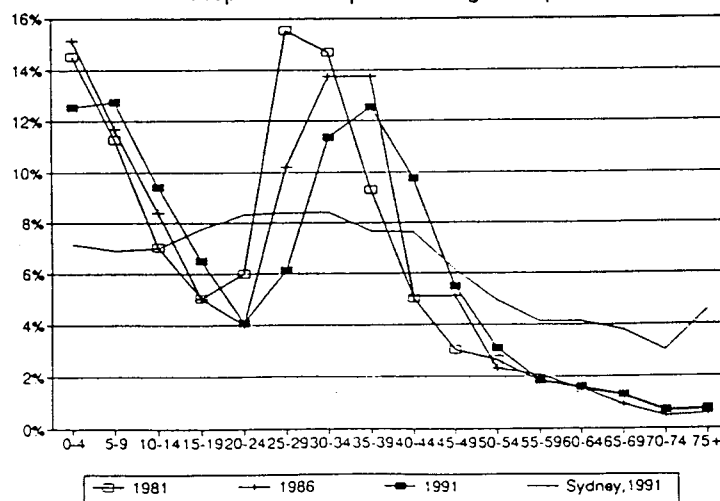


FIGURE A 2.3 :
POPULATION PROFILES, CHERRYBROOK
GLENHAVEN AND MENAI, 1981 - 91

Other salient characteristics of these comparable release areas include the following:

- Increasing proportions of the resident population are overseas born;
- The dominant family type is an adult couple with dependent children;
- Dwellings are almost exclusively separate houses;
- A very high proportion of households are purchasing their dwellings, and there is little rented accommodation;
- More than half the households comprise three or four persons and the proportion of such households in the community increases over time;
- Car ownership is high and increases over time, with the average being approximately two cars per household;
- Cars are used extensively for the journey to work and there appears to be little reliance on public transport, including buses, in contrast to the general Sydney situation.

These broad characteristics of developing area populations were also noted by the Department of Planning, when it analysed the 1986 Census for release areas within the different sub-markets. The Department found that, in the high price sub-market release areas:

- there were significantly high proportions of the population aged 0-4 and 5-19; there were low proportions of the population aged 60+;
- lower than average proportions of the population were born overseas in countries where English was not the first language;
- the areas housed high proportions of self-employed persons, and low unemployment;
- significant numbers of couples in families with children were both
- employed, higher than the figure for the Sydney region and for other sub-market release areas;
- income levels of the population were significantly higher than other sub-markets and also higher than the Sydney average;
- the occupancy rate for separate houses was a high 3.48 persons per household and 2.35 persons per household for multi-unit developments;

- more than half of all households had two motor cars, significantly higher than the rate in other housing sub-markets.

These general observations of the Department of Planning, based on the 1986 Census, are largely confirmed by our observations of our chosen comparable release areas in the high price sub-market based on 1991 data. There has been significant consistency across high-priced Sydney release areas in terms of population and dwelling characteristics, and it could be expected that the new Ingleside-Warriewood community will tend to exhibit many of the same characteristics.

It should be noted that this data is indicative only, and whilst based on reasonable observation, can only lead us to the suggestion of the future rather than be used as a totally accurate predictor of the whole range of population characteristics.

Nevertheless, it is instructive to have regard to the consistent population pattern arising from these observations in contemplating the possible future for Ingleside-Warriewood.

3. THE DEMOGRAPHIC MODEL

This chapter details the construction of the demographic model used to generate projections of population size and associated characteristics for the Ingleside- Warriewood Release Area.

3.1 METHODOLOGY

The overall methodology employed in model construction involved the following stages:

- Existing population data for Ingleside-Warriewood, Pittwater and the comparable release areas was examined in detail;
- A measure of fine tuning was applied to indicative population characteristics to account for local assumptions;
- An agreed range of critical variables was defined;
- A spreadsheet-based computer model was constructed, designed to produce estimates of new population size over the development period for assumed scenarios;
- Age/sex breakdown variations over time as derived from comparable area analysis and fine tuning were used to generate periodic population cross-sections;
- A cohort component computer analysis model was run in parallel, based on the existing Ingleside-Warriewood population and the assumptions regarding in-migration derived from the above;
- The two computer projections were compared as a means of verifying the assumptions of each against the other and in order to introduce a degree of reliability.

The intention was to produce an easily used spreadsheet-based model for Council, incorporating the key variables which impact on population characteristics, in order that future re-runs of the model can be undertaken by Council as detailed planning for the Ingleside-Warriewood area proceeds, in addition to producing a first indicative set of detailed population data to be used in subsequent sections of this overall demographic study for the release area.

3.2 VARIABLES

In discussion with Council staff and Committees, the following variables were identified as those most likely to affect the size and composition of the release area population:

- Overall dwelling density;
- Rate of dwelling production;
- Order of precinct development;

- Occupancy rate/household size;
- Extent of multi-unit housing.

The assumptions which were made regarding each of these variables in order to provide input to the computer model were as follows:

- Overall dwelling densities were agreed as the range from 13 dwellings per hectare, through 9 dwellings per hectare, to 5 dwellings per hectare, resulting from Council's earlier analysis and preliminary development scenarios;
- The rate of dwelling production was set at a maximum of 150 dwellings per development precinct per year, and the starting dates of development in each precinct were staggered by two years, in order to simulate a reasonable development path for the release area. This rate was set after having examined historical development rates in the comparable release areas, in the Pittwater Local Government Area in general, and controlled by suggesting that such a reasonable development rate would be acceptable to the housing market, given the uncertainties in that sector;
- The order of precinct development was assumed for modelling purposes to be that order suggested by Council in its preliminary development scenarios, being Warriewood Valley, followed by South Ingleside, North Ingleside, Chiltern Road and Wirreanda;
- A marginal occupancy rate (the average size of new households moving into the area at establishment) was set at three persons per separate house and two persons in each multi-unit dwelling. These rates were set after considering the historical development in the comparable release areas and that in the Pittwater community itself;
- The extent of multi-unit housing was set at 20% of new dwelling stock. It was felt it was unlikely in the early years of development that significant tracts would be developed for large scale multi-unit housing, but that it is possible this situation will alter in the medium term future. Establishing a rate of 20% for multi-unit housing was also considered reasonable in market terms in order to produce the first results from the model.

A simple computer spreadsheet was developed which enabled linking of these five agreed variables and their characteristics to the developable areas in each Ingleside-Warriewood precinct in order to produce a "run-out" of new dwelling numbers for each scenario based principally on the dwelling densities defined above.

The agreed proportion of multi-unit housing and the relevant occupancy rates were then applied to this run-out of dwellings in order to generate an estimate of new population in each development year.

A notional population breakdown by age groups was constructed independently, based on the

indications from the examination of the comparable release areas for specific periods during their development phases, but varied to reflect agreed assumptions regarding Ingleside-Warriewood in terms of the likelihood of increased numbers of aged persons. The result shows a population breakdown by year during the development period in terms of age groups, thereby providing an indication of the mix in the new community.

It is emphasised that this model assumes a somewhat regular pattern of development over time, not allowing for interruptions which will undoubtedly result from fluctuations in the housing market. The model must also assume that the development potential of the release area under each of the scenarios is fully realised by the end of the development period, and it is acknowledged that this is contrary to observations which suggest a longer *"tailing off"* period towards the end of release area development phases. For modelling purposes, these assumptions had to be made, and the indicative results should be viewed in this context.

3.3 SCENARIOS

Three development scenarios have been produced utilising this model - with overall dwelling densities of 13, 9 and 5 per developable hectare. **The range of results is 3,500 dwellings or 9,800 persons under the 5 dwellings per hectare scenario to 9,100 dwellings or 25,500 persons under the 13 dwellings per hectare scenario.** The full output for each of the three scenarios is included in Tables 3.1, 3.2 and 3.3 on the following pages. (Some results have been rounded from the normal spreadsheet output in order only to maintain consistency across the various elements of each scenario).

In these tables, the variables are highlighted, and each of the modelled scenarios can be re-run at Council's convenience with alternative figures inserted for these variables. In addition, the model can be re-run by altering the starting dates of development in any of the five precincts by laterally moving the relevant rows in the spreadsheet. As the spreadsheet is automatically recalculated when any changes are made, a wide variety of possible scenarios can be further tested by Council in the future.

The existing population in the release area, as estimated above, has been excluded from this aspect of the model on the basis that it represents a statistically insignificant figure in the context of the three scenarios.

For the purposes of establishing the likely bounds of population potential and the broad indicative age based characteristics of the population, the three scenarios summarised herein were used, as showing a range of development possibilities, in all subsequent analysis in these studies to identify services and facilities requirements.

DEVELOPMENT = **150** DWELLINGS per YEAR per PRECINCT, IF OVERALL AVERAGE YIELD = **13** DWELLINGS PER HECTARE, and

YIELD	RUN OUT	YEARS	CUMULATIVE DWELLINGS
100	100	100	100
90	90	90	90
80	80	80	80
70	70	70	70
60	60	60	60
50	50	50	50
40	40	40	40
30	30	30	30
20	20	20	20
10	10	10	10
0	0	0	0

[illegible]

IF MARGINAL OCCUPANCY RATES = and
AND IF MULTI-UNIT HOUSING =

FOR DETACHED HOUSING
FOR MULTI-UNIT HOUSING
OF NEW STOCK

NEW POPULATION ADDED PER YEAR WILL BE

6 (SINGLE) CUMULATIVE POPULATION WILL =

[illegible]

PERSONS

PERSONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0-2	29	58	118	175	282	385	514	642	803	983	888	974	1,075	1,177	1,278	1,380	1,481	1,570
3-4	18	37	74	110	166	253	338	422	528	633	646	708	782	856	930	1,003	1,077	1,142
5-9	43	87	173	260	380	545	727	908	1,136	1,363	1,650	1,811	1,969	2,188	2,376	2,565	2,754	2,818
10-14	35	70	140	209	314	429	572	715	864	1,073	1,277	1,401	1,547	1,693	1,839	1,985	2,131	2,258
15-19	28	59	118	177	265	384	502	640	813	735	992	1,068	1,201	1,315	1,428	1,541	1,655	1,753
20-24	27	55	110	165	247	362	480	613	735	860	974	1,088	1,201	1,315	1,428	1,541	1,655	1,753
25-29	47	95	189	284	428	622	826	1,032	1,290	1,548	1,415	1,553	1,715	1,878	2,038	2,200	2,362	2,503
30-34	50	101	201	302	453	619	826	1,032	1,290	1,548	1,415	1,553	1,715	1,878	2,038	2,200	2,362	2,503
35-39	37	73	147	220	331	481	637	808	1,000	1,200	1,396	1,532	1,692	1,851	2,011	2,170	2,330	2,489
40-44	25	50	100	151	228	341	468	603	752	902	1,038	1,174	1,310	1,446	1,582	1,718	1,854	1,990
45-49	18	35	71	108	159	238	341	468	603	752	902	1,038	1,174	1,310	1,446	1,582	1,718	1,854
50-54	18	33	66	98	148	215	317	438	585	702	833	914	1,009	1,105	1,200	1,295	1,390	1,473
55-59	12	23	46	69	104	154	228	328	441	541	641	741	841	941	1,041	1,141	1,241	1,341
60-64	11	23	45	68	102	148	222	318	428	528	628	728	828	928	1,028	1,128	1,228	1,328
65-69	9	18	35	53	80	131	175	218	268	318	368	418	468	518	568	618	668	718
70-74	6	12	24	36	54	84	128	181	231	281	331	381	431	481	531	581	631	681
75 +	6	12	25	37	55	86	131	181	231	281	331	381	431	481	531	581	631	681
Total	420	840	1,680	2,520	3,780	5,042	6,723	8,403	10,504	12,805	14,448	16,132	17,812	19,492	21,173	22,853	24,532	25,480

TABLE 3.1

In the Ingleside-Warriewood Urban Release Area,

IF OVERALL AVERAGE YIELD = **9** DWELLINGS PER HECTARE, and
DEVELOPMENT = **150** DWELLINGS per YEAR per PRECINCT,

YIELD	RUN OUT	YEARS =	CUMULATIVE DWELLINGS															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
WARRIEWOOD VAL	1,080	7.2 years	150	300	450	600	750	900	1050	1080	1080	1080	1080	1080	1080	1080	1080	1080
SOUTH INGLESIDE	1,701	11.3 years			150	300	450	600	750	900	1050	1200	1350	1500	1650	1701	1701	1701
NORTH INGLESIDE	1,305	8.7 years					150	300	450	600	750	900	1050	1200	1305	1305	1305	1305
CHILTERN ROAD	1,134	7.6 years						300	450	600	750	900	1050	1200	1305	1305	1305	1305
WIRREANDA	1,080	7.2 years						150	300	450	600	750	900	1050	1134	1134	1134	1134
TOTAL DWELLINGS	6,300	YR TOTAL CUMUL	150	300	600	900	1350	1800	2400	2880	3480	4080	4680	5280	5835	6120	6270	6300
YEARS =			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	THE END
																		16

IF MARGINAL OCCUPANCY RATES = **3.00** FOR DETACHED HOUSING
and **2.00** FOR MULTI-UNIT HOUSING
AND IF MULTI-UNIT HOUSING = **20.00%** OF NEW STOCK

NEW POPULATION ADDED PER YEAR WILL =	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	420	420	840	1,680	2,520	3,780	5,040	6,720	8,064	9,744	11,424	13,104	14,784	16,338	17,136	17,556
& (SIMPLE) CUMULATIVE POPULATION WILL =	420	840	1,680	2,520	3,780	5,040	6,720	8,064	9,744	11,424	13,104	14,784	16,338	17,136	17,556	17,640
																THE END

PERSONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0-2	29	58	116	175	262	365	514	642	745	873	791	893	994	1,063	1,060	1,086
3-4	18	37	74	110	166	253	338	422	490	574	576	649	723	773	771	789
5-9	43	87	173	260	390	545	727	909	1,054	1,236	1,471	1,660	1,848	1,976	1,971	2,018
10-14	35	70	140	209	314	429	572	715	830	973	1,139	1,284	1,430	1,529	1,525	1,562
15-19	29	59	118	177	265	394	532	690	869	1,067	1,284	1,529	1,797	1,841	1,841	1,841
20-24	27	55	110	165	247	365	504	672	840	1,028	1,224	1,440	1,672	1,672	1,672	1,672
25-29	47	95	189	284	426	619	826	1,032	1,197	1,404	1,662	1,944	2,244	2,552	2,864	3,180
30-34	50	101	201	302	453	619	826	1,032	1,197	1,404	1,662	1,944	2,244	2,552	2,864	3,180
35-39	37	73	147	220	331	481	632	804	985	1,166	1,347	1,528	1,709	1,890	2,071	2,252
40-44	25	50	100	151	226	321	434	566	717	888	1,069	1,250	1,431	1,612	1,793	1,974
45-49	18	35	71	106	159	238	334	448	580	731	892	1,053	1,214	1,375	1,536	1,697
50-54	16	33	66	98	148	215	294	386	490	604	728	862	1,006	1,150	1,294	1,438
55-59	12	23	46	69	104	150	201	258	321	388	459	530	601	672	743	814
60-64	11	23	45	68	102	146	197	254	311	368	425	482	539	596	653	710
65-69	9	18	35	53	80	113	151	190	229	268	307	346	385	424	463	502
70-74	6	12	24	36	54	81	108	135	162	189	216	243	270	297	324	351
75+	6	12	25	37	55	83	111	139	167	195	223	251	279	307	335	363
Total	420	840	1,680	2,520	3,780	5,040	6,720	8,064	9,744	11,424	13,104	14,784	16,338	17,136	17,556	17,640

TABLE 3.2

In the Ingleside-Warriewood Urban Release Area,

IF OVERALL AVERAGE YIELD =

DEVELOPMENT =

150 DWELLINGS per YEAR per PRECINCT, 5 DWELLINGS PER HECTARE, and

YIELD	RUN OUT	YEARS =	CUMULATIVE DWELLINGS											
			1	2	3	4	5	6	7	8	9	10	11	12
WARRIWOOD VAL	600	4.0 years	150	300	450	600	600	600	600	600	600	600	600	600
SOUTH INGLESIDE	945	6.3 years			150	300	450	600	750	900	945	945	945	945
NORTH INGLESIDE	725	4.8 years					150	300	450	600	725	725	725	725
CHILTERN ROAD	630	4.2 years						150	300	450	600	630	630	630
WIRREANDA	600	4.0 years							150	300	450	600	600	600

TOTAL DWELLINGS 3,500 YR TOTAL CUMUL

150	300	600	900	1200	1500	1950	2400	2870	3170	3350	3500
1	2	3	4	5	6	7	8	9	10	11	12
THE END											

IF MARGINAL OCCUPANCY RATES = 300 and 200 AND IF MULTI-UNIT HOUSING = 20.00%

FOR DETACHED HOUSING FOR MULTI-UNIT HOUSING OF NEW STOCK

NEW POPULATION ADDED PER YEAR WILL =

& (SIMPLE) CUMULATIVE POPULATION WILL =

420	420	840	840	840	840	1260	1260	1316	840	11	12
1	2	3	4	5	6	7	8	9	10	504	420
420	840	1,680	2,520	3,360	4,200	5,460	6,720	8,036	8,876	9,380	9,800
THE END											

PERSONS

PERSONS		1	2	3	4	5	6	7	8	9	10	11	12
0-2	29	58	116	175	233	321	417	514	642	678	587	592	
3-4	18	37	74	110	147	211	274	338	422	446	427	430	
5-9	43	87	173	260	346	454	591	727	909	960	1,091	1,100	
10-14	35	70	140	209	279	358	465	572	715	756	844	851	
15-19	29	59	118	177	235	245	319	392	490	518	655	661	
20-24	27	55	110	165	220	171	222	274	342	361	406	410	
25-29	47	95	189	284	379	352	458	563	704	744	489	493	
30-34	50	101	201	302	402	516	671	826	1,032	1,091	936	944	
35-39	37	73	147	220	294	516	671	826	1,032	1,091	1,086	1,096	
40-44	25	50	100	151	201	234	304	374	468	494	923	931	
45-49	18	35	71	108	141	104	135	166	208	219	307	309	
50-54	16	33	66	98	131	87	113	139	174	184	173	175	
55-59	12	23	46	69	92	63	82	101	126	133	146	147	
60-64	11	23	45	68	90	109	142	175	218	231	379	382	
65-69	9	18	35	53	71	113	147	181	227	240	340	343	
70-74	6	12	24	36	48	113	147	181	227	240	379	382	
75+	6	12	25	37	49	113	147	181	227	240	379	382	
Total	420	840	1,680	2,520	3,360	4,200	5,460	6,720	8,036	8,876	9,380	9,800	

The graph at Figure A3.1 summarises the variance in the three scenarios in terms of cumulative dwelling production over the respective development periods.

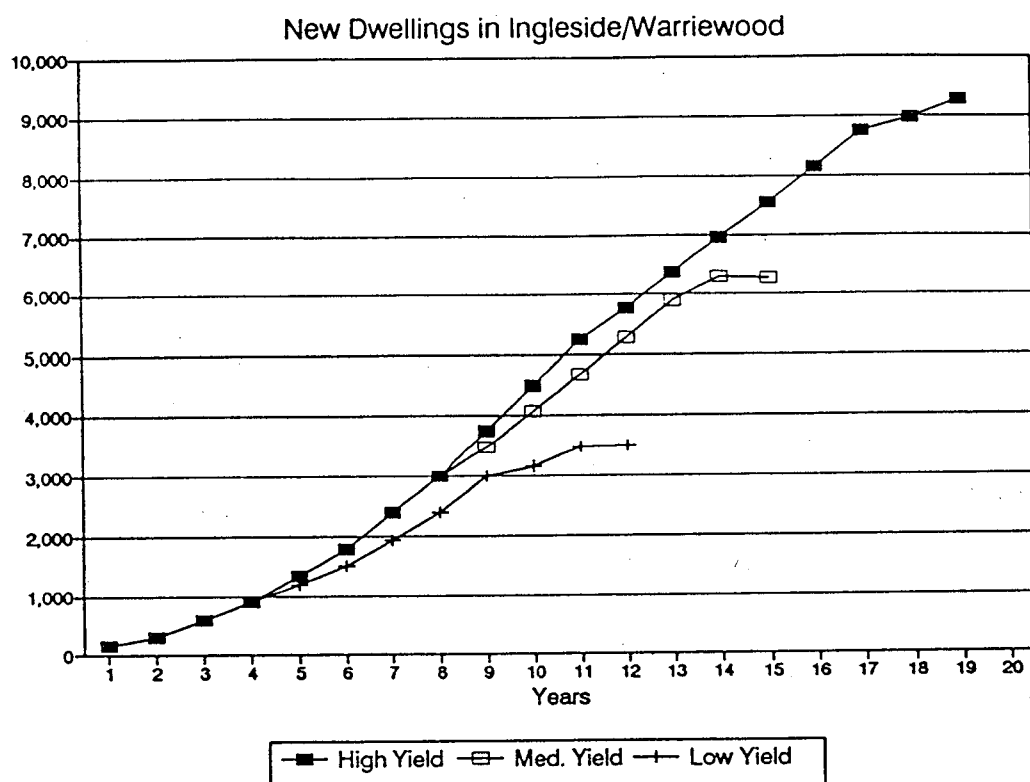


FIGURE A3.1

The graph highlights the significant differences between the highest and lowest scenarios in terms of both the length of development period and the number of dwellings anticipated. The graph also shows that all three scenarios follow approximately the same path for the first five years of release area development, and thereafter only diverge because of the variance in the density assumptions. Careful monitoring by Council and other development authorities during the earliest years of development will enable refined scenarios to be produced, and the implications examined, prior to committing substantial resources to specific release area facilities in accordance with actual population growth.

As a check on the reasonableness of the development and population scenarios summarised in Tables 3.1, 3.2 and 3.3, the Demograph population projection computer program was run, based on existing Ingleside-Warriewood population and expected in-migration (derived from the scenarios) in order to account for variations which might occur in the age breakdown of the resultant population because of natural population increase which is not accounted for in our model.

The detailed results of the Demograph projections for each of the agreed development density scenarios are included in Appendix A3 to this report.

Derived estimates for in-migration in each five year period were inserted in the Demograph program, but the program was allowed to generate its own births in the population (added to the 0-4 age group) and the resulting population compounded in each re-run of the program for each new five year period to 2016 (assuming population growth from 2001 only). The resulting detail population projections by age group are generally within 5% of the estimates generated already, although there are occasional wider differences in the older age groups as a result of the assumption regarding higher in-migration levels in those categories. This variance is considered acceptable and it is recommended that the population projections by age breakdown, summarised in Tables 3.1, 3.2 and 3.3, can reasonably be used in further analysis because they broadly reflect the generated population figures from the Demograph analysis. This latter analysis is only included here as a check on the influence of natural population increases in a new community which is largely and significantly derived from the effects of in-migration throughout the early development phases.

The implications of the scenarios for particular facilities and services are drawn out in the subsequent reports forming part of this overall demographic study of the Ingleside-Warriewood Release Area.

4. THE FUTURE COMMUNITY

The possible size and age composition of the Ingleside-Warriewood community under the agreed development scenarios has been outlined above and summarised in Tables 3.1, 3.2 and 3.3. It is considered that, under any scenario, the release area population will have a significant representation of young families in addition to an above average representation of retired and aged persons. The important differences therefore between the potential population under the three tested scenarios is the actual size of the population.

In addition, whatever the ultimate size of the release area population, we suggest that certain characteristics will be apparent. Some of the more important of these characteristics (in terms of providing background to future planning) are detailed below. Each of these descriptions is based on our analysis of both the existing population in Pittwater and on the observed changes which occur in developing populations in comparable release areas in the Sydney region. Each of these characteristics should be considered as indicative of the future population make-up rather than being a prescription as they can only at this time be based on observations of other areas.

4.1 HOUSEHOLDS

It is considered likely that a low 3% of households will be single parent households, and that a high 25% will be lone person households. The majority of households (up to 65%) are likely to comprise an adult couple with or without dependent children and with or without an additional adult family member. The average household size of the release area population at full development under any scenario is estimated at 2.8 persons.

4.2 INCOME

In line with the expectation that the Ingleside-Warriewood release area will fall within the high-priced housing sub-market, it could be anticipated that up to 30% of households will have household incomes in the highest income bracket, currently \$60,000 and above. This compares with the current rate in the Sydney metropolitan area of 21% of households in such categories. At the same time, significant household expenditure is likely to be applied to housing itself.

4.3 DWELLINGS

In developing the scenarios above, it was assumed that 20% of all new dwellings would be multi-unit housing. It could be further anticipated that this percentage might rise to approximately 25% within the first five years of the development period. Further, the scenarios assume that marginal occupancy rates (the number of people occupying each new dwelling) will be three persons per detached dwelling and two persons per multi-unit house. It can be anticipated that the average household size would be 2.8 persons per dwelling upon full development of the area, but that this figure would vary widely throughout the development period.

4.4 DWELLING TENURE

Having regard to the existing pattern in the Pittwater area, it is anticipated that only 15% of dwellings would be rented in the release area, unless the proportion of multi-unit dwellings is higher than anticipated, in which case this figure could be higher. In the early years of development, perhaps 50% of households would be actively purchasing their dwellings, and 30% having outright ownership thereof. As the development period progresses, these last two percentages are likely to change significantly so that, upon full development of the area, and before newly built dwellings are sold onto second owners, up to 50% of households would own their own dwellings and 30% would still be engaged in purchasing same.

4.5 WORKFORCE

At full development of the release area, the resident workforce is likely to number between 5,000 and 13,000 persons, depending on the scenario which best describes actual development. It is considered likely that a high female participation rate would apply and a significant number of households comprising two or more people would have two adults in the workforce. The release area has the potential to add significantly to Pittwater's existing resident workforce, and it is considered likely that the characteristics of this addition will maintain the character of the workforce currently resident in Pittwater, as detailed earlier. It is also possible that up to 60% of children in two-parent households will have both their parents working.

4.6 ETHNICITY

There are too many variables in operation to allow an accurate prediction of the possible ethnicity of the incoming population. However, given Australia's current migration policies, and observed trends over recent years, it is possible that up to 25% of new residents will be born overseas. It is also considered likely that more than two-thirds of these overseas-born people will come from countries with an English speaking background.

4.7 TRAVEL

Based on existing trends, and without introducing any alternative mass transport options on the northern beaches peninsula, it can be anticipated that car ownership will remain relatively high, with an average of two vehicles per household throughout the fully developed release area. It is also considered likely that up to 70% of journeys to work will involve private cars and that an augmented local bus system would attract only 10% of work journeys. It is considered highly likely that many new initial residents of the release area will travel some distance out of the area to their employment, as they are likely to "bring with them" their existing jobs, although this matter is investigated further in subsequent studies.

4.8 MONITORING THE COMMUNITY

These projected social indicators assist in refining the description of the likely future population and its composition. Of particular importance in utilising such indicators is the requirement to continually monitor the new population of the release area in order to refine expectations based on actual population increase, as the first analysis in this report must of necessity be based on assumptions and on the application of observed trends from other developed areas.

Establishing an effective monitor of the incoming population requires both the interpretation of data which will be collected as a matter of course and the collection of independent information. Available data will include from ABS (principally the Census) and Council's own data. The next Census is not scheduled until mid-1996 and, based on recent experience, the first data on population for small areas may not be available until mid-1997. It is likely that detailed data on households (including such elements as income and household composition) will not be available until some time in 1998. Certainly the next Census, and the following, are the most thorough data sources but their results will be of limited benefit to planning for the Ingleside-Warriewood release area in the early years.

Council will, as a matter of course, collect information on the community which may be of some benefit to this monitoring procedure. Data on the location, type and timing of residential development and dwelling construction will be continuously available from Council's records. Such data will indicate little about the people in the area, but should be regularly drawn together to provide checks on the pace and type of residential development.

In the short term, the only reliable source of data on the new population of the release area will come from specifically commissioned surveys which seek to gauge the size and composition of households. After one or two years of development, any local community centre which may be operating, or any local school, may be able to act as a distribution/collection point for a Council-administered survey of households. Any community workers operating in the area may also be able to assist in survey distribution and collection.

Experience in other Sydney release areas suggests to us that the community is not adverse to being surveyed in this manner if it is for the purpose of establishing up-to-date demand for the full range of human services. If such surveys were undertaken mid-way between the dates of the Census, and if the survey results were matched against Council's development records, an optimum coverage should be achieved, to Council's benefit in its ongoing planning for the developing release area.

5. EMPLOYMENT

The new community of Ingleside-Warriewood will not only generate demand for new services and facilities supportive of the new residential environment, but will also require access to appropriate job opportunities. While we have suggested that many new residents will *"bring their jobs with them"*, continuing to work where they have been and living in Ingleside-Warriewood, there will be increased demand for locally accessible jobs. In addition, the potentially significant increase in the Pittwater population resulting from the development of Ingleside-Warriewood will generate opportunities to increase the local employment prospects for local residents, thereby benefiting the whole of the Pittwater community.

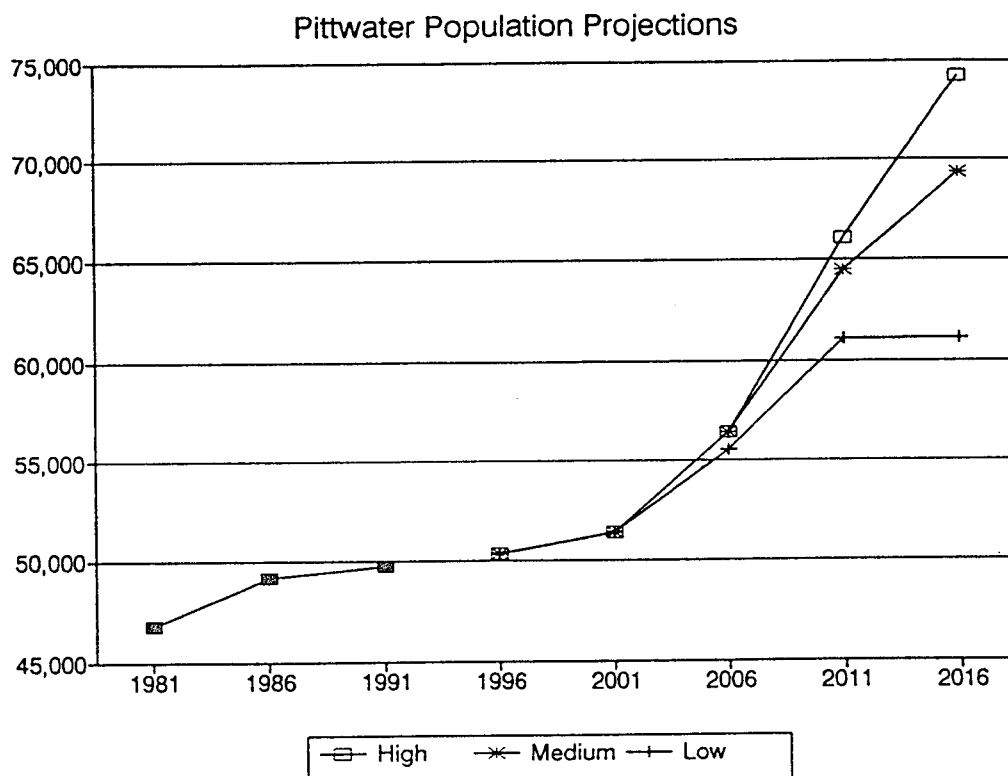
In this context, this chapter examines current regional employment characteristics in terms of workers and in terms of sites available to locate activities, and suggests where opportunities may exist to enhance the access to local jobs for the future population.

5.1 BACKGROUND

In Chapter 2 above, the general characteristics of the existing Pittwater labourforce were outlined. These characteristics include:

- * The combined area of Pittwater and Warringah had a 1991 resident workforce of 85,900, 45% of whom journey to work locations within Pittwater/Warringah;
- * The 1991 resident workforce of the Pittwater local government area was 26,600 of whom 1,500 were unemployed at that time;
- * The total number of jobs available in Pittwater/Warringah in 1991 was 50,100, and 78% of these jobs were taken by residents of the area;
- * The composition of the employed Pittwater labourforce in 1991 was that it had higher than average representation in the construction industry, in wholesale and retail trades, in finance, property, and business services, and in recreation and other personal services;
- * 10.6% of the employed workforce of Pittwater in 1991 was in the manufacturing sector, compared with a Sydney average of 14%, and 2.8% of the workforce was employed in public administration, in comparison with 4.9% in Sydney as a whole.

In Chapter 3 above, the size of the future Ingleside-Warriewood community was estimated at between 9,800 people (under the low scenario) and 25,500 people (under the high scenario). The graph at Figure A5.1 indicates the effect on the overall Pittwater population of the alternative scenarios for Ingleside-Warriewood, and includes an allowance for changes in the existing Pittwater population itself.

**FIGURE A5.1**

The graph illustrates the significant change which is predicted to occur in the rate of growth of the Pittwater population because of the development of Ingleside-Warriewood. When it is also considered that, under the high development scenario, it is possible that some 13,000 people will be added to the resident Pittwater workforce, the potential impact of this new development becomes even more significant.

The present strong local resident commitment to locally-based jobs might only be sustained in the future if opportunities are taken, at the same time as planning for the release area, to maintain the availability of local jobs within the highly competitive environment of metropolitan Sydney.

5.2 REGIONAL EMPLOYMENT

The detailed data from the 1991 Census in relation to journeys to work shows that the following local government areas were the top five in terms of the percentage of their resident workforce working within their home local government area:

Gosford	54.2%
Wyang	50.4%
Hawkesbury	46.5%
Pittwater/Warringah	45.5%
Blue Mountains	40.1%

The same data indicates that in 1991, the top five local government areas in Sydney in terms of the percentage of the local government workforce which was derived from that local government area were:

Blue Mountains	90.6%
Gosford	78.7%
Pittwater/Warringah	78.0%
Sutherland	75.7%
Wyang	75.6%

Considering the locations of all of these local government areas, the high degree of "self-containment" in terms of employment may have arisen historically because of their degree of relative "separateness" from the remainder of the metropolitan area and because of the associated difficulties in maintaining effective travel links with other areas where jobs may have been otherwise available.

Some even more detailed data is quoted in the allied Traffic Study and shows that 80% of all daily person trips generated within the Pittwater/Warringah area have destinations within the area. However, an even higher 89% of all daily person trips from within the Pittwater local government area had destinations within the Pittwater/Warringah area. This data is derived from the 1991 Home Interview Survey, the results of which have been collated by the Transport Study Group. While the Home Interview Survey recorded journeys for all purposes, not only work-related journeys, this data serves to reinforce our earlier observations, as journeys to work represent a significant proportion of all household journeys.

The graphs at Figure A5.2 and Figure A5.3 have been derived from the 1991 Census Journey to Work data for local government areas.

The first graph on Figure A5.2 shows the variations across the metropolitan area in the number of resident workers per local job in each local government area (Pittwater/Warringah is indicated by the initials WA). In 1991 the Pittwater/Warringah area had a relatively high relationship of resident workers to jobs, with the figure for both males and females being approximately 1.7 resident workers for each local job. As the graph indicates, many Sydney local government areas exhibited ratios which were well above this figure.

The second graph on Figure A5.2 shows, also for each local government area, the number of jobs per resident worker, and indicates that Pittwater/ Warringah (WA) had one of the lowest ratios in this respect, being 0.5 jobs for each resident worker. Most of the other Sydney local government areas were well above this figure.

The graphs at Figure A5.3 show the journeys to work from and to regions within the Sydney metropolitan area, including the Manly-Warringah region which is comprised of Manly, Warringah and Pittwater. The first graph at Figure A5.3 shows the regions to which Manly-Warringah residents journeyed for work purposes. The overwhelming number of journeys were undertaken within the Manly-Warringah region itself, with significant numbers going to adjoining regions of Hornsby/Ku-ring-gai and Lower Northern Sydney. The only other region to attract substantial numbers of Manly-Warringah workers was the Inner Sydney region.

The second graph at Figure A5.3 shows the number of work journeys into the Manly-Warringah region in 1991 and indicates that, apart from some significant journeys from the adjoining Hornsby/Ku-ring-gai and Lower Northern Sydney regions, the greatest number of work related journeys into the region came from within the region itself.

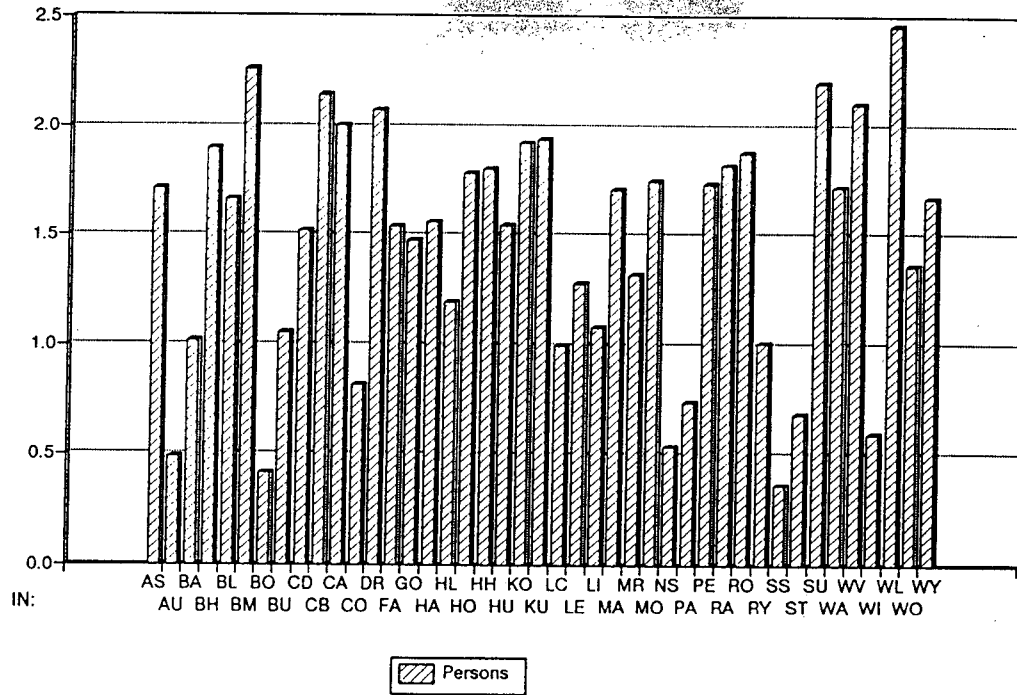
The existing pattern of regional employment therefore exhibits a high degree of self-containment. Given that some detailed results from the 1991 Census are not available for the Pittwater local government area itself (as the area was not created until after the Census) the indications from available data are that an above-average proportion of Pittwater residents travelled relatively short distances on the northern beaches peninsula to access their work places. Given that it is possible a significant number of new Ingleside-Warriewood residents might already hold jobs in locations within the region (and seek to relocate their residences closer to their jobs), it is considered likely that this pattern will continue in the future. On the other hand, it is also likely that there will be considerable demand from future Ingleside-Warriewood residents (who currently work outside the northern beaches region) for "new" jobs within the region, given the relatively long distances between the Pittwater area and other Sydney regions which have historically provided a proportion of jobs for local residents.

5.3 EMPLOYMENT LAND

As most jobs are located away from the home, there is always a demand for land by enterprises which provide employment. The location of such can take a number of forms, including:

- * industrial or "employment" areas, ranging from traditional manufacturing areas to high-tech business parks;
- * commercial centres, often allied to retail centres, containing offices of private and government business enterprises and services providers;

1991 Journey to Work Data:
Resident Workers per Job



BOTANY BO
LEICHHARDT LE
MARRICKVILLE MR
SOUTH SYDNEY SS
SYDNEY - INNER SI
SYDNEY - REMAIN SR
RANDWICK RA
WAVERLEY WV
WOOLLAHRA WO
HURSTVILLE HU
KOGARAH KO
ROCKDALE RO
SUTHERLAND SU
BANKSTOWN BA
CANTERBURY CA
FAIRFIELD FA
LIVERPOOL LI
CAMDEN CO
CAMPBELLTOWN CB
WOLLONDILLY WL
ASHFIELD AS
BURWOOD BU
CONCORD CO
DRUMMOYNE DR
STRATHFIELD ST
AUBURN AU
HOLROYD HL
PARRAMATTA PA
BLUE MOUNTAINS BM
HAWKESBURY HA
PENRITH PE
BAULKHAM HILLS BH
BLACKTOWN BL
HUNTERS HILL HH
LANE COVE LC
MOSMAN MO
NORTH SYDNEY NS
RYDE RY
WILLOUGHBY WI
HORNSBY HO
KU-RING-GAI KU
MANLY MA
WARRINGAH WA
GOSFORD GO
WYONG WY

1991 Journey to Work Data:
Jobs per Resident Worker

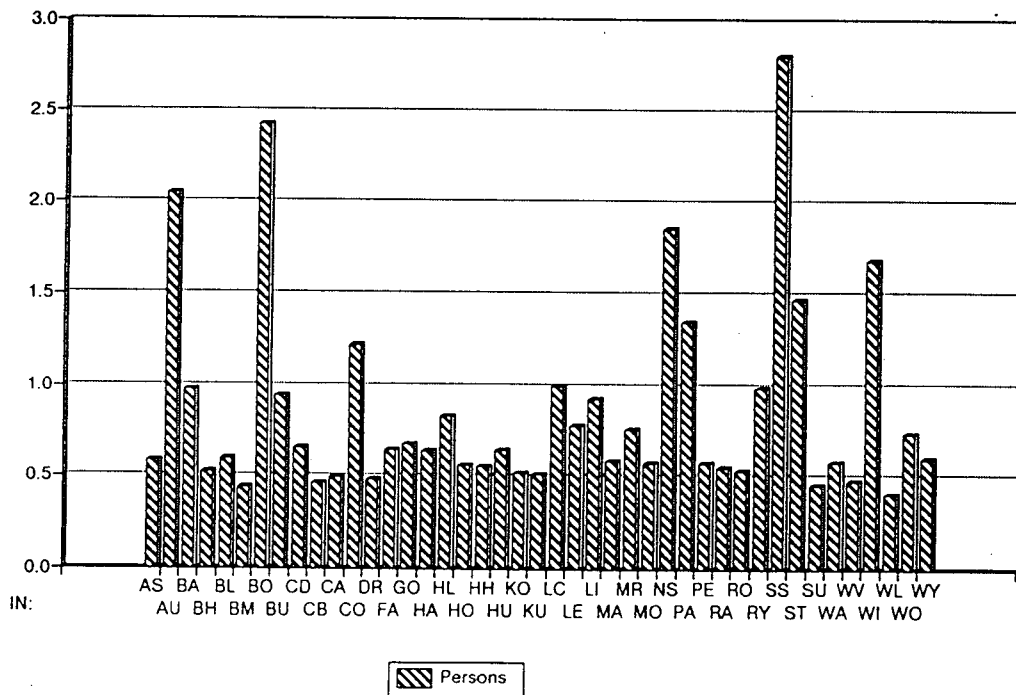
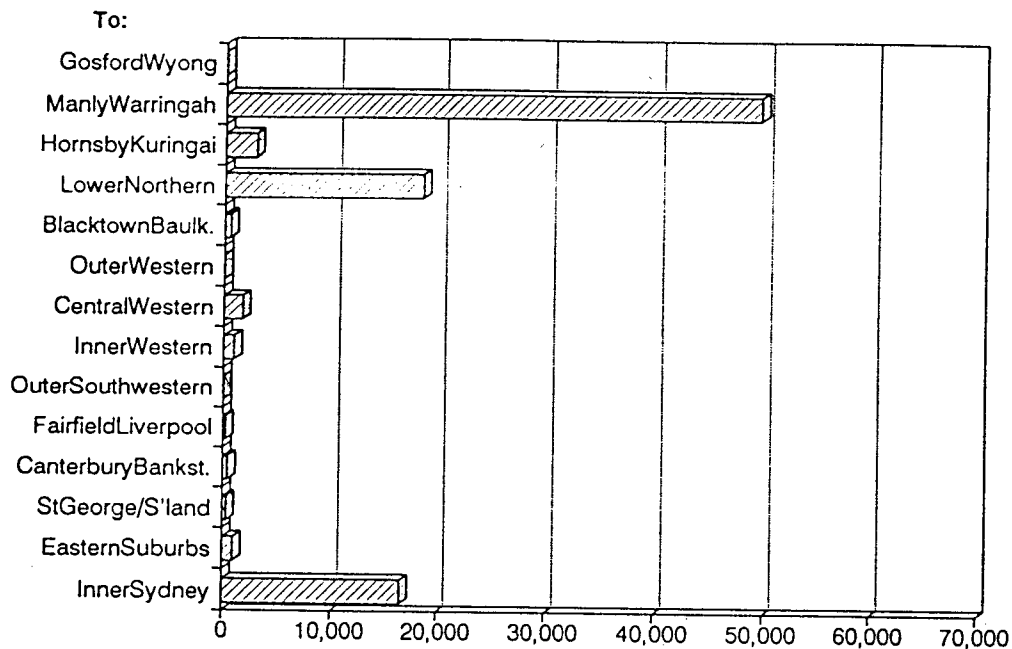


FIGURE A5.2

1991 Journey to Work from ManlyWarringah



1991 Journey to Work in ManlyWarringah

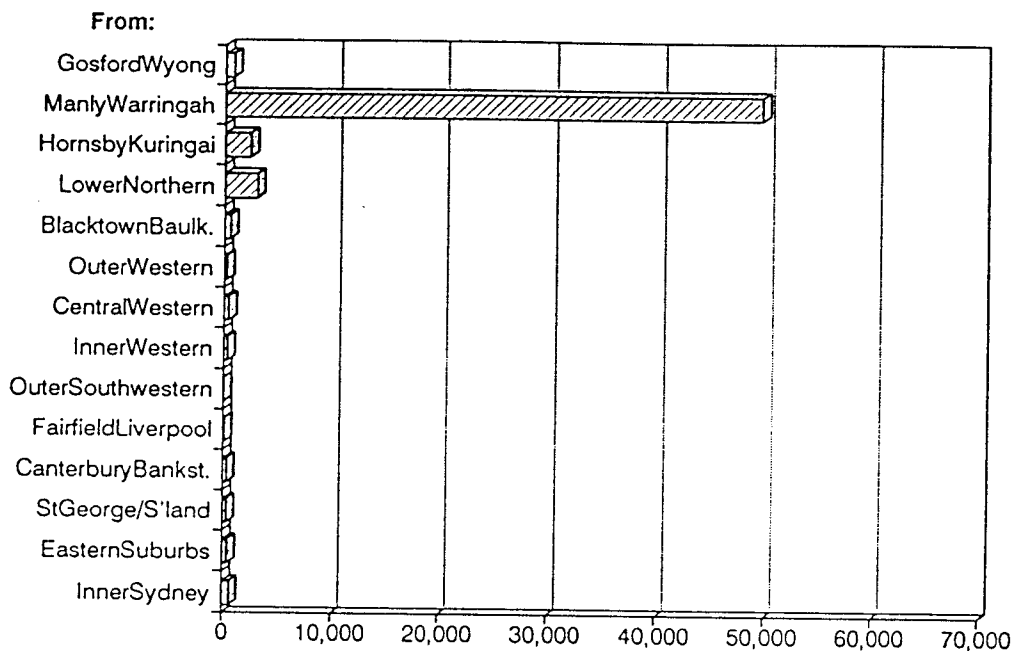


FIGURE A5.3

- * retail centres, generating jobs in shops and allied services, and in the whole range of support facilities (transport, communication and provisioning) which are generated by this activity;
- * community facilities, which are generally more dispersed throughout the community, including schools, hospitals, emergency services and a whole range of facilities generally described as "human services".

In recent years, there has been increasing attention to the planning for, and availability of, employment land, principally in industrial areas at the metropolitan level. The Department of Planning now administers an Employment Lands Development Program which, like the Urban Development Program seeks to monitor and plan for the provision of appropriate land for particular purposes. This program is directed only at the industrial or "employment" areas, that is lands which are generally zoned Industrial. The rationale being followed appears to be that positive planning should encourage the maintenance of employment lands of this type, given that jobs in retail and commercial centres, administration and community services generally result as a response to direct demand from population increases.

Therefore, whilst industrial lands might only have the potential to support a percentage of all jobs, their maintenance and expansion in a pro-active manner is seen as important in the context that demand for industrial-type enterprises does not generally of itself produce industrial facilities in the same way that retail or commercial facilities are often produced, without there being some planning to reserve sites and make them available for development.

Zoned industrial land in the northern beaches area is not extensive - there is approximately 10 hectares in Manly, 60 hectares in Pittwater and 280 hectares in Warringah, compared with a total of 13,600 hectares throughout the whole of the Sydney metropolitan area. Of this total, there is no vacant undeveloped industrial land in Manly, only 23 hectares in Pittwater, and 50 hectares in Warringah.

The vacant industrial land in Pittwater is all located in the Warriewood area, in two small industrial areas adjacent to the Ingleside-Warriewood urban release area. All 50 hectares of the vacant land in Warringah are in the Austlink Business Park at the intersection of Mona Vale Road and Forest Way. The rate at which industrial land in Pittwater and Warringah has been taken up since 1987 has steadily declined on a yearly basis, with the average demand per year between 1987 and 1992 being only 4.5 hectares. On this basis, the combined vacant available industrial land in Pittwater and Warringah would satisfy demand for approximately 16 years. If the commercial centre now proposed for the Austlink Business Park proceeds, some part of the currently available industrial land in that location will be alienated, however the opportunity would exist to create some new jobs in the commercial development itself.

In terms of Pittwater, with only 23 hectares of vacant industrial land available in Warriewood, the present average take-up rate would suggest this local supply could be exhausted within five years.

As an indication of the potential of zoned Industrial land to support employment, the Austlink Business Park was projected to provide 6,000 jobs when it was established. Based on the present pattern of development in the Business Park, the proponents of the commercial centre for that site now estimate that the ultimate development of the park might support only 4,000 jobs, representing approximately 76 workers per site hectare. Indications from a 1991 study by JLW Research and Consultancy for the Department of Planning into employment densities in Sydney commercial and industrial areas, are that the employee density in multi-unit industrial estates can be as low as 60 employees per gross hectare.

On this basis, the 23 hectares of vacant industrial land in Warriewood might be capable of supporting an additional 1,300 employees.

If the vacant industrial land in Warriewood is taken together with that at Austlink in Warringah, we consider that a total of 4,000 new jobs would be available upon full development of all available sites. Not all of these jobs would necessarily be available to a locally resident workforce (such as that in Ingleside-Warriewood) because workers with particular skills may have to be attracted from other areas.

Ultimately, the extent to which local residents could take advantage of these potential new jobs is conditioned less by the characteristics of the workforce than by the (as yet unrealised) development intentions of employers who need to be attracted to locate in these available areas.

5.4 POSSIBLE DEMANDS

It should be recognised that there is limited scope to increase the supply of employment lands in the established urban areas within Sydney. The greatest potential in general arises from the periodic availability of surplus public and institutional land.

The opportunity therefore exists in Warriewood to augment the supply of employment land in a rational manner, building on the reserve which currently exists in the Warriewood industrial area.

We have reviewed the operation of the market for the kind of employment land found in the Warriewood industrial area in recent years and conclude that the majority of dealings in such land have related to relatively small parcels capable of supporting individual developments. We also note that there is a general scarcity of industrial-type land in the northern part of the northern beaches peninsula capable of supporting increased commercial activity and service industry.

Whilst it is impossible to project the future take-up rate of the currently vacant 23 hectares of industrial land in Warriewood, we suggest it might be prudent to reserve some additional land within the Ingleside-Warriewood release area for small scale industrial purposes. Considering the existing land use patterns and likely servicing requirements, additional land is best reserved adjoining the existing Warriewood industrial area.

Whilst the ultimate effectiveness of the industrial land market in the area is dependent on land owners, it is recommended that Council consider reserving an additional 10 hectares of release area land adjoining the Warriewood industrial area for future expansion of that industrial zone.

Increasing the "buffer stock" of employment land in this locality to such an extent appears unlikely to significantly impact on the operation of the land market, whilst at the same time should provide for the potential take-up by small scale enterprises and associated commercial operations well into the future.

Clearly, as in other aspects of planning for the Ingleside-Warriewood release area, we recommend that Council monitor carefully the development of such industrial/employment land in order to provide continuing justification for its expansion in the manner we suggest.



APPENDIX A1

COMPARISON ANALYSIS



COMPARISON ANALYSIS developed by Hirst Consulting Services,
based on Census Applications Small Area System

AREA: **IngleSide/Warriewood**

DEMOGRAPHIC SUMMARY	1981	1986	1991	Change 1981-91	Sydney Change 1981-91
Males	678	756	877	29.35%	10.63%
Females	666	738	913	37.09%	10.20%
Persons	1,344	1,494	1,790	33.18%	10.41%
Aboriginal, TSI	0	4	0		123.80%
Aboriginal, TSI % of pop'n	0.00%	0.00%	0.00%		
Overseas Born	304	330	431	41.78%	28.33%
Overseas Born % of pop'n	22.62%	22.09%	24.08%		
Age 0-14	367	369	380	3.54%	-1.05%
Age 15-64	916	988	1,136	24.02%	12.44%
Age 65+	62	138	276	345.16%	23.98%
Age 0-14 % of pop'n	27.29%	24.72%	21.21%		
Age 15-64 % of pop'n	68.10%	66.04%	63.39%		
Age 65+ % of pop'n	4.61%	9.24%	15.40%		

BIRTHPLACE - Selected Countries

	1981	1986	1991		
Persons					
Australia	1,027	1,144	1,316	28.14%	1.93%
UK & Ireland	130	148	209	60.77%	-8.61%
New Zealand	17	28	28	64.71%	22.16%
South Africa	n/av	3	7	n/av	n/av
USA	3	4	12	300.00%	56.88%
China	2	n/av	6	200.00%	220.18%
Germany	11	10	11	0.00%	-9.17%
Greece	6	4	8	33.33%	-6.82%
India	1	1	2	100.00%	75.90%
Italy	29	30	25	-13.79%	-8.72%
Lebanon	0	0	3		38.96%
Malaysia	1	1	2	100.00%	118.37%
Malta	0	0	0		-8.73%
Netherlands	18	14	22	22.22%	-13.23%
Poland	0	1	4	15.01%	
USSR	2	n/av	2	0.00%	42.15%
Vietnam	2	1	0	-100.00%	209.99%
Yugoslavia	53	45	43	-18.87%	5.76%

Birthplace of parents of Australian born

	1981	1986	1991		
Both Parents Australia	695	788	897	29.06%	-0.99%
1 parent Aust, 1 parent OS	187	203	248	32.62%	1.61%
Both parents OS	134	152	166	23.88%	24.59%
Not Stated	10	10	10		
Total Australian born	1,026	1,153	1,321	28.75%	1.93%

BROAD AGE STRUCTURE

Persons	1981	1986	1991	Change 1981-91	Sydney Change 1981-91
0-4	106	112	122	15.09%	9.18%
5-9	133	125	129	-3.01%	-6.49%
10-14	128	132	129	0.78%	-4.71%
15-19	131	129	129	-1.53%	3.58%
20-24	88	111	115	30.68%	6.83%
25-29	87	89	120	37.93%	13.41%
30-34	126	121	113	-10.32%	10.11%
35-39	120	121	135	15.83%	20.89%
40-44	108	105	145	34.26%	43.96%
45-49	74	106	127	71.62%	32.67%
50-54	61	71	116	90.16%	1.26%
55-59	74	88	84	13.51%	-12.93%
60-64	47	64	68	44.68%	7.69%
65+	62	138	276	345.16%	23.98%
Total	1,345	1,493	1,792	33.23%	10.43%

(COMPARE: WC1, BA4 BQ91)

FAMILIES BY TYPE	1981	1986	1991	Change 1981-91	Sydney Change 1981-91
1. Numbers					
Parent & dep child(ren)	15	21	19	26.67%	2.05%
Couple	80	99	135	68.75%	8.82%
Couple & dep child(ren)	154	160	170	10.39%	5.53%
Related adults	15	19	23	53.33%	9.55%
Parent, child(ren), AFM	9	11	13	44.44%	30.56%
Couple, AFM	42	52	57	25.71%	19.88%
Couple, child(ren), AFM	35	37	44	25.71%	9.09%
	350	399	461	31.71%	8.72%

2. Per cent of total	1981	1986	1991		
Parent & dep child(ren)	4.29%	5.26%	4.12%		
Couple	22.86%	24.81%	29.28%		
Couple & dep child(ren)	44.00%	40.10%	36.88%		
Related adults	4.29%	4.76%	4.99%		
Parent, child(ren), AFM	2.57%	2.76%	2.82%		
Couple, AFM	12.00%	13.03%	12.36%		
Couple, child(ren), AFM	10.00%	9.27%	9.54%		

STRUCTURE OF DWELLINGS

	1981	1986	1991		
Numbers of Households					
Separate house	395	417	516	30.63%	14.99%
Semi-detached, row/terrace	2	4	53	2550.00%	76.43%
Flats 1-3 storeys	4	15	2	-50.00%	-15.48%
Flats over 3 storeys	0	0	0	0.00%	82.50%
Caravan etc in park	n/av	0	0	n/av	n/av
Other caravan etc	4	6	7	75.00%	-34.27%
Improvised home/campers	3	2	2	-33.33%	-61.23%
Hse/flat attach shop/office	1	2	2	100.00%	-29.57%
Not Stated	3	16	4	33.33%	-38.91%
Total	412	462	586	42.23%	14.52%

NATURE OF OCCUPANCY

Households: each group as % of total	1981	1986	1991		
Owned	32.77%	33.39%	49.74%		
Being purchased	46.60%	36.58%	22.91%		
Rented: Govt	0.00%	0.00%	0.68%		
Rented: Other & N/S	14.56%	16.88%	17.95%		
Other & N/S	6.07%	7.14%	8.72%		
Total	100.00%	100.00%	100.00%		
Occupancy Ratios (ie persons per dwelling)					
Owned	2.93	2.88	2.79	-4.76%	1.30%
Being purchased	3.66	3.76	3.57	-2.37%	-2.32%
Rented: Govt	0.00	0.00	2.00		-12.31%
Rented: Other & N/S	2.85	2.60	2.78	-2.42%	0.12%
Other & N/S	2.52	2.94	2.53	0.37%	6.21%
Total	3.24	3.17	2.94	-9.07%	-3.09%

HOUSEHOLD SIZE

Persons in Households	1981	1986	1991		
1 or 2	146	182	263	80.14%	13.57%
3 or 4	187	193	218	15.51%	11.71%
5 or more	78	87	98	25.64%	-0.70%
Total households	411	462	577	40.39%	10.67%
Average household size	3.53	3.45	3.27	-7.37%	-2.53%

NUMBER OF MOTOR VEHICLE

Households with the following no. of vehicles:	1981	1986	1991		
None	18	22	44	144.44%	3.79%
1	125	138	180	44.00%	7.55%
2	184	207	221	20.11%	26.13%
3 or more	74	87	119	60.81%	44.64%
Not Stated	9	10	14	55.56%	13.84%
Total households	410	464	578	40.39%	14.55%
Average	1.92	1.94	1.9	-1.04%	8.00%

AREA: **Pittwater Council**

DEMOGRAPHIC SUMMARY	1981	1986	1991	Change 1981-91	Sydney Change 1981-91
Males	23,131	24,350	24,581	6.27%	10.63%
Females	23,851	24,830	25,166	6.41%	10.20%
Persons	46,782	49,180	49,747	6.34%	10.41%
Aboriginal, TSI	42	74	103	145.24%	123.80%
Aboriginal, TSI % of pop'n	0.09%	0.15%	0.21%		
Overseas Born	10,664	10,911	11,258	5.57%	28.33%
Overseas Born % of pop'n	22.80%	22.19%	22.63%		
Age 0-14	11,439	10,804	9,925	-13.24%	-1.05%
Age 15-64	30,346	32,676	33,512	10.43%	12.44%
Age 65+	4,999	5,733	6,298	27.00%	23.88%
Age 0-14 % of pop'n	24.47%	21.95%	19.96%		
Age 15-64 % of pop'n	64.92%	66.40%	67.38%		
Age 65+ % of pop'n	10.61%	11.65%	12.66%		

FAMILIES BY TYPE	1981	1986	1991	Change 1981-91	Sydney Change 1981-91
1. Numbers					
Parent & dep child(ren)	902	733	738	-18.18%	2.05%
Couple	3,806	4,369	4,307	13.16%	8.82%
Couple & dep child(ren)	4,756	4,939	4,614	-2.99%	5.53%
Related adults	677	858	809	19.50%	9.55%
Parent, child(ren), AFM	204	221	221	8.33%	30.56%
Couple, AFM	1,192	1,547	1,567	31.46%	18.88%
Couple, child(ren), AFM	1,003	1,170	1,056	5.28%	9.09%
2. Per cent of total					
Parent & dep child(ren)	7.19%	5.30%	5.54%		
Couple	30.35%	31.57%	32.35%		
Couple & dep child(ren)	37.93%	35.69%	34.66%		
Related adults	5.40%	8.20%	6.08%		
Parent, child(ren), AFM	1.63%	1.60%	1.66%		
Couple, AFM	9.51%	11.18%	11.77%		
Couple, child(ren), AFM	8.00%	8.46%	7.93%		

BIRTHPLACE - Selected Countries

	1981	1986	1991		
Persons					
Australia	35,471	37,410	37,355	5.31%	1.93%
UK & Ireland	5,534	5,161	5,252	-5.10%	-8.61%
New Zealand	988	1,068	1,143	28.72%	22.16%
South Africa	n/av	164	227	n/av	n/av
USA	302	368	424	40.40%	56.88%
China	63	n/av	119	88.89%	220.18%
Germany	389	463	442	13.62%	-9.17%
Greece	54	52	70	29.63%	-6.82%
India	51	74	86	29.41%	75.90%
Italy	295	303	311	5.42%	-8.72%
Lebanon	14	20	21	50.00%	38.98%
Malaysia	59	76	72	22.03%	118.37%
Malta	30	28	21	-30.00%	-8.73%
Netherlands	586	573	511	-12.80%	-13.23%
Poland	49	37	47	-4.08%	15.01%
USSR	36	n/av	67	86.11%	42.15%
Vietnam	33	27	22	-33.33%	209.99%
Yugoslavia	651	593	617	-5.22%	5.78%

Birthplace of parents of Australian born

	1981	1986	1991		
Both Parents Australia	24,813	26,602	26,245	5.77%	-0.99%
1 parent Aust, 1 parent OS	6,865	6,771	7,180	4.59%	1.61%
Both parents OS	3,400	3,601	3,672	8.00%	24.59%
Not Stated	400	450	287		
Total Australian born	35,478	37,424	37,384	5.37%	1.93%

BROAD AGE STRUCTURE

Persons	1981	1986	1991	Change 1981-91	Sydney Change 1981-91
0-4	3,386	3,400	3,300	-2.54%	9.18%
5-9	4,044	3,496	3,271	-19.11%	-6.49%
10-14	4,009	3,908	3,354	-16.34%	-4.71%
15-19	3,617	4,013	3,813	5.42%	3.58%
20-24	3,195	3,319	3,475	8.76%	6.83%
25-29	3,431	3,484	3,969	11.81%	13.41%
30-34	4,083	4,102	3,831	-6.40%	10.11%
35-39	3,903	4,102	4,050	4.79%	20.89%
40-44	3,035	3,426	4,214	37.49%	43.96%
45-49	2,432	3,426	3,773	57.09%	32.67%
50-54	2,388	3,341	3,801	60.13%	1.28%
55-59	2,288	2,353	2,093	-9.07%	-12.63%
60-64	1,983	2,112	2,040	2.87%	7.69%
65+	4,959	5,733	6,298	27.00%	23.98%
Total	46,744	49,213	49,735	6.40%	10.43%

(COMPARE: WC1, BA4, BC9:)

STRUCTURE OF DWELLINGS

	1981	1986	1991		
Numbers of Households					
Separate house	13,692	14,285	14,817	8.22%	14.99%
Semi-detached, row/terrace	74	84	658	789.19%	76.43%
Flats 1-3 storeys	1,648	1,891	1,418	-13.96%	-15.48%
Flats over 3 storeys	27	92	328	1114.81%	82.50%
Caravan etc in park	n/av	127	124	n/av	n/av
Other caravan etc	24	40	31	29.17%	-34.27%
Improvised home/campers	11	10	9	-18.18%	-61.23%
Hse/flat attach shop/office	80	103	96	20.00%	-29.57%
Not Stated	245	416	158	-35.51%	-38.91%
Total	15,801	17,048	17,639	11.63%	14.52%

NATURE OF OCCUPANCY

Households: each group as % of total					
Owned	30.71%	38.02%	43.74%		
Being purchased	45.96%	37.38%	29.14%		
Rented: Govt	0.04%	0.22%	0.29%		
Rented: Other & N/S	16.63%	18.79%	19.56%		
Other & N/S	6.66%	5.60%	7.28%		
Total	100.00%	100.00%	100.00%		
Occupancy Ratios (ie persons per dwelling)					
Owned	2.46	2.55	2.60	5.75%	1.30%
Being purchased	3.43	3.36	3.31	-3.34%	-2.32%
Rented: Govt	2.17	3.22	3.08	42.15%	-12.31%
Rented: Other & N/S	2.58	2.51	2.48	-3.93%	0.12%
Other & N/S	2.17	2.45	2.31	6.23%	6.21%
Total	2.90	2.84	2.76	-4.86%	-3.09%

HOUSEHOLD SIZE

Persons in Households	1981	1986	1991		
1 or 2	7,531	8,349	8,532	13.29%	13.57%
3 or 4	6,073	6,551	6,480	6.70%	11.71%
5 or more	2,199	2,149	2,031	-7.64%	-0.70%
Total households	15,803	17,049	17,043	7.85%	10.67%
Average household size	3.12	3.05	3	-3.85%	-2.53%

NUMBER OF MOTOR VEHICLE

Households with the following no. of vehicles	1981	1986	1991		
None	1,311	1,299	1,308	-0.23%	3.79%
1	6,166	6,393	6,294	2.08%	7.55%
2	5,939	6,745	6,901	16.20%	26.13%
3 or more	1,776	2,094	2,565	44.43%	44.64%
Not Stated	605	538	537	-11.24%	13.84%
Total households	15,797	17,069	17,605	11.45%	14.55%
Average	1.59	1.66	1.72	8.18%	8.00%

APPENDIX A2

SUMMARY TABLE



	1981	1986	1991	1996	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Persons	46782	49180	49747	50551	51181	51811	52441	53071	53701	54331	54961	55591	56221	56851	57481	58111	58741	59371	60001	60631	61261	61891	62521	63151	63781	64411	65041	65671	66301	66931	67561	68191	68821	69451	70081	70711	71341	71971	72601	73231	73861	74491	75121	75751	76381	77011	77641	78271	78901	79531	80161	80791	81421	82051	82681	83311	83941	84571	85201	85831	86461	87091	87721	88351	88981	89611	90241	90871	91501	92131	92761	93391	94021	94651	95281	95911	96541	97171	97801	98431	99061	99691	100321	100951	101581	102211	102841	103471	104101	104731	105361	105991	106621	107251	107881	108511	109141	109771	110401	111031	111661	112291	112921	113551	114181	114811	115441	116071	116701	117331	117961	118591	119221	119851	120481	121111	121741	122371	123001	123631	124261	124891	125521	126151	126781	127411	128041	128671	129301	129931	130561	131191	131821	132451	133081	133711	134341	134971	135601	136231	136861	137491	138121	138751	139381	139991	140621	141251	141881	142511	143141	143771	144401	145031	145661	146291	146921	147551	148181	148811	149441	150071	150701	151331	151961	152591	153221	153851	154481	155111	155741	156371	157001	157631	158261	158891	159521	160151	160781	161411	162041	162671	163301	163931	164561	165191	165821	166451	167081	167711	168341	168971	169601	170231	170861	171491	172121	172751	173381	174011	174641	175271	175901	176531	177161	177791	178421	179051	179681	180311	180941	181571	182201	182831	183461	184091	184721	185351	185981	186611	187241	187871	188501	189131	189761	190391	191021	191651	192281	192911	193541	194171	194801	195431	196061	196691	197321	197951	198581	199211	199841	200471	201101	201731	202361	202991	203621	204251	204881	205511	206141	206771	207401	208031	208661	209291	209921	210551	211181	211811	212441	213071	213701	214331	214961	215591	216221	216851	217481	218111	218741	219371	220001	220631	221261	221891	222521	223151	223781	224411	225041	225671	226301	226931	227561	228191	228821	229451	230081	230711	231341	231971	232601	233231	233861	234491	235121	235751	236381	237011	237641	238271	238901	239531	240161	240791	241421	242051	242681	243311	243941	244571	245201	245831	246461	247091	247721	248351	248981	249611	250241	250871	251501	252131	252761	253391	254021	254651	255281	255911	256541	257171	257801	258431	259061	259691	260321	260951	261581	262211	262841	263471	264101	264731	265361	265991	266621	267251	267881	268511	269141	269771	270401	271031	271661	272291	272921	273551	274181	274811	275441	276071	276701	277331	277961	278591	279221	279851	280481	281111	281741	282371	283001	283631	284261	284891	285521	286151	286781	287411	288041	288671	289301	289931	290561	291191	291821	292451	293081	293711	294341	294971	295601	296231	296861	297491	298121	298751	299381	300011	300641	301271	301901	302531	303161	303791	304421	305051	305681	306311	306941	307571	308201	308831	309461	310091	310721	311351	311981	312611	313241	313871	314501	315131	315761	316391	317021	317651	318281	318911	319541	320171	320801	321431	322061	322691	323321	323951	324581	325211	325841	326471	327101	327731	328361	328991	329621	330251	330881	331511	332141	332771	333401	334031	334661	335291	335921	336551	337181	337811	338441	339071	339701	340331	340961	341591	342221	342851	343481	344111	344741	345371	346001	346631	347261	347891	348521	349151	349781	350411	351041	351671	352301	352931	353561	354191	354821	355451	356081	356711	357341	357971	358601	359231	359861	360491	361121	361751	362381	363011	363641	364271	364901	365531	366161	366791	367421	368051	368681	369311	369941	370571	371201	371831	372461	373091	373721	374351	374981	375611	376241	376871	377501	378131	378761	379391	380021	380651	381281	381911	382541	383171	383801	384431	385061	385691	386321	386951	387581	388211	388841	389471	390101	390731	391361	391991	392621	393251	393881	394511	395141	395771	396401	397031	397661	398291	398921	399551	400181	400811	401441	402071	402701	403331	403961	404591	405221	405851	406481	407111	407741	408371	409001	409631	410261	410891	411521	412151	412781	413411	414041	414671	415301	415931	416561	417191	417821	418451	419081	419711	420341	420971	421601	422231	422861	423491	424121	424751	425381	426011	426641	427271	427901	428531	429161	429791	430421	431051	431681	432311	432941	433571	434201	434831	435461	436091	436721	437351	437981	438611	439241	439871	440501	441131	441761	442391	443021	443651	444281	444911	445541	446171	446801	447431	448061	448691	449321	449951	450581	451211	451841	452471	453101	453731	454361	454991	455621	456251	456881	457511	458141	458771	459401	460031	460661	461291	461921	462551	463181	463811	464441	465071	465701	466331	466961	467591	468221	468851	469481	470111	470741	471371	472001	472631	473261	473891	474521	475151	475781	476411	477041	477671	478301	478931	479561	480191	480821	481451	482081	482711	483341	483971	484601	485231	485861	486491	487121	487751	488381	489011	489641	490271	490901	491531	492161	492791	493421	494051	494681	495311	495941	496571	497201	497831	498461	499091	499721	500351	500981	501611	502241	502871	503501	504131	504761	505391	506021	506651	507281	507911	508541	509171	509801	510431	511061	511691	512321	512951	513581	514211	514841	515471	516101	516731	517361	517991	518621	519251	519881	520511	521141	521771	522401	523031	523661	524291	524921	525551	526181	526811	527441	528071	528701	529331	529961	530591	531221	531851	532481	533111	533741	534371	535001	535631	536261	536891	537521	538151	538781	539411	540041	540671	541301	541931	542561	543191	543821	544451	545081	545711	546341	546971	547601	548231	548861	549491	550121	550751	551381	552011	552641	553271	553901	554531	555161	555791	556421	557051	557681	558311	558941	559571	560201	560831	561461	562091	562721	563351	563981	564611	565241	565871	566501	567131	567761	568391	569021	569651	570281	570911	571541	572171	572801	573431	574061	574691	575321	575951	576581	577211	577841	578471	579101	579731	580361	580991	581621	582251	582881	583511	584141	584771	585401	586031	586661	587291	587921	588551	589181	589811	590441	591071	591701	592331	592961	593591	594221	594851	595481	596111	596741	597371	598001	598631	599261	599891	600521	601151	601781	602411	603041	603671	604301	604931	605561	606191	606821	607451	608081	608711	609341	609971	610601	611231	611861	612491	613121	613751	614381	615011	615641	616271	616901	617531	618161	618791	619421	620051	620681	621311	621941	622571	623201	623831	624461	625091	625721	626351	626981	627611	628241	628871	629501	630131	630761	631391	632021	632651	633281	633911	634541	635171	635801	636431	637061	637691	638321	638951	639581	640211	640841	641471	642101	642731	643361	643991	644621	645251	645881	646511	647141	647771	648401	649031	649661	650291	650921	651551	652181	652811	653441	654071	654701	655331	655961	656591	657221	657851	658481	659111	659741	660371	661001	661631	662261	662891	663521	664151	664781	665411	666041	666671	667301	667931	668561	669191	669821	670451	671081	671711	672341	672971	673601	674231	674861	675491	676121	676751	677381	678011	678641	679271	679901	680531	681161	681791	682421	683051	683681	684311	684941	685571	686201	686831	687461	688091	688721	689351	689981	690611	691241	691871	692501	693131	693761	694391	695021	695651	696281	696911	697541	698171	698801	699431	700061	700691	701321	701951	702581	703211	703841	704471	705101	705731

APPENDIX A3

DETAILED RESULTS OF DEMOGRAPH PROJECTIONS



PROJECTIONS

Age	2001				2006				2011				2016			
	Male	Female	Total	Change	Male	Female	Total	Change	Male	Female	Total	Change	Male	Female	Total	Change
0-4	258	242	500	276.1%	612	589	1,211	142.1%	756	716	1,472	21.6%	872	827	1,698	15.4%
5-9	282	241	523	276.1%	714	740	1,473	181.8%	1,124	1,098	2,222	50.8%	1,025	985	2,010	-9.5%
10-14	223	230	453	240.5%	610	591	1,281	182.9%	1,100	1,139	2,239	74.7%	1,334	1,304	2,638	17.8%
15-19	212	185	397	214.8%	450	473	923	132.6%	1,071	899	1,970	113.5%	1,267	1,292	2,559	29.9%
20-24	176	197	372	223.8%	312	328	661	77.4%	660	631	1,291	95.3%	1,165	997	2,162	67.5%
25-29	266	275	540	335.8%	447	592	1,000	85.0%	315	353	668	-33.2%	751	776	1,527	128.8%
30-34	298	278	575	299.6%	806	827	1,633	183.8%	532	954	1,485	-9.0%	518	611	1,129	-24.0%
35-39	243	231	473	205.4%	893	897	1,790	278.1%	1,176	1,267	2,443	36.5%	790	1,229	2,019	-17.4%
40-44	190	190	380	173.4%	503	443	946	149.0%	1,559	1,527	3,086	226.2%	1,407	1,478	2,885	-6.5%
45-49	148	148	296	77.5%	417	432	919	209.9%	777	656	1,433	56.0%	1,688	1,635	3,323	131.9%
50-54	155	156	311	128.5%	239	215	455	46.3%	655	602	1,256	176.3%	838	718	1,556	23.9%
55-59	124	111	235	120.0%	230	227	457	94.3%	298	259	557	21.8%	673	626	1,300	133.3%
60-64	98	105	202	216.3%	156	153	310	52.9%	270	292	562	81.5%	311	288	598	6.6%
65-69	68	70	138	87.1%	200	234	434	213.1%	389	392	781	80.2%	331	372	703	-10.0%
70-74	54	64	118	33.0%	207	199	406	243.3%	348	429	777	91.4%	404	442	847	8.9%
75+	82	163	245	16.8%	184	331	515	110.2%	480	613	1,094	112.2%	581	829	1,410	29.0%
TOTAL	2,875	2,886	5,761	180.3%	7,141	7,271	14,412	150.2%	11,509	11,827	23,336	61.9%	13,957	14,408	28,364	21.5%

Area: Ingleside/Warriewood 150/13

AGE STRUCTURE

Age	1996			2001	2006	2011	2016
	Male	Female	Total				
0-4	7.1%	5.9%	6.5%	8.7%	8.4%	6.3%	6.0%
5-9	7.0%	6.5%	6.8%	9.1%	10.2%	9.5%	7.1%
10-14	7.4%	5.6%	6.5%	7.9%	8.9%	9.6%	9.3%
15-19	6.7%	5.6%	6.1%	6.9%	6.4%	8.4%	9.0%
20-24	6.5%	4.8%	5.6%	6.5%	4.6%	5.5%	7.6%
25-29	6.9%	5.2%	6.0%	9.4%	6.9%	2.9%	5.4%
30-34	6.9%	7.1%	7.0%	10.0%	11.3%	6.4%	4.0%
35-39	6.9%	8.1%	7.5%	8.2%	12.4%	10.5%	7.1%
40-44	6.3%	7.2%	6.8%	6.6%	6.6%	13.2%	10.2%
45-49	8.4%	7.9%	8.1%	5.1%	6.4%	6.1%	11.7%
50-54	7.2%	6.1%	6.6%	5.4%	3.2%	5.4%	5.5%
55-59	4.9%	5.5%	5.2%	4.1%	3.2%	2.4%	4.6%
60-64	3.5%	2.8%	3.1%	3.5%	2.1%	2.4%	2.1%
65-69	3.6%	3.6%	3.6%	2.4%	3.0%	3.3%	2.5%
70-74	3.0%	5.6%	4.3%	2.1%	2.8%	3.3%	3.0%
75+	7.6%	12.6%	10.2%	4.3%	3.6%	4.7%	5.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

NET MIGRATION

Age	Males Female		Total
0-4	103	95	198
5-9	212	178	390
10-14	154	160	314
15-19	139	125	264
20-24	110	137	247
25-29	202	224	426
30-34	230	222	452
35-39	175	155	330
40-44	123	103	226
45-49	87	72	159
50-54	75	72	147
55-59	56	48	104
60-64	53	48	101
65-69	38	42	80
70-74	25	29	54
75+	23	33	56
TOTAL	1,805	1,743	3,548

PROJECTIONS

Age	2001				2006				2011				2016			
	Male	Female	Total	Change	Male	Female	Total	Change	Male	Female	Total	Change	Male	Female	Total	Change
0-4	258	242	500	276.1%	569	538	1,107	121.3%	629	596	1,225	10.6%	587	556	1,142	-6.7%
5-9	282	241	523	276.1%	669	677	1,345	157.4%	932	908	1,840	36.8%	633	600	1,233	-33.0%
10-14	223	230	453	240.5%	637	543	1,180	160.6%	929	968	1,897	60.7%	934	912	1,846	-2.7%
15-19	212	185	397	214.8%	416	438	854	115.2%	924	770	1,694	98.4%	929	970	1,899	12.1%
20-24	176	197	372	223.8%	310	301	612	64.3%	572	547	1,119	82.9%	920	770	1,690	-51.1%
25-29	266	275	540	335.8%	367	535	903	67.0%	262	274	536	-40.6%	570	548	1,118	108.7%
30-34	298	278	575	299.6%	734	755	1,489	158.8%	411	775	1,186	-20.4%	264	278	542	-54.3%
35-39	243	231	473	205.4%	821	825	1,646	247.7%	980	1,061	2,041	24.0%	413	777	1,191	-41.7%
40-44	190	190	380	173.4%	467	413	880	131.6%	1,342	1,323	2,665	202.9%	976	1,059	2,035	-23.7%
45-49	148	148	296	77.5%	451	402	853	187.6%	665	565	1,230	44.2%	1,326	1,313	2,639	114.6%
50-54	155	156	311	128.5%	223	202	426	37.0%	575	531	1,106	160.0%	650	566	1,216	9.9%
55-59	124	111	235	120.0%	217	216	433	84.1%	260	228	488	12.6%	546	518	1,064	117.9%
60-64	98	105	202	216.3%	147	144	292	44.0%	241	261	502	72.2%	248	216	465	-7.4%
65-69	68	70	138	87.1%	186	217	403	190.7%	327	327	654	62.4%	216	249	464	-29.0%
70-74	54	64	118	33.0%	191	183	374	216.2%	293	364	656	75.4%	274	299	572	-12.8%
75+	82	163	245	16.8%	173	311	484	97.5%	413	529	942	94.5%	454	620	1,075	14.1%
TOTAL	2,875	2,886	5,761	180.3%	6,579	6,700	13,280	130.5%	9,754	10,027	19,781	49.0%	9,940	10,251	20,191	2.1%

Area: Ingleside/Warriewood 150/09

AGE STRUCTURE

Age	1996			2001	2006	2011	2016
	Male	Female	Total	Total	Total	Total	Total
0-4	7.1%	5.9%	6.5%	8.7%	8.3%	6.2%	5.7%
5-9	7.0%	6.5%	6.8%	9.1%	10.1%	9.3%	6.1%
10-14	7.4%	5.6%	6.5%	7.9%	8.9%	9.6%	9.1%
15-19	6.7%	5.6%	6.1%	6.9%	6.4%	8.6%	9.4%
20-24	6.5%	4.8%	5.6%	6.5%	4.6%	5.7%	8.4%
25-29	6.9%	5.2%	6.0%	9.4%	6.8%	2.7%	5.5%
30-34	6.9%	7.1%	7.0%	10.0%	11.2%	6.0%	2.7%
35-39	6.9%	8.1%	7.5%	8.2%	12.4%	10.3%	5.9%
40-44	6.3%	7.2%	6.8%	6.6%	6.6%	13.5%	10.1%
45-49	8.4%	7.9%	8.1%	5.1%	6.4%	6.2%	13.1%
50-54	7.2%	6.1%	6.6%	5.4%	3.2%	5.6%	6.0%
55-59	4.9%	5.5%	5.2%	4.1%	3.3%	2.5%	5.3%
60-64	3.5%	2.8%	3.1%	3.5%	2.2%	2.5%	2.3%
65-69	3.6%	3.6%	3.6%	2.4%	3.0%	3.3%	2.3%
70-74	3.0%	5.6%	4.3%	2.1%	2.8%	3.3%	2.8%
75+	7.6%	12.6%	10.2%	4.3%	3.6%	4.8%	5.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

NET MIGRATION

Age	Males		Total
	Male	Female	
0-4	103	95	198
5-9	212	178	390
10-14	154	160	314
15-19	139	125	264
20-24	110	137	247
25-29	202	224	426
30-34	230	222	452
35-39	175	155	330
40-44	123	103	226
45-49	87	72	159
50-54	75	72	147
55-59	56	48	104
60-64	53	48	101
65-69	38	42	80
70-74	25	29	54
75+	23	33	56
TOTAL	1,805	1,743	3,548

PROJECTIONS

Age	2001				2006				2011				2016			
	Male	Female	Total	Change	Male	Female	Total	Change	Male	Female	Total	Change	Male	Female	Total	Change
0-4	237	222	459	245.2%	455	430	885	92.7%	360	339	699	-21.0%	341	321	662	-5.3%
5-9	258	221	479	244.4%	532	540	1,072	124.0%	521	502	1,023	-4.6%	359	339	698	-31.8%
10-14	206	212	418	214.2%	518	438	955	128.6%	566	601	1,167	22.2%	520	502	1,022	-12.4%
15-19	197	171	368	191.8%	340	360	700	90.4%	605	491	1,096	56.6%	564	600	1,164	6.2%
20-24	164	182	345	200.3%	261	247	508	47.1%	380	365	745	46.6%	601	490	1,091	46.5%
25-29	244	250	493	297.9%	289	419	709	43.6%	147	108	255	-64.0%	377	364	741	190.2%
30-34	273	254	526	265.6%	582	598	1,180	124.2%	159	399	559	-52.7%	147	108	254	-54.5%
35-39	224	214	437	182.1%	660	661	1,321	202.0%	565	614	1,179	-10.7%	158	398	556	-52.8%
40-44	176	179	355	155.4%	384	344	727	104.9%	873	876	1,749	140.4%	560	611	1,171	-33.0%
45-49	138	140	278	66.7%	368	335	703	152.4%	415	365	780	10.9%	860	868	1,728	121.7%
50-54	147	148	295	116.7%	188	173	361	22.5%	401	377	778	115.5%	405	359	764	-1.8%
55-59	118	105	223	108.8%	188	188	376	68.3%	178	162	340	-9.6%	384	368	752	121.2%
60-64	92	100	191	199.1%	128	326	454	137.2%	177	192	370	-18.6%	165	156	321	-13.1%
65-69	64	65	129	75.0%	154	181	336	159.1%	194	379	573	70.9%	157	182	339	-40.9%
70-74	51	61	112	26.2%	155	148	303	170.0%	170	225	395	30.2%	161	344	505	27.7%
75+	79	159	238	13.4%	147	267	414	73.7%	267	347	614	48.3%	260	394	654	6.6%
TOTAL	2,666	2,683	5,349	160.3%	5,349	5,654	11,003	105.7%	5,977	6,344	12,321	12.0%	6,019	6,404	12,423	0.8%

Area: Ingleside/Warriewood 150/05

AGE STRUCTURE

Age	1996			2001	2006	2011	2016
	Male	Female	Total				
0-4	7.1%	5.9%	6.5%	8.6%	8.0%	5.7%	5.3%
5-9	7.0%	6.5%	6.8%	9.0%	9.7%	8.3%	5.6%
10-14	7.4%	5.6%	6.5%	7.8%	8.7%	9.5%	8.2%
15-19	6.7%	5.6%	6.1%	6.9%	6.4%	8.9%	9.4%
20-24	6.5%	4.8%	5.6%	6.5%	4.6%	6.0%	8.8%
25-29	6.9%	5.2%	6.0%	9.2%	6.4%	2.1%	6.0%
30-34	6.9%	7.1%	7.0%	9.8%	10.7%	4.5%	2.0%
35-39	6.9%	8.1%	7.5%	8.2%	12.0%	9.6%	4.5%
40-44	6.3%	7.2%	6.8%	6.6%	6.6%	14.2%	9.4%
45-49	8.4%	7.9%	8.1%	5.2%	6.4%	6.3%	13.9%
50-54	7.2%	6.1%	6.6%	5.5%	3.3%	6.3%	6.2%
55-59	4.9%	5.5%	5.2%	4.2%	3.4%	2.8%	6.1%
60-64	3.5%	2.8%	3.1%	3.6%	4.1%	3.0%	2.6%
65-69	3.6%	3.6%	3.6%	2.4%	3.0%	4.7%	2.7%
70-74	3.0%	5.6%	4.3%	2.1%	2.8%	3.2%	4.1%
75+	7.6%	12.6%	10.2%	4.5%	3.8%	5.0%	5.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

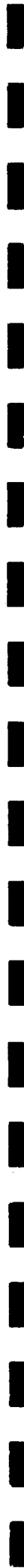
NET MIGRATION

Age	Males		Total
	Female	Male	
0-4	93	84	177
5-9	188	158	346
10-14	137	142	279
15-19	124	111	235
20-24	98	122	220
25-29	180	199	379
30-34	206	198	403
35-39	156	138	294
40-44	109	92	201
45-49	77	64	141
50-54	67	64	131
55-59	50	42	92
60-64	47	43	90
65-69	34	37	71
70-74	22	26	48
75+	20	29	49
TOTAL	1,607	1,549	3,156



SECTION B

TRAFFIC AND TRANSPORT



1. INTRODUCTION

1.1 THE STUDY OBJECTIVES

The objectives of the traffic and transport study are to:

- i) Estimate anticipated levels of private, commercial and bus traffic volume generated within and through the Ingleside-Warriewood Release Area for the various stages of development for a range of population expectations with particular attention to the inter-relationships between traffic generation and movement at a Regional and Sub-Regional level, and employment.
- ii) Propose a model for an arterial, sub-arterial, and collector road system for the Ingleside-Warriewood Release Area to adequately cater for a range of estimated traffic volumes and having regard to provision of a public transport system.
- iii) Develop a priority strategy for road provision for a range of population models.
- iv) Formulate recommendations for the design of road systems that minimises the need for purchase and road closure.
- v) Provide basic design and construction standards for the road network as regards its function, i.e. arterial, sub-arterial, collector, local, etc. (i.e. pavement width).
- vi) Define design standards for access provision to the range of defined roads.
- vii) Formulate methods for allocating contributions towards the funding and implementation of the arterial and sub-arterial road system.
- viii) Identify the likely demand, orientation of services, level of services and capital works cost associated with the provision of a bus, or other appropriate public transport system for the Ingleside-Warriewood Land Release Area in the medium term to service the commuter shopping, employment, educational and recreational needs of the projected population models.
- ix) Propose a model for an arterial, sub-arterial, collector and local road priority system necessary to facilitate a bus, or other appropriate public transport system, that efficiently services the area's population and provides effective access to sub-regional centres and regional centres and significant educational institutions.

1.2 MAJOR TASKS

The major tasks undertaken and reported in this section of the report are as follows:

- A description of the present and planned transport services both local and inter-regional.
- Existing movement data (private and public transport).
- Estimated traffic generation for the development scenarios and stages of development in terms of:
 - cars
 - public transport (buses)
 - commercial vehicle movements (construction and operation).
- Estimates of anticipated traffic levels for alternative development scenarios and staging options.
- Development of transport systems to cater for anticipated traffic levels.
- Review of impacts of alternative development options:
 - operational (junction capacity, link capacity layout standards)
 - public transport service levels, etc
 - likely financial costs.
- Development of a priority transport/traffic development strategy and formulation of planning guidelines and management strategies for road design standards in concept form.
- Review of feasible methods of developer contributions towards the cost of development and other non-Council funding opportunities.

The study provides preliminary advice for Council to choose the most appropriate transport plan for the selected land use/transport strategy. It is not a detailed study of individual developments. As such, the study provides guidelines and strategies that can be used as basis for further detailed traffic and transport studies that may be required following decision on specific development strategies and land use plans.

1.3 FORMAT OF THE REPORT

This section of the report is divided into five chapters. Chapter 2 contains a detailed analysis of the existing situation with regard to land use, the road system, traffic flows, intersection operation, through traffic patterns, traffic accidents, parking, public transport and other traffic issues.

Chapter 3 assesses the future development scenarios. It examines the three growth scenarios as described in Section A of the report and estimates future background traffic growth and road network development based on those scenarios.

Chapter 4 examines the traffic implications of the proposed development scenarios.

Chapter 5 recommends road improvement and traffic management strategies, the future road hierarchy, truck routes and other measures to address the varying levels of growth demand. It also presents the appropriate design guidelines of the road network and estimates of the broad transport development costs.

2. THE EXISTING SITUATION

The objective of this section of the report is to provide preliminary advice for Council to choose the most appropriate transport plan for the selected land use/transport strategy for the urban release area. It requires a clear understanding of the existing land use and traffic operation conditions in the study area and its vicinity in order to provide a framework in which to formulate traffic management and development strategies.

In this chapter, the report summarises existing land use patterns in the study area and its surroundings. It also reviews existing traffic/transport issues such as traffic volumes, traffic controls, on-street and off-street parking and public transport services.

2.1 EXISTING LAND USE

Different land uses have different travel demand characteristics. Most of the study area at present is rural or semi-rural in character.

The broad land use types extracted from the existing Pittwater Local Environmental Plan 1993 for the study area are shown in Figure B2.1. They are:

- Non-urban
- Open Space
- Special Uses
- RTA Road Reserve
- Environmental Protection.

2.1.1 Non-Urban

Most of the study area is classified as a non-urban zone. The rest of the study area is zoned into open spaces, special uses, reservations and environmental protection. However, some residential zones in Pittwater are adjacent to the study area. They include Church Point/Bayview to the north, Mona Vale to the east and Elanora Heights/North Narrabeen to the south of the study area. Also, several industrial zones are next to the eastern end of the release land.

2.1.2 Open Space

The main open spaces are the Council Nursery, Katandra Bushland Sanctuary, and Ingleside Park. Two much larger open spaces, Monash Golf Course and Elanora Golf Course, are just to the south of the study area.

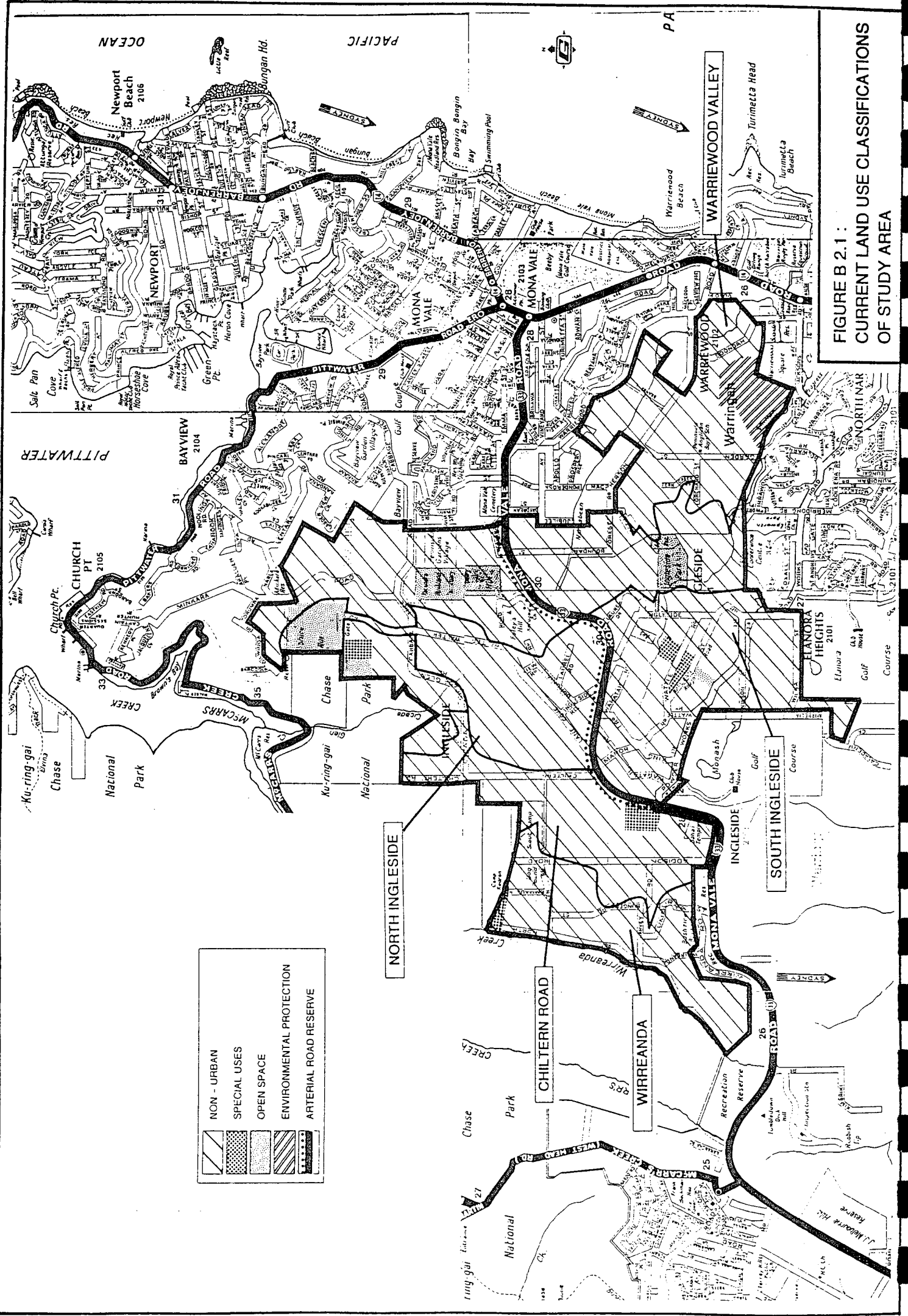


FIGURE B 2.1 :
CURRENT LAND USE CLASSIFICATIONS
OF STUDY AREA

2.1.3 Special Uses

Special uses zones comprise a sewage treatment plant at Warriewood; a sewage farm opposite the Council Nursery; a pumping station at Wattle Road; a school at Wattle Road/Mclean Street; another school at Mona Vale Road/Powder Works Road intersection and a youth centre at Emmaus Road.

2.1.4 RTA Arterial Road Reserve

Land on both sides of Mona Vale Road within the study area is reserved by RTA for future widening. A road reserve is also located on the eastern side of Pittwater Road between Barrenjoey Road and Mona Vale Road.

2.1.5 Environmental Protection

A large area at the south west of the study area is classified as an Environmental Protection zone.

2.2 POTENTIAL DEVELOPMENT AREAS

For the purpose of the study, Pittwater Council has divided the study area into five Potential Development Areas as shown on Figure 2 contained in the Foreword to this report.

These boundaries do not imply any difference in development standards rather they are just a structural device to allow the planning process to continue by utilising discrete areas for discussion and analysis purposes. Large contiguous areas of Category C land (i.e. land which is not suitable for urban development such as escarpment and Warriewood wetlands) have not been included in the defined potential development areas. The Potential Development Areas are described as follows and comprise a total area of about 700 hectares:

- | | | |
|-------------------|---|---|
| Warriewood Valley | - | To the east of the escarpment with the exception of the Warriewood wetlands. |
| South Ingle side | - | To the west of the escarpment and south of Mona Vale Road. |
| North Ingle side | - | To the west of the escarpment and to the east of Chiltern Road, north of Mona Vale Road. |
| Chiltern Road | - | To the north of Mona Vale Road bounded by Chiltern Road and including an area to the north-east surrounding Cicada Glen Road. |

- Wirreanda - To the north of Mona Vale Road and to the east of Wirreanda Creek, bounded on the east by the escarpment which forms the western boundary of the Chiltern Road Potential Development area.

2.3 ROAD HIERARCHY

2.3.1 Existing Functional Hierarchy of Roads

The existing road hierarchy in the study area and its vicinity is shown on Figure B2.2. The hierarchy, which was adopted by the Council in 1989, classifies roads into the following categories according to their traffic functions as defined by the Traffic Authority.⁽¹⁾

- **Arterial Roads** - predominantly carry through traffic from one region to another forming principal avenues of communication for metropolitan traffic movements. They are usually part of the proclaimed Main Road system, including highways and freeways.

Freeways are those roads having full access control and grade separated intersections. Their primary function is to serve large traffic volumes.

- **Sub-arterial Roads** - connect the arterial roads to areas of development or carry traffic directly from one part of a region to another. They may also relieve traffic on arterial roads in exceptional circumstances.
- **Collector Roads** - connect the sub-arterial roads to the local road system in developed areas.
- **Local Roads** - are the sub-divisional roads within a particular developed area. These are used solely as local access roads, but traffic volumes and types of vehicles will depend on the intensity and nature of development e.g. residential, commercial, industrial, recreational, etc.

A summary of criteria which apply to the functional classification of these categories of roads⁽²⁾ has been extracted from the Traffic Authority's publication and is reproduced as Table 2.1.

⁽¹⁾ "Function Classification of Roads" by Traffic Authority of New South Wales.

⁽²⁾ Table 2 of the above document.

EXISTING FUNCTIONAL HIERARCHY OF ROADS

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR
- LOCAL ROAD

**FIGURE B 2.2 :
EXISTING ROAD
HIERARCHY**

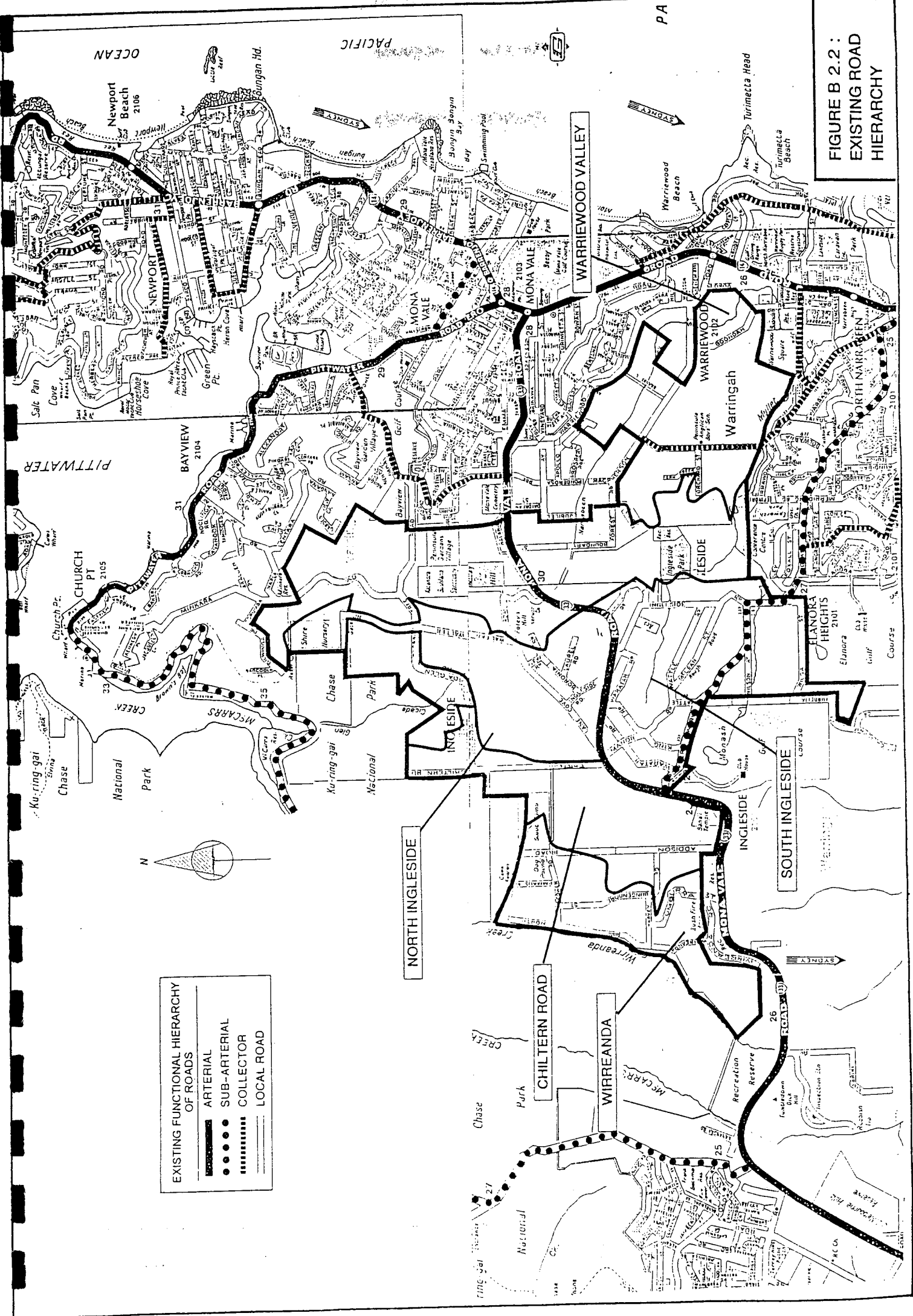


TABLE 2.1: SUMMARY OF CRITERIA - FUNCTIONAL CLASSIFICATION OF ROADS

	Arterial	Sub-Arterial	Collector	Local
Traffic Volume (AADT)	>15,000	5-20,000	2-10,000	<2,000
Traffic Composition				
Through Traffic	Yes	Some	Little	No
Local Traffic	No	No	Yes	Yes
Heavy and Commercial Vehicles	Yes	Yes	No	No
Local Delivery Vehicles	Yes	Yes	(Resid. areas only)	(Resid. area only)
Buses	Yes	Yes	Yes	Yes
Bicycles	No	No	Yes	Maybe
			In marked lanes only	Yes
Spacing (depends on density of development)	2 km-same class 1 km-lower class	1km-higher or same class 0.5km-lower class	0.5km-higher or same class	-
Number of Lanes	4 or more	4 or more	2 or more	2 or more
Interconnections (in addition to one of same class)	Sub-arterial	Arterial Collector	Sub-arterial Local	Collector
Traffic Management				
Parking (depends on adjacent land use)				
Peak Period	No	No	Yes	Yes
Off Peak	No	Yes	Yes	Yes
Period Parking	No	Maybe	Yes	Yes
Unrestricted	No	No	Maybe	Yes
Angle Parking	No	No	Maybe	Yes
Intersection Control	Yes	Yes	Maybe	-
Bus and Transit Lanes	Yes	Yes	-	-
Pedestrian Crossings	Controlled (signals, bridges, subways)	Signals, Zebra Crossings	Zebra Crossings	None
Speed Limit (km/hr)	60,80	60	60	60
Lane & Separation Lines	Yes	Yes	Preferred	No
Control of Turning Traffic	Yes	Maybe	No	No
Mid-Block Control of Access				
Access to abutting land use	None (on expressways); No (from major traffic generators)	Maybe	Yes	Yes
Right Turn Bays	Yes	Preferred	No	No
Medians	Yes	Maybe	No	No
Road Closures	No	No	No	Yes

Source: Traffic Authority developed from work by Lyle Marshall and Associates (1979).

2.3.2 Arterial Network

The arterial road network in the study area comprises Mona Vale Road, Pittwater Road and Barrenjoey Road.

The arterial roads are connected to several sub-arterial roads. McCarr's Creek Road connects Mona Vale Road at Terrey Hills and Pittwater Road at Church Point. Powder Works Road connects Mona Vale Road at Ingleside and Pittwater Road at North Narrabeen. Darley Street connects Pittwater Road and Barrenjoey Road at Mona Vale.

2.3.3 Collector Roads

The area's collector roads feed into the arterial and sub-arterial network. These comprise Cabbage Tree Road and Samuel Street between Pittwater Road and Mona Vale Road, Garden Street and Jacksons Road between Pittwater Road and Powder Works Road, Elanora Road and Kalang Road between Powder Works Road and Wakehurst Parkway.

2.3.4 Local Roads

The area's local roads provide direct access to individual developments and are connected to the collector road system.

2.3.5 RTA's New Classification

RTA has re-classified roads in New South Wales into the following categories, mainly for funding purposes:

- Federal roads
- State roads
- Regional roads
- Local roads.

Federal roads and State roads are entirely funded by the State and Federal governments. They are main roads carrying long distance traffic and connecting several districts. Examples in the Council area are all the arterial network stated above plus McCarr's Creek Road.

Regional roads are lower level routes which carry traffic from one district to another. They are jointly funded by the State Government and local councils. Examples in the Council area are all of the sub-arterial network stated above except McCarr's Creek Road. Figure B2.3 shows the re-classification of roads in the study area and its vicinity.

2.4 TRAFFIC FLOWS

2.4.1 Traffic Volumes

Annual Average Daily Traffic (AADT) records published by the RTA give an indication of the traffic growth rate on particular roads. Table 2.2 presents AADT counts on a number of selected roads in or near the study area.

RTA RE-CLASSIFICATION OF ROADS

- STATE ROAD
- REGIONAL ROAD
- LOCAL ROAD

FIGURE B 2.3:
RTA RE-CLASSIFICATION
OF ROADS

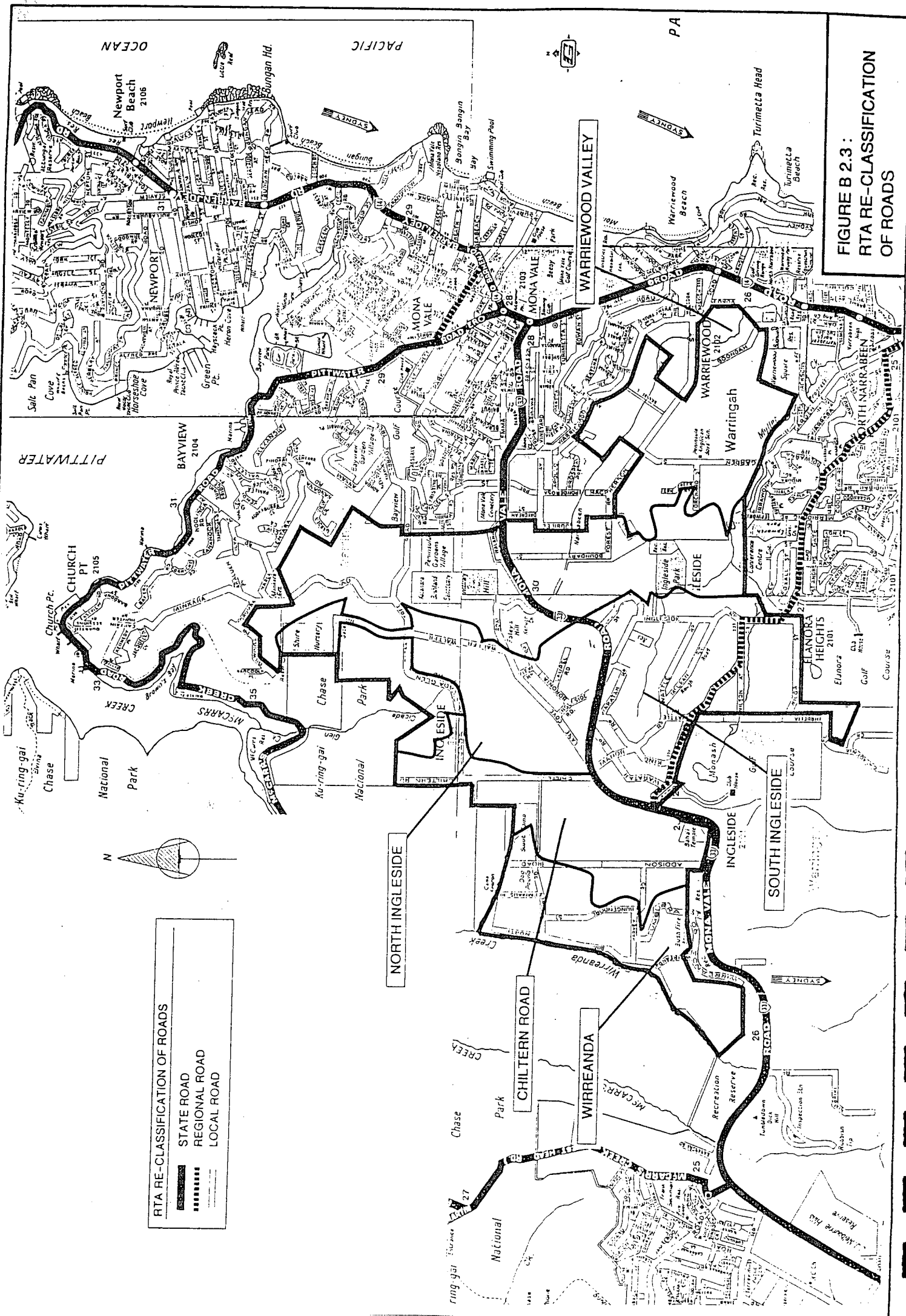


TABLE 2.2: ANNUAL AVERAGE DAILY TRAFFIC (AADT) - HISTORICAL GROWTH

Road	AADT (veh/day)				Average Growth Rate p.a.
	1985	1987	1989	1991	
Barrenjoey Rd north of Beaconsfield St	31,432	33,464	34,606	35,405	2%
Barrenjoey Rd east of Pittwater Rd	32,676	35,764	38,518	41,056	4%
Forest Way south of Mona Vale Rd	22,634	23,880	28,214	32,025	6%
Garden St west of Pittwater Rd	13,177	12,445	13,734	10,791	-3%
McCarrs Creek Rd south of San Martin Dr	1,240	1,838	2,052	1,351	1%
McCarrs Creek Rd east of San Martin Dr	801	1,191	1,236	1,050	5%
Mona Vale Rd west of Forest Way	30,232	30,354	38,792	42,146	6%
Mona Vale Rd east of Forest Way	22,268	24,406	26,518	27,718	4%
Mona Vale Rd north of Powder Works Rd	13,509	14,963	16,580	18,204	5%
Mona Vale Rd west of Emma St	14,160	12,816	15,145	15,786	2%
Pittwater Rd at Narrabeen Lagoon Bridge	33,556	39,422	39,985	42,363	4%
Pittwater Rd north of Nareen Pde	43,890	48,683	49,967	50,108	2%
Pittwater Rd south of Loquat Valley Rd	5,893	6,816	6,936	6,274	1%
Pittwater Rd south of Vineyard St	35,452	41,883	42,415	49,142	6%
Pittwater Rd south of Bungan St	9,359	11,225	10,669	10,925	3%
Wakehurst Parkway west of Pittwater Rd	17,830	19,113	20,237	19,073	1%
Walter Rd north of Lane Cove Rd	1,638	1,560	1,829	1,923	3%

Source: RTA Traffic Volumes and Supplementary Data 1985-1991

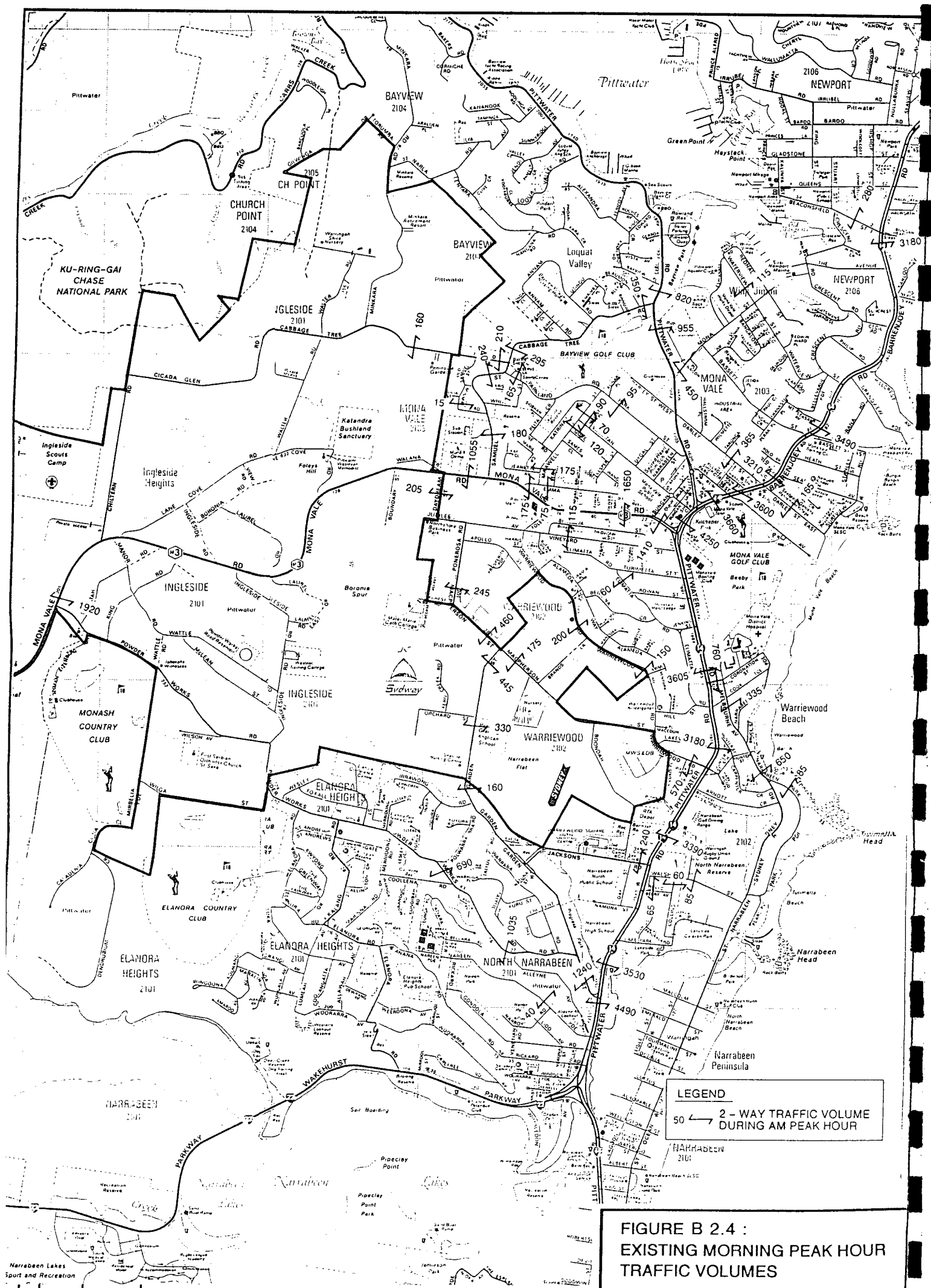
A growth pattern of 1% to 6% per year is revealed on arterial roads passing through and adjacent to the study area.

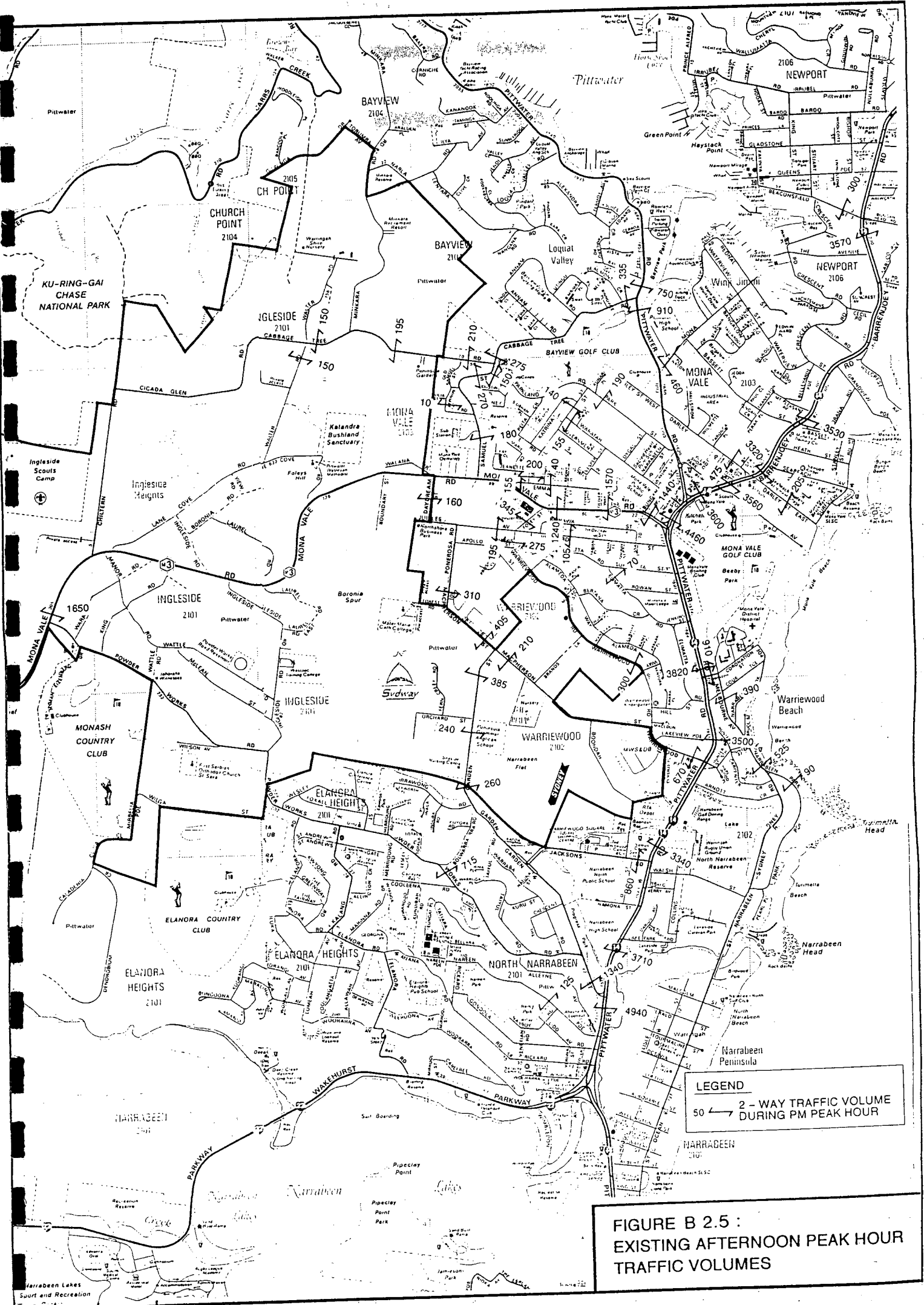
Both Pittwater Road and Mona Vale Road, the major access roads to the study area, have experienced progressive increases in daily traffic volume for the period 1985-1991.

The traffic growth pattern on sub-arterial and collector roads within and around the study area is much less well defined, varying from a growth of 4% per year on McCarrs Creek Road to a reduction of 3% on Garden Street.

Figures B2.4 and B2.5 summarise the current AM and PM peak hour traffic volumes respectively on the road network in and around the study area. This information was collated from various traffic counts that were carried out at different times in recent years including sources such as the RTA, the Council and consultant reports.

During these peak periods, Barrenjoey Road and Pittwater Road (south of Barrenjoey Road) carry more than 3,000 vehicles/hour each (with more than 4,000 vehicles/hour at some sections). Mona Vale Road carries around 1,400-1,600 vehicles/hour in peak periods. Other roads in the area carry less than 1,000 vehicles/hour except a section of Garden Street (south of Powder Works Road) which carries more than 1,200 vehicles/hour during peak periods.





A comparison was made between the existing road hierarchy classification shown on Figure B2.2 and the ranges of daily and peak hourly traffic flows. It shows that in general roads carry flows within the range of their classification.

Level of Service

The concept of Level of Service (LOS) is used to describe qualitatively the operational conditions on a road section, and the perception of their performance by motorists. A LOS defines these conditions in terms of speed, travel time, freedom to manoeuvre, traffic interruptions, comfort, convenience, and safety.

There are six levels of service used in the study, namely A to F, with LOS A representing the best operating conditions and LOS F the worst. Table 2.3 summarises the LOS definitions.

TABLE 2.3: LEVEL OF SERVICE ON ROADS	
LOS	PERFORMANCE
A	Free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.
B	In the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to manoeuvre within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behaviour.
C	In the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and manoeuvring within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.
D	High density, but stable flow. Speed and freedom to manoeuvre are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.
E	Operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to manoeuvre within the traffic stream is extremely difficult and it is generally accomplished by forcing a vehicle to give way to accommodate such manoeuvres. Comfort and convenience levels are poor, and driver frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.
F	Forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterised by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for a short distance, then be required to stop in a cyclic fashion.

Source: *Highway Capacity Manual, TRB, 1985*

The performance of roads in the study area was assessed using the following criteria:

Level of Service	Flow (Vehicles/Lane/Hour)
A/B	<537
C	537 - 804
D	805 - 1,129
E	1,130 - 1,800
F	>1,800

Assessment

Pittwater Road and Barrenjoey Road have dual 3-lane carriageways and act as a major north-south route in the area. They are generally operating at Level of Service (LOS) A/B in the northbound direction and LOS C/D in the southbound direction during the AM peak hour. The opposite applies for the PM peak hour.

Mona Vale Road provides for the major east-west traffic movements in the area. It is 4-lane divided to the west of West Head Road but becomes 2 lanes from West Head Road to shortly before the junction with Bungan Street. Overtaking lanes are provided at certain sections of Mona Vale Road between West Head Road and Powder Works Road.

The section of Mona Vale Road west of Wirreanda is currently operating at LOS D/E. To the east of Powder Works Road, Mona Vale Road is operating at LOS C/D. However due to the generally undulating and winding alignment of the road, traffic conditions will be much worsened by the presence of slow moving vehicles especially at sections where no overtaking lanes are provided.

Powder Works Road is a two lane, two way road with an overall carriageway width of approximately 8.5 metres. It starts its northern end at Mona Vale Road and runs south-easterly to form a signalised junction with Garden Street. It provides an alternative route connecting Mona Vale Road at Ingleside with Pittwater Road at North Narrabeen by-passing some of the traffic lights along Mona Vale and Pittwater Road.

Powder Works Road generally follows a rolling terrain and contains several sharp bends. It is currently operating at LOS A/B westbound and LOS C eastbound in the AM peak hour; and vice versa in the PM peak hour.

Wakehurst Parkway is an arterial road with a 2-lane, 2-way configuration. No overtaking lanes are provided for the whole length of Wakehurst Parkway. Presently, it is operating at LOS C/D in the AM peak hour; but LOS E for northbound in the PM peak hour. As with Mona Vale Road, the traffic conditions can become unstable in the presence of slow moving vehicles because of no overtaking lanes being provided.

Other roads in the study area are generally operating at LOS C or better.

Performance of intersections is discussed later in Section 2.5.

2.4.2 Origin and Destination

As indicated in Section A the 1991 Home Interview Survey⁽³⁾ has shown that Warringah Council (which, included the area of the present Pittwater Council at that time) is quite self-contained, i.e. most of the trips generated in the area had destinations within the area.

For the purpose of analysing the origins and destinations of trip patterns in the area, the council area was divided into 36 zones in the HIS. The zone boundaries are shown in Figure B2.6.

Table 2.4 summarises the number of daily person trips produced from and attracted to each zone and the percentage of those trips wholly within the Warringah Council area. About 80% of the daily person trips were undertaken wholly within the Warringah Council area.

2.5 INTERSECTION OPERATION

2.5.1 Capacity and Delay

The capacity of a road network is generally constrained by the operation of its intersections where the lanes of each of the intersecting streets are required to share the same road space. It is therefore important to consider intersection operation when assessing the capacity of the road network.

The concept of level of service (LOS) is also used to assess the operation of intersections. In this case the LOS is defined according to the delay experienced by vehicles at the intersection approach as follows:

Level of Service	Average Delay (seconds/vehicle)
A/B	<19.5
C	19.5 - 32.4
D	32.5 - 51.9
E	52.0 - 78.0
F	>78.0

⁽³⁾ Source: Transport Study Group

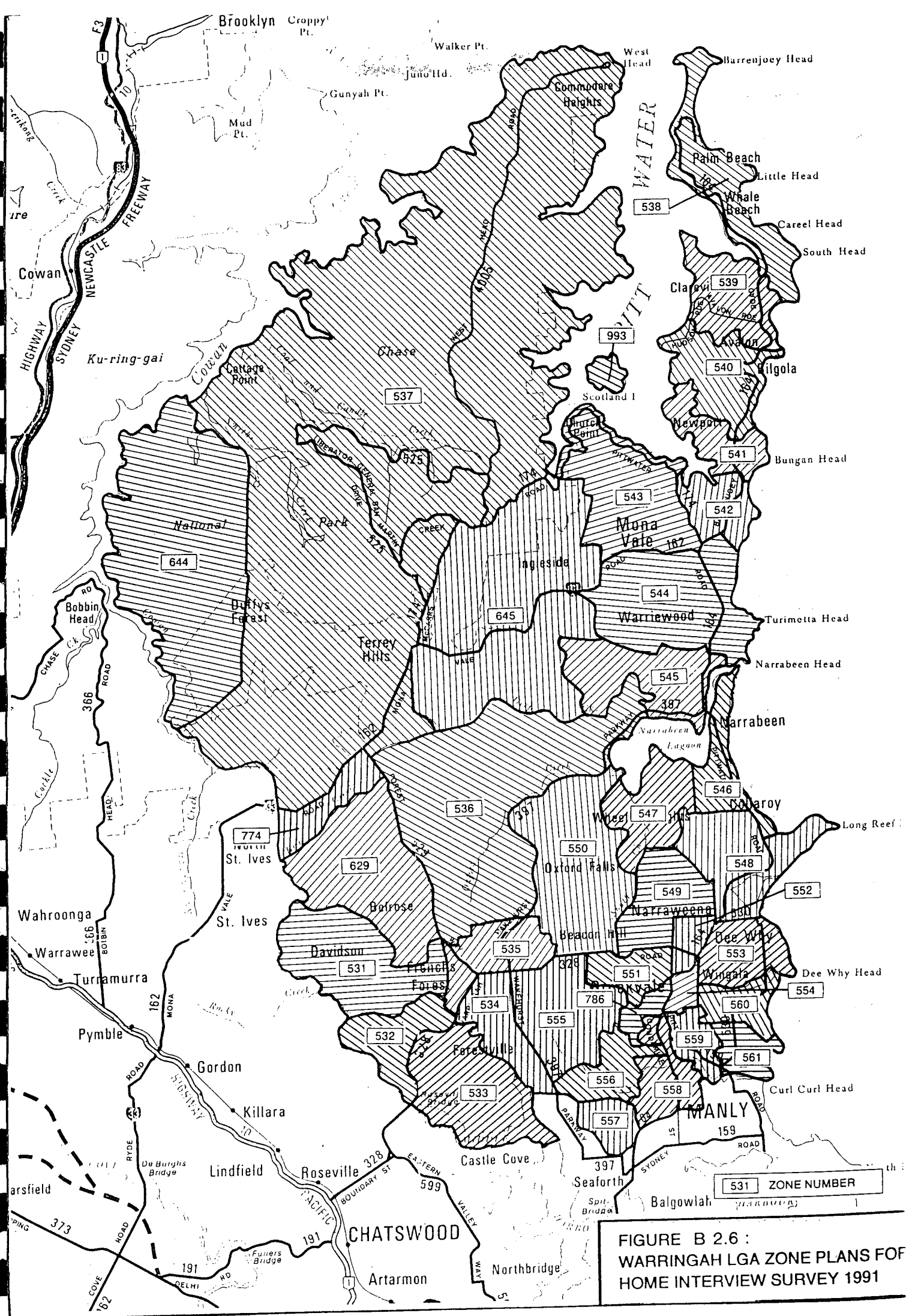


TABLE 2.4: DAILY PERSON TRIPS TO/FROM WARRINGAH COUNCIL (1991)

Zone	Production	% of trips destined within Warringah	Attraction	% of trips originated within Warringah
531	43,340	78	43,023	80
532	8,953	71	8,495	63
533	25,341	65	25,341	66
534	8,912	72	8,911	70
535	25,162	79	25,408	78
536	5,516	75	5,748	69
537	21,315	76	21,431	83
538	7,447	93	7,446	93
539	12,146	89	12,019	87
540	18,046	89	18,155	86
541	5,509	76	5,690	80
542	17,592	93	18,187	90
543	24,392	88	24,498	90
544	31,337	91	31,146	88
545	11,453	83	11,230	86
546	38,710	84	39,405	81
547	5,488	79	5,488	89
548	36,845	87	36,601	90
549	24,427	87	25,154	83
550	7,437	72	7,437	72
551	11,177	83	11,179	80
552	20,908	85	20,911	81
553	24,543	87	24,703	86
554	20,086	74	20,235	80
555	17,250	78	17,118	80
556	496	100	496	100
557	6,856	48	6,854	50
558	35,152	71	34,325	71
559	9,767	88	10,057	78
560	10,269	80	10,360	84
561	23,136	74	23,050	73
629	5,784	66	5,912	63
644	1,055	72	1,055	72
645	873	70	873	70
774	460	100	460	34
786	10,136	67	10,132	71
TOTAL	577,316	80	578,533	80

2.5.2 Intersection Assessment

In the AM peak hour, nearly all signalised intersections are operating at LOS A/B except:

- Pittwater Road/Mona Vale Road (LOS C)
- Pittwater Road/Wakehurst Parkway (LOS D)
- Mona Vale Road/Forest Way (LOS E)
- Wakehurst Parkway/Warringah Road (LOS F).

In the PM peak hour, the performance of intersections is similar to the AM peak. Signalised intersections which are operating at LOS C or worse include:

- Pittwater Road/Mona Vale Road (LOS C)
- Pittwater Road/Wakehurst Parkway (LOS C)
- Mona Vale Road/Forest Way (LOS D).
- Wakehurst Parkway/Warringah Road (LOS F).

Other signalised intersections are still operating at LOS A/B in the PM peak hour.

Unsignalised intersections in the study area are observed to operate generally at LOS A/B during peak hours.

2.6 TRAFFIC MANAGEMENT MEASURES

2.6.1 Signalised Intersections

Signalised intersections exist along Pittwater Road, Barrenjoey Road and Mona Vale Road.

2.6.2 LATM

A number of Local Area Traffic Management (LATM) schemes have been implemented near the study area over the years. They include road closures, intersection treatments, turning restrictions, one-way streets, pedestrian crossings, roundabouts, speed humps, slow points, etc.

Speed humps have been applied as a traffic calming measure near the study area. They can be found along Parkland Road, Peita Crescent, Elanora Road and Fermoy Avenue. A LATM scheme which includes intersection treatments, speed humps, slow points, etc. has been implemented along Vineyard Street in Warriewood.

The LATM scheme at Elanora Heights/North Narrabeen has also been completed. It includes intersection treatments, speed humps, slow points, rumble bars, mini-roundabout, thresholds, etc. Thresholds and speed humps have been applied along Elanora Road, Kalang Road, Leumeah Avenue, Marinna Road, Coolangatta Avenue, Allawah Avenue, Woorarra Avenue, Rickard Road, Gondola Road, Cooleena Road and Nareen Parade.

Other LATM schemes currently under construction include the installation of mini-roundabouts, islands and a reduced speed limit from 60 kph to 50 kph at Ocean Road, Sydney Road, Melbourne Avenue in North Narrabeen.

2.6.3 Roundabouts

Roundabouts are also used for traffic management in the area. They are installed at the following intersections:

- Bungan Street/Waratah Street
- Pittwater Road/Bungan Street/Park Street.

Other roundabouts proposed in the area include:

- Mona Street/Bassett Street
- Edwin Ward Place/Waterview Street
- Jubilee Avenue/Ponderosa Parade
- Mona Vale Road/Ponderosa Parade/Samuel Street.

2.7 TRAFFIC ACCIDENTS

2.7.1 Accident Records, January 1991 - December 1993

Traffic accident records are compiled by the Road Safety Bureau of RTA. These records consist of all traffic accidents at which either one or more persons were injured/killed or at least one motor vehicle was towed away. Accidents which incurred property damage only but no vehicle was towed away were not included in the record.

Appendix B1 provides a summary of traffic accidents recorded in the Study Area and the surrounding roads over a three year period (January 1991 to December 1993). For individual roads, only those which had an accident record of personal injury/fatality were included. All other roads had an insignificant number of traffic accidents recorded. However, research undertaken by NRMA suggests that the Road Safety Bureau statistics represent only a proportion of accidents reported to insurance companies.

2.7.2 Assessment of Records

The accident records indicate the following:

- (a) In terms of total number of accidents recorded during the three year period, the roads which have the greatest number of traffic accidents (10 or more accidents) are:

Road	No. of Accidents
Pittwater Road	141
Mona Vale Road	103
Barrenjoey Road	66
Powder Works Road	45
McCarrs Creek Road	21
Garden Street	18
Warriewood Road	15

Most of these roads are either classified as arterial or sub-arterial roads in the existing road hierarchy, except Warriewood Road and Garden Street which are collector roads. Pittwater Road and Mona Vale Road together account for about 47% of all traffic accidents in the area.

- (b) Powder Works Road, McCarrs Creek Road and Sydney Road have a record of fatal traffic accidents.

In addition to the above statistics, totals at individual intersections are aggregated and ranked on an annual basis by the RTA to provide an indication of the State's 1,000 worst accident blackspots. The RTA's 1990 and 1991 ratings are set out in Table 2.5 for blackspot intersections in the Pittwater area.

TABLE 2.5: BLACKSPOT INTERSECTIONS IN PITTWATER (1990-91)						
Rank in 1991	Street 1	Street 2	Total Accidents in 1990 and 1991			Rank in 1990
			Total	Fatal	Injury	
276	Barrenjoey Road	Park Street	7	1	8	249
417	Gondola Road	Pittwater Road	7	0	4	891
472	Garden Street	Pittwater Road	8	1	2	-
546	Ingleside Road	Powder Works Road	4	0	2	877

In 1992, there were substantial improvements in the blackspot ratings for the above sites, the four sites were no longer among the State's 1,000 worst blackspots.

2.8 PARKING

Sufficient supply of conveniently located car parking to cater for demand is important for the study area as residents and visitors to the various facilities are highly dependent on the motor car for transport. Although the use of public transport should be encouraged through land use-transport integration policies, the existing wide geographical spread of trips to/from and within the study area and its surrounding areas is such that the motor car is the predominant mode of transport at present.

Public parking provision in the vicinity of the study area was examined with regard to off-street provision and the inter-related on-street supply and demand.

2.8.1 Off-Street Parking

Figure B2.7 shows the location of major public off-street car parks in the vicinity of the study area. They are mainly provided at or near shopping centres and recreational facilities:

- Village Shopping Centre, Mona Vale
- Peninsula Plaza Shopping Centre, Mona Vale
- Warriewood Square Shopping Centre, Warriewood
- Mona Vale Golf Club, Mona Vale
- Pittwater Council
- Lake Park.

In general, they are operating well under capacity.

2.8.2 On-Street Parking

Site observations indicated that generally, there is no major problem with regard to on-street parking. This is largely due to the adequate supply of parking within individual developments.

2.9 PUBLIC TRANSPORT

2.9.1 Present Facilities

Public transport services to the study area are provided by STA and Forest Coach Lines Pty Ltd.

Rail

The study area is not currently served by railways. However, a rail option has been investigated in the Warringah Mass Transit Study to provide services between the city and the study area with a terminus at Warriewood Valley.

Buses

STA bus services mainly run north-south between Wynyard and Manly, via Narrabeen and the study area along or parallel to Pittwater Road. On the other hand, Forest Coach Lines buses serve east-west movements between the study area and railway stations at Chatswood, Pymble and Gordon. Shorelink operated a service between Mona Vale and Gordon but the service was sold to Forest Coach Lines about two years ago. A new, peak-hour STA service was started recently between Chatswood and Mona Vale, via Dee Why.

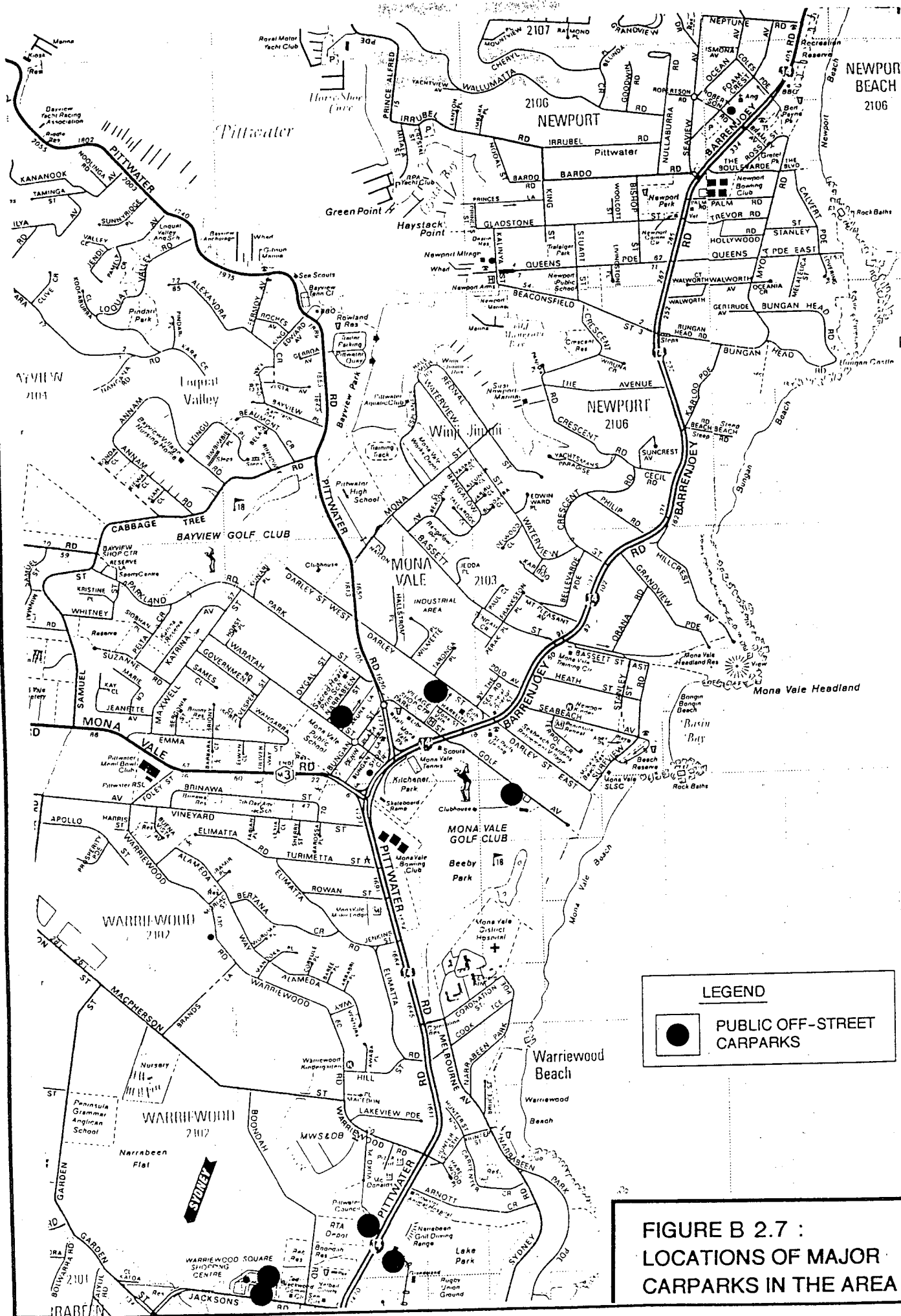


Table 2.6 shows the range of origins of bus routes into the study area. The study area has connections with a number of major centres and railway stations in the north shore.

Bus routes are illustrated in Figure B2.8 which also shows roads used as bus routes within the study area.

TABLE 2.6: BUS ROUTES SERVICING INGLESIDE-WARRIEWOOD AND SURROUNDING AREA	
Origins	Bus routes
City	184-190
Manly	155, 157
Chatswood (station)	160
Chatswood (station)	F285
Pymble (station)	F195, F196
Gordon (station)	F195

Source: State Transit Authority (STA), Forest Coach Lines Pty Ltd.

Note: (i) Prefix F denotes Forest Coach Lines services. (ii) School buses are not included in the table.

Ferry

The study area is not directly served by ferry. However, there are bus services connecting to Manly where there are relatively frequent services, both ferry and jetcat, to Circular Quay in the city.

2.9.2 Assessment

An assessment of the current frequencies of various bus routes serving the study area and its vicinity is given in Table 2.7.

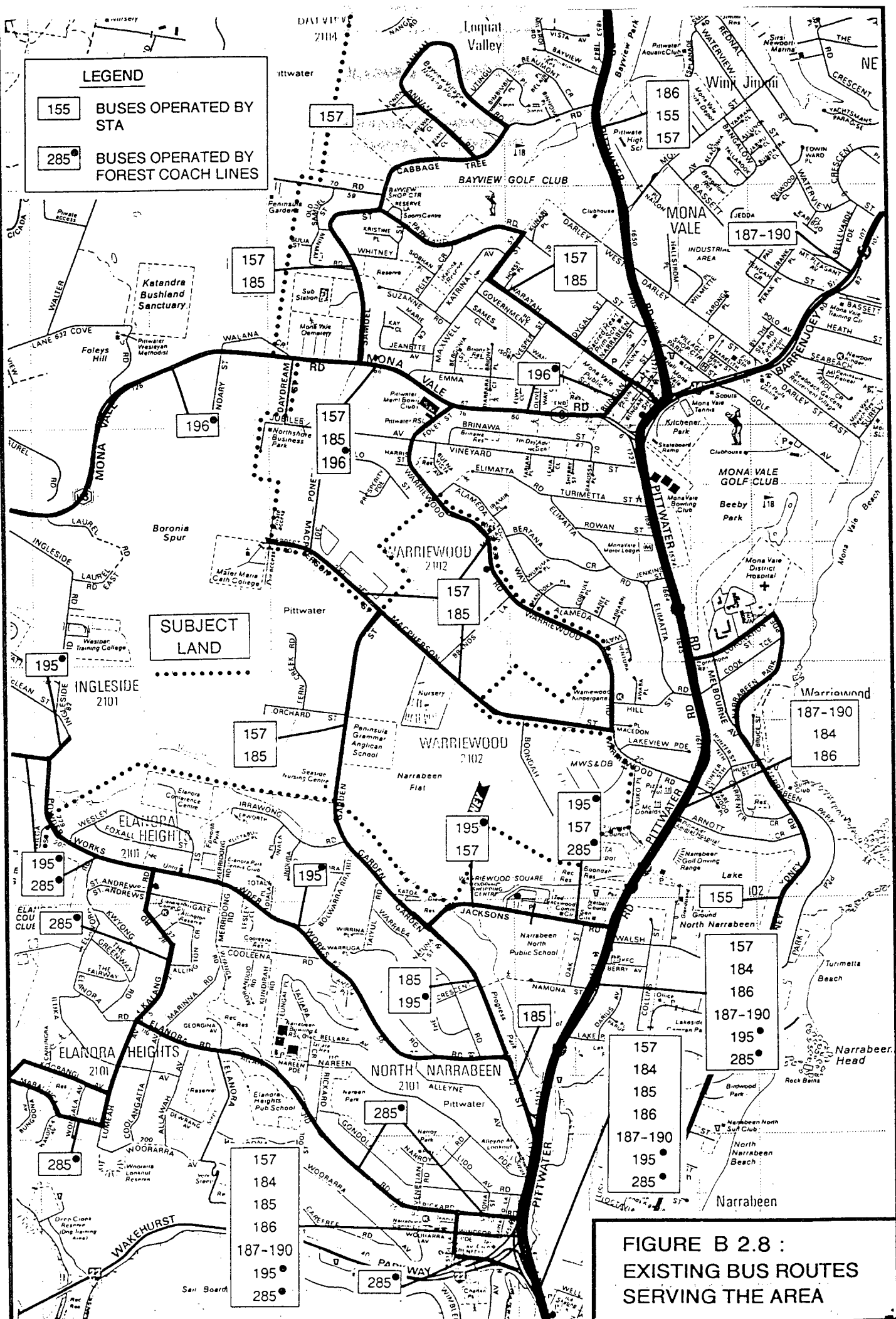
TABLE 2.7: NUMBER OF BUS SERVICES IN THE STUDY AREA	
Bus Routes	Bus Services Per Weekday (To/From Study Area)
184-190	83/85
155, 157	40/36
160	5/ 5
F285	12/13
F195	7/ 9
F196	6/ 8

Source: State Transit Authority (STA), Forest Coach Lines Pty Ltd.

Notes: (i) Prefix F denotes Forest Coach Lines services.

(ii) School buses are not included in the table.

(iii) The number of services shown is for weekdays other than Friday.



Based on 1991 Home Interview Survey results from RTA, the daily number of trips using buses are summarised in Table 2.8. Comprehensive bus patronage figures are not available. As indicated by the bus operators, there is adequate spare capacity within the existing bus system to accommodate further growth for some time.

TABLE 2.8: 1991 DAILY DEMAND OF BUS SERVICES IN PITTWATER				
Bus Services	Number of Trips			
	Government Buses		Private Buses	
	From	To	From	To
School Buses	822	973	302	302
Other Buses	4,236	4,130	921	919
Total	5,058	5,103	1,223	1,221

2.10 RESTRICTION ON HEAVY VEHICLES

Figure B2.9 shows the existing restriction on the movement of heavy vehicles in and near the study area. The restriction is in the form of **3 Tonnes Maximum** weight limits imposed on the following streets:

- Alameda Way
- Elanora Road (Wakehurst Parkway to Woorarra Avenue)
- Elimatta Road
- Foley Street
- Ilya Avenue
- Kananook Avenue
- Lane Cove Road
- Loquat Valley Road
- Narla Road (Ilya Avenue to Lentara Road)
- Taminga Street
- Turimetta Street
- Warriewood Road (Foley Street to Macpherson Street).

It can be seen that the weight restrictions are all imposed on local roads except the section of Elanora Road which is a collector road.

2.11 BICYCLE AND PEDESTRIAN PLANS

A comprehensive bicycle/pedestrian plan in the Pittwater Council area has yet to be implemented.

At present, a shared path between bicycles and pedestrians is provided along the eastern side of Pittwater Road from near the bridge over Narrabeen Lakes up to Garden Street. It has been proposed to be extended into the Lakeside Park up to the recreational reserve area near Narrabeen Head.

In addition, a bicycle circuit in Warriewood Valley which formalises bicycles' shared use of roadway has also been proposed.

The funding of a Bicycle Plan Study in Pittwater Council area has recently been approved and is expected to start very soon. It is meant to provide for comprehensive bicycle strategies in the whole Pittwater area.

3. FUTURE DEVELOPMENT

3.1 TRAFFIC GENERATION RATES

Future development in the urban release area will result in an increase in vehicle trips generated to and from Pittwater.

Based on the 1991 Home Interview Survey, the traffic generation rates for an average dwelling unit in Pittwater area was estimated as follows:

	AM Peak Hour	PM Peak Hour
Production	0.578 vehicle trips	0.187 vehicle trips
Attraction	0.114 vehicle trips	0.351 vehicle trips
Total	0.692 vehicle trips	0.539 vehicle trips

However experience in the area suggests a higher trip rate should be used due to the high car ownership and a general lack of public transport services. As a result, a conservative trip rate of 1.0 vehicle trips/dwelling was adopted for the morning peak hour which has provided some allowance for future traffic growth which may include later dual occupancy development. Directional split between the inbound/outbound traffic was based on that derived from the 1991 HIS.

The PM peak hour traffic generation rates were also adjusted by the same factor as for the AM peak hour trip rate. Consequently the traffic generation rates used for future developments in the urban release area are:

	AM peak hour	PM peak hour
Production	0.835 veh. trip/dwelling	0.270 veh. trip/dwelling
<u>Attraction</u>	<u>0.165 veh. trip/dwelling</u>	<u>0.507 veh. trip/dwelling</u>
Total	1.000 veh. trip/dwelling	0.777 veh. trip/dwelling

3.2 DEVELOPMENT SCENARIOS

For the purpose of devising a traffic and transport strategy to accommodate future developments in the urban release area, the three development scenarios of low, medium and high density described in Section A have been used.

In these three scenarios, the five Potential Development Areas are assumed to be developed separately at intervals of two years with a maximum of 150 dwellings to be constructed in each precinct each year.

The development scenarios are described in detail in Section A - Demographic Analysis and Model and summarised below as a basis for subsequent estimates of traffic generation.

3.2.1 Low Yield Development (5 dwellings per hectare)

The low yield development scenario represents an ultimate development of 3,500 dwellings in a time frame of 12 years. The population in the urban release area will increase to about 9,800 people. The total number of dwellings in each Potential Development Area is as follows:

Potential Development Area	Number of Dwellings
Warriewood Valley	600
South Ingleside	945
North Ingleside	725
Chiltern Road	630
Wirreanda	600

3.2.2 Medium Yield Development (9 dwellings per hectare)

The medium yield development scenario describes a development of 6,300 dwellings in a time frame of 16 years. The ultimate population in the urban release area will be about 18,000 people. The total number of dwellings in each Potential Development Area is as follows:

Potential Development Area	Number of Dwellings
Warriewood Valley	1,080
South Ingleside	1,701
North Ingleside	1,305
Chiltern Road	1,134
Wirreanda	1,080

3.2.3 High Yield Development (13 dwellings per hectare)

About 9,100 dwellings are assumed in the high yield development scenario. The time frame for the development is 19 years and a population of around 26,000 people is assumed. The total number of dwellings in each Potential Development Area is as follows:

Potential Development Area	Number of Dwellings
Warriewood Valley	1,560
South Ingleside	2,457
North Ingleside	1,885
Chiltern Road	1,638
Wirreanda	1,560

3.2.4 Population Projections for the Three Scenarios

Table 3.1 indicates the estimated likely population for each of the local development areas for five-year periods during the development phase.

TABLE 3.1: PROJECTED POPULATIONS INGLESIDE-WARRIEWOOD URBAN RELEASE AREA					
	Simple Cumulative Population (Low Yield)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Warriewood Valley	420	1,680	1,680	1,680	1,680
South Ingleside	-	1,260	2,646	2,646	2,646
North Ingleside	-	420	2,030	2,030	2,030
Chiltern Road	-	-	1,680	1,764	1,764
Wirreanda	-	-	840	1,680	1,680
TOTAL	420	3,360	8,876	9,800	9,800
	Simple Cumulative Population (Medium Yield)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Warriewood Valley	420	2,100	3,024	3,024	3,024
South Ingleside	-	1,260	3,360	4,763	4,763
North Ingleside	-	420	2,520	3,654	3,654
Chiltern Road	-	-	1,680	3,175	3,175
Wirreanda	-	-	840	2,940	3,024
TOTAL	420	3,780	11,424	17,556	17,640
	Simple Cumulative Population (High Yield)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Warriewood Valley	420	2,100	4,200	4,368	4,368
South Ingleside	-	1,260	3,360	5,460	6,870
North Ingleside	-	420	2,520	4,620	5,278
Chiltern Road	-	-	1,680	3,780	4,586
Wirreanda	-	-	840	2,940	4,368
TOTAL	420	3,780	12,600	21,168	25,480

3.3 BACKGROUND TRAFFIC GROWTH

The demographic study shows that, there are only minor changes in the future population in the Pittwater area (excluding Ingleside-Warriewood urban release area) for the next 17 years. It is projected that there will be a slight reduction in population in the Pittwater area in years beyond 1996. The projected population for the Pittwater area excluding Ingleside-Warriewood is summarised below:

Year	Projected Population	Change
1996	49,927	0.4%
2001	49,808	-0.2%
2006	49,306	-1.0%
2011	48,451	-1.7%

The above population projection suggests there will be no major change in the background traffic volume from the existing traffic volume, due to population changes. However, it is considered prudent to assume a 1% growth per year in background traffic in order to account for some future developments not yet to knowledge as well as a general increase in propensity to travel in the future.

3.4 PLANNED ROAD NETWORK DEVELOPMENT

3.4.1 Mona Vale Road

The construction of an overtaking lane of about 500 metres in length for the westbound traffic at Kimbriki Road is close to completion. Further widening works to provide climbing lanes for westbound traffic on three other sections, near Addison Road, Powder Works Road and Daydream Street have been investigated by RTA. However with regard to the current financial situation of RTA, the construction works are not likely to commence in 3 years' time.

Further improvement work on Mona Vale Road is referred to in a concept plan, with an ultimate configuration of a 4-lane divided road including signalisation of selected intersections. The actual timing of the improvement will depend on the progress of the urban release land development.

It should be noted that the RTA is constantly reviewing its road construction and upgrading program, which is sensitive to land use changes and RTA funding levels.

3.4.2 Powder Works Road

There have been concerns about the traffic conditions and safety at the eastern and western extremity of Powder Works Road and general safety and crash statistics for the length of the road.

Resurfacing of sections of Powder Works Road from Mona Vale Road to King Road and in the vicinity of Wattle Road has been included in a submission to the RTA under the Road Safety and Traffic Flow Program for 1993/94 after tests showed that the wearing course of these sections has been polished.

Also, it has been proposed that the speed limit in the western section of Powder Works Road should be reduced from 80 km/h to 60 km/h.

3.4.3 Closure of Macpherson Street and Jubilee Avenue

The closure of Macpherson Street near Narrabeen Creek and the closure of Jubilee Avenue west of Warriewood Road form part of the Development Control Strategy for the Warriewood Valley Industrial Development area. It will be implemented in conjunction with the extension of

Ponderosa Parade to the proposed Mona Vale Road/Samuel Street roundabout. Closure of the two roads is meant to isolate the industrial area to the west of Warriewood Road from the rest of Warriewood Valley area.

3.4.4 Proposed Signalled Junctions

Installation of traffic signals has been proposed at the intersections of Pittwater Road/Darley Street, Mona Vale and Pittwater Road/Rickard Road, North Narrabeen by RTA. Provision of pedestrian crossing will be included as part of the signalisation of Pittwater Road/Rickard Road intersection.

3.5 PUBLIC TRANSPORT DEVELOPMENT

3.5.1 Warringah Mass Transit Link

The need to improve public transport links to the Warringah Peninsula has been identified in strategic planning work by the state government. A mass transit system (whether it be heavy rail, light rail, monorail or some form of high speed busway) would enhance access to the Sydney CBD and major commercial and employment centres of the Lower North Shore, such as North Sydney, St Leonards and Chatswood.

Expressions of interest to develop such mass transit link have been called for by the NSW Department of Transport in order to explore the range of alternative transport options.

It provides an opportunity for the private sector to develop, finance, build and operate a mass transit link between the Warringah Peninsula and Lower North Shore and the Sydney CBD.

Six options have been put on exhibition by NSW Department of Transport. Evaluation of the options is underway. It is difficult, at this stage, to assess the extent of the traffic impact of such a mass transit link to the study area since the schemes present a variety of modes, routes and locations for terminals.

Most of the schemes terminate at or south of Dee Why and only one or two schemes have their terminals at Warriewood Valley. Hence, the impact on the study area will depend on the final selection by NSW Department of Transport.

3.5.2 Bus Services

Existing STA bus services are provided under Commercial Service Contracts. The Contract Region includes Warriewood Valley Development Area. The future bus services in the Warriewood Valley Development Area would be provided by STA. The future demand for bus services in Warriewood Valley could be met by increasing the frequencies of existing services, introducing new services and/or detour of existing services.

Existing bus services in other Development Areas are not provided under any Contract Region. Instead, they are provided on route basis along Mona Vale Road and Powder Works Road. The services are run by Forest Coach Lines.

Hence, a new Contract Region could be drawn up for the four development areas which are not under any current Contract Region. The bus services in this future Contract Region, as indicated by NSW Department of Transport, will be tendered out. The services, thus, could be run by either Forest Coach Lines, STA, or other bus operators, though both Forest Coach Lines and STA will have advantages in providing new services since their depots are in the vicinity of the development areas. Also, services for initial precincts could be provided by extensions of existing services.

Recommended strategies to promote public transport, bus services in particular, discussed further in Section 5.5.

4. FUTURE TRAFFIC IMPLICATIONS

This chapter presents the methodology used in analysing future traffic patterns and discusses the findings in relation to the operation of major roads and intersections.

4.1 METHODOLOGY FOR ASSESSING FUTURE DEVELOPMENT SCENARIOS

A spreadsheet model was developed to compute the projected link traffic volumes after the development of the urban release area. It also calculates the levels of service of road links based on the projected traffic flows.

Another program, SCATES, is used for analysing the future performance of signalised intersections based on the anticipated traffic flows.

We have investigated the future traffic patterns at two stages of the development for the three development scenarios. The first stage is when about half of the ultimate number of dwellings have been developed. This occurs at the end of 6th, 8th and 11th years in the low, medium and high yield scenarios respectively. The second stage analysed is the completion of the whole development, i.e. with the maximum number of dwellings for the whole Ingleside-Warriewood urban release area.

Table 4.1 presents the assumed number of occupied dwellings at the two stages for each Potential Development Area.

TABLE 4.1: ASSUMED NUMBER OF OCCUPIED DWELLINGS AT FIRST AND SECOND STAGES FOR DIFFERENT DEVELOPMENT SCENARIOS						
Potential Development Area	Number of Dwellings					
	Low Yield		Medium Yield		High Yield	
	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
Warriewood Valley	600	600	1,080	1,080	1,560	1,560
South Ingleside	600	945	900	1,701	1,350	2,457
North Ingleside	300	725	600	1,305	1,050	1,885
Chiltern Road	0	630	300	1,134	750	1,638
Wirreanda	0	600	0	1,080	450	1,560
Total	1,500	3,500	2,880	6,300	5,160	9,100

4.1.1 Input Parameters

For the spreadsheet model, input parameters include the development parameters such as the time frame (number of years between now and the design year) and the number of occupied dwellings in the design year.

A breakdown of the dwellings in various potential development areas is required. The annual traffic growth along different sections of the roads is also required. The future background traffic is modelled by applying the growth factors to the existing traffic.

Other user-defined parameters include the trip generation rates and the geographical distribution of the site generated traffic. The data currently adopted in the model were estimated based on the 1991 Household Interview Survey conducted by RTA, as discussed in Chapter 3.

4.1.2 Traffic Generation

The trip rates used in the spreadsheet model were estimated as in Section 3.1. Future traffic generation from the five Potential Development Areas was calculated by applying the trip rates to the number of dwellings in each area.

4.1.3 Traffic Distribution

The geographical distribution of the urban release area traffic was based on the HIS data for the Warringah LGA at the time the survey was conducted (1991). Both external and internal traffic were considered.

External traffic refers to traffic accessing areas outside the former Warringah LGA. The distribution patterns from the site area to various external statistical regions as determined from the HIS data were used.

For internal traffic (within the former Warringah LGA), the distribution patterns for the whole Warringah LGA had to be used in the absence of the detailed zone to zone movements within Warringah.

The traffic count at the intersection of Mona Vale Road and Forest Way was also used as a control for the proportion of traffic entering the intersection.

4.1.4 Traffic Assignment

Traffic generated by each Potential Development Area was assigned onto the road network in the following manner:

- All traffic associated with Ingleside North was assumed to use Mona Vale Road. Traffic generated by Chiltern Road and Wirreanda area were assumed to use Mona Vale Road to access north and west. Traffic to the south would have a 50/50 split between the usage of Mona Vale Road and Powder Works Road.

- Traffic from Ingleside South would travel to the north and west via Mona Vale Road. Traffic heading to the south was assumed to use Pittwater Road via Powder Works Road and Garden Street.
- Traffic from Warriewood Valley would travel via Mona Vale Road to the west. Traffic destined to the south was assumed to access Pittwater Road via Jacksons Road or Garden Street. Traffic to the north would have the option of using Pittwater Road or Mona Vale Road before joining Barrenjoey Road. A 50-50 split between the two routes was assumed.

The anticipated peak hour traffic volumes along major roads in the study area were calculated by adding this traffic to the projected background traffic.

4.1.5 Level of Service Assessment

The future operational characteristics of the road sections (from spreadsheet model) and intersections (from SCATES) were assessed for level of service using the criteria that have been stated in Chapter 2.

The number of lanes in the spreadsheet model are user defined to provide assessment of future widening. Different values can be used for different directions and time periods, so the effects of tidal flow arrangement can also be assessed.

4.2 IMPACT ON TRAFFIC CONDITIONS

4.2.1 Traffic Flows and Level of Service

The projected AM and PM peak hour traffic flows on selected roads under different development scenarios are shown in Figure B4.1 and B4.2 respectively. Table 4.2 summarises the anticipated performance on these roads.

As indicated in the table, Barrenjoey Road will generally operate at LOS D in the peak direction during peak hours while Pittwater Road would operate at generally LOS C/D/E, depending on stages and scenarios, for the section between Barrenjoey Road and Garden Street.

LEGEND:
Morning Peak Hour Traffic
Flow (in vehicles)

Stage 1 Stage 2

Low yield
development
scenario

935

1485

Medium

1100

1970

High

1515

2445

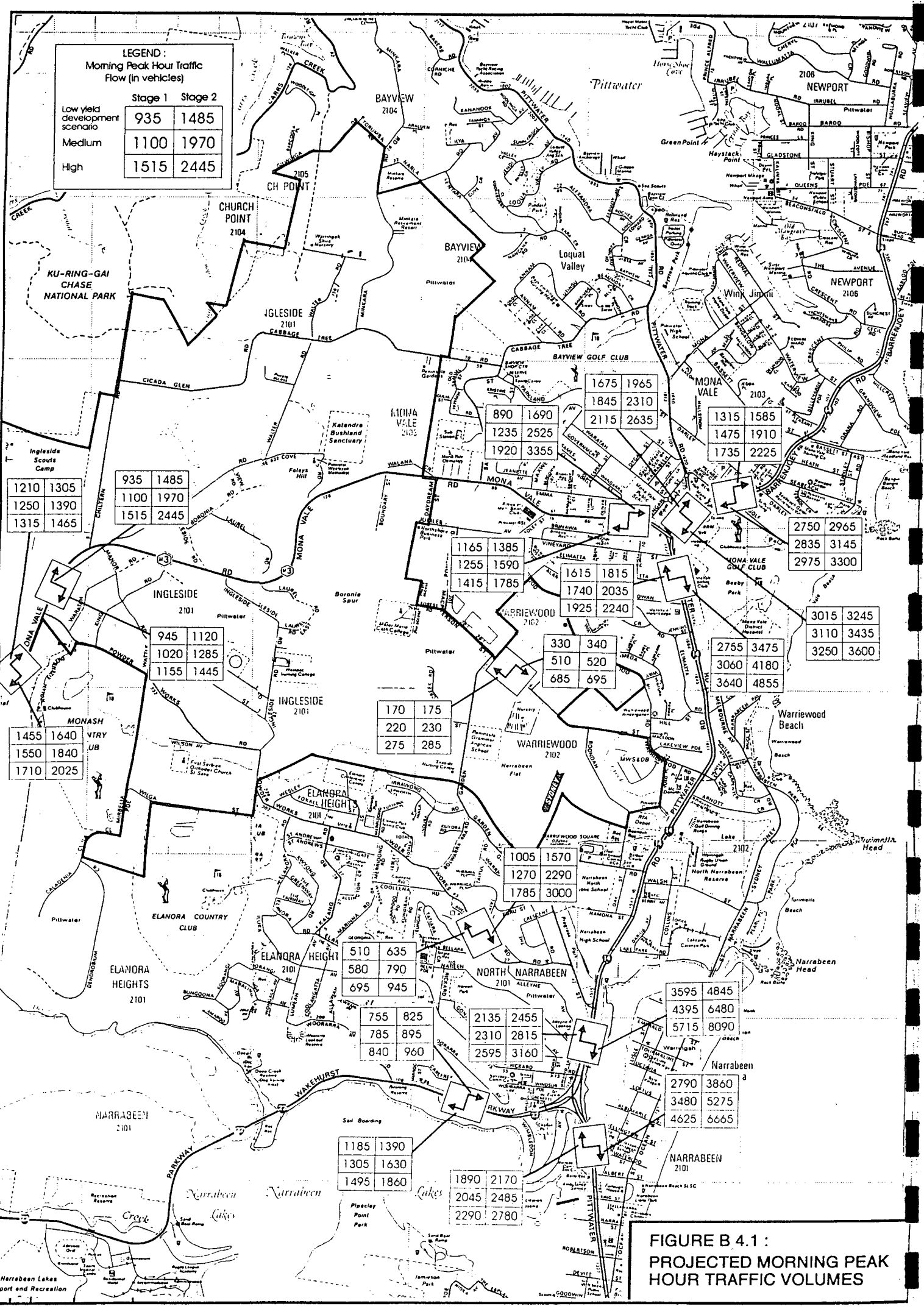


FIGURE B 4.1 :
PROJECTED MORNING PEAK
HOUR TRAFFIC VOLUMES

LEGEND :
Afternoon Peak Hour Traffic Flow (in vehicles)

	Stage 1	Stage 2
Low yield development scenario	935	1485
Medium	1100	1970
High	1515	2445

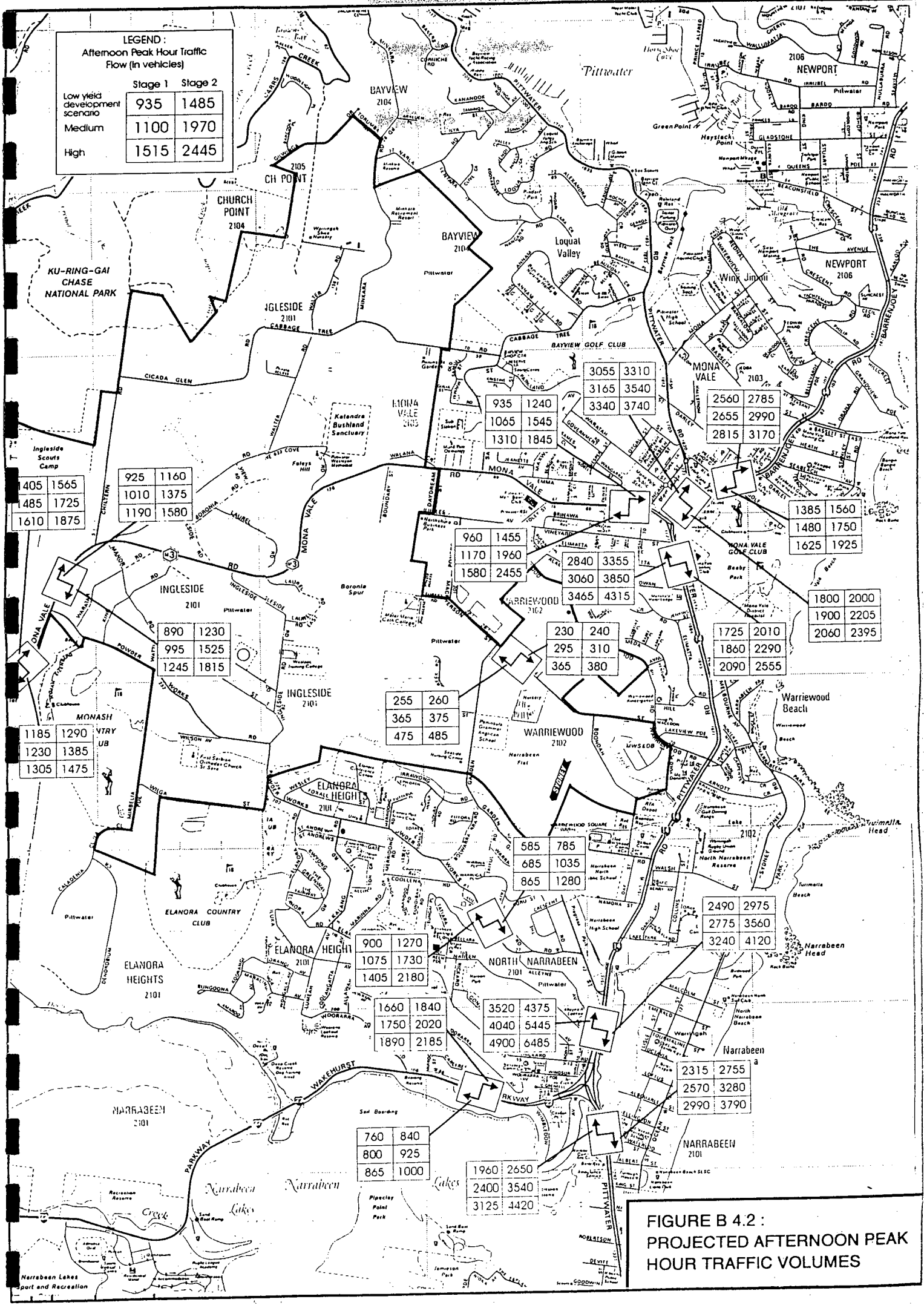


FIGURE B 4.2 :
PROJECTED AFTERNOON PEAK
HOUR TRAFFIC VOLUMES

TABLE 4.2: COMPARISON OF ROAD PERFORMANCE FOR DIFFERENT SCENARIOS AND STAGES							
Road Section	Level of Service at Peak Hours						
	Existing	Low Yield		Medium Yield		High Yield	
		First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
Barrenjoey Rd east of Pittwater Rd							
AM N/B	A/B	A/B	A/B	A/B	C	C	C
AM S/B	D	D	D	D	D	D	D
PM N/B	C	D	D	D	D	D	D
PM S/B	A/B	A/B	A/B	A/B	C	C	C
Pittwater Rd south of Barrenjoey Rd							
AM N/B	A/B	C	C	C	C	C	D
AM S/B	C	C	D	C	D	D	D
PM N/B	D	D	D	D	E	D	E
PM S/B	A/B	A/B)	A/B	A/B	C	A/B	C
Pittwater Rd south of Mona Vale Rd							
AM N/B	A/B	C	C	C	C	C	C
AM S/B	D	D	E	D	E	E	E
PM N/B	D	D	D	D	E	E	E
PM S/B	A/B	C	C	C	C	C	D
Pittwater Rd south of Garden St							
AM N/B	C	C	D	C	D	D	D
AM S/B	D	E	E	E	F	F	F
PM N/B	D	E	E	E	F	E	F
PM S/B	C	D	D	D	E	D	E
Pittwater Rd south of Wakehurst Parkway							
AM N/B	C	C	C	C	D	C	D
AM S/B	C	D	E	E	E	E	F
PM N/B	A/B	C	D	C	E	D	E
PM S/B	C	C	D	D	D	D	E
Mona Vale Rd west of Bungan St ⁽¹⁾							
AM E/B	C	D	E	E	F	F	F
AM W/B	D	E	E	E	E	E	E
PM E/B	C	D	E	D	E	E	F
PM W/B	C	D	E	E	F	E	F
Mona Vale Rd east of Powder Works Rd ⁽¹⁾							
AM E/B	D	D	E	D	F	E	F
AM W/B	D	D	D	D	E	E	E
PM E/B	D	D	E	D	E	E	E
PM W/B	C	D	E	D	E	E	F
Mona Vale Rd west of Wirreanda area ⁽¹⁾							
AM E/B	D	E	E	E	E	E	E
AM W/B	E	E	E	E	F	E	F
PM E/B	E	E	E	E	E	E	F
PM W/B	D	E	E	E	E	E	E
Mona Vale Rd west of Bungan St ⁽²⁾							
AM E/B	-	A/B	D	C	E	D	E
AM W/B	-	A/B	C	C	C	C	D
PM E/B	-	A/B	C	A/B	C	C	D
PM W/B	-	A/B	C	C	D	C	E

TABLE 4.2: COMPARISON OF ROAD PERFORMANCE FOR DIFFERENT SCENARIOS AND STAGES							
Road Section	Level of Service at Peak Hours						
	Existing	Low Yield		Medium Yield		High Yield	
		First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
Mona Vale Rd east of Powder Works Rd ⁽²⁾							
AM E/B	-	A/B	C	C	D	C	E
AM W/B	-	A/B	C	A/B	C	C	C
PM E/B	-	A/B	C	A/B	C	C	C
PM W/B	-	A/B	C	A/B	C	C	D
Mona Vale Rd west of Wirreanda area ⁽²⁾							
AM E/B	-	C	C	C	C	C	C
AM W/B	-	C	D	C	D	D	D
PM E/B	-	C	C	C	D	D	D
PM W/B	-	C	C	C	C	C	C
Powder Works Rd west of Alleyne Av							
AM E/B	C	D	E	E	F	E	F
AM W/B	A/B	A/B	C	C	C	C	D
PM E/B	A/B	C	C	C	D	D	E
PM W/B	C	D	E	D	E	E	F
Macpherson St east of Garden St							
AM E/B	A/B	A/B	A/B	A/B	A/B	C	C
AM W/B	A/B	A/B	A/B	A/B	A/B	A/B	A/B
PM E/B	A/B	A/B	A/B	A/B	A/B	A/B	A/B
PM W/B	A/B	A/B	A/B	A/B	A/B)	A/B	A/B
Wakehurst Parkway west of Pittwater Rd							
AM N/B	C	C	D	C	D	D	D
AM S/B	D	E	E	E	E	E	F
PM N/B	E	E	F	E	F	F	F
PM S/B	C	C	D	C	D	D	D)

Note: (1) With current configuration of one lane in each direction.
(2) Assume widened to two lanes in each direction.

After taking up traffic from Garden Street, Pittwater Road will be operating at LOS F when the medium or high yield development scenario is fully developed.

With the current 2-lane, 2-way configuration, Mona Vale Road will be operating over capacity (LOS F) when about 50% of the development has been completed for the high yield scenario; or about 75% for the medium yield scenario. Even with Mona Vale Road widened to 2 lanes in each direction, LOS E would still be envisaged during the peak hours under the high yield development scenario.

Both Powder Works Road and Wakehurst Parkway are expected to be over capacity near completion of the medium yield development; or about mid-way during the high yield scenario is developed.

Macpherson Street is found to operate satisfactorily at LOS C, even during peak hours in the high yield development scenario.

4.2.2 Operating Conditions at Intersections

The additional traffic generated by the urban release area is not expected to have significant effects on the performance of the intersections along Barrenjoey Road. The intersections will continue to operate satisfactorily at LOS C or better during peak hours under all 3 development scenarios.

On the other hand, Pittwater Road would sustain the major impact induced by the developments. Pittwater Road/Mona Vale Road would be operating at LOS E/F during peak hours upon completion of the medium yield developments. The 3 intersections on Pittwater Road with Coronation Street, Warriewood Road and Jacksons Road are currently operating and will continue to operate at LOS A/B under the low yield development scenario; but will operate at LOS C/D/E for the medium yield and be overloaded for the high yield development scenario.

Further south on Pittwater Road after picking up traffic from Garden Street, the two intersections with Garden Street and Wakehurst Parkway are envisaged to be over capacity when the low yield development is fully developed or at the first stage of the medium yield scenario. Pittwater Road/Waterloo Street will also reach a LOS F in the AM peak hour at completion of the medium yield development.

The intersection at Warringah Road/Wakehurst Parkway is presently operating at LOS F with extensive delays experienced during both AM and PM peak hour. With no improvements implemented, the situation will deteriorate to an unacceptable level. Similarly, Mona Vale Road/Forest Way is already close to capacity at present (LOS E in the AM peak and LOS D in the PM peak). Following the urbanisation of the study area, traffic congestion will be envisaged at the junction during AM peak hour by stage 1 of the low yield development scenario.

The proposed signalised intersection at Mona Vale Road/Powder Works Road is also anticipated to be operating near or over capacity during peak hours at completion of the medium yield development. Further improvements at the junction will thus be required.

TABLE 4.3: COMPARISON OF INTERSECTION PERFORMANCE FOR DIFFERENT SCENARIOS AND STAGES							
Intersection	Level of Service at Peak Hours ⁽¹⁾						
	Existing	Low Yield		Medium Yield		High Yield	
		First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
Barrenjoey Rd / Bassett St AM PM	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B
Barrenjoey Rd / Beaconsfield St AM PM	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B
Barrenjoey Rd / Pittwater Rd AM PM	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B
Barrenjoey Rd / Park St / Golf Av AM PM	A/B A/B	A/B A/B	C C	A/B C	C C	C C	C C
Pittwater Rd / Mona Vale Rd AM PM	C C	C C	D D	D D	F F	D D	F F
Mona Vale Rd / Bungan St AM PM	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B	A/B A/B	C A/B
Pittwater Rd / Garden St AM PM	A/B A/B	C D	F F	F F	F F	F F	F F
Pittwater Rd / Wakehurst Parkway AM PM	D C	D D	F F	F F	F F	F F	F F
Pittwater Rd / Jacksons Rd AM PM	A/B A/B	A/B A/B	A/B A/B	A/B A/B	D C	D C	F F
Pittwater Rd / Coronation St AM PM	A/B A/B	A/B A/B	A/B A/B	A/B A/B	E A/B	A/B A/B	F A/B
Pittwater Rd / Warriewood Rd AM PM	A/B A/B	A/B A/B	A/B A/B	A/B A/B	D C	C A/B	F F
Pittwater / Waterloo St AM PM	A/B A/B	A/B A/B	C A/B	A/B A/B	F A/B	F A/B	F E
Mona Vale Rd / Powder Works Rd ⁽²⁾ AM PM	A/B A/B	A/B A/B	C C	A/B C	F F	C C	F F
Mona Vale Rd / Forest Way AM PM	E D	F D	F E	F D	F E	F E	F F
Warringah Rd / Wakehurst Parkway AM PM	F F	F F	F F	F F	F F	F F	F F

Note: (1) Existing cycle time = 110 seconds. Assumed future cycle time = 120 seconds

(2) This intersection is assumed to be a signalised intersection in the future.

4.3 PUBLIC TRANSPORT USAGE

It is assumed that the levels of bus service provision (include accessibility to bus services, frequencies of bus services, destinations covered by bus network) in the urban release area will be at least equal to the existing bus services in the Pittwater area.

Based on similar travelling characteristics of Pittwater population from the 1991 Home Interview Survey, the anticipated demands of bus services for the urban release area are summarised in Table 4.4.

TABLE 4.4: ANTICIPATED DEMANDS OF BUS SERVICES FOR DIFFERENT DEVELOPMENT SCENARIOS						
Bus Services	Daily Number of Trips					
	Low Yield		Medium Yield		High Yield	
	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
School Buses (From Study Area)	100	220	190	410	340	590
School Buses (To Study Area)	110	250	210	460	380	670
Other Buses (From Study Area)	450	1,020	860	1,870	1,540	2,700
Other Buses (To Study Area)	440	990	840	1,830	1,510	2,640
Total	1,100	2,480	2,100	4,570	3,770	6,600

5. RECOMMENDED STRATEGIES

5.1 LIMITATION ON DEVELOPMENT POTENTIAL

5.1.1 Introduction

The analysis in Chapter 4 demonstrates that the major constraints in the road system are along major arterial roads, such as Mona Vale Road and Pittwater Road. Other roads in the area, from a purely traffic movement/delay point of view, can easily accommodate the three development scenarios proposed. Tables 4.2 and 4.3 show that the congestion along Mona Vale Road and Pittwater Road are primarily caused by the new traffic generated from the developments. The more development, the worse traffic conditions along these two major arterial roads will become.

On this basis, the selection of development scenarios should be considered along side with the possible scope of improvements to the road sections and intersections to accommodate the anticipated volume of traffic.

5.1.2 Options

Based on the analysis of future traffic impacts on the road system, the options available to Council are:

- No limitation on development potential, even though there would be severe traffic congestion or delay.
- Limitation on development potential depending on the scope of improvements of road system, sufficient to accommodate the anticipated traffic.
- Limitation on development potential to keep traffic congestion or delay at acceptable levels.
- Promotion of public transport and ride sharing. The anticipated traffic levels in our analysis are based on the modal split of the 1991 survey. A shift of modal split to favour public transport or ride sharing will reduce the anticipated traffic levels. Thus, a higher development potential could be achieved. However, the difficulties with a public transport system are the high capital and recurrent operating costs compared with the ridership, and the impact on the environment where the track and stations are located, in cases of a light or heavy rail line. In this respect, maximum use should be made of bus services by an active policy of integration of development and transport planning. The development scenarios should encourage higher density of residential developments along routes of frequent bus services.

- Major network improvements to reduce traffic congestion. This option often involves expensive infrastructures such as grade separated intersections, long sections of road widening, overpasses or road tunnels. Due to the funding constraints, long lead times for their provision and environmental factors, these are unlikely to happen.

In connection with the above options, development applications may involve a Section 94 type road improvement levy which is waived in part or full if the building owner successfully implements measures to reduce traffic generation. Part of the condition applied is that the developer should set up their own or engage an outside transport operator which helps to promote public transport service enhancement, subsidised fares, parking management, car pool matching services and subsidised minibus service etc.

5.2 PROPOSED ROAD AND INTERSECTION IMPROVEMENTS

As a result of the traffic analyses, road and intersection improvements are recommended for each development scenario. Such improvements include those already planned which may be required even without the urbanisation of the study area.

5.2.1 Road Improvements

Mona Vale Road

Mona Vale Road is presently operating at LOS D/E during peak hours and is worse for the uphill sections especially in the presence of heavy vehicles. With the intake of extra traffic generated from the urban release area, LOS F would be reached when about 50% of the development has been completed for the high yield scenario; or about 75% of the development for the medium yield scenario. Although LOS E is expected upon ultimate completion of the low yield development, it is already close to LOS F and traffic conditions can become highly unstable.

Interim improvements include the construction of overtaking lanes for westbound traffic on the uphill sections near Addison Road, Powder Works Road and Daydream Street.

Ultimate widening of Mona Vale Road into a 4-lane divided configuration should be implemented before a LOS F is achieved. If funding in the ultimate widening is found to be the major hurdle of the project, an intermediate widening of Mona Vale Road into 3 lanes with tidal flow arrangements to accommodate the peak hour direction of traffic should at least be considered. However a full 4-lane configuration would still be required upon completion of the development for the high yield scenario.

Intersection improvements along Mona Vale Road are separately outlined in Section 5.2.2.

Pittwater Road

A short section of Pittwater Road between Garden Street and Wakehurst Parkway is envisaged to be overloaded when about 50% of the high yield development; or about 80% of the medium yield development has been completed. Unfortunately there appears to be little scope for improvements along Pittwater Road apart from local widening and intersection improvements. It is however suggested that peak hour clearway should be applied on the whole length of Pittwater Road from Wakehurst Parkway to Mona Vale Road.

Powder Works Road

Powder Works Road is presently operating satisfactorily at LOS A/B/C. With reference to the accident records of the road, 45 accidents had been reported in the 3-year period from 1991 to 1993 which makes it ranked just behind Pittwater Road, Mona Vale Road and Barrenjoey Road in number of accidents. However considering its light traffic volumes compared with the other three roads, it is no doubt one of the roads with highest risk of accidents.

Interim improvements include resurfacing of Powder Works Road between Mona Vale Road and Wattle Road, and realignment of the section between Bolwarra Road and Merridong Road where crash rate appears to be highest. Parking control is recommended on Powder Works Road between Alleyne Avenue and Garden Street as site inspection reveals quite a number of vehicles parked on the footway but also occupy some road space further reducing the already narrow carriageway width there. LATM schemes such as mini-roundabouts or construction of traffic islands along Powder Works Road could also be considered. However anything more stringent such as slow points or speed humps are not recommended in order to retain the sub-arterial status of the road. The interim improvements stated are suggested on the ground of traffic operation and safety, but not a consequence of the proposed urban release area.

Following the urbanisation of the area, Powder Works Road is anticipated to operate with LOS F after 60% completion of the high yield development, or 80% completion of the medium yield development. Ultimately, the road needs to be upgraded to 4-lane configuration just south of the Ingleside Road intersection after taking up the bulk of the traffic generated by the South Ingleside development area. As with Mona Vale Road if the ultimate widening into 4 lanes is found not feasible, widening into 3 lanes with a tidal flow arrangement in the lane allocation should at least be considered.

Wakehurst Parkway

Wakehurst Parkway is now operating at LOS D/E during the peak hours. The major problem at Wakehurst Parkway is however at the intersection with Warringah Road. Following the urbanisation of the study area, Wakehurst Parkway will reach a LOS F especially in the northbound direction during the PM peak hour. It is therefore proposed that overtaking lanes be constructed in a regular interval, particularly at the uphill sections. Local widening at

intersections with Wakehurst Parkway to provide turning lanes to minimise conflict between turning traffic and through traffic is also recommended.

Warriewood Road

Warriewood Road should retain its current status as local residential access. To avoid intrusion of external traffic using Warriewood Road as an alternative to Mona Vale Road and then Pittwater Road, some forms of LATM schemes designed at discouraging through traffic using Warriewood Road should be considered. It is also suggested that Foley Road be re-constructed to intersect Mona Vale Road at Emma Street in order to provide better sight distance and thus enhance the traffic operation and safety at the intersection.

Local roads

To serve the future development traffic in the urban release area, some local roads are proposed to be upgraded to collector road or sub-arterial standard. They are summarised in Table 5.1 below.

TABLE 5.1: PROPOSED ROAD HIERARCHY UPGRADE	
Proposals	Justifications
1. Promote Macpherson St east of Garden St and Warriewood Rd (between Macpherson St and Pittwater Rd) to collector road standard	a. To serve future development in Warriewood Valley Potential Development Area.
2. Promote Chiltern Rd, Cicada Glen Rd and Cabbage Tree Rd, Parkland Rd and Park St to collector road (for low yield scenario) or sub-arterial road standard (for medium / high yield scenarios)	a. To serve future development in Chiltern Road / Ingleside North Potential Development Areas. b. Provide an alternative route for east-west movement to the north of Mona Vale Rd.
3. Promote Tumburra St, Harvey Rd, Bungendore St and McCowen Rd (with extension to Chiltern Rd) to collector road standard	a. To serve future development in Wirreanda / Chiltern Road Potential Development Areas.

The design standard for the proposed upgrade of these roads should be in compliance with the "Road Design Guide" by RTA or the relevant NAASRA guidelines.

The revised road hierarchy in the study area is depicted in Figure B5.1.

Table 5.2 summarises the proposed road section improvements required at each stage for each development scenario.

TABLE 5.2: SUMMARY OF RECOMMENDED ROAD SECTION IMPROVEMENTS FOR EACH DEVELOPMENT SCENARIO

Road Section Improvements	Order of Cost ⁽¹⁾ 1994 (\$)	Low Yield		Medium Yield		High Yield	
		First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
Provision of overtaking lanes on uphill sections of Mona Vale Rd	3.7m	Yes	Yes	Yes	Yes	Yes	Yes
Widening Mona Vale Rd west of Powder Works Rd to dual carriageway with 2 lanes in each direction	19m	No	No	No	Yes	No	Yes
Widening Mona Vale Rd east of Powder Works Rd to dual carriageway with 2 lanes in each direction	19m	No	No	No	Yes	Yes	Yes
Resurfacing / Realignment Powder Works Road	1m	Yes	Yes	Yes	Yes	Yes	Yes
Widening Power Works Road south of Ingleside Road to 4 lanes	14m	No	No	No	Yes	No	Yes
Traffic Management Improvement of Pittwater Rd south of Garden St ⁽²⁾	0.1m	No	No	No	Yes	Yes	Yes
Provision of overtaking lanes on Wakehurst Parkway	7.5m	No	No	No	Yes	Yes	Yes
Improvement of Chiltern Rd, Cicada Glen Rd, Cabbage Tree Rd, Parkland Road, Park St to collector road (for low yield scenario) or sub-arterial road (for medium/high yield scenarios) standard	5m ⁽³⁾	No	Yes	No	Yes	No	Yes
Improvement of Tumburra St, Harvey Rd, Bungendore St and McCowen Rd (with extension to Chiltern Rd) to collector road standard	2.5m	No	Yes	No	Yes	No	Yes
Improvement of Macpherson St east of Garden St, Warriewood Rd to collector road standard	1m	Yes	Yes	Yes	Yes	Yes	Yes

Notes: (1) Excludes the costs of land acquisition. No engineering design or geotechnical investigation has been undertaken. The order of cost should therefore be treated as preliminary.

(2) Possible measures include right turn ban into side street during peak hours, clearway, transit lane, tidal flow arrangement, etc. Details of implementation is subject to further analysis.

(3) Assume improvement to sub-arterial road standard.

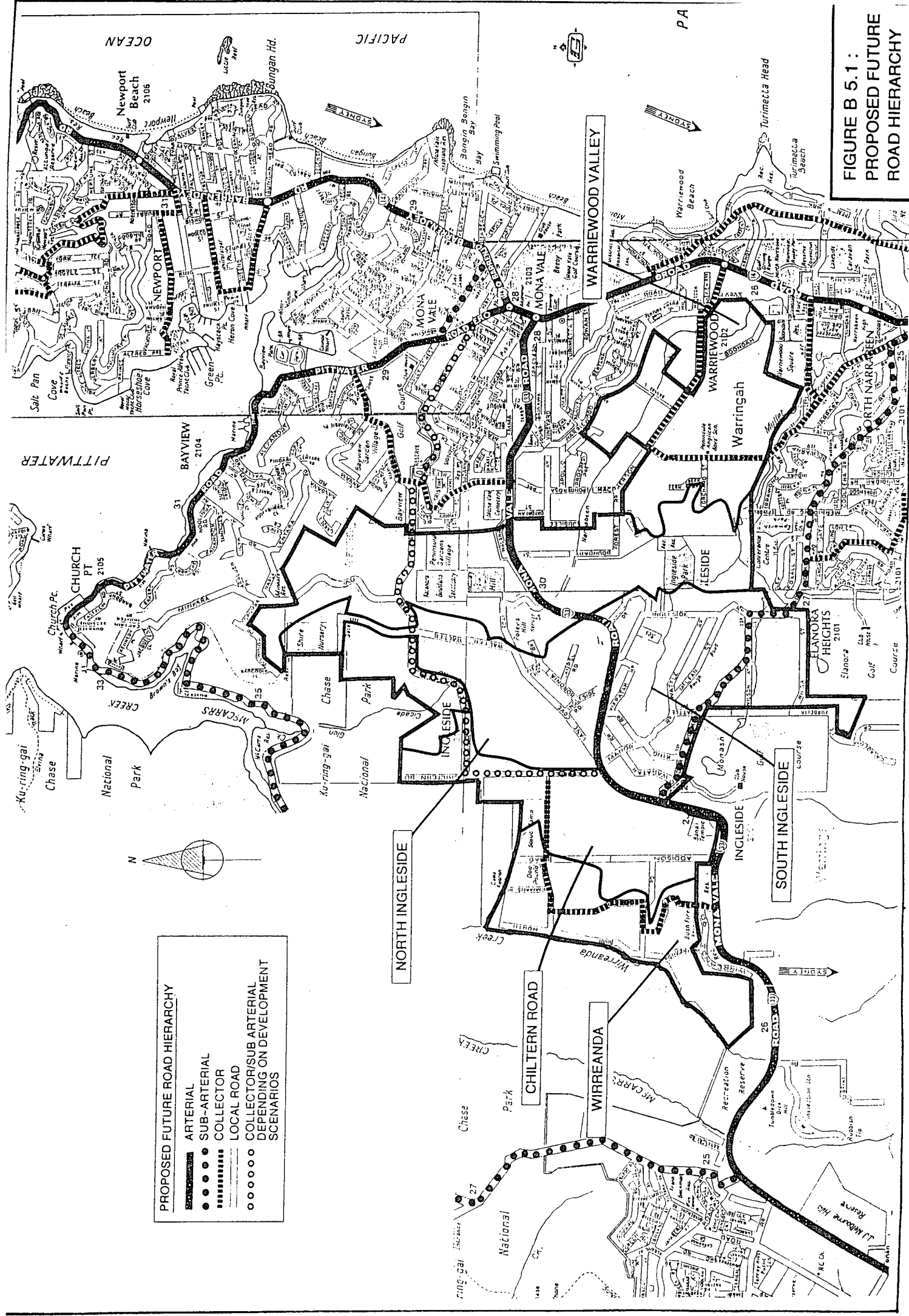


FIGURE B 5.1:
PROPOSED FUTURE
ROAD HIERARCHY

5.2.2 Intersection Improvements

Intersections along Mona Vale Road

Following development of the North Ingleside, Chiltern Road and Wirreanda development areas, current arrangement at the intersections of Mona Vale Road with Tumburra Street and Chiltern Road would not be adequate to accommodate the additional traffic. Signalisation at these two intersections are therefore recommended.

It is suggested that Lane Cove Road west be re-aligned to form a roundabout with Chiltern Road at about 200m north of Mona Vale Road with direct access from Lane Cove Road West to Mona Vale Road denied. Further consideration should be given to full closure of Manor Road at Mona Vale Road or restrict it to a left-in, left-out arrangement.

Ingleside Road may be used as an alternative route by South Ingleside traffic turning right onto Mona Vale Road as well as turning left from Mona Vale Road. A short section of left-turn slip lane is recommended at Mona Vale Road westbound to enhance smooth traffic operation. Right turning traffic onto Mona Vale should be encouraged to use Powder Works Road. As such, a peak hour right turn ban is recommended.

Mona Vale Road/Powder Works Road is currently a NAASRA 'Type B' intersection. Following development in South Ingleside, Chiltern Road and Wirreanda Potential Development Areas, there will be a substantial increase in right turning traffic into or out of Powder Works Road. Signalisation of this intersection is thus proposed.

To accommodate future traffic generated mainly from the North Ingleside development area, the intersection at Mona Vale Road/Lane Cove Road east should be constructed as a NAASRA 'Type B' intersection to protect turning manoeuvres. Possibility of re-alignment of this section of Lane Cove Road east and reconstruction of the junction further east of its current position in order to improve sight distance should also be looked at.

Construction of roundabout at Mona Vale Road/Samuel Street/Ponderosa Parade has been planned in conjunction with the future extension of Ponderosa Parade to Mona Vale Road.

It is suggested that Foley Road be re-constructed to join Mona Vale Road further west at Emma Street. Installation of roundabout at this new intersection is also recommended.

Intersections along Pittwater Road

The existing signalled junctions along Pittwater Road to the south of Mona Vale Road are anticipated to operate over capacity at certain stages depending on development scenarios. Improvements at these intersections may include local widening, provision of slip lane or turning bay, peak hour ban turn, etc. subject to more detailed design.

Intersections along Powder Works Road

Installation of roundabouts are proposed at Powder Works Road with Merridong Road, Kalang Road and Ingleside Road. With increasing traffic using Ingleside Road to access Powder Works Road, minor re-alignment and clearing of trees near the intersection of Powder Works Road/Ingleside Road to improve sight distance should also be considered.

It is also recommended that a NAASRA 'Type B' intersection be constructed at Powder Works Road/ Wattle Road to provide channelisation of traffic and thus reduce the disruption on through traffic by the right turn traffic.

Intersections along Wakehurst Parkway

Intersections along Wakehurst Parkway should be constructed as NAASRA type 'B' intersections to provide channelisation of traffic and thus minimise the disruption on through traffic by turning traffic.

The major congestion at Wakehurst Parkway occurs at the intersection with Warringah Road. At present, the intersection is already overloaded and extensive delay is experienced to get through the junction during peak hours. An improvement scheme to provide two right turn lanes for Warringah eastbound traffic into Wakehurst Parkway has recently been implemented and has resulted in some alleviations to the traffic problem. Other options of improvement including further widening of Warringah Road to provide additional lanes or overpass system connecting Forest Way are under investigation. It should be noted that a comprehensive study on the whole length of Warringah Road will be commissioned by RTA and further improvements to the intersection will be subject to the findings of the study.

Table 5.3 summarises the intersection improvements proposed for different development scenarios.

TABLE 5.3: SUMMARY OF RECOMMENDED INTERSECTION IMPROVEMENTS FOR EACH DEVELOPMENT SCENARIO

Intersection Improvements	Order of Cost ⁽¹⁾ 1994 (\$)	Low Yield		Medium Yield		High Yield	
		First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
Formation of signalised intersection at Mona Vale Rd / Powder Works Rd	0.5m	No	Yes	No	Yes	Yes	Yes
Construction of roundabout at Mona Vale Rd / Samuel St/ Ponderosa Pde (extension)	0.3m	Yes	Yes	Yes	Yes	Yes	Yes
Formation of signalised intersection at Mona Vale Rd / Tumburra St	0.5m	No	Yes	No	Yes	No	Yes
Formation of signalised intersection at Mona Vale Rd / Chiltern Rd	0.5m	No	Yes	No	Yes	No	Yes
Realignment of Lane Cove Rd west end to form a roundabout with Chiltern Rd instead of Mona Vale Rd	0.8m	No	Yes	No	Yes	No	Yes
Provision of short section of slip lane at Mona Vale Rd/Ingleside Rd	0.1m	Yes	Yes	Yes	Yes	Yes	Yes
Construction as a 'Type B' intersection at Mona Vale Rd / Lane Cove Rd east end	0.2m	No	Yes	No	Yes	No	Yes
Re-construction of Foley Rd to form a roundabout at Mona Vale Rd/Emma St	0.8m	Yes	Yes	Yes	Yes	Yes	Yes
Improvement of intersection at Mona Vale Rd/ Pittwater Rd ⁽²⁾	0.2m	No	No	No	Yes	No	Yes
Improvement of intersection at Pittwater Rd / Garden St ⁽²⁾	0.2m	No	Yes	Yes	Yes	Yes	Yes
Improvement of intersection at Pittwater Rd / Wakehurst Parkway ⁽²⁾	0.2m	No	Yes	Yes	Yes	Yes	Yes
Improvement of intersection at Pittwater Rd / Jacksons Rd ⁽²⁾	0.1m	No	No	No	No	No	Yes
Improvement of intersection at Pittwater Rd / Coronation St ⁽²⁾	0.1m	No	No	No	No	No	Yes
Improvement of intersection at Mona Vale Rd/ Forest Way ⁽²⁾	0.2m	Yes	Yes	Yes	Yes	Yes	Yes
Installation of 3 roundabouts along Powder Works Rd	0.8m	Yes	Yes	Yes	Yes	Yes	Yes
Construction of 'Type B' intersection at Powder Works Rd/Wattle Rd	0.2m	No	No	No	Yes	Yes	Yes
Improvement to intersections along Wakehurst Parkway	1.0m	No	Yes	Yes	Yes	Yes	Yes

Notes: (1) Excludes the costs of land acquisition. No engineering design or geotechnical investigation has been undertaken. The order of cost should therefore be treated as preliminary.

(2) Possible measures include right turn ban during peak hours, provision of right turning bay, local widening, tidal flow arrangements, etc. Details of implementation subject to further analysis.

5.2.3 Estimated Costs for Proposed Improvements

The estimated order of cost for each improvement is also presented in Tables 5.1 and 5.2. As a result, the total costs of road and intersection improvements for each stage and scenario are summarised as follows:

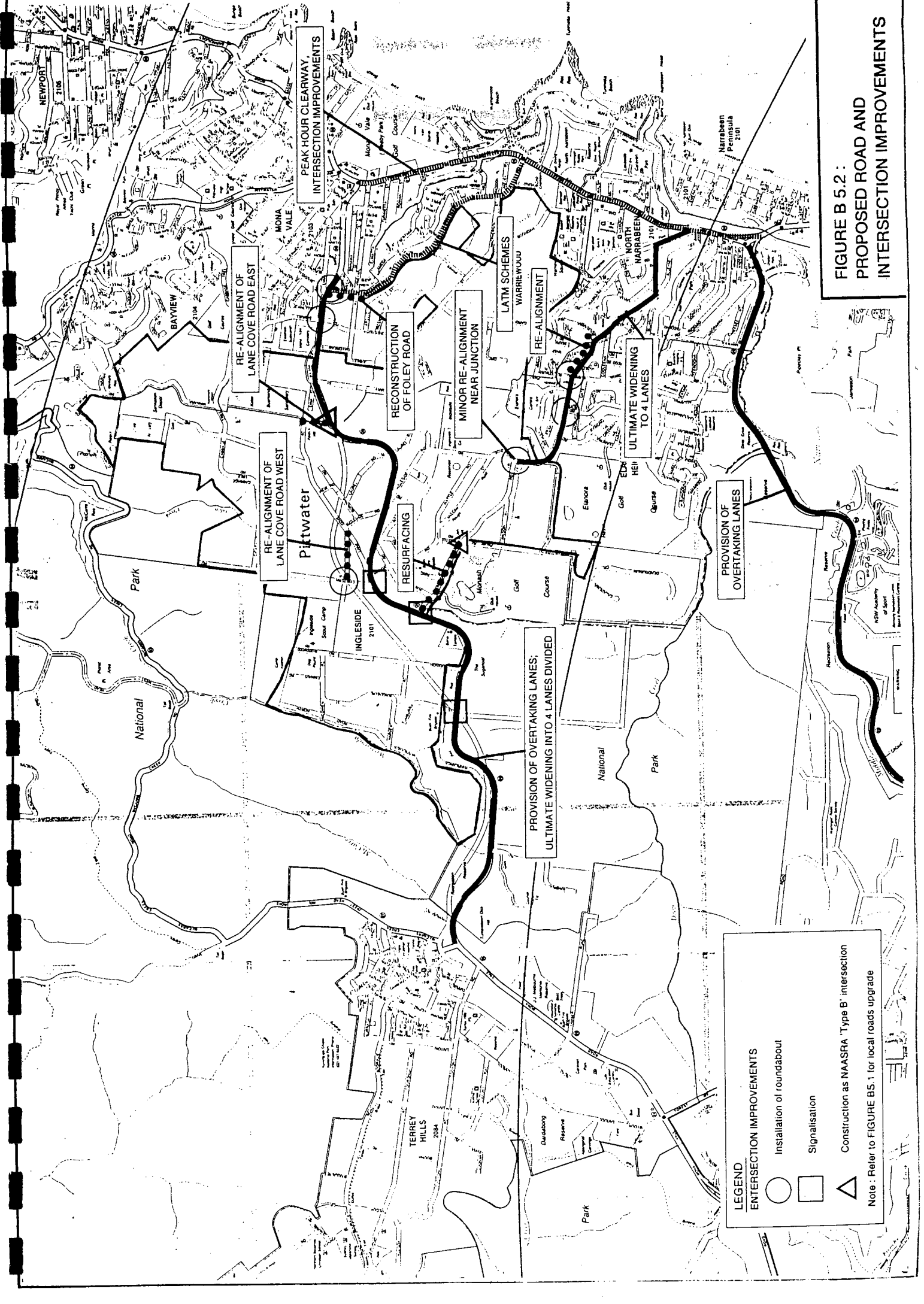
Scenario	Cost for Stage 1 (\$m)	Cost for Stage 2 (\$m)	Total Cost (\$m)
Low Yield	6.9	12.4	19.3
Medium Yield	8.3	71.0	79.3
High Yield	36.6	42.9	79.5

The proposed road and intersection improvements are illustrated in Figure B5.2.

5.3 TRUCK ROUTES

A recommended truck route network is shown in Figure B5.3. It is intended to ensure that trucks travelling through the study area generally remain along arterial roads whilst still providing easy truck access to the industrial areas and shopping centres. Also, it tries to reduce any potential intrusion of trucks into residential areas. It incorporates the following points:

- Existing restrictions to heavy vehicles as described in Section 2.10 and shown in Figure B2.9 should be retained.
- The existing industrial areas in Warriewood Valley are not served by any designated truck routes. It is therefore proposed that Mona Vale Road, Pittwater Road, Ponderosa Parade extension, Macpherson Street and Jubilee Avenue should become a truck route. Trucks should be encouraged to use truck routes instead of other roads. Also, the geometric layouts of roadways used for truck routes should be designed for easy truck manoeuvres. These will include wider traffic lanes (3.7 metres), larger turning radii at intersections, larger radii of curvature along the road and gentler grade.
- Powder Works Road is well connected to the arterial road network. In order to reduce the intrusion into Ingleside South Potential Development Area and Elanora Heights residential precincts by heavy trucks, it is proposed that Powder Works Road should be restricted to a 8 tonne limit. A part-time load limit of 3 tonnes during the night time, say from 10.00 pm to 6.00 am could also be considered.
- The major access roads to Wirreanda, Chiltern Road and Ingleside North Potential Development Area such as Tumburra Street, Harvey Road, Bungendore Street, McCowen Road, Chiltern Road, Cicada Glen Road and Cabbage Tree Road should be restricted to a 8 tonne limit.



**FIGURE B 5.2 :
 PROPOSED ROAD AND
 INTERSECTION IMPROVEMENTS**

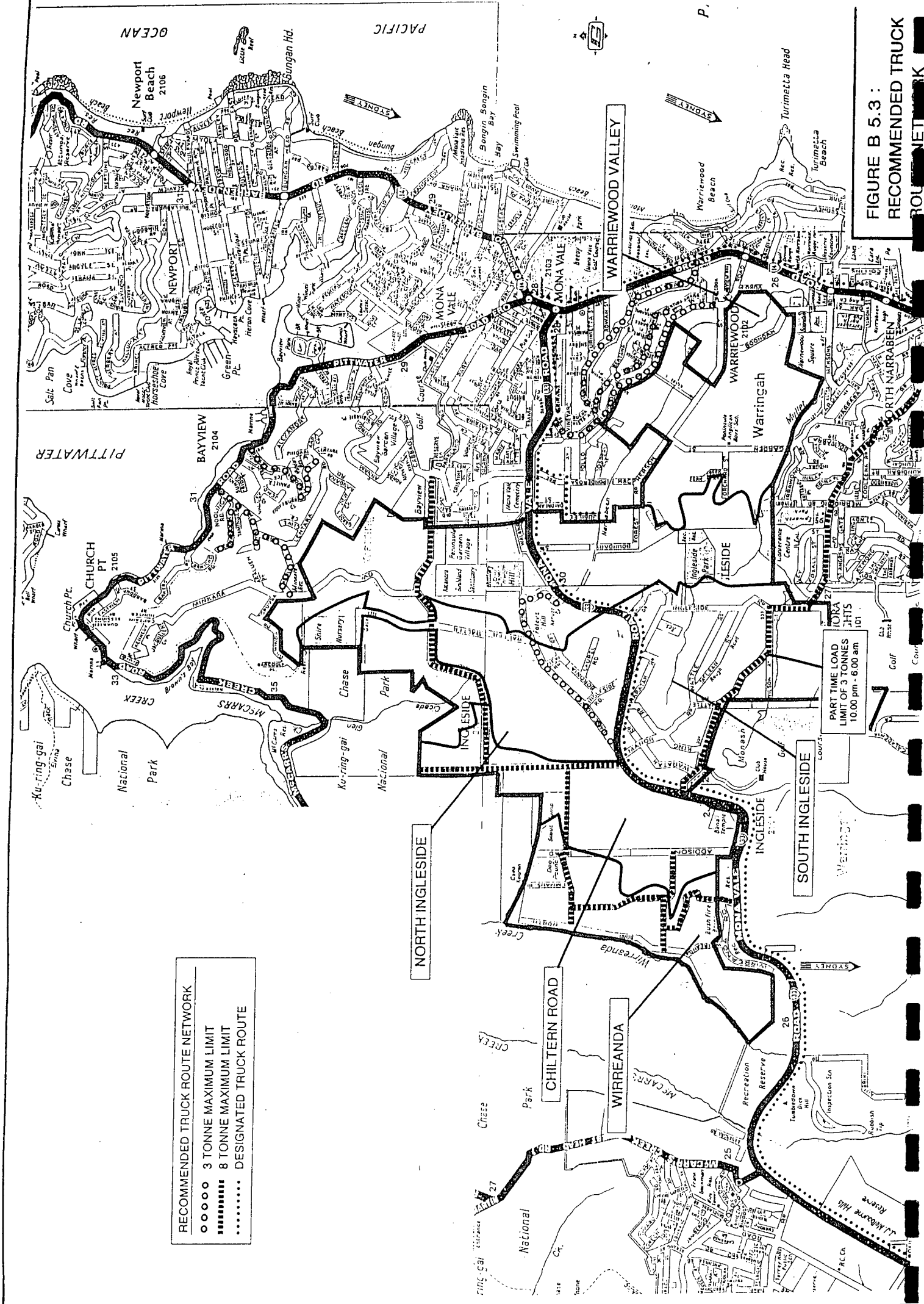


FIGURE B 5.3 :
RECOMMENDED TRUCK
ROUTE NETWORK

It should be noted that the proposed truck network is only relevant to the existing industrial land use pattern. It should be kept under review and suitably amended when major changes in land use pattern occur.

5.4 PARKING

The recent RTA's Guide to Traffic Generating Developments (Issue 2.0, December 1993) has recommended levels of parking provisions for different residential development densities.

The three development scenarios analysed in this report would result in a mixture of dwelling houses and medium density residential flat buildings developments.

For dwelling houses, a minimum of one parking space (preferably two) is recommended. For a dual occupancy on a residential lot, a minimum of two parking spaces is recommended.

In the case of medium density residential flat building (defined as a building containing at least 2 but less than 20 dwellings), the recommended minimum parking requirements are:

- One space per each unit, *plus*
- additional 1 space per each 5 x 2 bedroom units or part thereof *or*
- additional 1 space per each 2 x 3 bedroom units or part thereof
- additional 1 space per each 5 units for visitor parking or part thereof.

5.5 PUBLIC TRANSPORT

Traffic analyses indicate that following the urbanisation of the study area, there would unavoidably be varying degrees of traffic congestion in the existing road system depending on the development scenario. This is largely due to the high car ownership and car dependence in the area. It can be indicated by the fact that currently almost 70% of the households in the area own two or more cars. 1991 HIS data also reveals that 77% of the trips generated by the then Warringah Council (presently Pittwater and Warringah Council) are by private cars compared with around 70% for Sydney as a whole. Since there is only limited scope for road improvements to accommodate the future traffic, it is recommended that public transport should be broadly promoted not only in the future urban release area, but the entire Pittwater Council area.

A number of broad strategies to encourage public transport usage are outlined below. Details of implementation should be subject to more detailed investigations to be undertaken at a later date when further information is available concerning the specific planning and development of the release area.

5.5.1 Warringah Mass Transit Link

Six options have been put on exhibition by the Department of Transport. It is understood that most of these proposals only extend up to somewhere near Dee Why. It is not known whether the additional demand induced by the urban release area has been taken into account in the patronage forecasts for these proposals. It has been estimated in previous section 4.3 that with the current level of bus services, the additional demand for bus services induced by the development under the high yield scenario amounts to 6,600 trips daily. It is however based on a suppressed demand due to the insufficient services provided at present. Assuming a well established mass transit link providing a level of service similar to the train service, the additional demand created by a shift from private car usage would not be less than the demand for bus services (Sydney as a whole has 4.1% of total trips travelled by buses compared with 4.4% by train according to "Road Use in NSW 1992" published by RTA). Considering the whole Pittwater Council, the demand for the mass transit link amounts to almost 20,000 trips daily. It has not yet accounted for the possible shift from the existing bus services to the new mass transit link and the fact that all the numbers are based on the currently suppressed demand for bus services.

While the above estimation is only broad brush at this stage, it indicates that there is a potential demand for a good public transport service in the area. Therefore it is recommended that further consideration should be given to the extension of the future mass transit link to the Pittwater area.

5.5.2 Normal bus services

It is likely that bus services would remain the major public transport means in Pittwater Council area. In order to encourage the usage of bus services, the following strategies are recommended:

- encourage higher densities of residential development along the likely routes of frequent bus services during the planning stage.
- coordinate with Department of Transport and future bus operators to set down future bus routes before detailed road network planning takes place so that bus operation can be allowed for in the road network design.
- staging in development of the urban release area should be more concentrated at one development area first followed by another, preferably in the order of Warriewood Valley, South Ingleside, North Ingleside, Chiltern Road and lastly Wirreanda. So a better level of bus services can be provided with the minimum 'dead running'. Early servicing of initial precincts adjacent to existing lines of route can be achieved by extensions of those routes.

- introduce bus services as early as possible in the urban release areas and start with a 'more than minimum' level of service before critical decisions or travelling habits have been developed by residents.
- roads as proposed to be upgraded including Tumburra Street, Harvey Road, Bungendore Street, McCowen Road, Chiltern Road, Cicada Glen Road, Cabbage Tree Road, Parkland Road and Park Street are likely routes for future bus services. Bus operation should be taken into account in engineering design of the intersections, turning curvatures and alignments along these roads to ensure a smooth and comfortable ride.
- avoid vertical displacement traffic calming devices and allow enough room for bus manoeuvres in roundabout design for LATM schemes along potential bus routes.
- provide sheltered bus-stops, covered walkway accessing bus-stops or future public transport interchange to attract people using bus services.
- construct bus bays along Mona Vale Road and Pittwater Road to minimise the disruption caused by stopping buses to through traffic.
- implement bus priority measures such as transit lanes, exclusive bus phase at traffic signals, right turn ban except for buses. Potential sites for such applications are Pittwater Road and sections of Mona Vale Road. Bus only links could also be implemented where applicable. Closed section of Macpherson Street in the future can be a potential site for this application.

In order to achieve the above, it is suggested that the bus-related facilities and implementation of bus priority measures be included in the Section 94 Contribution Plan as well as Council's capital works program. Early introduction of bus services may require subsidy from DoT. However the possibility of inclusion of such subsidy in a Section 94 type levy in development applications can be considered.

5.5.3 Mini-bus services

Apart from the normal bus services, the introduction of a high-frequency mini-bus network can be considered as another option for the Council to promote public transport usage. The advantages of mini-bus services over conventional bus services include higher frequency, faster speed, more comfortable ride and higher operational flexibility. Smaller vehicle size and easier negotiation of turns make them less restricted by geometric constraints. Mini-buses also cause less road pavement damage and less pollution.

An example, and actually the first of its kind in Australia, is the "Nepean Nipper" mini-bus network introduced by Westbus to the Penrith district. It has been in service since Feb. 1993. Features of this new concept of bus services include:

- Double the original frequency on all bus routes
- Specially designed, more comfortable, 26-seater Mercedes-Benz buses are used. They have lower step-height and allow passengers to sit closer to the driver and front entrance.
- "Hail 'n' Ride" services. The buses will stop not only at the set stops but anywhere along the route when requested or "hailed". In this way passengers can be picked up or set down as close as possible to their front door.
- The separation of school bus travel from normal service buses, wherever possible.

The "Nepean Nipper" services have proved quite successful in boosting public transport patronage and feedback from passengers is positive. As indicated by the bus operator, patronage levels have gradually increased in the past 18 months and have now reached a level which warrants a further increase in frequencies. In some areas frequencies have gone from half-hourly to 10 minutes and this trend is expected to continue. Patronage figures show an increase of 24% on weekdays, and more than 30% on Saturdays and Sundays. According to overseas research, the conversion to mini-buses and the introduction of substantially increased frequencies in some areas has led to patronage levels up to three times higher than conventional buses.

The "Nepean Nipper" bus services are now operating with profits and require no direct government subsidy. Introduction of similar services could be included as one of the conditions for the future bus operator for the new contract area covering the urban release area.

5.5.4 Demand Responsive Bus Operation (TeleBus)

Demand Responsive bus services are meant to provide customer-friendly, door-to-door services for passengers. Initial operation of the TeleBus service started in Chirnside Park area, Victoria in 1978. Since then it has been expanded into other areas. The service is aimed at the second car user, mainly school children and shoppers. Small buses are generally used for their operational flexibility.

A notional fixed route is designed, which passes through "fixed stops", i.e. stops that the bus must pass on each journey. Passengers who wish to board away from the fixed stops phone their request to the despatcher, and the despatcher passes this call request on to the driver through radio. This stop is then included in the appropriate tour with other pickups logged from calls received, and the fixed stop sequence. Passengers who board at the termini, and want to alight away from the fixed stops, advise the driver on boarding. Then they will be included in the total tour stopping schedule as appropriate. A surcharge will be charged for pick-ups and drop-offs away from the fixed stops.

Experience illustrates that in certain areas, particularly where high levels of car ownership are evident, the lower frequency TeleBus services can generate patronage at levels which exceed that developed by normal services in other similar areas. Although the initial TeleBus concept is to ameliorate the inconvenience of low frequency operation with the ability to be called for or dropped at home in order to save vehicle costs and driver time; it is believed that the customer-friendly nature of the service may eventually boost patronage to a level that justifies increases in frequencies, and hence makes the service even more attractive.

Introduction of such demand-responsive bus services can be included as one of the conditions for the future bus operator for the new contract area covering the urban release area. Early introduction of good level of services may inevitably require subsidy. However the possibility of inclusion of such subsidy in a Section 94 type levy in development applications can be considered.

5.5.5 Ride sharing

Besides the promotion of public transport usage, encouraging commuter ride sharing is a relatively low-cost solution to reduce private vehicle numbers on roads and thus improve the efficiency of the road system. Carpool matching programs can be either operated by the developers, community groups or by "third-party" regional rideshare organisations.

In connection with this, future development applications may include a Section 94 type road improvement levy which can be waived in part if the developers successfully provide carpool matching services, either by their own or by contracting "third-party" organisations.

If this option is found feasible, it could be accompanied by the conversion of the kerbside lane on both sides of Pittwater Road into peak hour transit lanes. Special treatments at signalled intersections to favour transit vehicles such as exclusive phase for transit lane could also be implemented.

5.6 BICYCLE AND PEDESTRIAN PLANS

Cycling is increasing in popularity as a means of transport and for recreation. It is therefore essential to accommodate these road users on all existing and proposed road networks and provide necessary facilities to ensure their safety. It is also important to encourage cycling as an alternative to driving which helps reducing road congestion and environmental impacts. A well planned bicycle network can also promote dual mode transport and thus increases public transport usage.

Recommended bicycle strategies in the study area are discussed in the following context.

- (i) Provide adequate parking facilities at common bicycle destinations. Secure long-term parking such as bicycle lockers, cages should be provided at major employment centres, schools and future public transport interchange, if any. Short-term parking facilities such as parking rails should be provided at commercial/shopping centres, particularly Warriewood Square and Mona Vale commercial centre which will remain as the major retail centres in the area as well as the proposed Austlink Business Park.

Such facilities should preferably be protected from weather, especially for long-term parking. As a guideline, long-term parking should generally be located not more than 100 m from the cyclists' destination whereas parking rails for short-term parking should be provided individually every 20 - 30 m throughout strip shopping centres, or in small clusters near entrance to major shopping complexes.

- (ii) Formulate a comprehensive bicycle network which provides safer and more direct access to common bicycle destinations. It should be examined in full details in a bikeplan study as the Bicycle Strategy Study to be commissioned by the Council very soon. Some conceptual network improvements are nevertheless suggested in a broad sense as follows:

- The existing bicycle/pedestrian shared path along Pittwater Road between Narrabeen Lake Bridge and Garden St. has been proposed to be extended into the Lakeside Park. It is suggested to be further extended north to Barrenjoey Road in Mona Vale; and south across the bridge to connect with the beaches in Narrabeen Peninsula.
- The proposed sub-arterial/collector road network north of Mona Vale Road including Tumburra Street, Harvey Road, Bungendore Street, McCowen Road, Chiltern Road, Cicada Glen Road, Cabbage Tree Road, Samuel Street, Parkland Road and Park Street should be facilitated with wide kerbside lanes or shared bicycle/car parking lanes of width 4.0 metres to cater for bicycle movements.
- Bicycle facility, either in the form of wide kerbside lane or shared bicycle/car parking lane on-road, or off-road as pedestrian/bicycle shared path, is proposed at Manors Road, Wattle Road in South Ingleside; and Orchard Street, Ponderosa Parade (extension), Macpherson Street, Garden Street, Jacksons Road in Warriewood. They should be complemented by a bicycle path through existing Ingleside Park connecting Wattle Road and Orchard Street so as to establish a direct bicycle access connecting the two precincts with the Warriewood Square shopping centre.
- Through access for bicycles should be maintained after closure of Macpherson Street to general traffic.

- Intersections along Mona Vale Road should be carefully designed to cater for the potential increase in bicycle traffic crossing the road. In particular, the proposed signalled junction at Mona Vale Road/ Chiltern Road may need pedestrian-activated signal phase to facilitate pedestrians/cyclists crossing Mona Vale Road. Refuge island may also be required. The proposed roundabout at Mona Vale Road/Ponderosa Pde/ Samuel Street should be facilitated with islands, holding rails and pedestrian shared path at corners to ensure cyclist safety.

The recommended bicycle network plan is illustrated in Figure B5.4.

- (iii) Provide wider kerbside lanes (minimum 3.7 metres in width) wherever possible, to accommodate bicycle traffic. Adopt road construction and maintenance practices which result in road surfaces which are free of debris and smooth enough to provide a reasonable level of comfort for cyclists.
- (iv) Implement LATM schemes at internal streets to lower motorists' speed to provide a safe environment for cyclists. By-pass for cyclists should always be considered in LATM design.
- (v) Provide direct bicycle routes to link up future public transport system in the area. Safe routes to schools should also be provided.
- (vi) In future bicycle network design, preference should always be given to on-road rather than off-road facility, especially if intersections are prominent. Research indicates that separation of bicycles from vehicular traffic leads to blind conflicts at intersections. It also encourages wrong-way travel, both on sidewalks or paths and on the roadway at either end, further increasing conflicts.
- (vii) Provide bicycle track systems in open space/recreational areas. They create a very good means for the public to take advantage of the recreational experiences offered by open space within metropolitan areas. They also provide an environment in which young and inexperienced can learn to ride away from motor traffic. Many of them may then use bicycles for non-recreational purposes in the future.
- (viii) Promote cycling through education. These include bicycle education programs in schools, courses for inexperienced, media promotion and campaigns, provision of information, maps and signs to guide cyclists to appropriate routes and facilities, etc.

Pedestrian safety is also a critical issue in new development areas. Internal circulation systems and the external access points should be designed for pedestrian safety thereby minimising pedestrian/vehicle conflicts and providing access to public transport services.

A footpath with desirable width of 3 metres, is normally provided on at least one side of all streets carrying more than 1,000 vehicles/day. If the traffic flow exceeds 1,500 vehicles/day, a footpath is usually provided on both sides of a street.

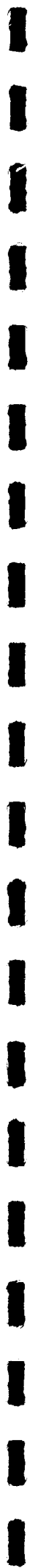
Also, pedestrian crossings on busy, new roads should be located either at traffic signals or at places where traffic speed is reduced to 30 km/h or less. Appropriate measures should be implemented to provide a more direct pedestrian access to bus stops in order to encourage a higher usage of public transport services.

Other measures such as pedestrian overpasses, zebra crossings, pedestrian operated signals, school crossings, audio tactile devices and refuge islands should be installed wherever possible to assist pedestrians to cross busy roads.



APPENDIX B1

**SUMMARY OF TRAFFIC ACCIDENTS
RECORDED IN THE STUDY AREA,
APRIL 1990 TO MARCH 1993**



**Traffic Accident Summary for Study Area and the Surrounding Roads
- 3 Years Period (January 1991 - December 1993)**

Year	No. of Fatal Accidents	No. of Injury Accidents	No. of Towaway Accidents	Total No. of Accidents
1991 Jan - 1991 Dec	2	74	108	184
1992 Jan - 1992 Dec	0	52	75	127
1993 Jan - 1993 Dec	1	93	112	206
Total	3	219	295	517

**Traffic Accidents Summary for Major Roads in Study Area and its vicinity
with Accidents Resulting in Injury or Fatality; January 1991 - December 1993**

	Total No. of Accidents	No. of Fatal Accidents	No. of Injury Accidents	No. of Towaway Accidents	No. of Accidents Involving Pedestrians
Alameda Way	2	0	0	2	0
Annam Road	2	0	1	1	0
Barrenjoey Road	66	0	38	28	10
Bassett Street	1	0	1	0	0
Bristol Lane	1	0	0	1	0
Bungan Street	1	0	0	1	0
Bungendore Street	1	0	1	0	0
Cabbage Tree Road	3	0	1	2	0
Carefree Road	1	0	0	1	0
Chiltern Road	1	0	0	1	0
Cicada Glen Road	1	0	1	0	0
Collins Street	1	0	1	0	0
Coolangatta Avenue	1	0	0	1	0
Coronation Street	3	0	1	2	0
Dendrobium Crescent	1	0	0	1	0
East Darley Street	2	0	1	1	0
Elimatta Road	1	0	0	1	0
Emma Street	1	0	1	0	0
Foley Street	1	0	0	1	0
Garden Street	18	0	6	12	0
Golf Avenue	1	0	0	1	0
Gondola Road	1	0	0	1	0
Heath Street	2	0	1	1	0
Hillcrest Avenue	1	0	1	0	0
Jacksons Road	6	0	3	3	0
Jubilee Avenue	1	0	1	0	0
Katrina Avenue	1	0	0	1	0
Lakeview Parade	1	0	0	1	0
Lane Cove Road	2	0	2	0	0
Loquat Valley Road	1	0	0	1	0
MacPherson Street	7	0	2	5	0
Manor Road	1	0	1	0	0
Maxwell Street	5	0	2	3	0
McCarrs Creek Road	21	1	8	12	1
Melbourne Avenue	2	0	0	2	0
Minkara Road	5	0	2	3	1
Mona Street	2	0	0	2	0
Mona Vale Road	103	0	32	71	4
Mt Pleasant Avenue	1	0	1	0	0

TRAFFIC AND TRANSPORT

Nareen Parade	1	0	1	0	0
Narla Road	2	0	0	2	0
Narrabeen Park Parade	1	0	0	1	0
Natuna Street	1	0	0	1	0
Park Street	4	0	2	2	0
Parkland Road	2	0	0	2	0
Pittwater Road	141	0	68	73	8
Ponderosa Parade	3	0	2	1	0
Powder Works Road	45	1	15	29	0
Rickard Road	2	0	1	1	0
Samuel Street	2	0	1	1	0
Sydney Road	1	1	0	0	1
Taiyul Road	2	0	1	1	0
Turimetta Street	1	0	0	1	0
Vineyard Street	3	0	2	1	0
Wakehurst Parkway	9	0	3	6	0
Walter Road	2	0	0	2	0
Waratah Street	2	0	1	1	1
Warraba Road	2	0	2	0	0
Warriewood Road	15	0	10	5	0
Waterview Street	1	0	0	1	0
Wattle Road	1	0	1	0	0
Wimbledon Avenue	1	0	0	1	0

SECTION C

RETAIL AND SERVICES FACILITIES



1. INTRODUCTION

The provision of appropriate retail and services facilities for the new population of the Ingleside-Warriewood release area is an important aspect of the development of this new community. In common with other studies in this series, this section of the report suggests a strategy to provide the framework for, and to encourage the provision of, retail and services facilities commensurate with growth in the new community.

In this context, **retail facilities** are those which are generally provided in shops, giving residents the opportunity to purchase food and other convenience items, in addition to the whole range of goods consumed by a typical household. In this context, **services facilities** refers to personal and professional services provided by business enterprises normally associated with retail facilities and includes general household support services, some recreation and entertainment facilities, and privately provided medical and other health services.

This report:

- examines the existing and anticipated supply of retail and services facilities which will be accessible to the residents of Ingleside- Warriewood;
- re-examines the nature of the likely future population in the release area and the implications for the provision of such services;
- specifically outlines the scale of future retail facilities which will be required by the release area population under the various agreed development scenarios;1.1 comments on the potential for the early provision of convenience local retailing appropriate to the needs of a developing community;
- outlines the elements of a retail and services strategy to guide future planning of the release area in this respect.

The primary concern in considering a realistic strategy for retail and services facilities provision in a developing release area is the emerging needs of the community and the fact that this demand should be capable of being satisfied at all times in a convenient manner. The location of the Ingleside-Warriewood release area in Pittwater, and as part of the broader northern beaches peninsula, means that some significant opportunities will be available to utilise the well-established existing retail and services facilities. At the same time, a specific strategy for the release area itself must recognise ways in which appropriate additional facilities can be planned for and encouraged to complement the scale of existing accessible facilities.

This analysis recognises that retailing is a particularly dynamic industry, and is subject to rapid change. Any resulting strategy in this field must therefore work towards accommodating the needs of retailing in order to encourage appropriate levels of investment by the private sector in providing facilities for community benefit. This analysis also recognises the need to retain

as much retail expenditure as possible within the Pittwater community in order to assist the development of a diverse base providing jobs and investment in the local area. It must be recognised that the potentially substantial increase in the Pittwater population as a result of full development of the Ingleside-Warriewood release area under the most intense development scenario may provide opportunities to augment the existing provision of retailing and services facilities which will be of benefit to the broader Pittwater community.

This analysis has also been completed having regard to the potential for retail and services facilities to provide a focus for future community life in association with other community facilities in an integrated manner.

As the provision of retailing and services facilities is primarily the responsibility of the private sector, the potential relationship of such with the commitment of public funds to community facilities should remain a significant concern.

2. CURRENT AND ANTICIPATED RETAIL PROVISION

As the Ingleside-Warriewood area is located on the western edge of an established community in Pittwater, there are a number of existing and proposed retail centres to which future residents would have access. This chapter details the nature of these facilities and assesses the degree to which they will be capable of providing for some of the future needs of the Ingleside-Warriewood community.

2.1 WARRINGAH MALL

Located at Brookvale, approximately 9 kilometres south of the Ingleside-Warriewood area, Warringah Mall is the largest existing shopping centre on the northern beaches peninsula, and is therefore of sub-regional significance. Warringah Mall provides the greatest variety of retail opportunities in the region, and contains the following major shops:

• Grace Bros	23,500 m ²
• David Jones	23,500 m ²
• Target	8,400 m ²
• Woolworths Supermarket	5,000 m ²
• Franklins Supermarket	2,000 m ²
• Hardware	2,000 m ²
• Harvey Norman	2,000 m ²

plus more than 140 specialty shops, and a cinema complex.

The total retail floor space of Warringah Mall is in excess of 90,000 square metres of leasable area.

It is understood that proposals are currently being finalised to re-vamp the centre and extend its retail functions. Such improvements would primarily be designed to retain the operating efficiency and attractiveness of the centre, although the proposal suggests an additional 20,000 square metres of retail floor space. Any improvements made to the centre will contribute towards it remaining attractive for a broad range of shopping opportunities for residents from a very wide trade area.

In close proximity to Warringah Mall, the Brookvale area also provides a range of secondary retailing opportunities and supports a broad range of personal and professional services which would also be expected to draw trade from a significant area of the northern beaches peninsula.

2.2 CHATSWOOD

While the Chatswood commercial area is located approximately 15 kilometres south-west of Ingleside-Warriewood, it remains a significant regional centre for the whole of northern Sydney, providing an even greater range of facilities and services than available in Warringah Mall.

There is currently in excess of 130,000 square metres of retail floor space in Chatswood, and although there are no major proposals to significantly expand this area, it is likely that some redevelopment of existing facilities will occur in the foreseeable future, commensurate with the desires of major retailers to maintain their market position. Chatswood is also a major commercial employment centre in the northern Sydney region, and therefore supports a very significant range of business and professional services in addition to retailing.

Major stores in Chatswood, both in planned centres and along street frontages include:

• Grace Bros	25,500 m ²
• David Jones	15,000 m ²
• K-Mart	8,000 m ²
• Target	8,800 m ²
• Coles Supermarket	2,600 m ²
• Franklins Supermarket	1,600 m ²

and more than 350 specialty shops.

2.3 WARRIEWOOD

Located adjacent to the south-eastern corner of the Ingleside-Warriewood release area, the Warriewood Square Shopping Centre contains approximately 18,000 square metres of leasable retail floor space. The centre was opened in 1980 and the major tenants at Warriewood include:

• K-Mart	7,600 m ²
• Coles Supermarket	2,500 m ²
• Franklins Supermarket	1,200 m ²

There are also approximately 60 specialty shops at Warriewood and 900 car parking spaces are presently provided.

Apart from retail facilities, Warriewood provides some services, including banks and medical facilities.

The location of the Warriewood centre means that it could be easily accessed by future residents in some of the Ingleside-Warriewood precincts, notably Warriewood Valley and Ingleside South, provided future internal road networks can assist such access. Warriewood, with its current broad base of retailing, is well positioned to take advantage of population growth in the adjoining release area, and should also be capable of ensuring that early residents have access to significant retail opportunities. These benefits are not available to new residents in many other Sydney urban release areas where significant travel in the early development years is necessary to gain access to a centre which provides a choice of supermarkets and an established discount department store.

The potential role of Warriewood as a major attractor for Ingleside-Warriewood residents should be considered in future planning, provided future access from the release area can be accommodated.

2.4 MONA VALE

The Mona Vale commercial centre is located east of the Ingleside- Warriewood release area and within the established Mona Vale urban area. The centre currently provides a mixture of retail and personal and business services which is unique in this locality. There are approximately 180 retail outlets in Mona Vale and 150 commercial premises. The major retail facilities are:

- Woolworths 4,200 m²
- Franklins 1,500 m²

The Mona Vale centre is therefore more diverse than Warriewood, although its facilities are not as conveniently located inside an enclosed mall environment. The structure of Mona Vale means that facilities are spread over a significant area which is likely to make it a slightly less convenient centre in terms of internal accessibility. However, the choice available to early residents of the Ingleside-Warriewood release area is increased by the potentially direct access along Mona Vale Road to the Mona Vale centre in order to enjoy a further choice in supermarket shopping, and to provide significant opportunities for early access to a large range of existing personal and commercial services. It is estimated that Mona Vale contains approximately 14,000 square metres of retail floor space, and a significantly greater amount of services floor space in its various precincts. The diversity of the centre, and the fragmented nature of land ownership within it, would suggest that future enhancements to the centre might only be achieved on a site-by-site basis.

The potential role of Mona Vale as an attractor for Ingleside-Warriewood residents should be considered in future planning.

2.5 NEWPORT

The retail and commercial centre at Newport, approximately 5 kilometres north-east of the Ingleside-Warriewood area, serves the established residential areas along the northern beaches. Newport contains more than 100 retail premises, and approximately 50 commercial premises, with a total estimated floor space of 15,000 square metres.

Because Newport provides a broad range of convenience retailing opportunities which are largely duplicated in Mona Vale or Warriewood, it is considered unlikely that it would be particularly attractive, given the travel distance and the direction from Ingleside-Warriewood. It is considered more likely that Newport will continue to function as an attractor to residents of Newport and coastal suburbs to its north.

2.6 LOCAL CENTRES

The map at Figure C2.1 shows the Ingleside-Warriewood release area in relation to the centres already discussed at Warriewood, Mona Vale and Newport in addition to indicating the relative proximity of a number of existing neighbourhood or local centres, one to the north and the remainder to the south, which currently serve local convenience retailing needs in established communities.

These local centres have also been surveyed recently, and have the following general characteristics:

- **Bayview** 8 shops with a total floor space of approximately 1,200 m²
- **Elanora Heights** 5 shops and 1 commercial premises occupying some 300 m²
- **Elanora Heights** 15 shops and an equal number of commercial premises with an estimated floor area of 4,500 m²
- **Narrabeen** 28 shops and a small number of commercial premises, totalling less than 10,000 m²
- **Narrabeen** 50 shops including Woolworths with approximately 1,600 m² of retail floor space and a number of commercial premises, totalling more than 10,000 m² of retail floor space
- **North Narrabeen** 16 shops and 4 commercial premises
- **North Narrabeen** 10 shops and 4 commercial premises, totalling some 2,500 m² of floor space.

The retail facilities provided in these local centres of varying sizes may be accessible to some residents of the Ingleside-Warriewood area, although access would be limited because the closest of these centres are located off major roads and central to their existing communities. Early residents of Ingleside-Warriewood who may benefit from these existing local centres would be those who live in parts of Warriewood Valley or South Ingleside which are located in reasonable proximity to one or other of these centres.

2.7 INGLESIDE-WARRIEWOOD

Within the area of the Ingleside-Warriewood release, there are a number of individual retail and services outlets, notably seventeen plant nurseries and one take-away food shop, in addition to several equipment hire and repair establishments.

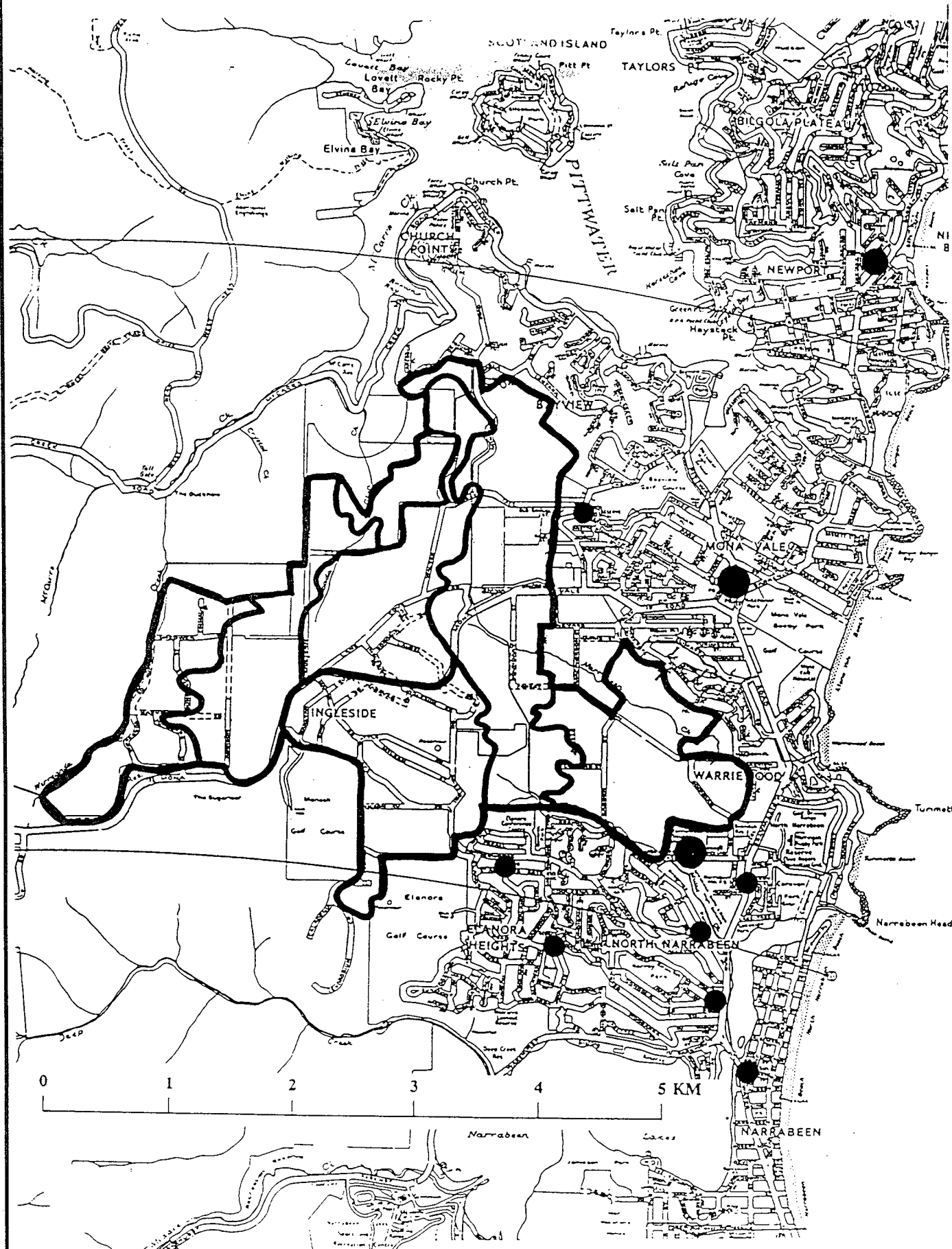


FIGURE C 2.1 :
INGLESIDE - WARRIEWOOD LAND RELEASE
AREA AND EXISTING RETAIL CENTRES

The existing pattern of these retail and services style outlets may not accord with the final development pattern determined by Council for the individual precincts within the release area. It could be anticipated that in preparing detailed zoning plans for the development precincts, Council may choose to pursue a broad development planning pattern which may or may not include the retention of any one of these individual premises as a retail style outlet. None of these uses could however be considered as forming the basis for local-serving convenience retail facilities.

2.8 PROPOSALS

Apart from expansion proposals in relation to centres mentioned above, the only significant proposal which may result in the provision of additional facilities is that currently being considered by Warringah Council for the Austlink Business Park at the intersection of Mona Vale Road and Forest Way (approximately 5 kilometres west of the Ingleside-Warriewood release area).

The proponents suggest a major retail centre should be developed in part of the business park, incorporating a discount department store, a supermarket and specialty shops, totalling some 17,000 square metres of retail floor space. In addition, fast-food outlets and community facilities are also proposed. Documentation presented to Warringah Council by the proponents suggests that the trade area of this centre would incorporate the Ingleside-Warriewood area, in addition to large areas of the northern beaches peninsula. Whilst this proposed centre is not immediately adjacent to Ingleside-Warriewood, it would be located on a major access road from the west, and would have the potential to draw trade from the western parts of Ingleside-Warriewood. Unless the centre incorporates some particularly attractive elements, it is considered unlikely to draw much trade from the eastern and southern precincts in Ingleside-Warriewood, in view of the fact that these areas would have reasonable access to existing discount department store and supermarket facilities at Warriewood and Mona Vale.

It is not possible to accurately predict the way in which the new Austlink centre would function at full development. Its potential significance is therefore likely to be that it could represent an attractor similar in size and composition to the Warriewood centre, and be likely to be particularly attractive to future residents of the western precincts in Ingleside-Warriewood, especially if they use Mona Vale Road to journey between home and work.

At this stage, the development proposal for Austlink can only be monitored carefully as it progresses through planning in order to be in a position to fully assess its potential if the proposal results in a new centre.

2.9 SUMMARY

This chapter has not only outlined the existing provision of retail and services facilities in close proximity to the Ingleside-Warriewood release area, but has also commented on the potential some of these facilities may have to satisfy early demand by new residents for essential facilities. The following chapters examine further possibilities for the provision of retail and services facilities **within** the release area.



3. FUTURE POPULATION AND HOUSEHOLDS

The demographic analysis study has established, by reference to the agreed development scenarios, the possible range of the future populations which might be expected in the Ingleside-Warriewood release area. For the purposes of developing a planning strategy to accommodate future retail and services facilities, the potential number of households in the release area under these scenarios is the appropriate and commonly used variable. This takes account of individual retail expenditure as part of general household expenditure, and allows use to be made of available statistical information relating to household characteristics (drawn from the Census) and indications of household retail expenditure drawn from the available results of the Household Expenditure Surveys which are regularly conducted by ABS.

The development potential, in terms of households (equating to dwellings) derived from the demographic analysis is summarised in Table 3.1.

TABLE 3.1: INGLESIDE-WARRIEWOOD DEVELOPMENT PRECINCTS POTENTIAL HOUSEHOLDS			
Precincts	High	Medium	Low
Warriewood Valley	1,560	1,080	600
South Ingleside	2,457	1,701	945
North Ingleside	1,885	1,305	725
Chiltern Road	1,638	1,134	630
Wirreanda	1,560	1,080	600
TOTAL	9,100	6,300	3,500

These alternative development scenarios present a wide diversity of potentials - with the high scenario capable of supporting almost three times the number of households of the low scenario. Planning for the provision of retail services in this context is made difficult by this variation, as retailing is directly linked to the available number of households in a trade area. Nevertheless, some indications of the possible impacts of the different scenarios can be generated.

Having reference to the detailed small area results from the 1991 Census, and making allowance for housing costs in terms of loan repayments or rentals assists in compiling a picture of likely expenditure on household goods. By linking the Census results with the indications derived from the 1988/1989 Household Expenditure Survey, we have been able to estimate (in 1991 dollar terms) the per household yearly expenditure on a range of retail commodities for particular populations. Our estimates of such expenditure for the existing Ingleside- Warriewood population, for that in the whole of Pittwater, and for the average Sydney household are shown in Table 3.2 below.

TABLE 3.2: ESTIMATED PER HOUSEHOLD YEARLY EXPENDITURE - 1991 (\$)			
Retail Commodity Groups	Ingleside-Warriewood	Pittwater	Sydney Metropolitan
Food for Home	5,660	5,664	5,360
Clothing	2,110	2,104	1,888
Small Household Goods	2,863	2,859	2,632
Large Household Goods	5,211	5,154	4,563
Personal Services	883	878	790
Restaurants/Take-Away Food	2,124	2,119	1,885
TOTAL	18,851	18,779	17,118

The details of the methodology employed by Hirst Consulting Services to derive these expenditure estimates are contained in Appendix C1 to this report.

As Table 3.2 shows, the indications are that household retail expenditure in Pittwater is higher than the Sydney average, and this would be broadly in line with the population characteristics of the area outlined in the demographic analysis. It is also noteworthy that the existing Ingleside-Warriewood population (although very small numerically) accords almost precisely in household retail expenditure with the Pittwater average.

We have assumed that the new residents of the Ingleside-Warriewood release area will exhibit household expenditure patterns similar to those existing in Pittwater. We therefore estimate that (in 1991 dollar terms) each new household in Ingleside-Warriewood would expend approximately \$18,800 per year on retail commodity items.

Although the Household Expenditure Survey, which has been used to derive in part the above figures, provides detailed estimates of expenditure on a broad range of household goods and services, our experience is that using the estimates derived by us for household retail commodity groups expenditure can allow some informed estimates of the need for retail facilities in the context of the comparison with broader community spending patterns.

This analysis, and that in the following chapter, maintains the use of mid-1991 dollar values as a convenience because of the manner in which the data has been assembled from the last Census, the Household Expenditure Survey (suitably updated in dollar value terms) and available information on the provision of retail floor space and turnover in the metropolitan area from the last Retail and Services Census.

It is therefore our estimate that the agreed development scenarios for Ingleside-Warriewood indicate an additional potential retail expenditure of between \$65,800,000 and \$171,000,000 per year depending on the actual development pattern of the release area.

Our observations of shopping patterns within the Sydney metropolitan area suggest that not all of this available household retail expenditure will in fact flow to local centres or retail facilities within the release area itself. The manner in which a future Ingleside-Warriewood household expends its \$18,800 per year on retail items will depend on a number factors, including:

- the composition of the household;
- its access to local facilities;
- shopping habits, such as combining shopping trips to large centres to purchase both convenience items and more expensive household goods;
- the relative attractiveness of local convenience retailing;
- the employment pattern of the household, including the location of work and the nature of the journey between home and work;
- transport options available to the household.

Given this number of variables, but considering the absolute essentiality of the need to shop for food and household items, the following chapter presents an analysis which relates these identified expenditure potentials to data on retail performance to arrive at an estimation of the range of actual retail demand in the future Ingleside-Warriewood community.

4. RETAIL AND SERVICES REQUIREMENTS

The pattern of potential retailing demand is discussed in this chapter in terms of expenditure flows from households within the release area to local centres and to other centres located outside of the local area.

We have found that some 30%-40% of total household retail expenditure is commonly devoted to shopping for frequently purchased food and other convenience items which are generally supplied in local shopping centres. Not all of this expenditure is necessarily contained within a local neighbourhood, as some shopping trips for food and other convenience items will be made to centres outside the immediate local area, because of some of the factors discussed in the previous chapter.

In the case of Ingleside-Warriewood, this means that some of this "convenience" proportion of expenditure might be available to shopping facilities located within the release area and easily accessible to future residents, and some expenditure will flow to larger supermarkets and other food outlets in existing or proposed shopping centres located outside the release area.

The remainder of household retail expenditure (60%-70%) is, in our experience, commonly devoted to spending at shopping centres other than those which are locally accessible, and is expended on purchases of major household goods, most clothing, appliances, furnishings and services which may not be available in local shops. In the case of Ingleside-Warriewood, a part of this remainder could be expected to flow towards the existing centres at Warriewood and Mona Vale, as they contain some higher-order retail facilities. In addition, some of this expenditure will undoubtedly flow to major centres such as Warringah Mall and Chatswood, reflecting shopping trips for substantial household items or for goods which involve an element of "comparison" shopping. Further, the remainder of this higher-order expenditure might flow to centres located near residents' workplaces, or at specific centres which trade in particular household or personal items and have very large trade areas within the metropolitan context.

It is therefore possible to gauge the demand for future local-serving convenience facilities by examining the gross expenditure pattern of future release area households, and by assuming that 25% of available retail expenditure might flow to local centres, in accordance with the above observations. We suggest that setting this proportion at the 25% level is reasonable in the case of Ingleside-Warriewood because of the relative proximity, and relative ease of access to, established supermarkets at either Warriewood or Mona Vale.

Table 3.3 below summarises the range of total retail expenditure which could be available from release area residents within specific precincts, and indicates the retail floor space which might be supported under the three development scenarios given the assumptions included in the table.

TABLE 3.3: INGLESIDE-WARRIEWOOD RETAIL POTENTIAL			
TOTAL YEARLY RETAIL EXPENDITURE (\$)			
	High	Medium	Low
Warriewood Valley	29,328,000	20,304,000	11,280,000
South Ingleside	46,191,600	31,978,800	17,766,000
North Ingleside	35,438,000	24,534,000	13,630,000
Chiltern Road	30,794,400	21,319,200	11,844,000
Wirreanda	29,328,000	20,304,000	11,280,000
TOTAL	171,080,000	118,440,000	65,800,000
Per square metre per year retail turnover		\$3,300	
Percentage of expenditure available to local shops		25%	
RETAIL FLOOR SPACE SUPPORTED (m ²)			
Warriewood Valley	2,222	1,538	855
South Ingleside	3,499	2,423	1,346
North Ingleside	2,685	1,859	1,033
Chiltern Road	2,333	1,615	897
Wirreanda	2,222	1,538	855
	12,961	8,973	4,985

The assumptions included in the above table are as follows:

- The yearly per household retail expenditure of \$18,800 (1991 dollars) was derived as indicated in the previous chapter from an analysis of existing retail expenditure patterns in Pittwater reflected in the 1991 Census, conditioned by the results of the most recently available Household Expenditure Survey;
- Assuming that 25% of total available household retail expenditure might flow to locally accessible convenience shops has been justified in terms of the observed patterns of retail expenditure in the context of areas where significant accessible retailing is already in place;
- The resultant percentage of total available expenditure has been divided by a constant, being the retail turnover per square metre per year of \$3,300, to produce floor space estimates of retail area required to satisfy demand. The turnover figure of \$3,300 has been derived from an examination of the 1991/1992 Retail and Services Census from ABS, and specifically from detailed data on the (then) Warringah local government area which indicated that the average per square metre yearly turnover of all shopfront retailing was \$3,300. The comparable figure for the Sydney metropolitan area was \$3,100. It is noted that the average turnover in food retailing establishments in Warringah in 1991/1992 was significantly higher and that the similar figure for the

Sydney metropolitan area was also higher. Although local retail facilities are likely to concentrate on food items in their commodity list, they are also likely to include personal services outlets and other convenience retailing including newsagents, for which the recorded turnover figures are much lower. It is therefore considered prudent to apply the conservative \$3,300 per square metre turnover figure in this analysis.

The resultant projections in Table 3.3 suggest that local convenience retailing could occupy between 5,000 square metres and 13,000 square metres of retail floor space within the Ingleside-Warriewood release area depending on the development scenario.

The table also shows the potential additional floor space which could be supported by new populations in each of the release area precincts. These individual estimates are not, under any of the scenarios, particularly high, and suggest that only under the high potential development scenario is there the capacity for local-serving retail floor space of any significant size in individual precincts.

The elements and the total of this estimation should be viewed in the context of the following observations:

- Any local centres could also support an additional element of floor space in services (such as medical), possibly up to an additional 10% of total floor space;
- There is a retail industry-wide trend towards larger supermarkets and towards supermarkets offering a wider range of packaged and fresh goods in the one premises;
- Recent changes in retail trading hours, and consequently in shopping habits, have tended towards greater support for larger "integrated" retail facilities, and have tended to act against the small local centre unless it is particularly well run or serves a particular niche in the local market.

Considering these observations, it is our opinion that only limited opportunities may be available within the Ingleside-Warriewood release area to plan for the establishment of small local centres (up to 2,000 square metres retail floor space), and only under the highest potential development scenario, and only if each such centre could be considered as a real community focal point.

Considering current trends in supermarket retailing, we consider it unlikely that a single stand-alone supermarket could be attracted to service the whole of the release area (let alone any individual precinct) except under the high scenario when the total development potential is to be 9,100 households.

Problems in attracting a single supermarket operator are compounded because of the physical nature of the release area and the manner in which the constituent precincts reflect broad topographic and other distinctions which separate the areas one from the other.

We suggest that, to be successful, a single integrated stand-alone supermarket operation designed to service the local community most comprehensively would have to be located on a major traffic route through the release area, in order to be accessible to all local residents and to attract significant passing traffic. It is unlikely that such a facility would be attracted to the area in the early years of development.

It is clear that the demand for additional retail floor space (supported by services floor space) resulting from the anticipated release area population could be accommodated in a variety of ways:

- A proportion of the new demand might be satisfied by additional accessible floor space in existing centres;
- Small local centres might be encouraged in each (or most) individual precincts, provided the high population potential is achieved;
- A single supermarket-dominated centre might be encouraged in one location, central to the whole release area, if it were accessible from all precincts, and if the site also encouraged access from passing traffic, and if the high population potential is achieved.

Bearing in mind the apparent reluctance of retailers to be involved in new small local centres (unless special circumstances apply), and the trends in supermarket size and operating hours, it is our observation that a combination of the solutions outlined above might be most appropriate in Ingleside-Warriewood unless there is a clear and early indication from a supermarket operator of significant interest in a single stand-alone-supermarket centre.

5. CONVENIENCE RETAILING

One of the most significant changes in local convenience retailing observed throughout Australia in the past ten years has been the emergence of the service station-based Convenience Store. Many such outlets have developed as extensions of existing service stations, although it is now common for purpose-built outlets to be proposed. Our understanding is that, as of last year, there were approximately 500 such convenience stores throughout Australia, and that 145 of these are located throughout the Sydney metropolitan area.

As an emerging retail phenomenon, convenience stores deserve consideration as facilities appropriate to new residential communities.

The Australasian Association of Convenience Stores, in an industry survey in 1992, offered the following definition of such outlets:

"A Convenience Store (which may also be known as a C-store or Food store) is a retail business with primary emphasis placed on providing the public with a convenient location to quickly purchase their requirements from a wide range of consumable products (predominantly food or food and petroleum products).

Generally, convenience stores have the following characteristics:

- *While building sizes may vary significantly, typically the size will range from 80 square metres to 350 square metres with a majority being between 170 and 240 square metres;*
- *Generally, these facilities will be modern, well-lit, air conditioned, with extensive equipment - eg. freezer, refrigerators, microwave oven, etc.;*
- *Off-street parking and/or convenient pedestrian access is considered an essential factor;*
- *Provide the public with the convenience of extended hours, with the majority of stores open 24-hours per day, 7 days per week;*
- *Product mix includes grocery items, and also includes items from the following groups: dairy, bakery, snack-foods, beverages, tobacco, health/beauty aids and confectionary;*
- *Products may also include prepared foods, frozen foods, meats, delicatessen items, produce, publications, general merchandise, petrol, liquor and LPG;*
- *The store may offer various services, including automated teller machines (ATMs), cheque cashing, movie rentals, lottery tickets, film processing and videos".*

The public perception of convenience stores might vary slightly from that of the Association, in that it is common for people to regard them as large petrol stations with a small shop attached, however the net effect remains the same - a number of convenient purchases may be

made at the one location, providing a number of income streams to the operator and representing convenience to the local resident or motorist.

Many local councils in the Sydney metropolitan area have placed effective floor space limits on convenience stores, with the general standard now being approximately 240 square metres of retail floor space in the shop component. This appears to accord well with the industry expectation, as the number of stores being proposed is still on the increase. Virtually all of the major petroleum companies now run (or franchise) convenience stores which combine sales of their own brand name petrol and automotive products with shops which have their own identities such as Shell Select, Food Plus or Road Pantry. The abovementioned survey by the Australasian Association of Convenience Stores estimates that the average merchandise sale (over and above petroleum products) is \$5.60 per customer, and that non-petroleum merchandise currently accounts for approximately 40% of all sales.

From our observations of retailing, it is evident that Convenience Stores do not compete directly with any other type of store or centre, but tend to overlap with both mixed businesses (corner stores) and supermarkets. The key distinction between these shop types is the pricing of the goods. As most convenience stores are franchised, or belong to some form of group, they have considerable bulk buying power, reducing their stock cost to levels below those incurred by independent small mixed business operators. On the other hand, because of the limits imposed by space on the volumes of goods available in individual convenience stores, they do not match the purchasing power of supermarkets nor can they match their retail prices. Because of this, the impact of convenience stores on existing large and medium supermarkets has, in our opinion, proved to be very slight, as the typical shopping trip to a supermarket is entirely different to a visit to a convenience store.

The relationship between convenience stores and traditional mixed businesses or corner stores is somewhat different. Convenience stores compete directly with such small businesses and in most cases can out-compete them in terms of price, presentation, hours of operation and parking convenience.

Our observations indicate that where traditional mixed businesses continue to remain viable, it is in cases where:

- the mixed business is located in a busy commercial centre and benefits from a high volume of pedestrian traffic; or
- the mixed business has a particular ethnic basis, catering to specific markets; or
- the mixed business is located well away from convenience stores and attracts a considerable proportion of local pedestrian trade, especially if the mixed business chooses to trade over extended hours.

We have also observed that the general decline in mixed businesses in many parts of Sydney is a result of many factors and we do not consider that the cause should be attributed to the emergence of Convenience Stores. Equally, we observe there has been a decline in the number of smaller older style supermarkets in neighbourhood centres throughout Sydney over the past ten years. We do not consider that this decline has been occasioned because of the emergence of Convenience Stores, but rather that it is related to changes we have already noted in large supermarkets in terms of size, price, presentation and hours of operation.

Given this background, we consider it possible that there may be a positive role for Convenience Stores in the Ingleside-Warriewood release area in terms of providing early satisfaction of convenience shopping needs. An option which we commend for Council's consideration is the possibility of reserving sites within each of the identified development precincts for local convenience retailing and permitting early development thereon of individual Convenience Stores. Depending on property ownership and land availability, an additional site area could be reserved for possible future expansion of these facilities into larger local centres if emergent demand suggests that such could be viable and if there is interest from potential operators. Equally this reserved land could provide Council the opportunity in the future to co-locate other community facilities should monitoring of the needs of the release area population indicate particular requirements.

We emphasise that care must be taken in reserving local sites for convenience retailing operations in the expectation that viable local centres would develop early in the development phase of the release area. Provided however that such sites are located appropriately on the road network to enable access by passing vehicles in addition to facilitating local resident pedestrian access, the likelihood of attracting commercial operators to install a Convenience Store early in the development phase could be considered with greater assurance than expecting a fully developed local centre in the context of the present operation of the broader retail network.

APPENDIX C1

**CALCULATION OF RETAIL EXPENDITURE
AVAILABLE FROM HOUSEHOLDS**

100

100

CALCULATION of RETAIL EXPENDITURE AVAILABLE from HOUSEHOLDS

The calculation is based on the following procedures:

- (i) Households in the study area are appointed into income quintile groups, using the income cut-off points indicated in the 1988 Household Expenditure Survey (updated by CPI to 1991 values) - refer HES Table 1, Cat. No. 6535.0.
- (ii) For each quintile group, potential expenditure is derived by applying the Australian average expenditure on Detailed Expenditure Items. This is multiplied by the number of households in the quintile group.
- (iii) The results for all quintile groups are totalled.
- (iv) The totals are divided by the number of households to give average expenditure per household per year.
- (v) All money values are set at a selected date, as shown on the output tables.

Output tables show average household and total expenditure on:

- (i) detailed expenditure items;
- (ii) selected expenditure categories;
- (iii) retail commodity groups (food, clothing, small household goods, large household goods and personal services).

These are shown on the following pages.

Expenditure Summary
Per Household

Area:
Money Values:
CPI:

Pittwater Council
June 1991
106.0

SELECTED EXPENDITURE CATEGORIES	\$ PER H'HOLD	TOTAL (\$MIL)	NSW AV. \$/H'HOLD
CURRENT HOUSING COSTS	4764	82.0	4241
FUEL and POWER	826	14.2	765
FOOD and NON-ALCOHOLIC BEVERAGES	6385	109.9	5673
ALCOHOLIC BEVERAGES	1185	20.4	995
TOBACCO	432	7.4	411
CLOTHING and FOOTWEAR	2173	37.4	1807
HOUSEHOLD FURNISHINGS and EQUIPMENT	2644	45.5	2204
HOUSEHOLD SERVICES and OPERATION	1605	27.6	1427
MEDICAL CARE and HEALTH EXPENSES	1470	25.3	1281
RECREATION	4240	73.0	3485
PERSONAL CARE	682	11.7	588
MISCELLANEOUS COMMODITIES and SERVICES	627	10.8	532
OTHER CAPITAL HOUSING COSTS (Excluding Mortgage and Purchase Costs)	1494	25.7	1185
TOTAL SELECTED HOUSEHOLD EXPENDITURE (Including Selected Other Payments)	28527	491.2	24596

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Expenditure Summary
Per Household

Area:
Money Values:
CPI:

Pittwater Council
June 1991
106.0

RETAIL COMMODITY GROUPS	\$ PER H'HOLD	TOTAL (\$MIL)	NSW AV. \$/H'HOLD
FOOD FOR HOME	5664	97.5	5162
CLOTHING	2104	36.2	1749
SMALL HOUSEHOLD GOODS	2859	49.2	2489
LARGE HOUSEHOLD GOODS	5154	88.7	4212
PERSONAL SERVICES	678	15.1	735
FOOD RESTAURANTS/TAKEAWAY	2119	36.5	1736
TOTAL	18779	323.3	16082

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Expenditure Summary
Per Household

Area:
Money Values:
CPI:

Pittwater Council
June 1991
106.0

BULKY GOODS RETAIL ITEMS	\$ PER H'HOLD	TOTAL (\$MIL)	NSW AV. \$/H'HOLD
WHITEGOODS	605	10.4	520
TV/AUDIO, HI-FI	639	11.0	541
FURNITURE AND FLOOR COVERINGS	1094	18.8	908
HARDWARE	161	2.8	136
OTHER CAPITAL HOUSING COSTS	1494	25.7	1185
TOTAL	3993	68.8	3289

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Expenditure Summary

Area:
Money Values:
CPI:

Pittwater Council
June 1991
106.0

DETAILED SELECTED EXPENDITURE ITEMS	\$ PER	TOTAL	Syd Av.
CURRENT HOUSING COSTS	HOUSEHOLD	(\$MIL)	\$/HHOLD
Total Current Housing Costs (Selected Dwelling)	4764	82.0	4451
FUEL and POWER			
Total Fuel and Power	826	14.2	789
FOOD and NON-ALCOHOLIC BEVERAGES			
Total Meat and Seafood	1206	20.8	1149
Total Dairy Products, Eggs, Edible Oils and Fats	625	10.8	602
Total Fruit, Nuts and Vegetables	855	14.7	811
Total Miscellaneous Food	832	14.3	798
Total Non-Alcoholic Beverages	480	8.3	438
Meals Out and Takeaway Food	1685	29.0	1497
TOTAL FOOD and NON-ALCOHOLIC BEVERAGES	6385	109.9	5652
ALCOHOLIC BEVERAGES			
Total Alcohol for Consumption Off Licensed Premises	533	9.2	465
Total Alcohol for Consumption On Licensed Premises	435	7.5	389
TOTAL ALCOHOLIC BEVERAGES	1185	20.4	1069
TOBACCO			
Total Tobacco	432	7.4	419
CLOTHING and FOOTWEAR			
Total Men's Clothing	423	7.3	374
Total Women's Clothing	681	11.7	605
Total Children's and Infants' Clothing	220	3.8	203
Total Headwear, Hosiery, Clothing Accessories and Clothing Materials	418	7.2	374
Total Footwear	364	6.3	331
Total Clothing and Footwear Services	69	1.2	62
TOTAL CLOTHING and FOOTWEAR	2173	37.4	1950
HOUSEHOLD FURNISHINGS and EQUIPMENT			
Total Furniture and Floor Coverings	1094	18.8	979
Total Blankets, Travelling Rugs, Household Linen & Hthold Furnishings	471	8.1	413
Total Household Appliances	605	10.4	552
Total Glassware, Tableware and Household Utensils	206	3.5	186
Total Tools, Other Household Durables and Household Durables, Undefined	268	4.6	243
TOTAL HOUSEHOLD FURNISHINGS and EQUIPMENT	2644	45.5	2372
HOUSEHOLD SERVICES and OPERATION			
Total Household Non-Durables	643	11.1	601
Total Other Household Hire and Maintenance Expenses	108	1.9	96
TOTAL HOUSEHOLD SERVICES and OPERATION	1605	27.6	1497
MEDICAL CARE and HEALTH EXPENSES			
Total Accident and Health Insurance	662	11.4	604
Total Practitioner's Fees	477	8.2	434
Total Medicines, Pharmaceut. Products, Therapeutic Appliances & Equipmt.	287	4.9	273
Total Other Health Charges	45	0.8	43
TOTAL MEDICAL CARE and HEALTH EXPENSES	1470	25.3	1355
RECREATION			
Total Television and Other Audio-Visual Equipment	639	11.0	580
Total Books, Newspapers, Magazines and Other Printed Material	396	6.8	364
Total Other Recreational Equipment	608	10.5	529
Total Gambling	254	4.4	224
Total Entertainment and Recreational Services	872	15.0	773
Total Animal Charges and Expenses	300	5.2	279
Total Holiday - Australia (Selected Expenses)	688	11.8	611
Total Holidays - Overseas (Selected Expenses)	482	8.3	418
TOTAL RECREATION	4240	73.0	3779
PERSONAL CARE			
Total Toiletries, Cosmetics and Toiletry Equipment	416	7.2	379
Total Hair Dressing and Other Personal Care Services	266	4.6	246
TOTAL PERSONAL CARE	682	11.7	625
MISCELLANEOUS COMMODITIES and SERVICES			
Total Miscellaneous Commodities	627	10.8	569
OTHER CAPITAL HOUSING COSTS (Excluding Mortgage & Purchase Costs)			
Total Other Capital Housing Costs	1494	25.7	1293
TOTAL SELECTED HOUSEHOLD EXPENDITURE (Including Selected Other Payments)	26527	491.2	26118
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SECTION D

COMMUNITY FACILITIES



1. PROFILE OF INCOMING RESIDENTS AND THEIR NEEDS

1.1 INTRODUCTION

As outlined in Section A - *Demographic Analysis and Model*, it is anticipated that over a 12 to 20 year period, the Ingleside-Warriewood release area may house 10,000-26,000 residents. This is based on a density of 5-13 dwellings per hectare comprised of a mix of both detached and multi-unit housing. The characteristics of these incoming residents, in summary, are:

- mainly second and third home buyers with young families;
- more singles, couples and younger families are expected with medium density development;
- retirees will also be significantly higher than in other new release areas;
- slightly higher proportion of residents from non-English speaking countries than currently evident in the LGA;
- household income will be consistently higher than the Sydney average;
- a significant number of households will have two working parents with dependent children;
- many new residents will be travelling outside the LGA to work.

Of importance to the planning of community services will be the size and characteristics of particular target groups in the new community who will require access to specific services. Also, as the release area is likely to comprise five distinct areas - Warriewood Valley, South Ingleside, North Ingleside, Chiltern Road and Wirreanda - the rate of development and housing mix of these areas will also be important. The major features of both the overall target groups and the five distinct communities, are outlined in the following sections.

1.2 PROJECTED COMMUNITY PROFILE BY TARGET GROUP

The three population scenarios developed in Section A have been used to determine the characteristics of each of the target groups. For the purposes of this report, these scenarios are called low - 5 dwellings per hectare, medium - 9 dwellings per hectare and high - 13 dwellings per hectare.

1.2.1 Infants 0-2 years

It is anticipated that this age group will comprise some 6-7% of the total new release population, peaking at 678 (low), 1,086 (medium) and 1,570 (high) infants by the end of the development period. Yearly increases of some 100 infants can be expected by Year 5 for all scenarios, with the greatest yearly increase likely to occur around Year 10 for the medium and high scenarios (some 128-160 infants). Compared to the existing number of infants in the Pittwater LGA, which in 1991 was 2,012, both the medium and high scenarios represent a substantial increase in the infant population of 50-75% over the development period. Even the low scenario represents an increase of one third of the current infant population.

1.2.2 Pre-Schoolers 3-4 years

Slightly less in size and number than infants, pre-schoolers will comprise 4-5% of the total new release population. Numbers are expected to peak at 446 (low), 789 (medium) and 1,142 (high) pre-schoolers by the end of the development period, with the greatest increases occurring from Year 5 to Year 10. For the high scenario, Year 12 to Year 16 is also a growth period. In 1991, the Pittwater LGA housed some 1,288 pre-schoolers.

1.2.3 School Aged Children 5-9 and 10-14 years

Two of the largest age groups in the projected new release population, school aged children will be evident from the early stages of the release area. Some 80 school aged children will locate in the area in Year 1 regardless of the density scenarios achieved, with this increasing to 600-700 by Year 5 and 1,716 (low), 2,200 (medium) and 2,400 (high) by Year 10.

School aged children will peak at 1,100 (low), 2,018 (medium) and 2,918 (high) for 5-9 year olds and 850 (low), 1,562 (medium) and 2,258 (high) for 10-14 year olds, totalling some 2,800-5,200 school aged children. In 1991, Pittwater's school aged population was 6,625 children (3,271 5-9 year olds and 3,354 10-14 year olds), highlighting the significant growth represented by all scenarios.

1.2.4 Youth 15-19 years

Many of this age group may still be attending school (based on current school retention rates) but given the long development scenario and changing educational programs, this group has been distinguished from the young dependents outlined earlier. Youth in Ingleside-Warriewood are expected to comprise some 6-7% of the total release area population and will be significant in the area from Year 3 (118 youth). Yearly increases of around 100 youth will occur from Year 6, peaking at a 250 youth population increase for the high scenario from Year 10 to Year 11.

The final youth population could range from 661 (low) to 1,753 (high) persons. In the Pittwater LGA, youth comprise 7.7% of the total population or 3,813 persons.

1.2.5 Adults Aged 20-54 years

Adults in the release area are expected to be aged primarily 30-45 years and comprise 30% of the total release area population. This reflects the trend towards older couples with families already started who, unlike the first home buyers prevalent in fringe urban release areas, are second and third home buyers.

With some medium density housing proposed for the release area, it is envisaged that singles and young couples starting families will be attracted to this type of housing. They will be

particularly attracted to the cheaper purchase price of medium density dwellings and also the increased availability of rental stock. National research has shown that medium density development often increases the availability of rental stock with an estimated 40-50% being purchased by landlords for rental accommodation (NHS, *Local Government and Housing*, No. 6 1991). This is further supported by the large proportion of households renting in the existing medium density development in Warriewood Stage 1 which from the 1991 Census was 38% compared to 25% owner-occupied and 28% being purchased. This is much higher than the existing rental component in the Pittwater LGA (19.9%) and Sydney as a whole (25.5%).

1.2.6 Older Residents 55-64 years

The smallest population group in the release area, older residents comprise only 2-3% of the total population. Peaking at 322 (low), 590 (medium) and 854 (high) residents by the end of the development period, it will nevertheless be important to remember that these residents are likely to retire in the area and impact on its aged profile.

1.2.7 Retirees 65-74 years and 75+ years

Reflecting the popularity of the Pittwater LGA for retirees, the release area profile envisages that a significant proportion of the community will be aged 65-74 years and 75+ years. Some 11% of the total eventual population may be retirees, 725 (low), 1,330 (medium) and 1,924 (high) aged 65-74 years and 382 (low), 701 (medium) and 1,014 (high) aged 75+ years.

For all scenarios, numbers will not be significant until Year 6, with the greatest increases occurring in Year 10-Year 11. For the medium and high scenarios, it is projected that by Year 10-Year 11, yearly increases will reach 240-440 new residents for 65-74 year olds and 203-233 residents for 75+ years. Retirees living in the Pittwater LGA in 1991 totalled 3,484 persons aged 65-74 years and 2,814 aged 75+ years.

1.2.8 Total Community

As highlighted earlier, the profile of the Ingleside-Warriewood release area will be significantly different to the current age profile of the Pittwater LGA. The area is likely to house a higher proportion of children than currently living in the LGA, particularly in the 0-2, 3-4, 5-9 and 10-14 year age groups. Unlike many other fringe new release areas, with predominantly first home buyers, significant numbers of children, particularly preschool and school aged children, will be evident in the early years of the development.

Older school aged children and youth will also be significant in the early development phases, which in many other release areas is not experienced until the development is well advanced. The maintenance of a similar proportion of retirees and aged residents in Ingleside-Warriewood, as currently found in the LGA, is also in contrast to the age profile of many other new release areas.

1.2.9 Families - Single Parents, Working Parents

It is anticipated that Ingleside-Warriewood will have a high component of nuclear family households moving into the new community. This is a typical characteristic of new release areas and is evident in similar high-priced new release areas such as Cherrybrook (55% couples with dependent children) and Menai (60%). However, both comparative areas have virtually no medium density development and if Ingleside-Warriewood does provide a wider range of housing types then the composition of households is likely to be more varied.

Analysis of 1991 Census data for housing around MacPherson St, Warriewood, which contains a high proportion of row/town house development indicates that the household structure is very different from those living in detached housing in Pittwater. Couples with dependent children comprise only 36% of families, while couples only comprise 32% and one parent families 6%. Higher density development, such as two/three storey units, also attract a different family structure. Analysis of 1986 Census data for recently developed units in the Warringah LGA indicate that residents tend to be more couples without children, couples starting families and lone person households.

Therefore, with greater range of housing types in the new release area, more single parent families and couples are likely to be attracted to the area.

Households with both parents/sole parent working are expected to be significant also in Ingleside-Warriewood. Currently, the proportion of dependent children with both parents/sole parents working in the Pittwater LGA is much higher than the Sydney average and this is likely to increase further in the new release area. In 1991, 47% of children aged 0-4 years in the LGA had both parents/sole parent working (36% Sydney Statistical Division [SSD]), 61% of children aged 5-12 years (48% SSD) and 68% of children aged 13+ years (55% SSD).

Based on experience from other release areas and the anticipated high mortgages of the majority of incoming residents to Ingleside-Warriewood, children with both parents working is expected to increase for all age groups to 60% for 0-4 years, 65% for 5-12 years and 60% for 13+ years. Therefore, based on the population projections, at full development 613 (low), 1,125 (medium) and 1,627 (high) 0-4 year olds; and 1,268 (low), 2,327 (medium) and 3,364 (high) 5-14 year olds will have both parents/sole parents working.

Currently, Council estimates that the LGA has 1,601 children aged 0-4 years and 3,293 children 5-12 years with both parents/sole parents working.

1.2.10 People with a Disability

The number of residents with a disability is difficult to determine with little research available on the incidence of disability in new release areas. Data available on the incidence of disability within the Pittwater LGA is also difficult to reconcile.

The *ABS Survey of Disability and Ageing 1988*, suggests that in the Manly/Warringah/Pittwater region, 21.64% of the population have some form of disability. This is high compared to many other regions (15.86% for NSW) and probably reflects the large aged population together with large number of specialist schools and support services in the region.

Unfortunately, the more recent *ABS Disability Ageing and Carers survey 1993* is not directly comparable to the 1988 survey (due to different survey questions and definitions) but does provide estimates of handicap and disability within the community. The survey notes that handicap and disability are strongly related to age and is likely to be higher in populations over 45 years. For many release areas, this would significantly reduce the projected disabled population, but for this release area, where the proportion of aged residents is likely to be only slightly less than the LGA average, a significant disabled population can be expected.

Two data sets have been compared from this survey. These are:

- NSW standardised rates of handicap and disability reflecting general trends in the population and
- Estimated proportion of profound/severe/moderate handicap of residents aged over 5 years in Warringah DCS Departmental Area (which includes the Pittwater, Manly, Warringah and Lower North Shore LGA)

The NSW standardised rate of handicap from the 1993 survey was 131 residents per 1,000 population (13%) and the rate of disability slightly higher at 166 persons per 1,000 population (16%). The estimate of handicap for residents over 5 years old for Warringah was 7.2%. Therefore, even based on a conservative estimate of 10% of the population, residents with some form of disability may total 980 (low), 1798 (medium) and 2599 (high) persons in Ingleside Warriewood.

1.2.11 Residents of Non-English Speaking Countries

As outlined in the Section A, the release area is likely to attract some residents from Non English Speaking Countries (NESC), and very much reflect the existing demographic profile of the LGA. Currently 8% of Pittwater residents are from NESC and for Ingleside-Warriewood, this similar profile will result in residents from NESC totalling 784 (low), 1,438 (medium) and 2,080 (high) persons. In 1991, the LGA housed 4,042 residents from NESC.

1.3 FEATURES OF POTENTIAL COMMUNITIES

Based on initial planning of the release area, it appears that the five areas identified in earlier studies may emerge as the focus for the new communities. These may change in the future but, regardless of the boundaries drawn, it is important to consider the physical boundaries and characteristics which separate and shape the communities. At this stage, these communities are:

- **Warriewood Valley**

This area may be developed initially and it has the potential for 600 (low), 1,080 (medium) to 1,560 (high) dwellings. Together with Wirreanda, it may house one of the smallest populations, although when viewed together with the adjacent Warriewood Valley Stage 1, an additional 375 dwellings can be added to this total potential.

- **South Ingleside**

Adjacent to Warriewood Valley, South Ingleside has a potential for 945 (low), 1,701 (medium) to 2,457 (high) dwellings and based on these figures, is the largest community within the release area.

- **North Ingleside**

North Ingleside has a potential for 725 (low), 1,305 (medium) to 1,885 (high) dwellings.

- **Chiltern Road**

This community has a potential for 630 (low), 1,134 (medium) to 1,638 (high) dwellings.

- **Wirreanda**

At the western end of the release area, Wirreanda has a potential for 600 (low), 1,080 (medium) to 1,560 (high) dwellings and is the smallest community proposed.

2. EXISTING PROVISION AND CAPACITY OF SERVICES IN AND ADJACENT TO THE RELEASE AREA

2.1 SERVICES FOR TARGET GROUPS

Community services are delivered in a variety of ways. Commonly, residents travel to an established facility for services (such as a community centre or child care centre) and/or services are delivered to a resident's home (such as Meals on Wheels and Home Nursing). Some services are based in one area but have mobile staff and resources, using a variety of facilities to service resident needs (Early Childhood Health Service).

In considering the availability of existing services for the Ingleside-Warriewood release area, these different service delivery models result in different catchment areas and therefore, differing abilities to service an area.

For facility-based services, it is likely that incoming residents will utilise services located within the existing release area boundaries and those located in the surrounding communities of Mona Vale, Warriewood, North Narrabeen, Elanora Heights and Terrey Hills. This is defined in this study as the Local Service Area (LSA).

Services located in the northern communities of the Pittwater LGA, in Newport, Avalon and Palm Beach are not likely to be greatly used by incoming residents due to the distance from the release area and the likely orientation of usual trips to schools, shopping and work being more south and west along Pittwater Road and Mona Vale Road. This orientation is also likely to result in some residents using services in the adjoining Warringah LGA, particularly child care services which will be in high demand.

Very often domiciliary and mobile services have a larger regional catchment and for Ingleside-Warriewood, these services may be located at Narrabeen, Dee Why and even Manly. These have been considered in the analysis of existing service provision as although they are not located within or adjacent to the release area, this new community will be in the extended catchment areas of these existing services.

Appendix D1 details the existing services/facilities available to residents of the release area and their capacities.

2.1.1 Children 0-4 years

In the LSA, Long day care services are provided by both Council (Warriewood Children's Centre and through Family Day Care) and the private sector (four private centres). In total, an estimated 235 effective full-time places are available within the LSA and all are at capacity (figure may vary slightly due to flexibility of Family Day Care scheme - currently 90 places estimated for Mona Vale and south).

For the Warriewood Children's Centre, 20 children remained on the waiting list after 1994 placements were made and for Family Day Care, 96 children remained unplaced. Importantly, the supply of places for children under two years is confined to Family Day Care with no centre-based care for 0-2 year olds in the Pittwater LGA.

At an LGA level, 419 long day care places are funded. Based on 1991 population figures, this represents 1 place per 8 children 0-4 years or using a target child care population (0-4 year olds with parents working full and part-time), 1 place per 4 children or 261 places per 1,000 targeted children.

Four pre-schools service the area, comprising of one private centre and three community-based kindergartens. Effective full-time places are 121 and all are at capacity, with several centres only taking four year olds. Both Elanora Heights and Narrabeen Community Kindergarten are located in Council-owned buildings. All pre-schools operate 9am-3pm and cater only for 3-6 year olds on a sessional basis.

An occasional care service is located in Warriewood Children's Centre providing 15 effective full-time places for children aged six weeks to 5 years. In 1993, 274 children used the centre achieving an occupancy rate of 95%. With its location in Warriewood Square, the centre provides a valuable service to parents requiring time to shop, go to appointments, interviews and courses on a casual basis. Being the only occasional care service in Pittwater, the standard of provision is 1 place per 220 children aged 0-4 years.

Council provides immunisation services every month at the Mona Vale Early Childhood Centre. The centre also provides a range of health services funded by the Department of Health for parents and pre-schoolers and is staffed by one full-time community nurse. In 1993, the centre's usage was 3,917 occasions of service (visits) and 359 new registrations (new births). This represented 60% of all visits in the LGA and 43% of the total new registrations.

2.1.2 School-Aged Children

There are four public primary schools adjacent to the release area together with one Catholic primary school. Several private schools are also located within close proximity to the release area, such as the Sydney Japanese School, Oxford Falls Grammar School and Loquat Valley Anglican School. Also, it is evident that there is a long established pattern on the Northern Beaches for children to travel to private schools on the North Shore. In 1991, 27% of Pittwater infants/primary students attended non-government schools.

The Regional Demographer for the Department of School Education (DSE) - Metropolitan North has provided the following information on the existing capacities and 1993 enrolments for public primary schools likely to be effected by the development.

School	Capacity	1993 Enrolment
Mona Vale Public	1,000	703
North Narrabeen Public	540	328
Elanora Heights Public	630	482
Terrey Hills Public	510	258

As shown, there is considerable capacity in each of the public primary schools and it is likely that this capacity will be evident when the new release area is developed.

Outside School Hours Care (OSHC) which provides care for children before and after school is operated by Council at two locations - Mona Vale (Kitchener Park) and Elanora Heights (Elanora Heights Public School) with 75 funded places providing care for up to 350 5-12 year olds per week. OSHC also operates at North Narrabeen School under the auspice of the school P&C. At all centres, care is primarily used by families in which both parents/sole parent work.

At an LGA level, this represents a provision of 1 place per 43 children aged 5-12 years or 1 place per 25 targeted 5-12 year olds (those with working parents).

Vacation care programs, aimed particularly at working parents, is provided at Mona Vale (Mona Vale Memorial Hall) and Narrabeen (Narrabeen Youth and Community Centre) and is used by 190 children per holiday.

2.1.3 Youth

Two major public high schools are located adjacent to the release area - Narrabeen Sports High and Pittwater High. Both were built to cater for the large youth population of the area in the 1960s and now have considerable capacity for additional students. Narrabeen has a capacity for 1,240 students with a 1993 enrolment of 666 students and Pittwater a capacity for 1,100 students and 1993 enrolment of 952 students.

As outlined earlier, the Northern Beaches also has a large number of private high schools located within close proximity to the release area, including Marta Maria Catholic High School, Hamazkaines Arshak and Sophie Galstaun School and St Lukes Grammar School. Other North Shore private schools such as Loreto, SCEGGS and Aloysius also have a strong affiliation with the area and in 1991, 36% of all Pittwater secondary students attended non-government schools.

Other services for youth include the Council-operated Holiday Activities Program which attracted 310 children in 1993. The Pittwater Youth Committee also is active throughout the LGA and organises activities such as dances and concerts. The committee is resourced by Council staff.

For youth in crisis, a youth refuge is located at Ingleside which caters for youth from the Northern region of Sydney. Youth counselling services are provided by Mona Vale Hospital

and the Queenscliff Health Centre with both services having little capacity. Adolescent District Officers, provided by the Department of Community Services (DCS) offer outreach services from Manly but due to existing demands, are limited in servicing this area.

2.1.4 Women

Services particularly focusing on women are limited in the local service area with the closest services being the Manly Warringah Women's Resource Centre and Family Support Service at Dee Why. It acts as a regional service, covering all of the Northern Beaches and like most refuges, have clients coming from even outside this catchment area. The service is heavily utilised.

Other services for women, particularly sole parents, women at home with children and isolated older women, are limited.

2.1.5 Aged 55+ years

Services focusing on the aged in the LSA are Meals on Wheels, Community Options, the Narrabeen Seniors Club and the Mona Vale Community Restaurant. Other HACC funded services, including Community Transport and Home Care, are located in Dee Why but do service the Pittwater LGA. Due to the large number of aged/residents with a disability and limited funding, all HACC services are at capacity.

Pittwater also has a concentration of resident-funded retirement village some also having assisted - living units. Very often HACC services also service residents in these complexes, although primarily these villages cater for the "well" aged.

The Nelson Heather Centre at Warriewood is the only Council facility in the LGA which caters primarily for aged residents. This represents a standard of 1 centre per 10,424 residents aged 55+ years.

2.1.6 People with a Disability

Many services focussing on the needs of people who are disabled are located on the Northern Beaches. The NSW Department of Community Services' Disability Team is located at Collaroy (12 positions) while six group homes are located in Warringah LGA. Four respite care homes are available for people with disabilities (again not in Pittwater LGA) together with vacation care programs for children with disabilities. The Mona Vale Rehabilitation and Geriatric Service at Mona Vale Hospital also provides health services for people with a disability.

Community based services in the LGA include Northern Beach Interchange and the Human Resource Centre - Narrabeen while the Department of Human Services and Health operate a

rehabilitation service at Mona Vale. The majority of services however, are located outside the Pittwater LGA and residents must travel to these services or receive domiciliary care.

Consultation with service providers on the Northern Beaches suggests that the Pittwater LGA is under-resourced and that the incidence of disability is much higher than the statistical averages suggest. It is argued that the area houses a higher number of people with a disability due to the large aged population and concentration of disability services in the region e.g. Sunnyfield, Spastic Centre etc. As a result, disability services are at capacity and unable to meet the high demand from the community.

2.1.7 Non English Speaking Born (NESB) Residents

Services for NESB residents are virtually unavailable in the LGA, with only limited services in Warringah and Manly. This lack of ethno-specific services has been identified in a recent report for MAPS, *Multiculture-Multigap* (Williams 1993). CO-AS-IT, a community-based Italian social welfare organisation, works with the Italian community, while some ethno-specific workers are available through particular government departments. However, these programs are limited. Access to English classes, ethno-specific social groups, respite care for the aged etc is difficult.

In the LGA there are several facilities which have been built or are used regularly by the NESB community. These are primarily churches, private schools and clubs such as the Dalmacija Club at Terrey Hills and the Serbian Orthodox Church at Elanora Heights. Several churches on the Peninsula also cater for the Tongan and Korean communities.

2.2 COUNCIL SERVICES AND FACILITIES

Within the LSA of Ingleside-Warriewood, Council owns 12 buildings which are currently used for community activities. As shown in Table 2.1, these comprise of 6 community centres (2 with permanent kindergartens and 1 as an environmental education centre), 1 centre for aged/disabled services, 1 library, 2 early childhood health centres and 2 bushfire stations.

The community centres in the LSA provide for a wide range of activities and on average, are well-utilised. The size of the centres vary from the larger, more traditional Mona Vale Memorial Hall (approximately 700 sqm) the smaller, but very local, Elanora Heights Community centre (273 sqm). The LSA contains the majority of Council's community centres with only 2 additional centres provided in other parts of the LGA. In total, Pittwater LGA has 9 community centres with a current standard of provision of 1 centre per 5,500 residents or 0.09 sqm of community centre space per resident.

Council does own two Early Childhood Health centres within the local service area, although only the Mona Vale centre currently provides early childhood health services for the community. In 1993, the clinic had 3,917 occasions of service (visits). The Elanora Centre is no longer

operated by the Dept of Health and currently this building is used by the Learning Difficulties Support group. In many LGAs, early childhood health services are no longer delivered through single-use facilities and rather are housed as part of purpose-built accommodation in schools or community centres. The service itself is flexible and provided that sufficient community health nurses are available, the service can operate from a range of facilities.

Library services within the LSA are focussed on Mona Vale library (626 sqm), which is the central library facility for the Pittwater LGA. The library is open 65 hours per week, visited by an average of 6,500 users and lends some 9,000 items per week. Together with the smaller, community-based Avalon library (273 sqm) and management/technical services staff based at the Council Chambers (60 sqm), the LGA library provision is 19 sqm per 1,000 residents. Based on the NSW State Library standards for public libraries, the central library at Mona Vale is well below that required to adequately service the Pittwater LGA.

The Nelson Heather Senior Citizens centre is a facility which caters to the needs of aged and disabled residents in the LGA. Housing a range of community-based organisations such as Meals on Wheels, Interchange and the Narrabeen Senior Citizens Club, the centre caters for residents throughout Pittwater. Therefore, as the only aged facility in the LGA, 1 aged centre (700 sqm) for 8,315 residents aged 60+ years is the existing LGA standard. This existing level of provision is considered to be a minimum with the centre at capacity and several aged/disabled services which operate in the LGA being located at Dee Why, Collaroy etc.

Council does not operate any specific youth centres in the LGA with most youth activities being attached to Surf Life Saving Clubs, churches, schools etc. As discussed earlier, Council does run a well-patronised Vacation Care program for local youth and resources the Pittwater Youth Committee. The NSW Police also employ a Youth Liaison Officer in the Warringah District - Northern Region.

Specific art/cultural centres are not available within the LSA nor within the broader Pittwater LGA. However, cultural activities are provided at the Narrabeen Community Centre which runs an art/craft program and the Manly Warringah Evening College based at Narrabeen High School. The LGA also has the very active Artists and Craftsmen of Pittwater community group which runs exhibitions and courses at community buildings and privately-operated centres throughout the community.

Five bushfire stations are located in the local service area. Within the release area, Tumbledown Dick station on Wirreanda Road has only recently been updated while plans for extensions to Ingleside station on Ingleside Road are imminent. Stations close to the release area include Coal and Candle Creek, Terrey Hills and Bush Fire Headquarters on Mona Vale Road, Terrey Hills. Discussions with Bushfire Headquarters indicates that all stations are well-equipped with Ingleside and Tumbledown Dick stations located with the recommended response time zone of 7.1 minutes to all properties in the release area.

TABLE 2.1: COMMUNITY BUILDINGS OWNED BY PITTWATER COUNCIL IN LOCAL SERVICE AREA					CAPACITY TO MEET ADDITIONAL NEEDS	
NAME	LOCATION	EXISTING USE AND GROSS FLOORSPACE	COUNCIL COSTS '93* (average costs)**	UTILISATION		
Elanora Heights Community Centre	Kalang Rd, Elanora Heights	Community centre and kindergarten 273 sqm	\$3,749 (\$3,000)	Primarily daytime use by Elanora Kindergarten, Elanora Players and Dance School - 66.5% in 1992 - 313 users in one week	Used primarily as kindergarten - some capacity for night-time and weekend use	
Kitchener Park Sports Centre	Pittwater Rd, Mona Vale	Community centre and amenities block 360 sqm	\$1,551 (\$3,000)	Used by Pittwater Soccer Club and After school care - 19.2% in 1992 - 150 users in one week	Has capacity for further use but needs upgrading	
Mona Vale Memorial Hall	Pittwater Rd, Mona Vale	Community centre 700 sqm	\$5,117 (\$8,000)	Council meetings, playgroups, ballet, exhibitions and parties - 53.6% usage in 1992 - 558 users in one week	Designed as formal centre with one large hall - difficult to use for more than one activity at a time - little use on weekends and nights	
Nelson Heather Senior Citizens Centre	Jackson Rd, Warriewood	Centre for Aged and Disabled Services 700 sqm	\$13,943 (\$8,000)	Narrabeen Senior Citizens Club, Bridge Club, Interchange. Mostly a focus for aged and disabled residents - 42% in 1992 - 1,145 users in one week	Planned expansion to provide for HACC services, community space for Warriewood Stage 1 and Local History Centre - 7 sqm extension	
Ted Blackwood Narrabeen Youth and Community Centre	Boondah and Jackson Rd, Warriewood	Community centre 500 sqm	\$2,087 (\$5,000)	Youth club, Vacation care, sports activities, church groups and parties - 48.5% in 1992 - 1,152 users in one week	Basic building used primarily for sporting activities	
Narrabeen Community Centre	Woorarra Ave, Nth Narrabeen	Community centre and kindergarten 660 sqm	\$15,612 (\$12,000)	Used by Kindergarten, Youth theatre art, craft, playgroup, music, karate and tennis court - average use 66% - 1,154 users in one week	Primarily a kindergarten with community use - some capacity for additional night activities but extensive usage	
Coastal Environment Centre	Lake Park Rd, Narrabeen	Environmental Education and Info centre 387 sqm	\$84,000 (includes staff, maintenance and general operation)	<ul style="list-style-type: none"> Jan-Sept '94 - 2,573 students and 4,892 general visitors School and TAFE visits, community education, library and venue hire 	Some capacity for further use	
Mona Vale Library	Park St, Mona Vale	Library services 626 sqm	\$721,469 (includes staff, books, maintenance etc) (\$14,000)	Average usage of 6,500 people per week + 9,000 loans per week	At capacity based on NSW Library standards - Council survey indicates need of more library services	
Mona Vale Early Childhood Health Centre	Park Rd, Mona Vale	Children health services 110 sqm	(\$6,000)	1993 - 3,917 visits	Has capacity for additional sessions if staff available	
Elanora Early Childhood Health Centre	Kalang Rd, Elanora	Learning Difficulties Support group 100 sqm	(\$6,000)	Not used for ECH but for community office space	Council currently assessing the possible uses for this building	
Tumbledown Dick Bushfire Brigade	Tumburra St, Ingleside	Volunteer bushfire brigade 100 sqm	\$513 (\$5,000)	Well used	Considers service can meet additional needs	
Ingleside Bushfire Brigade	King Rd, Ingleside	Volunteer bushfire brigade 180 sqm	\$91 (\$4,500 but planning \$80,000 refurbishment with training room and staff facilities)	Well used	Considers service can meet additional needs	

* 1993 costs including utilities, routine and programmed maintenance

** Average annual maintenance estimates provided by Council's Building Services Manager

2.3 GENERAL COMMUNITY SERVICES

In addition to catering to the needs of particular target groups, community services are also provided to meet the broader needs of the community. Pittwater Council provides a range of community facilities and services to its residents but the State and Federal governments, community-based organisations and private non-profit organisations are also actively involved in the provision of community services.

2.3.1 Health

Health services in Pittwater are primarily delivered by the Mona Vale District Hospital and Community Health Service. Mona Vale Hospital has a 170 bed capacity and a population of some 200,000 residents within its existing service area. It is part of the North Sydney Area Health Service (NSAHS) which also includes Manly Hospital and Royal North Shore.

Community health services are provided at the Mona Vale Community Health Centre and also through the Queenscliff Family and Child Health service. As outlined earlier, Early Childhood Health services are provided at Mona Vale.

Both hospital and community health services in the NSAHS are under particular pressure at present (as with all health services in established areas) with government priority being given to the reallocation of resources to other communities with larger populations and less health resources. This has put pressure on established health services in the area.

2.3.2 Education

In addition to the primary and high schools offered both through the public and private school education system (these are discussed in 3.1.2 and 3.1.3), education for the broader community is primarily through the adult education courses run by Manly Warringah Community College and the Northern Sydney Institute of TAFE.

The Manly Warringah Community College currently provides classes in the LSA at Narrabeen High with classes also at Forest High and Barrenjoey High. Discussions with the college indicate there is capacity for additional classes at most schools in the area.

For vocational training, the Northern Sydney Institute of TAFE have six colleges - Crows Nest, Hornsby, Meadowbank, North Sydney, Ryde and Northern Beaches (comprising of Seaforth and Brookvale). The Institute caters for 10,000 students per annum with an effective full-time enrolment of 3,000 students. Discussions with both the Principal and Manager- Planning and Evaluation indicate that the Brookvale college has some capacity for additional students.

In addition to these services, the Northern Beaches Learning Disabilities Support Group at Elanora assists students in the local community. Local community centres also provide education such as local history resources and family history courses. The University of the Third Age (U3A) runs a range of courses at the Nelson Heather Senior Citizens centre.

2.3.3 Support

The State and Federal government provide direct support services through their regional Northern Beaches offices. The State Department of Community Services has offices at both Collaroy and Manly. The Federal Department of Social Security at Dee Why provides pensions and benefits to residents who may be unemployed, single parents, people with a disability and/or carers. The Commonwealth Employment Service Job Centre is located at Brookvale.

Operating as an outreach of Chatswood Skillshare, Northern Beaches Skillshare (located at Dee Why) and the Human Resources Centre at Narrabeen provide targeted skills training for unemployed residents of Warringah and Pittwater. Funding is provided through the Department of Employment, Education and Training.

Support services are also provided through community-based organisations with the Manly Warringah Pittwater Community Information and Service Centre (CISC) being a major provider of support services to residents of the Northern Beaches. Although not located in Pittwater LGA, the service has two offices locations (one at Dee Why and the other at Manly) together with a mobile information van which travels throughout the community. CISC auspices a wide range of services, attracting funding from government bodies and facilitating service provision throughout its service area. These services include information and referral; volunteer training and placement; HACC management; financial counselling; legal advice; taxation advice; and a meeting place/office space for 8 community-based services.

Centacare Family Support service at Mona Vale provides counselling services for couples and families in crisis and is auspiced by the Anglican Church. Lifeline, St Vincent de Paul, the Salvation Army, Lone Parents Family Support Service and Marriage Guidance NSW also service the Northern Beaches.

2.3.4 Religion

Churches provide a valuable resource to many members of the community and are often the basis for support activities such as youth groups, aged activities etc. Five churches are actually located within the release area - the Baha'i Temple, Jehovah's Witness at Ingleside, Ingleside Baptist Church, Serbian Orthodox Church and Kerugma Church. Elanora Heights Uniting Church is on the edge of the release area. Other mainstream churches are primarily located in Mona Vale, including the Sacred Heart Catholic Church and Mona Vale Anglican Church, and Terrey Hills, with St Anthony's in the Fields Catholic Church, St Andrews Anglican Church and the Uniting Church. Narrabeen Baptist Church is located near Wakehurst Parkway, Narrabeen.

Given the number and range of existing churches in the LSA and based on information gained from Church representatives at the community consultation (see Appendix D2), there appears to be some capacity within the existing churches.

2.3.5 Other Government Services

Direct service provision by other government services which must be considered in the planning of Ingleside-Warriewood are:

- **Police** - two stations currently service the release area which is located within the Warringah District- Northern Region. These are Mona Vale station on Pittwater Road, Mona Vale which has a service catchment of some 39,000 residents and Collaroy station on Ramsay Street, Collaroy with a service catchment of some 31,000 residents. Tourism and the attraction of the beaches also impacts on the police requirements in the area (the Warringah Command quoted a Warringah Council estimate of 530,000 visitors to the beaches during January 1993).

Currently the patrol boundaries and policing services of the Warringah District are under review with possible redistribution by the NSW Police Service. Crime rates in the area are low compared to many other districts while both existing stations are poorly located in old-style cottages. Discussions with the District Command indicate that the current police provision in the area is at capacity although this is yet to be confirmed by the Establishment Branch, NSW Police Service.

- **Fire Brigade** - the NSW Fire Brigade has a 1 bay station in Harkeith St, Mona Vale. Other stations are also located at Narrabeen, Forestville and Avalon. Discussions with the North Zone Commander indicates that the current service has no capacity (all new stations have a minimum size of 2-3 bays) and is not suitably located to service the release area. The service is required to have a 7.1 minute response time, but seeks to achieve better service delivery through detailed assessment of fire hazards and optimum locations.

Currently, Ingleside-Warriewood is in the catchment area of both the NSW Fire Brigade and the Department of Bushfire Services.

- **Ambulance Services** - existing ambulances stations are located at Narrabeen (intensive care), Avalon, St Ives (intensive care) and Belrose. The NSW Ambulance Service has a response target of under 4 minutes although this varies depending on weather, road conditions etc. Pittwater is located in the Northern District which extends from the Harbour Bridge to Doyalson. Discussions with the Acting District Superintendent indicates that the area has some capacity and that the existing stations are well-located to respond to the release area. However, this capacity may be exceeded if the population

profile of the area houses a greater number of aged. Ambulance usage by established families tends to be moderate.

- **State Emergency Services** - based at Aumona St, Terrey Hills, this State Emergency Service centre services the Pittwater and Warringah LGAs. Its current facilities are limited and the service is reviewing its provision in the area.
- **Australia Post** - there are 5 post offices located in the local service area, with Warriewood and Mona Vale being the most accessible to the release area. Australia Post consider these existing post offices have capacity and that desirable locations for post offices and post-point shops (only sell stamps etc but no payment of bills) are in shopping centres and major workplaces.
- **Telecom** - regardless of the high socio-economic profile of residents projected for this release area, the need for public phones will still be evident. Demand may occur from new home buyers who are awaiting telephone installation; tradespeople working in the area; visitors to the community; children requiring pick ups from community buildings or bus stops; and residents with faulty services. Regardless of the level of private telephones, public telephones still provide a vital communication service and must be provided within a new community. Currently, public phones are located in Warriewood Square, Mona Vale shopping area and along Pittwater Road. No public phones are currently located in the release area.

3. PLANNING AND PROVISION OF COMMUNITY SERVICES IN COMPARATIVE RELEASE AREAS

3.1 INTRODUCTION

In preparing the demographic projection for the Ingleside-Warriewood Release Area, four existing profiles have been used as base models. The new areas used are Glenhaven (Baulkham Hills LGA), Menai (Sutherland LGA), Cherrybrook (Hornsby LGA) and the existing medium density development in Warriewood Stage 1.

Research has been undertaken in two of these areas to investigate and document the experiences of Council and the community in the planning and provision of community services. It is considered that these experiences can be used, together with information about the needs particular to Ingleside-Warriewood, to form a comprehensive base for service provision. Menai and Cherrybrook have been chosen as the two comparative release areas.

3.2 DEMOGRAPHIC PROFILES OF THE COMPARATIVE RELEASE AREAS

3.2.1 Menai

Comprised of the neighbourhoods of Alford's Point, Bangor, Illawong, Lucas Heights, Menai and Woronora, this development began in the early 1970s. It has more than doubled its population in the 1980s and by 1991 had experienced an inter-censal growth rate of 38% (an increase of 7,000 residents) reaching a population of 21,878 residents. By the year 2000 Menai is expected to house 29,000 residents. A further release of land at West Menai may result in a possible population peak of 45,000 residents.

The physical topography of the release area, with its ridges and gullies, has resulted in communities being relatively isolated and dispersed. Dead end streets and cul-de-sacs off arterial roads have meant that the operation of an effective and efficient bus system has been difficult and that access to neighbouring suburbs is often impossible without use of private transport.

As highlighted in Council's *Menai District Target Plan - Social Plan 1993* (Sutherland Shire Council, May 1993), the release area has a large number of preschoolers, school aged children, youth and young parents. Couples with dependent children and couples dominate the family structure in Menai. The average household size is 3.93 persons. Although relatively affluent in terms of income, many have high mortgage repayments and have relatively low levels of disposable income.

Residents of non-English speaking background are increasing in the area and in 1991 comprised almost 20% of the population. Major countries of birth are Lebanon, Yugoslavia, China, Italy, Greece and Malaysia.

3.2.2 Cherrybrook

Similar in size to Menai, the 1991 Census estimates the population of Cherrybrook to be 15,506 residents, an increase of over 10,000 residents since 1981. The community is expected to continue to grow with additional lots resulting in an estimated population of 26,149 persons by 1998. Unlike Menai, the physical topography of the area is undulating, enabling the community to be compact and continuous. The release area does not have discrete isolated communities as found in Menai.

Its profile is similar to that of Menai and other new release areas with a high proportion of children and young families. *Hornsby Council Development Contributions Plan 1993* indicate that Cherrybrook also houses primarily second and third home buyers with high mortgages and little disposal income; a high proportion of working women with dependent children; and a small number of older residents. The average household size is 3.85 persons. Council's research indicates that residents also tend to be pre-occupied with child-rearing and household issues and that many groups such as non-working parents, youth and single car families have limited mobility.

Residents of non-English speaking background comprise 34% of the Cherrybrook population and primarily originate from Malaysia, India, China and Italy.

3.3 PLANNED SERVICE PROVISION IN THESE NEW COMMUNITIES

3.3.1 Menai

Provision of services have occurred throughout the development life of Menai with initial planning of community services based on a Council plan prepared in 1984. Council's current plan, *Menai District Target Plan Social Plan 1993*, outlines the current level of provision and future needs. It reviews a number of normative service standards and needs identified by the community and professionals working in the area. The Social Plan, identifies the following level of provision available to its 22,000 residents:

- 4 Community centres - each centre provides some office space for workers and community activity space. One centre is a demountable and another is used as a temporary branch library. The average size of these centres is 250-300 sqm.
- 4 School halls available for community use (many are used by new churches who have not yet the funds for own building).
- 5 Long day care centres comprised of 2 Council centres (80 places) and 3 private centres (107 places).

- 8 Preschools mostly operating on shorter hours although some have extended their hours from 8am to 5pm. All are privately owned excepting one centre operated by the Baptist Church.
- 1 Occasional care service (operates from a community cottage)
- 5 Community-based and 1 private service provide Before and After school services
- Family day care has 11 carers in the area caring for some 30 children
- 10 playgroups operate in the community
- 3 Early childhood services operate from community centres and the community health centre. The services are flexible to meet the demand where and when it occurs.
- 5 Scout groups with 3 purpose-built scout halls
- 5 Churches all with Church halls available for community use and various support groups, e.g. youth groups, aged activities etc.
- 1 Community Health Centre staffed by 1.6 social workers, 2 community nurses, 2 dental therapists, 1 dental aid, 1 speech therapist and a Karitani Health Clinic
- 1 Community Worker New Estates
- 1 Youth Development Officer
- 1 Community Information Centre and Newsletter distributed bi-monthly by the Menai District Neighbourhood Services
- Outreach courses run by TAFE
- 1 Outreach HACC worker
- 1 church-based aged hostel
- 1 private function centre.

3.3.2 Cherrybrook

Services in Cherrybrook have been provided by both Council and the private sector. Importantly, the majority of Council-provided services have been funded through S94 contributions. This includes funds for the community centre, land for the long day care centre,

upgrading of a hall for preschool use, funds for the multi-use sports centre at Cherrybrook High School and the youth centre. Currently, Cherrybrook houses the following major services:

- 5 Long day care centres (155 places) comprising of 2 Council owned facilities and 3 private centres. At one Council centre, 200 children are awaiting child care. Council's long day care centre was the first facility built in the new community.
- 2 Private Preschools, one of which operates from a Council-owned building (original community hall). This centre has 25 places, caters for 3-5 year olds and operates from 8.30am to 3.30pm.
- 1 Community centre which has 1 large hall (capacity 400); 1 small hall (capacity 120) divisible into 2 rooms; and 2 meeting rooms with a capacity of 40 people each. The centre is approximately 1,000 sqm. It is extensively used for recreational activities, Adult Education classes, 11 playgroup sessions and private functions.
- 2 Shopping centres - the first centre has some 10 neighbourhood stores while the most recent and larger centre includes a Franklins supermarket, fruit barn, butcher and some 20 specialty shops. Take-away food chains have established in the area.
- 1 Youth centre which has just been built as part of a major amenities block on Cherrybrook's principal sporting fields. The centre came about in response to the expressed need of the community and the lack of local private entertainment for youth. With limited public transport to Castle Hill, Parramatta and Hornsby, there has been a need for youth activities both after school and on weekends.
- 2 Public primary schools with school halls and 1 Public high school with a joint use school hall built in conjunction with Council. The high school hall has a capacity for 500 people and is used for basketball and indoor sport.
- 1 Community Health Centre located outside the release area at Pennant Hills which services the community.
- 11 sessions of playgroup operate in the Community centre while scouts, guides and brownies are active in the area.
- Several private retirement villages and homes are located within and on the border of Cherrybrook.

3.4 IDENTIFIED FUTURE NEEDS

3.4.1 Menai

Information in Council's Social Plan suggests that the community and professional working in the area have identified the following issues:

- High mortgages, unemployment and the prevalence of dual incomes families have placed pressure on the community for support services. There is considerable evidence of isolation and difficulties resettling.
- Multicultural services are needed to assist NESB residents with no services available locally. The area has a significant Chinese and Arabic population.
- Public transport needs to be improved (frequency, quality, bus shelters etc) together with pedestrian/bicycle facilities. Strategies to overcome this include the provision of a bicycle network; community buses provided in conjunction with local groups such as Rotary, Apex etc; and greater lobbying of government for better services. Poor public transport and the heavy reliance on the private vehicle is a major issue in the area.
- Rapidly-growing youth population requires access to youth programs, youth workers and a youth facility. Council has plans to construct a youth centre but the lead time has proven to be long. It is hoped, given sufficient resources, that the centre will focus on:
 - improving educational opportunities
 - public transport options for youth
 - accommodation needs
 - health needs
 - legal advice
 - access for all disadvantaged and minority youth to services
 - recreational and cultural opportunities
 - environmental awareness.
- Demand for long day care is high in Menai and Council considers, based on waiting lists, demand is in excess of normative standards typically used (i.e. 1 place for 9 children aged 0-4 years). Also there are only 17 places for children 0-2 years old none of which have been provided by the private sector. Family day care is available but many of these mothers who access family day care are also waiting for places in long day care facilities. Council considers that Menai release area requires in excess of 4 x 40 place centres but have planned that they may only be able to secure funding for 2 centres. It has also been recommended that Council promote further the Family Day Care scheme and attract more carers and children to the scheme. Employer-provided child care has also been identified by Council as an opportunity to meet child care needs.

- Before and After School services are heavily used, with several exceeding their operating levels. Approximately 140 before and 175 after school places are provided. Some expansion is envisaged but Council consider that demand should stabilise in 5 years. Occasional care is currently available with a major facility at the planned Menai Centre.
- Few services for the aged and disabled are available but the need will increase as the population grows. Also disabled access to all buildings has been identified particularly at the new Menai shopping centre, bus interchange, community facilities, parks etc. It is not considered that sufficient demand exists for a separate aged facility, at this stage, but careful monitoring to ensure needs are being met through existing services is recommended.
- Women have particular problems of social isolation, single parenthood (female family head), domestic violence, health issues and need for vocational training to assist women to return to the workforce.
- Community-based committees need greater support/training to ensure greater and more efficient use of these buildings. Also access for disadvantaged groups needs to be improved.
- A 700 sqm library is planned for the Menai Centre but there is concern that this will be insufficient and is below the standards required by the State Library of NSW.
- Cultural development has been highlighted with very little available for new residents both in terms of Council activities and private facilities, e.g. squash courts, swimming pool, community arts, performance space, family restaurants etc. The area lacks "an identity" and Council's plan includes a range of initiatives to encourage community arts and to preserve local heritage.

Council's Social Plan identifies a range of facilities planned for Menai including:

- The Menai Centre - to provide a broader range of services to the community as a whole, the Menai Town Centre will comprise:
 - Library - 700 sqm
 - Occasional Child Care
 - Community centre with co-ordinator, community worker and outreach worker - approximately 900 sqm
 - Youth centre with 2 youth workers - approximately 520 sqm
 - Long Day Care Centre - 20 places for 0-2 years and 20 places for 3-5 years
 - Community Health Centre
 - Shopping Centre
 - Bus interchange

- Business Park
- Recreational Park.

At a local level, additional facilities are proposed:

- 3 new community/sports centres so that each neighbourhood has its own building for community and sporting activities. These centres are to be operated by Council committees and provide space for a range of community activities and programs;
- 1 new Scout hall with community access;
- 1 school hall/rooms available for community use;
- 1 small group of local shops (4 neighbourhoods already have some local shops);
- a Menai-wide cyclepath network.

3.4.2 Cherrybrook

As Cherrybrook has grown, the needs of its residents and resultant service provision has been traced through a variety of sources. Firstly, research undertaken for Hornsby Ku-ring-gai Hospital by Piper and Krolik, *Assessing Perceived Needs: A Study of Two Communities 1991*, provides an insight into the perceived needs of residents. This study highlights the following concerns for residents and health professionals in Cherrybrook:

- Health issues focussed on asthma for young children; drugs and alcohol abuse for teenagers; stress and medical conditions for adults; and for the over 60s, isolation and medical conditions were major issues. Cherrybrook residents suggested that the causes for medical conditions related to stress itself may be as a result of lack of transport, financial pressures, lack of facilities (e.g. information, services, child care), isolation, traffic and roads.
- Social issues focussed on parenting and lack of services/facilities for young children; boredom and lack of facilities/activities for youth; stress for adults; and for the over 60s, isolation. The causes for these perceptions were more difficult to determine but residents considered that a lack of community services had resulted in these needs and could be overcome by the provision of services such as community centres, children's services, youth facilities etc. Concern for the lack of services for the NESB community was also identified at Cherrybrook.
- Environmental issues included poor public transport, concern over traffic safety, traffic congestion, facilities for recreation, pollution, garbage and housing development. For Cherrybrook however, issues relating to traffic safety were of major concern.
- Services identified by Cherrybrook residents and health professionals as being needed in the area focussed on youth services, children's services, sport/recreation services, health/adult education and entertainment/relaxation activities.

After this research was undertaken some major services were provided in Cherrybrook including the community centre, high school, the establishment of some sporting fields and extensions to the shopping centre.

To assist in meeting the needs of the Cherrybrook community, Council will provide the following facilities through S94 funds:

- 1 Long Day care centre with 60 places based on a standard of 1 space per 10 children aged 0-4 years. However, this is considered conservative and demand is likely to remain high unless additional facilities are provided.
- 1 Neighbourhood family centre to be located in the shopping centre and provide primarily community information and a venue for community activities. The centre will be approximately 300 sqm.
- 1 Youth centre to cater for the needs of youth as the community grows. It will be some 300 sqm.
- 1 District library at Pennant Hills which will service Cherrybrook together with two other planning districts.

Interestingly, Cherrybrook is yet to gain a local post office while churches make extensive use of the local school and community halls but have yet to establish permanent facilities in the area.

3.5 IMPLICATIONS FOR INGLESIDE-WARRIEWOOD

Based on discussions with Council staff and workers (who were both also residents) in Menai and Cherrybrook, the following issues have been identified which may be relevant in the planning of the Ingleside-Warriewood release area.

3.5.1 Menai

- Community action and the presence of a New Estates Worker has played a significant role in ensuring that services reached the Menai community. As documented in the WSROC study *Monitoring the Delivery of Human Services to Western Sydney, 1987*, this process is consistent with many other new release areas developed in the 1980s. In 1983, Menai District Neighbourhood Services was formed by local residents in response to a lack of community services in the new development. Currently this community organisation auspices 14 subcommittees for a range of services and projects which operate in the community. The area also has a New Estates Worker who was originally employed through funding provided by the Department of Housing and is now funded by

the Department of Community Services. The worker has provided extensive support for a range of community services and programs which have been provided in Menai.

- In Menai, S94 contributions have not been tied to a flexible program of service provision and were often not used to fund facilities initially required by the community. In more recent years, Council has redressed this imbalance and sought to use S94 funds to jointly fund buildings (the proposed youth centre will be funded by a government grant, S94 funds and community funds); and build new buildings (main Community Centre at Menai). Some facilities have been (centres at Illawong and Bangor) and will be (Menai library) provided through agreements with developers.
- The Menai New Estates Planning Team has played a significant role in the provision of services in Menai and has been operating since the estate's inception. Its currently comprises of residents from each suburb; Council staff from Planning and Community Services; representatives from the Departments of Housing and Community Services; representatives from the local youth organisation; and relevant Councillors. Recommendations from the team are directed to Council for their consideration.
- Primarily due to its isolation, the Menai District Neighbourhood Service considers that it remains essential to provide an information service for new residents including a Welcome Kit, Welcome morning teas, community directory and bimonthly newsletter.
- Much of the initial planning focussed on providing a range of community services in the Menai Town Centre but with this only now being built, residents have lacked the services they required. Provision being planned or delayed until 20,000 residents are living in the community is not acceptable and the community has lobbied extensively to gain access to a range of more local services in the earlier development stages.
- The lack of public transport is a major issue in the area and has a significant impact on resident access to and need for community services. Regardless of the income levels, a lack of public transport significantly isolates those who cannot access private transport - children, youth, parents at home, the disabled and aged. Poor public transport also adds to the financial pressure on those who are forced to buy a second car and adds to the environmental impact of the development with increased emission of toxic gases and need for additional road infrastructure. A range of measures are advocated by the Social Plan to improve public transport including a bicycle network, safe pedestrian routes, community buses and lobbying of government for better bus services.
- Workers consider that a lack of access to funding for programs and activities has been difficult for Menai. Many other new release areas have access to "start up" grants through the Area Assistance Schemes funded by the Department of Planning. The community funding program was initiated to assist in the development of new developing areas which lacked community services and facilities. It provides initial funding for a

range of local projects/workers which historically is then taken up by the relevant government department for long-term funding. Although Menai is a new release area, the Sutherland LGA is not part of any Area Assistance Scheme. It has no access to "start up" funding grants even though it is a new community which, regardless of the income level of its residents, has similar social issues such as a lack of established services/facilities and social isolation.

- The Area Health Service has played an extensive role in developing local community health services in Menai and have provided the basis for many initial services in the community.
- There is a huge demand for sporting facilities and activities in the area. This is probably related to the predominance of children, youth and young adults in the community (these age groups are active in sports) together with a lack of other entertainment within the area and the inaccessibility of existing activities outside the area.
- Community space in schools is used extensively although there is some concern over how effective the additional community meeting rooms provided through Council funding are. Access to school facilities remains variable depending on the policies of the school principal and School Council. However, it appears that all available space, whether in school halls or community halls, is extensively used and needed.
- The need for youth facilities has been identified early in Menai, with funding for a youth centre received in the mid 1980s. However, as its location was earmarked for the Menai Town Centre, construction is only now being planned. A Youth Development Worker however has been working in the area since 1985, as part of the centre's funding package, seeking to facilitate the development of youth programs. For many residents, the provision of the youth centre is long overdue. The isolation of the community, its poor public transport and lack of existing entertainment/activities, has meant that the area has little to offer youth.
- Resident access to community space and activities in new release areas such as Menai, may be reduced by the user pays system. The community feels that very often groups are not formed or activities do not occur because of the fees/charges imposed for hiring community space etc. As with all new communities, regardless of their income, residents are always expected to contribute towards new activities in the area, i.e. new soccer club, new school equipment, new scout group etc. Add to this the lack of accumulated funds of the groups, and for many, they just cannot afford to pay high rates/rents to get activities going. In earlier years, community space was often available at very low or concessional rates.

3.5.2 Cherrybrook

- Cherrybrook has experienced a strong demand for additional long day care services and other forms of childcare. Services for children and families are considered to be important in the community, with these needs being regularly identified in community consultations, surveys etc. Some private services have been established but not enough to meet the needs and Council has been initiator of long day care services in the community.
- Youth needs have developed earlier than anticipated and as a result of expressed community needs, a youth centre has been constructed by Council. Compared to Menai, Cherrybrook currently has a higher proportion of youth in its population profile but similarly lacked the provision of any facilities, entertainment or recreation in their new community. With public transport poor, it has also been difficult for Cherrybrook youth to access entertainment outside the area. Problems have resulted with youth congregating in the Cherrybrook shopping centre, in parks and at the railway station with no activities to meet their needs.

Interestingly, Council staff feel that no major private entertainment facilities are likely to be provided in Cherrybrook, such as cinemas, discos, skating rinks etc, as existing developments are located at nearby Castle Hill, Parramatta and Hornsby. Cherrybrook is not perceived to have sufficient market in itself. Therefore, it is anticipated that the new youth centre, coupled with after school activities for youth, holiday activity programs and other youth programs will be essential to meet these needs.

- Residents consider that the area lacks sufficient recreational, leisure and social facilities which are suitable for children and families.
- The lack of public transport and poor access to established services are major issues. Even for residents with higher incomes, access to public transport is important, and is regarded as critical to the successful functioning of the community. This is particularly important for children, youth, residents with only one car, disabled and aged residents. In the early stages of the development, bus services were infrequent and did not service all of the developed precincts. Even now, the bus service to nearby Castle Hill, which is a major regional shopping centre, is inconvenient and infrequent.
- Compared to many other new release areas, Council considers that Cherrybrook has had limited access to funding for community development projects, specialist workers or specific new release area programs. As outlined earlier, the Department of Planning has established a number of Area Assistance Schemes (AAS) to assist the development of new communities but these have mostly focussed on the Western Sydney, Macarthur, Hunter and Illawarra LGAs.

- Hornsby has not been included and therefore has found access to funding sources particularly difficult. As highlighted in the report, *Monitoring the Delivery of Human Services to Western Sydney* (Masterplan Consultants for WSROC 1987), AASs have played an important role in facilitating project development and encouraging the formation of community-based organisations which then go on to attract funding from other established government programs. It is evident from the research done for this study, that Cherrybrook has not been successful in accessing any significant government funds for service development projects.

4. COMMUNITY SERVICE NEEDS BASED ON CONSULTATION

Consultation is widely accepted as a legitimate method by which the "real" needs of the community are determined. As the future residents of Ingleside-Warriewood are unable to participate in the consultation process at this stage, existing service providers and community representatives have provided an initial consultation base for the release area. Those already providing services in the area have an in-depth knowledge of the existing community, its characteristics, service capacities and the implications of increased demands.

Community consultations were held with government and community-based service providers and representatives of community groups on the 4th and 5th May 1994. Some 100 organisations/groups were invited with an excellent response of 70 participants at the consultation workshops. The overall feedback from the participants was very positive, with people pleased to be given the opportunity to discuss the planning of services for this new community. Submissions were also received from four organisations unable to attend the consultations. A full report on the consultation process and outcomes are given in Appendix D3.

The main issues/findings of the consultation were:

- **New residents in Ingleside-Warriewood are likely to have needs similar to residents in other new release areas related to issues of isolation, access, employment and financial stress. Transport and access were seen as major needs by the majority of participants.** Groups also saw a high need for information to be distributed to new residents, with particular emphasis on available community services/facilities and ensuring that appropriate information was available for incoming NESB residents.
- **Community facilities and services considered to be required by the new community were numerous although most groups considered that this should be determined by the new residents themselves and as the size of the development (eventual population) becomes more concrete.** They felt that the population scenarios presented (population 10,000-26,000 residents) may result in many different requirements for community services. However, there appears to be consensus on the following community services/facilities regardless of population size:
 - multi-purpose community meeting place/centre which caters for the diverse ages and backgrounds of the incoming residents
 - information services focussing on available community services/facilities for incoming residents
 - passive and active recreational space and facilities again catering for the range of ages and interests of the incoming residents
 - developmental workers who can devise programs to facilitate community activities and encourage resident settlement

- a full range of childcare facilities particularly for children 0-2 years and school aged children
 - youth facilities and entertainment which cater not just for sporting activities but also after-dark entertainment
 - public transport which is affordable, effective and links the services within the release area and links to the services outside the release area. This will be particularly important for the children, youth, aged and disabled residents who many not have access to a private motor vehicle
 - walkways and cycleways which make the community accessible for all residents and provides environmental benefits
 - library services which may need to be mobile or expanded to service new residents
 - services provided by voluntary and non-government sectors, e.g. churches, private child care operators, scout association etc
 - all facilities and services must be accessible to the aged and disabled particularly public buildings, shopping areas, footpaths, parks etc
- **The majority of groups considered that community services/facilities must be provided early in the development phase and may need to be flexible to meet changing needs.** Because of this, new residents and existing service providers need to be involved in the planning process to ensure the timely provision of services to meet the existing needs.
 - **Existing residents of the release area and in the surrounding communities are likely to benefit from any new services provided in the new community.** This will help to unite the residents and enable them to cope with this major change. However if limited new services are provided, and new residents place excessive demands on existing services, existing residents will be disadvantaged and may resent the new community.
 - **Many existing services are at capacity (particularly community-based services) and will require additional funds to expand.** Most will be able to use their existing premises and provide outreach services in community buildings in the new community. However, if the higher population is reached (i.e. 26,000 people), purpose-built office and activity space may be required in Ingleside-Warriewood. Particular concern was expressed over the "at capacity" nature of existing youth, aged and childcare services.
 - **The main locational criteria for services/facilities was public transport.** Overwhelmingly, the groups considered that all services need to be accessible by public transport and that walking and cycling provision be made to new facilities provided within the release area.

- To assist existing services to meet the needs of the Ingleside-Warriewood release area, groups considered that it was very important for Council to be the co-ordinator and facilitator of all community services to the new community. The role of the State and Federal government is to provide guarantees of funding for expanded services and that up-front guarantees will assist in forward planning. To ensure efficient and effective service provision occurs, it was highlighted that consultation between all players will be necessary - residents, existing service providers, church organisations, the private sector and all three levels of government. This was seen to be essential.
- Other issues raised which related more broadly to the development focussed on:
 - safety - roads, housing and community design to provide a safe environment particularly for children, youth, aged and disabled residents
 - community identity and focus - the importance of creating a strong identity for the new development
 - environmental protection - the unique character of Ingleside-Warriewood should be enhanced through preservation of bushland, nature trails, horse-riding areas etc

5. NORMATIVE STANDARDS, BASELINES AND THRESHOLDS

5.1 INTRODUCTION

In assessing the demand for community services, consideration should also be given to standards traditionally used in service planning. In the past, these approaches were often used exclusively to plan for service provision, but experience has shown that they have failed to meet the "real" needs of the community.

5.2 NORMATIVE STANDARDS

This methodology prescribes that community facilities and services have a set population catchment which can be used to integrate community facilities into a physical plan. It utilises a concept of local, district and regional facilities, with provision at all levels depending on the population base. The strength of the model lies in its ability to locate facilities on a physical plan consistent with traditional town planning concepts.

Many consider however, that normative standards are too rigid and prescriptive and do not adequately reflect service needs. They disregard unique local factors such as the existing service capacities, transport issues and population characteristics and are unable to accommodate issues of funding, alternative methods of service delivery, and staffing.

In practice, most service agencies, use normative standards only as one indicator of service need. Other information is used such as social indicators, existing service capacities and consultation to determine service provision.

The following normative standards have been gathered to provide some input into the assessment of service needs for Ingleside-Warriewood. They have not been used exclusively and by many service providers have been totally disregarded in favour of alternative planning methodologies. The government departments identified for each of the following standards are not necessarily involved in funding the service.

Long Day Care	1 child care space per 10 children 0-4 years Department of Community Services
	Full provision for all children 0-4 years with working parents Department of Human Services and Health
Occasional Care	1 centre per district shopping centre Department of Planning - baseline standard
Employer Sponsored Child Care	14% of working women with children 0-4 years would use work-based child care Department of Employment, Education and Training

Outside School Hours Care	1 centre per 4,500-6,000 residents Department of Community Services
Youth Centre	1 centre per 10,000 residents Department of Community Services
HACC Centre	1 centre per 50,000-100,000 residents Department of Local Government and Co-operatives
Community Centre	1 centre per 6,500 residents Department of Planning
	1 medium sized centre per 5,000-10,000 residents Department of Community Services
	1 District centre per 10,000-20,000 residents Department of Community Services
Library	Branch: For 10,000-20,000 residents 42 sqm/1,000 residents Main: For 35,000-65,000 residents 35 sqm/1,000 residents NSW State Library

5.3 BASELINES AND THRESHOLD STANDARDS

The Department of Planning recommends that a more appropriate approach to the planning of services and facilities in new release areas is to set a "baseline" or minimum level of local service provision for all new communities. This approach is widely used by Planning Teams in new release areas. It reflects the inadequacy of other planning approaches which do not consider the importance of early provision of services and the need for initial residents to have access to basic services.

Baseline local services are considered to be:

- community/neighbourhood centre
- child care centre
- public transport
- public school
- community worker
- community nurse
- corner shop
- public telephone.

More recently this local baseline has been extended to include district baseline services in recognition of the need for a higher level of service for larger release areas, e.g. library, sporting fields etc.

Threshold provision relate to service provision required as the population grows and is determined through community consultation and needs assessment. These services are not required from initial settlement but rather if and when they are needed.

6. ASSESSMENT OF DEMAND FOR COMMUNITY SERVICES

6.1 INTRODUCTION

This section brings together the needs assessed through the various methodologies outlined earlier to provide a determination of community services and facilities required for Ingleside-Warriewood. Consideration has been given to:

- provision and capacity of existing services/facilities in the local service area and the Pittwater LGA as a whole
- comparative assessment with Menai and Cherrybrook which have similar population profiles to Ingleside-Warriewood
- normative, baseline and threshold standards
- consultation.

As shown in Table 6.1, each of these elements has been used to determine the level of provision recommended and the catchment of the proposed facilities. Table 6.1 focuses on facilities which are traditionally provided/auspiced by Pittwater Council. The following section outlines in more detail the facilities/services required by target groups together with the likely requirements for additional government and non-government services to the release area. Table 6.2 identifies the full range of community services and facilities which may be required in Ingleside-Warriewood although this will be dependent on the eventual size of the release area. The low scenario is unlikely to generate sufficient demand to support the establishment of many of these services within the release area.

6.2 CHILDREN'S SERVICES 0-4 YEARS

This covers a range of services but focuses in particular on long day care, preschools, occasional care and child health. Given the significant increase in 0-4 years olds in the LGA as a result of this development, all of these services will be greatly effected and require funding to address the projected needs.

6.2.1 Long Day Care

Existing services are at capacity in the LGA with significant waiting lists. Given that the projected population will have a significant proportion of working parent families, the demand for long day care will be significant. Experience in both Menai and Cherrybrook reflect the high demand for childcare and although the private sector have provided some centres in both these new communities, it is considered that the demand for 0-2 year olds has not be met. In both Cherrybrook and Menai, Council is seeking to concentrate resources on meeting this need.

TABLE 6.1: DETERMINING COMMUNITY SERVICES PROVISION FOR COUNCIL SERVICES

SERVICE TYPE	EXISTING PROVISION	COMPARATIVE	STANDARDS	CONSULTATION	ASSESSMENT	RECOMMENDED PROVISION AND CATCHMENT
Children's Services 0-4 yrs						
Long Day Care	In LSA - 235 places In LGA - 419 places No centre-based care for 0-2yrs 1 space per 8 children 1 space per 4 children with working parent	MENAI 187 places built but require 2 more + FDC - need 0-2yrs care CHERRYBROOK 155 places built but require more	1 child care space per 10 children 0-4yrs (DCS) Full needs met (DHS&H) BASELINE PROVISION	High demand for childcare likely particularly for 0-2yrs - often not provided by private sector	No capacity in existing services - private sector likely to provide for 3-5yrs Council/govt provision for 0-2yrs	Low - 153 places Med - 281 places High - 406 places Increase FDC + new centres Based on 1 space per 4 children 0-4yrs with working parents
Occasional Care	In LSA - 15 places In LGA - 15 places 1 space per 220 children	MENAI 1 existing service 1 planned CHERRYBROOK No service	1 centre per district shopping centre THRESHOLD PROVISION	Some demand likely but not as high priority as other childcare services	Demand strongest in early years when no local networks established - service will be required	Low - 5 places Med - 9 places High - 14 places Based on 1 space per 200 children aged 0-4 yrs
Preschools	In LSA - 121 places In LGA - 371 places 1 space per 4 3-4 year olds	MENAI 8 centres - private and church based CHERRYBROOK 2 private centres - one in Council building	Demand based THRESHOLD PROVISION	Some demand	Likely to be taken up by private sector - need to encourage early provision	Low - 111 places Medium - 197 places High - 285 places Based on 1 space per 4 children aged 3-4 years
Employer sponsored childcare	In LSA - 0 In LGA - 0	MENAI no employment centre CHERRYBROOK no employment centre	14% of working women with children under 5yrs would use work-based childcare (Source: DEET). More local research required. THRESHOLD PROVISION	Not identified	New strategy by Federal Govt under National Childcare Strategy - may be possible for new schools, shopping centres or other major employers.	Dependent on type of employment generating activities in the release area - more research required Employment generating landuses
Children's Services 5-12 yrs						
Out of School Hours Care	In LSA - 120 places In LGA - 120 places 1 place per 28 children 5-12 yrs	MENAI 175 AS places required CHERRYBROOK is available	1 centre per 4,500-6,000 residents (DCS) BASELINE PROVISION	Strong demand due to working parents	Will be required immediately due to large school age population	Increase places at existing schools in area and then new service at each new school Low - 70 places Med - 128 places High - 185 places

TABLE 6.1: DETERMINING COMMUNITY SERVICES PROVISION FOR COUNCIL SERVICES

SERVICE TYPE	EXISTING PROVISION	COMPARATIVE	STANDARDS	CONSULTATION	ASSESSMENT	RECOMMENDED PROVISION AND CATCHMENT
Youth Centres/ Services	In LSA - Holiday program In LGA - Holiday program No purpose-built facility in LGA	MENAI Youth centre planned 520 sqm - Youth Officer runs activities/services CHERRYBROOK Youth centre built second centre planned - 300 sqm	1 centre per 10,000 residents (DCS) BASELINE PROVISION	High need for youth facilities/services; sporting facilities not enough; after dark and after school entertainment required - youth alcohol problem already	Based on experience in other release areas will be required - workers also to run activities and develop services	Year 10 Low - 267 sqm Med - 343 sqm High - 378 sqm End State Low - 294 sqm Med - 539 sqm High - 780 sqm Based on 0.03 sqm per resident
Aged/Disabled Facilities/Services	In LSA - 1 Council centre In LGA - limited 0.08 sqm per resident aged 60+ yrs	MENAI - 0 CHERRYBROOK - 0	1 seniors centre per 50,000 residents	High need already; will increase demand	Additional facilities will be required for aged services; may be additions to existing or annexes on new buildings	End State Low - 100 sqm Med - 184 sqm High - 226 sqm District
Community Centres	In LSA - 7 existing In LGA - 8 existing 0.09 sqm per resident	MENAI 4 centres existing Total planned 1 x 900 sqm District centre 5 x 300 sqm centres + rooms on school halls 0.1 sqm per resident CHERRYBROOK 1 District centre existing 1,000 sqm 1 x 300 sqm planned 0.05 sqm per resident	LOCAL 1 centre per 6,500 residents or 1 centre per 5-10,000 residents average size - 400-650 sqm DISTRICT 1 centre per 10-20,000 residents Average size 650-800 sqm BASELINE PROVISION	Multi-purpose centres required to meet diverse needs; information needs will be high-centre will assist	Maintain existing LGA standards as centres will be required in release area - be flexible with size of centre - initial one maybe larger to meet early needs - large centre may not be required but better smaller in each area as needed.	Year 10 Low - 799sqm Med - 1,029sqm High - 1,134sqm End State Low - 882sqm Med - 1,618sqm High - 2,240sqm based on 0.09sqm per resident Local/District
Library Facilities	In LSA - 1 central library In LGA - 1 central + 1 branch library + admin space 19sqm per 1,000 residents	MENAI 700 sqm library planned but concern that not big enough 30 sqm per 1,000 CHERRYBROOK 26sqm per 1,000	NSW State Library recommends Branch 10-20,000 residents 42sqm/1,000 Main 35-65,000 residents 35sqm/1,000 DISTRICT BASELINE	High usage likely particularly by children and youth	New library will be required - need to rationalise however where central library + admin functions to be located. Staged facility may be appropriate.	Year 10 Low - 266sqm Med - 343sqm High - 378sqm End State Low - 294sqm Med - 539sqm High - 780sqm Based on 30sqm per 1,000 residents Branch 10,000-26,000 residents

TABLE 6.1: DETERMINING COMMUNITY SERVICES PROVISION FOR COUNCIL SERVICES

SERVICE TYPE	EXISTING PROVISION	COMPARATIVE	STANDARDS	CONSULTATION	ASSESSMENT	RECOMMENDED PROVISION AND CATCHMENT
Other gov't/non-gov't services/facilities	In LSA - some capacity; varies with service	<p>MENAI Poor transport; main shopping centre to come; new community health centre proposed; some new churches 2 existing workers 2 youth workers required; new schools</p> <p>CHERRYBROOK Poor transport; 2 shopping centres; churches operate from school halls; existing and new schools; community health from Pennant Hills</p>	<p>Vary depending on service</p> <p>BASELINE PROVISION</p> <p>school community nurse community worker transport corner shop public telephone (gov't services)</p>	<p>Need for workers who can encourage service development and facilitate community activities.</p> <p>Public transport needed to reduce isolation.</p> <p>Information required.</p> <p>Accessible services for aged and disabled.</p>	<p>Need for some gov't services to move to the area, e.g. fire station, police, etc.</p> <p>Other important services are public transport, local retail, churches etc.</p> <p>Developmental workers will be required to co-ordinate centre activities, work with youth etc.</p>	<p>Fire station Police station Retail facilities Schools Community workers etc</p> <p>Vary depending on needs and service type</p>

TABLE 6.2: COMMUNITY SERVICES AND FACILITIES WHICH MAY BE REQUIRED FOR INGLESIDE-WARRIEWOOD*		
CHILDREN'S SERVICES Long Day Care Preschool Occasional Care Family Day Care Playgroups Services for Children with a Disability Before/After School Care Vacation Care Holiday Programs Other eg. toy library, baby sitting co-ops etc. RECREATION Neighbourhood parks Range of sports fields Netball courts, tennis courts Bicycle facilities Pedestrian facilities District Open Space Indoor Sports Centre Indoor Heated Pool Specific facility for groups GENERAL COMMUNITY Neighbourhood centres Meeting rooms/offices for community groups Special facilities eg. youth, aged etc. Arts and Crafts centre Arts Program/workers Library Information services Community workers Community development programs eg. festivals etc.	YOUTH SERVICES Youth worker Youth centre Targeted programs, eg. health, law, counselling etc. AGED SERVICES FOR PEOPLE WITH A DISABILITY Specific worker and programs Accom. eg. aged units HACC eg. Meals on Wheels Home Care Special Transport EDUCATION Primary-private and public Secondary-private and public TAFE Adult Education Special eg. migrant etc. RELIGIOUS Churches Associated services TRANSPORT Bus and rail Bicycle Taxi Community Bus	MIGRANT SERVICES Migrant worker Multicultural information and services Translator service EMERGENCY SERVICES Police Ambulance NSW Fire Brigade Bush Fire Brigade State Emergency Services HEALTH Early Childhood service Doctors Community Nurse Medical specialists eg. dentist, chiropractor etc. Day care centre for aged etc. Medical centre - private WELFARE SERVICES Refuges eg. women, men, youth Family support - community aid agencies and counselling Legal aid services

* Low scenario will not be of sufficient size to support many of these services.

Discussions with the Federal Department of Human Services and Health (DHS&H) support this view and consider that a strong demand will be evident. They similarly echo the high need for care for 0-2 years olds. With no centre-based care for 0-2 year olds in the LGA and the disinterest of the private sector to provide this type of care (due usually to high costs and therefore fees), it is evident that this is where Council should concentrate its efforts.

As shown in Table 6.1, demand for long day care places by residents of Ingleside-Warriewood will be significant. A standard of 1 long day care space per 4 children 0-4 years with working parents (existing LGA provision) has been used as it more accurately reflects the strong demand for long day care services expected from these new residents. This results in a demand for 153 places (low), 281 places (medium) and 406 places (high) in both centre-based and family day care services.

Under the current National Child Care Strategy, full capital funding of these places is unlikely to be forthcoming. Demand is high and as with many government programs, funds are limited. Other LGAs with extensive backlogs and little opportunity for private sector involvement will

be given priority. Therefore, it will be imperative for Council to actively facilitate the provision of these places. Opportunities/pilot schemes to encourage private sector provision should be advocated also with the DHS&H and DCS.

Currently, 60% of long day care places in the LGA are provided by the private sector. Therefore, if Council, supported by other levels of government, actively assists the sector to locate in Ingleside-Warriewood, S94 contributions could be sought for only 50% of places. These S94 funded places should focus on 0-2 year olds where demand will be high and private sector involvement limited. Long-term operation may be through Council management or lease to experienced operators such as Kindergarten Union. Further research should be undertaken to fully assess the operational options for centres provided through S94.

Given the expected high demand for long day care, the opportunity for provision of child care places through sponsorship by employers should be considered. At this stage there appears to be limited opportunities for major employment zones in the release area (see *Retail and Employment Study - Section C*) but other opportunities do exist from employers of planned new schools, shopping centres and other major services. Considerable tax benefits are available to employer sponsors, together with the benefit of attracting and retaining trained female staff in their workforce. The Federal government also offers considerable support and resources in the planning and establishment of employer sponsored child care. Employer sponsored child care includes both centre-based and family day care places. Council should take an active role in seeking to encourage employer-sponsored child care for employers within and adjacent to Ingleside-Warriewood.

6.2.2 Occasional Care

Occasional care services are in demand in new communities as incoming residents have few established networks on which to draw. Without established friends and family living nearby, parents are unable to find care for those few hours required for appointments, shopping or emergency situations. Existing provision is low in the LGA but this is a reflection more of funding availability than demand. Menai new release area has one service and is planning another to be located in its new Town Centre. Therefore, using a slightly higher standard than existing in the LGA, the assessed demand for occasional care is considered to be 5 places (low), 9 places (medium) and 14 places (high) although this should be increased if funding becomes more available and demand from residents is higher than anticipated. S94 funds should be used for the capital funding of these places, with relevant subsidies sought from the DHS&H.

6.2.3 Preschools

As both the Federal and State governments no longer provide funding for preschools, Pittwater Council like most local Councils are no longer involved in the provision of preschool services. Historically local government played a pivotal role in providing this service usually by providing the land and/or building on lease to a community-based committee or non-profit organisation.

Currently, Pittwater Council has two preschools in the LSA provided in this way - Elanora Heights Kindergarten and Narrabeen Community Kindergarten. The private sector however has responded to the demand for preschool services and the majority of services in the LGA are privately funded and operated.

The release area will generate a significant demand for preschool services but it is considered that demand for this service is likely to be best met by the private sector. However, to achieve private sector interest it is recommended that Council actively promote the expected demand for preschool services and seek to encourage private operators to locate in the area. This may require the upfront reservation of suitable sites, flexible zoning provisions to permit preschools in residential zones etc.

However, if the private sector is unable to meet the demand for preschool services, Council should make some provision to meet this demand. This may be through the allocation of 40-80 places (1 or 2 centres depending on the development scenarios) for preschool services which may be used for other children's services if required. Capital funds for preschool facilities should be met through S94 funding with recurrent costs met through user fees. As with long day care, Council may maintain long-term operation of preschool places or transfer it to a community-based group or experienced preschool operator.

6.3 SERVICES FOR SCHOOL AGED CHILDREN 5-12 YEARS

Public and private school facilities will be of prime importance to the residents of Ingleside-Warriewood. Although not the responsibility of local government, the need to plan ahead for these facilities is imperative. As outlined earlier, the release area is expected to have a significant school aged population from the early stages of development.

As discussed in Section 2.1.2, the DSE indicate that several existing public primary schools adjoining the release area have capacity for additional students. The area also is expected to lose some students to private schools as is currently occurring in the Pittwater LGA. The Department uses a planning standard of 1,600-2,200 new homes for a new primary school. Provision will also vary depending on the development pattern; rate of release; detailed profile of incoming residents; and bus/road patterns. However, at this stage, through a joint approach of busing new students to existing schools with capacity, and the construction of new schools as required, the DSE considers that it can meet the educational needs of these children by the following plan for provision:

- **Low scenario** - use capacity in existing schools with particular emphasis initially on North Narrabeen and Mona Vale schools. A new primary school would be required but given that the existing schools have a current capacity for an additional 900 primary students and a second school may not be required. Several of the established schools, together with the planned new school, also have the capacity for demountables which can be used to increase school capacity until the primary school aged peak has passed.

- **Medium scenario** - use capacity in existing schools with two new primary schools planned. Based on the expected lot yield, a third school may be required but, given the capacity of existing schools and high private school leakage, only two new schools are likely to be required.
- **High scenario** - use capacity in existing schools with three to four new primary schools required. Again, the impact of existing school capacities and the draw of private schools will greatly influence the demand on public school facilities.

Unlike new release areas on the urban fringe, which rely heavily on an extensive program of new school construction, the use of existing schools within the LSA has considerable advantages for new and existing residents. These include:

- increase in teaching staff and resources to existing schools as a result of student increases
- possible upgrading of existing school buildings/facilities to meet the increased student population
- established schools already have links into the community and should be able to support new residents and encourage interaction between new and existing residents
- less strain on new residents to establish new P&Cs, sporting organisations etc.

In addition to school facilities, provision for Outside School Hours Care will be required. As identified in Section 3.1.2, the release area will house a high number of school aged children with both parents/ sole parents working. Based on an existing standard of 1 place per 28 children aged 5-12 with working parents, the release area will generate a demand for 70 places (low), 128 places (medium) and 185 places (high). These should be provided through the extension of existing services at established schools and at new schools to be built in the release area. In the planning of new school buildings, provision will need to be made for Outside School Hours Care. S94 funds may be required to augment DSE funding of this provision.

6.4 SERVICES FOR YOUTH

Educational facilities will be a major requirement of youth moving into the release area. For high school students, the DSE considers that, as for primary school students, there is considerable capacity within existing high schools in close proximity to the release area. This capacity, together with the construction of new high school facilities as required, will effectively meet the increased demand. In total, Pittwater and Narrabeen High Schools have an existing capacity for some 700 additional students. The Department uses a planning standard of 2,800-3,600 new homes required for a core high school with a capacity for 800 students. A larger high school with a capacity for 1,000 students requires 6,000 new homes.

At this stage, the DSE consider that the following scenarios may be likely for the provision of high school facilities in Ingleside-Warriewood:

- **Low scenario** - may require a new high school by the end of the development phase but, given the existing capacity in both Pittwater and Narrabeen High schools, this may be difficult to justify. Both existing schools will be used fully prior to any construction of a new high school in the release area.
- **Medium scenario** - a new high school will definitely be required after existing capacity in both Narrabeen and Pittwater High Schools has been used.
- **High scenario** - with some 9,200 dwellings anticipated, this scenario may require one large high school (1,000 students) or two smaller high schools (800 students). A second high school would be difficult to justify however based on the projected draw by private schools and capacity in existing schools.

Provision of public high school facilities will also be effected by the anticipated draw on incoming students by private schools both within the immediate area and the entire North Shore. However, with the Department's dezoning of school catchment areas and policy of selective schools, this traditional pattern may not be maintained in Ingleside-Warriewood.

At Cherrybrook, Cherrybrook Technology High has proven extremely popular, with the school at capacity and a strong demand for additional places. A similar scenario in Ingleside-Warriewood may significantly increase the demand for public high school places. Similarly, with incoming residents likely to have high mortgages, private schools may be less attractive due to expensive private school fees. Careful monitoring of these factors, together with development patterns and bus/road patterns will be required to ensure the timely provision of high school facilities to this new community.

The benefits to the community and to the image of Ingleside-Warriewood of such a high profile public school should also be considered by Council. Good school facilities are an important issue for home buyers and such a facility may greatly improve the saleability of land in the release. For the community, it also means less travelling, more cohesion and stronger support for the area which will bring benefits to the LGA as a whole.

One of the major issues for youth will be access to effective and efficient public transport. Mobility is extremely important for this target group who have limited access to private transport. Activities, events and programs which help to reduce isolation and fulfil youth needs can only operate successfully when access is good. Council, the Department of Transport, the RTA and private bus operators must work together on sound public transport provision for this new community. For youth, safe and efficient pedestrian, bicycle and bus networks are essential.

In addition to school facilities and public transport, incoming youth will require access to a range of youth services. As highlighted in Section 3.4, it is imperative that youth services are provided early in the development phase. Given the initial large youth population and potential

lack of effective public transport (as experienced in other new releases), local youth activities will be essential.

Council currently operates a Holiday Activity program for older school aged children and this has proven to be well-used. Experience at both Cherrybrook and Menai, however indicate that the demand for youth services is likely to be extremely high and occur much earlier in the development stages than often experienced in other release areas. Hornsby Council has already provided a youth facility at Cherrybrook with a second centre planned, while Menai is constructing a youth centre as part of the main Town Centre development.

The consultation (see Section 4.0) also highlighted a need for youth facilities/services in the new community with a strong concern expressed that sporting facilities are not enough and youth activities/entertainment will be required.

The Department of Community Services (DCS) uses a standard of 1 youth centre per 10,000 residents and a youth centre is considered to be baseline provision. Based on planned levels of provision in Cherrybrook and Menai and standards recommended by the DCS, a standard of 0.03 sqm per resident is recommended for the provision of youth facilities in Ingleside-Warriewood. This may be used for youth facilities of varying size and location depending on the needs identified as the community develops. Early provision is recommended however for one facility which caters specifically to the needs of youth.

Capital funding from government funding programs for youth facilities and services are limited. The only opportunity for achieving early provision is through S94 and it is recommended that this approach be adopted.

To effectively operate and manage a youth centre, youth workers will be required to organise activities and develop services. Experience has shown that staffed centres are well utilised and usually attract government funding/services which can be used for a wide range of projects and activities. Funding for youth workers may be gained through DCS while DHS&H currently have a pilot scheme funding Youth Activity Services. Discussions with other government departments regarding sessional workers with a youth focus may be successful such as the Department of Health; Department of Education, Employment and Training; Ethnic Affairs etc. Funding of youth cultural activities should also be considered such as music, theatre and art. Possible funding sources are the Australia Council and corporate sponsorship.

Access to effective and efficient public transport will be a major requirement of youth in Ingleside-Warriewood. The majority of established attractions for youth such as entertainment, sporting facilities, shopping and beaches, are located outside the release area. Unless good public transport links are provided both within and outside the area, incoming youth may be particularly isolated. This has been the experience in both Cherrybrook and Menai, with a resultant high demand for youth activities. It must be remembered that even though car ownership may be high, the majority of youth will not have a licence nor access to private

vehicles. They often rely on public transport, bicycle and pedestrian networks to access friends, entertainment, sporting and recreational activities.

6.5 SERVICES FOR WOMEN

Due to a variety of circumstances, women in the community very often require access to specific services. Developing communities, in particular, often house women who are extremely isolated because of poor transport, lack of established social networks and/or the limitations of a young family. Although, Ingleside-Warriewood is likely to attract more established families, these issues may still be relevant to many women and unless services are provided, can result in social problems for women and their families.

Sole parents, the majority of whom are women, also require support in the form of childcare, social networks and good transport to enable them to be active members of the community. Similarly for lone older women who retire in the area, who become widowed/partnerless or who are part of an extended family living in the release area, community services will be vital. Assistance to form new social networks, to access health services and to be mobile through effective public transport will be important for these women.

Existing and new services in the area will need to focus on these specific issues and work to ensure that women's needs are met. If the high population scenario is reached, an additional women's refuge may also be required. Although one is already located in Dee Why, it is well-utilised and additional population growth will place considerable pressure on this service. The DCS recommends a standard of 1 women's refuge per 80,000 residents and based on the higher population scenario, Pittwater LGA will only just fall short of this threshold. Careful monitoring of the impact of the release area on demand for this service should be undertaken.

6.6 SERVICES FOR AGED 55+ YEARS

Many new release areas have a very minimal impact on aged services as usually they house few aged residents. However, this release area is unlikely to reflect this pattern and will attract a significant number of retirees. The provision of some medium density housing may increase the number of aged residents as very often they are seeking smaller homes with reduced maintenance.

Although Pittwater LGA already houses a wide range of aged services, it is evident that any increase in the aged population as a result of this development, will place additional demands on an already "at capacity" service area. The Northern Beaches already houses a large aged population and with services being provided often on a regional basis, most are located in Manly and Warringah. HACC funded services in particular will be effected, with these unable to cope with the existing demands. Any population growth in the LGA will impact on the need for expansion of existing HACC services. Discussions with the DCS - Warringah Area confirmed

that services for the aged are at capacity and this was further highlighted at the community consultations.

For all population scenarios, additional aged services will be required. This will primarily be through the Home and Community Care program (HACC) and consideration may need to be given to expanding existing Council facilities for the aged and/or office accommodation for aged services. This will be particularly important for the medium and high scenarios, both of which will significantly increase the number of aged residents in Pittwater.

Provision for the capital funding of these services should be made through S94 contributions as limited funding is available from other government sources. Recurrent funding for HACC services should be achieved through the DHS&H and DCS, although significant lobbying will be required to ensure provision. Provision of additional capital facilities and a joint Council/Government approach may help to secure HACC funds.

6.7 SERVICES FOR PEOPLE WITH A DISABILITY

It is anticipated that Ingleside Warriewood will house a significant disabled population due primarily to the high proportion of aged residents expected (the occurrence of disability increases with age) and the attractiveness of the area for those who want to be near major disability service providers eg Spastic Centre, House with No Steps, Sunnyfield etc.

For all population scenarios, demand for services for people with disabilities will increase although the greatest impact will occur for the medium and high scenarios. Based on DCS standards, these scenarios will generate the need for additional residential care, respite care and community disability teams to service residents who have disabilities. The existing need for post school options for residents with a disability and long term care for older residents with disabilities will be further exacerbated by the release area development. Currently there are very few existing disability services actually located in the Pittwater LGA and this needs to be considered in the future planning of disability services.

The release area however provides the opportunity for the DHS&H, DCS and the community to plan ahead and consider the acquisition and construction of facilities to meet the needs of existing and future disabled residents. Both capital and recurrent funding is available through these departments for a range of disability services. Council can play a facilitating role by working with all these groups to ensure that the needs of disabled residents of the LGA are met.

In addition, Council should ensure that all buildings and public spaces in the release area are fully accessible. This includes public parks, transport interchanges, shopping areas and community buildings.

6.8 SERVICES FOR NESB RESIDENTS

NESB residents are likely to require specialist services particularly in a new community where their knowledge of the surrounding area and how it works will be limited. This was highlighted in the consultation (see Section 4.0) with recommendations for information on services in the area to be targeted to NESB residents and that all new services address the needs of NESB residents.

This may be achieved through the distribution of New Resident Information Kits detailing contacts for ethno-specific services; for Council to ensure that services/activities in community centres attract NESB residents and for ethnic service providers to offer sessional services in the release area. More research on specific needs of NESB residents will be required as the community develops.

Very often, usage of community services by NESB residents is limited unless specific activities are focussed on these residents. Awareness of the needs of incoming NESB residents will need to be raised together with provision of specific activities/programs, e.g. English classes, social groups, interpreter services, cultural programs etc.

6.9 SERVICES FOR THE GENERAL COMMUNITY

A range of general services will also be required to meet the needs of the new community. These include:

6.9.1 Community Centres

All communities require a focus for community activities - a meeting place. This is supported by all current need assessment methodologies - comparison with Menai and Cherrybrook indicates the high demand for community centres; the community consultation identified the need for community meeting places; normative standards recommend that community centres are baseline provision; and already Pittwater houses eight community centres at a rate of 0.09 sqm per resident.

Research has shown that, particularly in new communities, community centres provide a base from where government services can be provided; community-based activities can start; where private classes can be run; and where cultural activities can develop. For many incoming residents, the community centre is an information point - where they can find out what is happening in the area and where they can meet people. They encourage the establishment of social networks and provide a space for private and community functions. Designed and operated effectively, they can be the central focus of the community.

Regardless of the development scenarios achieved, community centre provision will be required and should be one of the first facilities built in Ingleside-Warriewood. A standard of 0.09 sqm

per resident is recommended based on existing provision in the LGA and comparable standards in Menai and Cherrybrook. The number and size of community centres will vary depending on the needs of residents and the development pattern achieved. However, the first centre may need to be a medium sized centre (400-600 sqm) to cater for a wide range of initial needs. This may include office space for early childhood services; activity areas for playgroups; meeting rooms for new groups; and art/craft areas for leisure learning.

Isolation and poor transport links may also be evident in some parts of the release area. This may require the provision of small centres to ensure access for all residents. It is recommended that maximum flexibility be retained at this stage regarding the size and location of community centres and this be decided through an active monitoring process of community needs as the area develops.

Capital funding of community centres should be undertaken through S94. Provision should also be made for initial fitout of each building to ensure that the facility is operable on completion, i.e. chairs, tables, kitchen, storage etc. Very often new centres have struggled without this initial provision and been unused by new residents. Baseline provision requires that centres are available for immediate resident use.

Funds to provide staff for community centres is difficult to secure. DCS does provide limited funding but the "need" priority of this area is likely to be low compared to other areas with lower socio-economic status. Council should investigate the options of funding a co-ordinator to establish and run each community centre. Staffed centres have proven to be more effective in providing a range of activities while also being more profitable and self-funding. Care should be taken to ensure that initially Council subsidise the co-ordinator's salary, to permit initial establishment and facilitate concessional rates being offered to newly established community groups.

6.9.2 Fire Stations

The NSW Fire Brigades is interested in relocating its existing station at Mona Vale further west to provide a better service to the entire community. The service undertakes a very detailed planning assessment to ensure the most effective location for a station. It considers that a location within the release area would facilitate better access to its service area within the target 7.1 minute response time. The current site is limited (only a single bay station) and a new station within the release area would enable a modern and larger facility to be constructed.

Funding for the new station would be based on selling their existing station at Mona Vale and re-investing this capital in the construction of a new upgraded facility. However, with the capital cost of the facility likely to be \$1 million, the service considers that the provision of a site by Council would ensure that early provision is achieved. The budget process is highly competitive and the service has proven that with Council co-operation, early provision can be achieved through the provision of S94 funded land.

Staffing of the new station would be based on transfer of existing resources from Mona Vale with additional equipment required as the release area expands. This recurrent funding would be met through the usual service budget process.

Due to the current provision of well-located bushfire stations in the area, the NSW Bushfire Brigade consider that no new stations will be required as a result of Ingleside-Warriewood. Some additional equipment may be necessary but the service considers that it is well equipped to protect property owners and extensive areas of bushland in the area.

As Ingleside-Warriewood is within both the boundaries the NSW Bushfire Service and NSW Fire Brigades, negotiations will need to be settled as to the interface between the two services and areas of responsibility. Discussions are currently occurring and it is anticipated that both services will work to maximise the benefits for the community as a whole.

6.9.3 Library Services

The need for additional library services is evident as a result of this new development. This release area will house reasonably affluent residents who typically demand access to good library services. The large number of school children and youth will also require library services as an educational resource while the growth of retirees will increase the demand on library services. As shown in Menai and Cherrybrook, library services will be in demand and existing provision in the Pittwater LGA is limited.

A standard of 30 sqm per resident is recommended to meet the needs of the release area which is slightly less than that recommended by the NSW State Library but in keeping with provision in other comparative communities. It also provides sufficient space for a small branch library if only the low scenario is achieved (294 sqm) and sufficient for a major facility if the high scenario is achieved (780 sqm).

A staged facility or temporary library may be appropriate to enable early provision and will be dependent on factors such as resident demand, funding availability, siting etc. A temporary library may be established in a community centre near public transport and would be provide for students requiring study facilities and as a meeting place for new residents. Alternate staffing options may also need to be considered such as the use of volunteers as currently done in Avalon and Terrey Hills community libraries. Mobile services may also need to be investigated while existing outreach services provided by Mona Vale library such as housebound services and storytelling can be expanded if additional staff resources are provided.

Capital funding of library facilities is usually achieved through S94 funding. Libraries have traditionally been the funding responsibility of local government. In addition to capital construction, libraries require fitout, books and staffing. Again, it is recommended that fitout and the initial book collection be achieved through S94 provision as without this initial provision

the service will be inoperable. Staffing costs will need to be met by Council and allowance will need to be made for this on-going commitment.

With this new branch library, increased support and administrative staff will be required. This need for additional administration space should be accommodated within the floorspace provision recommended for the release area. Currently administration staff are based at Council's offices in Vuko Place and this will need to be reviewed when more detailed planning for library services is undertaken.

6.9.4 Health

Discussions with the Executive Director of Mona Vale Hospital and Area Health Service, has indicated that the release area will have a significant impact on the need for health services in the area. Considering the profile of the incoming residents, the service considers that the greatest demands will be made on maternity, paediatrics, community health services, aged services and accident/emergency.

The population scenarios are likely to generate the following demands:

- **Low scenario** - this should be met through additional staff resources only. Aged services may be stretched but with additional community support, no additions to existing hospital facilities will be required.
- **Medium scenario** - maternity and paediatrics may require some expansion while the number of general wards and aged services will need to be increased.
- **High scenario** - this scenario will have a significant impact on existing health services with capital and recurrent upgrading of the hospital and area health service required.

The extent of upgrading is yet to be determined and further investigation by the Area Health Service as to the impact of the development is required. However, it is apparent that the development will have some positive impacts for existing residents, in so far as maintaining the current level of health services. In fact, if funding is provided by the State and Federal governments, access to health services for Pittwater residents may improve as a result of Ingleside-Warriewood.

6.9.5 Education

Other educational services required by incoming residents will be access to TAFE and other Adult Education facilities.

Information from TAFE suggests that generally, 7.2% of the population participate in TAFE. This proportion however decreases where university expectations are high (university draw on

North Shore students is likely to be maintained for the release area). Therefore the participation rate from the release area may be low and existing TAFE spare capacity in the Brookvale college may be sufficient to meet the needs of new residents.

However if demand is higher, TAFE could develop a 15-hectare site at Belrose to meet the needs of residents of the release area and the North Shore. Opportunities for courses relating to business, computing, horticulture and environmental studies may all be relevant to business needs in this area.

Manly Warringah Community College will also be required to take up the expected additional demand for adult education. Experience of other colleges in the Hills area has shown a marked increase in demand for this service as a result of new development. As it operates primarily at existing high school facilities and is self-funding, additional capacity within Narrabeen High, Pittwater High and any new high schools built can be used. The service has the opportunity to provide courses also which will assist further in meeting the social needs of the incoming residents, e.g. English classes, parenting, retraining courses etc. and this should be encouraged.

6.9.6 Support

Government support services are primarily provided through joint funding programs of the DHS&H and DCS. While not attempting to detail all the services required or provided by these agencies, those support services which will be needed by this new community are highlighted below.

It is considered that, due to the large concentration of families, children and youth projected for Ingleside-Warriewood, the greatest need will be for community workers (preventative), family counsellors, child protection officers and adolescent district officers.

Strong liaison with both Departments will be required to achieve this provision due to the "perceived" low need of communities on Sydney's North Shore. However, research has shown that high socio-economic status does not always reflect a low need for particular services. This is often evident for issues of domestic violence, family breakdown, child abuse and drug and alcohol abuse. Although Council does not have a direct role in provision of these services, a strong advocacy role is recommended to ensure that resources and staff are provided to reduce the development of these social problems in Ingleside-Warriewood.

- **Low scenario** - recurrent funding for 1 community worker and 1 Family worker based in a community centre. An additional field officer should be provided on a pro-rata basis (1 per 7,500 residents) although more may be required due to the high concentration of children and youth and need for additional child protection services.

- **Medium and High scenario** - based on a planning standard of 20,000-50,000 residents, recurrent funding for 1 community worker/co-ordinator, 1 Family worker and 1 Outreach worker all based in a large community centre is recommended. In addition to this, DCS recognise the need for a youth worker and detached counsellor based in a youth facility. Additional field officers will be required and both scenarios provide a stronger case for more DCS staff.

6.9.7 Other Government Services

Depending on the development scenario adopted, additional government and non-government services may be required. Table 6.2 outlines in more detail the mix of community services which could eventuate depending on the size of the development and emerging community needs. The low scenario is unlikely to generate sufficient demand to support all the community services shown in Table 6.2.

It will also be important that, as the development is close to established communities and Section C - *Retail and Services Facilities* suggests that major new retail facilities will be limited, additional demand for community services may be met by developing new services/expanding existing services in established shopping areas. Established shopping centres are likely to be well used by new residents and their further development may encourage expansion of/development of new government and non-government community services eg HACC services developed further at Warriewood, private medical centre at Mona Vale etc. Any rezoning plans for the expansion of existing shopping centres should consider the additional community service demands which may arise as a result of Ingleside Warriewood.

Similarly, the involvement of the private sector and peak non-government welfare sector in the provision of services will need to be considered and regular information provided. This will enable the early identification of service demand and land availability by the full range of community service providers in the development eg new churches, private recreational facilities etc

More specifically, as outlined in Section 2.3.5, the NSW Police Service is reviewing the distribution of patrol boundaries and policing services in the area. The NSW government is currently looking at reallocation of police services to areas with high crime rates and population, and therefore the Northern Beaches (with its low crime rate and comparatively small population) is under considerable pressure to reduce existing service provision.

Based on the population scenarios for the release area, it is evident that the existing service will need to be maintained and if the medium and high scenarios are to be achieved, the service will need to expand. As the existing services in the area are primarily in residential-style buildings, a new site in the release area with an upgraded facility may be required to house the service.

More discussions with the NSW Police Service will be required to fully determine their needs. No firm commitments have been made due to the need for further internal discussions by the Service as to their planning needs.

The NSW Ambulance Service consider that its current facilities adjoining the release area will be sufficient to meet the needs of the new community. The service has expressed some uncertainty as to its ability to service the high population scenario and consider that factors such as the number of aged residents will have an impact on their service needs. At this stage however, additional land and facilities are not required. It is recommended that this be reassessed when a firm decision is made on the most acceptable population scenario and that the NSW Ambulance Service be requested to investigate the planning implications of the development further.

Discussions with both Telecom and Australia Post have indicated that no additional land will be required to service the new community and that they are well placed to meet the needs of incoming residents.

State Emergency Services consider that it may require additional land and further discussions should be held further into the planning process.

7. FUNDING AND REQUIREMENTS OF RECOMMENDED BASELINE COMMUNITY SERVICES

7.1 INTRODUCTION

The funding of community services is linked very closely with the implementation process in any new release area and it is considered that a proactive approach is required to secure funding opportunities as they become available. Government funding programs change regularly and due to the long development phase envisaged for Ingleside-Warriewood it is important that options with maximum flexibility be maintained. However, in determining appropriate funding it will be important to ensure that issues of equity and access are maintained for all residents of the release area, i.e. funding should not generate unaffordable user fees, building designs/standards should not be compromised etc.

The main sources of funding for community services are:

- i) S94 developer contributions for facilities provided by Council;
- ii) Commonwealth and State government funding programs such as DSE, DCS, DOH and DHS&H;
- iii) Joint funding with Commonwealth and State government departments, community-based organisations and the private sector. This may be in conjunction with DSE for community meeting rooms/school hall; Council community office space for government workers; pilot program with DHS&H to encourage private sector child care; corporate sponsorship of youth activities; shopping centre to provide child care facilities etc.;
- iv) Voluntary, charitable and community-based organisations and the resources they provide to service local community needs;
- v) Private sector initiatives to encourage provision in the new community. This includes entertainment and recreational facilities, medical services, private users of community buildings etc.;
- vi) Developing an entrepreneurial base which through revenue raising activities Council is able to fund and support community services. This is being considered by many Councils, e.g. Hawkesbury Council has built neighbourhood shops with rental funds returned to Council funds; Sutherland Council is manufacturing lifeguard buoys developed by staff etc.

7.2 JOINT COMMUNITY FACILITY PROJECTS

7.2.1 Introduction

Given the competition for limited resources to fund and operate community services, there is a growing demand from all levels of government and the community to look at more effective and efficient ways of provision. As highlighted in Section 7.1, the joint provision, joint financing and/or joint use of community services and facilities has been identified by many as one method by which these objectives may be achieved.

However, few have acknowledged the many problems associated with joint developments and the difficult experiences of practitioners in achieving successful joint projects.

Community use of schools is supported by the Department of School Education but in practice, has been difficult to achieve. Community use of school facilities has been reliant on the policies of individual school principals and with schools now being responsible for their own school budgets, revenue raising may place considerable pressure on user groups. Joint financing and joint use of facilities such as libraries and halls have proven particularly difficult, while some Councils are experimenting with joint sporting facilities.

Importantly, this movement towards joint projects has resulted in considerable exploration of the possibilities for greater co-operation and co-ordination between providers with the sharing of parking areas, office space and community buildings being common in many communities. Joint projects should not be blindly embraced nor coldly dismissed but rather explored to determine the opportunities available.

7.2.2 Defining the Range of Joint Projects

Joint projects cover a wide range of opportunities by which two or more parties work together to achieve mutually desirable goals. Typically, they fall into the following categories :

- **Joint provision** which is a cooperative agreement to plan, finance, construct and manage a community facility. This concept requires the full commitment of all parties and usually relates to large scale projects such as "educational precincts" (such as public and private secondary and tertiary education) and health related developments (such as hospital, medical centre and educational/research facility).

It typically involves the development of a fully integrated facility which meets the independent needs of all parties. It is likely to require extensive negotiation between all parties covering detailed finance, design and management issues.

- **Joint financing** which is part of the joint provision concept but individually, may only refer to an agreement to jointly fund or "pool" funds to construct a facility. Examples

may include a library integrated into a shopping complex where both the shopping centre developer and Council have contributed to the cost of construction. The operation and principal design of the facility is the responsibility of Council.

Similarly, an indoor recreation centre may be "pool" funded by Council, the State government and a developer. Again, the principal operator and user will be Council with the other parties being involved in financing and perhaps design and construction.

- **Joint use** is yet another concept which refers to the shared usage of facilities. With this concept, the initial planning, financing and construction maybe by one party with agreements for usage with various groups. The community use of schools is a good example of the joint use concept where the Department of School Education is the main construction and financing authority, but the community is able to use school facilities for a range of activities.

Others may include the construction of sessional office space for government and non-government human service providers and the shared usage of school and/or Council playing fields.

Each of these approaches may be used separately or in various combinations and involve two or more partners. The concept of joint projects has few limitations and the variety of completed and potential projects indicate the broad capacity of these approaches.

7.2.3 Potential Benefits

Benefits are likely to vary between projects, but in general terms, joint projects may achieve :

- **Reduction in capital and recurrent costs** - land, construction and/or operation costs are shared among all parties with the duplication of facilities minimised. For government, the usage of high capital cost facilities such as schools and health facilities is maximised.
- **Improved range and quality of services** - joint projects are likely to attract a broader range of service groups to the community and encourage innovation in service delivery. For example, the sharing of offices between various government and non-government service providers may reduce service duplication, improve communication between agencies and facilitate joint projects. Both aspects are advantageous to a new community, which very often, struggles to attract new services.
- **Maximum usage** - as outlined earlier, facilities are used to their maximum capacity through joint use projects, particularly at night and on weekends. The needs of a broad range of user groups may be accommodated by fewer facilities and therefore at a reduced cost to the government and the community.

To achieve maximum usage however, consultation with user groups is essential to ensure the facility meets their needs while good design and management structures are essential to maximise usage.

7.2.4 Potential Disbenefits

Disbenefits may also be evident and these may include :

- **Increased capital costs** - in some instances economic benefits may not be achieved and the joint capital costs may exceed the cost of separate provision. The additional cost of negotiation to achieve a suitable building to meet the needs of all parties together with the usually more complex design of the building, may exceed the cost of providing more traditional but separate facilities.

This has been the case for a joint use emergency services building in Hurstville (fire brigade, SES and ambulance) and the proposed Woodcroft community centre in South Australia (library, community meeting rooms, creche, TAFE, community health and welfare). The individual parties in both these projects consider that it may have been cheaper to construct separate facilities.

- **Complex decision-making and disputes** - with two or more parties involved in joint projects, decision-making in all joint projects becomes more complex and difficult. From the design of the building, to the final operation of the facility, decisions must be made to ensure that all parties agree with and abide by the decisions.

Joint school/Council community halls have been faced with this problem as the community user groups and school teachers work to ensure standards of security, cleanliness and access are maintained by all parties. Control of the building may be through a committee of residents and the school principal, both having different priorities for the use of the facility.

- **Negative impact on image and useability** - unless service types are fully compatible, joint facilities may become unattractive to clients due to factors such the size of the facility, range of people using the facility, reduced physical access etc.
- **Increased staff resources to co-ordinate** - joint projects require considerable time to negotiate, consult and determine actions appropriate for all parties. Experience has shown that a joint project will take considerably more organisation and require additional staff resources than many individual projects. Unless the staff resources are allocated, delays may occur in the timing of provision and again, the individual project may result in more timely provision.

7.2.5 Evaluating Potential Joint Projects

The following guidelines should be used to evaluate the opportunities for specific projects :

- **Philosophical commitment** - parties in a joint project must be willing partners, committed to working "in partnership; co-operation and sharing" throughout the life of the project. Without this commitment, negotiations are meaningless and time-consuming. All parties must have common goals and be willing to make financial and operational commitments to achieve these goals.
- **Financial benefit/implications** - it is imperative that all parties understand fully their financial obligations towards the capital and recurrent cost of the project. A basic investigation of the financial costs of the project should be undertaken prior to undertaking any joint project to ensure that the projected costs are acceptable to all parties. In some cases, although the project may not be greatly financially beneficial, other benefits may offset the financial implications eg early provision, attraction of broader client base etc.
- **Service compatibility** - the image, operating structure and client base of services sharing facilities needs to be compatible to ensure that for clients, usage is more attractive and desirable. Issues such as image are important with experience showing that some joint projects have impacted on the image of the service. For example, joint school/community libraries appear not to attract adult users while the sharing of facilities between youth and the aged is difficult. Consideration should also be given to the number of people attracted to each service particularly in relation to confidentiality, large numbers of volunteers, variance in age groups etc.
- **Location and timing requirements** - sites identified for joint facilities should be clustered, easily accessed by all potential users and be of sufficient size and zoning flexibility to accommodate a broad range of uses. Each party will have specific broad and detailed locational requirements and these will need to be compatible. Compromises may need to be made but should be canvassed early to ensure that the success of the project is not jeopardised. Timing of provision is important and each of the parties will need to share a common timeframe for provision.
- **Common design and management goals** - it is important that all parties agree on the design and management options for the project. In the past, this is where many projects have failed, with problems in the design or management of a facility rendering the project inoperable. Common goals and the achievement of significant benefits to each party as a result of the design and management are essential and these should be investigated prior to undertaking a project. Again, the process may be time-consuming, but it is important that written agreements are made to cover each component of the project. Where

appropriate, each party must be fully aware of its management responsibilities and that staff engaged to operate the completed project are committed to these agreements.

7.3 MINIMUM LEVEL OF COMMUNITY SERVICES REQUIRED

Based on these funding opportunities, the following minimum level of service provision will be required from the initial development stages of Ingleside-Warriewood. These services, together with the sources of funding, size and locational requirements are outlined below.

7.3.1 Long Day Care Services

Centre-Based and Family Day Care

- Average size 400 sqm particularly for larger numbers of 0-2 years
- Can be part of multipurpose children's centres
- Facility can be staged depending on funding
- Located on routes to school, shops and public transport
- Strongly related to resident work patterns
- Employment areas can be good locations
- Require good access for drop-off and pick-up
- Suitable for residential areas.

Funding Source

- Capital and recurrent funding typically provided through National Childcare Strategy - DHS&H.
- However, extremely limited funding available and competition high from other areas.
- Recommend S94 funding for 50% of places with the remainder to be achieved by private sector.
- Priority given to care for 0-2 year olds both through centre-based services, family day care and employer-sponsored provision.
- Preschool places may be required through S94 if private sector take up is low.
- Joint provision and employer-based care should be considered but may be difficult if not sufficient number of large employers/organisations are attracted to the area.

Out of School Hours Care

- 1 classroom minimum.
- Optimum location on school site but in separate room/facility.
- Can utilise community centre if required.
- Transporting of children should be minimised.
- Good access for drop-off and pick-up.
- On open space area for activities.

Funding Source

- Recurrent funding through DHS&H
- Capital not available but seek to ensure provision is made in existing and new schools; S94 may be required to supplement DSE capital/provision
- Utilise community centres if required

7.3.2 Community Nurse

- Use community centres and schools for early childhood health services.
- Sessional office and waiting space will need to be provided.
- On public transport, bicycle and pedestrian route.
- Good pram access/accessible venue is essential.

Funding Source

- Department of Health provide nursing staff; lobbying will be required to ensure early provision.
- S94 to provide sessional office space as part of community centre.

7.3.3 Public Schools

- Not on main roads but require good access for buses.
- Near other community facilities and open space.
- Opportunities for joint use facilities, e.g. childcare facility, community meeting rooms etc.
- Good bicycle and pedestrian access.
- Road with low speed and limited traffic.

Funding Source

- Capital and recurrent from Department of School Education.

7.3.4 Youth Facility

- Minimum size 350 sqm.
- Can be located near high school or shopping area/to capture where youth typically congregate.
- Location on public transport, bicycle and pedestrian routes is essential.
- Desirable to be close to sporting fields and school amenities.
- Not appropriate in residential areas or near hotels.

Funding Source

- Capital funding through S94 as other funding sources limited.
- Include building fitout.
- Recurrent funding for developmental youth workers and staff through DCS but difficult to secure.
- Up-front planning and extensive lobbying will be required with provision made for funding of co-ordinator through user pays and concessional charges.

7.3.5 Community Centre

- Small 300 sqm, medium 400-650 sqm and large 800-1,000 sqm.
- Medium sized facilities enable income to be generated from private classes, functions etc.
- Larger centre may not be required due to private function centres available throughout LGA.
- Include community art/cultural facilities in larger buildings as required.
- Temporary centres may be appropriate, e.g. existing house, project home to provide initial facility however often leads to permanent inappropriate facility.
- Centre can be built in stages with annexes being provided for community arts/meeting rooms as funds become available.
- Location on public transport, pedestrian and bicycle networks. Flat land near schools and shops.
- Can be jointly located with childcare facilities, schools and open space.
- May also be used for information services, cultural activities, cafes etc.

Funding Source

- Capital funding through S94 but flexible approach required.
- Building fitout as part of S94 is essential.
- Effective operation of centres is essential and co-ordinator to establish and operate each centre should be funded by Council. In the long term, staff costs may be offset by user fees but will need Council subsidy initially.
- May use full time experienced co-ordinator to set up each centre and then move on when centre established. Replaced by part-time co-ordinator and community-based committee.
- Community workers from DCS difficult to secure and extensive lobbying will be required. Workers to be centrally-based with outreach to several centres.

7.3.6 Facility for Services to the Aged and People with a Disability

- Size to be determined based on population needs; may be added onto new community centre.
- On public transport and good pedestrian network.
- Central location near shops important or other community facilities.

- Essential to have a flat site which is fully accessible.
- Parking for community bus and volunteers.
- Good drop-off and pick-up.

Funding Source

- S94 funding for capital funding to provide activity and office space of aged/disabled services required; include fitout of building.
- Capital funding can also be sought through HACC funding through Department of Local Government and Co-operatives.
- Recurrent funding through HACC and other government programs; may be base for community-based activities.

7.3.7 Library Facilities

- Recommend large central library of 500 sqm minimum which will not be achieved through low scenario; may require additional Council funds.
- Staging of the library may be appropriate.
- Located within a central shopping area or with other community facilities to create a central focus for the development.
- Close to schools and public transport, bicycle and pedestrian routes to facilitate use by school students and the aged.
- Mobile library should be investigated but experience indicates that can be difficult to achieve effective service.
- Any expansion of library services in the LGA will require additional support and administration staff. Location and funding of these central office resources will require further investigation when library plans more developed.

Funding Source

- S94 contributions should be used for construction and fit-out of library facilities. Fit-out should include book stock, shelving, computer cataloguing, furniture etc to ensure the library is operable.
- Limited funding is available from the State Library of NSW but competition is high.
- Recurrent funding will be required from Council to cover staffing costs.

7.4 NEXUS WITH SECTION 94

Under Section 94 of the Environmental Planning and Assessment Act 1979, local government has the power to levy contributions from developers for public amenities and services required as a result of development. Most importantly, local government must be able to show the "clear link or nexus" between the development and the resultant need for additional public services for which the levy is being collected.

Changes to the legislation in 1992 required that, in proving this nexus, Council must prepare a contributions plan and within it establish "the nexus between the expected types of development in the area and the demand for additional public amenities and services to meet that development" (*Environmental Planning and Assessment (Contributions Plans) Amendment Act 1991 No 64*).

This report, *Demographic and Facility/Service Needs Studies, Ingleside Warriewood Urban Release Area - Section D Community Facilities*, provides sound evidence of the nexus between the proposed development of the study area and the resultant demand for community facilities and services. The study methodology uses a range of assessment methods to determine a "fair and reasonable" level of services which will be required by the new residents. This requirement for "fair and reasonable" contributions is a strong principle of the new S94 legislation.

To levy for S94 contributions, Council must also prepare a S94 Contributions Plan which covers all aspects of services required for the new development. This may include public roads, public open space, car parking, drainage and community facilities.

Based on past experience, it is evident that the following issues should be considered in the preparation of the S94 Contributions Plan, particularly for community facilities/services:

- **Flexibility** - with changing government funding programs, development scenarios, community expectations etc it is imperative that the plan uses a flexible and broad approach which can accommodate the many changes likely over the long development phase of this new community. Guidelines set by the Department of Planning suggest that:

"Council may resolve to meet identified needs within a multipurpose facility or a number of non-specific facilities, which can be adapted to meet many community requirements, and levy on the basis of community floor space. The plan will justify and quantify this to reach a specific contribution, probably by reference to a supporting community amenities study. The broad purpose for contributions for community amenities will enable Council to retain a flexibility in determining the specific type of facility ultimately to be provided."

(Department of Planning, *Section 94 Contributions Plans Manual*, 1992 p17)

Therefore, by identifying a broad range of community facilities/services which may be required in the new development and relating this to a floorspace contribution level, the plan remains flexible and can accommodate changing needs and circumstances over time.

- **Links with Recurrent Funding Strategies** - S94 can only be levied for capital costs of development and does not cover recurrent costs. As highlighted throughout this report, community facilities require recurrent funds for staff, resources and on-going

operation/maintenance. The plan must consider the recurrent implications of the facilities/services proposed and strategies to meet these costs.

However, immediate guarantees from government funding programs to provide future levels of recurrent funding are unlikely as most departments fund on the basis of the existing target groups. However, early negotiations with relevant departments regarding the future needs of the community and Council's plans for meeting these needs, should put Ingleside Warriewood "on the agenda" for agencies and facilitate integration into departmental long-term funding budgets. Other funding sources should also be investigated.

- **Facilitating Early Provision** - critical to new release areas is the timing of facility/service provision and the need for services for the first residents. Unfortunately, initial residents are often subject to the most critical levels of isolation, poor accessibility, noise, dust and no facilities/services. And these are therefore the residents who are likely to be in need of support and assistance. Early provision of some initial services is essential for these residents.

Also for developers, the early provision of some facilities/services will enhance the image and marketability of the development. This is evident in many new developments throughout Sydney where developers support facilities/services which visually enhance the new community and which assist in their marketing of the development.

Therefore S94 strategies which facilitate early provision are important and may include the construction of facilities in stages; upfront funding by developers/Council; temporary facilities; mobiles etc. Analysis of projected cash flow from S94 based on projected release program and resultant population mix is recommended to inform the preparation of the S94 Contributions Plan.

- **Achievable Works Program** - The need to think strategically about the implications of the S94 Contributions Plans will be important and the ability of Council to expend the funds "within a reasonable time frame" as required by the Act. The design, tendering, construction and fitout of community buildings requires considerable lead time and it will be important for Council to consider the options for efficiently and effectively providing these facilities. The construction program must be achievable within Council's works program and consider other Council works, (ie not related to Ingleside Warriewood) also being undertaken in the LGA. Also linkages with site availability and the eventual users of the facility must be co-ordinated.
- **Inclusion of Fitout Costs** - community buildings cannot operate unless they have basic equipment to enable the service to operate. For example, a child care centre cannot operate without a commercial kitchen, storage areas and basic play equipment. A library requires equipment such as book stock, shelving, computers and office equipment. A

community centre requires a working kitchen, chairs, tables and office equipment. Basic levels of fitout are required to make the buildings operational on completion. Without this, new community facilities will be inefficient and not fully effective for many years as the new community struggles, probably through fund raising and limited Council funds, to equip the building. Typically, the pressure on new residents to fund raise is high as all groups/activities in the release area are new eg funds for new school, new sporting teams, new playgroups, new scout group etc.

- **Resourcing the S94 Implementation Process** - S94 requires considerable expertise and experience to ensure that all the facets of service provision are co-ordinated and an appropriate service emerges to meet identified community needs. A Community Planner will be required in the Community Services Branch to resource and manage the implementation of the Ingleside Warriewood S94 Plan and ensure that the Community Services Strategy outlined in Section 8 is implemented.

7.5 INDICATIVE CAPITAL AND RECURRENT COSTS OF COMMUNITY FACILITIES

To assist in the planning of service provision for the study area, information on indicative capital and recurrent building costs of community buildings have been identified based on discussions with Council's Building Services Manager and experience in other new release areas. This will assist Council in determining the S94 contributions required while also permitting some forward projections of cash flows, expenditure patterns and potential cost exposures to Council as a result of development. These costs however are only indicative, based on 1994 costs and standard community building designs and fitout. More detailed costings of buildings should be undertaken when further information is available regarding the identified site, user needs, building requirements etc. At this stage however, the following costs are useful guidelines to inform the planning process.

Three building types have been identified as forming the range of buildings required in the new development - child care centre/children's centre; multipurpose community centre; and library. Other services such as an outside school hours care centre, youth facility and centre for the aged/people with disabilities can be accommodated within the most appropriate of these building types. Indicative annual building maintenance costs for each of these buildings have also been identified excluding operating costs such as security, air conditioning, electricity, cleaning etc. These costs will need to be more fully identified as more definite plans of the size, type and design of community buildings are undertaken by Council.

For each of these building types, the following capital and recurrent cost components have been identified:

- land requirements
- building construction
- car parking

COMMUNITY FACILITIES

- landscaping
- site works
- fitout
- consultants fee
- contingency
- annual building maintenance.

7.5.1 Child Care Centre/Children's Centre

Land requirements	1,600 sqm for 400 sqm centre	
Building Cost for 400 sqm @ \$1,200 per sqm		\$ 480,000
Car parking		10,000
Landscaping		10,000
Site works - varies with the site - estimate		50,000
Fitout		30,000
Consultants		101,500
10% Contingency		69,000
TOTAL BUILDING COSTS		\$750,500
Estimated annual building maintenance costs		\$4,500

7.5.2 Multipurpose Community Centre

Land requirements	1,600 sqm for 650 sqm centre	
Building Cost for 650 sqm @ \$1,000 per sqm		\$ 650,000
Car parking		20,000
Landscaping		10,000
Site works - varies with the site - estimate		50,000
Fitout		30,000
Consultants		133,000
10% Contingency		89,300
TOTAL BUILDING COSTS		\$982,300
Estimated annual building maintenance costs		\$3,000

7.5.3 Library

Land requirements	1,600 sqm for 500 sqm library	
Building Cost for 500 sqm @ \$1,300 per sqm		\$ 650,000
Car parking		20,000
Landscaping		10,000
Site works - varies with the site - estimate		50,000
Fitout		300,000
Consultants		127,750
10% Contingency		116,000
TOTAL BUILDING COSTS		\$1,273,750
Estimated annual building maintenance costs		\$10,000

8. COMMUNITY SERVICES STRATEGY

Implementation is probably the most difficult aspect of community service planning. Unlike physical services such as water, roads and sewerage, community services require staff to provide services to the community. Therefore, for successful implementation, both capital and recurrent funding must be planned and co-ordinated to achieve results.

Also particular local characteristics and needs of Ingleside Warriewood will require strategies to address these concern over the long term planning and development of the community. These issues which have emerged from analysis of data and discussions held with Council, service providers and the community are:

1. Community Services may be improved through Medium/High Development Scenarios

For most services in the Pittwater LGA funded by the State and Commonwealth governments, such as schools, hospitals and policing, there is strong pressure to reallocate resources out of the area to other LGAs with larger population bases. Population increases projected by the medium and high development scenarios would maintain and in many cases, if additional funding is provided, improve existing service levels to the benefit of the wider community. However, the low scenario was considered by many agencies to have a minimal effect which may be considered to only fill up any existing capacity in local services and not warrant service upgrades.

Council services however have little or no capacity and all development scenarios will place increased demands on service provision.

2. Provision of an effective and efficient public transport network is essential

As experienced in other new release areas, social issues of isolation, limited employment opportunities and poor use of existing community services will occur unless a public transport network is provided early in the development phases. This includes bus transport, bicycle and pedestrian networks which link both within the release and to established communities outside. For many target groups who have limited access to private cars, such as children, youth, the aged and residents who are disabled, public transport is essential.

3. Proactive and flexible approach to funding of community services will be required

The release area is likely to be constantly battling a perception within government departments that because the incoming residents are likely to be of higher socio-economic status than in many fringe release areas, the needs are not great. It will be important to continually address this perception and reinforce the view that, due to significant social pressures generated by new releases (regardless of the socio-economic status of its residents), such as isolation, lack of facilities, limited social networks and high financial stress, the need is there. This is borne out by the experiences of similar release areas such as Cherrybrook and Menai. Equal access to

services and good planning should be the objective of all new developments regardless of resident economic status.

Also Ingleside Warriewood will be further disadvantaged by not having access to Area Assistance funding provided to many new release areas by the Department of Planning. This important program has been the source of start-up funding for many community services and activities and is considered to be an essential funding program for many new release areas. However, Ingleside Warriewood, like Menai and Cherrybrook is not included within the Area Assistance Scheme boundaries.

Flexibility will also be important as with the long development phase, changing government funding programs and changing community needs, the timing and type of services/facilities will be critical. It is recommended that S94 categories for community facilities be kept broad, to enable funds to be expended as required.

4. Existing service providers and community-based organisations are keen to support the development.

Based on feedback from the community consultations and discussions with service providers, it is evident that there is a wealth of resources available in the local community. This includes the large number of well-established community groups, service organisations and churches within the immediate area together with the many committed local service providers many of whom live within Pittwater or neighbouring LGAs. The large number of participants at the community consultation together with the very constructive views expressed at the consultations also highlighted this strong base of "local resources". Based on experiences in many other new communities, this is not evident in all release areas and may relate to the closeness of the site to a well-established community. This resource is invaluable and if used effectively and funded, can support, auspice and resource new services and facilities planned for Ingleside-Warriewood.

5. Incoming residents are likely to be articulate and interested in participating in their local community.

It would appear, based on the experiences of Cherrybrook and Menai, and given the likely profile for incoming residents (ie well-educated, high income, established families or retirees), that many new residents will have skills and backgrounds which may be of wider benefit to the community. Harnessed appropriately, incoming residents can provide invaluable support for the development of local community services. It is also likely that they will want to be informed and involved in ensuring that the needs of this new community are met.

From this basis, the following specific recommendations are made which should be used to form a Community Services Strategy for the release area. These recommendations assume that Council will prepare a S94 Contributions Plan for Community Facilities in keeping with the funding opportunities and locational strategies outlined in Section 7.

8.1 RECOMMENDATIONS

8.1.1 Provision Of Baseline Services

ACTION 1 - FACILITATE CHILD CARE

Discussions be held with the DHS&H regarding the expected high need of Ingleside Warriewood residents and the opportunity for a co-ordinated approach with the department which focuses on S94 capital funding by Council, employer-sponsored child care and private sector involvement. Seek the Department's involvement to encourage private involvement, support employer-sponsored schemes and earmark recurrent funds for Council provided child care.

ACTION 2 - PURSUE JOINT PROVISION

Council and the Department of School Education discuss opportunities for development of Outside School Hours Care facilities at existing schools to be used by children from the release area together with provision in any new schools in the area. Other joint provision opportunities such as community halls, playing fields etc also be canvassed.

Opportunities for joint provision with other government agencies, non-government service providers and the private sector should be pursued.

ACTION 3 - ENCOURAGE EARLY PROVISION AND STAGING OF FACILITIES

Priority be given to meeting the baseline requirements for community services during the initial development phase (identified in Section 5.0).

This may be required in several areas, if the development occurs on several unrelated fronts, and communities are physically disjointed. If insufficient S94 funds are available to meet these needs, Council should consider building facilities in stages or seeking up front/in kind contributions from major developers.

ACTION 4 - UTILISE EXISTING LOCAL SERVICE PROVIDERS AND COMMUNITY-BASED ORGANISATIONS

Establish a mechanism which facilitates involvement of existing services and community-based organisations provision in the delivery of their services/resources in Ingleside Warriewood. A working group of key local agencies/representatives together with a regular newsletter to other agencies detailing development plans, development monitor and issues should be considered.

ACTION 5 - GIVE PRIORITY TO STAFFING/RESOURCING OF COMMUNITY FACILITIES

Detailed funding options for staffing of initial community/youth centres be undertaken and discussions held with DCS and other appropriate government departments to seek short-term sessional opportunities for existing workers and long-term funding of permanent workers.

ACTION 6 - FACILITATE COMMUNITY INVOLVEMENT

Establish a community development policy for Ingleside Warriewood which focuses on establishing community management of new Council buildings; participation of incoming residents in the planning and provision of new facilities/services; provision of information on existing and proposed community services/facilities; and the encouragement of community initiatives e.g. fairs, cultural events, recreational activities, etc.

8.1.2 Management of the Planning and Implementation Process

ACTION 7 - LINK LOCAL NEEDS WITH GOVERNMENT FUNDING/PLANNING PROCESS

Establish a Release Area Management Committee - Community Services comprising of representatives of key government service providers, development representatives, community-based organisations and incoming residents.

Based on the experience of Menai and Cherrybrook (see Sections 3.5.1 and 3.5.2) and the community consultation identifying strongly for Council to take on a co-ordination/facilitation role in the development of services in this new community (see Section 4), the establishment of this committee is essential. It should be chaired and resourced by Council and utilise the information included in this and other relevant studies to form the basis of a forward planning program and commitment to co-ordinated provision.

ACTION 8 - ENSURE COMMUNITY SERVICE BRANCH INVOLVEMENT IN SERVICE PLANNING AND PROVISION

Council should establish processes and mechanisms which enable full participation of the Community Services Branch in the planning and implementation of community services in Ingleside Warriewood. This should include representation of Council's S94 Management Committee; New Release Area Planning Committees; participation in physical planning of overall release area and detailed subdivision design; facility design and construction; and responsibility for operation and management of buildings.

The Community Services Branch is best placed in Council to be responsible for the successful planning and implementation of community services. A strong working relationship must be

fostered with other Council departments particularly Town Planning and Property. The implementation of a S94 Contributions Plan requires a strong commitment from all Council branches to ensure its success.

ACTION 9 - MONITOR COMMUNITY NEEDS

Adopt a monitoring process which includes undertaking a simple survey of socio-demographic characteristics of incoming residents during the intercensal period; review of service usage and demands; and community consultation.

These three components will provide information to identify emerging community needs and ensure timely provision.

ACTION 10 - PROVIDE ADDITIONAL INTERNAL RESOURCES

Levy for S94 Contributions for the employment of a Community Planner during the development stage of the Ingleside-Warriewood release to resource and manage the implementation of the Community Services Strategy.

Council staff resources are totally committed to servicing the existing needs of the Pittwater LGA and additional resources will be required. Attached to the Community Services Branch, this person should also resource the Release Area Management Committee - Community Services.



APPENDIX D1

**EXISTING SERVICES WITHIN LOCAL SERVICE AREA
OF INGLESIDE-WARRIEWOOD RELEASE AREA**



APPENDIX TABLE 1: EXISTING SERVICES WITHIN LOCAL SERVICE AREA OF INGLESIDE-WARRIEWOOD RELEASE AREA

TARGET GROUP	SERVICE TYPE	SERVICE (AUSPICE)	LOCATION	CAPACITY	ABILITY TO EXPAND
Children 0 - 4 yrs	Long Day Care (extended hours)	No centres in service area caters for children under 2 years old	Jacksons Rd, Warriewood (Warriewood Sq)	25 places - caters for 52 children 98% from working parents 3 to 5 yrs only	At capacity - plans to increase to 40 places to accommodate Warriewood Stage 1
		Warriewood Children's Centre (Council)	Home-based service with admin at Cnr Gladstone Rd and Old Barrenjoey Rd, Newport	140 places - in 1993 255 children with 41 carers 255 children per week	Can be expanded but requires funding of a co-ordinator to increase the scheme + child care assistance
		Family Day Care (Council)	Dygal St, Mona Vale	34 places	At capacity
		Jack and Jill Kindergarten (private)	Seabeach Ave, Mona Vale	40 places	At capacity
	Preschools (9am - 3pm)	Mona Vale Kindergarten (private)	Oak St, North Narrabeen	8 places	At capacity
		Tall Tops Kindergarten (private)	Hill St, Warriewood	38 places	At capacity
		Warriewood Kindergarten (private)	Kalang Rd, Elanora Heights	40 places	Waiting list
School Aged Children 5 - 12 yrs	Occasional Care	Elanora Heights Kindergarten (community committee)	Darley St, Mona Vale	16 places	At capacity
		Darley St Kindergarten (private)	Barrenjoey Rd, Mona Vale	25 places	Waiting list
		Jemima Kindergarten (community committee)	Woorarra Ave, North Narrabeen	40 places	Waiting list
		Narrabeen Community Kindergarten (community committee)	As above	15 places - caters for 274 children in 1993 6 weeks-5 yrs	At capacity - current plans to expand for Warriewood Stage 1 to 30 places
	Immunisation	Warriewood Children's Centre (Council)	Park St, Mona Vale	557 vaccines in 1993 Service available each fortnight	Can expand
	Early Childhood Service	Mona Vale Early Childhood Centre (Council and Dept of Health)	Park St, Mona Vale	400 children/month	Limited capacity to increase
	Public Primary Schools	Mona Vale Primary Narrabeen North Primary Elanora Heights Primary Terrey Hills Primary	Waratah St, Mona Vale Jacksons Rd, North Narrabeen Elanora Rd, Elanora Heights Cooyong Rd, Terrey Hills	1,000 students 540 students 630 students 510 students	Not at capacity Not at capacity Not at capacity Not at capacity

APPENDIX TABLE 1: EXISTING SERVICES WITHIN LOCAL SERVICE AREA OF INGLESIDE-WARRIEWOOD RELEASE AREA

TARGET GROUP	SERVICE TYPE	SERVICE (AUSPICE)	LOCATION	CAPACITY	ABILITY TO EXPAND
Youth	Outside School Hours Care	Mona Vale After School Care (Council)	Kitchener Pk Sports Centre, Pittwater Rd, Mona Vale	30 places/day	Requires additional funding; current building is limited
		Elanora Heights After School Care (Council)	Elanora Rd, Elanora Heights	45 places/day	Requires additional funding; need additional facilities
		North Narrabeen Public School After School Care (P&C Committee)	Namona St, North Narrabeen	30 places/day	Requires additional funding; but space available
		Mona Vale Vacation Care (Council)	Mona Vale Memorial Hall, Pittwater Rd, Mona Vale) total of 190 children) per holiday at both) centres))	Requires additional funding; building is limited
		Narrabeen Vacation Care (Council)	Narrabeen Youth and Community Centre, Warriewood		Can expand with additional funding
	Public High Schools	Narrabeen High Pittwater High	Pittwater Rd, North Narrabeen Mona St, Mona Vale	1,240 students 1,100 students	Has capacity Has capacity
Women	Private Schools	Loquat Valley Anglican Hamazkaine Arshak and Sophie Galstaun school Marta Maria Catholic High	Loquat Valley Rd, Bayview Chiltern Rd, Ingleside		Has capacity Has capacity
	Holiday Activities	Pittwater Council Holiday Activities Program	Depends on program	24 programs run in 1993 310 children participated	Seeking sponsorship to offset costs
	Service Development	Pittwater Youth Committee	Resourced by Council	Unlimited	Self funding
	Crisis Accommodation	Warringah Youth Refuge (Community committee - DCS funding) Manly Warringah Youth Accommodation Assoc. (Community committee - DCS funding)	On request On request	8 people aged 12-18 years Varies	Well used Well used
	Activity Program - Drop in, Coffee shop etc.	The Junction (Uniting Church)	Pittwater Road, Mona Vale	Varies	Can expand
	Manly-Warringah Women's Resource Centre/Family Support Service	Refuge and family support service (Community-committee Dept of Community Services funding)	On request		Well used

APPENDIX TABLE 1: EXISTING SERVICES WITHIN LOCAL SERVICE AREA OF INGLESIDE-WARRIEWOOD RELEASE AREA				
TARGET GROUP	SERVICE TYPE	SERVICE (AUSPICE)	LOCATION	CAPACITY
Aged 55+ yrs	Senior Citizens Centre	Nelson Heather Senior Citizens Centre (Council)	Jackson Rd Warriewood	Used average 473 hours/month by 4,120 users
	Home Support Services (for disabled also)	Meals On Wheels Community Options Mona Vale Community Restaurant	Jacksons Rd, Warriewood Waratah St, Mona Vale The Junction, Mona Vale	Can expand. Requires additional funding Requires additional funding
		Easy Care Gardening Manly Warringah Pittwater Community Transport Home Care Service Community Aid Service Mona Vale Aged Care Assessment Team	Howard Ave, Dee Why Fisher Rd, Dee Why Pittwater Rd, Dee Why Nareen Pde, Narrabeen Mona Vale Hospital	At capacity; requires funding At capacity; requires funding Requires funding; at capacity Requires funding At capacity; requires additional funding
Disabled	Respite Care, Peer Support and Host Family Programs	Northern Beaches Interchange	Nelson Heather Centre, Warriewood	Requires funding
	Support for Disabled Children	Cubby House Toy Library (Community-committee)	Kiah Centre, Dee Why	Varies
	Developmental Disability Service	Manly Warringah Developmental Disability Service	Brissenden and Beach Rd, Collaroy	Varies
	Out-patient rehab health care and therapy for disabled	Mona Vale Rehab and Geriatric Service	Mona Vale Hospital	
	Work preparation for disabled	Human Resource Centre	Wetherill St, Narrabeen	
NESB residents	Service co-ordination	Northern Beaches, NESB Network	Howard Ave, Dee Why	Unlimited
No other direct NESB services within the study area - limited services in Dee Why, Manly etc.				

APPENDIX TABLE 1: EXISTING SERVICES WITHIN LOCAL SERVICE AREA OF INGLESIDE-WARRIEWOOD RELEASE AREA

TARGET GROUP	SERVICE TYPE	SERVICE (AUSPICE)	LOCATION	CAPACITY	ABILITY TO EXPAND
General Community	Community Centres	Narrabeen Community Centre	Woorarra Ave, North Narrabeen	660 sqm	66% usage; some capacity for weekend activities
		Mona Vale Memorial Hall	Pittwater Rd, Mona Vale	700 sqm	53.6% usage; some capacity but only suited to large activities and functions
		Ted Blackwood Narrabeen Youth and Community Centre	Boonah St, North Narrabeen	500 sqm	48% usage; basic building which can be further utilised
		Elanora Heights Community Centre	Kalang Rd, Elanora Heights	273 sqm	66.5% usage; some capacity at night and weekends
		Kitchener Park Sports Centre	Pittwater Rd, Mona Vale	360 sqm	19.2%; has capacity but needs upgrading
Health	Bushfire Brigade	Tumbledown Dick	Tumburra St, Ingleside	100 sqm	Can meet additional needs
		Ingleside	King Rd, Ingleside	180 sqm	Can meet additional needs
	Craft & Leisure activities	Terrey Hills	Yulong Rd, Terrey Hills	na	Can meet additional needs
		Bushfire Control Centre	Aumuna Rd, Terrey Hills	na	Can meet additional needs
	Library services	Creative Leisure	Nelson Heather Senior Citizens Centre	Varies	Can meet additional needs
		Mona Vale Library (Council)	Park St, Mona Vale	626 sqm with 6,500 users and lends 9,000 items per week	Has some capacity
Health	Hospital	Terrey Hills Library (Warringah Council and community committee)	Booralie Rd, Terrey Hills	17,160 loans in 1991	community run library - not set up for major increase in usage
		Mona Vale District Hospital	Coronation St, Mona Vale	Varies	Has capacity; will require additional funding depending on scenario
	Community Health Service	Mona Vale Community Health Service (Dept of Health)	Coronation St, Mona Vale	Adolescent service Audiology Health Promotion Rehab and Geriatric Speech Pathology Mental Health	Will require additional resources
		Queenscliff Family and Child Health Services	Cnr Lakeside Cr and Palm Ave, North Manly	Adolescent services Early Childhood services	

APPENDIX TABLE 1: EXISTING SERVICES WITHIN LOCAL SERVICE AREA OF INGLESIDE-WARRIEWOOD RELEASE AREA					
TARGET GROUP	SERVICE TYPE	SERVICE (AUSPICE)	LOCATION	CAPACITY	ABILITY TO EXPAND
Education	Adult Education	Manly Warringah Community College	At Narrabeen High School and has other locations near release area	Has capacity	Flexible
	TAFE	Brookvale College	Brookvale High, Old Pittwater Rd, Brookvale	Has capacity	Limited site
		Seaforth College	Frenchs Forest Rd and Sydney Rd, Seaforth	Has capacity	Limited site
		Learning Difficulties	Northern Beaches Learning Disabilities Support Group (community committee)	Elanora ECH Centre, Kalang Rd, Elanora	Limited
Support	Welfare and Information Services	Dept of Community Services Manly Warringah Community Information and Service Centre (community committee) Dept of Social Security Centacare Family Support Service	Sydney Rd, Manly Howard Ave, Dee Why and mobile van service Pittwater Rd, Dee Why Keenan & Park St, Mona Vale		
	Employment	Commonwealth Employment Service Human Resources Centre	Cross St, Brookvale Wetherill St, Narrabeen		
Religion	Churches	Baha'i Temple Serbian Church Kerugma Church Church of Latter Day Saints Uniting Church Baptist Church Others are located in Mona Vale, Terrey Hills and Elanora Heights	Mona Vale Rd, Ingleside Wilson St, Elanora Heights Lane Cove Rd, Ingleside Powderworks Rd, Narrabeen Powderworks Rd, Elanora Heights Grenfell Ave, Narrabeen		

APPENDIX TABLE 1: EXISTING SERVICES WITHIN LOCAL SERVICE AREA OF INGLESIDE-WARRIEWOOD RELEASE AREA					
TARGET GROUP	SERVICE TYPE	SERVICE (AUSPICE)	LOCATION	CAPACITY	ABILITY TO EXPAND
Other Govt. Services	Council	Pittwater Council offices	Vuko Pl, Warriewood		
	Police	Mona Vale Police	Pittwater Rd, Mona Vale		Limited site; additional funding required
	Fire Brigade	Mona Vale Fire Station	Harkerth St, Mona Vale		Limited site; can expand if new site available
	Ambulance Services	Avalon Narrabeen Belrose St Ives			Consider that have sufficient capacity - additional staff will be required; further assessment required
	State Emergency Services	Terrey Hills			Limited site
	Australia Post	Elanora Heights Post Office	Kalang Rd, Elanora Heights		Flexible to meet demand as it occurs
		Mona Vale Post Office Church Point Post Office Terrey Hills Post Office Warriewood Post Office	Pittwater Rd, Mona Vale Pittwater Rd, Church Pt Booralie Rd, Terrey Hills Warriewood Shopping Centre		

APPENDIX D2

COMMUNITY CONSULTATION -
LIST OF ATTENDEES



Wednesday 4th May, 1994

Aged and Disabled - Nan Bosler Community Development Officer

1. Helen Robinson - Home Care
2. Libby Palmer - Community Options
3. Greg Mott - Spastic Centre
4. Anne Church - Warringah Pittwater Meals on Wheels
5. Gena Villar - Interchange
6. Eliane Da Silva - North East Met HACC Forum
7. Rachel Elliot - Community Aid
8. Pat Pierson - Dee Why Education Resource Centre

Children and Youth - Fay Lewis - Recreation Services Co-Ordinator

1. Nan Walters - Jemina Kindergarten
2. Gail - Director Mona Vale Kindergarten
3. Ian Ross - Avalon Breakers
4. Veronica Dickson - Northern Beaches Youth Theatre
5. Mrs Piper - Pittwater Flora and Fauna Society
6. Maria Chidzey - Friendly Aliens

Community Services Group 1 - Kylie Frazer - Community Services Planner

1. Margi Abraham - Department of Transport
2. Jeannie Scott - Manly Warringah Pittwater Community Transport
3. Lyn Kelleher - CISC Mobile Van
4. Moni Gomez - Manly Warringah Community College
5. David Palmer - Ingleside Residents Association
6. Brian Kirk - Landcom
7. Chris Waterhouse - Telecom
8. Senior Sargeant Moss - Mona Vale Police
9. Anne Skarrat - Community Aid

Community Services Group 2 - Heather Ritchie - Community Services Manager

1. Barbara Kilpatrick - Womens Resource Centre
2. Victor Khatchikien - Armenian School
3. Henry Wardlaw - Pittwater Residents Committee
4. Harry Groves - Ingleside Blue Hatched Area Association
5. Debra Dickson - Landcom
6. Mrs Lanari - Hispanic Association
7. Greg Foster - CALM
8. Councillor Max Radmanovich
9. Sandra Murdock - Representative Hon. Jim Longley, Minister for Community Services

Churches - Allan Gear - Assistant Engineering Design Manager

1. Dorothy Davis - Pittwater Flora and Fauna Society
2. Alan Robinson - Elanora Heights Uniting Church
3. Les Dumesay - Christian Outreach Centre
4. Peter Davis - Elanora Heights Uniting Church
5. Father Grew - Sacred Heart Catholic Church
6. Reverend Coleman - St Johns Church of England Church
7. Lisa Soden - Salvation Army

Thursday 5th May, 1994

Children - Judy Warren - Children's Services Co-ordinator

1. Barry White - Department Human Services and Health
2. Director - Warriewood Kindergarten
3. Director - Tall Tops Kindergarten
4. Director - Narrabeen Community Kindergarten
5. Director - Darley Street Kindergarten
6. Stephanie Rothpletz - Elanora Heights Community Kindergarten
7. Bob Cockbaine - Ingleside Residents Association

Culture - Fay Lewis - Recreation Services Co-ordinator

1. Peter Main - Elanora Players
2. Ian Stroeng-Hansen - Artists and Craftsmen of Pittwater
3. Ted Blackwood - Narrabeen Youth and Community Centre
4. Nada Sekulich - Wilga Wilson Residents Association
5. Milly Sekulich - Wilga Wilson Residents Association
6. Jim Revitt - Pittwater Residents Association
7. Victor Guberina - Warriewood Valley Rezoning Association
8. Carol Gerrard - Library Services Manager
9. Mrs B Coric - Serbian Orthodox Church

Community Services - Kylie Frazer - Community Services Planner

1. Margaret Mathers - Sydney Home Nursing
2. Project Officer - Department Human Services and Health
3. Eileen Draeger - Narrabeen Youth and Community Centre
4. Warwick McCarthy - Pittwater Protection and Preservation Society
5. Harry Groves - Ingleside Blue Hatched Area Association
6. Phillip Walker - Warriewood Valley Residents Association
7. Geoff Chafer - Pittwater Uniting Church

Community Services - Heather Ritchie - Community Services Manager

1. Gordon Davies - Warriewood Valley Rezoning Association
2. Mr V Bubalo - Serbian Orthodox Church
3. Bob Harrison - Ingleside Residents Association
4. Rob Hack - Chairman, Warriewood Valley Residents Association
5. Brian Haze - Uniting Church
6. Robin Hill - Warringah Council Manager Community Development
7. Rick Rothpletz - Elanora Heights Progress Association
8. John Lettoof - Warriewood Valley Residents Association
9. Arch Deacon Platt - Church of England.



APPENDIX D3

**CONSULTATION WITH GOVERNMENT
AND COMMUNITY-BASED SERVICE PROVIDERS
AND REPRESENTATIVES OF COMMUNITY GROUPS**



CONSULTATION WITH GOVERNMENT AND COMMUNITY-BASED SERVICE PROVIDERS AND REPRESENTATIVES OF COMMUNITY GROUPS

BACKGROUND

As part of the Community Services and Facilities Study for the Ingleside Warriewood Release Area, a community consultation was held with government and community-based service providers and representatives of community groups on Wednesday 4th May and Thursday 5th May 1994. Some 100 organisations/groups were invited with an excellent responses of 70 participants at the consultation workshops. The overall feedback from the participants was very positive, with people pleased to be given the opportunity to discuss the planning of services for this new community. Submissions were also received from four organisations unable to attend the consultations.

At each consultation, after initial information was provided about the broad planning process for Ingleside Warriewood and projected characteristics of the new residents, participants were divided into smaller working groups to discuss seven questions about the proposed new community.

The following summary highlights the major outcomes of the consultation, based on the common issues and comments of the consultation participants. However, to ensure that views of individual organisations are represented, all comments from the discussion groups are provided after the summary.

MAJOR OUTCOMES

In summary, the main issues/findings of the consultation were :

1. **New residents in Ingleside-Warriewood are likely to have needs similar to residents in other new release areas related to issues of isolation, access, employment and financial stress. Transport and access were seen as major needs by the majority of participants.** Groups also saw a high need for information to be distributed to new residents, with particular emphasis on available community services/ facilities and ensuring that appropriate information was available for incoming NESB residents.
2. **Community facilities and services considered to be required by the new community were numerous although most groups considered that this should be determined by the new residents themselves and as the size of the development (eventual population) becomes more concrete.** They felt that the population scenarios presented (population 10,000-26,000 residents) may result in many different requirements for community services. However, there appears to be consensus on the following community services/facilities regardless of population size:
 - multi-purpose community meeting place/centre which caters for the diverse ages and backgrounds of the incoming residents
 - information services focussing on available community services/facilities for incoming residents
 - passive and active recreational space and facilities again catering for the range of ages and interests of the incoming residents
 - developmental workers who can devise programs to facilitate community activities and encourage resident settlement

- a full range of childcare facilities particularly for children 0-2 years and school aged children
 - youth facilities and entertainment which cater not just for sporting activities but also after-dark entertainment
 - public transport which is affordable, effective and links the services within the release area and links to the services outside the release area. This will be particularly important for the children, youth, aged and disabled residents who many not have access to a private motor vehicle
 - walkways and cycleways which make the community accessible for all residents and provides environmental benefits
 - library services which may need to be mobile or expanded to service new residents
 - services provided by voluntary and non-government sectors eg churches, private child care operators, scout association etc
 - all facilities and services must be accessible to the aged and disabled particularly public buildings, shopping areas, footpaths, parks etc.
3. **The majority of groups considered that community services/facilities must be provided early in the development phase and may need to be flexible to meet changing needs.** Because of this, new residents and existing service providers need to be involved in the planning process to ensure the timely provision of services to meet the existing needs.
 4. **Existing residents of the release area and in the surrounding communities are likely to benefit from any new services provided in the new community.** This will help to unite the residents and enable them to cope with this major change. However if limited new services are provided, and new residents place excessive demands on existing services, existing residents will be disadvantaged and may resent the new community.
 5. **Many existing services are at capacity (particularly community-based services) and will require additional funds to expand.** Most will be able to use their existing premises and provide outreach services in community buildings in the new community. However, if the higher population is reached (ie. 26,000 people), purpose-built office and activity space may be required in Ingleside Warriewood. Particular concern was expressed over the "at capacity" nature of existing youth, aged and childcare services.
 6. **The main locational criteria for services/facilities was public transport.** Overwhelmingly, the groups considered that all services need to be accessible by public transport and that walking and cycling provision be made to new facilities provided within the release area.
 7. **To assist existing services to meet the needs of the Ingleside Warriewood release area, groups considered that it was very important for Council to be the co-ordinator and facilitator of all community services to the new community.** The role of the State and Federal government is to provide guarantees of funding for expanded services and that up-front guarantees will assist in forward planning. To ensure efficient and effective service provision occurs, it was highlighted that consultation between all players will be necessary - residents, existing service providers, church organisations, the private sector and all three levels of government. This was seen to be essential.

8. Other issues raised which related more broadly to the development focussed on :

- safety - roads, housing and community design to provide a safe environment particularly for children, youth, aged and disabled residents
- community identity and focus - the importance of creating a strong identity for the new development
- environmental protection - the unique character of Ingleside Warriewood should be enhanced through preservation of bushland, nature trails, horse-riding areas etc.

DETAILED RESPONSES

1. *What will be the needs of these new residents/your target group? Experience in other new communities, particularly in the early stages of development, indicate that typical problems are:*

- *lack of access to community services eg shops, schools, child care etc;*
- *lack of public transport;*
- *lack of access to parks;*
- *feelings of isolation and not knowing people, the area etc;*
- *limited employment opportunities;*
- *financial stress due to high mortgages and expenses involved in moving into new home.*

Could these problems be similar for new residents of Ingleside-Warriewood? Are there other problems which may be unique for new residents here?

- keeping employed; to do this new residents need access to good transport, schools, shops (within walking distance) and employment opportunities (2)
- many will need to be dual income to build homes in this area
- with older second and third home buyers many may have older parents moving with them (2)
- community must have good accessibility in terms of transport; a good localised public transport system (6); transport has environmental impacts; good transport may be difficult to provide if development occurs in pockets
- road and pedestrian safety
- likely to have large youth population; large population of school aged children;
- community must be accessible for the aged and disabled eg buildings, curbs, toilets, transport etc
- isolation will be a big issue; likely to be an absence of family and friends
- isolation of aged NESB family members likely to exist eg as in Terrey Hills with isolated Italian market gardeners
- information about services/facilities/community service groups etc in the area will be vital for new residents (6), must also be suitable for NESB residents (3)
- processes/activities by which new residents can meet each other; this will need someone to organise and support these activities
- expectations of the population will determine what needs to be provided
- residents will have limited financial resources to provide their own services financial stress may be compounded when family has a member who is disabled
- must ensure that there is a balance between services needed v services liked
- need local facilities which encourage a strong sense of community
- affordable public housing
- information on service availability targeted to NESB residents

- planning of roads to ensure they are safe eg Mona Vale Road upgrade
 - will need affordable activities and sports
 - community focus such as shopping centre, community centre; to have a sense of community and reduce feelings of isolation
 - Mona Vale Road may divide the area and create more than one community; need transport links between communities
 - children and adolescents with disabilities living with their families will need access to schools, respite care, therapy services etc
 - older people with disabilities who have remained with family to adulthood require access to employment, recreation, adult respite, day services
 - many services are already provided in established areas eg Mona Vale; also have access to Garigal and Ku-ring-gai National Park
 - the beaches will be a major focus for new residents ie Mona Vale and Narrabeen, has environmental and planning impacts; coastal environmental protection.
2. *What services and facilities are required to meet these needs? Focus on your target group/services and consider what will be required. Is there a minimum level of service which should be available? When should it be available - is there a time, number of residents etc by which the situation would become critical if services and facilities were not available?*
- youth facilities(4); youth entertainment; purpose-built for identity; suitable for dances, theatre and meetings; youth support worker eg to go to schools etc; may help to solve some of our youth drinking problems; need after-dark activities
 - out of school hours care; vacation care (4)
 - public transport (6) and parking to shops, schools, employment, tertiary education, commuter service should be available; main roads need to be improved for better access to the area; higher density along transport routes
 - police facilities
 - shopping facilities preferably no larger than Warriewood Square
 - community facilities should be available from the very beginning; build facilities in stages; staffed from beginning by info/community development officer (5)
 - Welcoming/New Arrivals person (3); need to monitor needs versus provision of services/facilities
 - multipurpose meeting space which encourages usage by existing residents and new residents/ aged residents and young residents; focus for community; provide in early stage (8); staffed centres are best (2)
 - indoor and outdoor performing art activities; revive the old plans for a natural amphitheatre in the quarry (prepared when part of Warringah LGA); a great facility for existing and new residents
 - adult education classes (2); also for the aged and NESB residents
 - aged care; respite care
 - interesting playgrounds
 - English language classes for new NESB residents
 - childcare; particularly for 0-2 year olds; existing need already high; long existing waiting lists (7)
 - existing providers need to help to provide services; they have the local expertise
 - ensure land is set aside for facilities and services
 - major sporting facilities(4); for netball, hockey; baseball pitch; basketball; organised area for horse sport (to avoid the National Park); passive and active recreation space; local sports areas

- leisure centre as a regional facility eg Willoughby Leisure Centre with indoor pool, basketball etc
- health services eg district nurse, early childhood centre
- commercial entertainment eg cinema
- public library; need home service (3)
- bus stops
- bike and walking tracks/footpaths and cycleways (7)
- land for a scout hall catering for children and youth 6-24 years to enable them to participate in scouting
- space for community radio
- community arts; duplicate the Narrabeen Tramshed
- facilities/land for scouts and guides
- support services for the elderly; a senior citizens facilities
- voluntary services such as churches and community organisations (4); should assist in providing services to the community; churches already working with NESB community in Parramatta; St Vincent de Paul, Home Mission Society etc have expertise to provide services-need to be sought out
- local hydro pool
- public pool
- environmental centre
- entertainment/multipurpose centre at Mona Vale or Warriewood
- multicultural centre and information
- emergency services eg fire, ambulance
- hospital service?
- community bus
- corner shops
- integrated public housing
- broad rezonings of "Future Public Purposes" to be allocated for future needs which will be identified by new residents of the release area
- may need land for churches; should they be allowed in residential areas; also counselling and family support services
- accommodation for single parents
- community transport particularly as the community ages.

3. *What about existing residents? How can they best benefit from the new development in the area? Are their needs for community services likely to be better met as a result of this development?*

- comprises of residents living within the release area who are either long term residents; those who are pro-release and will sell when developable; and those in the middle who may be forced out anyhow due to higher rates, land tax etc. Other existing residents are those living in the surrounding suburbs of Mona Vale, Warriewood, Elanora etc.
- existing residents should benefit from the new services; development should upgrade some of the existing services (5); better roads, transport, Pittwater water access
- development will change the existing environment of Pittwater; change the ethos of the existing population; need a good consultation process for people to participate in this change
- chance to look at past release areas and learn from their mistakes
- pressure on horse riders; can they be accommodated?

- existing residents need a cultural/community centre
- limited footpaths in the area
- need graded walking areas
- will existing residents be isolated by the development?
- concern about existing road safety particularly on Powderworks Road, Mona Vale Road and Pittwater Road (5); concern that traffic calming is not the answer; what about Mona Vale Road corridor and Davidson Road corridor; how to solve problem of trucks on Powderworks Road
- consideration must be given to existing parking capacities at centres like Mona Vale and Warriewood as a result of new development
- need improved sporting facilities; some existing fields don't even have public amenities; will enable existing residents to use facilities within the area; won't have to travel outside the area
- existing need for better public transport(3); what about a mini bus service from the new area; would benefit all residents
- existing residents need better access to leisure classes particularly for children
- support services to assist existing residents to cope with change
- cost implications for existing residents need to be carefully considered
- need to unite the community
- there may be isolation of existing aged residents particularly NESB residents as has occurred in Terrey Hills

4. *What about the existing services in the area? Are there gaps in the current level of services provided in Pittwater which may be required for residents of Ingleside-Warriewood? How can existing services cope with this increased demand? Can any of the services expand to cope with these needs? What is needed to achieve this? Can existing buildings cope with these additional demands?*

- demand for services already exceeds availability (5); area lacks childcare, transport, youth facilities, neighbourhood centre, performance space; but we are well provided for compared to other areas; many current services need to be overhauled and relocated; many local services rely on volunteers
- youth services are poor; many youth travel to Manly for entertainment (2); youth need transport to get home from venues
- existing services will need additional funding to expand to provide services to the new area; must be provided to existing groups to enable area to be serviced
- no tertiary services in area; TAFE site sold off
- can Narrabeen Fitness Centre be used more?
- what about existing school halls?
- HACC cannot cope with existing demands eg Home Care and Home Nursing
- high demands on existing local police
- can Mona Vale Hospital cope?
- need to upgrade many of the existing sporting fields; inadequate; many have no toilets or showers
- existing pedestrian network is limited
- few outreach services to those not in main centres eg Mona Vale, Avalon
- existing library not sufficient, a mobile library may better service Ingleside Warriewood
- existing ethnic services are limited; need more facilities for local ethnic groups to use

- can existing regional services cope and they may need to be expanded eg specialist schools for the disabled; hospital transport; medical centres etc
 - OOSH care is at capacity
 - may help to increase volunteerism in the LGA
 - churches need to be on transport.
5. *What are the physical and locational requirements of these new services? List some the services/facilities identified for your group and what requirements they have eg within the release area, outreach from existing service; on a bus route, pedestrian route or major road; flat land; near the school, shops and/or open space; require office space and/or activity space from which to operate etc.*
- must be a connection between people and the community
 - walkable community and cycling community; all services should be on public transport (5)
 - some services may need to be mobile
 - on bus routes with mini buses to main route
 - preschool on same site as primary school
 - library service may need to be mobile
 - co-locate community facilities with open space; grouping of services may allow economies of scale eg with commercial area
 - expansion of existing services may be cheaper than building new ones
 - utilise the Wetlands for a central park with community facilities and transport
 - facilities should have a buffer zone
 - look at multi-use buildings by joint community/school use (2)
 - look at regional, community and neighbourhood facilities
 - people with disability should help to design community buildings
 - co-locate HACC services to promote co-operation between groups
 - community hall to be in each of the 5 areas so they are easily accessible by public transport, road, bike and footpath
 - Outreach from the following existing services
 - Home care
 - Meals on Wheels
 - Community Options
 - Interchange
 - Sydney Home Nursing
 - Community Aid
 - Community Info
 - Community Transport
 - Libraries
 - Specialist schools for disabled children
 - Day care for aged/disabled
 - DCS Disability Team and government facilities
 - Learning Difficulties Support Group
 - Shopping/banking/medical/post office
 - Churches.
 - childcare should be close to transport; B/A care needs to be close to school/or central; youth services must be on transport; multipurpose centre must be on open space for festivals etc
 - community facilities should be located with shopping centres.

6. *What co-ordination/support is required to assist existing services in providing services to Ingleside-Warriewood? What role should Council play? What role should State and Federal government agencies play?*

- need a process which bonds the community about its priorities
- need to adequately budget and plan for community facilities- flexible plan with firm commitment
- community co-operation is essential between residents, community groups and all spheres of government (3)
- need mechanism by which community can voice their needs and participate in the planning process
- Council, State and Federal government need to work/plan together; "Whole Of Government" approach to infrastructure and human services
- Council needs a commitment to human services
- Council should keep service providers informed so they can take action to meet needs
- Council should provide co-ordination, support and premises
- Council must be the major funder and co-ordinator of community services
- Council to be co-ordinator of service providers and also provide services which State/Federal government do not provide
- Council should be a catalyst for community leadership
- Council should continue process of consultation, feedback and clarification of issues; need a good consultation process where resident views are heard (2)
- Council should monitor flexibility of plans; ensure they can be changed to meet the needs
- Council to advocate strongly for funding of all required community services
- Council should make use of the community resources already available ie people
- Council should be the project manager while State/Federal government has the financial responsibility
- Council should play a leading role in co-ordinating services and providing physical facilities
- Council should financially support activities which encourage assimilation of new residents into the existing community
- State government should support Council in its role as co-ordinator and provider of physical facilities
- State/Federal government need to guarantee funding of childcare and other community services; may need to grant funds to extend existing centres eg childcare centres; to enable preschools to be long day care centres
- State/Federal government provide funding, premises, resources, personnel and support
- need funding for services and facilities (2)
- need flexibility in the use of space
- clear communication between all 3 local LGAs.

7. *Are there other issues which will be important in ensuring that the residents in the release area enjoy an acceptable "quality of life"?*

- a central civic space and a village identity; develop a community identity in each area; preserve the natural bushland; maintain the rural amenity of the area; good area in which to walk; provide a wide range of open space opportunities; a car free community with bike and walking trails; flat land in the Valley is an asset; existing

flat land near a main road is a regional resource which should be enhanced; graduation of density of development may help to maintain rural amenity; density of development may impact on transport options; is light rail viable? alternative access concepts such as walkways, cycleways and pedestrian links

- consultation; residents need to have a say in what is provided
- community infrastructure needs to be in place to meet community needs before they arise
- environmental concerns
- information
- transport and road access
- crime prevention and resident safety; particularly important for the aged and disabled
- variety of housing; more affordable housing for younger people not just Dept of Housing
- commitment of Dept of Housing to provide housing; public housing for people with disabilities
- concern over rates and impact on the community
- garbage disposal? It should be considered. Where and who pays? (2)



SECTION E

OPEN SPACE AND RECREATION



1. INTRODUCTION

1.1 THE ROLE OF OPEN SPACE AND RECREATION IN URBAN DEVELOPMENT

In his introduction to the publication "Outdoor Recreation and Open Space: Planning Guidelines for Local Government" (Department of Planning, 1992), the Minister for Planning stated:

"Outdoor recreation and open space issues at local government level have never been more significant than they are now. With strategies such as the urban development program and the government's initiatives in urban consolidation comes the pressure to plan and manage affordable, diverse and useable open space systems that meet the recreational needs of communities. At the same time, the management and maintenance of open space is changing fundamentally, with shrinking budgets and many councils subjecting this area of administration to performance and efficiency reviews, often for the first time."

Councils traditionally have expended substantial budgets (averaging about 10% of total expenditure) on the development and management of open space and outdoor recreation. Of these budgets some 85% is estimated to be spent on maintenance and other recurrent items.

Pittwater Council has an annual expenditure of a little over \$2.5 million budgeted for parks and reserves representing about 9% of its total budget. Of this amount about \$350,000 is spent on Reserves development and the balance (86%) is spent on maintenance items, including coastal maintenance and bushland management. The expenditure by Pittwater Council on parks and reserves appears to be consistent with other NSW Councils.

Because of the high maintenance costs involved, particularly for small areas, Councils are increasingly seeking to reduce these costs by establishing larger, more cost effective parks which may serve a number of functions. In addition, particularly in developing areas, the capital costs of acquiring and developing new parks is being placed on the developer through land dedication and contributions under the provisions of Section 94 of the Environmental Planning and Assessment Act, 1979. In a recent review of a sample of twelve local government Section 94 Contributions Plans, the Housing Industry Association (1994) reported that contributions for open space/recreation are required in all cases.

The Department of Planning's Outdoor Recreation and Open Space Guidelines aim to encourage Councils to move away from the traditional standards based approach to open space planning more to a needs-based approach which attempts to satisfy the need for a wide range of recreational experiences. This re-emphasis is aimed at creating a greater diversity of outdoor recreation opportunities in a more efficient and cost effective way.

The Department's Guidelines encourage Councils to consider outdoor recreation in terms of a so-called "recreational opportunity spectrum" in which a range of experiences would be provided through a range of settings. The settings described in the Guidelines and suggested for

application to planning and management of local councils' open space are illustrated in Figure E1.1.

The general approach recommended in the Guidelines has been adopted in this study as a means to identify likely needs for the future population of the Ingleside-Warriewood area. While the study is essentially concerned with the range of outdoor recreational and open space facilities that would normally be provided by local government, the study has also taken a broader perspective to assess trends in demand for the provision of recreational facilities in general.

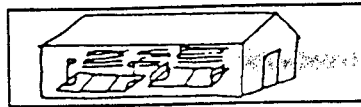
Traditionally local government has seen its role as providing for certain types of active (structured) sports fields and facilities and passive (non-structured) facilities. In recent years the range of activities demanded by residents has broadened out considerably as people seek to experience a wider range of recreational experiences. This has resulted in demands for a more diverse range of facilities in addition to the traditional facilities previously provided by Councils. In some cases the private sector has been able to establish such facilities as tennis courts, squash courts and a range of indoor recreational pursuits catering to the more specialised needs of the community. Nevertheless there continues to be a demand for a wide range of outdoor recreation facilities which can place severe financial strains on a Council particularly in developing areas where limited funds are available during the early stages of development.

1.2 SCOPE OF THE STUDY AND THE STUDY METHODOLOGY

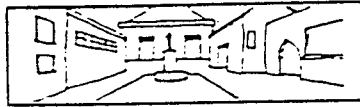
In this Section consideration has been given to a range of issues to assist Council in determining its future aims and objectives in the provision of open space and recreation facilities for the future residents of Ingleside-Warriewood.

The main issues considered in the study are:

- i) the future needs of the population for open space and outdoor recreational facilities and the likely timing of demand by type of open space and facility;
- ii) the existing provision of open space and facilities and its capability to provide for needs during the early stages of development;
- iii) consideration of planning guidelines concerning the suitability of areas for outdoor active and passive open space and environmentally sensitive open space;
- iv) the potential for provision of recreational facilities by the private sector;
- v) the potential cost of providing facilities and likely sources of funding.



Indoor facilities (only where these occur on open space)



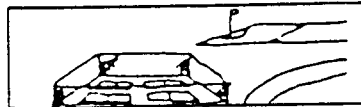
Civic spaces/malls



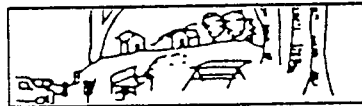
Formal gardens



Small parks/playgrounds



Outdoor sports facilities



Parkland



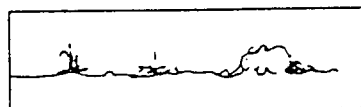
Beach/foreshore/river



Bushland



Ancillary (adjacent to road corridors)



Undeveloped (no present use)

FIGURE E 1.1 :
OPEN SPACE SETTINGS

Our approach to carrying out the study has involved a review of existing data relating to the supply of and need for open space for the Pittwater/Warringah area, a review of any comparable data from other relevant localities, consultations with local organisations and community groups and consideration of costing and funding implications for the provision of open space and outdoor recreational facilities.

2. NEEDS OF THE FUTURE POPULATION FOR OUTDOOR RECREATION

2.1 INTRODUCTION

In the absence of a large existing population that can be surveyed to obtain preferences for recreational activities, it is necessary to consider other data and surveys as a basis for assessing the likely needs of the future population of the Ingleside-Warriewood area. In addition discussions have taken place with representatives of sporting groups and the consultative committee for Ingleside-Warriewood to obtain local views on the general provision of sporting and recreational facilities. These meetings provided information on levels of participation in local sporting activities and perceived preferences for other outdoor recreational activities.

The results of three major recreational surveys are described below and are used as a basis for assessing the likely future demand for open space/recreational facilities in the Ingleside-Warriewood release area. They are:

- i) Recreation Participation Survey, February 1991. Department of the Arts, Sport, the Environment, Tourism and Territories;
- ii) Newcastle/Lake Macquarie Open Space Study, 1987. Newcastle and Lake Macquarie City Councils;
- iii) Recreation Study, June 1991, Warringah Shire Council.

Reference is also made to the Recreational Needs Study prepared by Hornsby Council in 1991, as the age profiles of the Hornsby and Pittwater Council areas are quite comparable.

2.2 RECREATION PARTICIPATION SURVEY

2.2.1 DASETT Sample Survey

Participation in Leisure Activities

The results of a sample survey of Australians' habits in participating in social/leisure/recreational and sports activities were published in 1991 by the Department of the Arts, Sport, the Environment, Tourism and Territories based on surveys undertaken in February 1991 of persons over the age of 14. The survey results do not therefore reflect what leisure and recreational activities are pursued by children under the age of 14.

Leisure activities cover a very wide range from watching television at home, relaxing, reading or talking to friends on the telephone to more robust activities such as walking and participation in active sports.

The survey reported that more than 25% of the population participate in the following leisure activities:

- watching TV at home (94%)
- listening to the radio (76%)
- reading (70%)
- visiting friends/relatives (67%)
- listening to music (65%)
- relaxing/doing nothing (58%)
- talking to friends on the telephone for more than 15 minutes (49%)
- gardening for pleasure (41%)
- entertaining at home (36%)
- exercising/keeping fit at home (36%)
- dining/eating out (34%)
- shopping for pleasure (31%)
- playing outdoors with children (29%)
- walking for pleasure (28%).

In addition 27% of females (16% males) participated in art/craft/hobbies at home.

Clearly the great majority of those activities are undertaken in the home and do not require any involvement from local government to enable participation to occur. Overall the survey demonstrates that there is a low level of participation by Australians over the age of 14 in active recreational pursuits.

Participation in Informal Outdoor Activities

The most popular activities undertaken away from the home involving some form of outdoor activities are listed in Table 2.1 for the total population and for males and females.

Participation rates in some activities were shown to vary considerably among different age groups. The highest participation rate was walking for pleasure for both males and females in the +55 age group (35%) compared with only 16% males, 24% females in the 14-19 age group.

Cycling maintained a relatively constant level of participation for all age groups for males whereas the female rate was significantly higher for the 20-39 age group only.

Overall the survey demonstrated that informal outdoor recreational pursuits were carried out to a much greater extent than sporting activities for both males and females over the age of 14. Table 2.1 also indicates a high level of non-participation (27%) in any outdoor activities.

TABLE 2.1: PARTICIPATION IN INFORMAL OUTDOOR ACTIVITIES			
Activity	Percent, February 1991		
	Total	Males	Females
Walking for pleasure	28	25	31
Going for a drive for pleasure	20	22	19
Walking the dog	15	14	17
Picnics/barbecues away from home	15	15	15
Visiting parks	11	11	11
Spectator at sport	7	8	6
Nature sketching/bird watching	3	2	3
Jogging/running	7	9	5
Cycling	9	10	9
Bushwalking/hiking	4	4	4
Surfing/surf life saving	5	6	3
No participation	27	28	26

Participation in Organised and Informal Sports

The survey found that the highest levels of participation for persons over the age of 14 in organised and informal sports were for golf, cricket, tennis, swimming/diving/water polo, lawn bowls and cycling. Table 2.2 summarises those organised and informal sports with levels of participation in excess of 5% of the population. As indicated most participation rates are quite low with a number of activities demonstrating a high level of participation only during particular stages of the life cycle.

The survey does not include children under the age of 14 and consequently misses out on a large area of a demand for organised and informal sports activities which take place in association with schools and sporting clubs as well as informal play by children. Nevertheless the results of the survey are a valuable guide to participation in sporting activities by those over the age of 14.

TABLE 2.2: PARTICIPATION IN ORGANISED AND INFORMAL SPORTS, PERCENT								
Activity	Males				Females			
	Organised		Informal		Organised		Informal	
	Age	%	Age	%	Age	%	Age	%
Golf	25-39	16	14-19	6	40-54	12	40-54	9
	40-54	10	20-24	8	55+	15	55+	5
	55+	28	25-39	8				
			40-54	6				
			55+	13				
	Total	12		8		5		3

TABLE 2.2: PARTICIPATION IN ORGANISED AND INFORMAL SPORTS, PERCENT							
Activity	Males				Females		
	Organised		Informal		Organised		Informal
	Age	%	Age	%	Age	%	Age %
Cricket (Outdoor)	14-19	20	14-19	14			
	20-24	10	20-24	15			
	25-39	11	25-39	7			
	Total	9		18		1	3
Tennis	14-19	8	14-19	13	14-19	5	14-19 8
	20-24	7	20-24	12	20-24	10	25-39 7
	25-39	6	25-39	8	25-39	8	40-54 11
	40-54	11	40-54	13	40-54	21	
					55+	7	
	Total	7		10		10	7
Cricket (Indoor)	14-19	15	20-24	7			
	20-24	13					
	25-39	7					
	Total	7		2		1	0
Basketball	14-19	17	14-19	13	14-19	5	
	20-24	9	20-24	7	25-39	7	
	Total	5		4		4	1
Lawn Bowls	40-54	9	55+	5	55+	30	55+ 10
	55+	22					
	Total	5		1		5	1
Aerobics/ Callisthenics	25-39	6			14-29	19	14-19 14
					20-24	36	20-24 17
					25-39	23	25-39 13
					55+	11	40-54 7
	Total	3		3		19	11
Cycling	55+	7	14-19	11	20-24	15	14-19 9
			20-24	11			20-24 13
			25-39	13			25-39 12
			40-54	5			55+ 5
			55+	11			
	Total	2		10		3	9
Football (Australian Rules)	20-24	6	14-19	5			
	Total	3		0		0	0
Soccer (Outdoor)	25-39	6	14-19	5			
	Total	2		2		1	0
Football (Touch)	20-24	6			20-24	14	
	Total	2		1		3	0
Martial Arts	20-24	6					
	25-39	5					
	Total	3		1		0	0

TABLE 2.2: PARTICIPATION IN ORGANISED AND INFORMAL SPORTS, PERCENT								
Activity	Males				Females			
	Organised		Informal		Organised		Informal	
	Age	%	Age	%	Age	%	Age	%
Running/Jogging	20-24	5	14-19	5	14-19	6	14-19	7
			20-24	14			20-24	10
			25-39	11			25-39	5
			40-54	9				
	Total	4		9		3		5
Squash	14-19	6	20-24	9	14-19	5		
	25-39	8			20-24	11		
					25-39	5		
	Total	4		3		5		1
Surfing/Surf Lifesaving	14-19	8	14-19	7				
			20-24	5				
			25-39	8				
			55+	5				
	Total	4		6		1		3
Swimming/Diving/ Water Polo	14-19	9	14-19	29	14-19	9	14-19	33
	25-30	5	20-24	19	20-24	22	20-24	39
			25-39	21	25-39	10	25-39	42
			40-54	25	40-54	6	40-54	41
			55+	23	55+	9	55+	34
	Total	5		23		10		39
Hockey (Indoor)					20-24	12		
	Total	0		0		2		0
Horse Riding					14-19	6	14-19	8
	Total	0		0		2		2
Netball (Indoor)					20-24	8		
					25-39	6		
	Total	0		0		4		0
Netball (Outdoors)					14-19	13	14-19	5
					25-39	5		
	Total	0		0		5		1
Ten Pin Bowling					40-54	10		
	Total	2		2		5		2
Bushwalking/ Hiking			20-24	6			40-54	8
			25-39	5				
	Total	2		4		0		4

TABLE 2.2: PARTICIPATION IN ORGANISED AND INFORMAL SPORTS, PERCENT								
Activity	Males				Females			
	Organised		Informal		Organised		Informal	
	Age	%	Age	%	Age	%	Age	%
Fishing			14-19	11			20-24	9
			20-24	6				
			25-39	9				
			40-54	7				
			55+	12				
	Total	2		9		0		4
Water Activities (Non Powered)			14-19	7	14-19	5		
			20-24	5				
	Total	2		3		2		1

Use of Facilities

The survey identified the use of various types of facilities by age group and sex. A summary of information relating to a range of facilities that would relate to a new urban release area is set out in Table 2.3. Figure E2.1 illustrates the use of a range of selected facilities by percentage and sex.

Significant findings of the survey of facility use are:

- Significant preference for use of water based facilities including beach and swimming pool by males and females throughout the life cycle
- High use of parks and playgrounds particularly by the 14-19 and 25-39 age groups
- High use of playing fields by the 20-24 age group for males
- Increasing use of library facilities by 40-55+ age groups for both males and females
- Generally an increasing preference for males and females not to use recreational facilities during the life cycle. Overall non-use of facilities amounted to 23% for males and 32% for females.

TABLE 2.3: FACILITY USE BY AGE AND SEX, PERCENT

	Age Group					
	14-19	20-24	25-39	40-54	55+	Total
MALES						
National/State park	5	12	10	8	8	9
Zoo/wildlife park	0	1	3	1	0	1
Park/playground	20	11	22	10	9	15
Walking trail	4	9	7	5	10	7
Cycle tracks	12	7	6	4	3	6
Beach	39	31	24	23	17	25
River/lake	12	7	11	14	2	10
Swimming pool	31	17	23	15	9	19
Gymnasium	5	13	7	1	0	5
Tennis court	12	16	9	8	2	9
Squash court	4	9	5	1	0	4
School facility	24	4	4	0	1	6
Skateboard facility	1	0	0	0	0	0
Golf course	5	8	11	9	10	9
Playing fields	11	21	10	6	1	9
Indoor sports centre	13	11	7	3	2	7
Amusement centre	6	3	1	1	1	2
Theatre	10	1	4	5	2	4
Library	8	9	9	13	19	11
Community centre	0	2	2	2	3	2
Museum/art gallery	0	4	1	4	1	2
Exhibition centre	0	0	0	1	2	0
Camping ground	7	5	3	3	0	3
Other	0	0	1	2	5	2
None of the above	13	13	21	30	31	23
FEMALES						
National/State park	5	5	9	11	6	8
Zoo/wildlife park	0	0	2	2	2	1
Park/playground	11	21	30	19	17	22
Walking trail	11	8	8	9	4	8
Cycle tracks	6	3	8	1	3	5
Beach	32	26	23	22	20	24
River/lake	15	6	7	5	6	7
Swimming pool	33	26	28	15	10	22
Gymnasium	14	7	4	3	1	5
Tennis court	8	7	6	7	1	6
Squash court	4	3	2	1	0	2
School facility	26	2	4	4	0	6
Skateboard facility	0	0	0	0	0	0
Golf course	1	2	2	7	5	3
Playing fields	13	2	4	4	1	4
Indoor sports centre	7	10	6	3	1	5
Amusement centre	1	0	0	0	1	0
Theatre	6	1	2	5	2	3
Library	15	7	15	19	26	17
Community centre	2	6	2	1	7	3
Museum/art gallery	0	0	1	4	3	2
Exhibition centre	0	0	0	2	1	1
Camping ground	4	5	2	1	0	2
Other	0	0	1	0	2	1
None of the above	9	31	19	24	28	32

2.2.2 Newcastle/Lake Macquarie Open Space Study

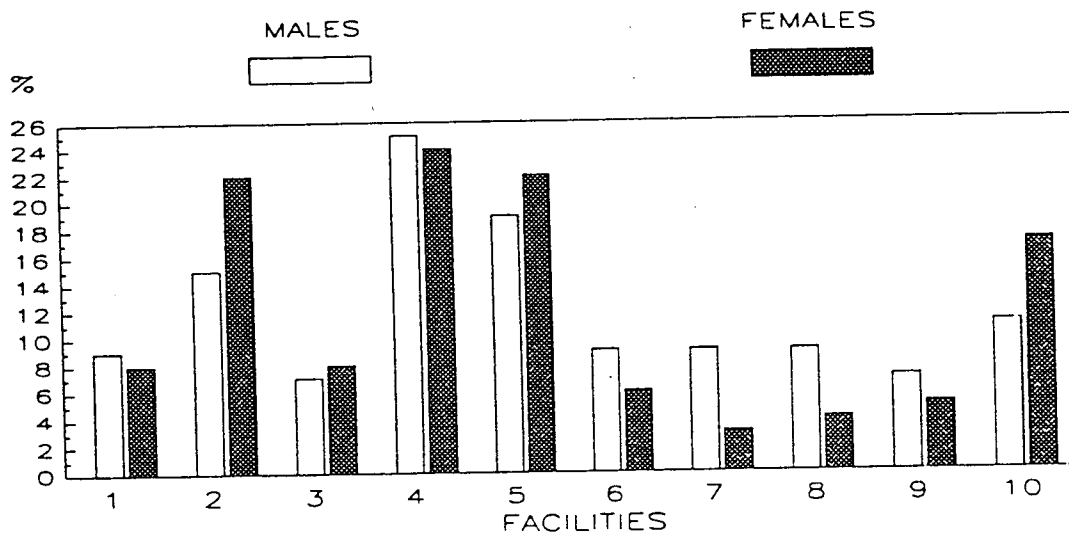
Participation in Recreation Activities

In this study a survey of 672 households was undertaken in which 1,386 people over the age of 5 were interviewed. The survey was carried out as a random sample in the Cities of Newcastle and Lake Macquarie during October/November 1985.

Table 2.4 identifies the top ten activities participated in during the past year according to the percentage of the population that took part either occasionally or regularly as active participants or as spectators.

TABLE 2.4: TOP TEN OUTDOOR RECREATIONAL ACTIVITIES		
Rank	Activity	% of Population Participation
1	Picnics and barbecues in Reserves	83
2	Swimming/sunbathing at the beach	65
3	Driving for pleasure	61
4	Visiting parks and gardens	59
5	Walking	57
6	Swimming in a public pool	48
7	Swimming/sunbathing at the lake	42
8	Fishing from the shore	42
9	Outdoor circus, markets and fairs	40
10	Hockey, soccer, football	38

Detailed information was collected in the survey in relation to activities undertaken during the previous week. The top 20 activities are described in Table 2.5 to indicate the type of activity, percentage of the population participating, the average number of times in which the activity was carried out each week and the proportion of the activity that is organised by schools or clubs.



KEY:

1. National/State Park
2. Park/Playground
3. Walking Trail
4. Beach
5. Swimming Pool
6. Tennis Court
7. Golf Course
8. Playing Fields
9. Indoor Sports Centre
10. Library

**FIGURE E 2.1 :
SELECTED FACILITY
USED BY SEX**

TABLE 2.5: TOP TWENTY RECREATIONAL ACTIVITIES UNDERTAKEN IN PREVIOUS WEEK

Rank	Activity	% of Population Participating	Ave. No. of Times per Person	% Organised Activity
1	Driving for pleasure	27.8	1.7	-
2	Walking	27.5	3.7	-
3	Picnics/barbecues in public areas	12.8	1.1	17.0
4	Cycling for pleasure	12.8	3.8	-
5	Walking the dog	9.1	3.9	-
6	Jogging	7.7	2.9	6.0
7	Tennis	7.1	1.4	45.0
8	Visiting parks and gardens	7.0	2.0	5.0
9	Swimming/sunbathing at the beach	6.8	1.9	9.0
10	Taking children to the playground	6.5	1.7	3.0
11	Informal games	6.4	2.8	4.0
12	Cricket	6.2	1.5	68.0
13	Hockey, soccer, football	6.1	1.6	69.0
14	Athletics	5.8	1.8	79.0
15	Swimming in a public pool	5.0	1.5	39.0
16	Bushwalking/orienteering	4.0	2.0	11.0
17	Lawn Bowls	3.9	1.6	90.0
18	Outdoor markets, circus, fairs	3.8	1.0	63.0
19	Golf	3.7	1.7	51.0
20	Sketching, painting, photography	3.5	2.1	23.0

2.2.3 Recreation Study of Warringah Shire Residents

During the last two weeks of September 1990, a random survey of 1,500 residents over the age of 19 was conducted by Warringah Shire Council. The survey was conducted via the phone and the respondents were asked about their recreation activities during the previous 12 months.

Participation in Outdoor Recreation Activities

Non-Organised

The 20 most popular non-organised outdoor recreation activities are listed in Table 2.6. Note that the rankings of these activities are very similar to the rankings in the DASETT and Newcastle/Lake Macquarie surveys. These three surveys indicate that the non-organised recreational activities with the highest percentage of participation are picnics/barbecue, walking, swimming at the beach, visiting parks and gardens, and driving for pleasure.

TABLE 2.6: TOP TWENTY NON-ORGANISED OUTDOOR RECREATION ACTIVITIES		
Rank	Activity	% of Population ⁽¹⁾ Participation
1	Picnics/barbecue	72
2	Walking	69
3	Visiting parks/gardens	61
4	Swimming at beach	60
5	Bushwalking	52
6	Driving for pleasure	50
7	Outdoor markets/fairs/circus	46
8	Swimming at rock pool	38
9	Visiting playgrounds	36
10	Swimming at public pool	34
11	Walking dogs	31
12	Cycling	29
13	Sketching/painting/photography	28
14	Jogging	27
15	Fishing from shore	25
16	Sailing	22
17	Going to boat/agricultural shows	21
18	Squash	21
19	Outdoor concerts	20
20	Fishing from boat	20

Note: (1) The survey results reported in this table include often, sometimes and seldom.

Organised

The survey found that the sporting activities with the highest levels of participation were tennis, rugby league, golf, squash, rugby union and soccer. Table 2.7 lists the top twenty organised sporting activities.

TABLE 2.7: TOP TWENTY ORGANISED OUTDOOR SPORTING ACTIVITIES		
Rank	Activity	% of Population Participation
1	Tennis	38
2	Rugby League	32
3	Golf	31
4	Squash	21
5	Rugby Union	19
6	Soccer	18
7	Competitive sailing/windsurfing/surfing	15
8	Touch football	12
9	Netball	12
10	Cricket (outdoor)	11
11	Basketball	11
12	Athletics	10
13	SLSA activities	9
14	Cricket (indoor)	7
15	Lawn bowls	7
16	Competitive swimming/water polo	7
17	Water skiing	6
18	Attending horse races	5
19	Beach volleyball	5
20	Volleyball	5

Need for Additional Recreation Facilities

Of the people surveyed, 25% said they would like Council to provide additional recreational facilities. The most popular suggestions were for:

1. Cycle/motorbike/walking and horse tracks (25% of responses)
2. Specialised sporting areas (14%)
3. Specific teenage/children's areas (13%)
4. Waterway facilities (12%)
5. Parks/playgrounds and associated facilities (11%).

The most popular locations suggested for cycleways were along the main roads and beachfront areas.

2.2.4 Comparison of the Recreation Participation Survey Findings

Table 2.8 provides a comparison of the most popular outdoor recreational activities chosen by respondents in the DASETT, Newcastle/Lake Macquarie and Warringah surveys.

Table 2.8 shows that the results obtained from the three surveys are generally very similar. However, it should be noted that the respondents in the Warringah survey appear to walk,

bushwalk/hike, play tennis, hockey, soccer and football, and swim in public pools more often than the respondents in the DASETT and Newcastle/Lake Macquarie surveys.

TABLE 2.8: SUMMARY OF MOST FREQUENT PARTICIPATION IN OUTDOOR RECREATION ACTIVITIES			
Activity	DASETT Survey 1991 % Participation	Newcastle/ L. Macquarie Survey 1986 % Participation	Warringah Survey 1991 % Participation
Walking for pleasure	28	28	42
Driving for pleasure	20	28	20
Walking the dog	15	9	21
Picnics/barbecues away from home	15	13	19
Visiting parks and gardens	11	7	15
Cycling	9	13	12
Spectator at sport	7	(included in sports)	(included in sports)
Jogging/running	7	8	12
Tennis		7	16
Surf/surf lifesaving	5	7 (swimming at beach)	3 (SLSA activities)
Taking children to playgrounds	(included in visiting parks)	6.5	(included in visiting parks)
Bushwalking/hiking	4	4	13
Cricket	10	6	5
Hockey, soccer, football	8	6	18
Athletics	1	6	2
Swimming in public pool	-	5	11
Lawn bowls	6	4	4
Golf	8	4	10
Sketching, painting, etc.	7	3.5	10

Notes: (1) DASETT and Newcastle/Lake Macquarie surveys recorded recreation activities over a one-month period.

(2) Warringah's survey recorded recreation activities over a 12-month period. In order to make the Warringah results more comparable with the results from DASETT and Lake Macquarie, only "often" participation results were used for Warringah.

A recreational needs study carried out for Hornsby Council in 1991 found that the preferred recreational activities in descending order were:

- visiting parks and gardens
- picnics/barbecues
- walking/walking the dog
- bushwalking
- swimming
- driving for pleasure
- taking the kids to the park
- tennis.

These preferences are very similar to those expressed in the other surveys described above and are therefore important indicators of the likely preferences of future residents of the Ingleside-Warriewood area.

The results from the surveys described above are used later in this report to assist in establishing an open space/recreation strategy for the future residents of the proposed Ingleside-Warriewood urban release area.

2.3 PREFERENCES FOR OUTDOOR RECREATION SETTINGS

Preferences for outdoor recreation settings have been identified by survey in the Newcastle/Lake Macquarie Open Space Study, the Warringah Recreation Survey and the Hornsby Recreational Study. A comparison of the preferred outdoor recreational settings is set out in Table 2.9.

TABLE 2.9: PREFERENCES FOR OUTDOOR RECREATION SETTINGS			
Rank	Newcastle/Lake Macquarie Open Space Study	Warringah Recreation Study	Hornsby Recreational Needs Study
1	Beach	Beaches and Shorelines	Bushland
2	Foreshore Parks	Indoor Recreation Facilities	Outdoor Sports Facilities
3	Parkland	Bushland	Parkland
4	Sports Facilities	Large Developed Parks	Waterways
5	Urban Nature Parks	Small Developed Parks	Indoor Sports Facilities
6	Forest Lands	Libraries	Playgrounds
7	Playgrounds and Gardens	Hilltops, bluffs and headlands	Formal gardens
8		Sportsgrounds	
9		Structured sport area	
10		Special purpose open space	

In the Newcastle/Lake Macquarie Open Space Study, a range of outdoor recreation settings was presented graphically as a means to identify preferred areas for recreational activities. The order of preference for activities in various settings is set out in Table 2.9 and illustrated in Figure E2.2.

Figure E2.3 illustrates the frequency of use of recreation settings by various age groups based on the Newcastle/Lake Macquarie Study. The diagrams demonstrate a high level of use for all informal recreational settings in the 5 to 49 age groups. There is a declining use of sports facilities with ageing of the population and a smaller decline in the use of playgrounds/gardens and beaches.

As illustrated, use of all settings by persons aged 55 and over was significantly lower than for other age groups.

Results from all three surveys demonstrate that there is a strong preference for beaches, waterways and foreshore parks, large and small developed parks, bushland and sports grounds/facilities.

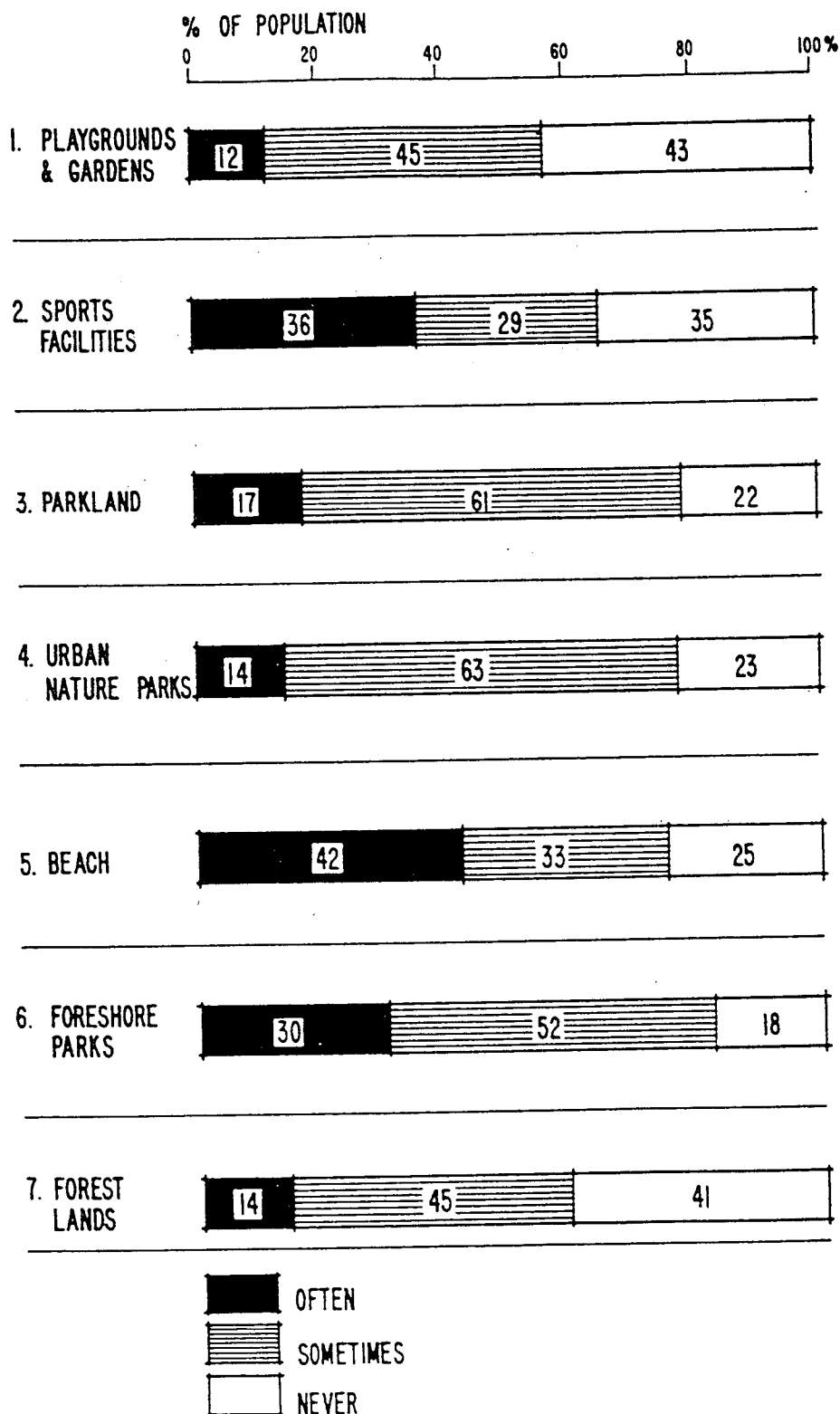


FIGURE E 2.2 :
NEWCASTLE/LAKE MACQUARIE
OUTDOOR RECREATION SETTINGS :
FREQUENCY OF USE

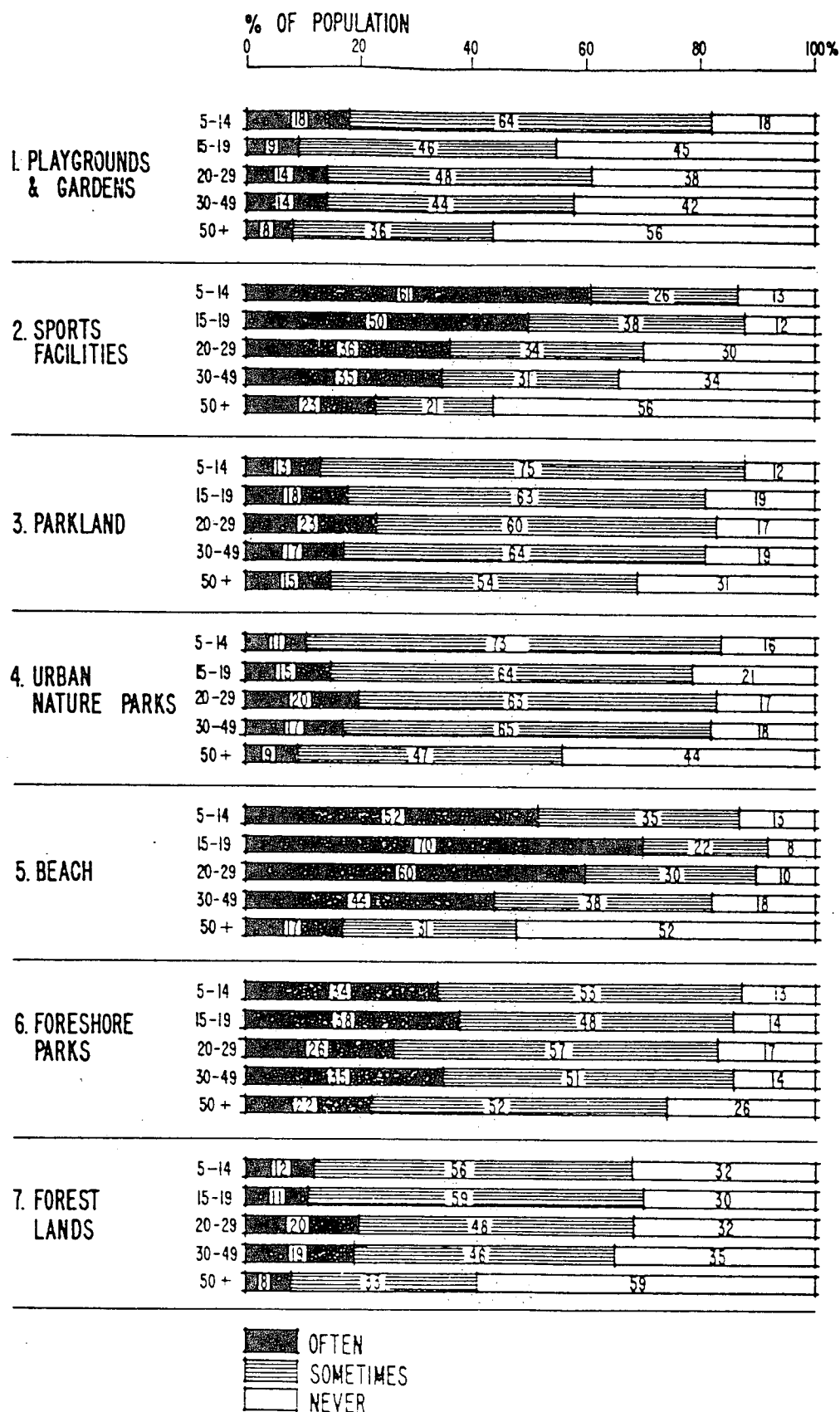


FIGURE E 2.3 :
NEWCASTLE/LAKE MACQUARIE
OUTDOOR RECREATION SETTINGS :
FREQUENCY OF USE ACCORDING TO AGE

2.4 OPEN SPACE AND RECREATION NEEDS

2.4.1 Projected Population of Ingleside-Warriewood

Population projection scenarios for the Ingleside-Warriewood Urban Release Area have been calculated using rates of 5, 9 and 13 dwellings per hectare. Each scenario assumes a rate of development equal to 150 dwellings per precinct per year and an occupancy rate of 2.8 persons per dwelling.

Table 2.10 shows the projected populations, in five year intervals, for the Ingleside-Warriewood Urban Release Area. The projections are derived from the demographic data included in Section A of this study.

TABLE 2.10: PROJECTED POPULATIONS INGLESIDE-WARRIEWOOD URBAN RELEASE AREA					
Development Area ⁽¹⁾	Simple Cumulative Population (5 dw/ha)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Warriewood Valley	420	1,680	1,680	1,680	1,680
South Ingleside	-	1,260	2,646	2,646	2,646
North Ingleside	-	420	2,030	2,030	2,030
Chiltern Road	-	-	1,680	1,764	1,764
Wirreanda	-	-	840	1,680	1,680
TOTAL	420	3,360	8,876	9,800	9,800
Development Area ⁽¹⁾	Simple Cumulative Population (9 dw/ha)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Warriewood Valley	420	2,100	3,024	3,024	3,024
South Ingleside	-	1,260	3,360	4,763	4,763
North Ingleside	-	420	2,520	3,654	3,654
Chiltern Road	-	-	1,680	3,175	3,175
Wirreanda	-	-	840	2,940	3,024
TOTAL	420	3,780	11,424	17,556	17,640
Development Area ⁽¹⁾	Simple Cumulative Population (13 dw/ha)				
	Year 1	Year 5	Year 10	Year 15	Year 20
Warriewood Valley	420	2,100	4,200	4,368	4,368
South Ingleside	-	1,260	3,360	5,460	6,870
North Ingleside	-	420	2,520	4,620	5,278
Chiltern Road	-	-	1,680	3,780	4,586
Wirreanda	-	-	840	2,940	4,368
TOTAL	420	3,780	12,600	21,168	25,480

Note: (1) Figure 2 in the Foreword illustrates the Development Areas referred to in the Table.

The main implications of population growth from Table 2.10 can be summarised as follows:

- 0-5 years - almost all population growth occurs in the Warriewood Valley and South Ingleside precincts.

- 6-10 years - majority of population growth occurs in the South Ingleside, North Ingleside and Chiltern Road precincts. Declining rate of growth in Warriewood Valley as it either approaches or reaches full development.
- 11-15 years - majority of population growth occurs in the South Ingleside, North Ingleside, Chiltern Road and Wirreanda precincts.
- 16-20 years - release area reaches full development with the South Ingleside and North Ingleside precincts containing the highest populations.

The provision of open space and recreation facilities should, where possible, aim to satisfy the needs of the community within a reasonable period of time as development proceeds. It is therefore very important that the provision of open space and recreation facilities should centre on the Warriewood Valley and South Ingleside precincts during the first five years of development. After this initial five-year period, the provision of open space and recreation facilities will need to be expanded so as to satisfy the needs of the North Ingleside, Chiltern Road and Wirreanda precincts as progressive development in those localities takes place.

2.4.2 Open Space Provision

The issue of how much open space to provide for a given future population is an issue that has been increasingly debated in recent years. The well established standard of 2.83 hectares (7 acres) per 1,000 persons has been adopted for many decades in new housing areas and has been used by the Land and Environment Court in the past in assessing an appropriate standard for open space provision. However more recently there has been a trend towards a needs-based approach for the assessment of open space provision.

The Department of Planning in "Outdoor Recreation and Open Space: Planning Guidelines for Local Government" states that for new release areas such as Ingleside-Warriewood, the following open space and recreation demand collection techniques should be adopted. These are:

- Community profiles, i.e. examine Warringah and Pittwater LGA community profiles;
- Organisation survey, i.e. conduct meetings with local sporting bodies and resident organisations;
- Comparative analysis, i.e. compare Ingleside-Warriewood with other similar areas in order to obtain comparable and relevant information;
- Use of standards, i.e. adopt existing standards of open space and recreation provision.

In estimating the likely future open space and recreation needs of Ingleside-Warriewood, all of the above techniques have been used to assist in determining an appropriate range and variety of open space for the future residents of the area. Each of the issues is discussed below.

Community Profile

A description of the projected community profile of the Ingleside-Warriewood area is included in section 4 of Section A - Demographic Analysis and Model, and section 1.2 of Section D - Community Facilities. These sections indicate that under all development scenarios the population is likely to comprise a high proportion of second and third home buyers with young families.

As a consequence of those trends it is anticipated that there will be a large number of pre-school age children and youth in the release area in households characterised by two working parents. Adults are expected to be primarily in the 30-45 age group comprising about 30% of the total population.

Because of the location and likely high land cost, there is also expected to be a relatively large proportion of retirees in the plus 65 age group reflecting the popularity of Pittwater as an area for retirement.

Based on the studies of recreational preferences described in Sections 2.2 to 2.4 above, the community profile for Ingleside-Warriewood is likely to result in the need for a broad mixture of open space and recreational facilities to cater for:

- local playground needs of pre-school and young school children
- sportsfields for school children and youth
- golf, tennis, lawn bowls and similar sporting facilities to cater for preferences of seniors
- walking trails and natural parks to cater for the likely high demand for walking for leisure
- natural parks to cater for the likely high demand for picnics/barbecues and bushwalking.

In addition, due to its location only a short drive from the coast, there will be a high level of demand from the future population to make use of the beaches, foreshores, lagoons and boating facilities existing in the Pittwater/Warringah area.

Meetings with Resident Organisations

Two meetings were held during the course of the study with representatives of community and sporting organisations. The main comments and views expressed by the participants at those meetings are summarised below.

a) *Provision of Sporting Facilities*

- Sports participation rates in recent years have increased most notably in netball, soccer, baseball, basketball and cycling. A result of this is that the demand for sportsgrounds and facilities currently far exceeds the supply and there is limited space within Pittwater to build new grounds. All participants in the discussions therefore urged Council to develop new sporting facilities as soon as possible, as additional population would place further pressure on inadequate resources.
- Many grounds are used for winter and summer competitions by a variety of clubs and schools, and hence there is not sufficient time to carry out extensive maintenance of grounds.
- The poor condition of many grounds presents a risk to players and some clubs have lost players to other areas because of the condition of the fields. The poor condition of some grounds also presents problems in insuring players.
- Security of grounds is substandard, goals being stolen and fields driven on by joy riders is not uncommon.
- Some grounds are built on disused rubbish tips and hence are unsafe to play on and subject to ground subsidence.
- It was indicated that if sports clubs were given more control over who uses a particular field and a guarantee of use for a number of years, then the clubs would have greater incentive to upgrade and maintain grounds and facilities.
- Facilities are generally very poor. Many grounds do not have toilets/changerooms and of the toilets/changerooms that are provided, some are unsafe due to the location and/or design of the toilet/changeroom.
- Training at night is limited because some fields either do not have floodlights or the lighting is substandard.
- Concern was expressed over the demands and impacts of Narrabeen Sports High School on local grounds and facilities. As a school of excellence it has increased the number of sports on offer to their students from 8 to 25, resulting in higher demand for the use of local sports facilities.
- Smaller codes have very limited resources and therefore can not afford to maintain grounds and facilities.

- Council should look into converting parts of smaller areas of open space into training areas, i.e. providing cricket nets in smaller parks.
- b) *Provision of Open Space*
 - The residents expressed the need for mixed use corridors of open space that would link the creeks, wetlands, lagoons, and active and passive open spaces. Of particular concern was the need for cycleways, horseriding tracks, dog training and walking areas, walkways, and sportsgrounds within these corridors.
 - The Council was urged to examine three open space submissions developed by the Narrabeen Lagoon Committee, Narrabeen Youth Club and the Bicentennial Park Committee during the 1980s as they were considered to be relevant to the future planning of the Ingleside-Warriewood area.
 - Apex Park was considered to be typical of what should be developed in the release area.
 - The downstream effects of sports fields on the natural environment was raised as a concern, hence "buffer" zones around grounds would need to be provided to reduce fertilizer run-off. Buffer zones were also seen as necessary to reduce any conflicts that may arise between participants of sports and those living adjacent to sports grounds.
 - The Pittwater area was seen as having regional significance because of its beaches and foreshore parks and hence obtaining State and Commonwealth government funds and land to assist with the provision and maintenance of open space was suggested.
 - A view was expressed that the development of Ingleside-Warriewood provides an opportunity to obtain a range of parks and sports grounds that could not otherwise be funded by the Pittwater community.

Comparative Analysis and Use of Standards

The following references have been used to provide a comparison with other local government areas in relation to the provision of different types of open space and the use of standards.

- "Contributions Plan No. 4. Glenhaven", Baulkham Hills Council, 1993;
- "Coffs Harbour Open Space Strategy", Coffs Harbour City Council, 1992;
- "Newcastle/Lake Macquarie Open Space Study", Newcastle and Lake Macquarie City Councils, 1987;

- "Open Space Draft Development Control Plan, Sutherland Planning Area", Sutherland Shire Council;
- Development Contributions Plan, Hornsby Council, 1993;
- "Section 94 Contributions Plans 1-10", Warringah Shire Council, 1992.

The amount of open space currently provided in a number of those areas together with suggested provisions for Ingleside-Warriewood are summarised in Table 2.11 for various open space settings.

TABLE 2.11: OPEN SPACE PROVISION FOR RECREATION SETTINGS AND SELECTED AREAS (ha/1,000 persons)						
Setting	Hornsby	Sutherland	Coffs Harbour	Lake Macquarie	Warringah	Proposed Ingleside-Warriewood
Playgrounds/Local Reserves	0.67	0.20	2.39	0.09	-	0.50
Parkland/District Reserves	0.87	0.18	2.15	0.98	0.85	1.00
Sporting Grounds	0.80	2.91	1.19	2.51	2.31	1.60
Beach/Foreshore/River	-	0.65	4.90	3.23	0.74	(i)
Urban Bushland	3.24	23.44	4.56	7.86	6.86	

Note: (i) The amount of urban bushland is dependent on the biophysical characteristics of the land rather than local population need.

As Ingleside-Warriewood is part of the broader Pittwater community, not all of the recreational settings illustrated in Figure E1.1 will necessarily be represented in the study area. For example, civic spaces/malls are usually associated with major civic buildings or commercial centres, which may not exist within the area. Similarly, beach and foreshore areas are not available in the Ingleside-Warriewood area and future residents will need to travel to their nearest beach areas along the coast.

The principal settings for outdoor recreation in the study area are likely to be playgrounds/small parks, parkland, sporting grounds and bushland areas, including possible linkages between them. For example there has been a proposal for an Ingleside to the ocean walkway/bikeway linking existing and proposed parks between the escarpment and Warriewood. This is given further consideration later in the report.

Other issues relating to the functions and purposes of open space areas and recreation facilities are set out below for each of the main settings listed in Table 2.11.

Playgrounds

The design and location of playgrounds has historically been determined by two factors: firstly, children are the main users of playgrounds, and secondly, children's main modes of transport are walking and cycling or in strollers with parents. A standard which has been frequently adopted is that playgrounds should be designed to cater for the demands of children and be located so that users do not have to travel more than 400-500 metres nor cross major physical barriers such as main roads.

A study of the Dee Why area of Warringah Shire (Manidis Roberts, 1993) found that eleven small parks represented about 2% of the total area of open space in the locality, yet were the preferred setting for 26% of the residents. The casual use of parks and reserves was found to be the most popular children's activity (81%). Notwithstanding this popularity, Councils are finding it increasingly difficult to maintain such parks due to their widespread location and small size.

In a new urban area such as Ingleside-Warriewood, it is therefore questionable whether the previously accepted standard of accessibility to small parks within 500 metres of all residents should be achieved. Such a decision will be in part dependent on the ultimate decision on the density of development in the area. Clearly the higher the density, the less private open space is available and the greater dependence is on well located local parks. In those circumstances a greater number of small playgrounds would be required if the higher density of development is planned.

In the Ingleside-Warriewood area it is considered reasonable to aim for a standard of 0.5 ha of playground per 1,000 population, with a small park having a minimum area of 5,000 square metres. In many instances such areas could be integrated with larger parks, areas of bushland forming linear reserves and sporting areas in order to minimise the costs of acquisition and maintenance.

Parkland

In the past many areas of parkland have been left over, undeveloped land that contain a minimum of embellishment and are poorly maintained. Parkland of this nature is not acceptable as its potential use is often severely constrained due to slopes, drainage, accessibility etc. In the Ingleside-Warriewood area non-structured parkland needs to provide a range of recreational settings integrated, where possible with other uses, such as children's playgrounds, walking paths and bikeways, so that the parks have a broadly based appeal to the community and hence usage rates are increased.

Based on experience elsewhere it is considered that about one hectare of parkland is required per 1,000 population, with a minimum size of 3 hectares. Where feasible such areas should be integrated into a linear system of parks based on a network of walking trails and bikeways.

Sports Grounds

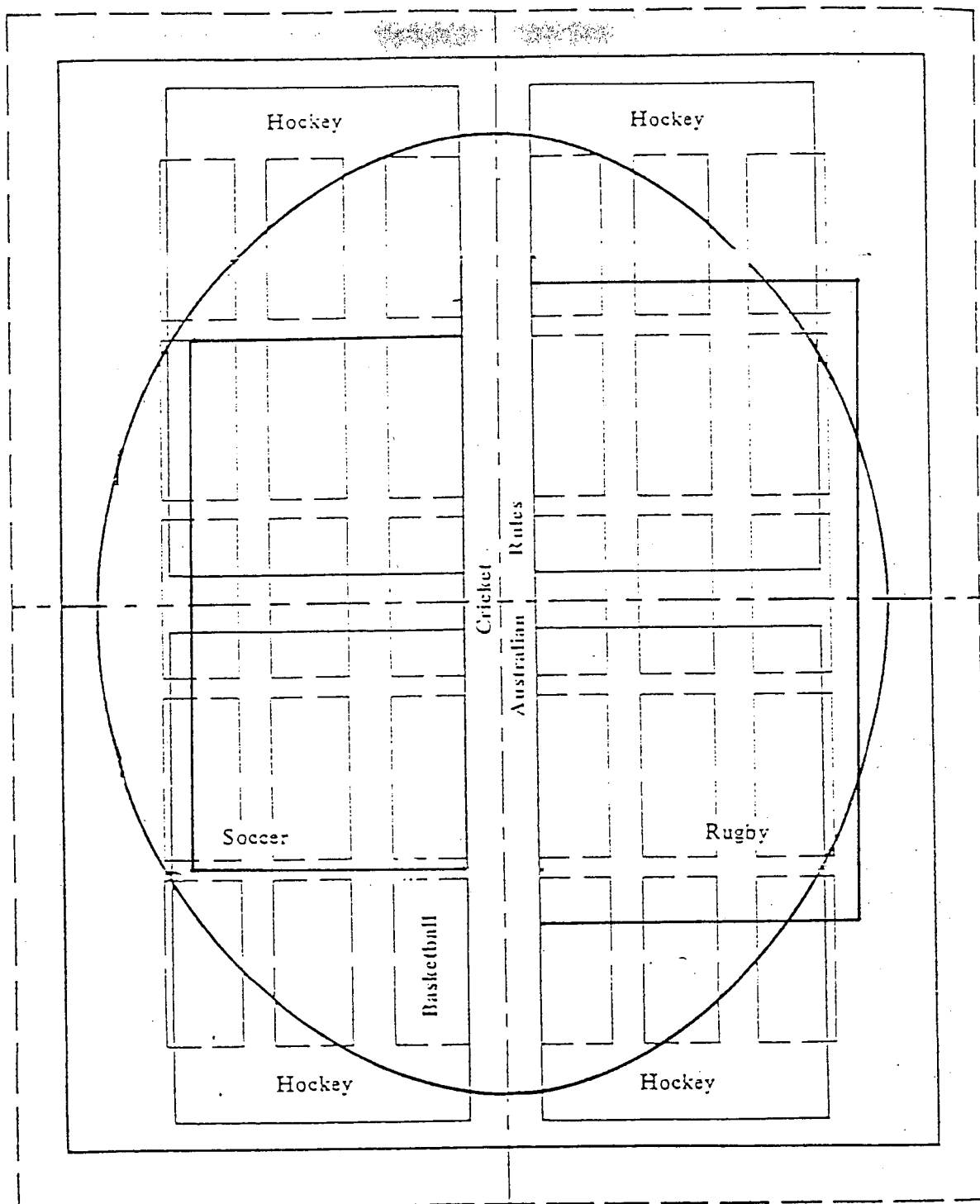
Sports grounds and facilities are characterised by high weekend use and moderate to high use during weekdays and evenings, particularly where adequate floodlighting is provided to enable them to be used for evening training sessions. Playing fields usually require flat, well drained areas, ample surrounding open space, good accessibility and car parking provision, toilets/change rooms, seating and taps/drinking fountains. It is recommended that grounds face north-south and are grouped into a complex of ovals and courts with, where possible, a minimum 2 oval provision. Such a sportsground requires a minimum area of 4 hectares to accommodate the ovals and associated facilities. A diagrammatic layout of a typical sportsground is illustrated in Figure E2.4.

Table 2.12 provides a summary of sporting ground provisions in Sutherland, Coffs Harbour, Lake Macquarie, Baulkham Hills and Hornsby together with estimates of future sporting ground provision in Ingleside-Warriewood.

As indicated there is a considerable variation in the level of provision for some sports, for example baseball/softball varying between 1 per 9,000 people to 1 per 48,000 people. The figures proposed for adoption for the Ingleside-Warriewood area are generally an approximate mean figure with recognition that some sports such as baseball/softball and basketball are increasing in popularity and participation in the community. The figures proposed are intended as a guide and would clearly need to be monitored as the population of the area increases to assess actual need based on continuing discussions with representatives of the sports bodies.

Facilities/ 1,000 persons	Suther- land	Coffs Harbour	Lake Macquarie	Baulkham Hills (Standard)	Hornsby	Dept of Planning, 1989	Ingleside- Warrie- wood ⁽¹⁾
Athletics	1:26000	1:22000	1:28000	1:40000	1:40000		1:31000
Baseball/Softball	1:9000	1:10000	1:48000	1:12000	-		1:11000
Basketball	1:26000	1:12000	-	-	-		1:19000
Bowling Green	-	1:3500	-	-	-		1:3500
Cricket	1:3000	1:2000	1:3500	1:3000	-	1:2000	1:3000
Croquet	-	1:43000	-	-	-	-	1:43000
Cycling	1:26000	1:22000	-	-	-	-	1:24000
Equestrian Arena	-	-	1:24000	-	-	-	1:24000
Football Codes							
- Aust Rules	1:26000	-	1:85000	1:89000	-	-	1:67000
- League	1:13000	1:4000	1:5000	1:17000	-	-	1:10000
- Rugby	-	-	1:56000	1:52000	-	-	1:54000
- Soccer	1:2000	1:3000	1:3000	1:2200	-	-	1:2500
Golf	1:26000	1:17000	-	-	-	-	1:21000
Hockey	1:26000	1:7000	1:24000	1:30000	-	-	1:22000
Netball	1:3000	1:1500	1:1000	1:2500	1:2500	1:2500	1:2000
Roller Skating	1:26000	-	-	-	-	-	1:26000
Sportsfields	-	-	-	1:2200	1:2500	1:3000	1:2500
Swimming Pool	1:26000	1:14000	1:42000	-	-	-	1:27000
Tennis	1:4000	1:750	1:3000	1:2100	1:1300	1:1300	1:2200

Note: (1) Calculated mean based on the Councils included in this table.



Basic Sports Unit for District Playing Fields

SCHEDULE		
30	BASKETBALL or	each 28m x 15m
	NETBALL	each 30.5m x 15.25m
4	HOCKEY	each 91.4m x 55m
2	RUGBY	each 120m x 60m
2	SOCCER	each 100m x 50m
1	AUST. RULES FOOTBALL	each 180m x 150m
1	CRICKET	

Concept

The 3.25 ha layout provides for a number of options to be used at different times.

Any supplementary area to the B.S.U. may be marked as the need dictates.

Major axis should be oriented north — south. Allow 15 m clearance from edge of field to 1st row of trees or other obstructions.

Note: Overall requirement of 4 ha.

Additional space is required for access, car parking, pavillions, change of levels, etc.

On the basis of providing one sportsfield having an area of 4 hectares for every 2,500 persons, the overall requirement for sporting grounds amounts to about 1.6 hectares per 1,000 persons.

Beach/Foreshore Park

Whilst the Ingleside-Warriewood Urban Release Area does not contain beaches or foreshore parks, Council should ensure that residents within the release area have good access to the nearby beaches and foreshore parks. Such access could be provided by developing open space corridors extending from Ingleside-Warriewood to Mona Vale, Warriewood, Turimetta, and Narrabeen beaches, as well as Narrabeen Lagoon.

Council should also ensure that the beaches and foreshore parks are of sufficient size and quality in order to cater for the higher usage rates that will arise as a result of population growth in the release area. This may require the upgrading of existing facilities and/or the provision of new facilities, as well as increasing maintenance of beaches and foreshore parks.

Urban Bushland

Residents within the release area should be provided with good access to Ku-ring-gai Chase National Park and Garigal National Park. The National Parks are of particular environmental importance and are used by people from all parts of the Sydney metropolitan area.

Bushland within the urban release area should be linked so as to produce corridors of bushland that will be large enough to sustain walking, cycling, horse riding and dog walking tracks. It is noted that cycling and horseriding within urban bushland will be dependent on the land capability classification of the bushland, and its suitability for these uses.

2.5 ESTIMATED DEMAND FOR OPEN SPACE/RECREATION FACILITIES

2.5.1 Open Space Requirements

Table 2.10 provides an estimate of the projected population growth of the Ingleside-Warriewood area under the three scenarios based on 5, 9 or 13 dwellings per hectare.

Table 2.13 provides an estimate of the amount of open space that will be required for each five year period based on the estimated population growth and using the standards of provision discussed in the previous subsection.

TABLE 2.13: ESTIMATED PROVISION OF OPEN SPACE BY FIVE YEAR PERIODS						
Density-Scenario Dwelling/Hectare	Type of Open Space and Standard Proposed	Period of Development				Total (ha)
		0-5	6-10	11-15	16-20	
5 dwellings/hectare		ha.	ha.	ha.	ha.	
	Playground (0.5 ha/1000p)	1.68	2.76	0.46	-	4.90
	Parkland (1.0 ha/1000p)	3.36	5.52	0.92	-	9.80
	Sporting Grounds (1.6 ha/1000p)	5.38	8.83	1.48	-	15.69
	Total	10.42	17.11	2.86	-	30.39
9 dwellings/hectare						
	Playground	1.89	3.82	3.07	0.04	8.82
	Parkland	3.78	7.64	6.13	0.08	17.63
	Sporting Grounds	6.05	12.23	9.81	0.13	28.22
	Total	11.72	23.69	19.01	0.25	54.67
13 dwellings/hectare						
	Playground	1.89	4.41	4.28	2.16	12.74
	Parkland	3.78	8.82	8.57	4.31	25.48
	Sporting Grounds	6.05	14.11	13.71	6.90	40.77
	Total	11.72	27.34	26.56	13.37	78.99

Table 2.14 provides an estimate of the total number of playgrounds, parklands and sporting fields that would be required for the future population of Ingleside-Warriewood under the three scenarios, using the proposed minimum area criteria referred to in the Table.

TABLE 2.14: ESTIMATED TOTAL REQUIREMENTS FOR OPEN SPACE AND SPORTSFIELDS FOR EACH SCENARIO				
Density Scenario	Total Population Estimate	Playgrounds Min. Area of 0.5 ha.	Parklands Min. Area of 3 ha.	Sportsfields Min. Area of 4 ha.
5 Dwellings/Hectare	9,800	10	3	4
9 Dwellings/Hectare	17,640	18	6	7
13 Dwellings/Hectare	25,480	25	8	12

2.5.2 Estimated Demand for Sporting Fields and Facilities

Table 2.15 provides an estimate of the total number of sporting fields and facilities that would be required for the various sporting activities and codes based on recommended standards of provision included in Table 2.12. Table 2.15 also provides an indication of the likely timing for the facilities based on estimated rates of development in the area.

TABLE 2.15: ESTIMATED REQUIREMENTS FOR SPORTING FIELDS AND FACILITIES					
Density Scenario	YEAR OF DEVELOPMENT				
	Total	0-5	6-10	11- 5	16-20
5 dwellings/ hectare Total population 9,800 persons	Baseball/Softball Basketball (1) Bowling Green (3) Cricket (3) Rugby League (1) Soccer (4) Netball (5) Tennis (4)	Bowling Green Cricket Soccer Netball (2) Tennis (2)	Bowling Green(2) Basketball Cricket (2) League Soccer (2) Netball (2) Tennis (2)	Baseball/Softball Netball Soccer	-
9 dwellings/ hectare Total population 17,640 persons	Baseball/Softball Basketball Bowling Green (5) Cricket (6) Rugby League (2) Soccer (7) Netball (9) Tennis (8) Hockey Golf	Bowling Green Cricket Soccer Netball (2) Tennis (2)	Baseball/Softball Basketball Bowling Green(2) Cricket (3) League Soccer (3) Netball (4) Tennis (3)	Bowling Green(2) Cricket (2) League Soccer (3) Netball (3) Tennis (3) Golf Hockey	
13 dwellings/ hectare Total population 25,480 persons	Athletics Baseball/Softball(2) Basketball (2) Bowling Green (7) Cricket (8) Cycling Equestrian Arena League (3) Soccer (10) Golf Hockey Netball (13) Roller Skating Swimming Pool Tennis (11)	Bowling Green Cricket Soccer Netball(2) Tennis (2)	Baseball/Softball Basketball Bowling Green(3) Cricket (3) League Soccer (4) Netball (4) Tennis (4)	Bowling Green (2) Cricket (3) League Soccer (3) Netball (4) Tennis (3)	Athletics Baseball/softball Basketball Bowling Green Cricket Cycling Equestrian Arena League Soccer (2) Golf Hockey Netball (3) Roller Skating Swimming Pool Tennis (2) Aust Rules

Tables 2.13 and 2.15 above have estimated the likely timing of demand for playgrounds, parkland and sporting grounds. Projected demands for these open spaces and recreational facilities can be summarised as follows:

- **Scenario 1: 5 dwellings per hectare**

Greatest demand for open space is in years 0-5 and 6-10. Sports for which grounds/facilities may be required are baseball/softball, lawn bowls, cricket, rugby league, soccer, netball, tennis and basketball. Almost all of these grounds/facilities will be required within the first 10 years of development.

- **Scenario 2: 9 dwellings per hectare**

Highest demand for open spaces occurs in years 6-10 and 11-15. However, early provision of essential facilities will be required in years 0-5 due to the existing overcrowding of sporting fields elsewhere in the Pittwater area. Sports for which grounds/facilities may be required are those in Scenario 1 plus golf and hockey. Majority of demand for sports grounds/facilities will be during years 6-15.

- **Scenario 3: 13 dwellings per hectare**

This scenario is similar to scenario 2, however, in years 16-20 Council may be faced with demands for high cost sporting grounds/facilities such as an athletics track, cycling course, equestrian arena and swimming pool. The provision of these and other sporting facilities with a lower overall demand will need to be reviewed in the broader context of facilities within the Pittwater area as a whole.

2.6 AVAILABILITY OF EXISTING OPEN SPACE

During the early years of development of the Ingleside-Warriewood area it would be desirable to be able to use existing open space/recreation and sporting facilities that may be available within the Ingleside-Warriewood area or within close proximity. The use of such facilities would defer the need for Council to spend scarce funds at a time when there is likely to be a relatively small population close to existing services and facilities.

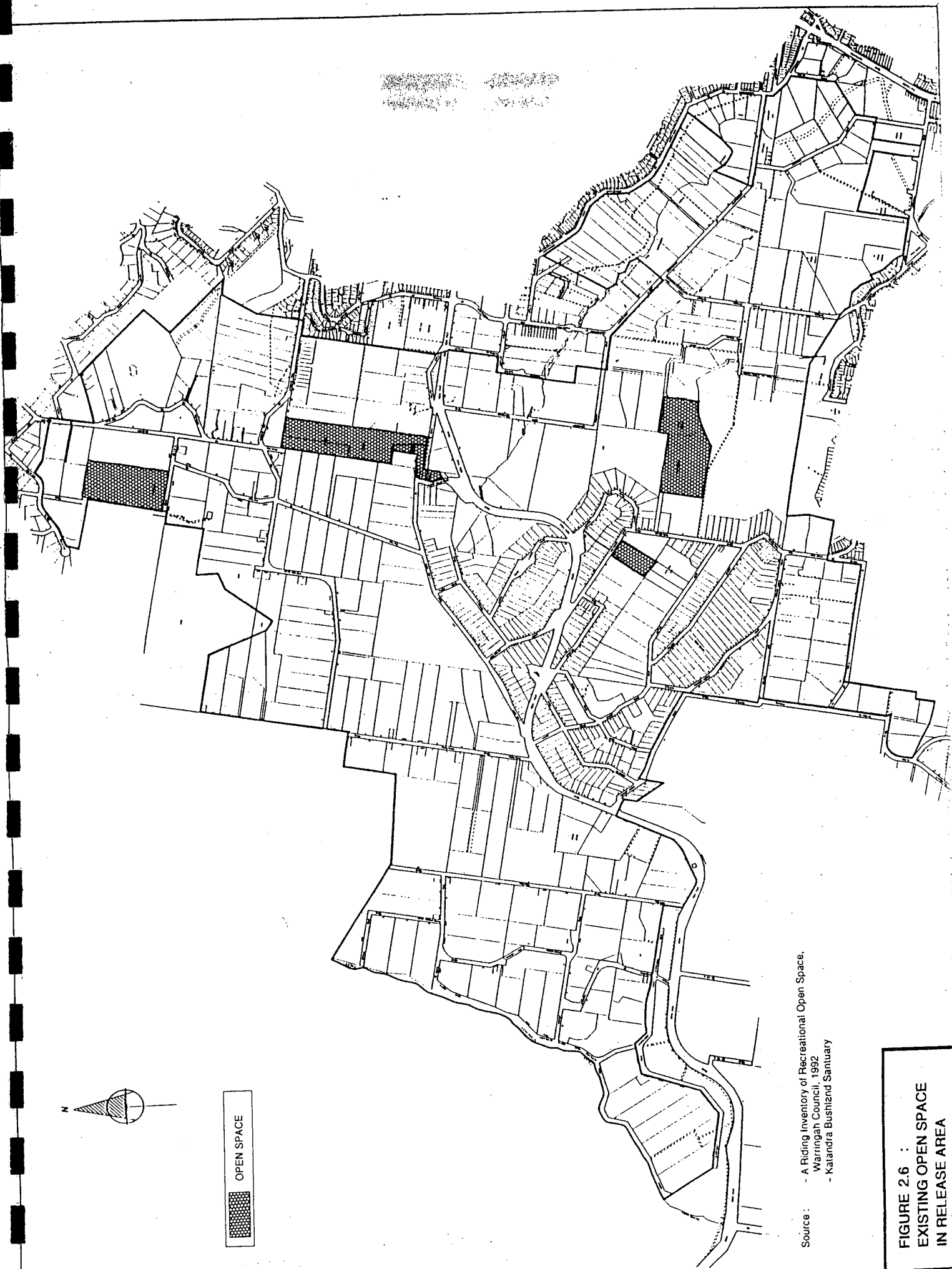
2.6.1 Open Space Currently Available Within a Reasonable Distance of the Study Area

Table 2.16 contains a summary list of the different types of open space currently available in Ingleside-Warriewood, and in the surrounding suburbs of Elanora Heights, Bayview, Mona Vale and North Narrabeen. The locations are illustrated on Figures E2.5 and E2.6.

TABLE 2.16: CURRENTLY AVAILABLE OPEN SPACE WITHIN AND SURROUNDING INGLESIDE-WARRIEWOOD URBAN RELEASE AREA				
Park Setting	Ingleside-Warriewood		Bayview, North Narrabeen, Mona Vale, Elanora Heights	
	Number	Area	Number	Area (ha)
Small Developed Park	-	-	33	9.1
Large Developed Park	-	-	7	27.07
Undeveloped Open Space	1	14.25	7	0.61
Ancillary Open Space	-	-	14	7.48
Sportsground	-	-	5	18.02
Structured Sports Area	-	-	6	65.07
Bushland	2	11.95	34	105.21
Beach and Shoreline	-	-	9	13.57
Hilltop, Bluff or Headland	1	0.75	4	9.36
Special Purpose Open Space	-	-	1	12.36
TOTAL	4	26.95	120	259.66

Source: *A Riding: Inventory of Recreational Open Space*, Warringah Council, 1991

As can be seen from the table, the main types of open space both within and surrounding the release area are bushland and sportsgrounds/structured sports areas. A brief description of each of the five existing open space areas at Ingleside-Warriewood is set out below in Table 2.17 with reference to the location illustrated in Figure E2.6.



Source : - A Riding Inventory of Recreational Open Space,
Warrington Council, 1992
- Kalandra Bushland Sanctuary

FIGURE 2.6 :
EXISTING OPEN SPACE
IN RELEASE AREA

TABLE 2.17: EXISTING OPEN SPACE RESERVES IN RELEASE AREA			
No.	Area	Type of Open Space	Area
1	Ingleside Park	Bushland	9.33 ha
2	Ingleside Reserve	Bushland	2.62 ha
3	Walter Road Reserve (incl. nursery)	Undeveloped open space	14.25 ha
4	Walter Road Reserve	Hilltop, bluff, headland	0.75 ha
5	Katandra Bushland Sanctuary	Bushland	11.53 ha

Source: A Riding: Inventory of Recreational Open Space, Warringah Shire Council, October 1991

As indicated these areas are primarily bushland that may be suitable for integration into a parks system for the area. The Walter Road Reserve is located on the fringe of the Ingleside-Warriewood development area and may not be appropriate as a major parkland. In its consideration of future development scenarios, Council may therefore not wish to retain this area for future parkland or sporting activities.

2.6.2 Capacity of Existing Sporting Facilities

A description of the major sports grounds in the locality is set out in Table 2.18 and illustrated in Figure E2.5.

TABLE 2.18: MAJOR SPORTING AREAS WITHIN A REASONABLE DISTANCE OF THE STUDY AREA		
Locality	Sporting Activities	Amenities
1. Boondah Reserve, Boondah Rd, Warriewood	Winter - 2 soccer - 4 junior soccer - 10 netball Summer - 4 junior baseball	Toilets, canteen, playground, flood lights
2. Kitchener Park, Barrenjoey Rd, Mona Vale	Winter - 2 soccer - 3 junior soccer Summer - 2 cricket	Toilets, slip rail for ambulance, skateboard ramp, flood lights, club rooms, kiosk, 2 cricket nets, power box. Parking: less than 100 cars.
3. Lake Park, Lake Park Rd, Narrabeen	Winter - 1 rugby league Summer - 1 cricket	2 cricket nets, toilets, 2 power boxes, flood lights, locked slip rail, playground, access to Narrabeen Lake, boat ramp. Parking: more than 50 cars.
4. North Narrabeen Reserve, Walsh Street, North Narrabeen	Winter - 2 hockey - 2 rugby union Summer - 3 junior baseball	Equestrian ground, golf driving range. Parking: over 100 cars.
5. Bayview, Mona Vale, Monash, Elanora	Golf courses	
6. Pittwater High School, Narrabeen High School, Narrabeen Primary	Schools	

Sources: Outdoor Recreation Facilities, Pittwater Council
Sydways
Manly Warringah Sporting Union

In meetings with sporting associations in the Pittwater area and the Ingleside-Warriewood Residents Consultative Committee, the capacity and quality of existing open spaces, and the perceived role of the release area were discussed. A summary of the main points of discussion is set out in Section 2.5.2.

The community consultations concluded that the demand for sportsgrounds and facilities currently far exceeds the supply and there is limited space within Pittwater to build new grounds. All participants in the discussions therefore urged Council to develop new sporting facilities as soon as possible, as additional population would place further pressure on inadequate resources.

3. COSTS OF OPEN SPACE/RECREATION FACILITIES AND LIKELY FUNDING SOURCES

The provision of open space and recreational facilities to meet the needs of the future population of Ingleside-Warriewood depends on three main factors:

- i) the amount of land to be acquired and the range of facilities to be provided and their respective costs;
- ii) the ability of future residents to pay for the facilities in terms of their capital costs and ongoing management costs and potential sources of other government funding;
- iii) the extent to which recreational facilities can be provided by the private sector.

3.1 ESTIMATED COSTS OF PROVIDING PARKS AND FACILITIES

There are three main components to the cost of providing and maintaining parks and facilities. They are:

- i) land acquisition costs;
- ii) embellishment costs, i.e. the costs of providing facilities including associated costs of car parking, access, installation of services etc. as well as the sporting fields or children's play equipment;
- iii) maintenance costs of the facilities once they have been installed.

3.1.1 Land Acquisition Costs

Section 2.5.1 of this report has provided indicators of the amount of land that is likely to be required to meet the needs of the future population of Ingleside-Warriewood for informal open space and for organised sportsgrounds.

The estimated requirements are summarised in Table 3.1 for each of the three demographic scenarios.

TABLE 3.1: SUMMARY OF OPEN SPACE REQUIREMENTS

Density Scenario	Children's Playgrounds 0.5 ha. per 1,000 persons		Informal Open Space 1.0 ha. per 1,000 persons		Active Sportsgrounds 1.6 ha. per 1,000 persons		Total 3.1 ha. per 1,000 persons
	Area	No.	Area	No.	Area	No.	Area
Low Density	4.90	10	9.80	3	15.69	4	30.39
Medium Density	8.82	18	17.63	6	28.22	7	54.67
High Density	12.74	25	25.48	8	40.77	12	78.99

In addition to the above there are substantial areas of land which have been identified in earlier studies as having high environmental values which should be conserved. The extent to which these areas can be brought into public ownership will depend on the availability and priorities for financing such acquisitions.

Under all scenarios there will be a need for a substantial purchase of open space lands. At this stage, it has not been possible to assess land acquisition costs in total due to uncertainties of likely land values assuming that the proposed land release proceeds to rezoning. At this stage it is not appropriate to use historic land values.

3.1.2 Embellishment Costs

Based on its experience in developing various types of parks, Pittwater Council has estimated the following costs for embellishment of parks:

- | | | |
|------|---|-----------|
| i. | Small Developed Park (0.25 ha)
(includes \$35,000 for children's playground equipment) | \$58,000 |
| ii. | Large Developed Park (2 ha) | \$347,000 |
| iii. | Sportsground (2.2 ha) | \$392,000 |

The components of cost contributing to the above figures are included in Appendix E1.

A review of a range of Section 94 Contributions Plans elsewhere in the Sydney Region indicates a range of embellishment costs as follows:

- | | | |
|------|---------------------------------|---------------|
| i. | Children's Playground | \$30-40,000 |
| ii. | Local Park | \$80-100,000 |
| iii. | Large Developed Park (District) | \$300-400,000 |
| iv. | Sportsfields | \$400-500,000 |

As it is desirable to provide a smaller number of slightly larger parks in a new development area than would exist in more established areas the following range of embellishment costs has been adopted for the purpose of estimating future embellishment costs at Ingleside-Warriewood.

- | | | |
|------|-------------------------------|-----------|
| i. | Small Developed Park (0.5 ha) | \$80,000 |
| ii. | Large Developed Park (3.0 ha) | \$400,000 |
| iii. | Sportsfields (4.0 ha) | \$500,000 |

The estimated costs of establishing the range of facilities required for the future population of Ingleside-Warriewood for each density scenario is set out in Table 3.2.

TABLE 3.2: ESTIMATED COSTS OF PARK EMBELLISHMENT (\$million)				
Density Scenario	Small Developed Parks (0.5ha)	Large Developed Parks (2 ha)	Sportsfields (4 ha)	Total Park Costs
	Embellishment Costs	Embellishment Costs	Embellishment Costs	Embellishment Costs
Low 5 dw/ha	0.80	1.20	2.00	4.00
Medium 9 dw/ha	1.44	2.40	3.50	7.34
High 13 dw/ha	2.08	3.20	6.00	11.28

3.1.3 Recurrent Maintenance Costs

Pittwater Council has provided information on typical examples of park maintenance costs currently being experienced elsewhere in the Pittwater area.

They are:

	Maintenance Cost Per Annum \$
i) Regional Open Space (Example: Governor Phillip Park, Palm Beach)	35,000
ii) District Park (Example: Apex Park, Mona Vale)	20,000
iii) Small Sportsground (Example: Newport Oval - one playing field and associated amenities)	5,000
iv) Neighbourhood Park	1,500

Based on the above costs for various types of existing parks, it has been estimated that the following recurrent maintenance costs would be incurred in respect of the types of parks proposed for establishment in the Ingleside-Warriewood area.

**Estimated Maintenance
Costs Per Annum**

	\$
i) Small Developed Park (0.5 ha)	5,000
ii) Large Developed Park (3.0 ha)	20,000
iii) Sportsfields (4.0 ha)	20,000

Table 3.3 summarises the total estimated annual maintenance costs for each of the three development scenarios.

TABLE 3.3: ESTIMATED MAINTENANCE COSTS (\$'000 PER ANNUM)				
Density Scenario	Small Developed Parks	Large Developed Parks	Sports Fields	Total
Low 5 dw/ha	50.0	60.0	80.0	190.0
Medium 9dw/ha	90.0	120.0	140.0	350.0
High 13 dw/ha	125.0	160.0	240.0	525.0

Based on current experience these costs would be largely met from general rate revenue with a small amount of income each year delivered from ground fees paid by sporting clubs. The additional costs to be borne from general rate revenue are expected to be offset by the additional rate revenues generated by the development of the Ingleside-Warriewood area.

3.2 FUNDING SOURCES FOR THE PROVISION OF OPEN SPACE AND RECREATIONAL FACILITIES

3.2.1 Funding Requirements

This section reviews the alternative sources of funding that are available for:

- the acquisition of open space lands;
- the embellishment of open space and provision of recreational and sporting facilities; and
- the management/maintenance of the open space/recreational assets.

Based on experiences in new urban release areas elsewhere in New South Wales by far the greatest amount of funding for future land acquisition and embellishment is derived from the receipt of developer contributions obtained as a result of the adoption by Council of a Section 94 Contributions Plan under the provisions of the Environmental Planning and Assessment Act, 1979.

Other funding alternatives are also available and are discussed below. However they are unlikely to achieve significant results in terms of the level of funding required for the establishment of the range of open space and recreational facilities required for the future population of Ingleside-Warriewood.

As Section 94 contributions are only capable of being obtained for the provision of capital works, Council will be responsible in the long term for the management and maintenance of facilities provided in the area. To date the costs of maintaining reserves have been largely funded from annual rate receipts with a small amount received as a result of "user-pay" principles. Opportunities for increased use of user-pay principles and possible further involvement by the private sector in the provision of recreational facilities are also discussed in this section.

3.2.2 Land Acquisition Methods

Based on experiences elsewhere there are four main methods for Council to acquire land for open space purposes. They are:

- general rate revenue or loan funds (repayable from rate revenue);
- developer contributions under Section 94 of the Environmental Planning and Assessment Act;
- grants or land swaps made available from the State Government;
- transfer of development rights.

General Rate Revenue/Loan Funds

Council has the ability to acquire land for a public purpose using funds generated from general or local rates.

It is unlikely that a Council would be prepared to undertake such acquisitions unless they were seen to have a wide benefit to the community and a high priority relative to other demands on the use of rate revenues. There are two circumstances where the use of general rate revenues could be substantiated in the Ingleside-Warriewood area:

- i) For the acquisition of land to meet the wider needs of the community for sporting activities. This would be based on a perception from the consultation program that there are inadequate areas for sporting activities currently existing in Pittwater Council. The accuracy or otherwise of this view is likely to be discussed further at the time of Council preparing an overall open space study of Pittwater.
- ii) For the acquisition of parts of the escarpment lands due to their regional significance on scenic and environmental conservation grounds, as identified in earlier studies undertaken as part of the investigations of the Ingleside-Warriewood area.

Developer Contributions Under Section 94

Section 94 of the Environmental Planning and Assessment Act, 1979 enables Councils to obtain contributions from developers in the form of a dedication of land free of cost or the payment of a monetary contribution where development is likely to require the provision of or increase the demand for public amenities and services.

As the development of the Ingleside-Warriewood urban release area will result in increases in demand for public open space and recreational amenities and services, it will be reasonable for Pittwater Council to require the dedication of land and/or payment of monetary contributions for those purposes.

Under Section 94AB of the Act, Council may prepare and approve a Contributions Plan for the purpose of levying contributions. The Environmental Planning and Assessment Regulation 1980 specifies the structure and subject matter to be included in a contributions plan.

The principal issue to be taken into consideration by Council in preparing a Contributions Plan is to ensure that there is a clear 'nexus' or linkage between the increase in demand for public amenities and services and the proposed contribution rates. Contribution rates must be reasonable and, in being calculated, need to take into consideration any components of cost that should be borne by the existing population.

Thus if a major sporting facility were to be constructed in Ingleside-Warriewood for general use of the population of Pittwater as well as the future residents of Ingleside-Warriewood, only that portion of the cost attributable to the future residents could be levied as a developer contribution. The balance of the cost would need to be raised by Council from its general rate revenue. The Department of Planning has prepared a Manual (1992) to assist Councils in the preparation of Section 94 Contributions Plans.

It would be preferable for a Section 94 Contributions Plan for Ingleside-Warriewood to be prepared following completion of a draft local environmental and draft development control plan for the area. In this way future land requirements would be clearly identified and costed to meet the needs of the population based on the findings of the draft plans.

Grants and/or Land Swaps Through the State Government

There are no regular programs available from the State Government for the acquisition of land for local open space purposes.

The Department of Planning administers the Sydney Region Development Fund which was set up to acquire land identified for regional planning purposes such as regional open space. Since the 1950s about 12,000 hectares of land has been acquired for open space purposes in the Sydney Region. Following acquisition the lands are generally managed by the Department

pending transfer to another appropriate authority. Many open space lands are transferred to local Councils for care control and management. At Ingleside-Warriewood, a strong case could be made to identify the escarpment lands as having regional significance. This would be comparable with escarpment and ridgelines identified in the City of Gosford as regional open space and the eastern escarpment of the Blue Mountains. The Department of Planning has assisted with the acquisition of lands in those localities for open space purposes.

Over the years the Department has acquired a substantial landholding in the "blue hatched area" in order to implement former planning objectives aimed at restricting development in the area. These lands are identified in Figure E3.1. Following rezoning of the Ingleside-Warriewood area these lands will be available for future development. Part of the proceeds from the sale of those lands could be made available for assistance towards the purchase of areas in the escarpment with significant regional environmental value for future conservation. Alternatively it may be feasible to organise land swaps with owners of land in the escarpment area, based on comparable land values.

The Department of Conservation and Land Management also manages a substantial land holding in the Ingleside-Warriewood area as indicated on Figure E3.1. A number of these lands have been identified as having high landscape or conservation significance as indicated on Figure E3.2. As these lands are already in the public domain they should be retained for essential public purposes and placed under the control and management of Pittwater Council or the National Parks and Wildlife Service as a buffer between the future development area and the existing National Park.

Transfer of Development Rights

Transfer of Development Rights is a technique for bringing lands of high conservation value into public ownership, through the granting of more generous development rights on adjoining lands or other lands in the locality. This technique has been used very successfully in the City of Gosford to enable landowners to dedicate ridge lands of high conservation value in exchange for additional development rights on properties with lesser conservation value. As a result more than 2,000 hectares of ridgetop lands, coastal cliffs and wetlands have been brought into public ownership during the past fifteen years. This concept may have some applicability to the future acquisition of the escarpment if other acquisition techniques described above are not feasible.

3.2.3 Provision of Recreation Facilities

Local Council Funding

As with land acquisition referred to above the only practical means of obtaining adequate funds to provide recreational and sporting facilities in the future parks at Ingleside-Warriewood will be through developer contributions obtained by Council through the provision of a Section 94 Contributions Plan.

In seeking to levy contributions from developers under Section 94 there is a need to identify the proposed use of the facilities to demonstrate that they will be used principally by future residents of the area. Any proportional use intended to be from existing residents of the municipality would need to be funded from general rates with possible assistance from State and Federal grants.

Federal and State Funding Sources

Small amounts of funding for recreation facilities including research for the management of natural areas are available from a number of sources from Federal and State agencies. A brief summary is included in Table 3.4.

TABLE 3.4: FEDERAL AND STATE FUNDING SOURCES	
Agency	Type of Funding Available
A. FEDERAL	
1. DASETT	Community, Cultural, Recreation and Sporting Facilities Program. Needs based program to assist in the provision of recreation and sporting facilities and programs. This program is not operational in 1994.
2. Landcare	Sponsorship of community groups involved in land management and conservation programs.
3. Greening Australia	Assistance in rehabilitation of cleared areas and tree planting. Available to semi-government organisations and community groups. Incorporates One Billion Trees Program by the year 2000.
4. Save the Bush	Preparation of plans and implementation of bush regeneration programs for semi-government organisations and community groups.
B. STATE	
1. Department of Sport, Recreation and Racing	Capital Assistance Program to provide up to 50% of the capital cost of building and maintaining local sport and recreation facilities on a dollar-for-dollar basis with local government or local sporting organisations.
2. Environment Protection Authority	Environmental Trust Grants to assist in research, planning and management of natural ecosystems.
3. Department of Planning	Greenspace Program - grants to local councils for the improvement and management of areas of regional significance, e.g. interpretation, walking tracks, etc. The land to which the grant applies must be Crown land. Funding is provided on a dollar for dollar basis with local government Area Assistance Scheme. The Ingleside-Warriewood is not covered by this scheme.

3.2.4 Private Sector Involvement in the Provision of Recreational Facilities

The private sector has increasingly become involved in the provision of recreation and leisure opportunities as more people are prepared to spend money in the pursuit of specialised activities. Many private recreational activities are based in buildings, e.g. squash courts, gyms, fitness centres, indoor cricket, etc. Such buildings are often located in commercial centres or industrial estates. Larger land requirements are needed for more extensive private outdoor recreational activities such as golf courses, paint ball parks, private zoos or nature parks.

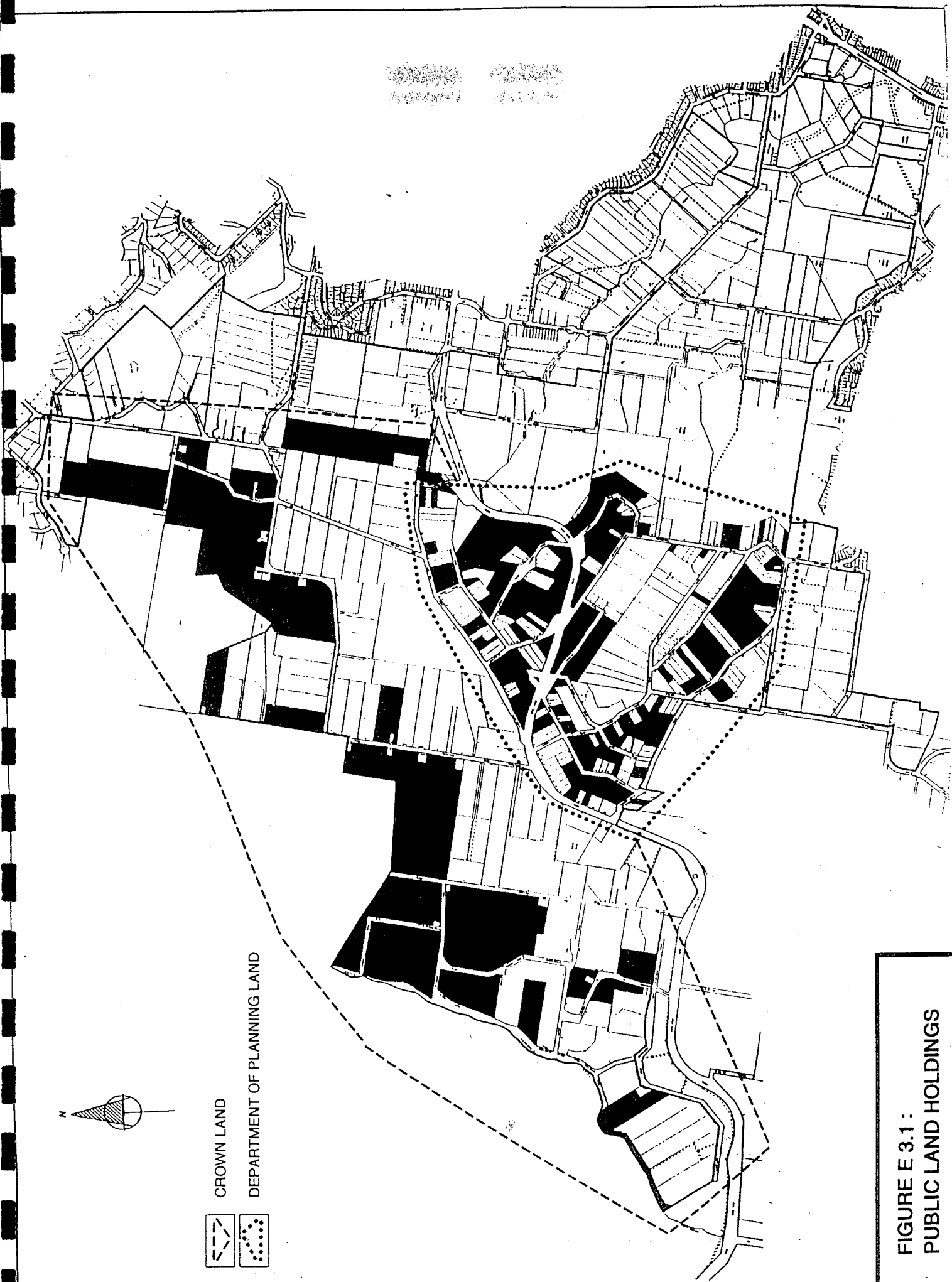
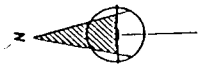


FIGURE E 3.1:
PUBLIC LAND HOLDINGS



UNSUITABLE FOR URBAN DEVELOPMENT - CONSERVATION AREAS
LOW SUITABILITY FOR URBAN DEVELOPMENT - RESTRICTED DEVELOPMENT

Source :
- Visual Impact Study : InglesideWarriewood Urban Release Area,
July 1993, Environmental Partnership.

FIGURE E 3.2
VISUAL IMPACT CLASSIFICATIONS

Surrounding the Ingleside-Warriewood area are three private golf courses (Elanora, Monash and Bayview) and one public golf course (Mona Vale).

The viability of these facilities is likely to be enhanced by the development of the Ingleside-Warriewood urban release area.

3.3 RECURRENT FUNDING

As indicated in Section 1.1 some 85% of Council's present parks and recreation budget is spent on maintenance and management of existing facilities.

The development of a range of new recreation facilities and services for the future residents of Ingleside-Warriewood will add further costs to the Council's budget which will need to be offset from the increase in rate revenue resulting from the future urban development.

Council has indicated that it is proposing to initiate a review of its overall open space/recreation program in the near future. Part of this review should be related to costs and revenues associated with the maintenance and use of parks and reserves. This is an issue that is beyond the scope of this present study as it requires policy considerations relating to the whole municipality rather than just the Ingleside-Warriewood area alone. Issues needing to be given consideration include:

- costs of maintenance and potential efficiency savings related to the size and type of open space area;
- cost recovery from users and how they relate to private sector recreational facilities;
- affordability for use of reserves especially for children and youth;
- opportunities for cost recovery in natural parks and beach locations, possibly through car parking fees;
- opportunities for greater private sector involvement in the provision of higher-cost recreational facilities;
- opportunities for sporting codes to have care, control and management of recreational sporting grounds subject to adequate safeguards for public access.

4. OPEN SPACE STRATEGY

4.1 PLANNING AND IMPLEMENTATION OF AN OPEN SPACE SYSTEM

The demographic analyses presented in this report provide estimates of future population at Ingleside-Warriewood ranging from a low density scenario of nearly 10,000 people to a high density scenario of more than 25,000 people.

One of the important objectives of this section of the report is to identify the likely future open space and recreational needs of the population, regardless of its ultimate size, indicate the range of open space/recreational facilities that will be needed, identify estimated costs and mechanisms for funding and provide a strategy for implementation as development proceeds.

While this report is concerned principally with the Ingleside-Warriewood area and its requirements as a future urban development area, its relationship to the larger Pittwater Council area should not be overlooked. To date, Pittwater does not have an overall park system plan for which the Ingleside-Warriewood area could form a part. It is understood that Council intends to undertake the preparation of an Open Space/Recreation Plan in the near future. A number of principles and guidelines are therefore included in this report for later consideration and integration with a wider-scale Pittwater Open Space/Recreation Plan.

Although the Ingleside-Warriewood area contains a small number of existing areas of open space, these will clearly be insufficient and may also be inappropriate for the area's future role as a residential community.

In view of the wider range of demands that will be placed on the area it is important to initiate an open space/recreation system that will meet the needs of the future population during its formative years and be capable of longer term adaptation as those needs change with the likely ageing of the population.

The establishment of an open space/recreation system in an almost greenfields location with a variety of biophysical characteristics provides a challenge which is not available in existing built areas where the framework has already been established. The open space system provides an opportunity to enhance the future urban area by providing green backdrops and linear corridors as components of a system which will contain a variety of settings to meet the needs of informal as well as organised recreational activities.

The remainder of this section provides a strategy framework for the future detailed planning and development of the release area. The main elements of the strategy in respect of the provision of open space and recreational facilities closely follow the contents of the study set out in the previous sections. They are:

- i) identifying and attempting to satisfy preferences for outdoor recreational activities in appropriate settings;

- ii) identifying costs of land acquisition, park embellishment and recurrent costs and providing adequate funding sources to meet those costs;
- iii) preparing guidelines and objectives for the future planning and implementation of open space/recreation as an important component of the urban release area.

4.2 PREFERENCES FOR OUTDOOR RECREATION ACTIVITIES AND SETTINGS

4.2.1 Recreation Activity Preferences

The results of a number of studies identifying preferences for outdoor recreational activities and settings have been presented in Section 2 of this report.

All of the surveys have shown that there is a much greater level of participation in informal outdoor recreation activities than in organised sports. The most frequently identified outdoor recreational activities involve:

- walking (for pleasure, with the dog, and bushwalking)
- driving for pleasure
- picnics/barbecues away from home
- visiting parks and gardens (including taking children to playgrounds)
- cycling
- jogging/running
- involvement in spectator sports
- swimming/surfing/surf life saving at the beach.

The most popular involvement in sporting activities which have a high proportion of organised activity include:

- tennis
- cricket
- hockey, soccer, football
- athletics
- swimming
- lawn bowls
- golf.

The surveys have also demonstrated that:

- males generally participate to a greater extent than females in sporting activities (with the exception of aerobics/callisthenics, netball and swimming);

- involvement in active sports tends to decline with age (exceptions being golf, lawn bowls, ten pin bowling and swimming);
- females have a higher general participation in visiting the library and involvement in crafts/hobbies;
- 23% of males and 32% of females do not participate regularly in any outdoor activities.

The surveys provide a valuable guide to the future requirements of Ingleside-Warriewood. The population projections (Section A) anticipate a future profile with a significant number of 5-14 year olds and 25-39 year olds in the first ten years of development. In the following ten years there is expected to be continuing high levels in all age groups between 0-49 with quite high numbers (in excess of 10%) in the 65+ age group.

There will therefore be a high demand for all forms of outdoor recreation activity during the first 20 years of growth with particularly high demand for organised sports grounds as well as informal parks, walkways, bikeways and children's playgrounds.

Comparisons of a number of other local government areas has led to the conclusion that about 1.5 hectares of "parkland" will be required for every 1,000 persons housed in the future urban release area.

These "parkland" areas need to range from small parklands capable of accommodating local children's playgrounds to larger district parks that can also be used for walking trails, picnics and barbecues preferably in modified bushland settings.

The provision of 1.5 hectares of land per 1,000 persons for these purposes would require the acquisition of about 15 hectares for the low density development scenario and about 38 hectares for the high density scenario. Preferably these acquisitions should take place in locations with attractive attributes to make them places that are interesting to visit. Where possible consideration also needs to be given to the provision of linkages using drainage lines, easements, pathways, bikeways and local roads with low traffic frequency. The provision of such linkages provides scope for a much greater variety of outdoor recreational experiences than separate isolated parks that can only be used for a small range of activities.

The provision of a number of sportsfields will also be an important component of a linked system of parks. Estimates (Table 2.14) earlier in the report indicate that the future population will need from 4 sportsfields (low density scenario) to 12 sportsfields (high density scenario). Where possible it is also preferable for these facilities to be located in close proximity to future schools to provide for joint use by schools and clubs.

4.2.2 Suitability of Land for Recreation Settings

The Ingleside-Warriewood area provides ample opportunity for establishing a broad spectrum of recreation opportunities because of its varied topography and land forms and proximity to existing National Parks, coastal lagoons and beaches.

Pittwater Council has undertaken a number of detailed investigations of the area as part of its preliminary planning studies. These studies have included:

- Vegetation Conservation Study
- Fauna Conservation Study
- Land Capability Study
- Visual Impact Study.

The findings of these reports have been used to establish guidelines for the identification of areas within the release area that are suitable for active and passive open spaces, and environmentally sensitive areas.

Areas Suitable for Sports Grounds

Large scale recreational/sporting complexes catering for soccer, cricket, athletics etc. require flat well drained areas and hence, where possible, should be located on land sloping between 0-10%. In certain circumstances, land sloping between 10-15% could be used if the complex can be placed on a number of levels so as to reduce the extent of cut and fill.

Small-medium recreation/sporting facilities such as netball/basketball courts, community/recreation centres, bowling greens etc, have smaller areas of potential land disturbance and therefore can be located in areas with steeper slopes, i.e. between 0-15%.

The Land Capability, Fauna Conservation and Vegetation Conservation Studies have identified the following areas that are suitable for active open spaces. These are:

- flat cleared lands present throughout the study area
- open forests within Warriewood Valley and Ingleside Plateau
- woodland communities within Ingleside Plateau.

Areas Suitable for Informal Outdoor Open Space

The various recreation participation surveys described in Section 2.2 have shown that the highest levels of participation by Australians are in informal outdoor settings. Principal activities comprise walking, jogging/running, cycling, visiting parks, going to the beach and having picnics/barbecues away from home.

For the most part these activities are undertaken in natural outdoor recreational settings in parklands, by the beach or the foreshores of lagoons, creeks and rivers. Walking, hiking and

cycling require linear open spaces which ideally are located in parkland settings, but which too frequently comprise only kerbside footpaths or on-road cycleways.

In a new greenfields release area there are opportunities to provide for more extensive linear walkways/cycleways based on the provision of linkages between parkland areas and other centres of community activity such as schools, community centres, shopping centres and places of employment.

Informal outdoor open space in Ingleside-Warriewood is therefore likely to comprise three main types of areas:

- informal parks in a semi-natural setting for the provision of play areas, barbecues, picnics, etc.;
- children's playgrounds;
- linear walkways/cycleways providing linkages between parks or centres of community activity.

A conceptual system of parks based on the provision of linkages is illustrated in Figure E4.1.

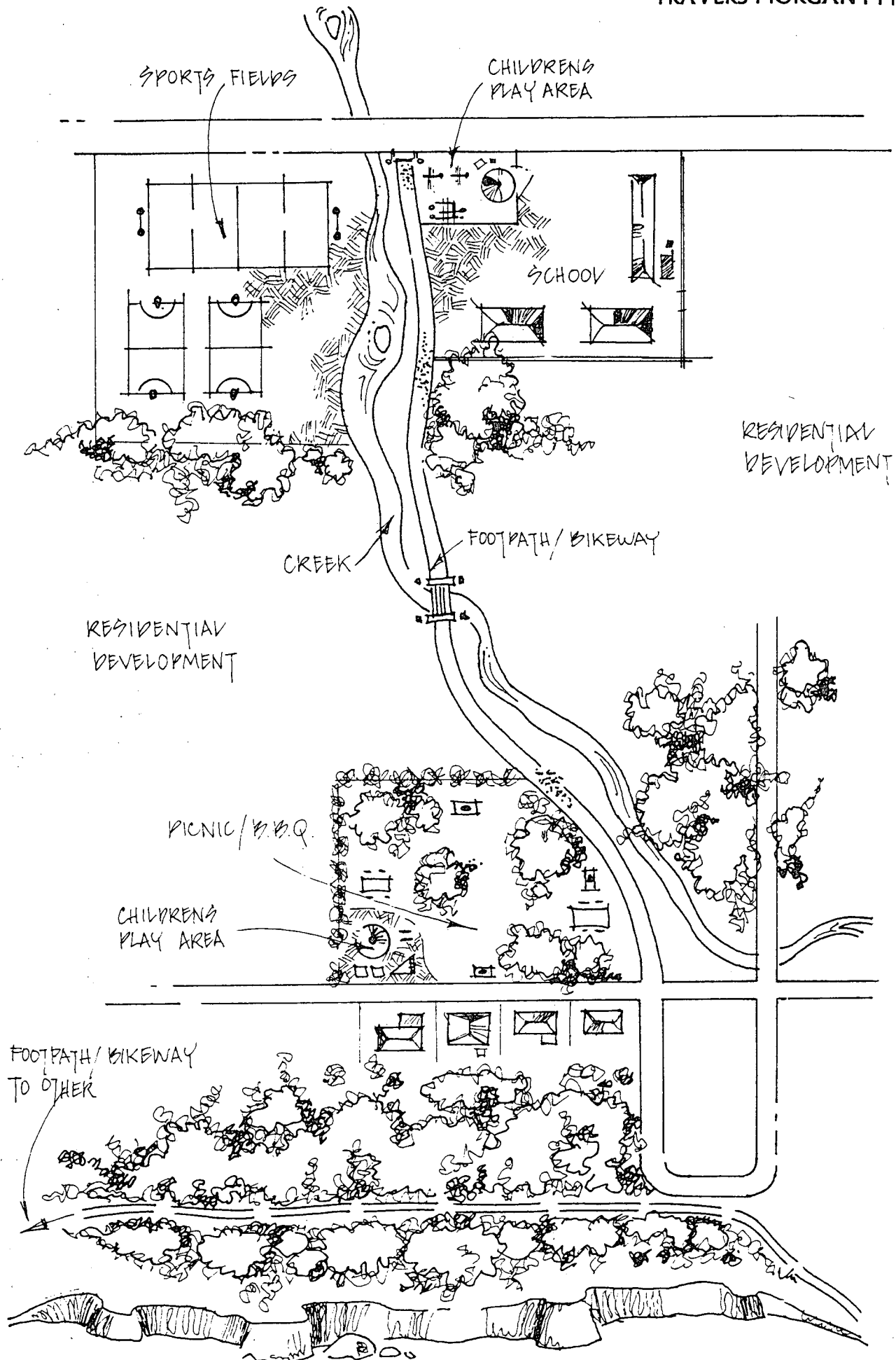
Where possible, it is desirable for larger informal parks to be established in areas that have a combination of vegetated and cleared areas with some topographic variety to create interest in the area. Creek lines which have not been identified as being of high environmental sensitivity are desirable locations, as well as areas with rocky outcrops for shelter and climbing. In selecting such areas, it is recognised that there is a need to avoid areas of high potential public risk and environmental sensitivity.

In order to minimise maintenance costs it is preferable for informal parks to have a minimum area of 3 hectares. In many instances children's playgrounds can also be incorporated into these parks. Such playgrounds need to be located so that they achieve maximum accessibility by foot or bicycle to residential areas without being obstructed by major roads or other physical barriers.

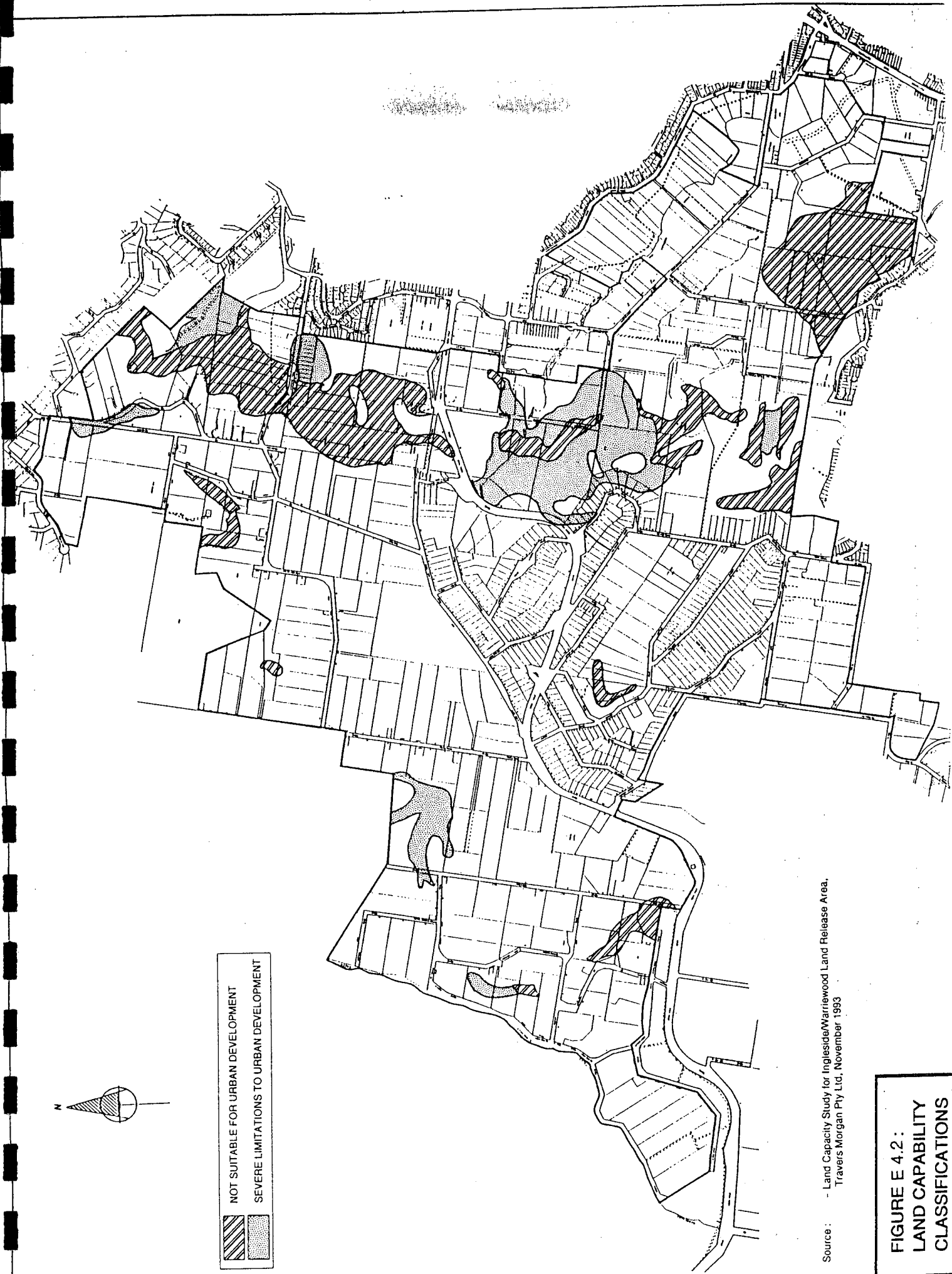
Parkland areas, likely to experience a high carrying capacity, should be located and designed to enable use to be regulated or spread among other areas and facilities. This can be achieved by careful design of access and car parking areas, the choice of hard wearing surfaces and separation of activities.

Environmentally Sensitive Areas

The Land Capability, Vegetation Conservation and Visual Impact Studies have identified a number of environmentally sensitive areas which are illustrated on Figures E4.2, E4.3 and E3.2, respectively. Significant features of these plans include:

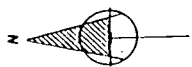


BUSHLAND ESCARPMENT FIGURE E4.1 : CONCEPTUAL PARK SYSTEM

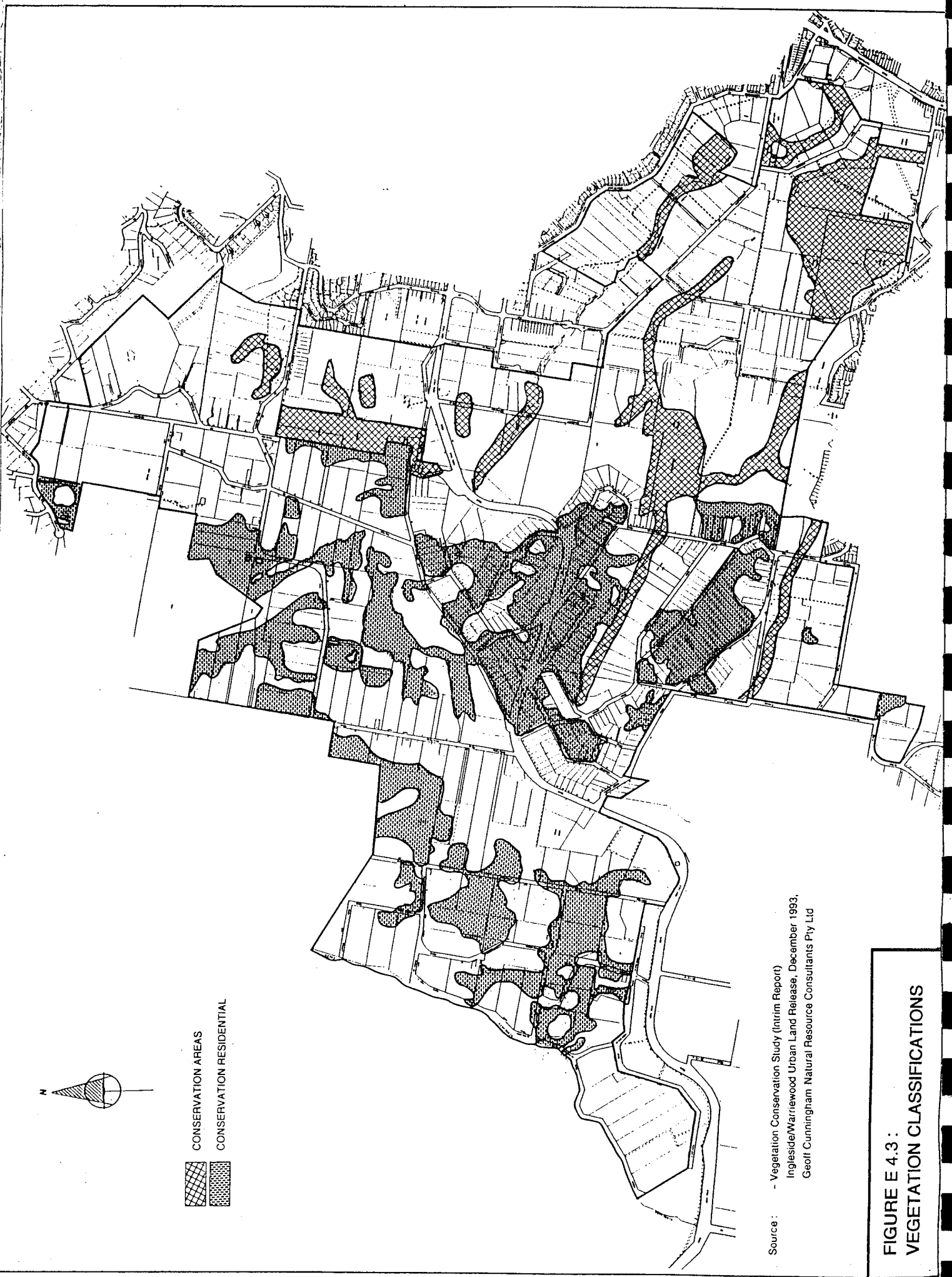


Source : - Land Capacity Study for Ingleside/Warriewood Land Release Area.
Travers Morgan Pty Ltd, November 1993

FIGURE E 4.2:
LAND CAPABILITY
CLASSIFICATIONS



CONSERVATION AREAS
CONSERVATION RESIDENTIAL



Source : - Vegetation Conservation Study (Interim Report)
Ingleside/Warriewood Urban Land Release, December 1993,
Geoff Cunningham Natural Resource Consultants Pty Ltd

FIGURE E 4.3 :
VEGETATION CLASSIFICATIONS

- Warriewood wetlands at the confluence of Mullet, Fern and Narrabeen Creeks;
- major drainage lines along Fern and Narrabeen Creeks;
- closed forest communities in the valley and steep slopes between Warriewood Valley and Ingleside Plateau;
- visually important areas such as the escarpment and major ridgelines;
- swamp mahogany communities mainly in Mullet Creek, Irrawong Reserve and downstream;
- areas with slopes steeper than 30%, this is because soil types in the release area are generally of a sandy nature and hence are highly erodible if disturbed.

Preservation of these environmentally sensitive areas should be of major consideration in the planning and development of the release area. Urban development should not be permitted within these areas and it would be desirable for Council to adopt appropriate measures to ensure the preservation and conservation of these areas preferably incorporated into publicly owned open space areas.

4.3 ACCESSIBILITY TO OPEN SPACE

If open space is to be used to its best effect, it needs to be easily accessible to those residents for whom it is intended.

Accessibility can come in many forms whether on foot, bicycle, horse, or car.

Visual accessibility is also very important as carefully located green backdrops or green corridors can significantly reduce the impact of urban development and provide a much higher standard of living environment.

4.3.1 Visual Accessibility

The visual impact study has identified a number of areas with high or very high visual quality, which are identified on Figure E3.2.

These areas have the highest visual significance for the locality and should be conserved to the highest degree possible as areas of natural landscape for long term incorporation into the open space system. In the short term such a goal is unlikely to be realised due to lack of funds for acquisition. Potential methods of conservation/acquisition are discussed in the next section.

4.3.2 Low Impact Accessibility

Low impact accessibility is used here to include walking trails, bikeways and horse trails (the latter is included as it is likely that there will continue to be a relatively high horse ownership at Ingleside-Warriewood for many years to come).

Walking and cycling are two of the most popular forms of informal outdoor recreation. Opportunities for such activities should therefore be provided within the urban release area and as linkages between the urban release area and other significant localities outside the area. These areas could include hiking trails within the adjoining National Parks and walking/cycling trails to the Warriewood shopping centre and Narrabeen Lagoon. Where possible these low impact forms of accessibility should avoid heavily trafficked roads.

Internal walking and cycling trails should form part of the integrated transport system for the release area linking residential areas with functional centres such as schools, community centres, shopping centres and recreation areas.

4.3.3 High Impact Accessibility

A large proportion of access to major sporting/recreation centres will be gained by car. Parents will drive their children to sporting venues for organised events, older persons will drive themselves. Families will use the car for access to informal parks for outings/barbecues/family gatherings. Major sporting areas and parks therefore need to be provided with good vehicle access, preferably including a frontage to the principal road system so that visual accessibility of such important parks is also given a high profile.

Adequate parking for cars and buses is an important component of such parks to enable full use to be made of the facilities provided.

The provision of access and car parking can also be used as effective management tools in controlling the extent of use of parks where limited access is desirable. This is particularly important where local environments may be sensitive to overuse and there are limitations on the carrying capacity of the land. In those circumstances it is important to restrict access and place a limitation on the number of car parking spaces provided. The actual form of access and number of spaces to be established will need to be determined for each park individually to meet the local conditions.

4.4 FUNDING AND PROGRAMMING FOR THE PROVISION OF OPEN SPACE/RECREATION FACILITIES

It has not been possible in this study to establish the full range of costs attributable to the provision of the proposed open space and recreational needs of a future population at Ingleside-Warriewood, as accurate information on land values is not available.

Table 3.2 provides a summary of the estimated costs of park embellishment for the three development scenarios. The total costs range from \$4.0 million for the low density option to \$11.28 million for the high density option.

A tentative program to satisfy future needs for open space and recreational facilities is set out in Tables 2.13 and 2.15. It is clear that the only way in which adequate funding can be made available to acquire and construct these facilities will be through the collection of developer contributions under the provisions of a Section 94 Contributions Plan. Council will therefore need to give a high priority to the preparation of such a plan as part of its detailed planning of the release area.

Other funding mechanisms are incapable of providing the level of funds needed to meet the future needs of the population. Notwithstanding this situation, Council should review opportunities for further club and private sector involvement in the provision of recreational facilities as part of a broader review of recreational needs throughout the Pittwater Council area.

In particular there is a need to review current levels of payment for the use of open space and recreational facilities as a means to reduce the extent to which recurrent expenditures are reliant on general rate revenue.

In particular the increasing demand for use of scarce beach and waterway resources may need to be more carefully allocated possibly through the use of car parking fees during peak periods.

4.5 PLANNING GUIDELINES

The following planning guidelines are intended to relate to open space provision within the release areas as a whole. Detailed "specific" guidelines pertaining to the related issues of visual impact, vegetation, fauna, land capability and land contamination may be found in the previously referred to reports.

When planning for the urban and in particular open space development of the release area, the following issues/ideas should be considered by Council:

- The escarpment, creeks, wetlands and lagoons are the major biophysical features of the Ingleside-Warriewood area. Hence Council's open space plan should endeavour to link these significant areas via multi-purpose open space corridors.
- Urban run-off into bushland, creeks, wetlands and lagoons is of major environmental concern. Council will have to include buffer zones into their open space plans so as to minimise the migration of pollutants and the potential for flooding of low lying areas.
- Before providing open spaces, Council should consider the proposed function of the open space and its accessibility. Open space whether it be passive or active should be

meaningful to the community, i.e. demanded by the community and of appropriate size and quality. The accessibility of open spaces should correspond to its function in that if it is designed to serve a local area it should be accessible to the community immediately surrounding the particular parcel of open space, likewise if open space is designed to be used by persons within a district or region it should have district or regional accessibility.

- The high capital and recurrent costs associated with providing and maintaining open spaces will place considerable burden on Council's financial resources and hence ability to provide open space in the short-medium term. Thus, in the initial stages of development, Council will have to identify and secure (either through land acquisition/swaps/dedications or development control plans) land they wish to use for open spaces in the future.

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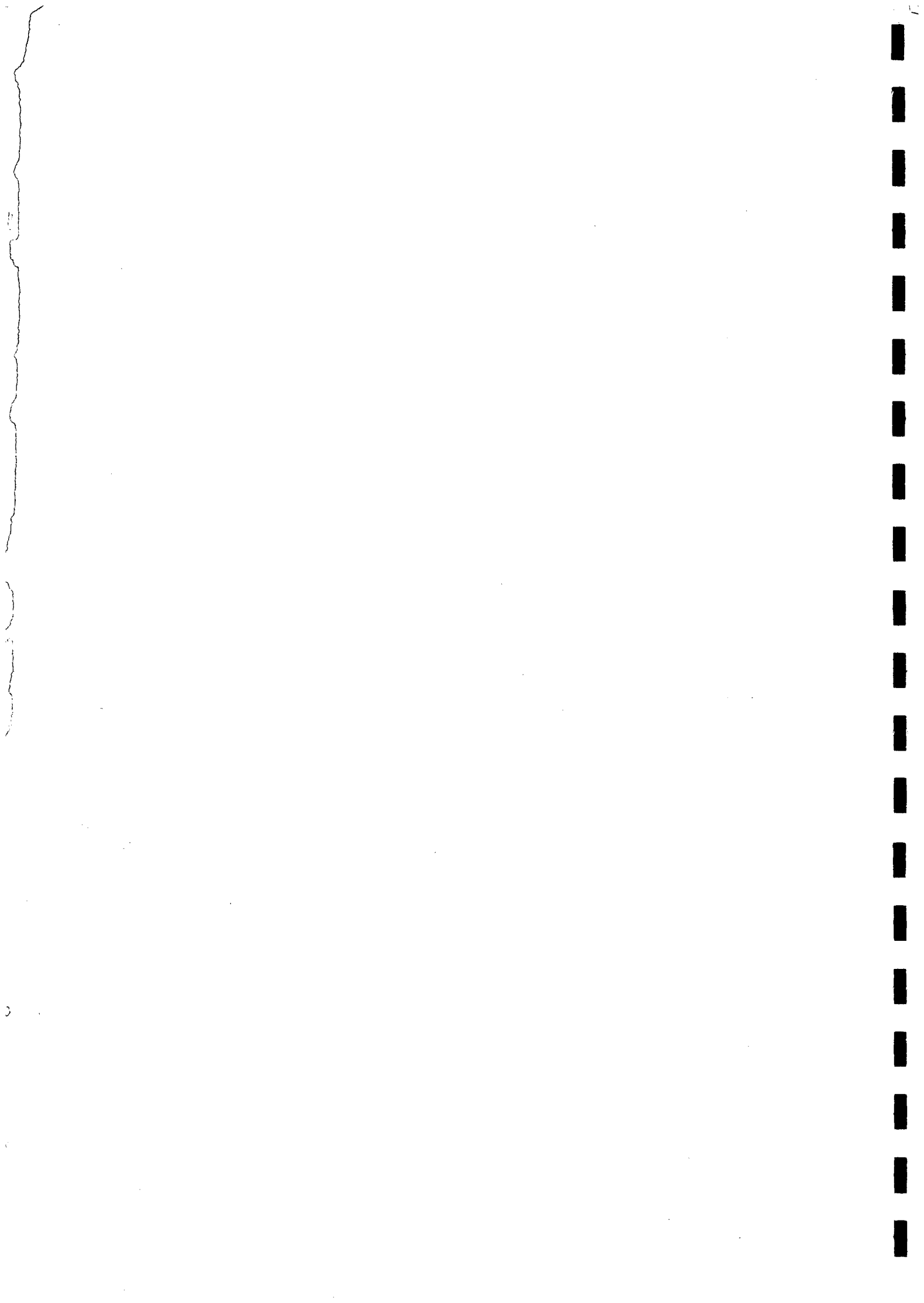
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APPENDIX E1

PARK EMBELLISHMENT COST ESTIMATES



SECTION 94 EXISTING EMBELLISHMENT VALUE

1. **Small Development Park** - Typical average size = 2,500 sqm or 0.25 ha.

Typical embellished infrastructure

Item	Cost (\$)
Turf	5,000
Trees and shrubs	3,000
Access path	1,500
Water service	1,500
Structural work (e.g. retaining walls/fences)	5,000
Drains (including sub-soil)	4,000
Signs and park furniture	3,000
Children's playground furniture	<u>35,000</u>
	\$58,000

2. **Large Developed Park** - Typical average size = 2 ha

Typical embellished infrastructure

Item	Cost \$
Turf	20,000
Trees and shrubs	12,000
Access path	10,000
Water service	10,000
Structural work (e.g. retaining walls/fences)	30,000
Drains (including sub-soil)	25,000
Signs and park furniture	25,000
Children's playground furniture	75,000
Formal or semi-formal gardens	20,000
Car park paved (nominal 40 spaces)	40,000
Public amenities	<u>80,000</u>
	\$347,000

