

Tract Consultants Pty Ltd

**Dee Why Town Centre Public Infrastructure Upgrades -
Investigation and Design - Stage 1 Research and Investigation
Traffic, Transport, Parking and Access Impact Assessment**

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Contents

	Page number
Glossary	v
1. Introduction	1
1.1 Background	1
1.2 Study area	2
1.3 Study scope	4
1.4 Site inspection	4
1.5 Document review	4
1.6 Stakeholder consultation	5
1.7 Structure of the report	5
2. Methodology, research and investigation	7
2.1 Study process	7
2.2 Proposed road network changes	7
2.3 Assumptions	7
2.4 Traffic modelling review	8
2.5 Proposed road network modifications	10
2.6 Cycle facilities considered	12
2.7 Connections with existing cycle network	12
2.8 Northern Beaches Transport Action Plan	14
2.9 Stakeholder workshop	14
2.10 Advice from TfNSW on the proposed design scheme	14
2.10.1 Active transport	14
2.10.2 Bus services	15
2.11 Crash data review	16
3. Existing conditions	19
3.1 Road network and hierarchy	19
3.1.1 Intersection performance	20
3.2 Parking	22
3.3 Buses	23
3.4 Taxis	25
3.5 Pedestrians	26

Contents (Continued)

	Page number
3.6 Cyclists	26
3.7 Planned future changes	27
4. Description of the proposal	29
4.1 Impact assessment	36
4.2 Recommendations and mitigation measures	40
5. New Link Road	41
5.1 Description of the proposal	41
5.1.1 Street design characteristics and requirements	41
5.1.2 Street concept plans	42
5.1.3 Intersection layouts	42
5.1.4 Intersection performance	42
5.2 Impact assessment	43
5.2.1 Impact assessment – street summary	43
6. New Link Lane	45
6.1 Description of the proposal	45
6.1.1 Street design characteristics and requirements	45
6.1.2 Street concept plans	46
6.1.3 Intersection layouts	46
6.1.4 Intersection performance	46
6.2 Impact assessment	47
6.2.1 Impact assessment – street summary	47
7. Conclusion	49
7.1 Next steps	49

List of tables

	Page number
Table 3.1	Intersection performance
Table 3.2	21
Table 3.2	Bus services on Pittwater Road
Table 3.2	23
Table 3.3	Bus services on Howard Avenue
Table 3.3	24
Table 3.4	Bus services on Pacific Parade
Table 3.4	25
Table 3.5	Bus services on Sturdee Parade
Table 3.5	25
Table 4.1	Impact assessment – Pittwater Road summary
Table 4.1	36
Table 4.2	Impact assessment – Howard Avenue summary
Table 4.2	37
Table 4.3	Impact assessment – St David Avenue summary
Table 4.3	37
Table 4.4	Impact assessment – Oaks Avenue summary
Table 4.4	38
Table 4.5	Impact assessment – Fisher Road summary
Table 4.5	38
Table 4.6	Impact assessment – Pacific Parade summary
Table 4.6	39
Table 4.7	Impact assessment – Sturdee Parade summary
Table 4.7	39
Table 4.8	Impact assessment – Dee Why Parade summary
Table 4.8	40
Table 5.1	Impact assessment – New Link Road summary
Table 5.1	43
Table 6.1	Impact assessment – New Link Lane summary
Table 6.1	47

List of figures

	Page number
Figure 1.1	Study area
Figure 1.1	3
Figure 2.1	Proposed road network changes
Figure 2.1	9
Figure 2.2	Proposed road network modifications for Dee Why Town Centre
Figure 2.2	11
Figure 2.3	Warringah Council Cycle Network
Figure 2.3	13
Figure 2.4	Northern Beaches BRT – Proposed Infrastructure Initiatives (GHD for Transport for NSW June 2014)
Figure 2.4	17
Figure 4.1	Proposed Dee Why Town Centre Infrastructure Upgrades
Figure 4.1	30
Figure 4.2	Pittwater Road concept plans
Figure 4.2	31
Figure 4.3	Dee Why Parade concept plans
Figure 4.3	32
Figure 4.4	Howard Avenue concept plans
Figure 4.4	33
Figure 4.5	St David Avenue concept plans
Figure 4.5	33
Figure 4.6	Oaks Avenue concept plans
Figure 4.6	34
Figure 4.7	Fisher Road concept plans
Figure 4.7	34
Figure 4.8	Pacific Parade concept plans
Figure 4.8	35
Figure 4.9	Sturdee Parade concept plans
Figure 4.9	35
Figure 5.1	New Link Road concept plans
Figure 5.1	42
Figure 6.1	New Link Lane concept plans
Figure 6.1	46

List of appendices

Appendix A	RMS crash data
Appendix B	Concept design drawing

Glossary

AADT	Annual Average Daily Traffic
AS	Australian Standard
BRT	Bus Rapid Transit
CBD	Central Business District
LGA	Local Government Area
LoS	Level of Service
km/h	Kilometres per hour
m	metres
P	Parking
PAMP	Pedestrian and Mobility Plan
RMS	Roads and Maritime Services
STA	State Transit Authority
TCS	Traffic Control Signal
TfNSW	Transport for NSW
WSUD	Water Sensitive Urban Design

1. Introduction

Tract Consultants Pty Ltd on behalf of Warringah Council has commissioned Parsons Brinckerhoff to undertake research, investigation and preliminary design for the Dee Why Town Centre Public Infrastructure Upgrades. The primary services relating to this commission include the review of previous project reporting and documents, assessment of the current road network, road user operation and provision of specialist traffic engineering and transport planning related advice to inform the preliminary designs.

1.1 Background

In 2013, Warringah Council adopted the Dee Why Town Centre Master Plan (Master Plan) as the guiding document to make 'Dee Why a highly liveable town centre and the focus for civic and cultural activities'. The Master Plan predominantly covers the commercial precinct of Dee Why, and provides a coordinated overall plan to address major public infrastructure upgrades, land use planning and development issues.

The Master Plan aims to:

- reconnect Dee Why with its natural environment
- create a well-connected town centre
- foster community sense of pride of place
- enhance open spaces
- consolidate buildings for the future
- provide safe and enjoyable public spaces
- generate investment through creating an attractive and vibrant town centre.

Key features of the Master Plan include:

- a Civic centre 'community hub' with an attractive outdoor plaza, amphitheatre and new library facilities
- a new Police Citizens and Youth Club
- 560 new car parking spaces
- new trees, paving, water features, landscaping and street furniture
- new bicycle lanes
- road changes to improve traffic flow
- new open spaces including the expansion of Walter Gors Park
- a new plaza at Redman Road
- use of Water-Sensitive Urban Design (WSUD)
- better accessibility
- buildings will generally remain at the current permissible floor space and heights. However, in selected areas, taller buildings may be considered on larger sites, subject to strict conditions and in return for connected open public spaces at the ground level.

1.2 Study area

The study area for this project is shown in Figure 1.1 on the following page. The study area is generally bounded by Fisher Road to the west, Dee Why Parade to the north, Avon Road to the east and Sturdee Parade to the south.



Figure 1.1 Study area

1.3 Study scope

The scope of this study includes:

- the review of previous project reporting, related documents, consultation and traffic modelling reporting completed to date
- undertaking a site inspection to inform the development of potential concept schemes by identifying constraints and opportunities and to gain an understanding of existing land uses, road network operation, parking circumstances, pedestrian and cyclist desire lines and facilities
- consideration of future development planning and proposed interchange upgrades
- providing advice and assistance to the project team to inform concept designs of the road network, intersections, pedestrian and cycle facilities
- prepare a report which documents the existing and future situations and the likely impacts of the proposed infrastructure upgrade changes.

1.4 Site inspection

Parsons Brinckerhoff conducted a site inspection during the afternoon of Thursday 10 July 2014 for site familiarisation, assessment of existing conditions and identification of opportunities and constraints in the preparation of future road network design and infrastructure upgrades. The site inspection was undertaken in fine and sunny conditions.

1.5 Document review

The following documents were reviewed as part of this study:

- Warringah Bike Plan, Warringah Council
- Dee Why Town Centre Traffic Study Final Traffic, Transport and Parking Report, GTA (2008)
- Dee Why Town Centre Traffic Model Update Traffic Modelling Report, GHD (2014)
- Guidelines for the Development of Public Transport Interchange Facilities, NSW Ministry of Transport (2008)
- Northern Beaches Transport Action Plan Flyer, NSW Government (2014)
- Brookvale and Dee Why Transport Management and Accessibility Study, GHD (2012)
- Dee Why Town Centre Traffic Management Proposals and Staging Plans, GTK Consulting
- Dee Why Town Centre Construction Drawings, Northrop and GTA (2012)
- Dee Why – 40 km/h Speed Limit and Pedestrian Access and Mobility Plan, URaP TTW (2007)
- Warringah Pedestrian Access and Mobility Plan, Aurecon (2011)
- Interchange Program Scoping Study Dee Why/Brookvale Transport Interchanges, GHD (2012)
- Crash Data July 2008 to June 2013, Transport for NSW (2014).

1.6 Stakeholder consultation

The following stakeholders were consulted by Parsons Brinckerhoff in preparation of this report:

- Warringah Council
- Transport for NSW (TfNSW)
- State Transit Authority (STA)
- Roads and Maritime Services (RMS)
- GHD.

1.7 Structure of the report

The report has been structured to describe the existing conditions for key roads within the study area, what is proposed for future infrastructure upgrades and the likely impacts of the proposed upgrades on road users. The report has the following structure:

- section 2 describes the study methodology, research and document review undertaken
- section 3 describes the existing conditions
- section 4 describes the proposed future conditions and anticipated impacts from the upgrades
- section 5 describes the proposed design of the New Link Road between Howard Avenue and Oaks Avenue
- section 6 describes the proposed design of the New Link Lane between Oaks Avenue and Pacific Parade
- section 7 provides a conclusion to the study and recommended next steps.

2. Methodology, research and investigation

The following methodology has been applied to this study:

2.1 Study process

The following general study process has been undertaken:

- review of previous study documents including reports, drawings, traffic modelling reports, development applications and bike plans
- inception meeting with the client
- site inspection of the study area to gain familiarisation of the area and to complete and existing condition review
- ongoing liaison with the client
- consultation with key stakeholders
- preparation of report.

2.2 Proposed road network changes

The proposed road network changes as modelled by GTA and GHD under Scenario 2A2 are shown in Figure 2.1 on the following page.

2.3 Assumptions

It has been assumed that the traffic modelling undertaken by GTA and GHD in earlier stages of this study have been calibrated and validated in accordance with RMS traffic modelling guidelines and that these traffic models are fit for purpose. It has also been assumed that Warringah Council had previously endorsed the traffic modelling outcomes and results, including the proposed road network layout (Scenario 2A2) and subsequent design changes which have been utilised to inform the preliminary design stage. It is also assumed that RMS have endorsed and approved the traffic modelling undertaken and the adopted proposed future road network.

2.4 Traffic modelling review

On review of the traffic modelling undertaken by both GTA and GHD the following comments should be noted:

- Neither GTA nor GHD modelled mid-block pedestrian traffic signals on Oaks Avenue or Howard Avenue. The provision of signal control in lieu of marked zebra crossings has been necessitated by the proposed one way operation and the consequential introduction of two trafficable lanes in a single direction. No signalised intersections were modelled at either end of the proposed one-way link road (New Link Road) with both Oaks Avenue and Howard Avenue. No queue lengths or vehicle volumes were provided for the one-way anti-clockwise road system.
- GHD did not model the proposed two-way link road (New Link Lane) between Oaks Avenue and Pacific Parade.

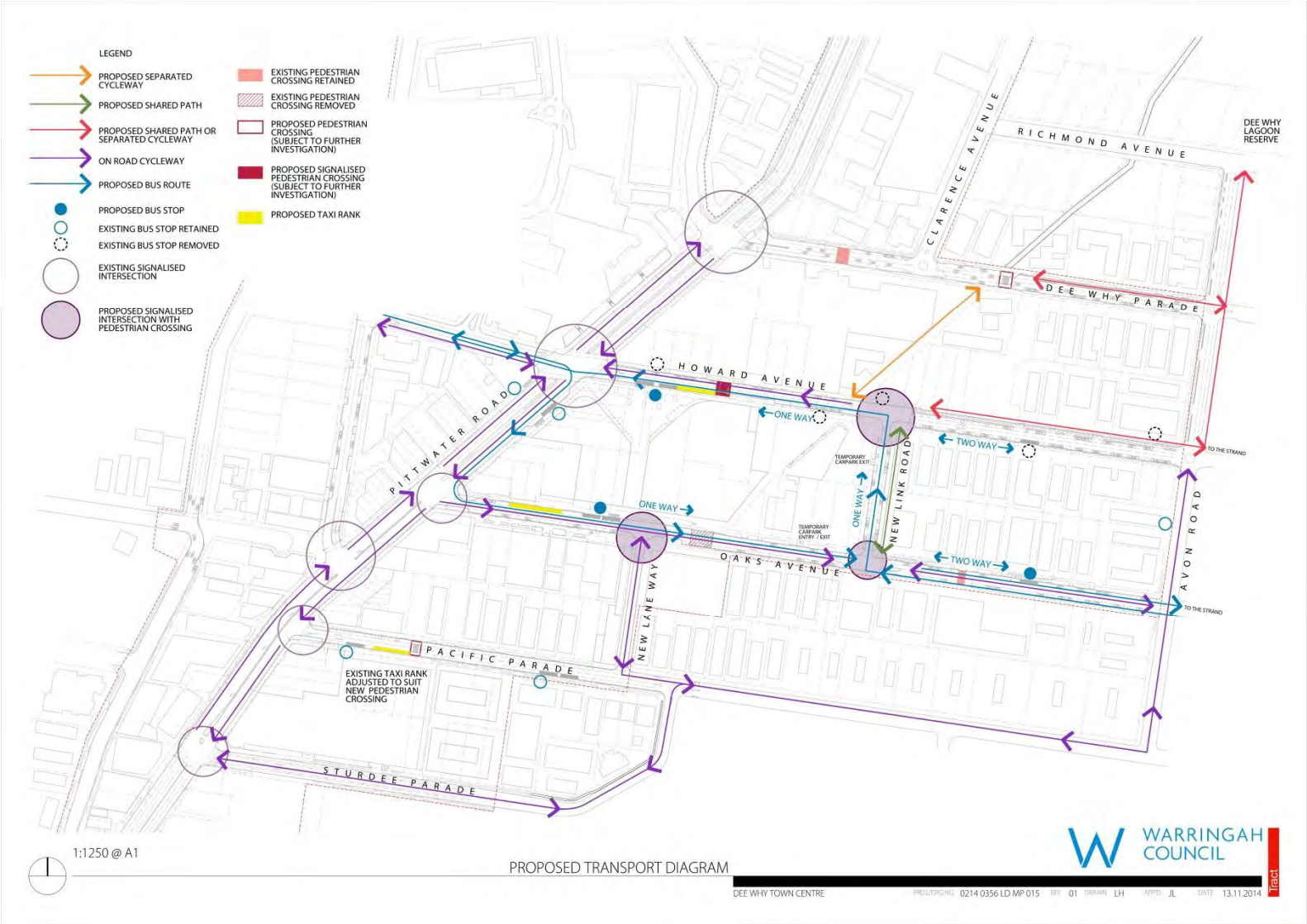
No traffic modelling has been undertaken by Parsons Brinckerhoff for this study. Parsons Brinckerhoff has sourced information from the traffic modelling reports prepared by both GTA and GHD to inform this study. It is likely that additional traffic modelling would be required once the concept design is further developed.



Figure 2.1 Proposed road network changes

2.5 Proposed road network modifications

The proposed road network modifications and infrastructure upgrades for Dee Why Town Centre are shown in Figure 2.2 on the following page.



Source: Tract Consultants Pty Ltd (2014)

Figure 2.2 Proposed road network modifications for Dee Why Town Centre

2.6 Cycle facilities considered

Warringah Council have identified a preference for separated (user-friendly) cycle facilities within Dee Why, which would be considered safe and appealing for all members of the community, including parents with children. Such provisions would be separated from vehicular traffic and designed to reduce the potential for conflict with pedestrians or driveway traffic, to facilitate safe cycle connections to key town centre destinations. The provision of secure and user-friendly end-of-trip facilities also further support cycling to the Town Centre.

The hierarchy of cycling facilities considered for inclusion within the Master Plan is as follows:

1. separated cycleways for long-distance connections from the town centre perimeter
2. shared paths to provide local connections around the town centre precinct
3. bicycle crossings incorporated with pedestrian crossings on inner Town Centre streets
4. kerb ramp transitions from the road way or cycleway to shared paths
5. sheltered and secure bicycle parking with water fountains and designed for passive surveillance.

2.7 Connections with existing cycle network

The current cycle network through Dee Why Town Centre includes the Dee Why Lagoon trail connecting to shared paths on the western side of Pittwater Road and on road bicycle lanes from The Strand at Dee Why along Pacific Parade and Sturdee Parade to a shared path on Pittwater Road. These routes are shown in Figure 2.3 overleaf.



Figure 2.3 Warringah Council Cycle Network

Figure 2.3 also highlights a number of missing links or opportunities to improve the cycle network connections to the Town Centre for local trips and also through the local area for commuting cyclists.

The Warringah Bike Plan identifies some of the deficiencies of the existing cycle network, including quality and frequency of connections and facilities. There are also opportunities for improved open space corridors through the town centre and a direct cycling connection from the Town Centre to Dee Why Beach along Howard Avenue or Oaks Avenue.

A north-south cycling corridor could be incorporated within the Master Plan. The cycling corridor would link the Dee Why Lagoon trail to city-bound cycling routes to the south and utilise existing bicycle friendly streets and potential shared connections through the Town Centre.

2.8 Northern Beaches Transport Action Plan

The NSW Government is investing \$125 million to deliver kerbside Bus Rapid Transit (BRT) on the Northern Beaches between Mona Vale and the Sydney CBD. BRT will deliver faster, more reliable, bus journeys and reduce door to door travel times with an average five minute wait times for buses.

Five new key public transport interchanges will be built including Dee Why with modern facilities that are convenient, offer good levels of security, information, weather protection and accessibility to all bus services.

At the time of writing this report, Transport for NSW have indicated support for the provision of an indented bus interchange on the eastern side of Pittwater Road for southbound (city bound) bus services. Proposed infrastructure changes at the Dee Why interchange are described in Figure 2.4 overleaf.

2.9 Stakeholder workshop

A stakeholder workshop was held on 15 September 2014 at TfNSW Lee Street offices to discuss the proposed Dee Why Town Centre project and the proposed Northern Beaches Bus Rapid Transit and associated upgrades to the bus interchange on Pittwater Road. This workshop was attended by key stakeholders including Warringah Council, TfNSW, RMS, Sydney Buses and the project team. Stakeholders will continue to work in close collaboration moving forward to make sure both these projects integrate with one another.

2.10 Advice from TfNSW on the proposed design scheme

The following comments relating to active transport and bus services are described below.

2.10.1 Active transport

The following comments were provided by TfNSW on active transport in the study area:

- The width of a shared path facility should be determined on the basis of expected pedestrian and cycle volumes. Having said this, a minimum clear path width of 3 metres is desirable to allow safe passing and negotiation of oncoming pedestrians and bicycle riders.
- Consideration needs to be given to the provision of on-road cycle lanes and the proximity to parked vehicles. Concerns include:
 - ▶ conflict with drivers opening doors adjacent to the on-road cycle lane
 - ▶ parked vehicles that straddle the on-road cycle lane.

- The provision of a separated bi-directional cycle facility might provide a better safety and connectivity outcome for cyclists as well as enhance street amenity.
- Consideration needs to be given to the continuation of on-road cycle facilities at roundabouts and intersections, using bus priority and bicycle lanterns.
- The location of bicycle parking racks at bus stops should not 'squeeze' the pedestrian thoroughfare. Bus stop areas should maintain not only sufficient waiting area to provide for public transport patrons based on expected queues, but should also be sufficient to accommodate passing pedestrian movements (including mobility impaired persons in wheelchairs).
- Pedestrian crossings shall be incorporated at every leg of signalised intersections.

2.10.2 Bus services

The following comments were provided by TfNSW on bus servicing in the study area:

- The route 136 service is the most significantly affected by the proposal. Routes E76, 176 and 159 are also affected.
- Apart from the customer legibility challenge presented by split routes, the proposal potentially provides for faster travel times for the 136.
- Once the eastbound 136 service is operating on Oaks Avenue, it will not be optimal to turn the bus into either the new link road or Avon Road onto Howard Avenue (due to the additional turns required, and the common occurrence of queuing at the right turn from Howard Avenue to The Strand) as opposed to operating on Oaks Avenue to The Strand. Using this alignment, buses from St David Avenue will turn right into Pittwater Road, left into Oaks Avenue, and then turn right at The Strand.
- TfNSW will require the provision of eastbound stops on Oaks Avenue to replace the stops currently on Howard Avenue:
 - ▶ this can be the stop on Oaks Avenue just east of Pittwater Road
 - ▶ an additional stop near the intersection of Avon Road and Oaks Avenue (preferably closer to the intersection than as proposed by Council).
- The preferred route for westbound buses is to turn left from The Strand into Oaks Avenue, the right at the new link road, then left into Howard Avenue. This will require an additional westbound bus stop in the vicinity of the Oaks Avenue and Avon Road intersection.
- The stop proposed by Council westbound on Howard Avenue between the new link road and Avon Road is not required.
- Existing bus stops on both sides of Howard Avenue east of the new link road can be removed.
- It is acceptable to provide fewer bus stops on the proviso that average spacing between stops is in the order of 400 metres, as per *Sydney's Bus Future* and TfNSW Integrated Service Planning guidelines.
- It is preferable that bus stops are located as close as practicable to intersections where pedestrians can cross safely, rather than mid-block, so as to maximise the walkable catchment of bus stops.
- It is preferable for bus stops to be 40 metres long to accommodate two rigid 12.5 metre buses, including draw-in and draw-out spaces, and where necessary, a gap between buses for independent operation.

2.11 Crash data review

A review of RMS crash data for the latest five year period (July 2008 to June 2013) of data was undertaken to gain an understanding of accidents relating to pedestrians and cyclists within the study area. Detailed crash data is provided in Appendix A and summarised in the following:

- 71 crashes occurred on Pittwater Road between Dee Why Parade and Sturdee Parade with 7 pedestrian and 2 bicycle crashes:
 - ▶ nine crashes at the intersection of Pittwater Road and Dee Why Parade
 - ▶ 19 crashes at the intersection of Pittwater Road and Fisher Road
 - ▶ 11 crashes at the intersection of Pittwater Road and Howard Avenue
 - ▶ 10 crashes at the intersection of Pittwater Road and Oaks Avenue
 - ▶ three crashes at the intersection of Pittwater Road and Pacific Parade
 - ▶ three crashes at the intersection of Pittwater Road and St David Avenue
 - ▶ 13 crashes at the intersection of Pittwater Road and Sturdee Parade
- 11 crashes have been recorded over the 5 year period on Dee Why Parade between Pittwater Road and Avon Road with no pedestrian and 1 bicycle crash
- 11 crashes occurred on Howard Avenue between Pittwater Road and Avon Road with 4 pedestrian and no bicycle crashes
- one crash was recorded on St David Avenue between Fisher Road and Pittwater Road with no pedestrian or bicycle crashes
- seven crashes have occurred on Fisher Road between St David Avenue and Pittwater Road with no pedestrian or bicycle crashes
- 10 crashes have been recorded in the five year period on Oaks Avenue between Pittwater Road and Avon Road of which 4 involved a pedestrian and 2 involving cyclists
- 12 crashes on Pacific Parade between Pittwater Road and Sturdee Parade of which 5 involved a pedestrian and 1 involving a cyclist
- seven crashes on Sturdee Parade between Pittwater Road and Pacific Parade of which 1 involved a pedestrian.

Not surprisingly the data shows that the majority of crashes within Dee Why Town Centre occur along Pittwater Road and adjoining intersections. The Pittwater Road and Fisher Road intersection recorded the highest number of crashes.

The following information on pedestrian safety has been sourced from the *Warringah Pedestrian Access and Mobility Plan (PAMP)*:

Pedestrian safety in the Dee Why focus area, particularly on Pittwater Road, has been identified in this PAMP as a major concern. Over the 5 year period for which pedestrian crash data was analysed (2004–2008 inclusive), the suburb with the most pedestrian crashes occurring within it was Dee Why, with over 20% of all pedestrian crashes in Warringah LGA. Dee Why also contained 3 of the 6 largest pedestrian crash clusters in Warringah LGA, and one pedestrian fatality. This crash history highlights the need to significantly improve pedestrian safety in Dee Why, particularly along Pittwater Road.

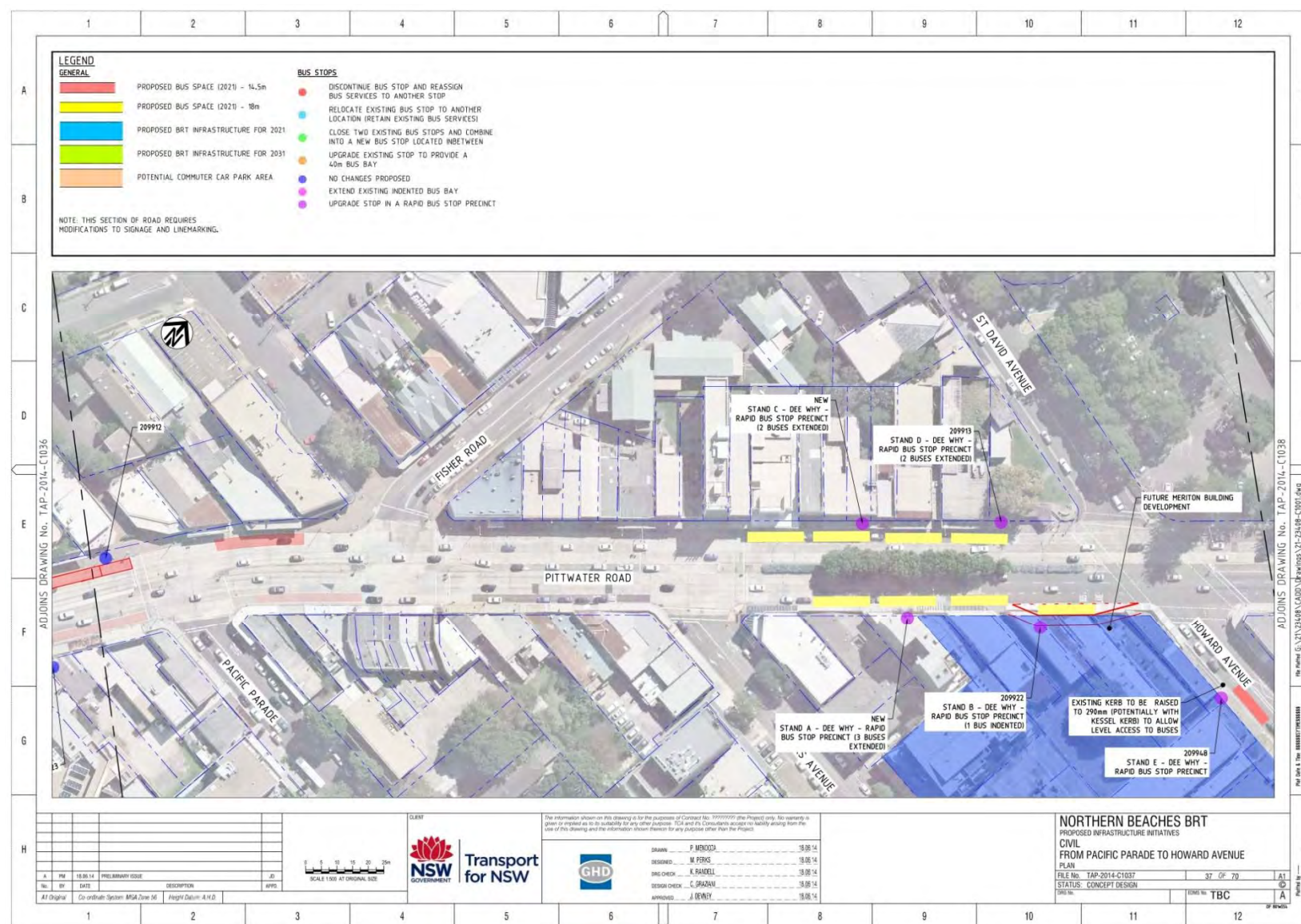


Figure 2.4 Northern Beaches BRT – Proposed Infrastructure Initiatives (GHD for Transport for NSW June 2014)

3. Existing conditions

This section describes the existing road, parking, public and active transport conditions in the study area.

3.1 Road network and hierarchy

Roads within a network are classified according to a road hierarchy relating closely to their functional role and volume of traffic they carry. Roads and Maritime Services have defined four classes for the classification of roads:

- Arterial roads – predominantly carry through traffic from one region to another forming a principal avenue for urban traffic environments. Typically traffic volumes would be in excess of 15,000 vehicles per day (vpd).
- 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 some circumstances. Typically traffic volumes would range from 5,000 vpd to 20,000 vpd.
- Collector roads – connect the sub-arterial roads to the local road system in developed areas. Typically traffic volumes would be in the range from 2,000 vpd to 10,000 vpd but residential amenity would begin to decline with volumes in excess of 5,000 vpd.
- Local roads – are the sub-divisional roads within a particular developed area. These are solely to provide local access, and typically carry low traffic volumes, usually less than 2,000 vpd.

The key roads within the study area include:

Pittwater Road

Pittwater Road is a six lane, separated arterial road which connects suburbs along the Northern Beaches between Manly and Mona Vale. Pittwater Road has an AADT of over 41,000 vehicles. Pittwater Road south of Howard Avenue carries approximately 2,500 vehicles during both the weekday AM and PM peaks with flows split 70% southbound and 30% northbound in the AM peak and 45% southbound and 55% northbound in the PM peak. The posted speed limit on Pittwater Road through Dee Why is 60 km/h, and there are six signalised intersections in the vicinity of the Town Centre connecting collector and local roads to the corridor.

Howard Avenue

Howard Avenue is two lane two-way with on-street parking on both sides of the road in selected locations. Howard Avenue is a local collector street which connects Pittwater Road to Dee Why beach via Dee Why Town Centre. Howard Avenue east of Pittwater Road carries approximately 650 vehicles during a weekday AM peak and 750 vehicles during a weekday PM peak with evenly split traffic flows. The posted speed limit is 50 km/h.

St David Avenue

St David Avenue is two lane two-way with on street parking on both sides of the road in selected locations. St David Avenue is a local collector street which connects Pittwater Road to Fisher Road. St David Avenue west of Pittwater Road carries approximately 550 vehicles during a weekday AM peak and 580 vehicles during a weekday PM peak with flows split 60% eastbound and 40% westbound in both peaks. The posted speed limit is 50 km/h.

Oaks Avenue

Oaks Avenue is two lane two-way with on street parking on both sides of the road in selected locations. Oaks Avenue is a local collector street which connects Pittwater Road to Dee Why beach via Dee Why Town Centre. Oaks Avenue east of Pittwater Road carries approximately 380 vehicles during a weekday AM peak and 590 vehicles during a weekday PM peak with flows split 60% eastbound and 40% westbound in the AM peak and 70% eastbound and 30% westbound in the PM peak. The posted speed limit is 50 km/h.

Fisher Road

Fisher Road is two lane two-way with on street parking on both sides of the road in selected locations. Fisher Road is a local collector road which connects Pittwater Road to the Cromer area. Fisher Road west of Pittwater Road carries approximately 800 vehicles during a weekday AM peak and 1000 vehicles during a weekday PM peak with flows split 50% southbound and 50% northbound in the AM peak and 45% southbound and 55% northbound in the PM peak. The posted speed limit is 50 km/h.

Pacific Parade

Pacific Parade is two lane two-way with on street parking on both sides of the road. Pacific Parade is a local collector street which connects Pittwater Road to Dee Why beach south of the Dee Why Town Centre. Pacific Parade east of Pittwater Road carries approximately 400 vehicles during a weekday AM peak and 580 vehicles during a weekday PM peak with flows split 35% eastbound and 65% westbound in the AM peak and 30% eastbound and 70% westbound in the PM peak. The posted speed limit is 50 km/h.

Sturdee Parade

Sturdee Parade is two lane two-way with on street parking on both sides of the road. Sturdee Parade is a local collector street which connects Pittwater Road to Pacific Parade. Sturdee Parade east of Pittwater Road carries approximately 520 vehicles during a weekday AM peak and 680 vehicles during a weekday PM peak with flows split 40% eastbound and 60% westbound in the AM peak and 60% eastbound and 40% westbound in the PM peak. The posted speed limit is 50 km/h.

Dee Why Parade

Dee Why Parade is two lane two-way with on street parking on both sides of the road. Dee Why Parade is a local collector street which connects Pittwater Road to Avon Road. Dee Why Parade east of Pittwater Road carries approximately 520 vehicles during a weekday AM peak and 670 vehicles during a weekday PM peak with flows split 20% eastbound and 80% westbound in both the AM and PM peaks. The posted speed limit is 50 km/h.

3.1.1 Intersection performance

Intersection performance has been sourced from the *Dee Why Town Centre Traffic Model Update Traffic Modelling Report* (GHD 2014) utilising 2013 traffic count data. Intersection performance along Pittwater Road intersections is documented in Table 3.1 for the various scenarios analysed in the morning, evening and Saturday peaks.

Table 3.1 Intersection performance

Intersection						Morning peak		Evening peak		Saturday peak	
						Av Delay (s)	LoS	Av Delay (s)	LoS	Av Delay (s)	LoS
Scenario 1: Base Case (Existing)											
Pittwater Road and Sturdee Parade						17	B	32	C	16	B
Pittwater Road and Pacific Parade						12	A	17	B	16	B
Pittwater Road and Fisher Road						24	B	16	B	20	B
Pittwater Road and Oaks Avenue						13	A	8	A	16	B
Pittwater Road and Howard Avenue/St David Avenue						20	B	19	B	32	C
Pittwater Road and Dee Why Parade						21	B	18	B	19	B
Pittwater Road and Hawkesbury Street						21	B	25	B	20	B
Fisher Road and St David Avenue/Lewis Street						27	B	27	B	20	B
Scenario 2: Option 2A2 + Pending and Approved DA's											
Pittwater Road and Sturdee Parade						29	C	42	C	25	B
Pittwater Road and Pacific Parade						27	B	14	A	7	A
Pittwater Road and Fisher Road						30	C	21	B	15	B
Pittwater Road and Oaks Avenue						32	C	13	A	17	B
Pittwater Road and Howard Avenue/St David Avenue						40	C	19	B	22	B
Pittwater Road and Dee Why Parade						39	C	19	B	20	B
Pittwater Road and Hawkesbury Street						21	B	20	B	18	B
Fisher Road and St David Avenue/Lewis Street						39	C	22	B	29	C
Scenario 3: Option 2A2 + Pending and Approved DA's + LEP FSR 100%											
Pittwater Road and Sturdee Parade						32	C	48	D	26	B
Pittwater Road and Pacific Parade						26	B	15	B	10	A
Pittwater Road and Fisher Road						30	C	26	B	19	B
Pittwater Road and Oaks Avenue						32	C	15	B	25	B
Pittwater Road and Howard Avenue/St David Avenue						46	D	22	B	41	C
Pittwater Road and Dee Why Parade						49	D	20	B	34	C
Pittwater Road and Hawkesbury Street						24	B	19	B	19	B
Fisher Road and St David Avenue/Lewis Street						46	D	35	C	45	D
Scenario 4: Option 2A2 + Pending and Approved DA's + LEP FSR 105%											
Pittwater Road and Sturdee Parade						30	C	46	D	29	B
Pittwater Road and Pacific Parade						26	B	14	B	10	A
Pittwater Road and Fisher Road						31	C	26	B	19	B
Pittwater Road and Oaks Avenue						33	C	16	B	24	B
Pittwater Road and Howard Avenue/St David Avenue						45	D	24	B	39	C
Pittwater Road and Dee Why Parade						48	D	21	B	30	C
Pittwater Road and Hawkesbury Street						24	B	19	B	18	B
Fisher Road and St David Avenue/Lewis Street						45	D	38	C	44	D
Scenario 5: Option 2A2 + Pending and Approved DA's + LEP FSR 110%											
Pittwater Road and Sturdee Parade						32	C	47	D	26	B
Pittwater Road and Pacific Parade						29	C	15	B	8	A
Pittwater Road and Fisher Road						31	C	28	B	19	B
Pittwater Road and Oaks Avenue						33	C	16	B	25	B
Pittwater Road and Howard Avenue/St David Avenue						41	C	18	B	33	C
Pittwater Road and Dee Why Parade						49	D	15	B	31	C
Pittwater Road and Hawkesbury Street						30	C	28	B	31	C
Fisher Road and St David Avenue/Lewis Street						43	D	46	D	39	C
LEGEND											
LoS A	Delay < 14 sec	LoS B	Delay < 15 to 28 sec	LoS C	Delay < 29 to 42 sec	LoS D	Delay < 43 to 56 sec	LoS E	Delay < 57 to 70 sec	LoS F	Delay > 70

Source: GHD (2014)

3.2 Parking

On street parking is provided in some form on all key roads within the study area. Based on information sourced from the *Dee Why Town Centre Traffic Study* (GTA 2008), peak parking utilisation in Dee Why during weekdays was approximately 80% and 60% on weekends. This suggests that the parking supply adequately meets parking demand in Dee Why. Having said this, observations indicate that during certain periods of the day, the demand does exceed supply, particularly at those locations in close proximity to key trip generating land uses in the Town Centre.

A summary of the existing on street parking situation is provided below.

Pittwater Road

Short term restricted parking is provided on both sides of Pittwater Road between Dee Why Parade and Sturdee Parade. No parking is permitted during peak period clearway operation (southbound in the AM peak and northbound in the PM peak). There are approximately 74 parking spaces located within this section of Pittwater Road.

Howard Avenue

Short term restricted and unrestricted parking is provided on Howard Avenue between Pittwater Road and Avon Road. Taxi and mail zones are located near Pittwater Road. There are approximately 69 parking spaces located within this section of Howard Avenue. There are 105 off-street car parking spaces located in the public car park 60 m from Pittwater Road including 2 disabled car spaces. There are a further 210 off-street car parking spaces located in Council's public car park including 3 disabled car spaces which is accessed from both Howard Avenue and Oaks Avenue.

St David Avenue

Short term restricted parking is provided on the southern side of St David Avenue between Fisher Road and Pittwater Road. Dedicated police parking is also provided on both sides of St David Avenue. There are approximately 14 general car parking spaces at this location.

Oaks Avenue

Short term restricted and unrestricted parking is provided on Oaks Avenue between Pittwater Road and Avon Road. There are approximately 131 parking spaces located within this section of Oaks Avenue including both parallel and ninety degree angled parking. As indicated previously, there are a further 210 off-street car parking spaces located in Council's public car park including 3 disabled car spaces which is accessed from both Howard Avenue and Oaks Avenue.

Fisher Road

Short term restricted parking is provided on both sides of Fisher Road between St David Avenue and Pittwater Road. There are approximately 37 parking spaces located within this section of Fisher Road.

Pacific Parade

Short term restricted and unrestricted parking is provided on Pacific Parade between Pittwater Road and Avon Road. There are approximately 44 parking spaces located within this section of Pacific Parade.

Sturdee Parade

Short term restricted and unrestricted parking is provided on Sturdee Parade between Pittwater Road and Pacific Parade. There are approximately 72 parking spaces located within this section of Sturdee Parade.

Dee Why Parade

Unrestricted parking is provided on both sides of Dee Why Parade between Clarence Avenue and Avon Road and on the northern side between Pittwater Road and Clarence Avenue.

3.3 Buses

The following bus services operate on Pittwater Road within the study area as shown in Table 3.2.

Table 3.2 Bus services on Pittwater Road

Bus stop location	Route no	Route description	Frequency
EASTERN SIDE			
Pittwater Road near Pacific Parade	151, 153, 155, 156, 169, 178, 179, 180, 183, 184, 185, 188, 190, E78	To City from Dee Why To Manly from Dee Why	Regular
Pittwater Road near St David Avenue (main interchange)	151, 153, 155, 156, 169, 178, 179, 180, 183, 184, 185, 188, 190, E78	To City from Dee Why To Manly from Dee Why	Regular
WESTERN SIDE			
Pittwater Road near Howard Avenue (main interchange)	151, 153, 155, 156, 158, 169, 178, 179, 180, 183, 184, 185, 187, 188, 190	To Dee Why from City To Dee Why from Manly	Regular
Pittwater Road near Pacific Parade	151, 153, 155, 156, 158, 169, 178, 179, 180, 183, 184, 185, 187, 188, 190	To Dee Why from City To Dee Why from Manly	Regular

Howard Avenue is a key bus corridor for services operated by Sydney Buses travelling between Chatswood, Manly and Dee Why, including a late night bus loop operating between Manly and Northern Beaches suburbs.

There are three bus stops on each side of Howard Avenue between Pittwater Road and Avon Road. Bus stops on Howard Avenue are used primarily during peak periods on weekdays with infrequent services during the off-peak periods. Bus services on Howard Avenue are described in Table 3.3.

Table 3.3 Bus services on Howard Avenue

Bus stop location	Route no	Route description	Frequency
NORTHERN SIDE			
Howard Avenue near Pittwater Road	136	To Manly via Dee Why Beach	2 services per hour during AM peak and off-peak 4 services per hour during PM peak
Howard Avenue 230 m east of Pittwater Road	136	To Manly via Dee Why Beach	As above
Howard Avenue near Avon Road	176, E76	To the city via Dee Why Beach	176: 2 services at 5.25 am and 6:26am on weekdays only E76: 5 services between 6.50 am and 8.10 am on weekdays only
	136	To Manly via Dee Why Beach	As above
SOUTHERN SIDE			
Howard Avenue near Pittwater Road	130	Manly late night bus (local area stops)	4 services between 1.50 am and 3.15 am only
	136	To Chatswood via Frenchs Forest	5 services per hour during AM peak 2 services per hour during off-peak and PM peak
	L60	To Chatswood via Frenchs Forest	3 services between 6.45 am and 8.05 am on weekdays only
Howard Avenue 200 m east of Pittwater Road	136	To Chatswood via Frenchs Forest	4 services per hour during AM peak 2 services per hour during off-peak and PM peak
	L60	To Chatswood via Frenchs Forest	As above
Howard Avenue near Avon Road	130, 136	As above	As above
	159	To Pacific Parade, Dee Why	1 services per hour during off-peak and 2 services during PM peak hour
	E76	Terminating from Dee Why Beach and the city	5 services between 5.10 pm and 7.30 pm on weekdays only

Currently there are no bus stops on St David Avenue between Fisher Road and Pittwater Road.

There are no current bus services or bus stops on Fisher Road between Pittwater Road and St David Avenue.

There are no current bus services or bus stops on Oaks Avenue between Pittwater Road and Avon Road.

There are no current bus services or bus stops on Dee Why Parade between Pittwater Road and Avon Road.

The bus services which operate on Pacific Parade as described in Table 3.4.

Table 3.4 Bus services on Pacific Parade

Bus stop location	Route no	Route description	Frequency
NORTHERN SIDE			
Pacific Parade near Sturdee Parade	159 E77	To Dee Why from Manly To Dee Why from City	4 services in weekday AM, 7 services in weekday PM and weekend services. 4 services in weekday PM.
Pacific Parade near The Crescent	159 E77	To Dee Why from Manly To Dee Why from City	As above
Pacific Parade near Avon Road	159 E77	To Dee Why from Manly To Dee Why from City	As above
SOUTHERN SIDE			
Pacific Parade near Pittwater Road	159	To Manly from Dee Why	4 services in weekday AM, 5 services in weekday PM and weekend services.
Pacific Parade near Sturdee Parade	159 E77	To Manly from Dee Why To City from Dee Why	4 services in weekday AM, 5 services in weekday PM and weekend services. 6 services in weekday AM.
Pacific Parade near The Crescent	159 E77	To Manly from Dee Why To City from Dee Why	As above
Pacific Parade near Avon Road	159 E77	To Manly from Dee Why To City from Dee Why	As above

The bus services which operate on Sturdee Parade are described in Table 3.5.

Table 3.5 Bus services on Sturdee Parade

Bus stop location	Route no	Route description	Frequency
NORTHERN SIDE			
Sturdee Parade near Pittwater Road	159 E77	To Dee Why from Manly To Dee Why from City	4 services in weekday AM, 7 services in weekday PM and weekend services. 4 services in weekday PM.

3.4 Taxis

An existing taxi rank is located approximately 60 m east of Pittwater Road on the southern side of Howard Avenue. This rank provides for six taxi spaced and two seating shelters.

A taxi zone is also located on the southern side of Pacific Parade adjacent to Dee Why Grand Shopping Centre. This taxi zone allows for two taxis.

3.5 Pedestrians

The following pedestrian facilities are provided within the study area:

Pittwater Road – concrete footpaths are provided on both sides of the road and signalised pedestrian crossings are provided at all intersections.

Howard Avenue – concrete footpaths are provided on both sides of the road and a mid-block pedestrian zebra crossing located approximately 110 m east of Pittwater Road.

St David Avenue – concrete footpaths are provided on both sides of the road and signalised pedestrian crossings are provided at all intersections.

Oaks Avenue – concrete footpaths are provided on both sides of the road, a mid-block pedestrian signal outside of St Kevin's Primary School and Church, and a mid-block pedestrian zebra crossing located outside Woolworths.

Fisher Road – concrete footpaths are provided on both sides of the road and signalised pedestrian crossings are provided at all intersections.

Pacific Parade – concrete footpaths are provided on both sides of the road and signalised pedestrian crossings are provided at Pittwater Road. A pedestrian zebra crossing is also located just west of the Sturdee Parade intersection.

Sturdee Parade – concrete footpaths are provided on both sides of the road and signalised pedestrian crossings are provided at Pittwater Road.

Dee Why Parade – concrete footpaths are provided on both sides of the road and a mid-block pedestrian zebra crossing located approximately 80 m east of Pittwater Road.

3.6 Cyclists

The following cycle facilities are provided within the study area:

- Pacific Parade is a designated on-road cycle route. Designated bicycle lanes are provided on both sides of Pacific Parade between Sturdee Parade and Avon Road.
- Sturdee Parade is a designated on-road cycle route. Designated bicycle lanes are provided on both sides of Sturdee Parade close to Pittwater Road. Further east the facility becomes a mixed traffic lane on both sides of the road.
- A shared path facility on the eastern side of Pittwater Road between Sturdee Parade and Harbord Road.

3.7 Planned future changes

Bus interchange

The existing bus interchanges on either side of Pittwater Road at Dee Why Town Centre are proposed to be upgraded as part of the Northern Beaches Bus Rapid Transit project. Information supplied by Transport for NSW indicates that an indented bus zone with in-lane bus zone will be positioned on the eastern side of Pittwater Road between Howard Avenue and Oaks Avenue, and an in-lane bus zone on the western side of the road. The proposed layout is conceptually described in Figure 2.4.

The eastern side bus stop would cater for three buses within the in-lane bus zone and one indented bus zone. The western side bus stop would cater for four buses within the in-lane bus zone. One kerbside bus zone would be retained on Howard Avenue.

Proposed developments adjacent to Pittwater Road

The following proposed developments need to be considered in future design with regard to access, use and road interfaces:

- the Cobalt development on the corner of Pittwater Road and St David Avenue, Dee Why
- the Meriton development at 888 Pittwater Road, Dee Why
- Council's proposed Community Hub on the corner of Pittwater Road and St David Avenue, Dee Why.

Special events and markets

Council proposes to close off sections of Howard Avenue and Walter Gors Park for special events and markets. A separate traffic impact assessment and traffic management plan is recommended for special event and market days.

4. Description of the proposal

The proposed road network modifications and infrastructure upgrades are shown in Figure 4.1 on the following page (and within Appendix B). A description of the proposal and changes to the affected sections of road follow.



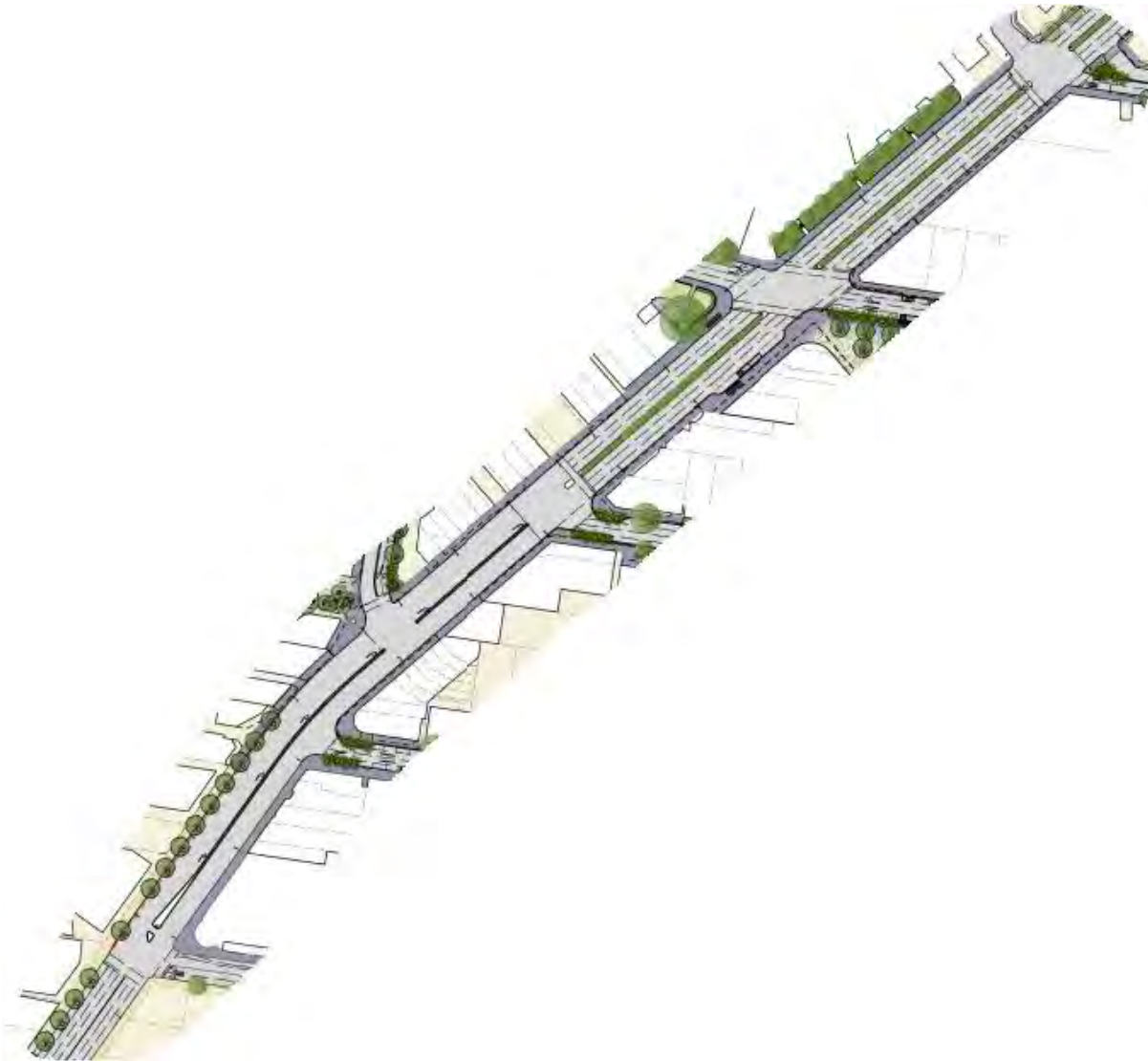
Source: Tract Consultants Pty Ltd (2014)

Figure 4.1 Proposed Dee Why Town Centre Infrastructure Upgrades

Pittwater Road

The following works are proposed on Pittwater Road between Sturdee Parade and Howard Avenue:

- extension of the right turn bay on Pittwater Road from Oaks Avenue to Sturdee Parade
- adjust lane widths/line marking on both the north and south bound carriageways due to road widening
- modification of the central median and install pedestrian fencing between Oaks Avenue and Sturdee Parade
- removal of the traffic signal control at the Pacific Parade intersection
- removal of signalised pedestrian crossing on the northern side of the Fisher Road intersection
- adjustment to the kerb radius at the intersection of Oaks Avenue and Pittwater Road to permit buses to turn left into Oaks Avenue
- modification to the TCS operation at Sturdee Parade, Fisher Road, St David Avenue and Howard Avenue
- installation of an indented bus bay on the eastern side for southbound buses, south of Howard Avenue.



Source: Tract Consultants Pty Ltd (2014)

Figure 4.2 Pittwater Road concept plans

Dee Why Parade

The following works are proposed on Dee Why Parade between Pittwater Road and Avon Road:

- construction of a pedestrian refuge to assist pedestrians and cyclists crossing Dee Why Parade from Walter Gors Park. The pedestrian refuge would be positioned away from the right turn lane entry into the Coles car park and so as to not impede sight lines for drivers, cyclists or pedestrians.
- provision of a separated on road cycleway or shared path facility on the northern side of the road between canal and Avon Road (connecting with Dee Why Lagoon Reserve).



Source: Tract Consultants Pty Ltd (2014)

Figure 4.3 Dee Why Parade concept plans

Howard Avenue

The following works are proposed on Howard Avenue between Pittwater Road and Avon Road:

- creation of a two lane one-way (westbound) road with parking on both sides between Pittwater Road and New Link Road
- lane configuration changes on approach to the Pittwater Road intersection
- creation of a two lane two-way road with parking on both sides between New Link Road and Avon Road or alternatively the option of having parking on only the southern side
- new bus zone and taxi interchange provisions on the southern side near to Pittwater Road
- relocation of the existing westbound bus stop near the Council car park, further west to between New Link Road and Avon Road
- relocation of the eastbound bus stops (northern side of Howard Avenue) to Oaks Avenue
- installation of mid-block pedestrian signals approximately 130 m east of Pittwater Road
- installation of a signalised T junction with New Link Road
- provision of a separated on road cycleway between New Link Road and Avon Road
- provision of an on road cycleway between Pittwater Road and New Link Road.



Source: Tract Consultants Pty Ltd (2014)

Figure 4.4 Howard Avenue concept plans

St David Avenue

The following works are proposed on St David Avenue between Pittwater Road and Fisher Road:

- modified lane configuration on St David Avenue including lane configuration changes to the intersections with Fisher Road and Pittwater Road
- provision of three lanes westbound and one lane eastbound including a dedicated bus only right turn bay from St David Avenue onto Pittwater Road
- implementation of a shared left and through lane and two right turning lanes westbound on St David Avenue
- removal of all on street parking
- modification to the kerb return on the north-eastern corner of the Fisher Road intersection to accommodate left turning buses from Fisher Road.



Source: Tract Consultants Pty Ltd (2014)

Figure 4.5 St David Avenue concept plans

Oaks Avenue

The following works are proposed on Oaks Avenue between Pittwater Road and Avon Road:

- creation of a two lane one-way (eastbound) road with parking on both sides between Pittwater Road and New Link Road
- creation of a two lane two-way road with parking on both sides between New Link Road and Avon Road

- installation of two bus stops on the northern side (relocated from Howard Avenue), one between Pittwater Road and New Link Lane and the other between New Link Road and Avon Road
- installation of a signalised T junction with New Link Lane approximately 120 m east of Pittwater Road
- installation of a signalised T junction with New Link Road
- adjustment to the kerb radius at intersection of Oaks Avenue and Pittwater Road to permit buses to turn left into Oaks Avenue.



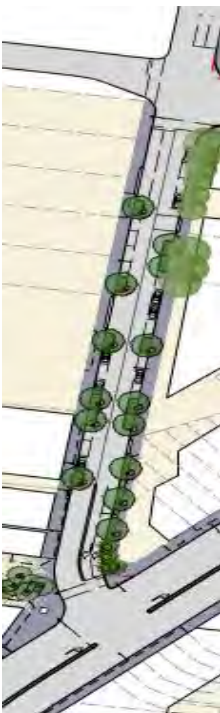
Source: Tract Consultants Pty Ltd (2014)

Figure 4.6 Oaks Avenue concept plans

Fisher Road

The following works are proposed on Fisher Road between Pittwater Road and St David Avenue:

- modified kerb radius at the intersection of Fisher Road and St David Avenue to allow buses to turn left into St David Avenue comfortably
- removal of the left turn movement from Fisher Road onto Pittwater Road
- modification to the TCS operation due to the removal of the left turn from Fisher Road.



Source: Tract Consultants Pty Ltd (2014)

Figure 4.7 Fisher Road concept plans

Pacific Parade

The following works are proposed on Pacific Parade between Pittwater Road and Sturdee Parade:

- relocation of the existing raised pedestrian zebra crossing westerly, from adjacent to the Woolworths site to towards Pittwater Road (outside Dee Why Grand Shopping Centre)
- removal of the right turn movement out of Pacific Parade onto Pittwater Road
- removal of the traffic signal control at the Pittwater Road intersection and installation of priority sign control
- installation of priority sign control on traffic exiting from the New Link Lane.



Source: Tract Consultants Pty Ltd (2014)

Figure 4.8 Pacific Parade concept plans

Sturdee Parade

The following works are proposed on Sturdee Parade between Pittwater Road and Pacific Parade:

- removal of on street parking on the southern side of Sturdee Parade on approach to Pittwater Road during peak periods to accommodate increased traffic demand to this intersection
- modification to the existing cycle facilities from a dedicated cycle lane westbound to a mixed traffic lane on approach to Pittwater Road.



Source: Tract Consultants Pty Ltd (2014)

Figure 4.9 Sturdee Parade concept plans

4.1 Impact assessment

The following assessment outlines the impact of the proposal on key roads within the study area:

- Road geometry
- Turning restrictions
- Intersection performance
- Bus operations
- On street parking
- Off street loading and service vehicle access
- Pedestrians
- Cyclists.

As discussed earlier, no intersection modelling has been undertaken by Parsons Brinckerhoff for this study. Previous traffic modelling completed by GTA and GHD has been reviewed and sourced for this study which is understood to be endorsed by both Warringah Council and the RMS. Additional traffic modelling is likely to be required once the concept design is further detailed.

Table 4.1 Impact assessment – Pittwater Road summary

Item	Description
Road geometry	Footpath narrowing and provision of indented bus bay on the eastern side of Pittwater Road between Howard Avenue and Oaks Avenue.
Turning restrictions	No right turn from Pittwater Road onto Pacific Parade. No left turn from Pittwater Road onto Howard Avenue.
Intersection performance	The intersection of Pittwater Road and Pacific Parade will no longer be signalised.
Bus operations	New bus interchanges at Dee Why on both sides of Pittwater Road near Howard Avenue and St David Avenue.
On street parking (Gain/Loss)	Loss of parking on both sides of Pittwater Road at the bus interchange.
Off street loading and service vehicle access	No changes anticipated.
Pedestrians	Signalised pedestrian crossings at Pittwater Road and Pacific Parade removed. Removal of signalised pedestrian crossing at the Fisher Road intersection.
Cyclists	No change.

Table 4.2 Impact assessment – Howard Avenue summary

Item	Description
Road geometry	Howard Avenue reconfigured to one-way road westbound between New Link Road and Pittwater Road. Howard Avenue to be two lanes wide with dedicated bus zone and taxi interchange area on the southern side and general parking on both sides of the road. The section between the New Link Road and Avon Road remains two-way.
Turning restrictions	No entry into Howard Avenue from Pittwater Road or St David Avenue. All vehicle entry and exit movements to and from driveway and property accesses to be in the westbound direction in this section of Howard Avenue. No left turn into New Link Road from Howard Avenue.
Intersection performance	Changes to intersection performance with Pittwater Road and the new intersection operation with pedestrian mid-block signals and New Link Road intersection.
Bus operations	Similar provision and position of the bus zone as per the existing situation for Howard Avenue westbound stop near Pittwater Road. Relocation of westbound stop to between New Link Road and Avon Road. Removal of eastbound bus services and stops on the northern side to Oaks Avenue.
On street parking (Gain/Loss)	Gain in parking spaces between Pittwater Road and New Link Road although this will be offset to some extent with a loss of parking spaces between New Link Road and Avon Road.
Off street loading and service vehicle access	All vehicle entry and exit movements to and from driveway and property accesses to be in the westbound direction on Howard Avenue between Pittwater Road and New Link Road.
Pedestrians	Removal of existing mid-block pedestrian zebra crossing.
Cyclists	Dedicated separated cycleway on the northern side of Howard Avenue between New Link Road and Avon Road. On road cycleway between Pittwater Road and New Link Road. Cyclists would have to cross at the signalised crossing with New Link Road to travel between the northern and southern sides of Howard Avenue.
Taxi	Similar provision and position of the taxi zone as per the existing situation.

Table 4.3 Impact assessment – St David Avenue summary

Item	Description
Road geometry	Changed traffic conditions. Three travel lanes westbound and one travel lane eastbound. Provision of combined left/through and dual right turn lanes westbound at Fisher Road intersection and left and short right turn lane (buses only) for eastbound at Pittwater Road intersection. Modified kerb return on north-east corner of St David Avenue and Fisher Road intersection to accommodate left turn buses from Fisher Road.
Turning restrictions	No entry to Howard Avenue and buses only permitted to undertake right turn from St David Avenue onto Pittwater Road.
Intersection performance	The reconfigured road arrangements on St David Avenue will inevitably alter the phasing and performance of the Pittwater Road and Fisher Road intersections.
Bus operations	No change, however the right turning swept path for buses from Fisher Road into the indented bus bay on Pittwater Road will need to be reviewed.
On street parking (Gain/Loss)	Loss of all (25) parking spaces. The majority of this parking is allocated for police vehicles. Alternative parking for police vehicles will need to be identified.
Off street loading and service vehicle access	Consideration of future access to Council's Community Hub and the proposed Cobalt development.
Pedestrians	No change.
Cyclists	No change.

Table 4.4 Impact assessment – Oaks Avenue summary

Item	Description
Road geometry	Changed traffic conditions and one –way eastbound travel between Pittwater Road and New Link Lane. The section between the New Link Road and Avon Road remains two-way.
Turning restrictions	All vehicle entry and exit movements to and from driveways and property accesses to be in the eastbound direction between Pittwater Road and New Link Road. No through movement westbound on Oaks Avenue at New Link Road.
Intersection performance	Changes to intersection operation at Pittwater Road and new signalised intersection operation with New Link Lane and New Link Road intersections.
Bus Operations	Existing eastbound bus services and stops on Howard Avenue relocated to Oaks Avenue.
On street parking (Gain/Loss)	Loss of parking spaces on both sides between Pittwater Road and Avon Road.
Off street loading and service vehicle access	Increased service vehicle demand and movements as a consequence of the proposed Meriton development. New Link Road needs to be capable of accommodating the largest design vehicle for Meriton and Woolworths sites.
Pedestrians	Removal of existing mid-block pedestrian zebra crossing.
Cyclists	No change.
Access	The removal of the left turn movement from Fisher Road onto Pittwater Road will mean that vehicles travelling from the western side of Pittwater Road to the eastern side will be required to turn left into Pacific Parade to access Oaks Avenue.

Table 4.5 Impact assessment – Fisher Road summary

Item	Description
Road geometry	Modified kerb return on north-east corner of St David Avenue and Fisher Road intersection to accommodate left turning buses from Fisher Road.
Turning restrictions	Introduction of no left turn from Fisher Road onto Pittwater Road.
Intersection performance	St David Avenue reconfigured road arrangements would alter the phasing and performance of the Fisher Road intersection.
Bus operations	No change.
On street parking (Gain/Loss)	No change.
Off street loading and service vehicle access	N/A
Pedestrians	No change.
Cyclists	No change.

Table 4.6 Impact assessment – Pacific Parade summary

Item	Description
Road geometry	Kerb return modifications at Pacific Parade intersection with Pittwater Road. New intersection with New Link Lane.
Turning restrictions	The implementation of a centre median on Pittwater Road adjacent to Pacific Parade will remove the right turn movement out of Pacific Parade.
Intersection performance	Removal of the signalised intersection and replacement with priority controlled intersection at Pittwater Road. Priority control intersection with New Link Lane.
Bus operations	No change.
On street parking (Gain/Loss)	Loss of parking spaces on both sides of the road.
Off street loading and service vehicle access	N/A
Pedestrians	Relocation of existing pedestrian zebra crossing further west towards Pittwater Road. Removal of the signalised pedestrian crossing on the southern and eastern side of the Pittwater Road/Pacific Parade intersection.
Cyclists	No change.
Access	Increased vehicle demand eastbound from western side of Pittwater Road (from Fisher Road).

Table 4.7 Impact assessment – Sturdee Parade summary

Item	Description
Road geometry	Minor change to the westbound lane configuration on approach to Pittwater Road – kerbside left turn lane to be extended through removal of on street parking during peak periods and bicycle lane becomes mixed traffic lane.
Turning restrictions	No change.
Intersection performance	Increased right turning demand from Sturdee Parade onto Pittwater Road.
Bus operations	N/A
On street parking (Gain/Loss)	Loss of parking spaces on the southern side to accommodate increased vehicle demand towards Pittwater Road intersection.
Off street loading and service vehicle access	No change.
Pedestrians	No change.
Cyclists	Shortening of westbound bicycle lane to a mixed traffic lane on approach to Pittwater Road.

Table 4.8 Impact assessment – Dee Why Parade summary

Item	Description
Road geometry	No change to road geometry.
Turning restrictions	No change.
Intersection performance	No change.
Bus operations	N/A
On street parking (Gain/Loss)	Loss of parking spaces to accommodate pedestrian refuge facility.
Off street loading and service vehicle access	No change.
Pedestrians	Installation of pedestrian refuge facility adjacent to Walter Gors Park connection and canal to assist pedestrians crossing.
Cyclists	Installation of pedestrian refuge facility adjacent to Walter Gors Park connection and canal to assist cyclists crossing.

4.2 Recommendations and mitigation measures

The following recommendation and mitigation measures are proposed to ameliorate project related impacts:

- the new link roads and lanes should be designed to accommodate articulated vehicles
- pedestrian crossings to be provided at all new signalised intersections
- adequate connections between pedestrian and cycle facilities
- access to property and service vehicles driveways to be maintained.

5. New Link Road

This section describes the proposed conditions on the New Link Road between Howard Avenue and Oaks Avenue. The proposed New Link Road road reservation will bisect the existing off street Council car park.

5.1 Description of the proposal

The following works are proposed on New Link Road between Howard Avenue and Oaks Avenue:

- two lane one-way road with indented parallel parking on both sides
- pedestrian footpath on the western side and a shared path facility on the eastern side
- signalised intersections with Howard Avenue and Oaks Avenue
- council car park exit onto New Link Road.

5.1.1 Street design characteristics and requirements

The following design characteristics are required for New Link Road:

- swept path and kerb radii to accommodate largest design vehicle (articulated vehicle of 19 m length)
- right turning movement from New Link Road onto Howard Avenue to potentially accommodate bus services.

5.1.2 Street concept plans



Source: Tract Consultants Pty Ltd (2014)

Figure 5.1 New Link Road concept plans

5.1.3 Intersection layouts

Two signalised intersections are proposed with Howard Avenue and Oaks Avenue.

5.1.4 Intersection performance

Further intersection traffic modelling will be required to determine intersection operation for New Link Road with Howard Avenue and Oaks Avenue intersections.

5.2 Impact assessment

The following assessment sets out the impact of the proposal on:

- Road geometry
- Turning restrictions
- Intersection performance
- Bus operations
- On street parking
- Off street loading and service vehicle access
- Pedestrians
- Cyclists.

5.2.1 Impact assessment – street summary

Table 5.1 Impact assessment – New Link Road summary

Item	Description
Road geometry	Two lanes one-way northbound with indented parking bays on either side. New exit driveway from the adjacent Council car park on the New Link Road frontage.
Turning restrictions	Egress from Council car park onto New Link Road. No left turn from Howard Avenue onto New Link Road due to the one way restriction.
Intersection performance	To be determined.
Bus operations	To be determined.
On street parking (Gain/Loss)	Loss of parking spaces from Howard Avenue, Oaks Avenue and Council car park to accommodate New Link Road would be offset by additional parking spaces on the New Link Road.
Off street loading and service vehicle access	N/A
Pedestrians	Footpaths on both sides of the road (shared path on eastern side of the road).
Cyclists	Shared path on eastern side of the road.

6. New Link Lane

This section describes the existing and proposed conditions on the New Link Lane between Oaks Avenue and Pacific Parade. The proposed New Link Lane road reservation will be positioned adjacent to the western side of the Woolworths site.

6.1 Description of the proposal

The following works are proposed on New Link Lane between Pacific Parade and Oaks Avenue:

- two lane two-way road with no parking provision
- pedestrian footpaths on both sides of the road
- on-road mixed traffic lane with cycle provision
- signalised intersection with Oaks Avenue and priority sign controlled intersection with Pacific Parade.

6.1.1 Street design characteristics and requirements

The following design characteristics are required for New Link Lane:

- swept path and kerb radii to accommodate largest design vehicle (waste collection vehicle of 9 m length).

6.1.2 Street concept plans



Source: Tract Consultants Pty Ltd (2014)

Figure 6.1 New Link Lane concept plans

6.1.3 Intersection layouts

One sign controlled priority intersection at Pacific Parade and one signalised intersection with Oaks Avenue is proposed.

6.1.4 Intersection performance

Further intersection traffic modelling will be required to determine intersection operation for New Link Lane with Pacific Parade and Oaks Avenue intersections.

6.2 Impact assessment

The following assessment sets out the impact of the proposal on:

- Road geometry
- Turning restrictions
- Intersection performance
- Bus operations
- On street parking
- Off street loading and service vehicle access
- Pedestrians
- Cyclists.

6.2.1 Impact assessment – street summary

Table 6.1 Impact assessment – New Link Lane summary

Item	Description
Road geometry	Two lane two-way road.
Turning restrictions	No left turn onto Oaks Avenue.
Intersection performance	To be determined.
Bus operations	N/A
On street parking (Gain/Loss)	Loss of parking to accommodate Oaks Avenue and Pacific Parade intersections.
Off street loading and service vehicle access	N/A
Pedestrians	Footpaths on both sides of the road.
Cyclists	On-road mixed traffic lane.

7. Conclusion

The infrastructure upgrades proposed for Dee Why Town Centre aim to create a well-connected and vibrant Town Centre. The several upgrades proposed will impact on the operation of the Town Centre with regards to vehicle, pedestrian and cycle movements. Impacts are anticipated to property access, general accessibility, parking, and road and intersection operation. Several recommendations and mitigation measures are proposed to ameliorate project related impacts.

7.1 Next steps

The following tasks are recommended in taking the next steps with this project:

- further traffic modelling to determine the impacts of the installation of new signalised and priority controlled intersections and signalised mid-block intersections
- further consultation with regards to relocated bus stops and servicing requirements, the proposed Dee Why bus interchange and interchange facilities on Pittwater Road
- swept path analyses of the largest design vehicles at new intersections to be completed
- liaison with RMS regarding proposed signalised intersection and signalised mid-block pedestrian crossings and adjustments to existing Pittwater Road signal operation
- integration of the construction planning and staging of both the Town Centre upgrades and Northern Beaches Rapid Transit project
- review of road safety concerns on Pittwater Road
- provide further detailed impacts to on street parking provision and accessibility once a design is adopted
- preparation of a traffic management plan for special events which incorporate road closures on Howard Avenue and New Link Road
- preparation of a construction traffic management plan for staging of works.

Appendix A

RMS crash data



Summary Crash Report

# Crash Type				Contributing Factors				Crash Movement				CRASHES				145		CASUALTIES				85												
Car Crash		134	92.4%	Speeding		3	2.1%	Intersection, adjacent approaches		19	13.1%	Fatal crash		0	0.0%	Killed		0	0.0%															
Light Truck Crash		16	11.0%	Fatigue		5	3.4%	Head-on (not overtaking)		1	0.7%	Injury crash		81	55.9%	Injured		85	100.0%															
Rigid Truck Crash		1	0.7%	Alcohol		3	2.1%	Opposing vehicles; turning		10	6.9%	Non-casualty crash		64	44.1%	^ Unrestrained		3	3.5%															
Articulated Truck Crash		0	0.0%	Weather				U-turn		2	1.4%	^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn																						
'Heavy Truck Crash		(1)	(0.7%)					Rear-end		53	36.6%	Time Group				% of Day				Crashes		Casualties												
Bus Crash		6	4.1%					Lane change		4	2.8%																							
"Heavy Vehicle Crash		(7)	(4.8%)					Parallel lanes; turning		3	2.1%																							
Emergency Vehicle Crash		0	0.0%					Vehicle leaving driveway		5	3.4%																							
Motorcycle Crash		20	13.8%	Overcast		11	7.6%	Overtaking; same direction		0	0.0%	06:00 - 06:59		2	1.4%	4.2%	25		2010	13														
Pedal Cycle Crash		8	5.5%	Fog or mist		0	0.0%	Hit parked vehicle		0	0.0%	07:00 - 07:59		8	5.5%	4.2%	25		2009	11														
Pedestrian Crash		22	15.2%	Other		0	0.0%	Hit railway train		0	0.0%	08:00 - 08:59		13	9.0%	4.2%	13		2008	7														
' Rigid or Artic. Truck " Heavy Truck or Heavy Bus # These categories are NOT mutually exclusive				Road Surface Condition				Hit pedestrian		15	10.3%	09:00 - 09:59		12	8.3%	4.2%	~ School Travel Time																	
Location Type		Wet						16	11.0%	Permanent obstruction on road		0	0.0%	10:00 - 10:59		7					4.8%	4.2%	Involvement		38		26.2%							
		Dry						129	89.0%	Hit animal		0	0.0%	11:00 - 11:59		6					4.1%	4.2%												
*Intersection		85	58.6%	Natural Lighting				Off road, on straight		0	0.0%	12:00 - 12:59		8	5.5%	4.2%	McLean Periods				% Week													
Non intersection		60	41.4%					Dawn		1	0.7%	Off road on straight, hit object		6	4.1%	13:00 - 13:59							11	7.6%	4.2%	A		21		14.5%		17.9%		
* Up to 10 metres from an intersection ~ 07:30-09:30 or 14:30-17:00 on school days								Daylight		98	67.6%	Off road, on curve		0	0.0%	14:00 - 14:59							7	4.8%	4.2%									B
Collision Type		Snow or ice		0	0.0%	Dusk		4	2.8%	Off road on curve, hit object		0	0.0%	15:00 - 15:59		13	9.0%	4.2%	C		38		26.2%		17.9%									
		Single Vehicle		5	3.4%	Darkness		42	29.0%	Out of control on curve		0	0.0%	16:00 - 16:59		9	6.2%	4.2%									D		9		6.2%		3.5%	
Multi Vehicle		140	96.6%	Speed Limit				Other crash type		25	17.2%	17:00 - 17:59		7	4.8%	4.2%	E		4		2.8%		3.6%											
Road Classification								40 km/h or less		0	0.0%	~ 40km/h or less		0	0.0%	18:00 - 18:59									12	8.3%	4.2%	F		21		14.5%		10.7%
								50 km/h zone		67	46.5%	80 km/h zone		0	0.0%	19:00 - 19:59		12	8.3%	4.2%	G		21		14.5%		7.1%							
								State Highway		0	0.0%	60 km/h zone		76	52.8%	90 km/h zone		0	0.0%	20:00 - 21:59									12	8.3%	8.3%	H		13
								Other Classified Road		86	59.3%	70 km/h zone		1	0.7%	100 km/h zone		0	0.0%	22:00 - 24:00		2	1.4%	8.3%	I		4		2.8%		12.5%			
Unclassified Road		59	40.7%	# Holiday Periods				110 km/h zone		0	0.0%	Street Lighting Off/Nil				% of Dark		J		12		8.3%		10.7%										
Day of the Week								40 km/h or less		0	0.0%	80 km/h zone		0	0.0%	2										of		42 in Dark		4.8%				
								50 km/h zone		67	46.5%	90 km/h zone		0	0.0%	Queen's BD				3	2.1%	Easter SH		6	4.1%									
								60 km/h zone		76	52.8%	100 km/h zone		0	0.0%	Labour Day				1	0.7%	June/July SH		3	2.1%									
								70 km/h zone		1	0.7%	110 km/h zone		0	0.0%	Christmas				4	2.8%	Sept./Oct. SH		7	4.8%									
Monday				20	13.8%	Thursday		24	16.6%	Sunday		16	11.0%	Anzac Day		1	0.7%	January SH		8	5.5%	December SH		5	3.4%									
Tuesday				16	11.0%	Friday		24	16.6%	WEEKDAY		111	76.6%																					
Wednesday				27	18.6%	Saturday		18	12.4%	WEEKEND		34	23.4%																					

Crashid dataset 6048 - Crashes within the study area July08 to June13

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Detailed Crash Report

NOTES: 6048 - Crashes within the study area July08 to June13

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors	
Sydney Region																					S F
Warringah LGA																					
Dee Why																					
Avon Rd																					
829491	25/01/2013	Fri	20:25		at OAKS AVE	RDB	STR	Unk	Dry	50	2	TRK	F30	W in OAKS AVE	40	Proceeding in lane	I	0	1		
E50144730						RUM:	10	Cross traffic				CAR	F34	S in AVON RD	20	Proceeding in lane					
811003	16/09/2012	Sun	08:30	10 m	S OAKS AVE	RDB	STR	Raining	Wet	50	2	CAR	F52	S in AVON RD	20	Incorrect side	N	0	0	F	
E48667525						RUM:	20	Head on				CAR	F60	N in AVON RD	20	Proceeding in lane					
824080	20/01/2013	Sun	15:00	20 m	S OAKS AVE	2WY	STR	Overcast	Dry	50	2	P/C	F20	S in AVON RD		Veering right	I	0	1		
E50654062						RUM:	34	Lane change right				OMV	M49	S in AVON RD	25	Proceeding in lane					
721961	19/08/2010	Thu	17:50		at PACIFIC PDE	RDB	STR	Fine	Dry	50	2	CAR	M20	S in AVON RD	5	Turning right	I	0	1		
E42601341						RUM:	2	Ped far side				TOY	M33	E in PACIFIC PDE		In/on toy vehicle					
743575	14/02/2011	Mon	13:45		at PACIFIC PDE	RDB	STR	Fine	Dry	50	2	4WD	M80	S in AVON RD	10	Proceeding in lane	I	0	1		
E44541516						RUM:	10	Cross traffic				P/C	M26	E in PACIFIC PDE		Proceeding in lane					
745043	10/03/2011	Thu	15:50		at PACIFIC PDE	RDB	STR	Fine	Dry	50	2	CAR	M80	S in AVON RD	20	Proceeding in lane	N	0	0		
E44542278						RUM:	10	Cross traffic				CAR	M37	E in PACIFIC PDE	50	Proceeding in lane					
788741	17/03/2012	Sat	01:00		at PACIFIC PDE	RDB	STR	Fine	Dry	50	6	CAR	F17	S in AVON RD	25	Proceeding in lane	N	0	0		
E47537966						RUM:	10	Cross traffic				OMV	M70	E in PACIFIC PDE	40	Proceeding in lane					
												CAR		E in PACIFIC PDE	0	Parked					
												CVN		E in PACIFIC PDE		Parked					
												CAR		E in PACIFIC PDE	0	Parked					
												4WD		E in PACIFIC PDE	0	Parked					
830071	10/03/2013	Sun	02:52	15 m	N PACIFIC PDE	2WY	STR	Fine	Dry	50	2	CAR	F31	S in AVON RD	50	Proceeding in lane	N	0	0		
E51012019						RUM:	73	Off rd rght => obj				4WD		N in AVON RD	0	Parked					
Dee Why Pde																					
805292	01/08/2012	Wed	18:58		at AVON RD	RDB	STR	Fine	Dry	50	3	CAR	F26	W in DEE WHY PDE	Unk	Proceeding in lane	N	0	0		
E48462911						RUM:	10	Cross traffic				CAR	M26	S in AVON RD	Unk	Proceeding in lane					
												CAR	M51	N in AVON RD	0	Stationary					
818408	04/11/2012	Sun	20:50		at AVON RD	RDB	STR	Fine	Dry	50	2	CAR	F17	E in DEE WHY PDE	Unk	Proceeding in lane	I	0	1		
E50127374						RUM:	10	Cross traffic				M/C	M27	N in AVON RD	Unk	Proceeding in lane					
842431	26/06/2013	Wed	18:45		at AVON RD	RDB	STR	Raining	Wet	50	2	OMV	U U	S in AVON RD	Unk	Proceeding in lane	I	0	1		
E52013846						RUM:	10	Cross traffic				M/C	M22	E in DEE WHY PDE	10	Proceeding in lane					

Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
SF																				
768436	23/09/2011	Fri	23:00	100 m	W AVON RD	2WY	STR	Fine	Dry	50	2	UTE	U U	E in DEE WHY PDE		Unk Proceeding in lane	N	0	0	F
E45581623						RUM:	71	Off rd left => obj				CAR		E in DEE WHY PDE		0 Parked				
795658	22/05/2012	Tue	14:50		at CLARENCE AVE	RDB	STR	Fine	Dry	50	2	M/C	M29	S in DEE WHY PDE		20 Turning right	I	0	1	
E47796232						RUM:	11	Right far				CAR	M79	W in CLARENCE AVE		20 Proceeding in lane				
813898	28/09/2012	Fri	18:15		at CLARENCE AVE	RDB	STR	Fine	Dry	50	2	CAR	F34	S in CLARENCE AVE		10 Turning right	N	0	0	
E51781481						RUM:	11	Right far				4WD	F32	W in DEE WHY PDE		10 Proceeding in lane				
635704	23/08/2008	Sat	16:47	20 m	E CLARENCE AVE	2WY	STR	Overcast	Dry	50	2	CAR	U U	S in DEE WHY PDE		1 Forward from drive	N	0	0	
E36689580						RUM:	47	Emerging from drive				M/C	M52	E in DEE WHY PDE		30 Proceeding in lane				
705221	31/01/2010	Sun	21:15	5 m	E PITTWATER RD	XJN	STR	Fine	Dry	50	2	CAR	F36	W in DEE WHY PDE		25 Proceeding in lane	I	0	1	
E41770787						RUM:	31	Left rear				CAR	M72	W in DEE WHY PDE		0 Waiting turn left				
830860	24/03/2013	Sun	16:10	20 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	3	CAR	F66	W in DEE WHY PDE		10 Proceeding in lane	I	0	1	
E51047526						RUM:	30	Rear end				CAR	F31	W in DEE WHY PDE		0 Stationary				
												CAR	F55	W in DEE WHY PDE		0 Stationary				
792127	13/03/2012	Tue	15:30	30 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	F66	W in DEE WHY PDE		Unk Proceeding in lane	I	0	1	
E47308712						RUM:	30	Rear end				CAR	M37	W in DEE WHY PDE		0 Stationary				
634771	20/08/2008	Wed	16:00	100 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	F76	N in DEE WHY PDE		20 Forward from drive	I	0	1	
E501712790						RUM:	47	Emerging from drive				P/C	M21	W in DEE WHY PDE		Proceeding in lane				
Fisher Rd																				
724820	18/09/2010	Sat	10:20		at LEWIS ST	XJN	STR	Fine	Dry	50	2	CAR	F17	E in LEWIS ST		Unk Turning right	N	0	0	
E43044808						RUM:	21	Right through				CAR	M29	W in LEWIS ST		30 Proceeding in lane				
759233	06/07/2011	Wed	11:15	5 m	N MCINTOSH RD	RDB	STR	Fine	Dry	50	5	WAG	M43	S in FISHER RD		Unk Proceeding in lane	I	0	2	S
E45915708						RUM:	30	Rear end				TRK	M31	S in FISHER RD		0 Stationary				
												CAR	M44	W in MCINTOSH RD		0 Stationary				
												CAR	M43	W in MCINTOSH RD		60 Proceeding in lane				
												CAR	F48	W in MCINTOSH RD		50 Proceeding in lane				
731590	09/11/2010	Tue	12:30	15 m	S MCINTOSH RD	2WY	STR	Fine	Dry	50	3	CAR	M21	N in FISHER RD		40 Proceeding in lane	N	0	0	
E44433285						RUM:	30	Rear end				4WD	F53	N in FISHER RD		0 Stationary				
												TRK	M46	N in FISHER RD		0 Stationary				
830528	04/03/2013	Mon	14:15	25 m	N PITTWATER RD	2WY	CRV	Fine	Dry	50	2	CAR	M60	N in FISHER RD		5 Pulling out	N	0	0	
E50881461						RUM:	42	Leaving parking				CAR	F28	N in FISHER RD		Unk Proceeding in lane				
671122	14/06/2009	Sun	15:50		at ST DAVID AVE	XJN	STR	Raining	Wet	60	1	CAR	F21	W in ST DAVID AVE		20 Turning right	N	0	0	S
E37886103						RUM:	81	Off left/rt bnd=>obj						Fence (prior to 2014)						

Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
682520	21/09/2009	Mon	18:45		at ST DAVID AVE	XJN	STR	Fine	Dry	60	2	CAR	F18	W in ST DAVID AVE	40	Turning right	N	0	0	
E38939377						RUM:	21	Right through				4WD	M22	E in ST DAVID AVE		Unk Proceeding in lane				
729017	13/10/2010	Wed	19:40		at ST DAVID AVE	XJN	STR	Raining	Wet	50	2	CAR	M22	W in ST DAVID AVE	30	Turning right	I	0	1	
E254203692						RUM:	21	Right through				M/C	M52	E in ST DAVID AVE	30	Proceeding in lane				
631126	12/07/2008	Sat	19:00	100 m	S ST DAVID AVE	2WY	STR	Fine	Dry	60	2	CAR	F84	W in FISHER RD	20	Reverse from drive	N	0	0	
E34611073						RUM:	46	Reversing into obj				4WD		N in FISHER RD	0	Parked				
790972	04/04/2012	Wed	10:45	100 m	S ST DAVID AVE	2WY	STR	Fine	Dry	60	2	OMV	U U	FISHER RD	Unk	Other forward	N	0	0	
E47884077						RUM:	49	Other manoeuvring				M/C		N in FISHER RD	0	Parked				
Howard Ave																				
670244	10/06/2009	Wed	10:15		at AVON RD	RDB	STR	Fine	Dry	50	2	CAR	F47	N in AVON RD	10	Proceeding in lane	I	0	1	
E37910749						RUM:	10	Cross traffic				CAR	F52	E in HOWARD AVE	20	Proceeding in lane				
707311	22/04/2010	Thu	19:50		at AVON RD	RDB	STR	Fine	Dry	50	2	4WD	F28	W in HOWARD AVE	10	Proceeding in lane	N	0	0	
E78376102						RUM:	10	Cross traffic				4WD	F43	S in AVON RD	40	Proceeding in lane				
756071	10/06/2011	Fri	09:40		at AVON RD	RDB	STR	Fine	Dry	50	2	TRK	F29	N in AVON RD	10	Turning right	N	0	0	
E45257351						RUM:	21	Right through				CAR	M82	S in AVON RD	5	Proceeding in lane				
772224	14/10/2011	Fri	19:25		at AVON RD	RDB	STR	Overcast	Dry	50	4	CAR	F56	W in HOWARD AVE	50	Proceeding in lane	I	0	1	
E663671490						RUM:	10	Cross traffic				CAR	M41	S in AVON RD	50	Proceeding in lane				
												CAR		N in AVON RD	0	Parked				
												CAR		S in AVON RD	0	Parked				
821935	16/12/2012	Sun	19:45		at AVON RD	RDB	CRV	Fine	Dry	50	2	CAR	F81	S in AVON RD	Unk	Proceeding in lane	I	0	1	
E51349455						RUM:	10	Cross traffic				CAR	M23	E in HOWARD AVE	10	Proceeding in lane				
756119	12/06/2011	Sun	07:45		at NUMBER 39 HN	2WY	STR	Raining	Wet	50	2	CAR	F25	W in HOWARD AVE	40	Proceeding in lane	N	0	0	
E44301609						RUM:	71	Off rd left => obj				WAG		W in HOWARD AVE	0	Parked				
822514	09/01/2013	Wed	15:50	60 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	M64	N in HOWARD AVE	2	Forward from drive	I	0	1	
E51085639						RUM:	7	Driveway				PED	M51	W in HOWARD AVE		Ped not on carriageway				
674991	10/07/2009	Fri	17:30	100 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	M34	W in HOWARD AVE	10	Reversing in lane	I	0	1	
E39974584						RUM:	0	Ped nearside				PED	F53	HOWARD AVE		Walk across carriageway				
707326	23/04/2010	Fri	19:30	100 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	OMV	M62	E in HOWARD AVE	20	Pulling out	N	0	0	
E40569427						RUM:	42	Leaving parking				CAR	M26	E in HOWARD AVE	20	Proceeding in lane				
756105	11/06/2011	Sat	18:40	120 m	E PITTWATER RD	2WY	STR	Raining	Wet	60	3	CAR	M22	W in HOWARD AVE	30	Proceeding in lane	I	0	2	
E45092773						RUM:	0	Ped nearside				PED	M31	N in HOWARD AVE		Walk across carriageway				
												PED	F37	N in HOWARD AVE		Walk across carriageway				

Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
SF																				
821773	26/10/2012	Fri	13:00	120 m	E PITTWATER RD	DIV	STR	Fine	Dry	50	2	TRK	M53	E in HOWARD AVE	10	Proceeding in lane	I	0	1	
E96689802						RUM:	2	Ped far side				PED	F65	N in HOWARD AVE		Walk across carriageway				
Mcintosh Rd																				
811579	04/09/2012	Tue	07:20	5 m	W FISHER RD	RDB	STR	Fine	Dry	60	2	CAR	M51	E in MCINTOSH RD	Unk	Proceeding in lane	I	0	1	
E48886872						RUM:	31	Left rear				CAR	F74	E in MCINTOSH RD		0 Waiting turn left				
Oaks Ave																				
838207	21/05/2013	Tue	19:00		at NUMBER 21 HN	2WY	STR	Fine	Dry	50	2	CAR	U U	E in OAKS AVE	20	Proceeding in lane	N	0	0	F
E52052643						RUM:	71	Off rd left => obj				M/C		E in OAKS AVE		0 Parked				
776781	31/10/2011	Mon	09:30	5 m	E PITTWATER RD	TJN	STR	Fine	Dry	50	2	4WD	F73	W in OAKS AVE	30	Proceeding in lane	I	0	1	
E45747720						RUM:	31	Left rear				CAR	F45	W in OAKS AVE		0 Waiting turn left				
782343	01/02/2012	Wed	12:15	50 m	E PITTWATER RD	2WY	STR	Raining	Wet	50	2	P/C	M50	E in OAKS AVE		Proceeding in lane	I	0	1	
E47034426						RUM:	63	Vehicle door				CAR	M56	E in OAKS AVE		0 Parked				
764494	19/08/2011	Fri	09:01	55 m	E PITTWATER RD	2WY	STR	Overcast	Dry	50	2	4WD	F53	N in OAKS AVE	Unk	Reverse parking	I	0	1	
E45092412						RUM:	9	Ped other				PED	F84	S in OAKS AVE		Walk across carriageway				
803787	21/06/2012	Thu	17:30	100 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	P/C	M27	E in OAKS AVE		Proceeding in lane	I	0	1	
E48270354						RUM:	63	Vehicle door				CAR	M49	E in OAKS AVE		0 Parked				
736187	12/12/2010	Sun	15:15	200 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	F41	W in OAKS AVE	15	Reverse parking	I	0	1	
E45496086						RUM:	3	Ped on carriageway				PED	F36	OAKS AVE		Stand on carriageway				
757321	19/05/2011	Thu	13:15	375 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	TRK	M28	W in OAKS AVE	2	Reverse parking	I	0	1	
E44531576						RUM:	0	Ped nearside				PED	F40	S in OAKS AVE		Walk across carriageway				
781550	09/01/2012	Mon	15:05	390 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	3	TRK	M18	E in OAKS AVE	50	Proceeding in lane	I	0	2	
E46865850						RUM:	31	Left rear				CAR	F19	E in OAKS AVE		0 Waiting turn left				
												CAR	M77	E in OAKS AVE		5 Turning left				
794492	13/05/2012	Sun	14:00	200 m	S PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	F49	S in OAKS AVE	3	Reverse parking	I	0	1	
E47496025						RUM:	3	Ped on carriageway				PED	F82	S in OAKS AVE		Stand on carriageway				
782525	29/12/2011	Thu	21:50	Unk Unk	UNKNOWN UK	2WY	STR	Fine	Dry	50	1	CAR	F38	S in OAKS AVE	50	Other forward	N	0	0	
E402813191						RUM:	99	Unknown												
Oaks Rd																				
650360	16/10/2008	Thu	19:30	30 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	M22	E in OAKS RD	20	Turning right	I	0	1	S
E35655728						RUM:	21	Right through				M/C	M24	W in OAKS RD	60	Proceeding in lane				
738624	08/01/2011	Sat	09:15	200 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	F39	W in OAKS RD	10	Pulling out	N	0	0	
E43448379						RUM:	42	Leaving parking				WAG	F44	W in OAKS RD	25	Proceeding in lane				
Pacific Pde																				

Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
818696	28/11/2012	Wed	11:00		at NUMBER 53 HN	2WY	STR	Overcast	Dry	50	1	P/C	M24	W in PACIFIC PDE		Proceeding in lane	I	0	1	
E49970407						RUM:	69	Other on path						Falling object						
768923	15/08/2011	Mon	10:49		at NUMBER 56 HN	2WY	STR	Fine	Dry	Unk	2	CAR	M20	W in PACIFIC PDE		5 Other reversing	N	0	0	
E45669162						RUM:	93	Pkd veh runaway=>obj						E in PACIFIC PDE		0 Parked				
766900	07/09/2011	Wed	18:00	15 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	F76	N in PACIFIC PDE		20 Forward from drive	N	0	0	
E45627076						RUM:	47	Emerging from drive						E in PACIFIC PDE		20 Proceeding in lane				
757840	24/06/2011	Fri	18:00	40 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	M35	W in PACIFIC PDE		30 Proceeding in lane	I	0	1	
E44170210						RUM:	2	Ped far side						PED F12	S in PACIFIC PDE		Run across carriageway			
777828	12/12/2011	Mon	08:55	40 m	E PITTWATER RD	2WY	STR	Raining	Wet	60	2	4WD	F48	E in PACIFIC PDE		5 Forward from drive	I	0	1	
E46537361						RUM:	7	Driveway						PED M78	N in PACIFIC PDE		Ped not on carriageway			
761063	21/07/2011	Thu	16:15	100 m	E PITTWATER RD	2WY	STR	Raining	Wet	50	2	WAG	M33	W in PACIFIC PDE		10 Perform U-turn	I	0	1	
E44884552						RUM:	40	U turn						4WD F45	E in PACIFIC PDE		40 Proceeding in lane			
773951	02/11/2011	Wed	14:15	100 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	M61	N in PACIFIC PDE		Unk Forward from drive	I	0	1	
E45725970						RUM:	1	Ped emerging						PED F U	S in PACIFIC PDE		Run across carriageway			
771650	07/10/2011	Fri	12:04	110 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	4WD	F45	N in PACIFIC PDE		5 Forward from drive	I	0	1	
E46732965						RUM:	0	Ped nearside						PED F69	S in PACIFIC PDE		Walk across carriageway			
692955	17/12/2009	Thu	21:54		at STURDEE PDE	RDB	STR	Raining	Wet	50	2	UTE	M28	E in PACIFIC PDE		50 Proceeding in lane	N	0	0	F
E39468661						RUM:	73	Off rd right => obj						TRK	W in PACIFIC PDE		0 Parked			
772498	01/11/2011	Tue	17:30		at STURDEE PDE	RDB	STR	Fine	Dry	60	2	CAR	F U	N in STURDEE PDE		5 Turning right	I	0	1	
E46629269						RUM:	0	Ped nearside						PED F28	E in PACIFIC PDE		Walk across carriageway			
633079	26/07/2008	Sat	12:00	50 m	E STURDEE PDE	2WY	STR	Fine	Dry	60	3	WAG	M37	E in PACIFIC PDE		50 Proceeding in lane	I	0	1	
E34202109						RUM:	30	Rear end						CAR F31	E in PACIFIC PDE		0 Stationary			
														WAG F41	E in PACIFIC PDE		0 Stationary			
807177	14/08/2012	Tue	18:00	20 m	W STURDEE PDE	2WY	STR	Fine	Dry	50	3	CAR	F34	W in PACIFIC PDE		10 Proceeding in lane	I	0	1	
E50876689						RUM:	30	Rear end						M/C M31	W in PACIFIC PDE		0 Stationary			
														CAR M24	W in PACIFIC PDE		0 Stationary			
796219	05/01/2012	Thu	13:15		at THE CRESCENT MS	TJN	STR	Fine	Dry	50	3	CAR	F29	E in PACIFIC PDE		5 Proceeding in lane	I	0	1	
E47209074						RUM:	30	Rear end						CAR M80	E in PACIFIC PDE		0 Stationary			
														CAR M34	E in PACIFIC PDE		0 Stationary			
Pittwater Rd																				
692967	17/12/2009	Thu	09:20		at DEE WHY PDE	XJN	STR	Fine	Dry	60	2	CAR	M23	S in PITTWATER RD		Unk Turning left	N	0	0	
E41344489						RUM:	37	Left turn sideswipe						CAR M68	S in PITTWATER RD		Unk Proceeding in lane			

Detailed Crash Report

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SF																				
744604 E44349242	07/03/2011	Mon	08:10		at DEE WHY PDE	XJN	STR	Fine	Dry	60	3	UTE	M24	W in DEE WHY PDE		Unk Turning right	I	0	1	
						RUM:	13	Right near				STA	M46	S in PITTWATER RD		40 Proceeding in lane				
												4WD	F48	W in DEE WHY PDE		5 Turning right				
771296 E45657235	27/07/2011	Wed	09:15		at DEE WHY PDE	XJN	STR	Fine	Dry	60	2	CAR	F60	S in PITTWATER RD		40 Proceeding in lane	I	0	1	
						RUM:	2	Ped far side				PED	F55	E in PITTWATER RD		Walk across carriageway				
806451 E94229302	03/08/2012	Fri	17:10		at DEE WHY PDE	XJN	CRV	Fine	Dry	60	2	CAR	F41	W in PITTWATER RD		10 Turning right	N	0	0	
						RUM:	32	Right rear				4WD	F54	W in PITTWATER RD		10 Turning right				
773768 E46804241	20/10/2011	Thu	08:10	5 m	N DEE WHY PDE	XJN	STR	Fine	Dry	60	2	CAR	F24	S in PITTWATER RD		Unk Proceeding in lane	I	0	1	
						RUM:	30	Rear end				CAR	M50	S in PITTWATER RD		0 Stationary				
724854 E43059108	20/09/2010	Mon	08:20	10 m	N DEE WHY PDE	XJN	STR	Fine	Dry	60	2	CAR	F23	S in PITTWATER RD		Unk Proceeding in lane	N	0	0	
						RUM:	30	Rear end				CAR	F18	S in PITTWATER RD		Unk Proceeding in lane				
772430 E46492368	28/10/2011	Fri	16:20	50 m	S DEE WHY PDE	DIV	STR	Fine	Dry	60	2	CAR	F30	S in PITTWATER RD		10 Pulling out	I	0	1	
						RUM:	42	Leaving parking				LOR	M24	S in PITTWATER RD		55 Proceeding in lane				
766346 E189309494	03/09/2011	Sat	19:25	100 m	S DEE WHY PDE	DIV	STR	Fine	Dry	60	2	CAR	M22	N in PITTWATER RD		40 Proceeding in lane	N	0	0	
						RUM:	30	Rear end				4WD	M49	N in PITTWATER RD		0 Stationary				
776858 E46362434	29/11/2011	Tue	08:35	100 m	S DEE WHY PDE	DIV	STR	Fine	Dry	60	2	4WD	M80	S in PITTWATER RD		40 Veering left	I	0	1	
						RUM:	35	Lane change left				CAR	F84	S in PITTWATER RD		60 Proceeding in lane				
662688 E36638336	21/03/2009	Sat	21:40		at FISHER RD	TJN	STR	Fine	Dry	60	2	P/C	M31	E in PITTWATER RD		Along footpath	I	0	1	
						RUM:	48	From footpath				4WD	M32	S in PITTWATER RD		5 Proceeding in lane				
660571 E37681753	23/03/2009	Mon	08:15		at FISHER RD	TJN	STR	Fine	Dry	50	2	CAR	F54	E in FISHER RD		30 Turning right	N	0	0	
						RUM:	11	Right far				CAR	F34	S in PITTWATER RD		30 Proceeding in lane				
691619 E38988024	02/12/2009	Wed	15:00		at FISHER RD	TJN	STR	Fine	Dry	60	3	CAR	F28	S in PITTWATER RD		20 Proceeding in lane	N	0	0	
						RUM:	30	Rear end				CAR	M U	S in PITTWATER RD		10 Proceeding in lane				
												CAR	F30	S in PITTWATER RD		20 Proceeding in lane				
765367 E44733010	25/08/2011	Thu	14:45		at FISHER RD	TJN	STR	Fine	Dry	60	2	TRK	M29	S in PITTWATER RD		40 Proceeding in lane	N	0	0	
						RUM:	30	Rear end				4WD	F39	S in PITTWATER RD		15 Proceeding in lane				
823381 E49924506	27/12/2012	Thu	15:10		at FISHER RD	TJN	STR	Fine	Dry	60	2	CAR	M24	S in PITTWATER RD		40 Veering right	N	0	0	
						RUM:	34	Lane change right				CAR	F21	S in PITTWATER RD		40 Proceeding in lane				
661119 E38555787	24/03/2009	Tue	15:15	10 m	E FISHER RD	TJN	STR	Fine	Dry	60	3	CAR	F23	S in PITTWATER RD		10 Proceeding in lane	N	0	0	
						RUM:	30	Rear end				CAR	F45	S in PITTWATER RD		Unk Proceeding in lane				
												4WD	M46	S in PITTWATER RD		0 Stationary				
821826 E49400270	30/11/2012	Fri	13:00	1 m	N FISHER RD	TJN	STR	Fine	Dry	60	2	CAR	F74	S in PITTWATER RD		30 Proceeding in lane	I	0	1	
						RUM:	0	Ped nearside				PED	M40	W in PITTWATER RD		Run across carriageway				

Detailed Crash Report

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SF																				
640463	09/10/2008	Thu	07:00	5 m	N FISHER RD	TJN	STR	Fine	Dry	60	2	CAR	M29	S in PITTWATER RD	50	Proceeding in lane	N	0	0	
E68133401						RUM:	30	Rear end				CAR	M57	S in PITTWATER RD	40	Proceeding in lane				
671650	29/05/2009	Fri	08:50	5 m	N FISHER RD	TJN	STR	Fine	Dry	60	2	CAR	M29	S in PITTWATER RD	30	Proceeding in lane	I	0	1	
E37936251						RUM:	30	Rear end				CAR	F50	S in PITTWATER RD	0	Stationary				
749400	12/04/2011	Tue	11:55	5 m	N FISHER RD	TJN	STR	Fine	Dry	60	2	CAR	M25	S in PITTWATER RD	5	Proceeding in lane	I	0	1	
E44527877						RUM:	30	Rear end				CAR	F53	S in PITTWATER RD	0	Stationary				
807074	10/08/2012	Fri	15:45	10 m	N FISHER RD	TJN	STR	Raining	Wet	60	2	CAR	F85	S in PITTWATER RD	60	Proceeding in lane	N	0	0	
E49033262						RUM:	30	Rear end				CAR	F23	S in PITTWATER RD	0	Stationary				
681776	09/09/2009	Wed	15:00	15 m	N FISHER RD	DIV	STR	Fine	Dry	50	4	CAR	M21	S in PITTWATER RD	Unk	Proceeding in lane	N	0	0	
E40845288						RUM:	30	Rear end				CAR	F40	S in PITTWATER RD	0	Stationary				
												WAG	M42	S in PITTWATER RD	0	Stationary				
												CAR	M44	S in PITTWATER RD	0	Stationary				
705417	01/04/2010	Thu	10:30	20 m	N FISHER RD	DIV	STR	Fine	Dry	60	2	CAR	M22	N in PITTWATER RD	50	Proceeding in lane	N	0	0	
E40346854						RUM:	30	Rear end				TRK	M23	N in PITTWATER RD	50	Veering left				
745828	23/03/2011	Wed	07:58	20 m	N FISHER RD	DIV	STR	Fine	Dry	60	3	CAR	F24	S in PITTWATER RD	10	Proceeding in lane	N	0	0	
E44300577						RUM:	30	Rear end				CAR	F67	S in PITTWATER RD	0	Stationary				
												CAR	M26	S in PITTWATER RD	0	Stationary				
718990	29/07/2010	Thu	09:20	10 m	S FISHER RD	TJN	STR	Fine	Dry	60	2	M/C	F20	S in PITTWATER RD	20	Proceeding in lane	I	0	1	
E42223642						RUM:	63	Vehicle door				CAR	F39	S in PITTWATER RD	0	Parked				
773328	29/10/2011	Sat	12:13	10 m	S FISHER RD	TJN	CRV	Fine	Dry	60	2	VAN	M21	N in PITTWATER RD	10	Veering left	I	0	1	
E45722015						RUM:	35	Lane change left				STA	M50	N in PITTWATER RD	15	Proceeding in lane				
836750	09/05/2013	Thu	21:45	10 m	S FISHER RD	TJN	STR	Fine	Dry	60	3	4WD	M36	N in PITTWATER RD	60	Proceeding in lane	N	0	0	
E181621796						RUM:	30	Rear end				CAR	F22	N in PITTWATER RD	0	Stationary				
												CAR	M48	N in PITTWATER RD	0	Stationary				
670767	28/05/2009	Thu	07:05	10 m	W FISHER RD	TJN	STR	Fine	Dry	60	2	CAR	F23	W in PITTWATER RD	Unk	Proceeding in lane	I	0	1	
E37959168						RUM:	30	Rear end				CAR	M31	W in PITTWATER RD	0	Stationary				
829022	19/02/2013	Tue	13:02	30 m	W FISHER RD	DIV	CRV	Fine	Dry	50	2	CAR	F48	W in PITTWATER RD	5	Reverse parking	N	0	0	
E50703056						RUM:	43	Entering parking				CCH	M47	E in PITTWATER RD	40	Proceeding in lane				
639491	27/09/2008	Sat	09:30		at HOWARD AVE	XJN	STR	Fine	Dry	60	2	UTE	M32	S in PITTWATER RD	20	Proceeding in lane	I	0	1	
E130292695						RUM:	6	Ped on footpath				PED	F57	PITTWATER RD		Ped not on carriageway				
693450	21/12/2009	Mon	07:15		at HOWARD AVE	XJN	STR	Fine	Dry	60	2	4WD	M54	N in PITTWATER RD	50	Proceeding in lane	N	0	0	
E38932560						RUM:	10	Cross traffic				CAR	F33	W in HOWARD AVE	40	Proceeding in lane				

Detailed Crash Report

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SF																				
700180 E40072464	19/02/2010	Fri	08:30		at HOWARD AVE	XJN RUM:	STR 30	Fine Rear end	Dry	60	3	CAR CAR WAG	M65 M17 F53	S in PITTWATER RD S in PITTWATER RD S in PITTWATER RD	10 Proceeding in lane 5 Proceeding in lane 5 Proceeding in lane		I	0	1	
765401 E47363680	25/08/2011	Thu	11:55		at HOWARD AVE	XJN RUM:	STR 30	Fine Rear end	Dry	60	3	CAR CAR WAG	F41 F66 M37	S in PITTWATER RD S in PITTWATER RD S in PITTWATER RD	40 Proceeding in lane 0 Stationary 0 Stationary		N	0	0	
779622 E46366836	25/12/2011	Sun	21:00		at HOWARD AVE	XJN RUM:	STR 12	Fine Left far	Dry	60	3	CAR CAR CAR	M29 M31 M49	S in PITTWATER RD W in HOWARD AVE W in HOWARD AVE	50 Turning left 0 Stationary 0 Stationary		N	0	0	
639456 E37366681	26/09/2008	Fri	21:27	5 m	N HOWARD AVE	XJN RUM:	STR 30	Fine Rear end	Dry	60	2	CAR CAR	F18 F33	S in PITTWATER RD S in PITTWATER RD	35 Proceeding in lane 0 Stationary		N	0	0	
703180 E40474626	19/03/2010	Fri	15:00	10 m	N HOWARD AVE	XJN RUM:	STR 30	Fine Rear end	Dry	60	3	CAR CAR OMV	F59 F20 U U	S in PITTWATER RD S in PITTWATER RD S in PITTWATER RD	35 Proceeding in lane Unk Proceeding in lane Unk Proceeding in lane		N	0	0	
729163 E42744958	20/10/2010	Wed	09:20	20 m	N HOWARD AVE	DIV RUM:	STR 30	Fine Rear end	Dry	60	4	4WD VAN CAR 4WD	F48 M82 F51 F33	S in PITTWATER RD S in PITTWATER RD S in PITTWATER RD S in PITTWATER RD	40 Proceeding in lane 0 Stationary 0 Stationary 0 Stationary		N	0	0	
686034 E160730094	19/10/2009	Mon	17:20	50 m	N HOWARD AVE	DIV RUM:	STR 30	Fine Rear end	Dry	50	4	CAR CAR CAR CAR	M30 M24 M25 F47	N in PITTWATER RD N in PITTWATER RD N in PITTWATER RD N in PITTWATER RD	30 Proceeding in lane 0 Stationary 30 Veering left 20 Proceeding in lane		I	0	1	
717408 E79911002	09/07/2010	Fri	19:00	10 m	S HOWARD AVE	XJN RUM:	STR 69	Fine Other on path	Dry	60	1	CAR CAR	M25 M25	S in PITTWATER RD S in PITTWATER RD	15 Proceeding in lane		N	0	0	
756517 E185800194	05/06/2011	Sun	19:25	5 m	N HOWARDS AVE	XJN RUM:	STR 30	Fine Rear end	Dry	60	2	CAR 4WD	M42 M U	S in PITTWATER RD S in PITTWATER RD	40 Proceeding in lane 0 Stationary		I	0	1	
656344 E36203652	18/02/2009	Wed	09:30	5 m	S KINGSWAY MS	XJN RUM:	STR 30	Raining Rear end	Wet	60	2	CAR STA	M25 M56	N in PITTWATER RD N in PITTWATER RD	50 Proceeding in lane 0 Stationary		N	0	0	
681213 E38489834	07/09/2009	Mon	08:30	5 m	S KINGSWAY MS	XJN RUM:	STR 30	Overcast Rear end	Dry	60	2	CAR TRK	M68 M58	N in PITTWATER RD N in PITTWATER RD	40 Proceeding in lane 0 Stationary		N	0	0	
697995 E39923818	01/02/2010	Mon	11:50	200 m	S MAY RD	DIV RUM:	STR 71	Fine Off rd left => obj	Dry	60	3	CAR UTE PED	F78 N M51	N in PITTWATER RD N in PITTWATER RD PITTWATER RD	50 Proceeding in lane 0 Parked Stand on carriageway		I	0	1	F

Detailed Crash Report

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829067	22/02/2013	Fri	16:11		at NUMBER 910 HN	DIV	STR	Overcast	Dry	60	2	CAR	F39	N in PITTWATER RD		2 Reverse parking	I	0	1	
E170963897						RUM:	2	Ped far side				PED	F74	E in PITTWATER RD		Walk across carriageway				
727159	09/10/2010	Sat	13:50	15 m	N OAK AVE	DIV	STR	Fine	Dry	60	2	CAR	F33	S in PITTWATER RD		50 Proceeding in lane	N	0	0	
E41693960						RUM:	30	Rear end				CAR	F20	S in PITTWATER RD		5 Proceeding in lane				
733971	01/12/2010	Wed	13:10	10 m	S OAKES AVE	TJN	STR	Raining	Wet	60	3	4WD	M40	N in PITTWATER RD		Unk Proceeding in lane	N	0	0	
E43167471						RUM:	30	Rear end				WAG	M82	N in PITTWATER RD		Unk Proceeding in lane				
												TRK	M40	N in PITTWATER RD		Unk Proceeding in lane				
683413	29/09/2009	Tue	09:30		at OAKS AVE	TJN	STR	Fine	Dry	60	2	CAR	M21	N in PITTWATER RD		15 Turning right	I	0	1	
E41036388						RUM:	21	Right through				OMV	M51	S in PITTWATER RD		45 Proceeding in lane				
810940	06/09/2012	Thu	08:15		at OAKS AVE	TJN	STR	Fine	Dry	50	2	TRK	F30	N in PITTWATER RD		15 Turning right	I	0	1	
E49394428						RUM:	21	Right through				M/C	M24	S in PITTWATER RD		45 Proceeding in lane				
647131	26/11/2008	Wed	08:48	10 m	N OAKS AVE	TJN	STR	Fine	Dry	60	2	CAR	M61	S in PITTWATER RD		45 Proceeding in lane	I	0	1	
E35573759						RUM:	2	Ped far side				PED	F42	E in PITTWATER RD		Walk across carriageway				
646835	26/11/2008	Wed	09:00	10 m	N OAKS AVE	TJN	STR	Fine	Dry	60	3	CAR	F20	S in PITTWATER RD		20 Proceeding in lane	N	0	0	
E148062394						RUM:	30	Rear end				CAR	M20	S in PITTWATER RD		0 Stationary				
												CAR	M31	S in PITTWATER RD		0 Stationary				
645524	31/10/2008	Fri	01:20	5 m	S OAKS AVE	TJN	STR	Overcast	Dry	60	2	OMV	M57	N in PITTWATER RD		60 Proceeding in lane	I	0	1	
E35650519						RUM:	30	Rear end				CAR	F24	N in PITTWATER RD		0 Stationary				
650619	11/12/2008	Thu	16:55	10 m	S OAKS AVE	TJN	STR	Overcast	Dry	60	2	P/C	M28	S in PITTWATER RD		Proceeding in lane	I	0	1	
E35952479						RUM:	63	Vehicle door				TRK	M29	S in PITTWATER RD		0 Parked				
725760	22/09/2010	Wed	18:30	20 m	S OAKS AVE	DIV	STR	Fine	Dry	60	4	OMV	M23	S in PITTWATER RD		10 Proceeding in lane	N	0	0	
E43002953						RUM:	30	Rear end				CAR	M20	S in PITTWATER RD		0 Stationary				
												CAR	F22	S in PITTWATER RD		0 Stationary				
												4WD	F28	S in PITTWATER RD		0 Stationary				
716149	27/06/2010	Sun	13:23	25 m	S OAKS AVE	DIV	STR	Overcast	Dry	60	6	WAG	M22	S in PITTWATER RD		50 Proceeding in lane	I	0	1	
E41267206						RUM:	30	Rear end				CAR	F26	S in PITTWATER RD		0 Stationary				
												CAR	M34	S in PITTWATER RD		0 Stationary				
												WAG		S in PITTWATER RD		0 Parked				
												4WD		S in PITTWATER RD		0 Parked				
												CAR		S in PITTWATER RD		0 Parked				
663545	15/04/2009	Wed	21:40		at PACIFIC PDE	TJN	STR	Fine	Dry	60	2	CAR	M25	S in PITTWATER RD		45 Proceeding in lane	I	0	1	
E36556710						RUM:	30	Rear end				M/C	M30	S in PITTWATER RD		35 Proceeding in lane				
771692	11/10/2011	Tue	14:50	5 m	N PACIFIC PDE	TJN	STR	Fine	Dry	60	2	CAR	M88	S in PITTWATER RD		50 Proceeding in lane	I	0	1	
E45673417						RUM:	30	Rear end				CAR	F29	S in PITTWATER RD		0 Stationary				

Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors
SF																				
733980	01/12/2010	Wed	06:50	15 m	N	PACIFIC RD	DIV	STR	Raining	Wet	60	2	CAR	F37	S in PITTWATER RD	30 Proceeding in lane		N	0	0
E43324767							RUM:	30	Rear end				CAR	M25	S in PITTWATER RD	0 Stationary				
638401	13/09/2008	Sat	00:05		at	ST DAVID AVE	XJN	STR	Fine	Dry	60	2	CAR	M22	N in PITTWATER RD	50 Proceeding in lane		N	0	0
E67089102							RUM:	10	Cross traffic				CAR	M20	W in ST DAVID AVE	20 Proceeding in lane				
771024	13/10/2011	Thu	22:40		at	ST DAVID AVE	XJN	STR	Fine	Dry	60	2	CAR	M65	N in PITTWATER RD	40 Proceeding in lane		I	0	1
E48484288							RUM:	2	Ped far side				PED	M24	W in PITTWATER RD	Run across carriageway				
828809	04/03/2013	Mon	06:20		at	ST DAVID AVE	XJN	STR	Fine	Dry	70	2	CAR	M24	N in PITTWATER RD	55 Proceeding in lane		I	0	1
E52531982							RUM:	10	Cross traffic				CAR	F43	W in ST DAVID AVE	Unk Proceeding in lane				
732086	04/11/2010	Thu	07:16		at	STURDEE PDE	TJN	STR	Raining	Wet	60	2	CAR	M28	N in PITTWATER RD	5 Turning right		I	0	1
E42287817							RUM:	21	Right through				4WD	M34	S in PITTWATER RD	40 Proceeding in lane				
779758	31/12/2011	Sat	12:30		at	STURDEE PDE	TJN	STR	Fine	Dry	60	2	4WD	F40	N in PITTWATER RD	15 Proceeding in lane		I	0	1
E149301398							RUM:	30	Rear end				CAR	F39	N in PITTWATER RD	0 Stationary				
781838	23/01/2012	Mon	07:45		at	STURDEE PDE	TJN	STR	Fine	Dry	60	2	M/C	M48	S in PITTWATER RD	40 Proceeding in lane		I	0	1
E177193995							RUM:	74	On road-out of cont.				TRK	M45	N in PITTWATER RD	0 Wait turn right				
810792	18/09/2012	Tue	19:15		at	STURDEE PDE	TJN	STR	Raining	Wet	60	2	CAR	F29	N in PITTWATER RD	10 Turning right		N	0	0
E49222503							RUM:	21	Right through				CAR	M73	S in PITTWATER RD	60 Proceeding in lane				
813181	26/09/2012	Wed	12:15		at	STURDEE PDE	TJN	STR	Fine	Dry	60	2	M/C	M27	S in PITTWATER RD	Unk Turning left		I	0	1
E95243902							RUM:	37	Left turn sideswipe				STA	M55	S in PITTWATER RD	15 Turning left				
826981	09/02/2013	Sat	10:15		at	STURDEE PDE	TJN	STR	Fine	Dry	60	3	CAR	F31	N in PITTWATER RD	Unk Proceeding in lane		N	0	0
E51015568							RUM:	30	Rear end				4WD	M42	N in PITTWATER RD	Unk Proceeding in lane				
													CAR	F30	N in PITTWATER RD	Unk Proceeding in lane				
835887	08/04/2013	Mon	18:35		at	STURDEE PDE	TJN	STR	Fine	Dry	60	2	4WD	M20	N in PITTWATER RD	15 Turning right		I	0	1
E51591168							RUM:	21	Right through				M/C	M25	S in PITTWATER RD	40 Proceeding in lane				
833631	13/04/2013	Sat	18:35		at	STURDEE PDE	TJN	STR	Fine	Dry	60	3	4WD	M26	S in PITTWATER RD	Unk Proceeding in lane		N	0	0
E98780701							RUM:	30	Rear end				WAG	M68	S in PITTWATER RD	30 Proceeding in lane				
													CAR	F26	S in PITTWATER RD	10 Proceeding in lane				
783372	05/02/2012	Sun	13:10	5 m	N	STURDEE PDE	TJN	STR	Fine	Dry	60	2	CAR	F31	S in PITTWATER RD	50 Proceeding in lane		N	0	0
E46886947							RUM:	30	Rear end				4WD	M22	S in PITTWATER RD	0 Stationary				
673032	17/01/2009	Sat	11:45	25 m	N	STURDEE PDE	DIV	STR	Fine	Dry	60	3	CAR	M43	S in PITTWATER RD	Unk Proceeding in lane		N	0	0
E35764360							RUM:	30	Rear end				CAR	M30	S in PITTWATER RD	0 Stationary				
													TRK	U U	S in PITTWATER RD	0 Stationary				
687130	23/10/2009	Fri	16:15	5 m	S	STURDEE PDE	TJN	STR	Fine	Dry	60	2	CAR	F26	N in PITTWATER RD	10 Proceeding in lane		I	0	1
E38865806							RUM:	30	Rear end				M/C	M27	N in PITTWATER RD	0 Stationary				

Detailed Crash Report

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors	
ST																					
757980	27/06/2011	Mon	12:55	10 m	S STURDEE PDE	TJN	STR	Fine	Dry	60	2	CAR	F44	N in PITTWATER RD	40	Proceeding in lane	I	0	1		
E45466942						RUM:	30	Rear end				4WD	F27	N in PITTWATER RD	0	Stationary					
679645	26/08/2009	Wed	10:00		at STURDEE ST	TJN	STR	Fine	Dry	60	2	STA	M44	S in PITTWATER RD	5	Turning left	N	0	0		
E38342948						RUM:	37	Left turn sideswipe				WAG	M25	S in PITTWATER RD	50	Turning left					
St David Ave																					
748538	11/04/2011	Mon	17:00	10 m	E FISHER RD	XJN	STR	Fine	Dry	50	3	CAR	M63	E in ST DAVID AVE	10	Proceeding in lane	N	0	0		
E152368296						RUM:	30	Rear end				CAR	M U	E in ST DAVID AVE	0	Stationary					
												CAR	F39	E in ST DAVID AVE	0	Stationary					
Sturdee Pde																					
730530	10/09/2010	Fri	21:45	10 m	E PITTWATER RD	TJN	STR	Fine	Dry	50	3	CAR	M42	S in PITTWATER RD	40	Turning left	I	0	2		
E41946154						RUM:	0	Ped nearside				PED	M45	S in STURDEE PDE		Walk across carriageway					
												PED	F47	S in STURDEE PDE		Walk across carriageway					
731176	09/10/2010	Sat	16:44	20 m	E PITTWATER RD	2WY	STR	Fine	Dry	60	3	CAR	F28	S in STURDEE PDE	50	Forward from drive	I	0	1		
E42168132						RUM:	47	Emerging from drive				M/C	M27	E in STURDEE PDE	Unk	Proceeding in lane					
												OMV		W in STURDEE PDE	0	Parked					
660732	17/02/2009	Tue	21:03	40 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	F32	W in STURDEE PDE	Unk	Pulling out	I	0	1		
E36510734						RUM:	43	Entering parking				M/C	M46	W in STURDEE PDE	50	Proceeding in lane					
663927	12/04/2009	Sun	14:30	100 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	F25	E in STURDEE PDE	Unk	Perform U-turn	I	0	1		
E37127118						RUM:	40	U turn				WAG	M18	E in STURDEE PDE	Unk	Proceeding in lane					
686909	27/10/2009	Tue	08:20	100 m	E PITTWATER RD	2WY	STR	Overcast	Dry	50	2	CAR	M21	E in STURDEE PDE	Unk	Pull out opposite	N	0	0		
E160930294						RUM:	50	Head on (overtake)				CAR	F U	W in STURDEE PDE	Unk	Proceeding in lane					
838045	29/04/2013	Mon	13:40	100 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	1	M/C	M44	E in STURDEE PDE	30	Proceeding in lane	I	0	1		
E51256247						RUM:	74	On road-out of cont.													
729616	20/10/2010	Wed	18:50	110 m	E PITTWATER RD	2WY	STR	Fine	Dry	50	2	CAR	M26	S in STURDEE PDE	5	Forward from drive	I	0	1		
E42347413						RUM:	47	Emerging from drive				M/C	M37	E in STURDEE PDE	30	Proceeding in lane					
Report Totals:		Total Crashes: 145				Fatal Crashes: 0				Injury Crashes: 81				Killed: 0				Injured: 85			

Crashid dataset 6048 - Crashes within the study area July08 to June13

Appendix B

Concept design drawing



