NOTE: The Mayor, Councillor Regan thanked the outgoing Deputy Mayor, Councillor Heins for her contributions over the last 12 months and welcomed the new Deputy Mayor, Councillor Menano-Pires.

8.3 DEE WHY TOWN CENTRE PLANNING PROPOSAL

NOTE: With the permission of the mover and seconder the addition of Point D to the motion was accepted

Cr Regan / Cr Menano-Pires

That Council:

A. Forward the Planning Proposal to the Department of Planning and Environment seeking gateway Determination

B. Upon Gateway Determination publicly exhibit the Planning Proposal and the draft amendments to the Warringah Development Control Plan concurrently

C. Adopt the findings from the Dee Why Town Centre Traffic Model Update (March 2014) by GHD Australia.

D Note the submission made by Mr Robert Player.

AMENDMENT

Cr De Luca / Cr Giltinan

That Council:

A. Forward the Planning Proposal to the Department of Planning and Environment seeking a gateway Determination with the exception of any increase in height particularly in view of the rejection of the Cobalt Development at 701 Pittwater Road Dee Why by Warringah Council's WDAP and the JRPP for: "The principal reason is the variation of permissible height from 24m to 51m is excessive".

B. Upon Gateway Determination publicly exhibit the Planning Proposal and the draft amendments to the Warringah Development Control Plan concurrently

C. Adopt the findings from the Dee Why Town Centre Traffic Model Update (March 2014) by GHD Australia.

Councillor Harrison left the chamber at 6:27pm

Councillor Harrison returned to the chamber at 6:30pm

VOTING

For the amendment: Crs De Luca and Giltinan

Against the amendment: Crs Gobert, Harrison, Heins, Menano-Pires, Moskal and Regan

LOST

Submission by Mr Rob Player tabled at Council meeting 23 September 2014.

THAT COUNCIL ALSO NOTES the amendments proposed by Mr. Player of DFP Planning Consultants and requests that these be taken into account in the drafting of the amendments to the Warringah LEP and DCP for the Dee Why Town Centre Planning Proposal.

The objectives of these proposed further amendments are:

A. to clarify the intended operation across the Dee Why Town Centre of certain provisions of the Draft amendments Warringah Local Environmental Plan 2011, and

B. to ensure that the draft amendments reflect the existing development proposals for Key Sites A, B and F.

The proposed further amendments are:

1. that the 3 metre maximum height allowance for roof top plant including lift overruns and roof access as referred to in clause 7.10 is in addition to the building heights shown on the Building Height Map;

2. that car parking is deemed to be below ground if it is lower than the existing ground level at the highest point of the site;

3. (a) that Key Site F is assigned a 4.4:1 maximum FSR on the Floor Space Ratio Map;

   (b) that floor space to be dedicated to Council for public and/or community purposes be excluded from the calculation of FSR; and

   (c) that the limitation that any variation in FSR for Key Site F be "minor" is deleted from clause 7.16; and

4. that the requirement for tower elements to be set back from the podium edge does not apply to Key Sites A, B and F.

ITEM 8.3	**DEE WHY TOWN CENTRE PLANNING PROPOSAL**
REPORTING MANAGER	**GROUP MANAGER STRATEGIC PLANNING**
TRIM FILE REF	**2014/235476**
ATTACHMENTS	**1 Dee Why Town Centre Planning Background and Chronology (Included In Attachments Booklet)** **2 Draft Warringah LEP Maps (Included In Attachments Booklet)** **3 Draft WLEP 2011 Amending Provisions (Included In Attachments Booklet)** **4 Draft Development Control Plan Amendments (Included In Attachments Booklet)** **5 Planning Proposal Dee Why Town Centre - Gateway Submission (Included In Attachments Booklet)** **6 Dee Why Town Centre Traffic Model Update (Included In Attachments Booklet)**

EXECUTIVE SUMMARY

PURPOSE

To seek Council's endorsement to commence amendments to planning controls within the Warringah Local Environmental Plan (WLEP) 2011 and Development Control Plan (DCP) as they relate to the Dee Why Town Centre.

SUMMARY

1. The Dee Why Town Centre Planning Proposal (the Planning Proposal) seeks to amend Council's planning instruments in order to implement strategies and recommendations contained within the Dee Why Master Plan 2013 (the Master Plan) and GHD Town Centre Traffic Model. Key amendments to Council's planning instruments include;

   (a) The designation of four new 'Key Sites' which are earmarked to deliver significant infrastructure and public benefits

   (b) The introduction of 'Floor Space Ratio' (FSR) development controls for land zoned B4 Mixed Use

   (c) The refinement of planning controls that relate to building setbacks, building height and design. The amendments aim to improve the relationship of future development on the streetscape and to protect the amenity of public places

   (d) The provision of an assessment framework which will allow the delivery of public benefits (by developers) in exchange for additional development rights.

2. The amendments to the DCP relate to Dee Why Town Centre specific car parking requirements for residential and various commercial land uses. The amending parking rates consider that the Dee Why Town Centre has increased accessibility to a range of transport options compared to the remainder of the Warringah Local Government Area (LGA).

The Planning Proposal does not seek to rezone land, nor does it amend any planning provisions as they relate to 'Site A', Council's carpark site between Howard and Oaks Avenue, or 'Site B', the former Multiplex/Brookfield site currently subject to Planning Proposal application PEX 2014/0004.

It should be stated that the proposed changes in height across the whole of Dee Why Town Centre, affects land owned by Warringah Council. Sections of the carpark fronting Pittwater Road and St Davids Avenue are proposed to increase in height from 24 metres to 27 metres which is consistent with the general increase of 3 metres across the whole of Dee Why Town Centre.

FINANCIAL IMPACT

The outcome of these proposed changes will generate additional infrastructure funded by the developers to support the new development within Dee Why Town Centre Council.

POLICY IMPACT

Nil

RECOMMENDATION OF DEPUTY GENERAL MANAGER ENVIRONMENT

That Council:

A. Forward the Planning Proposal to the Department of Planning and Environment seeking Gateway Determination

B. Upon Gateway Determination publicly exhibit the Planning Proposal and the draft amendments to the Warringah Development Control Plan concurrently

C. Adopt the findings from the Dee Why Town Centre Traffic Model Update (March 2014) by GHD Australia.

REPORT

BACKGROUND

Over a number of years, Council has commissioned several studies and strategy documents that detail the desired built form and public domain improvements required to rejuvenate the Dee Why Town Centre. A chronology of events has been enclosed as Attachment 1.

The Dee Why Master Plan 2013 (the Master Plan) incorporates findings from previous studies, detailed urban design analysis and the outcomes of a comprehensive community and industry group consultation. Council adopted the Master Plan at its meeting held 6 August 2013 and has since implemented a number of recommendations via the 'Get Excited Dee Why' Steering Committee.

The Committee continues to facilitate short and medium term projects to enliven the Dee Why Town Centre while other outcomes within the Master Plan can only be implemented through amendments to the WLEP 2011 and DCP.

In addition to the Master Plan, the proposed planning provisions have also been influenced by the conclusions contained within the GHD Traffic Model Update (March 2013) and Council's ongoing assessment of the required Dee Why Town Centre improvements.

Dee Why Town Centre infrastructure and improvements

There is renewed interest in private development within the Dee Why Town Centre. This is partly attributed to the Department of Planning and Environment, through consecutive versions of the Metropolitan Strategy, designating Brookvale and Dee Why collectively as a Major Centre and therefore the focus of increased housing, employment and supporting infrastructure.

Although grouped as the one centre, the two areas have different character as Dee Why contains the majority of civic, cultural and social amenities, whilst Brookvale contains the major regional shopping mall, bulky goods retail, some medical and community services as well as the regional TAFE. The Master Plan focuses on the significant opportunities for revitalising Dee Why through a combination of the development of private landholdings and improvement to the public domain.

The projected growth of the Major Centre needs to be supported by social and physical infrastructure to ensure an improved user experience. Key infrastructure and public domain upgrades highlighted within in the Master Plan and in Council's capital works programme include:

- Creation of a civic centre "Community Hub" including an outdoor plaza, amphitheatre and new library facilities
- Public car parking
- New bicycle lanes
- New roads and upgrades to existing roads
- Improve Dee Why Town Centre permeability for pedestrians and cyclists
- Interconnected public open space and plaza areas
- Improving streetscape through landscaping
- Use of water-sensitive urban design
- Flood mitigation and drainage works.

Existing funding streams, including the Warringah Section 94A Developer Contributions Plan do not provide for sufficient finances to complete all the priority public domain improvements and infrastructure upgrades within the desired timeframes.

The 2013 Dee Why Master Plan expressly identifies LEP amendments as a mechanism to introduce incentives, such as additional development rights, to encourage applicants to provide a range of public benefits.

Traffic and Transport

During community consultation of the Master Plan the most commonly noted issue related to traffic management at both the local and regional level. Previous community surveys have also indicated that transport/traffic management and congestion is the major 'top of mind' issue in Warringah.

From a regional perspective, Transport NSW has stated that in a 'do nothing' scenario, the Mona Vale to Sydney strategic corridor (which includes Pittwater Road, Dee Why) will be the most congested corridor across Sydney by the year 2031. The Department of Planning and Environment further reinforces traffic constraints in the area by reducing the Brookvale/Dee Why employment targets from 5,000 (within the Metropolitan Plan for Sydney to 2036 (2010)) to 3,000 (within the draft Metropolitan Strategy for Sydney to 2031 (2013)).

The current road network within Dee Why does not allow for the full realisation of achievable floor space under the existing WLEP 2011 due to the confined capacity of the network, particularly in terms of delays at intersections.

While preparing WLEP 2011, Council commissioned GTA traffic consultants to formulate options for Dee Why Town Centre road network upgrades. The preferred network design is commonly referred to as 'Option 2a2' and includes a range of alterations and new roads combined with intersection treatment to improve traffic flow and trip capacity. GTA concluded that implementation of the Option 2a2 road network would accommodate up to 85 precent of the developable floor space permitted under the WLEP 2011.

Updated Traffic Study

Due to the changes in traffic conditions and delivery of various development projects since GTA's 2007 traffic analysis, Council commissioned GHD Australia to review and update the report.

The GHD assessment concludes that the complete implementation of road network Option 2a2 will allow 105 precent WLEP 2011 floor space realisation, that is, the full realisation of the WLEP 2011 floor space with the delivery of up to an extra 5 precent of WLEP 2011 floor space. Any further development above the 105 precent quantum is likely to result in unacceptable traffic delays, particularly at the intersection of Howard Avenue and Pittwater Road.

The difference between the two outcomes (85 precent and 105 precent floor space capacity) is due to the combination of;

- Updated traffic generation rates for residential development as published by Roads and Maritime Service
- The market driven trend for less commercial floor space (which generates more traffic) in exchange for residential development
- The optimisation of traffic light signal phasing.

A copy of the Dee Why Town Centre Traffic Model Update (March 2014) by GHD Australia is enclosed as Attachment 6.

Implication of Traffic Analysis

Although the Master Plan emphasizes that there shall be no increase in gross floor area from that currently achievable under the existing WLEP 2011, the Option 2a2 road network can operate at an acceptable level of performance with the delivery of up to an additional 5 precent of WLEP 2011 floor space.

This provides Council with a unique opportunity to allow for some development proposals to exceed the available gross floor area maximum (set by the WLEP 2011 draft Floor Space Ratio map in Attachment 2). Council has therefore formulated WLEP 2011 and DCP controls to consider development that exceeds the current WLEP 2011 floor space maximum in exchange for the delivery of priority infrastructure and public benefits.

Public Benefits and Capital Value Uplift

Significant infrastructure improvements are required to support the growth and functioning of the Dee Why Town Centre. It is clear that without significant increase in funding, many of the required capital works will not be undertaken within the short and medium terms. A significant opportunity exists to obtain many of the required works from landowners and developers during the development process.

The proposed planning controls and guidelines prepared since the Master Plan outlines the criteria for which additional development rights (such as building height and floor space) can be considered in exchange of the delivery of public benefits.

The process is essentially a negotiation, and includes the valuation of the site based on the currently achievable yield under the WLEP 2011, while a second site valuation is carried out considering the increased development yield. The increase in land value is called capital or site value uplift.

Council's aim is to capture public benefit from the increase in site value. Public benefits can be delivered in a number of forms including the carrying out of works, provision of monetary contributions, dedication of land and other means.

The offer of public benefits in these circumstances does not relieve the developer from paying contributions pursuant to Councils Section 94A Developer Contribution Plan or upgrading infrastructure solely or partly required to service the development itself.

Considering many of the critical road and pedestrian upgrades are within the designated 'Key Sites' and therefore it is these sites that have priority in negotiating additional development rights, particular in the form of additional floor space noting that the quantum of additional floor space is ultimately constrained by the road network capacity. The location of Key Sites is shown on the WLEP 2011 Key Sites map (Attachment 2).

Amendments to planning provisions

In developing the desired outcomes of the Master Plan and supplementary studies, a number of amending WLEP 2011 and DCP provisions have been prepared. A summary of the key amending planning provisions are provided below whereas a full list of the intended amendments and explanatory notes are enclosed as Attachment 3.

Key amendments to the WLEP 2011 and DCP include;

A. Introduction of FSR planning controls and maps.

FSR is the calculation of gross floor area of a building/s as a ratio of the land area. FSR is commonly utilised to set the desired maximum development density.

Objective of FSR

i. To regulate the density of development to suit the desired future character of the Dee Why Town Centre

ii. To provide for an intensity of development that is commensurate with the capacity of existing road network and other existing and proposed infrastructure within and around the Dee Why Town Centre

iii. To ensure that new development minimises adverse impacts on amenity

iv. To allow Council to closely monitor the delivery of additional floor space and its associated traffic generation. This allows for accurate monitoring of road network performance and determination of associated upgrades.

Note that the draft Floor Space Ratio map (Attachment 2) represents the maximum gross floor area currently permitted by the existing WLEP 2011 and DCP.

B. Introduction of four additional 'Key Sites' (creating a total of six Key Sites).

Key Sites are located in areas where critical infrastructure and other public benefits such as 'through-site' pedestrian access ways and road network upgrades are identified. Specific outcomes within these sites are stipulated in the proposed draft WLEP 2011 amendments, enclosed as Attachment 3.

Objective

i. To highlight catalyst sites that offer significant potential of fulfilling the objective of revitalising the Dee Why Town Centre

ii. To highlight sites that may deliver considerable public benefit including pedestrian and road network upgrades in exchange for additional development rights

iii. To implement the endorsed road network 'Option 2a2' outlined in the GHD Traffic report provided in Attachment 4.

C. Introducing flexibility in locating required car parking above ground and reduce the number of required parking spaces for certain land uses.

Dee Why Town Centre specific parking requirements are being introduced to Part H of the DCP in order to reduce the required on-site parking for residential units, business premises, office premises and shops.

Due to difficult site conditions, a clause is being introduced to the WLEP 2011 to permit a proportion of parking to be provided outside of a basement carpark.

Objective

i. To stipulate the criteria and circumstances of when new development may locate parking above ground

ii. To stipulate the proportion of parking permitted in above ground structures

iii. To stipulate the requirements to visually screen above ground parking structures

iv. To reduce the number of spaces required for parking due to the improved accessibility of public transport within the Dee Why Town Centre.

The reduced parking requirements reflect the increased accessibility to public transport within the Dee Why Town Centre as compared to the remainder of the Warringah LGA and the increased likelihood of multi-purpose trips to the Dee Why Town Centre that is, parking once and visiting a number of shops and businesses. Further, the Dee Why Town Centre

contains businesses where peak visitation times vary, along with the demand for parking spaces.

D. Amendments to planning controls that relate to buildings setbacks and reduce the number of permissible 'podium' building levels.

As the proposed WLEP 2011 amendments may allow certain development to exceed the building height and FSR maximums, further emphasis is placed other aspects of development including building setbacks, street frontage height and building separation. In turn, planning controls relating to the number of podium building levels and building setbacks are to be located within the WLEP 2011 in order to give them statutory weight.

Objective

i. Reducing the maximum number of podium building levels seeks to increase solar access to adjoining land and buildings. The proposed controls also allow for a development with no podiums which would maximise the opportunity for additional ground level pedestrian circulation space

ii. To encourage a less dominant built form when viewed from open space and the street

iii. To promote adequate building separation and the retention of development potential for lots adjoining a development.

E. Amend the draft Height of Building map (Attachment 2) to increase the maximum permissible building height across the Dee Why Town Centre (excluding Key Site A and B) by one building level/ three metres.

As a result of mandating one less building podium level (outlined in D above), an additional storey is permitted to allow for the 'transplanting' of podium floor space. The option of delivering a building without a podium element is also available however extra building height would not be justified on this basis alone.

Objective

i. To encourage buildings that incorporate 'slimmer' tower elements

ii. To encourage buildings of suitable proportions

iii. To facilitate increased solar access to residents and the public domain

F. Provide criteria for the provision of infrastructure items and public benefits in exchange for additional development rights such as building height and extra gross floor area.

Objective

i. To promote the delivery of public benefits by developers and landowners

ii. To list the criteria in which additional development rights such as building height and gross floor area may be granted in exchange for public benefits

iii. To establish a process to assess development proposals that seeks to deliver public benefits

iv. To implement the endorsed 'Option 2a2' road network contained within the GHD Traffic report provided in Attachment 4.

Any additional building height permitted through negotiation will need to adhere to principles contained within the Master Plan and WLEP 2011 which includes transitioning building height down from the tallest buildings in the core (Key Site A and Site B) to the edges of the Dee Why Town Centre.

Any additional floor space above that currently permitted will need to consider the current and proposed road network capacity, the desired character and the environmental capacity of the site.

Predicted Rate of Development

One of the main impediments in rejuvenating Dee Why is the viability of redevelopment. Fragmented land holdings, land acquisition costs and environmental constraints such as flooding and topography all increased cost for redeveloping older building stock.

Without development of private landholdings, many of the Master Plan recommendations will not be realised.

A number of the proposed amendment to WLEP 2011 and DCP planning controls aim to improve the viability of re-developing land within the Dee Why Town Centre by;

- Providing flexible planning controls that permit, in certain circumstances, additional floor space and/or building height in exchange for the provision of public benefits
- Allowing flexibility in building design
- Reducing the required number of on-site car parking for certain land uses
- Permitting above ground car parking in certain circumstances
- Improving investor confidence within the Dee Why Town Centre through the reinforcement of development density and improved public amenity
- Providing certainty by implementing the findings of the Master Plan which were a result of extensive community consultation.

CONSULTATION

Consultation with government authorities and the public exhibition of the Planning Proposal will be carried out in accordance with the terms stipulated within the Gateway Determination issued by the Department of Planning and Environment.

FINANCIAL IMPACT

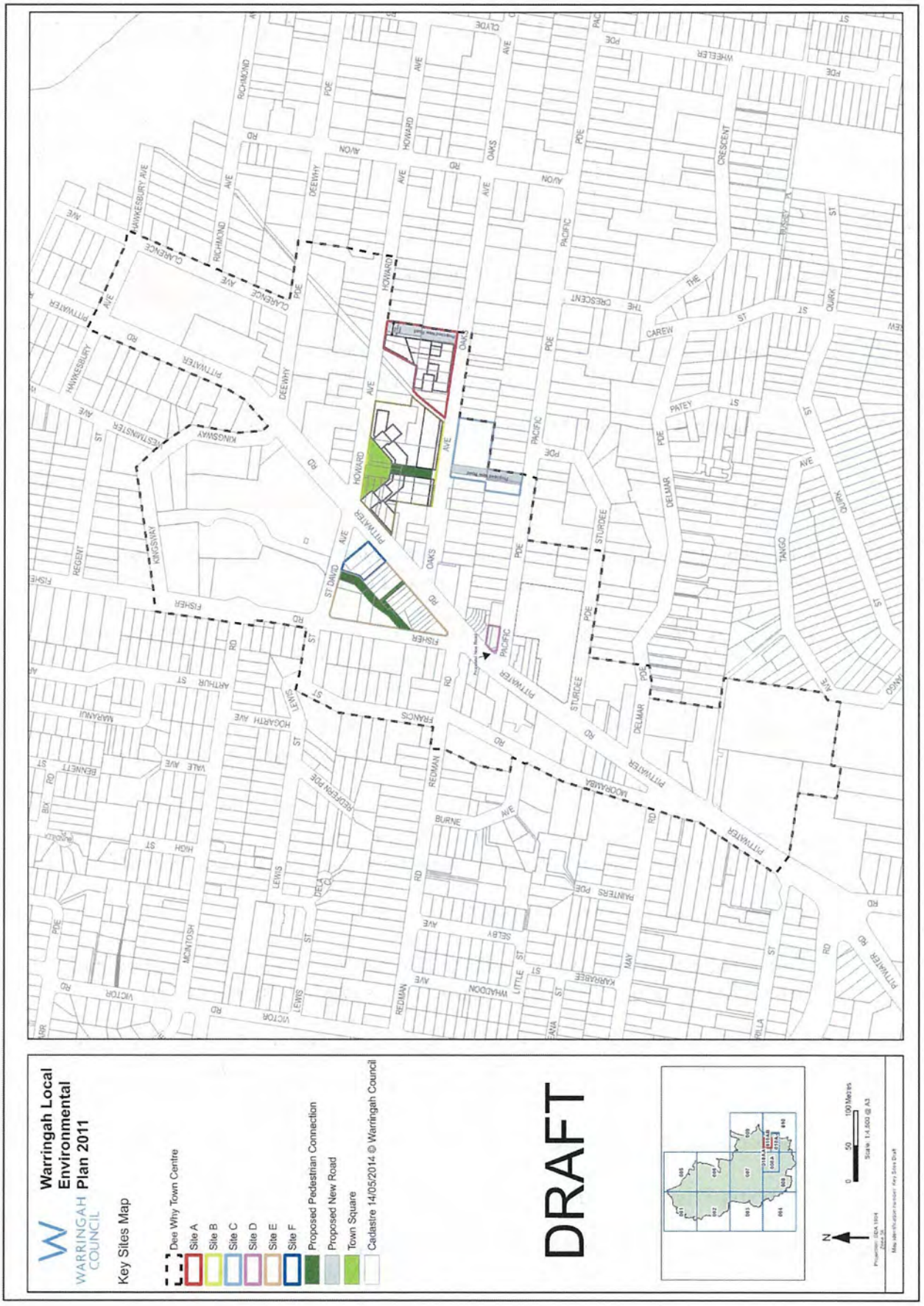
The outcome of these proposed changes will generate additional infrastructure funded by the developers to support the new development within Dee Why Town Centre.

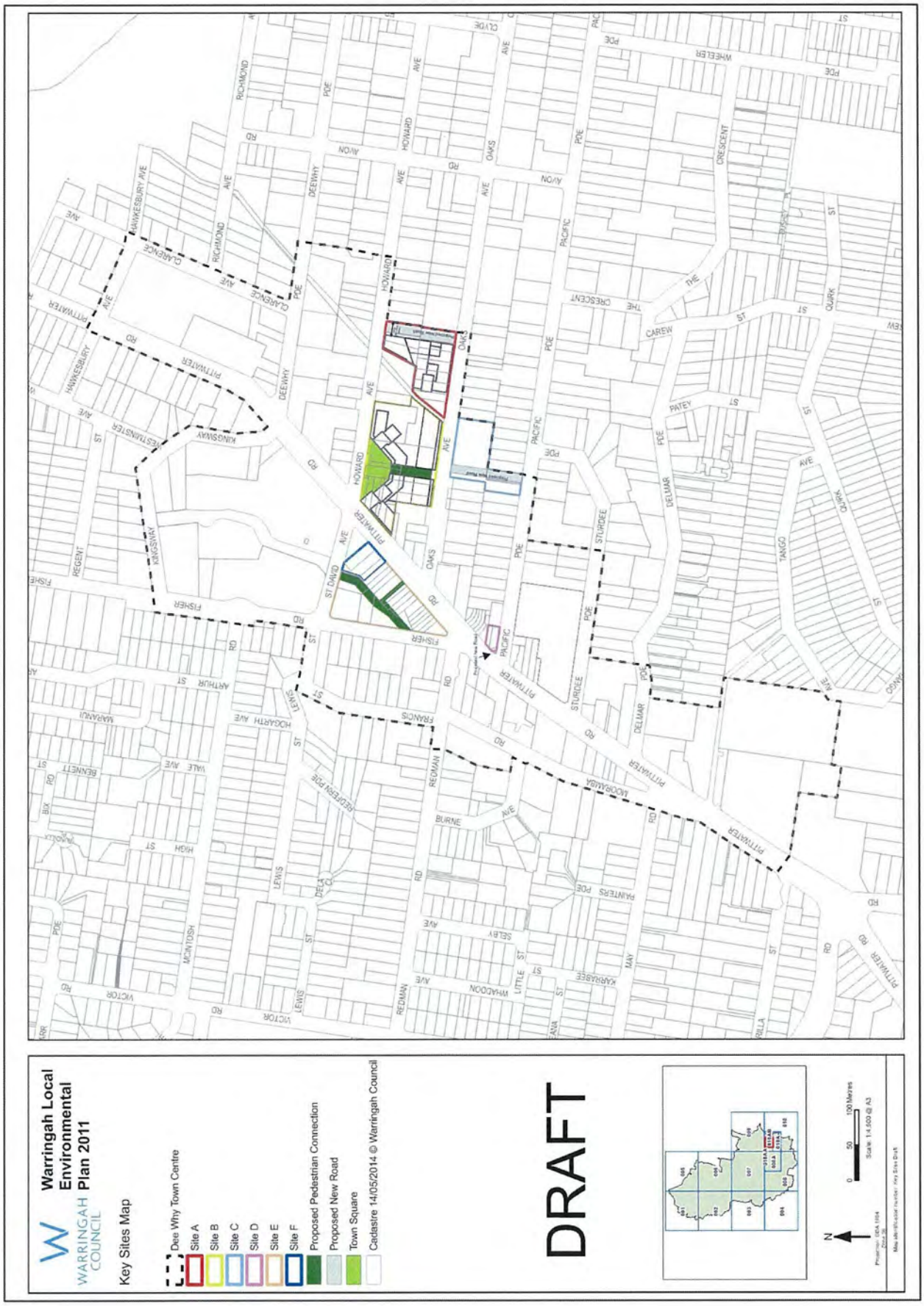
POLICY IMPACT

Nil

Chronology and planning background for Dee Why Town Centre 2000-2014

2000	Gazettal of the Warringah Local Environment Plan 2000 which implements findings from the Dee Why Urban Strategy Document (1996) and Urban Design Master plan and Cost Report (1998)
2004	NSW Government Architect Master Plan
2005	*City of Cities - Metropolitan Strategy* by the Department of Planning designates Brookvale/Dee Why as a Major Centre
2007	Release of draft North East Subregion Subregional Strategy with specific employment and dwellings targets for Major Centres
2007	Development of 'Site A' Master Plan proposal (Council-owned site)
	Development of 'Site B' Master Plan proposal (Multiplex-Vumbaca Joint Venture site) Urban Form Study
2007	Dee Why Town Centre Urban Design Review- Independent urban design review of the 'Site A & B' Master Plans and Urban Form Study
2009	Gazettal of the Warringah Local Environment Plan 2000 (Amendment No. 21) which implements specific Site A and Site B planning controls.
2010	Dee Why Town Centre Visioning forum
2011	Gazettal of the Warringah Local Environment Plan 2011 inclusive of detailed provisions for Site A and Site B
2012	Engagement of Place Design Group and formulation of the Dee Why Town Centre Working Party to deliver a new Dee Why Town Centre Master Plan
2013	Adoption of the Dee Why Master Plan 2013
	The 'Get Excited Dee Why' Steering Committee is established to implement recommendations of the Master Plan which includes 'Quick-win' projects.
	Drafting of Warringah Local Environment Plan 2011 and Development Control Plan amendments seeking to implement Master Plan objectives.
2014	GHD Consultants complete an update of the 2007 GTA Traffic Study (Dee Why Town Centre Traffic Model Update March 2014)
	Planning Proposal lodged by owner of Site B
Current	Preparation of the Dee Why Town Centre Planning Proposal and supporting documents which aim to implement the Dee Why Master Plan


Warringah Local Environmental Plan 2011
WARRINGAH COUNCIL
Key Sites Map
Dee Why Town Centre
Site A
Site B
Site C
Site D
Site E
Site F
Proposed Pedestrian Connection
Proposed New Road
Town Square
Cadastre 14/05/2014 © Warringah Council
DRAFT
0
50
100 Metres
Scale: 1:4,500 @ A3
N


Warringah Local Environmental Plan 2011
WARRINGAH COUNCIL
Key Sites Map
Dee Why Town Centre
Site A
Site B
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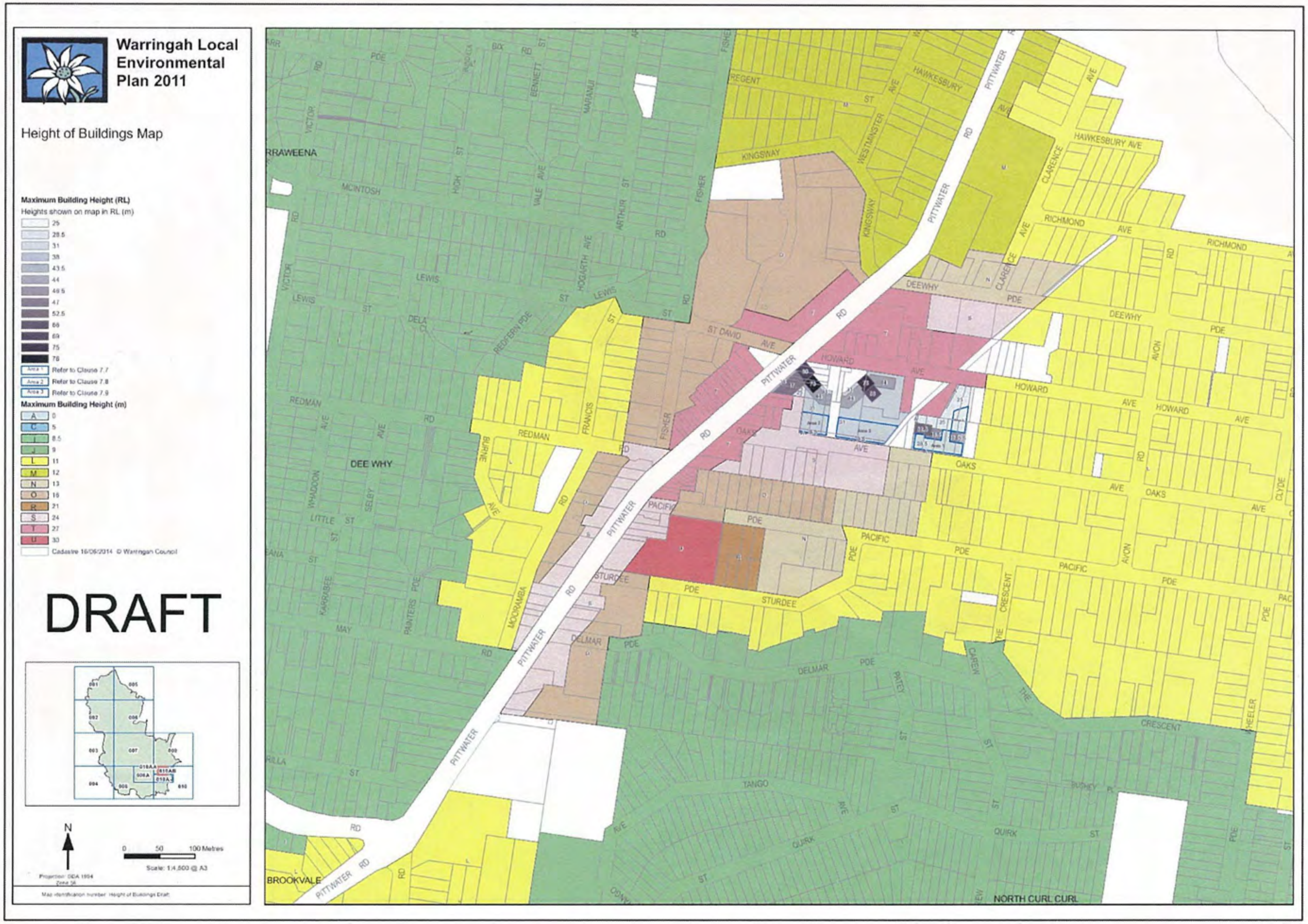
Proposed Pedestrian Connection
Proposed New Road
Town Square
Cadastre 14/05/2014 © Warringah Council
DRAFT
0
50
100 Metres
Scale: 1:4,500 @ A3
N


Warringah Local Environmental Plan 2011
Floor Space Ratio Map
Maximum Floor Space Ratio (n:1)
R 1.45
S 1.6
T 2.4
U 2.5
V 3.0
W1 3.2
W2 3.4
X 3.8
Y1 4.0
Y2 4.1
Y3 4.4
Cadastre 16/06/2014 © Warringah Council
DRAFT
DEE WHY
BROOKVALE
NORTH CURL CURL
KRAMEENA
0
50
100 Metres
Scale 1:4,500 @ A3
N


Warringah Local Environmental Plan 2011
Height of Buildings Map
Maximum Building Height (RL)
Heights shown on map in RL (m)
25
28.5
31
38
43.5
44
49.5
47
52.5
66
69
75
78
Refer to Clause 7.7
Refer to Clause 7.8
Refer to Clause 7.9
Maximum Building Height (m)
A 0
C 5
I 8.5
J 9
L 11
M 12
N 13
O 16
R 21
S 24
T 27
U 30
DRAFT
N
0 50 100 Metres
Scale: 1:4,500 @ A3
DEE WHY
BROOKVALE
NORTH CURL CURL
PITTWATER RD
HOWARD AVE
OAKS AVE
PACIFIC PDE
STURDEE PDE
DELMAR PDE
REDMAN RD
RICHMOND AVE
HAWKESBURY AVE
DEEWHY PDE
KINGSWAY
REGENT ST
ST DAVID AVE
CRESCENT
QUIRK ST
TANGO AVE
LEWIS ST
MCINTOSH RD
VICTOR RD
FISHER RD
MAY RD
LITTLE ST

WARRINGAH COUNCIL

Draft amendments Warringah Local Environmental Plan 2011

DEE WHY TOWN CENTRE

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SCHEDULE OF DRAFT AMENDMENTS

WARRINGAH LOCAL ENVIRONMENTAL PLAN

2011

This document provides suggested wording for amending clauses to Warringah Local Environment Plan (WLEP) 2011. Note that the wording and effect of the clauses may change in response to Councils resolution, consultation with the Department of Planning and Infrastructure, public authorities and the outcomes of the upcoming public exhibition.

Explanatory notes have also been provided to clarify the intent of the amendments.

A. Warringah Local Environment Plan Maps

A range of map changes are required in order to support and compliment the new planning provisions. The proposed mapping changes are detailed in Table 1.

Warringah LEP 2011 Maps	Proposed Amendments
No current Floor space ratio map	Introduce Floor Space Ratio maps to illustrate the maximum gross floor area currently achievable under the existing WLEP 2011 and DCP planning controls.
WLEP 2011 – Height of Buildings Map (HOB-010AA & HOB-010AB)	Except for Key Site A* and B*, increase the maximum height of buildings for all land zoned B4 Mixed Use by 3 metres. *Key Sites A and B are the subject to specific Planning Proposals and separate analysis in terms of potential future development.
WLEP 2011 – Key Sites (KYS- 010AA & KYS-010AB)	Retain Key Site A and B as per the existing Key Site notation and add the following properties as key sites; • Site C- 33 Oaks Avenue Dee Why (Lot 1, DP 588603, Lot B DP 326907) • Site D- 848 & 850 Pittwater Road Dee Why (Lot CP SP 15960, Lot 1 DP 539517) • Site E- Total of 20 lots bounded by Pittwater and Fisher Road and St David's Avenue Dee Why.

Table 1 Amendments to the Warringah LEP maps

Explanatory Note

A Floor Space Ratio (FSR) map is being introduced for all land zoned B4 Mixed Use within the Dee Why Town Centre. The advantage of a FSR control is that it sets the desired maximum development density.

The use of an FSR has the added advantage of allowing Council to monitor the quantum of gross floor area being developed, and associated incremental increase of traffic generation. This is considered particularly important for the Dee Why Town Centre which has a constrained road network capacity.

B. Amending provisions

4.4 Floor Space Ratio (New Clause)

(1) The objectives of this Clause are as follows:

(a) To provide sufficient floor space to support the growth of the Dee Why Town Centre

(b) To regulate the density of development and land use intensity so as to not exceed the capacity of the local road network

(c) To provide for an intensity of development that is commensurate with the capacity of existing and planned infrastructure within, and proximity to the Dee Why Town Centre

(d) That new development in the Dee Why Town Centre reflects the desired character of the locality and minimises adverse impacts on the amenity of that locality.

(2) The maximum FSR for a building on any land is not to exceed the floor space ratio shown for the land on the draft Floor Space Ratio Map.

Explanatory note

FSR is the calculation of gross floor area of a building/s as a ratio of the land area. FSR is commonly utilised to set the desired maximum development density on a site by site basis.

In the context of Dee Why, the use of FSRs have the added advantage of allowing Council to monitor the quantum of gross floor area and associated incremental increase of traffic generation in the context of overall road network capacity.

As per Clause 4.4 (2) above, development proposals shall not exceed the stipulated gross floor area to land size ratio illustrated on the WLEP 2011 draft Floor Space Ratio map. However, consent may be given to proposals that exceed the maximum FSR if it is demonstrated that the development complies with the objectives of Clause 4.4(1) above, and the considerations contained within Clause 7.16 outlined on in this document.

4.5 Calculation of FSR and site area (New Clause)

(1) The objectives of this clause are as follows:

(a) To define FSR

(b) To set out rules for the calculation of the site area of development for the purpose of applying permitted FSR, including rules to:

(i) Prevent the inclusion in the site area of an area that has no significant development being carried out on it

(ii) Prevent the inclusion in the site area of an area that has already been included as part of a site area to maximise floor space area in another

building

(iii) Require community land and public places to be dealt with separately.

(2) Definition of "*floor space ratio*"

The FSR of buildings on a site is the ratio of the gross floor area of all buildings within the site to the site area.

(3) Site area

In determining the site area of proposed development for the purpose of applying a FSR, the *site area* is taken to be:

(a) If the proposed development is to be carried out on only one lot, the area of that lot

(b) If the proposed development is to be carried out on two or more lots, the area of any lot on which the development is proposed to be carried out that has at least one common boundary with another lot on which the development is being carried out.

In addition, subclauses (4)–(7) apply to the calculation of site area for the purposes of applying a FSR to proposed development.

(4) Exclusions from site area

The following land must be excluded from the site area:

(a) Land on which the proposed development is prohibited, whether under draft amendments Warringah Local Environment Plan 2011 (this Plan) or any other law

(b) Community land or a public place (except as provided by subclause (7)).

(5) Strata subdivisions

The area of a lot that is wholly or partly on top of another or others in a strata subdivision is to be included in the calculation of the site area only to the extent that it does not overlap with another lot already included in the site area calculation.

(6) Only significant development to be included

The site area for proposed development must not include a lot additional to a lot or lots on which the development is being carried out unless the proposed development includes significant development on that additional lot.

(7) Certain public land to be separately considered

For the purpose of applying a FSR to any proposed development on, above or below community land or a public place, the site area must only include an area that is on, above or below that community land or public place, and is occupied or physically affected by the proposed development, and may not include any other area on which the proposed development is to be carried out.

(8) Existing buildings

The gross floor area of any existing or proposed buildings within the vertical projection (above or below ground) of the boundaries of a site is to be included in the calculation of the total floor space for the purposes of applying a FSR, whether or not the proposed development relates to all of the buildings.

(9) Covenants to prevent "double dipping"

When development consent is granted to development on a site comprised of two or more lots, a condition of the consent may require a covenant to be registered that prevents the creation of floor area on a lot (the restricted lot) if the consent authority is satisfied that an equivalent quantity of floor area will be created on another lot only because the site included the restricted lot.

(10) Covenants affect consolidated sites

If:

(a) A covenant of the kind referred to in subclause (9) applies to any land (affected land)

(b) Proposed development relates to the affected land and other land that together comprise the site of the proposed development

(c) The maximum amount of floor area allowed on the other land by the FSR fixed for the site by this Plan is reduced by the quantity of floor space area the covenant prevents being created on the affected land.

(11) Definition

In this Clause, ***public place*** has the same meaning as it has in the *Local Government Act 1993*.

Explanatory note

This is a standard clause as per the Standard Instrument (Local Environmental Plans) Order 2006. This clause sets out the definition of FSR, the rules for calculating the site area and clarifying the methods of applying a FSR to a site.

Part 7 – Dee Why Town Centre

7.1 Definitions (existing WLEP 2011 clause 7.1 is being amended to the following)

In this Part:

"Dee Why Town Centre" means the land shown on the *Key Sites Map* as the Dee Why Town Centre.

"Proposed New Road" means the land shown on the *Key Sites Map* as the Proposed New Road.

"Site A" means the land shown on the *Key Sites Map* as Site A.

"Site B" means the land shown on the *Key Sites Map* as Site B.

"Site C" means the land shown on the *Key Sites Map* as Site C.

"Site D" means the land shown on the *Key Sites Map* as Site D.

"Site E" means the land shown on the *Key Sites Map* as Site E.

"Site F" means the land shown on the *Key Sites Map* as Site F.

Explanatory note

The existing Clause 7.1 has been amended to include an additional four 'Key Sites'.

Key Sites are deemed to offer significant potential of fulfilling the objectives of revitalising the Dee Why Town Centre. Key sites have been selected on the basis of any one, or a number of the following characteristics below.

Key Sites;

- Are strategically located to provide specific on-site and priority public benefits and key infrastructure items
- Comprise of larger site area in single ownership or consist of a number of sites that can reasonably be expected to amalgamate
- Have the potential to create significant landmark developments
- Form part of, or are located in close proximity to the town centre core
- Have been the subject of extensive urban design and options analysis.

Proposed Clause 7.16 below contains specific objectives for the development of Key Sites C-F whilst the existing WLEP 2011 provisions for Key Sites A and B are being retained within re-numbered clauses.

7.2 Land to which this Part applies (existing WLEP 2011 Clause 7.2 is being amended to the following)

This Part applies to land within the Dee Why Town Centre as Defined on the *Key Sites Map*.

7.3 Objectives for development within Dee Why Town Centre (existing WLEP 2011 Clause 7.3 is being amended to the following)

(1) Consent must not be granted to development on land in the Dee Why Town Centre unless the consent authority is satisfied that the development is consistent with the following objectives:

(a) To create an attractive major centre that sustains the social, economic and environmental needs of its community and visitors

(b) To ensure a balance between high quality housing with a mix of retail, business, employment, civic, cultural and recreational facilities

(c) To ensure that development within the Dee Why Town Centre positively contributes to the provision of a high quality, connected system of public open spaces, pedestrian and cycleway links

(d) To create a consistent built form that includes:

(i) Where minimal ground floor setbacks are proposed, above podium built form that is set back to achieve adequate levels of natural sunlight and high levels of amenity to occupiers, surrounding residents and the adjacent public domain

(ii) Where no podium element is proposed, increased building setbacks at ground level providing useable open space for pedestrian circulation and passive recreation

(e) To achieve good sunlight penetration to public spaces, including footpaths, by building tower elements and modulation

(f) To ensure that development responds to the surrounding natural environment and protects local and district views and vistas

(g) To establish ground floor levels that are occupied by retail and business uses that are:

(i) Active, accessible to the street and create a lively ambience

(ii) Are at the same level as the footpaths and provide opportunities for a generous promenade and distinctive street tree planting for shade and shelter

(h) To accommodate employment opportunities, and provide a range of goods and services by providing at least a level of non-residential land uses within new developments in the B4 Mixed Use zone

(i) To ensure that development positively contributes to pedestrian comfort of the public domain and integration between public and private spaces

(j) To provide for a transition in building height from the permitted building height at Site A and B down to the Dee Why Town Centre boundaries

(k) To establish priority infrastructure and public benefit items to be delivered commensurate with development of Key Sites

(l) To ensure that development is designed to take account of, and be compatible with, the hydrological conditions associated with the Dee Why Lagoon South Catchment

(m) To provide planning provisions that permit additional building height and gross floor area in certain circumstances in exchange for the provision or contribution towards public benefits above that required by the Warringah Section 94A Development Contributions Plan 2013 or equivalent.

Explanatory note

The purpose of the clause is to detail the objectives Council will consider in assessing development proposals within the Dee Why Town centre.

The above objectives rationalise and clarify many of the existing objectives within the current Clause 7.3 with the addition of the Master Plan objective of allowing additional development in certain circumstances in exchange for public benefits.

7.4 Water management (the component of the existing WLEP 2011 Clause 7.4 that relates to water management has been reworded and incorporated into the proposed clause below)

(1) Development consent must not be granted to development on land in the Dee Why Town Centre unless the consent authority is satisfied that the development incorporates:

a) Stormwater management measures, including water sensitive urban design and ecologically sustainable development principles

b) Innovative design solutions that minimise stormwater impacts, including stormwater quantity and quality impacts, on the Dee Why Lagoon system

c) Finished floor levels and basement car park entry levels that include adequate freeboards to protect against the entry of stormwater from the Council's street drainage system.

Explanatory note

The purpose of the Clause is to detail the requirements that development must meet in terms of stormwater management.

7.5 Design excellence within Dee Why Town Centre (the existing WLEP 2011 Clause 7.5 is being amended to the following Clause)

(1) Development consent must not be granted to development involving the construction of a new building or external alterations to an existing building on any site within the Dee Why Town Centre unless the consent authority is satisfied that the development exhibits design excellence.

(2) In determining whether development exhibits design excellence, the consent authority must have regard to the following matters:

(a) Whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved

(b) Whether the form and external appearance of the proposed development will improve the quality and amenity of the public domain

(c) Whether the building meets sustainable design principles in terms of sunlight, natural ventilation, wind, reflectivity, visual and acoustic privacy, safety and security and energy and water efficiency

(d) Whether satisfactory arrangements have been made to ensure that the proposed design is carried through to the completion of the development concerned

(e) Whether the design of communal access and communal recreational areas incorporate exemplary and innovative treatments and will promote a socially effective urban village atmosphere

(f) Whether the development connects with and provides a high quality interface with surrounding streets and public domain areas at pedestrian level.

Explanatory note

This Clause requires that all development in the Dee Why Town Centre be assessed against the design excellence criteria. This Clause replaces existing WLEP 2011 Clause 7.5 *Design excellence within Dee Why Town Centre* and incorporates aims contained within the existing WLEP 2011 Clause *7.4 Development must be consistent with objectives for development and design excellence.*

7.6 Height of buildings Key Sites A & B (minor amendment to existing WLEP 2011 Clause 7.6)

This Clause is currently titled Height of Buildings and identified as Clause 7.6 of WLEP 2011. There are no proposed changes to the wording of this clause apart from adding the words Key Sites A & B to the Clause heading.

7.7 Site A Oaks Avenue above podium elements

There are no proposed changes to the wording of the existing WLEP 2011 Clause.

7.8 Site B Oaks Avenue above podium elements (existing WLEP 2011 Clause)

There are no proposed changes to the wording of this WLEP 2011 Clause.

7.9 Site A Proposed New Road above podium elements (Existing WLEP 2011 Clause)

There are no proposed changes to the wording of this WLEP 2011 Clause.

7.10 Allowance for external ancillary plant and roof access (Existing WLEP 2011 Clause 7.10 has been amended to improve readability)

(1) The objectives of this Clause are:

(a) To ensure that the height and scale of external ancillary structures (whether permanent or temporary) located on roofs do not add to the perceived height of buildings or visually detract from the roof form of buildings

(b) To ensure that roof forms are attractive when viewed from surrounding vantage points, including when viewed at a short distance, from the public domain and surrounding apartment buildings, and when viewed from a long distance, from the southern and western hill sides that have northerly and easterly aspects, respectively, over Dee Why

(c) To promote low scale vegetative landscaping of podium roofs of buildings and the use of podium roof spaces as areas for passive recreation for residents of the buildings concerned.

(2) Development consent must not be granted to development on land in the Dee Why Town Centre involving the construction of a new building or external alterations to an existing building unless the consent authority is satisfied that:

(a) The height of any external ancillary plant or access point is minimised and does not exceed three metres

(b) Any external ancillary plant on the rooftop is centrally located within the roof area or screened behind landscaping or architectural features to minimise or completely avoid being visible from the public domain in close proximity to the building

(c) The total area of such plant and access points does not exceed 10 precent of the roof area

(d) Any balustrade or similar safety restraint (except a building parapet) is set in from the roof edge at least three metres

(e) No external ancillary plant is located on the roof any tall towers located on Site A or the two slimline towers on Site B.

(3) In this Clause "***external ancillary structure***" means an access point or ancillary plant or a balustrade or similar safety restraint.

Explanatory Note

The Clause aims to limit the visual impact of plant/equipment structures on rooftops of buildings.

7.11 Site B Town Square and pedestrian connections (Existing WLEP 2011 Clause)

WLEP 2011 Clause 7.11 is currently titled *Town Square and pedestrian connections.* There are no proposed changes to the wording of this Clause apart from adding the words Key Site B to the Clause heading.

7.12 Provisions promoting retail activity (Existing WLEP 2011 Clause)

This Clause specifically relates to Site A and B and seek to encourage a particular mix of uses and building frontage activation. There are no changes proposed to the wording of this WLEP 2011 Clause.

Explanatory note

It is forecasted that market conditions will continue to favour residential development and therefore traffic analysis assumes that well over half of new floorspace delivered would be for housing.

For this reason, the retention of controls that promote 'active' commercial frontages at the ground level is an important objective considering the benefits it provides, including;

- Agglomeration of commercial uses which are complementary
- Passive surveillance of the street and open space areas
- Buildings with visual interest through human activation and transparent facades as opposed to blank walls at street level
- Promotion of economic activity and employment growth.

7.13 Mobility, traffic management and parking (Existing WLEP 2011 Clause has been amended as follows)

(1) The objectives of this clause are as follows;

(a) To ensure increased road network capacity and improved vehicle circulation throughout the Dee Why Town Centre

(b) To provide flexibility in the location of required parking

(c) To encourage alternate forms of transport from private vehicle use

(d) To minimise the disruption of pedestrian movement and safety

(e) To reduce the visual scale of parking and servicing facilities.

(2) Development consent must not be granted to the construction of new buildings in the Dee Why Town Centre unless the consent authority is satisfied that:

(a) Car parking will be provided underground or if above ground, within a maximum of two podium levels above the finished ground level

(b) Above ground car parking shall not be visible from public streets, thoroughfares, parks or plazas

(c) A maximum of 15 precent of required parking may be provided above ground and only if the development complies with (a) and (b) above, and there are demonstrated constraints to providing all of the required parking underground such as groundwater, flooding, existing easements, utility infrastructure or the like

(d) Loading and waste collection facilities are accommodated in a way that does not adversely impact on the amenity of the public domain, adjoining or nearby residential properties or conflict with pedestrian access

(e) There will only be minimal disruption to retail and commercial activity at street level because the proposed development:

(i) Minimises the width of footpath crossings and vehicle entrances

(ii) Ensures that loading facilities are substantially enclosed by occupied floor space

(3) In relation to Key Sites A & B, the following provisions also apply;

(a) Any development on Site A will be consistent with the establishment of a new north-south street, between Howard and Oaks Avenue, along the eastern side of Site A, shown on the Key Sites Map as the Proposed New Road

(b) The Proposed New Road reserve shall have a minimum width of 18 metres where it adjoins Lot 1, DP 526306 (St Kevin's Church) and 20 metres where it adjoins Strata Plan 1493

(c) The development is designed to respond to an on-street traffic circulation pattern that is one way in an anti-clockwise direction around the centre via Oaks Avenue, the Proposed New Road and Howard Avenue

(d) The development will improve vehicle access and circulation within the Dee Why Town Centre and will reinforce the priority of pedestrian movements and networks to make the Dee Why Town Centre safe, enjoyable and attractive

(e) If the development is on Site B, there will be a maximum of one level of above ground car parking that will:

(i) Be located on level one and two (excluding the ground floor level) and

(ii) Incorporate appropriate architectural screening that is visually integrated and coordinated with the design of the building facades of the remainder of the development and will ensure that vehicles are screened completely from surrounding vantage points and that the streetscape and urban design quality of the development is protected.

Explanatory note

This Clause aims to limit the quantum of parking provided above ground as it adds to the gross building area of development thus contributing towards building bulk and scale. The objective of limiting the number of podium levels is to maximise solar access to adjoining open space, residential dwellings and public footpath areas.

On land where geotechnical and other significant site constraints exist, a development may provide up to 15 precent of the required on-site parking above ground on the proviso that the parking areas are not visible form a public place and that those site constraints are demonstrated to the satisfaction of Council.

The Clause also seeks to ensure that access arrangement to carparks and servicing areas do not unduly interrupt pedestrian traffic flow and safety.

Subclause (3) contains specific Site A and B road network improvements as per the existing requirements of existing WLEP 2011 Clause 7.13 *Mobility, traffic management and parking.*

7.14 Podiums, setbacks & awnings (New Clause)

(1) Development consent must not be granted to development on land in the Dee Why Town Centre unless the consent authority is satisfied that the development incorporates:

(a) A maximum of three podium levels on buildings fronting Pittwater Road and two podium levels on buildings fronting all other roads in the Dee Why Town Centre

(b) The ground level of building elevations that front roads within the Dee Why Town Centre are to be setback a minimum of four metres from the kerb of the adjacent road

(c) Notwithstanding (b), a building setback of greater than four metres for up to 40 precent of the length of the front property boundary is encouraged to provide articulation of the podium levels facade and increased area for pedestrian movement and kerb side dining areas

(d) Tower elements above podiums being setback a minimum of four metres from all edges of the podium to maximise solar access, building separation and amenity of residents

(e) Continuous colonnades or pedestrian awnings on those parts of any building fronting and built to the edges of streets or other public spaces.

Note: For the purpose of this Clause, podium levels refer to levels 1-3 of a building that have no or minimal setback to the property boundary.

Explanatory note

This Clause sets the parameters for design and building setbacks with the intent to promote increased ground level pedestrian circulation space.

The above podium building setbacks seek to maximise solar access to adjoining properties and ground level public space.

The podium height controls aim to achieve a consistent street frontage presentation while the reduction in the maximum podium levels allows for increased solar access and less dominant built form along the streetscape.

The 'loss' of floorspace through the reduction in maximum podium levels has been recovered through the addition of one storey (three metres) of permissible building height currently offered under the WLEP 2011.

This Clause replaces elements of the existing WLEP 2011 clause *7.4 Development must be consistent with objectives for development and design excellence.*

7.15 Site B Oaks Avenue Landscaping (New Clause)

(1) Development consent must not be granted to development on Site B, at the Howard Avenue frontage, unless the consent authority is satisfied that the development will be lined by trees of distinctive coastal indigenous species that provide landscape elements while not obscuring the views into and out of the Town Square from Pittwater Road or Howard Avenue.

Explanatory note

This provision has been copied from the existing WLEP 2011Clause 7.5 *Design excellence within Dee Why Town Centre* and drafted to a stand-alone clause.

7.16 Alternative buildings heights and floor space allowance

(1) The objectives of this Clause are to:

(a) Reinforce Dee Why as the major centre for the Northern Beaches

(b) Ensure the provision of quality public domain areas within the Dee Why Town Centre

(c) Consolidate the town centre into an identifiable place with a defined core with an appropriate transition of building height to surrounding land uses

(d) Improve pedestrian and cycle connections

(e) provide open spaces that reflect the theme of water sensitive urban design and connect destinations within the Dee Why Town Centre

(f) Stipulate the required public benefits to be delivered on and adjoining Key Sites.

(g) Facilitate the delivery of road infrastructure upgrades during the development process.

(h) To outline the criteria to be satisfied for development proposals that propose to exceed the maximum building height and floor space ratio requirements expressed in Clause 4.3 and 4.4.

(2) Despite clause 4.3 and 4.4 of this Plan, consent may be granted for development that exceeds the maximum building height and floor space ratio for land identified within Key Site C on the Key Sites Map only if:

(a) The development application is for the entire area identified as Key Site C

(b) The maximum building height of any buildings within Site C does not exceed 46 metres

(c) The proposed development includes the construction and dedication to Council of a public road reserve not less than 12 metres wide that links Oaks Avenue and Pacific Parade identified as Proposed New Road on the and Key Sites Map

(d) All buildings comply with the requirements defined in Clause 7.9.

(3) Despite clause 4.3 and 4.4 of this Plan, consent may only be granted for development that exceeds the maximum building height and FSR that applies to land identified as Key Site D on the Key Sites Map only if:

(a) The proposed development includes the dedication of 35 square metres of land to Council on the corner of Pacific Parade and Pittwater Road and the construction of a traffic turning lane from Pittwater Road into Pacific Parade, including a pedestrian path no less than four metres wide and road pavement in the area identified

(b) The gross floor area for development of the whole of Site D may exceed that permitted under the Floor Space Ratio map by up to 240 square metres in exchange for the land dedication and associated road and pavement construction outlined in (a)

(c) All buildings comply with the requirements defined in Clause 7.9.

(d) Development which exceeds the gross floor area above that permitted in (b) may be permitted subject to the considerations expressed in subclause (6) of this clause.

(4) Despite clause 4.3 and 4.4 of this Plan, consent may be granted for development that exceeds the maximum building height, and to a minor extent, the FSR for land identified as Key Site E on the Key Sites Map if:

(a) The proposal is for the development of the entire area identified as Key Site E

(b) The proposal is for part of the area identified as Key Site E and accompanied by a detailed precinct plan indicating suitable development and delivery of public domain outcomes for the entire Key Site

(c) That the owners of all the sites of Key Site E have endorsed the detailed precinct plan outlined in (b) above

(d) The maximum building height of any buildings within Site E on lots fronting Pittwater Road does not exceed 49 metres

(e) The maximum building height of any buildings within Site E on lots fronting St David Avenue and/or Fisher Road does not exceed 20 metres

(f) The proposed development includes the construction, landscaping and dedication to Council of a pedestrian and servicing through site link with a minimum width of 12 metres wide in the area generally identified as Pedestrian Connection on Key Site E on the Key Sites Map

(g) The proposed development includes the construction of a pedestrian through building connection to Pittwater Road, open to the general public during normal commercial and retail opening hours, a minimum of 6 metres wide either open to the sky or by six metre high void generally in the area identified as New Pedestrian Connection on the Key Sites Map

(h) All buildings comply with the requirements defined in Clause 7.9.

(5) Despite clause 4.3 and 4.4 of this Plan, consent may be granted for development that exceeds the maximum building height, and to a minor extent, the FSR for land identified as Key Site F on the Key Sites Map if:

(a) The proposal is for the development of the entire area identified as Key Site F

(b) The maximum building height of any buildings fronting Pittwater Road does not exceed 49 metres

(c) The proposed development includes a through site vehicular access way to adjoining properties within Key Site E

(d) The development facilitates public pedestrian access from St David Avenue to the proposed Pittwater Road pedestrian overpass

(e) All buildings comply with the requirements defined in Clause 7.9.

(6) Despite clause 4.3 and 4.4 of this Plan, consent may be granted for development on any site (including Key Sites) within the Dee Why Town Centre that exceeds the maximum building height and, to a minor extent, the FSR in exchange for the provision of public benefits only in the event the proposed development demonstrates;

(a) The provision of adequate solar access to nearby dwellings and the public domain

(b) Limited impact upon the privacy of adjoining residents

(c) Compliance with the desired street frontage building height and street edge alignment

(d) An appropriate interface with the public domain

(e) The provision of sufficient on-site parking and landscaping

(f) The retention of significant local and district view lines

(g) That there is adequate capacity within the existing community infrastructure and road network

(h) Compliance with the desired character established by the Warringah Development Control Plan and objectives contained within this Plan

(i) Consistency with the principle of decreasing building height from Key Site B shown on the Key Sites Map to the edges of the Dee Why Town Centre

(j) The requirements of State Environmental Planning Policy No. 65 Design Quality of Residential Flat Development

(k) Whether the site is of acceptable dimension and of sufficient area to;

(i) Allow for the efficient and safe manoeuvring of vehicles
(ii) Allow for acceptable proportions of building design
(iii) Provide adequate separation to existing buildings
(iv) Provide equitable building separation from the proposed development to future development on adjoining sites
(v) Ensure adjoining sites are not sterilised from redevelopment.

(7) Development which seeks to utilise subclause (6) will not be supported unless Council is of the opinion that the proposal also demonstrates compliance with Clause 4.6 *Exceptions to development standards.*

Explanatory note

The purpose of this Clause is to provide a list of relevant matters to be considered when assessing development that exceeds the maximum building height and FSR controls in exchange for public benefits.

The onus is on the applicant to demonstrate that the site is capable of achieving an increase in development yield from that envisaged under the WLEP 2011 controls whilst satisfying environmental and amenity considerations.

The quantum of gross floor area is constrained primarily by the capacity of the road network. Any application seeking to develop gross floor area above that permitted on the proposed draft Floor Space Ratio map shall consider the relevant traffic studies undertaken by or on behalf of Council.

Regardless of the value, scale and nature of the proposed public benefit, the development needs to be deemed acceptable on planning and environmental grounds for Council to consider granting consent.

Public benefits items that are to be delivered as part of this process are not to include infrastructure upgrades required as a consequence of the development or the developments obligations stipulate in the Warringah Section 94A Development Contributions Plan 2013 or equivalent.

WARRINGAH COUNCIL

Draft amendments

Warringah Development Control Plan

Part G1 & Part H

DEE WHY TOWN CENTRE

WARRINGAH COUNCIL

Draft amendments

Warringah Development Control Plan

Part G1 & Part H

DEE WHY TOWN CENTRE

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5. Town Centre Character Areas (1-10)

1. INTRODUCTION

Applies to Land

This part provides specific controls for the development of the B4 Mixed Use Zone within the Dee Why Town Centre (Figure 1).

Note:

- For land zoned R3 Medium Density Residential within the Town Centre, refer to the specific R3 development controls contained within this Development Control Plan (DCP)
- Part B *Built Form Controls* does not apply to land zoned B4 Mixed Use within the Dee Why Town Centre. All other parts of the DCP apply to the land identified within the Dee Why Town Centre
- In the event of any conflict between this part and other parts of the DCP, the provisions of this part shall prevail in relation to the identified areas
- If there is an inconsistency between this DCP and the Warringah Local Environmental Plan 2011 (WLEP 2011), the WLEP 2011 prevails

Figure 1. Dee Why Town Centre study area

2. DESIRED FUTURE CHARACTER

The Dee Why Town Centre (combined with the Brookvale employment areas) has been identified in various NSW Government planning strategies as the Major Centre for the northern beaches.

Located between the ocean and the escarpment, it enjoys a close connection to Dee Why Beach and the Narrabeen Lagoon system. During the preparation of this DCP and the Dee Why Town Centre Master Plan 2013 (the Master Plan), the community expressed a wish for the centre to be revitalised as a vibrant, prosperous and high quality centre.

Council's Vision:

> *"Dee Why will be home to a thriving cosmopolitan community who cherish their past, celebrate its unique and engaging vibe and embrace its bold commitment to urban sustainability. It will be a place of both energy and refuge, a city at the beach, with a distinctive modern urban identity."*

Figure 2. Pittwater Road Master Plan Vision

In August 2013, Council adopted the Master Plan which reviewed all previous plans and policies as well as documenting key constraints and opportunities for future development.

The Master Plan illustrates the desired character for Dee Why and recommends a number of initiatives to encourage development and improve the public domain to achieve revitalisation.

The desired character for the Dee Why Town Centre is to be defined by the following principles;

- A consolidated centre that is identifiable and inclusive of a defined core
- A system of new and improved connected public spaces
- Landscaped areas that utilise Water Sensitive Urban Design (WSUD) principles that reflects the location of the centre adjacent to the lake and the ocean
- The clustering of taller buildings around the proposed Town Square (Key Site B) with an appropriate transition of height down to the edges of the Dee Why Town Centre

- Tall and slim buildings which allow greater solar access and are less visually dominant to the streetscape
- An attractive, vibrant and safe centre that is accessible at all times by people with all level of abilities
- A sense of community and pride and inclusiveness achieved through place making and engagement
- A new revitalised civic and community hub that will house government services, provide a meeting place, public parking, community facilities and supporting retail
- Retention of significant views to landscape features such as the Lagoon, Long Reef headland, the coast line and Stony Range Reserve.

An illustrative example of the desired public domain is shown in Figures 3 and 4 below.

Figure 3. Redman Road Plaza (Character Area 7)

Figure 4. Civic Plaza View from Pittwater Road (Character Area 10)

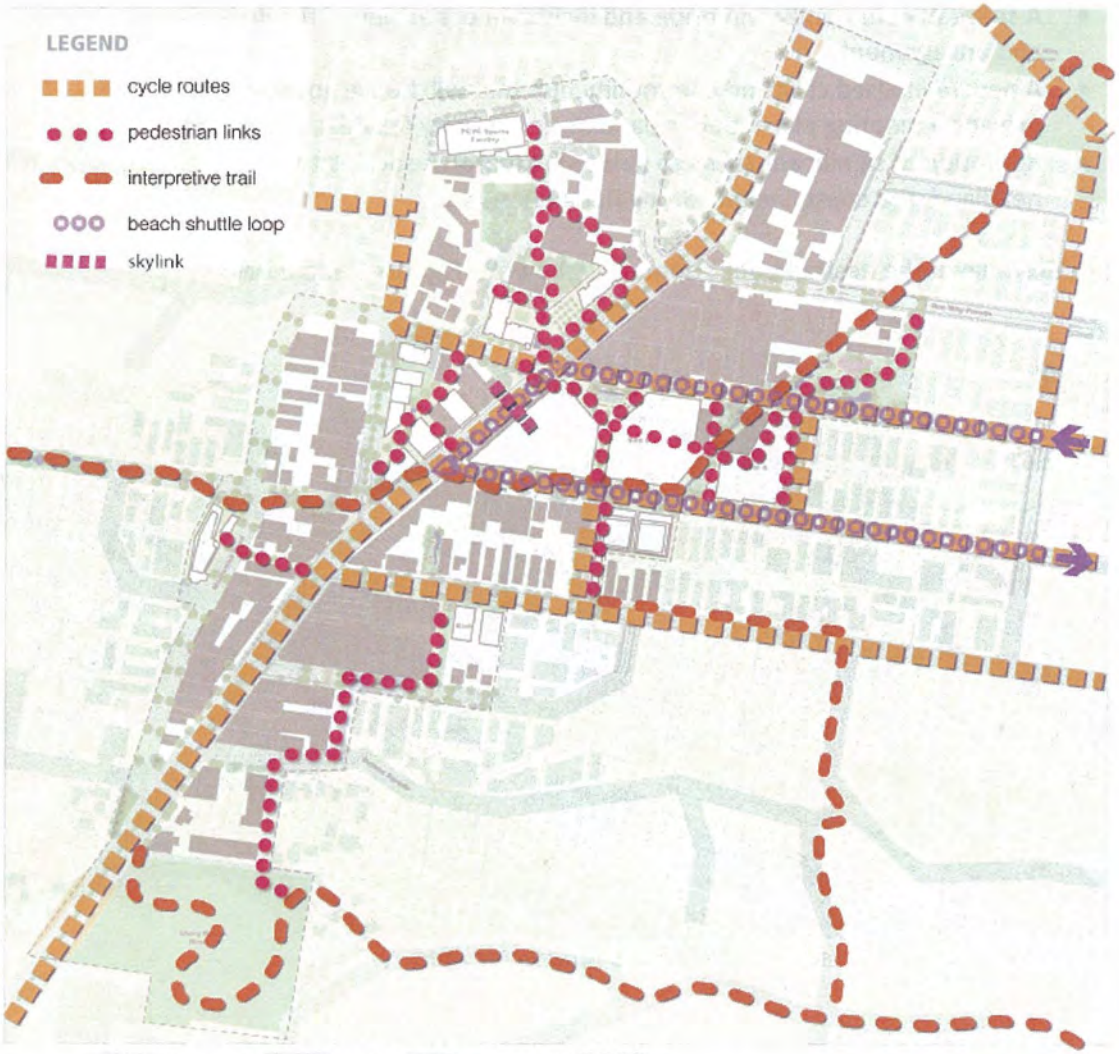

Figure 5. Dee Why Movement Map

Figure 5 illustrates the desired improvements to access and circulation. Separated cycle ways are proposed for Howard and Oaks Avenues providing a strong connection to the beach and linkages to the Warringah Bicycle Route Network.

3. GENERAL DEVELOPMENT CONTROLS

In addition to the General Development Controls contained in the previous sections of this DCP, this section contains specific controls that apply to the whole of the Dee Why Town Centre.

3.1 Key controls within Warringah LEP 2011

1. The maximum permissible height of buildings is identified on WLEP 2011 Height of Buildings Maps.
2. The maximum permissible Floor Space Ratio is identified on the WLEP 2011 Floor Space Ratio Map.
3. The Dee Why Town Centre boundary, key catalyst sites, priority road and through site link upgrades are illustrated in the Key Sites Map
4. Other key objectives and development controls that relate to built form, building setbacks, location of parking etc. are located within Part 7 of the WLEP 2011.

3.2 General controls

1. New development is to incorporate non-residential uses at ground level (as a minimum) which is designed to address street frontages. Single entry lobbies to residential uses are however permitted within the ground floor.
2. Buildings are to be designed with strong vertical proportions and facilitate the sharing of views and sunlight.
3. Buildings are to be highly articulated and modulated to reduce the apparent building mass.
4. The maximum building length above podiums is to be 45 metres measured across the frontage of the site and maximum above podiums building depth is to be 20 metres.
5. The residential component of new development is to comply with the *State Environmental Planning Policy 65 Residential Flat Design Code*. For buildings which incorporate podiums, it can be assumed the Code's building separation requirements apply to the building elements above the podium, with the roof of the podium considered as the ground level.
6. Minimum floor to ceiling heights seek to emphasise the ground floor of buildings (which incorporate non-residential uses), maximise the amenity of dwellings and facilitate flexibility of land uses. The floor to ceiling height requirements are as follows:

    (a) Ground floor storey: 3.6 metres; and
    (b) Upper storeys: 2.7 metres.

7. All Development Applications for new buildings are to be accompanied by a detailed traffic and parking impact assessment prepared by a suitably qualified traffic consultant. The analysis shall confirm any impacts upon the road network performance.
8. Site amalgamation is required to facilitate development with;
    a. Appropriately proportioned buildings
    b. Adequate separation to existing buildings and expected future development on adjoining sites
    c. Basement car parking with an efficient internal configuration and safe vehicular and pedestrian access and egress.
9. The design and arrangement of buildings are to recognise and preserve significant views to the Long Reef landscape, the coastline and landscaped ridgeline.

3.3 Site Amalgamation

Objectives

- To encourage site amalgamation to ensure that the development potential of all sites within the Dee Why Town Centre is maximised
- To avoid the isolation of small sites which may result in poor built form outcomes and inability for such sites to be developed to their potential
- To provide for adequate site widths that allow design flexibility, desirable building proportions and where possible, at grade public and private open space

Requirements

1. Documentary evidence is to be submitted with development applications for works valued at over $2 million to demonstrate that a genuine and reasonable attempt has been made to purchase an isolated site based on a fair market value. This is to include at least one recent independent valuation and a written offer to cover reasonable expenses likely to be incurred by the owner of the isolated site during the sale of the property.
2. Where amalgamation of an isolated site is not feasible, applicants will be required to demonstrate that an orderly and economic use and development of the separate sites can be achieved.
3. Applicants will be required to detail an envelope for the isolated site, indicating height, setbacks, resultant site coverage (building and basement), sufficient to understand the relationship between the application and the isolated site. The likely impacts developments will have on each other in terms of solar access, visual privacy, building separation and streetscape must also be addressed.

3.3 Building heights

Objectives

- To ensure buildings are developed within the principles established in the Master Plan, which is to cluster taller buildings around the proposed Town Square (Key Site B) with an appropriate transition of height down to the edges of the Dee Why Town Centre
- To consider taller, slimmer buildings which allow greater solar access to adjoining land and are less visually dominant to the streetscape
- To retain view lines of the Long Reef landscape, the coastline and landscaped ridgeline.

Requirements

1. The maximum permissible height of buildings is identified on the WLEP 2011 Height of Buildings Map.
2. Buildings may exceed the height stated on the WLEP 2011 Height of Buildings Map only if;

    (i) That development provides for public benefits and is deemed to meet the criteria set out in WLEP 2011 draft Clause 7.16 and this DCP
    (ii) The development is consistent with the principle of gradually decreasing building height from Key Site B down to the edges of the Dee Why Town Centre
    (iii) The proposal does not significantly obscure district views of the Long Reef landscape, coastline and escarpment ridgeline
    (iv) The development consists of a 'slim' tower built form with appropriate separation from adjoining buildings and setback from property boundaries.

3. The intent of Figure 6 *Height Principles Map* is to demonstrate that the tallest built form within the Dee Why Town Centre is to be located at 'Site B' (between Howard and Oaks Avenue) with a reduction in building height from that site, along the Pittwater Road spine down to the edges of the Dee Why Town Centre.

4. The heights expressed in Figure 6 are not to be considered as the building height control across the Dee Why Town Centre; however some development may be constructed within the indicated height range if the development accords with the Part 7 of WLEP 2011 and this DCP, particularly in terms of the objective to construct 'slim' tower forms and compliance with amenity considerations.

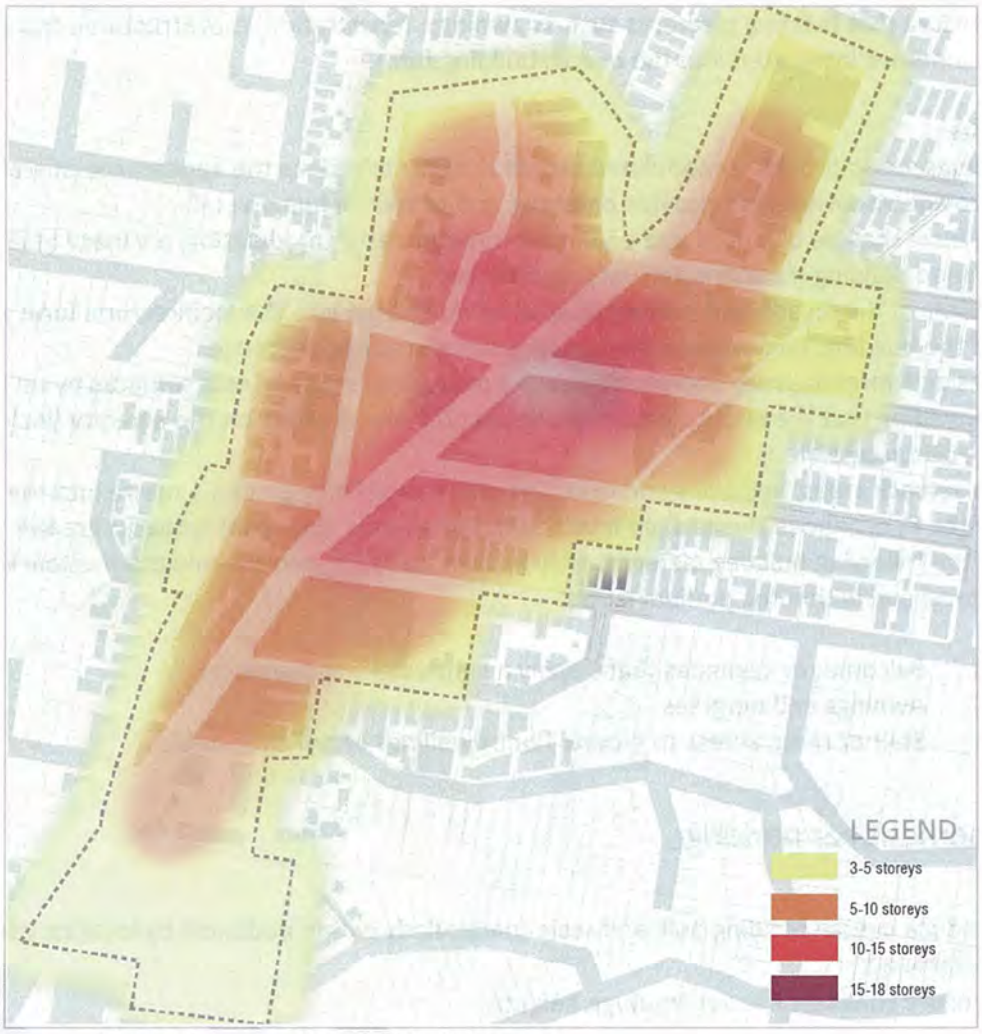

Figure 6. Height Principles map

3.4 Pedestrian connections

Objectives

- To enhance pedestrian access, activity and mobility throughout the Dee Why Town Centre
- To better integrate land uses supporting the centre's activities
- To improve the exposure and therefore viability of businesses

Requirements

1. Public open spaces and through site pedestrian/cycle path links are to be provided in accordance with Figure 5 and the WLEP 2011 Key Sites Map.
2. The provision of additional pedestrian links to those outlined in (1) above shall be considered for development that has two streets frontages or other attributes that allow extension of the pedestrian network.
3. Through site links shall be well lit and allow 24 hour access.
4. Through site links may be provided in the form of arcades.
5. Through site links shall be visually permeable and not incorporate acute turns or 'dog legs'.

3.5 Building Articulation and design

Objectives

- To create visual interest in building facades
- To minimise the appearance of building mass
- To ensure that building facades to help enhance the public domain.
- To ensure that building elements such as awnings, fenestration, roof structures and service elements are integrated into the overall building form.

Requirements

1. All buildings are to provide a modulated façade in order to reduce the appearance of scale and mass, provide visual interest, provide diversity, and provide a human scale.
2. Building form shall be balanced and enhanced through design modulation, a variety of finishes, use of varied building materials and varying setbacks.
3. All elements of the façade and roof areas shall be integrated into the architectural form and detail of the building, and present an appealing streetscape appearance.
4. Balconies and verandas may encroach upon the prescribed side and rear setbacks by up to 1 metre providing that the encroachment produces no adverse effect on the amenity (including privacy, solar access etc.).
5. For zero setback areas, balconies and over podium terraces may extend 1 metre into the setback area for the floors above the podium levels only. For all sites with front setbacks greater than 4 metres, the following building elements may project up to 1m into the minimum setback area at ground level and within the podium levels:

    (a) Balconies or verandas that display a lightweight appearance
    (b) Awnings and pergolas
    (c) Stair or ramp access to ground floor dwellings or building lobbies.

3.6 Basement car parking

Objectives

- To reduce overall building bulk and scale (particularly within podiums) by locating parking underground
- To ensure consistent street frontage heights
- To maximise the availability of deep soil planting
- To minimise disruption to pedestrians and cyclists.

Requirements

1. Car parking and vehicle access points shall be designed to minimise the impact on the streetscape and amenity of pedestrians by incorporating the following design elements;

    (a) Recessed car park entries from the main building facade alignment
    (b) Avoidance of large voids in the facade by providing security doors or decorative grills to car park entry
    (c) Returning the facade finishes into the car park entry recess for the extent visible from the street
    (d) Design and build parking with conceal services, pipes and ducts.

2. Basement car parking is to be located to optimise deep soil planting.
3. Basement car parking is to be designed to encourage natural ventilation and designed to consider prevailing winds through the appropriate size and siting of air vents.
4. All driveways must be located a minimum of 6 metres from the perpendicular of any intersection of any two roads.
5. Basement car parking that protrudes above ground level must:

(a) Include landscaped terraces or landscape screening (green walls) in front of any above ground basement car parking to reduce the overall visual impact.
(b) Be protected from inundation from 100-year ARI flood levels (or greater).

6. Whole levels of above ground parking levels are to be laminated or sleeved with another use for a minimum depth of 10 metres, e.g. building entry lobbies, retail tenancies, residential units etc.

3.7 Energy and Water Efficiency

Objectives

- To supplement controls contained within DCP Part D22 *Conservation of Energy and Water*
- To ensure substantial new developments incorporate the latest practice for energy and water efficiency
- To establish benchmarks for building rating scheme compliance.

Requirements

1. New commercial development should be designed to meet a minimum rating of 5 Green Star Office Design (or equivalent).
2. Any building refurbishment with a value greater than $600,000 should result in a refurbished building with an estimate minimum 3.5 NABERS star rating (or equivalent).
3. *'BASIX affected buildings'* must accord with the BASIX requirements stipulated within the Environmental *Planning and Assessment Regulation 2000.*

3.8 Landmark and corner sites

Objectives

- That development on corner sites adequately address both street frontages
- That development capitalises on site visibility and opportunities derived from building to street frontages such as availability to solar access and separation from buildings opposite the street
- That development is of high architectural quality.

1. Buildings which are located on corner sites must:

(a) Be designed to add variety and interest to the street and clarify the street hierarchy.
(b) Present each frontage of a corner building as a main street frontage.
(c) Combine architecture, materials and landscape design that define corners.

4. KEY SITES

Six Key Sites are identified on the WLEP 2011 Key Sites Map. These sites are considered to offer significant potential to revitalise the Dee Why Town Centre and are strategically located to provide on-site and localised public benefits including roads and public domain infrastructure.

Development of Key Sites is to be consistent with the requirements of this DCP and the specific Key Site provisions within the WLEP 2011.

4.1 Key Sites A & B – Town Square

The Warringah Local Environment Plan 2000 Amendment No.21 (November 2008) introduced amended development standards for the Howard & Oaks Avenue car park site known as Site A as well as the adjoining Site B. The detailed designs incorporate tall and slim tower buildings in exchange for the delivery of a Town Square, pedestrian thoroughfare, public car parking, a new road and other community facilities.

The desired outcomes are implemented through the specific development controls in part 7 of the WLEP 2011.

Figure 7. Key Sites A & B

4.2 Key Site C – Oaks Avenue

This site is identified as 33 Oaks Avenue Dee Why (Lot 1 DP 588603, Lot A & B DP 326907). The site contains a supermarket, support retail premises fronting Oaks Avenue and a pedestrian arcade linking Oaks Avenue to Pacific Parade.

Key Site C is located within Character Areas 3 and 4 of the Town Centre and is outlined in Figure 8.

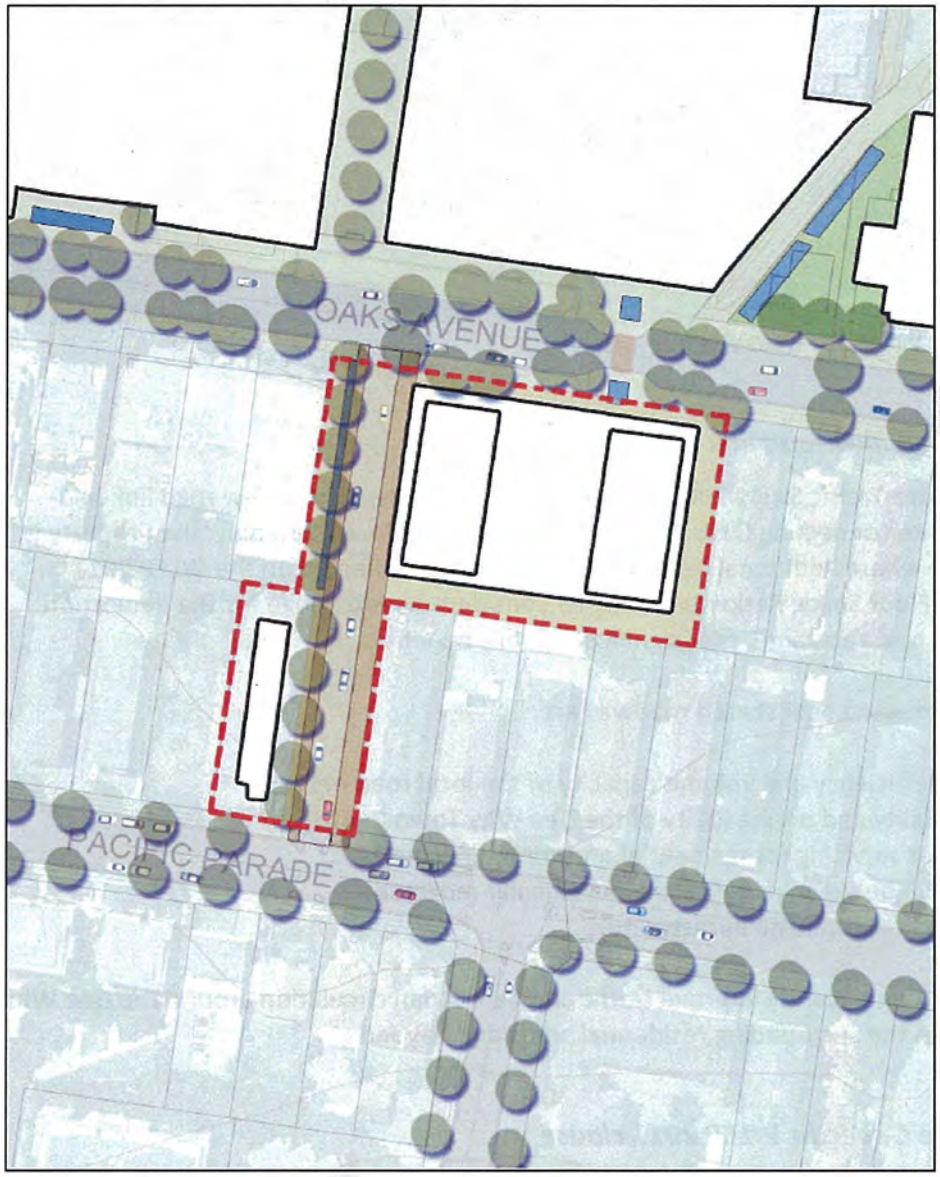

Figure 8. Key Site C

Figure 9. Vision for Oaks Avenue

4.2.1 Proposed new road link

The Dee Why Town Centre Traffic Study 2007 by GTA identifies the need for a new road link mid-block link through this site connecting Oaks Avenue and Pacific Parade. Accordingly, the property is nominated as a Key Site where additional development above that reflected on the WLEP 2011 Height of Buildings and Floor Space Ratio maps may be considered in exchange for the dedication and construction of the new road and other significant public benefits.

The objectives of the proposed new shared roadway are:

- To improve the efficiency and volume capacity of the local road network
- To improve legibility and permeability of the Dee Why Town Centre
- To provide better servicing for residential and commercial uses
- To reduce conflict between pedestrian and vehicular movements
- To allow upgrades to drainage infrastructure.

This new road link would significantly improve traffic and pedestrian circulation around the Dee Why Town Centre Core and to the surrounding residential areas and beyond.

4.2.2 Key Site C specific WLEP 2011 clause

Development of Key Site C is to be consistent with the development standards contained in the WLEP 2011, including Clause 7.16 which states that:

> *"consent may be granted for development that exceeds the maximum building height and floor space ratio for land identified within Key Site C on the Key Sites Map only if:*
>
> *(a) The development application is for the entire area identified as Key Site C;*
>
> *(b) The maximum building height of any buildings within Site C does not exceed 46 metres;*
>
> *(c) The proposed development includes the construction and dedication to Council of a public road reserve not less than 12 metres wide that links Oaks Avenue and Pacific*

Parade identified as Proposed New Road on the Dee Why Town Centre and Key Sites Map...".

4.2.3 Site specific requirements for Key Site C

1. The required new roadway shall facilitate two-way vehicle movements with vibrant pedestrian areas linked seamlessly to public domain areas associated with the adjacent buildings.
2. The new roadway and pedestrian verges are to be provided in accordance with Figure 10 and 11 of this DCP Part and the WLEP 2011 Key Sites Map.
3. The required new roadway and pedestrian verges are to have direct sight lines between Oaks Avenue and Pacific Parade, be well lit and facilitate an environment for outdoor seating.
4. New development is required to address both the main street frontage and new roadway link for the purpose of activating and improve the safety and amenity of that connection.
5. Although the WLEP 2011 provides an additional building height incentive along the Oaks Avenue in exchange for the proposed new road, additional building height within the Area 4 component of Site C (southern portion) is not encouraged due to the proximity to residential development and the desired low scale character of Pacific Parade.

4.2.4 Indicative Development Options for Key Site C

1 Examples of concept Site C building envelopes are illustrated in Figures 10 and 11 within this part of the DCP. Alternative design solutions may be acceptable if it can be successfully demonstrated that the proposed design:

(a) Achieves a positive and cohesive relationship with adjacent buildings and surrounding public domain.
(b) Minimises the effects of overshadowing upon open space, or habitable rooms of adjoining development.
(c) Responds to the vision, objectives and requirements for the revitalisation of the Dee Why Town Centre.

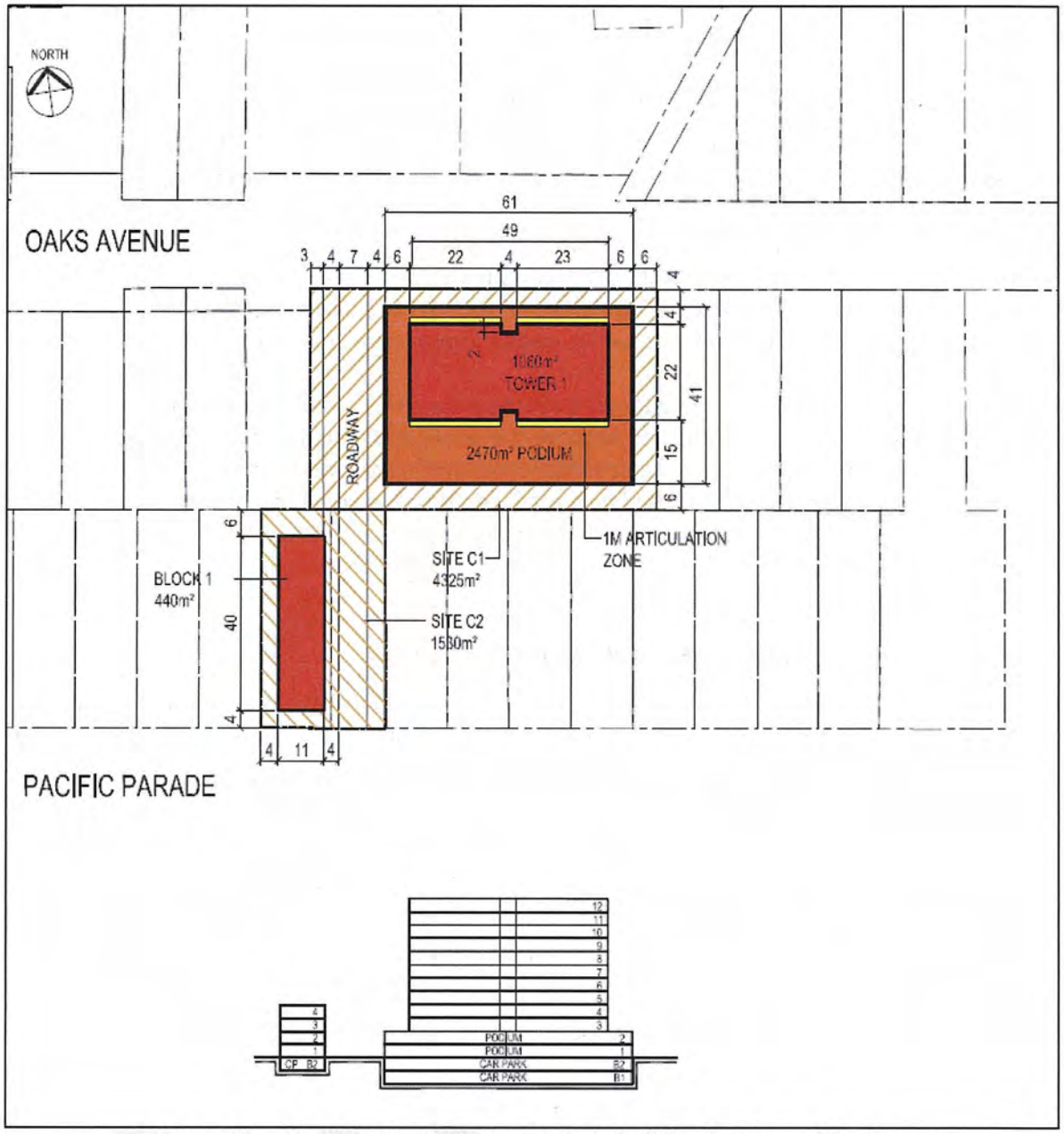

Figure 10. Key Site C – Option1; Example building layout and form

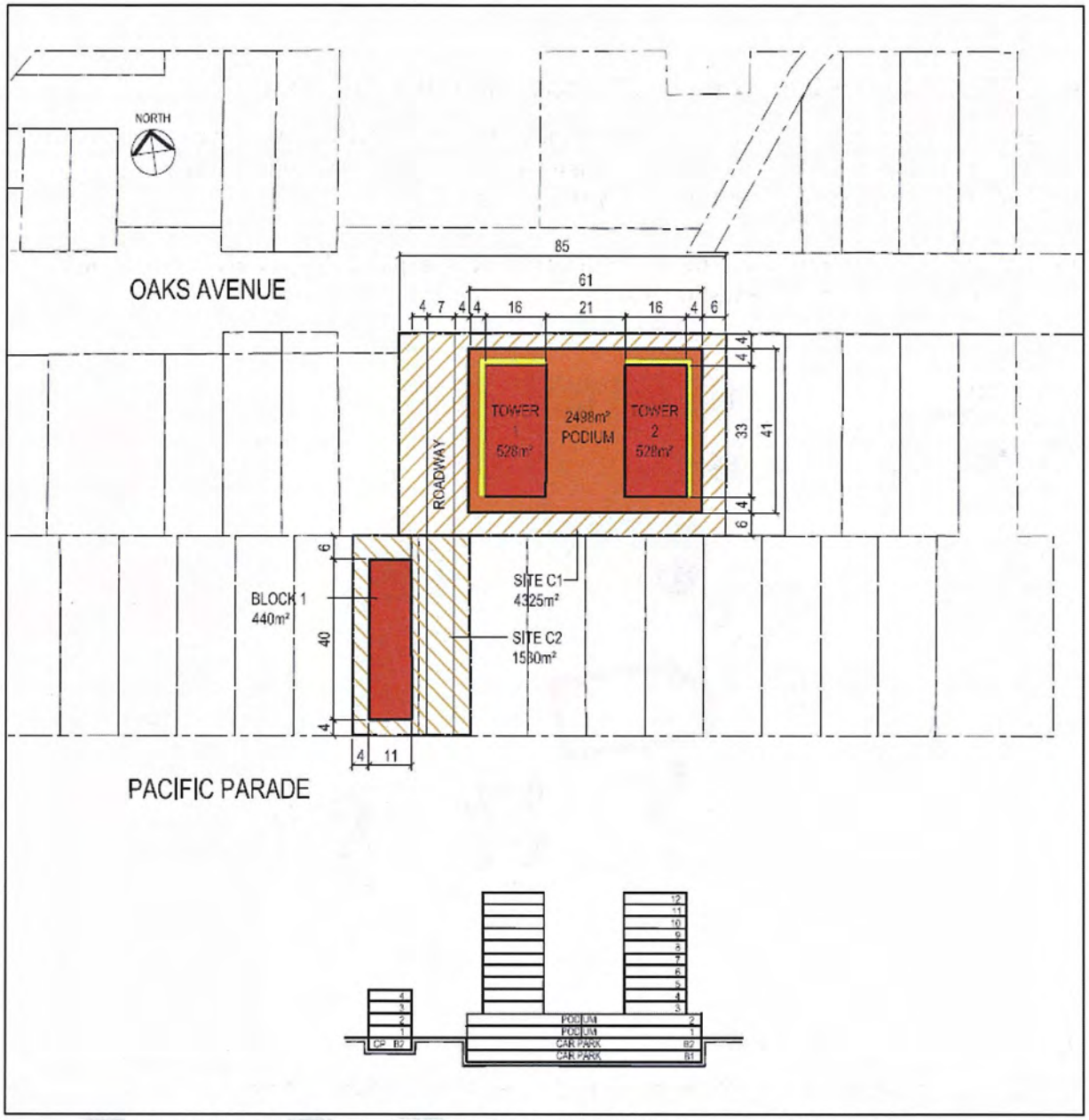

Figure 11. Key Site C - Option 2; Example building layout and form study

4.3 Key Site D – Corner Pacific Parade and Pittwater Road

Key Site D is located on the corner of Pacific Parade and Pittwater Road and is outlined in Figure 10. A portion of this land is required to facilitate a left hand turning lane for semi- articulated vehicles travelling from Pittwater Road and left into Pacific Parade. (Refer to Figure 13)

The upgrade will substantially improve traffic flow in that area, particularly by way of reducing the interruption of traffic flow on Pittwater Road.

Figure 12. Key Site D Corner of Pacific Parade and Pittwater Road

In order to facilitate the construction and dedication of land for the turning lane, the development of additional floor space may be considered to offset the cost of land dedication and associated road and footpath works.

4.3.1 Key Site D specific WLEP 2011 clause

Development of Key Site D shall to be consistent with the development standards contained in the WLEP 2011, including Clause 7.16 which states:

> *"consent may only be granted for development that exceeds the maximum building height and floor space ratio that applies to land identified as Key Site D on the Dee Why Town Centre and Key Sites Map only if;*
>
> *(a) The proposed development includes the dedication of 35 square metres of land to Council on the corner of Pacific Parade and Pittwater Road and the construction of a traffic turning lane from Pittwater Road into Pacific Parade, including a pedestrian path no less than 4 metres wide and road pavement in the area identified.*

(b) The gross floor area for development of the whole of Site D may exceed that permitted under the Floor Space Ratio Map by up to 240 square metres in exchange for the land dedication and associated road and pavement construction outlined in (a)...".

4.3.2 Site Specific Requirements and Development Controls

1. Development of Key Site D is to display design excellence and be of a form and character to define and address this visually prominent corner.
2. Proposed road widening is to be carried out to facilitate a left hand turn for a semi-articulated vehicle generally in accordance with Figure 13.
3. Site amalgamation is promoted to ensure well-proportioned buildings and a safe and efficient basement car parking arrangement.

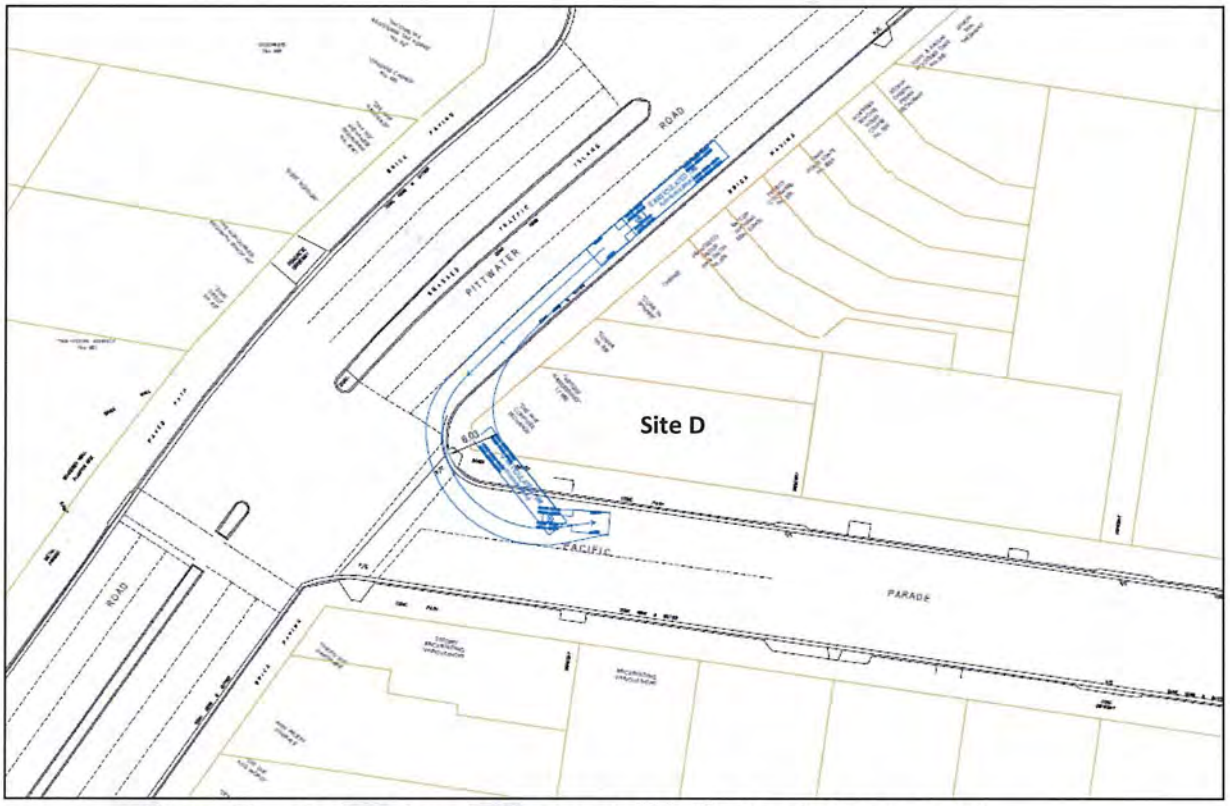

Figure 13. Proposed road widening plan Pacific Parade (not to scale)

4.4 Key Site E

Key Site E addresses Pittwater Road, St David Avenue and Fisher Road and is highlighted in Figure 14 below. The site is identified in the Master Plan as an important focal point within the Dee Why Town Centre and presents an opportunity to improve pedestrian links via a centrally landscaped shared access way (pedestrian and service vehicles) linking Fisher and Pittwater Roads to St David Avenue and the planned civic precinct to the north.

The proposed through site link contributes to the vision to improve the pedestrian environment and connectivity across the Dee Why Town Centre.

Figure 14. Key Site E

Figure 15. Key Site E vision from Fisher Road

4.4.1 Key Site E specific WLEP 2011 clause

The WLEP 2011 and this DCP promotes consolidation of a number of sites and the delivery of the though site links in exchange for development that may exceed the WLEP 2011 maximum building height and floor space ratio controls.

"consent may be granted for development that exceeds the maximum building height, and to a minor extent, the floor space ratio for land identified as Key Site E on the Key Sites Map if;

(a) The proposal is for the development of the entire area identified as Key Site E; or

(b) The proposal is for part of the area identified as Key Site E and accompanied by a detailed precinct plan indicating suitable development and delivery of public domain outcomes for the entire Key Site;

(c) That the owners of all the sites of Key Site E have endorsed the detailed precinct plan outlined in (b) above;

(d) The maximum building height of any buildings within Site E on lots fronting Pittwater Road does not exceed 49 metres;

(e) The maximum building height of any buildings within Site E on lots fronting St David Avenue and/or Fisher Road does not exceed 20 metres;

(f) The proposed development includes the construction, landscaping and dedication to Council of a pedestrian and servicing through site link with a minimum width of 12 metres wide in the area generally identified as Pedestrian Connection on Key Site E on the Key Sites Map;

(g) The proposed development includes the construction of a pedestrian through building connection to Pittwater Road, open to the general public during normal commercial and retail opening hours, a minimum of 6 metres wide either open to the sky or by 6 metre high void generally in the area identified as New Pedestrian Connection on the Key Sites Map...".

4.4.2 Site Specific Requirements and Development Standards

1. The new pedestrian links shall be provided and suitably landscaped between Fisher Road, St David Avenue. The provision for access by service and delivery vehicles should also be considered for the shared access way.
2. Buildings that address the street, public domain areas and through site pedestrian links are to be articulated with stepped facades.

4.4.3 Example development scenarios Site E

1. Figures 16 and 17 provide indicative development layouts. Alternative design solutions may be acceptable if it can be successfully demonstrated that the design:

   (a) Achieves a positive and cohesive relationship with adjacent buildings, site context and surrounding public domain
   (b) Achieves optimum solar access and minimised overshadowing does not affect functional open space, or habitable rooms of adjoining development
   (c) Responds to the vision, objectives and requirements for the revitalisation of the Dee Why Town Centre.

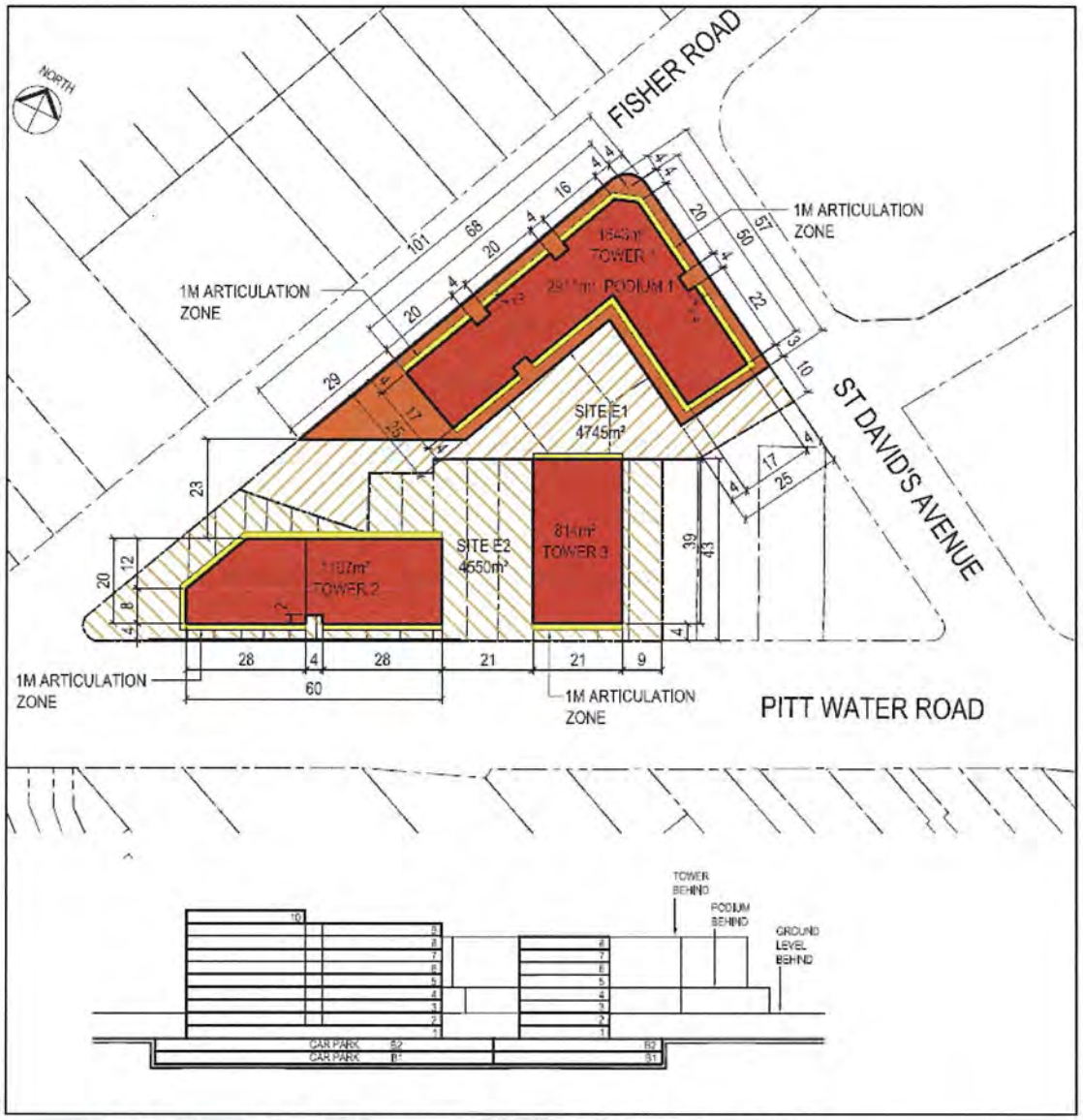

Figure 16. Site E Option 1 - Example building layout and form

Note: Option 1 demonstrates two tower forms (at 10 and 11 storeys) addressing Pittwater Road. The absence of podium levels allows for greater ground level circulation space and improved solar access to pedestrian areas.

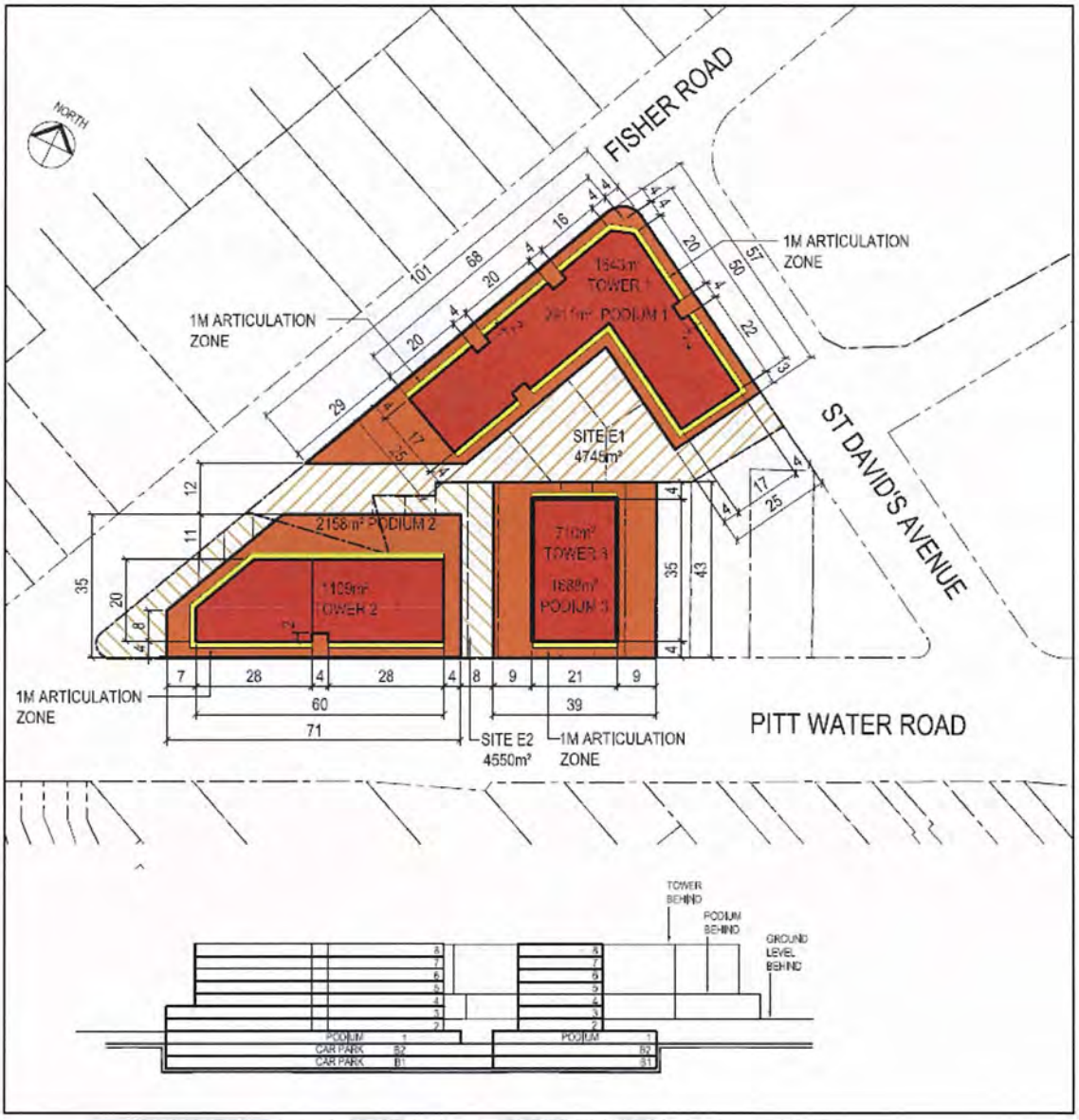

Figure 17. Site E Option 2- Example building layout and form

Note: Option 2 demonstrates three podium and tower forms (up to 8 storeys) whilst allowing adequate through site links.

4.5 Key Site F- Corner Pittwater Road and St David Avenue

Key Site F addresses the corner of Pittwater Road, St David Avenue and is adjacent to a public park.

The site is identified in the Master Plan as having the potential to facilitate public pedestrian access from St David Avenue to the proposed Pittwater Road pedestrian overpass. It is also desirable that the site incorporates a right of way allowing vehicular access from St David Avenue to the adjoining lots within Site E, which are otherwise constrained by access restrictions along Pittwater Road.

Figure 18. Key Site F (outlined in orange)

4.5.1 Specific WLEP Development standards for Key Site F

The WLEP 2011 and this DCP promotes consolidation of a number of sites and the delivery of the though site links in exchange for development that may exceed the WLEP 2011 maximum building height and floor space ratio controls.

> *"Consent may be granted for development that exceeds the maximum building height, and to a minor extent, the floor space ratio for land identified as Key Site F on the Key Sites Map if;*
>
> *(a) The proposal is for the development of the entire area identified as Key Site F,*
>
> *(b) The maximum building height of any buildings fronting Pittwater Road does not exceed 49 metres;*
>
> *(c) The proposed development includes a through site vehicular access way to adjoining properties within Key Site F;*
>
> *(d) The development facilitates public pedestrian access from St David Avenue to the proposed Pittwater Road pedestrian overpass...".*

4.5.2 Site Specific Requirements and Development Standards

1. Development shall integrate with the adjoining open space and consider opportunities to improve the amenity and functioning of the park.
2. Development of Key Site F is to display design excellence and be of a design and character to define and address this visually prominent corner.
3. The scale of development will be respectful of the heritage listed commercial building nearby.

5. TOWN CENTRE CHARACTER AREAS

The Dee Why Town Centre consists of a number of character areas which are illustrated in Figure 19 below.

Each character area has specific objectives for development, which is to be considered along with development controls provided within this DCP.

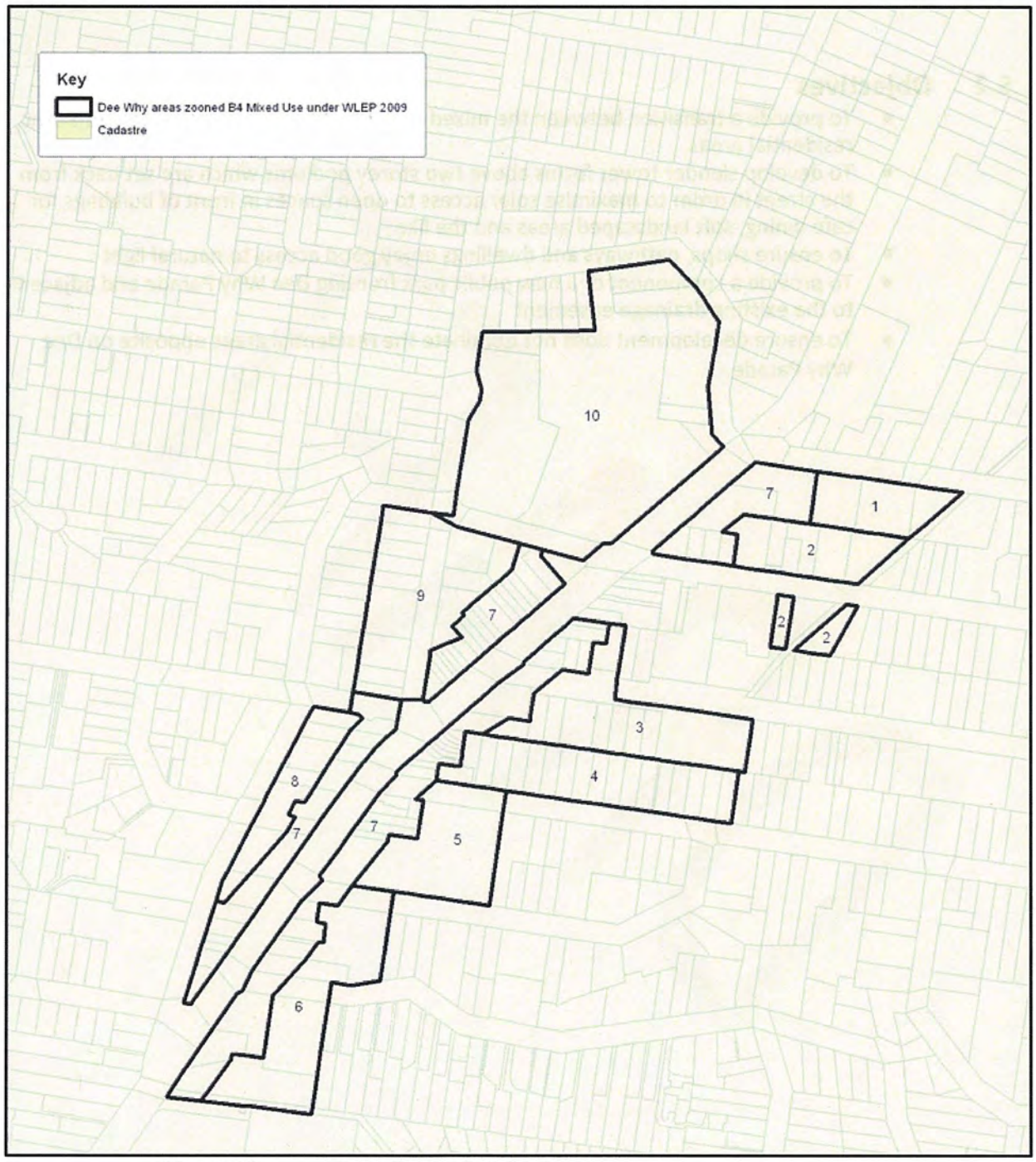

Figure 19. Town Centre Special Areas

AREA 1: DEE WHY PARADE (TOWN CENTRE EDGE NORTH)

5.1 Applies to Land

This part applies to the land shown as 'Area 1' on the Dee Why Town Centre DCP Map.

5.2 Objectives

- To provide a transition between the mixed use Dee Why Town Centre and adjacent residential areas
- To develop slender tower forms above two storey podiums which are set back from the street in order to maximise solar access to open spaces in front of buildings for café dining, soft landscaped areas and the like
- To ensure shops, pathways and dwellings enjoy good access to natural light
- To provide a component of a new public park fronting Dee Why Parade and adjacent to the existing drainage easement
- To ensure development does not dominate the residential areas opposite on Dee Why Parade.

6. AREA 2: HOWARD AVENUE (TOWN CENTRE CORE NORTH)

6.1 Applies to Land

This part applies to the land shown as 'Area 2' on the Dee Why Town Centre DCP Map.

Figure 20. Howard Avenue Streetscape vision

6.2 Objectives

- To ensure that Howard Avenue is a pedestrian friendly boulevard and an important focus of shopping and community activity
- To ensure development is designed to address the existing and proposed parks and access ways
- To encourage building design that will contribute to the vibrancy of area by helping to define the streets and public spaces
- To create an environment that is human in scale as well as comfortable, interesting and safe
- To ensure the ground level of buildings have an active street frontage
- To enable the provision of a road connection mid- block linking Howard Avenue and Oaks Avenue.

7. AREA 3: OAKS AVENUE (TOWN CENTRE CORE SOUTH)

7.1 Applies to land

This part applies to the land shown as 'Area 3' on the Dee Why Town Centre DCP Map.

Figure 21. Oaks Avenue Streetscape vision

7.2 Objectives

- To ensure that Oaks Avenue is the primary boulevard in the Dee Why Town Centre and the focus of shopping, recreation and business activity
- To ensure the transition of building height from Site B down towards the eastern edge of the Dee Why Town Centre
- To create a built environment that is attractive and smaller in scale than buildings in neighbouring Howard Avenue
- To ensure shops, dwellings and pedestrian circulation areas enjoy good access to natural light
- To enable the provision of a road connection mid- block linking Oaks Avenue and Pacific Parade during the consideration of development for Key Site C.

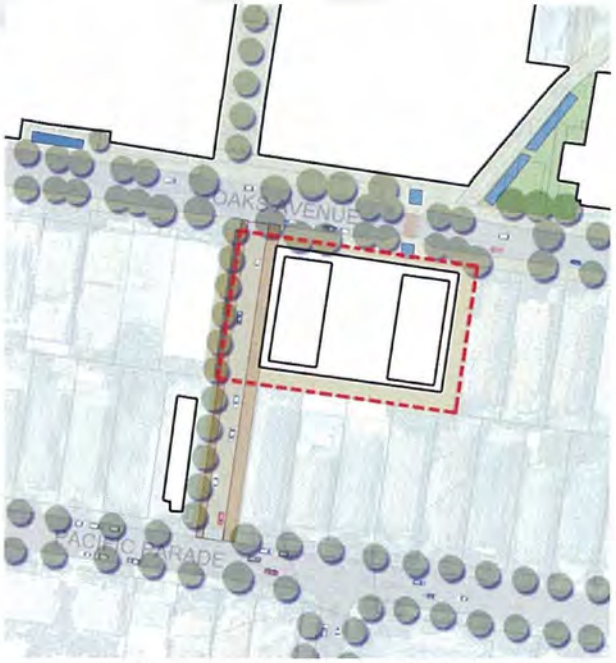

Figure 22. Component of Key Site C in Area 3

8. AREA 4: PACIFIC PARADE (TOWN CENTRE EDGE SOUTH)

8.1 Applies to Land

This part applies to the land shown as 'Area 4' on the Dee Why Town Centre DCP Map

8.2 Objectives

- To provide a high quality public interface between development and pedestrian areas
- To protect the amenity of residential properties along the southern side of Pacific Parade
- To create an environment that is human in scale as well as comfortable, interesting and safe
- To enable the provision of a road connection mid- block between Oaks Avenue and Pacific Parade during the consideration of development for Key Site C.

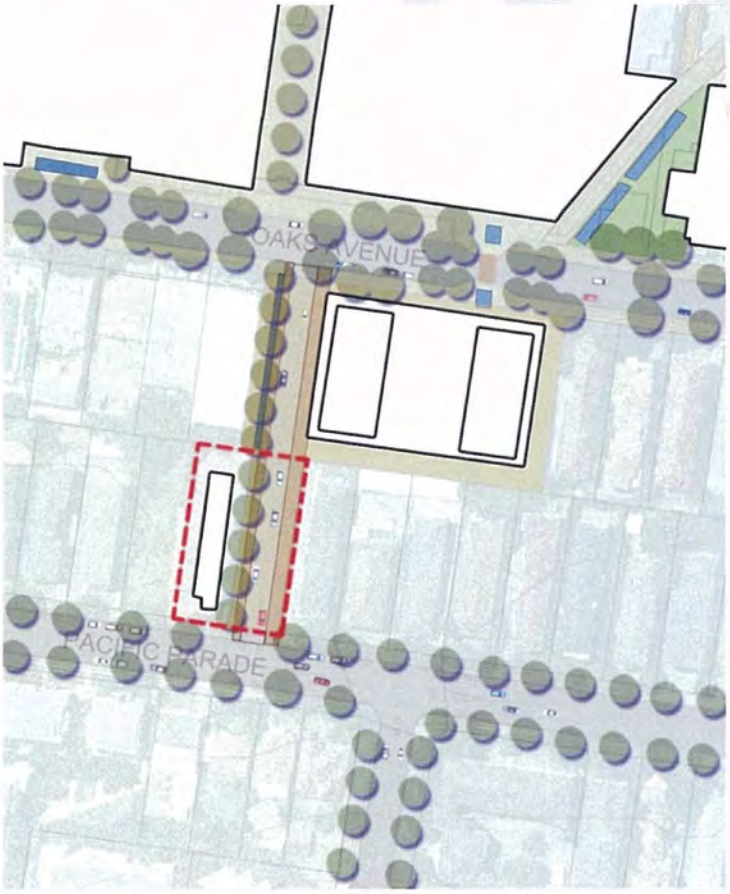

Figure 23. Component of Key Site C in Area 4

9. AREA 5: STURDEE PARADE (TOWN CENTRE EDGE SOUTH)

9.1 Applies to Land

This part applies to the land shown as 'Area 5' on the Dee Why Town Centre DCP Map.

9.2 Objectives

- To improve pedestrian and vehicular access between Pacific and Sturdee Parades
- To create an environment that is human in scale as well as comfortable, interesting and safe
- To ensure the transition of building height from Pittwater Road down towards the eastern edge of the Dee Why Town Centre
- The design and arrangement of buildings are to recognise and preserve existing significant public views (from parks, streets etc.) and significant views from private properties to landscape features such as the Lagoon, Long Reef headland, the coast line and Stony Range Reserve.

10.AREA 6: TOWN CENTRE (SOUTH)

10.1 Applies to Land

This part applies to the land shown as 'Area 6' on the Dee Why Town Centre DCP Map.

10.2 Objectives

- To ensure shops and dwellings enjoy good access to natural light
- To create an environment that is human in scale as well as comfortable, interesting and safe
- To ensure the transition of building height from Pittwater Road down towards the eastern edge of the Dee Why Town Centre
- To ensure the scale of residential development at the street frontage is consistent with existing development on either side of Delmar Parade and Sturdee Parade as viewed by pedestrians.

11.AREA 7: PITTWATER ROAD (TOWN CENTRE SPINE)

11.1 Applies to Land

This part applies to the land shown as 'Area 7' on the Dee Why Town Centre DCP Map.

Figure 24. Pittwater Road vision from corner of Pacific Parade

11.2 Objectives

- To reinforce the Dee Why Town Centre as the focus of regional activity for the Northern Beaches via the treatment of public spaces, the arrangement of land uses and the scale and intensity of development
- To ensure shops, dwellings and public footpaths have good access to natural light
- To appropriately manage priority pedestrian movements
- To ensure building height transitions from Key Site B along Pittwater Road and down to the northern and southern ends of the Dee Why Town Centre
- To set the character and provide an identity to the Dee Why Town Centre
- To promote high quality development that defines and announces the central spine of the Dee Why Town Centre.

12.AREA 8: MOORAMBA ROAD

12.1 Applies to Land

This part applies to the land shown as 'Area 8' on the Dee Why Town Centre DCP Map.

12.2 Objectives

- To establish a transition between the B4 Mixed Use zone and adjacent residential zones
- To ensure future development defines the streets and provides passive surveillance of adjoining public spaces
- To create an environment that is human in scale as well as comfortable, interesting and safe.

13.AREA 9: FISHER ROAD

13.1 Applies to Land

This part applies to the land shown as 'Area 9 'on the Dee Why Town Centre DCP Map

13.2 Objectives

- To create an environment that is human in scale as well as comfortable, interesting and safe
- To ensure future development defines the streets and public spaces
- To ensure that buildings have an active street frontage
- Tho ensure the height of buildings provide an appropriate transition in scale between the B4 Mixed Use zone and surrounding zones.

14.AREA 10: CIVIC CENTRE

14.1 Applies to Land

Applies to the land shown as 'Area 10 'on the Dee Why Town Centre DCP Map

Figure 25. Civic Centre vision view from corner of Pittwater road and St David Avenue

14.2 Objectives

- To ensure the Civic Site is developed as the main community meeting place and place of celebration
- To create a pedestrian environment that is comfortable, interesting and safe
- To ensure shops, dwellings pedestrian areas enjoy good access to natural light
- To develop a public area which will function as the focus of civic activity within Warringah and the premier community hub for the Northern Beaches
- Develop new buildings and public facilities along the Pittwater Road and St David road frontage.

Figure 26. Civic Centre Site vision

14.2.1 Specific Development standards

1. Development is to maintain a minimum front building setback. The minimum front setbacks will be 15 metres from Pittwater Road, zero metres from St. David Avenue and 6 metres from The Kingsway.
2. The first 4 storeys of the civic building must be set back a sufficient distance to enable the establishment of a double row of Norfolk Pines and the provision of a 4 metre footpath.
3. Built form above the fourth storey must be set back at least 4 metres from the parapet line of the fourth storey.
4. The minimum building setback to a property boundary shared with non-Council land is 4.5 metres.
5. Landscaping for the site shall include the planting of double row of Norfolk Island Pines along Pittwater Road.
6. Design and locate buildings to reduce noise nuisance from Pittwater Road to the proposed civic areas.
7. Defining the corner of St David Avenue and Pittwater Road as a point of interest and main pedestrian access to the site.
8. The sandstone outcrops and vegetation between the existing Council administration building, the existing library and along the western side of Civic Drive shall be retained.

DCP PART H Parking

Appendix 1 Car Parking Requirements

The proposed amendments to the parking schedule are highlighted in red text.

Note: As expressed within the requirements table below, specific parking rates may apply to certain uses within the Dee Why Town Centre. The boundaries of the Dee Why Town Centre are shown in Figure 1 of Part G1 Dee Why Town Centre.

Residential	
Use	**Requirement**
Multi-dwelling housing, Residential flat buildings, Serviced apartments (including holiday flats), Shop-top housing (residential component)	1 space per 1 bedroom dwelling 1.2 spaces per 2 bedroom dwelling 1.5 spaces per 3 bedroom dwelling 1 visitor space per 5 units or part of dwellings Requirements within the Dee Why Town centre; 0.6 - 1 space per 1 bedroom dwelling 1 space per 2 bedroom dwelling 1.5 spaces per 3 bedroom dwelling 1 visitor space per 5 units or part of dwellings
Office and Business	
Use	**Requirement**
Business premises	1 space per 40 m^2 GFA excluding customer service/access areas, plus, for customer service/access areas 1 space per 16.4 m^2 GFA. Requirements within the Dee Why Town Centre; 1 space per 40 - 60 m^2 GFA
Office premises	1 space per 40 m^2 GFA. Requirements within the Dee Why Town Centre; 1 space per 40 - 60 m^2 GFA

Retail and Commercial	
Use	**Requirement**
Shop (includes retail / business component of shop top housing, retail premises and neighbourhood shop)	1 space per 16.4 m^2 GLFA (6.1 spaces per 100 m^2 GLFA). The above rate may be varied in shopping centre complexes, such as shopping malls, where multi-purpose trips predominate, in accordance with the following: for 0-10,000 m^2 GLFA - 6.1 spaces per 100 m^2 GLFA for 10,000-20,000 m^2 GLFA - 5.6 spaces per 100m^2 GLFA for 20,000-30,000 m^2 GLFA - 4.3 spaces per 100 m^2 GLFA for more than 30,000 m^2 GLFA - 4.1 spaces per 100 m^2 GLFA Requirements within the Dee Why Town Centre; 1 space per 20m^2 GLFA (5 spaces per 100 m2 GLFA) The above rate may be varied in shopping centre complexes, such as shopping malls, where multi-purpose trips predominate, in accordance with the following: for 0-10,000 m^2 GLFA – 4.8 spaces per 100 m^2 GLFA for 10,000-20,000 m^2 GLFA – 4.4 spaces per 100 m^2 GLFA for 20,000-30,000 m^2 GLFA – 3.4 spaces per 100 m^2 GLFA for more than 30,000 m^2 GLFA – 3.2 spaces per 100 m^2 GLFA

Warringah Council

Dee Why Town Centre Traffic Model Update
Traffic Modelling Report

20 March 2014

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

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Appendix A Model Calibration and Validation
Appendix B GEH Statistics
Appendix C Approved and Pending Development Applications
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1. Introduction

1.1 Background

GHD has been commissioned by Warringah Council to update the Dee Why Town Centre Traffic Model. This report comprises the initial testing of the revised 'Base Case' and 'Option 2A2' Paramics models previously prepared by GTA Consultants in 2007 to identify potential changes in road network performance as a result development that could be realised under the Dee Why Masterplan. This includes testing of the assumed mix of commercial, residential and retail land uses within Dee Why that are currently permissible under the Warringah LEP.

1.2 Purpose of this report

The purpose of this study is to determine the level of development in Dee Why Town Centre that can be accommodated under the Option 2A2 scenario road network under a revised set of land use assumptions reflecting likely market take-up. This report documents the changes in traffic conditions throughout the Dee Why Town Centre a under range of development densities and using a new mix of land uses with substantially less commercial development.

The model has been developed using the Paramics micro simulation traffic modelling software suite and has been calibrated and validated according to the methodology set out in the *RMS Traffic Modelling Guidelines, 2013*. This calibrated model has been used to test the impacts of likely development under the Warringah LEP 2011 on the basis of performance measures including travel times and intersection Levels of Service under existing, and forecast traffic flows.

1.3 Limitations and Assumptions

As is normal in traffic modelling studies, the scope of this work entails a number of limitations and assumptions on the latitude of this study. The main limitations and assumptions include:

- Traffic count data collected by SkyHigh for Thursday morning and evening peak periods (including turning movement counts, travel time surveys and origin-destination surveys) are a true and accurate representation of existing traffic conditions along Pittwater Road;
- Traffic demand for the Saturday peak period has been determined by applying the growth factor between the surveys conducted by GTA in 2007 and the surveys conducted in 2013 to GTA's surveyed traffic flows for the Saturday peak.
- Information relating to changes in land use provided by Warringah Council for the Cobalt, Woolworths and PCYC sites is correct;
- Traffic generation rates for approved and pending development applications are based on the rates used by GTA Consultants and outlined in their original traffic report.
- Signal timing data provided by RMS is correct (confirmed by site visits);
- Revised intersection arrangements for the proposed option including traffic signal phasing have been taken from the original traffic models produced by GTA Consultants in 2007;
- The right-turn into the Dee Why Hotel development from Pacific Parade West that was originally banned in GTA's traffic model has been permitted to reflect existing traffic conditions (confirmed by site visits);
- The Option 2A2 AM peak modelling scenario has been developed based on GTA's Option 2A2 PM model incorporating updated traffic demand and optimized signal timing; and

- Does not include modelling of cycleways or mid-block pedestrian crossings.

1.4 Report Structure

This report is structured as follows:

- Model Revision and Update – Outlines the scope and methodology used to revise and update the traffic model (Section 2).
- Scenario Testing – Outlines the scenarios tested as a part of this assessment (Section 3).
- Model Results – Outlines the results of scenario testing (Section 4).
- Summary and Conclusions – Outlines the conclusions of the scenario testing and assessment process (Section 5).

2. Model Revision and Update

2.1 Overview

The Dee Why Town Centre micro simulation model was originally developed by GTA consultants in 2007. This model has been revised and updated by GHD to determine changes in traffic conditions throughout the Dee Why Town Centre as a result of increasing the proposed density of development that is currently allowed under the Warringah LEP 2011. The model has been revised and updated using the Paramics micro simulation modelling package (version 6.7.1) with additional functionality provided by the CeeJazz suite of Plugins. Version 6.7.1 G05 of Ceejazz was used, with the following Plugins active:

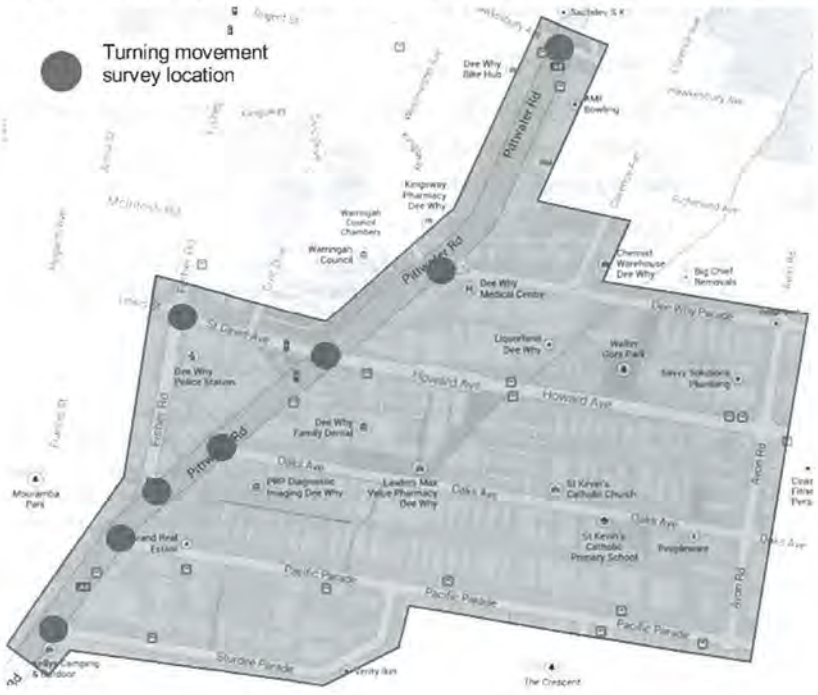
- Lane Choice;
- Validator;
- Level of Service; and
- Trailmaker.

Of these Plugins, only the Lane Choice Plugin has an effect on the model operation, while the other Plugins are used only for reporting purposes.

2.2 Model Extents

The Dee Why Town Centre micro simulation traffic model covers the Dee Why Town Centre bounded by Francis Street in the West, Avon Road in the East, Hawkesbury Avenue in the North and Sturdee Parade in the South. A map of the study area is shown in Figure 1.

Figure 1 Dee Why Town Centre Micro Simulation Model Extents



Source: Warringah Council

The Dee Why Town Centre models have been revised and updated using a synthesis of traffic data from 2013 including surveyed traffic counts and travel time surveys.

2.3 Traffic Data

Traffic data collected by SkyHigh for Thursday AM and PM peak periods was used to update the models to reflect existing traffic conditions and included:

- Classified intersection turning movement counts at the following intersections:
  - Pittwater Road – Sturdee Parade;
  - Pittwater Road – Pacific Parade;
  - Pittwater Road – Fisher Road;
  - Pittwater Road – Oaks Avenue;
  - Pittwater Road – Howard Avenue – St David Avenue;
  - Pittwater Road – Dee Why Parade – Kingsway;
  - Pittwater Road – Hawkesbury Avenue; and
  - Fisher Road – St David Avenue – Lewis Street.
- Travel time surveys undertaken along Pittwater Road between Sturdee Parade and Hawkesbury Avenue.

Since Saturday peak period surveys were not undertaken, the traffic demand for this period was determined by applying a growth factor between the surveys conducted by GTA in 2007 and the surveys conducted in 2013 to GTA's surveyed traffic flows for the Saturday peak.

In addition to the traffic survey data, signal timing data provided by RMS was used in the model calibration and validation process.

2.4 Temporal Coverage

The Dee Why Town Centre micro simulation traffic model covers the following time periods:

- Weekday morning peak (07:00 to 09:00);
- Weekday evening peak (16:00 to 18:00); and
- Saturday midday peak (10:00 to 12:00).

These time periods have been updated to represent the intersection survey periods and consist of a "warm-up" hour, which is used to allow the model to reach typical congested traffic conditions during the analysis period (second hour).

2.5 Model Calibration and Validation

Calibration and validation of the Dee Why Town Centre micro simulation model has been undertaken according to the methodology set out in the RMS Traffic Modelling Guidelines, 2013. The results of this process indicate that the model is well-calibrated and validated and meets the standards outlined in the guidelines. A detailed outline of the calibration and validation process used in the development of the Dee Why Town Centre Model is included in Appendix A.

3. Scenario Testing

3.1 Overview

The Base Case and Option 2A2 models originally produced by GTA Consultants in 2007 have been modified and updated to reflect 2013 traffic conditions, optimised signal arrangements and changes in land use proposed by Warringah Council.

The traffic modelling for the scenarios detailed below was undertaken for the morning, evening and Saturday peak periods. This is in contrast to the traffic modelling undertaken by GTA, which only considered the weekday evening and Saturday peak periods.

3.2 Road Network Options

The following road network configurations were tested as part of the modelling process.

3.2.1 Base Case (Existing Road Network)

The base case modelling scenario assumes that no changes will be made to the road network. The models have been revised and tested based on changes in traffic demand identified by traffic count surveys conducted by SkyHigh in October 2013, for the morning, evening and Saturday peak periods.

3.2.2 Option 2A2

Option 2A2 incorporates a one-way road system eastbound on Oaks Avenue and westbound on Howard Avenue. All traffic management measures included in the Option 2A2 road network remains consistent with that originally modelled by GTA, with the exception of the removal of a right-turn ban from Pacific Parade West into the Dee Why Hotel development.

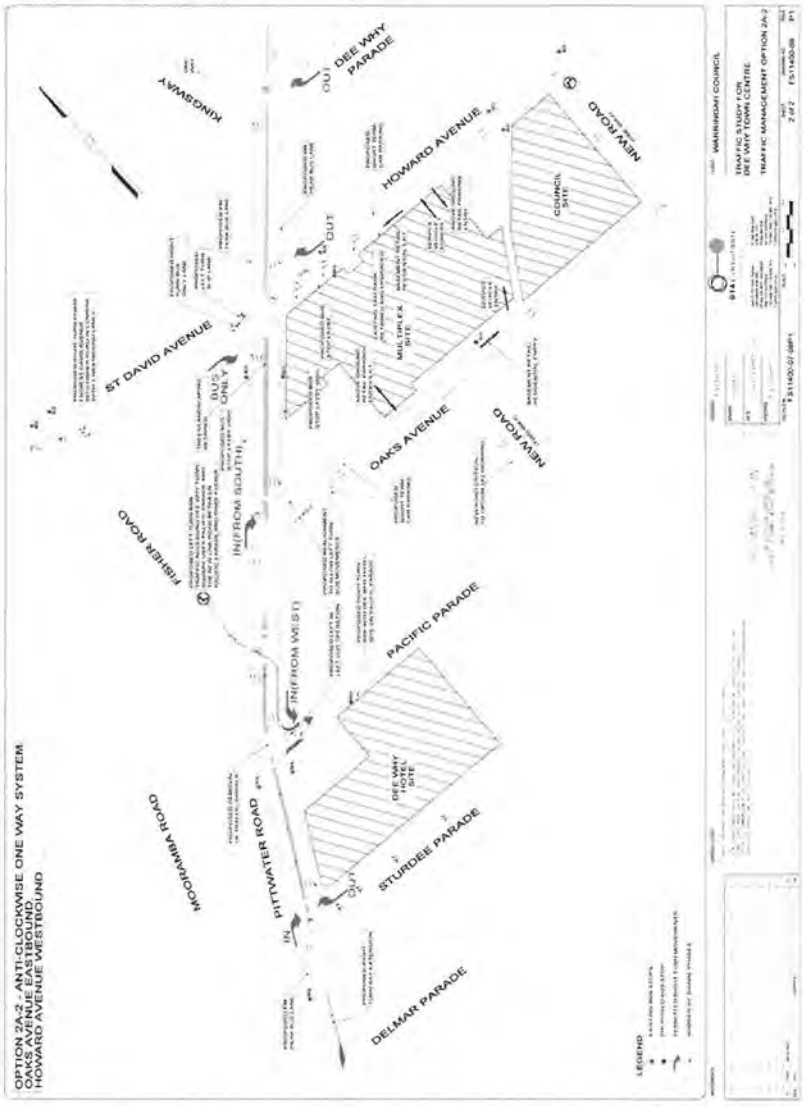
In summary, Option 2A2 applies the following traffic management measures to the existing road network:

- The removal of traffic signals at the intersection of Pacific Parade and Pittwater Road and conversion to a left-in left-out priority controlled intersection arrangement;
- The establishment of a one-way anti-clockwise road system that runs eastbound along Oaks Avenue and westbound on Howard Avenue. This system includes a one-way northbound road link that runs between Oaks Avenue and Howard Avenue.
- The addition of a right-turn signal phase from Sturdee Parade into Pittwater Road.
- The extension of the right-turn bay on the southern approach of Pittwater Road and Sturdee Parade;
- The removal of the right turn from Delmar Parade onto Pittwater Road;
- The establishment of four-phase signal arrangement at the intersection of Pittwater Road and Fisher Road;
- The establishment of a bus-only right-turn bay from St David Avenue onto Pittwater Road;
- The establishment of a left-slip lane from St David Avenue onto Pittwater Road;
- Removal of parking on the southern kerb of Sturdee Parade;
- Restriction of parking during the Saturday peak along the eastern kerb of Fisher Road between Pittwater Road and St David Avenue;

- The right-turn into the Dee Why Hotel development from Pacific Parade West that was originally banned in GTA's traffic model has been permitted to reflect existing traffic conditions (confirmed by site visits); and
- Altering the geometry of the north-eastern corner of the intersection of Oaks Avenue and Pittwater Road to permit left turn bus movements from the northern approach of Pittwater Road into Oaks Avenue.

A preliminary plan showing road network arrangements under Option 2A2 is provided in Figure 2.

Figure 2 Option 2A2 Preliminary Plan



During the revision of the Option 2A2 model, the removal of the road link between Pacific Parade and Oaks Avenue (originally proposed by GTA Consultants as a part of the Option 2A2 scheme) was tested to determine if the one-way road system would perform adequately without this link. Further testing showed that the road link is essential to the operation of the one-way road system, and its removal results in network-wide congestion under all modelling scenarios. This is consistent with the original assumptions made by GTA Consultants.

3.2.3 Inclusion of Signalised Pedestrian Crossing under Option 2A2

Option 2A2 would require the replacement of the existing marked pedestrian crossings on Oaks Avenue and Howard Avenue with mid-block signalised pedestrian crossings. This was not documented within the original GTA report, and these pedestrian crossings were not part of the original model developed by GTA. Paramics does not model unsignalised pedestrian crossings and no data was available regarding the demand at these crossings.

It is expected that the provision of signalised pedestrian crossings on Howard Avenue and Oaks Avenue will formalise pedestrians crossing opportunities and improve safety pedestrian safety, particularly on these proposed one-way streets. These signalised crossings can be coordinated with traffic signals on Pittwater Road to streamline traffic flow and reduce interruption of traffic flow through the one way system.

The introduction of signalised pedestrian crossing on Howard Avenue and Oaks Avenue needs to be further investigated to ascertain the likely traffic implications.

3.2.4 Inclusion of Cycling Lane on Howard Avenue under Option 2A2

The modelling results indicate Howard Avenue is approaching capacity during the morning peak period. In order for the intersection of Howard Avenue and Pittwater Road to operate satisfactorily under Option 2A2, the proposed lane configuration on the Howard Avenue East will require three westbound lanes.

The inclusion of a cycle lane in Howard Avenue will either require the removal of parking or a traffic lane. The latter will have a detrimental effect on the road carrying capacity of Howard Avenue. The other option will be to reduce the footpath width on Howard Avenue to accommodate a cycle lane.

3.2.5 Pacific Parade Swept Path Analysis

A swept path analysis was undertaken for rigid and articulated heavy vehicles turning left from Pittwater Road north into Pacific Parade, plots of which are provided in Appendix E. This analysis determined that due to the physical constraints of the intersection, rigid and articulated heavy vehicles would not be able to complete the left turn manoeuvre unless significant modifications are made to the north-east corner of the intersection to widen the road. If road widening is not undertaken, then any developments along Pacific Parade that are serviced by heavy vehicles need to consider that heavy vehicles will not be able to complete the left-turn manoeuvre from Pittwater Road north. In order to maintain heavy vehicle access along Pacific Parade, these developments would need to arrange alternative access routes for the heavy vehicles; or road widening at the intersection of Pittwater Road and Pacific Parade will need to be undertaken.

3.3 Land Use Options

The land use options tested within the model are described below.

3.3.1 Approved and Pending Development Applications S

Of the identified development applications within the study area, 12 have received Council approval with 5 still pending. The trip generation for the majority of these sites remains consistent with what was originally assumed by GTA Consultants in 2007 and is provided in Appendix C. These trips were assigned to the model based on the spatial distribution assumptions outlined in Section 3.2.

The trip generation for the Woolworths site (27-33 Oaks Avenue) and associated pass-by traffic has been determined based on the land use information provided in the 'Preliminary Redevelopments Concepts' by Marchese Partners (10/09/2012) and the traffic generation rates originally used by GTA consultants in 2007 (presented in Table 1) and is consistent with assumptions provided by Council.

Recent development applications for Woolworths and Cobalt sites have indicated that there is reduced market demand for commercial space within Dee Why Town Centre, with both these development applications proposing no commercial space and a single floor of retail. As residential land uses generally generate fewer trips for the same developable area than commercial trips, the change in land use assumptions from commercial to residential development present the opportunity to develop these sites with greater floor area for the same traffic impact.

3.3.2 Potential LEP Development

A total of 48 sites (listed in Appendix D) have been earmarked by Council for potential development under the Warringah LEP 2011. Some of these sites fall outside what is considered the 'town centre' under the Dee Why Masterplan, but been included as part of trip generation associated with potential LEP developments (refer to Figure 3) as agreed with Warringah Council. The trip generation for these sites is provided in Appendix D and the trip generation rates are provided in Table 1.

The traffic generation for potential LEP developments has been determined based on the assumption that all sites are to comprise the following land-use mix:

- Zero (0) floors of commercial GFA,
- One (1) floor of retail GFA (ground floor)
- Remaining floors assumed to be residential.

The above assumptions reflect the changing trend in market demand away from commercial development and towards residential development (also identified in Section 3.3.1). The aforementioned land-use assumptions were applied to all of the potential LEP developments in the study area, resulting in the following split of GFA by land use type:

- 0% Commercial
- 18% Retail
- 82% Residential

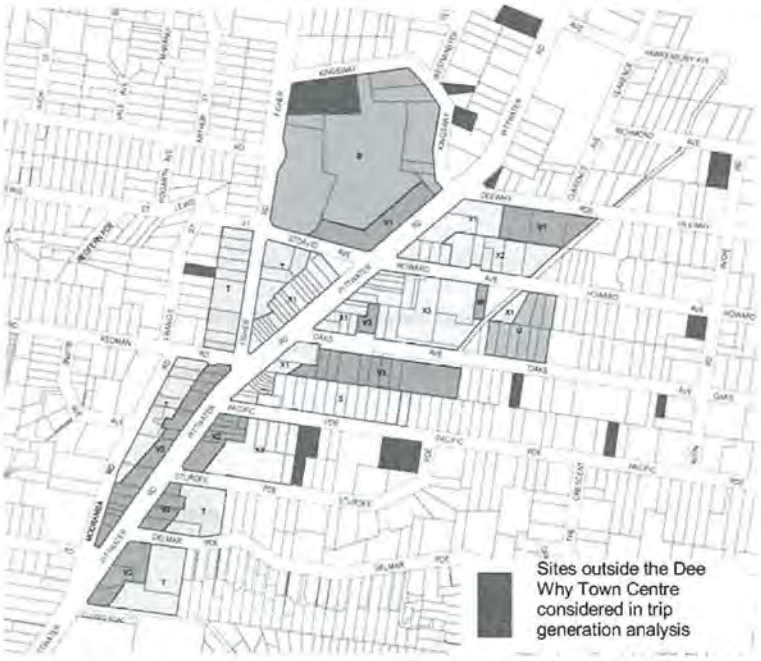
The traffic generation estimated as a part of this exercise differs significantly from that originally estimated by GTA. This difference in traffic generation can be attributed to the following changes:

- Adoption of the updated trip generation rates as prescribed by Roads and Maritime Services NSW in 2013.
- Changes in land-use mix assumptions, as detailed above.

Further sensitivity testing was undertaken to test the capacity of the road network under the current Warringah LEP 2011. This was achieved by increasing the floor-to-space (FSR) ratio for each of the identified sites listed in Appendix D by a nominated percentage. Accordingly, the increase in traffic generation for each of the subsequent scenarios (i.e FSR 105, FSR 110) correlates to the percentage increase in FSR. The increase in the FSR was then applied uniformly across all of the potential development sites within the study area, and the resulting traffic was assigned to the model based on the directional and distribution splits outlined in Section 3.2.

Traffic generation for the proposed PCYC development (36-48 Kingsway) has been determined based on the land use information provided in the 'PCYC Project and Car Park Redevelopment, Dee Why Traffic Impact Assessment' by Bitzios Consulting (page 7) updated traffic generation rates (presented in Table 1), and is consistent with assumptions defined by Council.

Figure 3 Location of LEP Developments outside of Dee Why Town Centre



3.3.3 Trip Generation Rates

The following table provides a summary of the trip generation rates used in the development of the models. It compares the old rates originally used by GTA Consultants in 2007 with the updated trip generation rates as prescribed by Roads and Maritime Services NSW in 2013.

Table 1 Trip Generation Rates

Peak	Residential (Trips per Unit Dwelling)			Commercial (Trips/GFA)	Retail (Trips/GLFA)	School (veh/stu)
	House	High Density Sub-metro	Aged/Disabled Housing			
GTA Trip Generation Rates						
Morning	0.85	0.29	0.2	0.02	0.01	0.8
Evening	0.85	0.29	0.2	0.02	0.04	0.7
Saturday	0.425	0.145	0.1	0	0.052	0
Updated Trip Generation Rates						
Morning	0.95	0.19	0.4	0.016	0.046	0.8
Evening	0.99	0.15	0.4	0.012	0.046	0.7
Saturday	0.495	0.075	0.2	0	0.061	0

The update of trip generation rates has resulted in a reduction in the number of trips generated by high-density residential dwellings, and an increase in the number of retail trips. With respect to revisions to the Dee Why Masterplan, the replacement of commercial units with high-density residential dwellings has resulted in a reduction in the overall trip generation associated with potential LEP developments.

Directional Distribution

The directional distributions used by GHD in updating the traffic generation are consistent with the original assumptions used by GTA Consultants in 2007. The directional distribution for AM, PM and Saturday peaks is shown in Table 2.

Table 2 Directional Distribution Rates

Period	Residential	Commercial	Retail
Morning, Evening and Saturday			
North	15%	40%	40%
East	15%	20%	20%
South	40%	20%	20%
West	30%	20%	20%

Directional Split

The directional split used by GHD to determine inbound and outbound trips remains consistent with those originally used by GTA Consultants in 2007. The directional splits for incoming and outgoing vehicle trips are shown in Table 3.

Table 3 Directional Split for Incoming and Outgoing Vehicles

Period	Residential	Commercial	Retail
Incoming			
Morning	20%	90%	90%
Evening	60%	10%	50%
Saturday	50%	-	50%
Outgoing			
Morning	80%	10%	10%
Evening	40%	90%	50%
Saturday	50%	-	50%

3.4 Scenario Tests

Traffic model 'Option 2A2' was used by GHD as the basis for further scenario testing, with each scenario being assessed for AM, PM and Saturday peak period traffic conditions. The scenarios that were tested using the 'Base Case' and 'Option 2A2' models include the following:

- Scenario 1: Existing traffic network with 2013 surveyed traffic flows;
- Scenario 2: 'Option 2A2' with 2013 surveyed traffic flows + traffic demand derived from approved and pending development applications;
- Scenario 3: 'Option 2A2' with 2013 surveyed traffic flows + traffic demand derived from approved and pending development applications + traffic demand derived from full (100%) LEP development;
- Scenario 4: 'Option 2A2' with 2013 surveyed traffic flows + traffic demand derived from approved and pending development applications + traffic demand derived from 105% of the full LEP development; and
- Scenario 5: 'Option 2A2' with 2013 surveyed traffic flows + traffic demand derived from approved and pending development applications + traffic demand derived from 110% of the full LEP development.

3.5 Trip Generation

The total trip generation associated with each of the land use options is shown in Table 4.

Table 4 Land Use Option Total Trip Generation

Peak	Total Trip Generation
Approved and Pending Development Applications	
Morning	857
Evening	1401
Saturday	1121
LEP FSR 100%	
Morning	749
Evening	668
Saturday	1003
LEP FSR 105%	
Morning	773
Evening	689
Saturday	1011
LEP FSR 110%	
Morning	799
Evening	711
Saturday	1023

A more detailed breakdown of the trip generation is provided in Appendix C and Appendix D. The table shows that approved and pending development applications and the LEP developments generate a similar quantum of trips.

4. Model Results

4.1 Overview

The Dee Why Town Centre traffic models have been evaluated as agreed with Warringah Council on the basis of the following performance measures:

- Network statistics including unreleased vehicles;
- Intersection Level of Service; and
- General traffic travel times.

Analysis of all of the scenarios tested showed that the critical peak period for the operation of the Option 2A2 network was the morning peak period, when the performance of the intersection of Pittwater Road and Howard Avenue is closest to capacity. This is in contrast to modelling work undertaken by GTA, which concentrated on the evening and Saturday peak periods only, and which has overlooked this critical period in the assessment of the capacity of the surrounding road network.

4.2 Network Statistics

Network statistics were collected for each of the models, including the following:

- Vehicle Hours of Travel (VHT);
- Vehicle Kilometres of Travel (VKT);
- Average Network Speed (km/hr); and
- Total Unreleased Vehicles.

These statistics are summarised in Table 5 below.

Table 5 Morning Peak Network Statistics Summary

Option	VHT (hr)	VKT (km)	Average Travel Speed (km/hr)	Total Unreleased Vehicles
Morning Peak				
Scenario 1: Base Case (Existing)	387	10,018	26	1
Scenario 2: Option 2A2 + DA	566	13,041	23	22
Scenario 3: Option 2A2 + DA + LEP FSR 100	695	14,040	20	150
Scenario 4: Option 2A2 + DA + LEP FSR 105	700	14,009	20	170
Scenario 5: Option 2A2 + DA + LEP FSR 110	705	14,082	20	174
Evening Peak				
Scenario 1: Base Case (Existing)	472	10,722	23	58
Scenario 2: Option 2A2 + DA	564	14,962	27	9
Scenario 3: Option 2A2 + DA + LEP FSR 100	849	15,862	24	54
Scenario 4: Option 2A2 + DA + LEP FSR 105	655	15,927	24	14
Scenario 5: Option 2A2 + DA + LEP FSR 110	690	16,021	23	76

Option	VHT (hr)	VKT (km)	Average Travel Speed (km/hr)	Total Unreleased Vehicles
Saturday Midday Peak				
Scenario 1: Base Case (Existing)	433	10,663	25	1
Scenario 2: Option 2A2 + DA	505	14,526	29	0
Scenario 3: Option 2A2 + DA + LEP FSR 100	652	15,939	24	16
Scenario 4: Option 2A2 + DA + LEP FSR 105	649	15,999	25	9
Scenario 5: Option 2A2 + DA + LEP FSR 110	659	15,937	24	25

Analysis of the network statistics shows a general tendency towards increased vehicle hours and kilometres travelled across the network as a result of the introduction of traffic generated by approved and pending development applications as well as potential LEP scenarios.

The number of total unreleased vehicles represents queuing at various locations throughout the Dee Why Town Centre network. It is evident that the number of total unreleased vehicles increases drastically under both LEP scenarios during the morning peak, which can be attributed to changes in signal timing at the intersection of Pittwater Road and Howard Avenue. The eastern approach of Howard Avenue requires a greater proportion of green-time allocation in order to account for increased traffic as a result of the one-way road system.

The requirement to provide more phase time for east-west traffic at the intersection of Pittwater Road and Howard Avenue results in greater congestion for northbound and southbound traffic on Pittwater Road. Consequently, southbound queues on Pittwater Road tend to increase as development density through Dee Why Town Centre increases. This issue is presented in Figure 4.

Figure 4 Queuing on Pittwater Road during Morning Peak – LEP FSR 105%

Analysis of the morning peak LEP scenarios showed that the critical movement in the Option 2A2 network is the westbound movement from Howard Avenue at Pittwater Road. Increasing development results in larger demand and longer queues on this approach. Due to the constrained nature of the one-way pair, excess queuing on this approach will result in extensive

congestion through Dee Way Town Centre. Consequently, increase in development density and traffic in the Dee Why must come at the cost of decreased through capacity on Pittwater Road.

The theoretical maximum level of LEP development that can be accommodated by the 'Option 2A2' road network before queuing becomes excessive and impacts on the operation of the network is in the order of 105% of full LEP development (refer to Section 3.3.2). This corresponds to approximately 170 vehicles queued on Pittwater Road north of Howard Avenue during the morning peak. Queues of longer than this are likely to impact on other intersections on Pittwater Road to the north of Dee Why.

4.3 Intersection Performance

The assessment of intersection operation is based on criteria outlined in Table 6 as defined in the Guide to Traffic Generating Developments published by the NSW Roads and Traffic Authority (RTA) in 2002.

Table 6 Intersection Levels of Service

Level of Service	Average Delay per Vehicle	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts will require other control mode	At capacity, requires other control mode
F	>70	Over capacity, unstable operation	Over capacity, unstable operation

Source: Guide to Traffic Generating Developments, NSW RTA (2002)

Intersection Levels of Service have been reported for Weekday (0800 to 0900 and 1700 to 1800) and Saturday (1100 to 1200) peak hours for the following intersections:

- Pittwater Road/Sturdee Parade
- Pittwater Road/Pacific Parade
- Pittwater Road/Fisher Road
- Pittwater Road/Oaks Avenue
- Pittwater Road/Howard Avenue/St David Avenue
- Pittwater Road/Dee Why Parade
- Pittwater Road/Hawkesbury Street
- Pittwater Road/Fisher Road

A summary of the modelled average delays and intersection levels of service in the 'Base Case' and 'Option 2A2' networks is shown in Table 7.

Table 7 Intersection Levels of Service

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

Analysis of the modelled intersection Levels of Service show that the all of intersections in the study area are forecast to operate satisfactorily, with a Level of Service D or better under both the Base Case and Option 2A2 models.

It should be noted that the intersection delays shown above are for interrelated intersections, hence high delays at one intersection can result in reduced flow to downstream intersections, which in turn reduces delay for those downstream intersections. It is this "gating" effect that can result in some intersection performing better under higher demands.

Under Option 2A2, average delay at some intersections may increase during the weekday morning peak when compared to the Base Case scenario. These average delays are likely to increase further with the introduction of traffic generated by potential LEP developments.

Average delay at most intersections is largely comparable during the weekday evening and Saturday midday peaks under all modelling scenarios, with the exception of Fisher Road/St David Avenue and Pittwater Road/Sturdee Parade, which are forecast to increase with the introduction of traffic generated by potential LEP developments.

4.4 Travel Time Comparison

Travel time observations were conducted by SkyHigh along Pittwater Road between Sturdee Parade and Hawkesbury Avenue on Wednesday October 9th 2013 during morning (08:00-09:00) and evening (17:00-18:00) peak periods. A comparison of the observed and modelled travel times along this section are presented in the following section.

Table 8 Comparison of Observed and Modelled Travel Times

Section	Travel Time (min:sec)					
	Observed	Scenario 1: Base Case	Scenario 2: Option 2A2 + DA	Scenario 3: Option 2A2 + DA + LEP FSR 100%	Scenario 4: Option 2A2 + DA + LEP FSR 105%	Scenario 5: Option 2A2 + DA + LEP FSR 110%
Northbound						
Thursday: 08:00-09:00	02:01	01:19	01:33	01:34	01:34	01:34
Thursday: 17:00-18:00	01:50	01:15	01:20	01:23	01:23	01:23
Saturday: 11:00–12:00	-	01:38	01:21	01:22	01:22	01:25
Southbound						
Thursday: 08:00-09:00	01:39	01:25	03:11	03:29	03:35	03:41
Thursday: 17:00-18:00	01:35	01:26	01:58	02:13	02:12	02:14
Saturday: 11:00–12:00	-	01:33	01:38	02:49	02:39	02:55

Analysis of the modelled travel times along Pittwater Road shows that forecast travel times are comparable during the both weekday peak periods under the Base Case and Option 2A2 modelling scenarios. The only exception is the southbound route which increases as a result of traffic generation of approved and pending development applications as well as potential LEP changes. This can be attributed to changes in signal timing at the intersection of Pittwater Road and Howard Avenue. The eastern approach of Howard Avenue requires a greater proportion of green-time allocation in order to account for increased traffic as a result of the one-way road system.

In comparison to the surveyed travel times, the results of the Base Case and Option 2A2 scenarios are generally favourable for northbound vehicles, with forecast reductions in travel times under all modelling scenarios.

5. Summary and Conclusion

5.1 Key Findings

The key findings from the review and update of the Dee Why Town Centre traffic models are as follows:

- The implementation of a road link between Pacific Parade and Oaks Avenue is essential to the operation of the one-way road system, proposed under Figure 2. Removing this link results in network-wide congestion under all modelling scenarios.
- The intersection of Howard Avenue and Pittwater Road is the critical intersection within the one way system as this intersection controls the overall capacity of the surrounding road network.
- Testing of the various land use scenarios showed that the morning peak period is the critical period, where the intersection of Howard Avenue and Pittwater Road experiences the highest delays. This was not identified as part of the assessment undertaken by GTA, as that previous assessment was focussed only on the evening and Saturday peak periods.
- There is likely to be a significant change in the operation for the majority of intersections in Dee Why during the morning peak with the addition of traffic generated by pending and approved developments as well as potential LEP developments. However, the majority of intersections are not likely to change substantially during weekday evening and Saturday midday peak periods under the same circumstances.
- Northbound travel times along Pittwater Road under all development scenarios are likely to remain comparable with observed times. Changes to signal timing at the intersection of Pittwater Road and Howard Avenue under the one-way road system means that southbound travel times are likely to increase under the proposed development scenarios.

5.2 Key Conclusions

The key conclusions from the modelling of the Dee Why Town Centre are:

- The addition of traffic generated by approved and pending development applications can be accommodated by the 'Option 2A2' network.
- The theoretical maximum level of LEP development that can be accommodated by the 'Option 2A2' road network is in the order of 105% of full LEP development. Increasing the level of LEP development beyond this may result in excessive queuing southbound on Pittwater Road during the morning peak, potentially affecting other intersections to the north of Dee Why.
- Original modelling undertaken by GTA indicated that the road network surrounding Dee Why could accommodate approximately 85% of the proposed LEP development. The difference between the two outcomes is largely a result of the change from commercial land use to residential land use, which generates less traffic.
- The intersection of Pittwater Road and Howard Avenue operates close to capacity with the application of traffic generated by approved and pending development applications, and full (100%) LEP development.

Appendices

Appendix A Model Calibration and Validation

Data Collection and Validation

Traffic count data for each hour in the morning, evening and Saturday midday peak periods was plotted on a network diagram to identify any mismatches or discrepancies in vehicle flow. No significant discrepancies in vehicle flows were identified during this process.

Model Calibration

Overview

Calibration of the Dee Why Town Centre micro simulation model has been undertaken according to the methodology set out in the RMS Traffic Modelling Guidelines, 2013. Calibration has been undertaken for the weekday morning and evening peak periods based on a comparison against average hourly turning movements for the peak two-hour period.

Model Stability

The flow of traffic and the associated traffic conditions are randomly variable phenomena, and micro simulation models attempt to capture this variability by releasing traffic into the network at randomly varying intervals. Whether or not a vehicle is released from a zone in any given second is dependent on the outcome of a random number generator, and this generator is controlled by the seed value. The same model run under different seed values will results in a different simulation result. For this reason, micro simulation models are generally run using a range of seed values, with results being reported over a range of runs. The Dee Why Town Centre micro simulation model has been run under the prescribed RMS seed values of 560, 28, 7771, 86524, and 2849.

Calibration Statistics

Model calibration was undertaken on the basis of comparison of modelled and observed traffic volumes. The GEH statistic is used in the calibration of traffic models to compare the difference between observed and modelled traffic flows. The GEH statistic is defined as follows:

$$GEH = \sqrt{\frac{(V_{Observed} - V_{Modelled})^2}{(0.5 \times (V_{Observed} + V_{Modelled}))}}$$

Based on the calibration and validation guidelines presented in RMS *Traffic Modelling Guidelines, 2013*, a calibrated model must conform to the following requirements:

- No flow comparisons with GEH greater than 10; and
- At least 85% of flow comparisons with GEH less than 5.

Based on the adjusted traffic flows, a total of 62 individual turning counts were used in the calibration of the model. Barred turns were omitted from the turning count comparison. The table below shows the turning count comparisons for the morning and evening peak periods.

GEH Turning Count Comparisons

Period	Number of Movements with GEH			
	<3	<5	<10	>10
Morning Peak				
07:00-09:00	45 (75%)	53 (88%)	62 (100%)	0 (0%)

Period	Number of Movements with GEH			
	<3	<5	<10	>10
Evening Peak				
16:00-18:00	47 (78%)	58 (97%)	62 (100%)	0 (0%)

Analysis of the turning flow comparisons for the morning and evening peak periods shows that the model is well calibrated and conforms to the requirements set out in the RMS *Traffic Modelling Guidelines, 2013.* A detailed list of turning movement comparisons is provided in Appendix B.

Model Validation

In order to determine the suitability of the Dee Why Town Centre micro simulation traffic model in forecasting future traffic conditions, it is necessary to validate the model against a set of data that is independent to that used in the calibration process.

Travel times northbound and southbound along Pittwater Road, between Sturdee Parade and Hawkesbury Avenue were used to validate the operation of the model. Validation to travel times demonstrates that the model accurately reflects the volume to delay response that occurs in the field.

For the Dee Why Town Centre micro simulation traffic model, the travel time validation criteria from RMS *Traffic Modelling Guidelines, 2013, Section 11.5* has been adopted. This standard requires that 85% of modelled travel times be within 15% or one minute (whichever is greater) of observed travel times to be considered valid. A summary of the modelled and observed travel times for the morning and evening peak period is presented in the following tables.

Base Model Travel Time Comparison – Morning Peak

Route		8AM – 9AM		
		Observed	Modelled	%Diff
Pittwater Road	NB	02:01	01:19	-35%
Pittwater Road	SB	01:39	01:25	-14%

Base Model Travel Time Comparison – Evening Peak

Route		5PM – 6PM		
		Observed	Modelled	%Diff
Pittwater Road	NB	01:50	01:15	-32%
Pittwater Road	SB	01:35	01:26	-9%

Analysis of the observed and modelled travel times shows that all of the 'base model' travel times are within 15% or one minute (whichever is greater) of the observed travel times. In general, the modelled travel times are lower than the observed travel times. Comparisons of travel time for very short sections are difficult to calibrate to within one minute or less and these differences are generally not significant. Overall, comparisons of travel time for the Dee Why Town Centre model show that the model is well-validated with respect to travel times through the study area.

Appendix B GEH Statistics

AM Peak Turning Movement Comparison

GHD Mvmt	Turn ID	Observed	Modelled	Diff	%	GEH
i1302m1	7:1302:8	87	103	16	18.39%	1.64
i1302m10	8:1302:68	36	86	50	138.89%	6.40
i1302m11	8:1302:63	87	55	-32	-36.78%	3.80
i1302m12	8:1302:7	57	57	0	0.00%	0.00
i1302m2	7:1302:68	422	442	20	4.74%	0.96
i1302m3	7:1302:63	238	193	-45	-18.91%	3.07
i1302m4	63:1302:7	147	157	10	6.80%	0.81
i1302m5	63:1302:8	50	44	-6	-12.00%	0.88
i1302m6	63:1302:68	14	1	-13	-92.86%	4.75
i1302m7	68:1302:63	13	8	-5	-38.46%	1.54
i1302m8	68:1302:7	347	398	51	14.70%	2.64
i1302m9	68:1302:8	36	56	20	55.56%	2.95
i940m10	52:940:62	36	41	5	13.89%	0.81
i940m11	52:940:53	134	144	10	7.46%	0.85
i940m12	52:940:121	23	22	-1	-4.35%	0.21
i940m2	121:940:62	1663	1664	1	0.06%	0.02
i940m3	121:940:53	458	510	52	11.35%	2.36
i940m4	53:940:121	176	195	19	10.80%	1.40
i940m5	53:940:52	70	77	7	10.00%	0.82
i940m6	53:940:62	24	28	4	16.67%	0.78
i940m7	62:940:53	49	43	-6	-12.24%	0.88
i940m8	62:940:121	1057	1044	-13	-1.23%	0.40
i940m9	62:940:52	22	16	-6	-27.27%	1.38
i941m2	61:941:73	1618	1580	-38	-2.35%	0.95
i941m3	61:941a:40	105	142	37	35.24%	3.33
i941m4	941a:941:61	302	286	-16	-5.30%	0.93
i941m5	941a:941:58	85	74	-11	-12.94%	1.23
i941m6	941a:941:73	80	60	-20	-25.00%	2.39
i941m8	73:941:61	826	827	1	0.12%	0.03
i941m9	73:941:58	47	30	-17	-36.17%	2.74
i942m11	85:942:64	251	176	-75	-29.88%	5.13
i942m12	85:942:74	48	58	10	20.83%	1.37
i942m2	74:942:75	1623	1595	-28	-1.73%	0.70
i942m3	74:942:64	75	36	-39	-52.00%	5.24
i942m4	64:942:74	71	50	-21	-29.58%	2.70
i942m5	64:942:85	181	200	19	10.50%	1.38
i942m6	64:942:75	66	56	-10	-15.15%	1.28
i942m8	75:942:74	754	756	2	0.27%	0.07
i942m9	75:942:85	46	29	-17	-36.96%	2.78
i943m2	76:943:80	1604	1634	30	1.87%	0.75
i943m3	76:943:29	85	29	-56	-65.88%	7.42
i943m6	29:943:80	124	80	-44	-35.48%	4.36
i943m7	77:943:29	201	248	47	23.38%	3.14

i943m8	77:943:76	800	786	-14	-1.75%	0.50
i944m10	67:944:945	440	453	13	2.95%	0.62
i944m12	67:944:77	32	87	55	171.88%	7.13
i944m2	80:944:945	1728	1728	0	0.00%	0.00
i944m8	945:944:77	969	943	-26	-2.68%	0.84
i944m9	945:944:67	396	460	64	16.16%	3.09
i945m2	944:945:81	2013	2061	48	2.38%	1.06
i945m3	944:945:21	155	131	-24	-15.48%	2.01
i945m4	21:945:944	170	109	-61	-35.88%	5.16
i945m6	21:945:81	96	80	-16	-16.67%	1.71
i945m8	81:945:944	1195	1296	101	8.45%	2.86
i946m2	82:946:120	2071	2079	8	0.39%	0.18
i946m3	82:946:14	38	39	1	2.63%	0.16
i946m4	14:946:82	38	11	-27	-71.05%	5.45
i946m6	14:946:120	278	241	-37	-13.31%	2.30
i946m7	120:946:14	160	179	19	11.88%	1.46
i946m8	120:946:82	1157	1277	120	10.37%	3.44

Count	60	100%
>10	0	0%
<5	53	88%
<3	45	75%

Evening Peak Turning Movement Comparison

GHD Mvmt	Turn ID	Observed	Modelled	Diff	%	GEH
i1302m1	7:1302:8	94	129	35	37.23%	3.31
i1302m10	8:1302:68	37	46	9	24.32%	1.40
i1302m11	8:1302:63	121	89	-32	-26.45%	3.12
i1302m12	8:1302:7	132	118	-14	-10.61%	1.25
i1302m2	7:1302:68	412	394	-18	-4.37%	0.90
i1302m3	7:1302:63	216	184	-32	-14.81%	2.26
i1302m4	63:1302:7	150	149	-1	-0.67%	0.08
i1302m5	63:1302:8	65	62	-3	-4.62%	0.38
i1302m6	63:1302:68	24	14	-10	-41.67%	2.29
i1302m7	68:1302:63	22	5	-17	-77.27%	4.63
i1302m8	68:1302:7	487	464	-23	-4.72%	1.05
i1302m9	68:1302:8	60	99	39	65.00%	4.37
i940m10	52:940:62	41	37	-4	-9.76%	0.64
i940m11	52:940:53	147	162	15	10.20%	1.21
i940m12	52:940:121	28	26	-2	-7.14%	0.38
i940m2	121:940:62	1133	1196	63	5.56%	1.85
i940m3	121:940:53	294	360	66	22.45%	3.65
i940m4	53:940:121	186	190	4	2.15%	0.29
i940m5	53:940:52	127	139	12	9.45%	1.04
i940m6	53:940:62	22	21	-1	-4.55%	0.22
i940m7	62:940:53	110	106	-4	-3.64%	0.38
i940m8	62:940:121	1620	1566	-54	-3.33%	1.35
i940m9	62:940:52	28	35	7	25.00%	1.25
i941m2	61:941:73	1063	1058	-5	-0.47%	0.15
i941m3	61:941a:40	133	185	52	39.10%	4.12
i941m4	941a:941:61	300	296	-4	-1.33%	0.23
i941m5	941a:941:58	113	97	-16	-14.16%	1.56
i941m6	941a:941:73	85	52	-33	-38.82%	3.99
i941m8	73:941:61	1458	1389	-69	-4.73%	1.83
i941m9	73:941:58	59	23	-36	-61.02%	5.62
i942m11	85:942:64	285	224	-61	-21.40%	3.82
i942m12	85:942:74	47	50	3	6.38%	0.43
i942m2	74:942:75	1080	1032	-48	-4.44%	1.48
i942m3	74:942:64	68	69	1	1.47%	0.12
i942m4	64:942:74	112	107	-5	-4.46%	0.48
i942m5	64:942:85	205	200	-5	-2.44%	0.35
i942m6	64:942:75	82	70	-12	-14.63%	1.38
i942m8	75:942:74	1358	1262	-96	-7.07%	2.65
i942m9	75:942:85	29	16	-13	-44.83%	2.74
i943m2	76:943:80	1059	1042	-17	-1.61%	0.52
i943m3	76:943:29	103	55	-48	-46.60%	5.40
i943m6	29:943:80	159	116	-43	-27.04%	3.67
i943m7	77:943:29	324	324	0	0.00%	0.00
i943m8	77:943:76	1387	1282	-105	-7.57%	2.87
i944m10	67:944:945	412	422	10	2.43%	0.49
i944m12	67:944:77	61	33	-28	-45.90%	4.06

i944m2	80:944:945	1218	1157	-61	-5.01%	1.77
i944m8	945:944:77	1650	1573	-77	-4.67%	1.92
i944m9	945:944:67	569	565	-4	-0.70%	0.17
i945m2	944:945:81	1459	1440	-19	-1.30%	0.50
i945m3	944:945:21	171	135	-36	-21.05%	2.91
i945m4	21:945:944	296	246	-50	-16.89%	3.04
i945m6	21:945:81	107	93	-14	-13.08%	1.40
i945m8	81:945:944	1923	1890	-33	-1.72%	0.76
i946m2	82:946:120	1490	1468	-22	-1.48%	0.57
i946m3	82:946:14	76	61	-15	-19.74%	1.81
i946m4	14:946:82	55	42	-13	-23.64%	1.87
i946m6	14:946:120	198	175	-23	-11.62%	1.68
i946m7	120:946:14	334	310	-24	-7.19%	1.34
i946m8	120:946:82	1868	1864	-4	-0.21%	0.09
	Count	60	100%			
	>10	0	0%			
	<5	58	97%			
	<3	47	78%			

Appendix C Approved and Pending Development Applications

AM Peak	Zone	Residential	Commercial	Retail	School	TOTAL
Approved DA's						
25 Fisher Road	12	3	--	--	--	3
4-16 Kingsway	14	25	--	--	--	25
9 Kingsway	14	--	--	--	--	0
2 Clarence Ave	15	1	--	--	--	1
7 Oaks Ave	19	--	35	3	--	39
61-67 Oaks Ave	21	--	--	--	110	110
69-71 Oaks Ave	21	3	--	--	--	3
30 Pacific Pde	19	2	--	--	--	2
629-631 Pittwater Rd	10	10	-14	3	--	-2
697 Pittwater Rd	13	12	-3	2	--	11
701 Pittwater Rd	13	4	14	1	--	19
834 Pittwater Rd (Dee Why Hotel)	20	43	101	68	--	213
Pending DA's						
914-922 Pittwater Rd	15	14	-24	--	--	-10
Multiplex	18	90	38	96	--	224
Council	17	37	99	6	--	141
27-33 Oaks Ave (Woolworths)	19	--	--	88	--	88
Pass-by	13	--	--	-15	--	-10

PM Peak	Zone	Residential	Commercial	Retail	School	TOTAL
Approved DA's						
25 Fisher Road	12	3	--	--	--	3
4-16 Kingsway	14	25	--	--	--	25
9 Kingsway	14	--	--	--	--	--
2 Clarence Ave	15	1	--	--	--	1
7 Oaks Ave	19	--	35	14		49
61-67 Oaks Ave	21	--	--	--	96	96
69-71 Oaks Ave	21	3			--	3
30 Pacific Pde	19	2			--	2
629-631 Pittwater Rd	10	10	-14	11	--	7
697 Pittwater Rd	13	12	-3	6	--	15
701 Pittwater Rd	13	4	14	4	--	22
834 Pittwater Rd (Dee Why Hotel)	20	43	101	273	--	417
Pending DA's						
914-922 Pittwater Rd	15	14	-24	0	--	-10
Multiplex	18	90	38	385	--	513
Council	17	37	99	23	--	159
27-33 Oaks Ave (Woolworths)	19	--	--	130	--	130
Pass-by	13	--	--	-31	--	-31

Saturday Peak	Zone	Residential	Commercial	Retail	School	TOTAL
Approved DA's						
25 Fisher Road	12	1	--	--	--	1
4-16 Kingsway	14	13	--	--	--	13
9 Kingsway	14	--	--	--	--	--
2 Clarence Ave	15	--	--	--	--	--
7 Oaks Ave	19	--	--	18	--	18
61-67 Oaks Ave	21	--	--	--	--	0
69-71 Oaks Ave	21	2	--	--	--	2
30 Pacific Pde	19	1	--	--	--	1
629-631 Pittwater Rd	10	5	--	14	--	18
697 Pittwater Rd	13	6	--	8	--	14
701 Pittwater Rd	13	2	--	6	--	7
834 Pittwater Rd (Dee Why Hotel)	20	22	--	355	--	376
Pending DA's						
914-922 Pittwater Rd	15	7	--	--	--	7
Multiplex	18	45	--	501	--	546
Council	17	18	--	29	--	48
27-33 Oaks Ave (Woolworths)	19	--	--	110	--	110
Pass-by	13	--	--	-40	--	-40

Appendix D Potential LEP Developments

LEP FSR 100% - AM Peak

AM Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	100%	15	2	0	14	0	16
18-22 Howard Ave	100%	22	18	-48	18	0	-12
31-35 Howard Ave & 36-44 Oaks Ave	100%	17	31	0	204	0	235
9 Oaks Ave	100%	19	5	0	5	0	9
19-21 Oaks Ave	100%	19	10	0	12	0	22
33 Oaks Ave	100%	19	38	0	-47	0	-8
L8 & 12 Pacific Pde	100%	19	5	0	39	0	44
16 Pacific Pde	100%	19	2	0	-41	0	-39
33 Oaks Ave	100%	19	38	0	-47	0	-8
900 Pittwater Rd & 10 Howard Ave	100%	22	17	0	-5	0	11
854-860 Pittwater Rd	100%	19	15	0	63	0	78
836-844 Pittwater Rd & 1 Pacific Pde	100%	20	11	-7	37	0	41
627 Pittwater Rd	100%	11	1	-3	-2	0	-4
635 Pittwater Rd	100%	11	8	-36	41	0	14
643 Pittwater Rd	100%	11	1	0	10	0	11
651-661 Pittwater	100%	11	14	-35	33	0	12
673-683A Pittwater Rd	100%	23	16	-30	-8	0	-22
687-693A Pittwater Rd	100%	23	10	-24	7	0	-7
699 Pittwater Rd	100%	23	6	0	-21	0	-15
23 Fisher Rd	100%	13	21	0	0	0	21
Civic Centre	100%	13	103	0	2	0	105
727 Pittwater Rd	100%	13	3	-4	17	0	16
10 Fisher Rd	100%	11	2	0	-7	0	-5
16-20 Fisher Rd	100%	11	9	-18	62	0	53
28-30 Fisher Rd	100%	11	9	-17	62	0	54
36 Fisher Rd	100%	11	5	0	30	0	35
1-3 St. David; L1 & L2 Fisher	100%	23	10	-11	72	0	71
21 Mooramba & 665 Pittwater Rd	100%	11	7	-17	23	0	13
14 Dee Why Pde	100%	15	0	0	0	0	0
50 Pacific Pde	100%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	100%	20	6	0	0	0	6
39-45 Pacific Pde	100%	20	3	0	0	0	3
703 Pittwater Rd	100%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	100%	13	0	0	0	0	0
7 Kingsway	100%	2	0	0	0	0	0
11 Kingsway	100%	2	1	0	0	0	1
20-26 Avon Rd	100%	4	2	0	0	0	2
30-40 Howard: Park	100%	16	0	0	0	0	0
46-50 Oaks Ave	100%	17	0	0	0	0	0
65-69 Howard Ave	100%	17	0	0	-10	0	-10
45 Oaks Ave	100%	21	0	0	0	0	0
57-59 Oaks Ave	100%	21	0	0	0	0	0
74 Pacific Pde	100%	21	0	0	0	0	0
73 Oaks Ave	100%	21	0	0	0	0	0
755 Pittwater Rd	100%	2	2	0	0	0	2
2 Dee Why Pde	100%	15	2	0	0	0	2
13 & L36 Redman	100%	11	0	0	0	0	0
9 Francis St	100%	11	2	0	0	0	2

LEP FSR 100% - PM Peak

PM Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	100%	15	2	0	14	0	16
18-22 Howard Ave	100%	22	14	-48	18	0	-16
31-35 Howard Ave & 36-44 Oaks Ave	100%	17	24	0	204	0	228
9 Oaks Ave	100%	19	4	0	5	0	8
19-21 Oaks Ave	100%	19	8	0	12	0	20
33 Oaks Ave	100%	19	30	0	-47	0	-17
L8 & 12 Pacific Pde	100%	19	4	0	39	0	43
16 Pacific Pde	100%	19	2	0	-41	0	-39
33 Oaks Ave	100%	19	30	0	-47	0	-17
900 Pittwater Rd & 10 Howard Ave	100%	22	13	0	-5	0	8
854-860 Pittwater Rd	100%	19	12	0	63	0	75
836-844 Pittwater Rd & 1 Pacific Pde	100%	20	9	-7	37	0	38
627 Pittwater Rd	100%	11	1	-3	-2	0	-5
635 Pittwater Rd	100%	11	7	-36	41	0	12
643 Pittwater Rd	100%	11	1	0	10	0	11
651-661 Pittwater	100%	11	11	-35	33	0	9
673-683A Pittwater Rd	100%	23	12	-30	-8	0	-25
687-693A Pittwater Rd	100%	23	8	-24	7	0	-9
699 Pittwater Rd	100%	23	5	0	-21	0	-16
23 Fisher Rd	100%	13	16	0	0	0	16
Civic Centre	100%	13	81	0	2	0	83
727 Pittwater Rd	100%	13	2	-4	19	0	17
10 Fisher Rd	100%	11	2	0	-7	0	-6
16-20 Fisher Rd	100%	11	7	-18	62	0	51
28-30 Fisher Rd	100%	11	7	-17	62	0	52
36 Fisher Rd	100%	11	4	0	30	0	34
1-3 St. David; L1 & L2 Fisher	100%	23	8	-11	72	0	69
21 Mooramba & 665 Pittwater Rd	100%	11	6	-17	23	0	11
14 Dee Why Pde	100%	15	0	0	0	0	0
50 Pacific Pde	100%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	100%	20	3	0	0	0	3
39-45 Pacific Pde	100%	20	1	0	0	0	1
703 Pittwater Rd	100%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	100%	13	0	22	0	0	22
7 Kingsway	100%	2	0	0	0	0	0
11 Kingsway	100%	2	0	0	0	0	0
20-26 Avon Rd	100%	4	1	0	0	0	1
30-40 Howard: Park	100%	16	0	0	0	0	0
46-50 Oaks Ave	100%	17	0	0	0	0	0
65-69 Howard Ave	100%	17	-1	0	-10	0	-11
45 Oaks Ave	100%	21	-1	0	0	0	-1
57-59 Oaks Ave	100%	21	0	0	0	0	0
74 Pacific Pde	100%	21	0	0	0	0	0
73 Oaks Ave	100%	21	-1	0	0	0	-1
755 Pittwater Rd	100%	2	1	0	0	0	1
2 Dee Why Pde	100%	15	1	0	0	0	1
13 & L36 Redman	100%	11	0	0	0	0	0
9 Francis St	100%	11	1	0	0	0	1

LEP FSR 100% - Saturday Peak

Saturday Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	100%	15	1	0	18	0	19
18-22 Howard Ave	100%	22	7	0	23	0	30
31-35 Howard Ave & 36-44 Oaks Ave	100%	17	12	0	270	0	283
9 Oaks Ave	100%	19	2	0	6	0	8
19-21 Oaks Ave	100%	19	4	0	16	0	20
33 Oaks Ave	100%	19	15	0	-62	0	-47
L8 & 12 Pacific Pde	100%	19	2	0	51	0	53
16 Pacific Pde	100%	19	1	0	-54	0	-53
33 Oaks Ave	100%	19	15	0	-62	0	-47
900 Pittwater Rd & 10 Howard Ave	100%	22	7	0	-7	0	0
854-860 Pittwater Rd	100%	19	6	0	84	0	90
836-844 Pittwater Rd & 1 Pacific Pde	100%	20	4	0	49	0	53
627 Pittwater Rd	100%	11	1	0	-3	0	-3
635 Pittwater Rd	100%	11	3	0	55	0	58
643 Pittwater Rd	100%	11	0	0	13	0	14
651-661 Pittwater	100%	11	6	0	43	0	49
673-683A Pittwater Rd	100%	23	6	0	-10	0	-4
687-693A Pittwater Rd	100%	23	4	0	10	0	14
699 Pittwater Rd	100%	23	2	0	-28	0	-26
23 Fisher Rd	100%	13	8	0	0	0	8
Civic Centre	100%	13	41	0	2	0	43
727 Pittwater Rd	100%	13	1	0	23	0	24
10 Fisher Rd	100%	11	1	0	-9	0	-9
16-20 Fisher Rd	100%	11	3	0	82	0	86
28-30 Fisher Rd	100%	11	3	0	82	0	85
36 Fisher Rd	100%	11	2	0	40	0	42
1-3 St. David; L1 & L2 Fisher	100%	23	4	0	95	0	100
21 Mooramba & 665 Pittwater Rd	100%	11	3	0	30	0	33
14 Dee Why Pde	100%	15	0	0	0	0	0
50 Pacific Pde	100%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	100%	20	1	0	0	0	1
39-45 Pacific Pde	100%	20	1	0	0	0	1
703 Pittwater Rd	100%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	100%	13	0	90	0	0	90
7 Kingsway	100%	2	0	0	0	0	0
11 Kingsway	100%	2	0	0	0	0	0
20-26 Avon Rd	100%	4	0	0	0	0	0
30-40 Howard; Park	100%	16	0	0	0	0	0
46-50 Oaks Ave	100%	17	0	0	0	0	0
65-69 Howard Ave	100%	17	0	0	-14	0	-14
45 Oaks Ave	100%	21	0	0	0	0	0
57-59 Oaks Ave	100%	21	0	0	0	0	0
74 Pacific Pde	100%	21	0	0	0	0	0
73 Oaks Ave	100%	21	0	0	0	0	0
755 Pittwater Rd	100%	2	1	0	0	0	1
2 Dee Why Pde	100%	15	0	0	0	0	0
13 & L36 Redman	100%	11	0	0	0	0	0
9 Francis St	100%	11	1	0	0	0	1

LEP FSR 105% - AM Peak

AM Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	105%	15	3	0	14	0	17
18-22 Howard Ave	105%	22	19	-48	18	0	-11
31-35 Howard Ave & 36-44 Oaks Ave	105%	17	33	0	204	0	237
9 Oaks Ave	105%	19	5	0	5	0	10
19-21 Oaks Ave	105%	19	11	0	12	0	23
33 Oaks Ave	105%	19	41	0	-47	0	-6
L8 & 12 Pacific Pde	105%	19	6	0	39	0	44
16 Pacific Pde	105%	19	2	0	-41	0	-39
33 Oaks Ave	105%	19	41	0	-47	0	-6
900 Pittwater Rd & 10 Howard Ave	105%	22	18	0	-5	0	12
854-860 Pittwater Rd	105%	19	16	0	63	0	79
836-844 Pittwater Rd & 1 Pacific Pde	105%	20	12	-7	37	0	41
627 Pittwater Rd	105%	11	1	-3	-2	0	-4
635 Pittwater Rd	105%	11	9	-36	41	0	15
643 Pittwater Rd	105%	11	1	0	10	0	11
651-661 Pittwater	105%	11	15	-35	33	0	13
673-683A Pittwater Rd	105%	23	17	-30	-8	0	-21
687-693A Pittwater Rd	105%	23	11	-24	7	0	-6
699 Pittwater Rd	105%	23	7	0	-21	0	-15
23 Fisher Rd	105%	13	22	0	0	0	22
Civic Centre	105%	13	108	0	2	0	110
727 Pittwater Rd	105%	13	3	-4	17	0	17
10 Fisher Rd	105%	11	2	0	-7	0	-5
16-20 Fisher Rd	105%	11	9	-18	62	0	53
28-30 Fisher Rd	105%	11	9	-17	62	0	54
36 Fisher Rd	105%	11	5	0	30	0	35
1-3 St. David; L1 & L2 Fisher	105%	23	11	-11	72	0	72
21 Mooramba & 665 Pittwater Rd	105%	11	8	-17	23	0	13
14 Dee Why Pde	105%	15	0	0	0	0	0
50 Pacific Pde	105%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	105%	20	6	0	0	0	6
39-45 Pacific Pde	105%	20	3	0	0	0	3
703 Pittwater Rd	105%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	105%	13	0	0	0	0	0
7 Kingsway	105%	2	0	0	0	0	0
11 Kingsway	105%	2	1	0	0	0	1
20-26 Avon Rd	105%	4	2	0	0	0	2
30-40 Howard: Park	105%	16	0	0	0	0	0
46-50 Oaks Ave	105%	17	0	0	0	0	0
65-69 Howard Ave	105%	17	0	0	-10	0	-10
45 Oaks Ave	105%	21	0	0	0	0	0
57-59 Oaks Ave	105%	21	0	0	0	0	0
74 Pacific Pde	105%	21	0	0	0	0	0
73 Oaks Ave	105%	21	0	0	0	0	0
755 Pittwater Rd	105%	2	2	0	0	0	2
2 Dee Why Pde	105%	15	2	0	0	0	2
13 & L36 Redman	105%	11	0	0	0	0	0
9 Francis St	105%	11	2	0	0	0	2

LEP FSR 105% - PM Peak

PM Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	105%	15	2	0	14	0	16
18-22 Howard Ave	105%	22	15	-48	18	0	-15
31-35 Howard Ave & 36-44 Oaks Ave	105%	17	26	0	204	0	230
9 Oaks Ave	105%	19	4	0	5	0	8
19-21 Oaks Ave	105%	19	8	0	12	0	21
33 Oaks Ave	105%	19	32	0	-47	0	-15
L8 & 12 Pacific Pde	105%	19	5	0	39	0	43
16 Pacific Pde	105%	19	2	0	-41	0	-39
33 Oaks Ave	105%	19	32	0	-47	0	-15
900 Pittwater Rd & 10 Howard Ave	105%	22	14	0	-5	0	9
854-860 Pittwater Rd	105%	19	12	0	63	0	76
836-844 Pittwater Rd & 1 Pacific Pde	105%	20	9	-7	37	0	39
627 Pittwater Rd	105%	11	1	-3	-2	0	-4
635 Pittwater Rd	105%	11	7	-36	41	0	13
643 Pittwater Rd	105%	11	1	0	10	0	11
651-661 Pittwater	105%	11	12	-35	33	0	9
673-683A Pittwater Rd	105%	23	13	-30	-8	0	-25
687-693A Pittwater Rd	105%	23	9	-24	7	0	-8
699 Pittwater Rd	105%	23	5	0	-21	0	-16
23 Fisher Rd	105%	13	18	0	0	0	18
Civic Centre	105%	13	85	0	2	0	87
727 Pittwater Rd	105%	13	3	-4	19	0	17
10 Fisher Rd	105%	11	2	0	-7	0	-5
16-20 Fisher Rd	105%	11	7	-18	62	0	51
28-30 Fisher Rd	105%	11	7	-17	62	0	52
36 Fisher Rd	105%	11	4	0	30	0	34
1-3 St. David; L1 & L2 Fisher	105%	23	9	-11	72	0	69
21 Mooramba & 665 Pittwater Rd	105%	11	6	-17	23	0	11
14 Dee Why Pde	105%	15	0	0	0	0	0
50 Pacific Pde	105%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	105%	20	3	0	0	0	3
39-45 Pacific Pde	105%	20	1	0	0	0	1
703 Pittwater Rd	105%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	105%	13	0	22	0	0	22
7 Kingsway	105%	2	0	0	0	0	0
11 Kingsway	105%	2	0	0	0	0	0
20-26 Avon Rd	105%	4	1	0	0	0	1
30-40 Howard: Park	105%	16	0	0	0	0	0
46-50 Oaks Ave	105%	17	0	0	0	0	0
65-69 Howard Ave	105%	17	-1	0	-10	0	-11
45 Oaks Ave	105%	21	-1	0	0	0	-1
57-59 Oaks Ave	105%	21	0	0	0	0	0
74 Pacific Pde	105%	21	0	0	0	0	0
73 Oaks Ave	105%	21	-1	0	0	0	-1
755 Pittwater Rd	105%	2	1	0	0	0	1
2 Dee Why Pde	105%	15	1	0	0	0	1
13 & L36 Redman	105%	11	0	0	0	0	0
9 Francis St	105%	11	1	0	0	0	1

LEP FSR 105% - Saturday Peak

Saturday Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	105%	15	1	0	18	0	19
18-22 Howard Ave	105%	22	7	0	23	0	31
31-35 Howard Ave & 36-44 Oaks Ave	105%	17	13	0	270	0	283
9 Oaks Ave	105%	19	2	0	6	0	8
19-21 Oaks Ave	105%	19	4	0	16	0	21
33 Oaks Ave	105%	19	16	0	-62	0	-46
L8 & 12 Pacific Pde	105%	19	2	0	51	0	53
16 Pacific Pde	105%	19	1	0	-54	0	-53
33 Oaks Ave	105%	19	16	0	-62	0	-46
900 Pittwater Rd & 10 Howard Ave	105%	22	7	0	-7	0	0
854-860 Pittwater Rd	105%	19	6	0	84	0	90
836-844 Pittwater Rd & 1 Pacific Pde	105%	20	5	0	49	0	53
627 Pittwater Rd	105%	11	1	0	-3	0	-3
635 Pittwater Rd	105%	11	4	0	55	0	58
643 Pittwater Rd	105%	11	0	0	13	0	14
651-661 Pittwater	105%	11	6	0	43	0	49
673-683A Pittwater Rd	105%	23	7	0	-10	0	-4
687-693A Pittwater Rd	105%	23	4	0	10	0	14
699 Pittwater Rd	105%	23	3	0	-28	0	-26
23 Fisher Rd	105%	13	9	0	0	0	9
Civic Centre	105%	13	43	0	2	0	45
727 Pittwater Rd	105%	13	1	0	23	0	24
10 Fisher Rd	105%	11	1	0	-9	0	-9
16-20 Fisher Rd	105%	11	4	0	82	0	86
28-30 Fisher Rd	105%	11	4	0	82	0	86
36 Fisher Rd	105%	11	2	0	40	0	42
1-3 St. David; L1 & L2 Fisher	105%	23	4	0	95	0	100
21 Mooramba & 665 Pittwater Rd	105%	11	3	0	30	0	33
14 Dee Why Pde	105%	15	0	0	0	0	0
50 Pacific Pde	105%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	105%	20	1	0	0	0	1
39-45 Pacific Pde	105%	20	1	0	0	0	1
703 Pittwater Rd	105%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	105%	13	0	90	0	0	90
7 Kingsway	105%	2	0	0	0	0	0
11 Kingsway	105%	2	0	0	0	0	0
20-26 Avon Rd	105%	4	0	0	0	0	0
30-40 Howard: Park	105%	16	0	0	0	0	0
46-50 Oaks Ave	105%	17	0	0	0	0	0
65-69 Howard Ave	105%	17	0	0	-14	0	-14
45 Oaks Ave	105%	21	0	0	0	0	0
57-59 Oaks Ave	105%	21	0	0	0	0	0
74 Pacific Pde	105%	21	0	0	0	0	0
73 Oaks Ave	105%	21	0	0	0	0	0
755 Pittwater Rd	105%	2	1	0	0	0	1
2 Dee Why Pde	105%	15	0	0	0	0	0
13 & L36 Redman	105%	11	0	0	0	0	0
9 Francis St	105%	11	1	0	0	0	1

LEP FSR 110% - AM Peak

AM Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	110%	15	3	0	14	0	17
18-22 Howard Ave	110%	22	20	-48	18	0	-10
31-35 Howard Ave & 36-44 Oaks Ave	110%	17	35	0	204	0	239
9 Oaks Ave	110%	19	5	0	5	0	10
19-21 Oaks Ave	110%	19	11	0	12	0	24
33 Oaks Ave	110%	19	43	0	-47	0	-4
L8 & 12 Pacific Pde	110%	19	6	0	39	0	45
16 Pacific Pde	110%	19	2	0	-41	0	-38
33 Oaks Ave	110%	19	43	0	-47	0	-4
900 Pittwater Rd & 10 Howard Ave	110%	22	19	0	-5	0	13
854-860 Pittwater Rd	110%	19	17	0	63	0	80
836-844 Pittwater Rd & 1 Pacific Pde	110%	20	13	-7	37	0	42
627 Pittwater Rd	110%	11	2	-3	-2	0	-4
635 Pittwater Rd	110%	11	10	-36	41	0	15
643 Pittwater Rd	110%	11	1	0	10	0	11
651-661 Pittwater	110%	11	16	-35	33	0	13
673-683A Pittwater Rd	110%	23	18	-30	-8	0	-20
687-693A Pittwater Rd	110%	23	11	-24	7	0	-6
699 Pittwater Rd	110%	23	7	0	-21	0	-14
23 Fisher Rd	110%	13	24	0	0	0	24
Civic Centre	110%	13	113	0	2	0	115
727 Pittwater Rd	110%	13	4	-4	17	0	17
10 Fisher Rd	110%	11	2	0	-7	0	-5
16-20 Fisher Rd	110%	11	10	-18	62	0	54
28-30 Fisher Rd	110%	11	10	-17	62	0	55
36 Fisher Rd	110%	11	6	0	30	0	36
1-3 St. David; L1 & L2 Fisher	110%	23	12	-11	72	0	72
21 Mooramba & 665 Pittwater Rd	110%	11	8	-17	23	0	14
14 Dee Why Pde	110%	15	0	0	0	0	0
50 Pacific Pde	110%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	110%	20	6	0	0	0	6
39-45 Pacific Pde	110%	20	3	0	0	0	3
703 Pittwater Rd	110%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	110%	13	0	0	0	0	0
7 Kingsway	110%	2	0	0	0	0	0
11 Kingsway	110%	2	1	0	0	0	1
20-26 Avon Rd	110%	4	2	0	0	0	2
30-40 Howard: Park	110%	16	0	0	0	0	0
46-50 Oaks Ave	110%	17	0	0	0	0	0
65-69 Howard Ave	110%	17	0	0	-10	0	-10
45 Oaks Ave	110%	21	0	0	0	0	0
57-59 Oaks Ave	110%	21	0	0	0	0	0
74 Pacific Pde	110%	21	0	0	0	0	0
73 Oaks Ave	110%	21	0	0	0	0	0
755 Pittwater Rd	110%	2	2	0	0	0	2
2 Dee Why Pde	110%	15	2	0	0	0	2
13 & L36 Redman	110%	11	0	0	0	0	0
9 Francis St	110%	11	2	0	0	0	2

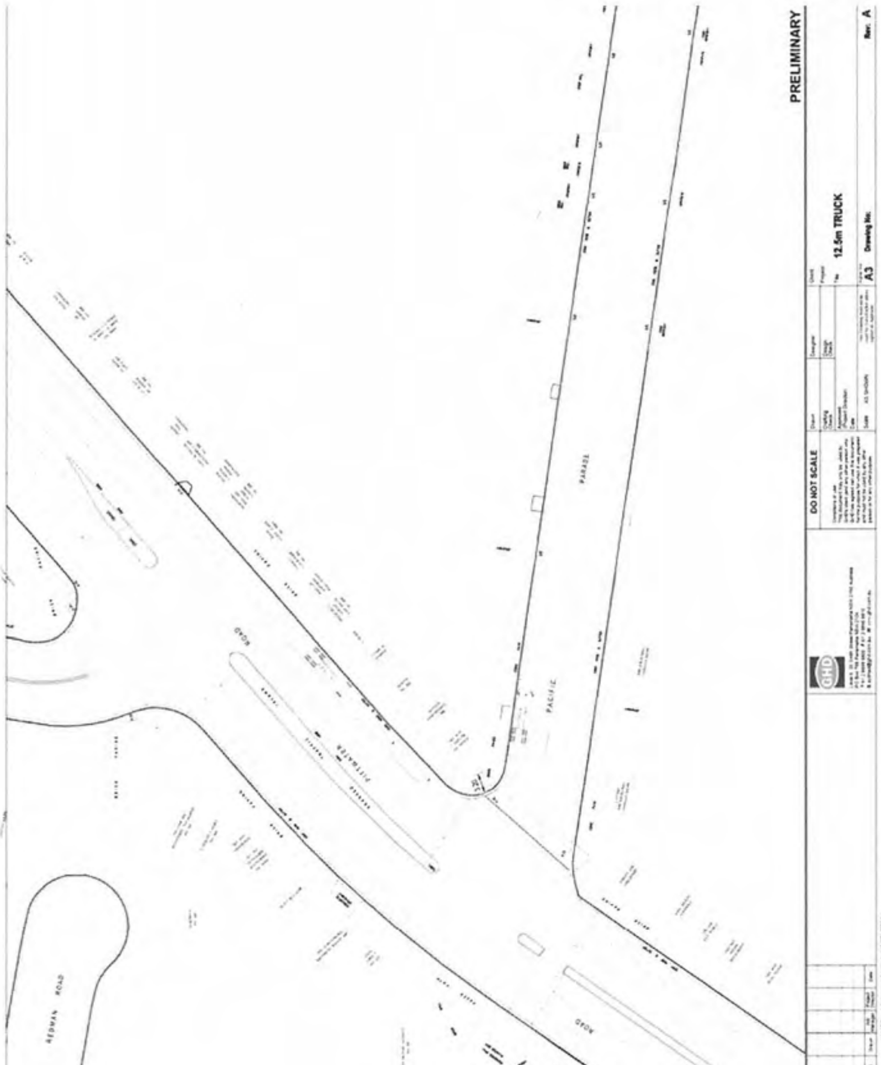
LEP FSR 110% - PM Peak

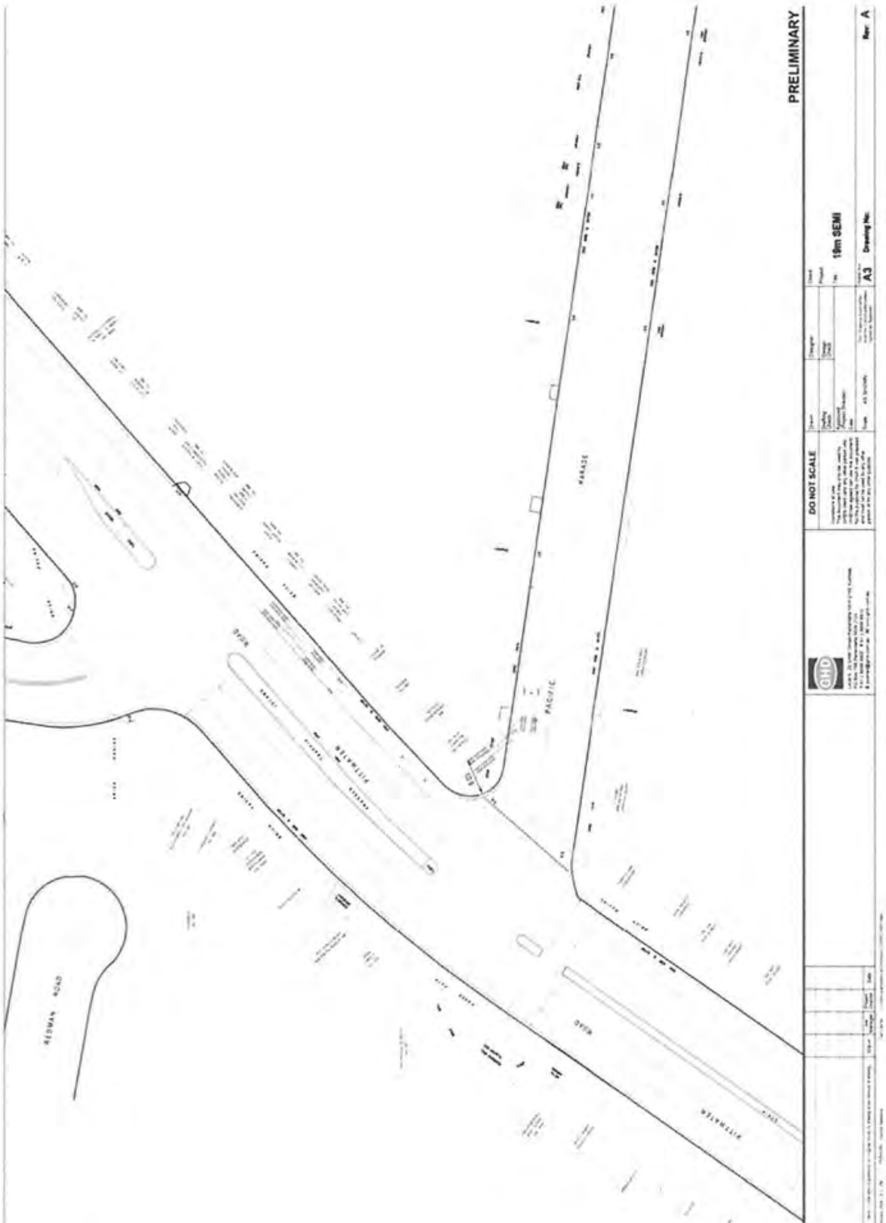
PM Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	110%	15	2	0	14	0	16
18-22 Howard Ave	110%	22	16	-48	18	0	-14
31-35 Howard Ave & 36-44 Oaks Ave	110%	17	27	0	204	0	231
9 Oaks Ave	110%	19	4	0	5	0	9
19-21 Oaks Ave	110%	19	9	0	12	0	21
33 Oaks Ave	110%	19	34	0	-47	0	-13
L8 & 12 Pacific Pde	110%	19	5	0	39	0	43
16 Pacific Pde	110%	19	2	0	-41	0	-39
33 Oaks Ave	110%	19	34	0	-47	0	-13
900 Pittwater Rd & 10 Howard Ave	110%	22	15	0	-5	0	9
854-860 Pittwater Rd	110%	19	13	0	63	0	77
836-844 Pittwater Rd & 1 Pacific Pde	110%	20	10	-7	37	0	39
627 Pittwater Rd	110%	11	1	-3	-2	0	-4
635 Pittwater Rd	110%	11	8	-36	41	0	13
643 Pittwater Rd	110%	11	1	0	10	0	11
651-661 Pittwater	110%	11	13	-35	33	0	10
673-683A Pittwater Rd	110%	23	14	-30	-8	0	-24
687-693A Pittwater Rd	110%	23	9	-24	7	0	-8
699 Pittwater Rd	110%	23	6	0	-21	0	-16
23 Fisher Rd	110%	13	19	0	0	0	19
Civic Centre	110%	13	90	0	2	0	92
727 Pittwater Rd	110%	13	3	-4	19	0	18
10 Fisher Rd	110%	11	2	0	-7	0	-5
16-20 Fisher Rd	110%	11	8	-18	62	0	52
28-30 Fisher Rd	110%	11	8	-17	62	0	53
36 Fisher Rd	110%	11	4	0	30	0	35
1-3 St. David; L1 & L2 Fisher	110%	23	9	-11	72	0	70
21 Mooramba & 665 Pittwater Rd	110%	11	6	-17	23	0	12
14 Dee Why Pde	110%	15	0	0	0	0	0
50 Pacific Pde	110%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	110%	20	3	0	0	0	3
39-45 Pacific Pde	110%	20	1	0	0	0	1
703 Pittwater Rd	110%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	110%	13	0	22	0	0	22
7 Kingsway	110%	2	0	0	0	0	0
11 Kingsway	110%	2	0	0	0	0	0
20-26 Avon Rd	110%	4	1	0	0	0	1
30-40 Howard: Park	110%	16	0	0	0	0	0
46-50 Oaks Ave	110%	17	0	0	0	0	0
65-69 Howard Ave	110%	17	-1	0	-10	0	-11
45 Oaks Ave	110%	21	-1	0	0	0	-1
57-59 Oaks Ave	110%	21	0	0	0	0	0
74 Pacific Pde	110%	21	0	0	0	0	0
73 Oaks Ave	110%	21	-1	0	0	0	-1
755 Pittwater Rd	110%	2	1	0	0	0	1
2 Dee Why Pde	110%	15	1	0	0	0	1
13 & L36 Redman	110%	11	0	0	0	0	0
9 Francis St	110%	11	1	0	0	0	1

LEP FSR 110% - Saturday Peak

Saturday Peak	FSR	Zone	Residential	Commercial	Retail	School	TOTAL
6 Dee Why Pde	110%	15	1	0	18	0	20
18-22 Howard Ave	110%	22	8	0	23	0	31
31-35 Howard Ave & 36-44 Oaks Ave	110%	17	14	0	270	0	284
9 Oaks Ave	110%	19	2	0	6	0	8
19-21 Oaks Ave	110%	19	4	0	16	0	21
33 Oaks Ave	110%	19	17	0	-62	0	-45
L8 & 12 Pacific Pde	110%	19	2	0	51	0	54
16 Pacific Pde	110%	19	1	0	-54	0	-53
33 Oaks Ave	110%	19	17	0	-62	0	-45
900 Pittwater Rd & 10 Howard Ave	110%	22	7	0	-7	0	0
854-860 Pittwater Rd	110%	19	7	0	84	0	91
836-844 Pittwater Rd & 1 Pacific Pde	110%	20	5	0	49	0	54
627 Pittwater Rd	110%	11	1	0	-3	0	-3
635 Pittwater Rd	110%	11	4	0	55	0	58
643 Pittwater Rd	110%	11	0	0	13	0	14
651-661 Pittwater	110%	11	6	0	43	0	50
673-683A Pittwater Rd	110%	23	7	0	-10	0	-3
687-693A Pittwater Rd	110%	23	5	0	10	0	14
699 Pittwater Rd	110%	23	3	0	-28	0	-26
23 Fisher Rd	110%	13	10	0	0	0	10
Civic Centre	110%	13	45	0	2	0	47
727 Pittwater Rd	110%	13	1	0	23	0	24
10 Fisher Rd	110%	11	1	0	-9	0	-9
16-20 Fisher Rd	110%	11	4	0	82	0	86
28-30 Fisher Rd	110%	11	4	0	82	0	86
36 Fisher Rd	110%	11	2	0	40	0	42
1-3 St. David; L1 & L2 Fisher	110%	23	5	0	95	0	100
21 Mooramba & 665 Pittwater Rd	110%	11	3	0	30	0	33
14 Dee Why Pde	110%	15	0	0	0	0	0
50 Pacific Pde	110%	21	0	0	0	0	0
23-27+29 Pacific Pde+ 16-22 Sturdee Pde	110%	20	1	0	0	0	1
39-45 Pacific Pde	110%	20	1	0	0	0	1
703 Pittwater Rd	110%	23	0	0	0	0	0
36-48 Kingsway (PCYC)	110%	13	0	90	0	0	90
7 Kingsway	110%	2	0	0	0	0	0
11 Kingsway	110%	2	0	0	0	0	0
20-26 Avon Rd	110%	4	0	0	0	0	0
30-40 Howard: Park	110%	16	0	0	0	0	0
46-50 Oaks Ave	110%	17	0	0	0	0	0
65-69 Howard Ave	110%	17	0	0	-14	0	-14
45 Oaks Ave	110%	21	0	0	0	0	0
57-59 Oaks Ave	110%	21	0	0	0	0	0
74 Pacific Pde	110%	21	0	0	0	0	0
73 Oaks Ave	110%	21	0	0	0	0	0
755 Pittwater Rd	110%	2	1	0	0	0	1
2 Dee Why Pde	110%	15	0	0	0	0	0
13 & L36 Redman	110%	11	0	0	0	0	0
9 Francis St	110%	11	1	0	0	0	1

Appendix E Pacific Parade Turning Path Analysis


PRELIMINARY
DO NOT SCALE
12.5m TRUCK
A3
Rev: A


PRELIMINARY
DO NOT SCALE
19m SEMI
A3
Rev A

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