Parade Consulting

PLANNING
URBAN FUTURES

Planning Proposal Final Consolidated Report

16 September 2020

3-5 Help Street
Chatswood

Amendment to
Willoughby LEP 2012

Submitted to
City of
Willoughby
on Behalf of
H & J Vakili

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Prepared for: H & J Vakili
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03	16/09/2020	Final Submission	Matt Hurst	MEH

1 PREFACE

1.1 Introduction

This Consolidated Planning Proposal Report, for the site known as 3-5 Help Street Chatswood, is submitted to the Willoughby City Council (WCC) to support a Planning Proposal to amend the Willoughby Local Environmental Plan 2012 (WLEP 2012).

This consolidated report has been prepared on behalf of H & J Vakili Pty Ltd, and R Vakili, whom together have an interest in the subject site, and the key objectives of the report are to demonstrate the strategic planning merit of accommodating a responsive higher density development in the form of a tall slender building on the site, to evaluate the impact of additional building height and density on the site, and to assess the relevant environmental, social and economic impacts of the proposal in accordance with Section 55 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act).

This consolidated report has been prepared in response to the recommendations endorsed by Willoughby City Council (WCC) at that Council Meeting held on Monday 11th of February 2019 and correspondence sent by the Department of Planning, Industry and Environment (PIE) to the WCC on the 9th of July 2020 which containing a number of recommendations for amendments to the Chatswood CBD Strategy. Where each of these recommendations are material to this planning proposal they have been dealt with individually in the body of this report.

The report is accompanied by a range of plans and supporting documents prepared by specialist consultants to provide a comprehensive analysis of the issues raised by both Council's and DPIE's recommendations. These address the key issues and impacts associated with the proposal and can be found as separate attachments to this consolidated report. These include:

- Indicative Design Concepts (KannFinch/DDA Architects) (Appendix A)
- Concept Landscape Plan (KannFinch/DDA Architects) (also contained in Appendix A)
- Site Survey (John Walton) (Appendix B)
- Transport Impact Assessment (GTA Consultants) (Appendix C)
- Market Appraisal and Feasibility Analysis (AEC Group) (Appendix D)
- Amended LEP and Height Maps (Ethos Urban) (Appendices E1 and E2)
- Arborist Report (Advanced Arborist Reporting) (Appendix F)

1.2 How to Read this Consolidated Report

This consolidated report consists of the amalgamation of the original Planning Proposal Submission prepared by Ethos Urban dated 15th of December 2017, the First Addendum Report dated 18th of June 2018, a letter of undertaking regarding our intent to enter into a Planning Agreement with Council which will apply to the subject site – dated 13th of December 2018, and the Second Addendum Report dated 8th of March 2019.

Each of these reports are contained in full, and contain their own explanatory notes regarding the issues raised by Council which are then addressed in each report. These reports have been consolidated into this single report in consecutive dated order to provide clarity with regards when during the process each set of issues were raised, and how these issues have subsequently been addressed by our proposal. In this regard - superseded drawings have not been reproduced as part of this consolidated report, instead we have only presented the final revised drawings resultant of the process. This is to ensure clarity regarding the agreed design which represents this completed proposal.

1.3 Addressing issues raised by the Departmental correspondence of 9th July 2020

Our Planning Proposal for this site was previously endorsed by full Council on the 11th of February 2019 and is consistent with Council's CBD Strategy (including its proposed amendments).

We offer the following information demonstrating our Proposal's consistency with the CBD strategy, including its proposed amendments:

1. Upon completion of the current Traffic and Transport study being undertaken by TNSW, any recommendations that are to be incorporated into the CBD Strategy will also be incorporated into our Proposal, and will be implemented at the appropriate stage of the development assessment process and no later than during the final DA submission stage for development.

2. Our Planning Proposal is for a site that will be subject to the overall 6:1 FSR and achieves the currently required 1:1 FSR for the commercial component. Should Council reduce this minimum requirement below 1:1 our proposal will remain compliant as it already satisfies the current higher minimum requirement.

3. Our Planning Proposal will not be impacted by the likely adoption of the built form mitigation recommendations contained within the GMU Chatswood Precinct Urban Design Study as the subject site of our proposal has not been identified in the recommendations as one of those where the maximum permissible height should be lowered below 90m. Accordingly, the recommended FSR will not need to be reduced below 6:1 and our Planning Proposal would remain compliant.

4. The subject site of our Planning Proposal is at 3-5 Help Street – with a combined site area of 2290m^2. This is well above the required minimum of 1200m^2 and should continue to be suitably large enough to meet the CBD Strategy's objectives should Council decide to raise the minimum site area requirements.

5. Our Planning Proposal specifically addresses and satisfies the requirements of the Chatswood CBD Strategy with regards to both a) minimum deep soil area retention on site with corresponding landscaping, and b) provision for increasing both pedestrian and cycling movement through the CBD.

6. The site of our Planning Proposal is not adjacent to the heritage precincts considered by the recommendations contained in the Weir Phillips Chatswood Precinct Heritage Review. Our proposal would not be impacted by the implementation of the recommendations in this report should they be incorporated into the CBD strategy.

Additionally, we undertake that, any changes to Council's Planning Agreement Policy that require further consideration and agreement regarding our site and Planning Proposal will be satisfied as we progress forwards through the planning process. Accordingly, we are willing to work with Council collaboratively to achieve agreement regarding any contributions required by either WCC and/or the DPIE.

1.4 Statement of Support

This consolidated Planning Proposal Report has been prepared in accordance with Section 55 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act) and the relevant guidelines prepared by the NSW Department of Planning including *A Guide to Preparing Local Environmental Plans* and *A Guide to Preparing Planning Proposals*. It has also been prepared in accordance with Willoughby City Council's Chatswood CBD Strategy 2036.

The entire Planning Proposal provides a comprehensive justification of the proposed amendment to WLEP, and is considered justified for the following reasons:

The consolidated Planning Proposal report documents how we have integrated the environmental, social, and economic analysis undertaken for the site which has led to our design for an optimal built form within the proposed constraints of land use, height, density, and amenity.

A redevelopment of the site could provide significant public benefits as outlined within the primary report. These benefits include:

- Delivery of a new landmark building providing boutique grade retail floor space which will support Chatswood's position and attract national and international business and capital;
- Delivery of an iconic building that does not result in additional overshadowing on Victoria Avenue Mall and limits new shadowing to those areas where shadows are predominantly already cast by existing development, ensuring that a high level of amenity is maintained;
- Delivery of a building which provides enhanced amenity to occupants, maximises views, and provides a new striking addition to Chatswood's CBD skyline;
- Delivery of a building with activated street frontages;
- Delivery of a building with a substantial commercial floorspace component of 1:1;
- Delivery of a building with communal space, including a communal playground area.

Overall, it is considered that the Planning Proposal has a range of positive benefits, and it is requested that the proposed amendments to the WLEP2012 are fully endorsed by Willoughby City Council, and that the Planning Proposal is enabled to proceed to Gateway Determination under Section 56 of the EP&A Act.

Matt Hurst BTP
Director - Planning and Infrastructure
Parade Consulting
September 2020

Consolidated Report Contents

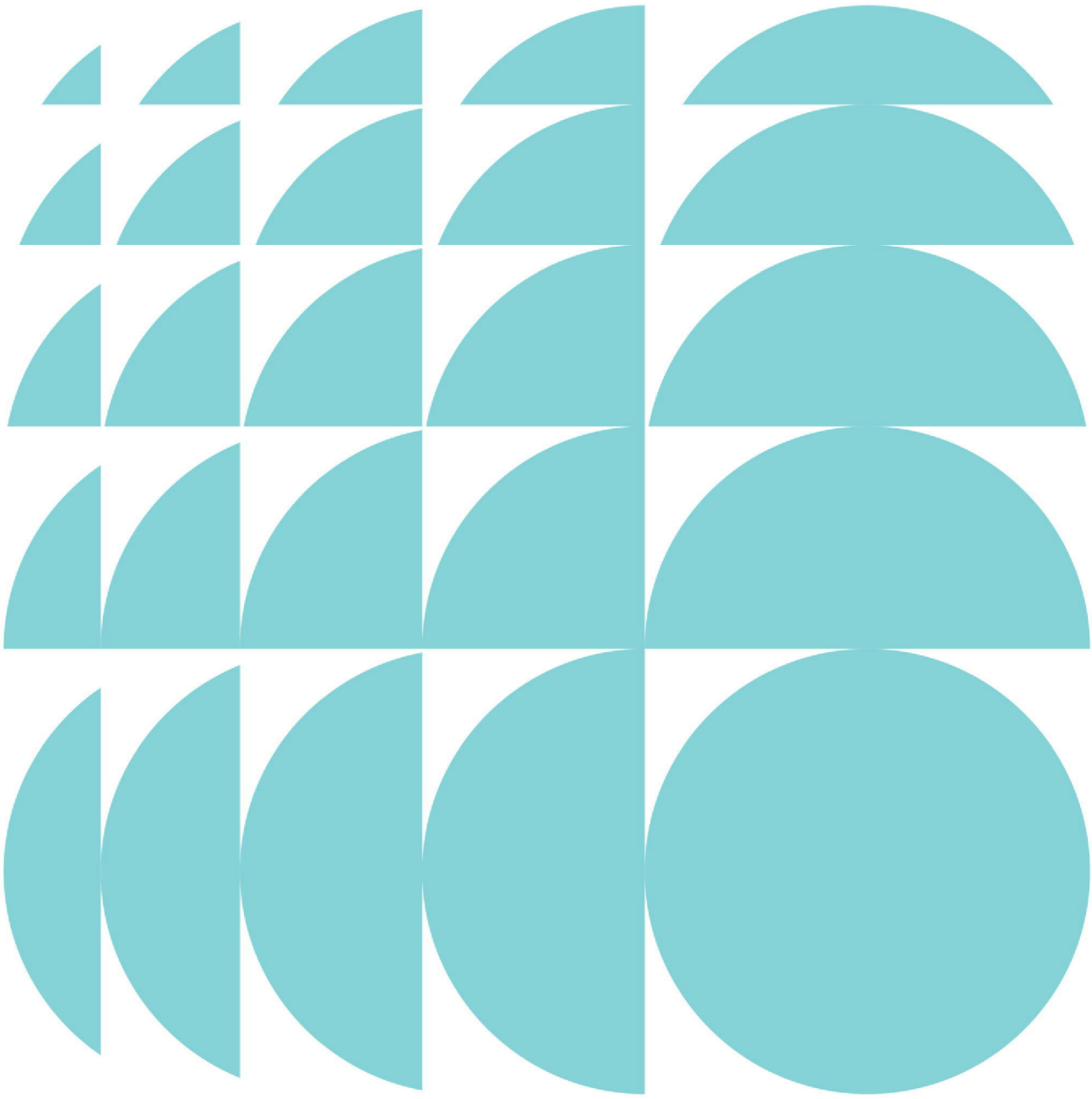
ETHOS URBAN

Amendment to Willoughby LEP 2012

3-5 Help Street, Chatswood

Submitted to Willoughby City Council
On behalf of H&J Vakili

15 December 2017 | 17641



CONTACT

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This document has been prepared by:

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Updated by Parade Consulting September 2020 by authorisation of the Client Hassan Vakili

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This Document has been updated where required to reflect changes in the specified planning requirements for the site so as to be suitable for resubmission of this document in September 2020. These changes have been made by Parade Consulting and authorised by the client Hassan Vakili. These updates are mostly to the FSR and design drawings. Some sections of the document relating to the justification for the previous 7:1 FSR remain as they cannot be removed from the document without significantly compromising its structure.

Figures

Tables

Appendices

1.0 Introduction

This report has been prepared by Ethos Urban on behalf of H&J Vakili/ 3-5 Help Pty Ltd in support of a Planning Proposal to amend the *Willoughby Local Environmental Plan 2012* (the WLEP 2012) related to 3-5 Help Street, Chatswood (the site).

The site is currently occupied by two residential buildings of up to three storeys in height. The existing buildings represent an underutilisation of the site given its prominent location within Chatswood CBD, within 400 metres of Chatswood Railway Station.

The Planning Proposal is a result of the findings of the *Chatswood CBD Planning and Urban Design Strategy* (the CBD Strategy) which identifies the site as being suitable for increased densities to support the future growth of Chatswood CBD. The Planning Proposal seeks to amend core development standards within the WLEP 2012 to facilitate a development concept that is generally compliant with the findings of the CBD Strategy though provided additional merit based justification for some additional density.

Should the WLEP 2012 be amended as envisaged by this Planning Proposal, a redevelopment of the site would be facilitated to provide for a mixed-use scheme incorporating a four-storey commercial and residential podium and a 24-storey residential tower (28 storeys overall). In order to facilitate the development concept, the Planning Proposal seeks to amend the maximum 'Height of buildings' and 'Floor space ratio' development standards of the WLEP 2012, as follows:

- Increase the maximum building height from part 20 and part 25 metres to 90 metres; and
- Increase the mapped maximum floor space ration from 2.7:1 to 6:1 (including a minimum 1:1 commercial floor space).

The key objective of this report is to demonstrate the strategic planning merit of accommodating a higher density development on the site in the form of a tall slender mixed use building, also to evaluate the impact of additional building height and density, and to assess the relevant environmental, social and economic impacts of the proposal in accordance with Section 55 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act).

This Planning Proposal describes the site, details the proposed amendments and provides justification for the rezoning. This Planning Proposal has been prepared in accordance with the Department of Planning and Environment's '*A Guide to Preparing Planning Proposals'*.

This Planning Proposal is generally consistent with relevant guiding strategic documents, State Environmental Planning Policies and relevant Section 117 Ministerial Directions.

1.1 Pre-lodgement Consultation

A pre-planning proposal meeting was held with Council on 21 July 2017. A summary response to Council's comments is provided at **Table 1** below.

Table 1 – Council Comments

Key Issues	Response
Relationship to strategic planning framework	Assessment of key strategic plans is provided at Section 5.1 and 5.2.
Mixed Use	Commercial floor space has been provided on the Ground floor and a minimum non-residential FSR is proposed. The Planning Proposal is largely consistent with the CBD Strategy – this is further discussed at Section 5.1.
Scale and Form of Development	The Planning Proposal would facilitate a tower, including lift overrun and plant, which remains below the 90m height control recommended by the CBD Strategy. As shown in the reference design provided within the Architectural Plans (**Appendix A**) a slim tower with a 530m^2 floor plate can be accommodated on the site. This is smaller than the 700m^2 floorplate recommended by CBD Strategy. FSR is discussed further at Section 5.1.
Setbacks at Ground level and upper levels	The reference design provided at **Appendix A** demonstrated that a future development of the site in line with the proposed modifications to the WLEP 2012 would be able to comply with all setbacks and separation distances required by the Apartment Design Guide and relevant CBD Development Control Plans.
Access and Parking	Assessment of traffic and parking is provided at Section 5.3. A development of the site as envisaged by the Planning Proposal would not generate adverse traffic impacts on the local street network.
Usability of roof open space	A reference design has been provided as **Appendix A** that demonstrates that the podium roof facilitated by the Planning Proposal would be usable and would be able to provide future residents with external amenity, including landscaped areas and a pool deck with discrete seating.
Landscaping	The reference design provided as **Appendix A** illustrates that deep soil and soft landscaping on the podium roof can be provided in a manner consistent with requirements of the CBD Strategy objective of greening the CBD.
Affordable Housing	The development concept includes provision of 4% affordable housing throughout the development. Any future detailed development application would comply with Clause 6.8 of Willoughby LEP.
Value Uplift	The applicant is prepared to enter into a VPA to allow the uplift in density on the site.
Public Art	A contribution toward public art will be made in line with Council policy at the detailed DA stage.
Draft DCP Controls	The reference design outlined in **Appendix A** has been designed to comply with relevant DCP controls identified by the CBD Strategy. Refer to Section 4.6.
Timing	Council's comments are noted. The Planning Proposal will be reviewed and exhibited in line with existing policies.

2.0 The Site

2.1 Site Description

This Planning Proposal applies to land located at 3 – 5 Help Street in Chatswood Central Business District (CBD) (the site). The site comprises two parcels of land legally described as Strata Plan 134 and Strata Plan 52320. The site has an area of approximately 2,290m^2 and is irregular in shape.

The site is located approximately 8km north-west of Sydney CBD in the Chatswood CBD, in the Willoughby Local Government Area (LGA) as shown at **Figure 1**. Chatswood CBD is a densely-populated area in New South Wales and is one of Sydney's major commercial and retail centres. The centre provides a variety of facilities ranging from a major shopping centre (Westfield), specialty shops, street front retail, commercial offices, private health and medical services, community facilities and residential accommodation. The site is within the Chatswood CBD northern edge, and is approximately within 200m from Chatswood Railway Station.

The site has a 48 metre frontage to Help Street to the south, a 66m frontage to Cambridge Lane to the west, an 11 metre frontage to McIntosh Street to the north and shares a 61 metre boundary with development to the east (28 Anderson Street).

A survey has been prepared by John Walton and is provided at **Appendix B**.

An aerial photograph of the site is provided at **Figure 2** below.

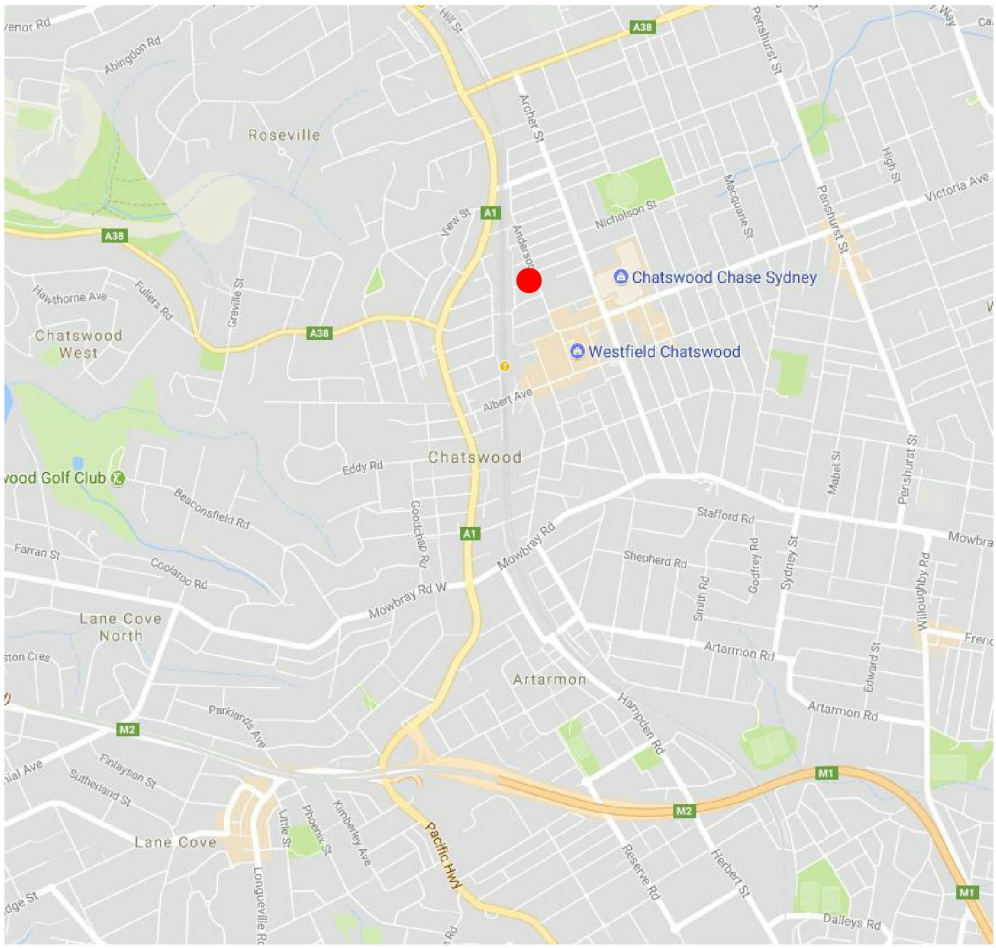

Figure 1 – Site context map

Source: Google maps

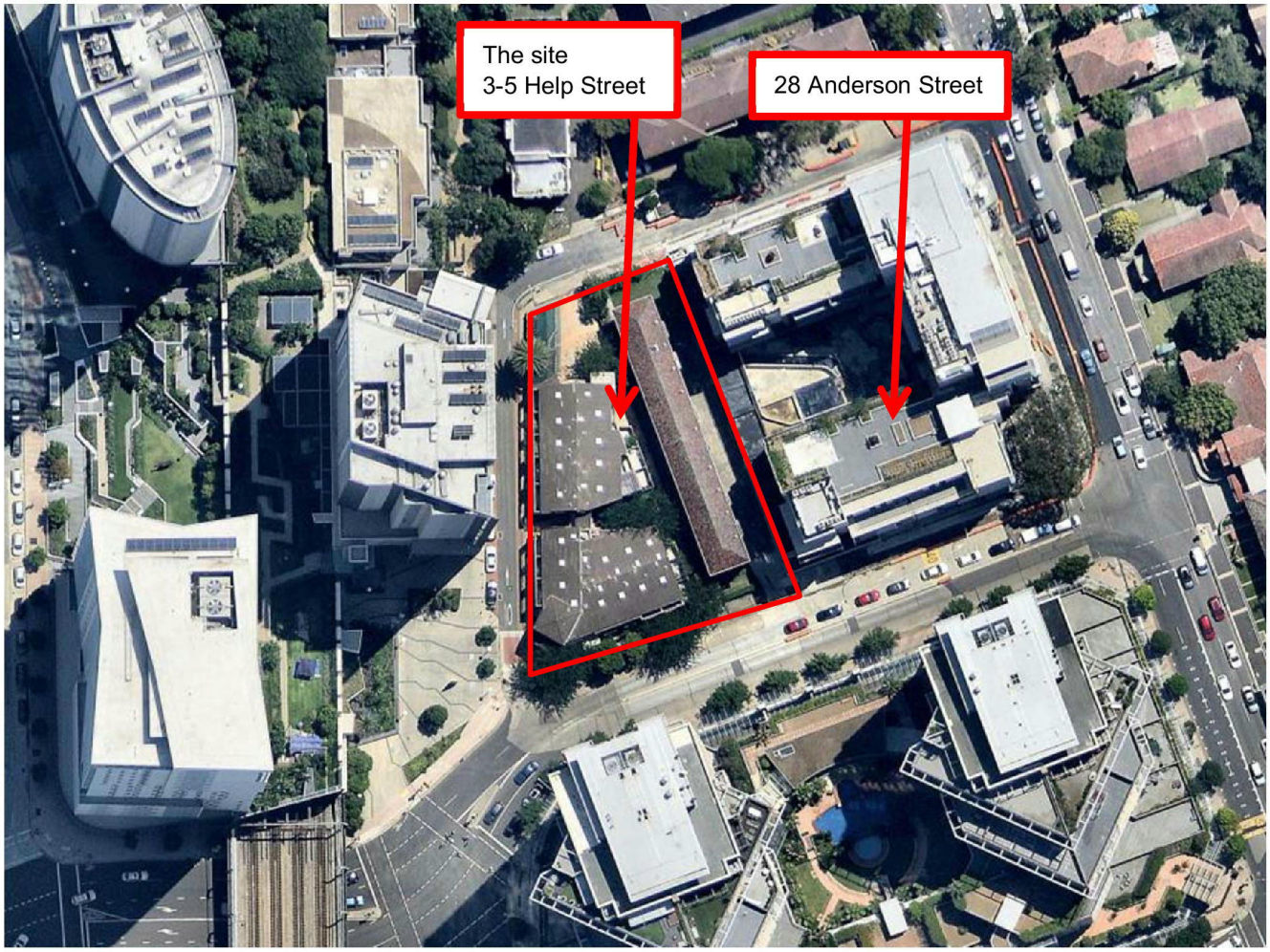

Figure 2 – Aerial Image

Source: Nearmap

Key Planning Controls

The *Willoughby Local Environmental Plan 2012* is the primary environmental planning instrument applying to the site. This Planning Proposal seeks to amend the height and FSR controls that currently apply to the site to facilitate a feasible future mixed use redevelopment. The key current planning controls that apply to the site are summarised in **Table 2** below.

Table 2 - Key Planning Controls

Control	LEP
Zone	B4 Mixed Use
Building Height	20 metres in the southern part of the site; and 25 metres in the northern part of the site
Floor Space Ratio	2.7:1 (up to 4:1 subject to Clause 4.4A (see below))
Clause 4.4A (19)	The maximum floor space ratio for a building on land identified as “Area 14” on the Floor Space Ratio Map may exceed 2.7:1 if: (a) the site area exceeds 2,200 square metres, and (b) the floor space ratio will not exceed 4:1, and (c) the floor space ratio of any shop top housing will not exceed 2:1.

Existing Development

The site currently accommodates two separate three (3) storeys residential flat buildings, which were constructed in the 1960s and 1970s. These buildings comprise 57 units, along with their associated parking. Despite the properties being subject to a Strata title, the majority of the properties are controlled by the proponent of this Planning Proposal, which represents an opportunity for the site to be redeveloped.

The existing apartment buildings relate poorly to the surrounding context of modern mix-use high rise developments, resulting in limited amenity and contemporary functionality and offer no street activation. A photo graph of 3 and 5 Help Street is shown at **Figure 3** and **Figure 4** respectively.

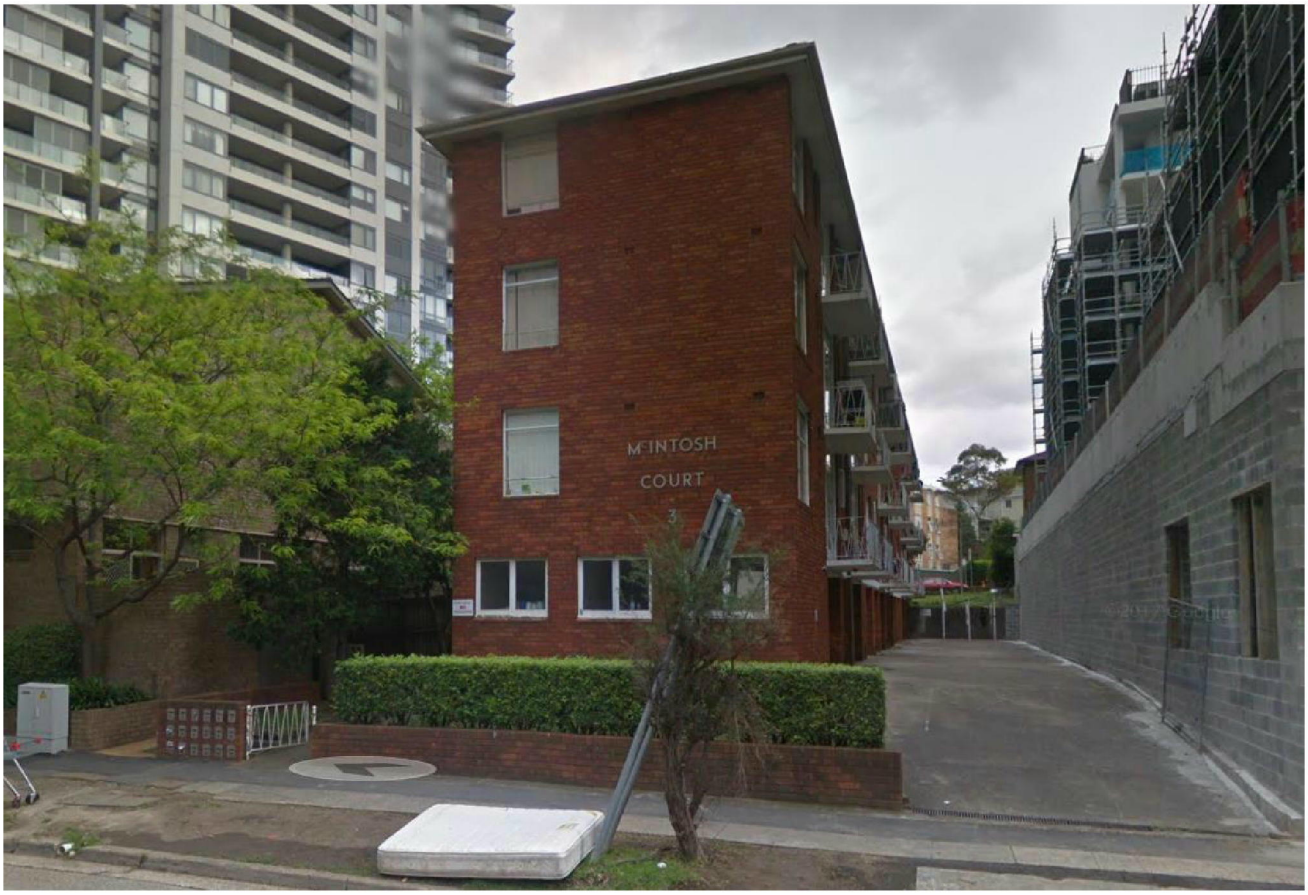

Figure 3 – 3 Help Street

Source: Nearmap

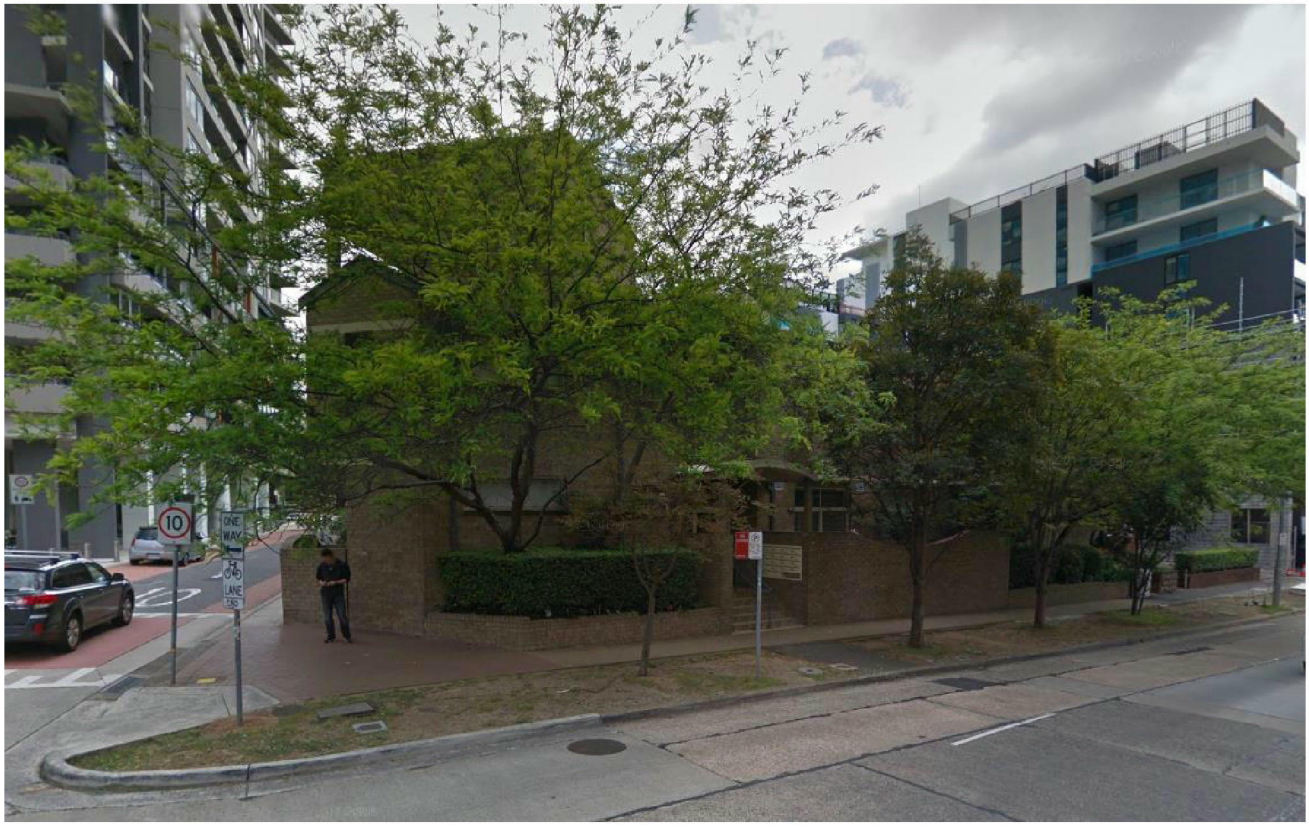

Figure 4 – 5 Help Street

Source: Nearmap

Topography

The site has a fall of approximately four metres from north to south with an elevation of RL 91.48m at the south-east corner and an elevation of RL 95.45 m at the north-east corner.

Heritage

The site is not listed as an item of heritage significance and is not located within a heritage conservation area under Schedule 5 of WLEP 2012 (refer to **Figure 5**).

There are a number of items of local heritage significance in the surrounding area including:

- 455 Victoria Street – Orchard Tavern, approximately 144 metres to the south;
- 94A Archer Street – Our Lady Dolours Church, approximately 260 metres to the east; and
- 4-8 Daisy Street – residential houses, approximately 180 metres north east.

The North Chatswood Heritage Conservation Area is located approximately 170 metres north east of the site, as shown at **Figure 5**.

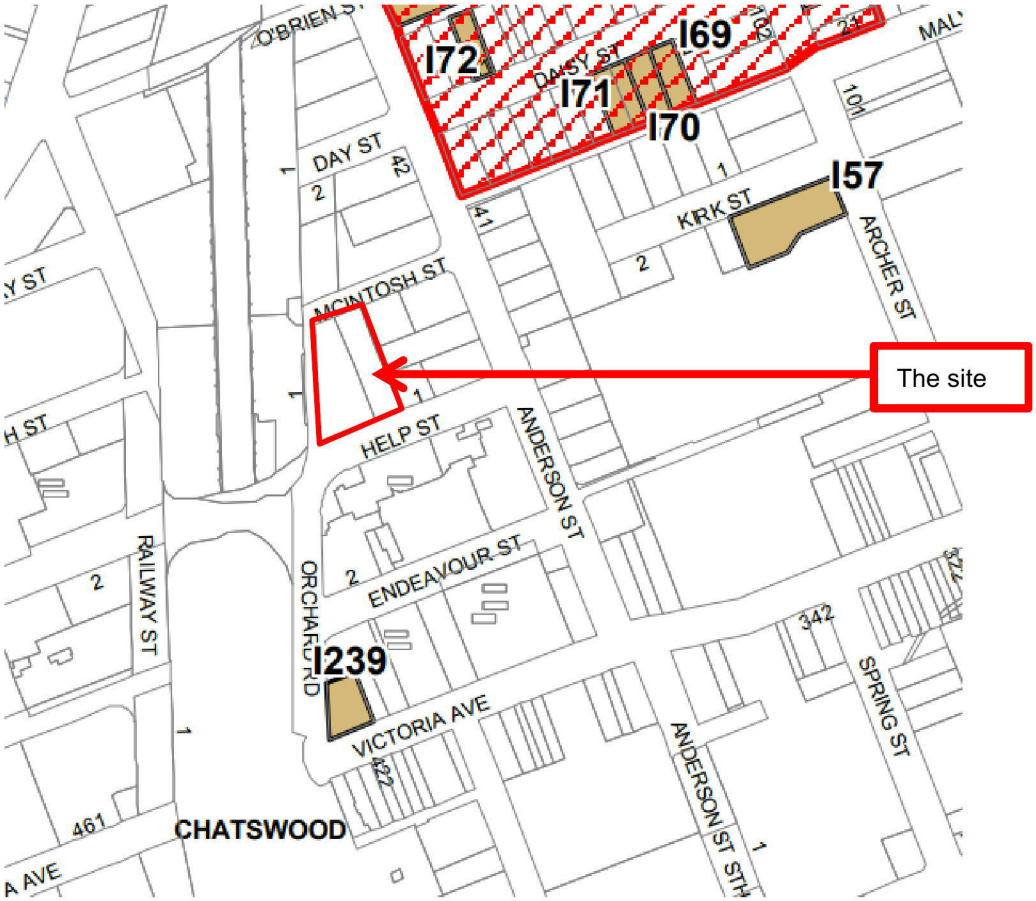

Figure 5 – Heritage Map

Source: Willoughby LEP 2012

Vegetation

Whilst the site is largely developed, there are several trees and shrubs scattered across 5 Help Street. 3 Help Street is largely cleared of vegetation with limited hedging along Help Street.

Flooding

The site is not identified as being flood affected by WLEP2012 or Council's online mapping tool.

Contamination

The site has a historic residential use and it is considered unlikely to be contaminated. An assessment of contamination consistent with the requirements of SEPP 55 would be undertaken at the appropriate DA stage.

Access/driveways

Pedestrians can access the site from Chatswood Railway Station, which is 200 metres south of the site via Orchard Road. The site is well connected to the surrounding road network, being located on Help Street providing connections east-west of the railway line to the Pacific Highway in the west and Anderson Street in the east.

Vehicular access to 3 Help Street is made from an existing crossover at Help Street. Access to 5 Help Street is made from Mcintosh Street.

2.2 Surrounding Development

The height, bulk, and scale of existing buildings at the site are significantly lower than other existing and recently approved buildings in the CBD. The land uses and development adjoining and surrounding the site are described below.

North

Existing developments to the north of the site include:

- Three (3) storey walk-up residential flat buildings that were built during the 1960s and 1970s.
- Situated to the north west of the site are the B2E Apartments at Day Street. B2E was completed in 2003 and is a low-rise complex of four buildings linked together. There are 64 residential apartments in total on this site.

South

Existing developments to the south of the site include:

- An existing mixed-use development that provides commercial, retail and residential uses and is referred to as Regency Towers. The development includes two residential towers. On the Orchard Road side to the west is Tower A at 28 storeys and on the Anderson Street side to the east is Tower B at 19 storeys.
- Further south is Victoria Avenue and the Mall, Westfield Chatswood shopping centre, and the public transport interchange.

The block immediately to the south of the site has a maximum permissible FSR of 7:1.

East

Existing developments to the east of the site include:

- Mixed-use development of 28 Anderson Street;
- The Presbyterian Church, St Pius College and associated dwellings; and
- To the north east of the site, the existing development consists of medium density residential buildings.

West

A number of high-rise buildings are located to the west of the site including:

- Situated on Cambridge Lane is a high-density residential development, known as the ‘Cambridge Apartments’, which are approximately 72 metres tall (25 Storeys);
- The ERA residential tower situated at 7 Railway Street is approximately 135 metres tall (43 Storeys);
- Situated along the railway corridor at 9 Railway St are the EPICA Apartments with a height of 32 Storeys and at 11 Railway St, the Altura Apartments at 25 Storeys; and
- Chatswood CBD (further to the west) is occupied by a range of business, retail and office premises.

The block immediately to the west of the site has a maximum permissible FSR of 7:1.

3.0 Development Concept

This Planning Proposal is seeking to amend the height of buildings and floor space ratio development standards within the WLEP 2012 as they apply to the site. An indicative development concept (reference design) has been developed by Kann Finch, and is detailed in **Appendix A**.

3.1 Urban Design Principles

The urban design principles that underpin this Planning Proposal are as follows:

- facilitate a mixed-use tower that responds to the location of the site and the neighbouring properties;
- no additional overshadowing to Victoria Avenue; and
- facilitate development on a strategic site in the Chatswood CBD within walking distance of the railway station.
- Provide a mix of non-residential (podium) and residential development;
- Shape the building to minimise overshadowing of adjoining apartment buildings;
- Set up an envelope that allows design excellence to be further explored in the detailed DA stage

3.2 Proposed Development

To facilitate the above design principles and test the site's capacity, Kann Finch has prepared an indicative development concept as detailed at **Appendix A**. The reference design provides a building on the site that:

- Provides a maximum building height of 90 metres; and
- Provides a building with a total FSR of 6:1 (including a minimum 1:1 commercial FSR).

A numeric overview of the development concept the Planning Proposal would facilitate is provided at **Table 3**.

Table 3 – Numerical Overview

Aspect	Development Concept
Site Area	2,290m^2
Gross Floor Area – Commercial – Residential – Total	 2,290m^2 11,450m^2 13,740m^2
Floor Space Ratio – Commercial – Residential – Total	 1:1 5:1 6:1
Height	90m

3.3 Height

It is proposed to amend WLEP 2012, as it applies to the site, to increase the maximum 'height of buildings' development standard to 90 metres. This is in line with the CBD Strategy (refer to **Section 5.1**). The indicative height of the development concept is illustrated at **Appendix A** is 28 storeys.

3.4 FSR

It is proposed to amend WLEP 2012 to amend the maximum 'floor space ratio' development standard to 7:1. The Planning Proposal seeks to require a minimum 1:1 FSR for commercial floor space for any development on site. The indicative built form delivered by a FSR of 7:1 (including 1:1 commercial floor space) is illustrated by the development concept at **Appendix A**.

A 3D model and elevation of the development concept is shown at **Figure 6** and **Figure 7** below.

Figure 6 - 3D Model of the development concept

Source: Kann Finch

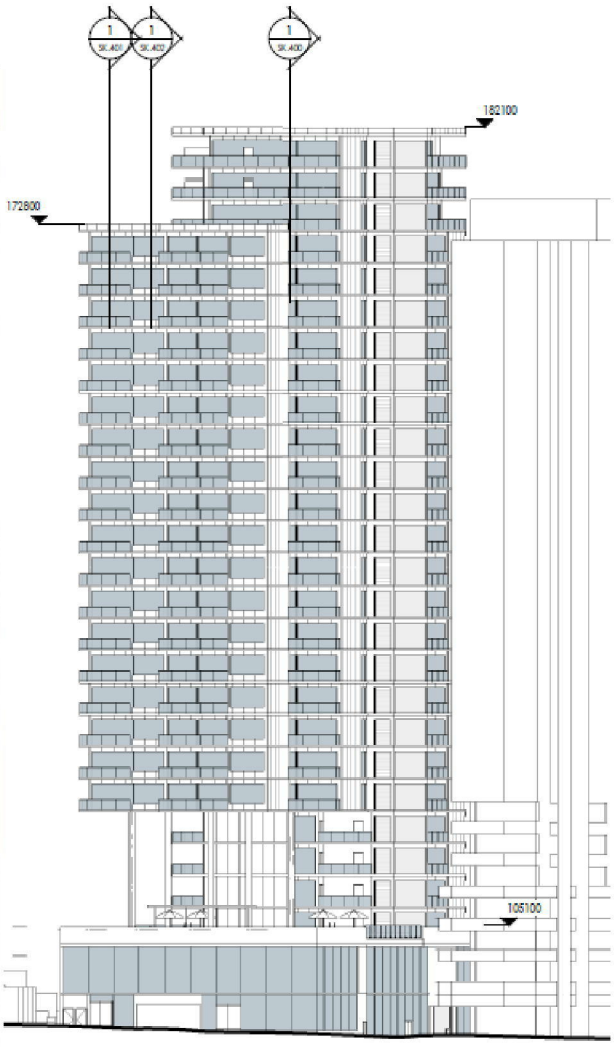

Figure 7 - Development Concept elevation view from McIntosh Street

Source: Kann Finch

3.5 Car Parking

A future development at the site would be able to accommodate car parking in accordance with the current requirements of the Willoughby DCP. Due to the central CBD location of site it may be appropriate to explore reduced car parking rates at the DA Stage. A traffic and transport report has been prepared by GTA Consultants and is provided as **Appendix C.**

4.0 Planning Proposal

This Planning Proposal has been prepared in accordance with Section 55 of the *Environmental Planning & Assessment Act, 1979* (EP&A Act), and *'A Guide to Preparing Planning Proposals'* prepared by the NSW Department of Planning and Environment, which requires the following matters to be addressed:

- The objectives and intended outcomes of the amendment to the WLEP 2012;
- Explanation of provisions;
- Justification, including:
  - Relationship to strategic planning frameworks;
  - Environmental, social and economic impact;
  - State and Commonwealth interests;
- Maps; and
- Community consultation.

The following Section outlines the objectives and intended outcomes and provides an explanation of provisions in order to achieve those outcomes, including relevant mapping. The justification and evaluation of impacts is set out in **Section 6** of this report.

4.1 Objectives and Intended Outcomes

The objective of this Planning Proposal is to facilitate the redevelopment of land at 3-5 Help Street, Chatswood in a manner generally consistent with the provisions of the CBD Strategy which designate the site for mixed uses.

The intended outcome of the Planning Proposal is to amend the height and FSR controls of the WLEP 2012 to support mixed use development on the site as detailed in **Section 3.0**.

4.2 Explanation of Provisions

The Planning Proposal incorporates a number of amendments to the WLEP 2012 as it relates to the site. These amendments are summarised in **Table 4**.

Table 4 – Summary of Proposed Amendments to Willoughby LEP

	Existing	Proposed
Land Use Zone	B4 Mixed Use	B4 Mixed Use
Building Height	20 metres in the southern part of the site; and 25 metres in the northern part of the site	90 metres
Floor Space Ratio	2.7:1	6:1 (including at least 1:1 commercial)
Clause 4.4A (19)	The maximum floor space ratio for a building on land identified as "Area 14" on the Floor Space Ratio Map may exceed 2.7:1 if: (a) the site area exceeds 2,200 square metres, and (b) the floor space ratio will not exceed 4:1, and (c) the floor space ratio of any shop top housing will not exceed 2:1.	Development consent must not be granted for the purpose of erecting a building on land identified as "Area 14" unless commercial floor space equating to at least 1:1 is included.

4.3 Height of Buildings

It is proposed to increase the maximum building height from 20m in the southern part of the site and 25m in the northern part of the site to 90m across the entire site by amending the Height of Buildings Map

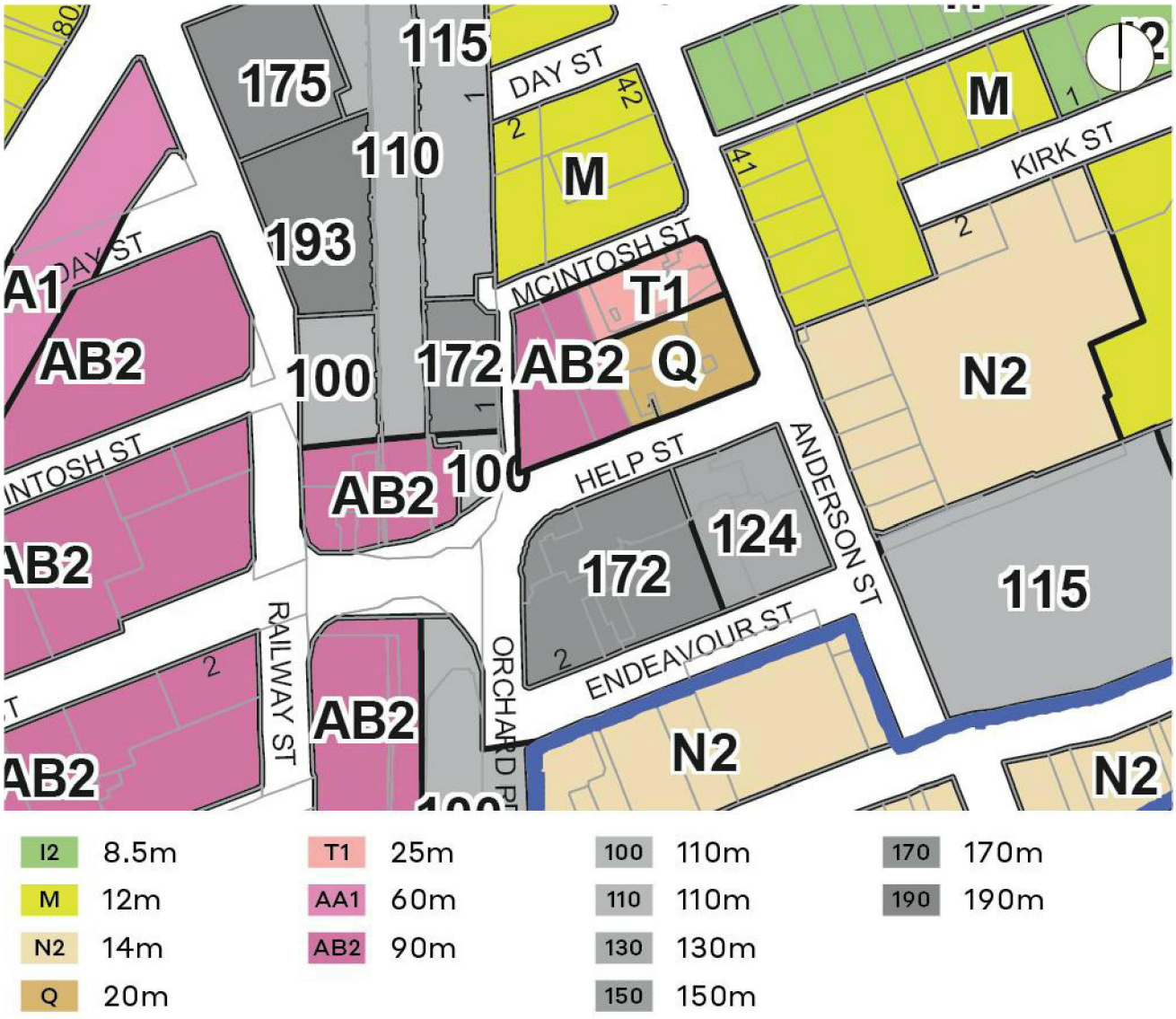

Figure 8 – Proposed Amendment to the Maximum Building Height

Source: Ethos Urban

4.4 Floor Space Ratio

It is proposed to increase the maximum floor space ratio (FSR) from 2.7:1 to 6:1 by amending the Floor Space Ratio Map as shown below.

It is also proposed to amend Clause 4.4A (19) as follows:

Delete
~~(19) The maximum floor space ratio for a building on land identified as "Area 14" on the Floor Space Ratio Map may exceed 2.7:1 if:~~
~~(a) the site area exceeds 2,200 square metres, and~~
~~(b) the floor space ratio will not exceed 4:1, and~~
~~(c) the floor space ratio of any shop top housing will not exceed 2:1.~~

Insert
(19) Development consent must not be granted for the purpose of erecting a building on land identified as "Area 14" unless commercial floor space equating to at least 1:1 is included.

Area 14 of the Floor Space Ratio Map will be amended to align with the change to Clause 4.4A. (Refer to **Figure 9**).

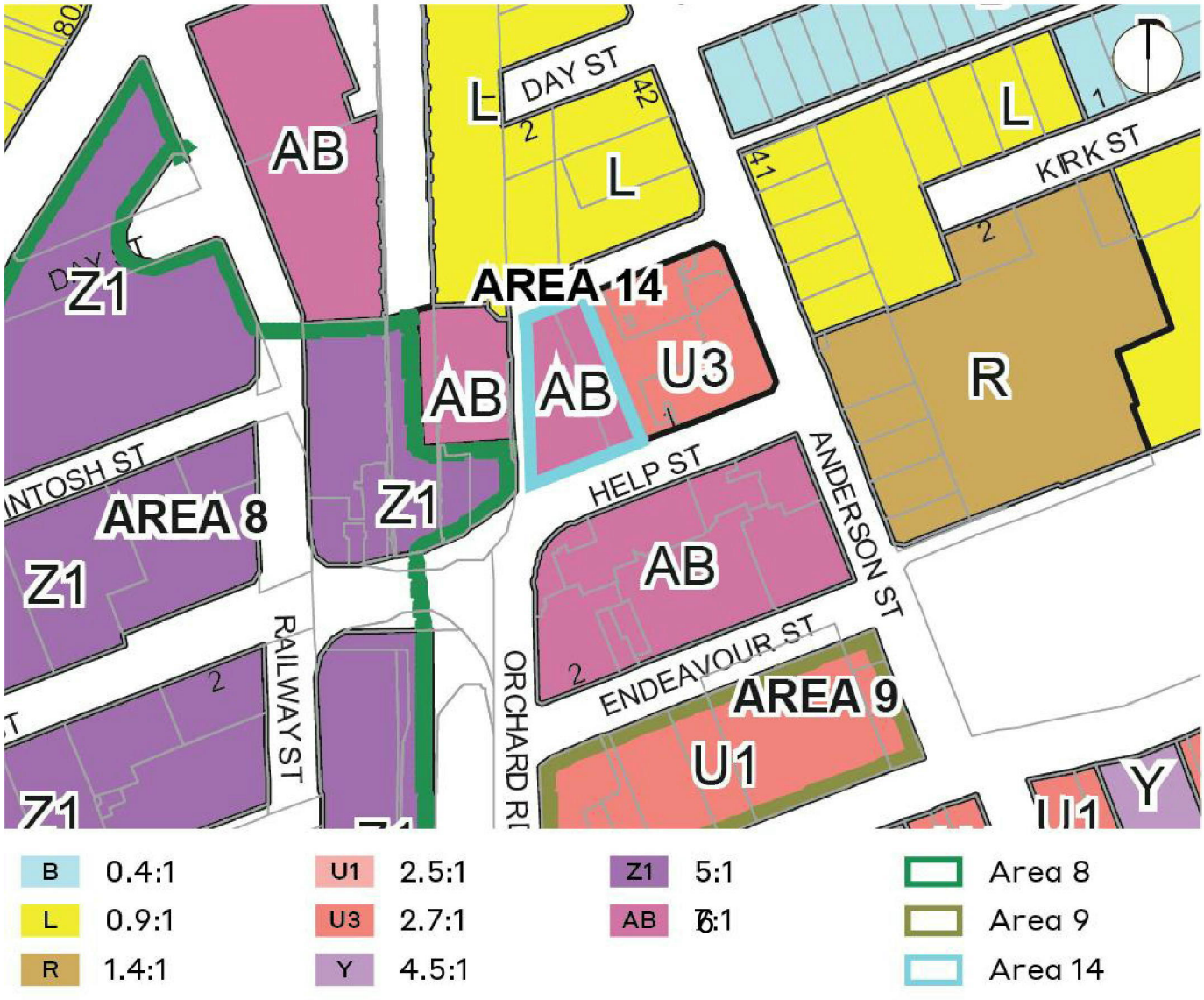

Figure 9 – Proposed Amendment to the Maximum Floor Space Ratio

Source: Ethos Urban

4.5 Mapping

This Planning Proposal seeks to amend the following maps of the WLEP 2012:

- Height of Buildings Map - Sheet HOB_004; and
- Floor Space Ratio Map - Sheet FSR_004.

The proposed maps are included at **Appendix E**.

4.6 DCP Controls

Council's CBD Strategy envisaged a new CBD DCP, which will be developed by Council. A specific DCP is proposed to be developed for the site, which could be developed generally in accordance with Council's current or future DCP requirements.

5.0 Strategic Justification

5.1 The Need for a Planning Proposal

Q1 – Is the Planning Proposal a result of any strategic study or report?

Yes. The Planning Proposal is the result of the CBD Strategy, which was publicly exhibited during the first quarter of 2017. The CBD Strategy is intended to establish a framework to guide growth and development in the CBD over the next 20 years and to achieve exceptional design and a distinctive, resilient and vibrant centre for Chatswood. As outlined in the following section, the development concept is a direct result of the findings of the CBD Strategy.

The CBD Strategy anticipates significant growth for the Chatswood CBD over the next 30 years including the need for an additional:

- 501,750m^2 residential Gross Floor Area.
- 297,500m^2 office Gross Floor Area
- 136,200m^2 other commercial Gross Floor Area.

A future development of the site, such as that facilitated by this Planning Proposal, would contribute an additional 13,7400m^2 floor area in total including 2,290m^2 commercial floor area and 11,450m^2 residential floor area, contributing to the delivery of the above CBD growth and providing a vibrant residential population to partake in services of the CBD for one of the few sites identified for mixed use and capable of redevelopment (due to the ownership of the existing strata arrangements).

To accommodate and shape this growth the following key outcomes are recommended by the CBD Strategy:

- Delivery of floor space (residential and non-residential) which is appropriate to the projected requirements within the future Chatswood CBD;
- Chatswood's future as an employment centre is protected, by provided a development outside of the commercial core with some non-residential uses, whilst allowing capacity for residential growth;
- Good sun access to key public spaces and adjoining residential properties;
- High quality built outcomes will be achieved through a design excellence process; and
- Tower developments are encouraged to be slim and well separated.

The development concept is consistent with the above key outcomes recommended by the CBD Strategy.

The CBD Strategy identifies the site as an "opportunity site with strata" as shown at **Figure 10** below. It is located in the outer centre of Chatswood CBD, adjacent to the office and retail core where mixed uses are encouraged.

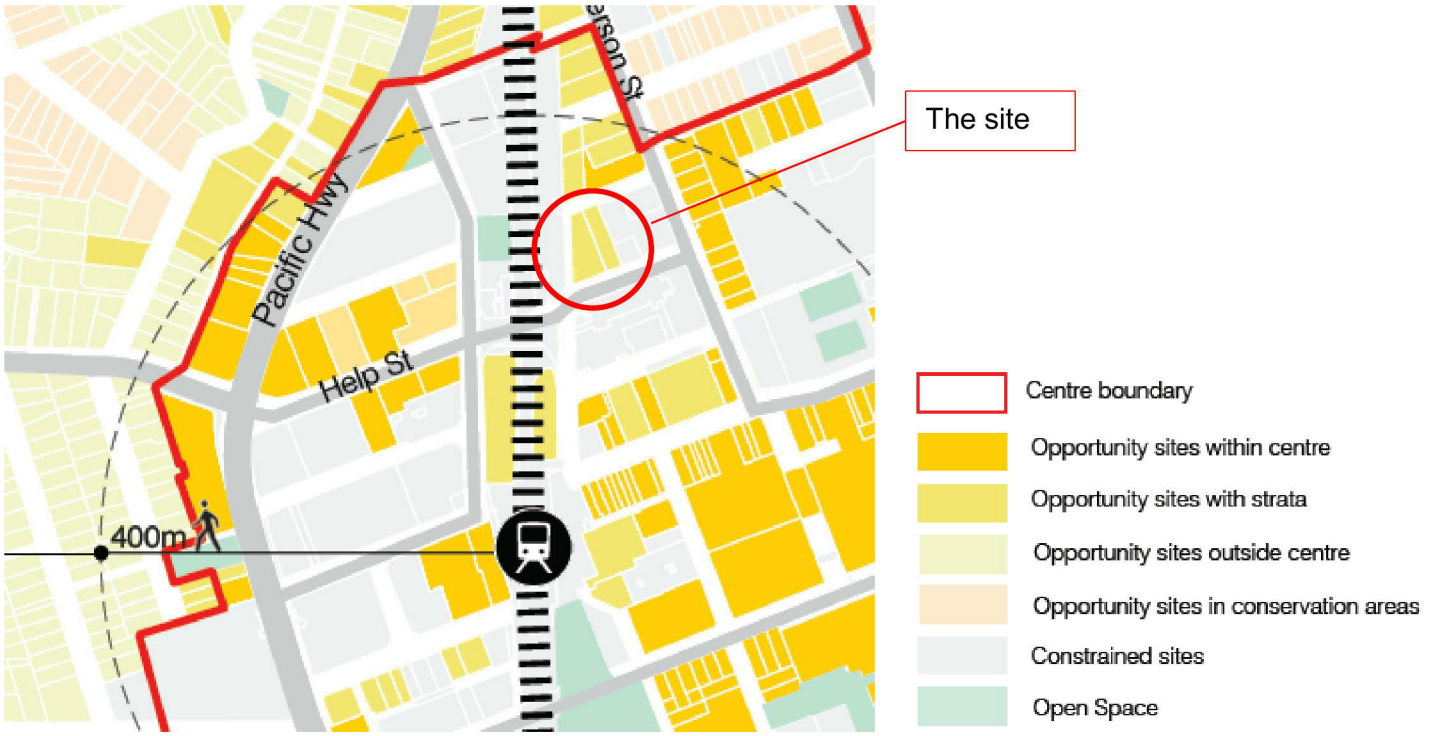

Figure 10 – Opportunity sites map

Source: Chatswood CBD Planning and Urban Design Strategy

The development concept (as outlined at **Section 3.0**), which can only be facilitated by this Planning Proposal, is consistent with the key planning considerations for the future, including:

- Encouraging smaller office uses in mixed use buildings which form a vital part of the overall office mix in the CBD;
- Delivery of residential uses that will contribute to the activity of Chatswood CBD to the benefit of office and retail uses;
- Providing integral residential uses ensure Chatswood remains a mixed-use centre, providing jobs closer to homes;
- Contributing capacity for residential growth without affecting the viability of Chatswood's office core;
- Delivery of high architectural quality;
- Contribution to the centre through developer contributions contributing funding to new open space, streetscape and public domain improvements.

The development concept is also largely consistent with the recommended LEP and DCP controls for the site within the CBD Strategy (other than a merit based justification for further FSR on a well-located site). A summary assessment is provided at **Table 5** below.

Table 5 - Consistency with Strategy recommended LEP controls

	Recommended Control	This Planning Proposal
Land Use	Mixed Use	No change to the applicable zone of the site is proposed. The site would retain its current zone (B4 Mixed Use).
Height	90m	90m
	Approximately RL190 sun access plane to Victoria Avenue	RL185
Floor Space Ratio	6:1	6:1 (including minimum 1:1 commercial floor space). Refer below for further discussion.

Floor Space Ratio

Development that would be facilitated by this Planning Proposal is largely consistent with findings of the CBD Strategy as it would provide a slim mixed-use building on an opportunity site, within 400 metres of Chatswood Railway Station. The Planning Proposal seeks that an FSR of 7:1 apply to the site, this is 1:1 above the relevant recommended of CBD Strategy. The additional FSR is considered appropriate for the following reasons:

- The feasibility analysis undertaken by AEC (refer below) shows that it is not feasible to redevelop the site under the controls recommended by the Strategy. The FSR threshold required for feasible development is inversely related to the minimum non-residential FSR required. AEC found that to deliver a 1:1 commercial component a total FSR of at least 6.5:1 would be required for the development to be feasible.
- Proposed uplift of the site is strategically justified by seeking to increase housing and jobs within walking 200m walking distance of the Chatswood Railway Station, consistent with the relevant actions and directions of A Plan for Growing Sydney and the North District Plan.
- The site is capable of accommodating a built form of 6:1 FSR without causing additional environmental impacts to the locality in terms of overshadowing or traffic generation. A slim tower floor plate below the recommendations of the strategy is able to be provided without adverse impacts and incorporating the additional floor space.
- The proposed FSR is consistent with the FSR permitted on surrounding sites, being 6:1.

These justifications are explored in more detail below.

Market Feasibility Analysis

To accompany this Planning Proposal AEC Group undertook a market appraisal and feasibility analysis (**Appendix D)** of the Chatswood residential and commercial market to:

- Determine the nature of demand from commercial occupiers (in particular boutique operators outside the main commercial core) within Chatswood and ascertain the type of commercial floor space that would be sustainable on the site;
- Understand if development of the site under existing and proposed planning controls is feasible given the high cost of consolidating the two residential strata buildings;
- Determine the quantity of additional density required for development to be commercially viable.

The report found commercial office vacancy rates have fallen in the last six months and that there is demand for smaller commercial suites (less than 300m^2) in the Chatswood market. Commercial office spaces in mixed use buildings are well regarded by smaller professionals who do not require a corporate location and that benefit from

co-locating retail and residential uses. This Planning Proposal includes a provision to require commercial uses to be provided on the site at a density of at least 1:1. As such, future development of the site in line with this Planning Proposal would facilitate range of commercial suite sizes between 175m^2 to 887m^2 with larger floor plates capable of being broken into smaller or larger tenancies as required to appeal to the commercial sector.

Market conditions indicate there is strong demand for residential development in Chatswood, with a particular focus of high density apartment living in the CBD, close to amenities and high frequency public transport. Current demand is expected to continue and grow in the short to medium term. The development concept will contribute to residential growth and development of the northern CBD fringe, complimenting surrounding land uses and is located on a mixed-use site which will not undermine the main commercial core.

Feasibility modelling for the site was undertaken by AEC, the findings of the report are as follows:

- Current planning controls (FSR 2.7:1) are not feasible given the cost to consolidate two strata unit blocks for development.
- To provide for non-residential (commercial) of FSR 2:1, a total FSR in the order of 7.4:1 is required for feasible development.
- If a commercial FSR of 1:1 were provided, a total FSR of at least 6.5:1 is required for feasible development.
- The FSR threshold required for feasible development is inversely related to the minimum non-residential FSR required.

The analysis indicates that redevelopment of the site (including 1:1 commercial floor space) is not feasible should the site achieve a 6:1 FSR as recommended by the CBD Strategy. Accordingly, the development concept should seek approval for a 7:1 FSR which is considered an appropriate density for the CBD location. The environmental assessment at Section 5.3 demonstrates the site is capable of accommodating the additional density and the development concept is capable of appropriately managing any environmental impact.

Suitability of Built Form

A comprehensive evaluation of the site's physical and strategic attributes has been undertaken to assess the appropriateness of a future development delivered in accordance with an LEP modified in accordance with this Planning Proposal. The site is able to achieve an appropriate massing, bulk and height, which is responsive to the CBD context. The Planning Proposal retains the CBD Strategy's recommended height limit of 90m, which assists in maintaining amenity to surrounding buildings and solar access to Victoria Avenue.

An assessment of the environmental impacts of the development concept is provided at Section 5.3 including assessment of traffic generation and overshadowing. The assessment demonstrates that a building of 7:1 FSR would not result in adverse impact to adjoining development or the locality. Accordingly considering the location of the building within the CBD, proximity to the Railway Station and lack of environmental impact the potential for 7:1 FSR could be considered appropriate. This Planning Proposal currently proposes 6:1 for the site.

28 Anderson Street

An assessment of the FSR sought by the Planning Proposal for the site, along with the (as constructed) development outcomes for 28 Anderson Street is provided at **Table 6** below. A comparison provides the recommended FSR within the CBD Strategy for these sites and demonstrates that when 3-5 Help Street and 28 Anderson Street are considered as a single site the combined developments would achieve an overall FSR of 5.2:1, which is less than the 6:1 recommended by CBD Strategy. **Table 6** demonstrates that the additional 2,290m^2 sought by the planning proposal is more than offset by 6,712m^2 underdevelopment of 28 Anderson Street.

Table 6 – Floor Space Ratio comparison

	28 Anderson Street	3-5 Help Street	28 Anderson Street + 3-5 Help Street
Area	3,356m^2	2,290m^2	5,646m^2
Recommended Strategy FSR	6:1	6:1	6:1
Recommended Strategy GFA	20,136m^2	13,740m^2	33,876m^2
FSR	4:1 (constructed)	7:1 (considered)	5.2:1 (Combined)
GFA	13,424m^2	16,030m^2	29,454m^2
Variation from Strategy	- 6,712m^2	+ 2,290m^2	- 4,422m^2

Q2 – Is the Planning Proposal the best means of achieving the intended outcome?

Yes. The Planning Proposal is the best means to achieve the objectives and intended outcomes described in Section 3 of this report for the following reasons:

- The current WLEP 2012's *Height of Building Map* and *Floor Space Ratio Map* would need to be amended to permit the height and floor space proposed.
- The extent in numeric variation from the current built form controls could not reasonably be achieved through the use of Clause 4.6 – Exceptions to Development Standards.
- A site-specific request for a 7:1 FSR is required to justify additional density (and assess no adverse environmental impacts) separate to the overall findings of the draft CBD Strategy

Given that the WLEP 2012 came into effect on 31 January 2013 there are no alternative options available to avoid a standalone Planning Proposal. This Planning Proposal could accompany the draft CBD Strategy; however, it proposes a minor deviation from the strategy which requires a site specific justification.

5.2 Relationship with the Strategic Planning Framework

5.2.1 Q3 – Is the Planning Proposal consistent with the objectives and actions of the applicable regional, sub-regional or district plan or strategy (including any exhibited draft plans or strategies)?

Yes. The Planning Proposal is consistent with the objectives and directions and actions of the Metropolitan Strategy: A Plan for Growing Sydney.

A Plan for Growing Sydney

Chatswood is identified as a Strategic Centre. A Strategic centre is defined as:

> *"locations that currently or are planned to have at least 10,000 jobs. These are priority locations for **employment**, retail, **housing**, services and **mixed uses**"*

The Planning Proposal proposes to increase residential and commercial density in an area close to the Chatswood Railway Station and strategic centre, while maintaining a high level of amenity.

The Planning Proposal is also consistent with other relevant directions and actions contained in A Plan for Growing Sydney.

> **Action 1.7.1: Invest in strategic centres across Sydney to grow jobs and housing and create vibrant hubs of activity**
>
> *"The Government will:*
>
> - *prioritise strategic centres for targeted investment based on the potential of a centre to*

- *provide a large number of jobs to increase jobs close to where people live;*
- *attract significant investment;*
- *provide a range of services and be an attractive place to live, work and play; and*
- *continue to grow"*

The site, being close to Chatswood CBD commercial core will help achieve this action. A range of services currently exists in proximity to the site itself. It is close to various forms of transport, extensive range of Chatswood services and the Sydney CBD.

A high quality mixed use building will deliver more homes and jobs at a key location on the edge of the Chatswood commercial centre that will help to create a vibrant hub of activity in the CBD.

Action 2.1.1: Accelerate housing supply and local housing choices

Currently, State Government has proposed an additional 664,000 new dwellings by 2031. Increasing housing supply and addressing housing affordability and choice, requires the Government to:

- work with councils to identify where development is feasible;
- identify where investments in local infrastructure can create housing supply;
- target locations which deliver homes closer to jobs;
- directly facilitate housing supply and choice through the projects of Urban Growth NSW and Priority Precincts; and
- direct the Greater Sydney Commission to work with councils over the long-term with a requirement that councils review housing needs when preparing their Local Environmental Plans.

It is anticipated that these actions will increase housing supply across the whole metropolitan area, particularly in and around centres.

"The most suitable areas for significant urban renewal are those areas best connected to employment and include:

- *in and around centres that are close to jobs and are serviced by public transport services that are frequent and capable of moving large numbers of people; and*
- *in and around strategic centres"*

Given Chatswood's role as a 'strategic centre', the Planning Proposal complies with this direction.

Direction 2.2: Accelerate urban renewal across Sydney – providing homes closer to jobs

Action 2.2.2: Undertake urban renewal in transport corridors which are being transformed by investment, and around strategic centres

A Plan for Growing Sydney focuses on new housing in centres which have public transport that runs frequently and can carry large numbers of passengers. New housing will be complemented by additional jobs and social infrastructure – especially in strategic centres.

The Planning Proposal provides the following opportunities:

- the opportunity to connect new homes to the job-rich areas of the Sydney CBD and the northern section of the Sydney Rapid Transit corridor from North Sydney to Norwest; and
- the opportunity to connect new homes to job-rich locations via good public transport, within an approximate 30-minute rail or light rail journey.

Toward our Greater Sydney 2056

Toward our Greater Sydney 2056 outlines a draft amendment to A Plan for Growing Sydney. It identifies a metropolitan priority for the 30-minute city where people can access jobs and services within 30 minutes. The Planning Proposal will facilitate housing and jobs in close proximity to high frequency public transport consistent with this priority.

In addition to the findings of A Plan for Growing Sydney guidance for investigating urban renewal corridors includes considering accessibility to regional high frequency transport and a catchment within walking distance of centers with regional transport. The Planning Proposal is consistent with this criterion.

Draft Greater Sydney Region Plan

The Planning Proposal will facilitate housing and jobs in the Chatswood Strategic Centre, close to services and frequent transport infrastructure which will contribute to the realisation of the 30-minute city. The Planning Proposal is consistent with the following objectives:

- Objective 10 – Greater Housing Supply
- Objective 11 – Housing is more diverse and affordable
- Objective 12 – Great places that bring people together
- Objective 14 - A metropolis of three cities – integrated land use and transport creates walkable and 30-minute cities

NSW Long Term Transport Master Plan 2012

The NSW Long Term Transport Master Plan 2012 has the aim of better integrating land use and transport. A Plan for Growing Sydney has been prepared to integrate with the Long-Term Transport Master Plan.

The Planning Proposal will serve the objectives of the Transport Plan by locating both residential and employment generating uses close to an existing railway station. This will promote the use of public transport and reduce reliance on private motor vehicles.

Revised Draft North District Plan

The North District is expected to grow significantly, and the Draft North District Plan highlights the need more housing choice, including more compact and diverse housing with an anticipated need for an additional 1,250 homes by 2021. The Planning Proposal is therefore consistent with Liveability Priority 1 which aims to deliver the North Districts five-year housing target.

The Chatswood Strategic Centre will also grow with an additional 6,300 – 8,300 jobs expected to be accommodated by the Centre by 2036. The Planning Proposal includes a minimum provision of 1:1 FSR for commercial floor space which equates to 2,290m^2 of commercial GFA and approximately 114 jobs.

The Planning Proposal is consistent with Productivity Priority 2: Manage growth and change in strategic centres as it will:

- deliver on the Chatswood strategic centre's job targets;
- promote the use of walking, cycling and integrated public transport solutions by locating housing and jobs close to high frequency transport and provision of bicycle parking on-site; and
- manage the transition between higher intensity activity in and around a centre and lower intensity activity that frames the centre.

Chatswood CBD Planning and Urban Design Strategy

Willoughby City Council prepared a Planning and Urban Design Study of the Chatswood CBD, supported by transport and traffic advice from Arup and economic advice from BIS Shrapnel. The purpose of CBD Strategy is to establish a strong framework to guide all future private and public development in the Centre over the next 20 years and to achieve exceptional design and a distinctive, resilient and vibrant centre for Chatswood.

The study focuses on the land 800m from Chatswood Railway Station. It anticipates growth for the Chatswood CBD over the next 30 years based on statistics from the Department of Planning and Environment, the Bureau of Transport Statistics and BIS-Shrapnel. The draft study recommends controls to achieve the objectives for the Chatswood CBD including:

- Delivery of floor space which is appropriate to the projected requirements within the future Chatswood CBD;
- Chatswood's future as an employment centre is protected whilst allowing capacity for residential growth;
- Good sun access to key public spaces;
- Retaining Chatswood CBD as the focus of Chatswood;
- Capturing the value of uplift in development capacity for Council in order to be able to deliver required improvements to the public realm for a major and attractive residential and commercial centre;
- High quality built outcomes are achieved through a design excellence process; and
- Tower developments are encouraged to be slim and well separated.

As outlined at Section 5.1 the Planning Proposal is largely consistent with the objectives and recommendations of CBD Strategy.

Q4 – Is the Planning Proposal consistent with a Council's local strategy or other local strategic plan?

Willoughby City Council has prepared local strategic documents that reinforce the key local matters relevant to the LGA including Willoughby City Strategy and the Chatswood City Centre Plan 2008 and CBD Strategy.

Council's community strategic plan and long-term vision guide the future growth of the city. The City Strategy includes key *strategic directions* which relate to community and cultural life, natural environment, housing, infrastructure, economic activity and governance. The objectives relating to housing and economic activity are of most relevance to the proposal.

- Housing – The Strategies seeks to promote housing choice, quality living amenity for residents and protection of local character. The Planning Proposal responds positively to these objectives by enabling housing diversity of apartment types, sizes at various price-points designed in accordance with the guidance of the Development Control Plans (DCPs). The potential adverse impacts of the proposed uplift in height and density are limited and the development concept demonstrates the ability to preserve the local character of Chatswood CBD and surrounding residential amenity.
- Economic Activity – The Strategies aim to promote growth for local business, support of centres and engagement with business. The provision of commercial floor space and housing on the site will allow for the comprehensive redevelopment of the site and inclusion of commercial floor space for the first time on the site. The proposal will provide for an additional 114 jobs.

Q5 – Is the Planning Proposal consistent with applicable State Environmental Planning Policies?

Yes.

An assessment of the Planning Proposal against relevant State Environmental Planning Policies (SEPPs) is set out in **Table 7** below.

Table 7 – Consistency with State Environmental Planning Policies

SEPP	Consistency		N/A	Comment
	Yes	No		
SEPP (State and Regional Development) 2011			✓	The future development of the site is likely to be deemed as 'regional development' (meeting the relevant thresholds under Schedule 4A of the EP&A Act), with the Northern Planning Panel acting as the determining authority.
SEPP (Affordable Rental			✓	Not relevant to proposed WLEP 2012 amendment

SEPP	Consistency		N/A	Comment
Housing) 2009				
SEPP (Exempt and Complying Development Codes) 2008			✓	Not relevant to proposed WLEP 2012 amendment. May apply to future development on the sites.
SEPP (Housing for Seniors or People with a Disability) 2004			✓	Not relevant to proposed WLEP 2012 amendment.
SEPP (BASIX) 2004	✓			Detailed compliance with SEPP (BASIX) will be demonstrated at the time of making a development application for the site facilitated by this Planning Proposal.
SEPP (Infrastructure) 2007	✓			The future development is likely to be considered traffic generating development under the relevant thresholds of Schedule 3 and referral to RMS would be required.
SEPP No. 55 Remediation of Land	✓			A contamination study has not been commissioned at this early stage of planning. This can be undertaken if required by the Gateway Determination, though the site has been used for residential uses for some time and as such is considered at low risk of contamination
SEPP No. 64 Advertising and Signage			✓	Not relevant to the proposed WLEP 2012 amendment.
SEPP No. 65 Design Quality of Residential Apartment Development	✓			Nothing within this amendment will prevent a future DA's ability to comply with SEPP 65. The indicative development concept prepared by Kann Finch Architects complies with key SEPP 65 and ADG principles.
Urban Renewal 2010			✓	The site is not located within a potential precinct as identified by the SEPP.
Sydney Harbour Catchment SREP	✓			The site is located within the Sydney Harbour Catchment area associated with the SREP. Future development would be consistent with the aims and planning principles related to the Sydney Harbour Catchment

5.2.2 Q6 – Is the Planning Proposal consistent with applicable Ministerial Directions (s. 117 directions)?

Yes.

An assessment of the Planning Proposal against applicable Section 117 Directions is set out in **Table 8** below.

Table 8 – Consistency with Section 117 Directions

Direction	Consistency		N/A	Comment
	Yes	No		
1. Employment and Resources				
1.1 Business and Industrial Zones	✓			While the Planning Proposal does not seek to amend the B4 Mixed Use zoning, the Planning Proposal will facilitate a mixed-use development consistent with this direction in that it retains a zoning that permits all types of commercial premises with consent.
1.2 Rural Zones			✓	Not applicable
1.3 Mining, Petroleum Production and Extractive Industries			✓	Not applicable

Direction	Consistency		N/A	Comment
1.4 Oyster Aquaculture			✓	Not applicable
1.5 Rural Lands			✓	Not applicable
2 Environment and Heritage				
2.1 Environmental Protection Zones			✓	Not applicable
2.2 Coastal Protection			✓	Not applicable
2.3 Heritage Conservation			✓	Not applicable
2.4 Recreational Vehicle Area			✓	Not applicable
3. Housing, Infrastructure and Urban Development				
3.1 Residential Zones	✓			The proposed amendment would see the delivery of new dwellings that are located close to public transport, employment opportunities and day to day services. The proposal will therefore make more efficient use of this infrastructure and will reduce the consumption of land for housing and associated urban development on the urban fringe.
3.2 Caravan Parks and Manufactured Home Estates			✓	Not applicable
3.3 Home Occupations			✓	Not applicable
3.4 Integrating Land Use and Transport	✓			The Planning Proposal, through unlocking the development potential of the site, will concentrate critical mass to support public transport, and improve access to housing and jobs and services by walking, cycling and public transport. In light of this it is expected that the proposal will reduce travel demand including the number of trips generated by the development and the distances travelled, especially by car.
3.5 Development Near Licensed Aerodromes			✓	Not applicable
3.6 Shooting Ranges			✓	Not applicable
4. Hazard and Risk				
4.1 Acid Sulfate Soil	✓			The WLEP 2012 contains acid sulphate soils provisions and this proposal does not seek to amend them. Acid sulphate soils investigations and analysis will accordingly be undertaken as part of any future development of the land in accordance with the requirements of the WLEP 2012.
4.2 Mine Subsidence and Unstable Land			✓	Not applicable
4.3 Flood Prone Land			✓	Not applicable
4.4 Planning for Bushfire Protection			✓	Not applicable

Direction	Consistency		N/A	Comment
5. Regional Planning				
5.2 Sydney Drinking Water Catchment			✓	Not applicable
5.10 Implementation of Regional Plans	✓			As outlined at Section 5.2 the Planning Proposal is consistent with A Plan for Growing Sydney.
6. Local Plan Making				
6.1 Approval and Referral Requirements	✓			This Planning Proposal is consistent with this Direction in that it does not introduce any provisions that require any additional concurrence, consultation or referral.
6.2 Reserving Land for Public Purposes	✓			This Planning Proposal is consistent with this Direction in that it does not create, alter or reduce existing zonings or reservations of land for public purposes.
6.3 Site Specific Provision			✓	Not applicable
7. Metropolitan Planning				
7.1 Implementation of A Plan for Growing Sydney	✓			As discussed in Section 5.2 above, the Planning Proposal provides a range of new job opportunities, housing and increased high quality commercial floor space which is consistent with the priorities of A Plan for Growing Sydney.

5.3 Environmental, Social and Economic Impacts

Q7 – Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The Planning Proposal will not result in any impact on critical habitat or threatened species, populations or ecological communities or other habitats, given the site's urban location. These matters can be appropriately considered at the Development Application stage, if relevant.

Q8 – Are there any other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?

The remaining development controls under the WLEP 2012 and DCP provide appropriate guidance to ensure that a high quality development outcome is achieved for any future development of the site and environmental impacts will be assessed in detail in a future development application. Notwithstanding this, an assessment is undertaken below of the potential environmental impacts of the proposed WLEP 2012 amendment.

Shadowing

Kann Finch have undertaken a shadow study of the building envelope provided by the reference scheme (refer to **Figure 11** to **Figure 13**). The shadow diagrams demonstrate that during mid-winter the development concept would generate some minor overshadowing of adjoining properties. However, this impact is considered appropriate in the context of the CBD and as there remains significant solar access for most of the day.

The building has been designed to provide a slim profile that is oriented to narrow from north to south so as to minimise the shadow cast. This will allow solar access to be maintained to surrounding buildings and the shadow diagrams show that in mid-winter the slim shadow will move fast from west to east as the sun tracks across the sky (refer to **Figure 11** to **Figure 13**). This will allow all surrounding buildings to maintain a minimum 2 hours solar access mid-winter as required by the ADG.

The shadow studies show that Victoria Avenue would not be additionally overshadowed by a future building on the site during the critical lunchtime period, between 12.00pm and 2.00pm. The shadow diagrams show that Victoria Avenue, between the interchange and Anderson Street is overshadowed by surrounding development and the development concept would not further increase shadowing compared to the existing situation.

As outlined at **Table 5** the planning proposal is consistent with the recommended height control of maximum building height of 90m and the recommended sun access plane to Victoria Avenue which recommends a maximum RL190m for the site. The indicative development concept as detailed at **Appendix A** shows the development concept has a maximum building height of RL185m.

Figure 11 – 9am mid-winter

Source: Kann Finch

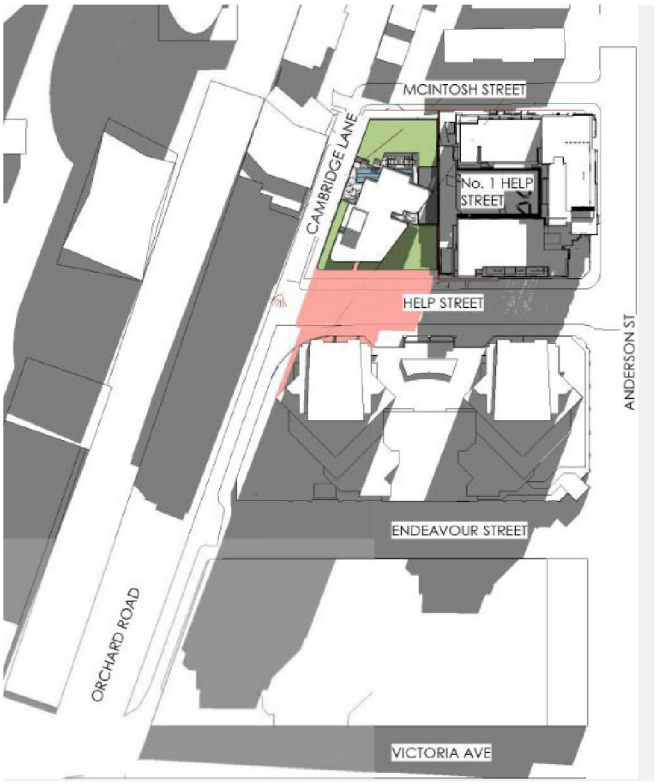

Figure 12 – 12pm mid-winter

Source: Kann Finch

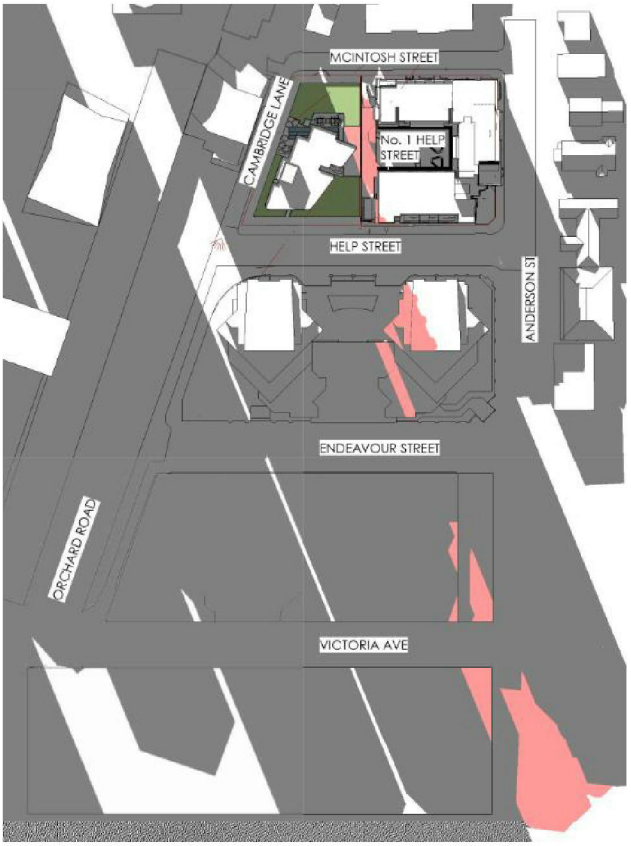

Figure 13 – 3pm – mid-winter

Source: Kann Finch

Built Form

The architectural plans at Appendix A show the additional 7:1 density proposed by the reference scheme is capable of compliance with the requirements of SEPP65 and the ADG. The reference scheme also demonstrates compliance with the podium and tower setback recommendations of the CBD strategy. The development concept accordingly incorporates:

- A podium with setbacks of 3m from the street boundary;
- A tower with setbacks of 6m from the street boundary;
- Compliant separation between the podium and tower components and neighbouring buildings to the north, south, east and west that meet ADG guidelines;
- Slim floorplates that are below the CBD Strategy recommendations;
- Floorplates that are capable of compliance with the requirements of the ADG, including solar access and natural ventilation;
- No additional overshadowing to Victoria Avenue;
- Adequate solar access to adjoining properties;
- A sound and feasible commercial component of 1:1 FSR;

The existing strata titled development is an opportunity site capable of redevelopment due to the majority of the site being in single ownership. The site is within 200 metres of the Chatswood Railway Station and represents a rare opportunity to redevelop the site for a true transit oriented development.

Traffic and Parking

A Transport and Traffic Assessment has been prepared by GTA Consultants (**Appendix C**) to assess the impacts of the proposal on the site, and review the preferred design concepts. The results show that the site is capable of accommodating development that satisfies DCP requirements for car parking, motorcycle and bicycle parking.

Traffic Generation

The development concept would generate 38 vehicle movements peak hour, with 380 vehicle movements generated over the entire day.

The following intersections were modelled for park AM and MP traffic movements generated by the concept development:

- Orchard Road/Help Street
- Anderson Street/Help Street
- Anderson Street/McIntosh Street

The modelling results demonstrate the development concept would continue to operate at the same (acceptable) level of service as existing with no change to the average delay in seconds and only a minor increase to the 95th percentile queues predicted.

The post development assessment of McIntosh Street and Cambridge Lane shows these streets would operate within their daily volume threshold as shown at **Table 9** below.

Table 9 – McIntosh Street and Cambridge Lane capacity assessment

	Daily Capacity/threshold	Existing	Additional	Post Development	Threshold
McIntosh Street	2,000 to 3,000	700	+210	910	Y
Cambridge Lane AM Peak	100vph	67vph	+20vph	89vph	Y
Cambridge Lane PM Peak	100vph	49vph	+22vph	71vph	Y
Cambridge Lane Daily	1,000vpd	701vpd	+210vpd	910vpd	Y

Q9 – Has the Planning Proposal adequately addressed any social and economic impacts?

The Planning Proposal will have a positive economic impact by increasing flexibility of future use of the site to reflect changing economic and market demands. A market assessment of residential and office development has been undertaken by AEC Group (**Appendix D**) that has found:

- there is significant demand for residential apartment development in Chatswood CBD, close to high frequency transport; and
- there is a demand for boutique commercial suites in mixed use buildings.

The Planning Proposal will contribute to delivery of housing in a strategic location that has been found to be a suitable location for increased densities by the CBD Strategy.

It will have a positive economic impact on the locality by redeveloping an underutilised site that will incorporate employment generating uses. Construction of the development concept will create construction jobs with additional multiplier effect economic benefit to the local economy.

The proposal is unlikely to have any negative social impacts, as the proposal will only facilitate the provision of additional compatible uses within the area. Accordingly the proposal would result in increased residential populations activating the area, adding to the vibrancy of Chatswood CBD.

5.4 State and Commonwealth Interests

Q10 – Is there adequate public infrastructure for the Planning Proposal?

The site is located in an established urban area and has access to a range of existing services. Further investigations will be undertaken as part of the preparation of the DA to determine whether any upgrade of existing facilities is required.

Q11 – What are the views of State or Commonwealth public authorities consulted in accordance with the Gateway determination?

The views of State and Commonwealth public authorities will be known once consultation has occurred in accordance with the Gateway determination of the Planning Proposal.

5.5 Community Consultation

Confirmation of the public exhibition period and requirements for the Planning Proposal will be given by the Minister as part of the LEP Gateway determination.

Any future DA for the site would also be exhibited in accordance with Council requirements, at which point the public and any authorities would have the opportunity to make further comment on the proposal.

6.0 Conclusion

This Planning Proposal seeks an amendment to the height and FSR controls of the WLEP 2012 to support mixed use development at 3-5 Help Street, Chatswood.

The Planning Proposal is considered justified for the following reasons:

- The proposal is consistent with the objectives of the EP&A Act, in that it promotes the orderly and economic use and development of land.
- The proposal is consistent with the metropolitan, sub-regional and regional strategic planning framework which places a strong emphasis on achieving efficient use of existing urban areas which already enjoy access to existing infrastructure and services.
- The proposal is consistent with the applicable SEPPs and Section 117 Directions.
- The proposal is largely consistent with findings of the CBD Strategy.
- The proposal will respond to market and investor demand for residential and commercial office space in Chatswood by introducing new planning controls that will stimulate investment and renewal within the centre.
- The proposal would introduce high quality boutique commercial office space to the site for the first time by replacing the ageing residential buildings existing on the site.
- The proposal provides the potential for an iconic, high quality, mixed use development, with improved street activation on a strategically significant site, in a highly prominent location within Chatswood CBD.
- The proposal will not generate any quantifiable adverse impacts on the operation of the surrounding road network.
- The proposal is located on a strata opportunity site capable of redevelopment due to ownership of the strata within 200m of the station and therefore represents a rare opportunity.
- The proposal has no adverse environmental impacts from the height or FSR proposed.
- The proposal will complement the FSR of the area and will match neighbouring sites with an FSR of 6:1 and higher in the surrounding area.
- The proposal will contribute towards the vibrancy and revitalisation of Chatswood.

In light of the above, we would have no hesitation in recommending that the Planning Proposal proceed through Gateway to public exhibition.

Parade Consulting

PLANNING
URBAN FUTURES

Planning Proposal Addendum Report

18 June 2018

3-5 Help Street
Chatswood
Amendment to
Willoughby LEP 2012

Submitted to City of Willoughby
On Behalf of H & J Vakili

Parade Consulting Pty Ltd
ABN 66069129960
PO Box 239
Potts Point NSW 1335
Australia
Phone (+61) 0419 306916

Prepared for: H & J Vakili
Project Name: 3-5 Help Street Chatswood
File Reference: Addendum Report for Planning Proposal – 3-5 Help Street Chatswood 20180618
Job Reference: 201707
Date: 18 June 2018
Version Number: 02

Document Control Table				
Revision	Date	Details	Name	Signoff
01	7/06/2018	First Draft	Matt Hurst	
02	18/06/2018	Final for Submission	Matt Hurst	MEH

Contents

1 BACKGROUND

1.1 Introduction

This Planning Proposal Addendum Report, for the site known as 3-5 Help Street Chatswood, is submitted to the City of Willoughby Council (Council) to support a Planning Proposal to amend the Willoughby Local Environmental Plan 2012 (WLEP 2012).

This addendum report has been prepared on behalf of H & J Vakili Pty Ltd, and R Vakili, whom together have an interest in the subject site, and the key objectives of the report are to demonstrate the strategic planning merit of accommodating a responsive higher density development in the form of a tall slender building on the site, to evaluate the impact of additional building height and density on the site, and to assess the relevant environmental, social and economic impacts of the proposal in accordance with Section 55 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act).

This report has been prepared in response to several queries and comments raised by Council Staff regarding the proposed Concept development that has been prepared to support the Planning Proposal. These queries are contained in Table 1 on the following page, and have been converted into a checklist shown as Appendix A. Each of these queries is dealt with individually in the body of this addendum report.

The report is accompanied by a range of plans and reports prepared by specialist consultants to provide a comprehensive analysis of the issues raised by Council's queries. These address the key issues and impacts associated with the proposal:

- Indicative Design Concepts (KannFinch/DDA Architects) – Refer to **Appendix B**
- Traffic Impact Assessment (GTA Consutants) – Refer to **Appendix C**.

1.2 Consultation

Council notified our project team of preliminary feedback, which formed several queries and comments relating to the proposed Concept Design prepared in support of the Planning Proposal, on 26 April 2018. A summary of Council's queries and comments are provided in **Table 1** below:

Table 1 – Queries Raised in Preliminary Feedback from Council

Council Feedback	Date Received	Addressed in this Addendum
1. Podium Height of between 6 to 14m.	26/04/2018	yes
2. 1:1 FSR for Commercial component.	26/04/2018	Yes
3. 2 lifts servicing the residential required.	26/04/2018	Yes
4. Green roof at podium level.	26/04/2018	Yes
5. Document the garbage requirements of the development.	26/04/2018	Yes
6. Help Street is the point of entry and exit (not Cambridge Lane).	26/04/2018	Yes
7. There should be no vehicles waiting on Help Street.	26/04/2018	Yes
8. Allow for the commercial activity to front Cambridge Lane.	26/04/2018	Yes
9. Cambridge Lane to be an active street shared zone.	26/04/2018	Yes
10. Document how the separation of garbage and couriers/deliveries will be managed.	26/04/2018	Yes
11. Separation, designation and security of resident, employee, visitor and customer parking within the car park needs to be clarified.	26/04/2018	Yes
12. Servicing should be able to accommodate at a minimum MRV trucks	26/04/2018	Yes
13. Disabled parking should be provided in close proximity to lifts.	26/04/2018	Yes
14. Undertake turning path analysis for both access and egress points.	26/04/2018	Yes
15. Two-way access to the site needs to be achieved for residents/commercial parking.	26/04/2018	Yes
16. Vehicular access should be left-in and left-out.		Yes
17. All car parking designs must satisfy Australian Standards.	26/04/2018	Yes
18. Bicycle parking designs must satisfy Australian Standards.	26/04/2018	Yes
19. There should be no need for a turntable.	26/04/2018	Yes
20. Bike rider showers and lockers to be adjacent to bicycle racks/storage.	26/04/2018	Yes
21. Any design amendments would require an updated Traffic Report.	26/04/2018	Yes
22. Contaminated sight investigations would be required to be submitted at Development Application stage.	26/04/2018	Acknowledged
23. Due to the proximity of the North Shore Rail Line the site will require a noise and vibration assessment completed to accompany any Development Application.	26/04/2018	Acknowledged
24. A detailed Wind Impact Assessment including model testing in a wind tunnel should accompany any Development Application for the site.	26/04/2018	Acknowledged
25. Any Development Proposal should address the interface with the streetscape and surrounding development regarding landscape elements.	26/04/2018	Acknowledged
26. Landscaping elements should achieve the intent of the greening strategy and benefits of visual, wind and heat amelioration.	26/04/2018	Yes
27. Relatively high winds to the podium levels may be experienced.	26/04/2018	Yes
28. Provision of planter boxes to balconies.	26/04/2018	Yes
29. Undergrounding of power should form part of any proposal to enable provision of tall canopy trees.	26/04/2018	Acknowledged
30. Enhancement of the green corridor opportunities through the CBD.	26/04/2018	Acknowledged
31. Further design development to follow the Government Architect Draft Greener Places Guideline.	26/04/2018	Acknowledged
32. Attention to the 'fine grain' detail at ground level promoted by the	26/04/2018	Acknowledged

Chatswood CBD Planning & Urban Design Strategy would include however not be limited to: a) treatment of /interface with Cambridge Lane and adjoining plaza open space opposite the site b) Continuation of landscape treatments established by the development to the east along Help Street c) Possible retention/re-use of the mature *Phoenix canariensis* (Canary Island Date Palm) at the Cambridge lane/McIntosh St corner d) Being a mixed-use proposal, with the predominant use being residential, perimeter greening and space creation should be more reflective of the image of a residential setting rather than residential use in a commercial setting. That is less use of hard elements and development of more biophilic concepts.		

2 Queries and Comments raised by Willoughby Council Planners

This section is a summary of the responses prepared by our team of consultants' in response to the queries and comments raised by Council as relates to the Concept Design supporting the Planning Proposal. Each of these have been addressed independently and have been summarised here. For more detailed information regarding each issue, where applicable, please refer to the referenced consultants reports in the Appendices.

2.1 Podium Height of between 6 to 14m

The podium height of the revised design is now a maximum of 13.4m above the lowest level of the footpath fronting Help Street.

2.2 1:1 FSR for Commercial component

The FSR for the commercial component is now 1.1 to 1.

2.3 Two Lifts minimum required to service the Residential Tower

The residential component of the building will be services by 3 lifts.

2.4 Green roof at podium level

The Top of the Podium level has a landscaped area on all but the south western corner. Part of this space will be dedicated for a children's adventure playground and outdoor bar-b-que area. (Please refer to: Plan – A3 – Rev G – PP004 – Level 02 & 03 to 05 Plan – 3-5 Help Street Chatswood).

2.5 Garbage requirements of the development

Garbage requirements for the building have been addressed with the provision of a sizable garbage bin room on the ground floor. Pedestrian access to the Garbage Bin collection dock is via a door in the residential lobby. Commercial garbage cleaning contractors will also have access to this lobby from the commercial lobby.

2.6 Help Street is the point of entry and exit (not Cambridge Lane)

Help street is now the point of entry for all deliveries, garbage collection and bicycle access. Access to and from the Residential and Commercial car park is now via a two-way ramp accessing Macintosh Street.

2.7 There should be no vehicles waiting on Help Street

The use of the truck dock by delivery and garbage vehicles only should ensure that queuing to leave or enter the driveway is momentary at worst. Vehicles leaving the driveway will be expected to depart to the left only, facilitated by any vehicle arriving simultaneously which can then immediately enter once the departing vehicle has departed to the left.

2.8 Allow for the Commercial activity to front Cambridge Lane.

Commercial activity front Cambridge Lane with three commercial/retail premises potentially opening to Cambridge Lane, one of which has the corner position with Help Street, another has a corner position with Macintosh Street. Together these 3 premises total just over 500 square meters of floor space.

2.9 Cambridge Lane to be an active street shared zone.

The commercial/retail premises fronting to Cambridge Lane should facilitate the activation of the streetscape, including footpath seating associated with cafés or restaurants.

2.10 Separation of garbage and couriers/deliveries.

Some of the visitor spaces on the first basement floor of the carpark will be allocated for courier deliveries beside the commercial lift. Larger bulkier deliveries will be via the loading dock lower level near the rear of the dock away from the garbage truck turning area.

2.11 Separation and security of resident, employee, visitor, and customer parking.

The upper level of the carpark will be for commercial employees, visitors, and customers only. The lower levels will be gated and accessed via the residential key card. The front gates will be key card and intercom controlled.

2.12 Docks to accommodate at a minimum MRV trucks.

The design of the loading and garbage dock can accommodate an LRV, or one SRV and one MRV simultaneously.

2.13 Disabled parking near lifts.

Parking for the disabled has been accommodated on each floor of the car parking basements. Several parking spots in immediate proximity to the lifts are available on each floor to accommodate this purpose.

2.14 Undertake turning path analysis for both access and egress points.

Turning path analysis for the loading docks has been undertaken and can be reviewed in appendix C of the associated Traffic Impact Assessment report. Access into and out of the carpark driveway is via a conventional driveway fronting Macintosh Street with more than sufficient turning width to accommodate the vehicles using the carpark as they turn to and from the street (Please refer to: Plan – A3 – Rev G – PP003 – Ground Floor and Level 01 Plan – 3-5 Help Street Chatswood.)

2.15 Two-way access to the site needs to be achieved for residents/commercial parking

Car Parking access has been converted to a two-lane two-way access via Macintosh Street with queuing for 3 departing cars inside the property boundary whilst cars arrive. (Please refer to Plan – A3 – Rev G – PP003 – Ground Floor and Level 01 Plan – 3-5 Help Street Chatswood.)

2.16 Vehicular access should be left-in and left-out.

Vehicle access for truck using the dock is left-in and left-out. Access to the carpark is right-in and right-out due to the one-way arrangement of Macintosh Street and the orientation of the site fronting Macintosh Street making this arrangement a necessity.

2.17 All car parking designs must satisfy Australian Standards

All Car parking designs have been designed in accordance with the required relevant Australian Standards.

2.18 Bicycle parking designs must satisfy Australian Standards

The design of the Bike Parking basement can comfortably comply with the relevant Australian Standards. (Please refer to Plan – A3 – Rev G – PP002 – Basement and Lower Ground Plan – 3-5 Help Street Chatswood.)

2.19 No need for a turntable

Although the site is very constrained in terms of available area for turning large vehicles the loading dock has been designed such that there is no need for a turntable.

2.20 Bike rider showers and lockers to be adjacent to bicycle racks/storage

The Bike Club Basement parking area has a Bike Change room, lockers and shower immediately adjacent to the lockable bike park area. Access to the Bike Club for residents, commercial tenants and cleaning staff is by security pass only. The Bike Club Basement can be seen on the Lower Ground Floor Plan. (Please refer to Plan – A3 – Rev G – PP002 – Basement and Lower Ground Plan – 3-5 Help Street Chatswood.)

2.21 Provide a revised Traffic Report

Please refer to the associated Revised Traffic Impact Assessment prepared by GTA Consultants Report. (refer to Appendix C)

2.22 Contaminated sight investigations at Development Application stage.

We acknowledge that a Contaminated Site Investigation Report will need to be prepared and submitted as part of any subsequent Development Application for the site.

2.23 North Shore Rail Line proximity noise and vibration at DA stage.

We acknowledge that a Noise and Vibration Study and Report will need to be prepared as part of any subsequent Development Application given the proximity of the site to the North Shore Rail Line.

2.24 Detailed Wind assessment at Development Application stage.

We acknowledge that a detailed Wind Impact Assessment, including model testing in a wind tunnel, should accompany any Development Application for the site.

2.25 Streetscape treatments integration with surrounding developments.

We acknowledge that any Development Proposal should address the interface with the streetscape and surrounding development regarding landscape elements. These details will be provided as part of any subsequent Development Application for the site.

2.26 Landscaping should be in accordance with Council's Greening Strategy

Landscaping elements should achieve the intent of the greening strategy and provide the benefits of visual, wind, and heat amelioration. These details will be provided as part of any subsequent Development Application for the site.

2.27 Relatively high winds to the podium levels will require considered planting.

Planting on the podium levels will take account of the results of the wind modelling and any planting strategy will take account of the effect these winds will have on proposed planting suitability. These details will be provided as part of any subsequent Development Application for the site.

2.28 Provision of planter boxes to balconies.

The balconies will be designed to (hold unclimbable) planter boxes to enhance the greening of the façades.

2.29 Undergrounding of power to enable provision of tall canopy trees.

We acknowledge that the proposed undergrounding of power lines should form part of any Development proposal to enable provision of tall canopy trees.

2.30 Enhancement of the green corridor opportunities through the CBD.

Any subsequent Development Application for the site will take into consideration that the green corridors through the CBD should be enhanced by the proposed landscaping elements of the proposal.

2.31 Government Architect's Draft Greener Places Guidelines.

Further design development will follow the Government Architect's Draft Greener Places Guidelines.

2.32 Attention to the "fine grain" details of the Planning Strategy

We acknowledge that any Development Application for the Site must pay attention to the 'fine grain' detail at ground level promoted by the Chatswood CBD Planning & Urban Design Strategy, and would include, however not be limited to:

a) treatment of /interface with Cambridge Lane and adjoining plaza open space opposite the site,
b) Continuation of landscape treatments established by the development to the east along Help Street
c) Possible retention/(probable) re-use of the mature *Phoenix canariensis* (Canary Island Date Palm) at the Cambridge lane/McIntosh St corner in the deep soil area proposed on the eastern site of the site
d) Being a mixed-use proposal, with the predominant use being residential, perimeter greening and space creation should be more reflective of the image of a residential setting rather than residential use in a commercial setting. That is less use of hard elements and development of more biophilic concepts.

We undertake to ensure that these considerations will be incorporated into subsequent DA level designs for the site.

3 CONCLUSION

The addendum report has been prepared in accordance with Section 55 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act) and the relevant guidelines prepared by the NSW Department of Planning including *A Guide to Preparing Local Environmental Plans* and *A Guide to Preparing Planning Proposals*.

The Planning Proposal provides a comprehensive justification of the proposed amendment to WLEP, and is considered justified for the following reasons:

This addendum report and the primary Planning Proposal report have documented and integrated the environmental, social, and economic analysis undertaken to select the most optimal built form for the site within the proposed constraints of land use, height, density, and built form.

A redevelopment of the site could provide significant public benefits as outlined within the primary report. These benefits include:

- Delivery of a new landmark building providing boutique grade retail floor space which will support Chatswood's position and attract national and international business and capital;
- Delivery of an iconic building that does not result in additional overshadowing on Victoria Avenue Mall and limits new shadowing to those areas where shadows are predominantly already cast by existing development, ensuring that a high level of amenity is maintained;
- Delivery of a building which provides enhanced amenity to occupants, maximises views, and provides a new striking addition to Chatswood's CBD skyline;
- Delivery of a building with activated street frontages;
- Delivery of a building with a substantial commercial floorspace component of 1:1;
- Delivery of a building with communal space, including a communal playground area.

Overall, it is considered that the Planning Proposal has a range of positive benefits, and it is requested that the proposed amendments to the WLEP2012 are considered acceptable by Willoughby City Council, and that the Planning Proposal is enabled to proceed to Gateway Determination under Section 56 of the EP&A Act.

4 REFERENCES

KannFinch/DDA Architects
Indicative Design Concepts – 3-5 Help Street Chatswood
June 2018

GTA Traffic Engineers
Traffic Impact Assessment for 3-5 Help Street Concept Design
June 2018

Greater Sydney Commission
Draft Greater Sydney Region Plan – Our Greater Sydney 2056
October 2017

Greater Sydney Commission
Draft North District Plan
November 2016

NSW Government
A Plan for Growing Sydney
December 2014

NSW Government
Department of Planning and Environment
Apartment Design Guide
July 2015

Willoughby City Council and Architectus
Draft Chatswood CBD Planning and Urban Design Study
December 2016

Willoughby City Council
Willoughby Development Control Plan 2016

Willoughby City Council
Willoughby Local Environmental Plan 2012

Appendix A
Planning Proposal Issues Checklist Table

Checklist for 3-5 Help Street					
Task	Responsibility	Commenced	Expected Complete	Completed	Comments
1. Podium Height of between 6 to 14m.	KF	Y	4-Jun	Y	
2. 1:1 FSR for Commercial component.	KF	Y	4-Jun	Y	Check prior to submission
3. 2 lifts servicing the residential required.	KF	Y	4-Jun	Y	
4. Green roof at podium level.	KF	y	4-Jun	y	Check Prior to Submission
5. Document the garbage requirements of the development.	KF	Y	8-Jun	Y	
6. Help Street is the point of entry and exit (not Cambridge Lane).	KF	Y	4-Jun	y	Check Prior to Submission
7. There should be no vehicles waiting on Help Street.	KF and Parade	Y	4-Jun	y	Include comments with submission
8. Allow for the commercial activity to front Cambridge Lane.	KF	Y	4-Jun	y	ensure details are provided in submission
9. Cambridge Lane to be an active street shared zone.	KF	Y	4-Jun	y	ensure details are provided in submission
10. Document how the separation of garbage and couriers/deliveries will be managed.	KF and Parade	Y	15-Jun	y	
11. Separation, designation and security of resident, employee, visitor and customer parking within the car park needs to be clarified.	KF and Parade	Y	15-Jun	y	achieved
12. Servicing should be able to accommodate at a minimum MRV trucks.	KF and Traffic Engineers	y	15-Jun	y	achieved
13. Disabled parking should be provided in close proximity to lifts.	KF and Traffic Engineers	Y	15-Jun	Y	achieved
14. Undertake turning path analysis for both access and egress points.	Traffic Engineers	Y	15-Jun	y	include traffic report in submission
15. Two-way access to the site needs to be achieved for residents/commercial parking.	Traffic Engineers	y	15-Jun	y	include traffic report in submission
16. Vehicular access should be left-in and left-out.	KF and Traffic Engineers	Y	15-Jun	y	ensure details are provided in submission
17. All car parking designs must satisfy Australian Standards.	Traffic Engineers	y	15-Jun	y	
18. Bicycle parking designs must satisfy Australian Standards.	Traffic Engineers	Y	15-Jun	y	
19. There should be no need for a turntable.	Traffic Engineers	Y	15-Jun	y	achieved
20. Bike rider showers and lockers to be adjacent to bicycle racks/storage.	KF and Traffic Engineers	y	15-Jun	Y	
21. Any design amendments would require an updated Traffic Report.	Traffic Engineers	Y	15-Jun	y	Check Prior to Submission
22. Contaminated sight investigations would be required to be submitted at Development Application stage.	Parade and Vakili	n	DA	n	for DA stage
23. Due to the proximity of the North Shore Rail Line the site will require a noise and vibration assessment completed to accompany any Development Application.	Parade and Vakili	n	DA	n	for DA stage
24. A detailed Wind Impact Assessment including model testing in a wind tunnel should accompany any Development Application for the site.	Parade and Vakili	n	DA	n	for DA stage
25. Any Development Proposal should address the interface with the streetscape and surrounding development regarding landscape elements.	KF and Vakili	n	DA	n	for DA stage
26. Landscaping elements should achieve the intent of the greening strategy and benefits of visual, wind and heat amelioration.	KF and Vakili	n	DA	n	for DA stage
27. Relatively high winds to the podium levels may be experienced.	KF	n	DA	n	for DA stage
28. Provision of planter boxes to balconies.	KF	y	4-Jun	y	ensure details are provided in submission
29. Undergrounding of power should form part of any proposal to enable provision of tall canopy trees.	KF	n	DA	n	for DA stage
30. Enhancement of the green corridor opportunities through the CBD.	KF	n	DA	n	for DA stage
31. Further design development to follow the Government Architect Draft Greener Places Guideline.	KF	n	DA	n	for DA stage
32. Attention to the 'fine grain' detail at ground level promoted by the Chatswood CBD Planning & Urban Design Strategy would include however not be limited to:	KF and Vakili	n	DA	n	for DA stage
a) treatment of /interface with Cambridge Lane and adjoining plaza open space opposite the site	KF and Vakili	n	DA	n	for DA stage
b) Continuation of landscape treatments established by the development to the east along Help Street	KF and Vakili	n	DA	n	for DA stage
c) Possible retention/re-use of the mature Phoenix canariensis (Canary Island Date Palm) at the Cambridge lane/McIntosh St corner	KF and Vakili	n	DA	n	for DA stage
d) Being a mixed-use proposal, with the predominant use being residential, perimeter greening and space creation should be more reflective of the image of a residential setting rather than residential use in a commercial setting. That is less use of hard elements and development of more biophilic concepts.	KF and Vakili	n	DA	n	for DA stage

Appendices B, C, and D are contained in separate files

PARADE CONSULTING PTY. LTD.
ABN: 66069129960 ACN: 069129960.
PO Box 239,
POTTS POINT NSW 1335.

Parade Consulting
STRATEGIC PLANNING
Since 1995

13/12/2018
Our Ref: C:\Parade\Vakili Projects\3-5 Help
Your Ref:

ATTENTION: **1) Craig O'Brien & Philip Adams**
Willoughby City Council
PO Box 57
Chatswood NSW 2057

Subject: **Letter of Offer to enter into a Planning Agreement in support of the Planning Proposal for 3-5 Help Street Chatswood**

Dear Willoughby City Council,

We are the site owners and proponents for the Planning Proposal to rezone 3-5 Help Street Chatswood.

We wish to formally offer to enter into a Planning Agreement with Willoughby City Council regarding the value uplift and subsequent contributions that will likely result from the successful rezoning of our site.

We understand that this letter forms the basis for further negotiation regarding the Planning Proposal process.

We look forwards to jointly developing an agreeable Planning Agreement as part of progressing the Proposal.

Should you have any questions or wish to commence discussions regarding this offer, please contact myself on the number below or our Planning and Project Manager – Matt Hurst on 0419 306916.

With Best Regards

H & J Vakili
Site Owner
3-5 Help Street
Chatswood NSW

Prepared by Parade Consulting
On behalf of
H & J Vakili (P'shp)

WILLOUGHBY CITY COUNCIL
City of Diversity

PLANNING AND INFRASTRUCTURE
Planning Unit

15 February 2019

Parade Consulting
PO Box 239
Potts Point NSW 1335
ATT: Matt Hurst

RE: Planning Proposal 2017/8
3-5 Help Street, Chatswood

Dear Mr Hurst

I am writing to advise that at its meeting of 11 February 2019, Council passed a resolution with regard to Planning Proposal 2017/8 for 3-5 Help Street, Chatswood.

A copy of this Council resolution is attached for your reference.

Note that this Council resolution remains a draft until the Minutes of the Council Meeting are confirmed at the following Council Meeting, which is to be held on 26 February 2019.

It is advised that you refer to the 26 February 2019 Council Meeting Minutes for confirmation of the previous Minutes and the particular Council resolution.

Subject to confirmation of the Council resolution as detailed above, it is requested that you update or provide additional information to address Council resolution Points 3, 4, 5 and 6. This information is required by Council prior to the matter being referred to the Gateway for determination.

Should you have any queries regarding this matter please contact Strategic Planner Craig O'Brien on 9777 7647.

Yours faithfully

Norma Shankie-Williams
Strategic Planning Team Leader

18.3 3 - 5 HELP STREET, CHATSWOOD - PLANNING PROPOSAL

ATTACHMENTS:

1. IMPLICATIONS
2. COUNCIL DETAILED ASSESSMENT
3. COUNCIL ASSESSMENT OF DEPARTMENT OF PLANNING AND ENVIRONMENT'S A GUIDE TO PREPARING PLANNING PROPOSALS
4. PLANNING PROPOSAL CONCEPT PLANS
5. DRAFT DEVELOPMENT CONTROL PLAN PROVISIONS
6. PROPOSED WRITTEN AMENDMENTS TO WILLOUGHBY LOCAL ENVIRONMENTAL PLAN 2012
7. PROPOSED WILLOUGHBY LOCAL ENVIRONMENTAL PLAN 2012 LAND ZONING, HEIGHT OF BUILDINGS, FLOOR SPACE RATIO, SPECIAL PROVISIONS AREA AND ACTIVE STREET FRONTAGE MAPS
8. WILLOUGHBY LOCAL PLANNING PANEL RECORD OF ADVICE 30 JANUARY 2019

RESPONSIBLE OFFICER: IAN ARNOTT - PLANNING MANAGER

AUTHOR: EMMA BROWN – STRATEGIC PLANNER

CITY STRATEGY OUTCOME: 3.5 – MAINTAIN QUALITY OF LIFE BY BALANCING POPULATION GROWTH WITH THE PROVISION OF ASSETS AND SERVICES

5.1 – BE HONEST, TRANSPARENT AND ACCOUNTABLE IN ALL THAT WE DO

MEETING DATE: 11 FEBRUARY 2019

PURPOSE OF REPORT

To seek endorsement for the forwarding of the Planning Proposal 2018/0008 for 3 – 5 Help Street, Chatswood, to the Department of Planning and Environment for a Gateway Determination under Section 3.34 of the *Environmental Planning and Assessment Act 1979* and proceed to public exhibition.

Members of the Sydney (North) Planning Panel should retire from Council Chambers during consideration of the Agenda Item.

Procedural Motion

That Matt Hurst, Parade Consulting Pty Ltd address the meeting.

b) If in Area 9 on the Special Provisions Area Map, the gross floor space of the residential component of the development to which the development application relates, including any residential floor area of the building that is used for affordable housing purposes.

e) To add Clause 6.23 as follows:
"6.23 Minimum commercial floor space within the Mixed Use zone

Land zoned B4 Mixed Use is to contain a minimum commercial floor space component of 1:1 if located within Area 11 on the Special Provisions Area Map."

f) To add Clause 6.24 as follows:
"6.24 Design Excellence

(1) The objective of this clause is to deliver the highest standard of architectural, urban and landscape design.

(2) This clause applies to development involving the erection of a new building on land shown in Area 12 on the Special Provisions Area Map.

(3) Development consent must not be granted to development to which this clause applies unless, in the opinion of the consent authority, the proposed development exhibits design excellence."

g) To amend the Height of Buildings Map (Sheet HOB_004) for 3 – 5 Help Street, Chatswood, to 90 metres.

h) To amend the Floor Space Ratio Map (Sheet FSR_004) for 3 – 5 Help Street, Chatswood, to 6:1.

i) To amend the Special Provisions Area Map (Sheet SPA_004) to show 3 Help Street & 5 Help Street, Chatswood, as Area 8, Area 9, Area 11 and Area 12.

j) To amend the Active Street Frontages Map (Sheet ASF_ 004) to show 3 – 5 Help Street, Chatswood to include the Help Street, McIntosh Street and the Cambridge Lane frontages.

2. Subject to 1. Above, endorse for public exhibition the Planning Proposal as outlined in 1. above.

3. Endorse for public exhibition the draft site specific *Development Control Plan* provisions, subject to the following amendments:

a) Number all objectives

b) Under 'Design excellence and building sustainability':

i). Add 5A: "A minimum 5 star GBCA building rating is expected. A report is to be submitted at Development Application Stage."

c) Under 'Built Form':

4. **Require an updated Letter of Offer to enter into a Planning Agreement, to be submitted to Council prior to referral to Gateway, as the basis for further negotiation.**

5. **Prior to referral to Gateway, updated Concept Plans are to be submitted to Council demonstrating compliance with the 'Sun Access to Key Public Places - Key Element 19', and 'Building Heights - Key Element 20 and Key Element 21' of the *Chatswood CBD Planning and Urban Design Strategy*.**

6. **Prior to referral to Gateway, a Concept Landscape Plan is to be submitted to Council demonstrating compliance with 'Key Element 22 – Links, Open Space and Landscaping' of the *Chatswood CBD Planning and Urban Design Strategy*.**

7. **Note that following public exhibition the Planning Proposal will be reported back to Council detailing the outcome of the public exhibition period at which time Council may resolve:**
   a) To proceed as recommended.
   b) To not proceed with the Planning Proposal.

8. **Request that the Department of Planning and Environment nominate Council as the Planning Authority to finalise the Planning Proposal and that the Department of Planning and Environment delegate authority to the Council Planning Manager, Mr Ian Arnott to process and finalise the Planning proposal documentation for the purposes of Section 3.36 of the *Environmental Planning and Assessment Act, 1979*.**

9. **Delegate authority to the General Manager to make any minor amendments to the Planning Proposal which does not alter the policy intent.**

MOVED COUNCILLOR MUSTACA

SECONDED COUNCILLOR CAMPBELL

CARRIED

The motion on being put to the meeting was carried to become the resolution of Council.

Voting
For the Resolution: Councillors Campbell, Coppock, Eriksson, Fernandez, Mustaca, Norton, Rozos, Tuon, Wright and Zhu.
Against: Councillor Saville
Absent: Councillor Giles-Gidney, Rutherford, Fernandez.

Councillor Fernandez declared a non-pecuniary significant interest in Item 18.3 and withdrew from the meeting taking no part in the discussion or voting on this topic.

Due to Item 18.3: 3-5 Help Street, Chatswood – Planning Proposal being a Sydney North Planning Panel (SNPP) matter, Her Worship the Mayor Councillor Giles-Gidney and Deputy Mayor, Councillor Rutherford declared a non-pecuniary significant interest as members of the SNPP and withdrew from the meeting taking no part in the discussion or voting on this topic.

Former Deputy Mayor Eriksson assumed the Chair in the Mayor and Deputy Mayor's absence for this item.

Parade Consulting

PLANNING
URBAN FUTURES

Planning Proposal 2nd Addendum Report

8 March 2019

3-5 Help Street
Chatswood

Amendment to
Willoughby LEP 2012

Submitted to City of Willoughby
On Behalf of H & J Vakili

Parade Consulting Pty Ltd
ABN 66069129960
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Potts Point NSW 1335
Australia
Phone (+61) 0419 306916

Prepared for: H & J Vakili
Project Name: 3-5 Help Street Chatswood
File Reference: 2nd Addendum Report for Planning Proposal – 3-5 Help Street Chatswood 20190308
Job Reference: 201707
Date: 8 March 2019
Version Number: 03

Document Control Table				
Revision	Date	Details	Name	Signoff
01	22/02/2019	First Draft	Matt Hurst	
02	26/02/2019	Final Draft	Matt Hurst	MEH
03	8/03/2019	Submission Draft	Matt Hurst	MEH

Contents

1 BACKGROUND

1.1 Introduction

This 2nd Planning Proposal Addendum Report, for the site known as 3-5 Help Street Chatswood, is submitted to the City of Willoughby Council (Council) to support a Planning Proposal to amend the Willoughby Local Environmental Plan 2012 (WLEP 2012).

This 2nd addendum report has been prepared on behalf of H & J Vakili Pty Ltd, and R Vakili, whom together have an interest in the subject site, and the key objectives of the report are to demonstrate the strategic planning merit of accommodating a responsive higher density development in the form of a tall slender building on the site, to evaluate the impact of additional building height and density on the site, and to assess the relevant environmental, social and economic impacts of the proposal in accordance with Section 55 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act).

This report has been prepared in response to the recommendations endorsed by Willoughby City Council at that Council Meeting held on Monday 7th of February 2019. These recommendations requiring action are contained in Table 1 on the following page. Each of these recommendations is dealt with individually in the body of this addendum report.

The report is accompanied by a range of plans and reports prepared by specialist consultants to provide a comprehensive analysis of the issues raised by Council's recommendations. These address the key issues and impacts associated with the proposal:

- Indicative Design Concepts (KannFinch/DDA Architects)
- Concept Landscape Plan (KannFinch/DDA Architects)

1.2 Consultation

Council notified our project team of the endorsed recommendations requiring action via emailed letter on Thursday Afternoon, 21st of February 2019. A summary of Council's recommendations requiring action is provided in **Table 1** below:

Table 1 – Recommendations requiring Action from Council

Council Recommendations	Date Received	Addressed in this Addendum
3a) Number all draft DCP Objectives	21/02/2019	yes
3b) Under Design excellence and Building Sustainability - Section 5 of the draft DCP, add Section 5A	21/02/2019	Yes
3c) Under Built Form in Section 9 of the draft DCP, replace section 9	21/02/2019	Yes
3d) Under Building Heights in section 14 of the draft DCP, replace Section 14, and add Section 14A	21/02/2019	Yes
3e) Under Links, Open Space and Landscaping, amend Section 28	21/02/2019	Yes
3f) Under Street Frontage, Heights, and Setbacks, add Section 29C	21/02/2019	Yes
3g) Under Further Built Form Controls, add to Section 33	21/02/2019	Yes
3h) Under Traffic and Transport, add three subsections	21/02/2019	Yes
4. Provide an updated Letter of Offer to enter into a Planning Agreement	21/02/2019	Yes
5. Update the Concept Plans to demonstrate Compliance with Key Elements 19 and 20	21/02/2019	Yes
6. Prepare a Concept Landscape Plan for Council demonstrating compliance with Key Elements 22, 23, 24, 25, and 26.	21/02/2019	Yes

2 Proponents Responses to the Council Recommendations

This section provides a summary of the responses prepared by our team of consultants' in response to the Council recommendations listed in the table above. This summary lists where the more detailed response can be found.

2.1 Council Recommendation 3(a) through 3(h)

The response to these recommendations involved making minor amendments to the Proposed DCP Amendment documentation prepared in support of our proposal. These changes have all been incorporated into the latest version Proposed DCP Amendment document sent to Council by email on Monday the 25th of February 2019.

2.2 Council Recommendation 4

The response to this recommendation involved providing Council with an updated Letter of Offer from the proponent to enter into a Planning Agreement with Council. The latest version of this letter was sent to Council by email on the 25th of February 2019.

2.3 Council Recommendation 5

The response to this recommendation involved updating the Concept Plans supporting the Planning proposal to demonstrate compliance with Key elements 19 and 20 of Council's Strategy. Namely the 90m height limit and the Solar Access Plan for Victoria Avenue. These updated plans, showing both the compliance with the height limit at a number of sections through the concept design and revised shadow diagrams showing where new shadows are cast – all clear of Victoria Avenue, were submitted to Council via email on the 25th of February 2019.

2.4 Council Recommendation 6

The response to this recommendation involved preparing revised landscape plans for the revised proposal, and an assessment of the existing Palm Tree located near the corner of Macintosh Street and Cambridge Lane. Compliance with Key Elements 22, 23, 24, 25 and 26 were required. A revised Landscape Plan was submitted to Council by email on Wednesday the 6th of March 2019.

- With regards to KE22, Council's strategy does not propose or require any new linkages through the site, however, the open space components of this proposal are adjacent to those on the adjacent site.
- With regards to KE23, the revised Landscape Plan proposes the installation of new street trees as part of completing the proposed development.
- With regards to KE24, the proposal incorporates a green roof on top of the podium with a mix of passive and active green space, which is mostly not overshadowed from the north by the proposed tower.
- With regards to KE25, the proposed Landscape plan demonstrates that over 20% of the site area has been provided as green space, mostly at podium rooftop level, but also in the deep soil component, and with planting in the street setback.
- With regards to KE26, The proposed landscape plan demonstrates that the rooftop level open space will satisfy safety requirements with edge planting and un-mountable barriers, whilst also incorporating high quality design, with regards layout, configuration and materials, as well as usability and utility.

In addition to the revised landscape plan, an Arborist's report, specifically addressing the condition of the existing palm tree located on the corner of the site and the likely viability of relocating it elsewhere, was submitted to Council via email on Wednesday the 6th of March 2019.

3 CONCLUSION

This 2nd addendum report has been prepared in accordance with Section 55 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act) and the relevant guidelines prepared by the NSW Department of Planning including *A Guide to Preparing Local Environmental Plans* and *A Guide to Preparing Planning Proposals*.

The Planning Proposal provides a comprehensive justification of the proposed amendment to WLEP, and is considered justified for the following reasons:

The addendum reports and the primary Planning Proposal report have documented and integrated the environmental, social, and economic analysis undertaken to select the most optimal built form for the site within the proposed constraints of land use, height, density, and built form.

A redevelopment of the site could provide significant public benefits as outlined within the primary report. These benefits include:

- Delivery of a new landmark building providing boutique grade retail floor space which will support Chatswood's position and attract national and international business and capital;
- Delivery of an iconic building that does not result in additional overshadowing on Victoria Avenue Mall and limits new shadowing to those areas where shadows are predominantly already cast by existing development, ensuring that a high level of amenity is maintained;
- Delivery of a building which provides enhanced amenity to occupants, maximises views, and provides a new striking addition to Chatswood's CBD skyline;
- Delivery of a building with activated street frontages;
- Delivery of a building with a substantial commercial floorspace component of 1:1;
- Delivery of a building with communal space, including a communal playground area.

Overall, it is considered that the Planning Proposal has a range of positive benefits, and it is requested that the proposed amendments to the WLEP2012 are considered acceptable by Willoughby City Council, and that the Planning Proposal is enabled to proceed to Gateway Determination under Section 56 of the EP&A Act.

4 REFERENCES

Dr. Hawkeswood, Trevor J. - Arborist
Arboricultural Impact Statement for a Phoenix canariensis palm at 5 Help Street, Chatswood,
March 2019

KannFinch/DDA Architects
Indicative Design Concepts – 3-5 Help Street Chatswood
February and March 2019

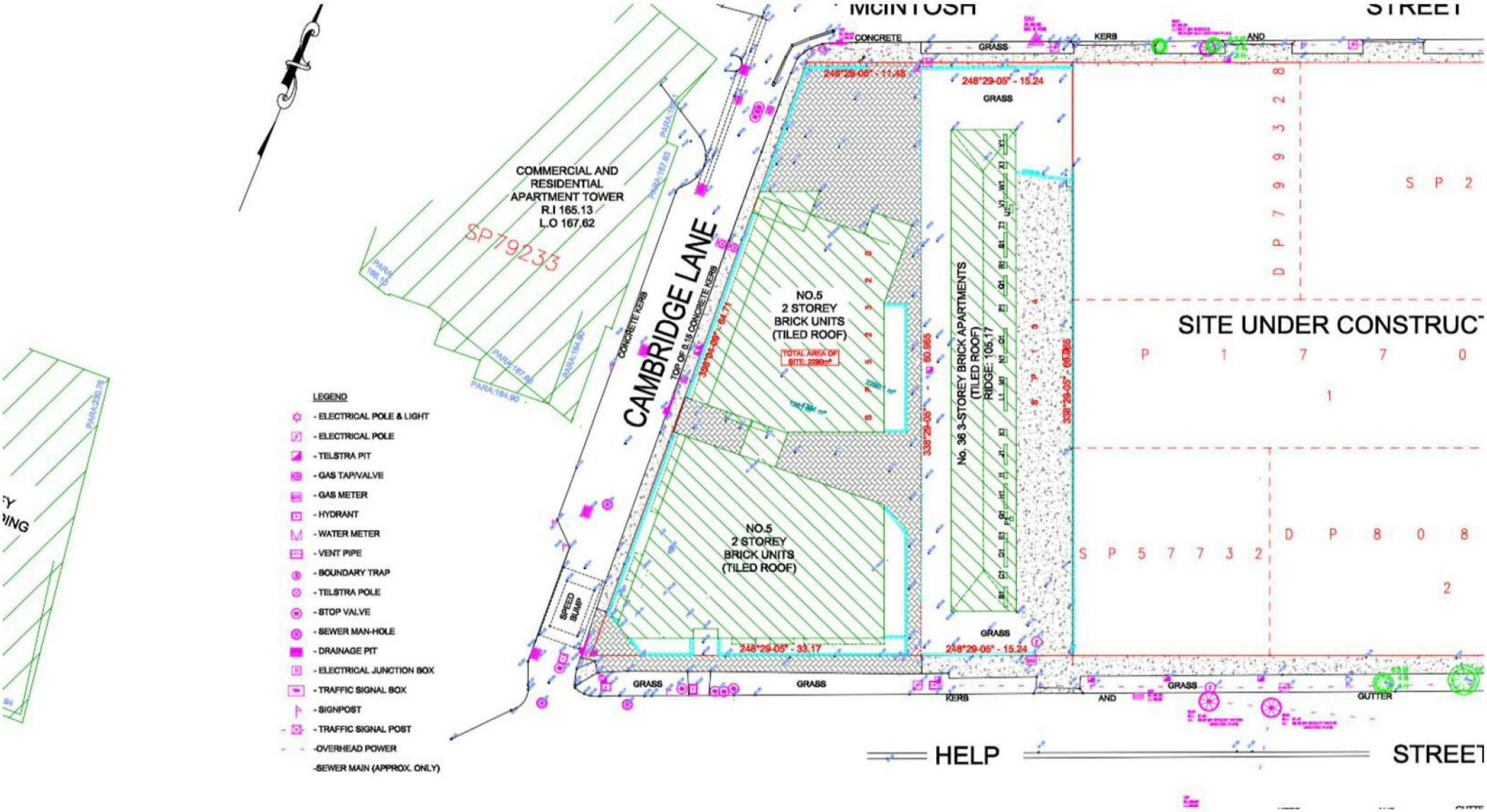
Willoughby City Council and Architectus
Chatswood CBD Planning and Urban Design Strategy to 2036
January 2018

Willoughby City Council
Willoughby Development Control Plan 2016

Willoughby City Council
Willoughby Local Environmental Plan 2012

Appendix B
Site Survey

2923-15 Detail Survey & Elevation - Victoria Avenue Mall (Rev.2,06-02-17....dwg



AUTODESK VIEWER

Appendix C
Traffic Report

GTAconsultants

3-5 Help Street, Chatswood
Planning Proposal
Transport Impact Assessment

Client // H & J Vakili

Office // NSW

Reference // N102342

Date // 17/10/18

3-5 Help Street, Chatswood

Planning Proposal

Transport Impact Assessment

Issue: D 17/10/18

Client: H & J Vakili

Reference: N102342

GTA Consultants Office: NSW

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	17/08/17	Final	Liam Stevens	Andrew Farran	Tim De Young	
B	15/12/17	Updated	Will Croagh	Andrew Farran	Tim De Young	
C	15/06/18	Updated Final	Daniel Mead	Andrew Farran	Andrew Farran	
D	17/10/18	Updated Final	Daniel Mead	Andrew Farran	Andrew Farran	

GTAconsultants
Melbourne | Sydney | Brisbane
Canberra | Adelaide | Perth
Gold Coast | Townsville

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Tables

1. Introduction

1.1 Background

A Planning Proposal is to be lodged with Willoughby City Council for a proposed mixed-use development on land located at 3-5 Help Street, Chatswood. The proposed development includes a multi-storey building consisting of 128 residential apartments, 1,774sqm of office and 503sqm of retail. The total GFA of the development will be 16,030sqm.

GTA Consultants (GTA) was commissioned by H & J Vakili in May 2017 to undertake a transport impact assessment for the Planning Proposal.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

i existing traffic and parking conditions surrounding the site
ii suitability of the proposed parking in terms of supply (quantum) and layout
iii service vehicle requirements
iv pedestrian and bicycle requirements
v the traffic generating characteristics of the proposed development
vi suitability of the proposed access arrangements for the site
vii the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds
- Willoughby Council Development Control Plan (DCP)
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- traffic and car parking surveys undertaken by Data Audit Systems as referenced in the context of this report
- plans for the proposed development prepared by Kann Finch, Project Number 6521, dated 13 June 2018 (Revision G).
- other documents and data as referenced in this report.

2. Existing Conditions

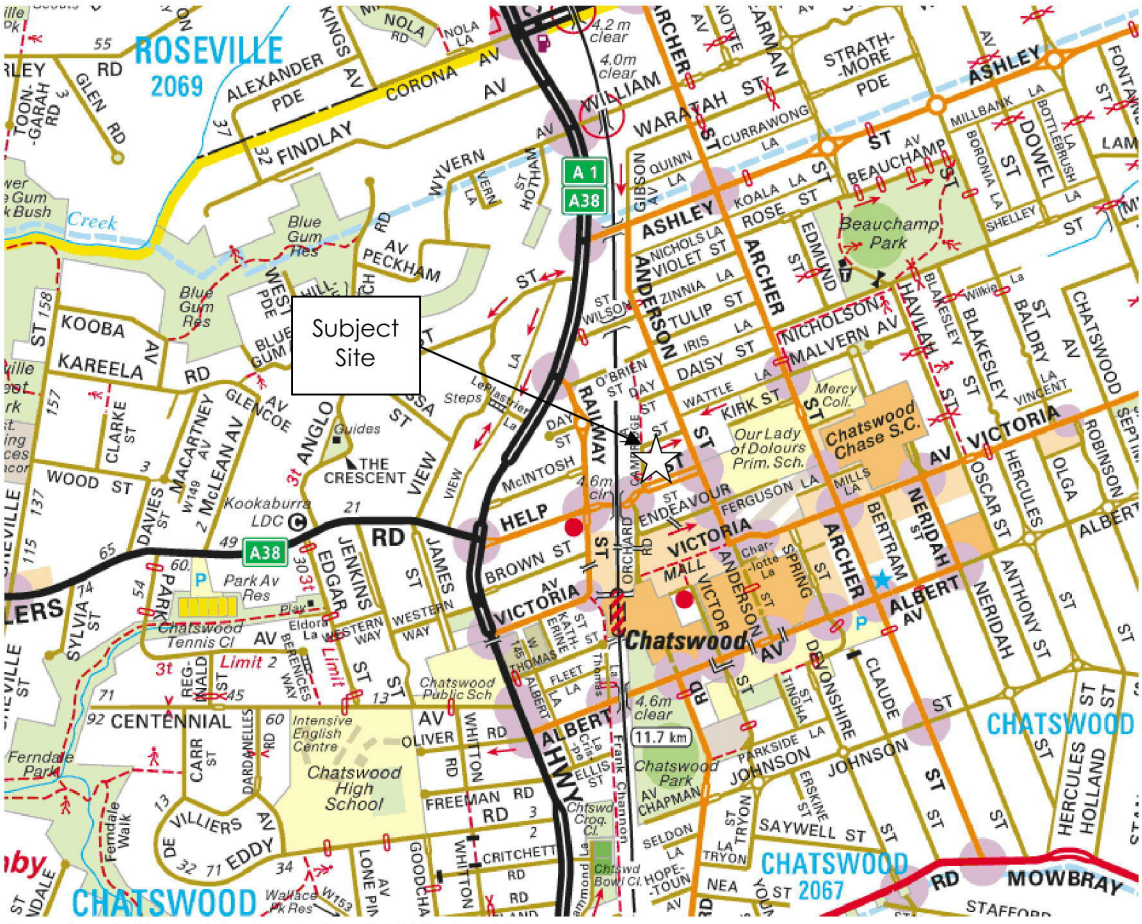
2.1 Subject Site

The subject site is located at 3-5 Help Street, Chatswood. The site of approximately 2,290sqm has approximate frontages of 38m to Help Street, 18m to McIntosh Street and 68m to Cambridge Lane. The site currently has a land use classification of 'B4 Mixed Use' and is occupied by two medium density residential buildings.

The site is located on the periphery of the Chatswood CBD with surrounding properties including predominantly retail, commercial and high density residential uses, with some low density residential land uses located to the northeast of the site. The Chatswood Transport Interchange is located approximately 100m south of the site.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject Site and Its Environs



(Reproduced with permission from Sydway Publishing Pty Ltd)

2.2 Road Network

2.2.1 Overview

The subject site is located between the intersections of Orchard Road and Anderson Street with Help Street. In this respect, Help Street forms a key access route to the Chatswood CBD and includes a signalised intersection with Pacific Highway and a grade separated crossing of the railway line. Anderson Street provides access between Victoria Avenue and Ashley Street (which provides an onward connection to the Pacific Highway). Cambridge Lane and McIntosh Street are local roads and provide property access.

2.2.2 Adjoining Roads

Help Street

Help Street functions as a collector road and is aligned in an east-west direction.

It is a two-way road configured with a four-lane, 13m wide carriageway and has a sign posted speed limit of 40km/h. Kerbside parking is permitted on the southern side of the carriageway outside of clearway times and subject to time restrictions.

Help Street is shown in Figure 2.2 and carries approximately 11,000 vehicles per day[1].

Anderson Street

Anderson Street functions as a collector road and is aligned in a north-south direction.

It is a two-way road configured with a four-lane, 13m wide carriageway and has signposted speed of 40km/h. Kerbside parking north of the Help Street intersection is permitted outside of clearway times, subject to time restrictions.

Anderson Street is shown in Figure 2.3 and carries approximately 13,200 vehicles per day[1].

Cambridge Lane

Cambridge Lane functions as a shared zone for cars, cyclists and pedestrians (although also has a separated pedestrian path provided on the east side of the carriageway) and is aligned in a north-south direction.

It is a one-way road configured with a single-lane northbound traffic lane, albeit with two-way cycle paths. Cambridge Lane has a signposted speed limit of 10km/h. Kerbside parking is permitted on the western side of the lane, subject to time restrictions (10 minutes parking between 7:00am and 6:00pm Monday to Friday).

Cambridge Lane is shown in Figure 2.4 and carries approximately 700 vehicles per day[2].

McIntosh Street

McIntosh Street functions as a local road and is aligned in an east-west direction in the vicinity of the site.

It is a one-way road eastbound configured with a single-lane, 7m wide carriageway and has a sign posted speed limit of 40km/h. Kerbside parking is permitted on the northern side of the street,

1 Based on the peak hour traffic counts commissioned by GTA in June 2017 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

2 Based on the tube counts commissioned by GTA in June 2017.

subject to time restrictions. A dedicated on-road bike lane is provided on the southern side of the carriageway.

McIntosh Street is shown in Figure 2.5 and carries approximately 700 vehicles per day[1].

Figure 2.2: Help Street, facing east

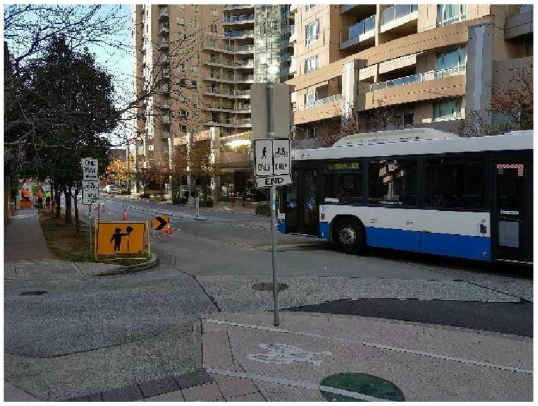
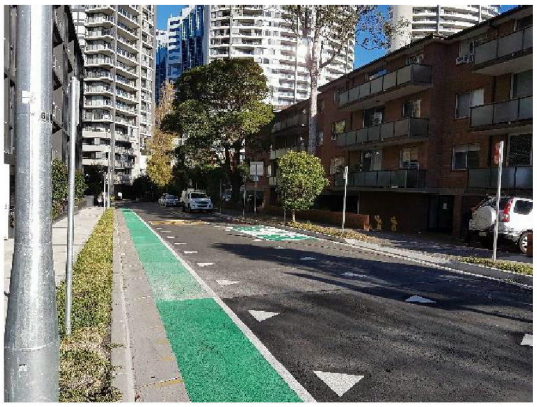


Figure 2.3: Anderson Street, facing south

Figure 2.4: Cambridge Lane, facing east

Figure 2.5: McIntosh Street, facing south



2.2.3 Surrounding Intersections

The following intersections currently exist in the vicinity of the site:

- Orchard Road / Help Street (signalised)
- Anderson Street / Help Street (signalised)
- Help Street / Cambridge Lane (unsignalised)
- Anderson Street / McIntosh Street (unsignalised).

2.3 Traffic Volumes

GTA commissioned traffic movement counts on key roads in the vicinity of the site on Wednesday 7 June 2017 during the following peak periods:

- 7:00am and 9:00am
- 4:00pm and 6:00pm.

The AM and PM peak hour traffic volumes are summarised below, with full results contained in Appendix A.

Figure 2.6: Existing AM Peak Hour Traffic Volumes

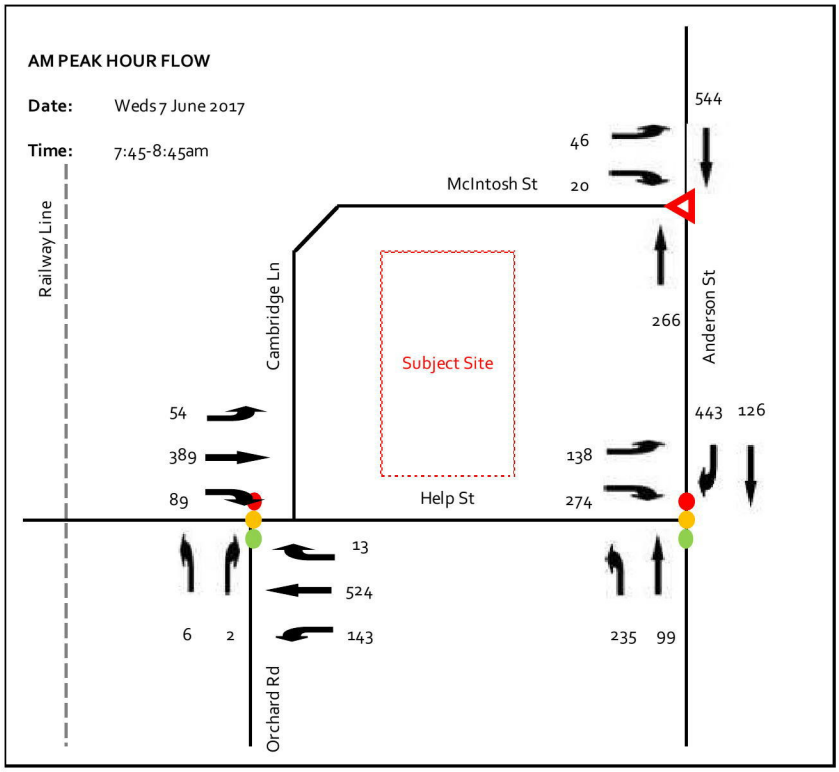
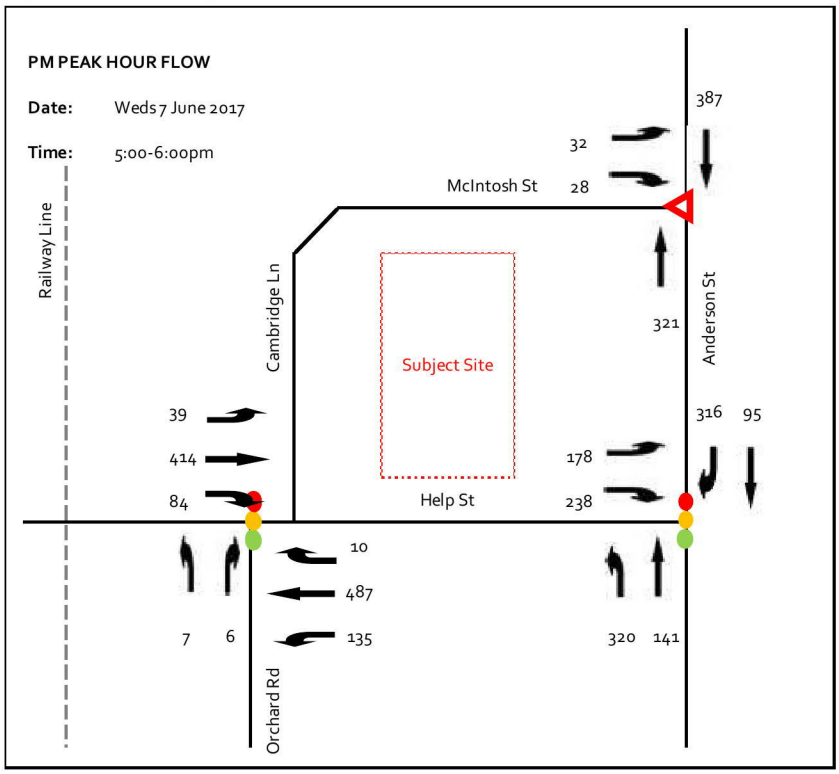


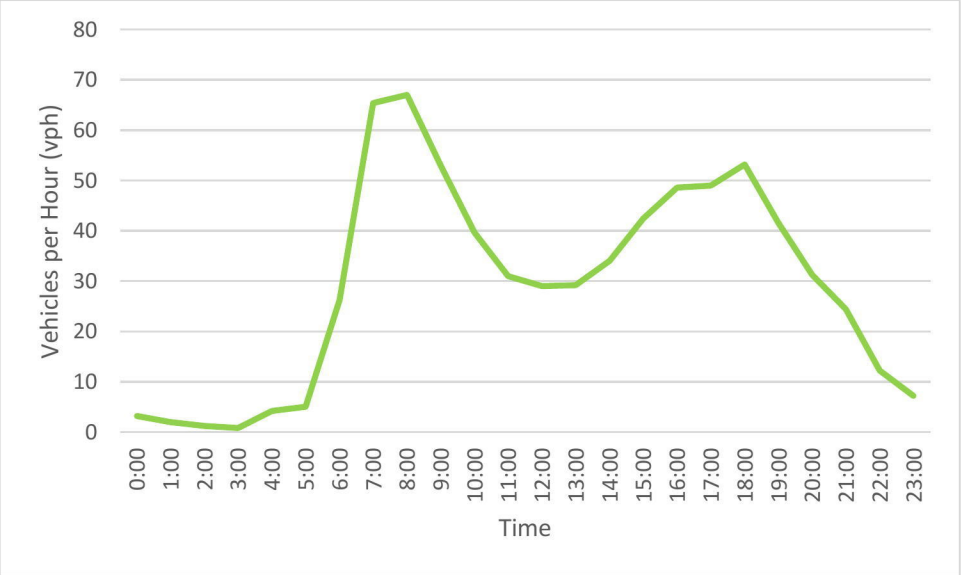
Figure 2.7: Existing PM Peak Hour Traffic Volumes



In addition, GTA commissioned 7-day, 24-hour tube counts on Cambridge Lane for the week commencing Sunday 4 June 2017. The weekday average traffic volumes are presented in Figure 2.8 and indicate that the laneway carries up to approximately 50 and 70 vehicles during the AM

and PM peak hours, respectively. These volumes are consistent with typical RMS Guidelines for shared zones (i.e. less than 100vph).

Figure 2.8: Cambridge Lane Daily Traffic Volumes



2.4 Intersection Operation

The operation of the three surveyed intersections within the study area have been assessed using SIDRA INTERSECTION[3], a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the RMS, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 2.1: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 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	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.2 presents a summary of the existing operation of the intersection, with full results presented in Appendix B of this report.

[3] Program used under license from Akcelik & Associates Pty Ltd.

Table 2.2: Existing Operating Conditions

Intersection	Peak	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Orchard Road/ Help Street	AM	25	85	C
	PM	23	73	C
Anderson Street/ Help Street	AM	30	121	C
	PM	29	90	C
Anderson Street/ McIntosh Street	AM	1	2	A
	PM	1	2	A

Table 2.2 indicates that the three intersections in the vicinity of the site currently operate with acceptable levels of service (LOS C or better) during peak periods.

2.5 Car Parking

GTA compiled an inventory of publicly available on-street parking in the vicinity of the site. The inventory identified a number of on-street car parking spaces on Help Street, McIntosh Street and Anderson Street, all subject to various time restrictions.

Parking demand sample surveys were undertaken by GTA during daytime periods and indicate that the majority of on-street parking spaces in the vicinity of the site are typically occupied, with minimal vacancies available.

It is also noted that the site is located in close proximity to three publicly available off-street car parks, which provide additional car parking beyond that provided on-street, as summarised in Table 2.3.

Table 2.3: Public Off-Street Parking Summary

Location	Distance to Site	Number of Spaces (approx.)
Chatswood Chase	250m	2,550
Westfield Chatswood	300m	2,800
Mandarin Centre	350m	300
Total		**5,650**

2.6 Public Transport

The subject site is well served by public transport services with Chatswood Transport Interchange located approximately 100m south of the site.

Chatswood is considered a major node in the CityRail network having undergone a major redevelopment in recent years and is well served by the Northern, North Shore and Western Lines. In the near future (and prior to the likely occupation of any development on the site), Chatswood will also serve as a major interchange for the North-West rail link. The rail journey time between Chatswood and Town Hall is 23 minutes. Chatswood Interchange also functions as one of the main bus interchanges in the northern suburbs of Sydney.

A review of the rail and bus services available in the vicinity of the site are summarised in Table 2.4 and Table 2.5.

Table 2.4: Chatswood Interchange Rail Services

Route	Route Description	Frequency On/Off Peak
Northern Line	Hornsby or Epping to the City	15 mins peak/ 20-30 mins off peak
North Shore Line	Berowra to Parramatta via City	3-5 mins peak/ 5-10 mins off peak
Western Line	Emu Plains or Richmond to Chatswood	3-5 mins peak/ 5-10 mins off peak

Table 2.5: Chatswood Interchange Bus Services

Route	Route Description	Frequency On/Off Peak
136/137	Chatswood to Manly, Dee Why & Mona Vale	15 mins peak/ 30 mins off peak
143/144	Chatswood to Manly	15 mins peak/ 15-20 mins off peak
200	Chatswood to Bondi Junction	15 mins, peak only
255/256	Chatswood to Chatswood West	30 mins, peak only
257/258	Chatswood to Balmoral/ Lane Cove Industrial	30 mins peak and off peak
267	Chatswood to Crows Nest	30 mins peak and off peak
273	Chatswood to City - Wynyard via Willoughby and North Sydney	10 mins peak/ 20-30 mins off peak
277/278/279	Chatswood to Castle Cove/ Killarney Heights/ Frenchs Forest	Hourly peak and off peak/ 20 mins peak only/ 3 services daily
280/281/283	Chatswood to Warringah Mall/ Davidson/ Belrose	15-30 mins peak/ hourly off peak
284	Chatswood to Duffys Forest via Frenchs Forest and Terrey Hills	10-30 mins peak/ hourly off-peak
533/534	Chatswood to Sydney Olympic Park via Mowbray Rd and Ryde	40 mins peak and off peak
536	Gladesville via Lane Cove and Hunters Hill	40 mins peak and off peak
545/550	Chatswood to Parramatta	15 mins peak and off peak
558	Chatswood to Lindfield	Hourly peak and off peak
565	Chatswood to Macquarie University via UTS Ku-ring-gai, Lindfield and West Lindfield	Hourly off peak
M40	Chatswood to Bondi Junction	10 mins peak/ 15 mins off peak
N90	Hornsby to Town Hall via Chatswood	30 mins, night only

2.7 Pedestrian Infrastructure

Pedestrian paths are located as follows:

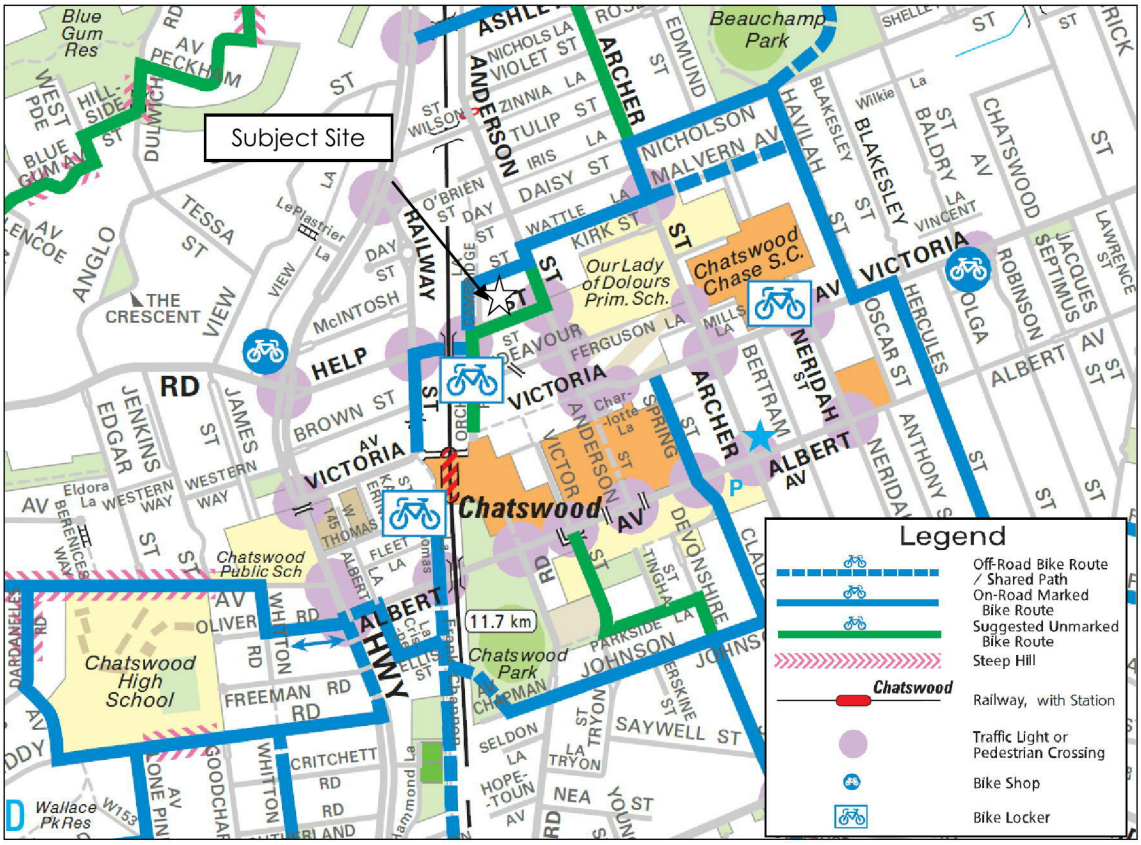
- Help Street (2 sides) – 1.6m wide path northside and 2.9m wide path southside
- Cambridge Lane (2 sides) – 1.3m wide path eastside and 2m wide path westside
- McIntosh Street (2 sides) – 1.6m wide path northside and 1.8m wide path southside.

Signalised pedestrian crossings are provided at the Orchard Road / Help Street, Anderson Street / Help Street and Railway Street / Help Street intersections.

2.8 Cycle Infrastructure

The subject site is located close to several established cycle routes. An extract of the Northern Sydney Cycling Map showing cycling infrastructure surrounding the subject site is shown in Figure 2.9. Of particular note, a 1m wide cycle lane is located along Cambridge Lane and McIntosh Street.

Figure 2.9: Cycle Infrastructure



Source: Northern Sydney Cycling Map

2.9 Transport Policy Direction – CBD Strategy

In January 2018, Willoughby City Council released the Chatswood CBD Strategy. The Strategy establishes a framework to guide future development in the Chatswood CBD for the next 20 years. The vision for the CBD Strategy sets out seven guiding principles, including "sustainable and active transport".

The key items relating to transport are provided in Section 3.1 of the strategy and have been reproduced below:

"Traffic and Transport

The CBD Strategy employs a Travel Demand Management approach seeking to modify travel decisions to achieve more desirable transport, social, economic and environmental objectives. A new CBD Transport Strategy will build on the approach. In addition, site specific traffic and transport issues are to be addressed as follows:

a) Vehicle entry points to a site are to be rationalised to minimise streetscape impact, with one entry into and exiting a site. To achieve this objective loading docks, including garbage and residential removal trucks, are to be located within Basement areas.

b) In order to facilitate rationalisation of vehicle entry points on neighbouring sites, all development sites are to provide an opportunity within Basement levels to provide vehicle access to adjoining sites when they are developed.

c) All vehicles are to enter and exit a site in a forward direction. In this regard vehicle turntables should be provided where necessary.

d) All commercial and residential loading and unloading is required to occur on-site and not in public streets.

e) Car parking should be reduced by utilising RMS car parking rates for sites close to public transport, as well as reciprocal parking and car share strategies."

This Planning Proposal has been prepared having regard for the transport recommendations of the strategy.

3. Development Proposal

3.1 Land Uses

The Planning Proposal intends to amend the existing planning controls imposed on the site to allow for an increase in the maximum height controls and increase the maximum floor space ratio.

The amended planning controls are being sought with a view to constructing mixed use development incorporating residential uses set above lower level commercial uses. The indicative proposed land uses are summarised in Table 3.1.

Table 3.1: Planning Proposal Land Use Summary (Indicative)

Use	Dwelling Type	Size
Dwellings	1-bedroom	40 dwellings
	2-bedroom	80 dwellings
	3-bedroom	8 dwellings
	Sub-Total	**128 dwellings**
Commercial	Retail	503sqm
	Office	1,774sqm
	Sub-Total	**2,277sqm**

Table 3.1 indicates that the Planning Proposal anticipates some 128 residential apartments, 2,277sq.m of commercial floor area (incorporating retail and office floor area).

3.2 Vehicle Access, Car Parking and Loading

Vehicle access to the site is proposed via two locations, as follows:

- car parking via Mcintosh Street
- loading area via Help Street

A loading area is provided on the lower ground level, with car parking generally provided in the basement levels. A total of 174 car parking spaces and 9 motorcycle spaces (approx.) are to be provided across the basement levels.

3.3 Pedestrian and Bicycle Facilities

Pedestrian access to the residential components of the site are proposed via a lift lobby located on the lower ground level connecting to Help Street and a lift lobby located on the upper ground level connecting to Cambridge Lane. The commercial components of the development directly front Help Street and Cambridge Lane on the lower ground level and McIntosh Street on the upper ground level.

The development will include parking for 34 bicycles (16 visitor spaces, 13 resident spaces and 5 employee spaces), which are located on the lower ground level. In addition, the plans show a storage cage at the front of each of the car spaces which would be capable of accommodating a bicycle.

4. Car Parking

4.1 Council Transport Objectives

The transport requirements of future developments within Willoughby Council area are set out in Part C.3 of the Willoughby Development Control Plan (DCP).

There are 12 standards and guidelines that seek to establish the intent of the DCP Transport Requirements. These are reproduced below:

"1. Minimise the adverse environmental effects of car use within the City;

2. Manage the existing and future on and off road car parking in a manner that sustains and enhances the economic and environmental qualities of Willoughby;

3. Encourage the use of public transport in areas close to transport nodes;

4. Encourage alternative modes of transport;

5. Ensure that appropriate facilities are provided for bicycles;

6. Provide for the safe, convenient, and efficient movement and accommodation of vehicles within the City;

7. Ensure that provision is made for a reasonable number of parking spaces for vehicles generated by a development including visitor, employee, service and commercial vehicles;

8. Ensure that vehicular movements and parking do not impede pedestrian traffic safety and efficiency;

9. Ensure that the design of parking and servicing areas and their access is safe and compatible with the best practice standards;

10. Ensure that car parking facilities contribute positively to the public domain;

11. Minimise hard surfaces in order to enhance areas for on-site infiltration of stormwater, where relevant; and

12. Manage demand for car use by employing the principle of travel demand management. Travel Demand Management is intervention (excluding provision of major infrastructure) to modify travel decisions so that more desirable transport, social, economic and/or environmental objectives can be achieved, and the adverse impacts of travel can be reduced. The purpose of travel demand management is to reduce the total amount of travel, minimise the need to expand road systems, reduce the incidents of vehicle crashes, prevent further congestion, reduce air pollution, conserve scarce resources and increase the share of non-car based transport. Increasing the supply of parking can induce a greater number of vehicular trips which increases congestion, impacting negatively on the city environment."

In summary, the Council transport objectives seek to minimise the reliance on private motor vehicle usage by minimising car parking provisions (in appropriate locations), promoting alternate transport modes and leveraging off existing public transport nodes.

4.2 Car Parking Requirements

4.2.1 DCP Requirements

The car parking requirements for different development types are set out in Willoughby DCP 2006. A review of the car parking rates and the floor area schedule results in a DCP parking requirement for the Planning Proposal as summarised in Table 4.1.

Table 4.1: DCP 2006 Car Parking Requirements

Description	DCP Parking Rate	No. of Dwellings/ NLA (sq.m)	DCP Parking Requirement
Residential Flats within Railway Precincts	1 space / 1-bedroom	40 dwellings	40 spaces
	1 space / 2-bedroom	80 dwellings	80 spaces
	1.25 space / 3-bedroom	8 dwellings	10 spaces
		Sub-Total	**130 spaces**
	1 space / 4 dwellings (visitor parking)	128 dwellings	32 spaces
		Sub-Total	**162 spaces**
Shop	1 space / 25sq.m NFA	503sq.m	20 spaces
Office	1 space / 110sq.m NFA	1,774sq.m	16 spaces
	Total		**198 spaces**

Note: where the parking spaces required is not a whole number, DCP 2006 states that the number of spaces required is to be rounded down to the nearest whole number.

Table 4.1 indicates that the Planning Proposal is required to provide 198 car parking spaces. The proposed car parking provision of 174 spaces is less than the prescribed DCP parking requirements.

Given the sites location within Chatswood CBD and adjacent to the Chatswood Transport Interchange it would be considered appropriate to reduce the overall car parking provision on the site (discussed further in the following section).

4.2.2 Departure from DCP Parking Requirements

Alternate Parking Approach

The standard approach to car parking provision (i.e. provide a minimum) has historical origins which follow a 'predict and provide' approach. The recently released Austroads 'Guide to Traffic Management Part 11 (2017)' describes the 'predict and provide' approach to car parking as a technique which readily interprets a 'parking problem' as an issue of 'inadequate supply'. It goes on to note that this ideology is underlined by the premise that:

- *"More parking is better,*
- *Every destination should satisfy its own parking needs (minimum ratios),*
- *Car parks should never fill,*
- *Parking should always be free or subsidised or incorporated into buildings costs."*

In more recent times, the 'predict and provide' approach is being replaced by a range of travel demand management (TDM) techniques which challenge historical travel behaviours and encourage mode change away (reversing the trend) from private motor vehicle travel, particularly during road network peak hours.

The TDM approach involves the individual or collective application of techniques including:

- Congestion pricing.
- Car parking management.

- Land use management & Urban design.
- The delivery of compact mixed use development.
- The provision of high capacity transit services.

Overall, it is considered that there is potential to adopt a reduced car parking rate approach for the subject site that would be consistent with TDM orientated transport and land use planning practise, as well as Councils' overarching transport objectives.

Shared Car Parking Demand Assessment

To comprehensively assess the likely car parking demands, consideration must also be given to the extent to which the car parking associated with each use does, or does not, coincide throughout the day.

When consideration is given to the different patterns of activity of the various land uses, and the correspondingly different pattern of car parking demand, an assessment of the overall parking requirement for the proposed development can be made. Such an assessment is presented in Table 4.2.

Table 4.2: Variation in Non-Resident Car Parking Demand

Land Use	DCP Parking Requirement	Proportion of Peak Car Parking Demand (approx.)		Resultant Car Parking Demand	
		Daytime	Evening	Daytime	Evening
Residential (visitors)	32 spaces	25%	100%	8 spaces	32 spaces
Shop	20 spaces	100%	0%	20 spaces	-
Office	16 spaces	100%	0%	16 spaces	-
Total	**68 spaces**	**-**	**-**	**44 spaces**	**32 spaces**

Table 4.2 indicates that the site has a non-resident peak car parking demand of 68 spaces assuming all the demands peak simultaneously or 44 spaces when consideration is given to how the demands vary across the day for each of the uses.

4.2.3 Adequacy of Parking Provision

Based upon the above discussions and analysis, it is evident that the proposed car parking provision of 174 spaces is appropriate to accommodate the peak parking demand of 174 spaces (130 resident spaces + 44 other spaces) likely to be generated by the development.

4.3 Motorcycle Parking

DCP 2006 requires motorcycle parking to be provided at the rate of one space per 25 car parking spaces. Given the car parking requirements outlined above, the Planning Proposal is required to provide some 9 motorcycle parking spaces, with these able to be accommodated within the basement car parking levels.

The proposed motorcycle parking provision is 9 spaces which meets the DCP minimum requirement.

4.4 Car Parking Layout

The car park layout and site access provisions should be designed in accordance with the requirements of the Willoughby City Council's DCP 2006 and the Australian Standard for Off Street Car Parking (AS2890.1:2004 and AS2890.6:2009).

General car park access and circulation is considered appropriate and would be further addressed at the development application stage. Vehicle access to and from the site is also discussed in Section 6.2 of this report.

5. Sustainable Transport Infrastructure

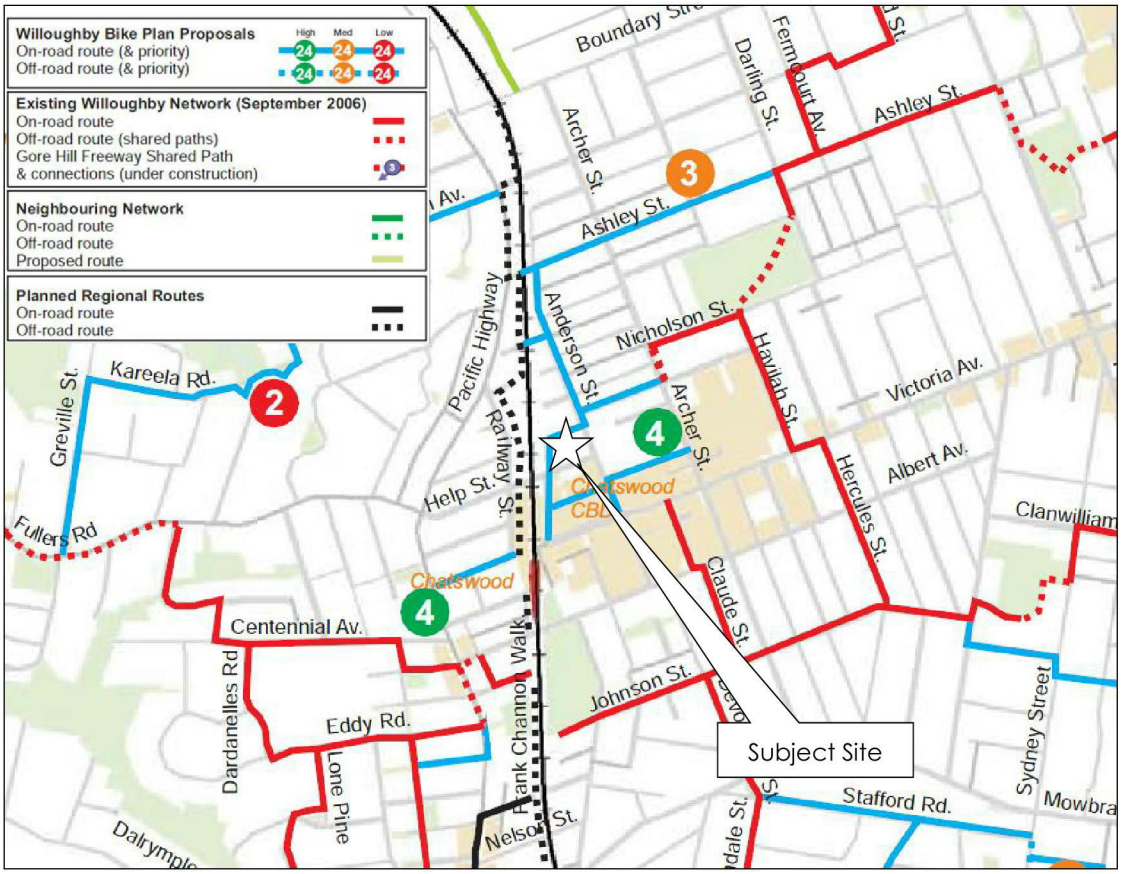
5.1 Cycle Network

Willoughby Bike Plan (2006) identified and prioritised 27 proposed cycle routes to be implemented in Willoughby LGA including the following two on-road routes in Chatswood CBD:

- Anderson Street and Ashley Street Bike Route (Route 3, medium priority)
- Chatswood CBD Access Bike Routes (Route 4, high priority).

These proposed cycle routes will improve cycling accessibility in and around Chatswood CBD and are shown in Figure 5.1. Both of these routes would directly benefit cyclists accessing the subject site.

Figure 5.1: Willoughby Bike Plan Proposed Cycle Routes



Source: Willoughby Bike Plan (2006)

5.2 Bicycle End-of-Trip Facilities

5.2.1 Supply

DCP 2006 contains a guide to bicycle parking facilities for different types of developments as summarised in Table 5.1.

Table 5.1: DCP 2006 Bicycle Parking Guide

Description	Suggested Parking Rate		No. of Dwellings/ NLA (sq.m)	Suggested Parking Provision	
	Bicycle Lockers	Bicycle Rails		Bicycle Lockers	Bicycle Rails
Residential	1 per 10 units	1 per 12 units	128 dwellings	13	11
Retail	1 per 450sqm	1 per 150m^2	503sqm	1	3
Office	1 per 600sqm	1 per 2,500sqm	1,774sqm	2	1
Total				**16**	**15**

Table 5.1 suggests that the DCP requires 116 bicycle lockers for residents/ employees and 15 bicycle rails for visitors. It is proposed that the development will meet the DCP requirements.

5.2.2 Design

DCP 2006 contains general requirements for bicycle parking as follows:

- enable wheels and frame to be locked to the device without damaging the bicycle
- be placed in public view and well-lit for security purposes
- be in a convenient and accessible location outside pedestrian and vehicular movement paths
- be protected from the weather.

DCP 2006 requires that the design of bicycle parking facilities be in accordance with AS2890.3. It is anticipated that shower and change facilities will be provided within individual commercial tenancies.

Bicycle lockers are intended for use by residents and therefore should be included within the secure areas of the building noting that where security devices are provided for resident car parking, these are acceptable and can replace bike lockers. Bicycle-rails are intended for use by visitors/ employees and as such will be located in publicly accessible areas within close proximity to the site.

5.3 Pedestrian Network

The site is well connected to the existing pedestrian network with pedestrian paths provided on both sides of the roads in the immediate vicinity of the site. The site is located in close vicinity of Chatswood Transport Interchange, and as such experiences high pedestrian activity.

5.4 Public Transport

As discussed previously, the site is easily accessible by public transport with Chatswood Transport Interchange located 100m south of the site. The proximity to public transport will increase the use of public transport by residents and employees and discourage the use of private motor vehicles.

6. Loading Facilities

6.1 Loading Requirements

The loading requirements for different development types are contained in DCP 2006, noting that residential developments in excess of 12 apartments are to provide for removalist trucks to park, load and unload on-site. DCP 2006 also notes that Council will determine the required number of loading bays.

6.2 Proposed Loading Arrangements

A loading area is proposed on the lower ground level, with vehicle access proposed from the Help Street crossover. The loading dock is shown on the plans on the plans as approximately 4m wide and 11m long.

Preliminary planning suggests that the loading dock would be capable of accommodating the Council's 9.7m long waste collection vehicle (assuming no other vehicles are at the loading dock) or alternatively could accommodate two smaller loading vehicles simultaneously (including one 6.4 SRV and one 8.8m MRV). Swept path assessments of the 9.7m waste collection vehicle been completed using AutoTURN (a computer package designed to simulate vehicle swept paths in a CAD environment), with the results provided in Appendix C.

Overall, the proposed loading arrangements are considered to be an acceptable outcome and would be refined at the development application stage.

6.3 Waste Collection

A garbage room is provided on the lower ground level adjacent to the on-site loading area. It is anticipated that waste will be collected as part of the weekly Council collection.

7. Traffic Impact Assessment

7.1 Traffic Generation

7.1.1 Residential

Traffic generation estimates for the residential use have been sourced from the RMS Technical Direction (August 2013).

The dataset indicates a "Sydney Average" traffic generation rate of 0.17 movements per dwelling for high density residential flat dwellings. Further interrogation of the RMS dataset indicates that those sites with excellent public transport accessibility (i.e. located within 250m of a railway station) exhibit lower traffic generation rates than the remaining sites (i.e. located further than 250m from a railway station). A summary of this data is provided below:

- < 250m of a railway station[4]: 0.11 movements per apartment per weekday peak hour
- >250m from a railway station: 0.20 movements per apartment per weekday peak hour

Furthermore, it is noted that one of the eight sites surveyed was located at 1 Cambridge Lane, Chatswood directly opposite the subject site. This site consisted of 129 residential dwellings (8 x 1-bedroom, 96 x 2-bedroom and 25 x 3-bedroom dwellings) and 206 car parking spaces (at a rate of 1.6 spaces per dwelling). The surveys of this site indicated a weighted peak hour traffic generation (average of AM and PM) rate of 0.11 movements per dwelling.

Based on the above data, it is considered appropriate to adopt a peak hour traffic generation rate of 0.11 movements per dwelling. Application of this rate to the residential component of the development indicates a traffic generation of 14 vehicle movements.

7.1.2 Office

The commercial traffic generation estimates have been sourced from the data that informs the RMS Technical Direction (August 2013). Given that the commercial car parking provision is lower than a traditional office use, it is considered appropriate to adopt a 'per space' traffic generation rate than a traditional 'per floor area' rate.

In this respect, GTA has collated the 'per space' traffic generation data for each of the inner and middle ring office sites surveyed as part of the RMS Guide (this excludes sites at Liverpool and Bella Vista). The full dataset is attached and indicates the following peak hour traffic generation rates:

- AM Peak hour: 0.44 movements per space
- PM Peak hour: 0.36 movements per space

Application of this rate to the office component of the development indicates a traffic generation of 7 and 6 vehicle movements during the AM and PM peak hour periods, respectively.

7.1.3 Retail

Traffic generation rates of 0.5 and 1 movements per space has been adopted for each of the retail car parking spaces during the AM and PM peak hours, respectively. Application of this rate to the

[4] Includes St Leonards, Strathfield and Chatswood.

retail car parking allocation (20 spaces) indicates a traffic generation of 10 and 20 vehicle movements during the AM and PM peak hours, respectively.

7.1.4 Summary

A summary of the peak hour and daily traffic volumes estimates resulting from the proposal are set out in Table 7.1.

Table 7.1: Traffic Generation Estimates

Land Use	Size	Traffic Generation Rate			Resultant Traffic Generation		
		AM Peak Hour	PM Peak Hour	Daily	AM Peak Hour	PM Peak Hour	Daily
Residential	128 dwellings	0.11 movements per dwelling	0.11 movements per dwelling	1.1 movements per dwelling [1]	14	14	141
Retail	503sqm (20 spaces)	0.5 movement per space	1 movement per space	10 movements per space [1]	10	20	200
Office	1,774sqm (16 spaces)	0.44 movements per space	0.36 movements per space	2.4 movements per space	7	6	38
				Total	**31**	**40**	**379**

[1] Assuming a peak to daily ratio of 10% for the residential and retail uses.
[2] Assuming each office car parking space turns over 1.5 times throughout the day.

Table 7.1 indicates that the site could potentially generate in the order of 31 to 40 vehicle movements in a peak hour with 379 vehicle movements over the entire day.

7.2 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

i configuration of the arterial road network in the immediate vicinity of the site
ii existing operation of intersections providing access between the local and arterial road network
iii distribution of households in the vicinity of the site
iv surrounding employment centres, retail centres and schools in relation to the site
v likely distribution of employee's residences in relation to the site
vi configuration of access points to the site.

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions have been assumed and are generally based on the existing turning movements observed in the vicinity of the site:

Vehicle Ingress

- Help Street (west): 80%
- Anderson Street (south): 10%
- Anderson Street (north): 10%

Vehicle Egress

- Help Street (west): 20%
- Anderson Street (south): 20%
- Anderson Street (north): 60%

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) for each of the land uses is presented in Table 7.2.

Table 7.2: Adopted Directional Distributions

Land Use	Directional Distribution Splits				Resultant Directional Distribution					
	AM Peak hour		PM Peak Hour		AM Peak Hour			PM Peak Hour		
	In	Out	In	Out	In	Out	Total	In	Out	Total
Residential	20%	80%	60%	40%	3	11	14	8	6	14
Retail	80%	20%	40%	60%	8	2	10	8	12	20
Office	90%	10%	10%	90%	6	1	7	1	5	6
Total					**17**	**14**	**31**	**17**	**23**	**40**

Based on the above, Figure 7.1 and Figure 7.2 have been prepared to show the estimated marginal increase in turning movements in the vicinity of the subject property following full site development. The figures indicate a maximum traffic volume increase on Cambridge Lane of 23 vehicle movements (being the egress volume during the PM peak hour).

Figure 7.1: AM Peak Hour Site Generated Traffic Volumes

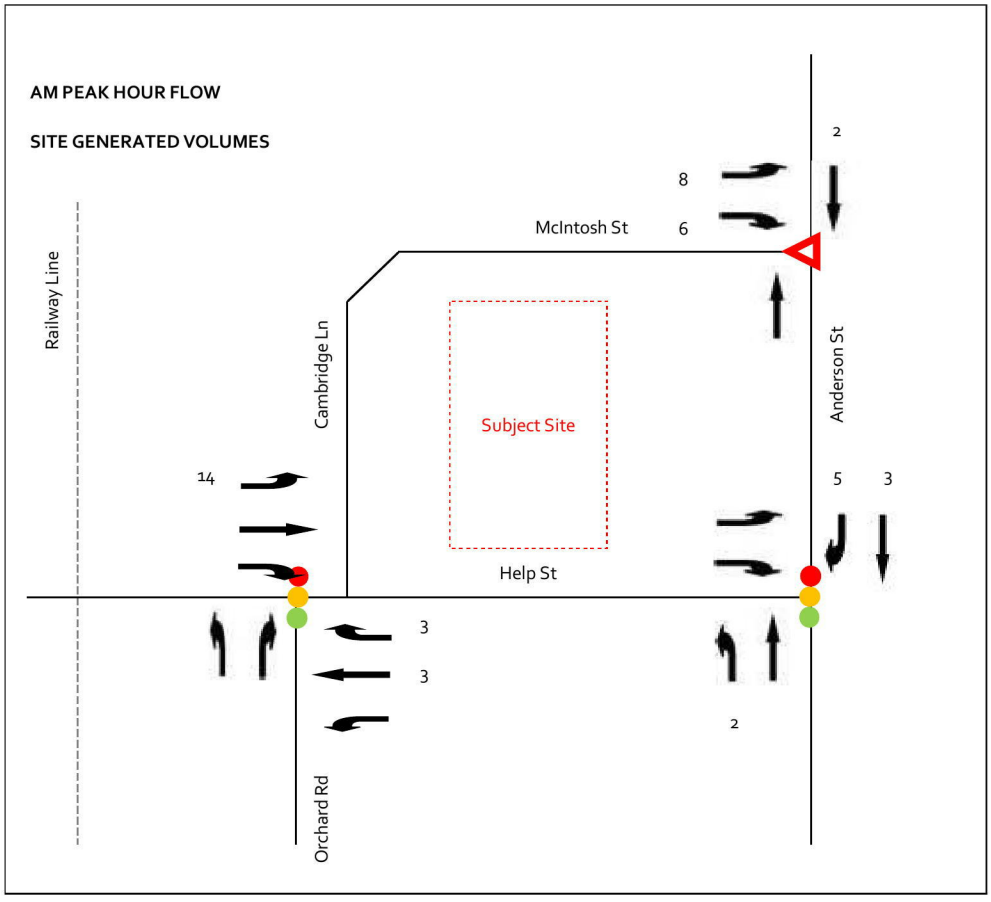
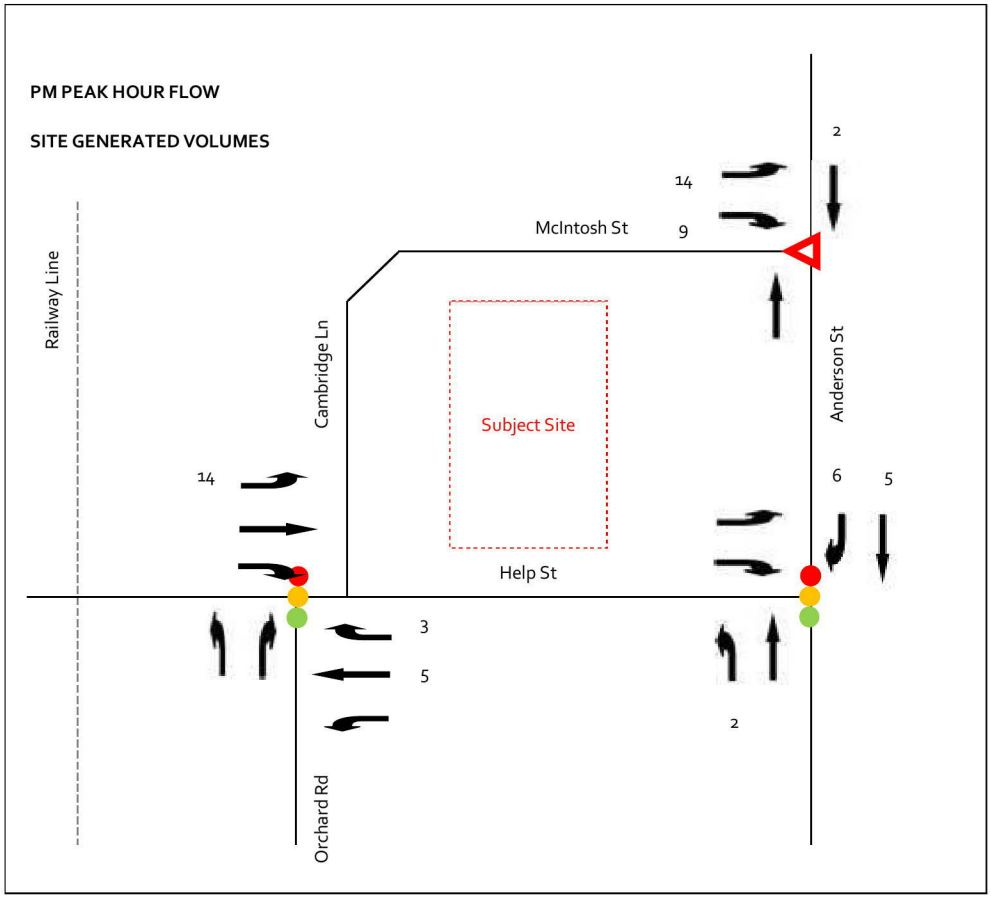


Figure 7.2: PM Peak Hour Site Generated Traffic Volumes



7.3 Surrounding Development Traffic Generation

7.3.1 Preamble

There are a number of developments currently being constructed or proposed in the vicinity of the subject site that will increase traffic volumes along the Help Street and Anderson Street corridors. The following developments are considered the most relevant and have been included in the cumulative traffic assessment presented in this report:

- 1 Help Street, Chatswood – TOGA site (traffic surveys completed prior to occupation)
- Chatswood Chase Shopping Centre (Planning Proposal)

The anticipated traffic generation from these developments is presented below, with the anticipated traffic volume estimates presented in Appendix D.

7.3.2 1 Help Street, Chatswood

A summary of the proposed development yield for the neighbouring Toga site is provided in Table 7.3. The table also includes a summary of the anticipated traffic generation to the site (adopting the traffic generation rates assumed for the subject site).

Table 7.3: Development Summary – 1 Help Street, Chatswood

Land Uses	Size [1]	Car Parking Provision	Resultant Traffic Generation	
			Peak Hour	Daily
Residential	136 dwellings	170 spaces (136 resident and 34 visitor spaces)	15	150
Café/Restaurant	650sqm	23 spaces	23	230
Office	368sqm			
Retail	270sqm			
Total	**-**	**193 spaces**	**38**	**380**

[1] development schedule sourced from the Council Assessment Report dated 19 November 2013 – incorporating the change of use from part seniors living to residential dwelling.

Table 7.3 indicates that the recently completed development at 1 Help Street is anticipated to generate in the order of 38 additional peak hour movements (the traffic surveys were completed prior to the completion of the development). Vehicle access to the site is provided solely via a left in / left out access to Help Street and therefore would not increase traffic volumes on Cambridge Lane.

The anticipated resultant traffic volumes are presented in Appendix D.

7.3.3 Chatswood Chase Shopping Centre

A Planning Proposal was submitted to Willoughby City Council seeking to expand the existing shopping centre from 58,650sq.m to 75,650sq.m; an increase of 17,000sqm.

Reference to the transport impact assessment report that accompanied the application[5] indicates the Centre is expected to generate 237 additional vehicle movements during the PM peak hour.

The report FURTHER indicates that up to 6 additional vehicle movements would be distributed to Victoria Avenue from the expanded shopping centre (eastbound during the PM peak hour). In order to present a conservative assessment, this additional traffic has been assumed for both the AM and PM peak hours.

The anticipated resultant traffic volumes are presented in Appendix D.

7.4 Post Development Traffic Volumes

A summary of the existing and future traffic volume scenarios assessed are provided in Table 7.4.

Table 7.4: Traffic Volume Scenarios Assessed

Scenario	Existing Road Network Traffic Volumes	Surrounding Developments	Subject Site	Traffic Volume Figure
Existing Traffic Volumes	✓	-	-	Figure 2.6 and 2.7
Base Scenario	✓	✓	-	Appendix B5 and B6
Post Development	✓	✓	✓	Appendix B7 and B8

5 GTA Report titled 'Archer Street Planning Proposal – Chatswood Chase: Transport Impact Assessment Report' dated 20 April 2017.

7.5 Traffic Impact

7.5.1 Peak Hour

The base and post development scenarios have been assessed using the SIDRA INTERSECTION. An overview of the results for each scenario is presented in Table 7.5, with the detailed results provided in Appendix E.

Table 7.5: SIDRA INTERSECTION – Base Case and Post Development Operating Conditions

Intersection	Peak Hour	Base Case			Post Development		
		Average Delay (sec)	95th Percentile Queue (m)	LOS	Average Delay (sec)	95th Percentile Queue (m)	LOS
Orchard Road/ Help Street	AM	25	85	C	25	85	C
	PM	23	73	C	23	74	C
Anderson Street/ Help Street	AM	30	121	C	30	123	C
	PM	29	90	C	29	91	C
Anderson Street/ McIntosh Street	AM	1	2	A	1	2	A
	PM	1	2	A	1	3	A

Table 7.5 indicates that each of the intersections in the vicinity of the site is anticipated to continue to operate with acceptable levels of service (LOS C or better) with only minor increases to average delays and 95th percentile queues predicted.

7.5.2 Midblock

McIntosh Street

The midblock capacity assessment assesses the forecast future traffic demands against the indicative two-way volume capacity of a road.

The capacity of a road varies depending on a number of factors, such as number of traffic lanes, carriageway width, property access, on-street car parking, land use frontages, etc. The indicative capacity of McIntosh Street has been sourced from RMS Guide to Traffic Generating Developments document.

An assessment of the midblock capacity of McIntosh Street has been undertaken with a summary of the results provided in Table 7.6.

Table 7.6: Midblock Capacity Assessment

Road (Location)	Indicative Daily Capacity	Daily Traffic Volume (vpd)			Adequacy of Road Link
		Existing	Additional	Post Development	
McIntosh Street	~2,000 to 3,000vpd	700	+190 [1]	890	✓

[1] All vehicles exiting the site travel on McIntosh Street (i.e. 50% x 379vpd).

Table 7.6 indicates that McIntosh Street is anticipated to operate well within its theoretical daily volume capacities.

Cambridge Lane

Transport for New South Wales (TfNSW) has a speed zone policy and guidelines relating to shared zones, published in 2012. The guidelines state that shared zones must meet specific site conditions and are assessed against the following site criteria:

- the current speed limit is ≤50km/h
- the current traffic flow is ≤100 vehicles/h and ≤1,000 vehicles/day

- the speed limit on approaching roads to be ≤50km/h
- the shared zone must be less than 400 metres in length
- the shared zone must not be on a bus route or a heavy vehicle route
- the minimum trafficable width must be 2.8m
- any delineation, kerb and gutter shall be removed to enhance the sense of equality between pedestrians and vehicles, unless excepted by Roads and Maritime Services
- there must be no designated pedestrian facilities located within a shared zone.

An assessment of the existing and post development peak hour and daily traffic volumes is presented in Table 7.7.

Table 7.7: Shared Zone Capacity Assessment – Cambridge Lane

Period	Shared Zone Threshold	Traffic Volume			Adequacy of Road Link
		Existing	Additional	Post Development	
AM Peak Hour	~100vph	67vph	+17vph	84vph	✓
PM Peak Hour	~100vph	49vph	+24vph	73vph	✓
Daily	~1,000vph	701vpd	+190vpd [2]	891vpd	✓

[1] Conservatively adopting the higher in / out peak hour volume accessing the site for each peak hour.
[2] All vehicles entering the site travel on Cambridge Lane (i.e. 50% x 379vpd).

Table 7.7 indicates that the post development traffic volumes on Cambridge Lane during the AM peak hour, PM peak hour and totally daily volume will continue to be in accordance with the thresholds set out in the TfNSW documentation.

7.5.3 Summary

The additional development traffic volumes through each of the surrounding intersections is less than 6% of the existing traffic volumes at each of these locations. Indeed, the anticipated additional traffic generated by the development is the equivalent of approximately 1 additional vehicle movement every minute and a half during the weekday peak periods.

Against existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development could not be expected to compromise the safety or function of the surrounding road network. In addition, on Cambridge Lane, the traffic volume increases are not expected to exceed RMS shared zone limits, and accordingly could not be expected to compromise the safety of pedestrians or cyclists.

Moreover, the use of Cambridge Lane and McIntosh Street by vehicles accessing residential uses which abut them is entirely appropriate and consistent with their functional role in the road network. Furthermore, the provision of direct vehicle access to Help Street would not be consistent with RMS access management policies.

Should the level of additional traffic to Cambridge Lane and McIntosh Street be perceived as an issue by Council there would be opportunities to limit car parking on-site and in turn supress traffic generation. This could be explored further at the development application stage.

7.5.4 Long-Term McIntosh Street Operation

It is understood that Willoughby Council have identified a potential opportunity to convert Mcintosh Street to allow two-way traffic in the future. Whilst the implications of such a treatment have not been examined in this report, it is not a requirement of this development nor will the development prevent such a change in the future.

8. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

i The indicative proposal generates a Willoughby DCP 2006 parking requirement of 198 car parking spaces.

ii It is proposed to provide 174 car parking spaces on-site which is considered appropriate having regard for the likelihood of shared car parking demands across the day. Given the sites attributes (CBD location, proximity to transport interchange, etc.), there would be opportunities to explore a further reduced car parking provision at the Development Application stage.

iii The proposed car park access and circulation, as well as the on-site loading facilities, are considered appropriate and would be further addressed at the Development Application stage.

iv The proposed bicycle parking will be provided in accordance with the minimum requirements of the DCP.

v The development is expected to generate up to 31, 40 and 379 vehicle movements during the weekday AM, weekday PM and daily periods, respectively.

vi There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development.

vii If desired, a reduced car parking provision (below the DCP parking requirements), particularly for the retail land use, would reduce the traffic generation to and from the site and in turn reduce the traffic impact to the surrounding road network. This could be explored further at the Development Application stage.

Appendix A

Survey Results

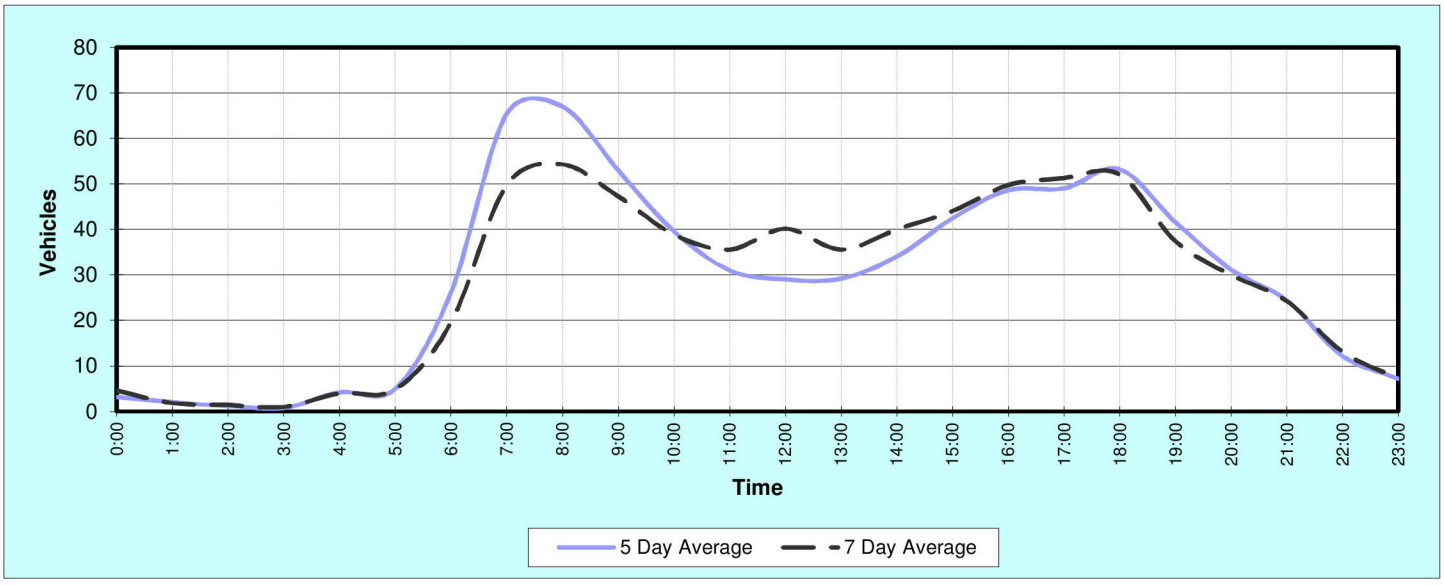
Volume Summary

Data Audit Systems
TRAFFIC SURVEYS

Street	Cambridge Lane		
Suburb	Chatswood		
Location	Between Help Street and McIntosh Street		
Count No.	1		
Start Date	Sunday	4-Jun-17	Speed Limit 10 km/h
Direction	Northbound		

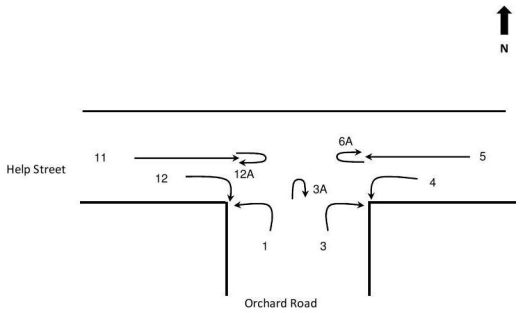
5 Day Average	701
7 Day Average	688
5 Day Heavy (Class 3 to 12)	1.7%
7 Day Heavy (Class 3 to 12)	1.4%

	Day of Week - Class 1 to 12							5 Day Average	7 Day Average
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
Time	5-Jun	6-Jun	7-Jun	8-Jun	9-Jun	10-Jun	4-Jun		
AM Peak	69	87	66	76	62	47	47		
PM Peak	64	55	62	47	56	67	83		
0:00	2	3	4	4	3	6	10	3	5
1:00	1	2	5	1	1	2	1	2	2
2:00	1	1	1	2	1	4	0	1	1
3:00	2	0	1	0	1	1	2	1	1
4:00	3	8	4	4	2	2	5	4	4
5:00	5	2	10	5	3	6	3	5	5
6:00	22	39	24	20	26	3	3	26	20
7:00	69	79	66	76	37	16	5	65	50
8:00	61	87	61	64	62	25	20	67	54
9:00	61	63	49	48	44	30	36	53	47
10:00	44	57	32	40	25	37	37	40	39
11:00	48	31	20	22	34	47	47	31	36
12:00	27	33	26	33	26	53	83	29	40
13:00	25	35	30	36	20	37	66	29	36
14:00	37	32	36	32	33	57	53	34	40
15:00	49	41	40	35	47	58	38	42	44
16:00	57	51	45	42	48	51	54	49	50
17:00	51	55	62	36	41	67	47	49	51
18:00	64	54	47	45	56	52	46	53	52
19:00	42	25	41	47	53	25	29	42	37
20:00	19	31	25	34	47	33	21	31	30
21:00	23	24	27	21	27	29	19	24	24
22:00	11	12	14	14	10	20	11	12	13
23:00	6	10	7	3	10	10	5	7	7
Total	730	775	677	664	657	671	641	701	688
Heavy %	1.6%	1.0%	2.1%	2.1%	1.8%	0.7%	0.2%	1.7%	1.4%



Data Audit Systems
FOR INFORMED DECISION MAKING
TRAFFIC SURVEYS

Location: Help Street/Orchard Road
Weather: Overcast
Date: Wednesday, 7 June 2017
Survey Period : 7:00am-9:00am and 4:00pm-6:00pm
AM Peak: 7:45am-8:45am
PM Peak: 5pm-6pm



Approach	Light	Heavy	Total
AM	931	40	971
PM	971	11	982

Departure	Light	Heavy	Total
AM	789	30	819
PM	800	16	816

Departure	Light	Heavy	Total
AM	888	32	920
PM	912	28	940

Approach	Light	Heavy	Total
AM	1059	104	1163
PM	1090	104	1194

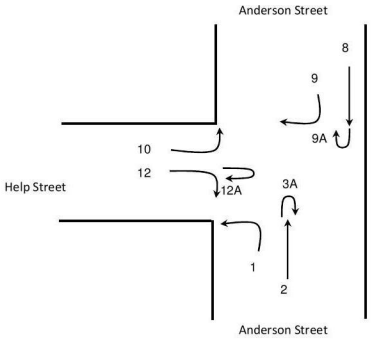
Approach	Light	Heavy	Total	Departure	Light	Heavy	Total
AM	4	15	19	AM	317	97	414
PM	0	23	23	PM	349	94	443

	1			3			3A			4			5			6A			11			12			12A			AM PEAK	
TIME	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Hour	Total
07:00	0	0	**0**	0	0	**0**	0	0	**0**	16	8	**24**	71	1	**72**	0	0	**0**	63	2	**65**	8	4	**12**	0	0	**0**	**7:00 - 8:00**	**976**
07:15	0	1	**1**	1	3	**4**	0	0	**0**	20	15	**35**	82	2	**84**	0	0	**0**	86	5	**91**	13	4	**17**	0	0	**0**	**7:15 - 8:15**	**1102**
07:30	1	1	**2**	0	2	**2**	0	0	**0**	15	12	**27**	117	5	**122**	0	0	**0**	105	4	**109**	17	1	**18**	0	0	**0**	**7:30 - 8:30**	**1189**
07:45	0	1	**1**	0	1	**1**	0	0	**0**	28	10	**38**	116	4	**120**	0	0	**0**	107	2	**109**	21	1	**22**	0	0	**0**	**7:45 - 8:45**	**1207**
08:00	0	0	**0**	0	0	**0**	0	0	**0**	32	10	**42**	109	2	**111**	0	0	**0**	120	4	**124**	18	4	**22**	0	0	**0**	**8:00 - 9:00**	**1177**
08:15	1	1	**2**	0	1	**1**	0	0	**0**	25	8	**33**	151	3	**154**	0	0	**0**	108	0	**108**	19	2	**21**	0	0	**0**		
08:30	1	2	**3**	0	0	**0**	0	0	**0**	22	8	**30**	137	2	**139**	0	0	**0**	100	2	**102**	22	1	**23**	1	0	**1**		
08:45	0	1	**1**	0	1	**1**	0	0	**0**	17	8	**25**	101	6	**107**	0	0	**0**	99	3	**102**	24	1	**25**	0	0	**0**		
TOTAL	**3**	**7**	**10**	**1**	**8**	**9**	**0**	**0**	**0**	**175**	**79**	**254**	**884**	**25**	**909**	**0**	**0**	**0**	**788**	**22**	**810**	**142**	**18**	**160**	**1**	**0**	**1**		
AM PEAK	**2**	**4**	**6**	**0**	**2**	**2**	**0**	**0**	**0**	**107**	**36**	**143**	**513**	**11**	**524**	**0**	**0**	**0**	**435**	**8**	**443**	**80**	**8**	**88**	**1**	**0**	**1**		

	1			3			3A			4			5			6A			11			12			12A			PM PEAK	
TIME	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Hour	Total
16:00	0	0	**0**	0	1	**1**	0	0	**0**	21	14	**35**	107	2	**109**	0	0	**0**	84	0	**84**	26	4	**30**	0	0	**0**	**16:00 - 17:00**	**1027**
16:15	0	2	**2**	0	0	**0**	0	0	**0**	19	15	**34**	118	2	**120**	0	0	**0**	97	0	**97**	17	0	**17**	0	0	**0**	**16:15 - 17:15**	**1085**
16:30	0	1	**1**	0	4	**4**	0	0	**0**	22	12	**34**	108	1	**109**	0	0	**0**	92	1	**93**	16	1	**17**	0	0	**0**	**16:30 - 17:30**	**1093**
16:45	0	1	**1**	0	1	**1**	0	0	**0**	16	11	**27**	99	5	**104**	0	0	**0**	77	0	**77**	30	0	**30**	0	0	**0**	**16:45 - 17:45**	**1120**
17:00	0	3	**3**	0	2	**2**	0	0	**0**	25	10	**35**	137	3	**140**	0	0	**0**	117	0	**117**	19	1	**20**	0	0	**0**	**17:00 - 18:00**	**1172**
17:15	0	1	**1**	0	3	**3**	0	0	**0**	25	9	**34**	107	0	**107**	0	0	**0**	109	0	**109**	23	1	**24**	0	0	**0**		
17:30	0	1	**1**	0	0	**0**	0	0	**0**	17	5	**22**	121	4	**125**	0	0	**0**	113	2	**115**	22	0	**22**	0	0	**0**		
17:45	0	2	**2**	0	1	**1**	0	0	**0**	33	11	**44**	115	0	**115**	0	0	**0**	111	1	**112**	18	0	**18**	0	0	**0**		
TOTAL	**0**	**11**	**11**	**0**	**12**	**12**	**0**	**0**	**0**	**178**	**87**	**265**	**912**	**17**	**929**	**0**	**0**	**0**	**800**	**4**	**804**	**171**	**7**	**178**	**0**	**0**	**0**		
PM PEAK	**0**	**7**	**7**	**0**	**6**	**6**	**0**	**0**	**0**	**100**	**35**	**135**	**480**	**7**	**487**	**0**	**0**	**0**	**450**	**3**	**453**	**82**	**2**	**84**	**0**	**0**	**0**		

Data Audit Systems
FOR INFORMED DECISION MAKING
TRAFFIC SURVEYS

Location: Help Street/Anderson Street
Weather: Overcast
Date: Wednesday, 7 June 2017
Survey Period : 7:00am-9:00am and 4:00pm-6:00pm
AM Peak: 7:45am-8:45am
PM Peak: 5pm-6pm



N

Departure	Light	Heavy	Total	Approach	Light	Heavy	Total
AM	418	35	453	AM	920	43	963
PM	519	30	549	PM	779	37	816

	Light	Heavy	Total
Approach			
AM	704	29	733
PM	735	17	752
Departure			
AM	1042	108	1150
PM	1129	104	1233

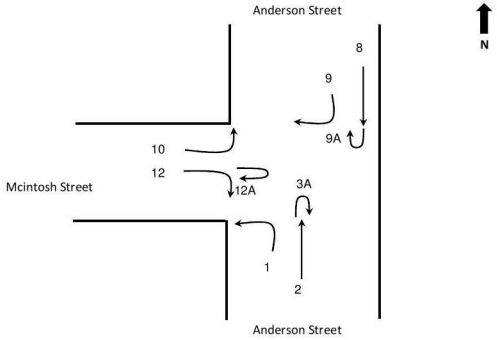
Approach	Light	Heavy	Total	Departure	Light	Heavy	Total
AM	487	101	588	AM	651	30	681
PM	771	99	870	PM	637	19	656

	1			2			3A			8			9			9A			10			12			12A			AM PEAK	
TIME	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Hour	Total
07:00	31	8	39	12	3	15	0	0	0	13	0	13	59	2	61	0	0	0	22	1	23	37	1	38	0	0	0	7:00 - 8:00	1042
07:15	30	11	41	20	5	25	0	0	0	17	1	18	70	7	77	0	0	0	30	1	31	47	6	53	0	0	0	7:15 - 8:15	1187
07:30	32	11	43	19	7	26	0	0	0	24	1	25	92	7	99	1	0	1	43	1	44	45	5	50	0	0	0	7:30 - 8:30	1282
07:45	44	10	54	23	6	29	0	0	0	27	0	27	109	5	114	0	0	0	33	0	33	60	3	63	0	0	0	7:45 - 8:45	1315
08:00	48	7	55	17	4	21	0	0	0	34	2	36	100	4	104	0	0	0	37	0	37	77	4	81	0	0	0	8:00 - 9:00	1242
08:15	50	8	58	25	4	29	0	0	0	30	0	30	115	3	118	0	0	0	39	0	39	64	2	66	0	0	0		
08:30	61	7	68	18	2	20	0	0	0	33	0	33	103	4	107	0	0	0	29	0	29	62	2	64	0	0	0		
08:45	34	7	41	23	1	24	0	0	0	29	0	29	64	7	71	0	0	0	27	0	27	52	3	55	0	0	0		
TOTAL	330	69	399	157	32	189	0	0	0	207	4	211	712	39	751	1	0	1	260	3	263	444	26	470	0	0	0		
AM PEAK	203	32	235	83	16	99	0	0	0	124	2	126	427	16	443	0	0	0	138	0	138	263	11	274	0	0	0		

	1			2			3A			8			9			9A			10			12			12A			PM PEAK	
TIME	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Hour	Total
16:00	58	11	69	24	2	26	0	0	0	23	1	24	61	6	67	0	0	0	24	0	24	60	1	61	0	0	0	16:00 - 17:00	1150
16:15	70	10	80	20	6	26	0	0	0	24	2	26	86	5	91	0	0	0	22	0	22	63	1	64	0	0	0	16:15 - 17:15	1213
16:30	57	10	67	29	2	31	0	0	0	36	0	36	71	4	75	0	0	0	33	1	34	50	4	54	0	0	0	16:30 - 17:30	1228
16:45	67	12	79	26	5	31	0	0	0	17	0	17	66	3	69	0	0	0	36	0	36	40	1	41	0	0	0	16:45 - 17:45	1227
17:00	78	9	87	29	1	30	0	0	0	21	0	21	76	4	80	0	0	0	58	0	58	56	2	58	0	0	0	17:00 - 18:00	1288
17:15	69	6	75	42	5	47	0	0	0	23	0	23	79	3	82	0	0	0	45	0	45	50	2	52	0	0	0		
17:30	72	5	77	28	3	31	0	0	0	22	0	22	67	5	72	0	0	0	35	0	35	57	2	59	0	0	0		
17:45	74	7	81	28	5	33	0	0	0	29	0	29	78	4	82	0	0	0	40	0	40	66	3	69	0	0	0		
TOTAL	545	70	615	226	29	255	0	0	0	195	3	198	584	34	618	0	0	0	293	1	294	442	16	458	0	0	0		
PM PEAK	293	27	320	127	14	141	0	0	0	95	0	95	300	16	316	0	0	0	178	0	178	229	9	238	0	0	0		

Data Audit Systems
FOR INFORMED DECISION MAKING
TRAFFIC SURVEYS

Location: Mcintosh Street/Anderson Street
Weather: Overcast
Date: Wednesday, 7 June 2017
Survey Period : 7:00am-9:00am and 4:00pm-6:00pm
AM Peak: 7:45am-8:45am
PM Peak: 5pm-6pm



N

Approach	Light	Heavy	Total
AM	117	3	120
PM	106	1	107

Departure	Light	Heavy	Total
AM	1	0	1
PM	1	0	1

Departure	Light	Heavy	Total	Approach	Light	Heavy	Total
AM	498	37	535	AM	922	42	964
PM	591	31	622	PM	736	36	772

Approach	Light	Heavy	Total	Departure	Light	Heavy	Total
AM	422	35	457	AM	962	43	1005
PM	534	31	565	PM	784	37	821

	1			2			3A			8			9			9A			10			12			12A			AM PEAK	
TIME	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Hour	Total
07:00	0	0	0	32	4	36	1	0	1	67	2	69	0	0	0	0	0	0	11	0	11	2	0	2	0	0	0	7:00 - 8:00	708
07:15	0	0	0	49	6	55	0	0	0	84	7	91	0	0	0	1	0	1	7	1	8	4	1	5	0	0	0	7:15 - 8:15	805
07:30	0	0	0	61	8	69	0	0	0	121	9	130	0	0	0	0	0	0	10	0	10	3	0	3	0	0	0	7:30 - 8:30	878
07:45	0	0	0	62	6	68	0	0	0	124	4	128	0	0	0	0	0	0	14	0	14	7	0	7	0	0	0	7:45 - 8:45	878
08:00	0	0	0	56	4	60	0	0	0	135	7	142	0	0	0	0	0	0	12	0	12	2	0	2	0	0	0	8:00 - 9:00	833
08:15	1	0	1	65	4	69	1	0	1	142	2	144	0	0	0	0	0	0	10	0	10	8	0	8	0	0	0		
08:30	0	0	0	47	2	49	0	0	0	139	7	146	0	0	0	0	0	0	10	1	11	6	0	6	0	0	0		
08:45	0	0	0	47	1	48	0	0	0	109	4	113	0	0	0	0	0	0	4	0	4	7	0	7	0	0	0		
TOTAL	1	0	1	419	35	454	2	0	2	921	42	963	0	0	0	1	0	1	78	2	80	39	1	40	0	0	0		
AM PEAK	1	0	1	230	16	246	1	0	1	540	20	560	0	0	0	0	0	0	46	1	47	23	0	23	0	0	0		

	1			2			3A			8			9			9A			10			12			12A			PM PEAK	
TIME	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Total	Hour	Total
16:00	0	0	0	52	3	55	0	0	0	84	8	92	0	0	0	0	0	0	5	0	5	6	0	6	0	0	0	16:00 - 17:00	676
16:15	0	0	0	50	6	56	0	0	0	102	5	107	0	0	0	0	0	0	9	0	9	3	1	4	0	0	0	16:15 - 17:15	712
16:30	1	0	1	64	3	67	0	0	0	97	5	102	0	0	0	0	0	0	7	0	7	9	0	9	0	0	0	16:30 - 17:30	733
16:45	0	0	0	60	5	65	0	0	0	81	3	84	0	0	0	0	0	0	5	0	5	2	0	2	0	0	0	16:45 - 17:45	731
17:00	0	0	0	87	1	88	0	0	0	91	4	95	0	0	0	0	0	0	4	0	4	7	0	7	0	0	0	17:00 - 18:00	768
17:15	0	0	0	79	5	84	0	0	0	93	2	95	0	0	0	0	0	0	11	0	11	7	0	7	0	0	0		
17:30	0	0	0	69	2	71	0	0	0	89	5	94	0	0	0	0	0	0	8	0	8	11	0	11	0	0	0		
17:45	0	0	0	72	6	78	0	0	0	99	4	103	0	0	0	0	0	0	9	0	9	3	0	3	0	0	0		
TOTAL	1	0	1	533	31	564	0	0	0	736	36	772	0	0	0	0	0	0	58	0	58	48	1	49	0	0	0		
PM PEAK	0	0	0	307	14	321	0	0	0	372	15	387	0	0	0	0	0	0	32	0	32	28	0	28	0	0	0		

Appendix B

SIDRA INTERSECTION Results – Existing Conditions

MOVEMENT SUMMARY

Site: 101 [AM Anderson Street / Help Street]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
1	L2	247	13.6	0.731	41.2	LOS D	9.8	76.7	0.99	0.88	35.0
2	T1	104	16.2	0.295	30.1	LOS C	3.6	28.4	0.89	0.71	40.2
Approach		352	14.4	0.731	37.9	LOS D	9.8	76.7	0.96	0.83	36.4
North: Anderson Street											
8	T1	133	1.6	0.110	6.4	LOS A	2.1	14.6	0.43	0.35	54.3
9	R2	466	3.6	0.736	31.7	LOS C	16.7	120.7	0.94	0.87	38.7
Approach		599	3.2	0.736	26.1	LOS C	16.7	120.7	0.82	0.76	41.3
West: Help Street											
10	L2	145	0.0	0.120	11.2	LOS B	2.1	14.8	0.40	0.68	49.5
12	R2	288	4.0	0.710	38.6	LOS D	11.0	79.9	0.98	0.87	36.1
Approach		434	2.7	0.710	29.4	LOS C	11.0	79.9	0.79	0.80	39.7
All Vehicles		1384	5.9	0.736	30.1	LOS C	16.7	120.7	0.85	0.79	39.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	32.5	LOS D	0.1	0.1	0.90	0.90
P3	North Full Crossing	53	32.5	LOS D	0.1	0.1	0.90	0.90
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	33.1	LOS D			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [PM Anderson Street / Help Street]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
1	L2	337	8.4	0.669	33.6	LOS C	12.0	89.8	0.94	0.84	37.8
2	T1	148	9.9	0.282	24.1	LOS C	4.6	34.6	0.82	0.66	43.0
Approach		485	8.9	0.669	30.7	LOS C	12.0	89.8	0.90	0.79	39.3
North: Anderson Street											
8	T1	100	0.0	0.080	5.9	LOS A	1.5	10.2	0.40	0.32	54.7
9	R2	333	5.1	0.675	34.5	LOS C	12.0	87.4	0.95	0.85	37.6
Approach		433	3.9	0.675	27.8	LOS C	12.0	87.4	0.82	0.73	40.5
West: Help Street											
10	L2	187	0.0	0.179	14.6	LOS B	3.5	24.7	0.52	0.71	47.3
12	R2	251	3.8	0.652	38.0	LOS D	9.3	67.4	0.97	0.84	36.3
Approach		438	2.2	0.652	28.0	LOS C	9.3	67.4	0.77	0.78	40.3
All Vehicles		1356	5.1	0.675	28.9	LOS C	12.0	89.8	0.83	0.77	40.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	33.4	LOS D	0.1	0.1	0.91	0.91
P3	North Full Crossing	53	33.4	LOS D	0.1	0.1	0.91	0.91
P4	West Full Crossing	53	28.1	LOS C	0.1	0.1	0.84	0.84
All Pedestrians		158	31.6	LOS D			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [AM Help Street / Orchard Road]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Orchard Road											
1	L2	6	66.7	0.074	38.6	LOS D	0.3	3.8	0.92	0.67	35.1
3	R2	2	100.0	0.074	38.4	LOS D	0.3	3.8	0.92	0.67	35.3
Approach		8	75.0	0.074	38.5	LOS D	0.3	3.8	0.92	0.67	35.1
East: Help Street											
4	L2	151	25.2	0.566	29.6	LOS C	10.9	84.2	0.87	0.78	40.6
5	T1	552	2.1	0.566	23.7	LOS C	11.9	84.8	0.87	0.76	42.8
Approach		702	7.0	0.566	24.9	LOS C	11.9	84.8	0.87	0.77	42.3
West: Help Street											
11	T1	466	1.8	0.358	21.7	LOS C	6.9	49.2	0.80	0.67	44.2
12	R2	94	9.0	0.537	45.1	LOS D	3.7	28.1	0.99	0.78	33.7
Approach		560	3.0	0.537	25.6	LOS C	6.9	49.2	0.83	0.69	42.0
All Vehicles		1271	5.7	0.566	25.3	LOS C	11.9	84.8	0.85	0.73	42.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	21.1	LOS C	0.1	0.1	0.73	0.73
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	29.9	LOS C			0.86	0.86

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [PM Help Street / Orchard Road]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Orchard Road											
1	L2	7	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.5
3	R2	6	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.4
Approach		14	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.5
East: Help Street											
4	L2	142	25.9	0.475	26.5	LOS C	9.3	72.4	0.81	0.74	42.0
5	T1	513	1.4	0.475	20.6	LOS C	10.3	72.8	0.81	0.71	44.4
Approach		655	6.8	0.475	21.9	LOS C	10.3	72.8	0.81	0.72	43.9
West: Help Street											
11	T1	477	0.7	0.327	19.2	LOS B	6.7	46.9	0.76	0.63	45.5
12	R2	88	2.4	0.484	44.6	LOS D	3.5	24.8	0.99	0.77	33.9
Approach		565	0.9	0.484	23.2	LOS C	6.7	46.9	0.79	0.66	43.2
All Vehicles		1234	5.1	0.484	22.7	LOS C	10.3	72.8	0.80	0.69	43.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	18.9	LOS B	0.1	0.1	0.69	0.69
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	29.2	LOS C			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [AM Anderson Street / McIntosh Street]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
2	T1	282	6.3	0.075	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		282	6.3	0.075	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Anderson Street											
8	T1	573	3.7	0.150	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		573	3.7	0.150	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: McIntosh Street											
10	L2	48	2.2	0.042	6.1	LOS A	0.1	1.1	0.24	0.56	52.8
12	R2	21	0.0	0.065	15.3	LOS C	0.2	1.6	0.72	0.89	46.6
Approach		69	1.5	0.065	8.9	LOS A	0.2	1.6	0.38	0.66	50.7
All Vehicles		924	4.3	0.150	0.7	NA	0.2	1.6	0.03	0.05	59.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Anderson Street / McIntosh Street]

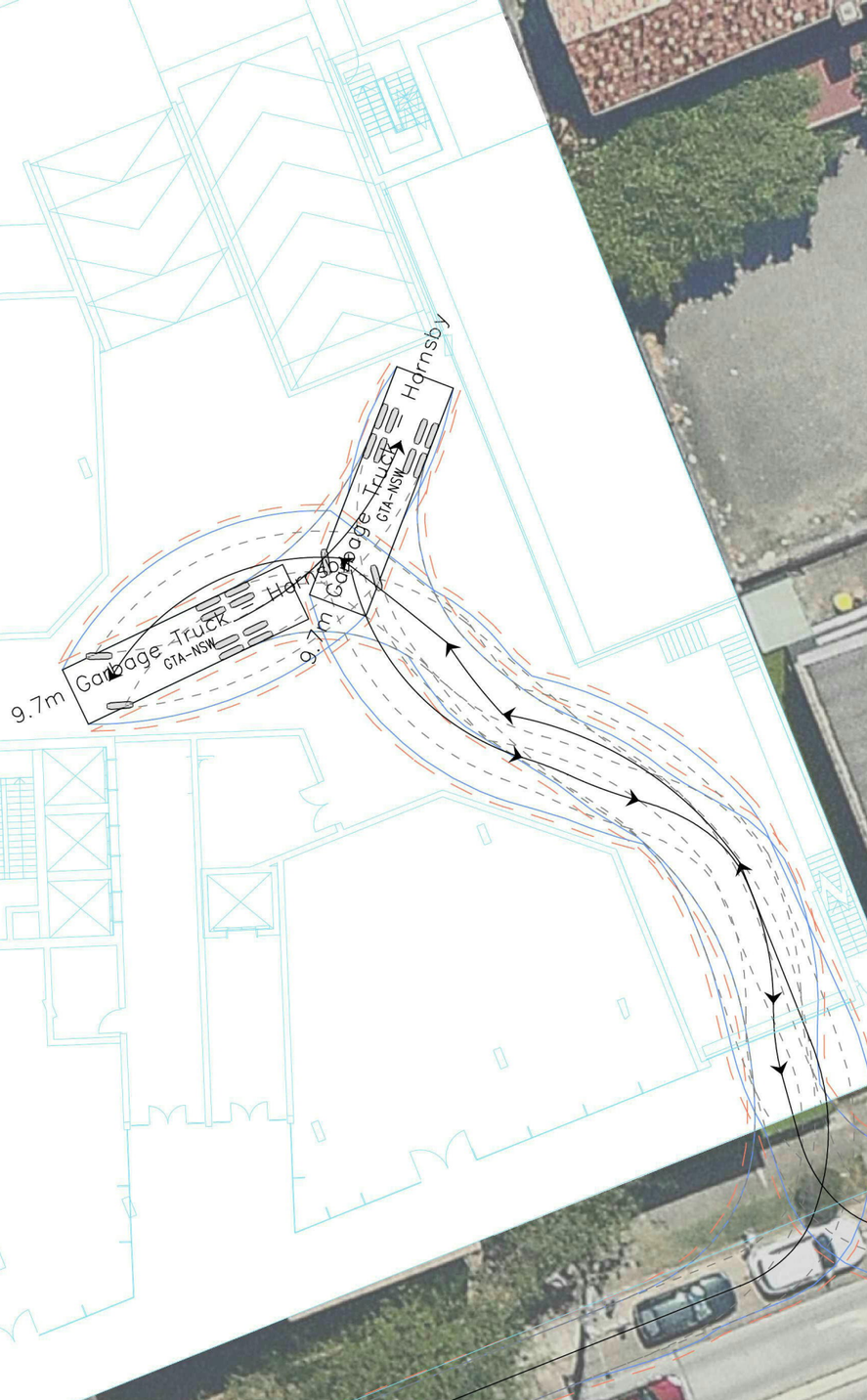
New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
2	T1	338	4.4	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		338	4.4	0.089	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Anderson Street											
8	T1	407	3.9	0.107	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		407	3.9	0.107	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: McIntosh Street											
10	L2	34	0.0	0.030	6.2	LOS A	0.1	0.7	0.26	0.56	52.8
12	R2	29	0.0	0.075	13.1	LOS B	0.3	1.9	0.66	0.86	47.9
Approach		63	0.0	0.075	9.4	LOS A	0.3	1.9	0.45	0.70	50.4
All Vehicles		808	3.8	0.107	0.7	NA	0.3	1.9	0.03	0.05	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix C

Swept Path Assessment



SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h

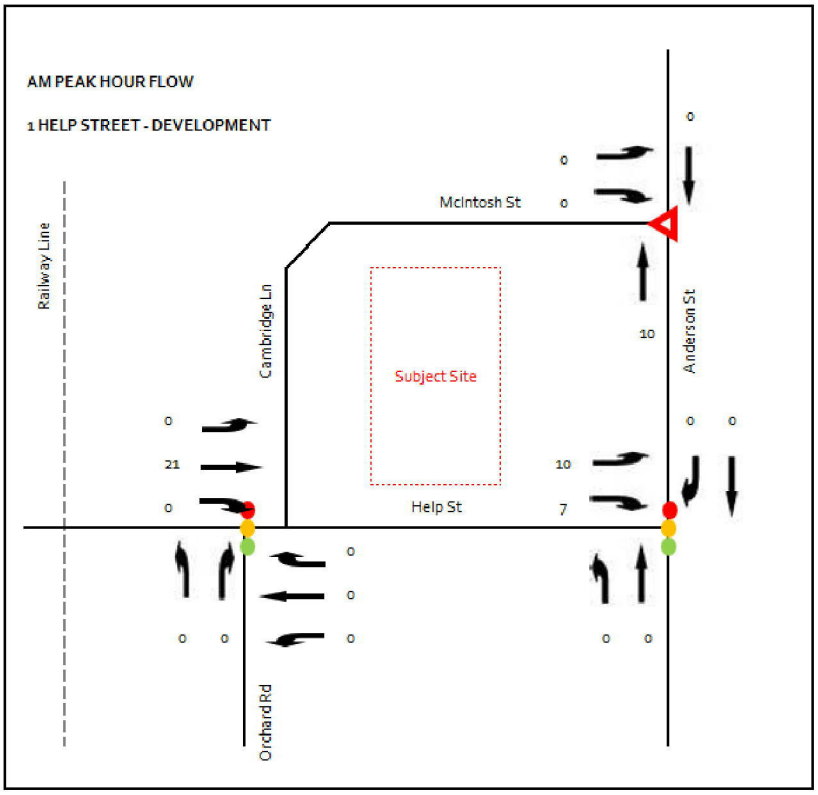
9.7m Garbage Truck – Hornsby

	meters
Width	: 2.40
Track	: 2.40
Lock to Lock Time	: 6.0
Steering Angle	: 35.0

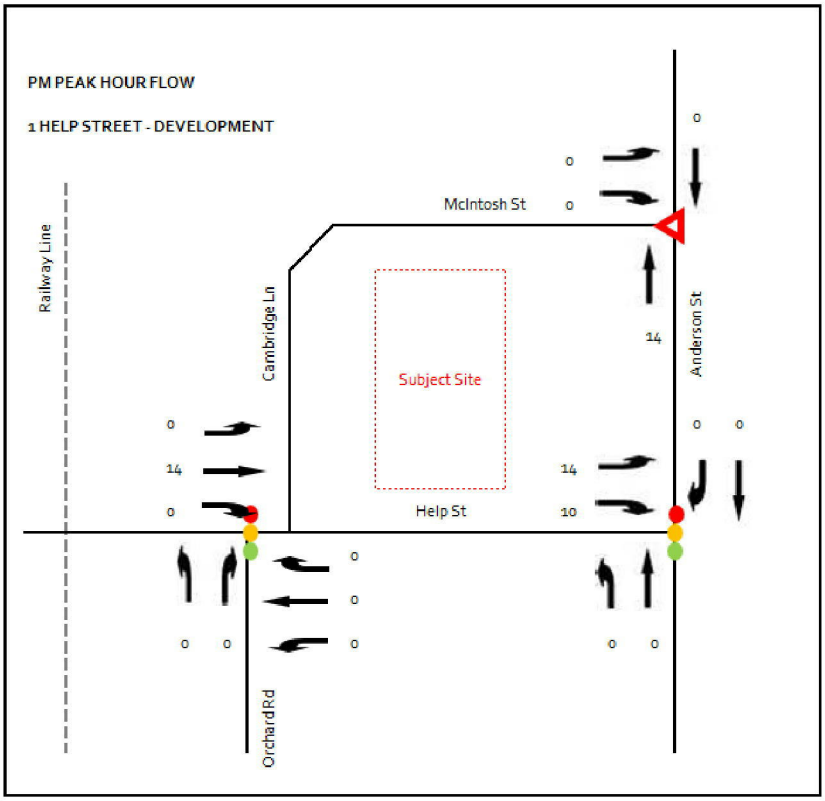
Appendix D

Traffic Volume Estimates

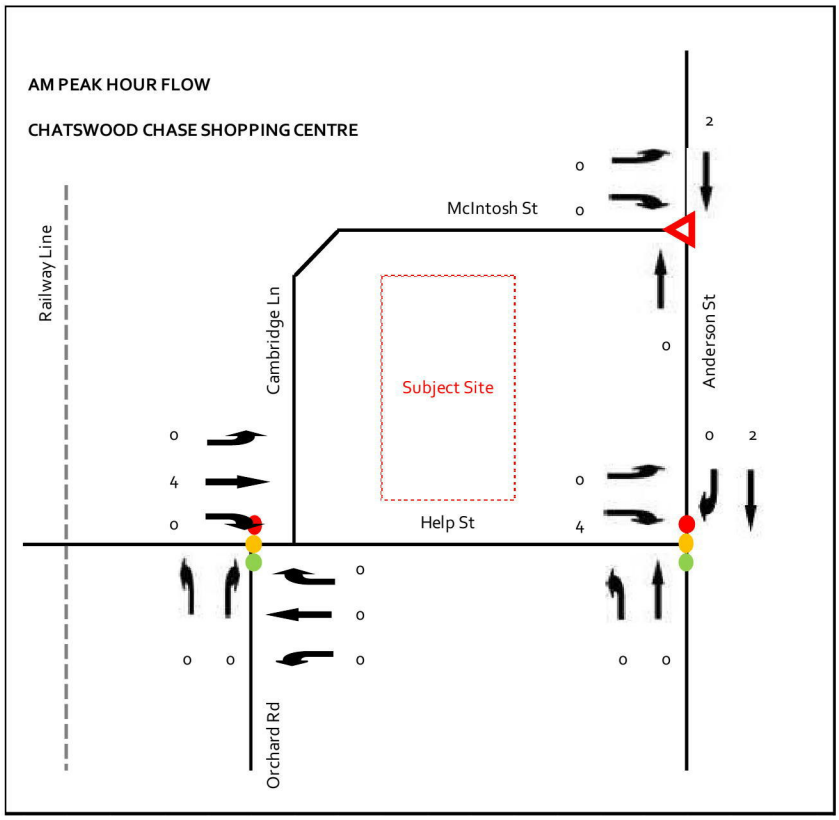
Appendix D1: 1 Help Street, Chatswood – AM Peak Hour Additional Traffic Volumes



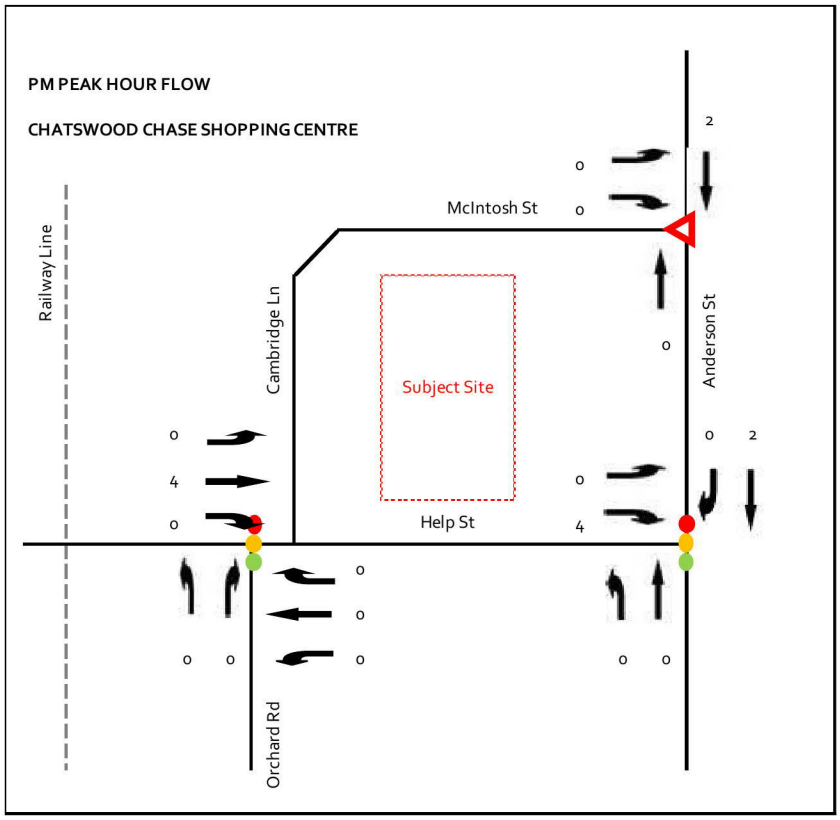
Appendix D2: 1 Help Street, Chatswood – PM Peak Hour Additional Traffic Volumes



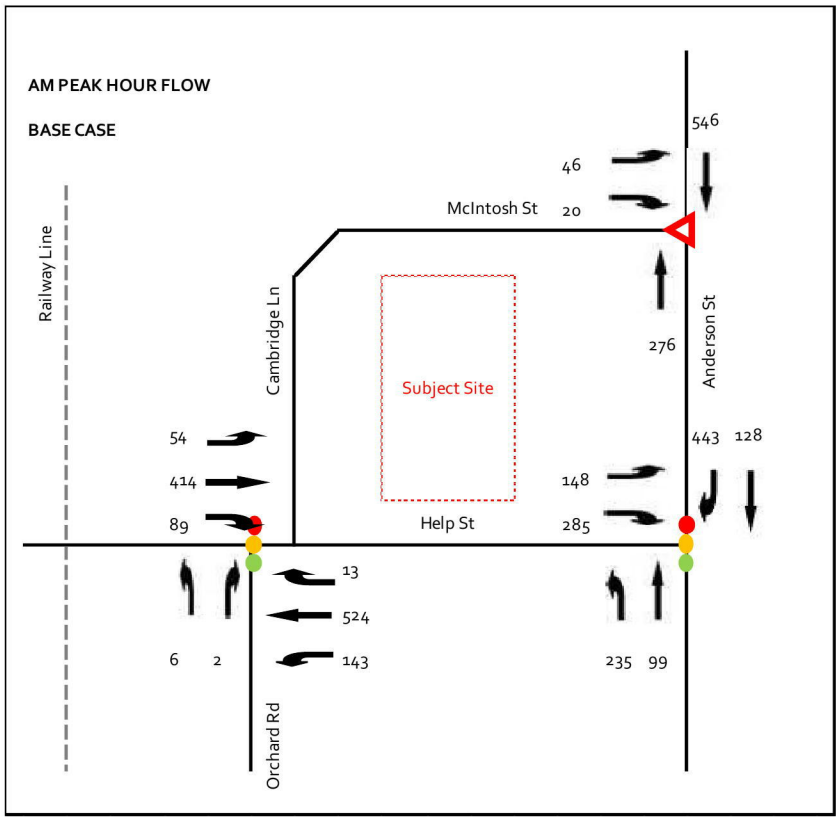
Appendix D3: Chatswood Chase Shopping Centre – AM Peak Hour Additional Traffic Volumes



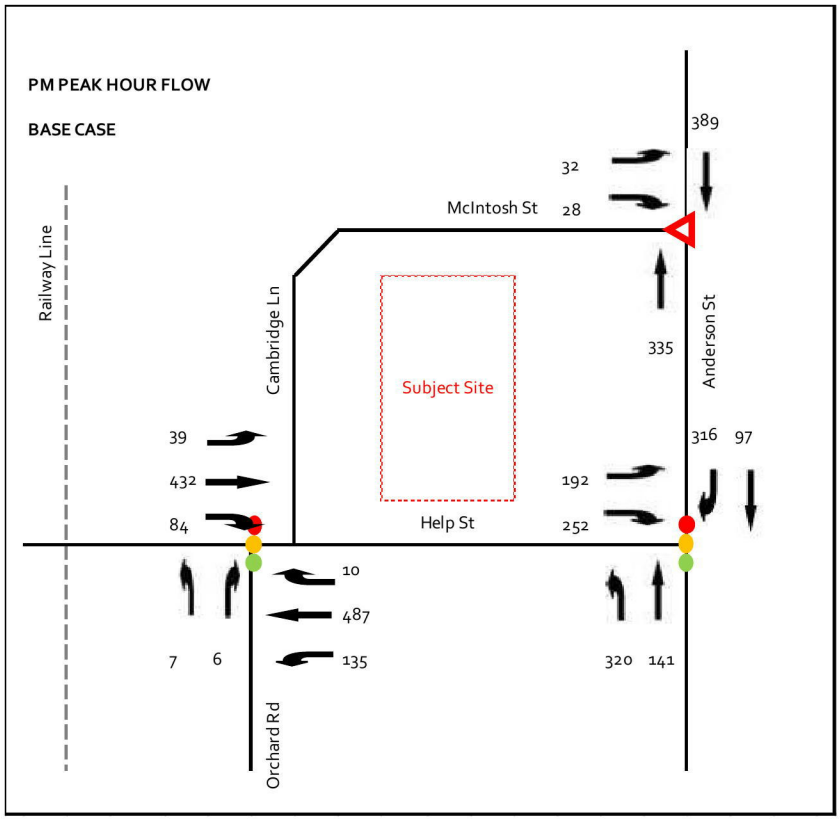
Appendix D4: Chatswood Chase Shopping Centre – PM Peak Hour Additional Traffic Volumes



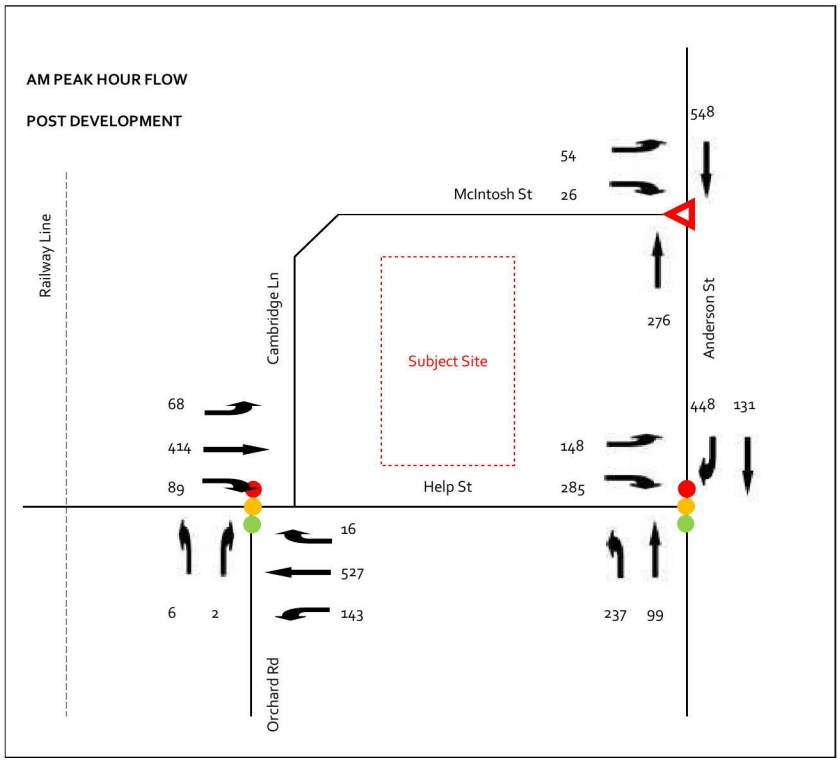
Appendix D5: Base Case AM Peak Hour Traffic Volumes



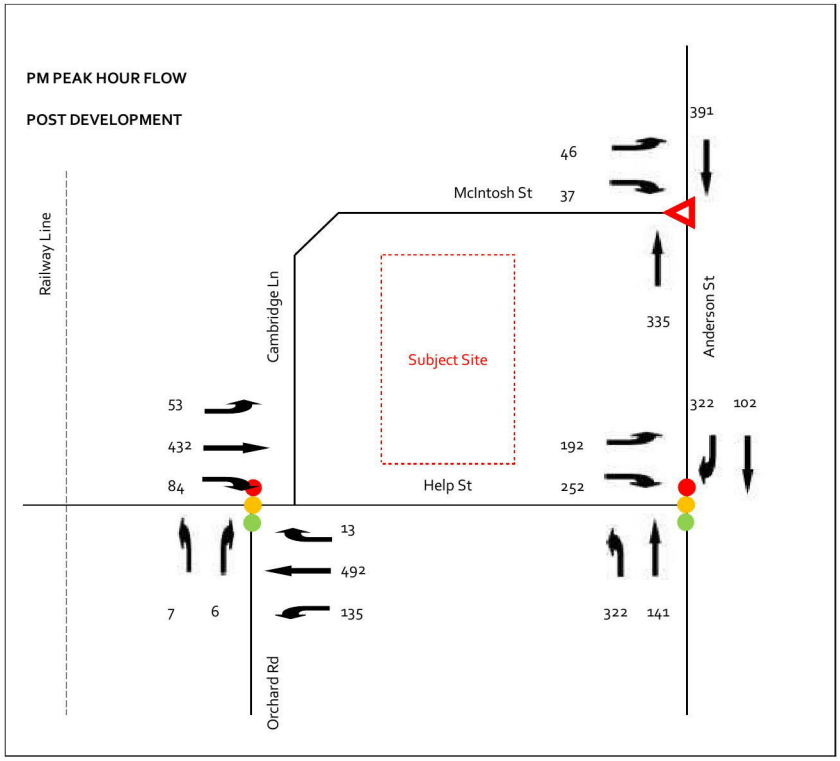
Appendix D6: Base Case PM Peak Hour Traffic Volumes



Appendix D7: Post Development AM Peak Hour Traffic Volumes



Appendix D8: Post Development PM Peak Hour Traffic Volumes



Appendix E

SIDRA INTERSECTION – Post Development

MOVEMENT SUMMARY

Site: 101 [AM Anderson Street / Help Street - Post Development]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
1	L2	249	13.5	0.736	41.4	LOS D	9.9	77.5	0.99	0.88	35.0
2	T1	104	16.2	0.295	30.1	LOS C	3.6	28.4	0.89	0.71	40.2
Approach		354	14.3	0.736	38.0	LOS D	9.9	77.5	0.96	0.83	36.4
North: Anderson Street											
8	T1	138	1.5	0.114	6.4	LOS A	2.1	15.2	0.43	0.35	54.3
9	R2	472	3.6	0.744	32.1	LOS C	17.1	123.1	0.94	0.88	38.5
Approach		609	3.1	0.744	26.3	LOS C	17.1	123.1	0.82	0.76	41.3
West: Help Street											
10	L2	156	0.0	0.129	11.2	LOS B	2.3	16.0	0.40	0.68	49.5
12	R2	300	3.9	0.738	39.4	LOS D	11.7	84.7	0.99	0.88	35.7
Approach		456	2.5	0.738	29.8	LOS C	11.7	84.7	0.79	0.81	39.5
All Vehicles		1419	5.7	0.744	30.3	LOS C	17.1	123.1	0.85	0.79	39.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped

P1	South Full Crossing	53	32.5	LOS D	0.1	0.1	0.90	0.90
P3	North Full Crossing	53	32.5	LOS D	0.1	0.1	0.90	0.90
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	33.1	LOS D			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [AM Anderson Street / Help Street - Base]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
1	L2	247	13.6	0.731	41.2	LOS D	9.8	76.7	0.99	0.88	35.0
2	T1	104	16.2	0.295	30.1	LOS C	3.6	28.4	0.89	0.71	40.2
Approach		352	14.4	0.731	37.9	LOS D	9.8	76.7	0.96	0.83	36.4
North: Anderson Street											
8	T1	135	1.6	0.112	6.4	LOS A	2.1	14.8	0.43	0.35	54.3
9	R2	466	3.6	0.736	31.7	LOS C	16.7	120.7	0.94	0.87	38.7
Approach		601	3.2	0.736	26.0	LOS C	16.7	120.7	0.82	0.76	41.3
West: Help Street											
10	L2	156	0.0	0.129	11.2	LOS B	2.3	16.0	0.40	0.68	49.5
12	R2	300	3.9	0.738	39.4	LOS D	11.7	84.7	0.99	0.88	35.7
Approach		456	2.5	0.738	29.8	LOS C	11.7	84.7	0.79	0.81	39.5
All Vehicles		1408	5.8	0.738	30.2	LOS C	16.7	120.7	0.85	0.79	39.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped

P1	South Full Crossing	53	32.5	LOS D	0.1	0.1	0.90	0.90
P3	North Full Crossing	53	32.5	LOS D	0.1	0.1	0.90	0.90
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	33.1	LOS D			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [AM Anderson Street / McIntosh Street - Base]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
2	T1	291	6.2	0.077	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		291	6.2	0.077	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Anderson Street											
8	T1	575	3.7	0.151	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		575	3.7	0.151	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: McIntosh Street											
10	L2	48	2.2	0.042	6.1	LOS A	0.2	1.1	0.24	0.56	52.8
12	R2	21	0.0	0.067	15.5	LOS C	0.2	1.6	0.72	0.89	46.4
Approach		69	1.5	0.067	9.0	LOS A	0.2	1.6	0.39	0.66	50.7
All Vehicles		935	4.3	0.151	0.7	NA	0.2	1.6	0.03	0.05	59.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Anderson Street / McIntosh Street - Post Development]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
2	T1	291	6.2	0.077	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		291	6.2	0.077	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Anderson Street											
8	T1	577	3.6	0.151	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		577	3.6	0.151	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: McIntosh Street											
10	L2	57	1.9	0.050	6.1	LOS A	0.2	1.3	0.24	0.56	52.8
12	R2	27	0.0	0.087	15.7	LOS C	0.3	2.1	0.73	0.89	46.3
Approach		84	1.3	0.087	9.2	LOS A	0.3	2.1	0.40	0.67	50.5
All Vehicles		952	4.2	0.151	0.8	NA	0.3	2.1	0.04	0.06	59.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [AM Help Street / Orchard Road - Base]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Orchard Road											
1	L2	6	66.7	0.074	38.6	LOS D	0.3	3.8	0.92	0.67	35.1
3	R2	2	100.0	0.074	38.4	LOS D	0.3	3.8	0.92	0.67	35.3
Approach		8	75.0	0.074	38.5	LOS D	0.3	3.8	0.92	0.67	35.1
East: Help Street											
4	L2	151	25.2	0.566	29.6	LOS C	10.9	84.2	0.87	0.78	40.6
5	T1	552	2.1	0.566	23.7	LOS C	11.9	84.8	0.87	0.76	42.8
Approach		702	7.0	0.566	24.9	LOS C	11.9	84.8	0.87	0.77	42.3
West: Help Street											
11	T1	493	1.7	0.378	21.8	LOS C	7.4	52.3	0.81	0.68	44.1
12	R2	94	9.0	0.537	45.1	LOS D	3.7	28.1	0.99	0.78	33.7
Approach		586	2.9	0.537	25.6	LOS C	7.4	52.3	0.84	0.69	42.0
All Vehicles		1297	5.6	0.566	25.3	LOS C	11.9	84.8	0.86	0.73	42.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped

P1	South Full Crossing	53	21.1	LOS C	0.1	0.1	0.73	0.73
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	29.9	LOS C			0.86	0.86

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [AM Help Street / Orchard Road - Post Development]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Orchard Road											
1	L2	6	66.7	0.074	38.6	LOS D	0.3	3.8	0.92	0.67	35.1
3	R2	2	100.0	0.074	38.4	LOS D	0.3	3.8	0.92	0.67	35.3
Approach		8	75.0	0.074	38.5	LOS D	0.3	3.8	0.92	0.67	35.1
East: Help Street											
4	L2	151	25.2	0.569	29.6	LOS C	10.9	84.6	0.87	0.78	40.6
5	T1	555	2.1	0.569	23.7	LOS C	12.0	85.2	0.87	0.76	42.8
Approach		705	7.0	0.569	25.0	LOS C	12.0	85.2	0.87	0.77	42.3
West: Help Street											
11	T1	512	1.6	0.393	22.0	LOS C	7.7	54.6	0.81	0.68	44.0
12	R2	94	9.0	0.537	45.1	LOS D	3.7	28.1	0.99	0.78	33.7
Approach		605	2.8	0.537	25.6	LOS C	7.7	54.6	0.84	0.70	42.0
All Vehicles		1319	5.5	0.569	25.3	LOS C	12.0	85.2	0.86	0.73	42.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped

P1	South Full Crossing	53	21.1	LOS C	0.1	0.1	0.73	0.73
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	29.9	LOS C			0.86	0.86

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [PM Anderson Street / Help Street - Base]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
1	L2	337	8.4	0.669	33.6	LOS C	12.0	89.8	0.94	0.84	37.8
2	T1	148	9.9	0.282	24.1	LOS C	4.6	34.6	0.82	0.66	43.0
Approach		485	8.9	0.669	30.7	LOS C	12.0	89.8	0.90	0.79	39.3
North: Anderson Street											
8	T1	102	0.0	0.082	5.9	LOS A	1.5	10.5	0.40	0.32	54.7
9	R2	333	5.1	0.675	34.5	LOS C	12.0	87.4	0.95	0.85	37.6
Approach		435	3.9	0.675	27.7	LOS C	12.0	87.4	0.82	0.72	40.6
West: Help Street											
10	L2	202	0.0	0.193	14.7	LOS B	3.8	26.9	0.52	0.71	47.3
12	R2	265	3.6	0.689	38.8	LOS D	10.1	72.8	0.98	0.86	36.0
Approach		467	2.0	0.689	28.4	LOS C	10.1	72.8	0.78	0.79	40.1
All Vehicles		1387	5.0	0.689	29.0	LOS C	12.0	89.8	0.83	0.77	40.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped

P1	South Full Crossing	53	33.4	LOS D	0.1	0.1	0.91	0.91
P3	North Full Crossing	53	33.4	LOS D	0.1	0.1	0.91	0.91
P4	West Full Crossing	53	28.1	LOS C	0.1	0.1	0.84	0.84
All Pedestrians		158	31.6	LOS D			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [PM Anderson Street / Help Street - Post Development]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
1	L2	339	8.4	0.673	33.7	LOS C	12.1	90.6	0.94	0.85	37.8
2	T1	148	9.9	0.282	24.1	LOS C	4.6	34.6	0.82	0.66	43.0
Approach		487	8.9	0.673	30.8	LOS C	12.1	90.6	0.90	0.79	39.3
North: Anderson Street											
8	T1	108	0.0	0.087	5.9	LOS A	1.6	11.2	0.40	0.33	54.7
9	R2	341	4.9	0.691	34.9	LOS C	12.4	90.6	0.95	0.86	37.4
Approach		449	3.7	0.691	27.9	LOS C	12.4	90.6	0.82	0.73	40.5
West: Help Street											
10	L2	202	0.0	0.193	14.7	LOS B	3.8	26.9	0.52	0.71	47.3
12	R2	265	3.6	0.689	38.8	LOS D	10.1	72.8	0.98	0.86	36.0
Approach		467	2.0	0.689	28.4	LOS C	10.1	72.8	0.78	0.79	40.1
All Vehicles		1404	4.9	0.691	29.1	LOS C	12.4	90.6	0.84	0.77	39.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped

P1	South Full Crossing	53	33.4	LOS D	0.1	0.1	0.91	0.91
P3	North Full Crossing	53	33.4	LOS D	0.1	0.1	0.91	0.91
P4	West Full Crossing	53	28.1	LOS C	0.1	0.1	0.84	0.84
All Pedestrians		158	31.6	LOS D			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [PM Anderson Street / McIntosh Street - Base]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
2	T1	353	4.2	0.093	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		353	4.2	0.093	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Anderson Street											
8	T1	409	3.9	0.108	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		409	3.9	0.108	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: McIntosh Street											
10	L2	34	0.0	0.030	6.2	LOS A	0.1	0.7	0.27	0.56	52.8
12	R2	29	0.0	0.077	13.3	LOS B	0.3	1.9	0.67	0.87	47.7
Approach		63	0.0	0.077	9.5	LOS A	0.3	1.9	0.45	0.70	50.3
All Vehicles		825	3.7	0.108	0.7	NA	0.3	1.9	0.03	0.05	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Anderson Street / McIntosh Street - Post Development]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Anderson Street											
2	T1	353	4.2	0.093	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		353	4.2	0.093	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Anderson Street											
8	T1	412	3.8	0.108	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		412	3.8	0.108	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: McIntosh Street											
10	L2	48	0.0	0.043	6.2	LOS A	0.2	1.1	0.27	0.57	52.8
12	R2	39	0.0	0.102	13.5	LOS B	0.4	2.5	0.67	0.87	47.6
Approach		87	0.0	0.102	9.5	LOS A	0.4	2.5	0.45	0.70	50.4
All Vehicles		852	3.6	0.108	1.0	NA	0.4	2.5	0.05	0.07	58.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [PM Help Street / Orchard Road - Base]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Orchard Road											
1	L2	7	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.5
3	R2	6	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.4
Approach		14	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.5
East: Help Street											
4	L2	142	25.9	0.475	26.5	LOS C	9.3	72.4	0.81	0.74	42.0
5	T1	513	1.4	0.475	20.6	LOS C	10.3	72.8	0.81	0.71	44.4
Approach		655	6.8	0.475	21.9	LOS C	10.3	72.8	0.81	0.72	43.9
West: Help Street											
11	T1	496	0.6	0.340	19.4	LOS B	7.0	49.0	0.76	0.64	45.5
12	R2	88	2.4	0.484	44.6	LOS D	3.5	24.8	0.99	0.77	33.9
Approach		584	0.9	0.484	23.2	LOS C	7.0	49.0	0.79	0.66	43.2
All Vehicles		1253	5.0	0.484	22.7	LOS C	10.3	72.8	0.80	0.69	43.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped

P1	South Full Crossing	53	18.9	LOS B	0.1	0.1	0.69	0.69
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	29.2	LOS C			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [PM Help Street / Orchard Road - Post Development]

New Site
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Orchard Road											
1	L2	7	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.5
3	R2	6	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.4
Approach		14	100.0	0.174	41.1	LOS D	0.5	6.9	0.96	0.69	34.5
East: Help Street											
4	L2	142	25.9	0.479	26.6	LOS C	9.4	73.2	0.81	0.74	42.0
5	T1	519	1.4	0.479	20.7	LOS C	10.4	73.6	0.81	0.71	44.4
Approach		661	6.7	0.479	21.9	LOS C	10.4	73.6	0.81	0.72	43.8
West: Help Street											
11	T1	512	0.6	0.351	19.5	LOS B	7.2	50.8	0.76	0.64	45.4
12	R2	88	2.4	0.484	44.6	LOS D	3.5	24.8	0.99	0.77	33.9
Approach		600	0.9	0.484	23.2	LOS C	7.2	50.8	0.80	0.66	43.3
All Vehicles		1275	5.0	0.484	22.7	LOS C	10.4	73.6	0.81	0.69	43.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	18.9	LOS B	0.1	0.1	0.69	0.69
P2	East Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
P4	West Full Crossing	53	34.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		158	29.2	LOS C			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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Appendix D
Market Appraisal

3-5 HELP STREET, CHATSWOOD

MARKET APPRAISAL AND FEASIBILITY ANALYSIS

H&J VAKILI
AUGUST 2017

aecgroupltd.com

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EXECUTIVE SUMMARY

BACKGROUND AND OVERVIEW

AEC Group has been engaged by H&J Vakili to undertake a Market Appraisal and Feasibility Analysis (the 'Study') to support a Planning Proposal for a mixed-use development on 3-5 Help Street, Chatswood (referred to as the 'Subject Property' and the 'Site' interchangeably).

The Site is approximately 2,290sqm in size and is currently improved with two freestanding strata-titled residential unit complexes - 3 Help Street improved with a three (3) storey brick unit block comprising 18 apartments while 5 Help Street is improved with a two (2) storey brick unit block comprising 35 apartments.

An indicative development scheme has been developed by Kann Finch Architects to redevelop the Site into a 31 storey mixed use development, proposing 190 units and 2,296sqm of commercial floorspace across six levels.

The proposed development is premised on the provision of additional density and maximum building height with an FSR of 8.82:1 and a maximum building height circa 100m. This represents an increase from the existing density and height controls at FSR 4:1 and 20m-25m, respectively.

PURPOSE OF THE STUDY

The Study seeks to address several key objectives with regard to the proposed development of the Site, specifically:

- Determine the nature of demand from commercial occupiers within Chatswood and ascertain the type of commercial floorspace that would be sustainable on the Site.
- Understand if development of the Site under existing planning controls is feasible given the high cost of consolidating the two residential strata buildings.
- Should development under existing planning controls not be feasible, assess the quantum of additional density required for development on the Site to be commercially viable.

The Study also analyses the Proposal (and corresponding density) against the minimum density that would be required to progress a feasible development on the Site.

KEY FINDINGS

Findings from the property market analysis enable an understanding of the type and quantum of demand that would be received for a mixed-use development on the Site, in addition to the likely price points that could be achieved.

- **Buyer Profile**
  Enquiries with selling and marketing agents operating within Chatswood a strong mix of owner occupiers and investors remain active into 2017 with a large proportion of the market being Australian-Chinese residents and Chinese internationals in addition to a strong downsizer contingent.
- **Take-Up Rates**
  Swift take-up rates are continuing to be observed within Chatswood and are amongst the strongest within metropolitan Sydney. Even developments on the periphery of the CBD are keenly sought as observed with the recent sales at 666 Pacific Highway.
- **Potential Price Points**
  Most recent off-the-plan activity observed indicates units are predominantly achieving between $16,000/sqm and $18,000/sqm of internal floor area and even up to $20,000/sqm of floor area in some recent projects.
- **Demand for Commercial Floorspace in a Mixed-Use Setting**
  Commercial office vacancy levels have fallen over the 6 months to July 2017 with strong net absorption rates observed. Extensive discussions with local commercial letting agents indicates that demand for small commercial suites (<300sqm) is particularly strong, as evidenced by recent sales evidence.

FEASIBILITY ANALYSIS

Existing Planning Controls

To test the viability of a mixed-use development on the Site, findings from the market analysis were applied in a feasibility analysis to understand if development under the existing planning controls is feasible and, if not, to ascertain the required amount of FSR needed to make development on the Site a commercial proposition. The relationship between residential and non-residential floorspace and their impact on viability was also examined in this process.

Feasibility testing of the Site was undertaken in the following three scenarios:

- **Scenario 1** - feasibility of developing the Site under existing planning controls (based on FSR 4:1 with minimum non-residential FSR 2:1).
- **Scenario 2** - if Scenario 1 is not feasible, iteratively test the quantum of additional residential FSR required for feasible development (subject to minimum non-residential FSR 2:1).
- **Scenario 3** - if the minimum non-residential requirement was lowered to FSR 1:1, iteratively test the additional residential FSR required for feasible development.

The feasibility modelling demonstrates that development on the Site under the existing planning controls is not feasible. Furthermore, there is an inverse relationship between the FSR required for feasible development and the minimum non-residential FSR required. The results of Scenario 2 indicate the minimum non-residential requirement of FSR 2:1 requires a total FSR of 7.4:1 for feasible development. If, however the non-residential component required is reduced to FSR 1:1, a total FSR of 6.5:1 is required for feasible development.

The Proposal

The Proposal responds to market need and requirements by seeking to provide a range of smaller sized office suites across multiple levels in conjunction with ground floor retail and upper residential levels. Market analysis demonstrates strong demand for smaller, non-traditional office accommodation as demand from serviced-orientated commercial occupiers grows in tandem with the Chatswood CBD's expanding population. Accordingly, the Proposal is a direct market response to the growth in demand from non-traditional commercial occupiers.

Feasibility testing indicates development under existing planning controls is not viable given the cost of consolidating the residential strata complexes. The minimum non-residential FSR provision also has direct implications on the density required in order for development to become commercially viable.

The Proposal seeks of FSR 8.4:1 which is slightly greater than the threshold required (assessed at FSR 6.5:1).

An informal enquiry to Council indicates that for proposals that exceed permissible densities under the LEP, subject to site environmental capacity Council will require a contribution to public benefit calculated at 45% of the (land) value uplift. A valuation of the Site (under the existing planning controls and per the proposed development) will be required to calculate the land value uplift prior to applying a rate of 45% to calculate the contribution payable.

TABLE OF CONTENTS

1. INTRODUCTION

1.1 BACKGROUND

AEC Group has been engaged by H&J Vakili to undertake a Market Appraisal and Feasibility Analysis to support a Planning Proposal for a mixed-use development on 3-5 Help Street, Chatswood (referred to collectively as 'the Subject Property' and 'the Site' interchangeably).

The Site is approximately 2,290sqm in size and is currently improved with two freestanding strata-titled residential unit complexes:

- 3 Help Street improved with a three (3) storey brick unit block comprising 18 apartments.
- 5 Help Street improved with a two (2) storey brick unit block comprising 35 apartments.

An indicative development scheme has been developed by Kann Finch Architects to redevelop the Site into a 31 storey mixed use development, proposing 190 units and 2,296sqm of commercial floorspace on Levels 1-6. The following indicative yield is proposed:

Table 1.1: Proposed Units and Mix

Level	Studios	1 bedroom	1 bedroom + study	2 bedroom	3 bedroom	Total
Upper Ground	-	-	1	3	-	4
1	-	4	1	1	-	6
2	1	10	2	2	-	15
3	1	10	2	2	-	15
4	1	10	2	2	-	15
5	1	10	2	2	-	15
6	1	10	2	2	-	15
7	-	-	-	-	3	3
8-24	-	-	-	85	-	85
25-30	-	-	-	12	3	15
31	-	-	-	-	2	2
Total	**5**	**54**	**12**	**111**	**8**	**190**
Proportion	**2.6%**	**34.8%**		**58.4%**	**4.2%**	**100.0%**

Source: Kann Finch Architects

The proposed development scheme as identified above in Table 1.1 is premised on the permissibility of additional density and building height to an FSR of 8.42:1 and a maximum building height circa 100m. This is greater than the existing density and height controls under the Willoughby Local Environmental Plan (2012). The development scheme also envisages a smaller component of non-residential floorspace than that required under existing planning controls.

1.2 PURPOSE OF THE STUDY

The objectives of the Study are several-fold:

- To understand the nature of demand from commercial occupiers, and consequently the type of commercial floorspace that would be sustainable on the Site.
- To understand if development under the existing planning controls is a feasible proposition for the Site, particularly considering the cost to consolidate the Site for development.
- If development under existing planning framework is not a commercially feasible proposition, assess the quantum of additional density required for development to be feasible on the Site.

Additionally, the Study compares that which is proposed for development (and corresponding density) against the minimum density required for development to be commercially feasible.

1.3 METHODOLOGY AND APPROACH

In order to fulfil the requirements of this brief, AEC completed the following tasks:

- Property Market Research:
    - A review of the residential property market in Chatswood, including major residential developments (ongoing and proposed) to understand the nature of housing demand and supply.
    - Investigation into the nature and extent of the take-up of units in existing and proposed developments to understand the nature of market demand, purchaser profiles, their requirements and current price points.
    - Analysis of recent development site sales to understand the level of market demand and appetite for development opportunities within Chatswood.
    - Investigate the success or otherwise of ground floor retail/commercial suites provided in comparable mixed use developments. Observe the pre-conditions required for successful and sustainable provision of non-residential uses.
    - Review commercial space in the immediate vicinity of the Site, particularly market take-up and desirability.
- Feasibility Analysis:
    - Feasibility modelling incorporating the results from the property market research is undertaken to test the existing planning controls and those envisaged in the proposed development scheme.

The findings of the Study are ultimately to investigate if and how the proposed development scheme responds to market expectations and commercial realities of development.

1.4 ASSUMPTIONS AND LIMITATIONS

In the absence of detailed technical studies (cost planning, traffic, geotechnical, etc), development costs assumed are ‘generic’ and based upon industry benchmarks. Various other feasibility modelling assumptions are detailed in the body of the report.

Should any of our adopted assumptions subsequently be found to be inaccurate, we reserve the right to review and amend the findings.

2. THE PROPOSAL

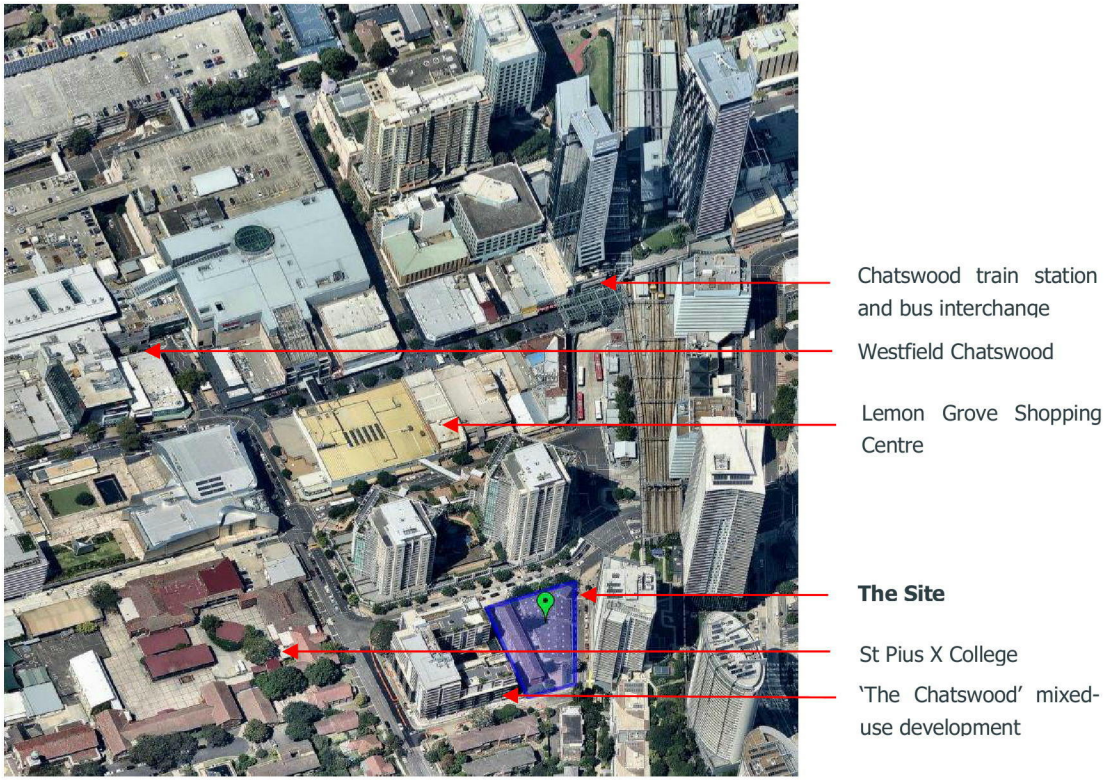
2.1 LOCATION CONTEXT

The Site is located on Help Street within the Central Business District (CBD) of Chatswood, approximately 10km north of the Sydney CBD. Chatswood is a major retail and commercial centre of Northern Sydney and is a key employment hub. Chatswood is also a densely populated residential precinct and has a rich multicultural diversity.

The Site is bounded by McIntosh Street to the north, Cambridge Lane to the west, Help Street in the south and a mixed use development site to the east nearing completion (12 storey mixed use flat building). Accordingly, the Site has three street frontages with a 48m southern frontage along Help Street, a 72m frontage to Cambridge Lane and a 26m northern frontage to McIntosh Street.

The Site is well-positioned within the Chatswood CBD; the Chatswood train station and bus interchange, Chatswood Chase Shopping Centre, Westfield Shopping Centre and Victoria Avenue retail strip located south of the Site within a 350m radius. The Pacific Highway is located approximately 550m west of the Site, providing access to the North Shore, Central Coast, Hunter Region and Newcastle. The Gore Hill Freeway and M2 Hills Motorway are accessible approximately 2km south of the Subject Property providing access to the Sydney CBD and Sydney's north western suburbs.

Figure 2.1: Location Map



Source: Nearmps

The immediate surrounding area is dominated by high-rise commercial and mixed-use buildings ranging from 12 to 30 storeys. The Help Street and Orchard Road intersection is identified as high flow traffic area given it provides bus access to the Chatswood bus interchange and Pacific Highway to the north.

A recently completed mixed-use development site comprising 1 Help Street, 26-36 Anderson Street and 2A McIntosh Street ('The Chatswood') borders the eastern boundary of the Site. The mixed-use development comprises a U-shaped building ranging from 7 to 12 storeys and incorporates 1,339sqm of ground floor commercial floorspace and 156 apartments. The building was occupied in June 2017.

2.2 EXISTING BUILDINGS

The Site is comprised of two, low-rise residential unit blocks ranging from 2 to 3 storeys. Both buildings are strata titled with the majority of apartments in both buildings understood to be currently tenanted.

3 Help Street comprises a three storey "walk-up" textured red brick unit complex (construction circa 1960s) comprising a total of 18 apartments. The building is rectangular and narrow as a result of the shape of the allotment with building dimensions of 8m by 51m (approximate).

Figure 2.2: Location Map and Photograph, 3 Help Street

Source: Google Maps, Sixmaps

5 Help Street comprises a modern two storey (constructed circa 1996) unit complex across two freestanding low-rise brick buildings, comprising a total of 35 apartments. Owing to the irregular shape of the block, both buildings are positioned away from the narrow northernmost end of the lot which is used as an at-grade visitor carpark.

Figure 2.3: Location Map and Photograph, 5 Help Street

Source: Realestate.com.au, Sixmaps

2.3 PLANNING CONTEXT

2.3.1 A Plan for Growing Sydney (2014)

A Plan for Growing Sydney (NSW DPE, 2014) (the Plan) sets the strategic direction for Sydney towards 2031. The overarching vision is that by 2031, Sydney will be "a strong global city, a great place to live". The Plan is built around four key goals:

- A competitive economy with world-class services and transport.
- A city of housing choice with homes that meet our needs and lifestyles.
- A great place to live with communities that are strong, health and well connected.
- A sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources.

Goal 1: A Competitive Economy with World-class Services and Transport

Of particular relevance to this Report is *Goal 1: A competitive economy with world-class services and transport*.

One of the associated directions – *Direction 1.6: Expand the Global Economic Corridor* states that by 2030, there will be demand for around 190,000 new stand-alone office jobs: around 75 per cent of these will likely seek to locate in Sydney's 10 major office markets. Many of these jobs will be outside Sydney CBD and North Sydney, in the eight suburban office markets of Chatswood, Macquarie Park, Norwest, Parramatta, Rhodes, St Leonards, Sydney Olympic Park and South Sydney, situated along the Global Economic Corridor.

Another of the associated directions – *Direction 1.7: Grow Strategic Centres* by providing more jobs closer to home states that removing "pinch points" in access to strategic centres and transport gateways improves access to jobs and services.

The public transport network connecting these centres provides many people with direct access to a range of job locations, as well as access to education facilities, health centres and hospitals, and sporting, cultural and entertainment facilities. Delivering more housing through targeted urban renewal around centres on the transport network will provide more homes closer to jobs and boost the productivity of the city.

2.3.2 Draft North District Plan (2016)

Chatswood is located in the North District (formerly the North subregion) and is identified as Strategic Centre in accordance with the Plan. One of the key priorities for Chatswood Strategic Centre in the Plan is to "work with Council to provide capacity for additional mixed-use development in Chatswood including offices, retail, services and housing".

2.3.3 Willoughby Local Environment Plan (2012)

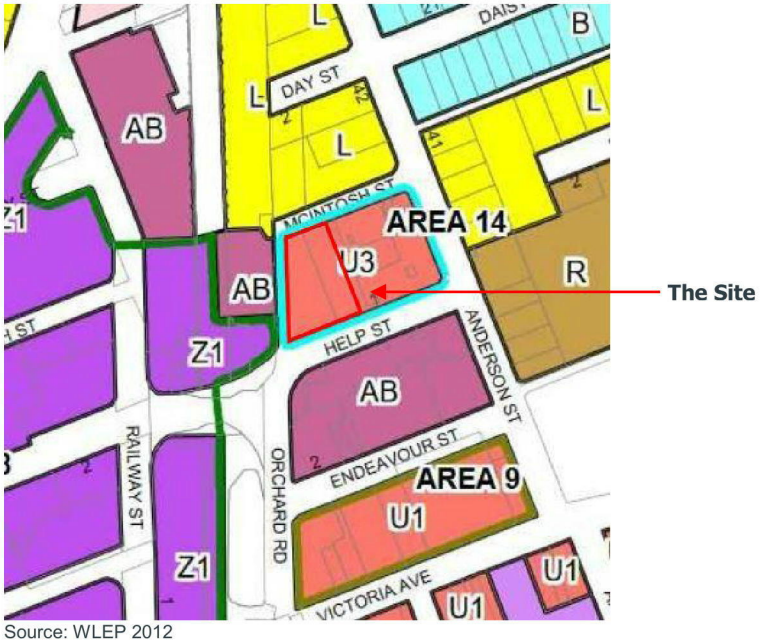
The Willoughby Local Environment Plan 2012 (WLEP 2012) is the principal planning instrument which guides land use and development in the Willoughby local government area (LGA).

Under the WLEP 2012, the Site is designated B4 Mixed Use subject to FSR 2.7:1 with maximum building heights of 25m (northern portion of Site) and 20m (southern portion of Site).

The Site is located within a precinct identified as Area 14 with additional floorspace up to FSR 4:1 provided if site consolidation can yield a minimum site area of 2,200sqm. Given the Site exceeds the minimum lot size threshold, the bonus FSR 4:1 is considered applicable. The bonus FSR 4:1 is further premised on any shop top housing developed on the Site being restricted to a maximum FSR 2:1.

Furthermore, cl. 6.8 of the WLEP 2012 prescribes that any residential development on the Site must incorporate a minimum of 4% of total GFA as affordable housing in accordance with the Willoughby Affordable Housing policy. This can be delivered as affordable housing units or as a monetary contribution.

Figure 2.4: FSR Map



Source: WLEP 2012

2.3.4 Willoughby Development Control Plan (2006)

The Willoughby Development Control Plan 2006 (referred to as the DCP) sets out development controls to guide the siting, design and assessment of new development within identified local centres across the LGA. The DCP establishes a framework for development in the Willoughby LGA and demonstrates the preferred ways in which objectives are to be achieved for improving site and building design.

The objectives and controls outlined in Part E of the DCP apply to the development of retail, business and mixed-use buildings in the B4 Mixed Use zone. Specific controls of relevance to the Site and this Report include:

- Provision of ground floor retail and/or commercial space to maintain the commercial character and retain activity at street level.
- No more than 30% of the street frontage is to be used for vehicular and pedestrian access to lower and upper levels. A minimum of 60% gross floor space at street level is to be used for retail or business premises.
- Views from neighbouring dwellings are not unduly compromised.
- Prominent corner sites (such as the Site) can incorporate a partly additional storey or parapet extension to serve as gateway identifier.
- Private open space requirements (sqm) per shop-top housing dwelling.

Under the DCP, the Site is identified as within the Chatswood City Centre Precinct. The strategic objectives on potential future land uses within the Chatswood City Centre are documented in the *Chatswood City Centre Vision and Strategic Plan 2008*. Whilst a review of the *Strategic Plan 2008* is beyond the scope of this report, the identification of sites for high-density residential development on the fringes of the Chatswood City Centre, such as the Site, is a key land use objective espoused within the *Strategic Plan 2008*.

2.4 PROPOSED DEVELOPMENT

The Site is located within an area zoned B4 Mixed Use and is permitted to FSR 4:1, subject to requirements per the provisions of the WLEP 2012.

The proposed development seeks to redevelop the two existing low-rise strata unit complexes in a consolidated mixed-use development comprising 390sqm of ground floor retail floorspace, 1,906sqm of commercial floorspace and 183 residential apartments.

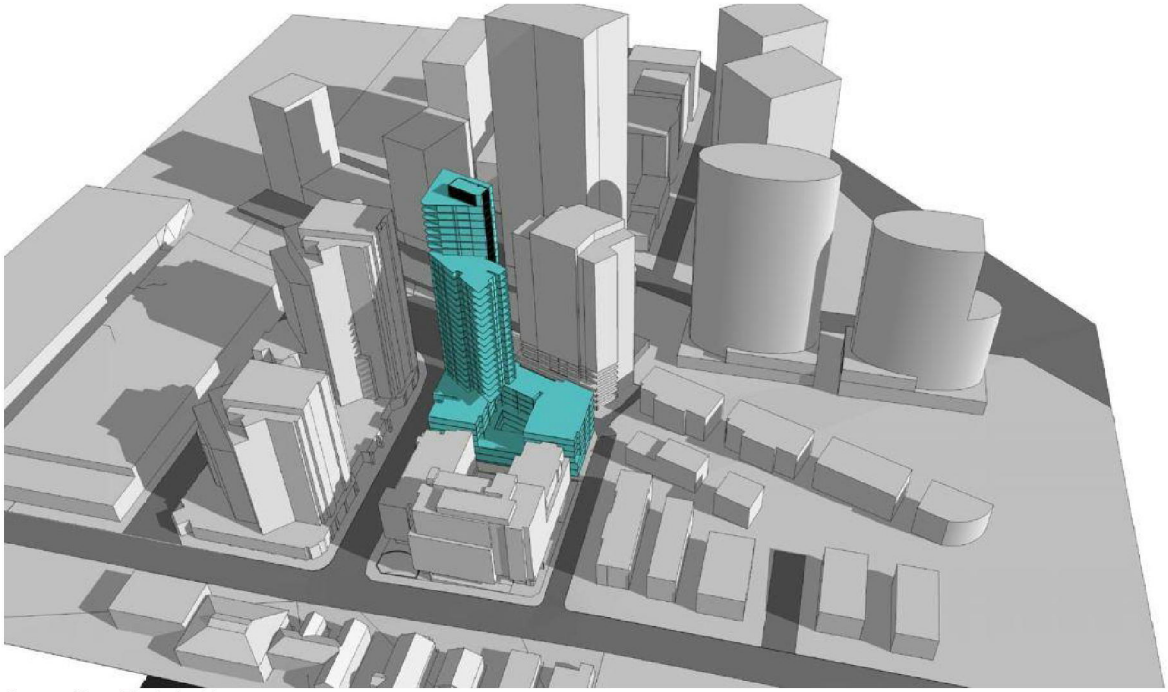
The proposed development envisages a podium and contiguous six storey building across the Site with a 26 storey and 31 storey residential towers located above on the south-eastern corner.

The proposed development requires the following amendments to the WLEP 2012:

- Density controls to be increased from FSR 4:1 to FSR 8.42:1, comprised commercial FSR 1:1 and a residential FSR of 7.42:1.
- Concession in the requirement for non-residential floorspace to allow for proposed commercial FSR 1:1.
- Maximum building heights to be lifted from 20m-25m to circa 100m.

The proposed development aligns with the objectives of the B4 Mixed Use zoning and with the vision for greater mixed-use densification along the area of Help Street.

Figure 2.5: Massing Diagram of Proposed Development



Source: Kann Finch Architects

3. MARKET APPRAISAL

3.1 GENERAL MARKET CONDITIONS

The strength of the Chatswood residential market is widely commented upon. The suburb has emerged as a focal point of high-density development driven by exceptional sale and take-up rates of off-the-plan product in recent years. Market activity is dominated by high density mixed use and residential development compared to any other land use. This is trend is not unique to Chatswood but is observed across many inner ring suburbs of Sydney.

Chatswood benefits from strong access owing to public transportation links and proximity to several major arterial roads. Existing road and rail connections to the Sydney CBD are strong and will be further strengthened following the completion of Sydney Metro Northwest.

It is an undisputed fact that dwelling completions over the last decade fell well below the number needed to meet underlying demand. This resulted in rapidly rising house and rental prices as competition grew between purchasers and renters.

Developers (local and overseas alike) responded to the call for more housing by assembling sites in myriad locations. Locations in and around transport nodes are obvious candidates targeted for site assembly. Additionally, commercial buildings in appropriately zoned locations (i.e. B4 Mixed Use) in a variety of CBDs and established centres with excellent transport connections are increasingly being acquired for mixed use residential development (e.g. St Leonards, Burwood, Parramatta, etc.).

The mixed use and residential zones in Chatswood are no exception. Benefitting from strong transport links, various sites have been acquired and progressed for mixed use residential development in recent times. Recent acquisitions of prime commercial office buildings within the Chatswood CBD are understood to be long-term residential plays given the lack of available development sites.

Chatswood serves as a major employment hub within Sydney with a commercial CBD amongst the largest in the North Shore office market. Additionally, the suburb serves as a major retail destination for the larger North Shore region given the location of two major regional shopping centres within the city centre, i.e. Chatswood Chase and Westfield Chatswood.

Furthermore, excellent exposure and accessibility afforded by a ‘Pacific Highway location’ sees many businesses seeking to capitalise on well exposed sites along Pacific Highway. Large format retail/bulky goods centres typically flourish in extremely high profile, main road locations, receiving excellent exposure to passing traffic and are easily accessible from both a local and regional perspective.

3.2 TRENDS AND DRIVERS

The Chatswood residential market continues marching from strength to strength despite the slowdown in some metropolitan apartment markets observed since Q1 2017. Demand for high-density product is acutely observed within Chatswood with local selling agents commenting there remains little sign of a tapering over the short to medium term.

A combination of compounding factors has brought on the success of the Chatswood apartment market. Strong public transport and road access are critical components which will be further strengthened through the delivery of Sydney Metro Northwest. Chatswood is a major retail hub within metropolitan Sydney and serves as a significant attractor to both residents and the wider North Shore. The local Chinese-Australian population has grown significantly since the 1980s with the suburb taking on a distinctly Asian character through local restaurants, grocers, retailers and community centres.

Recognising the above factors, Chatswood has been well-placed to benefit from the recent Sydney property boom. Understanding the wider drivers of demand also at play across metropolitan Sydney are also important, as detailed below:

Benefits of High-rise Living

Over the past decade, the transition to high-rise living has been acutely observed across many parts of Sydney. A variety of factors have contributed to this trend; rising house prices creating affordability issues, lifestyle preferences for low maintenance property with high amenity and a shrinking average family size have all resulted in the rising popularity of high-density product. These influences transcend both renters and owner occupiers alike, and as such have driven interest from both the owner occupier and investor markets.

The emergence of residential towers across the Chatswood skyline will further increase over the coming 5-10 years as more projects come online. This has resulted in many marginal commercial assets to be acquired by overseas and local investors for long-term residential play. Change in house price growth may cause developers to delay or strategically time delivery of new product (considering commercial lease expiries) but is unlikely to reverse the strong residential development trend in Chatswood.

Overseas Purchaser Activity

Foreign investment in the Australian property market has been the focus of intensified political debate in recent times. While the impact of foreign investment on residential prices is to a degree overplayed, foreign buyers do form a pivotal component of select residential off-the-plan sub-markets within Sydney. Chatswood is arguably the most important and popular of these limited markets amongst Chinese internationals.

The Chatswood residential market has proven particularly popular amongst Chinese internationals over the past 24 months. Reputable secondary schools and public transport are cited by local selling agents as the immediate drivers in this demand, whilst proximity to the Sydney CBD, modern retail precincts (e.g. Chatswood Westfields) and prestigious North Shore location have provided a solid base for overseas Chinese demand.

Whilst further State government charges and taxes on foreign buyers coupled with stricter lending requirements and tightening of capital outflows from mainland China will undoubtedly result in a fall in demand from this cohort, new buyers in Chatswood are overwhelmingly Australian citizens and residents as opposed to foreign investors. As overseas migration to Sydney from China and other Asian countries continues to increase, the appeal of Chatswood will undoubtedly persist.

3.3 RESIDENTIAL LAND USES

The Chatswood market has continued to show its dominance over neighbouring markets over the past 12 months with new projects still achieving exceptional take-up and sales rates. The recent example of 666 Pacific Highway exemplifies this trend with the 75 apartment development completely selling over a 2 week period from June 2017 with record sales rates achieved.

Enquires with local selling and marketing agents suggest demand for both existing and off-the-plan stock is evenly split between owner occupiers and investors. The investor market is evenly based between domestic and overseas purchasers with Chinese nationals still particularly active in the investor market. Furthermore, downsizers are increasingly active in the larger apartment sector (3 and 4 bedrooms) after relocating from nearby North Shore suburbs.

Owner occupier purchasers are overwhelmingly young professional couples and/or newly established families owing to the respective price points of the Chatswood market; first home buyers (FHBs) have found it difficult to compete for similar reasons.

Select markets within metropolitan Sydney with well-established high-density submarkets exhibit both strong supply and demand of studio and one bedroom apartment product. Chatswood is one of these few select markets; proximity to major transport infrastructure and major regional retail centres provides the essential requirements in which the accommodation size versus lifestyle and amenity compromise is favourably geared towards such product. Furthermore, the existing and growing Chinese-Australian community observed within Chatswood is typically less resistant to small apartment sizes which has further supported market conditions.

Off-the-Plan Sales Activity

Numerous development projects within Chatswood are currently marketing off-the-plan with numerous projects settling over the course of 2016. Several projects are currently or have completed marketing in 2017 with three select developments analysed below in Table 3.1:

Table 3.1: Sales Analysis, Chatswood

Address	Internal Area (sqm)	Sale Price		
		Low	High	Analysis ($/sqm)
Chatswood Place (Final Stage) 260 Victoria Ave	44	$730,000	$770,000	$16,500-$17,500
	50-67	$850,000	$1,000,000	$15,000-$16,000
	70-96	$1,350,000	$1,875,000	$19,000-$19,500
	97-144	$1,950,000	$3,800,000	$20,000-$26,000
	118-173	$2,975,000	$4,500,000	$25,000-$26,000
The Meridian, 666 Pacific Hwy	50-60	$900,000	$1,200,000	$18,000-$20,000
	70-80	$1,260,000	$1,600,000	$18,000-$20,000
	90	$1,710,000	$1,800,000	$19,000-$20,000
Vista, 871-877 Pacific Hwy	50-57	$810,000	$875,000	$15,500-$16,200
	77-80	$1,165,000	$1,420,000	$15,500-$16,000
	103-125	$1,880,000	$2,000,000	$16,000-$18,000

Source: AEC/Cordell Connect

Anecdotal evidence from local selling and marketing agents provides further context and background information on the buying activity observed at the three developments analysed above in Table 3.1:

- **Chatswood Place, 260 Victoria Avenue**
  The final stage of Chatswood Place is understood to have been released in early 2017 with similar take-up and sales rates to those observed in 2016 (circa 10-15 sales per month). A relatively even mix of owner occupiers and investors are active, many being local Chinese-Australian young professional couples and families. Chinese nationals remain active within the investor cohort, albeit less active compared to 2015-16.

- **The Meridian, 666 Pacific Highway**
  The 666 Pacific Highway mixed use development was released to market in June 2017 and exemplifies the growing strength of Chatswood as a premier metropolitan residential market. The 75 apartments were sold as one stage and sold out in little over 2 weeks, averaging a take-up rate of over 35 apartments per week. Exceptional sales prices were achieved considering the relatively small unit sizes offered, ranging from $18,000/sqm to $20,000/sqm of floor area.

  Similar to Chatswood Place, local sales agents indicate a relatively even mix of owner occupiers and investors were active, with significant interest observed from the Chinese-Australian market.

- **Vista, 871-877 Pacific Highway**
  A 7 storey mixed use development comprising 42 apartments located on the northern periphery of the Chatswood CBD which was released to the market in February 2017. The development is understood to be approximately 80% sold, indicating a take-up rate of approximately 10 sales per month. Owner occupiers have dominated the buyer cohort to date, predominantly young professional couples and families in addition to some downsizers. Few investors have been observed to date.

Unit Mix

Review of the development pipeline indicates developers strongly favour leveraging the unit mix towards smaller unit product (studios and one bedroom units), often incorporating up to 60% of the total unit mix as such product. Two bedroom apartments remain a strong component of residential developments, particularly in smaller developments (<100 apartments). Three bedroom apartments only comprise a small component of unit mix in most projects observed in the pipeline, typically sub 10% however do feature strongly in some prominent developments.

Table 3.2 details the unit mixes of major residential and mixed-use developments being progressed in Chatswood.

Table 3.2: Unit Mix, Chatswood

Address	Total Units	Unit Mix							
		Studio		1BR		2BR		3BR	
		No.	%	No.	%	No.	%	No.	%
45 Victor St	300	90	30%	90	30%	72	24%	48	16%
65 Albert Ave	285	5	2%	166	58%	48	17%	12	4%
36-44 Hercules St 256-260 Victoria Ave & 17 Albert Ave	233	21	9%	103	44%	75	32%	34	15%
28-36 Anderson St 2A McIntosh St & 1 Help St	156	0	0%	105	67%	46	29%	5	3%
654-666 Pacific Hwy 1 Freeman Rd & 2A Oliver Rd	75	0	0%	27	36%	44	59%	4	5%
38 Albert St	71	0	0%	18	25%	37	52%	16	23%

Source: Cordell Connect

Development Pipeline

The residential pipeline has the potential to deliver just over 1,000 new dwellings within Chatswood over the coming 3-6 years (assuming all proposals eventuate into delivery). Virtually all of these new dwellings are high-density apartments with very little medium-density development observed. New low-density housing is non-existent in the current pipeline.

Table 3.3 comprises the current residential and mixed-use developments at various stages of planning and delivery in the Chatswood market.

Table 3.3: Development Pipeline, Chatswood

Address	Type	Status	Completion Date (est.)	Units
45 Victor St	Mixed Use	Rezoning Application	2021	300
65 Albert Av	Mixed Use	Rezoning Application	2023	285
36-44 Hercules St, 256-260 Victoria Av & 17 Albert Av	Mixed Use	Construction	2020	233
654-666 Pacific Hwy, 1 Freeman Rd & 2A Oliver Rd	Mixed Use	Development Approval	2017	75
38 Albert Av	Mixed Use	Construction	2017	71
871-877 Pacific Hwy	Mixed Use	Development Approval	2019	42
153-157 Victoria Av	Mixed Use	Construction	2017	18
2-6 Kooringa Rd	Residential	Development Approval	2018	17
745 Pacific Hwy	Residential	Development Approval	2018	15
231 Victoria Av	Residential	Development Approval	2018	7
64 Stanley St	Residential	DA Refused- pending	2018	5
12 Whitton Rd	Residential	Development Approval	2018	4

Source: Cordell Connect

Development Site Sales

The flurry of development site sale activity that was witnessed in Chatswood over the 2012-2015 has largely tapered off as high existing use values and limited redevelopment opportunities limit developers' ability to acquire and progress development sites.

Sites along Pacific Highway remain highly appealing, a trend observed not only within Chatswood but across much of the North Shore from St Leonards to Gordon. A number of local and Chinese prospective developers are actively seeking development opportunities within Chatswood according to local agents given the continued strength of the local off-the-plan apartment market. Given the dearth of development opportunities, developers are observed to be acquiring a range of properties (commercial office buildings, detached dwellings, unit blocks) across a multitude of zonings. A number of developments currently observed in the pipeline are being progressed by landowners as opposed to developer-purchasers which further explains the lack of recent development site sales activity.

Table 3.4 analyses development sites sales which have transacted over the 2014-2017 period to understand current market trends and developers' capacity to pay for development opportunities.

Table 3.4: Development Site Sales, Chatswood

Address	Site Area (sqm)	Zoning	Sale Price (Sale Date)	Analysis	Description
270 Victoria Ave	1,093	B3	$22,300,000 (January 2017)	• $8,150/sqm GFA • $20,400/sqm site area	Five storey commercial building with long term lease to a large medical operator (Chatswood Medical Centre). As per Schedule 1, shop top housing is permitted on the site should any development include a component of affordable housing as guided by the Willoughby Affordable Housing Principles. Site is understood to have sold to a local developer with a long term hold strategy with a mixed-use development being considered.
282-284 Victoria Ave	2,128	B3	$46,250,000 (Oct 2016)	• $8,700/sqm GFA • $21,700/sqm site area	Two freestanding commercial buildings (2 storeys and 5 storeys) sold in one line understood to have been purchased by an overseas developer for a mixed-used development. As per cl 4.1B and Schedule 1 of the WLEP, shop top housing is allowed if the ground level and first level of the development are used for the purpose of retail premises or business premises. The site would require further consolidation of the neighbouring property to meet the minimum lot size requirement of 2,500sqm.
745 Pacific Hwy	576	R4	$5,600,000 (August 2016)	• $5,900/sqm GFA • $350,000/unit • $9,700/sqm site area	Two storey residential unit block comprising four apartments acquired by a local developer for construction of a five storey residential flat building including 16 apartments. The site was sold by the previous owner-developer following DA approval which was granted in February 2014.
654-666 Pacific Hwy, 1 Freeman Rd & 2A Oliver Rd	2,855	B5	$28,000,000 (August 2015)	• $3,600/sqm GFA • $375,000/unit • $9,800/sqm site area	Low rise commercial building used as a discount clothing outlet sold to a local developer for construction of a 7-10 storey mixed use development across two buildings comprising ground floor retail space and 75 apartments. Following the acquisition the developer submitted a Planning Proposal to increase of maximum permitted building height from 18m to 36m and increase the FSR from 2:1 to 3:1 which was subsequently approved by the Sydney North Planning Panel in December 2016.
871-877 Pacific Hwy	1,432	B5	$17,181,000 (Dec 2014)	• $6,300/sqm GFA • $409,000/unit • $12,000/sqm site area	Two separate, two storey brick commercial buildings comprising a total 10 strata suites acquired by an Asian developer for construction of a 6-7 storey mixed use development across two buildings comprising 42 apartments and ground floor retail space.
231 Victoria Ave	572	R3	$2,300,000 (June 2014)	• $5,000/sqm GFA • $330,000/unit • $4,000/sqm site area	Single storey detached dwelling acquired by local developer for construction of a 4 storey residential flat building comprising a total of 7 apartments. A DA was submitted following the acquisition in January 2015 and subsequently approved by Willoughby City Council in June 2016.

Source: AEC/Cordell Connect

The development site acquisition activity observed over the 2014-2017 period indicates developers are observed to be paying in the order of $5,000/sqm of GFA up to $6,300/sqm of GFA. On prices paid per unit/site, developers are observed to be generally paying between $330,000 to $380,000 per unit/site, with this ranging up to $410,000 per unit/site in the case of 871-877 Pacific Highway.

It is understood that 815 Pacific Highway comprising a 15 storey commercial office building was offered to the market via an EOI campaign in late 2016; there is no record of a transaction occurring to date. The site is zoned B3 Commercial Core with a Planning Proposal to allow for shop top housing (accommodating 201 residential units) that Willoughby Council refused in 2015. The site was originally purchased in 2014 for $29m, equating to $17,500/sqm of site area.

A number of distinct observations can be drawn from the site sales analysed in Table 3.4:

- **Limited recent sales activity**
  Little recent development site sale activity is currently observed in the Chatswood market; the vast majority of development site sales occurring in prior 2014 and as a result of landowners progressing developments on their sites themselves. Despite the strengthening Chatswood apartment market and stiff competition for development sites between local and foreign developers, the availability of development sites is expected to be constrained over the coming 12-18 months.
- **Development versus existing planning controls**
  Developers are observed to consistently seeking amendments to existing planning controls within Chatswood, particularly for inclusion of residential shop-top housing in B3 Commercial zones and additional density and/height in B5 Business Development zones. Where developers have succeeded in achieving variations to planning controls after purchasing sites, significant value upside is achieved, e.g. 666 Pacific Highway.
- **Focus on Pacific Highway**
  Residential and mixed-use development continues to focus on sites along the Pacific Highway with developers targeting a range of existing building typologies. For example, a two storey brick unit block at 745 Pacific Highway and low-rise brick commercial building at 666 Pacific Highway.

Summary of Key Findings

Findings from the property market analysis enable an understanding of the type and quantum of demand that would be received for a mixed-use development on the Site, in addition to the likely price points that could be achieved.

- **Buyer Profile**
  Enquiries with selling and marketing agents operating within Chatswood suggest a strong presence of both owner occupier and investor purchasers of off-the-plan stock over the past 12 months. The majority of owner occupier buyers are affluent middle aged established couples and/or families who are relocating from the surrounding areas. A large proportion of the investor market are Chinese nationals given Chatswood's strong appeal factors such as strong public transport and road connections, proximity to Sydney CBD, co-location with major retail centres and a strong existing Australian-Chinese resident community.

  Many Australian-Chinese are also understood to be buying off-the-plan with financial backing of their extended families with the reputable surrounding public school catchments a major drawcard. Downsizers relocating from the upper and lower North Shore areas are understood to have become more active throughout 2016 to Q2 2017.
- **Take-Up Rates**
  Swift take-up rates are continuing to be observed within Chatswood despite the slowdown being experienced in many other metropolitan markets. Demand for high quality apartments, particularly within the Chatswood CBD, remains amongst the strongest within metropolitan Sydney. Even developments on the periphery of the CBD are keenly sought as observed with the recent sales at 666 Pacific Highway where the entire 75 apartment development sold out in 2 weeks following release in June 2017.
- **Potential Price Points**
  The off-the-plan apartment market in Chatswood has continued to gain momentum throughout 2017. Most recent off-the-plan activity observed within the market indicates units are predominantly achieving between $16,000/sqm and $18,000/sqm of internal floor area and even up to $20,000/sqm of floor area in the case of 666 Pacific Highway.

3.4 RETAIL AND COMMERCIAL LAND USES

3.4.1 Chatswood Retail Market

Chatswood represents one of the largest retail destinations in Sydney and is one of the only precincts in Australia to include two regional shopping centres, namely Westfield Chatswood and Chatswood Chase. Over 200,000sqm of retail floor space is provided within the suburb and the majority of major tenants in the Australian market are provided at Chatswood, with the exception of Big W and a full-line Woolworths supermarket. No comparable precinct, with the exception of Sydney CBD which sits above Chatswood in the retail hierarchy, has a provision of retail floorspace greater than Chatswood.

Whilst Westfield Chatswood and Chatswood Chase provide the bulk of total retail floorspace, there are also a number of smaller arcade style shopping centres located throughout the CBD and fringes. Victoria Avenue serves as the primary spine of retail activity within the suburb with a large number of specialty retailers located thereon with the two major shopping centres (Westfield Chatswood and Chatswood Chase) both having major entrances from the street.

A number of different price points are served in Chatswood with a predominance for serving higher end non-food shopping requirements in the major shopping centres whilst more value focused retail offers are provided in small shopping centres with entrances of Victoria Avenue.

The health of any retail market is largely population driven. Following the recent completion of several major residential and mixed-use developments within the Chatswood CBD, coupled with those still under construction and in early planning, will continue to drive demand for service-based retail.

Retail Sales Activity

Retail property values are fundamentally linked to the exposure and passer-by traffic attributed to their location as well as their aesthetic presentation. Anecdotal evidence from local letting agents indicates there remains strong interest for retail opportunities within the CBD as well as in mixed-use developments on the fringe.

For example, a small retail shop (105sqm) at the mixed-use development at 871-877 Pacific Highway sold off-the-plan following a 2 month marketing campaign with strong interest observed throughout despite being relatively poorly located with minimum pedestrian exposure.

Table 3.5 identifies a number of retail shops located at the base of mixed-use developments within the Chatswood CBD and fringe which have transacted over the past 12-15 months.

Table 3.5: Retail Sales Activity, Chatswood

Address	Area	Sale Price (Sale Date)	$/sqm floor area	Description
2/9 Railway St	290sqm	$1,730,000 (April 2017)	$6,000/sqm	Modern ground floor restaurant located including dining space, toilets and commercial kitchen. Located at the base of Mirvac's 'Epica' mixed-use development completed in 2008.
Shop 1/871-877 Pacific Hwy	105sqm	$945,000 (March 2017)	$9,000/sqm	Small retail suite located at the base of a 7 storey mixed-use development currently under construction which will comprise 42 apartments. Sold off-the-plan to a local F&B operator following a 2-month marketing campaign.
1/6 Mcintosh St	62sqm	$600,000 (June 2016)	$9,700/sqm	Small café shop located at the base of secondary grade, four storey commercial office building. Despite the age of the building and relatively poor condition of the suite, the space is ideally located within the Chatswood CBD benefiting from strong exposure and high pedestrian footfall.
1/640-650 Pacific Hwy	168sqm	$770,000 (May 2016)	$4,600/sqm	Large ground floor commercial space occupied by real estate agency located at the base of a five storey mixed-use building; located on the fringe of the Chatswood CBD. Space suffers from relatively poor exposure and nominal pedestrian traffic.

Source: Corelogic RP Data

3.4.2 Chatswood Commercial Market

The commercial market in Chatswood is multi-faceted, underpinned by trends and drivers that influence demand for commercial floorspace by type and by location. Residential development activity continues to outpace commercial development within the Chatswood CBD, with modest supply planned over the coming 24 months.

Commercial office vacancy rates increased over the six months to January 2017, rising from 6.6% to 7.7% (Knight Frank, 2017). This was largely due to the relocation of several large tenants which has accordingly driven down overall absorption levels given the large floorplates now on the market. More recent data released by the Property Council of Australia (2017) indicates that this trend has largely reversed in over the course of 2017 however, with vacancy levels within Chatswood falling over the six months to July 2017 from 7.7% to 6.9%.

Accordingly, current vacancy levels remain well below the 10 year average of 11.4% and landlords are continuing to seek higher rents as spill-over demand from neighbouring markets is observed along with anticipation of the Sydney Metro Northwest.

The appetite for prime commercial assets within Chatswood remains strong with several major institutional acquisitions over the 2016 calendar year illustrating this trend. The most prominent example was the sale of the Zenith building at 821-843 Pacific Highway in May 2016, secured by Centuria and Blackrock for $279m at a yield of 7.5%. The secondary grade market similarly remains strong with several transactions observed with the sale of an 8 storey commercial building 15 Help Street to an off-shore investor in June 2016 for $43.8m demonstrative in this regard.

Whilst it is important to understand the market conditions at play within the broader Chatswood commercial office market, it is equally important to recognise the distinction between the two major forms of commercial property within the Chatswood CBD, both attracting different types of commercial occupiers:

- Traditional commercial office space within *purpose-built office buildings*, generally located within the 'commercial core' west of the rail line.
- Commercial space in a mixed-use setting, e.g. within a mixed use residential building or retail/commercial building (generally lower rise in nature).

Traditional commercial office space is typically sought by businesses seeking long-term accommodation within a corporate setting. Tenant interest in such space within Chatswood is diverse; a range of users are active including medical-related occupiers, IT companies, engineering firms, accountants, finance companies and start-up businesses. Purpose-built office buildings typically feature large floorplates (up to 2,000sqm) to accommodate large businesses and corporates.

Corporate image and co-location with like businesses is a major determinant in demand for traditional office space. Proximity to residential and/or other mixed uses is often a major drawback on the appeal of traditional office buildings as it can erode the prestige and corporate identity such businesses are seeking.

The proposed development on the Site does not envisage the provision of office space as provided in the CBD core west of the train line; it is by definition a mixed-use development and will accordingly attract a different set of occupiers compared to those observed in traditional office buildings. Accordingly, for the purposes of this Report and in the context of the Site, the demand for and performance of commercial floorspace in mixed-use settings within the Chatswood CBD is instead considered in further detail to assess the proposed development in the context of local market conditions.

Commercial co-located with Retail/Mixed Uses

There are a range of commercial occupiers who do not require a 'corporate' location or building with a corporate identity. Tenants such as child care centres, small professional practices (accountant, lawyer) and medical practices typically seek out space that is accessible to their target markets. Co-location within a retail cluster or centre is commonly sought after.

As the local population of Chatswood CBD grows, so too will the demand for commercial space to accommodate businesses that respond to local population growth. These businesses would also suit space in a mixed use

residential building. With the completion of several major mixed-use and residential developments within Chatswood CBD over the coming years, demand for service-based commercial floorspace from businesses servicing the local population will undoubtedly grow commensurate.

The demand for small commercial suites is witnessed from leasing and sales activity in ERA at 7 Railway Street. Completed and sold a couple of years ago, demand is understood to remain strong from owner occupier businesses where opportunities within the building arise. 1-5 Railway Street (Chatswood Central) is understood to be leasing fairly well, achieving gross rents of $450/sqm-$500/sqm. A range of businesses are accommodated here (e.g. IT companies, real estate, accountants, new/start-up businesses) and are generally in suites of 100sqm or less.

Along with a high concentration of traditional office buildings, research suggests there is a presence of serviced and shared/co-working office space in Chatswood, predominantly serviced office space and co-working office space. Along with North Sydney, Chatswood is a tech hub within the North Shore region and attracts strong demand from start-up companies.

Leasing agents active in the local area indicate there is greater market depth for tenancy sizes of <300sqm compared to larger offices (>300sqm), with Chatswood providing such accommodation as opposed to nearby markets such as North Sydney where such suites are more a rarity.

The recently completed mixed-use development 'The Chatswood' adjacent the Site comprises just under 1,400sqm of commercial and retail floorspace. Completed in June 2017, it is understood the developer is holding the commercial and retail suites for lease as opposed to selling. Informal discussions with local letting agents note that several service-based retailers (Korean food grocer, laundry mat) have secured tenancies with large volumes of offers refused by the developer as they are seeking certain types of occupiers and users.

Anecdotal evidence from local letting agents indicates that there is sufficient demand within the market to absorb such space, particularly given it is both modern and well-located. This has direct connotations for the likely take-up of commercial space which could be observed at the Site, which sits directly to the west of Chatswood at an arguably better location given its corner position.

Commercial (Mixed Use) Sales Activity

Several sales of commercial suites within mixed-use or non-traditional office buildings have been observed in recent times. Anecdotal evidence from local commercial agents indicates demand for smaller office suites remains buoyant; strong interest for small suites (50sqm-250sqm) within secondary grade commercial building or mixed-use buildings has been observed over the past 6-12 months.

Two useful examples which exemplify demand for commercial space within mixed-use settings can be observed at 7 Railway Street and 71-73 Archer Street. The age and condition of both buildings vary substantially, with sale prices for spaces commercial suites therein expectedly different. The strong demand for smaller commercial suites observed by local agents in recent times is however evident in recent sales evidence at both buildings, and provide a useful gauge for the likely sales rates which could be potentially achieved on the Site.

- **7 Railway Street, Chatswood**
  A 43 storey mixed-use development 'ERA' comprising two levels of commercial floorspace comprises a range of commercial suites ranging from 50-100sqm for smaller sized suites and from 150sqm-175sqm for larger suites. Informal discussions with local commercial agents indicates that despite the age of the building (>7 years), strong demand from small professional occupiers is still observed. Recent sales indicate smaller suites expectedly achieve higher sales rates at circa $8,000/sqm to $9,000/sqm of floor area with the larger suites achieving rates between $6,000/sqm to $7,500/sqm of floor area.

  The associated development adjacent Era known as 'Epica' located at 9 Railway Street is a 31 storey mixed development comprising a single level of commercial suites with upper residential levels. A recent resale of a 247sqm commercial suite in April 2017 sold for $1.73m, equating to just over $7,000/sqm of floor area.

- **71-73 Archer Street, Chatswood**
  An aged 5 storey brick commercial building comprising ground floor retail space with four levels of commercial office space with suites ranging from 60sqm to 250sqm. Anecdotal evidence from a local commercial agent

indicates a 122sqm suite recently sold in July 2017 after a brief EOI campaign (10 days). Strong interest was observed from over 15 different parties with the sale price understood to be circa $725,000 to $750,000 ($6,000/sqm to $6,200/sqm of floor area). Strong interest was observed from both investors and owner occupiers, many being local medical users.

A 200sqm ground floor commercial suite at the base of the 'Vista' mixed-use development (871 Pacific Highway) is currently marketing for sale for $1,800,000, equating to $9,000/sqm of floor area. Informal discussions with the selling agent indicate the property has been on the market for approximately 3 months with strong interest exhibited from several parties observed.

3.5 IMPLICATIONS FOR THE PROPOSAL

The proposed development on the Site seeks to address both underlying demand for residential and commercial floorspace.

Residential Uses

Buoyant market conditions and sustained price growth underlies a robust residential property market in Chatswood. Strong supply has been met with commensurate demand amid an increasing appeal of high-density apartment living in an amenity-rich environment to young professionals, established families and downsizers alike. Chatswood has emerged as one of the focal points of apartment development with metropolitan Sydney with current demand suggesting this is likely to continue and strengthen over the short to medium term.

In light of robust market conditions and keen market activity, the proposed residential offer on the Site will contribute to the transformation/revitalisation of the northern fringe of the Chatswood CBD and complement surrounding land uses. The Site represents the remaining section of Help Street ripe for redevelopment and the proposed development will conceivably complete Council's vision for the precinct.

Commercial Uses

Overall vacancy levels have tightened the six months to July 2017 with anecdotal evidence indicating strong appetite from service-based commercial occupiers who, similar to retail occupiers, tend to respond to local population growth. Extensive discussions with local commercial letting agents indicates that demand for small commercial suites (<300sqm) remains particularly strong, as evidenced by recent sales evidence.

Commercial office space located within mixed-use developments in the Chatswood CBD have been well-regarded by smaller professional users such as consultants, real estate agents, accountants and the like who do not require a corporate location and benefit from co-locating with residential and retail uses. This is exemplified by the enduring demand for space within the 'Era' development at 7 Railway Street; local agents note that this is amongst the most sought after locations for such users within Chatswood with recent sales evidence highlighting that despite its age it still commands strong sale prices.

Notwithstanding demand from small scale commercial occupiers, non-purpose built office buildings in non-corporate locations and that offer smaller commercial suites can struggle to secure pre-commitments from large anchor tenants if mandated by financiers. Many mixed use developments therefore rely on residential pre-sales (off-the-plan) to meet financier requirements.

The proposed development on the Site to accommodate small scale commercial occupiers and residential would be well-met given current market conditions. Furthermore, the proposed development would conceivably complete the redevelopment of Area 14 as identified in the WLEP 2012 and complete its transition towards a high-density mixed use precinct.

The next chapter assesses the viability of a development on the Site under the current planning framework.

4. FEASIBILITY ANALYSIS

4.1 INTRODUCTION

This chapter carries out feasibility modelling to examine the viability of development on the Site under the existing planning controls. Development feasibility is directly linked to the cost of assembling the two existing residential strata blocks from the 53 individual strata holders.

Should development of the Site be assessed as unviable under existing planning controls, iterative modelling is undertaken to ascertain the quantum of density required to progress a feasible development on the Site, referred to as the FSR threshold.

Feasibility modelling is also undertaken to assess the commercial viability of the Proposal, compared against the earlier assessed FSR threshold.

4.2 METHODOLOGY

The feasibility modelling in this chapter utilises available market evidence (in Chapter 3) to develop revenue assumptions for application in a Residual Land Value Analysis. Generic cost assumptions are developed from past industry experience and available cost publications.

The Residual Land Value (RLV) approach is a method of valuation that involves assessment of the value of the end product of the development, allowing for development costs and making a further deduction for the profit and risk that a developer would require to take on the project. The Residual Land Value is the remainder that is available to pay for the land.

The accuracy of assumptions in the RLV Analysis is critical for reliability. In the case of the Site where detailed cost plans are not available, even though as valuers and property economists we can apply industry knowledge and past experience in developing up a series of assumptions, direct comparison of the assessed residual land value (RLV) against the sales of development sites is critical to ensure the RLV is in line with market activity.

A key driver for development feasibility on the Site is the total cost to consolidate the Site from multiple strata holders. It is understood the proponent has been progressively securing the sale of individual residential units over the 2015-2017 period, to a total land cost in the region of $44 million[1].

Given the Site has been progressively acquired since March 2015, feasibility modelling includes a capitalised interest component to reflect the potential interest charges incurred since the commencement of site acquisition. For the purposes of modelling, an interest rate of 5% has been applied over a period of 24 months. This results in a total land cost of $51.2 million.

4.3 FEASIBILITY MODELLING

The RLV analysis is undertaken using industry standard Estate Master development feasibility software. Feasibility modelling is undertaken to examine three scenarios:

1. Scenario 1 - feasibility of developing the Site under existing planning controls (based on FSR 4:1 with minimum non-residential FSR 2:1).
2. Scenario 2 - if Scenario 1 is not feasible, iteratively test the quantum of additional residential FSR required for feasible development (subject to minimum non-residential FSR 2:1).
3. Scenario 3 - if the minimum non-residential requirement was lowered to FSR 1:1, iteratively test the additional residential FSR required for feasible development.

[1] The purchase of several units is understood to be under negotiation

Similar to the hypothetical assumption in Scenario 3, the Proposed Development Scheme envisages a non-residential component of FSR 1:1. Feasibility modelling examines how the proposed scheme compares to the FSR threshold assessed in Scenario 3.

Feasibility modelling outcomes for the three scenarios are shown in Table 4.1.

Table 4.1: Feasibility Modelling Outcomes

	Scenario 1	Scenario 2	Scenario 3
Modelling Objective	Test if current planning controls facilitate feasible development	If Scenario 1 not feasible, test additional FSR required for feasible development (subject to non-residential FSR 2:1)	If Scenario 1 not feasible, reduce non-residential FSR to 1:1 and test additional FSR required for feasible development
Description			
Site Area	2,290sqm	2,290sqm	2,290sqm
Total FSR	4:1	7.4:1	6.5:1
Non-residential	2:1	2:1	1:1
Residential	2:1	5.4:1	5.5:1
Total GFA*	9,160sqm	16,880sqm	14,840sqm
Non-residential	4,580sqm	4,580sqm	2,290sqm
Residential	4,580sqm	12,300sqm	12,550sqm
Assumed Land Cost	$51,200,000	$51,200,000	$51,200,000
Feasible?	No	Additional FSR 3.4:1 required	Additional FSR 2.5:1 required
Key Modelling Metrics/Performance Indicators			
Total Acquisition Cost[1]	$51,255,495	$51,255,495	$51,255,495
Project Internal Rate of Return[2]	(9.57%)	28.30%	28.81%
Residual Land Value (NPV)[3]	$22,058,350	$51,485,574	$51,734,918

*All scenarios assume 4% of total GFA is constructed and contributed as affordable housing.
Notes: 1 – Total acquisition costs including land cost, capitalised interest and stamp duty, 2 - Project Internal Rate of Return: discount rate where the NPV equals zero, 3 - Residual Land Value (based on NPV): purchase price for the land to achieve a zero NPV
Source: AEC

The following observations emerge from the above feasibility modelling outcomes:

- Current planning controls (minimum non-residential FSR 2:1 to a total FSR 4:1) are not feasible given the cost to consolidate two strata unit blocks for development.
- Maintaining the requirement for non-residential of FSR 2:1, a total FSR in the order of 7.4:1 is required for feasible development.
- If the requirement for non-residential FSR was reduced to 1:1, a total FSR in the order of 6.5:1 is required for feasible development.
- The FSR threshold required for feasible development is inversely related to the minimum non-residential FSR required.

The Proposed Scheme

The proposed scheme at FSR 8.4:1 is greater than the FSR threshold (6.5:1) required for feasible development.

An informal enquiry to Council indicates that for proposals that exceed permissible densities under the LEP, subject to site environmental capacity Council will require a contribution to public benefit calculated at 45% of the (land) value uplift. A valuation of the Site (under the existing planning controls and per the proposed development) will be required to calculate the land value uplift prior to applying a rate of 45% to calculate the contribution payable.

In the case of the Site, as development under the existing planning controls is not feasible, the cost of land (including capitalised interest) is the relevant value for calculating the contribution payable.

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APPENDIX A: FEASIBLITY MODELLING ASSUMPTIONS

The Residual Land Value method involves assessing the value of the end product of the hypothetical development, and then deducting all of the development costs including site acquisition costs, site demolition and / or clearance, consultant fees for design and project management, developer levies and taxes, construction costs, and making a further deduction for GST, land holding costs, marketing and financing costs.

The residual amount is the amount that a developer can afford to pay for the Site in exchange for the opportunity to develop the Site to its assumed potential.

In undertaking the feasibility modelling, four Scenarios have been assessed (including the Proposed Development Scenario):

- Scenario 1 (FSR 4:1, min. non-residential FSR 2:1, 52 units including 5 affordable housing units)
- Scenario 2 (FSR 7.4:1, min. non-residential FSR 2:1, 131 units including 9 affordable housing units)
- Scenario 3: (FSR 6.5:1, non-residential FSR 1:1, 135 units including 8 affordable housing units)
- Proposal Scenario: (FSR 8.4:1, non-residential FSR 1:1, 193 units including 10 affordable housing units)

Development Mix and Staging

For the purposes of assessing a Residual Land Value, an indicative development scheme developed by Kann Finch Architects has been applied to each Scenario:

- Unit mix – Studio: 1 bed unit: 2 bed unit: 3 bed unit (2.5%: 37.8%: 55.6%: 4.1%).
- Internal area – Studio (45sqm): 1 bed unit (60sqm): 2 bed unit (82sqm): 3 bed unit (105sqm).
- Parking spaces – Studio (1 space):1 bed unit (1 space): 2 bed unit (1 space): 3 bed unit (1.25 spaces): visitor parking (1 space per 4 dwellings): commercial office (1 space per 110sqm commercial GFA).

Following settlement of the purchase, vacant possession is assumed to be forthcoming. A lead-in period of 6 months is assumed, thereafter 6 months for DA lodgment and consent.

Following development consent, construction works are assumed to commence in Month 15 (after allowing for 50% of pre-sales to occur).

Gross Revenue

Market analysis undertaken in Chapter 3 demonstrates the resounding demand for new residential product within Chatswood, evidenced by rapid take-up rates and remarkably strong sale prices.

Table A.1: Gross Sale Values

Type	Average Sale Price	
Studios	$720,000	$16,000/sqm-$17,000/sqm
1 bedroom units	$960,000	$16,000/sqm-$17,000/sqm
2 bedroom units	$1,428,000	$16,000/sqm-$17,000/sqm
3 bedroom units	$1,848,000	$16,000/sqm-$17,500/sqm
Retail		$7,000/sqm
Commercial		$5,000/sqm

Source: AEC

At least 50% off-the-plan sales are assumed to be completed prior to construction commencement with the remaining units progressively sold at a take-up rate in the order of 10-15 per month.

Other sales revenue assumptions:

- GST is included in residential sales.
- Residential and retail sale prices are assumed to escalate at 3% per annum through the development period; commercial sale prices are assumed to escalate at 2% per annum.
- Sales commission of 2% of gross residential sales.
- 10% of gross purchase price received as deposit and invested at 3% in trust account (50% to be retained by developer).
- Marketing and legal costs at 1% and 0.25% of gross sales respectively.
- No revenue is attributed the GFA (4% of total GFA) designated for affordable housing.

Development Costs

In the absence of a detailed development scheme and cost plan, estimates of development costs are based on commercial cost publications and past industry experience.

Main construction costs assumed are:

- Residential:
  - Building construction at $2,750/sqm.
  - Balconies at $800/sqm.
- Retail/commercial at $2,200/sqm.
- Basement parking at $45,000 per space.
- Demolition at $100/sqm of site area.
- Site works and excavation at 1% of construction costs.
- Services infrastructure at 1% of construction costs.
- Landscaping at $200/sqm of 50% of site area.
- Professional fees of 10% of construction cost comprised of:
  - Masterplanning and design at 1.5%.
  - Development application at 0.5%.
  - Construction documentation at 3.5%.
  - Fees during construction at 4.5%.
- Development management fee of 1%.

A further 5% construction contingency allowance (to cover risks) was included.

- Statutory fees:
  - Section 94A contributions as per the Chatswood Central Business Section 94A Contributions Plan 2011: 3% of the estimated cost of the development
  - DA and CC fees as per scheduled rates.
  - Strata titling at $800 per lot.
  - An affordable housing contribution is assumed to be made in-kind and included in the cost of construction.
- Land holding costs including land tax, Council and water rates based on assumed unimproved land values.
- Developer's equity is assumed at land acquisition cost (including capitalised interest at 5% per annum for 24 months). Equity is progressively injected when required.

- The balance of project cost is assumed to be debt funded with interest capitalised monthly (nominal 7.0% per annum).
- Finance establishment costs at 0.35% of project debt.

Hurdle Rates and Performance Criteria

Target hurdle rates are dependent on the perceived risk associated with a project (planning, market, financial and construction risk). The more risk associated with a project, the higher the hurdle rate. Key hurdle rates assumed for the feasibility modelling are 20% discount rate (effective) and 20% development margin.

A number of performance indicators are relied upon when ascertaining the feasibility or otherwise of a development.

- Development margin is the profit divided by total development costs (including selling costs).
- Residual Land Value – this has been determined by establishing the maximum land value a developer is willing to pay based on a 20% internal rate of return (IRR) taking into account all other costs and project revenue.
- Development Profit – this represents the total revenue less total cost including interest paid and received.
- Discount Rate – this refers to the project internal rate of return (IRR) at which the net present values of an investment becomes zero.

If the resulting profit from this feasibility analysis is sufficient to meet the target hurdles (target development margin and discount rate), the project is considered financially viable for development.

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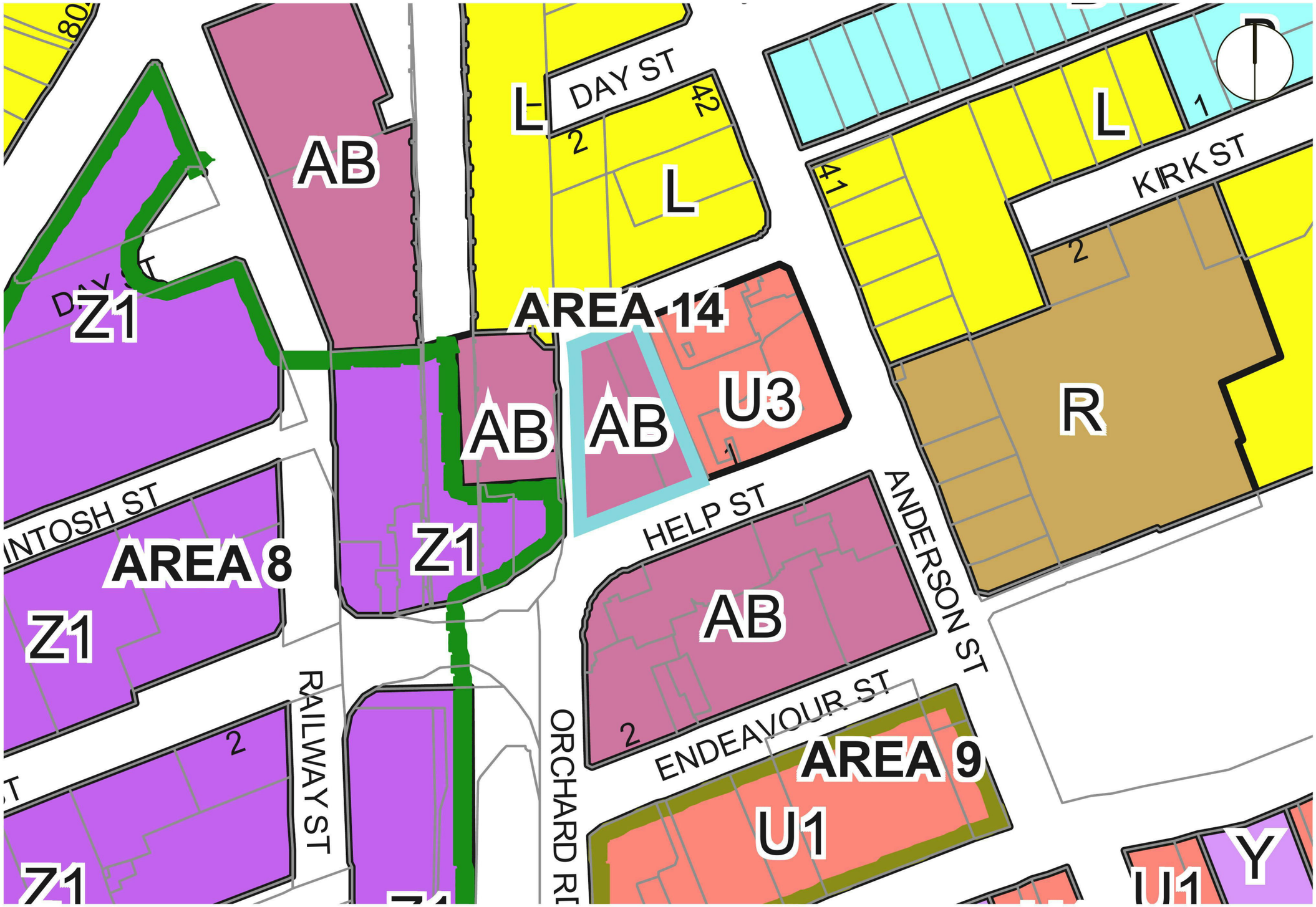
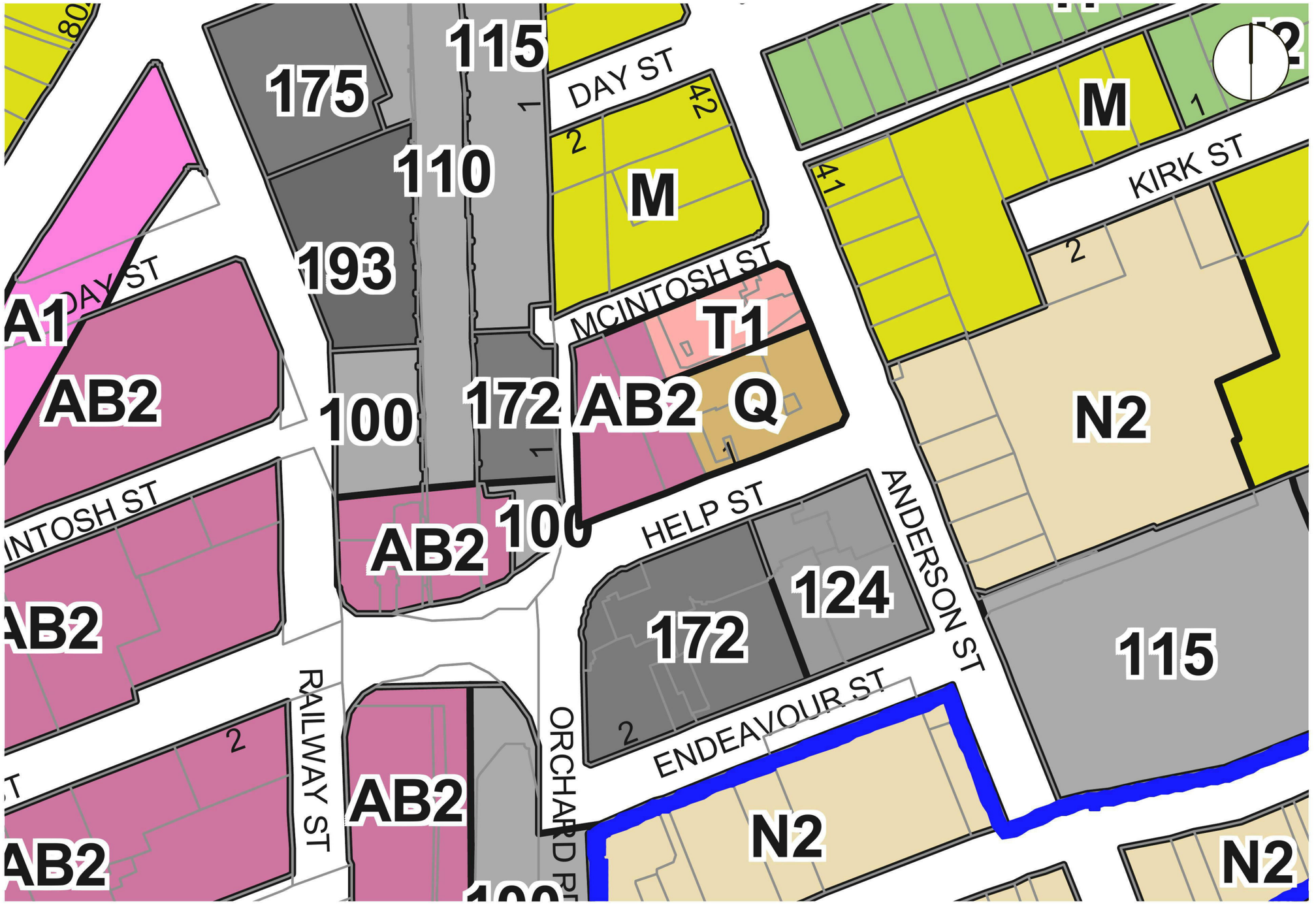
Appendix E1
FSR Map



B	0.4:1	U1	2.5:1	Z1	5:1		Area 8
L	0.9:1	U3	2.7:1	AB	6:1		Area 9
R	1.4:1	Y	4.5:1				Area 14

Appendix E2
Height Map



I2	8.5m	T1	25m	100	110m	170	170m
M	12m	AA1	60m	110	110m	190	190m
N2	14m	AB2	90m	130	130m		
Q	20m			150	150m		

Appendix F
Arborist Report

Arboricultural Impact Statement for a *Phoenix canariensis* palm at 5 Help Street, Chatswood, New South Wales

by

Dr Trevor J. Hawkeswood

[BSc(Hons)(NE), BAppSc(EnvSc)(CSturt), PhD (AIM, BPI, IMHS)]

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PO Box 842
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[28 February 2019]

Contents

1.0. Introduction

During 28 February 2019 I made a detailed inspection of a mature *Phoenix canariensis* (Arecaceae) palm tree growing on the grounds of 5 Help Street, Chatswood, NSW (Fig. 1).

The subject tree was inspected during fine hot weather with no wind.

2.0. Observations

The tree is over 50 years old and has been growing in a less than ideal situation because of the lack of soil. This lack of soil has resulted in the palm tree producing numerous roots and causing the tree to grow upwards because of its failure to secure a rooting medium in any soil. The older roots as well as the new roots have got most nutrients from rain water, the palm tree appears to be growing on concrete. The palm tree may have been disperse there as a seed from a bird spreading the seed. The tree has infestations of somewhat parasitic *Ficus rubiginosa* (Moraceae) at least three plants as well as a hanger on plant of *Pittosporum undulatum* (Pittosporaceae). The tree base is weakened by the aerial roots and the tree is weakened by the parasitic plants especially the *Ficus.* The tree has many dead fronds and has just started to flower. I believe the tree is rather stressed to say the least.

3.0. Recommendations

The tree is definitely stressed with declining health and cannot survive under the present growing conditions. My recommendations are that it needs urgent removal to a better growing environment as it is dying in this present location. The tree can be transplanted but great care needs to be undertaken. (see references below for more information). Firstly the dead fronds and the strangling fig *Ficus* (Moraceae) plants and the *Pittosporum undulatum* (Pittosporaceae) need to be removed from the tree. Before removal, the fronds need to be protected by being folded and tied up. The tree requires careful extraction by a large bobcat or similar machine to lift it from position onto awaiting truck. The roots require watering before the tree is removed. Removal has to be during warm weather but not during hot or cold weather. The tree should be removed to an arboretum or a botanical reserve or a suitable property where other palms are growing. There should be in readiness a suitable planting hole where the palm can be placed immediately after being removed from the truck. [see e.g., youtube video on how the palm should be translocated. [https://www.youtube.com/watch?v=9BaJDgk4280.]. Once the palm tree has been relocated in the new ground (preferably with good drainage), it should be watered regularly and nutrients such as potassium and magnesium added as fertiliser.

4.0. References

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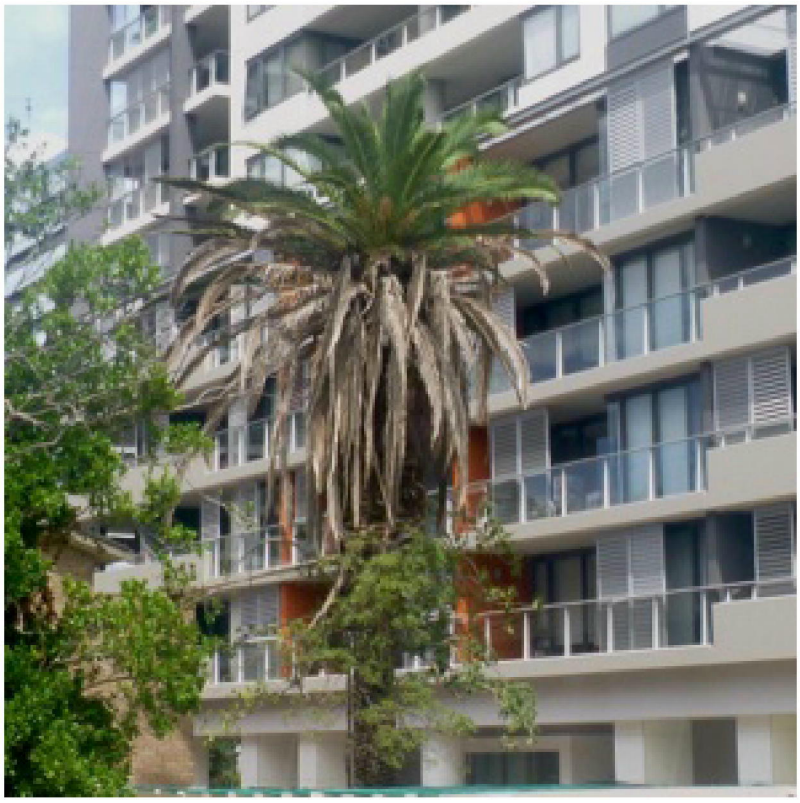

Fig. 1. The *Phoenix canariensis* (Arecaceae) tree on the subject property. (Photo: T.J. Hawkeswood).

Fig. 2. Base of the palm tree. (Photo: T.J. Hawkeswood).

Fig. 3. View of tree side on showing parasitic plants on the trunk. See also Fig. 4 below. (Photo: T.J. Hawkeswood).

Fig. 4. View looking up into the canopy showing *Ficus rubiginosa* (Moraceae) and *Pittosporum undulatum* (Pittosporaceae) growing on the tree. (Photo: T.J. Hawkeswood).

5.0. Qualifications of the Author

I have undertaken flora and fauna and arborist reports in the Sydney Bioregion since 1997 with over 2100 reports having been completed. I have been written over 500 tree reports as stand alone documents or as part of flora and fauna reports or vegetation management plans (VMP). Over 22,000 trees have been assessed in these reports. In addition another 50,000 + trees have been examined during the course of flora and fauna studies etc. These reports in the main have been accepted without much fuss and ado by the following Councils: Cooma, Parramatta, Holroyd, Bankstown, Camden, Hornsby, Penrith, Hawkesbury, Liverpool, Blacktown, Blue Mountains and The Hills. I have also represented clients successfully against Councils in the Land & Environment Court, where my qualifications and experience have been recognized.

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A further selection of my tree/environmental reports can be found at https://www.researchgate.net/profile/Trevor_Hawkeswood

Appendix G
Draft DCP

Draft Site Specific Development Control Plan

for
3 – 5 Help Street
Chatswood

1.0 GENERAL

These controls apply to land bounded by 3-5 Help Street, Mcintosh Street and Cambridge Lane shown on the map below:

Figure 1: Site that is subject to this section of the DCP.

In the event of an inconsistency between this section and the remaining provisions of this DCP, the controls in this section shall prevail in relation to development on the site to the extent of the inconsistency.

The aims and objectives of this plan are to:

1. Provide guidelines for a mixed use development on the site.
2. Provide a development that ensures the viability of adjoining site for future development.
3. Minimise traffic impacts on the surrounding road network
4. Ensure development on the site minimises impacts to the amenity of neighbouring residential properties.
5. Provide landscaping in and surrounding the site that enhances the presentation of the site as well as the amenity of the development.
6. Achieves architectural and urban design excellence
7. Maximise activation to Help Street, Mcintosh Street and Cambridge Lane.

2.0 BUILT FORM

Performance Criteria

The built form of the new development shall:

1. Achieve a slender tower form on the site
2. Achieve a site layout that provides a pleasant environment for the occupants and minimises impact on surrounding properties.
3. Ensure visual and acoustic privacy, natural ventilation, sun access and views.
4. Provide suitable areas for communal open spaces, deep soil zones and landscaping.

Controls

1. The maximum tower floor plate that applies to this site for residential towers above a podium is 700m2
2. The width of each side of any tower should be minimised and design elements that contribute to building bulk should be minimised.
3. Substations are to be provided within buildings, not within the streets, open spaces or setbacks and not facing key active street frontages. Substations are to be designed to ensure protection of residents from Electro Magnetic Radiation (EMR) emissions.

3.0 BUILDING HEIGHTS

Performance Criteria

The built form of the new development shall:

1. Be compatible with the planned scale of surrounding development.
2. Minimise overshadowing of surrounding properties and the adjacent public domain.

Controls

1. The maximum building height of 90m is to include all structures located at roof level, including lift over runs and any other architectural features.
2. All structures located at roof level are to be integrated into the overall building form.

4.0 STREET FRONTAGE HEIGHTS AND SETBACKS

Performance Criteria

Setbacks shall:

1. Contribute to deep soil areas, landscaping and open space at street level
2. Minimise the effects of adverse wind conditions at street level
3. To ensure the positioning of new buildings contribute to the existing or proposed streetscape character.

Controls

1. The building setbacks are to be in accordance with Figure 2 “Street Frontage Heights and Building Setbacks”. The setbacks are summarised as below.
   a. Help Street, Mcintosh Street, and Cambridge Lane frontages
      i. Minimum 0m setback at Ground level from boundary for street walls.
      ii. Mixed use frontage with commercial ground floor, 6-14m street wall height.
      iii. Minimum 3m setback above street wall.

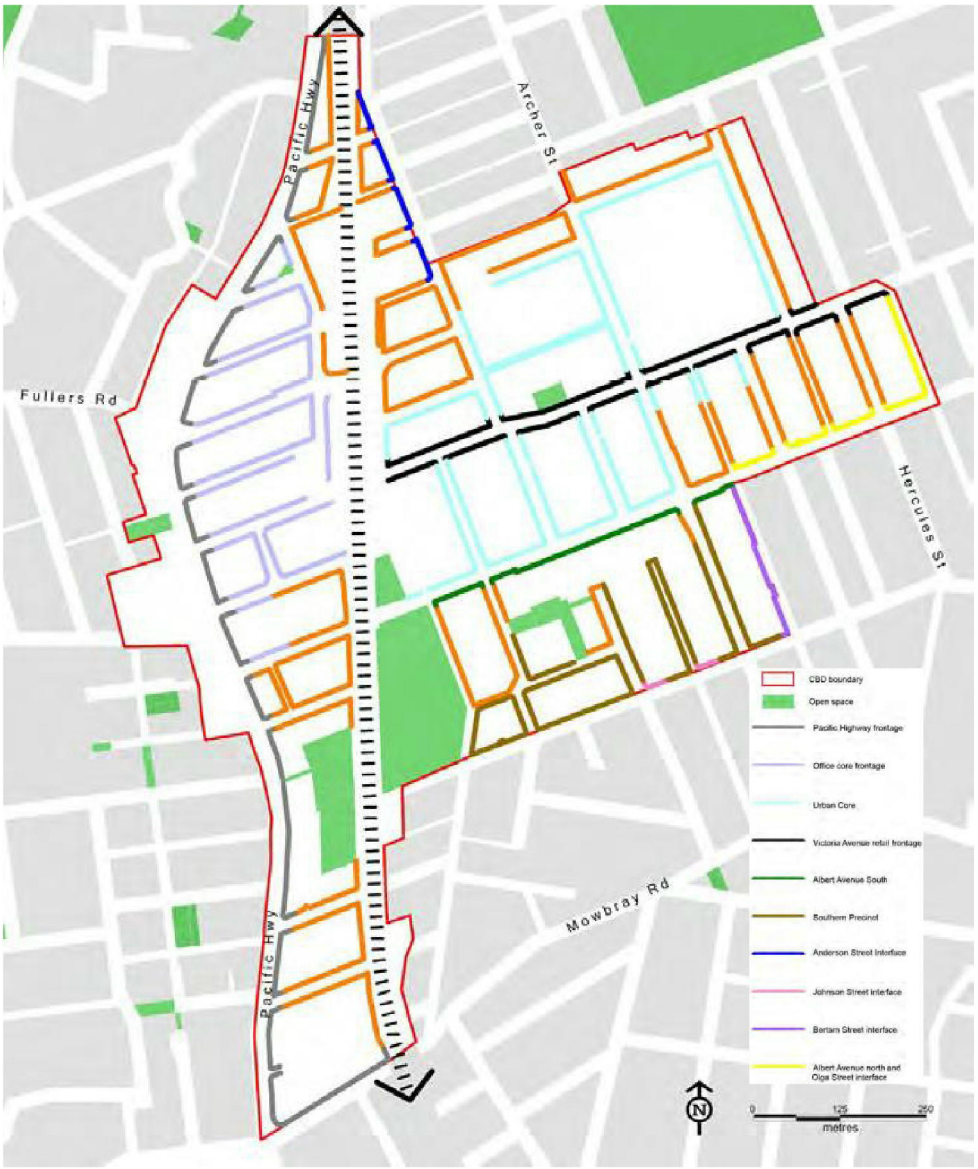

Figure 2: Street frontage heights and building setbacks.

5.0 BUILDING EXTERIOR

Performance Criteria

1. Buildings are to demonstrate a high visual quality of development when viewed from the public domain and the surrounding area.
2. Façade treatment and design is to be used to break down the mass and bulk of buildings.
3. High quality façade materials and finishes are to be used which contribute positively to the built environment.

Controls

1. At street level, façade designs must be sensitive to the pedestrian environment in terms of wall height finishes and setbacks for planting.
2. Extensive blank walls shall be avoided at street level.

6.0 AMENITY

Performance Criteria

1. To maximise solar access and ventilation to residential units.
2. Ensure visual and acoustic privacy of residential units within the development and developments on adjoining properties.
3. Improve pedestrian amenity surrounding the site.

Controls

1. A Wind Assessment shall be submitted at Development Application Stage.
2. A detailed Acoustic Assessment shall be submitted at Development Application Stage.
3. Residential units shall be designed to maximise solar access, cross ventilation, visual and acoustic privacy.

7.0 LINKS, OPEN SPACE AND LANDSCAPING

Performance Criteria

1. Landscaping is to soften and complement the development.
2. Landscaping at street level shall improve the amenity and appearance of the pedestrian environment.
3. The development shall provide publicly accessible links and open space.
4. Publicly accessible open space is to include green landscaping.
5. Green roof tops and usable rooftop areas shall be provided.

Controls

1. Publicly accessible open space and green landscaping such as street trees will be required by all developments.
1. Large canopy tree planting must be provided in accessible open space (if required) and green landscaping such as street trees will be required in all setbacks (if required), and subject to other design principles.
2. All development proposals for the site should have regard to the potential for through links on adjacent sites.
3. Pedestrian and cycling linkages should be sought in order to improve existing access within and through the Site and the Block. New linkages may also be sought where these are considered to be of public benefit. All such links will be provided with public rights of access and designed with adequate width, sympathetic landscaping, passive surveillance, and lighting, including the requirement to meet relevant access legislation.
4. All roofs up to 30 metres from ground are to be green roofs. These are to provide a balance of passive and active green spaces that maximise solar access.
5. A minimum of 2 hours of sun access is to be provided to any public open space on the site.
6. Communal open space for residents of the building is to be incorporated within/on the building, and include seating, recreational areas (e.g. barbeque area) and landscaping.
7. Any communal open space, with particular regard to roof top level on towers, should be designed to address issues of quality, safety and usability.
8. A minimum of 20% of the site is to be provided as soft landscaping, which may be located on Ground, Podium and roof top levels or green walls of buildings. Soft landscaping includes plantings on and above structures (e.g. planter boxes).
9. Any development is to provide a minimum deep soil planting setback of 6 metres along some part of the eastern boundary of the consolidated site, with screen planting of trees being allowed to achieve a mature height, and lower level shrubs.
10. Deep soil plantings include trees, shrubs and grasses, and are to be unimpeded by buildings or structures below ground.

8.0 ACTIVE STREET FRONTAGES

Performance Criteria

1. To ensure that uses on the ground level contribute to the activation of the public domain.
2. To ensure that design and location of ground floor uses maximise surveillance of the public

Controls

1. At ground level buildings are to maximise active frontages to Help Street, Mcintosh Street and Cambridge Lane.
2. A building has an active street frontage if all premises on the ground floor of the building facing the street/s are used for the purposes of commercial premises.

9.0 TRAFFIC AND TRANSPORT

Performance Criteria

1. Development must be designed to provide adequate and safe access to the site.
2. Development on the site is not to cause adverse traffic impacts on the surrounding road system.
3. Ensure future vehicular access can be provided to the adjoining site.
4. Minimise the number of vehicular access points to the development.

Controls

1. As the site is located within 800m of a train station, car parking rates for the development are to utilise RMS car parking rates as per the 'Guide to Traffic Generating Developments', as well as reciprocal parking and car share strategies.
2. All vehicles are to enter and exit a site in a forward direction without the need for supporting technologies. Vehicle manoeuvring technologies such as turntables should only be provided in exceptional circumstances and demonstrated to be necessary.
3. Traffic shall be restricted to left in/left out on the Help Street entrance, to be facilitated by the introduction of a median strip and constructed at the cost of the proponent and involving consultation with Council's Traffic Section.
4. The ability of all vehicles to safely access/egress the development via Help Street from the kerb lane shall be confirmed through the use of turning path analysis/assessment.
5. All commercial and residential loading and unloading is required to occur on-site and not in public streets.
6. Sufficient on-site disabled parking capacity to be provided that is designed to meet the relevant design standards.
7. Development sites are to provide an opportunity within Basement levels to deliver vehicle access to adjoining sites if they require a shared driveway.
8. Bicycle access/facilities and circulation along McIntosh Street shall be encouraged, including "filling the gaps" in the existing bicycle network across intersections.
9. Safe and secure on-site bicycle parking capacity including lockers and racks and end-of-trip facilities to meet the expected site demands to be provided and designed to meet the relevant design standards.

10. WASTE AND LOADING

Performance Criteria

1. Ensure waste collection and loading can be provided to the adjoining site.
2. To ensure that adequate provision is made for waste storage and disposal.

Controls

1. Any loading docks, including garbage, deliveries, and residential removal trucks are to be located in the basement areas. Loading docks may be permitted on the ground floor for constrained/narrow sites where it can be demonstrated it is not practical to provide within basement levels.
2. If a shared driveway will be required for adjoining sites, loading and servicing of the adjacent site is to be considered as part of the development.
3. Vehicular access to the site is to be via Help Street for commercial deliveries and Garbage collection and via Macintosh Street for residential entries and exits – no accessway is to be provided via Cambridge Lane.
4. A Waste Management Plan shall be submitted at Development Application Stage.

11. DESIGN EXCELLENCE AND BUILDING SUSTAINABILITY

A. Design Excellence

Controls

1. Design excellence is required for all developments that have a height of 35m or more.

12. PUBLIC ART

Performance Criteria

1. Ensure public art is considered as part of development within the Chatswood CBD.

Controls

1. Any Public Art is to be in accordance with Council's Public Art Policy.

13. SUSTAINABILITY

Performance Criteria

1. Achievement of design excellence shall include achievement of higher building sustainability standards.

Controls

1. A minimum of 5 star GBCA building rating is expected. A report is to be submitted at Development Application Stage.

14. UTILITY SERVICES

Performance Criteria

1. To ensure that the provision of utility services do not adversely impact on public space or building functionality and amenity.

Controls

1. All utility services and cabling associated with the proposed development will be located underground.

15. CONSTRUCTION IMPACT MITIGATION

Performance Criteria

1. To ensure that building construction impacts on the surrounding community and environment are appropriate mitigated

Controls

1. An acoustic assessment of construction process is to be provided at development application stage, with any noise attenuation measures incorporated into the construction plans.

2. A development application will require an updated assessment of traffic controls and truck routes at the time of lodgement.