Prepared for:
Russell Kennedy Lawyers on behalf of SFA Land Developments Pty Ltd (Henley Property Group)

Prepared by:
Hilary Marshall

Transport Expert Evidence
Craigieburn West Precinct Structure Plan (PSP 1068)

1600 Mickleham Road, Mickleham

19 April 2021

ratio:

r:

traffic:evidence

ratio:consultants

8 Gwynne Street
Cremorne VIC 3121
ABN 93 983 380 225

Prepared for:

Russell Kennedy Layers on behalf of SFA Land Developments Pty Ltd.
Our reference 17900PANEL01 F01 1600 Mickleham Rd, Craigieburn West PSP

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1 Statement of Evidence

Reference

Craigieburn West Precinct Structure Plan (PSP 1068)

1600 Mickleham Road, Mickleham

Name and Address

Hilary Anne Marshall - Director

Ratio Consultants Pty Ltd

8 Gwynne Street, Cremorne, VIC 3121

Professional Qualifications

Bachelor of Engineering (Civil) Hons, 1998, RMIT University

Bachelor of Business Administration (Management), 1998, RMIT University

Professional Experience

Director – Ratio Consultants	Jan 2018 - present
Senior Associate – Ratio Consultants	Jan 2016 – Dec 2017
Associate – Cardno	Nov 2015 – Jan 2016
Senior Engineer – Cardno	Feb 2011 – Oct 2015
Associate – Urban Crossroads, Irvine, California USA	2004-2006
Senior Engineer – Grogan Richards	2002-2004
Engineer – Grogan Richards	1999 - 2001

Professional Expertise

1.1.1 I have worked in the area of Traffic and Transportation Engineering throughout my career. My area of expertise includes traffic advice and assessment of a wide range of land use and development proposals for planning authorities, government agencies, corporations and developers.

1.1.2 I have particular experience in the growth areas, having worked on various projects within 30 plus different PSP areas, including provision of evidence at Planning Panels Victoria, providing traffic engineering services on numerous residential and industrial subdivisions and assisting the VPA in forming new PSPs.

1.1.3 My training, qualifications and experience including involvement with a wide variety of developments over a number of years, qualifies me to comment on the traffic and transport implications of this proposal.

Instructions which define the scope of this report

1.1.4 I have been instructed by Russell Kennedy Lawyers on behalf of SFA Land Developments Pty Ltd to undertake a review of the traffic and transport implications of the proposed Craigieburn West PSP relating to the property at 1600 Mickleham Road, Mickleham, and prepare an expert evidence statement for submission and presentation at the upcoming advisory committee.

Facts, Matters and Assumptions Relied Upon

1.1.5 In the course of preparing this report the facts, matters and assumptions I have relied upon are outlined as follows:

- PSP 1068 – Craigieburn West Precinct Structure Plan, Draft for Public Consultation, prepared by the VPA, dated November 2020.
- Craigieburn West Precinct Structure Plan, Transport Impact Assessment, prepared by onemilegrid (OMG), dated 9 November 2020.
- Craigieburn West Precinct Structure Plan, Existing Conditions Assessment, prepared by OMG dated 18/2/2020.
- Victoria's Draft 30-Year Infrastructure Strategy, prepared by Infrastructure Victoria, December 2020.
- Craigieburn West – PSP 1068, Background Report, Draft for Public Consultation, November 2020.
- Hume Planning Scheme, Clause 52.06, 56.06
- Online maps, including Melway, Nearmap, Streetview, Vicplan and google maps.
- VPA website including interactive maps and benchmark intersection designs.
- ABS Census Data 2016 for the City of Hume
- Craigieburn West PSP, Traffic and Transport Expert Evidence Statement to Panel, prepared by Ross Hill of Onemilegrid, dated 15/4/2021, which includes an Addendum to the OMG Traffic Impact Assessment, dated 1/4/2021.

Identity of Persons Undertaking the Work

1.1.6 Hilary Marshall of Ratio Consultants.

Declaration

1.1.7 I have read the Planning Panels Victoria Expert Witness guidelines (April 2019) as well as the Guide to Committees and Inquiries and understand my obligations to the Advisory Committee.

1.1.8 I have no relationship with the client other than a business engagement to comment on this matter.

1.1.9 My involvement in this project commenced in March 2021 and I was not involved in the preparation of the exhibited Precinct Structure Plan or the SFA Land Developments Pty Ltd submission. I declare that I was involved in the preparation of the submission made by Peet Limited regarding their land parcel south of Craigieburn Road within the Craigieburn West PSP area. I am not currently assisting Peet with preparation or attendance at the Advisor Committee.

1.1.10 I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge, been withheld from the Advisory Committee.

Hilary Marshall
Director: Traffic
Ratio Consultants

2 Introduction

2.1 Overview

2.1.1 I have been instructed by Russell Kennedy Lawyers on behalf of SFA Land Developments Pty Ltd, to provide my expert opinion with respect to the proposed Craigieburn West Precinct Structure Plan (PSP 1068) and the potential traffic and transport implications for land at 1600 Mickleham Road, Mickleham (subject site),

2.1.2 This report has been prepared in accordance with the Planning Panels Victoria Expert Witness guidelines, with reference to the Guide to Committees and Inquiries.

2.1.3 In the course of preparing this assessment, I have examined the Craigieburn West PSP documentation and relevant supporting background reports, reviewed the traffic modelling and referred to the documents outlined in Section 1 of this report.

2.1.4 My opinions with respect to the traffic and transport issues relating to the subject site (1600 Mickleham Road, Mickleham) in regards to the proposed Precinct Structure Plan are set out in the following report.

2.2 Instructions

2.2.1 I received the following instructions from Russell Kennedy Lawyers on the 31st March 2021:

"We are instructed to request you to review our client's submission to the VPA (see Tab 3 of the index) and the exhibited Amendment documentation and subject to your preliminary opinion, to prepare and present expert traffic evidence at the Advisory Committee hearing which commences on 26 April 2021 (see Tab 9 of the index). Please note that traffic evidence from all traffic engineering experts is scheduled to be heard as a block on 3 and 4 May 2021. Please diarise accordingly.

Subject to your preliminary comments, we will instruct you to prepare an expert witness statement within the scope of your expertise and express your opinion (including recommendations) as to whether the Amendment is appropriate having regard to:

- *Our client's submission: and in particular the matters raised in paragraphs 4), 14), and 18) of the submission. Please also provide your expert opinion on the adequacy of the intersection treatment to our client's land from Mickleham Road and the costings allocated for those works.*
- *The matters raised by the draft PSP dated November 2020.*
- *Any regulatory framework applicable to the proposal which is within your expertise to examine and comment on having regard to the strategic planning background giving rise to the Amendment with consideration of relevant planning controls including strategies and policies in the Hume Planning Scheme.*
- *Your own judgement and experience, and*
- *Any other matter which you regard as relevant to the formulation of your opinion, stating clearly the basis of your views."*

2.3 Abbreviations

2.3.1 For convenient reference, a summary of commonly used acronyms in this report are outlined as follows:

PSP	Precinct Structure Plan	VPA	Victorian Planning Authority
ICP	Infrastructure Contribution Plan	vpd	Vehicles per day
PIP	Precinct Infrastructure Plan	vph	Vehicles per hour

3 Locality and Site Context:

3.1 Overview

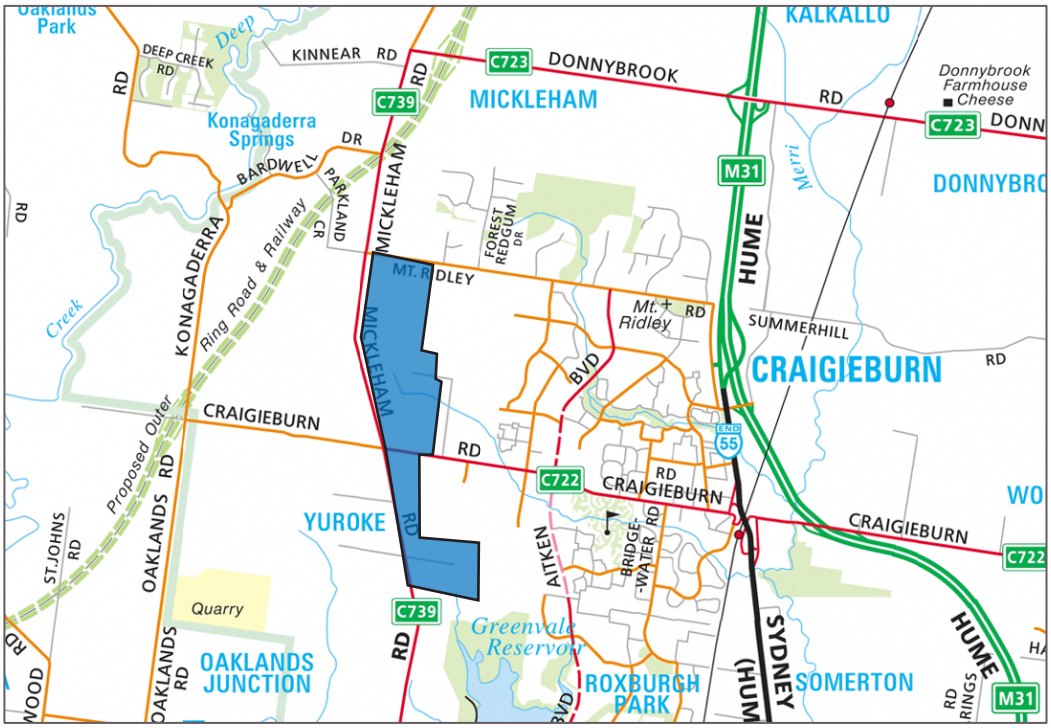
3.1.1 The Craigieburn West Precinct Structure Plan (PSP) seeks to rezone land between the completed Craigieburn R2 PSP and the urban growth boundary. After the PSP is approved it will be incorporated into the Hume Planning Scheme.

3.1.2 The Draft Craigieburn West PSP has been prepared by the VPA in consultation with Hume Council and other stakeholders.

3.2 Location and Context

3.2.1 The Craigieburn West PSP is located within the Northern Growth Corridor, generally bound by Mt Ridley Road to the north, the Craigieburn R2 PSP currently being developed to the east, existing development to the south and Mickleham Road along its western boundary, as shown in context with the surrounding area in Figure 3.1.

Figure 3.1: Craigieburn West PSP Locality



Source: melway.com.au

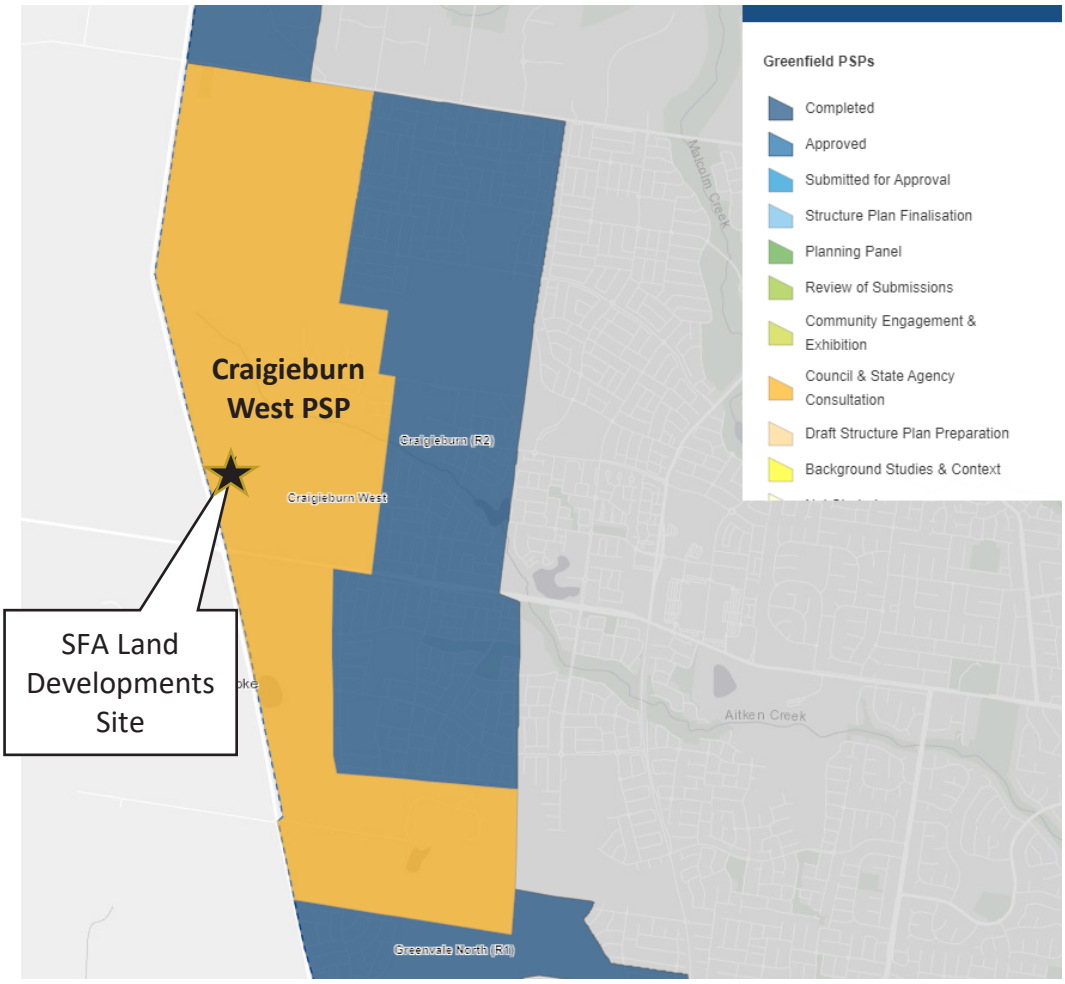
3.2.2 As shown in the preceding figure, the land has good vehicular connectivity with frontage to three arterial roads: Mt Ridley Road, Craigieburn Road and Mickleham Road, as well as convenient access to the Hume Freeway to the east.

3.2.3 The Outer Metropolitan Ring Road (OMR) will be located in close proximity to the west of the site, with a fully directional interchange proposed at Craigieburn Road.

3.3 Surrounding PSP Areas

3.3.1 The Craigieburn West PSP is bordered by three completed PSP's as shown in Figure 3.2.

Figure 3.2: Status of surrounding PSPs



Source: VPA website (April 2021)

3.3.2 As shown in the preceding figure, the Craigieburn West PSP abuts the Lindum Vale (Mt Ridley West) PSP to the north, the Craigieburn R2 PSP to the east and Greenvale North R1 PSP to the south. The abutting PSPs are all gazetted and are in various stages of development.

3.3.3 All land to the west is outside the Urban Growth Boundary (UGB) and generally comprises rural residential dwellings.

4 SFA Land Developments:

4.1 SFA Land Developments Submission

4.1.1 Breese Pitt Dixon (BPD) consultants made a submission to the VPA on behalf of SFA Land Developments, regarding the draft Craigieburn West PSP, dated 18 December 2020.

4.1.2 I was not involved in the preparation of the BPD submission.

4.1.3 My instructions are to consider the entire submission, with particular reference to the following paragraphs:

4) A residential subdivision-lead form of development supporting a minimum housing density of 26.5 dwellings/NDha has a higher potential to undermine preferred urban design objectives. The symptoms of a housing density of this order include a higher proportion of narrower lots requiring single space garages and resultant increased on-street parking and congestion. Whilst Clause 56.06-8 the planning scheme requires on-street parking provision at a rate of one space to every two lots the reality is that Councils require one space per lot to gain planning and engineering approval. Whilst a level of rear accessed lots will typically compromise a portion of residential lots within a walkable catchment context the majority of lots typically support front access and is reflective of market preference. The provision of an increased number of smaller lots results in a higher demand for on-street parking, albeit such lots and associated driveways decrease the quantum of on-street parking availability leading to congested local streets and reduced amenity. Where increased housing density is achieved through the creation of small lots infrastructure services within the nature strip and vehicle crossings commonly result in a reduced ability to provide sufficient unencumbered and permeable area to provide the desired level of street tree planting which is detrimental to character and amenity outcomes.

14) R4 states "Development along Mickleham Road and Mt Ridley Road must provide a sensitive rural interface through design treatments, which include a landscaped nature strip between the row of housing and road reservation". The PSP provides no direction on what is expected for this road design. R4 should be redrafted as it suggests provision of a nature strip separate to a typical local street reserve cross section. It is unclear what landscaping requirement are contemplated by the requirement.

18) As the local town centre is positioned centrally within the PSP area access is required via the connector street network through residential areas rather than via an arterial road. We request the VPA further review the proposed location of the town centre and its potential relocation along an arterial road.

4.2 Areas for review

4.2.1 Based on the instructions received from Russell Kennedy Lawyers and the submission lodged by SFA Land Developments, I have focused on the following issues:

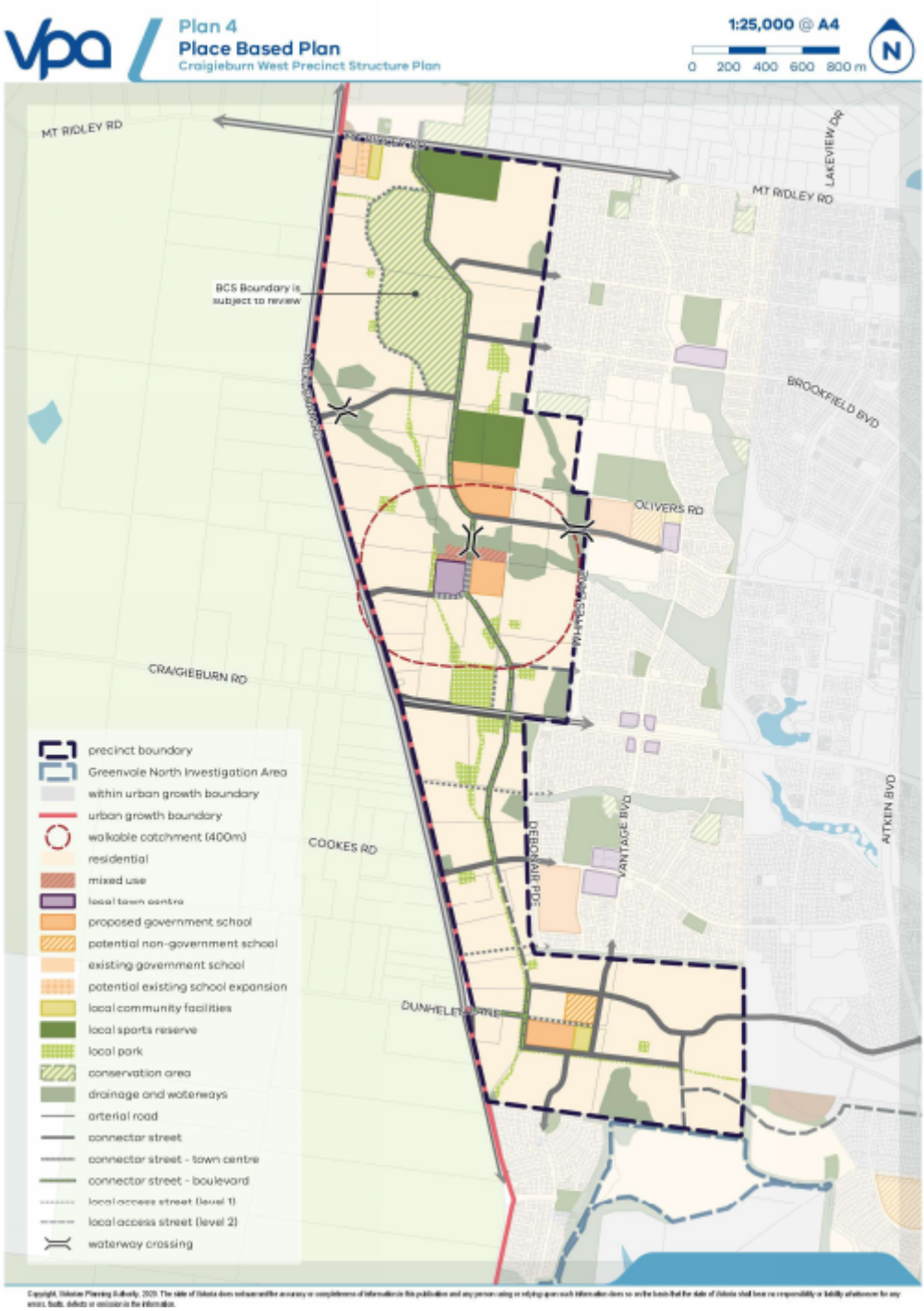
- Proposed Road Network
- Mickleham Road Requirement R4
- Intersection Operation
- On-street Car Parking Implications

5 Draft Craigieburn West PSP:

5.1 Place Based Plan

5.1.1 The subject site is identified as parcel 17 on Plan 3 Land Use Budget, of the exhibited PSP. The proposed Place Based Plan for the Craigieburn West PSP is reproduced as Figure 5.1.

Figure 5.1: Draft Craigieburn West PSP Place Based Plan



5.1.2 The Place Based Plan indicates that the subject site will be zoned residential and is almost entirely located within the identified 400m catchment of the proposed activity centre immediately to the east of the site.

5.1.3 Land to the north and south will also be residential in nature. The activity centre to the east is separated from the subject site by a linear park.

5.2 Residential Density

5.2.1 The OMG Traffic Impact Assessment that accompanies the draft PSP, states that the PSP will cater for **6153 dwellings**, one activity centre and active and passive open space.

5.2.2 A minimum average density for land inside and outside the walkable catchment has been proposed within the PSP as follows:

Table 5-1: Minimum Residential Density Requirements

Developable Area	Minimum Average Density (DW/NDHA)
Standard residential outside walkable catchment	18.5 dwellings per ha
Residential within walkable catchment	26.5 dwellings per ha

5.2.3 The subject site is located within the walkable catchment area and is identified in the PSP as having a net developable area of 11.13ha.

5.2.4 Applying the above rate of 26.5 dwellings per net developable hectare results in a requirement for a minimum of 295 dwellings.

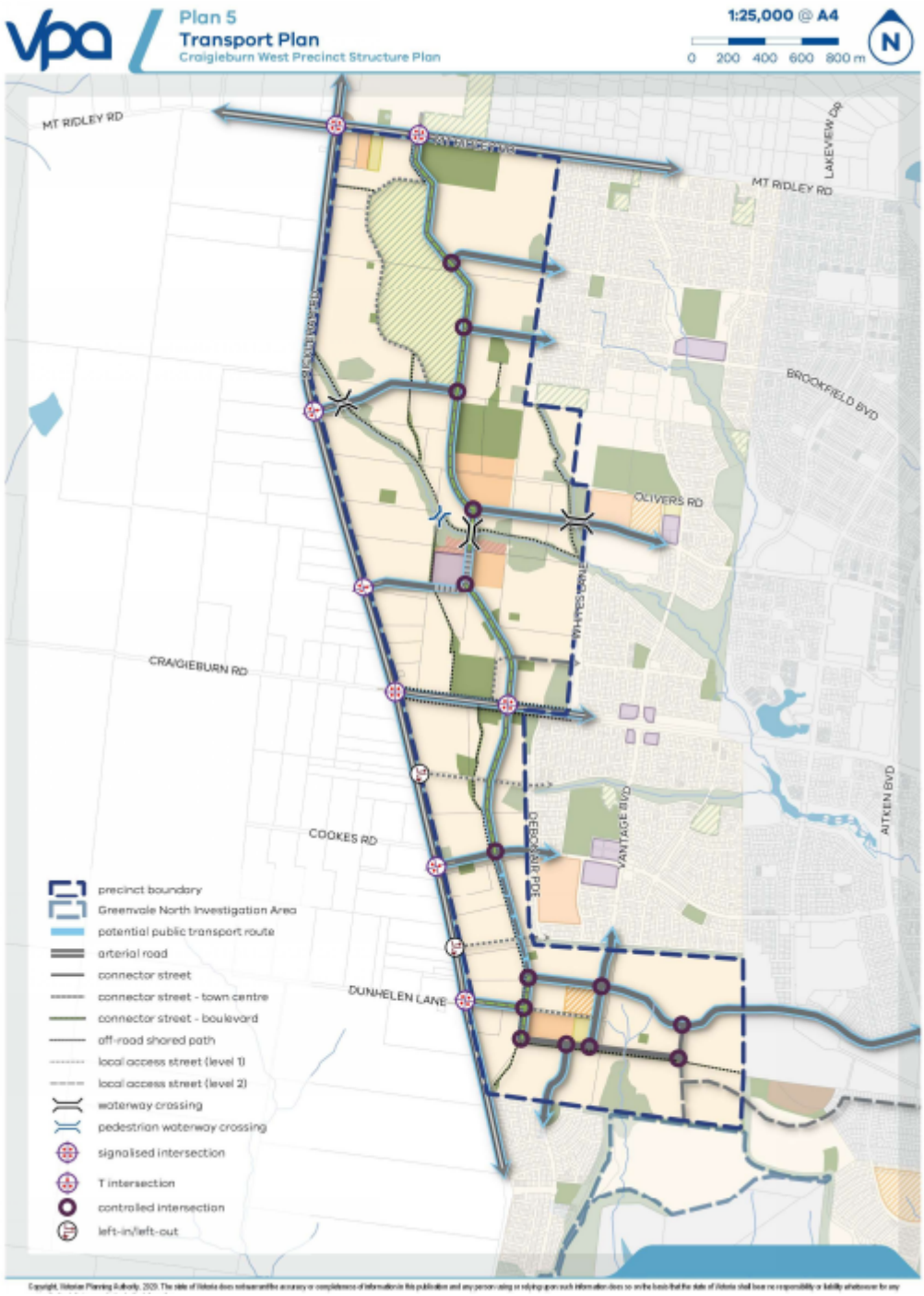
5.1 Town Centre

5.1.1 One activity centre is proposed within the entire Craigieburn West PSP area, which will be located on land abutting the eastern boundary of the subject site. The Local Town Centre is proposed to contain 6,000sqm of retail floor area and 1000sqm of commercial floor area. The uses are anticipated to include one full line supermarket, specialty retail and some non-retail local services.

5.2 Transport Plan

5.2.1 Plan 5 of the Draft PSP outlines the proposed road network, potential bus routes, path network, intersection locations and types. The Transport Plan is reproduced as Figure 5.2

Figure 5.2: Proposed Transport Plan



5.2.2 The Craigieburn West PSP area abuts 3 arterial roads, including Mt Ridley Road, Mickleham Road and Craigieburn Road. The primary arterial road serving the PSP area is Mickleham Road fronting the entire PSP area along its western boundary for a distance of over 5 kilometres.

5.2.3 The subject site has an east west connector road through the site, providing a signalised T-intersection with Mickleham Road and connection to the activity centre.

5.2.4 Mickleham Road and the east west connector road are identified as potential bus routes.

5.3 Precinct Infrastructure Plan

5.3.1 The Precinct Infrastructure Plan (PIP) is reproduced as Figure 5.3.

Figure 5.3: Proposed Precinct Infrastructure Plan

5.3.2 The entire PSP includes 7 intersections, noting that the two on Mt Ridley Road are partially funded by the adjacent PSP. As no arterial roads are proposed within the PSP, there are no ICP road projects shown on the PIP or to be included in the subsequent ICP.

5.3.3 Three bridges are identified in the Precinct Infrastructure table (Section 4.1) but are not included as PIP items or proposed to be included in the ICP.

5.3.4 The proposed signalised East West Connector Road / Mickleham Road intersection located on the subject site is identified as IN-04 on the PIP as shown in Figure 5.4.

Figure 5.4: IN-04 Mickleham Road / East West Connector 2

5.3.5 IN-04 is identified as a short to medium term project, requiring the ultimate land with interim intersection construction, 100% funded by the PSP.

6 Traffic Modelling Review:

6.1 OMG Traffic Modelling

6.1.1 Onemilegrid (OMG) were commissioned by the VPA to prepare an Existing Conditions Assessment and a Transport Impact Assessment during the preparation of the draft Craigieburn West PSP.

6.1.2 Two scenarios were modelled: an interim year of 2031 representing a 10 year time frame and an Ultimate 2046 scenario, representing full buildout.

6.1.3 The OMG modelling is based on a standard lot size of 600sqm, equivalent to 16.7 dwellings per hectare. This is lower than the minimum of 18.5 dwellings per hectare and 26.5 dwellings per hectare specified by the PSP.

6.1.4 The OMG traffic assessment estimates that the PSP will contain approximately 6,153 lots, however as the assumed density is lower than that proposed by the PSP, the overall number of dwellings is likely to be higher. A greater number of dwellings would result in an increased number of vehicle movements generated by the PSP area.

6.2 Traffic Generation

6.2.1 A rate of 9 vehicle movements per lot per day has been adopted for the Craigieburn West PSP. Based on case study data collected by Ratio and traffic generation rates used by other consultants within recently adopted PSPs, the rate of 9vm/lot/day is considered to be overly conservative.

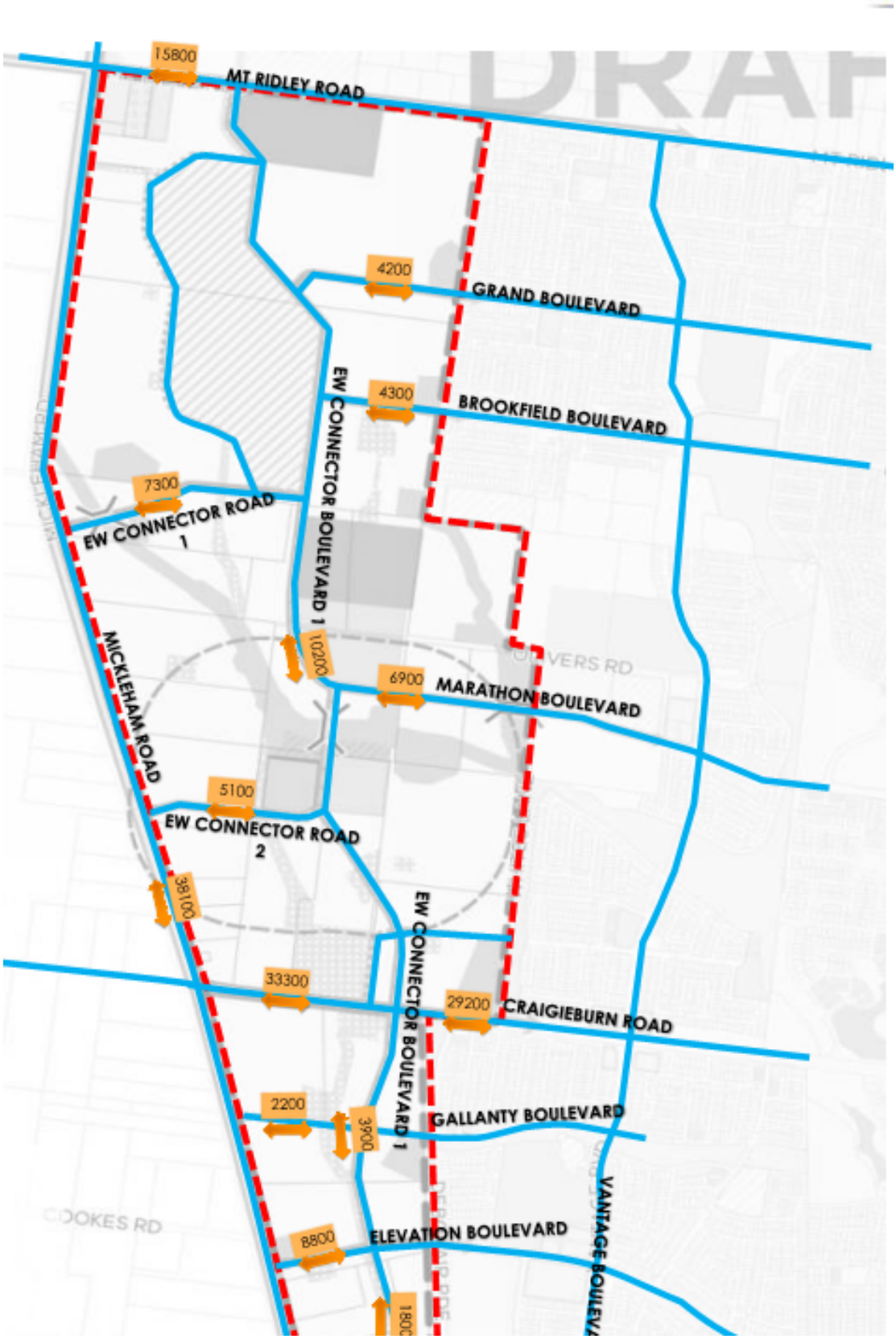
6.2.2 It is noted that a lower traffic generation rate may balance out some of the potential discrepancy created by the OMG lower residential density assumption.

6.3 Anticipated Daily Traffic Volumes

6.3.1 The interim Daily Traffic Volumes are depicted in Appendix E of the OMG traffic assessment, with an extract shown in Figure 6.1.

Figure 6.1: Interim (2031) Daily Traffic Volumes – Modelled by OMG

Figure 6.2: Ultimate (2046) Daily Traffic Volumes – Modelled by OMG



6.3.2 The OMG study identifies that the theoretical upper capacity of the modelled roads are as follows:

Table 6-1: OMG Indicative Upper Maximum Traffic Volumes

Road Type	Traffic Volume
Access Street Level 2	2000-3000 vpd
Connector Road	3000-7000 vpd
Boulevard Connector	7000-12000 vpd
Secondary Arterial	12000-40000 vpd
Arterial	>30000 vpd

6.3.3 In comparison to Clause 56.06 of the Hume Planning Scheme, the indicative OMG traffic volumes for a Connector Road is relevant to a Connector Road Level 2.

6.3.4 The capacity of a Boulevard Connector is not defined in the Planning Scheme.

6.3.5 Arterial Roads are defined in the Planning Scheme as having a capacity of greater than 7,000 vehicles per day.

6.4 Road Capacity Analysis

6.4.1 A road capacity analysis has been undertaken within the OMG report, with 4 Connector Roads expected to operate over capacity, including:

- East West Connector Road 1
- East West Connector Road 3
- Elevation Boulevard
- Fairways Boulevard.

6.4.2 In addition to the above roads, it is noted that the daily volume on the north south Connector Road through the PSP area is expected to have a volume of 10,000vpd. This volume exceeds the typical volumes of a Connector Road and has therefore been nominated as a Boulevard Connector, which restricts access to left in / left out from adjacent lots to increase the traffic capacity. The implication of adopting a Boulevard Connector for such a significant length of the PSP area is that it will require longer trips by adjacent lots to turn around.

6.4.3 No recommendations or mitigating measures were identified or discussed in the OMG assessment in regard to the overcapacity roads.

6.5 OMG Intersection Analysis

6.5.1 The OMG PSP traffic assessment does not include an intersection analysis. However, Section 13.2.1 of the Background Report states the following:

"The intersections of Mickleham Road / Craigieburn Road, Mickleham Road / Elevation Boulevard and Mickleham Road / Dunhelen Lane will all operate with a Degree of Saturation of above 0.9 under interim conditions. Whilst this is not desirable, these intersections will improve in operation under ultimate conditions and the queues anticipated under interim conditions will not impact the operation of other intersections within the vicinity".

6.5.2 Given that a number of roads were identified as being over capacity, a peak hour intersection analysis within the OMG traffic assessment would have been useful to ensure that the VPA benchmark intersection designs are adequate for the proposed signalised intersections.

7 Onemilegrid Addendum Assessment:

7.1 Overview

7.1.1 Expert evidence was circulated by Mr Hill of Onemilegrid dated 15th April 2021 on behalf of the VPA.

7.1.2 The evidence includes an Addendum to the original Traffic Impact Assessment prepared by OMG.

7.1.3 Due to the limited time frame between circulation of the OMG evidence and completion of this report, I have only had a limited time to review the substantial changes associated with the traffic modelling.

7.1.4 Of significance I note the following changes:

- The projected yield of the Craigieburn West PSP has increased from 6153 dwellings to 8230 dwellings an increase of 2077 dwellings, an increase of 33%.
- Applying the OMG rate of 9 vehicle movements per dwelling to the additional 2077 lots results in approximately 18,693 additional vehicle movements per day.

7.2 Over Capacity Roads

7.2.1 Mr Hill states the following in his evidence statement (Pg 6 paragraph 2):

> In regard to Marathon Boulevard, Dunhelen Lane, Vantage Boulevard (south of Fairways Boulevard), North-South Connector Boulevard 1, Navigation Road and Horizon Boulevard, these roads are all anticipated to operate at a maximum of 11% over their theoretical capacity. This is considered to be within an acceptable range, given that the inclusion of lower order access streets within the network (which have not been modelled) is expected to reduce the actual traffic volumes on the modelled road network, and considering typical margins of error for large scale modelling such as that undertaken as part of this study, and from previous modelling undertaken by others.

7.2.2 I disagree that 11% over capacity is an appropriate outcome for the findings of a precinct structure plan. Although traffic volumes may exceed their theoretical capacities in reality, this is not an appropriate starting point for future planning.

7.2.3 Clause 56.06 of the Planning Scheme outlines the indicative traffic volumes appropriate for each road type, with a notation stating the following (Key to Table C1):

> **Key to Table C1**
>
> 1. Indicative maximum traffic volume for 24-hour period. These volumes depend upon location. Generation rates may vary between existing and newly developing areas.

7.2.4 As shown in the following excerpt from Clause 56.06 the traffic volumes are clearly nominated as maximum traffic volume.

7.3 Updated Traffic Modelling

7.3.1 The Addendum contains updated traffic modelling for the Craigieburn West PSP for both Interim and Ultimate conditions. The results are reproduced as follows:

Figure 7.1: Interim Traffic Volumes – OMG Addendum

onemilegrid

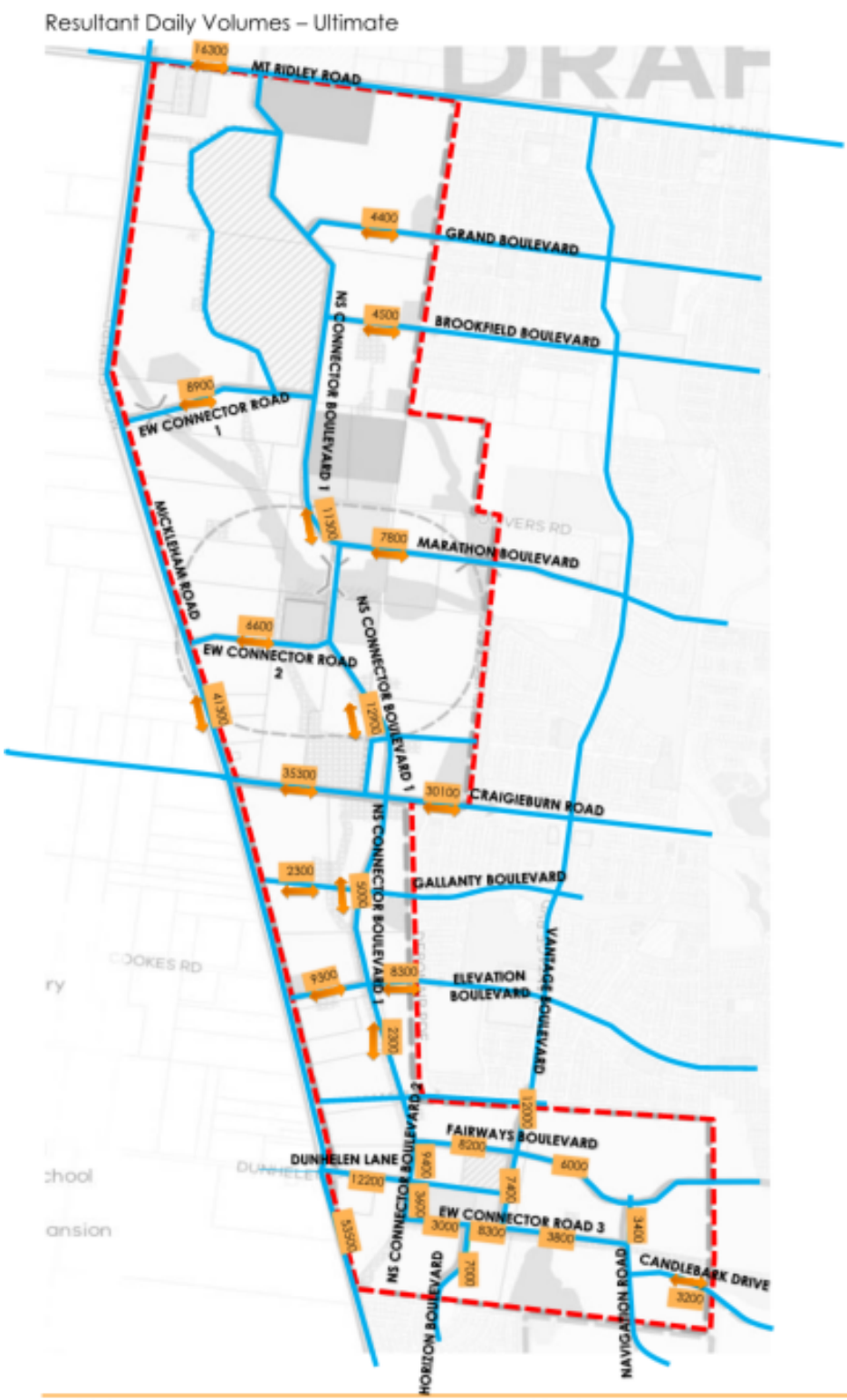
7.3.2 Of relevance to 1600 Mickleham Road, the following interim traffic volumes have changed:

Table 7-1: Changes to OMG Traffic Modelling

Road	Original Daily Traffic Volume	Addendum Daily Traffic Volume	Change
Mickleham Road	32500	35800	3300 (10%)
East West Connector 2	5100	6500	1400 (27%)

7.3.3 As shown in the preceding table, the interim traffic volumes affecting my client's land have increased substantially.

Figure 7.2: Ultimate Daily Traffic Volumes – OMG Addendum



8 Road Network Concerns:

8.1 General Principles

8.1.1 Clause 56.06 Standard C17, of the Planning Scheme outlines the neighbourhood street network requirements. Some of the Clause 56.06 guidelines that 'should' be adopted are:

- Include arterial roads at intervals of approximately 1.6 kilometres that have adequate reservation with to accommodate long term movement demand.
- Include connector streets approximately halfway between arterial roads and provide adequate reservation widths to accommodate long term movement demand.
- Ensure connector streets align between neighbourhoods for direct and efficient movement of pedestrians, cyclists, public transport and other motor vehicles.
- Provide an interconnected and continuous network of streets within and between neighbourhoods for use by pedestrians, cyclists, public transport and other vehicles.

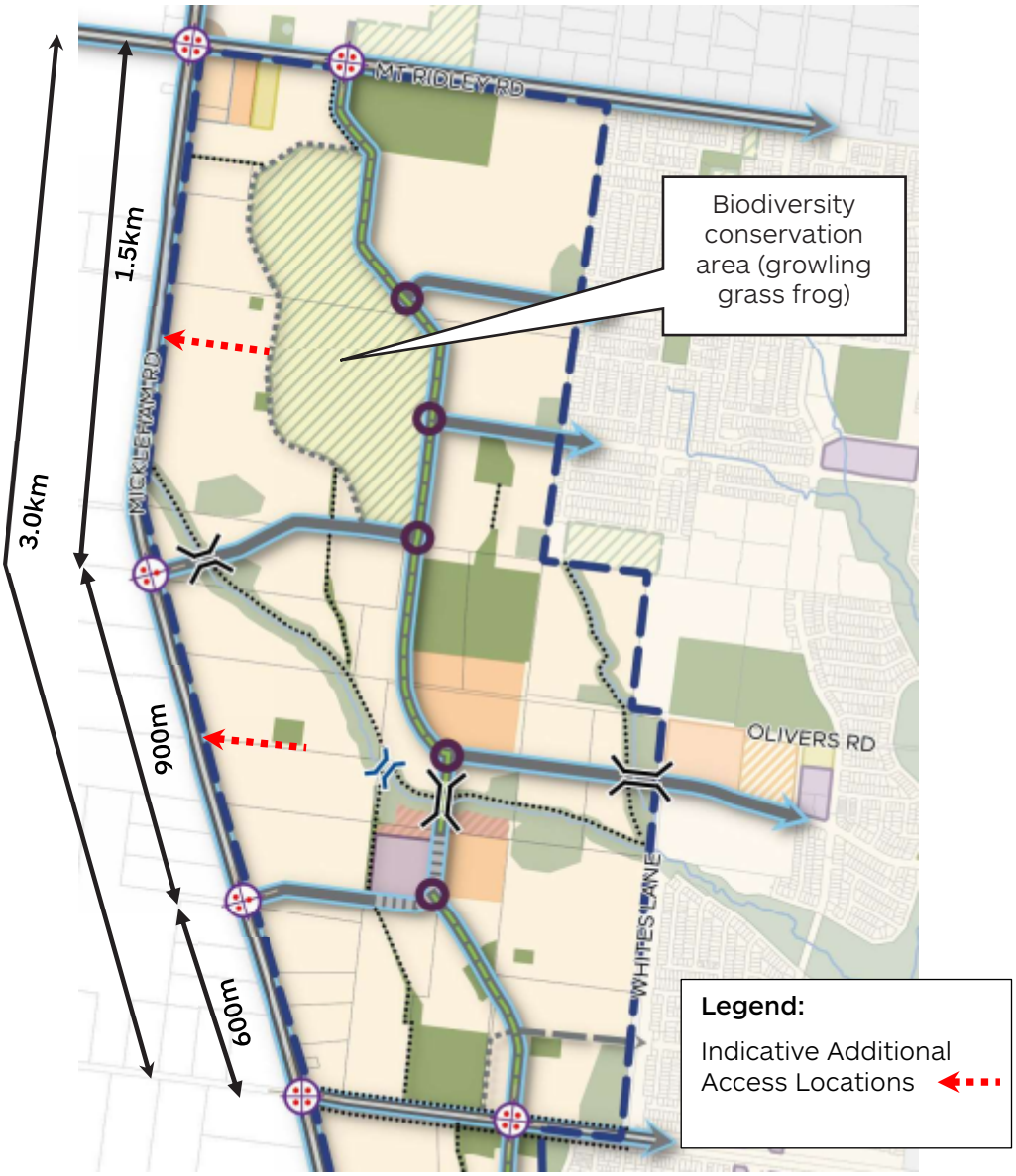
8.2 Issue

8.2.1 Craigieburn Road divides the PSP area such that frontage to Mickleham Road is approximately 3km north of Craigieburn Road and 2km south of Craigieburn Road.

8.2.2 As the Mickleham Road frontage is 3km long, road network planning would normally require an arterial road at the midpoint, supported by two Connector Roads at approximately 800m spacings between arterial roads.

8.2.3 The spacing of the proposed intersections north of Craigieburn Road is shown on Figure 8.1.

Figure 8.1: Mickleham Road Access Spacing



8.2.4 In comparison the shorter section south of Mickleham Road will be provided with 2 signalised intersections as well as 2 left in / left out points of entry.

8.2.5 The reduced number of road connections combined with the lack of an arterial road connection, results in a concentration of traffic activity on the two connector roads provided.

8.2.6 As shown in the OMG modelling the northern connector is over capacity for a Connector Road link (7300vpd) and the Connector through my client's land is expected to carry over 5,000vpd.

8.2.7 Another issue with such limited access arrangements to Mickleham Road is that the development of the norther portion of the PSP area is heavily reliant on the development of two land parcels which trigger the construction of the two access points to Mickleham Road.

8.2.8 In my client's case there is a high probability that this connection will not be available in the short term due to the density requirements associated with the Town Centre, which could remain undeveloped for at least the next 10 years.

8.2.9 A large number of land parcels in the northern portion of the PSP will remain landlocked until one or both connectors are constructed, as well as internal road connections.

8.1 Limitations

8.1.1 It is noted that a large portion of the northern section of the PSP area is identified as biodiversity conservation area (growling grass frogs), which is assumed to limit vehicular access through this part of the PSP.

8.2 Recommendation

8.2.1 It is my opinion that the following should be considered:

- Add at least two left in / left out locations between the signalised intersections, noting that fully directional access may be achieved in the interim, subject to approval by the road authority.

8.2.2 The proposed access locations are indicatively depicted on Figure 8.1.

8.2.3 The benefit of providing extra connections to the arterial road network is primarily to disperse the concentration of traffic activity on the two east west connector roads.

8.2.4 Additional access locations also provide more opportunity for development to proceed in the event that the land owners with the only two connections do not choose to develop their land in the near future, effectively land locking most other land parcels within proximity to Mickleham Road.

9 PSP Requirement R4:

9.1 Issue

9.1.1 Requirement R4 of the Draft PSP states the following:

"*Development along Mickleham Road and Mt Ridley Road must provide a sensitive rural interface through design treatments, which include a landscaped nature strip between the row of housing and road reservation*".

9.1.2 No arterial cross sections are included in the draft PSP.

9.1.3 It is noted that the existing road reserve of Mickleham Road is 60 metres wide. The standard cross section for a Primary Arterial Road is currently 41 metres, which is consistent with the VPA Benchmark designs.

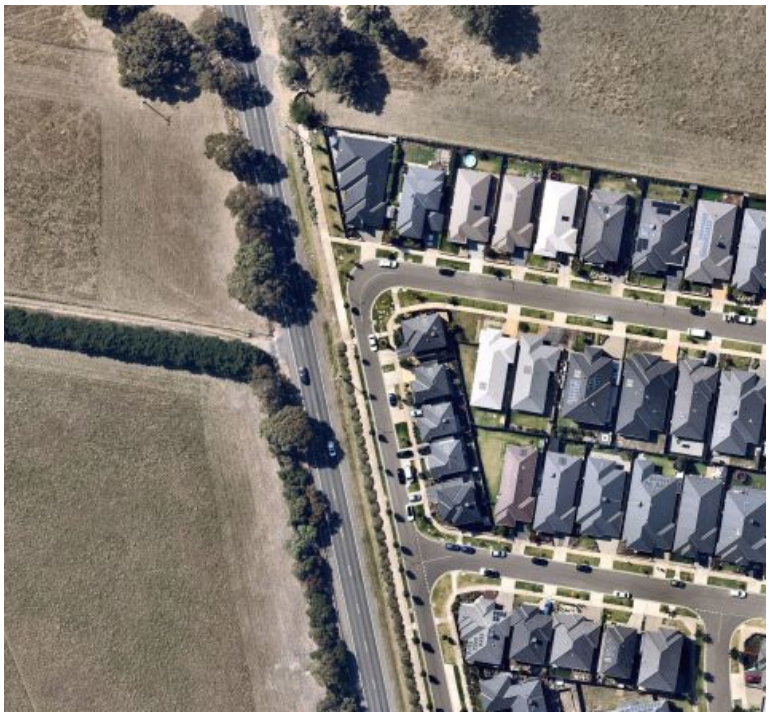
9.1.4 Therefore, there is an additional 19 metres of space for landscaping opportunities etc already within the road reserve.

9.1.5 Furthermore, although not shown in the PSP, any subdivision adjacent Mickleham Road is expected to require frontage roads or landscaping strip along any lots siding Mickleham Road.

9.1.6 It is noted that development within the Greenvale North R1 PSP does not have a similar requirement for a rural interface, noting that the land zoning on the western side of Mickleham Road is the same as the Craigieburn West PSP and that it is also bordered by the Urban Growth Boundary.

9.1.7 The recently constructed estate bordering the southern edge of the Craigieburn West PSP is shown in Figure 9.1.

Figure 9.1: Aspect Estate Immediately South of Craigieburn West PSP



9.2 Recommendation

9.2.1 It is my opinion that the R4 requirement is unclear and appears to be unnecessary based on the existing Mickleham Road reserve and development adjacent to Mickleham Road immediately to the south.

10 Mickleham Rd / East West Connector Intersection:

10.1 Issue

10.1.1 Due to the limited number of connections proposed to Mickleham Road north of Craigieburn Road as discussed earlier in this report, there is a concentration of traffic volumes on the Connector Roads and their intersections with Mickleham Road.

10.1.2 The concern is that the concentration of traffic will result in the geometry of the VPA Benchmark intersection designs being inadequate to accommodate the interim traffic volumes anticipated.

10.2 Peak Hour Traffic Volumes

10.2.1 Due to the high projected traffic volumes on both Mickleham Road and the East West Connector Road through the subject site, I have undertaken an intersection analysis using the SIDRA intersection program for both the AM and PM peak hours, based on the updated OMG Addendum traffic volumes.

10.2.2 The OMG assessment does not include peak hour turning movements. In order to undertake the intersection analysis, I have adopted the same assumptions outlined in the OMG transport assessment as follows:

- Peak hour volumes assumed to be 10% of the daily volume.
- AM Peak split 70% outbound / 30% inbound.
- PM Peak split 40% outbound / 60% inbound.
- Overall directional distribution was 14.5% of all trips to the north and 32.7% of all trips to the south. Converting these to 100% as north and south are the only choices at the intersection, results in 30% to/from the north and 70% to and from the south.
- I used the existing conditions peak hour turning movements at Mickleham Road / Craigieburn Road to determine the AM and PM peak hour splits past the subject site.
- Existing directional splits on Mickleham Road in the AM Peak hour are 35% northbound 65% southbound. In the PM Peak, the split is 57% northbound and 43% southbound.

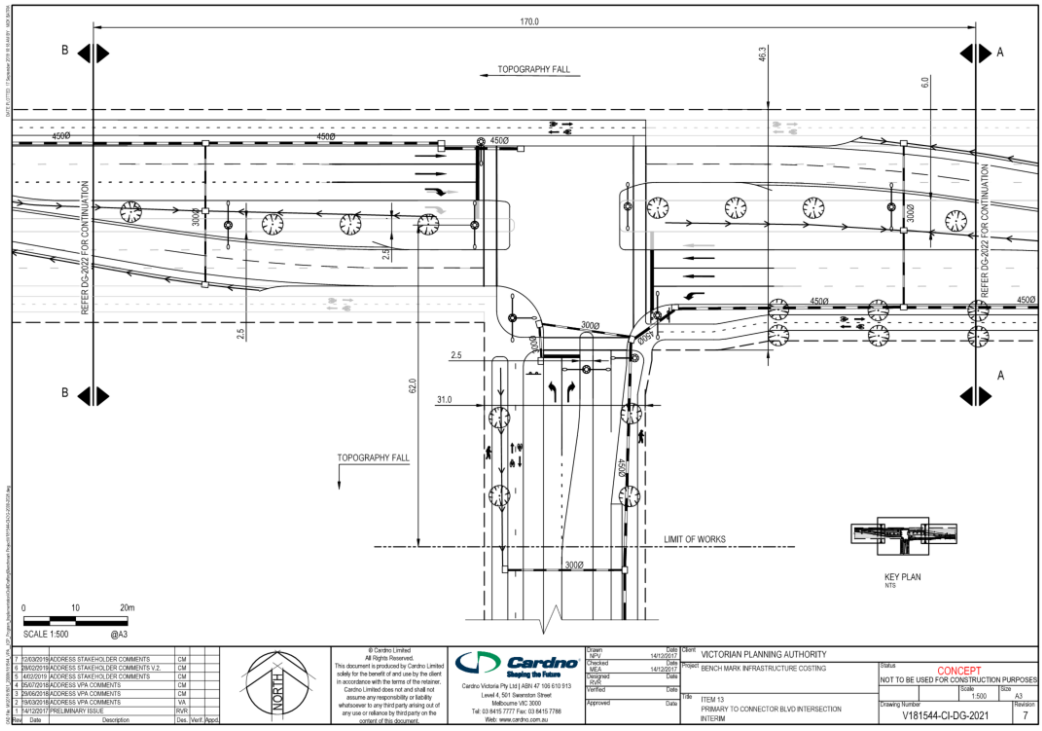
10.2.3 The preceding assumptions from the OMG assessment allowed me to derive the peak hour turning movements at the proposed Mickleham Road / East West Connector 2 Road (IN-04). The anticipated peak hour traffic volumes are attached as Appendix A, along with the relevant SIDRA parameters.

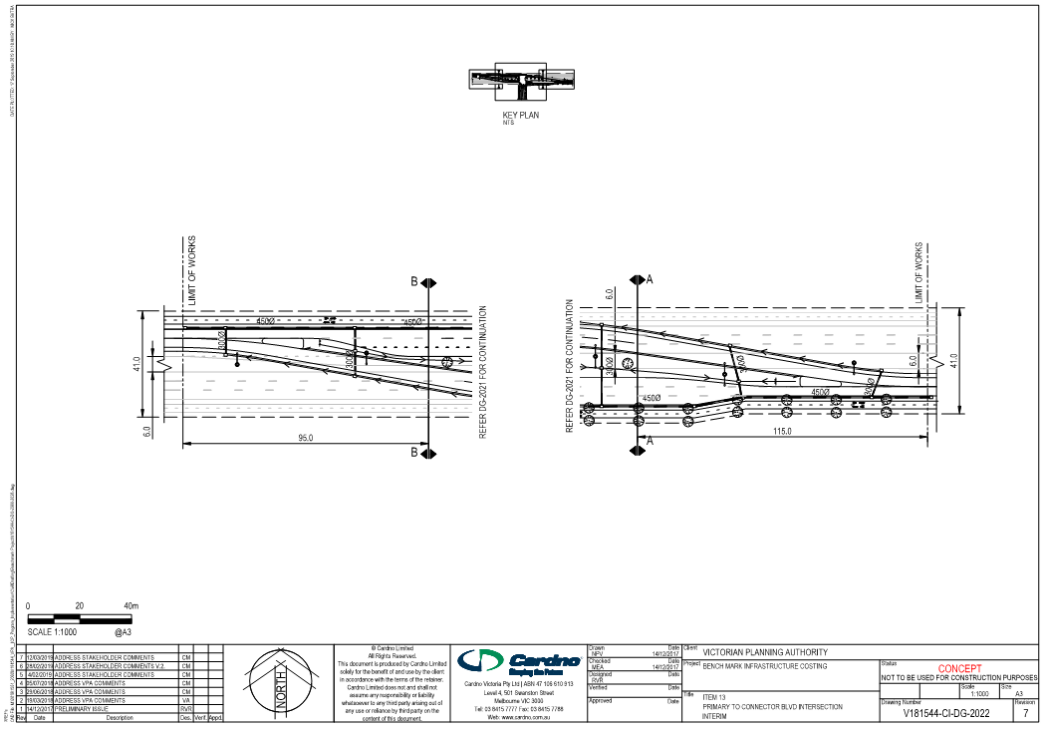
10.3 Intersection Geometry

10.3.1 The VPA have recently adopted a series of Benchmark intersection designs that are used to determine the Infrastructure Contribution (ICP) for the ICP intersections throughout the PSP.

10.3.2 The relevant benchmark design for Mickleham Road / Connector Road is the Primary Arterial / Connector as shown in Figure 10.1.

Figure 10.1: VPA Benchmark Intersection Design for Primary Arterial to Connector Road (T-intersection)





10.4 IN-04 Intersection Analysis Results

10.4.1 The intersection analysis is based on the benchmark intersection layout shown in Figure 10.1.

10.4.2 The results of the intersection analysis are summarised in the following table and attached as Appendix A.

Table 10-1: Mickleham Road / East West Connector Road 2 (IN-04)

Leg	Movement	AM Peak Hour			PM Peak Hour		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
Mickleham Road (S)	Through	0.57	151	7	1.11	1020	98
	Right	0.84	49	57	093	117	72
East West Connector Road €	Left	1.19	321	239	0.30	58	36
	Right	0.47	55	55	0.27	30	53
Mickleham Road (N)	Left	0.04	4	7	0.09	13	9
	Through	1.37	1872	256	1.11	772	106
Intersection Total		**1.37**			**1.11**		

10.4.3 The preceding table indicates that the projected traffic volumes exceed the capacity of the Benchmark intersection geometry and that the intersection is over capacity in both the AM and PM peak hours.

10.4.4 Therefore, the benchmark geometry is expected to be insufficient to accommodate the likely traffic volumes, based on the OMG modelling for interim conditions.

10.5 Discussion

10.5.1 In the event that the Benchmark geometry is insufficient to accommodate the projected peak hour traffic volumes the intersection will need to be increased in size to satisfy the Department of Transport that the intersection could operate safely and efficiently.

10.5.2 Requirements by Department of Transport or Council above the benchmark design is typically at the cost of the developer constructing the intersection.

10.5.3 The subject site at 1600 Mickleham Road will most likely be responsible for constructing the intersection on Mickleham Road (IN-04).

10.5.4 It is noted that the daily traffic volumes on the East West Connector 1 and Elevation Boulevard are significantly higher than the East West Connector 2 and are therefore also unlikely to operate satisfactorily with the standard Benchmark geometry.

10.6 Recommendation

10.6.1 Based on the projected interim traffic volumes modelled by OMG, it is anticipated that the following intersections will need additional improvement beyond the VPA Benchmark Designs:

- Mickleham Road / East West Connector Road 1
- Mickleham Road / East West Connector Road 2
- Mickleham Road / Elevation Boulevard

10.6.2 On that basis it is recommended that the road network within the northern portion of the PSP is reviewed with additional road capacity provided to Mickleham Road, as previously identified.

11 On-street Parking:

11.1 Issue

11.1.1 Paragraph 14 of BPD's submission correctly identifies the ongoing discrepancy between the requirements of the Planning Scheme and Council's expectations in regard to on-street parking in growth areas.

11.1.2 Clause 56.06-8 of the Planning Scheme requires one space per 2 lots, which is ignored by most growth area Councils, who generally require one on-street space for every lot. Equivalent to a 50% increase in on-street parking above and beyond the statutory requirements.

11.1.3 The reason this needs to be addressed, preferably within the PSPs going forward, is that the Council requirement directly impact the aspirations of the PSP. Namely the desire to have increased density, alternative street cross sections and increased landscaping.

11.1.4 These aspirations become even harder in higher density areas where the blocks are narrower (potentially 7-8m wide), which once a crossover is added leaves an inadequate frontage to achieve one on-street parking space per lot, resulting in rear loaded product.

11.1.5 Although I have no problem with the development of rear loaded dwellings, it needs to be acknowledged that the requirement for a rear laneway (7-8m wide) decreases the developable area and increases the overall road pavement within a development. It is also noted that there is no reduction in the frontage road width when rear access is provided.

11.2 Craigieburn West PSP Requirements

11.2.1 Section 3.2.3 Street Network, of the draft PSP includes two requirements and a number of guidelines. The guidelines are reproduced as follows:

GUIDELINES	
G16	Slip lanes should be avoided in areas of high pedestrian activity (including schools and the Local Town Centre) and only provided at intersections between connector streets and arterial roads where they are necessitated by high traffic volumes but with pedestrian priority crossings.
G17	Culs-de-sac should not detract from convenient pedestrian and vehicular connections.
G18	The frequency and impact of vehicular crossovers on verges of connector roads should be minimised by applying a combination of: • Rear loaded lots with laneway access. • Vehicular access from the side streets. • Combined or grouped crossovers. • Increased lot widths.
G19	All signalised intersections should be designed having regard to the Department of Transport (DOT) working document *Guidance for Planning Road Networks in Growth Areas* November 2015 (as updated), to the satisfaction of The Head, Transport for Victoria and the responsible authority.
G20	Street trees should be provided on both sides of all roads and streets (excluding laneways) at regular intervals appropriate to tree size at maturity, unless otherwise agreed by the responsible authority. **Average interval** — **Tree size** 8–10 metres — Small (less than 10 metre canopy) 10–12 metres — Medium (10–15 metre canopy) 12–15 metres — Large (canopy larger than 15 metres) The design and siting of street trees should address relevant council policies & guidelines.
G21	A variety of road cross sections should be utilised in a subdivision layout to create differentiation and neighbourhood character. Alternative cross sections should ensure that: • Minimum required carriageway dimensions are maintained to ensure safe and efficient operation of emergency vehicles on all streets as well as buses on connector streets. • The performance characteristics of standard cross sections as they relate to pedestrian and cycle use are maintained. • Relevant minimum road reserve widths for the type of street are maintained, unless otherwise approved by the responsible authority.

11.2.2 The preceding guidelines are well intentioned but highlight the difficulty for my client who has a Connector Road through the site. The guidelines suggest larger lots or rear loaded dwellings along the Connector Road competing with the requirement for higher density within the walkable catchment.

11.3 Planning Scheme Requirements

Residential Dwellings and Visitor Parking

11.3.1 Table 1 of Clause 52.06 of the Hume Planning Scheme outlines the car parking requirements for residential dwellings as follows:

Table 11-1: Planning Scheme Car Parking Requirements, Clause 52.06

Use	Rate Column A	Rate Column B	Car Parking Measure Column C
Dwelling	1	1	To each use or two bedroom dwelling, plus
	3	2	To each three or more bedroom dwelling (with studies or studios that are separate rooms counted as a bedrooms) plus
	1	0	For visitor to every 5 dwellings for developments of 5 or more dwellings

11.3.2 Column A is generally applicable throughout the growth areas as the Column B rates apply to locations within the Principal Public Transport Network (PPTN) and parking overlays. Neither of which are usually in place during the early stages of development.

11.3.3 As shown above the standard requirement for visitor parking, which is typically assumed to occur on street is one space for every five dwellings.

11.3.4 Residential dwellings in growth areas rarely seek a dispensation for parking and as such are usually provided with either a single or double car garage in accordance with the requirements outlined above.

Subdivision Road Design On-Street Parking

11.3.5 Clause 56.06-8 of the Hume Planning Scheme outlines the Lot Access Objectives for residential subdivision. Table C1 Design of roads and neighbourhood streets includes a discussion on parking spaces within the carriageway width requirements. The requirements are summarised as follows:

Table 11-2: Clause 56.06 On-Street Parking Requirements

Street Type	Carriageway width and parking provision within street reservation*
Access Lane	5.5m wide with no parking spaces to be provided. Appropriately signed.
Access Place	5.5m wide with 1 hard standing verge parking space per 2 lots. Or 5.5m wide with parking on carriageway – one side Appropriately signed.
Access Street Level 1	5.5m wide with 1 hard standing verge parking space per 2 lots.
Access Street Level 2	7m-7.5m wide with parking on both sides of carriageway.
Connector Street Level 1	An additional dedicated parking lane or indented parking within the verge must be provided where street parking is required. A parking lane width of 2.3m is required where parallel parking is provided.
Connector Street Level 2	An additional dedicated parking lane or indented parking within the verge must be provided where street parking is required. A parking lane width of 2.3m is required where parallel parking is provided.

*' includes parking related comments only.

11.3.6 As outlined above, one space per 2 lots is required for an Access Place or Access Street Level 1, with an unspecified quantity of on-street parking provided both sides of an Access Street Level 2 or Connector Road.

11.3.7 It is also noted that provision of parking as a hard stand area within the verge reduces the available space for tree planting.

11.3.8 The majority of residential streets are designed as 16m wide cross sections containing a 7.3m wide carriageway which provides on-street parking on both sides.

11.4 Growth Area Council Requirements

11.4.1 Hume Council amongst other growth area Councils require one space per lot on average for all residential subdivisions. The justification for this requirement is generally provided to avoid future complaints by residents about on-street parking.

11.4.2 The Council requirement sets up an expectation by residents that an on-street parking space will be provided along the frontage of their property.

11.5 Parking Demand

11.5.1 In my experience the Planning Scheme requirement for one space per 5 dwellings for visitor parking is generally appropriate and accepted. Furthermore, peak visitor parking is short term and typically occurs on a Friday and Saturday evening.

11.5.2 Therefore, the on-street parking demand issue from Council's perspective is understood to derive from overflow residential parking, where the residents own more than one or two vehicles and are therefore reliant to some degree on on-street parking for the short fall.

11.5.3 In order to understand the extent of the perceived problem, I have reviewed the ABS Census data for car ownership within the Hume Council area. The results of the Census data are summarised in Table 11-3.

Table 11-3: City of Hume Car Ownership by No. of bedrooms per dwelling

Number of bedrooms	Number of Dwellings	Number of Motor Vehicles Owned					Average Car Ownership
		None	One	Two	Three	Four or more	
None	108	47	31	21	4	5	0.97
One Bedroom	440	124	238	67	5	6	0.93
Two Bedrooms	3785	447	2126	1020	153	39	1.26
Three Bedrooms	29763	1487	10495	12504	3763	1514	1.78
Four Bedrooms	18384	278	3239	8565	3784	2518	2.27
Five Bedrooms	2534	32	269	889	660	684	2.67
Six Bedrooms or more	451	10	33	121	99	188	2.94
Total	**55465**	**2425**	**16431**	**23187**	**8468**	**4954**	

11.5.7 As shown above the average car ownership per dwelling is less than 2 cars for all dwellings with 3 bedroom or less.

11.5.8 The average increases to more than 2 spaces for 4, 5 and 6 or more bedroom dwellings.

11.5.9 The breakdown of dwelling types in terms of bedrooms is summarised as Table 11-4.

Table 11-4: Type of Dwellings in City of Hume

Number of bedrooms	Number of Dwellings	Percentage
None	108	0%
One Bedroom	440	1%
Two Bedrooms	3785	7%
Three Bedrooms	29763	54%
Four Bedrooms	18384	33%
Five Bedrooms	2534	5%
Six Bedrooms or more	451	1%
Total	55465	100%

11.5.10 More than half (54%) of all houses in Hume contain 3 bedrooms. A further 33% contain 4 bedrooms.

11.5.11 The results of the investigation are summarised as follows:

- 74% (40935) of dwellings have a demand that matches the Planning Scheme parking requirements. Therefore, these dwellings are not expected to generate an overflow demand for residential on-street parking.
- 17% (9414) of dwellings generate a demand for 1 resident on street parking space.
- 9% (5066) of dwellings generate a demand for 2 resident on-street parking spaces.
- Total demand for on-street parking generated by residential over flow is 19,696 spaces throughout the City of Hume.
- Adopting a residential visitor parking rate of 1 space per 5 dwellings, generates an additional short term demand for a further 11,093 spaces.
- Therefore, total demand for on-street parking generated by residents and their visitors is 30,789 spaces.
- Based on the preceding analysis, the City of Hume generates a demand for 0.55 spaces per dwelling, which is very close to the 1 space per 2 lots identified in Clause 56.06.

11.6 Other Considerations

11.6.1 Infrastructure Victoria recently released Victoria's Draft 30-year Infrastructure Strategy, which has a number of suggested strategies specific to growth areas, with the following relevant to this discussion:

"71. Target 30% tree canopy coverage in new growth areas.

Achieve 30% tree canopy coverage in new growth areas by mandating coverage during precinct development. Fund relevant Victorian Government agencies and local government to plan, replace and maintain canopy trees."

11.6.2 Although there are a number of ways the above strategy may be achieved, providing opportunity within our road reserves is one of them.

11.7 Summary of Opinion

11.7.1 Based on the preceding discussion it is my opinion that:

- I agree that on-street parking is an important resource for communities and needs to be provided equitably throughout residential neighbourhoods.
- However, the Council requirement for one space per lot is not considered reasonable or necessary and increases the amount of hard surface and road pavement considerably, that could be alternatively allocated.
- In my opinion better street outcomes are being compromised by Council's requiring 50% more on-street parking than their own Planning Scheme requires and is actually required.
- In terms of future proofing development, the ambition is not for car ownership to increase but for travel to be undertaken by more sustainable modes of transport. It is appreciated that there is a lag in growth areas between occupation of dwellings and provision of public transport, bike lanes, footpaths and services. However, as the ABS Census data demonstrates the average demand is well below the need for one space per lot and in my opinion a better streetscape could be achieved with the same traffic functionality with less on-street parking.

11.8 Recommendation

- A clear requirement under the Street Network section of the PSP, that is consistent with the Planning Scheme requirements of one space per 2 lots, would strengthen the ability of developers to negotiate an on-street parking requirement of less than one space per lot.

12 Summary of Opinion

12.1 Overview

12.1.1 As outlined in the preceding discussion, the following recommendations are made in regard to the areas I have reviewed:

12.2 Proposed Road Network

- Access to Mickleham Road north of Craigieburn Road has not been provided in accordance with the Planning Scheme.
- I recommend that at least two left in / left out locations between the signalised intersections north of Craigieburn Road are added, noting that fully directional access may be achieved in the interim, subject to approval by the road authority.

12.3 Mickleham Road Requirement R4

- The R4 requirement is unclear and appears to be unnecessary based on the existing Mickleham Road reserve and development adjacent to Mickleham Road immediately to the south.

12.4 Intersection Operation

12.4.1 Based on the projected interim traffic volumes modelled by OMG, it is anticipated that the following intersections will need additional improvements beyond the VPA Benchmark Designs:

- Mickleham Road / East West Connector Road 1
- Mickleham Road / East West Connector Road 2
- Mickleham Road / Elevation Boulevard

12.4.2 On that basis it is recommended that the road network within the northern portion of the PSP be reviewed with additional road capacity provided to Mickleham Road.

12.5 On-street Car Parking Implications

12.5.1 To reduce the over provision of on-street parking, it is recommended that the PSP requirements add wording to the effect that on-street parking is only required as per the Planning Scheme Clause 56.06 requirements. To reduce unnecessary road pavement within the growth areas, it is recommended that the following addition to the PSP is made:

- Add a requirement under the Street Network section of the PSP, that is consistent with the Planning Scheme requirements of one on-street space per 2 lots.

Appendix A: **SIDRA Analysis**

SIDRA Parameters

The key parameters used to determine the operational capacity of an intersection are queue length, average delay and degree of saturation (or volume to capacity ratio).

Degree of Saturation is a ratio of arrival (or demand) flow to capacity. Degrees of saturation above 1.0 represent oversaturated conditions and degrees of saturation below 1.0 represent undersaturated conditions.

The operational rating associated with the degree of saturation is summarised in Table 12-1.

Table 12-1: Ratings of Degree of Saturation

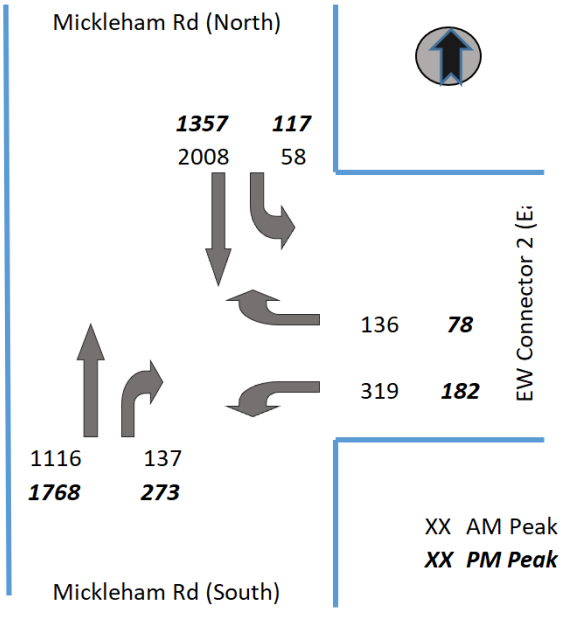
Degree of Saturation (DOS)	Rating
Up to 0.6	Excellent
0.61 – 0.70	Very Good
0.71 – 0.80	Good
0.81 – 0.90	Fair
0.91 – 1.00	Poor
Greater than 1.00	Very poor

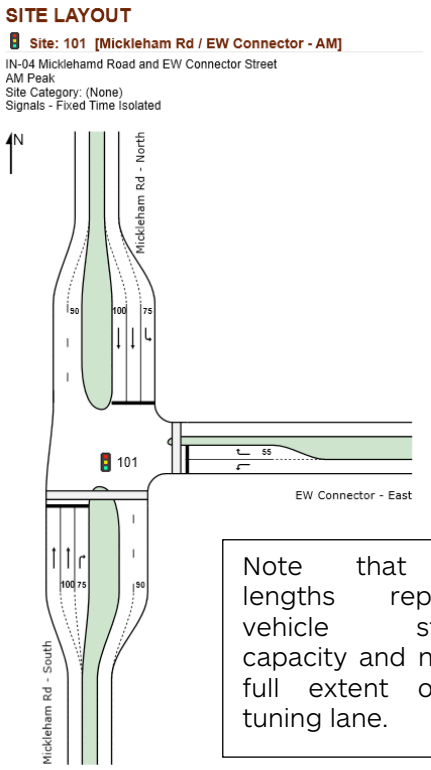
Although operating conditions with a degree of saturation around 1.00 are undesirable, it is acknowledged that this level of congestion is typical of many metropolitan intersections during the AM and PM peak hours.

The 95th percentile queue length is the value below which 95 percent of all observed cycle queue lengths fall, or 5 percent of all observed queue lengths exceed.

Average Delay is the average time, in seconds, that all vehicles making a particular movement can expect to wait at an intersection.

Peak Hour Turning Movements Based on OMG Addendum Assessment and Geometry





Note that lane lengths represent vehicle storage capacity and not the full extent of the tuning lane.

AM Peak Results

PHASING SUMMARY

Site: 101 [Mickleham Rd / EW Connector - AM Addendum]

IN-04 Micklehamd Road and EW Connector Street
AM Peak
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

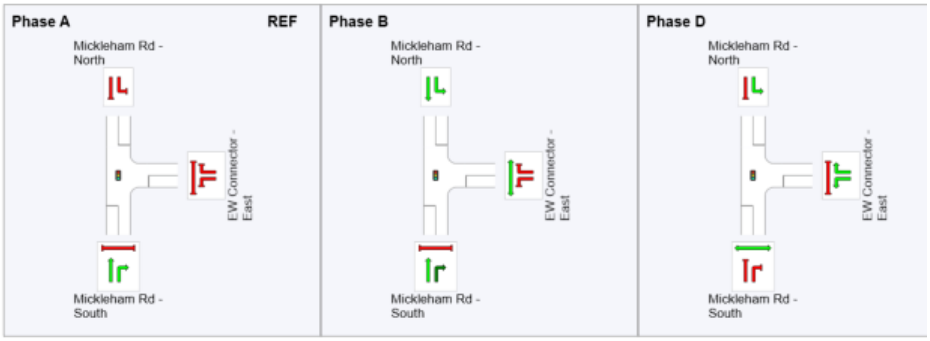
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Split Phasing
Reference Phase: Phase A
Input Phase Sequence: A, B, D
Output Phase Sequence: A, B, D

Phase Timing Summary

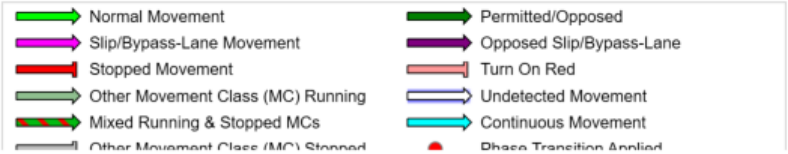
Phase	A	B	D
Phase Change Time (sec)	0	13	94
Green Time (sec)	7	75	20
Phase Time (sec)	13	81	26
Phase Split	11%	68%	22%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 101 [Mickleham Rd / EW Connector - AM Addendum]

IN-04 Micklehamd Road and EW Connector Street
AM Peak
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mickleham Rd - South												
2	T1	1175	5.0	0.569	7.0	LOS A	20.7	150.9	0.45	0.41	0.45	53.8
3	R2	144	2.0	0.837	57.0	LOS E	6.8	48.7	1.00	0.96	1.51	30.5
Approach		1319	4.7	0.837	12.5	LOS B	20.7	150.9	0.51	0.47	0.57	49.6
East: EW Connector - East												
4	L2	336	2.0	1.186	239.2	LOS F	45.1	321.0	1.00	1.47	2.52	11.8
6	R2	143	2.0	0.469	55.2	LOS E	7.7	55.0	0.95	0.80	0.95	31.0
Approach		479	2.0	1.186	184.2	LOS F	45.1	321.0	0.99	1.27	2.05	14.5
North: Mickleham Rd - North												
7	L2	61	2.0	0.040	7.2	LOS A	0.6	4.0	0.17	0.61	0.17	52.3
8	T1	2114	5.0	1.371	256.3	LOS F	256.5	1872.3	0.88	1.96	2.31	11.4
Approach		2175	4.9	1.371	249.3	LOS F	256.5	1872.3	0.86	1.92	2.25	11.6
All Vehicles		3973	4.5	1.371	162.8	LOS F	256.5	1872.3	0.76	1.36	1.67	16.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

PM Peak Results

PHASING SUMMARY

Site: 101 [Mickleham Rd / EW Connector - PM Addendum]

IN-04 Micklehamd Road and EW Connector Street
PM Peak
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

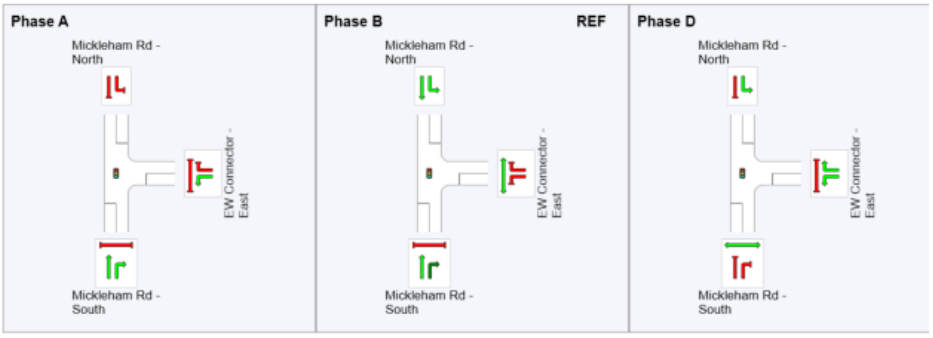
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase B
Input Phase Sequence: A, B, D
Output Phase Sequence: A, B, D

Phase Timing Summary

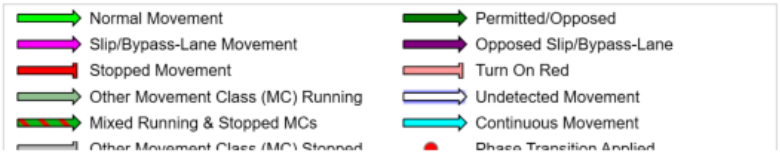
Phase	A	B	D
Phase Change Time (sec)	98	0	72
Green Time (sec)	16	66	20
Phase Time (sec)	22	72	26
Phase Split	18%	60%	22%

See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 101 [Mickleham Rd / EW Connector - PM Addendum]

IN-04 Micklehamd Road and EW Connector Street
PM Peak
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mickleham Rd - South												
2	T1	1861	5.0	1.110	98.0	LOS F	139.7	1019.9	0.79	1.22	1.40	22.8
3	R2	287	2.0	0.928	71.8	LOS E	16.4	117.0	1.00	1.11	1.78	27.2
Approach		2148	4.6	1.110	94.5	LOS F	139.7	1019.9	0.82	1.21	1.45	23.3
East: EW Connector - East												
4	L2	192	2.0	0.299	35.8	LOS D	8.1	57.6	0.77	0.78	0.77	37.1
6	R2	82	2.0	0.269	53.2	LOS D	4.3	30.3	0.91	0.76	0.91	31.6
Approach		274	2.0	0.299	41.0	LOS D	8.1	57.6	0.81	0.77	0.81	35.2
North: Mickleham Rd - North												
7	L2	123	2.0	0.088	9.2	LOS A	1.8	12.5	0.27	0.64	0.27	50.8
8	T1	1428	5.0	1.105	105.5	LOS F	105.7	771.9	0.88	1.29	1.50	21.7
Approach		1552	4.8	1.105	97.9	LOS F	105.7	771.9	0.83	1.24	1.40	22.7
All Vehicles		3974	4.5	1.110	92.2	LOS F	139.7	1019.9	0.82	1.19	1.39	23.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).