AJP PROJECTS PTY LTD

SEPTEMBER 2023

177 MELROSE DRIVE, LYONS

TRANSPORT IMPACT ASSESSMENT

Question today
Imagine tomorrow
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177 Melrose Drive, Lyons
Transport Impact Assessment

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REV	DATE	DETAILS
C	24 November 2022	Final
D	7 September 2023	Final – Revised for change in development

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1 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

AJP Projects Pty Ltd is proposing to redevelop the vacant public housing site at 177 Melrose Drive, Lyons into 492 residential apartments across six buildings. This report addresses the traffic and transport impacts of the proposed redevelopment of the site to support the Development Application.

1.2 SITE LOCATION

The site is located at 177 Melrose Drive, Lyons (Block 1, Section 70, LYONS), in the inner south of Canberra and approximately 8.7 kilometres from the Canberra CBD (Civic), as shown in Figure 1.1.

The site is within the Woden Valley District of the ACT.

Basemap source: ACTmapi

Figure 1.1 Site location – regional context

The site is bordered by the Woden Gardens residential complex to the north, a corridor of urban open space to the west, Hindmarsh Drive to the south and Melrose Drive to the east.

The surrounding area generally comprises low density residential dwellings to the south and west, commercial and retail uses in the Woden Town Centre to the east and the Phillip service trades areas is located to the south-east.

The site was formally known as the Strathgordon public housing site. The buildings associated with this development have been demolished.

Basemap source: Nearmap

Figure 1.2 Site location and its surrounds

1.3 LAND ZONING

The site is zoned RZ5: High Density Residential in the Territory Plan (refer Figure 1.3).

To the west the surrounding area generally comprises low density residential housing. Whilst low density residential is predominant to the north and south of the site, there are also pockets of medium density residential. Commercial zoning occurs to the east of the site.

Source: ACTmapi

Figure 1.3 Land use zoning

1.4 BACKGROUND

1.4.1 STRATEGIC CONTEXT

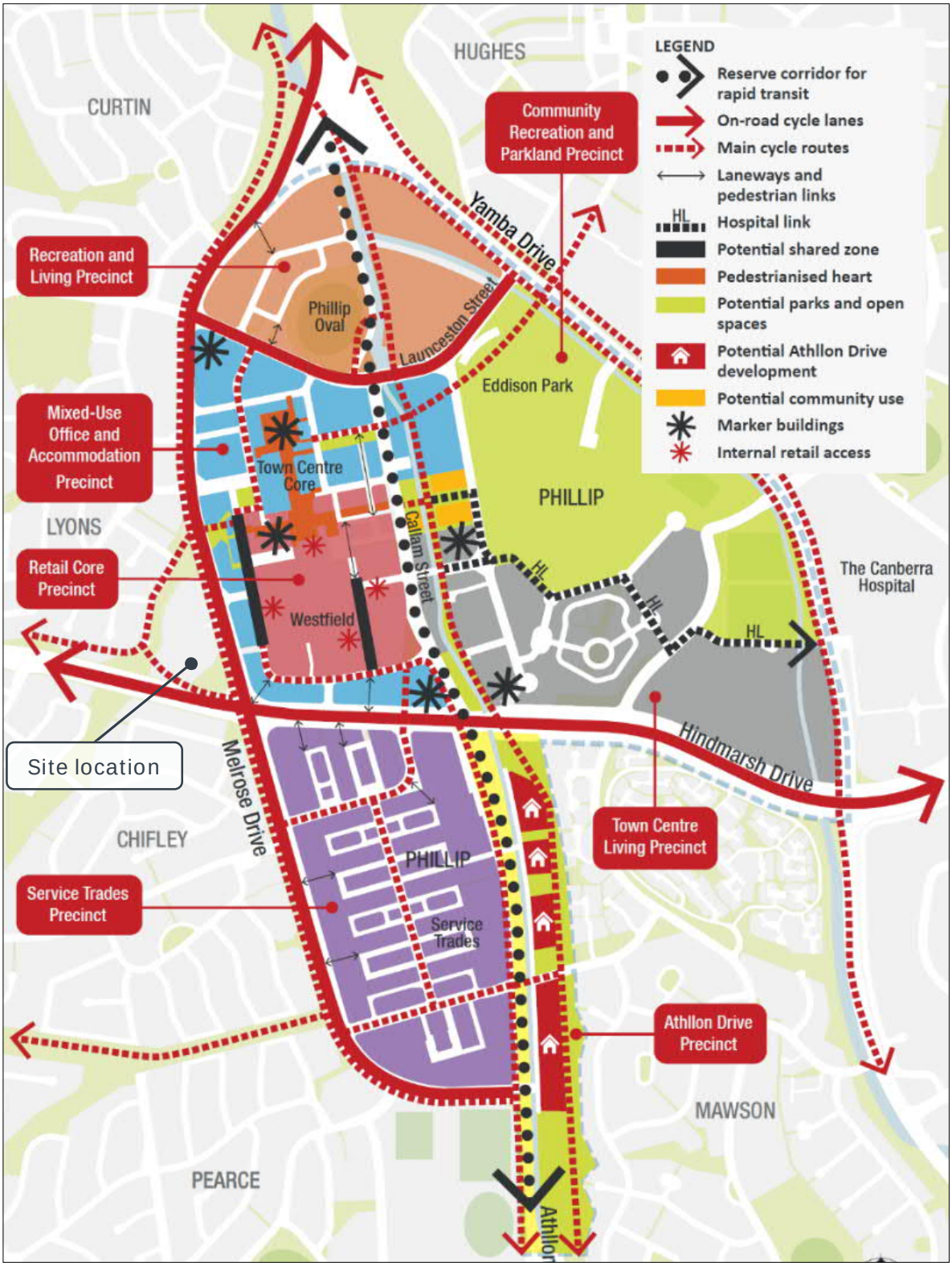
Strategic documents relevant to this Transport Impact Assessment include:

— *Moving Canberra 2019-2045 Integrated Transport Strategy* (TCCS, draft 2019)

This document presents the long-term integrated transport strategy for Canberra. The Vision for transport is for an experience that is "modern, sustainable, integrated and provides real alternatives to driving." The Indicative Investment Plan of the strategy identifies the current infrastructure investment priorities for the ACT road network.

— *Woden Town Centre Masterplan* (ACT Government, 2015)

The Masterplan presents the vision, planning principles, spatial framework, planning strategies, and policies for the Woden town centre. Whilst the development site is located outside of the Masterplan area (Figure 1.4), it is directly adjacent, and several transport proposals of the Masterplan have implications for the site.



Source: Woden Town Centre Masterplan (ACT Government, 2015)

Figure 1.4 Woden Town Centre Masterplan – spatial framework

2 EXISTING TRANSPORT CONDITIONS

2.1 SURROUNDING ROAD NETWORK

The site has frontages to Hindmarsh Drive and Melrose Drive (Figure 1.2).

Hindmarsh Drive is a dual carriageway with a posted speed limit of 80 km/hr. Within the vicinity of the site, the road has three traffic lanes in each direction. In addition, left turn slip lanes as well as a dedicated right-turn lane on the western approach to the Melrose Drive intersection are provided.

Melrose Drive is a dual carriageway with a posted speed limit is 60 k/hr. Within the vicinity of the site, the road has three traffic lanes in the northbound direction and two traffic lanes in the southbound direction. In addition, a right-turn lane is provided on the southern approach to the Melrose Drive and Brewer Street intersection, and one increasing to two right-turn lanes are provided on the northern approach to the Hindmarsh Drive and Melrose Drive intersection. Figure 2.1 provides a view of Melrose Drive, looking south towards Hindmarsh Drive.

Figure 2.1 View of Melrose Drive, looking south towards Hindmarsh Drive

Hindmarsh Drive and Melrose Drive are both classified as Arterial Roads (trunk roads) within the Canberra road hierarchy (Figure 2.2). Arterial roads predominately serve longer distance travel within a district and through traffic from one district to another. They include limited access roads and parkways (or freeways) having full access control and grade separated intersections. A small number have higher levels of property access for urban design reasons or reflect the planning and design parameters of the time of their construction. Traffic capacity is a function of the design of the road rather than being constrained by environmental objectives.

Source: www.activeinfrastructure.net.au

Figure 2.2 Road hierarchy

Moving Canberra 2019-2045 Integrated Transport Strategy identifies 14 strategic transport corridors within Canberra. Hindmarsh Drive forms part of Corridor 13: Inner South East-West Corridor, a 16 kilometre east-west strategic road corridor between Weston Creek and Fyshwick via Woden.

Hindmarsh Drive and Melrose Drive are both approved ACT Routes for Performance Based Standards (PBS) Level 1 Vehicles. This category encompasses several truck and trailer, semitrailer, B-double, and AB-double vehicles, with the equivalent prescriptive vehicle configuration being a 19-metre prime mover and semitrailer. Hindmarsh Drive and Melrose Drive (south of Hindmarsh Drive) are also approved B-double vehicle routes.

2.2 KEY INTERSECTIONS

Adjacent or nearby key intersections to the site are (Figure 2.3):

- Hindmarsh Drive and Melrose Drive: Signalised intersection.
- Melrose Drive and Brewer Street: Signalised intersection. Located approximately 300 metres to the north of the Melrose Drive and Hindmarsh Drive intersection.
- Melrose Drive and Corinna Street: Signalised intersection. Located approximately 275 metres to the north of the Melrose Drive and Brewer Street intersection.

Source: Nearmap

Figure 2.3 Melrose Drive, between Corinna Street and Hindmarsh Drive

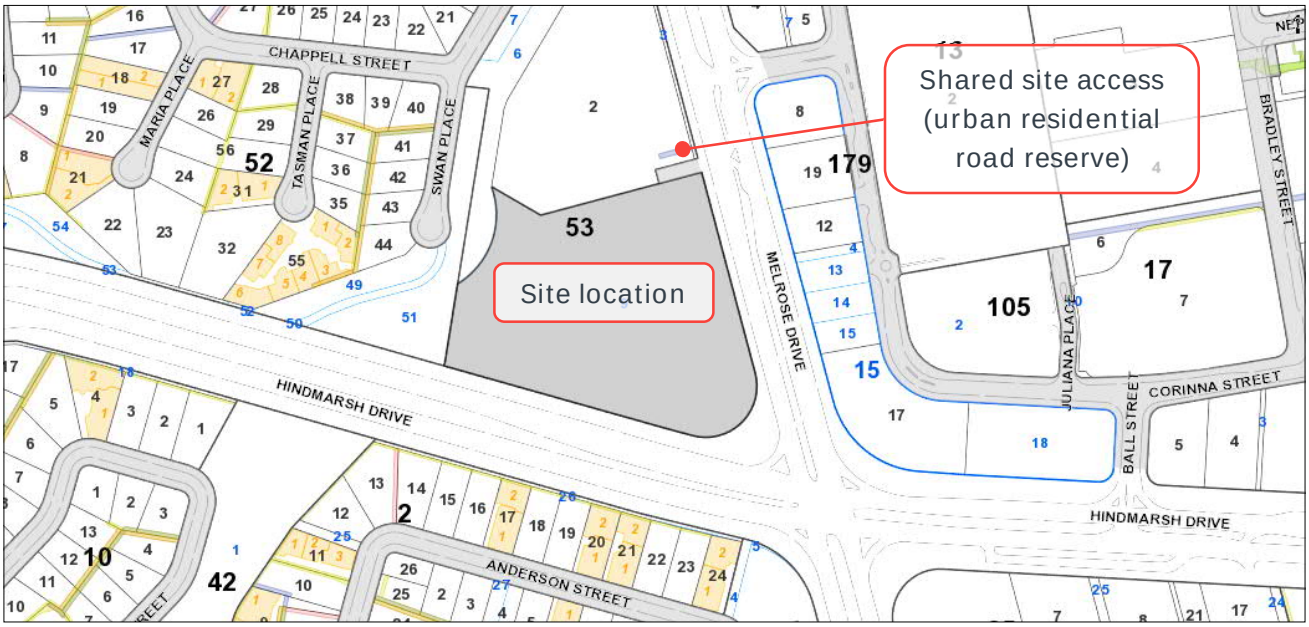
2.3 SITE ACCESS

Existing access to the site is via Melrose Drive, with a shared access between the site and the Woden Gardens residential complex to the north. The access is zoned as an urban residential road reserve (Figure 2.4). It is a give-way controlled T-intersection, with Melrose Drive as the major through road. All movements are currently permitted at the Melrose Drive / access road intersection through a seagull type road geometry.

The access is located approximately 245 metres to the north of the Melrose Drive and Hindmarsh Drive intersection, and 55 metres south of the Melrose Drive and Brewer Street intersection. The road configuration between the access and Brewer Street contains several turning lanes which can lead to lane weaving activity (Figure 2.5).

The site has no other existing driveway accesses to the road network.

There are no vehicular access points from other properties to Melrose Drive between Hindmarsh Drive and Brewer Street.



Source: ACTmapi

Figure 2.4 Cadastre indicating shared site access

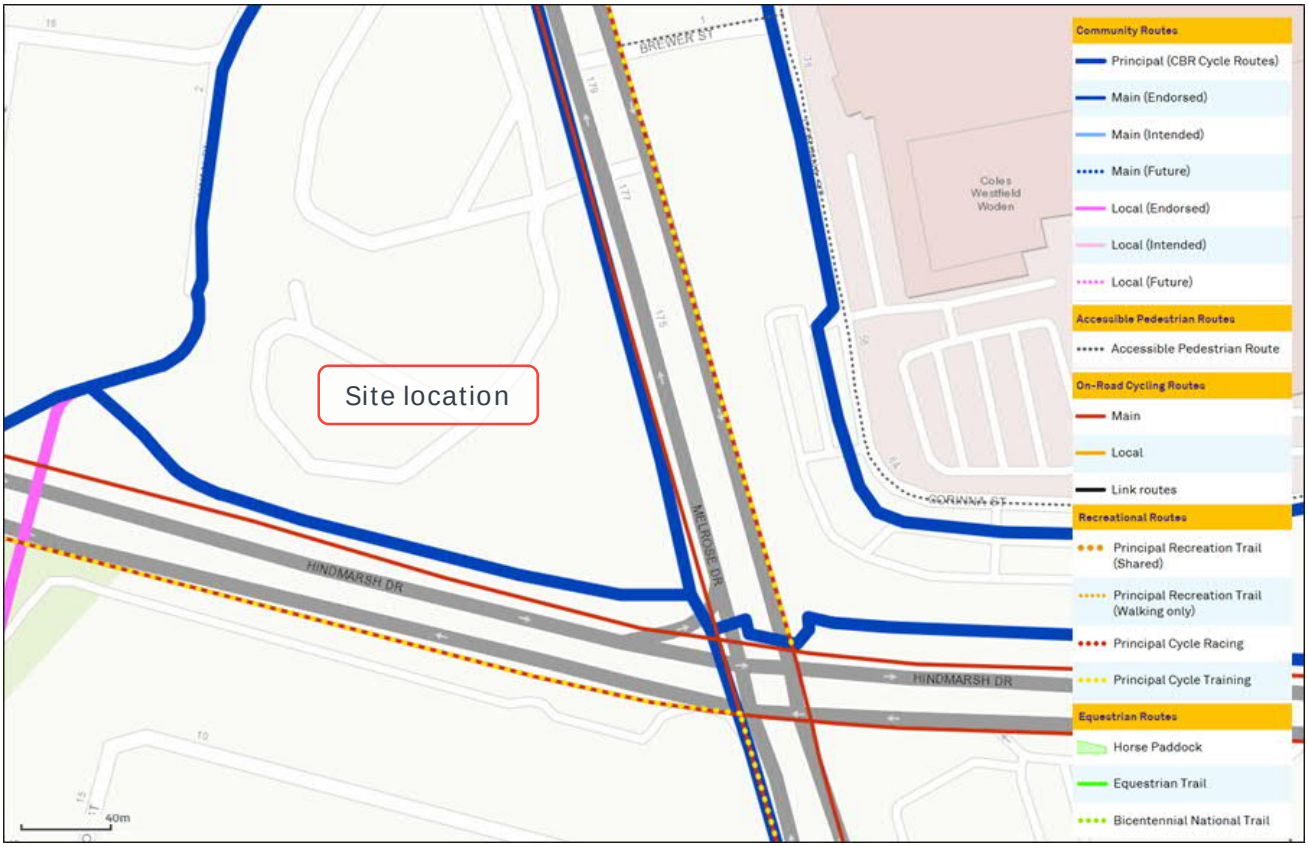
Source: Nearmap

Figure 2.5 Melrose Drive intersections with Brewer Street and the existing shared site access

2.4 ACTIVE TRANSPORT

Active travel routes surrounding the project site are illustrated in Figure 2.6. Hindmarsh Drive and Melrose Drive, in both directions, comprise of on-road cycling routes with on-road cycle lanes (Hindmarsh Drive) or shoulders (Melrose Drive).

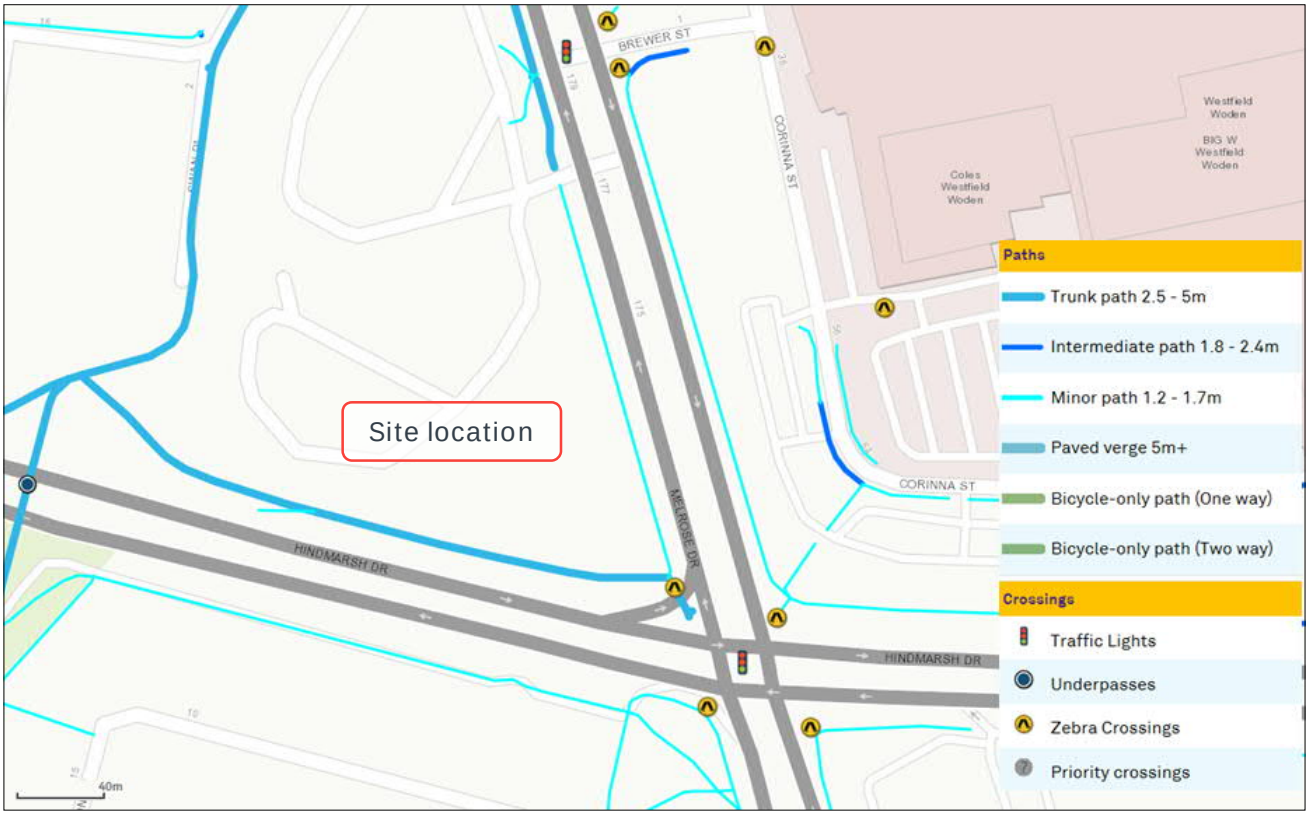
A principal recreational cycle training route is located on the northern side of Hindmarsh Drive and western side of Melrose Drive, adjacent to the site.



Source: www.activeinfrastructure.net.au

Figure 2.6 Active travel routes

The existing active travel path infrastructure surrounding the site is shown in Figure 2.7. Trunk paths (2.5 - 5 metres) are located to the south and west of the site, and along Melrose Drive to the north of the shared site access. Minor paths (1.2 - 1.7 metres) are located along both sides of Melrose Drive. Controlled crossing facilities are provided on all arms the signalised intersection of Melrose Drive and Hindmarsh Drive and on the southern and eastern arms of the Brewer Street and Melrose Drive intersection. A grade separated crossing (underpass) of Hindmarsh Drive approximately 300m west of the Melrose Drive intersections also provided Melrose Drive.



Source: www.activeinfrastructure.net.au

Figure 2.7 Path infrastructure

2.5 BUS NETWORK

The site is well serviced by the Canberra bus network. Buses operate along Melrose Drive and Hindmarsh Drive, and further bus routes operate from the Woden Bus Interchange located on Callam Street. Table 2.1 and Figure 2.8 outline the bus services available to the site.

The nearest bus stops to the site are located on:

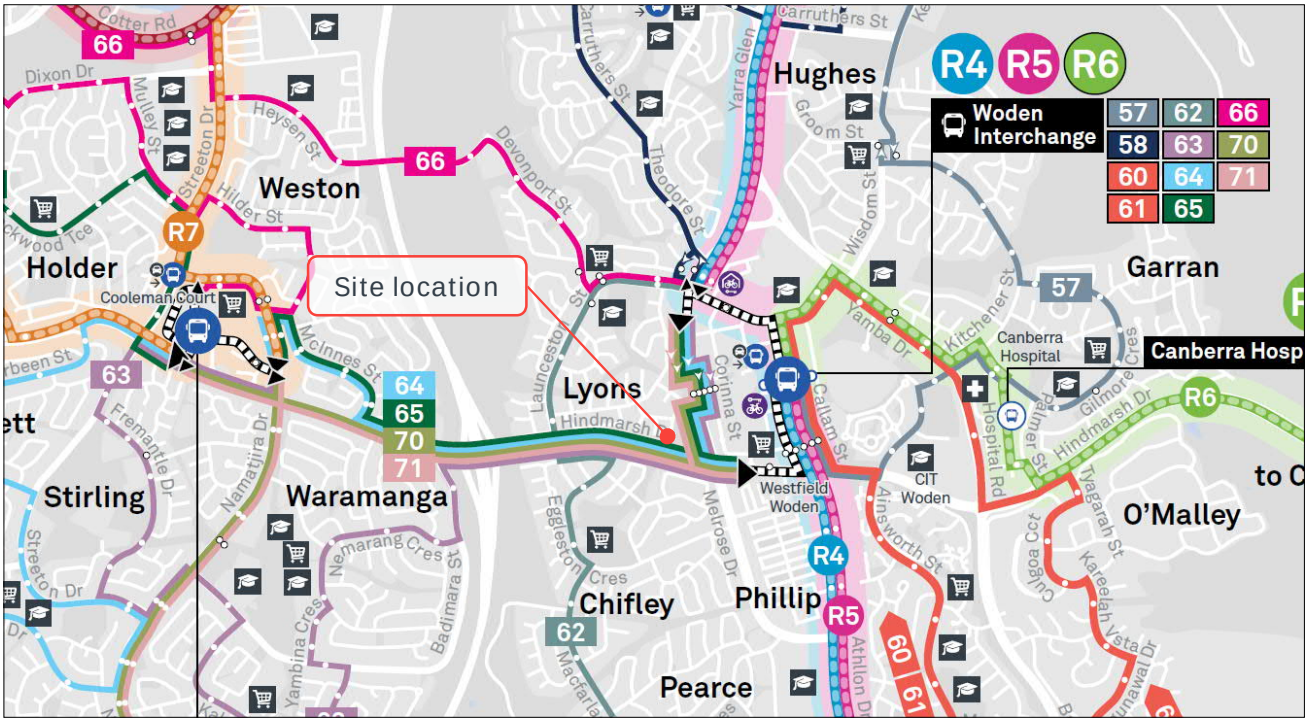
— Corinna Street, approximately 200 metres away

— Woden Bus Station, approximately 600 metres away

Note: distances are measured from Melrose Drive (at existing shared site access) along roads or paths.

Table 2.1 Existing bus routes

From stop	Route	Type	Description
Corinna Street – 190m	63	Local	Woden Bus Station, Phillip, Waramanga, Fisher, Stirling, Cooleman Court
	64	Local	Woden Bus Station, Phillip, Weston, Cooleman Court, Rivett, Chapman
	65	Local	Woden Bus Station, Phillip, Weston, Cooleman Court, Holder, Duffy
	70	Local	Woden Bus Station, Phillip, Cooleman Court, Kambah West, Tuggeranong Bus Station
	71	Local	Woden Bus Station, Phillip, Cooleman Court, Kambah, Tuggeranong Bus Station
Woden Bus Station – 600m	57	Local	City Interchange, Parkes, Deakin, Yarralumla, Hughes, Garran, Phillip, Woden Bus Station
	58	Local	City Interchange, Parkes, Deakin, Curtin, Woden Bus Station
	60	Local	Woden Bus Station, O'Malley, Isaacs, Farrer, Mawson
	61	Local	Woden Bus Station, Mawson, Farrer, Isaacs, O'Malley
	62	Local	Woden Bus Station, Lyons, Chifley, Pearce, Torrens, Mawson
	66	Local	Woden Bus Station, Lyons, Weston, Coombs, Denman Prospect, Wright, Duffy, Holder, Cooleman Court
	R4	RAPID	Belconnen Bus Stations, Bruce, City Int., Woden Bus Station, Tuggeranong Bus Station
	R5	RAPID	City West, City Int., Russell, Barton, Forrest, Woden Bus Station, Wanniassa, Erindale Bus Station, Calwell, Lanyon Marketplace
	R6	RAPID	City West, City Int., Parkes, Barton, Kingston, Griffith, Narrabundah, Garran, Woden



Source: Transport Canberra Woden, Weston Creek & Molonglo Region Map

Figure 2.8 Public transport routes

2.6 JOURNEY TO WORK

Journey to Work (JTW) data obtained from the Census of Population and Housing (Australian Bureau of Statistics, 2016) summarises the origin, destination, and mode of people's travel to work at a statistical area level. The relevant statistical area for the Lyons Redevelopment is Lyons.

JTW from Place of Usual Residence indicates where the residents from an area work and the modes of travel they use to get there. Figure 2.9 and Table 2.2 highlights the areas where residents of Lyons work.

Obtained from the JTW data, the most common methods for people travelling to work from Lyons were:

— Car, as driver: 57.2%

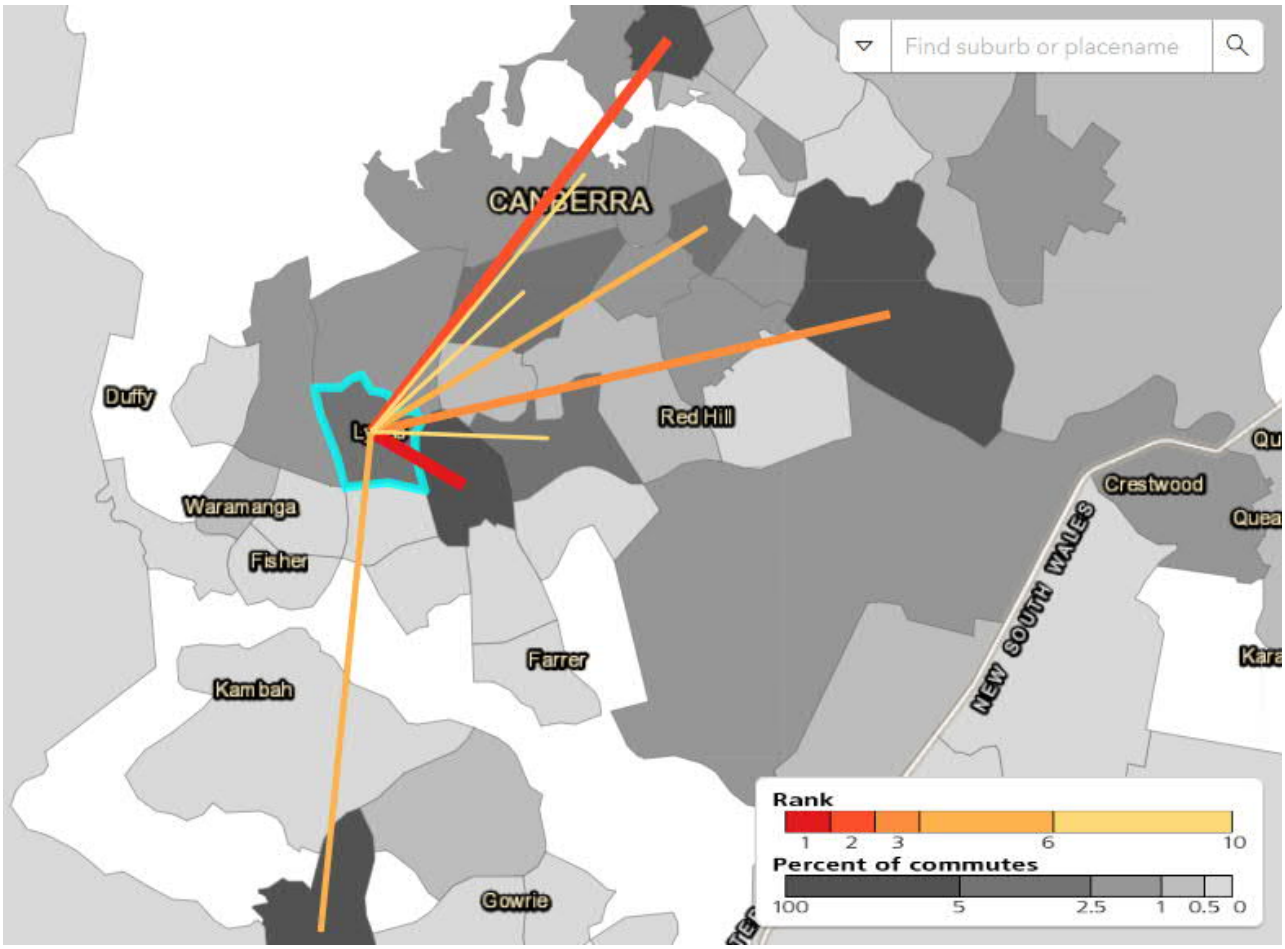
— Bus: 11.5%

— Walked only: 8.1%

— Car, as passenger: 5.5%

— Worked at home: 3.0%

The Woden Town Centre is located directly across the road (Melrose Drive) from the project site. A Town Centre is a high-order centre and offers a wide range of facilities and services to serve the community and visitors from the surrounding district. In relation to trips made for other purposes (e.g. shopping, recreation, medical, community services), the Woden Town Centre would be a strong attractor and the proximity of the site suggests walking or cycling would be common modes of travel to this destination



Source: Australian Bureau of Statistics, 2016

Figure 2.9 Journey to Work from Place of Usual Residence

Table 2.2 Journey to Work proportion of trips per location

Place of work statistical area	Percent of trips	Direction
Canberra North, Molonglo, Uriarra	20%	North
Tuggeranong	10%	South
Canberra East, South Canberra, Woden Valley	60%	East
Belconnen, Gungahlin, Weston Creek	10%	West

Source: Australian Bureau of Statistics, 2016

2.7 TRAFFIC VOLUMES

Intersection counts were completed for the AM and PM peak periods (7:30am to 9:30am and 4:00pm to 6:00pm) on Tuesday 10 March 2020 at the following intersections adjacent to or nearby the site:

— Melrose Drive and Hindmarsh Drive (signalised intersection)

— Melrose Drive and the existing shared site access (priority-controlled intersection)

— Melrose Drive and Brewer Street (signalised intersection)

— Melrose Drive and Corinna Street (signalised intersection)

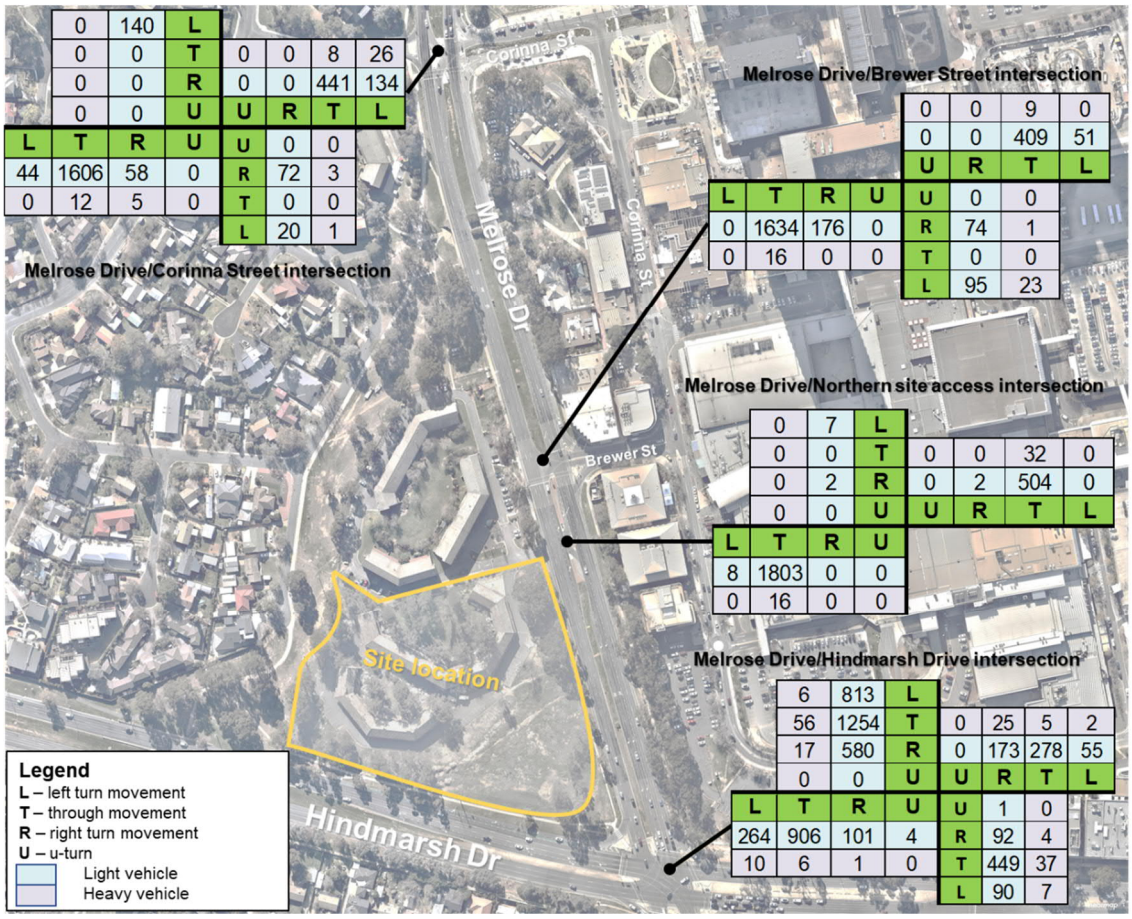
Based on a review of the count data, the road network peak hours are:

— AM peak: 8:15am to 9:15am

— PM peak: 4:45pm to 5:45pm

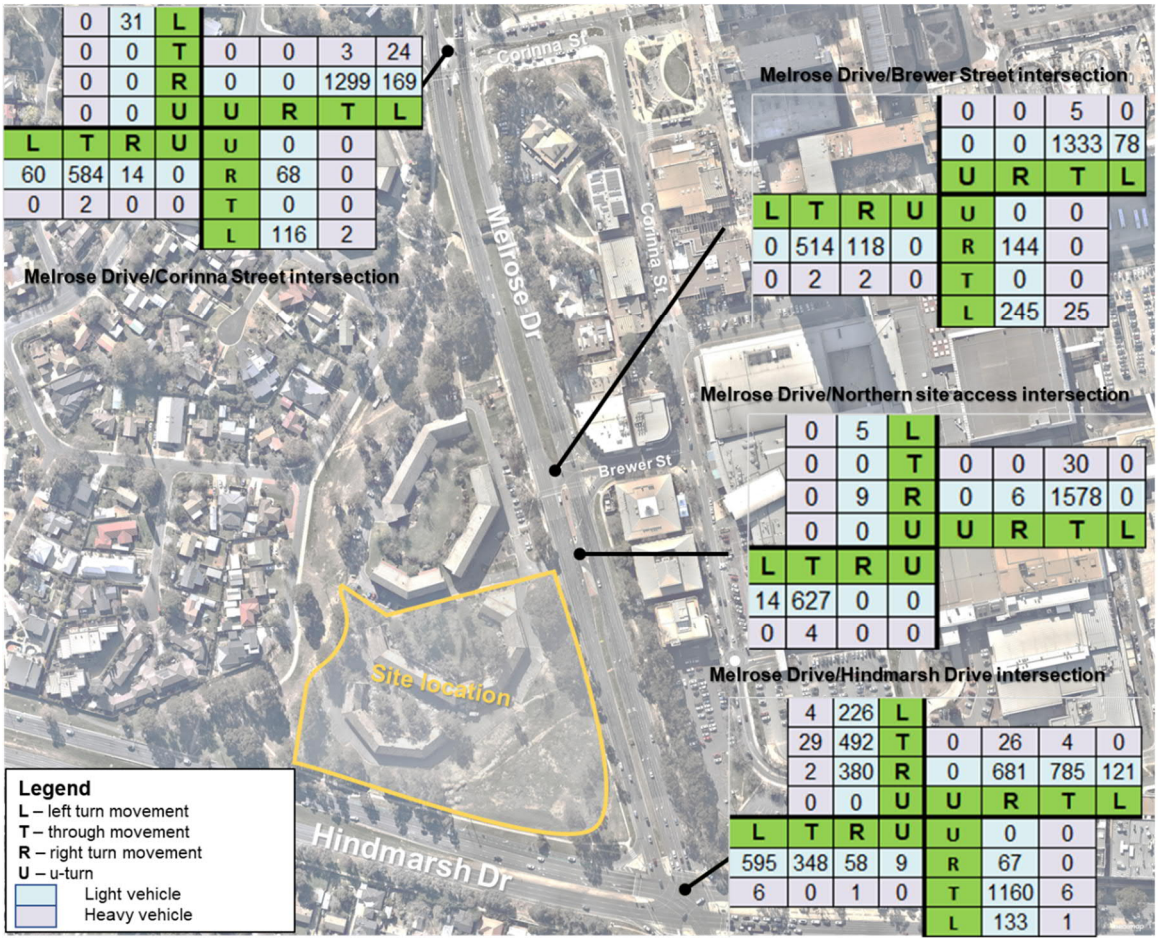
COVID-19 uncertainty may have started affecting travel patterns within the ACT when the traffic data was surveyed. Traffic data was recorded on 10 March 2020 and the ACT Public Health Emergency was declared on 16 March 2020. SCATS data was compared between early February 2020, and early March 2020 to identify the degree to which traffic volumes may have been reduced due to COVID-19. It was identified that traffic volumes in March 2020, up to and including 10 March 2020 was comparable to volumes recorded by SCATS data in February.

Accordingly, the adopted existing traffic volumes for the AM and PM peak hours are summarised in Figure 2.10 and Figure 2.11.



Basemap source: *Nearmap*

Figure 2.10 Existing AM peak traffic volumes



Basemap source: *Nearmap*

Figure 2.11 Existing PM traffic volumes

2.8 PEDESTRIAN VOLUMES

The AM and PM peak hourly pedestrian volumes at the following intersections have been recorded in Table 2.3 to Table 2.5 inclusively.

— Melrose Drive and Corinna Street

— Melrose Drive and Brewer Street

— Melrose Drive and Hindmarsh Drive

Table 2.3 Melrose Drive and Corinna Street pedestrian volumes

Peaks	North Approach Melrose Drive		East Approach Corinna Street		South Approach Melrose Drive		West Approach Corinna Street		Total
	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	Northbound	Southbound	
AM	20	1	10	3	18	0	10	11	73
PM	1	8	3	18	1	22	10	11	74

Table 2.3 indicates that the Melrose Drive and Corinna Street intersection generally accommodates east-west pedestrian demands across Melrose Drive during both AM and PM peaks.

Table 2.4 Melrose Drive and Brewer Street pedestrian volumes

Peaks	North Approach Melrose Drive		East Approach Brewer Street		South Approach Melrose Drive		West Approach Brewer Street		Total
	EB	WB	NB	SB	EB	WB	NB	SB	
AM	0	0	5	0	28	9	3	1	46
PM	0	0	2	3	14	19	0	0	38

Table 2.4 indicates that the Melrose Drive and Brewer Street intersection is not utilised as much in comparison to the other two intersections. The main pedestrian demand in the AM peak is an east-west movement, with pedestrians crossing Melrose Drive from the western to eastern side. This particular movement can be associated with pedestrians walking to the bus interchange Additionally, the pedestrian demand in the PM peak is also an east-west demand. There is a combination of pedestrian moving both eastbound and westbound across Melrose Drive. The marginally larger westbound movement could be attributed to pedestrians walking home. The eastbound movement across Melrose Drive can be attributed to pedestrians walking to the nearby retail developments.

Table 2.5 Melrose Drive and Hindmarsh Drive pedestrian volumes

Peaks	North Approach Melrose Drive		East Approach Hindmarsh Drive		South Approach Melrose Drive		West Approach Hindmarsh Drive		Total
	EB	WB	NB	SB	EB	WB	NB	SB	
AM	18	11	33	12	11	2	28	2	117
PM	1	8	3	31	2	7	0	70	122

Table 2.5 conveys that the Melrose Drive and Hindmarsh Drive accommodates a mix of east-west and north-south demands.

2.9 INTERSECTION OPERATION

The existing operation of the study intersections has been assessed using the network function of the SIDRA Intersection modelling software, adopting the existing surveyed traffic volumes, and noting that the signalised intersections in the study area are coordinated.

The *Traffic Modelling Guidelines* (Roads and Maritime Services, 2013) specifies that intersection operation is generally measured by degree of saturation, Level of Service and 95th percentile base of queue distance.

SIDRA Intersection measures these elements, with the intersection level of service being a measure of the average delay at the intersection, as defined by the criteria set out in Table 2.6.

Table 2.6 SIDRA Intersection Level of Service criteria

Level of service	Average delay (seconds per vehicle)	Criteria for traffic signals	Criteria for give way and stop signs
A	<14	Good operation	Good operation
B	15 to 28	Good operation with acceptable delays and spare capacity	Good operation with acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays	At capacity, requires other control mode
F	>70	Extra capacity required	At capacity, requires other control mode

Source: Adopted from Guide to Traffic Generating Developments (Roads and Maritime Services, 2002)

Table 2.7 and Table 2.8 present a summary of the existing intersection operation of the key study intersections during the weekday AM and PM peak hours. It should be noted that the critical movement for level of service at a roundabout or priority-controlled intersection is the movement with the worst delay, whereas for a signalised intersection, the average movement delay and level of service overall movements should be adopted.

Table 2.7 Existing intersection operation – weekday AM peak

Intersection	Degree of Saturation	Average delay (seconds)	95th percentile queue (metres)				Level of Service
			South	East	North	West	
Melrose Drive and Corinna Street	0.70	19	281	33	80	29	B
Melrose Drive and Brewer Street	0.52	18	16	31	58		B
Melrose Drive and Site Access	0.29	1	69		1	1	NA
Melrose Drive and Hindmarsh Drive	0.93	54	205	125	73	274	D

Table 2.8 Existing intersection operation – weekday PM peak

Intersection	Degree of Saturation	Average delay (seconds)	95th percentile queue (metres)				Level of Service
			South	East	North	West	
Melrose Drive and Corinna Street	0.79	14	54	28	259	2	B
Melrose Drive and Brewer Street	0.97	39	16	84	296		D
Melrose Drive and Site Access	0.10	1	0		1	1	NA
Melrose Drive and Hindmarsh Drive	1.04	74.5	205	125	73	274	E

Table 2.7 and Table 2.8 shows that the intersection of Melrose Drive and Hindmarsh Drive operate at a low level of service in both peaks (LoS D and E). Melrose Drive and Brewer Street intersection also operates at a low level of service in the PM peak (LoS D).

As this project progressed, TCCS gave WSP permission to use the Strathgordon Court Aimsun model. Future intersection operations have been analysed using the Aimsun model, rather than continuing this Sidra model. Future intersection operations are detailed in Section 3.

2.10 CRASH HISTORY

The latest 5-year crash data for Melrose Drive in the vicinity of the redevelopment site (between Hindmarsh Drive and Brewer Street) indicates 190 reported crashes occurred in the period 2014-2018. The location of these crashes is summarised in Table 2.9. The majority of crashes were of severity level 'property damage only' (94%), and the balance (6%) were 'injury.'

The predominant crash type was 'read end collision' (73%), followed by 'same direction side swipe' (13%), and 'right angle collision' (5%).

Table 2.9 Melrose Drive crash data summary

Location	Number of crashes
Melrose Drive and Hindmarsh Drive intersection	162
Melrose Drive and Brewer Street intersection	15
Melrose Drive: Mid-block between Hindmarsh Drive and Brewer Street	13

3 FUTURE TRANSPORT CONTEXT

3.1 ROAD NETWORK PLANNING

An upgrade to the Hindmarsh Drive and Melrose Drive intersection is identified as a medium term (5-10 years) priority action in the *Moving Canberra 2019-2045 Integrated Transport Strategy*.

Recommendations of the *Woden Town Centre Masterplan* include:

- Reinforce Hindmarsh Drive as an arterial road. Retain safe pedestrian crossings at traffic lights and improve with any road upgrades.
- Establish Melrose Drive as a reduced-speed environment that reinforces its role as a primary cycle corridor. The road will serve all user groups and include improved pedestrian and cycle crossings, large street trees, where appropriate removal of slip lanes, and provision of on-street parking. Restrict driveway access on Melrose Drive.
- A new connection between Corrina Street and Melrose Drive to relieve pressure on nearby intersections and Corinna Street.

3.2 ACTIVE TRANSPORT

The *Woden Town Centre Masterplan* recommends improved cycle and pedestrian connections and intersections across arterial roads to better connect to nearby suburbs. The Spatial Plan (Figure 1.4) indicates retention of the main cycle route from Hindmarsh Drive and Melrose Drive intersection to the public open space to the west of the site. The on-road cycle lanes along Melrose Drive are also proposed to be retained.

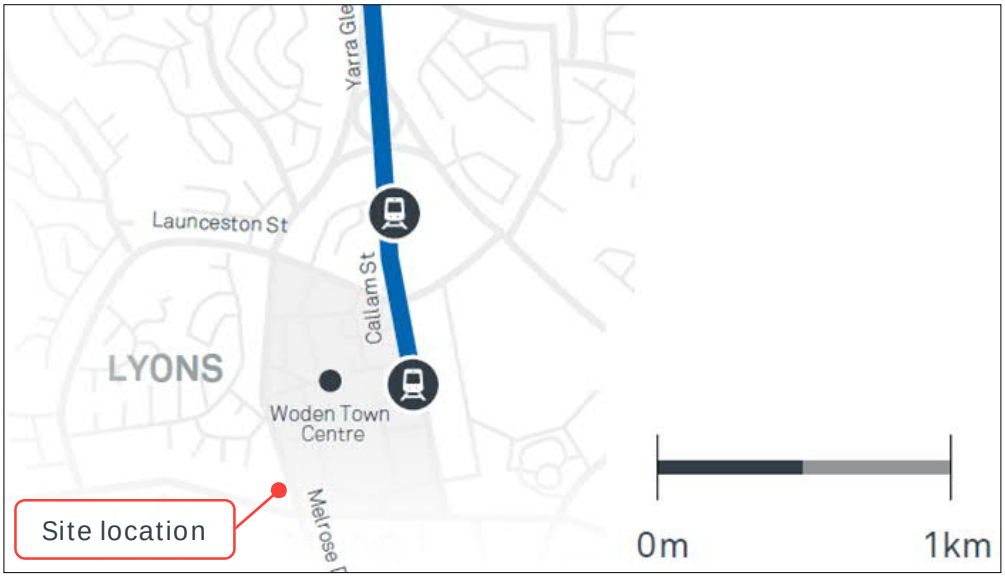
3.3 PUBLIC TRANSPORT

The first stage of Canberra's light rail network, Gungahlin to City, commenced operation in April 2019. The ACT Government is currently progressing the second stage of the network, divided into Stage 2A City to Commonwealth Park and Stage 2B Commonwealth Park to Woden.

The delivery of light rail between the City and Woden is identified as a short term (0-5 years) priority action in the *Moving Canberra 2019-2045 Integrated Transport Strategy*. Stage 2A is scheduled to commence operations in 2024.

The terminus of Stage 2 in Woden is indicatively located on the eastern edge of the Woden Town Centre (Figure 3.1). This stop is approximately 600 metres from the project site. This aligns with the recommendation of the *Woden Town Centre Masterplan* for future rapid transit, including light rail, along Callam Street and Athllon Drive.

The Woden Bus Interchange is to be integrated with the light rail stop on Callum Street in the future, with the aim to make public transport more convenient, safe, and attractive. The ACT Government has committed in the 2019-20 budget to progress detailed design, planning, and enabling works for Stage 2 of light rail from the City to Woden, which will include starting work on the new Woden Bus Interchange.



Source: Stage 2 of Light Rail – Building Light Rail to Woden (ACT Government, 2020)

Figure 3.1 Stage 2B of the Canberra light rail network – indicative alignment and stop locations through Woden

3.4 NEARBY DEVELOPMENTS

Several new developments are proposed for the Woden Town Centre and surrounding region, to create a future mixed-use precinct while maximising the town Centre's public transport and active transport accessibility. As discussed above in Section 3.3, light rail is planned for the precinct with a new light rail and bus interchange to be developed to support this project. Aside from transport-oriented developments, the following projects are planned for the Woden Town Centre or surrounding the site location.

WODEN GARDENS DEVELOPMENT

An active Development Application is on the block adjacent to the project site (to the north – Woden Gardens). The proposal is for an additional driveway that connects Block 2 Section 53 via Block 3 Section 53 to the road reserve with Block 6 Section 53 to be used as site compound during construction. The proposed development includes removal of existing street lighting and installation of new street lighting, associated services and landscaping works, installation of boom gate and exit sensor loop within Block 2 Section 53, and block boundary changes on adjoining unleased land.

CANBERRA INSTITUTE OF TECHNOLOGY WODEN CAMPUS

The ACT government is planning to design and build a new Canberra Institute of Technology (CIT) Campus in Woden, integrated with the future bus and light rail interchange. The CIT site is proposed to front Callam Street in Woden Town Centre.

WODEN GREEN

Woden Green is a mixed-use community that is being progressively developed to the south of the site, along Wilbow Street.

The N11 development is a four-storey commercial development set to be constructed on the south-east corner of the Wilbow Street and Callam Street intersection. The development will include basement parking.

The N12 development includes twin towers of 25 and 26 storeys and four-level podium on the north-west corner of Easty Street and Wilbow Street. The development is planned to include 437 apartments and eight town houses, as well as ground floor retail and commercial uses. The site's current public parking supply is proposed to be relocated into the basement car park of the proposed development.

4 THE PROPOSAL

4.1 DESCRIPTION OF PROPOSAL

The following description has been provided by Canberra Town Planning.

The proposal is for a housing precinct to allow for 492 units across 6 buildings that range in height between 4 and 10 storeys.

The site is currently developed with two residential buildings, with the south-eastern extent of the site undeveloped and only landscaping. The subject block is zoned RZ5 (High Density Residential Zone) under the Territory Plan. Block 1 Section 70 Lyons has a total site area of 23,290m².

Surrounding uses include large scale retail, light industrial, single detached suburbia, medium density housing and urban open spaces.

The proposed site is bordered to the east by Melrose Street, to the south by Hindmarsh Drive, to the west by Swan Place and Block 51 Section 52 Lyons that forms part of a public open space network, and to the north by Block 2 Section 53 Lyons that is developed with a medium density residential development.

The site is situated on a significant urban intersection, creating substantial obstacles (visual, aural phenomena) towards the provision of high-quality housing.

The site suffers to a great degree from a long term 'place-less-ness', born mainly from a lack of significant visual connections / markers, intense vehicular proximity throughout the day, and an inconsistent planning context, varying from suburban to light industrial contexts.

The scheme seeks an outcome that aspires to the establishment of high quality, enduring housing of quality construction.

The application has completed public consultation and is now in the process of collating consulting documents required for submission of the Development Plan and Development Application.

4.2 PROPOSED LAND-USE

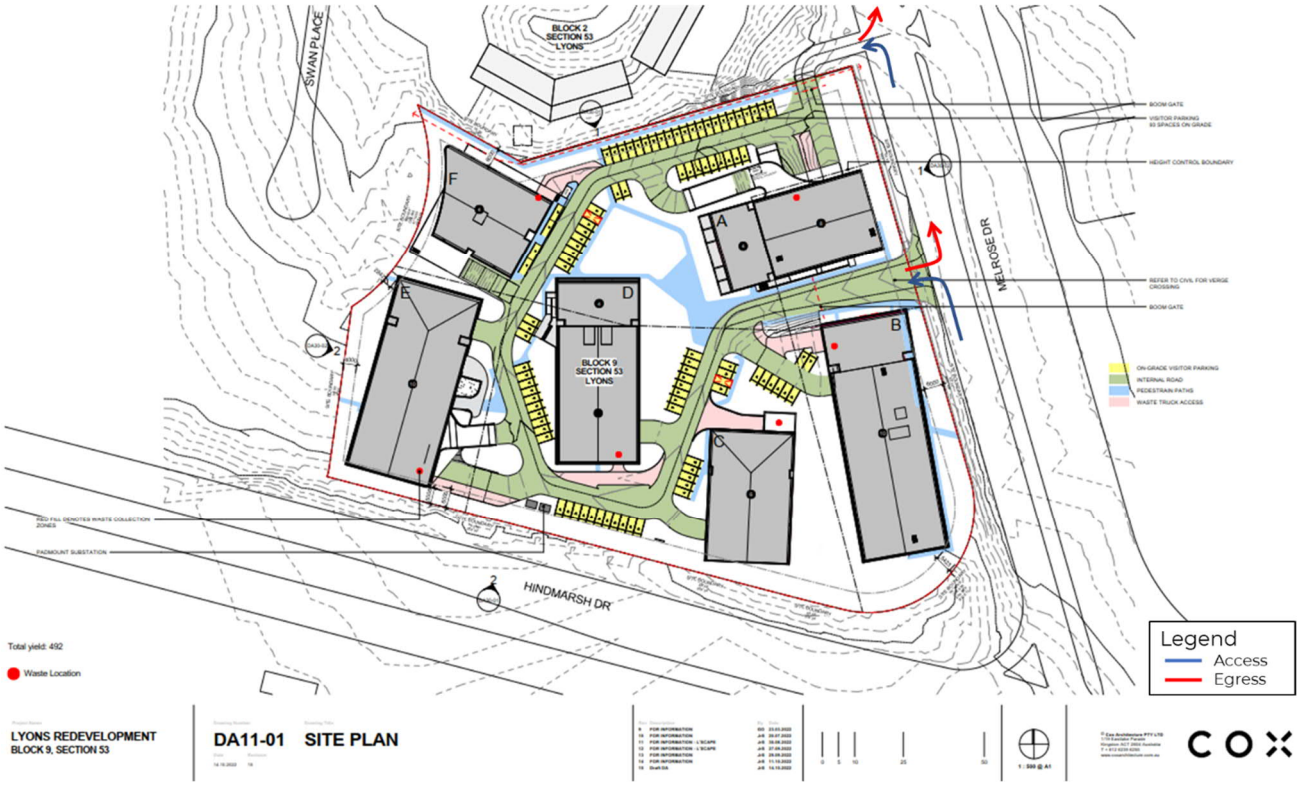
The proposed development is for 492 residential units across six buildings. Details for the proposed mix of unit types are given in Table 4.1. Of the 492 apartments being provided, 50 are proposed to be configured as adaptable residences.

Table 4.1 Proposed residential development land use

LAND USE	TOTAL	BUILDING					
		A	B	C	D	E	F
1-bed	**190**	12	88	0	24	56	10
1-bed affordable	**70**	0	0	70	0	0	0
2-bed	**232**	42	64	0	48	64	14
2-bed affordable	**0**	0	0	0	0	0	0
Total	**492**	**54**	**152**	**70**	**72**	**120**	**24**

4.3 INDICATIVE SITE LAYOUT

The proposed site layout is illustrated in Figure 4.1. It consists of six individual buildings and two site accesses. A loop road is proposed to join these access/egress points and create a local streetscape.



Source: Cox Architecture

Figure 4.1 Site access arrangements

The proposed site layout includes the following transport elements:

- Primary vehicle access via an existing priority-controlled intersection to the north-east of the site. This existing access is shared with an adjacent block and is located about 38m south of the Melrose Drive/Brewer Street intersection. Consultation with TCCS has indicated that this intersection will be required to operate as a left-in/left-out in the future. Further details of this are included in Section 6.
- Secondary vehicle access via a new left-in/ left-out vehicle access via Melrose Drive, about 125m north of the Hindmarsh Drive and Melrose Drive intersection. This site access would align with the potential future Corinna Street extension and signalised intersection that is identified in the Woden Town Centre Master Plan.
- Basement and podium car parking provided beneath each building.
- Pedestrian access provided via an east-west connection adjacent to Building F (northern side) and then along the loop road to connect with the wider footpath network at Melrose Drive.
- Loading, servicing, and waste collection facilities for each individual building, are provided at the indicative locations shown in Figure 4.2. Swept paths prepared by Sellick Consultants are reproduced below and in Section 6.2.

Basemap source: Sellick Consultants – Waste Strategy Statement

Figure 4.2 Locations of waste collection points and general servicing arrangements

5 PARKING ASSESSMENT

5.1 PARKING REQUIREMENTS

The car parking requirements for developments are typically defined by *Parking and Vehicular Access General Code* (ACTS Planning and Land Authority, 2014). The parking requirements for the development are summarised in Table 5.1, noting that the proposed development includes 492 residential dwellings.

Table 5.1 Car parking requirements for a residential zone

User	Bedrooms	Rate	Number of dwellings	Number of spaces
Resident	1 bedroom	1 space per unit	260	260
	2 bedroom	1.5-2 spaces per unit	232	348 - 464
Visitor	-	0.25 spaces per dwellings	492	123
Total				731 - 847

The development has plans for car spaces both in basements and at grade, these are shown in Table 5.2.

Table 5.2 Proposed car spaces per building

BUILDING	A	B	C	D	E	F	TOTAL
1 bed unit	12	88	70	24	56	10	260
2 bed unit	63	96		72	96	21	348
Basement Visitor	6	15	2	9	-	4	36
Sub Total (Basement)	*81*	*199*	*72*	*105*	*152*	*35*	*644*
At Grade Visitor	8	23	16	9	30	2	88
Total	**89**	**222**	**88**	**114**	**182**	**37**	**732**

Currently it is proposed that the site will contain a minimum of 732 car spaces for residential and visitor parking.

VISITOR CAR PARKING

Table 5.1 indicates that the proposed development would typically require 123 visitor parking spaces. Within the Special Conditions of the Deed of this site, all generated visitor parking is required to be contained within the site. A total of 123 spaces are proposed to be provided of which 88 will be provided at grade on the sites' internal roads with the remainder within the carparking basement levels.

5.2 BICYCLE PARKING

The *End-of-Trip Facilities General Code (Appendix A)* (ACT Planning & Land Authority, 2022) includes bicycle parking requirements for residential apartments. One bicycle space per apartment and one space per 10 apartments for visitors are to be provided. This equates to 49 bicycle parking spaces to be accommodated for visitors of the

development. The requirement for resident's bicycle parking is proposed to be allowed for by the provision of general-purpose storage areas. Whilst dedicated bicycle parking is not necessary to meet the resident requirement, at grade visitor parking rails in accordance with the Code requirements will be provided at strategic locations throughout the site.

Any proposed bicycle parking should be designed in accordance with the *End-of-Trip Facilities General Code*.

5.3 ACCESSIBLE PARKING

Accessible parking is required at a minimum of three per cent of the total number of parking spaces required. This equates to a requirement for 23 accessible parking spaces. It is recommended that the development incorporate a minimum of four accessible spaces for visitor use. In addition, accessible parking spaces should be provided to meet the supply of adaptable housing provided as part of this development.

5.4 MOTORCYCLE PARKING

Three dedicated spaces per 100 car parking spaces are required. Minimum provision of one space for carparks with a minimum of 30 car parking spaces. These spaces are in addition to the number of required car parking spaces.

As there are a minimum of 732 car parking spaces provided (visitors and residents), this corresponds to 22 parking spots for motorcycles or scooters.

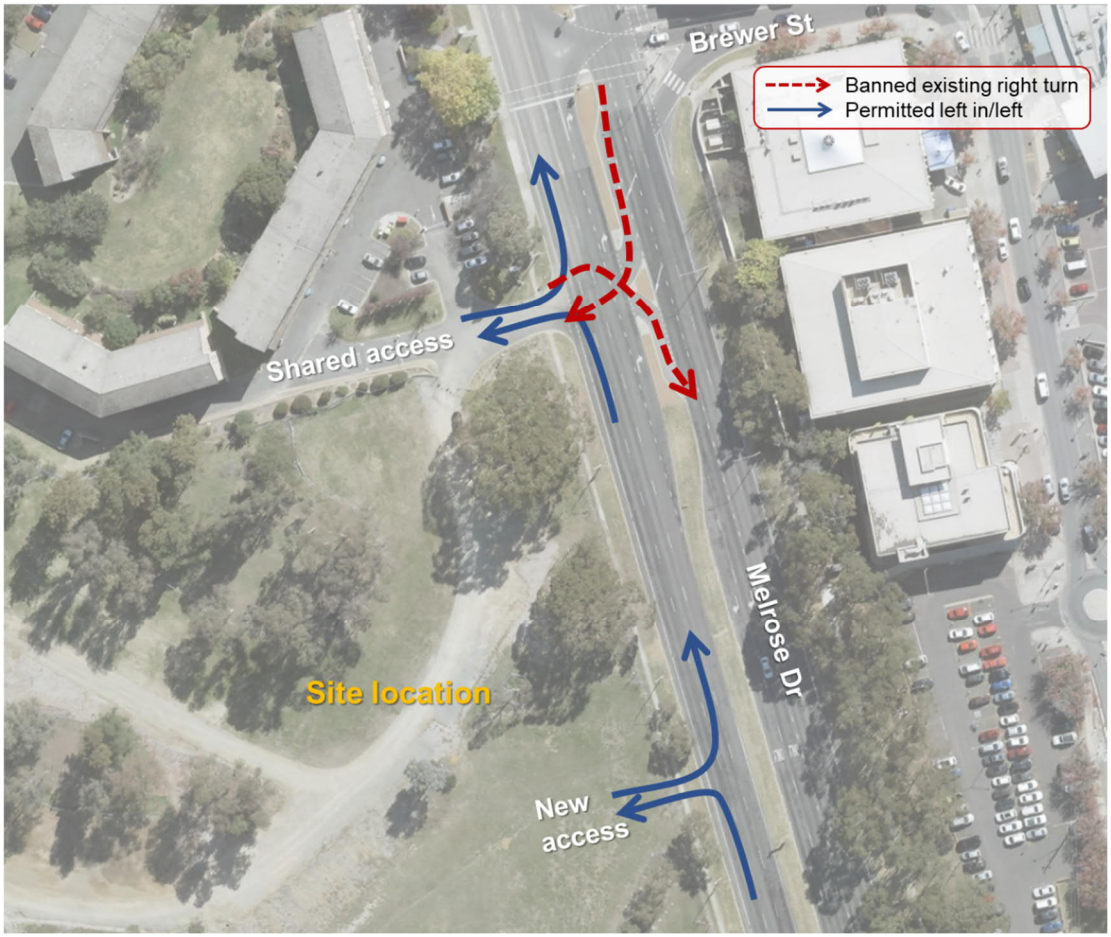
6 TRANSPORT ASSESSMENT

This section of the report outlines the traffic and transport impact assessment for the proposed development, including the estimated, traffic generation, the traffic distribution and assignment and the intersection operations, as well as the active transport impacts.

6.1 ACCESS ARRANGEMENTS

Consultation with TCCS was held between March and June 2021 to understand possible access arrangements for the proposed site. The existing shared access from Melrose Drive contributes to safety concerns along Melrose Drive from the number of priority controlled turning movements at this intersection. Options were explored to improve the safety of this intersection through restricted movements at peak times and/or banning the right turn out of the site. Ultimately, TCCS has stated that the right turn both in and out of the site at this shared access will be banned to minimise potential for conflicts. Left in/left out will be the only permissible access arrangement to the site. The permitted turning movements for this development are shown in Figure 6.1.

The removal of the right turn movements to and from the site impedes access to the site. Residents will be required to use alternative access and egress routes. An example of alternative routes residents will likely take are shown in Figure 6.2. Residents will likely use a range of access/egress routes across Canberra's transport network depending on their point of origin/destination. The routes shown in Figure 6.2 are simply the closest alternative routes to the site.



Basemap source: *Nearmap*

Figure 6.1 Access arrangements

Basemap source: *Nearmap*

Figure 6.2 Access and egress routes

6.2 ON-SITE PARKING, LOADING, AND CIRCULATION

The on-site car parking should be designed in accordance with the *Australian Standards AS/NZS 2890.* Referencing Table 1.1 of AS/NZS 2890.1: 2004, the proposed off-street car parking spaces should be designed for user class 1A for residential access.

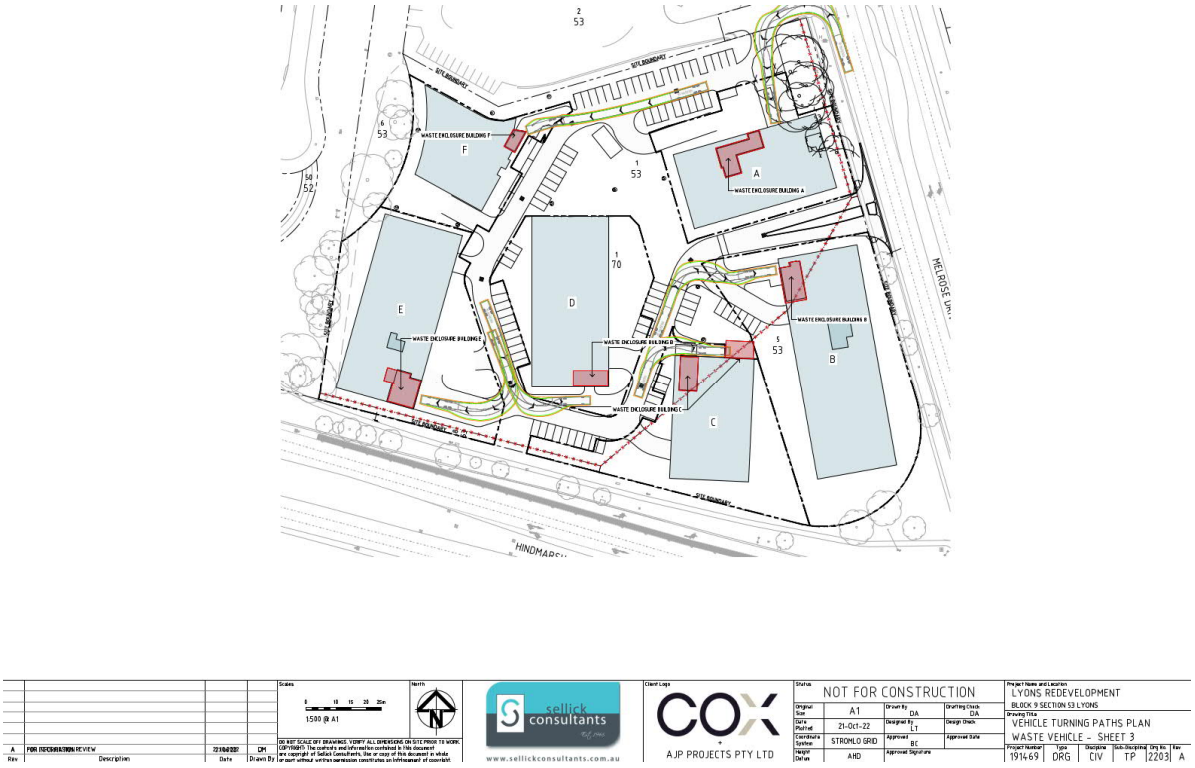
A design review of the draft car park layout dated 02 November 2022 was completed as part of this transport assessment. The draft car park layout was reviewed to ensure general compliance against Australian Standards. After a few minor non-structural recommendations are rectified, the car park will be considered compliant and suitable for the proposed residential use.

Design review comments and swept path assessment used to complete the design review on the draft plans are included in Appendix A.

With regards to loading, service vehicles and waste collection vehicles will utilise the driveways (marked in red within the site plan shown in Figure 4.2) near the respective buildings.

For waste collection, vehicles up to 12.5m Heavy Rigid Vehicles (HRVs) will be able to enter left-in / left-out from the northern Melrose Drive intersection, travel in an anti-clockwise direction, front load in order to collect waste and exit the development through the southern left-in / left-out intersection. For recycling, the rear recycling truck will approach the block from the left-in / left-out southern Melrose Drive intersection and travel in a clockwise direction before exiting the development through the northern left-in / left-out intersection. Separate turning diagrams have been prepared by Sellick Consultants to demonstrate how waste collection vehicles will be entering / exiting the site. These are reproduced in

Figure 6.3 and Figure 6.4. These areas are also proposed to be utilised by other large vehicles such as removalists vans and white good deliveries.



Source: Waste Strategy Statement – Sellick Consultants (2022)

Figure 6.3 Swept paths - service access arrangement (waste collection)

Source: Waste Strategy Statement – Sellick Consultants (2022)

Figure 6.4 Swept paths – service access arrangement (recycling)

6.3 ACTIVE TRANSPORT

The site would generate additional pedestrian activity between the site and the broader Woden Town Centre, including to existing and future public transport options around the bus and light rail interchange. Pedestrians would use the existing pedestrian crossing opportunity at the Melrose Drive and Brewer Street intersection as indicated in Figure 6.5.

The site would also generate cyclist activity on Melrose Drive to connect with the C4 cycling route to the north of the site. It will also increase cyclist activity along Hindmarsh Drive.

It is understood that active travel infrastructure improvements are included as part of the wider Woden Master Plan. This will assist in reaching mode share targets and reducing the numbers of private vehicles to Woden Town Centre. Active travel improvements should be considered by the wider Woden Master Plan more generally. No active travel improvements are required to support this development.

Basemap source: *Nearmap*

Figure 6.5 Pedestrian routes through Woden Town Centre

6.4 PUBLIC TRANSPORT

The bus interchange in Woden Town Centre is approximately 650 metres from the site and a 10-minute walk. Residents should be encouraged to use public transport to increase Canberra's mode share targets.

On-site observations indicate that the 14 bus routes and three rapid routes that transport passengers to/from the Woden bus interchange are currently operating with spare capacity. Therefore, any further public transport uptake by residents would have negligible impact on these bus services. It is also noted that the Woden bus interchange is planned for redevelopment to integrate with Canberra light rail, improving public transport options for residents.

6.5 ROAD NETWORK PERFORMANCE

WSP and members of the Strathgordon Court Redevelopment consultant team met with TCCS on 2 December 2020. During this meeting, TCCS advised the project team that detailed traffic modelling (using Aimsun software) would be needed to support the transport impact assessment. This is due to the complexity of the site access arrangements and recognising that this type of modelling has previously been completed for the ACT Government in order to assess the suitability of the proposed site access arrangements and dwelling yields.

TCCS have provided WSP with the previously prepared Aimsun traffic model. TCCS have given WSP permission to use this model for the purpose of the Strathgordon Court Redevelopment project and assumptions were agreed with TCCS before modelling commenced.

The traffic modelling assessment for this site was completed using Aimsun for three access options identified:

1. Maintain existing shared access (all movements) and provide a new left in/left out intersection on Melrose Drive
2. Maintain existing shared access (but restrict the right turn out during peak hours) and provide a new left in/left out intersection on Melrose Drive
3. Signalise existing shared access and provide a new left in/left out on Melrose Drive

Discussions were held with TCCS between March to June 2021 regarding the traffic modelling results for the above options. The discussions also focussed on safety concerns with the existing shared site access from Melrose Drive. Following meetings with TCCS, advice was received on 28 June 2021 that the existing shared access should be restricted to a left-in/left-out only with development of the site.

The traffic arrangement, as proposed by TCCS (all right turn movements banned at all times), is closest to Option 2 where the right turn out of the site is only restricted during peak hours. Whilst the Option 2 scenario doesn't fully replicate the arrangement required by TCCS the modelling results for Option 2 inevitably represent a worst-case scenario over the TCCS left in/left out arrangement with one less movement (right in) needed to be accommodated. The results of this restricted right turn out arrangement (Option 2) are included below.

As suggested, the operation of the proposed intersection will differ from these results slightly as the right turn into the site is also removed. However, as the intersection has been reduced to a left in/left out, the intersection performance of the site access will improve from the modelled scenario. As the proposed access arrangements have changed to the modelled arrangements below, there may be impacts at other intersections which have not been modelled. As noted in Section 6.1, it is expected residents and visitors to the site will change their routes further upstream in the road network. The impacts are expected to be minimal at further upstream intersections as residents have increased choices on what is the best approach route to the site. Further commentary on the model results and how this compares to the proposed arrangement is included in Section 6.5.4.

6.5.1 TRAFFIC MODELLING ASSUMPTIONS

The following data and assumptions for the traffic modelling have been adopted from Strathgordon Court Traffic Model. These has been agreed with TCCS prior to the analysis.

MODELLING SOFTWARE

The traffic model was developed in Aimsun Next 8.2.3. (R54491), the Aimsun version used for Strathgordon Court Traffic Modelling Scenario Analysis Report (hereafter referred to as the "Strathgordon Court Model").

MODEL NETWORK

The model was developed by using the Aimsun model completed for Strathgordon Court Model. The model network is covering the sub-area shown in Figure 6.6. The sub-area cordon was cut from the North Canberra Aimsun Model (NCAM) which included the following intersections:

- Melrose Drive / Hindmarsh Drive
- Melrose Drive / Site Access
- Melrose Drive / Brewer Street
- Melrose Drive / Corinna Street
- Melrose Drive / Worgan Street
- Melrose Drive / Launceston Street
- Hindmarsh Drive / Tuggeranong Parkway
- Hindmarsh Drive / Launceston Street
- Hindmarsh Drive / Eggleston Crescent
- Hindmarsh Drive / Ball Street
- Hindmarsh Drive / Botany Street
- Hindmarsh Drive / Callam Street.

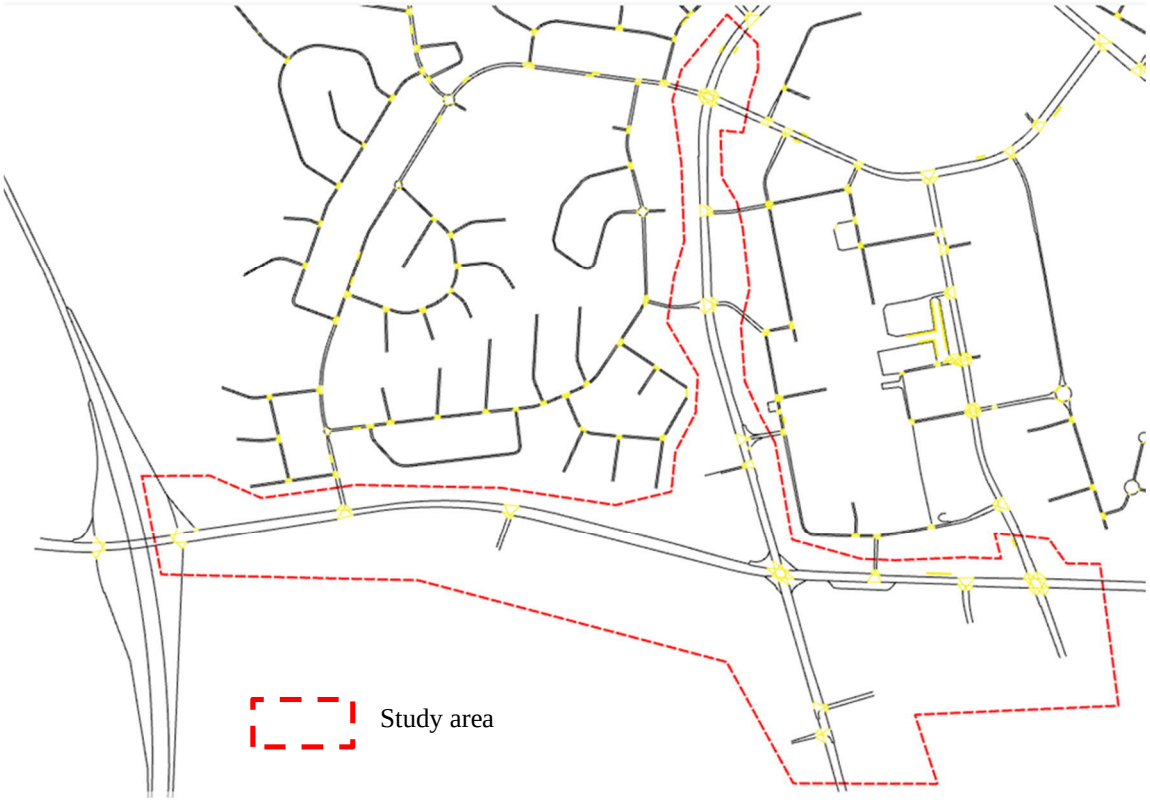


Figure 6.6 Strathgordon Court traffic modelling area

The Strathgordon Court Model includes the Aimsun model for assessment year of 2026 with and without the proposed development. No changes have been made to the 2026 without development model. The 2026 with development model include an additional proposed development access (left-in/left-out) to the south of existing access point as shown below.

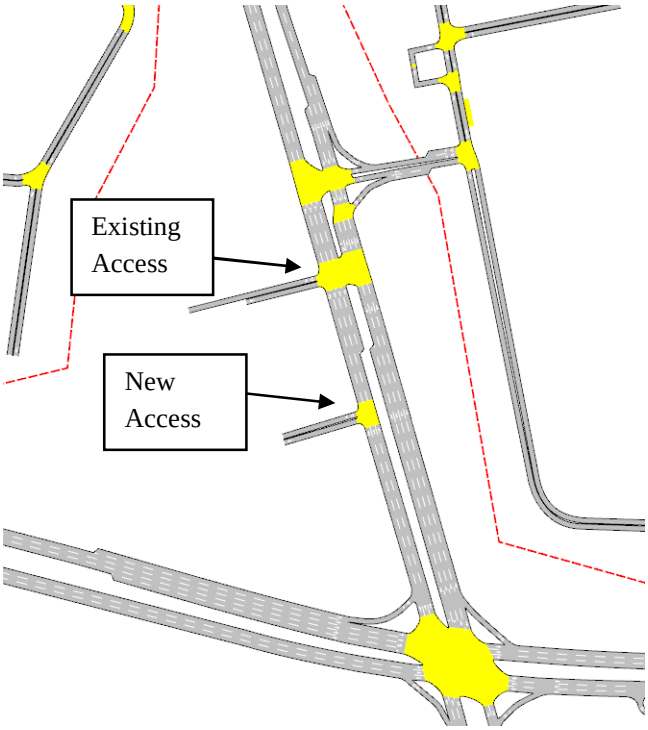


Figure 6.7 Site access

ASSESSMENT YEAR

The assessment years for this study are:

— 2026 with development AM Peak

— 2026 with development PM Peak

The 2026 without development model output were included as a comparison to the 2026 with development.

DATA AND ASSUMPTIONS

The development has 492 dwellings (compared with the previous modelling that assessed 700 dwellings). The traffic demand matrices for 2026 with development was developed by applying a factor of 0.702 (492/700) to the development matrices used in Strathgordon Court Traffic Model.

A trip generation rate of 0.4 trips per dwelling has been used for the AM and PM peak hours. This resulted in 197 trips generated in each peak hour.

The proposed development in/out split is included:

— AM in/out split: 20/80

— PM in/out split: 60/40.

The traffic generation is split across the two intersections.

Table 6.1 Traffic generation

Land use	**AM**		**PM**	
	In	**Out**	**In**	**Out**
492 Residential dwellings	40	158	118	79

The trip distribution assumptions are shown below.

Table 6.2 Trip distribution

Intersection	Final Trip Distribution
Woden Centre	5%
North	54%
East	20%
South	11%
West	11%

The modelled time periods are as follows:

— Weekday AM peak: 8.00 am–9.00 am

— Weekday PM peak: 5.00 pm–6.00 pm

The Aimsun model incorporates a 30-minute warm-up period and 30-minute cool-down period to allow the loading and unloading of the model network.

6.5.2 INTERSECTION PERFORMANCE

The total flow (vehicles) and average delay (seconds) were exported from Aimsun model. The Level of service (LOS) based on delay was used to measure traffic performance as per New South Wales Roads and Maritime Services (RMS) LOS definitions shown in Table 6.2. For signalised intersections, the average delay over all movements was used to define the LOS of the intersection. For roundabouts and priority-controlled intersections, the worst movement was used to define the LOS of the intersection.

Table 6.3 Summary of LOS criteria using Roads and Maritime method

LOS	Average delay per vehicle in seconds
A	$d \leq 14$
B	$14 < d \leq 28$
C	$28 < d \leq 42$
D	$42 < d \leq 56$
E	$56 < d \leq 70$

Table 6.4 shows the summary of the 2026 intersection performance with a banned right turn out, with and without development. The results shows that the overall delay will slightly increase at most of the intersections. However, the overall LOS remains the same, except at the development access point which will perform at a better LoS due to the banned right turn.

Table 6.4 Summary of intersection performance

INTERSECTION	2026 WITHOUT DEVELOPMENT						2026 WITH DEVELOPMENT					
	AM Peak			PM Peak			AM Peak			PM Peak		
	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS
Melrose Dr / Hindmarsh Dr	5072	89	F	5258	150	F	5148	91	F	5267	153	F
Melrose Dr / Access 1	2197	43	C	2352	20	B	2354	21	B	2479	9	A
Melrose Dr / Access 2							1638	10	A	857	3	A
Melrose Dr / Brewer St	2219	26	B	2414	22	B	2476	28	B	2605	22	B
Melrose Dr / Corinna St	2383	16	B	2258	16	B	2626	16	B	2439	16	B
Melrose Dr / Launceston St	3540	44	D	3354	53	D	3660	46	D	3484	53	D
Melrose Dr / Worgan St	2455	24	B	2116	20	B	2614	24	B	2242	21	B
Hindmarsh Dr / Tuggeranong Pkwy	4540	90	F	4973	56	D	4601	87	F	4927	56	D
Hindmarsh Dr / Launceston St	4525	64	E	4478	37	C	4575	69	E	4446	38	C
Hindmarsh Dr / Eggleston Cres	3988	50	D	4097	38	C	4020	50	D	4067	40	C
Hindmarsh Dr / Botany St	2721	25	B	2918	37	C	2770	26	B	2922	39	C
Hindmarsh Dr / Callam St	4690	53	D	4505	98	F	4737	54	D	4498	107	F

6.5.3 NETWORK OBSERVATIONS

Screenshots from the model have been recorded to show network performance 30 minutes into the peak hour period. Figure 6.8 and Figure 6.9 show the network performance for 2026 with development and a banned right turn from the site. In the AM scenario, it was observed that the queue on the west approach to Melrose Drive / Hindmarsh Drive would spill back onto Tuggeranong Parkway. In the PM scenario, the westbound queue along Hindmarsh Drive started at Melrose Drive and reached Eggleston Crescent. The eastbound queue along Hindmarsh Drive started at Melrose Drive and reached past Callam Street. There is no queue observed along development access point in the 2026 both with and without development during AM and PM Peak.

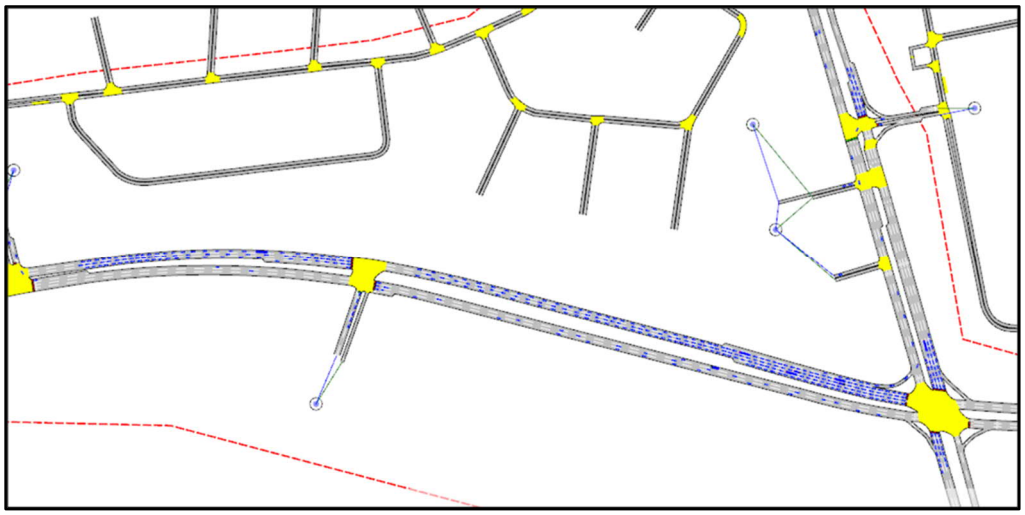


Figure 6.8 Network screenshot for 2026 with development at 8:30 AM

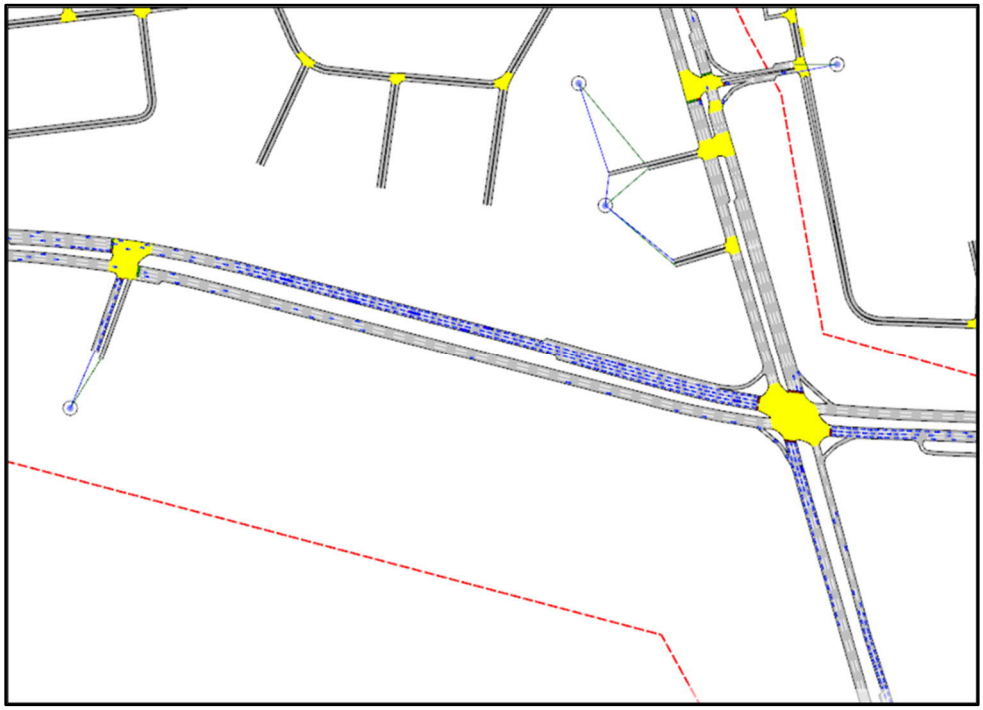


Figure 6.9 Network screenshot for 2026 with development at 5:30 PM

6.5.4 LEFT IN/LEFT OUT ARRANGEMENTS

The proposed access arrangements for the site are for two left in/left out intersections. The traffic modelling above was completed to also allow a right turn into the site. This turning movement will be banned with development. The additional impacts of removing this right turn on the road network is detailed below.

- The impacts of banning the right turn into the site would occur in the PM peak.
- An assumed 118 vehicles turn into the site in the PM peak (shown in Table 6.1).
- 54% of these would be coming from the north and impacted by the banned right turn in (shown in Table 6.2), therefore 64 vehicles in the PM peak hour from the development may need to be rerouted. The Aimsun model results (Table B.1) show 85 vehicles making this right turn into the site in the PM peak, this includes existing vehicles from the neighbouring site.
- These 85 additional vehicles will likely be distributed among the wider Canberra network depending on their origin. This is likely due to the large number of arterial roads surrounding the site.
- These vehicles will likely be rerouted via Tuggeranong Parkway, Hindmarsh Drive and then Melrose Drive.
- A smaller portion may continue south on Melrose Drive, turning right at Launceston Street. This access route is shown in Figure 6.2.

The additional impacts from removing the right turn into the site is not expected to significantly alter the modelling results detailed above.

7 CONCLUSIONS

Based on the traffic and transport assessment documented in this report, the following conclusions are made:

- AJP Projects Pty Ltd is proposing to redevelop the vacant public housing site at 177 Melrose Drive, Lyons into 492 residential apartments across six buildings.
- The site is zoned RZ5: High Density Residential in the Territory Plan. It is located adjacent to Woden Town Centre which hosts good access to shopping and employment, bus services and future light rail services.
- The sites access is from Melrose Drive. The site is bordered by the Woden Gardens residential complex to the north, the existing shared access is planned to be limited to a left in/left out intersection and a new left in/left out intersection is proposed to the south.
- Adjacent or nearby key intersections to the site are:
  - Hindmarsh Drive and Melrose Drive: Signalised intersection.
  - Melrose Drive and Brewer Street: Signalised intersection. Located approximately 300 metres to the north of the Melrose Drive and Hindmarsh Drive intersection.
  - Melrose Drive and Corinna Street: Signalised intersection. Located approximately 275 metres to the north of the Melrose Drive and Brewer Street intersection.
- The road network impacts were modelled using the previous Strathgordon Court Aimsun model with assumptions confirmed with TCCS.
- The proposed development is estimated to generate an additional 197 vehicle trips in the peaks.
- In the existing conditions, Melrose Drive performs mostly at a LoS B or better in both peaks with the following exceptions:
  - Melrose Dr / Hindmarsh Dr has a LoS F in both peaks.
  - Melrose Dr / Existing shared access has a Los C in the AM (this LoS would improve when it is reduced to a left in/left out configuration).
  - Melrose Dr / Launceston St has a LoS D in both peaks.
- Traffic assessment was undertaken for the post-development scenario with all intersections indicating post development operation at a similar level of service to the existing conditions.
- The modelled post-development scenario included a right turn into the site from Melrose Drive. It was decided that this turning movement would be removed after the traffic modelling was completed. The vehicles which were using this right turn will now be redistributed across the road network, predominantly to Tuggeranong Parkway/Hindmarsh Drive. The removal of the right turn is not expected to significantly change the level of service modelled.
- The development includes 738 car parking spaces (614 for residents and 124 for visitors) which satisfies the requirement of providing a minimum of 736 parking spaces.
- Specific bicycle parking for visitors is provided in the form of racks throughout the public domain areas within the site. Bicycle parking for residents is provided through the storage cages in the basement level car parks in the respective buildings.
- Waste collection will occur at the driveways near the 6 respective buildings.
  - 12.5m HRVs will be the largest waste collection vehicles accessing the site from the Melrose Drive intersection, circulating in an anti-clockwise direction, and exiting through the southern left-in / left-out intersection.
- A design review of the draft car park layout dated 02 November 2022 was completed and a few minor non-structural recommendations have been provided. After these recommendations have been rectified, the proposed car park will be considered compliant with the *Australian Standards AS2890* series and suitable for the proposed use.

APPENDIX A

DESIGN REVIEW AND SWEPT PATH ASSESSMENT

APPENDIX B

AIMSUN RESULTS

B1.1 WITHOUT DEVELOPMENT

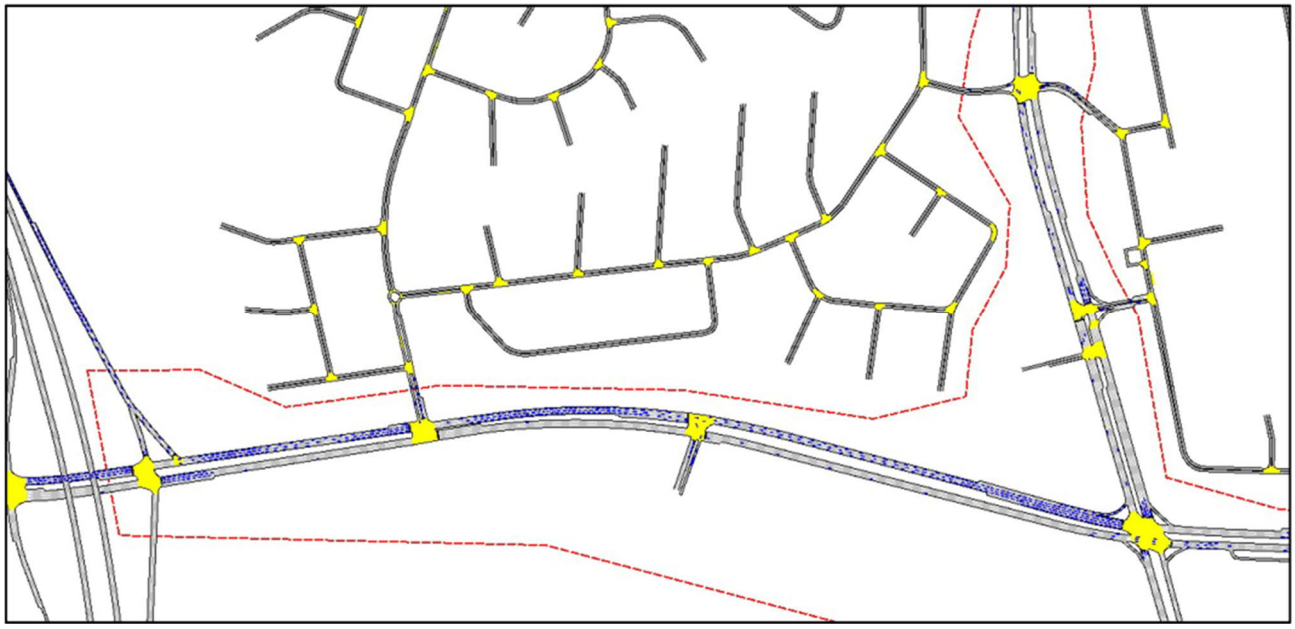


Figure B.1 Network screenshot for 2026 without development at 8:30 AM

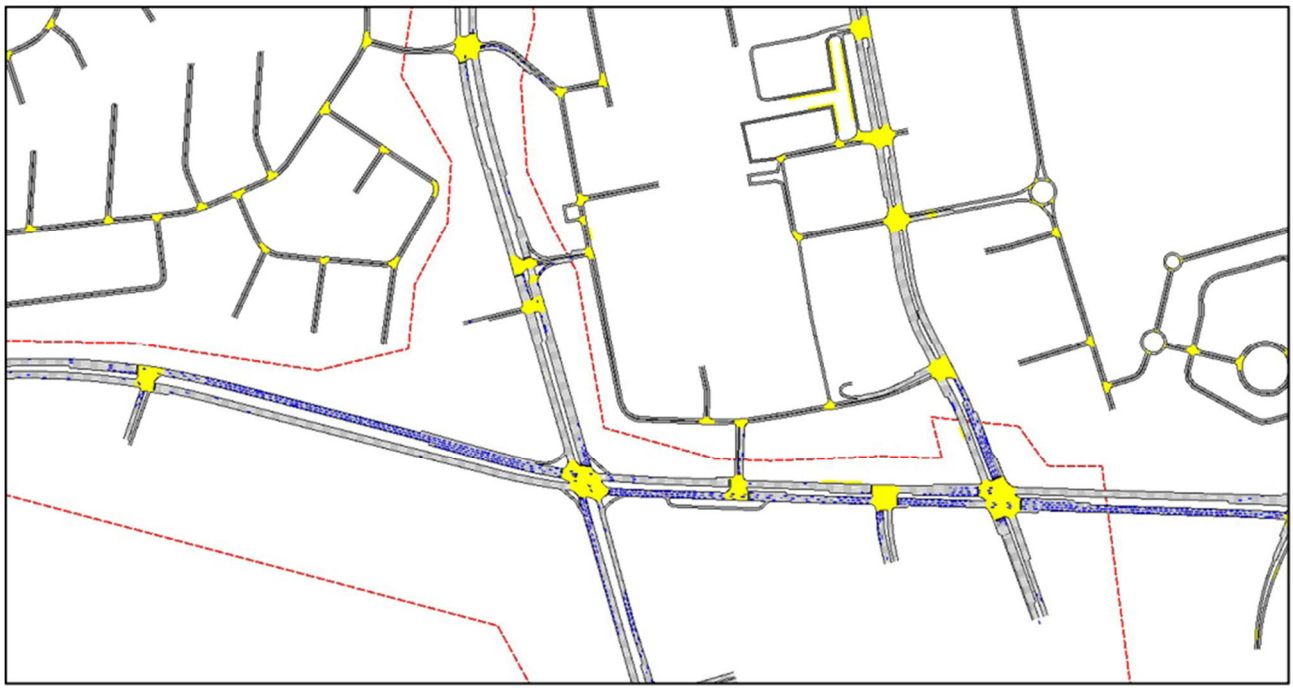


Figure B.2 Network screenshot for 2026 without development at 5:30 PM

B1.2 WITH DEVELOPMENT AND BANNED RIGHT TURN OUT OF SITE

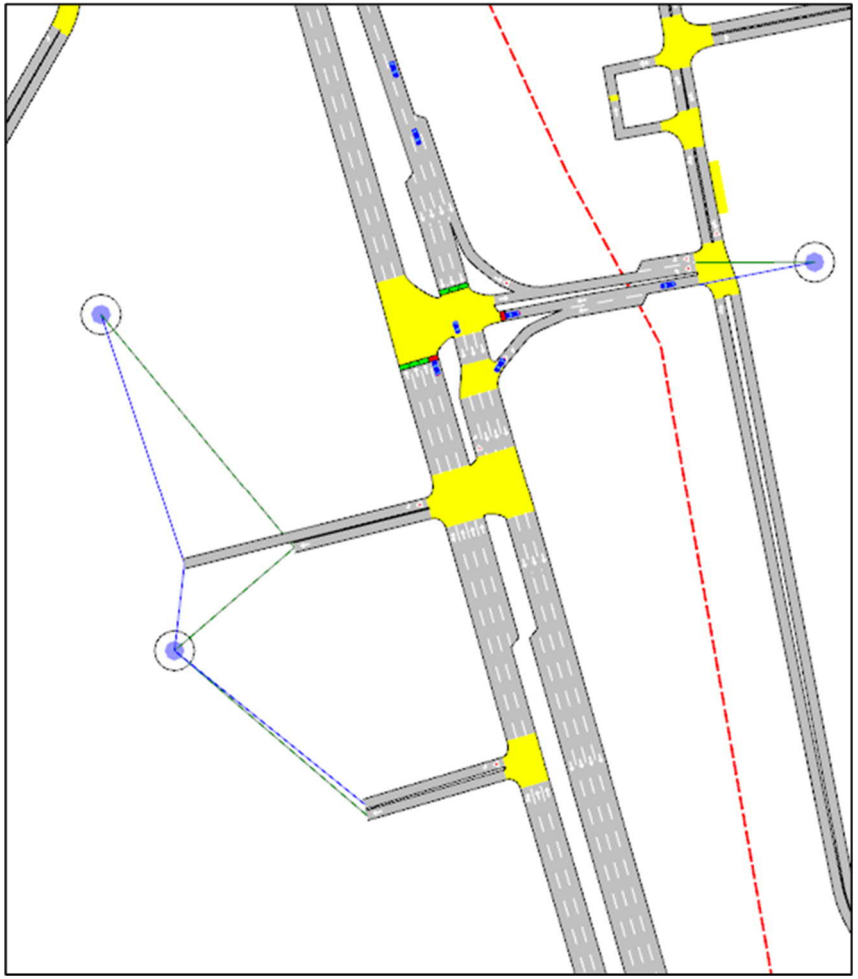
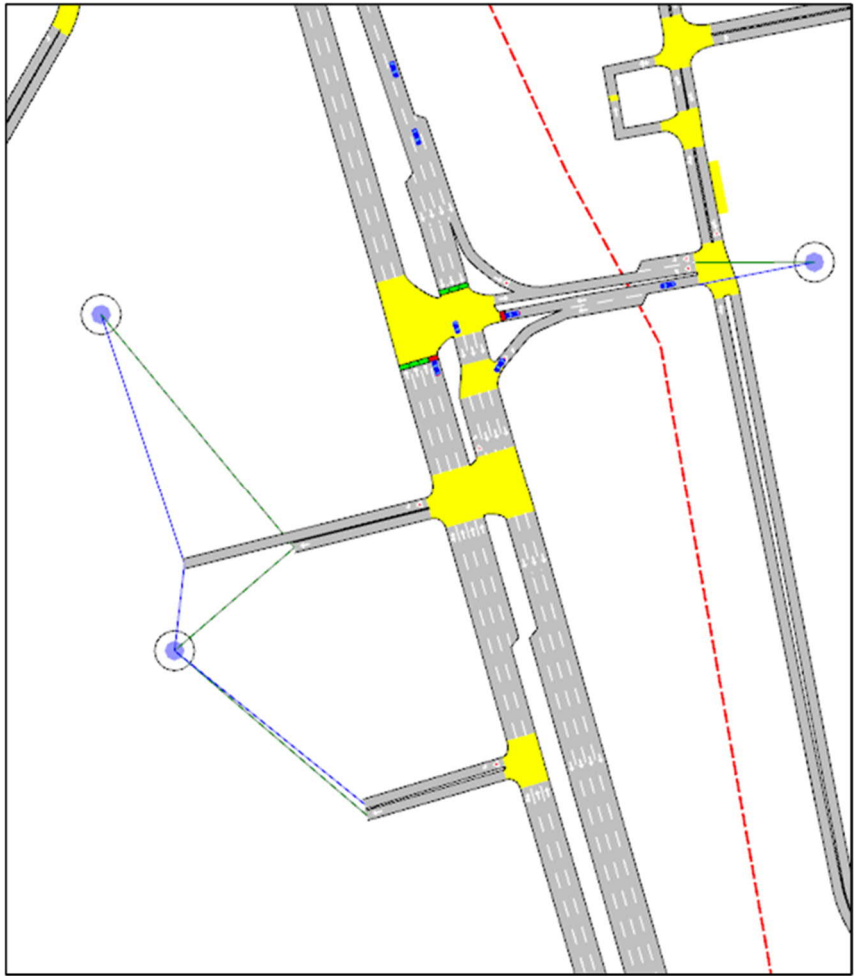
	AM	PM
Melrose Drive		

Figure B.3 Network screenshot for 2026 with development AM and PM

Table B.1 Intersection performance – Core intersection

Intersection	Movement	2026 Without Development						2026 With Development					
		AM Peak			PM Peak			AM Peak			PM Peak		
		Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS
Melrose Dr / Hindmarsh Dr	Melrose Dr (S) - LT	236	45	D	532	136	F	235	51	D	508	166	F
	Melrose Dr (S) - TH	847	58	E	430	112	F	849	63	E	431	116	F
	Melrose Dr (S) - RT	143	58	E	55	107	F	141	63	E	52	112	F
	Hindmarsh Dr (E) - LT	95	25	B	131	84	F	96	27	B	130	84	F
	Hindmarsh Dr (E) - TH	523	48	D	1214	100	F	524	48	D	1194	100	F
	Hindmarsh Dr (E) - RT	101	54	D	121	102	F	106	54	D	142	103	F
	Melrose Dr (N) - LT	92	53	D	119	17	B	117	58	E	132	19	B
	Melrose Dr (N) - TH	355	69	E	895	19	B	368	75	F	903	21	B
	Melrose Dr (N) - RT	188	65	E	541	34	C	188	67	E	538	36	C
	Hindmarsh Dr (W) - LT	602	140	F	227	166	F	613	135	F	241	164	F
	Hindmarsh Dr (W) - TH	1393	254	F	607	453	F	1411	249	F	611	447	F
	Hindmarsh Dr (W) - RT	497	203	F	386	468	F	499	205	F	386	464	F
	Overall	5072	89	F	5258	150	F	5148	91	F	5267	153	F
Melrose Dr / Access 1	Melrose Dr (S) - LT	9	4	A	28	4	A	5	3	A	24	4	A
	Melrose Dr (S) - TH	1530	1	A	745	2	A	1534	1	A	735	2	A
	Melrose Dr (N) - TH	615	1	A	1519	1	A	675	1	A	1554	1	A
	Melrose Dr (N) - RT	3	14	A	16	6	A	25	7	A	85	9	A
	Access (W) - LT	15	18	B	26	7	A	114	21	B	81	8	A
	Access (W) - RT	25	43	C	17	20	B						
	Overall	2197	43	C	2352	20	B	2354	21	B	2479	9	A
Melrose Dr / Access 2	Melrose Dr (S) - LT							17	4	A	47	3	A
	Melrose Dr (S) - TH							1545	1	A	764	1	A
	Access (W) - LT							76	10	A	46	3	A
	Overall							1638	10	A	857	3	A

Intersection	Movement	2026 Without Development						2026 With Development					
		AM Peak			PM Peak			AM Peak			PM Peak		
		Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS
Melrose Dr / Brewer St	Melrose Dr (S) - TH	1423	4	A	707	9	A	1589	4	A	791	8	A
	Melrose Dr (S) - RT	120	19	B	61	57	E	131	22	B	66	56	D
	Hindmarsh Dr (E) - LT	50	1	A	352	10	A	52	1	A	357	11	A
	Hindmarsh Dr (E) - RT	24	52	D	68	46	D	24	52	D	68	47	D
	Melrose Dr (N) - LT	33	14	A	48	3	A	31	22	B	47	3	A
	Melrose Dr (N) - TH	568	68	E	1178	5	A	648	67	E	1276	5	A
	Overall	2219	26	B	2414	22	B	2476	28	B	2605	22	B
Melrose Dr / Corinna St	Melrose Dr (S) - LT	66	18	B	110	12	A	146	13	A	162	9	A
	Melrose Dr (S) - TH	1343	5	A	625	3	A	1431	5	A	659	3	A
	Melrose Dr (S) - RT	43	29	B	59	39	C	44	27	B	59	37	C
	Corinna St (E) - LT	30	0	A	83	0	A	30	0	A	83	0	A
	Corinna St (E) - RT	20	55	D	80	61	E	20	55	D	80	61	E
	Melrose Dr (N) - LT	124	5	A	122	4	A	122	6	A	122	4	A
	Melrose Dr (N) - TH	570	7	A	1132	6	A	646	9	A	1227	6	A
	Corinna St (W) - LT	187	12	A	47	5	A	188	14	A	47	5	A
	Overall	2383	16	B	2258	16	B	2626	16	B	2439	16	B
Melrose Dr / Launceston St	Melrose Dr (S) - LT	51	46	D	121	45	D	52	45	D	119	46	D
	Melrose Dr (S) - TH	1025	37	C	583	32	C	1108	37	C	619	32	C
	Melrose Dr (S) - RT	166	29	C	88	43	D	166	29	B	87	43	D
	Launceston St (E) - LT	77	19	B	151	75	F	76	21	B	150	78	F
	Launceston St (E) - TH	202	51	D	448	101	F	202	51	D	446	100	F
	Launceston St (E) - RT	300	50	D	496	94	F	300	50	D	497	94	F
	Melrose Dr (N) - LT	336	3	A	206	5	A	336	4	A	206	4	A
	Melrose Dr (N) - TH	583	55	D	838	35	C	604	54	D	903	36	C
	Melrose Dr (N) - RT	41	54	D	17	58	E	41	53	D	17	58	E

Intersection	Movement	2026 Without Development						2026 With Development					
		AM Peak			PM Peak			AM Peak			PM Peak		
		Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS
	Launceston St (W) - LT	111	64	E	61	50	D	102	73	F	61	50	D
	Launceston St (W) - TH	484	63	E	197	49	D	458	69	E	197	49	D
	Launceston St (W) - RT	164	61	E	148	50	D	215	61	E	181	49	D
	Overall	3540	44	D	3354	53	D	3660	46	D	3484	53	D

Table B.2 Intersection performance – Other intersection

Intersection	Approach	2026 Without Development						2026 With Development					
		AM Peak			PM Peak			AM Peak			PM Peak		
		Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS	Flow (veh)	Delay (sec)	LOS
Hindmarsh Dr / Tuggeranong Pkwy	E	1222	29	C	2732	21	B	1226	29	C	2675	21	B
	N (left-slip)	1279	160	F	693	15	A	1314	152	F	692	15	A
	N	137	176	F	486	74	F	140	167	F	486	74	F
	W	1901	73	F	1062	101	F	1922	71	F	1073	102	F
	Overall	4540	109	F	4973	53	D	4601	105	F	4927	53	D
Hindmarsh Dr / Launceston St	E	1182	45	D	2504	29	C	1182	47	D	2456	30	C
	N	258	87	F	340	68	E	253	103	F	346	69	E
	W	3084	59	E	1633	15	A	3139	56	D	1643	15	A
	Overall	4525	64	E	4478	37	C	4575	69	E	4446	38	C
Hindmarsh Dr / Eggleston Cres	E	326	32	C	286	72	F	326	32	C	285	70	E
	N	963	15	B	2317	8	A	965	14	A	2273	8	A
	W	2698	104	F	1493	36	C	2728	103	F	1509	40	C
	Overall	3988	50	D	4097	38	C	4020	50	D	4067	40	C
Hindmarsh Dr / Botany St	S	166	30	C	398	41	C	166	33	C	398	44	D
	E	1137	3	A	1554	39	C	1145	3	A	1545	43	D
	W	1419	41	C	965	31	C	1459	42	C	979	31	C
	Overall	2721	25	B	2918	37	C	2770	26	B	2922	39	C
Hindmarsh Dr / Callam St	S	1019	80	F	561	40	C	1023	79	F	562	40	C
	E	1567	48	D	1643	136	F	1573	48	D	1623	169	F
	N	592	37	C	1149	164	F	593	36	C	1147	163	F
	W	1512	49	D	1152	54	D	1548	50	D	1166	55	D
	Overall	4690	214	F	4505	394	F	4737	214	F	4498	427	F