



CIT Woden Transport Interchange

Transport Assessment Report (TAR)

1 | 3

10 May 2021

Major Projects Canberra

N637

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CIT Woden Transport Interchange

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Abbreviations and definitions

ACT	Australian Capital Territory
CSTM	Canberra Strategic Transport Model
CIT	Canberra Institute of Technology
CG	Critical gap
DA	Development Application
EDP	Estate Development Plan
GEH	A formula used in traffic modelling to assess the goodness of fit of modelled data. GEH are the initials of the formula creator.
IDM	Intersection Diagnostic Monitor
LoS	Level of Service
LRT	Light Rail Trams
MPC	Major Projects Canberra
OD	Origin-Destination
PT	Public transport
Released Vehicles	Vehicles which are able to enter the modelled network.
SCATS	Sydney Coordinated Adaptive Traffic System
TCCS	Transport Canberra and City Services
TDM	Travel Demand Management
Unreleased Vehicles	Vehicles which are unable to enter the modelled network, typically due to localised congestion near the point of release.
VHT	Vehicle hours travelled
VKT	Vehicle kilometres travelled
VOC	Vehicle operating costs
VOT	Value of travel time
Vissim	Traffic simulation software PTV Vissim (Version 2020.00-10)

Important note about your report

The sole purpose of this report and the associated services performed by Jacobs is to document the CIT Woden Transport Interchange Traffic Impact Assessment in accordance with the scope of services set out in the contract between Jacobs and the Client. That scope of services, as described in this report, was developed with the Client.

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Executive Summary

Jacobs has been engaged by Major Projects Canberra (MPC) and Transport Canberra and City Services (TCCS) to prepare a Transport Assessment Report (TAR) focussing on the proposed developments and road enabling works in Woden Town Centre, to support the circulation and lodgement of the Estate Development Plan (EDP) development applications.

Proposed Development

The CIT Woden Interchange Project comprises of the following three key packaged improvements:

- **Package 1 – Bus Layovers and Ancillary Roadworks:** Two bus layovers, Phillip Oval Bus Layover and Easty Street Bus Layover, and ancillary roadworks are proposed on Callam Street, Wilbow Street, Easty Street and Launceston Street.
- **Package 2 – Callam Street Transport Interchange:** The transport interchange is proposed to be relocated onto Callam Street, catering for buses and future light rail.
- **Package 3 – CIT Building:** The CIT building is proposed to be located to the west of Callam Street, between Bradley Street and Bowes Street. This package will include off-site road works, including the Bradley Street and Bowes Street vehicular connection.

Existing Conditions

- **Subject Site:** The subject site sits to the eastern side of Woden Town Centre, which is a major employment hub, with the government and retail sector being the largest employers. The centre has a number of important community, education and recreation uses including Woden Community Services, Westfield Shopping Centre, childcare facilities, health-related facilities, Woden Library, Canberra College, Eddison Park, pocket parks and ovals.
- **Intersection Performance:** The base model results show that key intersections within the subject site along Callam Street, Wilbow Street and Easty Street are operating at an LoS C or above, indicating that the performance of the network is satisfactory, with limited delays. There are slightly longer delays observed at peripheral intersections, such as Yamba Drive/Hindmarsh Drive, and Hindmarsh Drive/Melrose Drive, operating at an LoS E.
- **Crash Analysis:** A five-year crash analysis was prepared to provide an overview of the study area and identify crash patterns including common crash types, crash severity and time of day trends. Hotspot locations that have been identified include:
 - Hindmarsh Drive/Melrose Drive intersection and adjoining divided roads
 - Hindmarsh Drive/Yamba Drive intersection and adjoining divided roads
 - Athllon Drive/Callam Street/Hindmarsh Drive intersection and adjoining divided roads
 - Melrose Drive/Yarra Glen/Yamba Drive roundabout and adjoining divided roads.
- **Existing Interchange:** Under existing conditions, the Woden Transport Interchange is located off-street, west of Callam Street. Buses use Bowes Street and Bradley Street to access the 11 platform stops. Some bus layover spaces are currently provided to the north and along Bradley Street.
- **Car Parking:** There are several on and off-street parking areas within Woden Town Centre, near the subject site. A parking survey was undertaken by Austraffic in November 2019 to obtain relevant parking supply and occupancy information.
- **Cycling:** The Woden Town Centre is serviced by several cycling routes which link the site to the broader Canberra cycle network. These include on-road cycling routes along Hindmarsh Drive, Melrose Drive and Launceston Street and shared-use paths along the Yarralumba Creek, Callam Street, Athllon Drive, Yamba Drive, Melrose Drive and within Eddison Park.
- **Walking:** The pedestrianised 'hub' of Woden Town Centre to the east of Bowes Street generates considerable foot traffic in the vicinity of the site, providing an accessible link between notable local

landmarks. These landmarks include the Westfield Shopping Centre, Centraplaza and Scarborough House multi-storey corporate office buildings, government buildings, Australia Post and the Woden Public Library. Further pedestrian volume is generated along walkways between the Town Centre and Eddison Park, along shared-use paths along the Yarralumbra Creek and to rapid transit stops along Melrose Drive, Launceston Street and Callam Street.

Future Conditions

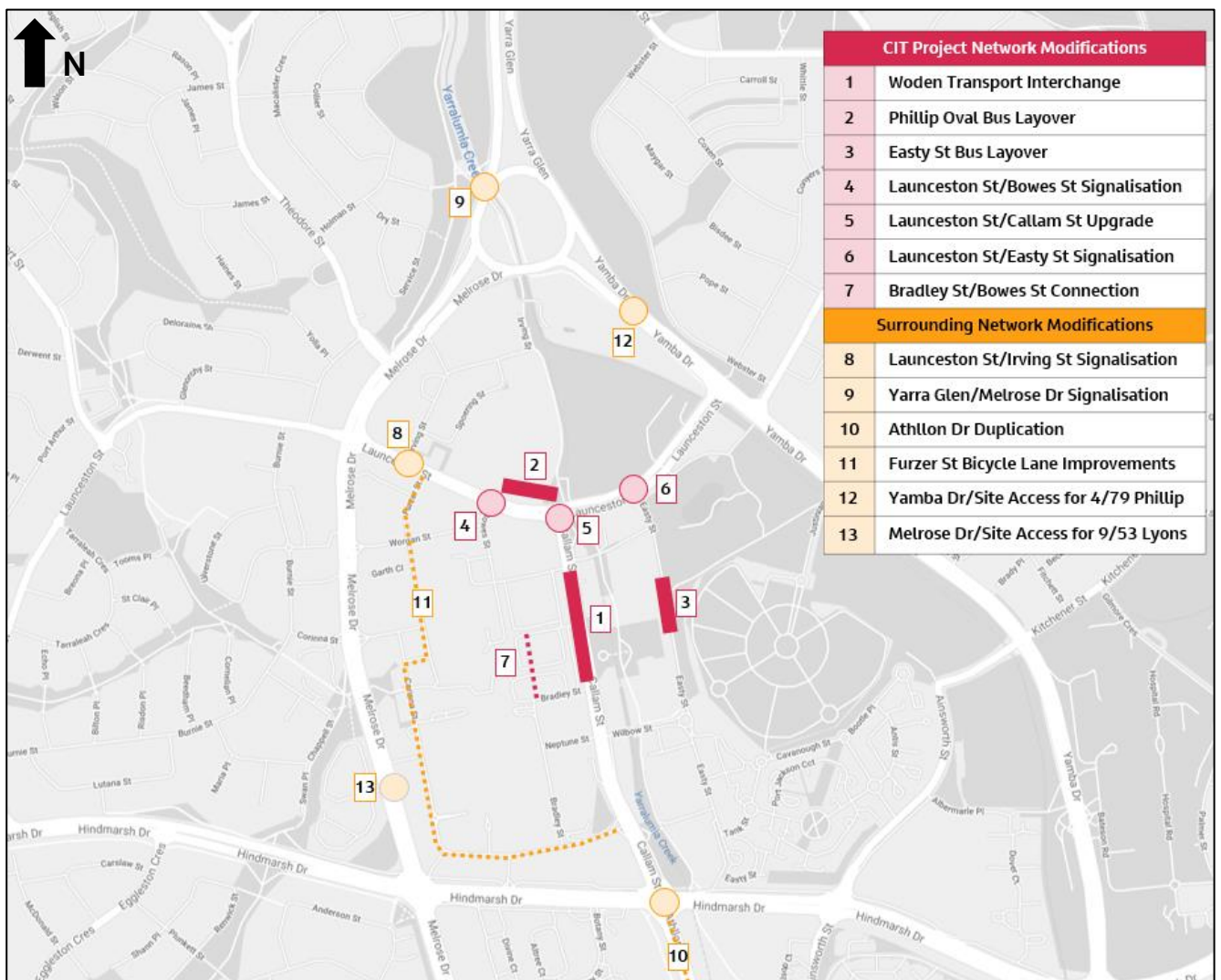
To assess future conditions, the base model and several traffic demand scenarios were tested for AM and PM weekday peaks, described in the table below:

Design Year Scenario	Description
2019 Base Option	Provides an assessment of the network performance under existing conditions
'Day One' Option 1: Single lane Wilbow Street	Provides an opening day assessment of the network performance with the Woden transport interchange and road enabling works scheduled for 2022, before the introduction of the CIT Building. The assessment considers the project network without LRT and the 2019 existing base demand matrices. A single lane arrangement is assumed at Wilbow Street and no signalised pedestrian crossing on Wilbow Street between Callam Street and Easty Street. A single right turn lane has been included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection.
'Day One' Option 2: Double lane Wilbow Street	Provides an opening day assessment of the network performance with the Woden transport interchange and road enabling works scheduled for 2022, before the introduction of the CIT Building. The assessment considers the project network without LRT and the 2019 existing base demand matrices. A double lane arrangement is assumed on Wilbow Street (eastbound) not including the signalised pedestrian crossing on Wilbow Street between Callam Street and Easty Street. Dual right turn lanes have been included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection.
2026 Option: No CIT and No Bradley-Bowes connection (2026 No CIT)	Provides an assessment of the network performance with the Woden transport interchange, 5 years post-opening, before the introduction of the light rail. This scenario provides a future 'base' condition, which considers the network without CIT or the Bradley Street-Bowes Street vehicular connection. A double lane arrangement is assumed on Wilbow Street (eastbound), with dual right turn lanes included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection.
2026 Option: With CIT and No Bradley-Bowes connection (2026 CIT No BB)	Provides an assessment of the network performance with the Woden transport interchange, 5 years post-opening, before the introduction of the light rail. This scenario includes the CIT development and no Bradley Street-Bowes Street vehicular connection.
2026 Option: With CIT and Bradley-Bowes connection (2026 CIT BB)	Provides an assessment of the network performance with the Woden transport interchange, 5 years post-opening, before the introduction of the light rail. This scenario includes the CIT development and Bradley Street-Bowes Street vehicular connection.
2026 Option With LRT*	<i>Provides an assessment of the network performance with the Woden transport interchange, 5 years post-opening, and after the introduction of the light rail. A double lane arrangement is assumed on Wilbow Street (eastbound), with dual right turn lanes included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection. The model was also modified to allow two eastbound through lanes on Launceston Street between Easty Street and Callam Street.</i>
2031 Option: No CIT and No Bradley-Bowes connection (2031 No CIT)	Provides an assessment of the network performance with the Woden transport interchange, 10 years post-opening, and after the introduction of the light rail. This scenario provides a future 'base' condition, which considers the network without CIT or the Bradley Street-Bowes Street vehicular connection.
2031 Option: With CIT and No Bradley-Bowes connection (2031 CIT No BB)	Provides an assessment of the network performance with the Woden transport interchange, 10 years post-opening, and after the introduction of the light rail. This

Design Year Scenario	Description
	scenario includes the CIT development and no Bradley Street-Bowes Street vehicular connection.
2031 Option: With CIT and Bradley-Bowes connection (2031 CIT BB)	Provides an assessment of the network performance with the Woden transport interchange, 10 years post-opening, and after the introduction of the light rail. This scenario includes the CIT development and Bradley Street-Bowes Street vehicular connection.
2036 Option With LRT*	Provides an assessment of the network performance with the Woden transport interchange, 15 years post-opening. The road network modelled is the same as 2026 Option – With LRT.

*Note, 2026 With LRT and 2036 With LRT option scenarios were tested in earlier stages of the project. Their results have not been discussed in this report.

A series of additional infrastructure changes are proposed to occur by 2026 and 2031. The indicative locations of the proposed CIT Woden Interchange network modifications and surrounding road network modifications are shown below.



Operation and Service Assessment – 2026 and 2031 Performance

A vehicle performance assessment within the network showed that:

- Intersections located within the CIT Woden Interchange project area experienced some increases in delay between the 2019 and 2026 No CIT scenarios. Key intersections directly located within the project area

experience some increases in delay. Callam Street/Wilbow Street/Neptune Street experiences an LoS D. Other key intersections operate with an LoS C or better.

- With the 2026 CIT No BB scenario, the results generally show similar but slightly longer delays at some intersections. Key intersections within the project area which are expected to experience an LoS D include:
 - Callam Street/Wilbow Street/Neptune Street
 - Callam Street/Bradley Street
 - Launceston Street/Easty Street
- With the inclusion of the Bradley-Bowes connection (2026 CIT BB), the results show similar but shorter delays at some intersections. The following intersections within the project area improve from an LoS D to an LoS C or better:
 - Callam Street/Bradley Street
 - Launceston Street/Easty Street
- Intersections located within the CIT Woden Interchange project area experienced some increases in delays between the 2026 No CIT and 2031 No CIT scenarios. Key intersections within the project area which are expected to experience an LoS E include:
 - Callam Street/Wilbow Street/Neptune Street
 - Callam Street/Bradley Street
- With the 2031 CIT No BB scenario, the results generally show similar but slightly longer delays at some intersections. Callam Street/Bradley Street is expected to experience an LoS F, while Callam Street/Wilbow Street/Neptune Street continues to operate at LoS E.
- With the inclusion of the Bradley-Bowes connection (2031 CIT BB), improvements to delays are observed at some intersections, while others deteriorate. Key intersections within the project area which are expected to experience an LoS E or worse include:
 - Wilbow Street Roundabout
 - Callam Street/Bradley Street
 - Launceston Street/Easty Street

It should be noted that the intersection performance of Callam Street/Bradley Street and the southbound movements from the Interchange are directly influenced by the Callam Street/Wilbow Street/Neptune Street intersection. Every effort was made to optimise this intersection to improve intersection performance, however we found there was a direct correlation to the poor performance and inefficient bus circulation, which uses these intersections as a gateway between the layovers and subsequent bus routes.

The intersections such as Melrose Drive, Yamba Drive and Hindmarsh are experiencing extended delays in the 2026 and 2031 No CIT scenarios. This means the delays are likely to be a result of the cumulative effect of additional developments, organic traffic growth and the introduction of the light rail across the Woden area, rather than from the CIT Woden Transport Interchange project.

A bus performance assessment within the network showed that:

- Under 2026 No CIT conditions, there are some travel time savings observed for buses travelling on Callam Street between Launceston Street and Hindmarsh Drive, and from Launceston Street west to the Woden Transport Interchange, likely due to the bus priority along Callam Street. For other destinations to and from the Woden Transport Interchange, travel times are generally longer. This could be due to a number of reasons including the additional signalised intersections and increased number of private vehicles and buses in the network under future conditions.
- For the 2026 CIT No BB and CIT BB conditions, there are some minor fluctuations in travel times, with some travel time savings and minor increases in travel time. However, the increases do not exceed 10% of the 2026 No CIT travel times.

- Under 2031 No CIT conditions, bus travel times for most routes assessed are expected to take longer than the 2026 No CIT conditions, due to the extended delays in the network.
- For the 2031 CIT No BB conditions, increases to bus travel times are observed, particularly in the AM peak. Increases are observed for buses travelling on Callam Street (SB) between Launceston Street and Hindmarsh Drive, which are likely to be the combined result of the increased traffic travelling to/from the CIT building, coupled with the large number of buses circulating within the area and general traffic congestion. Increases are also observed for buses travelling between the Interchange and Hindmarsh Drive, likely due to the delays discussed around Callam Street. When the Bradley-Bowes connection is included (2031 CIT BB), these bus journey times reduce, however they still remain slightly higher than the 2031 CIT No BB scenario.

It should be noted that the assumptions applied to bus movements for the peak period mean that the results shown represent the worst-case scenario. Under normal operating conditions, the number of buses travelling between the interchange and the layovers would be significantly less during these peak periods than the modelled scenarios. Additionally, this exercise has been undertaken separate to the bus scheduling, therefore some efficiencies could be gained when the bus scheduling has been planned.

Overall, the increased number of trips to/from Woden, combined with the network modifications, may impact the overall performance of bus services operating within the study area. Whilst the bus interchange and layover areas will allow for increased services, the overall traffic growth within the Woden network means buses may experience increased delays compared to the base case.

Operation and Service Assessment – Day One Scenarios

A 'day one' traffic assessment was conducted to assess the opening day traffic conditions for Woden Transport Interchange. This traffic analysis considers the project network without light rail and the 2019 existing base demand matrices.

Overall, during both AM and PM peaks for the 'Day One' Scenarios, the delays and LoS of the intersections did not have significant impacts on the intersections in the study compared to the 2019 base model. There were a few intersections on Yamba Drive which experienced additional delays due to increased traffic resulting from the changes in travel patterns owing to the closure of Callam Street to private vehicles.

Whilst the single lane Wilbow Street option still operates satisfactorily in terms of delays and LoS at Callam Street/Wilbow Street/Neptune Street, Option 1 results in longer average and maximum queues compared to Option 2. As shown, during the AM peak, the maximum queue for the northbound right turn from Callam Street (south) into Wilbow Street (east) extends up to the upstream intersection (spillback up to Callam Street/Corinna Street). Additionally, the single lane arrangement tested in an earlier 2026 No LRT scenario (now 2026 CIT No BB scenario) resulted in extended queuing observed for northbound vehicles heading towards Wilbow Street from Callam Street.

Operation and Service Assessment - Other

Other operational and service assessment outcomes are detailed below:

- The configuration of the interchange and layovers means that the routing of buses within the Woden study area can strongly influence the level of congestion experienced along key roads such as Callam Street, Wilbow Street and Easty Street. The bus routing is a contributing factor to the increase in bus travel times. Investigating maximising the use of efficient routes for each bus layover should be considered to minimise bus congestion anticipated in the area.
- It is forecast that traffic volumes along Easty Street and Wilbow Street will increase significantly as a result of the road closure along Callam Street, operating as a movement corridor between Launceston Street, the southern end of Callam Street and Hindmarsh Drive.
- Traffic volumes along Bowes Street are also expected to increase, with increased traffic to/from the CIT building and surrounding Woden Town Centre developments, under future conditions.

- The proposed developments provide additional active transport infrastructure within the subject site, enhancing the local network through the provision of numerous additional pedestrian crossings and shared use facilities. Bicycle parking cages are also proposed on either side of Callam Street at the Interchange.
- A parking assessment undertaken by MPC demonstrated there will be a demand of 150 car parking spaces for the use of CIT. As part of the Easty Street layover works, approximately 65 parking spaces may be impacted, and these will be managed by TCCS on a case-by-case basis depending on surrounding development intensity and timing.
- The closure of Callam Street between Matilda Street and Bradley Street may see benefits to road safety, with improvements to safety for pedestrians travelling in the area.
- The movement and place assessment undertaken as part of this traffic impact assessment shows that many of the roads situated within Woden Town Centre do not align with their road hierarchy classifications, or with their proposed movement and place classifications.

Impacts and Mitigation Measures

Based on the findings from the assessment, a number of opportunities and mitigation measures could be considered for future investigation:

- Intersection improvements by 2031 should be considered at the following key intersections which are expected to operate at an LoS E or worse:
 - Callam Street/Wilbow Street/Neptune Street
 - Callam Street/Bradley Street
 - Wilbow Street Roundabout
 - Launceston Street/Easty Street
- To mitigate the impacts from the heightened traffic along the Easty Street and Wilbow Street Corridor, there is the opportunity to provide the following treatments:
 - Local area management and traffic calming devices
 - Duplication of lanes on Easty Street and Wilbow Street
- To mitigate the impacts from the Yamba Drive, Melrose Drive, Hindmarsh Drive, Launceston Street Corridor, there is the opportunity to provide capacity upgrades of key north-south arterials roads such as Yamba Drive and Melrose Drive and capacity upgrades of key east-west arterials roads such as Hindmarsh Drive and Launceston Street.
- A wider Movement and Place study for Woden Town Centre (at a precinct level), should be undertaken to establish and agree on the role of different roads within Woden and establish an implementation plan to ensure the roads correctly align with their proposed classification.
- To better align the operation of traffic signals within Woden Town Centre, the following network modification opportunities have been identified, which can be investigated:
 - Traffic signal corridor optimisation using SCATS across the Woden Town Centre network should be considered to ensure that the operation of the traffic signals align with the relative modal priorities as suggested by the Movement and Place framework.
 - Congestion management/ travel demand management strategies should be considered using SCATS to help manage the flow of traffic within the network.
- Further upgrades to improve the efficiency of public transport in the area include:
 - Bus priority at key intersections, including bus jump lanes, priority signal phases and 'B' lanterns, with a particular focus on improving the efficiency of buses entering and exiting the Woden transport interchange and layovers.
 - Greater number of 'bus only' lanes providing dedicated bus facilities along the key road corridors within Woden.

- Investigate and implement intelligent transport systems, such as real-time information relating to the bus bay availability at layovers to ensure drivers can efficiently travel to the most suitable layover from the Interchange.
 - Conduct a light rail corridor strategy once the light rail comes online in Woden to ensure it is well integrated with the bus network.
 - Bus network planning which considers efficient movements to/from the interchange via the Phillip Oval and Easty Street layovers.
- Continual investment across the Town Centre and surrounding suburbs is required, now and into the future, to maintain a high-performing active transport network in Woden.

1. Introduction

1.1 Background

Jacobs has been engaged by Major Projects Canberra (MPC) and Transport Canberra and City Services (TCCS) to prepare a Transport Assessment Report (TAR) focussing on the proposed developments and road enabling works in Woden Town Centre, to support the circulation and lodgement of the Estate Development Plan (EDP) development applications.

This TAR covers the works associated with three key proposed works packages as part of the CIT Woden Interchange Project :

- Package 1 - Bus Layovers and Ancillary Roadworks (enabling works)
- Package 2 - Callam Street Transport Interchange
- Package 3 - Canberra Institute of Technology (CIT) Building, including off-site roadworks

1.2 Aim of this report

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

- Existing land uses surrounding the site
- Existing and future traffic conditions of the surrounding transport network
- Existing and future public transport operations, including potential scenarios associated with the proposed Canberra Light Rail project
- Car parking facilities
- Pedestrian and cyclist requirements
- The impacts from the proposed development on the surrounding transport network

1.3 References

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

- Austroads Guide to Road Design Part 4: Intersections and Crossings
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development
- RMS NSW Guide to Traffic Generating Developments (October 2002 Version 2.2)
- TCCS Guidelines for Transport Impact Assessment
- Transport Canberra and City Services Standard Drawings.
- ACT Transport Strategy 2020

2. Proposed Development

The CIT Woden Interchange Project comprises of the following three key packaged improvements:

- **Package 1 – Bus Layovers and Ancillary Roadworks:** Two bus layovers, Phillip Oval Bus Layover and Easty Street Bus Layover, and ancillary roadworks are proposed on Callam Street, Wilbow Street, Easty Street and Launceston Street.
- **Package 2 – Callam Street Transport Interchange:** The transport interchange is proposed to be relocated onto Callam Street, catering for buses and future light rail.
- **Package 3 – CIT Building:** The CIT building is proposed to be located to the west of Callam Street, between Bradley Street and Bowes Street. This package will include off-site road works, including the Bradley Street and Bowes Street vehicular connection.

Each of these packaged developments and their location is shown in Figure 2.1. Details regarding each package are described below. Whilst they are described separately, all elements have been developed iteratively and holistically to maximise positive outcomes for all developments and their users.

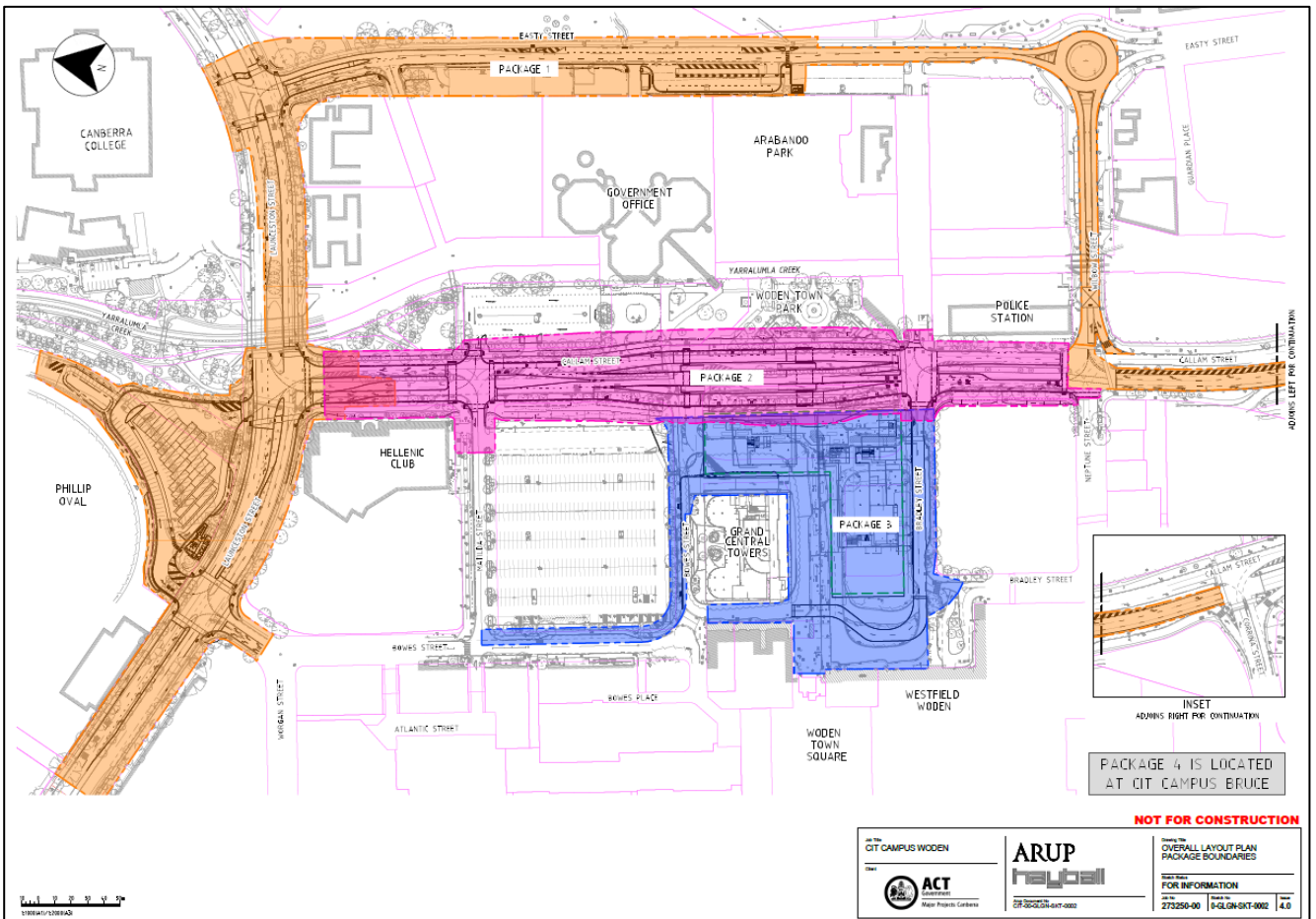


Figure 2.1: General Arrangement of Proposed Developments and Works (Source: Arup 2021)

2.1 Package 1 - Bus Layover and Ancillary Roadworks

To enable the construction of the new transport interchange, a number of changes will be made in and around the eastern edge of Woden Town Centre. Two new bus layover areas will be constructed to replace layover facilities in the current Woden transport interchange. Key road enabling works are also expected on Callam Street, Launceston Street, Wilbow Street and Easty Street. These facilities are expected to be completed in 2022, to cater for the new interchange. Further details regarding the bus layovers and road enabling works are described below.

2.1.1 Phillip Oval Bus Layover

The Phillip Oval Bus Layover will be located in the carpark adjacent to the northern end of Callam Street and Launceston Street. As part of the layover facility, a northern leg at the Launceston Street/Bowes Street intersection is proposed to be added to allow buses to access the layover. A north-eastern leg connecting to Launceston Street/Callam Street is proposed to be added to allow buses to exit the layover. The layover will have 24 new bus layover spaces, with meal and toilet amenities available.

Pedestrian crossings throughout the Phillip Oval Bus Layover along Launceston Street include:

- Four new signalised pedestrian crossings for each leg of the Bowes Street intersection, including across the proposed entrance to the Phillip Oval Bus Layover
- At the Launceston Street/Callam Street intersection:
 - Two signalised pedestrian crossings, across the western side of Launceston Street and across Callam Street, are to be reinstated
 - One new signalised pedestrian crossing at the proposed exit from the Phillip Oval Bus Layover
 - The existing signalised crossing across the eastern side of Launceston Street is proposed to be retained
 - The existing pedestrian crossing provision over the left-turning slip lane into Launceston Street is to be removed.
- Pedestrian crossing provisions within the proposed bus layover to provide access to parked buses

2.1.2 Easty Street Bus Layover

The Easty Street Bus Layover is proposed to be located about 200 metres east of the Woden Interchange on the eastern and western sides of Easty Street. The layover will provide approximately six bus layover spaces on the western side and five spaces on the eastern side of Easty Street.

Pedestrian crossings throughout the Easty Street bus layover include:

- Three new signalised pedestrian crossings at the Launceston Street intersection across the east and western side of Launceston Street and across the southern side of Easty Street.
- Two new unsignalised pedestrian crossing provisions across Easty Street, south and north of the proposed bus layover bays.
- An existing crossing for bicycles and pedestrians across Wilbow Street along the path following the Yarralumla Creek.
- The existing pedestrian crossing provisions at the Easty Street and Wilbow Street roundabout and the Wilbow Street/Callam Street intersection are to be minorly reconfigured.

2.1.3 Key Road Enabling Works

As part of the project, key road enabling works are expected to be conducted to facilitate the additional bus movements:

- Easty Street will be widened and modified to allow for the Easty Street Bus Layover.
- Signalisation of Easty Street/Launceston Street to accommodate the increased number of buses and general traffic accessing Easty Street.
- Reconfiguration of Launceston Street/Callam Street and Launceston Street/Bowes Street to accommodate the access lanes from Phillip Oval Bus Layover.
- Signalisation of Launceston Street/Bowes Street
- Signalised left turn from Callam Street onto Launceston Street
- Modifications will be made through Callam Street to allow the light rail route to run through Callam Street.

2.2 Package 2 - Callam Street Transport Interchange

Under existing conditions, the Woden transport interchange is located off-street, just west of Callam Street. Buses use Bowes Street and Bradley Street to access the platform stops.

The Callam Street Transport Interchange is proposed to be relocated onto Callam Street, catering for buses and future proofed for the provision of light rail to Canberra's south. The new interchange on Callam Street aims to create a safe, integrated and seamless interchange point for pedestrians between bus and light rail; and to support public transport uptake to access the new CIT Woden campus. The new interchange is expected to be completed by 2022.

The design of the interchange responds to:

- Ease of interchange between buses and other transport modes.
- Provision of the future extension of light rail to Woden.
- Efficient use of space that promotes function whilst minimising peripheral impacts on the precinct.

Key changes as a result of the Callam Street Transport Interchange include:

- Callam Street, between Matilda Street and New Bradley Street, will be closed for private vehicles. This will facilitate the efficient operations of the Callam Street Transport Interchange.
- The interchange includes 18 bus stops, an increase from the current 11 bus stops.
- Future-proofed for the extension of light rail to Woden, with light rail terminus stop.
- Enabling roadworks on Easty Street and Wilbow Street to support the redistribution of traffic between Launceston Street and the south of Callam Street and Hindmarsh Drive.

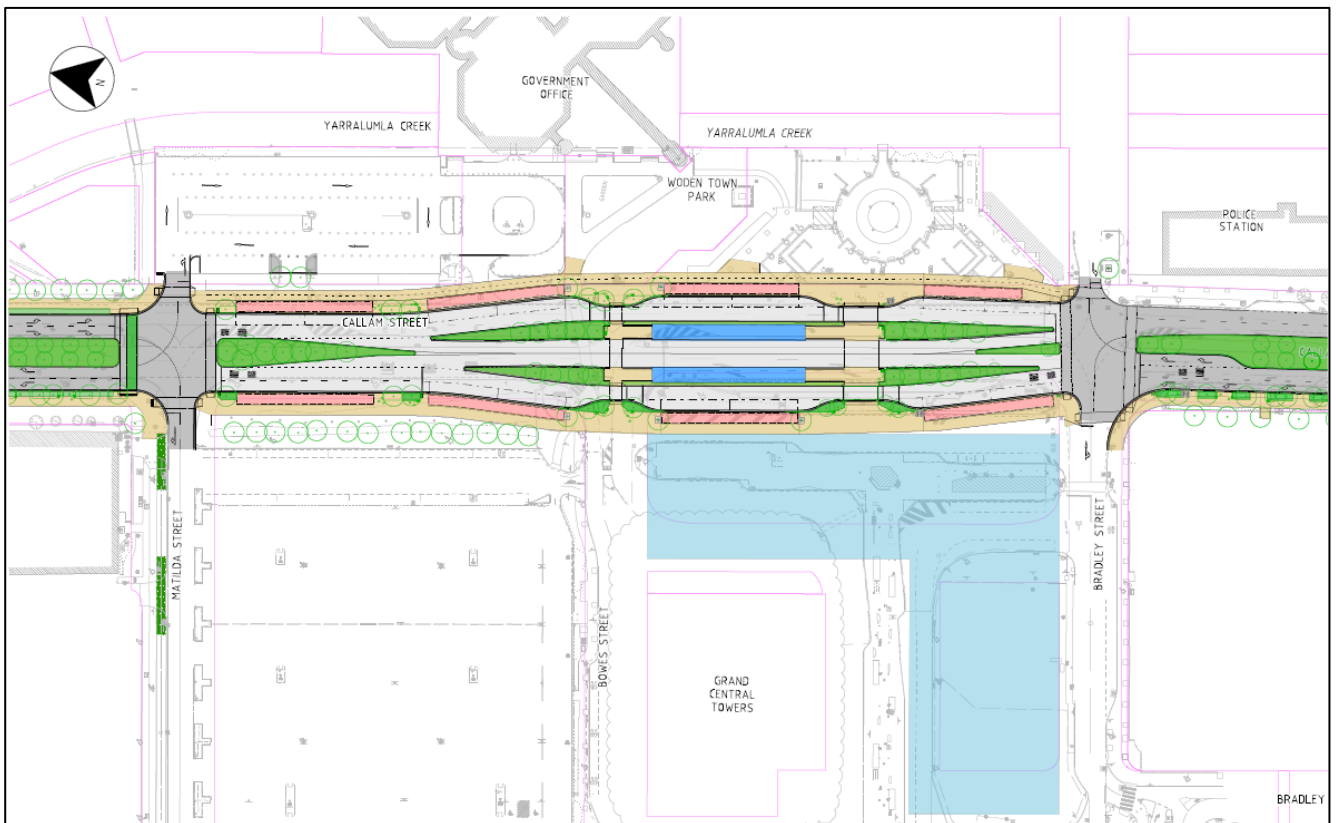


Figure 2.2: Callam Street Interchange prior to arrival of Light Rail (Source: Arup 2020)

Pedestrian crossings and shared user paths have been provided throughout the project to facilitate bus-pedestrian connectivity and ensure that the design reflects the key active transport priorities for Woden Town Centre. Pedestrian and cycling infrastructure upgrades throughout the Woden transport interchange along Callam Street include:

- Four new signalised pedestrian crossings across each leg of the Matilda Street intersection.
- Two pedestrian crossings through the bus interchange across Callam Street have been provided at Bowes Street and a location between Bowes Street and Bradley Street.
- New pedestrian crossings at the Callam Street/Bradley Street intersection.
- A shared path has been provided on the eastern side of Callam Street adjacent to the bus interchange. This path connects the Matilda Street intersection with the Bradley Street intersection.

2.3 Package 3 - CIT Building and off-site roadworks

The new CIT Building is proposed to be a 22,500m² purpose-built educational facility, located on the site of the existing Woden transport interchange. The new CIT facility is expected to open in 2025.

Entry to the CIT Building is predominantly via Bradley Street and accommodates services functions such as loading, car parking entry, a dedicated cycle entry, electrical switch rooms and facilities stores. A single level of the basement accommodates car parking, services, rainwater harvesting tanks and end-of-ride facilities including bike parking. Being in such close proximity to the Callam Street Transport Interchange, and future light rail terminus the CIT Building is proposed to provide 70 spaces on campus.

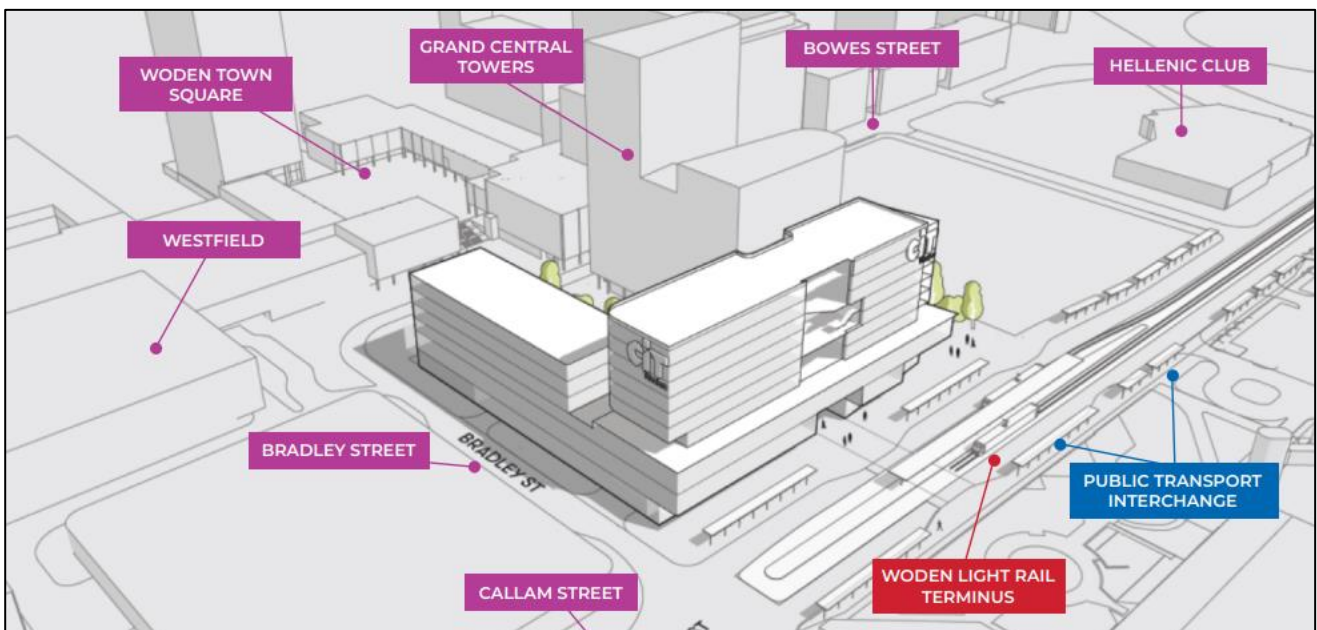


Figure 2.3: Early design concept of CIT building and surrounding environment (Source: ACT Government)

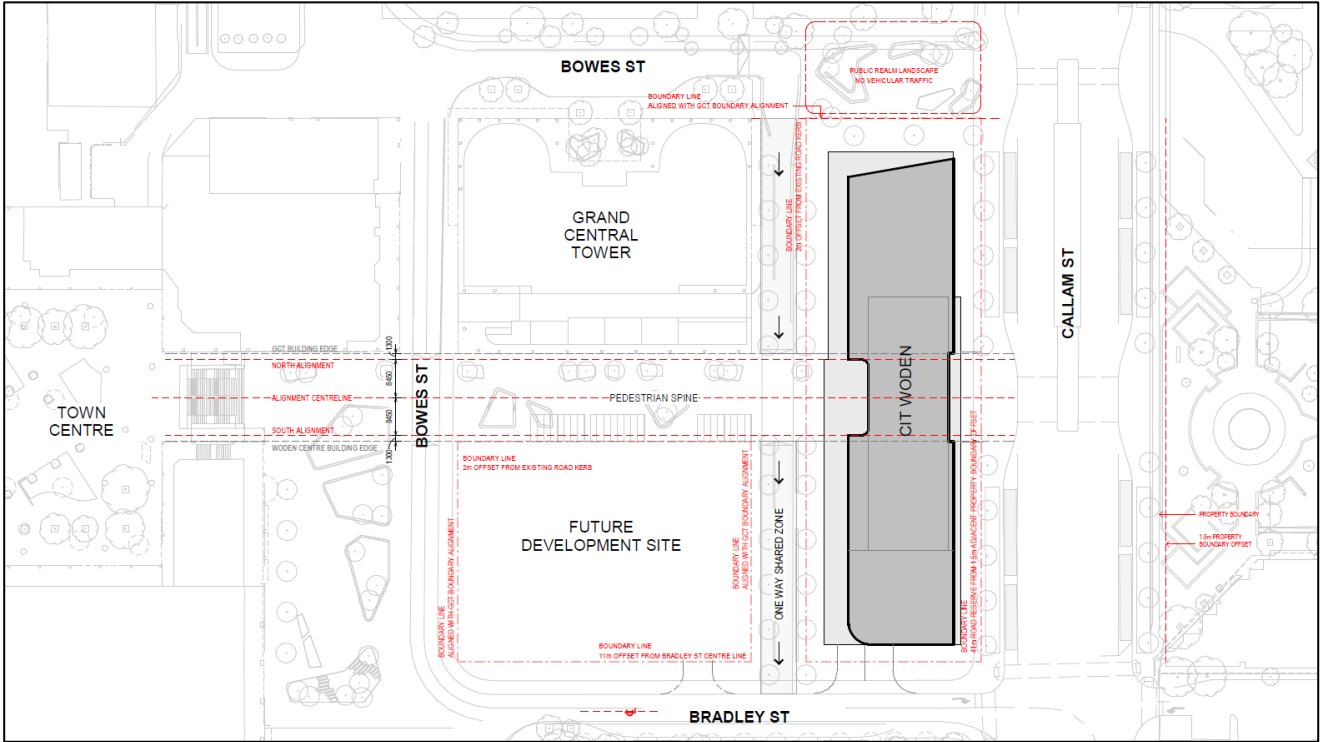


Figure 2.4: Site Layout of CIT building (Source: CIT Design Report, Arup 2020)

2.3.1 Key Road Enabling Works

The development of the CIT building will include the future connection of Bradley Street and Bowes Street. The future connection will be a shared pedestrian and vehicle zone, with a maximum speed of 10km/hr. The concept design of the connection is shown in Figure 2.5.

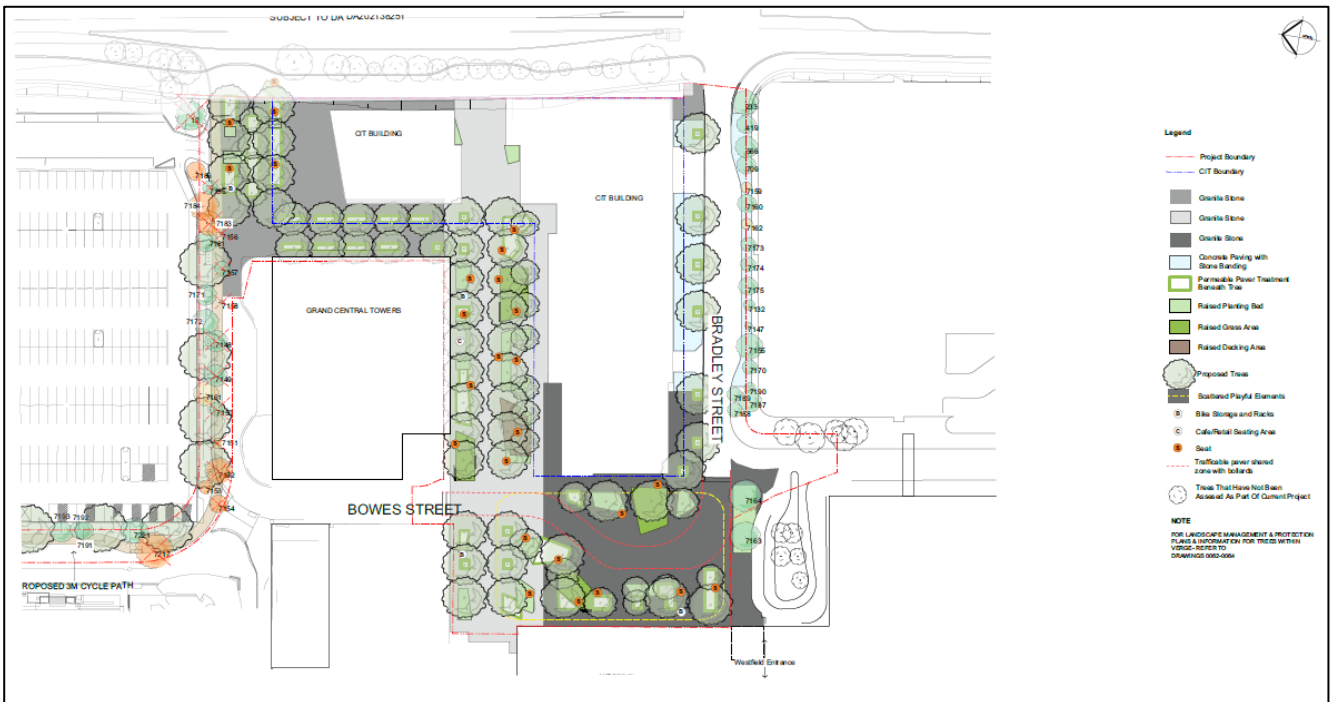


Figure 2.5: Layout of Bowes Street and Bradley Street future connection (Source: Arup 2020)

2.4 Travel Demand Management

As described in the CIT Woden Campus Design Report (Arup, 2020), a strategic transport hierarchy has been adopted to inform the development outcomes within the public realm space. Public transport, local pedestrian connectivity and other forms of active travel underpin the ways in which people move into, out of and around the CIT development.

To support the proposed transport hierarchy, the following principles have been developed:

- Minimal on-site car parking
- Provide direct, efficient and safe pedestrian connections between the interchange, CIT and other areas of the Town Centre
- Minimise traffic and pedestrian conflict. Where conflicts cannot be avoided, strong and contrasting paving will be used to define relevant areas such as pedestrian crossings, shared zones and vehicle routes.

2.5 Study Area Definition

An overview of the study area context covered by the traffic analysis is shown below. The study area has been used to undertake the traffic modelling analysis within Vissim.



Figure 2.6: Study Area

3. Existing Conditions

3.1 Site Location and Environs

The location of the key subject site and its surrounding environment is shown in Figure 3.1. The surrounding land uses predominantly include office, retail and commercial uses.

The subject site sits to the eastern side of Woden Town Centre, which is a major employment hub, with the government and retail sector being the largest employers. The centre has a number of important community, education and recreation uses including Woden Community Services, Westfield Shopping Centre, childcare facilities, health-related facilities, Woden Library, Canberra College, Eddison Park, pocket parks and ovals.

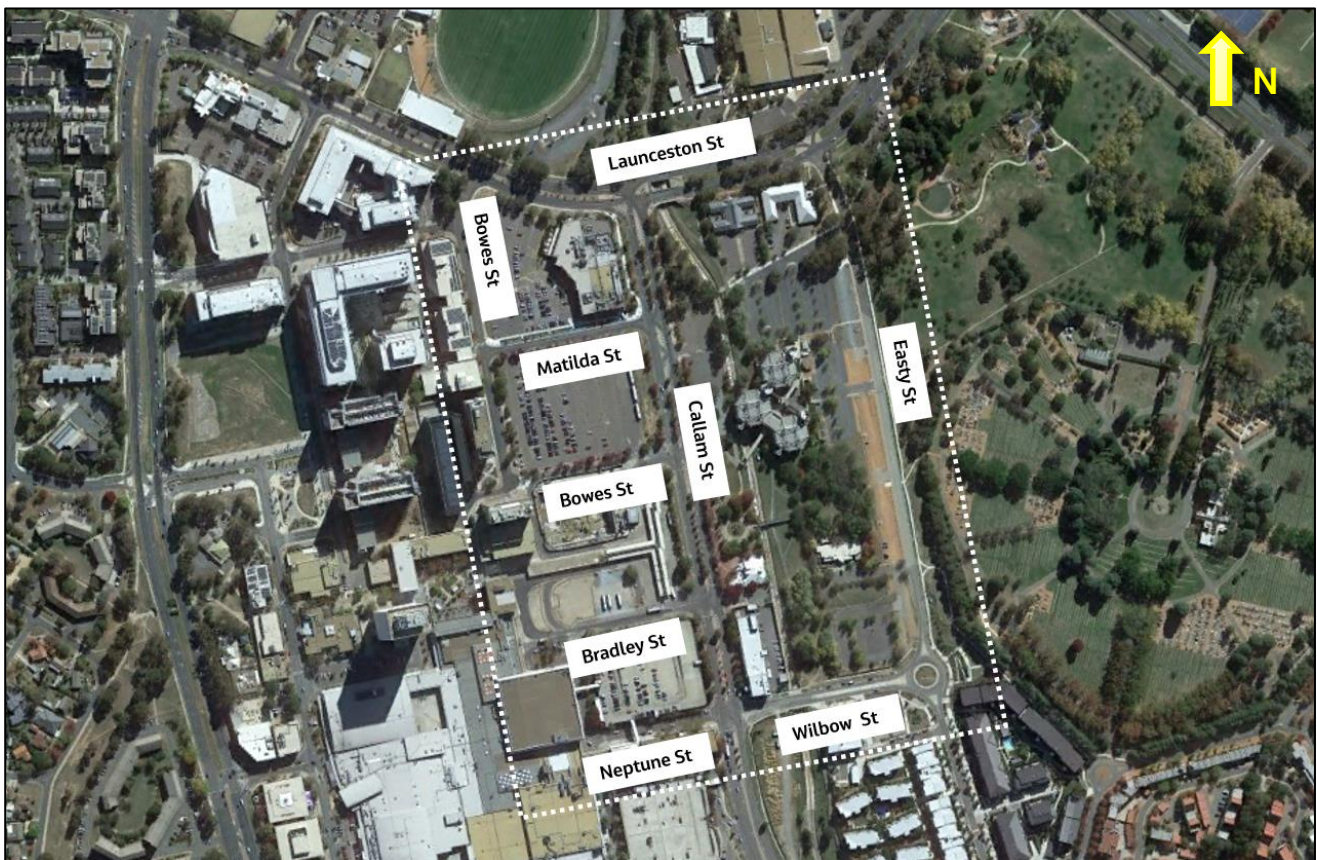


Figure 3.1: Subject site and it's environment

3.2 Land Use

Under the ACT Territory Plan, the subject site is predominantly zoned as the following:

- **Commercial (CZ1) – Core:** Existing development in the CZ1. ore zone land use zones mainly consist of the Woden Plaza (Westfield Shopping Centre), bus interchange, structured parking and other retail uses.
- **Commercial (CZ2) – Business:** Development in the CZ2 land use zone currently consists mostly of Australian Government offices and smaller commercial offices.
- **Urban Parks and Recreation (PRZ2) – Urban Open Spaces:** These areas provide an appropriate quality, quantity and distribution of parks and open spaces that will contribute to the recreational and social needs of the community.
- **Transport and Services (TSZ1) – Transport:** These areas cover the key road corridors within the subject site, such as Callam Street and Launceston Street.

- **Community Facilities:** Woden Town Centre plays an important district and regional role, providing essential facilities and services to the community. Sites zoned as a community facility include facilities like Woden Early Childhood Centre, Woden Library, Philip Heath Centre and Woden Community Services, etc.

The land uses of the surrounding environment are shown in Figure 3.2.

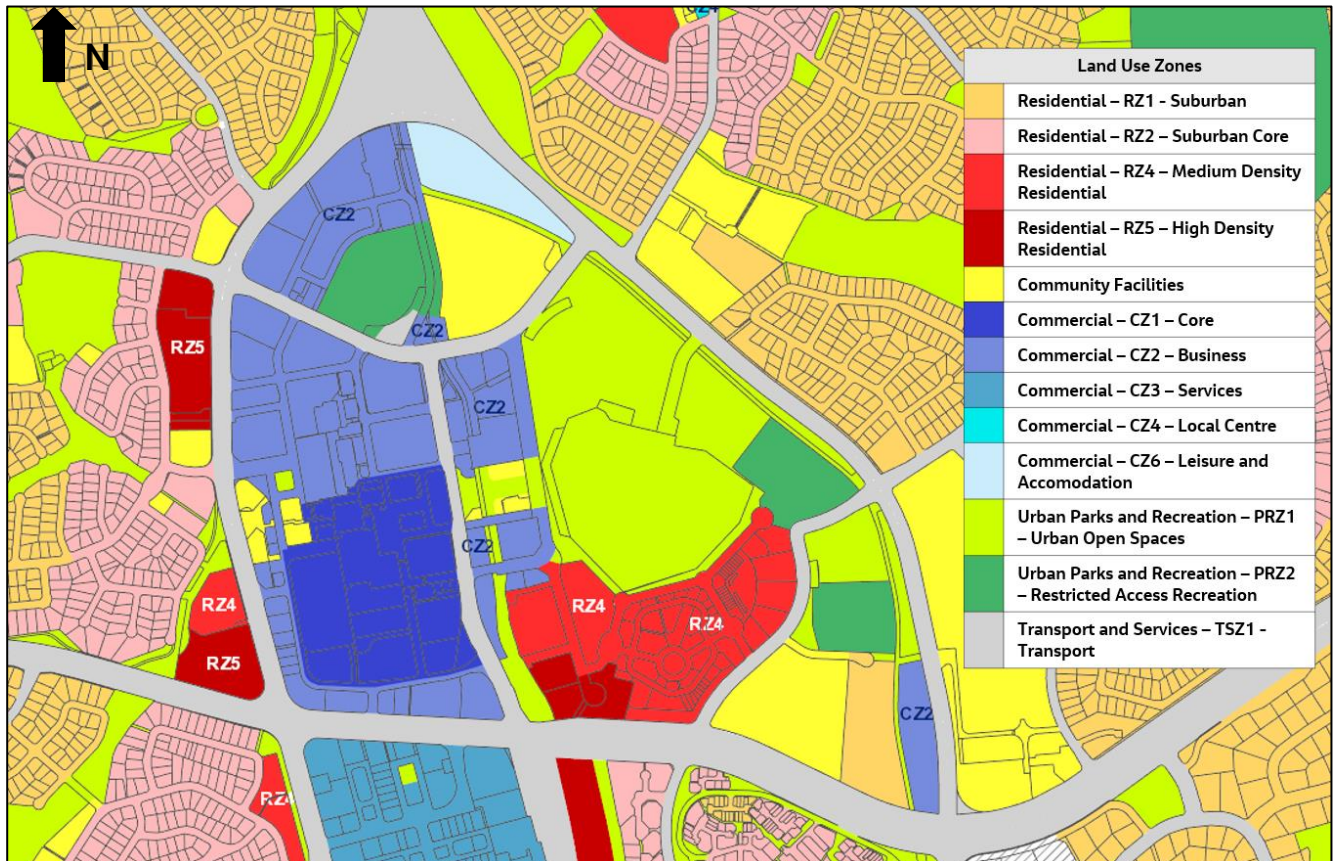


Figure 3.2: Land Use (Source: ACT Territory Plan, 2020)

3.3 Road Network

3.3.1 Key Roads

The key roads within the road network are described below.

- **Callam Street:** Callam Street is a Major Collector road and aligns in a north-south direction between Launceston Street and Hindmarsh Drive. Callam Street currently provides a number of vehicle access points to the Woden Town Centre. It is a two-way road generally configured with two traffic lanes in each direction.
- **Launceston Street:** Launceston Street is classified as a Major Collector but functions as an Arterial road and aligns in an east-west direction. It connects Yamba Drive to the east and Hindmarsh Drive to the southwest. Launceston Street is a two-way road configured with predominantly two traffic lanes in each direction. West of Melrose Drive, it is configured with one traffic lane in each direction.
- **Easty Street:** Easty Street is classified as a Local Access Street, but likely functions as a Minor Collector Road based on traffic volumes. The street aligns in a north-south direction, running parallel to Callam Street. Easty Street is a two-way road, configured with one traffic lane in each direction. It provides access for government employees accessing workplaces along Easty Street, and residents accessing residential developments at the road's southern extent.
- **Bowes Street:** Bowes Street is classified as a Local Access Street, but likely functions as a Minor Collector Road based on traffic volumes. The street runs in an L-shaped direction, connecting Launceston Street to

the north, and Callam Street to the East. It is a two-way road configured with one traffic lane in each direction.

- **Matilda Street:** Matilda Street is a Local Access Street and aligns in an east-west direction between Bowes Street and Callam Street. It is a two-way road configured with one traffic lane in each direction. Off road cycling paths are located on the northern side of Matilda Street.
- **Wilbow Street:** Wilbow Street is classified as a Local Access Street but likely functions as a Minor Collector road and aligns in an east-west direction between Callam Street and Easty Street and linking to higher order roads within the neighbourhood, such as Callam Street.

The associated road hierarchy for the study area can be found in Figure 3.3. As shown in Figure 3.3, freight routes (B-double or PBS) are reserved to Melrose Drive, Yamba Drive and Hindmarsh Drive.



Figure 3.3: Road Hierarchy (Source: Active Infrastructure, 2020)

3.3.2 Surrounding Road Network

The surrounding road network study area was determined based on the location of the Woden transport interchange and the key access roads entering/leaving the interchange area. The extents of the study area are Yamba Drive/Melrose Drive/Yarra Glen Roundabout to the north, Yamba Drive to the east, Melrose Drive to the west and Hindmarsh Drive to the south. Within the study area, 18 signalised intersections are included. The list of the intersections along with SCATS identification number are given in Table 3.1 and shown in Figure 3.4.

Table 3.1: Major signalised intersections in study area

SCATS ID	Intersection
25	Launceston Street / Melrose Drive
75	Callam Street / Launceston Street
152	Yamba Drive / Launceston Street / Wisdom Street
155	Bowes Street / Callam Street
60	Bradley Street / Callam Street
116	Neptune Street / Callam Street / Wilbow Street
168	Corinna Street / Callam Street
295	Melrose Drive / Worgan Street
296	Melrose Drive / Corinna Street
167	Melrose Drive / Brewer Street
16	Melrose Drive / Hindmarsh Drive
166	Hindmarsh Drive / Ball Street
34	Hindmarsh Drive / Botany Street
93	Hindmarsh Drive / Callam Street
17	Hindmarsh Drive / Ainsworth Street
37	Hindmarsh Drive / Yamba Drive
150	Yamba Drive / Bateson Rd
42	Yamba Drive / Kitchener Street

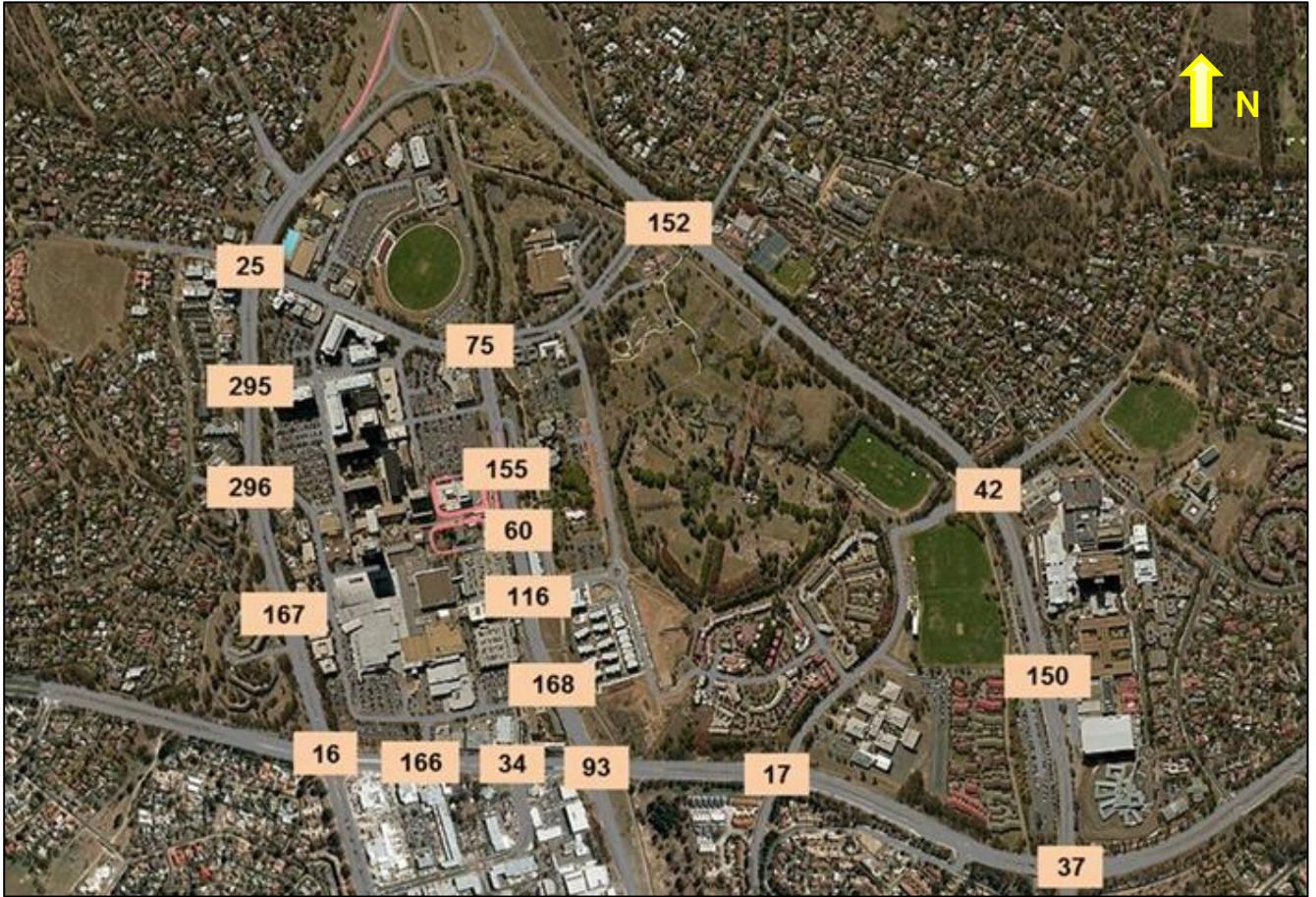


Figure 3.4: SCATS data locations in the study area

3.4 Existing Traffic Flows

SCATS data was obtained from TCCS for all signalised intersections within the study area. Traffic signal information such as phase arrangements and average phase times were also obtained from TCCS as part of the SCATS data. The existing two-way midblock traffic volume data were derived from the Vissim 2019 existing model outputs and is summarised in Figure 3.5.

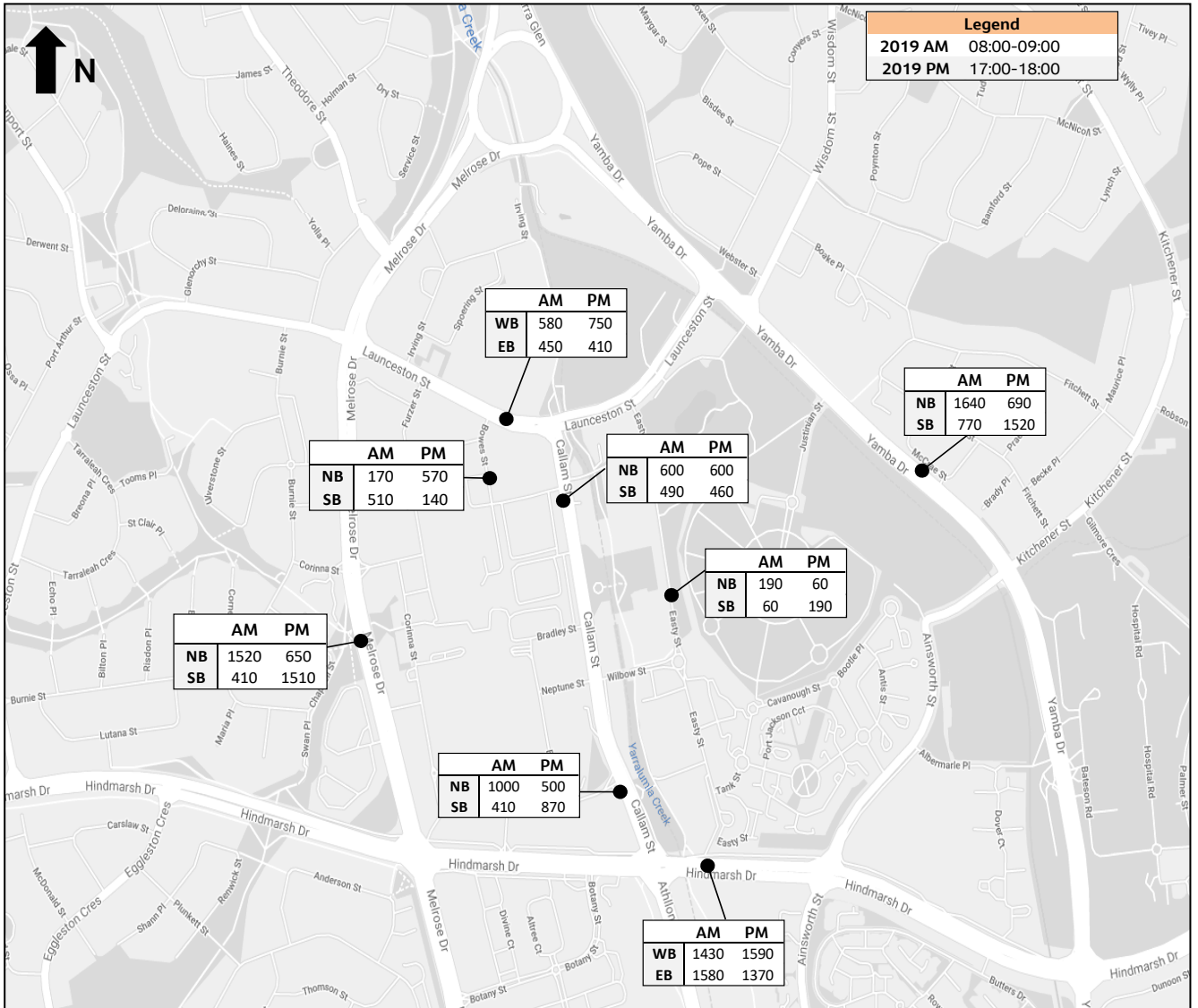


Figure 3.5: Midblock Peak Hour Traffic Volumes (rounded to the nearest 10)

3.5 Existing Intersection Operation

The operation of the existing intersections has been analysed using PTV Vissim (Version 2020.00-10), a microsimulation software package developed by PTV Group. Microsimulation models developed in Vissim utilise dynamic, stochastic, discrete-time modelling techniques that simulate the movement of individual vehicles based on car-following, lane changing and gap acceptance algorithms that are updated several times every second. The software is efficient in modelling the individual interactions between different vehicles such as motor vehicles, buses, light rail and pedestrians. It is also helpful in assessing the performance of the road network by estimating the delays and queues occurring at intersections.

Vissim was used for this TIA to provide a preliminary assessment of the traffic performance of the Canberra Institute of Technology (CIT), Woden light rail and bus interchange. This assessment builds on previous microsimulation modelling in Vissim undertaken by Jacobs in 2018/2019 for the Woden transport interchange Project. As part of the broader study, a more comprehensive Woden Town Centre Aimsun model is being developed concurrently. Following the completion of the preliminary traffic modelling documented in this report, one of the next steps will involve rerunning the Aimsun model with the same network changes to validate the findings from this preliminary modelling assessment.

The base year traffic models were developed for existing conditions to represent a typical weekday for the following time periods, considered based on the peak periods modelled:

- AM peak model: 8:00 to 9:00
- PM peak model: 17:00 to 18:00

Additionally, a half hour warmup period was included for both the AM (07:30 to 08:00) and PM (16:30 to 17:00) peak models to ensure that traffic builds up on the network prior to the peak hour, therefore reflecting appropriate travel times during the core modelled 1-hour period.

For this traffic impact assessment, the LoS criteria assessment shown in Table 3.2 has been adopted (Austroads, 2017). Figure 3.6 shows the existing performance of the intersections analysed within the traffic network. For more detailed results, see Appendix F. The detailed results include information on average delay, total vehicles, average and maximum queue lengths for each intersection movement assessed.

Table 3.2: LOS Criteria for Intersection Capacity Analysis (Source: Austroads, 2017)

Level of Service (LoS)	Average Delay per Vehicle (sec/veh)		
	Unsignalised Intersection	Roundabout	Signalised Intersection
A	$d \leq 10$	$d \leq 10$	$d \leq 10$
B	$10 < d \leq 15$	$10 < d \leq 20$	$10 < d \leq 20$
C	$15 < d \leq 25$	$20 < d \leq 35$	$20 < d \leq 35$
D	$25 < d \leq 35$	$35 < d \leq 50$	$35 < d \leq 55$
E	$35 < d \leq 50$	$50 < d \leq 70$	$55 < d \leq 80$
F	$50 < d$	$70 < d$	$80 < d$

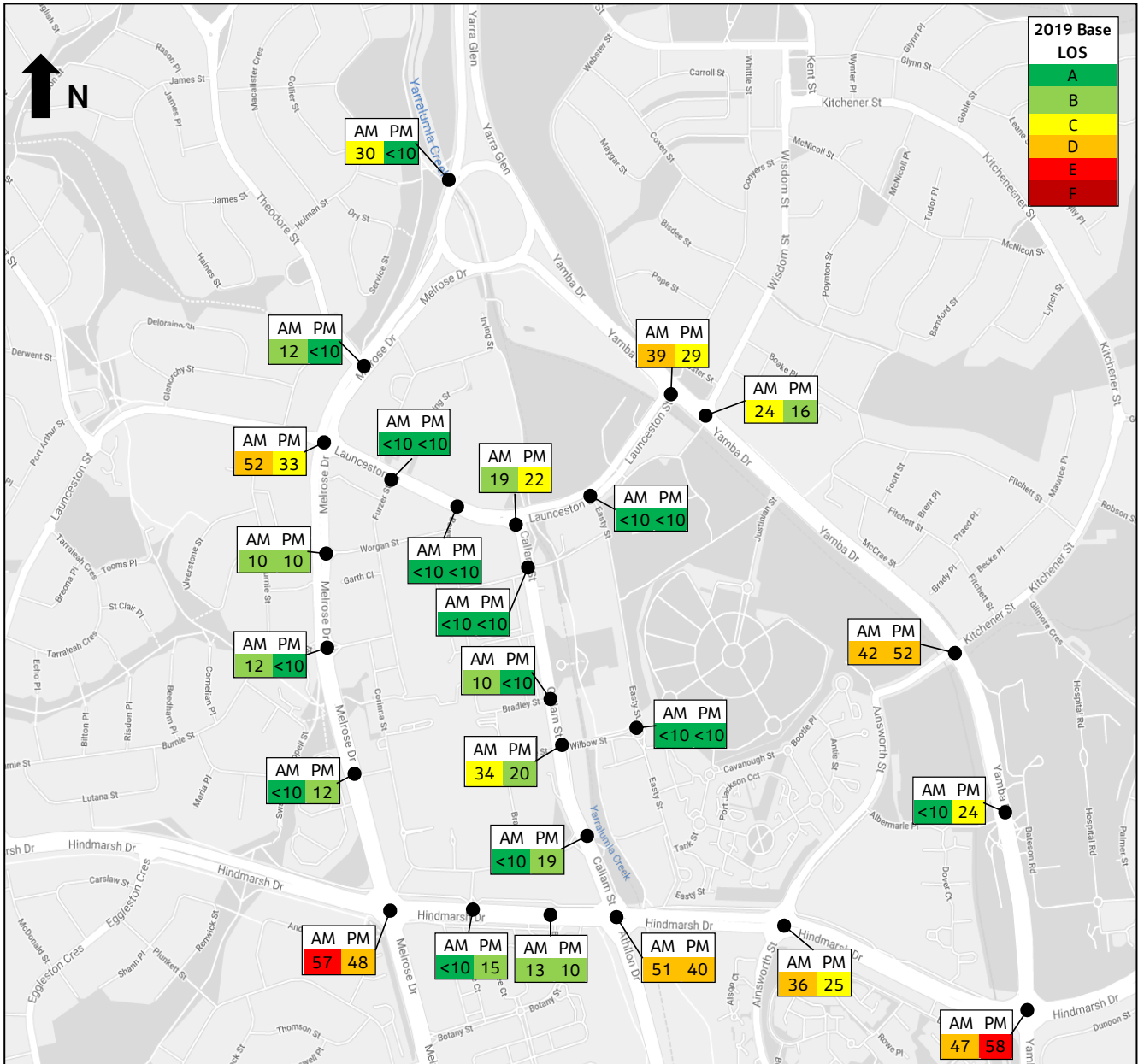


Figure 3.6: Base Model Average Intersection Delay and LoS

The base model results show that key intersections within the subject site along Callam Street, Wilbow Street and Easty Street are operating at an LoS C or above, indicating that the performance of the network is satisfactory, with limited delays. There are slightly longer delays observed at peripheral intersections, such as Yamba Drive/Hindmarsh Drive, and Hindmarsh Drive/Melrose Drive, operating at an LoS E.

The key intersections located within the CIT Woden Interchange subject site have been examined further, with the LoS, delays and number of vehicles by approach shown in Table 3.3. The key findings from the intersection analysis for the base conditions are summarised below:

- **Wilbow Street Roundabout:** All approaches operate at LoS A in the AM and PM peaks.
- **Launceston Street/Callam Street:** From Launceston Street (east), the intersection operates with an LoS C and D in the AM and PM peaks respectively. Launceston Street (west) and Callam Street (south) operates at LoS B.
- **Callam Street/Bradley Street:** Bradley Street (west) operates at LoS D in the peak periods. The Callam Street approaches operate at LoS B or better.
- **Callam Street/Wilbow Street/Neptune Street:** Callam Street (south) operates at LoS D in the AM peak. Other approaches operate at LoS C or better.
- **Callam Street/Corinna Street:** Corinna Street (west) approach experiences an LoS D in the PM peak. All other approaches operate at LoS B or better.
- **Launceston Street/Bowes Street:** All approaches operate at LoS A under both peaks.
- **Launceston Street/Easty Street:** All approaches operate at LoS A or B under both peaks.
- **Callam Street/Matilda Street:** All approaches operate at LoS A under both peaks.

Table 3.3: Key Intersection Performance by Approach (2019 Base)

Intersection Name	Approach	2019 Base AM Peak			2019 Base PM Peak		
		Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS
Wilbow Street Roundabout	Easty St (north)	61	<10	A	191	<10	A
	Easty St (south)	140	<10	A	111	<10	A
	Wilbow St (west)	222	<10	A	79	<10	A
Launceston Street/Callam Street	Launceston St (east)	549	31	C	563	40	D
	Callam St (south)	597	14	B	595	11	B
	Launceston St (west)	454	<10	B	410	11	B
	Phillip Oval Bus Layover (north)	-	-	-	-	-	-
Callam Street/Bradley Street	Callam St (north)	357	<10	A	453	<10	A
	Callam St (south)	791	12	B	518	<10	A
	Bradley St (west)	<10	40	D	52	38	D
Callam Street/Wilbow Street/Neptune Street	Callam St (north)	331	15	B	497	15	B
	Wilbow St (east)	63	21	C	202	<10	A
	Callam St (south)	1,155	40	D	563	25	C
	Neptune St (west)	87	35	C	144	30	C
Callam Street/Corinna Street	Callam St (north)	428	12	B	759	11	B
	Callam St (south)	1,241	<10	A	564	16	B
	Corinna St (west)	245	13	B	272	47	D
Launceston Street/Bowes Street	Launceston St (east)	578	<10	A	741	<10	A
	Bowes St (south)	97	<10	A	327	<10	A
	Launceston St (west)	495	<10	A	343	<10	A
Launceston Street/Easty Street	Launceston St (east)	651	<10	A	580	<10	A
	Easty St (south)	86	<10	A	196	13	B
	Launceston St (west)	536	<10	A	360	<10	A
Callam Street/Matilda Street	Callam St (north)	484	<10	A	463	<10	A
	Callam St (south)	775	<10	A	572	<10	A
	Matilda St (west)	16	<10	A	72	<10	A

3.6 Road Safety

A crash summary has been prepared to provide an overview of the study area and identify crash patterns including common crash types, crash severity and time of day trends. Crash data is primarily from the suburb of Phillip. Nearby crashes from the suburbs of Chifley, Curtin, Deakin, Garran, Hughes, Lyons, were also considered in this analysis.

From the crashes recorded in the five-year study period (January 2015 – December 2019 inclusive):

- A total of 1,377 crashes were recorded in the study area.
- 70% of crashes occurred at intersections and 30% occurred along mid-block sections.
- 94% of crashes involved a multi-vehicle collision, and 6% were single-vehicle collisions.
- 89% of crashes were on dry road surface conditions, and 11% were on wet, icy, muddy or oily road surface conditions.
- Approximately 0.1% (two crashes) were fatal, with a further 5% (66 crashes) causing injury.
- One fatal crash was recorded in 2018 which occurred along Yarra Glen (north of the roundabout with Melrose Drive/Yamba Drive) after a vehicle overturned on the road.
- The other fatal crash was recorded in 2019 which occurred along Hindmarsh Drive (west of the Melrose Drive intersection) after a vehicle struck an object off road.
- Of the crashes which caused injury, 85% occurred at intersections and 15% occurred along mid-blocks.

A summary map of all crashes, by location and type, is shown in Figure 3.7 and Figure 3.8. Hotspot locations that have been identified include:

- Hindmarsh Drive/Melrose Drive intersection and adjoining divided roads
- Hindmarsh Drive/Yamba Drive intersection and adjoining divided roads
- Athllon Drive/Callam Street/Hindmarsh Drive intersection and adjoining divided roads
- Melrose Drive/Yarra Glen/Yamba Drive roundabout and adjoining divided roads.

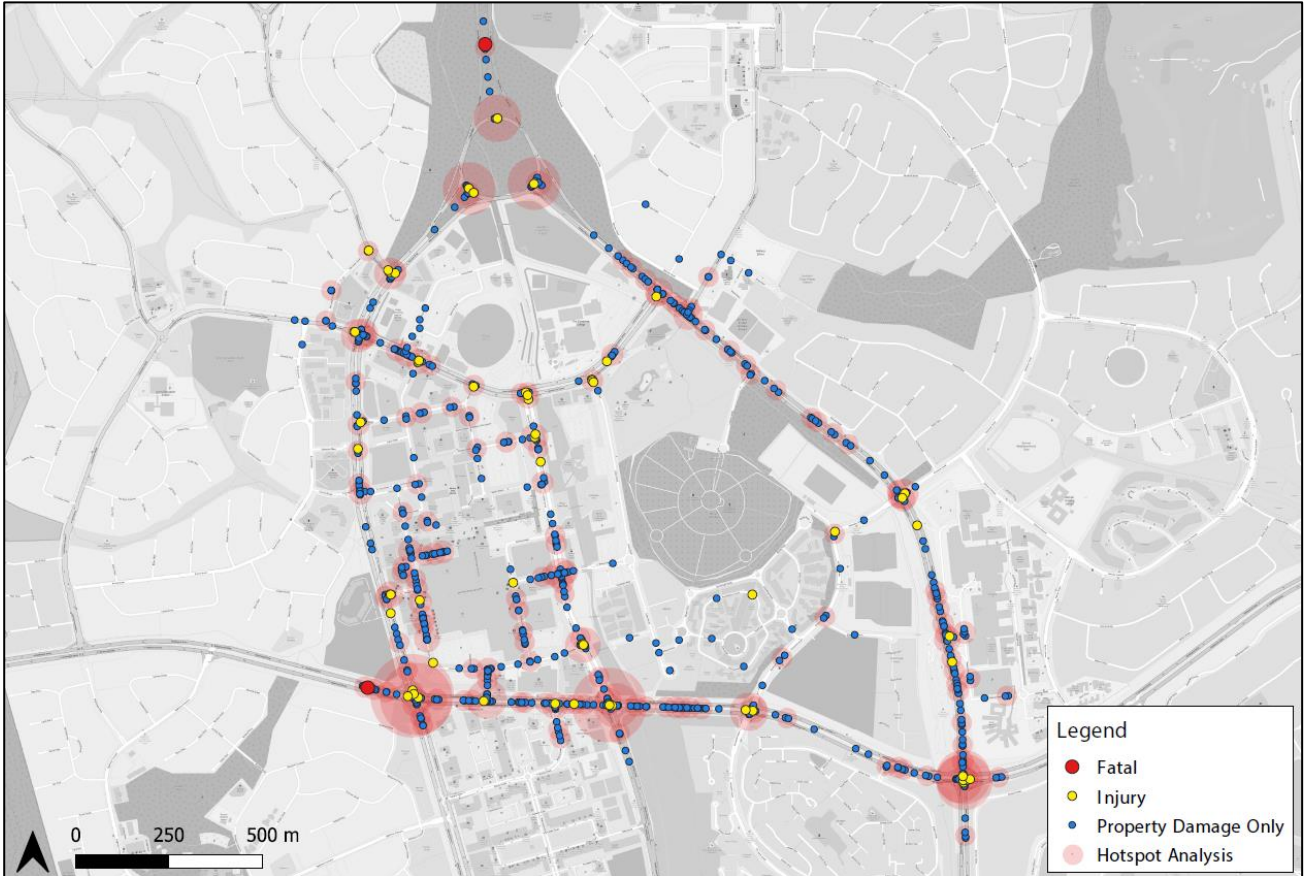


Figure 3.7: Crash locations within study area



Figure 3.8: Fatal and injury crash locations within study area

Table 3.4: Total number of crashes by location

Location	Location Type	No. of crashes	Crash severity		
			Fatal	Injury	Property Damage Only
Intersection					
Hindmarsh Drive/Melrose Drive	Signalised cross-intersection	164	-	4	160
Melrose Drive/Yarra Glen/Yamba Drive	Roundabout	139	-	7	132
Hindmarsh Drive/Yamba Drive	Signalised cross-intersection	134	-	7	127
Athllon Drive/Callam Street/Hindmarsh Drive	Signalised cross-intersection	116	-	2	114
Launceston Street/ Melrose Drive	Signalised cross-intersection	38	-	2	36
Ainsworth Street/Hindmarsh Drive	Signalised cross-intersection	36	-	2	34
Kitchener Street/Yamba Drive	Signalised cross-intersection	29	-	2	27
Hindmarsh Drive/Ball Street	Signalised T-intersection	27	-	1	26
Callam Street/Corinna Street	Signalised T-intersection	24	-	3	21
Callam Street/Neptune Street/Wilbow Street	Signalised cross-intersection	23	-	-	23
Melrose Drive/Theodore Street	Non-signalised T-intersection	19	-	5	14
Launceston Street/Yamba Drive	Signalised T-intersection	18	-	1	17
Brewer Street/Melrose Drive	Signalised T-intersection	17	-	2	15
Callam Street/Matilda Street	Unsignalised T-intersection	12	-	2	10
Callam Street/Launceston Street	Signalised T-intersection	11	-	3	8
Easty Street/Launceston Street	Unsignalised T-intersection	5	-	4	1
Bowes Street/ Callam Street	Signalised T-intersection	4	-	-	4
Bradley Street/Callam Street	Signalised T-intersection	3	-	-	3
Local mid-blocks	Multiple roads	119	1	1	117
Midblock					
Yamba Drive	Divided road	92	-	2	90
Hindmarsh Drive	Divided road	87	1	1	85
Corinna Street	Undivided road	44	-	2	42
Melrose Drive	Divided road	31	-	2	29
Callam Street	Divided road	23	-	1	22
Launceston Street	Divided road	16	-	1	15
Local intersections	Multiple intersections	146	-	9	137
Total		1377	2	66	1309

Figure 3.9 shows the distribution of crashes across the five-year period. As demonstrated, the year with the worst cases of crashes occurred in 2015, with 298 crashes including 17 crashes causing injury. Since 2015, the number of crashes in the study area has shown a decrease, falling to 247 crashes in 2019, including 15 crashes causing injury and one fatal incident.

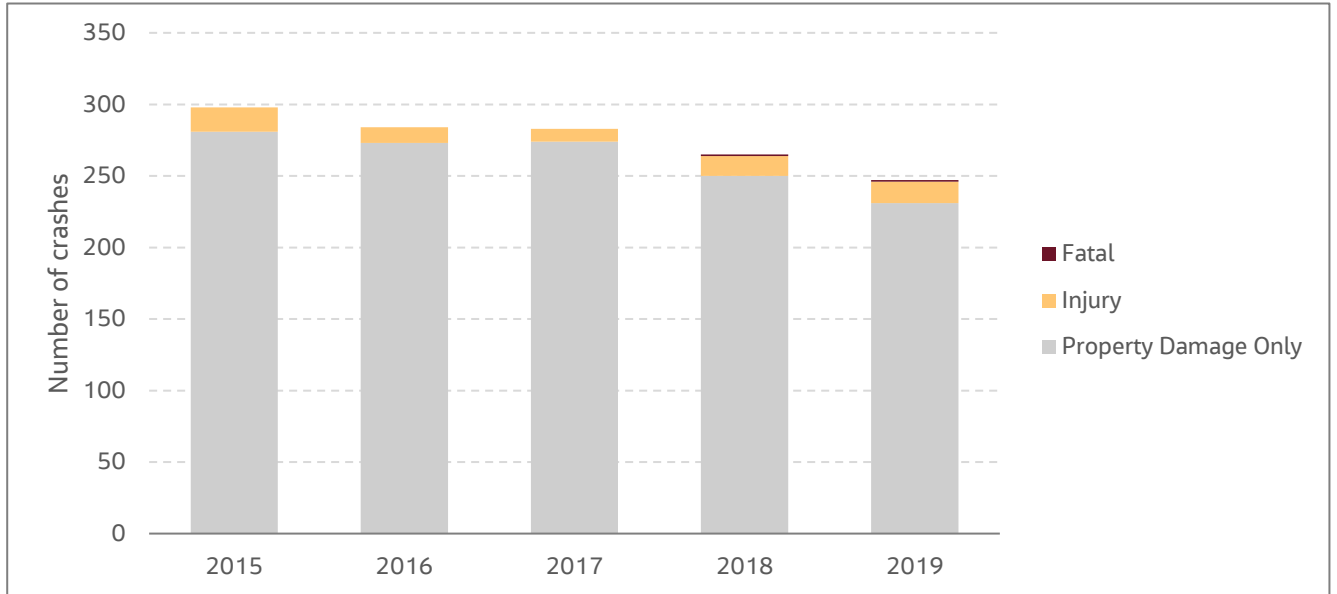


Figure 3.9: No. of crashes over the five-year period (2015-2019)

The crashes observed within the study area have further been analysed based on the type of crash movement that caused the crash. A summary of these movements is displayed in Figure 3.10. As shown, the most prevalent crash type was found to be rear-end crashes (59%), which includes the road user movement (RUM) codes 301-304. This was followed by same direction side swipes (13.6%) and right-angle collisions at intersections (9.1%).

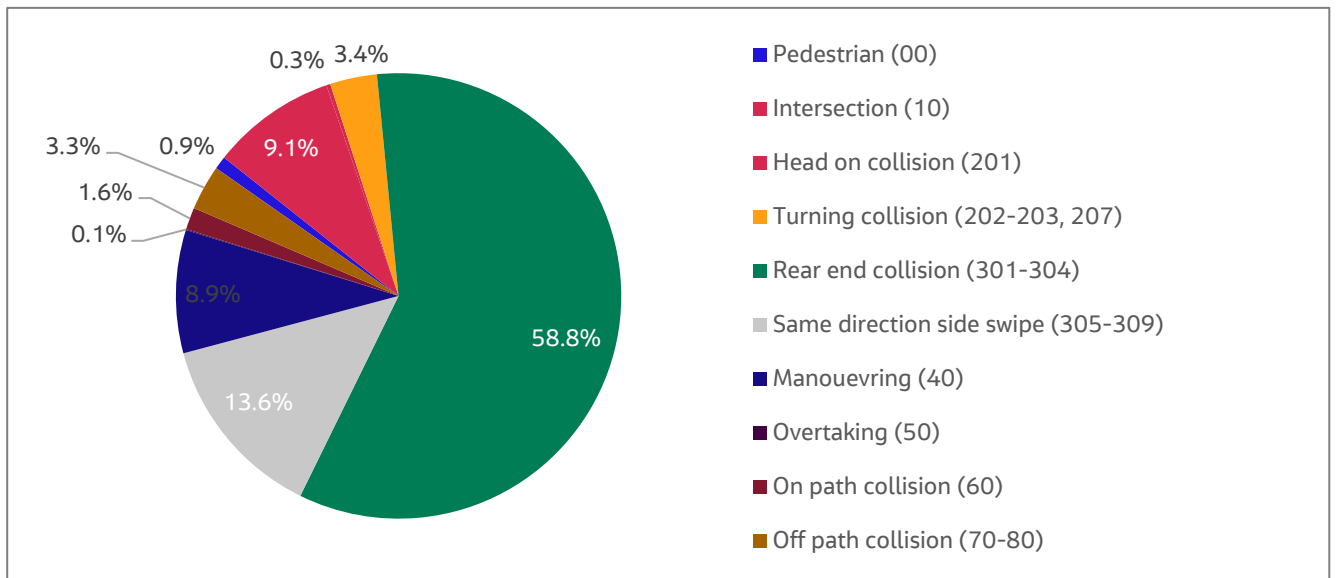


Figure 3.10: Summary of crash movements (RUM Code)

3.7 Public Transport

3.7.1 Existing Bus Interchange

Under existing conditions, the Woden transport interchange is located off-street, west of Callam Street. Buses use Bowes Street and Bradley Street to access the 11 platform stops. Some bus layover spaces are currently provided to the north and along Bradley Street. Figure 3.11 shows the existing bus facilities, which were constructed in the mid-1970s and are unable to respond to forecasted increases in demand for bus service.



Figure 3.11: Woden Interchange bus facilities at the Bradley Street entrance (Source: Google Maps, 2020)

3.7.2 Bus Operation

Woden Town Centre is well serviced by public transport to a range of destinations, including Tuggeranong, Belconnen and the City Centre. An update to the ACT's bus network was planned for 2020 (Network 19 Update) which altered some routes that serve the Woden transport interchange. As part of the update, the number of bus routes serving the Woden Interchange have increased. As shown in Figure 3.12, 17 local routes and 3 Rapid routes stop at the Woden Interchange.

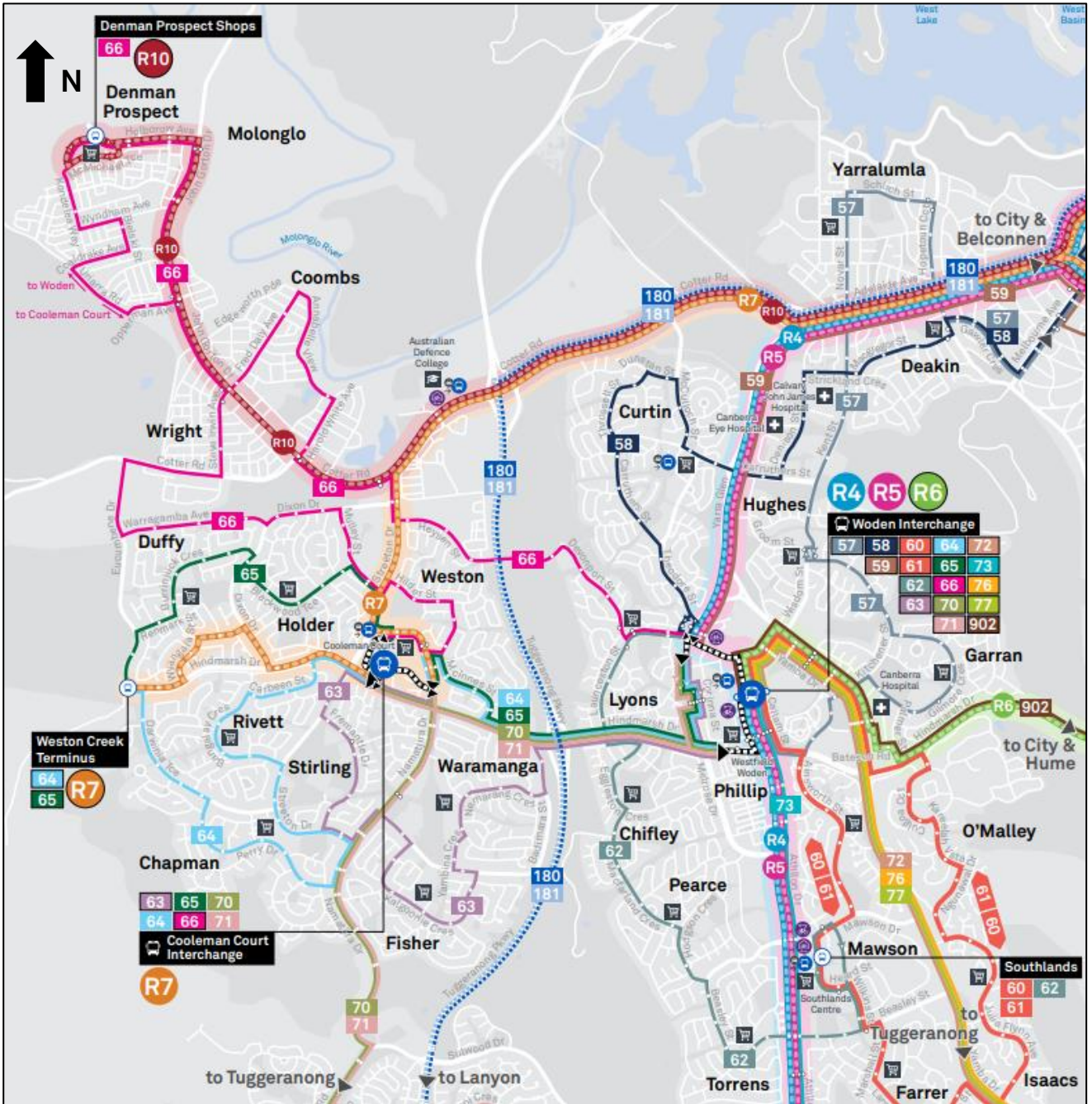


Figure 3.12: Network 19 Update in the Woden, Weston Creek and Molonglo region (Source: ACT Government)

Table 3.5 displays weekday morning peak (7:30–8:30am) frequencies for bus routes using the Woden Interchange. The 'peak direction' column refers to the number of buses arriving at the Woden transport interchange in the direction of travel indicated by the route name, while the 'counter peak direction' indicates the frequency of buses in the reverse direction.

Table 3.5: Woden Interchange bus routes/groups and frequencies 2020 (Source: VLC Report)

Route	Name	Operation	Peak Direction (buses /hr)	Counter Peak Direction (buses /hr)
R4	Tuggeranong to Belconnen via City	Through	12	9
R5	Lanyon to City via Calwell & Erindale	Through	6	6
R6	Woden to City via Manuka	Terminate	4	4
57	Woden to City via Deakin & Garran	Terminate	3	3
58	Woden to City via Yarralumla & Curtin	Terminate	3	3
59	Woden to City via Russell and Barton	Terminate	4	4
60	Mawson Circuit clockwise	Loop	2	-
61	Mawson Circuit anti-clockwise	Loop	2	-
62	Torrens Loop	Terminate	3	-
64	Weston to Woden via Chapman & Cooleman Court	Terminate	3	2
65	Weston to Woden via Duffy & Cooleman Court	Terminate	3	2
63	Cooleman Court to Woden via Fisher	Terminate	3	3
66	Cooleman Court to Woden via Denman Prospect and Lyons	Terminate	3	3
70	Tuggeranong to Woden via Kambah West & Cooleman Court	Terminate	3	3
71	Tuggeranong to Woden via Kambah East & Cooleman Court	Terminate	3	2
72	Tuggeranong to Woden via Oxley & Erindale	Terminate	2	2
73	Tuggeranong to Woden via Monash & Erindale	Terminate	2	2
76	Tuggeranong to Woden via Calwell, Chisholm & Erindale	Terminate	2	2
77	Tuggeranong to Woden via Gowrie & Erindale	Terminate	2	2
902	Hume to Woden (after 8.30)	Terminate	1	1
2025	Telopea & Forrest PS Woden via Deakin Curtin	Terminate	1	-
2022	Telopea & Forrest PS Woden	Terminate	1	-
2014	Canberra Grammar Schools - Woden	Terminate	1	-
2057	Montessori St Judes Orana & Islamic - Woden	Terminate	1	-
2044	Marist & Melrose HS Weston Lyons Woden	Through	1	-
2007	St Edmunds & St Clare's Woden	Terminate	1	-
2032	Alfred Deakin HS Hughes Garran Phillip (after 8.30)	Terminate	1	-
2029	Alfred Deakin HS - Woden (after 8.30)	Terminate	1	-
Total			74	53

3.8 Car Parking

There are several on and off-street parking areas within Woden Town Centre, near the subject site. A parking survey was undertaken by Austraffic in November 2019 to obtain relevant parking supply and occupancy information. Figure 3.13 shows the locations of on-road and off-road parking available within Woden Town Centre near the subject site. The full parking survey analysis, including sites south of Hindmarsh Drive can be found in Appendix C.

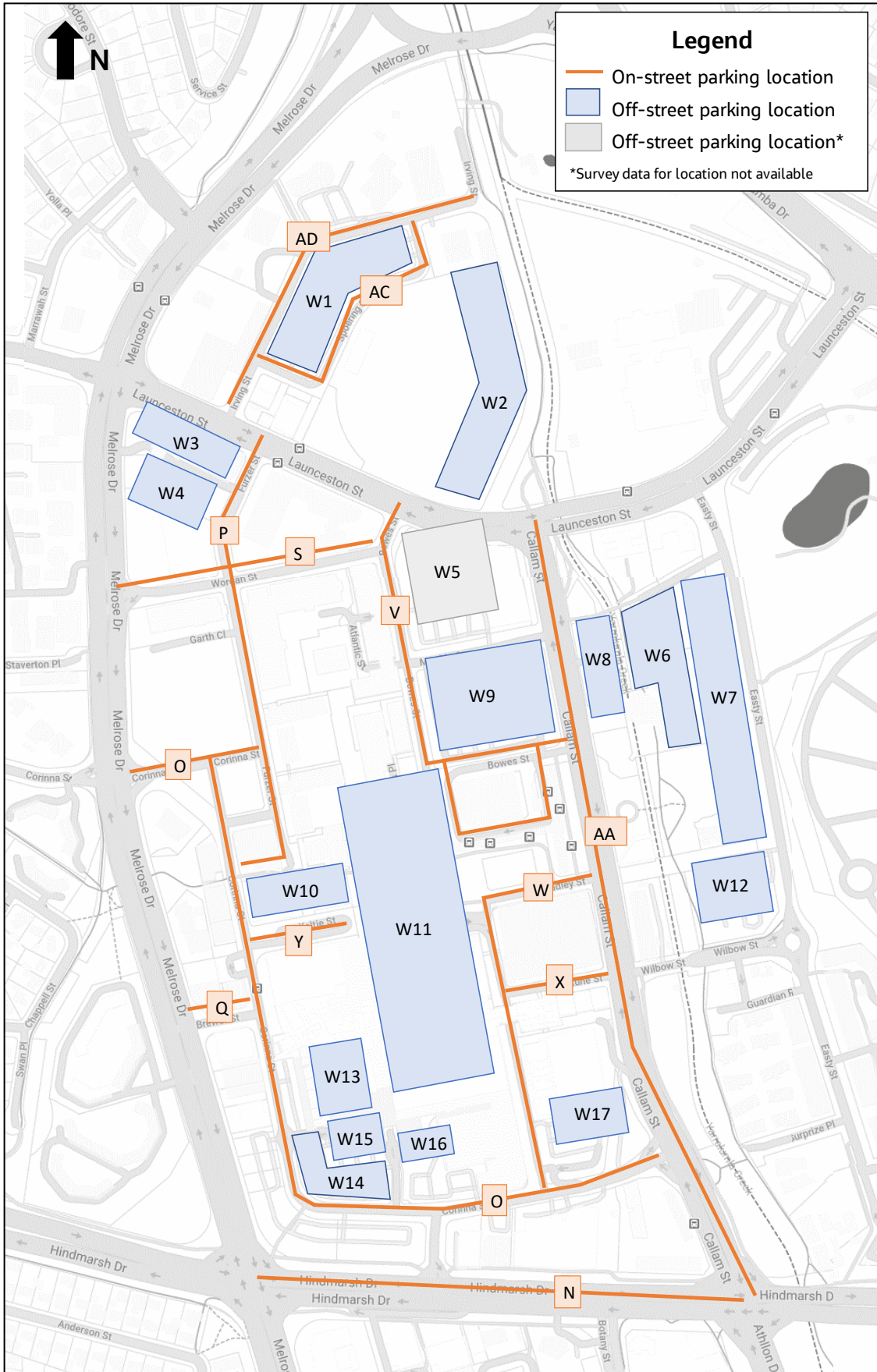


Figure 3.13: Woden Town Centre Parking (Source: Austraffic Survey 2019)

Table 3.6: Woden Parking Supply¹ (Source: Austraffic Survey EPSDD 2019)

Type	Zone Group	Location	Short-stay supply	Long-stay supply	Other	Total
On-street parking	N	Hindmarsh Drive	9	0	0	9
	O	Corinna Street	32	0	14	46
	P	Furzer Street	20	0	17	37
	Q	Brewer Street	0	0	3	3
	S	Worgan Street	23	0	4	27
	V	Bowes Street	19	0	4	23
	W	Bradley Street	18	0	8	26
	X	Neptune Street	3	0	5	8
	Y	Keltie Street	0	0	2	2
	AA	Callam Street	11	0	2	13
	AC	Spoering Street	49	0	0	49
AD	Irving Street	53	0	0	53	
Off-street parking	W1	Irving Street	16	393	11	420
	W2	Phillip Oval	0	186	2	188
	W3	Woden Tradies	0	108	10	118
	W4	Sky Park	0	986	6	992
	W6	Callam Offices North and East	4	248	25	277
	W7	Easty Street road reserve	0	182	1	183
	W8	Callam Offices West	0	111	0	111
	W9	Bowes Street	131	109	211	451
	W10	Keltie Street Road Reserve	20	0	16	36
	W11	Westfield Woden	0	1852	52	1904
	W12	Corner Easty and Wilbow Street	0	109	0	109
	W13	Westfield restaurants surface	34	0	5	39
	W14	Corinna Street South-West	12	242	27	281
	W15	Westfield Juliana Place West	167	0	40	207
	W16	Westfield Juliana Place East	0	100	0	100
	W17	Corner Callam and Corinna Street	0	48	0	48
	Total			621	4674	465

¹ Parking supply is based on 2019 counts. Parking supply provided does not include bus zones.

3.8.1 Parking Utilisation – Off Street Parking

The occupancy profile for off-street carparks located near the subject site have been examined further below. The profiles are based on parking survey data conducted by Austraffic on Thursday 16th October 2019. Figure 3.14 shows carparks with more than 250 available parking spaces and Figure 3.15 shows carparks with less than 250 available parking spaces. Table 3.7 highlights the maximum observed occupancy on the study day.

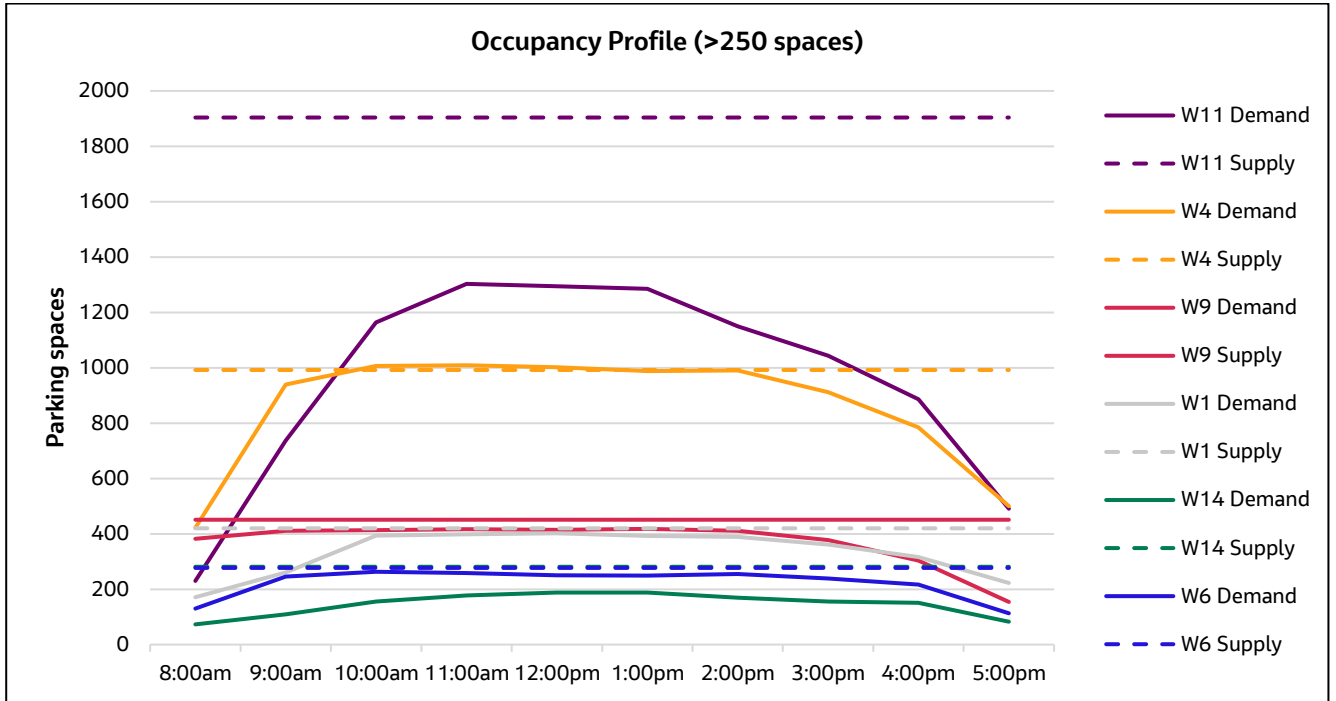


Figure 3.14: Parking Supply and Demand for Off-Street Parking with Supply > 250 spaces (Source: Austraffic Survey 2019)

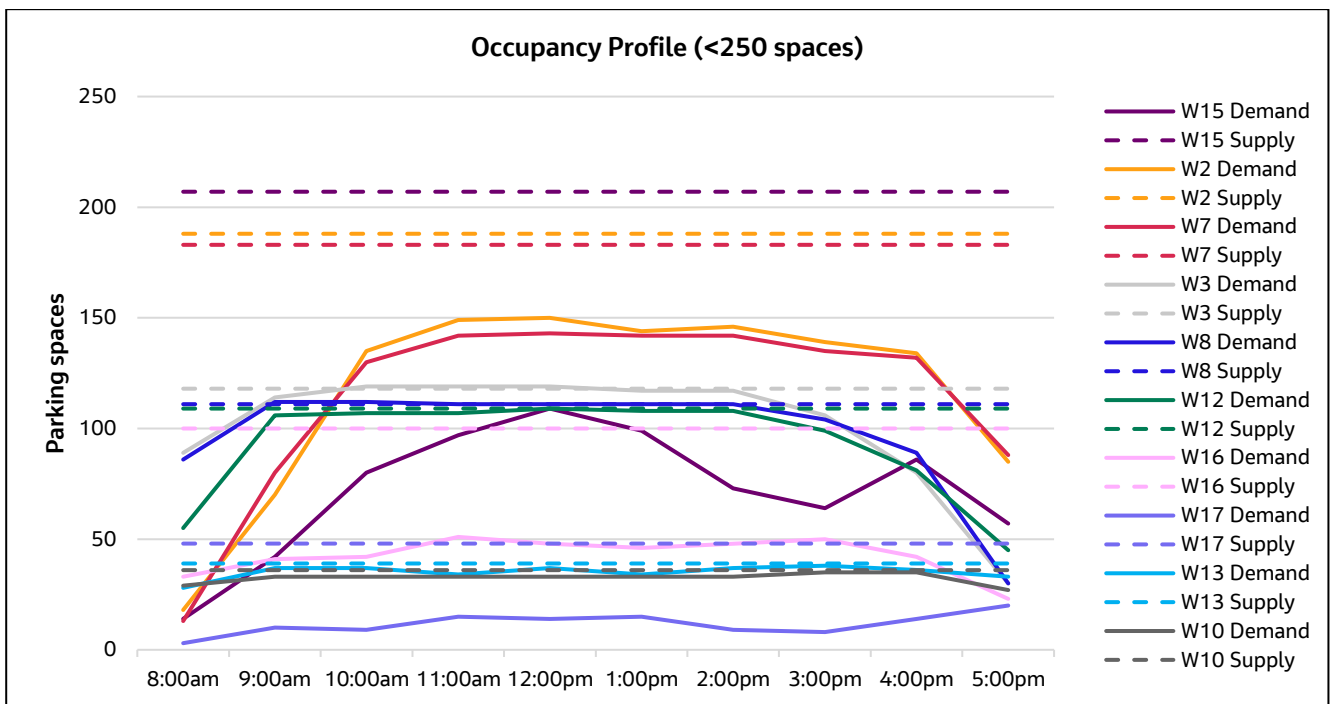


Figure 3.15: Parking Supply and Demand for Off-Street Parking with Supply < 250 spaces (Source: Austraffic Survey 2019)

Table 3.7: Off-Street Parking and Maximum Observed Occupancies (Source: Austraffic 2019)

Carpark	Location	Operator	Total Supply	Maximum Occupancy*
W1	Irving Street	Government	420	96%
W2	Phillip Oval	Government	188	80%
W3	Woden Tradies	Private	118	100%*
W4	Sky Park	Private	992	100%*
W6	Callam Offices North and East	Government	277	95%
W7	Easty Street road reserve	Government	183	78%
W8	Callam Offices West	Government	111	100%*
W9	Bowes Street	Government	451	93%
W10	Keltie Street Road Reserve	Government	36	97%
W11	Westfield Woden	Private	1904	68%
W12	Corner Easty and Wilbow Street	Private	109	100%
W13	Westfield restaurants surface	Private	39	97%
W14	Corinna Street South-West	Government	281	67%
W15	Westfield Juliana Place West	Government	207	53%
W16	Westfield Juliana Place East	Private	100	51%
W17	Corner Callam and Corinna Street	Government	48	42%

*Maximum occupancy capped at 100%

As shown in Figure 3.14, Westfield Shopping Centre (Carpark W11) provides the largest amount of spaces in the study area, with 1904 available spaces. However, the carpark operates at a relatively low level of occupancy, reaching 68% capacity at maximum occupancy during the 11:00am and 12:00pm hourly intervals. The low utilisation can likely be attributed to the centre seeking to provide plentiful parking for shoppers, with a daily rate of \$35 likely to deter many commuters.

Skypark (Carpark W4), Irving Street (W1), Bowes Street (Carpark W9) and Callam Offices North and East (Carpark W6) observed a high occupancy rate, with over 90% of all spots taken between 10:00am and 2:00pm. Corinna Street South-West (W14), although a relatively large carpark with 277 available spaces, observed maximum occupancy rates between 12:00pm and 1:00pm of only 67%.

Smaller carparks saw varied levels of occupancy. Westfield Julian Place West and East (Carparks 15 and 16) reached 53% and 51% of their maximum capacity, while Phillip Oval (Carpark 2) and East Street (Carpark 7), both with over 180 available spaces, were consistently around 80% full between 10:00am and 4:00pm.

3.8.2 Parking Utilisation – On Street Parking

On-street parking characteristics for surveyed streets located within the subject site have been examined further and shown in Table 3.8. This includes Bowes Street, Bradley Street, Neptune Street and Callam Street. The maximum occupancy rates are based on parking survey data conducted by Austraffic on Thursday 16th October 2019. As shown, parking available to the general public along these streets is exclusively short-stay, with signage indicating 5-minute parking prevailing along Bowes Street, Bradley Street and Neptune Street. The 'Other' parking supply highlighted along these roads in Table 3.8 indicate zones restricted to buses, taxis, police, loading zones or pick up only areas.

The on-street parking areas saw varied levels of occupation. Loading zones typically observed a maximum occupancy of 100% throughout the day. P5 signage areas has a maximum occupancy of 78%-100% observed. The pick-up only area along Callam Street only saw a maximum occupancy of 27%, equivalent to 3 vehicles, during the surveyed date.

Table 3.8: On-street parking supply near subject site

Carpark	Location	Side of Street	Parking Type	Total Supply	Maximum Occupancy
V	Bowes Street, between Worgan St and Atlantic St	West	Loading Zone 30 Minutes 7:30am-6pm & Public Holidays excepted	4	100%
	Bowes Street, between Atlantic St and Bowes Pl	West	P5 Minutes	9	89%
	Bowes St, between Matilda St and Bowes Pl	East	1/2P 30 Minutes	6	67%
	Bowes St, between Matilda St and Bowes Pl	East	No Parking Pick Up & Set down only	4	75%
W	Bradley Street, Btw Bradley Street & Neptune Street	East	Taxi Rank (Taxi Zone)	6	17%
	Bradley Street, Btw Neptune Street & Corinna Street	West	Loading Zone 30 Minutes 7:30am-6:00pm Mon-Fri & Public Holidays Excepted, P5 All Other Times	2	100%
	Bradley Street, Btw Neptune Street & Corinna Street	West	1/4P 15 Mins	9	78%
	Bradley Street, Btw Neptune Street & Corinna Street	South	P5 Minutes	9	78%
X	Neptune Street, Btw Bradley Street & Callam Street	South	Loading Zone 30 Minutes	2	100%
		South	P5 Minutes	3	100%
		South	Loading Zone 30 Minutes 7:30am-6pm & Public Holidays Excepted	3	100%
AA	Callam Street, between Bradley St and Bowes St	West	No Parking Pick Up and Set down Only	11	27%
	Callam Street, between Launceston St and Wilbow St	East	Police Vehicles Only	2	50%

3.9 Pedestrian and Cyclist Facilities

The Woden Town Centre is serviced by several cycling routes which link the site to the broader Canberra cycle network. These include on-road cycling routes along Hindmarsh Drive, Melrose Drive and Launceston Street and shared-use paths along the Yarralumba Creek, Callam Street, Athllon Drive, Yamba Drive, Melrose Drive and within Eddison Park.

The pedestrianised 'hub' of Woden Town Centre to the east of Bowes Street generates considerable foot traffic in the vicinity of the site, providing an accessible link between notable local landmarks. These landmarks include the Westfield Shopping Centre, Centraplaza and Scarborough House multi-storey corporate office buildings, government buildings, Australia Post and the Woden Public Library. Further pedestrian volume is generated along walkways between the Town Centre and Eddison Park, along shared-use paths along the Yarralumba Creek and to rapid transit stops along Melrose Drive, Launceston Street and Callam Street.

The Active Travel Infrastructure, as classified by the ACT Government’s Active Travel Infrastructure Practitioner Tool, is demonstrated in Figure 3.16, which shows the extent of the active transport network within and surrounding Woden Town Centre.

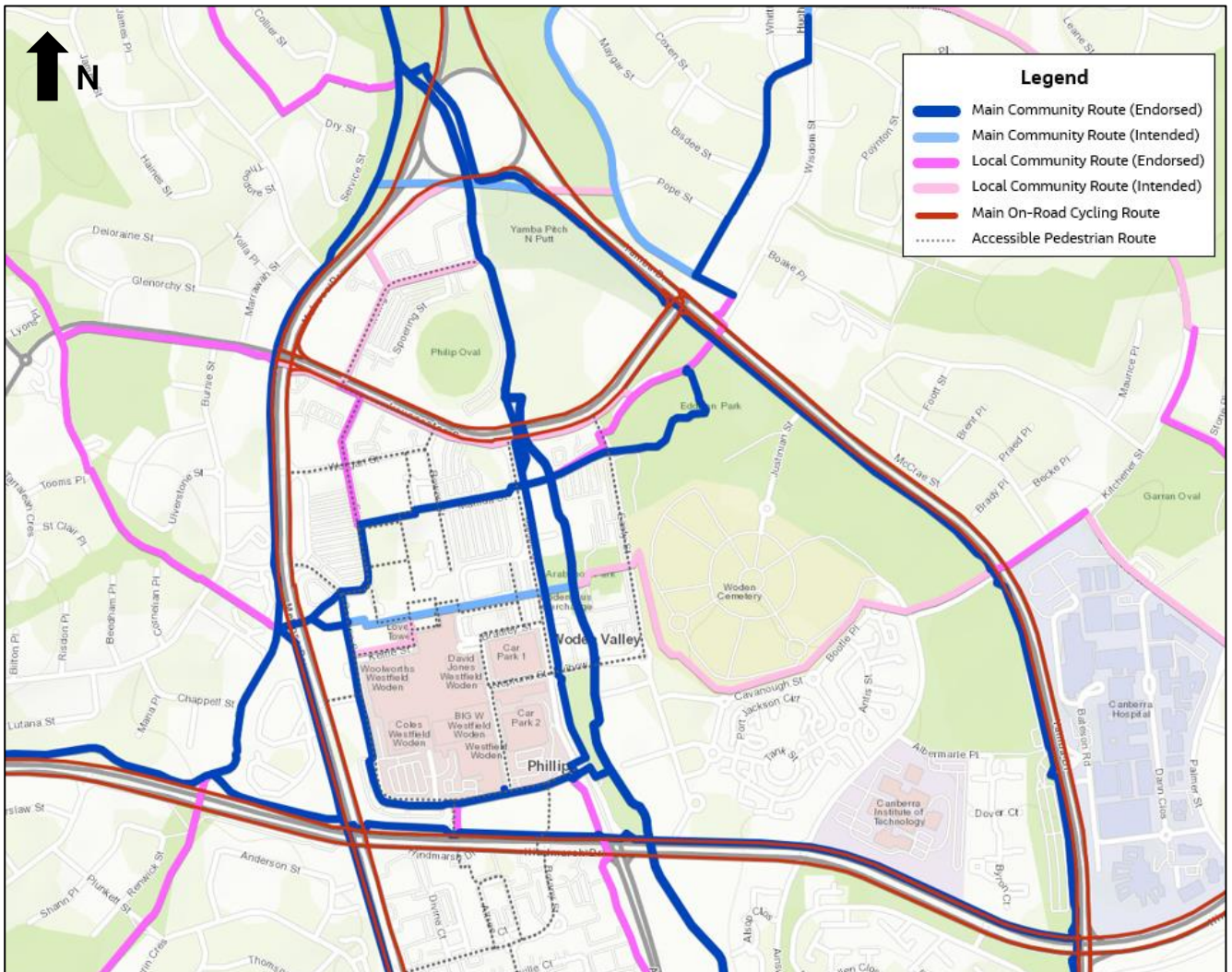


Figure 3.16: Woden Active Travel Infrastructure (Source: Active Infrastructure, 2020)

3.9.1 Walk Score

The walkability of a location can be measured using a system known as ‘Walk Score’, which scores locations based on distance to amenities, pedestrian friendliness, and road metrics such as block and intersection density. Based on data from Walk Score, Callam Street, between Bradley Street and Wilbow Street, records a Walk Score of 79. Scores between 70 and 89 outlines a very walkable area where most errands can be accomplished by foot.

3.9.2 Place Audits

Inhabit Place conducted a series of place audits to obtain data relevant to active travel movements in and around Woden Town Centre. In total, seven place audits were conducted, examining how people use different locations at different times of day. The main modes captured include walking and cycling. Other modes captured include with prams, skateboards, wheelchairs, scooters, etc.

The locations of the audits can be found in Figure 3.17. A summary of the main modes of travel undertaken over the study period in November 2019 is provided in Table 3.9.

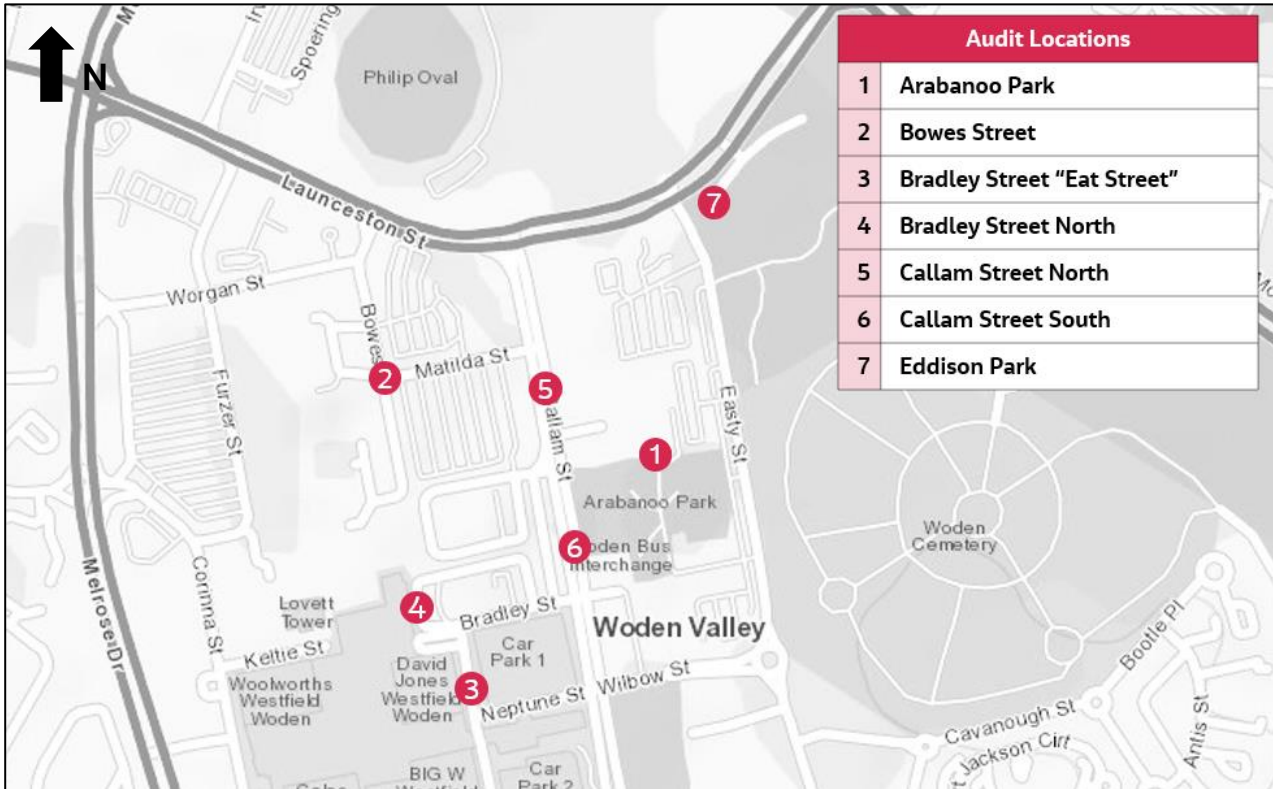


Figure 3.17: Audit Locations

Table 3.9: Patterns of movement documented in Woden Town Centre (Source: Inhabit Place, 2020)

Location	Location description	Daily total movement ¹	Main modes		
			Walking	Cycling	Other ²
Arabanoo Park	East of the Yarralumla Creek floodway, south of Callam Offices, north of Woden Early Childhood Centre and west of Easty Street.	156	81.8%	14.4%	0.8%
Bowes Street	Between Matilda Street and Bowes Place.	668	96.4%	3.0%	0.4%
Bradley Street "Eat Street"	South of the overhead pedestrian bridge connecting Westfield and the carpark.	663	93.7%	0.2%	1.7%
		562*	95.6%*	2.1%*	2.3%*
Bradley Street North	North of the David Jones service entry, including Woden transport interchange.	783	97.2%	0.8%	1.9%
Callam Street North	Between Launceston Street and Bowes Street.	275	92.4%	4.4%	3.3%
		191*	47.6%*	38.7%*	13.6%*
Callam Street South	Between Bowes Street and Bradley Street.	73	91.8%	5.5%	2.7%
		59*	86.4%*	6.8%*	2.8%*
Eddison Park	Interface of Easty Street and Eddison Park, south of the Launceston Street intersection.	170*	77.0%*	15.1%*	2.9%*

1. Represents the total number of people counted for 15 minutes every hour between 8am and 6pm, on the day of the audit.

2. Includes use of prams, skateboards, wheelchairs, scooters and other alternative transport modes.

* Indicates audit conducted on a Weekend.

4. Future Conditions

This section examines the conditions for the study area in future scenarios. To assess the overall performance and viability of future option scenarios, the following changes and considerations were made:

- **Traffic Growth:** Canberra Strategic Transport Mode (CSTM) demand was used to calculate the origin and destination totals in future years, and the associated per annum growth expected for future scenarios.
- **Trip Generation and Distribution:** Trip generation demands from proposed developments and special generation zones were calculated and distributed within the network.
- **Network Modifications:** A number of infrastructure changes, including upgrades as part of the CIT Woden Interchange Project and surrounding upgrades, were applied to the future option scenarios, to account for planned road network changes in future years.
- **Future Transportation Upgrades:** Several upgrades to the public transport network and operation were applied to the future options scenarios, to account for the planned public transport network changes in future years.

The construction timeline and design years are also described below.

4.1 Construction Timeline

The construction timeline for the proposed development is described below:

- Construction commences in **2021** on the new bus interchange, road enabling works and bus layovers, followed by demolition of the existing bus facility. These are expected to be completed by **Early 2022**.
- Construction commences in **Mid-2022** on the new CIT building. The new CIT building is expected to open by **2025**.

4.2 Design Years

To assess future conditions, the base model and several traffic demand scenarios were tested for AM and PM weekday peaks. They have been described in further detail below in Table 4.1.

Table 4.1: Modelled Scenarios

Design Year Scenario	Description
2019 Base Option	Provides an assessment of the network performance under existing conditions
'Day One' Option 1: Single lane Wilbow Street	Provides an opening day assessment of the network performance with the Woden transport interchange and road enabling works scheduled for 2022, before the introduction of the CIT Building. The assessment considers the project network without LRT and the 2019 existing base demand matrices. A single lane arrangement is assumed at Wilbow Street and no signalised pedestrian crossing on Wilbow Street between Callam Street and Easty Street. A single right turn lane has been included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection.
'Day One' Option 2: Double lane Wilbow Street	Provides an opening day assessment of the network performance with the Woden transport interchange and road enabling works scheduled for 2022, before the introduction of the CIT Building. The assessment considers the project network without LRT and the 2019 existing base demand matrices. A double lane arrangement is assumed on Wilbow Street (eastbound) not including the signalised pedestrian crossing on Wilbow Street between Callam Street and Easty Street. Dual right turn lanes have been included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection.

Design Year Scenario	Description
2026 Option: No CIT and No Bradley-Bowes connection (2026 No CIT)	Provides an assessment of the network performance with the Woden transport interchange, 5 years post-opening, before the introduction of the light rail. This scenario provides a future 'base' condition, which considers the network without CIT or the Bradley Street-Bowes Street vehicular connection. A double lane arrangement is assumed on Wilbow Street (eastbound), with dual right turn lanes included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection.
2026 Option: With CIT and No Bradley-Bowes connection (2026 CIT No BB)	Provides an assessment of the network performance with the Woden transport interchange, 5 years post-opening, before the introduction of the light rail. This scenario includes the CIT development and no Bradley Street-Bowes Street vehicular connection.
2026 Option: With CIT and Bradley-Bowes connection (2026 CIT BB)	Provides an assessment of the network performance with the Woden transport interchange, 5 years post-opening, before the introduction of the light rail. This scenario includes the CIT development and Bradley Street-Bowes Street vehicular connection.
2026 Option With LRT*	<i>Provides an assessment of the network performance with the Woden transport interchange, 5 years post-opening, and after the introduction of the light rail. A double lane arrangement is assumed on Wilbow Street (eastbound), with dual right turn lanes included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection. The model was also modified to allow two eastbound through lanes on Launceston Street between Easty Street and Callam Street.</i>
2031 Option: No CIT and No Bradley-Bowes connection (2031 No CIT)	Provides an assessment of the network performance with the Woden transport interchange, 10 years post-opening, and after the introduction of the light rail. This scenario provides a future 'base' condition, which considers the network without CIT or the Bradley Street-Bowes Street vehicular connection.
2031 Option: With CIT and No Bradley-Bowes connection (2031 CIT No BB)	Provides an assessment of the network performance with the Woden transport interchange, 10 years post-opening, and after the introduction of the light rail. This scenario includes the CIT development and no Bradley Street-Bowes Street vehicular connection.
2031 Option: With CIT and Bradley-Bowes connection (2031 CIT BB)	Provides an assessment of the network performance with the Woden transport interchange, 10 years post-opening, and after the introduction of the light rail. This scenario includes the CIT development and Bradley Street-Bowes Street vehicular connection.
2036 Option With LRT*	<i>Provides an assessment of the network performance with the Woden transport interchange, 15 years post-opening. The road network modelled is the same as 2026 Option – With LRT.</i>

*Note, 2026 With LRT and 2036 With LRT option scenarios were tested in earlier stages of the project. Their results have not been discussed in this report.

4.3 Traffic Growth

To determine a reasonable growth rate for traffic passing through the study area, the Canberra Strategic Transport Model (CSTM) demand was obtained for the modelling area for 2021, 2026, 2031 and 2041. Each CSTM zone was mapped with a respective Vissim zone as per the location and boundary of the CSTM zones. There are cases where there are multiple Vissim zones inside a single CSTM zone.

Growth rates were calculated for origin and destination totals for the CSTM demand. Based on the total growth, the per annum growth was calculated. This growth rate represents background traffic. The following adjustments were made to some cordon zones:

- Internal zones with negative growth were assigned 0% growth
- Major external cordon zones with less than 1% growth were assigned as minimum of 1% growth.

Key annual growth rates adopted for each zone can be found in Table 4.2. The governing growth rate used in the AM peak is based on the destination zones, while in the PM peak, the origin zone growth rate is used.

Table 4.2: Growth rates adopted

Vissim Zone	CSTM Zone	Growth per annum (2026)				Growth per annum (2031, 2036)			
		Origin Zone		Destination Zone		Origin Zone		Destination Zone	
		AM	PM	AM	PM	AM	PM	AM	PM
102, 140	810	1.29%	1.77%	0.98%	1.29%	1.31%	1.38%	0.48%	1.02%
101, 139	811	1.33%	1.71%	1.07%	1.54%	1.47%	0.93%	0.46%	1.30%
119, 141, 120	812	1.89%	1.53%	0.90%	1.42%	1.47%	0.89%	0.43%	1.29%
142, 103, 104	813	0.67%	1.71%	0.89%	4.67%	1.58%	1.00%	0.54%	1.40%
105	814	3.24%	1.61%	1.85%	2.26%	1.90%	1.34%	1.45%	1.53%
118, 121, 122, 116	815	2.36%	1.58%	0.97%	1.71%	1.59%	0.93%	0.46%	1.34%
112-115, 117	816	1.80%	1.61%	0.92%	1.45%	1.41%	1.10%	0.52%	1.32%
106, 143	817	9.39%	7.07%	6.18%	8.67%	2.68%	2.54%	2.05%	2.03%
107, 108, 109	818	9.78%	9.22%	9.77%	9.04%	2.60%	2.61%	2.85%	2.35%
110, 111	819	9.71%	5.84%	3.24%	8.46%	2.58%	2.02%	1.36%	2.27%
124	7920	0.00%	1.00%	0.00%	0.00%	1.03%	1.89%	1.00%	1.00%
125	8156	0.00%	0.00%	1.00%	0.00%	1.00%	0.00%	0.00%	1.00%
136	8170	1.00%	1.00%	2.70%	1.00%	1.00%	1.00%	1.43%	1.00%
134	8368	1.02%	0.00%	3.31%	1.00%	1.00%	1.00%	1.37%	1.00%
127	8411	0.00%	2.45%	1.51%	1.00%	1.00%	1.49%	2.06%	1.48%
130	8433	4.41%	5.72%	5.48%	7.95%	1.00%	1.68%	1.73%	1.00%
129	8471	4.10%	9.36%	10.18%	1.04%	1.00%	2.30%	2.97%	1.00%
133	8498	1.00%	0.00%	1.00%	1.00%	1.00%	0.00%	0.00%	1.00%
128	8701	1.00%	1.00%	1.29%	1.00%	1.00%	0.00%	0.00%	1.00%
123	12059	2.84%	1.00%	1.36%	1.00%	1.43%	1.00%	1.00%	1.00%
131	12140	1.00%	0.00%	0.00%	0.00%	1.00%	0.00%	1.00%	1.00%
137	12542	1.93%	5.14%	3.38%	1.14%	0.27%	0.97%	1.41%	1.00%
132	13262	1.00%	1.39%	0.00%	1.11%	2.58%	2.39%	1.00%	4.12%
138	14494	1.00%	2.35%	7.65%	1.00%	1.00%	3.51%	0.00%	1.89%
135	18814	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
126	19067	0.00%	4.22%	6.98%	0.00%	0.00%	1.60%	2.55%	0.00%

This per annum growth was applied to the 2019 Vissim matrices to arrive at future year origin and destination totals for each zone.

4.4 Trip Generation and Distribution

The Woden Town Centre has been earmarked for several developments to increase the density of residential, retail and commercial developments within a major activity centre. Key developments which are expected to be incorporated into the network by 2026 have been identified. The trip generation rates, access arrangements and distribution of trips onto the road network for the development trips were derived with consideration given to assumptions from the relevant development plans and reports. These assumptions have been detailed in Appendix E. A summary of peak hour generation for the surrounding sites is shown in Figure 4.1.

To incorporate the additional traffic into the model, the additional trips have been added to the relevant existing Vissim zones:

- Where the development covers the entire zone, for instance the CIT campus, the additional trips generated by the development replace the existing origin and destination trips for that zone.
- Where the development covers a small portion of a zone, for instance The Oaks, an estimation of the additional trips was undertaken based on engineering judgment and added to the origin and destination trips for that zone.

Once all adjustments on growth and trip generation are added to the origin and destination zones, a furness (OD matrix balancing) procedure was used to automatically redistribute trips based on the required origins and destinations inputted. This procedure is used to provide the final matrix, which is converted into 15-minute matrices that can be inputted into Vissim.

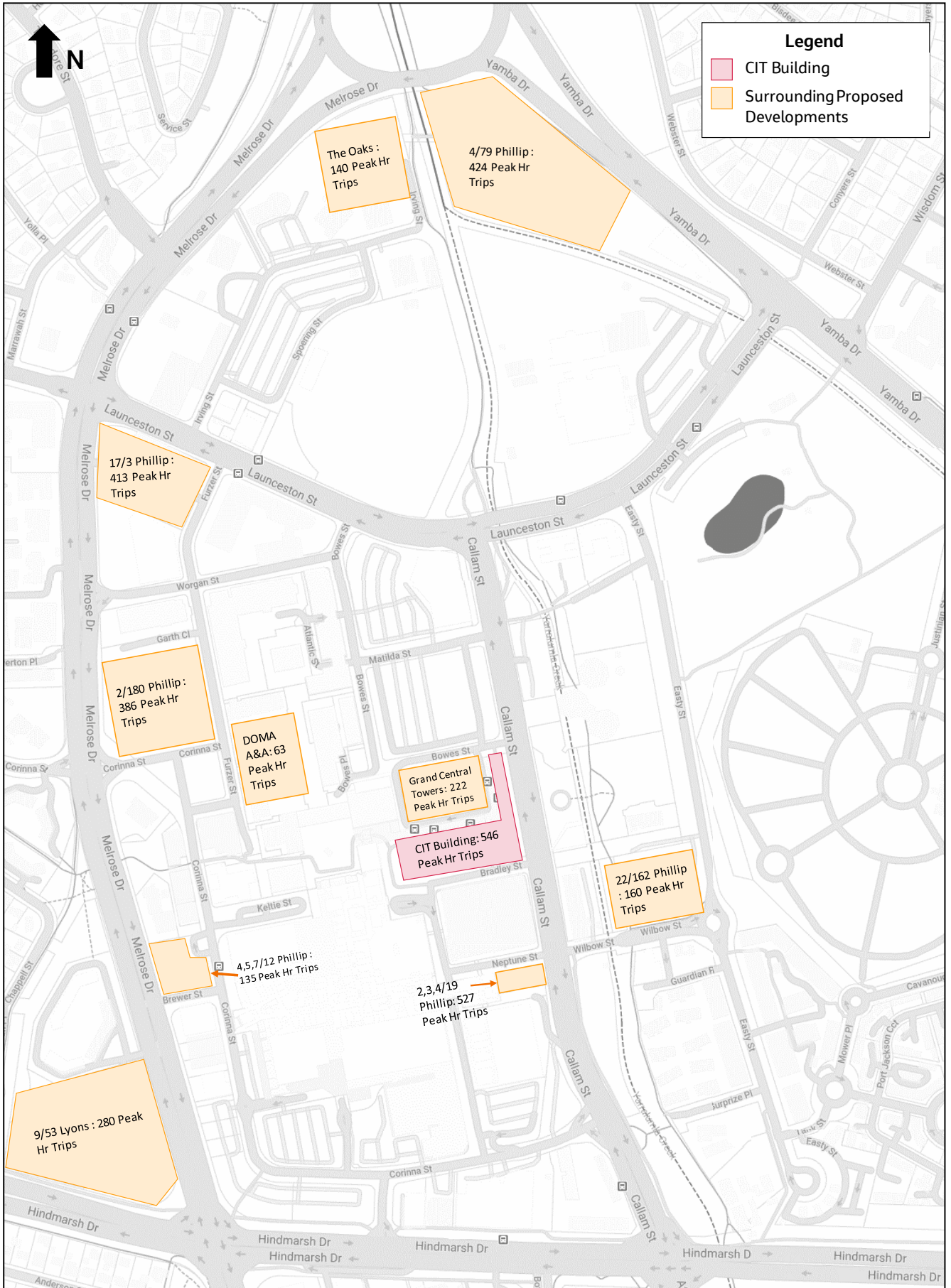


Figure 4.1: Peak Hour Trip Generation

4.5 Network Modifications

A series of additional infrastructure changes are proposed to occur by 2026. Figure 4.2 shows the indicative locations of the proposed CIT Woden Interchange network modifications and surrounding road network modifications.

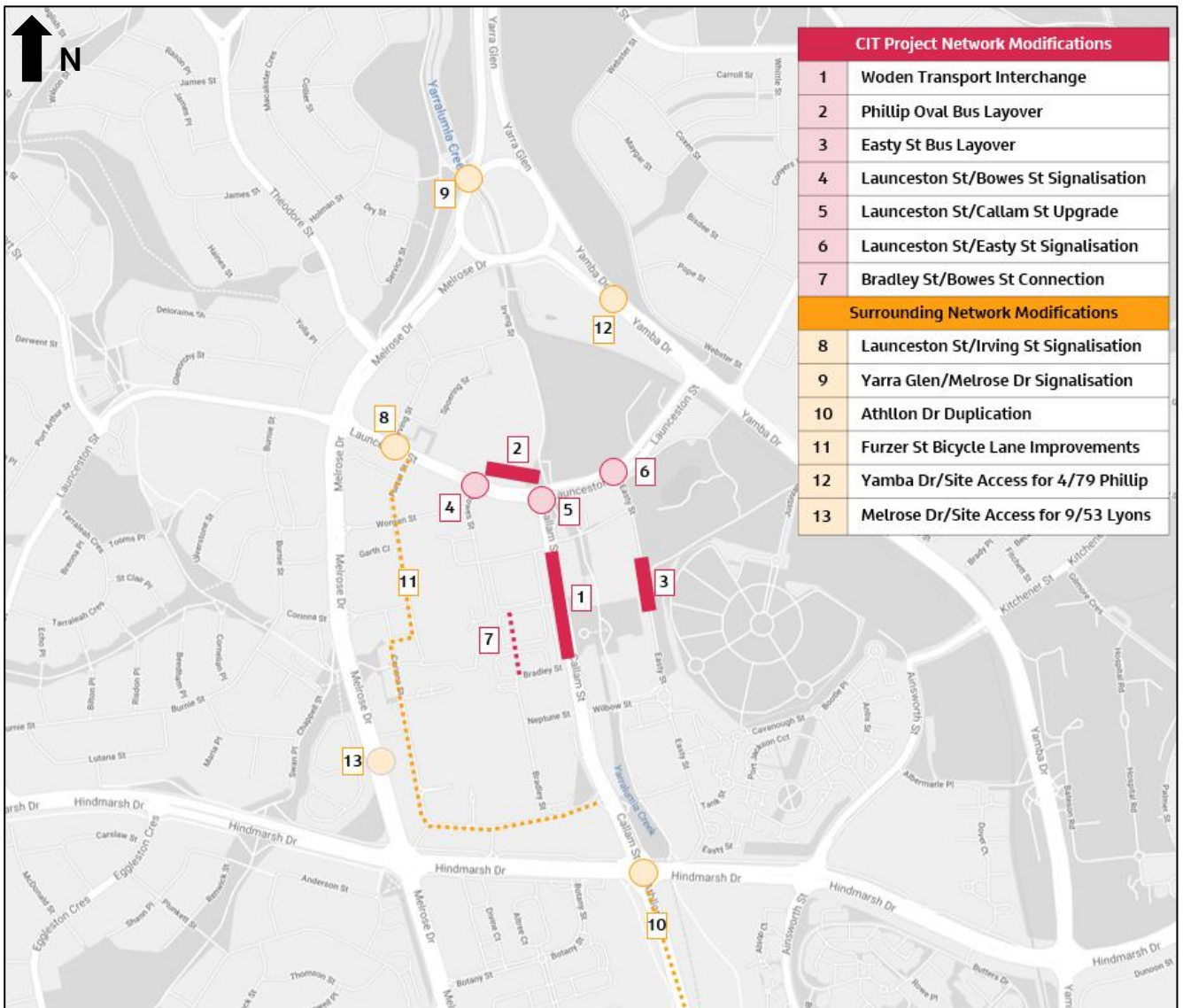


Figure 4.2: Indicative locations of network modifications in the study area

Other infrastructure changes and surrounding network modifications which have been assumed in the future option models are shown previously in Figure 4.2 and below in Table 4.3. It should be noted that these modifications are independent of the CIT Woden Interchange Project improvements.

Table 4.3: Surrounding Network Modifications

Location	Network Modifications	2026			2031		
		No CIT No BB	CIT No BB	CIT BB	No CIT No BB	CIT No BB	CIT BB
Launceston Street/ Irving Street	Launceston Street/Irving Street is proposed to be signalised. The proposed work includes an additional signalised pedestrian crossing along Launceston Street, and east of Furzer Street. Furzer Street/Launceston Street is planned to become left-in/left-out.	x	x	x	x	x	x
Hindmarsh Drive/ Athllon Drive	The Athllon Drive duplication will include small improvements to the Hindmarsh Drive/Athllon Drive intersection, with a dedicated bus priority lane to be included in the northbound direction.	x	x	x	x	x	x
Yamba Drive 4/79 Phillip Access	A left-in/left-out arrangement for Yamba Drive/Site Access (4/79 Phillip) is proposed.	x	x	x	x	x	x
Melrose Drive	The existing intersection of Melrose Drive/Site Access for 9/53 Lyons Street is proposed to be signalised. Two new left-in/left-out intersections will be added to the Melrose Drive.	x	x	x	x	x	x
Furzer Street	Bicycle lane improvements along Furzer Street and Corinna Street have been proposed.	x	x	x	x	x	x
Yarra Glen Roundabout	Yarra Glen Roundabout/Melrose Drive is proposed to be signalised. A new light rail bridge and road bridge will be constructed over the Yarralumla Channel.	-	-	-	x	x	x

4.6 Future Transportation Facilities

A population assessment was undertaken by VLC to inform the estimates of future bus movements. From the assessment, substantial population growth is expected in some of the areas served by bus routes using the Woden Interchange. Most notably, Molongo is expected to grow significantly, with over 20,000 additional residents by 2028. The population of the Woden Valley is also expected to increase by 20% due to urban intensification. This results in increased demand at Woden Interchange.

4.6.1 Bus operations

As the major focus area of the project is around bus operations in Woden Town Centre, all public transport services utilising the road network within the study area were considered. The following bus operations apply for each future modelled year:

- Without light rail operations (2022 Day One, 2026 Scenarios):** The future bus network has been modelled using bus route and frequency assumptions provided in the CIT Woden Interchange report (VLC, September 2020). For this option scenario, it is assumed that the Woden Bus Depot will be open. At the Woden transport interchange, buses will use platforms in Callam Street as construction on light rail stage 2B has

not started. Approximately 191 bus movements are expected in the peak hour. Detailed bus routes and movements can be found in the VLC report included in Appendix B.

- **With light rail operations (2031 Scenarios):** The future bus network has been modelled using bus route and frequency assumptions provided in the CIT Woden Interchange report (VLC, September 2020). The completion of the light rail stage 2B will mean at Woden transport interchange, light rail services will originate/terminate at the stops in the central transit corridor. Buses will continue to use the layovers on Easty Street and at Phillip Oval, as well as Woden Bus Depot. Approximately 244 bus movements through the Woden Interchange are expected during the peak hour. Detailed bus routes and movements can be found in the VLC report included in Appendix B.

A summary of the bus operations applied for the Vissim models is shown in Table 4.4.

Table 4.4: Bus Operations Summary

Model	Year	Source	Properties
Without light rail operations	2022 Day One	CIT Woden Interchange report (VLC, September 2020)	191 bus movements
	2026		
With light rail operations	2031		244 bus movements

Key operational assumptions, as agreed with MPC, have been applied regarding the bus layovers:

- We have assumed the split of bus movements across the two layovers:
 - Approximately 80% of bus routes were directed to Phillip Street Layover
 - Approximately 20% of bus routes were directed to Easty Street Layover
- Bus movements to/from the layovers have been assumed to travel in routes as depicted in Section 5.8. As shown, some movements to/from the layovers provide an inefficient route.
- Buses have been assumed to layover in the peak travel period within the modelling.
- This exercise has been undertaken separate to the bus scheduling.

Therefore, it should be noted that bus movements modelled in the peak periods represent the worse-case scenario.

4.6.2 Light rail operations

Stage 2B of the Canberra Light Rail project is proposed to connect Commonwealth Park to Woden by 2026. During peak times the light rail is proposed to offer a six-minute service for commuters, providing a reliable and frequent transport option for Canberrans living or working in the suburbs adjacent to the rail corridor.

In the absence of light rail schedules and operations, the following operational assumptions have been applied to the 2031 option scenarios, which includes light rail trams (LRT):

- An LRT headway of 6 minutes has been assumed, in both directions across both peak periods
- An average speed of 60km/hr has been applied for LRT movements
- LRT has been given priority at signals

5. Operation and Service Assessment

5.1 Traffic Performance

This section provides the traffic performance summary of 2026 and 2031 option scenarios. A summary of the 2022 'Day One' Scenarios can be found in Section 5.3.

5.1.1 Network performance comparison

Table 5.1 and Table 5.2 shows the vehicle network performance comparison between the base, and option models for AM and PM peak periods. The following comparisons can be shown:

- The 2026 No CIT scenario shows an increase in vehicles entering the network, and an overall network total travel time and the average delay in both AM and PM peaks. The overall network average speed also decreases by 5 km/hr and 9 km/hr for AM and PM peak models, respectively.
- The 2026 CIT No BB scenario and 2026 CIT BB scenarios show an increase in vehicles entering the network in the AM and PM peaks when compared to the 2026 No CIT scenario. When compared to the 2026 No CIT scenario, the overall network average speeds remain the same.
- The 2031 No CIT scenario shows an increase in the latent demand in the model for both AM and PM peaks. This indicates that the surrounding road network is beginning to operate in highly congested conditions, with vehicles waiting to enter, but cannot, because the roads are too busy. In the AM peak, the latent demand is predominantly from Hindmarsh Drive West, Yamba Drive South and Bradley Street. In the PM peak, the latent demand is predominantly from Bradley Street, Canberra Hospital and Yarra Glen intersection.
- The 2031 CIT No BB scenario and 2031 CIT BB shows an increase in vehicles entering the network in the AM and PM peaks when compared to the 2031 No CIT No BB scenario. The average speed reduces by 1-2km/hr in the AM peak. In the PM peak, the average speed remains the same for the 2031 CIT BB scenario, and increases by 1km/hr in the 2031 CIT No BB scenario.

Overall, the network is generally shown to result in increases in average delays and decreases to average speed. It should be noted that the overall network performance is not only influenced by the CIT Woden Interchange project, but also by surrounding developments, and road network modifications that are independent of the project.

Table 5.1: Network Performance Comparison Summary – AM Peak

Network Statistics	2019	2026 No CIT	2026 CIT No BB	2026 CIT BB	2031 No CIT	2031 CIT No BB	2031 CIT BB
Total No. Arrived (released vehicles)	13,914	16,656	16,997	18,041	16,622	16,864	17,769
Total Distance (km)	35,507	39,650	39,639	39,849	41,585	41,307	41,229
Total Travel time (hrs)	1,266	1,640	1,676	1,637	1,700	1,866	1,821
Total Delay (hrs)	679	963	1,002	955	998	1,167	1,120
Average Delay (sec)	158	184	188	171	192	221	201
Average Speed (km/hr)	29	24	24	24	24	22	23
Total Stop	54,425	91,517	95,908	91,299	84,968	98,015	97,889
Average Stop	3	5	5	5	5	5	5
Latent demand (unreleased vehicles)	165	575	609	575	643	1,121	992

Table 5.2: Network Performance Comparison Summary – PM Peak

Network Statistics	2019	2026 No CIT	2026 CIT No BB	2026 CIT BB	2031 No CIT	2031 CIT No BB	2031 CIT BB
Total No. Arrived	13,182	16,033	16,467	17,526	16,002	16,181	17,153
Total Distance (km)	34,116	37,802	38,589	38,414	39,201	39,570	39,452
Total Travel time (hrs)	1,075	1,626	1,680	1,675	1,849	1,835	1,877
Total Delay (hrs)	502	976	1,017	1,010	1,178	1,159	1,197
Average Delay (sec)	126	199	201	188	236	230	226
Average Speed (km/hr)	32	23	23	23	21	22	21
Total Stop	39,174	83,065	86,341	83,433	91,160	89,212	93,336
Average Stop	3	5	5	4	5	5	5
Latent demand (number of vehicles)	96	271	34	30	681	576	645

5.1.2 Intersection LoS

The average delay and level of service (LoS) was used to compare the intersection performance between scenarios. For all intersections, the average delay over all movements was used to define the LoS of the intersection. Table 5.3 and Table 5.4 show the intersection LoS for the base model and option designs. The AM and PM peak delay and LoS plots are presented for Base, 2026 and 2031 scenarios, as shown below. Detailed results, including delays and queue lengths for all intersections assessed, can be found in Appendix F.

The difference in AM/PM peak LoS between the 2019 Base and 2026 No CIT shows the following outcomes:

- There is generally some increase in delays observed at the intersections between the 2019 and 2026 No CIT scenarios
- Key intersections directly located within the project area experience some increases in delay. Callam Street/Wilbow Street/Neptune Street experiences an LoS D. Other key intersections operate with an LoS C or better.
- Intersections within the surrounding network that are generally expected to experience an LoS E or worse include:
 - Yamba Drive/Hindmarsh Drive
 - Melrose Drive/Hindmarsh Drive
 - Yamba Drive/Kitchener Drive

The difference in AM/PM peak LoS between the 2026 No CIT and 2026 CIT No BB shows the following outcomes:

- The results generally show similar but slightly longer delays at some intersections.
- Some increases to delays are observed for key intersections within the project area. Key intersections which are generally expected to experience an LoS D include:
 - Callam Street/Wilbow Street/Neptune Street
 - Callam Street/Bradley Street
 - Launceston Street/Easty Street
- The intersections within the surrounding network that are generally expected to experience an LoS E or worse in the 2026 No CIT scenario continue to perform similarly.

The difference in AM/PM peak LoS between the 2026 CIT No BB and 2026 CIT BB shows the following outcomes:

- The results generally show similar but slightly shorter delays at some intersections.
- The following intersections within the project area improve from an LoS D to an LoS C or better:
 - Callam Street/Bradley Street
 - Launceston Street/Easty Street
- The intersections within the surrounding network that are generally expected to experience an LoS E or worse in the 2026 No CIT scenario continue to perform similarly.

The difference in AM/PM peak LoS between the 2026 No CIT and 2031 No CIT shows the following outcomes:

- There is generally some increase in delays observed at the intersections between the 2026 and 2031 No CIT scenarios
- Some increases to delays are observed for key intersections within the CIT Woden Interchange project area. Key intersections which are generally expected to experience an LoS E include:
 - Callam Street/Wilbow Street/Neptune Street
 - Callam Street/Bradley Street
- In addition to the intersections which were operating at LoS E or worse under 2026 No CIT conditions, intersections within the surrounding network that are generally expected to experience an LoS E or worse also include:
 - Yamba Drive/Bateson Road

The difference in AM/PM peak LoS between the 2031 No CIT and 2031 CIT No BB shows the following outcomes:

- The results generally show similar but slightly longer delays at some intersections.
- Some increases to delays are observed for key intersections within the CIT Woden Interchange project area. Key intersections which are generally expected to experience an LoS E or worse include:
 - Callam Street/Wilbow Street/Neptune Street
 - Callam Street/Bradley Street
- The intersections within the surrounding network that are generally expected to experience an LoS E or worse in the 2031 No CIT scenario continue to perform similarly.

The difference in AM/PM peak LoS between the 2031 CIT No BB and 2031 CIT BB shows the following outcomes:

- Key intersections which are generally expected to experience an LoS E or worse include:
 - Wilbow Street Roundabout
 - Callam Street/Bradley Street
 - Launceston Street/Easty Street
- The intersections within the surrounding network that are generally expected to experience an LoS E or worse in the 2031 No CIT scenario continue to perform similarly.

It should be noted that the delays at Callam Street/Wilbow Street/Neptune Street have a strong influence on the subsequent delays at Callam Street/Bradley Street, given they are closely spaced intersections. Therefore, signal modifications to either intersection can cause additional impacts to Callam Street or the associated side streets.

As shown, the intersections such as Melrose Drive, Yamba Drive and Hindmarsh are experiencing extended delays in the 2026 and 2031 No CIT scenarios. This means the delays are likely to be a result of the cumulative effect of additional developments, organic traffic growth and the introduction of the light rail across the Woden area, rather than from the CIT Woden Transport Interchange project.

Table 5.3: Intersection LoS Comparison – AM Peak

Intersection	Base	2026 No CIT No BB	2026 CIT No BB	2026 CIT BB	2031 No CIT No BB	2031 CIT No BB	2031 CIT BB
Woden Town Centre Intersections							
Wilbow St Roundabout	A	A	B	A	C	D	E
Launceston St/Callam St	B	B	B	B	C	C	D
Callam St/Bradley St	A	B	B	B	D	F	F
Callam St/Wilbow St/Neptune St	C	D	D	D	E	E	D
Callam St/Corinna St	A	B	A	A	B	B	B
Launceston St/Bowes St	A	B	B	C	B	B	C
Launceston St/Easty St	A	C	D	C	C	C	E
Callam St/Matilda St	A	B	B	B	C	D	C
Surrounding Road Network Intersections							
Yarra Glen Roundabout	C	C	C	D	A	B	B
Melrose Dr/Theodore St	B	C	B	B	A	A	A
Melrose Dr/Launceston St	D	D	D	D	D	D	D
Yamba Dr/Launceston St	D	C	D	C	C	C	C
Yamba Dr/Wisdom St	C	C	C	C	C	C	C
Yamba Dr/Hindmarsh Dr	D	E	E	E	E	E	E
Callam St/Hindmarsh Dr/Athllon Dr	D	D	D	D	D	D	D
Melrose Dr/Hindmarsh Dr	E	E	E	E	E	F	F
Yamba Dr/Kitchener St	D	E	E	E	E	E	E
Yamba Dr/Bateson Rd	A	C	C	C	B	C	B
Hindmarsh Dr/Ainsworth St	D	D	D	D	D	D	D
Hindmarsh Dr/Botany St	B	A	A	A	B	B	B
Hindmarsh Dr/Ball St	A	B	B	B	C	C	B
Melrose Dr/Worgan St	B	B	A	A	B	B	B
Melrose Dr/Corinna St	B	A	A	A	B	A	A
Melrose Dr/Brewer St	A	B	B	B	B	B	B
Launceston St/Irving St/Furzer St	A	B	B	B	C	C	C

Table 5.4: Intersection LoS Comparison – PM Peak

Intersection	Base	2026 No CIT No BB	2026 CIT No BB	2026 CIT BB	2031 No CIT No BB	2031 CIT No BB	2031 CIT BB
Woden Town Centre Intersections							
Wilbow St Roundabout	A	A	A	A	A	A	A
Launceston St/Callam St	C	B	B	B	C	C	C
Callam St/Bradley St	A	C	D	C	F	F	F
Callam St/Wilbow St/Neptune St	B	D	D	D	D	C	C
Callam St/Corinna St	B	B	B	B	B	B	B
Launceston St/Bowes St	A	B	C	C	B	B	B
Launceston St/Easty St	A	C	C	C	C	C	C
Callam St/Matilda St	A	C	C	C	C	C	C
Surrounding Road Network Intersections							
Yarra Glen Roundabout	A	D	C	C	D	C	D
Melrose Dr/Theodore St	A	A	A	A	A	A	A
Melrose Dr/Launceston St	C	D	D	D	D	D	D
Yamba Dr/Launceston St	C	D	D	D	E	D	D
Yamba Dr/Wisdom St	B	C	C	C	C	C	C
Yamba Dr/Hindmarsh Dr	E	F	F	F	F	F	F
Callam St/Hindmarsh Dr/Athllon Dr	D	D	D	D	C	C	C
Melrose Dr/Hindmarsh Dr	D	E	E	E	E	E	E
Yamba Dr/Kitchener St	D	E	E	E	F	F	E
Yamba Dr/Bateson Rd	C	D	D	D	E	E	E
Hindmarsh Dr/Ainsworth St	C	C	D	D	D	D	D
Hindmarsh Dr/Botany St	B	A	B	A	B	B	B
Hindmarsh Dr/Ball St	B	B	D	C	B	C	C
Melrose Dr/Worgan St	B	C	A	A	B	A	B
Melrose Dr/Corinna St	A	B	A	A	A	A	A
Melrose Dr/Brewer St	B	D	D	D	C	C	D
Launceston St/Irving St/Furzer St	A	C	C	C	C	D	D

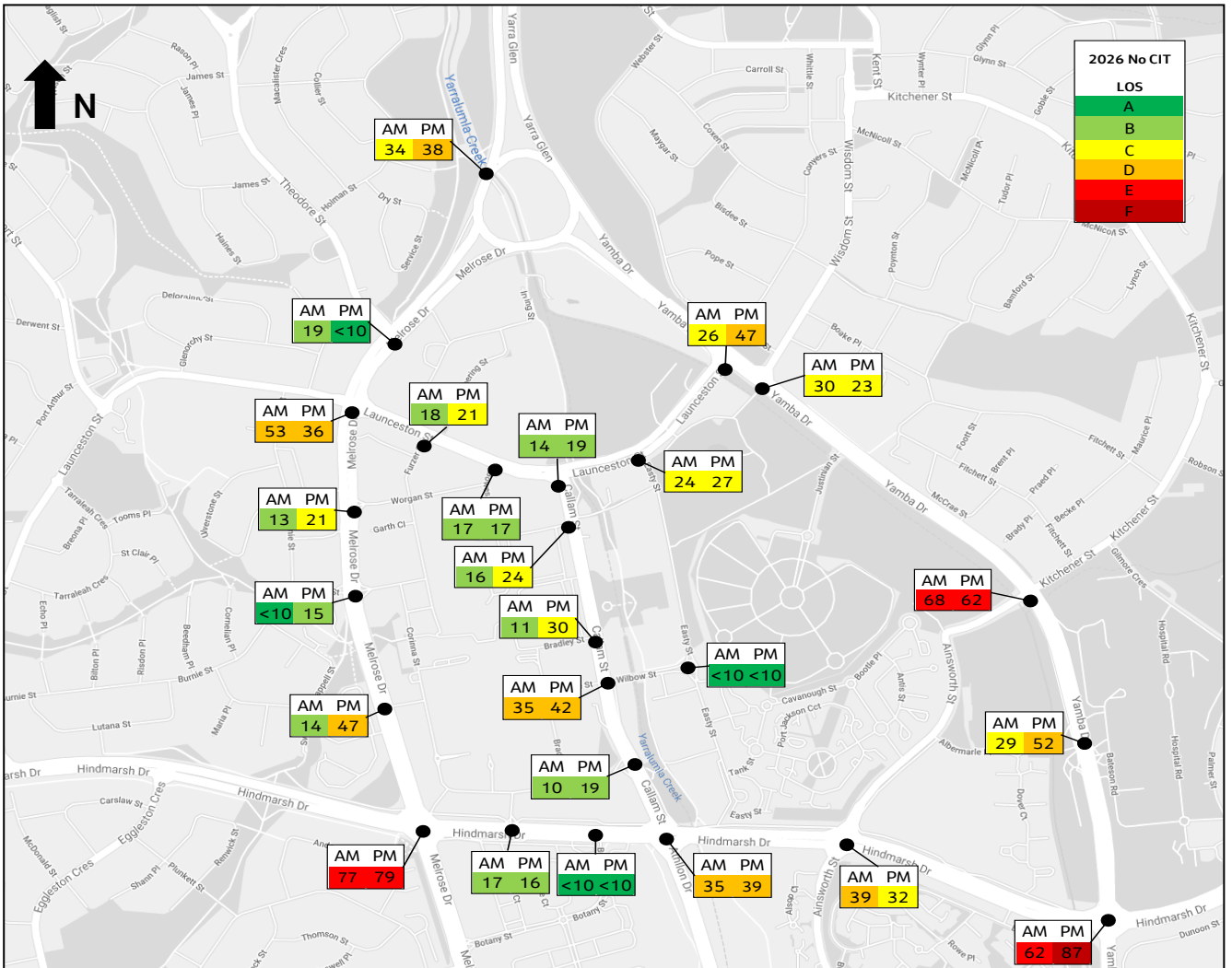


Figure 5.1: 2026 No CIT No Bradley Bows Connection - Average Intersection Delay and LoS

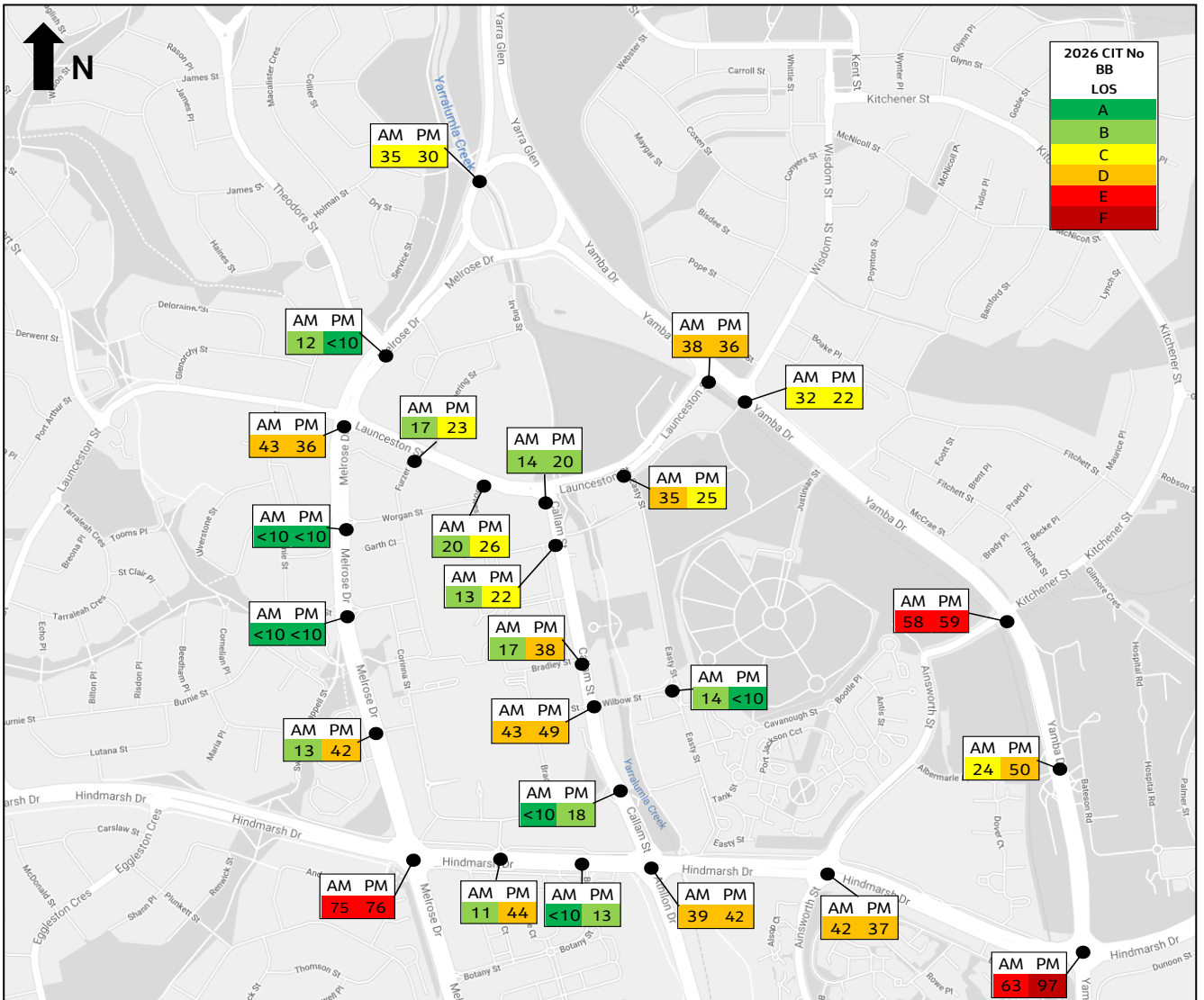


Figure 5.2: 2026 With CIT No Bradley Bowes Connection - Average Intersection Delay and LoS

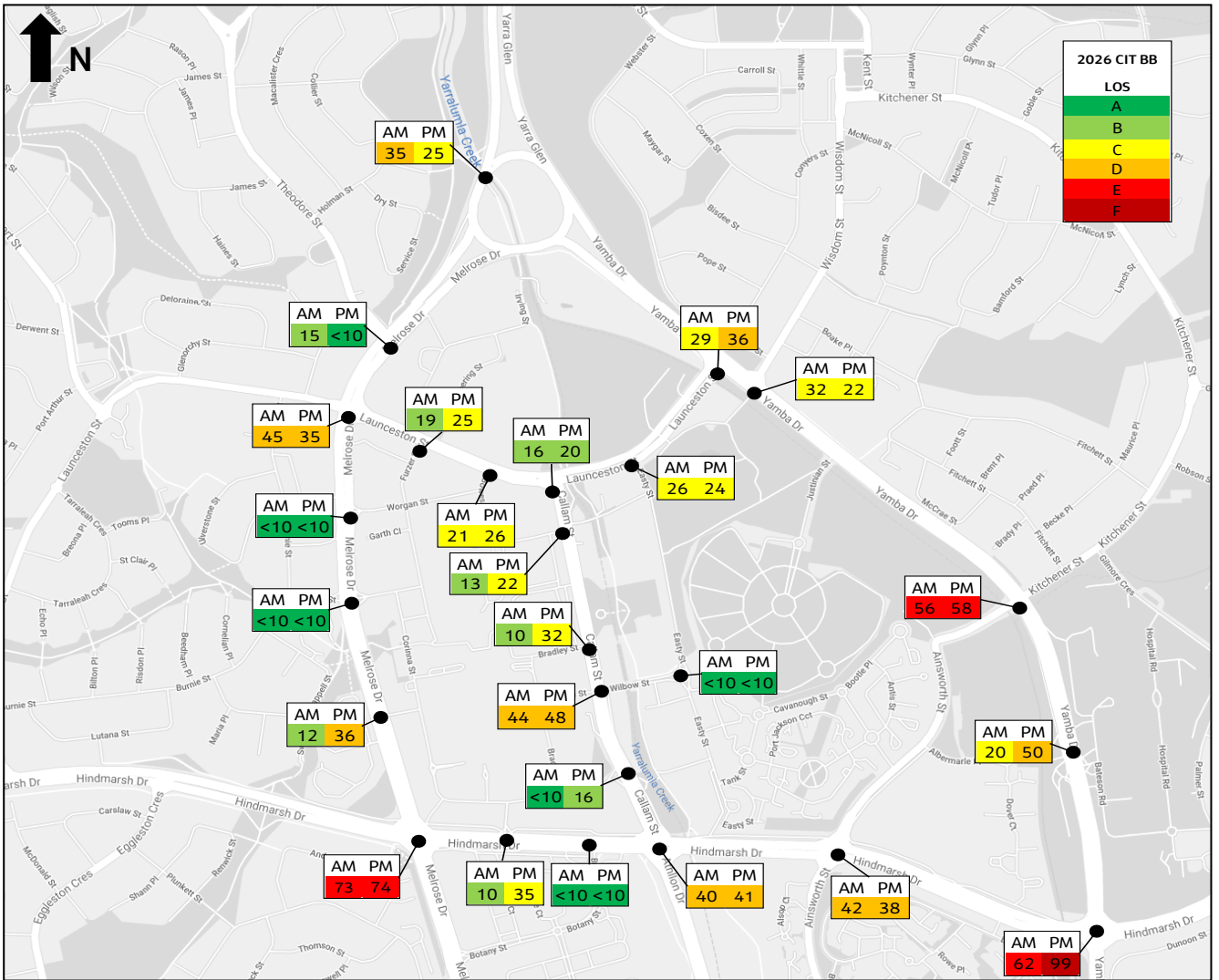


Figure 5.3: 2026 With CIT and Bradley Boves Connection - Average Intersection Delay and LoS

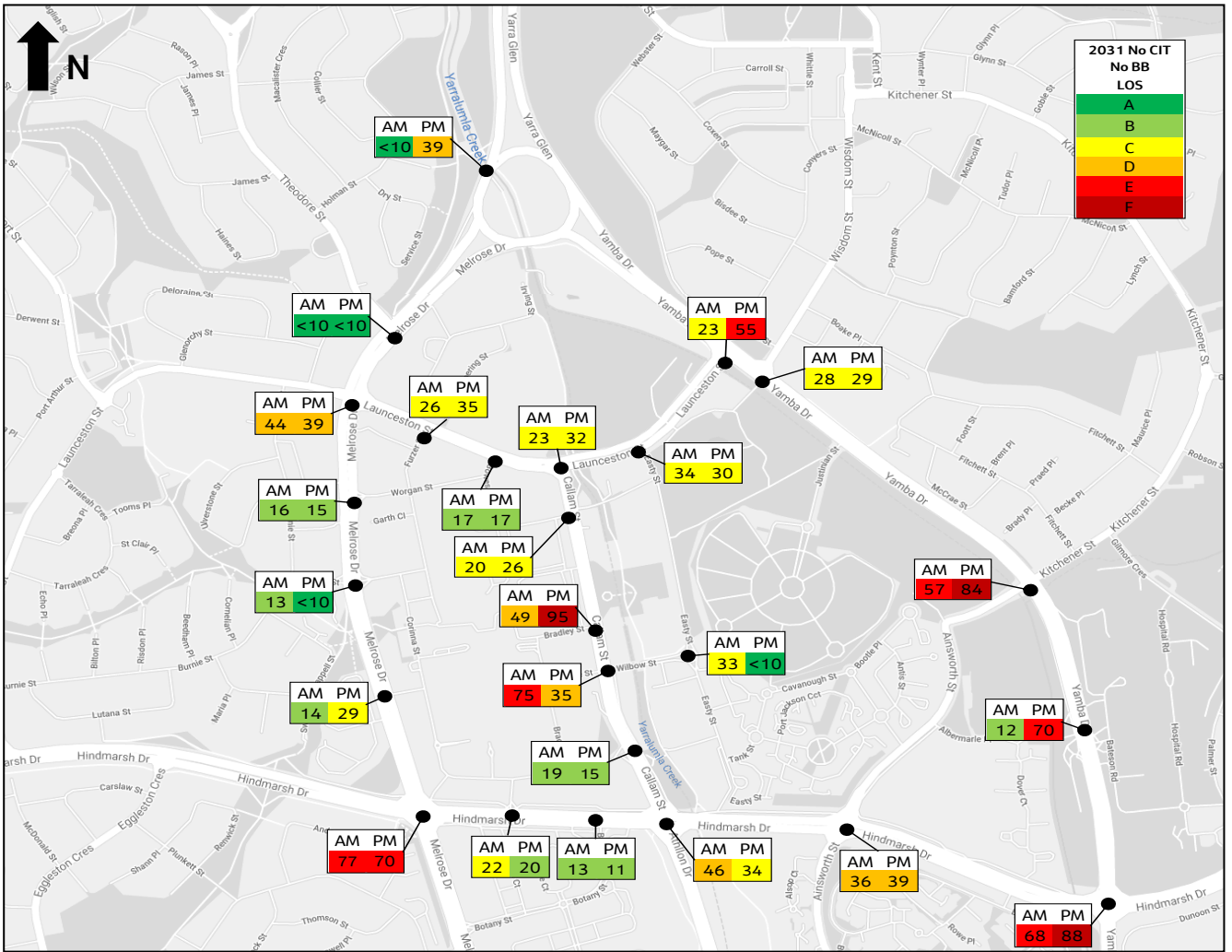


Figure 5.4: 2031 No CIT No Bradley Bowes Connection - Average Intersection Delay and LoS

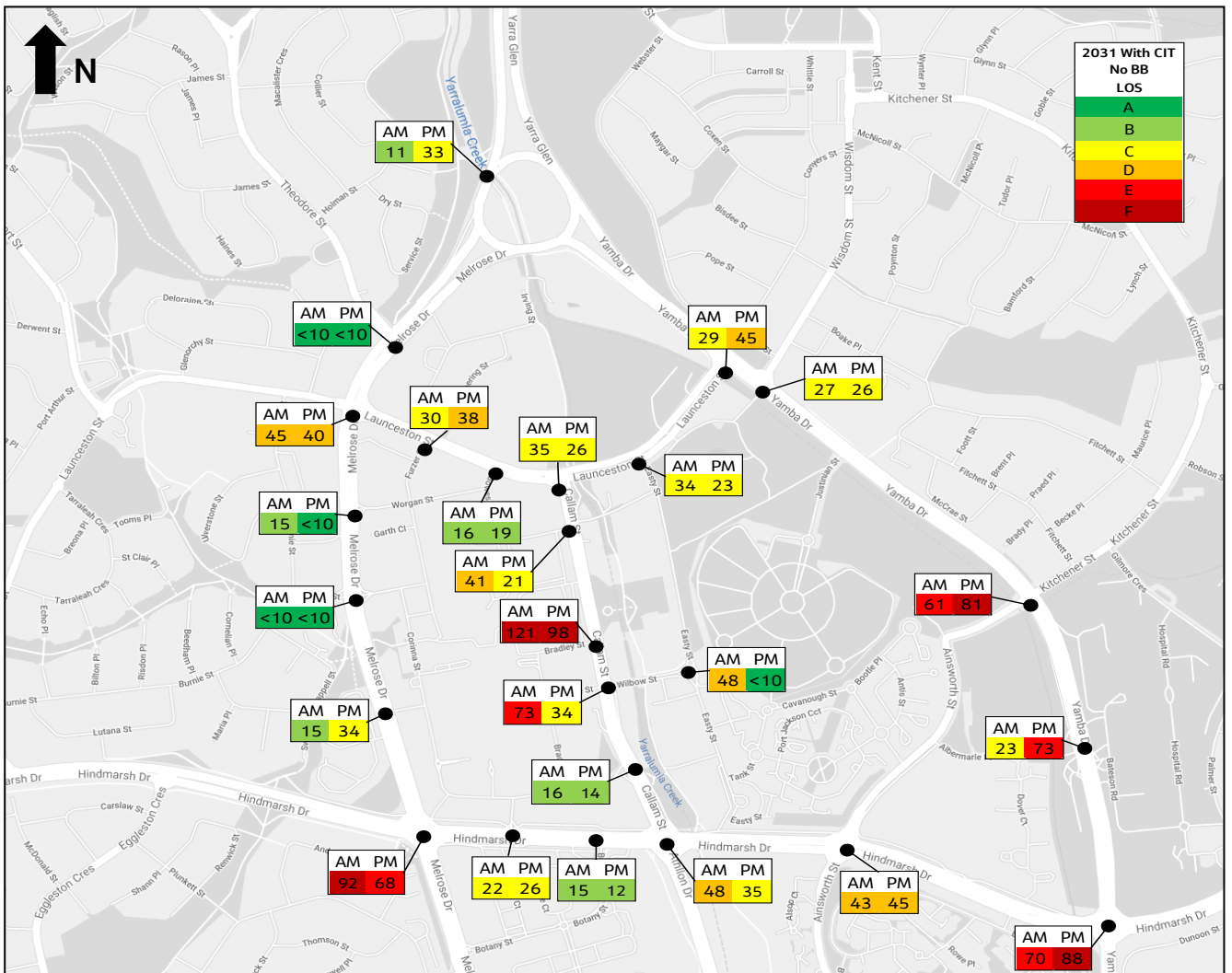


Figure 5.5: 2031 With CIT No Bradley Bowes Connection - Average Intersection Delay and LoS

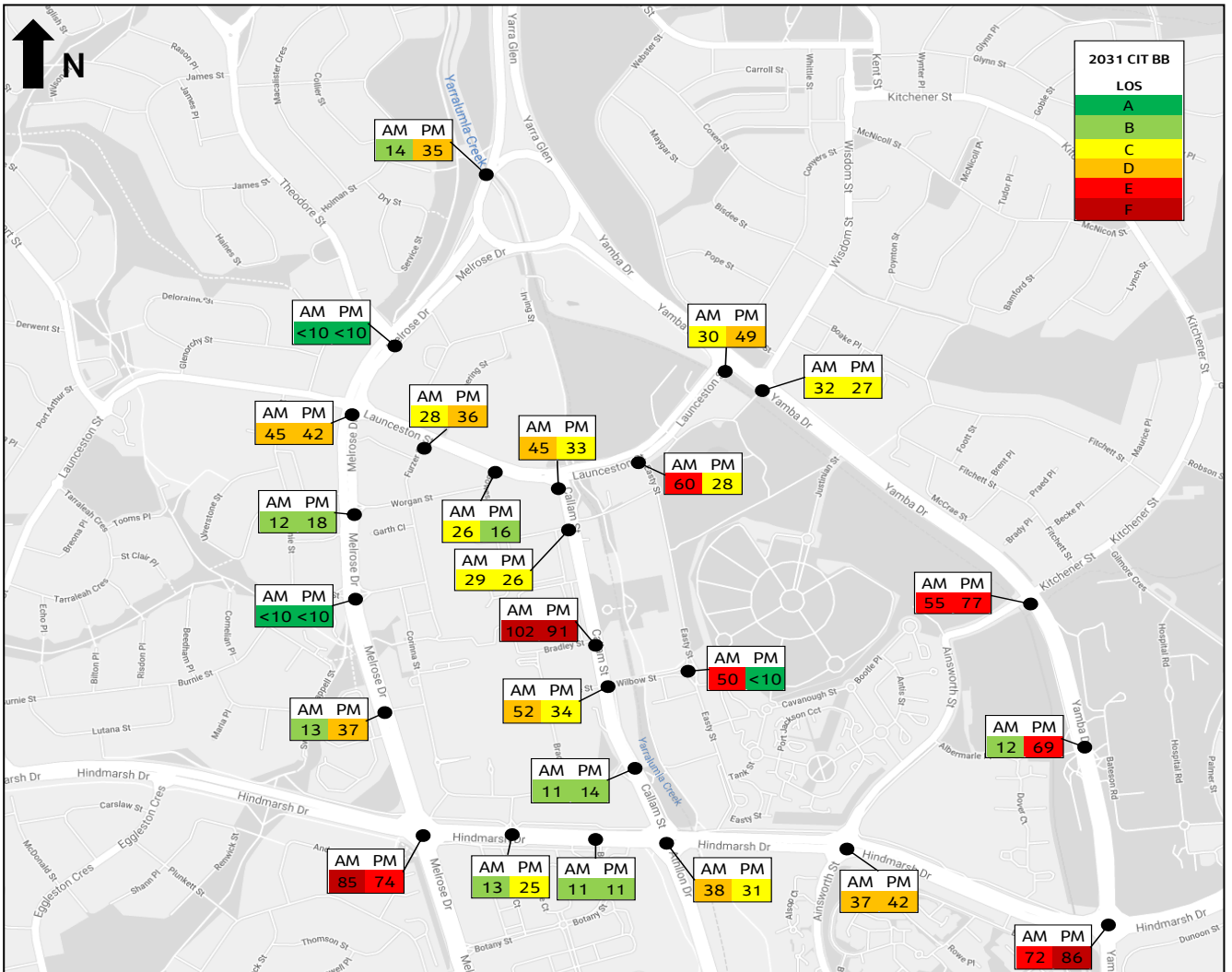


Figure 5.6: 2031 With CIT and Bradley Boves Connection - Average Intersection Delay and LoS

The key intersections located within the CIT Woden Transport Interchange subject site have been examined further, with the LoS, delays and number of vehicles by approach shown in the tables below.

The key findings from the intersection analysis are summarised:

Willow Street Roundabout:

- Under 2026 No CIT conditions, delays remain minimal, operating at an LoS A.
- With the introduction of the CIT building, there are slightly longer delays observed. Under 2026 CIT No BB conditions, Easty Street approaches operates at an LoS C or better. Under 2026 CIT BB conditions, the intersection operates at LoS B or better.
- Under 2031 No CIT conditions, there are longer delays observed, with the Willow Street approach operating at an LoS E in the AM peak. This is due to the additional bus and private vehicle trips being loaded onto this intersection from the future year matrices.
- Under the 2031 CIT No BB scenarios, the Willow Street approach operates at LoS F in the AM peak. With the inclusion of Boves-Bradley connection (CIT BB), the delays shift onto Easty Street approaches, operating at LoS E or worse.

Launceston Street/Callam Street:

- Under all 2026 scenarios, the Phillip Oval layover approaches operate at an LoS D. All other approaches operate at an LoS C or better.
- Under 2031 No CIT conditions, Phillip Oval layover approach experiences increased delays, with the approach operating at an LoS E. This is due to the large proportion of buses travelling through the approaches, and the shorter phase times which may be allocated to this approach, given the Launceston Street approaches have significantly higher volumes.
- Under 2031 CIT No BB conditions, the Phillip Oval layover experiences further delays, operating at an LoS E or F. With the introduction of the Bowes-Bradley connection, the delays at the Phillip Oval layover approach improves slightly in the AM peak, however the Callam Street (south) approach experiences increased delays at LoS E. These are likely to be due to signal phasing timing changes as a result of the changing volume distributions arriving at the intersection from Launceston Street and Callam Street.

Callam Street/Bradley Street:

- Under 2026 No CIT conditions, the intersection operates at LoS D or better.
- With the introduction of the CIT building, there are slightly longer delays observed. Under 2026 CIT No BB conditions, Bradley Street (west) approach operates at an LoS E in the PM peak. Under 2026 CIT BB conditions, the intersection improves slightly and operates at LoS D or better.
- Under 2031 No CIT conditions, there are longer delays observed. Both the Callam Street (north) and Bradley Street (west) approaches operate at LoS E or worse under both peaks.
- With the introduction of the CIT building, longer delays are observed at Callam Street (north) and Bradley Street (west), operating at LoS F. The inclusion of the Bradley-Bowes connection improves the intersection slightly, with lower delays, however it remains at LoS F.
- Since the Woden Transport Interchange is located at the Callam Street (north) approach, buses travelling through the interchange are likely to wait at their respective bus stops and at the pedestrian crossings across Callam Street. These manoeuvres combined with the large number of buses travelling through Callam Street (north) contribute to the delays captured at Callam Street/Bradley Street.

Callam Street/Wilbow Street/Neptune Street:

- For 2026 and 2031 scenarios, it is assumed that Callam Street (south) will include a dual right turn lane to enter Wilbow Street.
- Under 2026 No CIT PM peak conditions, the intersection operates with longer delays at the Callam Street (south) approach, performing at LoS E. Other approaches operate at LoS D or better.
- Under the 2026 CIT No BB and CIT BB scenarios, there are slightly longer delays observed for Callam Street (south) approach in the AM peak, performing at LoS E. In the PM peak, Callam Street (south) approach improves from an LoS E to an LoS D.
- Under 2031 scenarios, longer delays are observed for the Callam Street approaches in the AM peak, operating at LoS E or F. In the PM peak, all approaches operate at LoS D or better.
- It should be noted that the intersection performance of Callam Street/Bradley Street and the southbound movements from the Interchange are directly influenced by the Callam Street/Wilbow Street/Neptune Street intersection. Every effort was made to optimise this intersection to improve intersection performance, however we found there was a direct correlation to the poor performance and inefficient bus circulation, which uses these intersections as a gateway between the layovers and subsequent bus routes.

Callam Street/Corinna Street:

- Under 2026 scenarios, the Corinna Street (west) approach operates at an LoS D in both peaks. Other approaches operate at an LoS B or better.
- Under 2031 scenarios, the Corinna Street (west) approach continues to operate at an LoS D in both peaks. Other approaches operate at an LoS C or better.

Launceston Street/Bowes Street:

- Under 2026 No CIT conditions, all approaches operate at an LoS C or better in both peaks.
- Under 2026 CIT No BB and CIT BB conditions, Bowes Street (south) experiences increased delays from LoS C to LoS D in the PM peak.
- Under 2031 scenarios, all approaches operate at an LoS D or better in both peaks.

Launceston Street/Easty Street:

- Under 2026 No CIT conditions, approaches operate with an LoS C or better.
- Under 2026 CIT No BB, Launceston Street (east) and Easty Street (south) experiences increased delays from LoS C to LoS D in the AM peak.
- With the inclusion of the Bradley Bowes connection (2026 CIT BB), the Launceston Street (east) and Easty Street (south) approaches return to operating at an LoS C.
- For 2031 scenarios, some changes in delays are observed for the AM peak. For the 2031 No CIT condition, Easty Street (south) operates at LoS D. With the introduction of the CIT building, this approach experiences increased delays from LoS D to LoS E. With the inclusion of the Bradley-Bowes connection, the intersection experiences improvements to Easty Street (south), operating at LoS D, however deterioration of Launceston Street (east) approach, operating at LoS E.
- For 2031 scenarios, minimal changes in the PM peak are observed, with all approaches operating at LoS C.

Callam Street/Matilda Street:

- In the 2026 No CIT AM peak, the Callam Street (south) approach experiences an LoS E. Slightly shorter delays by 5 seconds are observed in the 2026 CIT No BB condition, with the same approach operating at LoS D. When the Bradley-Bowes connection is included, this approach returns to an LoS E.
- In the 2031 No CIT AM peak, the intersection operates at LoS D or better. A similar performance is shown for the 2031 CIT No BB scenario. When the Bradley-Bowes connection is included, the Callam Street (south) approach experiences an increased delay from LoS D to LoS E.
- In the PM peak, the intersection performs relatively consistently throughout both 2026 and 2031 scenarios, operating at an LoS D or better for all approaches.
- Since the Woden Interchange is located at the Callam Street (south) approach, buses travelling through the interchange are likely to wait at their respective bus stops and at the pedestrian crossings across Callam Street. These manoeuvres combined with the large number of buses travelling through Callam Street (south) contribute to the delays captured at Callam Street/Matilda Street intersection.

Table 5.5: Key Intersection Performance by Approach – Base and 2026 Scenarios (AM Peak)

Intersection Name	Approach	2019 Base			2026 No CIT No BB			2026 CIT No BB			2026 CIT BB		
		Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS
Wilbow Street Roundabout	Easty St (north)	61	<10	A	544	<10	A	616	18	B	615	14	B
	Easty St (south)	140	<10	A	274	<10	A	262	20	C	255	14	B
	Wilbow St (west)	222	<10	A	598	<10	A	741	<10	A	702	<10	A
Launceston Street/Callam Street	Launceston St (east)	549	31	C	827	17	B	803	17	B	846	18	B
	Callam St (south)	597	14	B	99	27	C	74	27	C	85	31	C
	Launceston St (west)	454	11	B	669	<10	A	709	<10	A	666	<10	A
	Phillip Oval Bus Layover (north)	-	-	-	44	51	D	44	51	D	44	54	D
Callam Street/Bradley Street	Callam St (north)	357	<10	A	111	19	B	110	27	C	110	20	B
	Callam St (south)	791	12	B	153	<10	A	181	<10	A	164	<10	A
	Bradley St (west)	4	40	D	30	22	C	89	35	C	29	21	C
Callam Street/Wilbow Street/Neptune Street	Callam St (north)	331	15	B	161	24	C	218	34	C	158	31	C
	Wilbow St (east)	63	21	C	514	20	C	617	32	C	615	31	C
	Callam St (south)	1,155	40	D	604	49	D	709	55	E	712	59	E
	Neptune St (west)	87	35	C	188	40	D	313	45	D	313	45	D
Callam Street/Corinna Street	Callam St (north)	428	12	B	578	<10	A	713	<10	A	711	<10	A
	Callam St (south)	1,241	<10	A	1,286	<10	A	1,656	<10	A	1,722	<10	A
	Corinna St (west)	245	13	B	82	54	D	84	53	D	66	50	D
Launceston Street/Bowes Street	Launceston St (east)	578	<10	A	529	<10	A	537	10	B	519	11	B
	Bowes St (south)	97	<10	A	218	28	C	290	23	C	341	22	C
	Launceston St (west)	495	<10	A	777	21	C	890	24	C	886	27	C
Launceston Street/Easty Street	Launceston St (east)	651	<10	A	875	26	C	885	39	D	887	26	C
	Easty St (south)	86	<10	A	590	28	C	697	47	D	644	32	C
	Launceston St (west)	536	<10	A	691	19	B	707	20	B	673	19	B
Callam Street/Matilda Street	Callam St (north)	484	<10	A	351	<10	A	322	<10	A	385	<10	A
	Callam St (south)	775	<10	A	60	59	E	59	55	D	60	60	E
	Matilda St (west)	16	<10	A	39	49	E	16	49	D	25	46	D

Table 5.6: Key Intersection Performance by Approval – 2031 Scenarios (AM Peak)

Intersection Name	Approach	2031 No CIT			2031 CIT No BB			2031 CIT BB		
		Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS
Wilbow Street Roundabout	Easty St (north)	539	11	B	471	19	B	572	83	F
	Easty St (south)	243	19	B	213	31	C	196	53	E
	Wilbow St (west)	739	55	E	708	72	F	751	23	C
Launceston Street/Callam Street	Launceston St (east)	772	29	C	784	46	D	747	36	D
	Callam St (south)	125	34	C	129	31	C	107	66	E
	Launceston St (west)	862	13	B	727	17	B	785	49	D
	Phillip Oval Bus Layover (north)	54	70	E	53	114	F	54	85	F
Callam Street/Bradley Street	Callam St (north)	139	67	E	115	386	F	123	314	F
	Callam St (south)	235	7	A	612	5	A	544	11	B
	Bradley St (west)	127	108	F	165	363	F	199	237	F
Callam Street/Wilbow Street/Neptune Street	Callam St (north)	261	64	E	279	80	F	323	56	E
	Wilbow St (east)	546	29	C	502	46	D	561	52	D
	Callam St (south)	707	124	F	925	95	F	855	56	E
	Neptune St (west)	184	44	D	310	47	D	310	44	D
Callam Street/Corinna Street	Callam St (north)	596	9	A	559	9	A	610	9	A
	Callam St (south)	1,398	22	C	1,914	16	B	1851	9	A
	Corinna St (west)	78	46	D	84	52	D	86	51	D
Launceston Street/Bowes Street	Launceston St (east)	584	8	A	641	7	A	555	7	A
	Bowes St (south)	194	29	C	215	29	C	250	38	D
	Launceston St (west)	993	21	C	817	20	C	956	35	C
Launceston Street/Easty Street	Launceston St (east)	811	30	C	780	26	C	784	79	E
	Easty St (south)	679	54	D	671	56	E	673	53	D
	Launceston St (west)	890	22	C	769	23	C	792	42	D
Callam Street/Matilda Street	Callam St (north)	263	7	A	214	35	D	268	16	B
	Callam St (south)	76	52	D	77	50	D	75	65	E
	Matilda St (west)	40	50	D	42	50	D	29	52	D

Table 5.7: Key Intersection Performance by Approach – Base and 2026 Scenarios (PM Peak)

Intersection Name	Approach	2019 Base			2026 No CIT			2026 CIT No BB			2026 CIT BB		
		Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS
Wilbow Street Roundabout	Easty St (north)	191	<10	A	497	<10	A	659	11	B	628	<10	A
	Easty St (south)	111	<10	A	251	<10	A	241	14	B	241	11	B
	Wilbow St (west)	79	<10	A	722	<10	A	676	<10	A	705	<10	A
Launceston Street/Callam Street	Launceston St (east)	563	40	D	914	21	C	905	26	C	890	24	C
	Callam St (south)	595	11	B	170	31	C	110	29	C	117	32	C
	Launceston St (west)	410	11	B	540	10	B	666	<10	A	645	<10	A
	Phillip Oval Bus Layover (north)	-	-	-	44	51	D	44	49	D	44	52	D
Callam Street/Bradley Street	Callam St (north)	453	<10	A	114	32	C	114	46	D	114	40	D
	Callam St (south)	518	<10	A	81	<10	A	134	<10	A	123	<10	A
	Bradley St (west)	52	38	D	142	43	D	172	59	E	121	53	D
Callam Street/Wilbow Street/Neptune Street	Callam St (north)	497	15	B	277	28	C	306	35	C	255	39	D
	Wilbow St (east)	202	<10	A	545	17	B	678	26	C	680	24	C
	Callam St (south)	563	25	C	421	71	E	312	45	D	386	49	D
	Neptune St (west)	144	30	C	590	50	D	901	72	D	908	69	D
Callam Street/Corinna Street	Callam St (north)	759	11	B	944	15	B	1,240	15	B	1,254	15	B
	Callam St (south)	564	16	B	533	<10	A	539	<10	A	599	<10	A
	Corinna St (west)	272	47	D	276	53	D	244	52	D	225	49	D
Launceston Street/Bowes Street	Launceston St (east)	741	<10	A	744	<10	A	816	12	B	776	13	B
	Bowes St (south)	327	<10	A	417	30	C	650	43	D	684	41	D
	Launceston St (west)	343	<10	A	353	22	C	427	25	C	410	26	C
Launceston Street/Easty Street	Launceston St (east)	580	<10	A	759	27	C	816	29	C	773	26	C
	Easty St (south)	196	13	B	836	31	C	737	25	C	724	25	C
	Launceston St (west)	360	<10	A	621	20	C	683	22	C	668	21	C
Callam Street/Matilda Street	Callam St (north)	463	<10	A	236	<10	A	159	<10	A	186	<10	A
	Callam St (south)	572	<10	A	58	54	D	59	51	D	59	54	D
	Matilda St (west)	72	<10	A	112	45	E	51	42	D	59	43	D

Table 5.8: Key Intersection Performance by Approach – 2031 Scenarios (PM Peak)

Intersection Name	Approach	2031 No CIT			2031 CIT No BB			2031 CIT BB		
		Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS	Vehicles	Delay (s)	LoS
Wilbow Street Roundabout	Easty St (north)	589	10	B	518	10	B	477	<10	A
	Easty St (south)	193	12	B	160	<10	A	234	<10	A
	Wilbow St (west)	791	<10	A	696	<10	A	768	<10	A
Launceston Street/Callam Street	Launceston St (east)	1,105	38	D	1,012	30	C	1032	39	D
	Callam St (south)	158	40	D	93	32	C	187	33	C
	Launceston St (west)	625	15	B	540	11	B	545	17	B
	Phillip Oval Bus Layover (north)	54	70	E	54	75	E	54	74	E
Callam Street/Bradley Street	Callam St (north)	146	150	F	150	236	F	147	191	F
	Callam St (south)	284	<10	A	408	<10	A	384	<10	A
	Bradley St (west)	399	136	F	416	138	F	401	134	F
Callam Street/Wilbow Street/Neptune Street	Callam St (north)	545	24	C	564	23	C	547	24	C
	Wilbow St (east)	643	23	C	569	27	C	571	21	C
	Callam St (south)	469	49	D	464	35	D	581	42	D
	Neptune St (west)	583	50	D	582	50	D	582	49	D
Callam Street/Corinna Street	Callam St (north)	1,122	13	B	1,038	11	B	1089	11	B
	Callam St (south)	576	<10	A	613	<10	A	665	<10	A
	Corinna St (west)	275	51	D	258	53	D	310	49	D
Launceston Street/Bowes Street	Launceston St (east)	998	<10	A	917	12	B	915	<10	A
	Bowes St (south)	444	30	C	499	28	C	344	29	C
	Launceston St (west)	444	20	C	451	23	C	409	20	C
Launceston Street/Easty Street	Launceston St (east)	721	32	C	709	24	C	649	30	C
	Easty St (south)	874	27	C	727	24	C	860	30	C
	Launceston St (west)	685	30	C	529	23	C	597	25	C
Callam Street/Matilda Street	Callam St (north)	183	<10	A	177	<10	A	235	<10	A
	Callam St (south)	79	50	D	79	48	D	78	54	D
	Matilda St (west)	70	47	D	6	44	D	96	47	D

5.1.3 Traffic Diversions

Due to the closure of Callam Street to private vehicles between Bradley Street and Matilda Street, and an increased number of buses travelling through the subject site, significant diversions in traffic are expected under future conditions.

As shown in Figure 5.7 and Figure 5.8, the road network assessment shows some difference in traffic flows along key roads in the study area between the base and future scenarios. It should be noted that in addition to traffic diversions, general traffic growth within the study area also contributes to the volume changes observed. The volume change analysis shows the following outcomes:

No CIT Scenarios:

- When the 2026 and 2031 No CIT scenarios are compared to the 2019 base, there are decreases in traffic volume observed along Callam Street (north), due to the closure of Callam Street to private vehicles between Matilda Street and New Bradley Street. Vehicles travelling along Callam Street North in the future scenarios are mostly buses.
- The largest increase in traffic volume (> 200% increase in both peak periods in both directions) is on Easty Street. This increase is likely a combination of the vehicles re-routing from Callam Street, as well as bus services travelling to/from Easty Street Bus Layover.
- There are increases in traffic volume observed along Melrose Drive. As a result of vehicles who previously travelled north or south via Callam Street, a large proportion of traffic have instead opted to take Melrose Drive. Therefore, this increase is likely a combination of the vehicles re-routing from Callam Street, as well as general traffic growth.
- No significant changes are observed along Hindmarsh Drive. The routes of vehicles travelling in an east-west direction on Hindmarsh Drive are not likely disrupted by the Callam Street closure, therefore differences observed are predominantly due to traffic growth and changing trip distributions.
- Between 2026 and 2031 scenarios, there are fluctuations in terms of volumes, with both increases and decreases on different roads across the network depending on the peak period. The general decrease in volumes observed on roads between 2026 and 2031 are likely to be the combined result of the network changes, including the introduction of the light rail in the 2031 scenario, and the signalisation of the Yarra Glen intersection. As a result, the routing choices made across the network will change slightly.

With CIT No BB Scenarios:

- When the 2026 and 2031 With CIT No BB scenarios are compared to the corresponding No CIT scenarios, there are some decreases in traffic volume observed along Callam Street (north).
- There are increases in traffic volumes observed along Neptune Street. These increases are likely due to the increased traffic and trip distributions originating to/from the CIT building.
- There are increases in traffic volumes observed along Callam Street (south) and Launceston Street in the 2026 scenario. These increases are influenced by the increased traffic and trip distributions originating to/from the CIT Building.

With CIT BB Scenarios:

- When the Bradley-Bowes connection is included, approximately 80-100 vehicles are expected to travel through the connection during the AM and PM peak.

Under existing conditions, the Vissim model showed that vehicles which originated near Athllon Drive, and needing to travel north towards the Yarra Glen roundabout previously travelled along Callam Street and Launceston Street. Under future conditions, these vehicles have instead diverted to travel west on Hindmarsh Drive and then north via Melrose Drive instead. The same applies for the route vice-versa. This route was also commonly used for vehicles located near Callam Street (south) towards Hindmarsh Drive.

As a result of the change in traffic volumes observed along key routes within the study area, changes in road hierarchy are also expected for Easty Street and Wilbow Street. Under existing conditions, both roads function as a local access street, providing access for government employees accessing workplaces, and residents accessing residential developments. Under future conditions, the traffic volumes are expected to rise, and as a result the roads are expected to be reclassified, primarily functioning as major collector roads.

Changes in road hierarchy are also expected for Bowes Street. Under existing conditions, the road is classified as a local access street. Under future conditions, the traffic volumes are expected to rise with increased traffic congestion to/from the CIT building, and as a result, the road is expected to be reclassified, primarily functioning as a major collector road, excluding the Bradley-Bowes shared zone connection. The Bradley-Bowes shared zone connection should primarily function as a local access street.

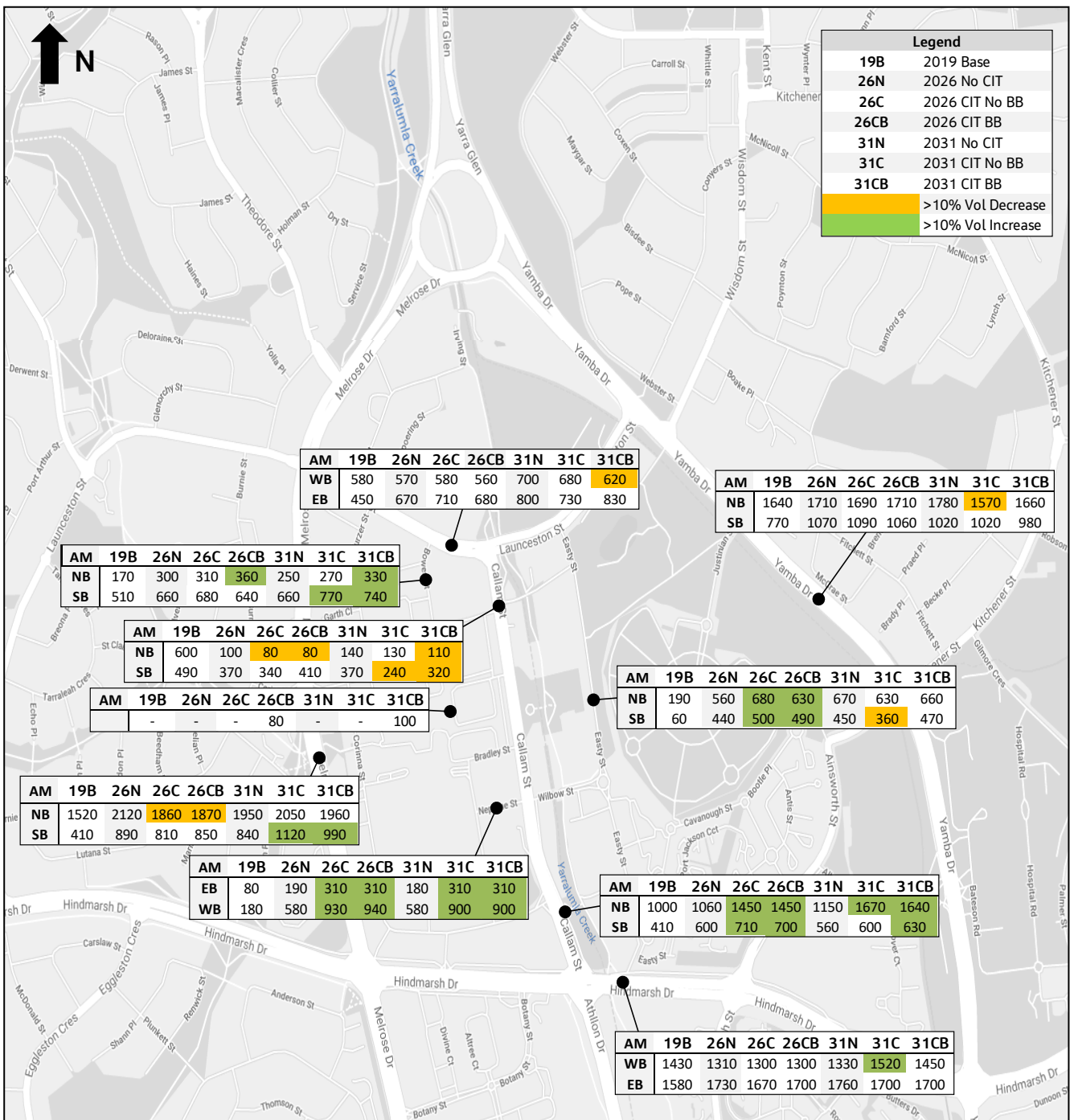


Figure 5.7: Volume Comparison Diagram (AM Peak) (rounded to the nearest 10)

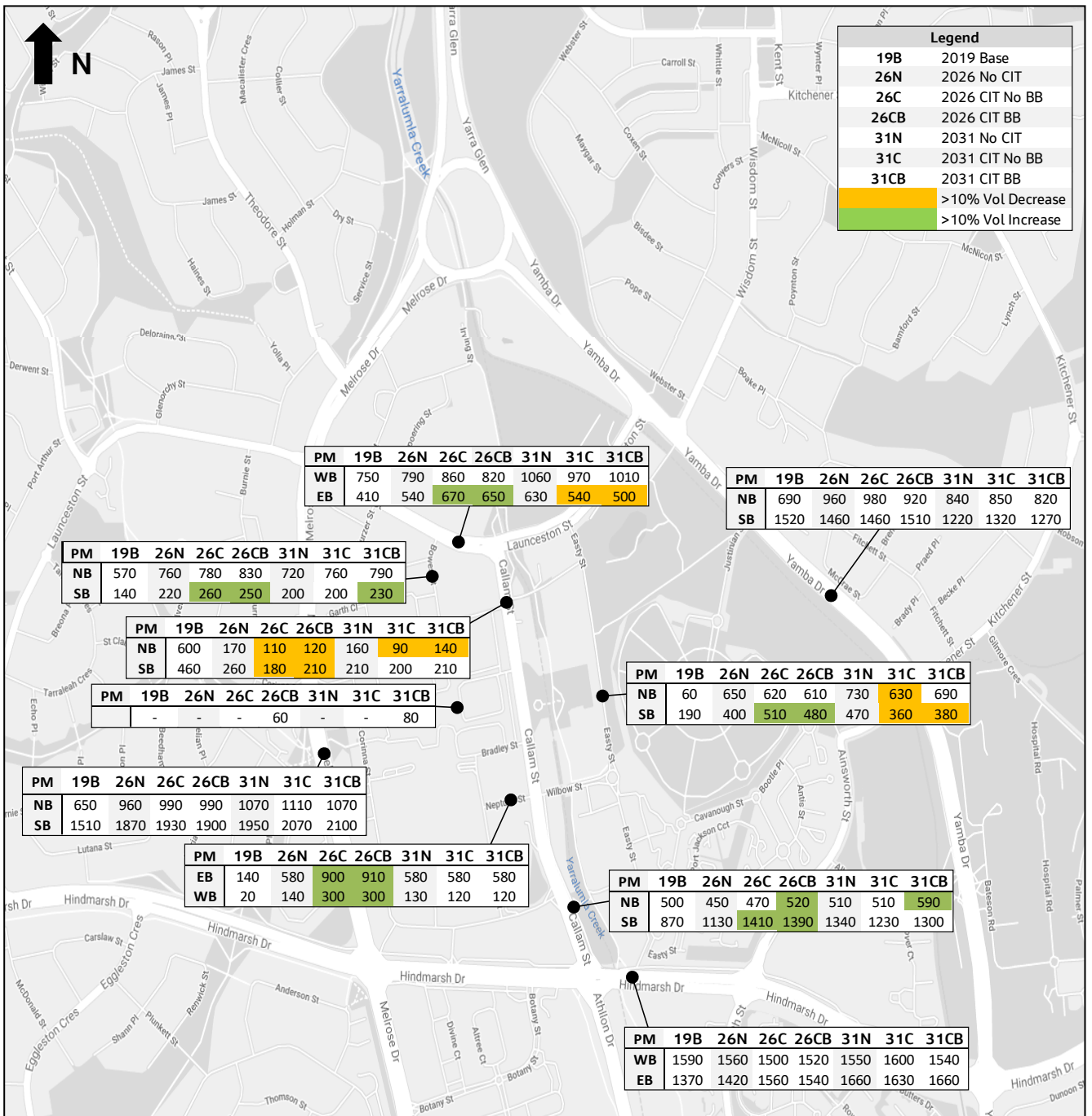


Figure 5.8: Volume Comparison Diagram (PM Peak) (rounded to the nearest 10)

5.1.4 Journey Time Comparison

A series of routes, shown in Figure 5.9, have been assessed regarding their journey time for each scenario. Table 5.9 and Table 5.10 shows the full-length route journey time comparison for the base model and future option designs in the AM and PM peaks.

- Under 2026 No CIT conditions, the journey times vary, with increased and reduced travel times experienced at different routes and peak periods. Melrose Drive (SB) experiences an average travel time saving around 1 minute. In contrast, a 2.5 minute increase in average travel time is experienced on the Melrose Drive (SB) route during the PM peak. The journey times along Yamba Drive (SB) also increase by almost 5 minutes in the PM peak.
- Under 2026 CIT No BB and CIT BB conditions, some journey time savings are observed when compared to the 2026 No CIT conditions on Melrose Drive and Yamba Drive. During the PM peak, Melrose Drive (SB)

experiences a travel time of 224 seconds and 186 seconds in the CIT No BB and CIT BB scenarios respectively, which is significantly lower than the 2026 No CIT journey time (302 seconds).

- For 2026 CIT No BB and CIT BB conditions, some journey time increases are observed on Hindmarsh Drive.
- Under 2031 No CIT conditions, the journey times continue to fluctuate. Compared to the 2026 No CIT conditions, there are some improvements to journey times observed on Melrose Drive. This improvement is likely due to the signalisation of the Yarra Glen intersection, which was previously a roundabout. Increased journey times are observed on Yamba Drive SB.
- For 2031 CIT No BB and CIT BB scenarios, there are generally some minor fluctuations compared to the 2026 No CIT conditions.

As shown, increases to journey times on periphery routes, such as Yamba Drive, Melrose Drive and Hindmarsh Drive are likely to be a result of the cumulative effect of additional developments, traffic growth and introduction of the light rail across the Woden area, rather than solely from the CIT Woden Interchange project. Issues on the strategic road network in Woden will be explored further in the Aimsun model being developed concurrently.

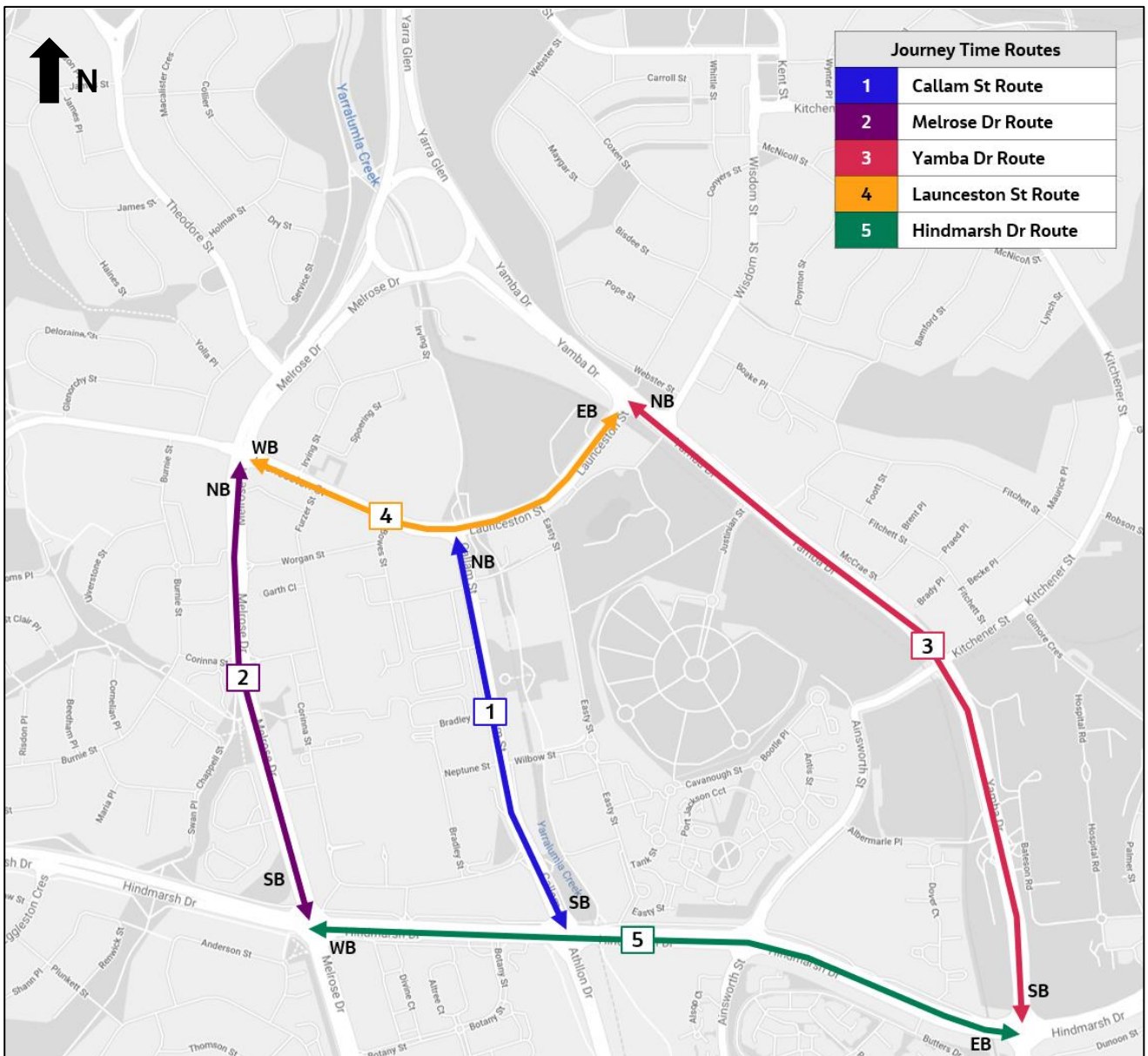


Figure 5.9: Journey Time Routes

Table 5.9: Journey Time Comparison – AM Peak (vehicles)

Journey Time Route	Distance (m)	AM Peak – Average Travel Time (sec)						
		Base 2019	2026 N	2026 C	2026 CB	2031 N	2031 C	2031 CB
Callam St (Full SB)	860	122	0	0	0	0	0	0
Callam St (Full NB)	850	133	0	0	0	0	0	0
Melrose Dr (SB)	1,010	196	139	130	129	136	167	143
Melrose Dr (NB)	990	126	99	74	77	81	90	85
Yamba Dr (SB)	1,650	227	236	234	230	255	229	247
Yamba Dr (NB)	1,630	142	286	310	293	185	236	199
Launceston St (EB)	950	189	145	217	177	163	198	254
Launceston St (WB)	950	166	186	192	194	262	225	264
Hindmarsh Dr (EB)	1,510	225	274	299	308	296	275	283
Hindmarsh Dr (WB)	1,540	167	190	177	177	178	192	181
	Reduction in journey time		Increase in journey time < 10%				Increase in journey time >10%	

Table 5.10: Journey Time Comparison – PM Peak (vehicles)

Journey Time Route	Distance (m)	PM Peak – Average Travel Time (sec)						
		Base 2019	2026 N	2026 C	2026 CB	2031 N	2031 C	2031 CB
Callam St (Full SB)	860	137	0	0	0	0	0	0
Callam St (Full NB)	850	131	0	0	0	0	0	0
Melrose Dr (SB)	1,010	147	302	224	186	144	165	188
Melrose Dr (NB)	990	93	99	102	101	84	88	88
Yamba Dr (SB)	1,650	290	583	535	546	790	740	738
Yamba Dr (NB)	1,630	139	142	143	145	124	129	125
Launceston St (EB)	950	98	183	165	160	205	170	173
Launceston St (WB)	950	171	186	197	207	227	215	221
Hindmarsh Dr (EB)	1,510	246	215	246	259	214	220	209
Hindmarsh Dr (WB)	1,540	199	185	269	256	219	247	233
	Reduction in journey time		Increase in journey time < 10%				Increase in journey time >10%	

5.2 Public Transport

5.2.1 Bus Performance

Journey time and network performance parameters were used to evaluate the performance of public buses within the study area. A sample of bus journey routes from Woden Interchange were assessed, with the routes shown below. A journey time comparison is shown in Table 5.11 and Table 5.12. Regarding bus journey times across the network, the following observations can be shown:

- Under 2026 No CIT conditions, there are some travel time savings observed for buses travelling on Callam Street between Launceston Street and Hindmarsh Drive, and from Launceston Street west to the Woden Transport Interchange, likely due to the bus priority along Callam Street. For other destinations to and from the Woden Transport Interchange, travel times are generally longer. This could be due to a number of reasons including the additional signalised intersections and increased number of private vehicles and buses in the network under future conditions.
- For the 2026 CIT No BB and CIT BB conditions, there are some minor fluctuations in travel times, with some travel time savings and minor increases in travel time. However, the increases do not exceed 10% of the 2026 No CIT travel times.
- Under 2031 No CIT conditions, bus travel times for most routes assessed are expected to take longer than the 2026 No CIT conditions, due to the extended delays in the network.
- For the 2031 CIT No BB conditions, increases to bus travel times are observed, particularly in the AM peak. Increases are observed for buses travelling on Callam Street (SB) between Launceston Street and Hindmarsh Drive, which likely to be the combined result of the increased traffic travelling to/from the CIT building, coupled with the large number of buses circulating within the area and general traffic congestion. Increases are also observed for buses travelling between the Interchange and Hindmarsh Drive, likely due to the delays discussed around Callam Street. When the Bradley-Bowes connection is included (2031 CIT BB), these bus journey times reduce, however they still remain slightly higher than the 2031 CIT No BB scenario.

In terms of bus travel times between the Woden Transport Interchange and layovers, the following observations were found for 2026 No CIT conditions:

- Bus travel times between the Interchange and Phillip Oval layover takes up to 4.3 minutes.
- Bus travel times between the Interchange and Easty Street layovers generally takes between 80-140 seconds.
- Bus travel times through the Interchange generally takes around 1-2 minutes.

Under 2026 CIT and CIT BB conditions, the following bus travel time observations can be shown:

- There is a slight increase in travel time compared to 2026 No CIT conditions in the AM peak for trips between the Interchange and Easty Street layovers.

Under 2031 No CIT conditions, the following bus travel time observations can be shown:

- Bus travel times between the Interchange and Phillip Oval layover generally takes up to 4.6 minutes.
- Bus travel times between the Interchange and Easty Street layovers generally takes between 110-160 seconds.
- Bus travel times through the Interchange generally takes up to 3 minutes.

Under 2031 CIT and CIT BB conditions, the following bus travel time observations can be shown:

- There is an increase in travel time compared to 2031 No CIT conditions in the AM peak for trips between the interchange and layovers.
- Under 2031 CIT conditions, there is an increase in the bus travel times through the Interchange, with southbound movements taking up to 8.3 minutes in the AM peak. When the Bradley-Bowes connection is included (2031 CIT BB), this bus travel time reduces to 6.3 minutes.

- The increases in bus travel times are likely to be a result of general traffic congestion, coupled with the increased traffic travelling to/from the CIT building, and the large number of buses circulating the project area.

As described in Section 4.6.1, the assumptions applied to bus movements for the peak period mean that the results shown represent the worst-case scenario. Under normal operating conditions, the number of buses travelling between the interchange and the layovers would be significantly less during these peak periods than the modelled scenarios. Additionally, this exercise has been undertaken separate to the bus scheduling, therefore some efficiencies could be gained when the bus scheduling has been planned. Further information relating to bus layover circulation and access can be found in Section 5.8.

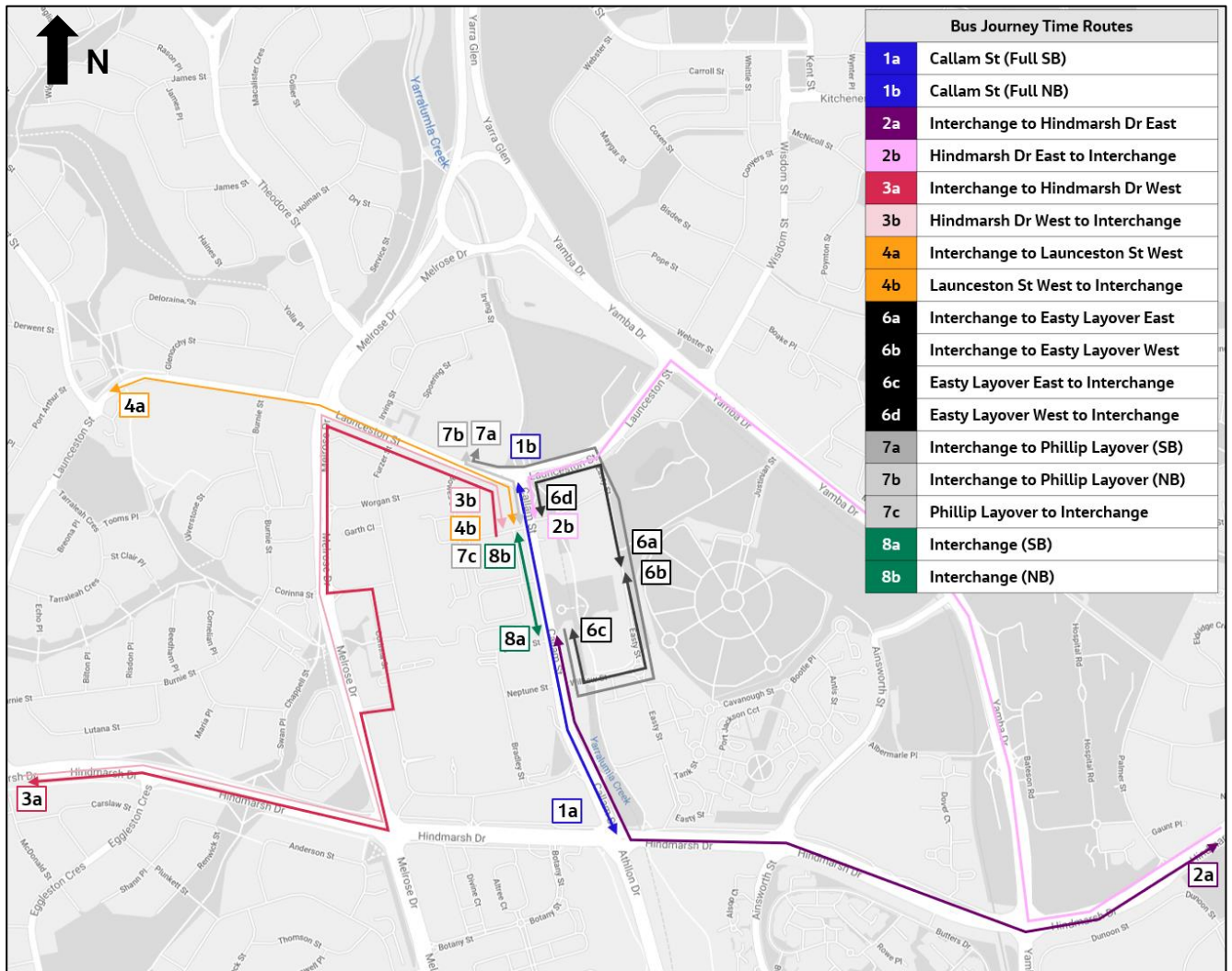


Figure 5.10: Bus Journey Time Routes

Table 5.11: Journey Time Comparison (Buses) – AM Peak

Journey Time Route	Average Travel Time (sec)						
	2019 Base	2026 N	2026 C	2026 CB	2031 N	2031 C	2031 CB
Callam St (Full SB)	315	163	157	156	164	709	571
Callam St (Full NB)	290	182	185	185	186	226	208
Interchange to Hindmarsh Dr East	514	505	525	525	473	823	699
Hindmarsh Dr East to Interchange	408	698	691	670	654	732	686
Interchange to Hindmarsh Dr West	519	520	485	512	566	560	574
Hindmarsh Dr West to Interchange	399	585	572	567	599	756	694
Interchange to Launceston St West	247	291	283	304	346	338	331
Launceston St West to Interchange	277	247	253	268	261	357	297
Interchange to Easty Layover West	-	82	125	98	112	404	252
Interchange to Easty Layover East	-	129	145	124	157	162	252
Interchange to Phillip Layover (NB)	-	99	99	102	100	99	102
Interchange to Phillip Layover (SB)	-	215	294	236	266	559	333
Easty Layover West to Interchange	-	83	116	85	110	236	178
Easty Layover East to Interchange	-	104	128	127	117	147	266
Phillip layover to Interchange	-	71	70	74	93	163	124
Interchange (NB)	-	104	100	105	101	101	104
Interchange (SB)	-	61	64	60	64	498	379
Reduction in journey time		Increase in journey time < 10%				Increase in journey time > 10%	

Table 5.12: Journey Time Comparison (Buses) – PM Peak

Journey Time Route	Average Travel Time (sec)						
	2019 Base	2026 N	2026 C	2026 CB	2031 N	2031 C	2031 CB
Callam St (Full SB)	332	183	191	192	311	429	368
Callam St (Full NB)	307	170	162	164	175	176	177
Interchange to Hindmarsh Dr East	554	615	619	592	540	668	573
Hindmarsh Dr East to Interchange	494	627	669	687	685	653	662
Interchange to Hindmarsh Dr West	482	583	584	587	649	716	609
Hindmarsh Dr West to Interchange	389	428	425	426	454	437	472
Interchange to Launceston St West	248	296	294	276	305	306	307
Launceston St West to Interchange	279	252	248	256	250	250	247
Interchange to Easty Layover West	-	109	112	114	115	116	113
Interchange to Easty Layover East	-	135	126	127	155	142	142
Interchange to Phillip Layover (NB)	-	103	101	106	97	94	92
Interchange to Phillip Layover (SB)	-	258	270	277	275	269	260
Easty Layover West to Interchange	-	105	85	87	112	108	112
Easty Layover East to Interchange	-	135	137	135	142	150	146
Phillip layover to Interchange	-	73	69	72	90	95	96
Interchange (NB)	-	99	100	102	102	100	105
Interchange (SB)	-	67	72	68	174	286	243
Reduction in journey time			Increase in journey time < 10%			Increase in journey time > 10%	

Table 5.13 and Table 5.14 shows the bus network performance comparison between the base, and option models for AM and PM peak periods. The following comparisons can be shown:

- The 2026 No CIT scenario shows an increase in buses entering the network, and an overall network total travel time and the average delay in both AM and PM peaks.
- The 2026 CIT and CIT BB scenarios shows a small increase in overall network total travel time and the average delay in the AM peak. The overall network average speed decreases by 1km/hr in the 2026 CIT scenario when compared to the 2026 No CIT AM peak scenario.
- The 2031 No CIT scenario shows a further increase in buses entering the network, and an overall network total travel time and the average delay in both AM and PM peaks. The overall network average speed decreases by 2km/hr for both peak models, when compared to the 2019 Base.
- The 2031 CIT and CIT BB scenarios shows an increase in overall network total travel time and the average delay in both AM and PM peaks. The overall network average speed decreases by 4-5km/hr and 1km/hr in the AM and PM peak models when compared to the 2031 No CIT scenario.

Overall, the increased number of trips to/from Woden, combined with the network modifications, may impact the overall performance of bus services operating within the study area. Whilst the Woden Interchange and layover areas will allow for increased services, the overall traffic growth within the Woden network means buses may experience increased delays compared to the base case.

Table 5.13: Network Performance Comparison Summary – Buses – AM Peak

Network Statistics	2019	2026 No CIT	2026 CIT No BB	2026 CIT BB	2031 No CIT	2031 CIT No BB	2031 CIT BB
Total No. Arrived	143	188	185	188	223	209	204
Total Distance (km)	375	570	566	573	671	639	641
Total Travel time (hrs)	22	31	33	32	45	65	61
Total Delay (hrs)	11	17	19	17	29	50	45
Average Delay (sec)	236	274	304	279	373	628	575
Average Speed (km/hr)	17	18	17	18	15	10	11
Total Stop	656	1,266	1,551	1,325	2,410	3,335	3,106
Average Stop	4	6	7	6	9	12	11

Table 5.14: Network Performance Comparison Summary – Buses – PM Peak

Network Statistics	2019	2026 No CIT	2026 CIT No BB	2026 CIT BB	2031 No CIT	2031 CIT No BB	2031 CIT BB
Total No. Arrived	143	188	189	188	236	237	235
Total Distance (km)	375	578	574	575	683	688	684
Total Travel time (hrs)	22	33	33	33	47	51	49
Total Delay (hrs)	11	19	19	19	30	34	32
Average Delay (sec)	236	300	298	301	376	425	408
Average Speed (km/hr)	17	17	17	17	15	14	14
Total Stop	656	1,439	1,388	1,407	2,197	2,413	2,332
Average Stop	4	6	6	6	8	8	8

5.3 'Day One' Traffic Assessment

A 'day one' traffic assessment has been conducted to assess the opening day traffic conditions for Woden transport interchange. This traffic analysis has been conducted considering the project network without light rail and the 2019 existing base demand matrices.

The following assumptions were made for this assessment:

- Yarra Glen roundabout configuration is retained from the existing base conditions (no signalisation).
- Callam Street is closed to private vehicles between Matilda Street and Bradley Street
- The Woden transport interchange is implemented
- Launceston Street/Irving Street signalisation is implemented. Furzer Street/Launceston Street is modified to become a left-in/left-out arrangement.
- The bicycle lane improvements along Furzer Street and Corinna Street have been implemented
- No growth factor was applied on the base existing traffic demand
- Updated bus numbers have been used for this assessment

As part of the assessment, two network configurations have been considered:

- **Option 1:**
 - Based on Option 4 in Arup's report "*Removal of Wilbow Street Works, Callam Street Right Turn Options*", to convert through lane to right turn lane.
 - A single right turn lane has been included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection.
 - A single lane has been incorporated on Wilbow Street eastbound between Callam Street and Easty Street Roundabout
 - No midblock signalised pedestrian crossing on Wilbow Street (between Callam Street and Easty Street) has been included
- **Option 2:**
 - Dual right turn lanes have been included from Callam Street south to Wilbow Street east, at the Callam Street/Neptune Street/Wilbow Street intersection.
 - Dual lanes have been incorporated on Wilbow Street eastbound between Callam Street and Easty Street Roundabout
 - A midblock signalised pedestrian crossing on Wilbow Street (between Callam Street and Easty Street) has been included

5.3.1 Network Statistics

Figure 5.16 shows the vehicle network performance comparison between the base, and option models for AM and PM peak periods. The following comparisons can be shown:

- The 2022 Day One Option 1 scenario shows a slight increase in vehicles entering the network, and an overall network total travel time and the average delay in both AM and PM peaks. The overall network average speed remains the same in both peaks.
- The 2022 Day One Option 2 scenario shows a similar number of vehicles entering the network in the AM and PM peaks as the 2022 Day One Option 1 scenario. When compared to the 2019 Base, the overall network average speed decreases by 1km/hr the PM peak model.

Overall, the network in 2022 Day One conditions are generally shown to perform similarly to the 2019 Base under both option scenarios.

Figure 5.11: Network Statistics – ‘Day One’ Comparison

Network Statistics	Base – 2019		‘Day One’ Option 1		‘Day One’ Option 2	
	AM	PM	AM	PM	AM	PM
Total No. Arrived (released trips)	13,914	13,182	14,372	13,288	14,477	13,398
Total Distance (km)	35,507	34,116	36,063	33,321	36,050	33,293
Total Travel time (hrs)	1,266	1,075	1,231	1,050	1,232	1,062
Total Delay (hrs)	679	502	632	494	633	507
Average Delay (sec)	158	126	143	123	142	125
Average Speed (km/hr)	29	32	29	32	29	31
Total Stop	54,425	39,174	53,926	40,435	53,677	41,993
Average Stop	3.49	2.72	3.39	2.79	3.35	2.87
Latent demand (unreleased trips)	165	96	12	15	20	14

5.3.2 Intersection LoS

The average delay and level of service (LoS) was used to compare the intersection performance between the two network configurations. For all intersections, the average delay over all movements was used to define the LoS of the intersection. Table 5.15 presents a comparison between the Base Case and Options considered, with Figure 5.12 and Figure 5.13 further highlighting the intersection LoS for Option 1 and Option 2 respectively for the AM and PM peak delays.

The difference in AM/PM peak LoS between the 2019 Base and both Option 1 and Option 2 shows the following outcomes:

- The Callam Street/Matilda Street intersection when configured with Option 1 performs slightly better experiencing LoS B in the AM peak whereas Option 2 experiences an LoS C. All other intersections in the study area operate at the same LoS.
- In both peak periods, key intersections directly located within the CIT Woden Interchange project area generally experience some increases in delay between the 2019 base case scenario and the two options considered. All key intersections operate with an LoS C or better.
- Intersections within the surrounding network that are generally expected to experience an LoS E or worse include:
 - Yamba Drive/Hindmarsh Drive (AM Peak only)
 - Melrose Drive/Hindmarsh Drive (AM Peak only)

Table 5.15: Intersection LoS Comparison

Intersection	AM			PM		
	Base	2022 Option 1	2022 Option 2	Base	2022 Option 1	2022 Option 2
Key Intersections						
Wilbow St Roundabout	A	A	A	A	A	A
Launceston St/Callam St	B	B	B	C	B	B
Callam St/Bradley St	B	A	A	A	C	C
Callam St/Wilbow St/Neptune St	C	C	C	B	C	C
Callam St/Corinna St	A	B	B	B	B	B
Launceston St/Bowes St	A	B	B	A	B	B
Launceston St/Easty St	A	B	B	A	B	B
Callam St/Matilda St	A	B	C	A	C	C
Surrounding Road Network Intersections						
Yarra Glen Roundabout	C	C	C	A	B	B
Melrose Dr/Theodore St	B	A	A	A	A	A
Melrose Dr/Launceston St	D	C	C	C	C	C
Yamba Dr/Launceston St	D	C	C	C	C	C
Yamba Dr/Wisdom St	C	C	C	B	B	B
Yamba Dr/Hindmarsh Dr	D	E	E	E	D	D
Callam St/Hindmarsh Dr/Athllon Dr	D	D	D	D	C	C
Melrose Dr/Hindmarsh Dr	E	E	E	D	D	D
Yamba Dr/Kitchener St	D	D	D	D	D	D
Yamba Dr/Bateson Rd	A	C	C	C	D	D
Hindmarsh Dr/Ainsworth St	D	C	C	C	C	C
Hindmarsh Dr/Botany St	B	A	A	B	A	A
Hindmarsh Dr/Ball St	A	B	B	B	A	A
Melrose Dr/Worgan St	B	B	B	B	A	A
Melrose Dr/Corinna St	B	A	A	A	A	A
Melrose Dr/Brewer St	A	A	A	B	B	B
Launceston St/Irving St/Furzer St	A	B	B	A	B	B

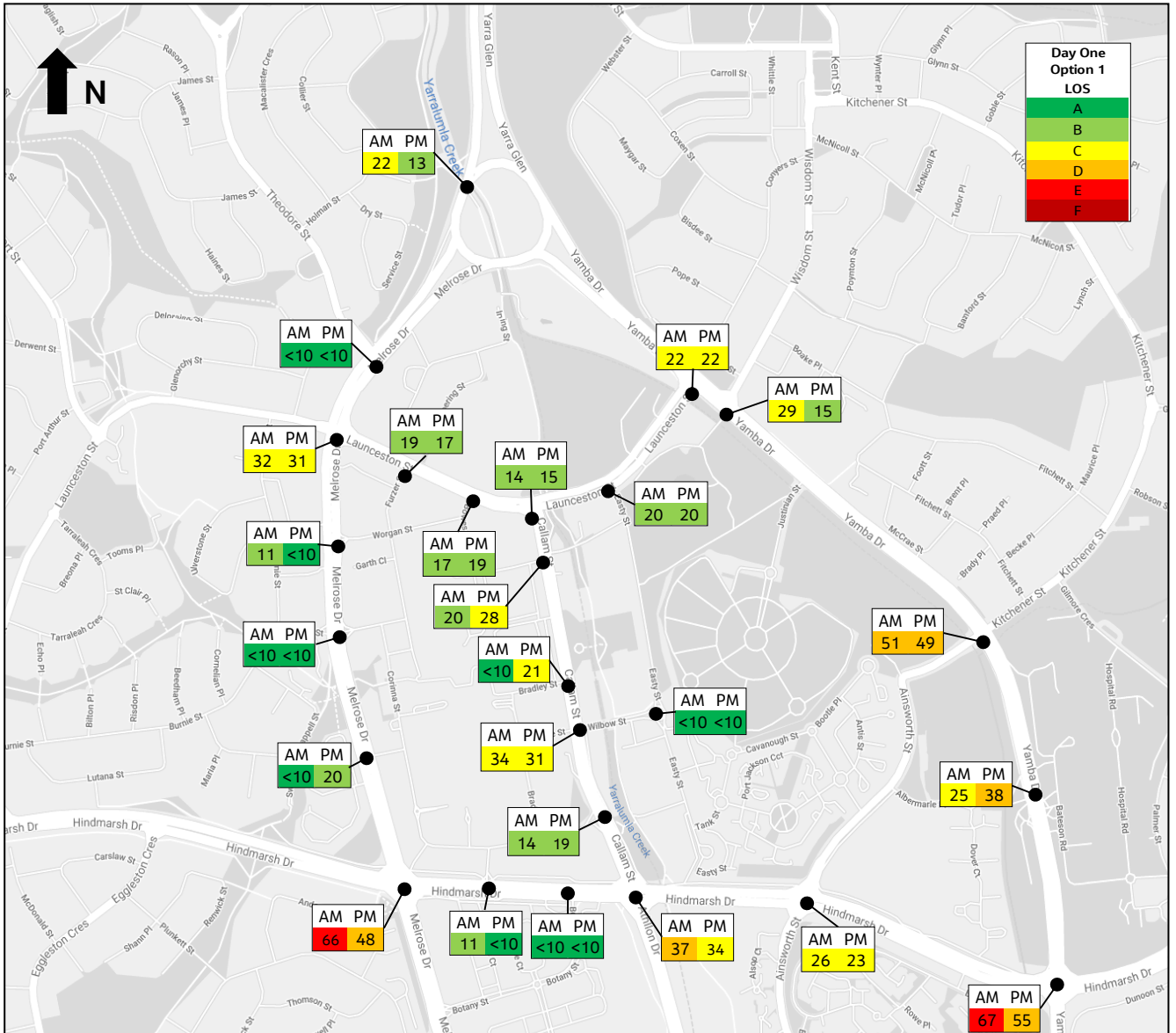


Figure 5.12: Day One – Option 1 Intersection LoS

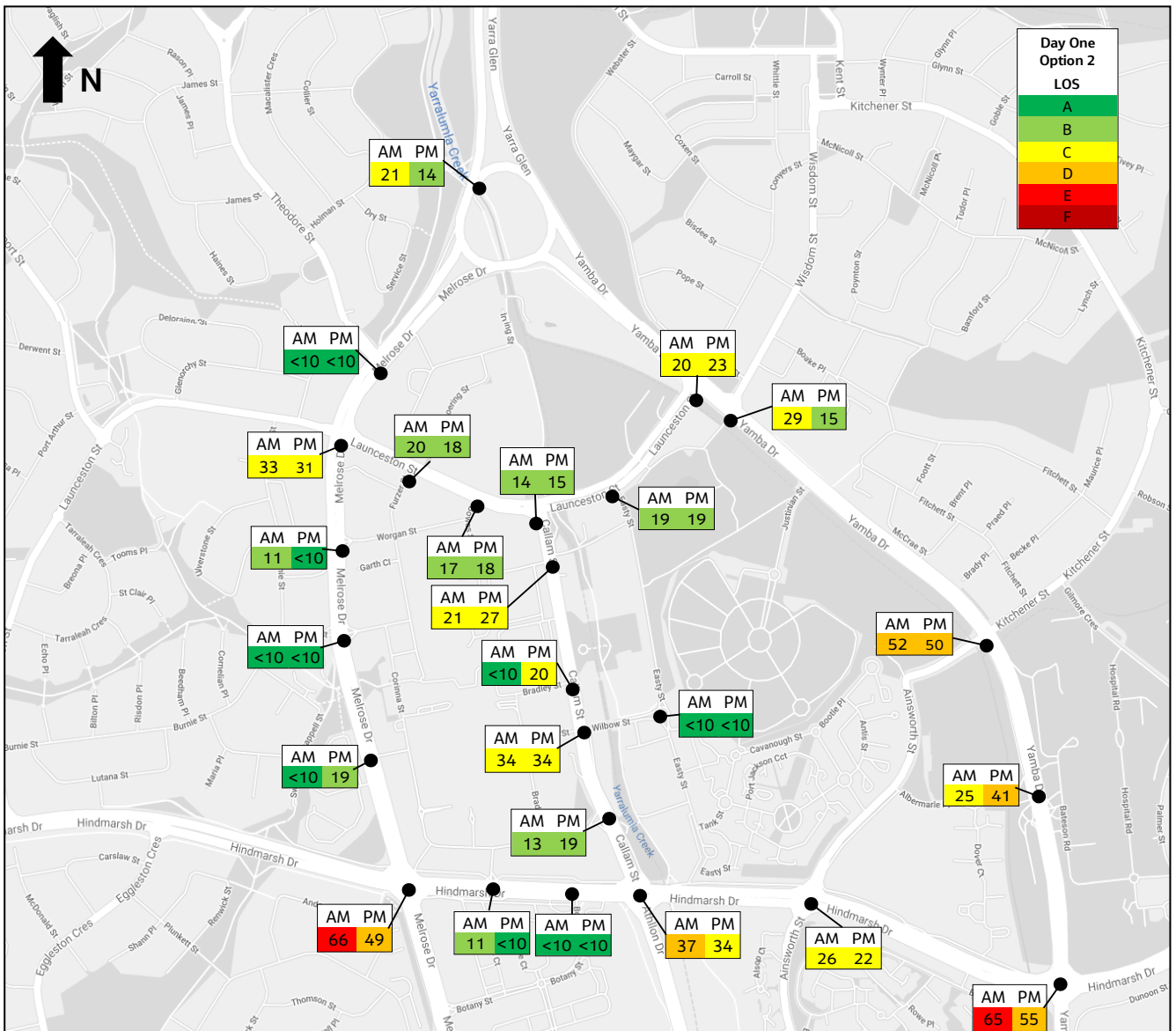


Figure 5.13: Day One – Option 2 Intersection LoS

5.3.3 Traffic Diversions

As shown in Figure 5.14 and Figure 5.15, the road network assessment shows some differences in traffic flows along key roads in the study area between the base and 2022 Day One scenarios. The volume change analysis shows the following outcomes when compared to the 2019 Base:

- There are decreases in traffic volume observed along Callam Street (north), due to the closure of Callam Street to private vehicles between Matilda Street and New Bradley Street. Vehicles travelling along Callam Street North in the future scenarios are mostly buses.
- Decreases are also observed on Launceston Street, Callam Street (south) and Hindmarsh Drive. This is likely due to the diversion of traffic away from Callam Street (north).
- There is an increase in volumes observed on Easty Street. This increase is likely a combination of the vehicles re-routing from Callam Street, as well as bus services travelling to/from Easty Street Bus Layover
- There are increases observed on Yamba Drive and Melrose Drive. As a result of vehicles who previously travelled north or south via Callam Street, a large proportion of traffic have instead opted to take Melrose Drive or Yamba Drive.

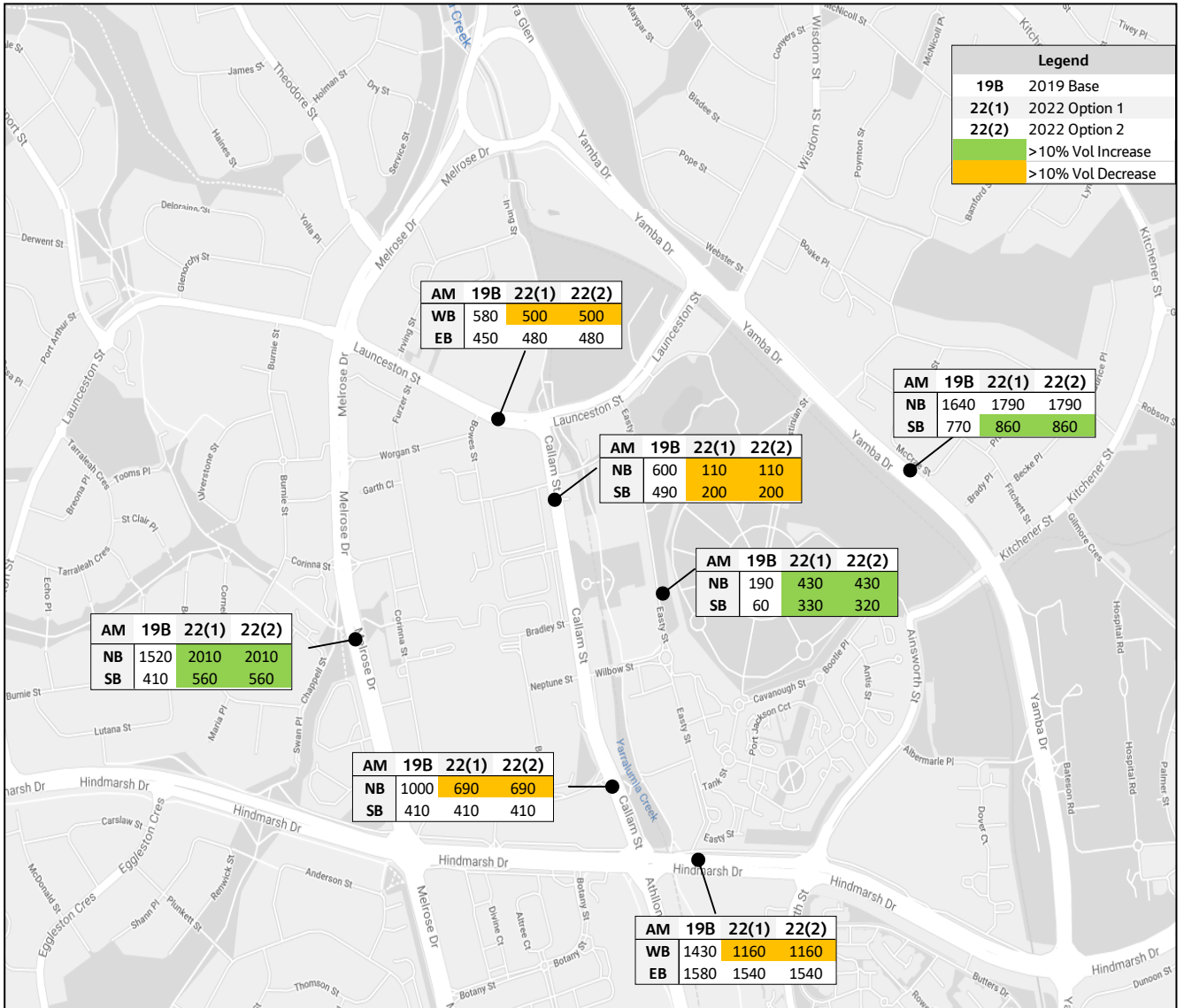


Figure 5.14: Day One – Option 1 and 2, Volume Change Comparison AM Peak (rounded to the nearest 10)

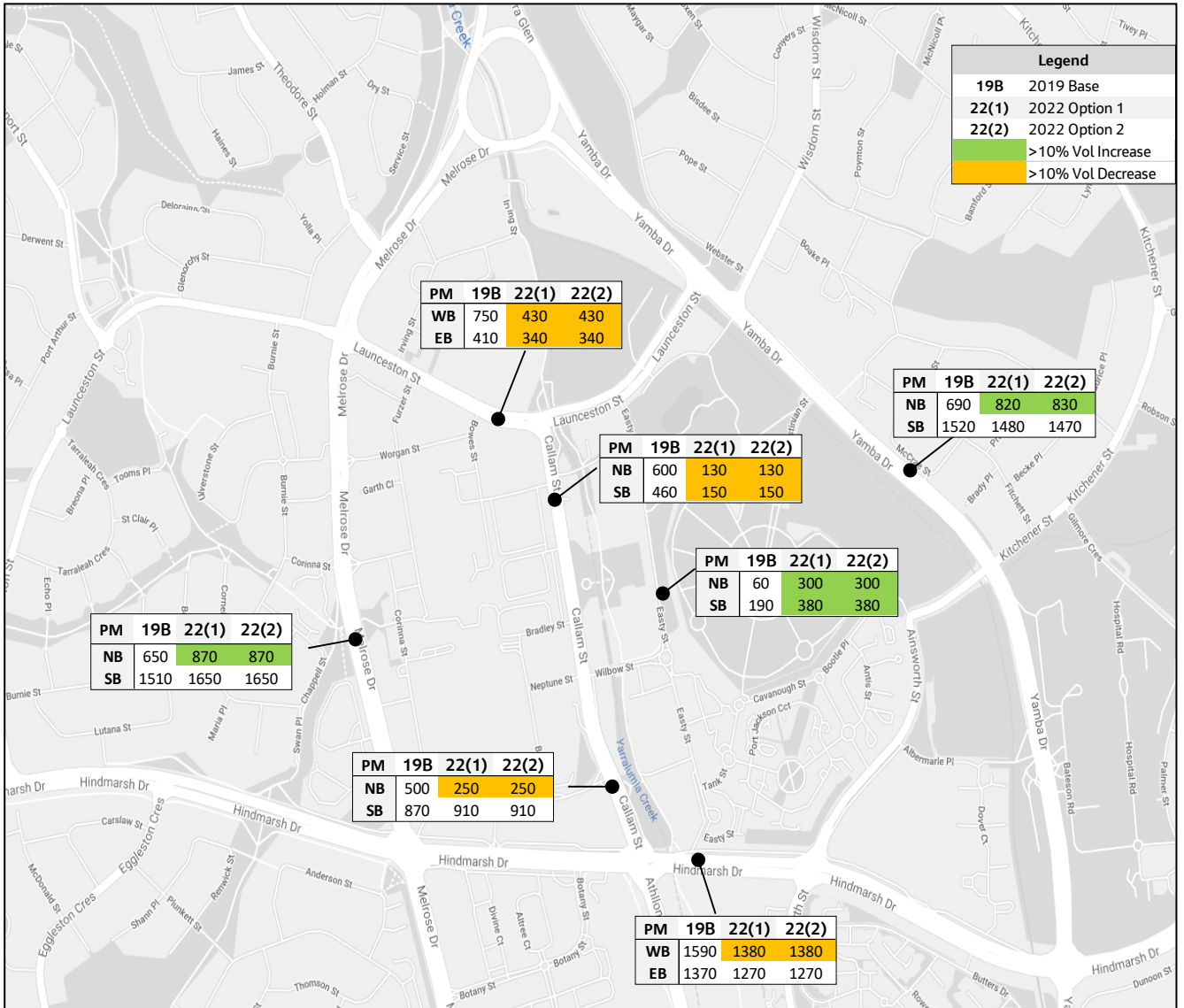


Figure 5.15: Day One – Option 1 and 2, Volume Change Comparison PM peak (rounded to the nearest 10)

5.3.4 Journey Time

Table 5.16 shows the full-length route journey time comparison for the base model and 2022 Day One options in the AM and PM peaks. Overall, no significant changes on the travel times are observed, when compared to the existing base conditions. Travel times on Yamba Drive have increased slightly due to the diverted traffic during the PM peak.

Table 5.16: Journey Time Comparison (vehicles)

Journey Time Route	Distance (m)	AM Peak – Average Travel Time (sec)			PM Peak – Average Travel Time (sec)		
		Base 2019	Day One Option 1	Day One Option 2	Base 2019	Day One Option 1	Day One Option 2
Callam St (Full SB)	860	122	-	-	137	-	-
Callam St (Full NB)	850	133	-	-	131	-	-
Melrose Dr (SB)	1,010	196	129	129	147	135	136
Melrose Dr (NB)	990	126	74	75	93	95	95
Yamba Dr (SB)	1,650	227	192	194	290	365	388
Yamba Dr (NB)	1,630	142	255	255	139	139	140
Launceston St (EB)	950	189	137	133	98	139	141
Launceston St (WB)	950	166	157	163	171	153	151
Hindmarsh Dr (EB)	1,510	225	284	275	246	181	179
Hindmarsh Dr (WB)	1,540	167	170	171	199	157	155
Reduction in journey time			Increase in journey time < 10%			Increase in journey time > 10%	

5.3.5 Bus Performance

The bus performance statistics show that generally, there is a significant increase in the number of buses arriving during the 'Day One' scenarios, to reflect the increase in bus services after opening day.

Table 5.17: Journey Time Comparison (Buses)

Journey Time Route	AM Peak – Average Travel Time (sec)			PM Peak – Average Travel Time (sec)			
	Base 2019	Day One Option 1	Day One Option 2	Base 2019	Day One Option 1	Day One Option 2	
Callam St (Full SB)	315	175	167	332	174	173	
Callam St (Full NB)	290	173	172	307	169	164	
Interchange to Hindmarsh Dr East	514	725	715	554	826	825	
Hindmarsh Dr East to Interchange	408	629	640	494	555	550	
Interchange to Hindmarsh Dr West	519	496	508	482	534	538	
Hindmarsh Dr West to Interchange	399	447	439	389	412	409	
Interchange to Launceston St West	247	386	357	248	328	325	
Launceston St West to Interchange	277	239	233	279	242	245	
Interchange to Easty Layover	-	436	438	-	432	434	
Easty Layover to Interchange	-	281	280	-	286	282	
Interchange to Phillip Layover (SB)	-	227	226	-	225	220	
Interchange to Phillip Layover (NB)	-	123	125	-	140	140	
Phillip Layover to Interchange	-	70	70	-	70	69	
Reduction in journey time			Increase in journey time < 10%			Increase in journey time > 10%	

Table 5.18: Network Performance Comparison Summary - Buses

Network Statistics	Base – 2019		Day One Option 1		Day One Option 2	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Total No. Arrived	143	159	191	191	191	191
Total Distance (km)	375	438	585	589	586	589
Total Travel time (hrs)	22	23	31	31	31	31
Total Delay (hrs)	11	9	16	16	16	16
Average Delay (sec)	236	191	259	256	258	253
Average Speed (kph)	17	19	19	19	19	19
Total Stop	656	601	1,128	1,103	1,136	1,127
Average Stop	4	3	5	5	5	5

5.3.6 Queue Length Comparison

The following comparison can be made for the Day One options scenarios, with a particular focus on the Callam Street (South) right turn into Wilbow Street.

Day One Option 1:

- AM peak – The maximum queue for the northbound right turn from Callam Street (south) into Wilbow Street (east) extends up to the upstream intersection (spillback up to Callam Street/Corinna Street). The average queue length however is approximately 50m, which is contained within the available storage length.
- PM Peak – The maximum and average queues for the northbound right turn from Callam Street (south) into Wilbow Street (east) are contained within the available storage length.

Day One Option 2:

- AM and PM peaks – The maximum and average queues for the northbound right turn from Callam Street (south) into Wilbow Street (east) are contained within the available storage length.

Queues length screenshots as obtained from Vissim can be found in Appendix G.

Table 5.19: Queue Length Comparison

Intersection Name	Approach Name	Movement	Design Lane Length (m)	AM Peak		PM Peak	
				Avg. Queue Length (m)	Max. Queue Length (m)	Avg. Queue Length (m)	Max. Queue Length (m)
2022 Day One Option 1 – Wilbow Street Single Lane							
Callam St / Wilbow St / Neptune St	Callam St (South)	Left/ Through/ Right	180	52	169	37	77
	Wilbow St (East)	Left/ Right	150	15	114	17	188
2022 Day One Option 2 – Wilbow Street Double Lane							
Callam St / Wilbow St / Neptune St	Callam St (South)	Left/ Through/ Right	180	23	87	21	43
	Wilbow St (East)	Left/ Right	150	17	126	15	164

5.3.7 Option Testing in 2026

As part of the initial model run for 2026 Option – No LRT, the single lane (Option 1) and double lane (Option 2) arrangements were also tested. The single lane arrangement resulted in extended queuing observed for northbound vehicles heading towards Wilbow Street from Callam Street. Due to the delays experienced in the model, this option was discontinued, and instead, a duplication of the right-turn lane into Wilbow Street was used for the 2026 option scenarios.

5.3.8 Day One Scenario Summary

Overall, during both AM and PM peaks for the 'Day One' Scenarios, the delays and LoS of the intersections did not have significant impacts on the intersections in the study compared to the 2019 base model. There were a few intersections on Yamba Drive which experienced additional delays due to increased traffic resulting from the changes in travel patterns owing to the closure of Callam Street to private vehicles.

Whilst the single lane Wilbow Street option still operates satisfactorily in terms of delays and LoS at Callam Street/Wilbow Street/Neptune Street, Option 1 results in longer average and maximum queues compared to Option 2. As shown, during the AM peak, the maximum queue for the northbound right turn from Callam Street (south) into Wilbow Street (east) extends up to the upstream intersection (spillback up to Callam Street/Corinna Street). Additionally, the single lane arrangement tested in 2026 Option – No LRT resulted in extended queuing observed for northbound vehicles heading towards Wilbow Street from Callam Street.

5.4 Active Travel

The proposed development is expected to provide additional active transport infrastructure within the subject site, enhancing the active transport network within Woden. Active transport users may benefit from the proposed developments, including additional signalised crossings and provisions at redeveloped intersections, across the proposed Woden Interchange and along the Yarralumla Creek. The improved amenity for pedestrians and cyclists using the facilities for travel or recreation will enhance Woden's active transport network and benefit the surrounding environment. A summary of additional infrastructure that the site will be connecting into is shown below in Figure 5.16.

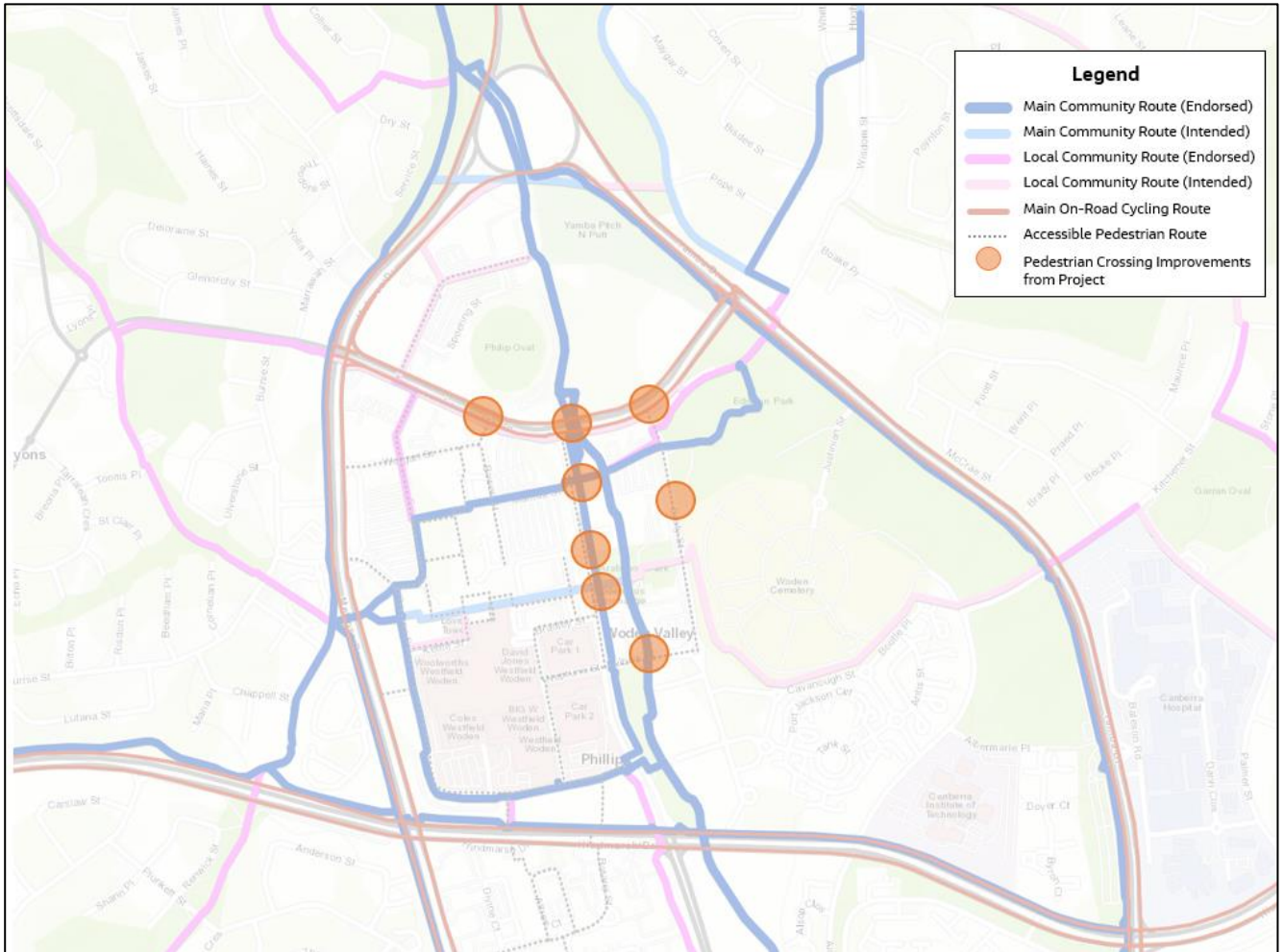


Figure 5.16: Pedestrian Improvement Locations from Project (Source: Active Infrastructure, 2020)

Public transport users, particularly those accessing a transport interchange, are likely to make use of bicycle parking, as this increases the catchment of the public transport services and reduces the need to drive and park a car near the stop. It is anticipated that bicycle parking facilities will be required for the design of the Woden Transport Interchange. Bicycle parking facilities are proposed to be located on either side of Callam Street within the proposed landscaped areas, in the form of BikeNRide bicycle storage cages (see example in Figure 5.17). Such bicycle storage cages usually have the capacity for 24 bikes to be parked in each cage. The provision of the number of bike parking spaces required for Woden Transport Interchange will be investigated further during the detailed design stage.



Figure 5.17: Example of bike cage (Source: Transport Canberra, 2020)

5.5 Parking and Service Vehicles

5.5.1 CIT Woden Campus

A parking assessment was undertaken by MPC with options developed based on anticipated parking demand at the CIT Woden Campus. The assessment demonstrated there will be a demand of 150 car parking spaces for the use of CIT. The current MPC proposal is to provide 70 spaces on campus (Underground – Level 1 Parking) leaving 80 parking spaces required off-campus to meet the Parking and Vehicular Access General Code (PVAGC) requirement. A reduction in the number of on campus spaces is proposed due to the integration of CIT Campus with the Woden transport interchange.

As described in the MPC assessment, 80 car parking spaces required for the project are met through:

- Existing off campus Car Parking facilities within a 200m of the CIT Campus
- Reduction in demand of parking spaces due to increase use of public transport in proximity of the CIT Campus – Woden to the future Bus/ Light Rail Interchange; and
- Reduction by providing additional active travel provision for bicycle parking and end of trip facilities within the project

5.5.2 Easty Street Layover

As part of works for the Easty Street bus layover, the removal of some carparking spaces within the informal gravel car park located on the Western side of Easty Street (shown as W7 in Figure 3.13) is proposed. This is estimated to include approximately 7 formal spaces, and 58 informal spaces to be removed. To address the impact on surrounding developments, this will be managed by TCCS on a case-by-case basis depending on development intensity and timing.

5.6 Safety

The closure of Callam Street between Matilda Street and Bradley Street may see benefits to road safety, with improvements to safety for pedestrians travelling in the area. Crash data analysed over a five-year study period (January 2015 – December 2019 inclusive) found that 23 crashes were recorded along Callam Street, with a further 24 crashes associated with the Callam Street / Corinna Street intersection and 23 at the Callam Street / Neptune Street / Wilbow Street intersection. These intersections fall outside the road closures required for the Woden transport interchange, however the inability for vehicles to travel between Launceston Street and Hindmarsh Drive via Callam Street may reduce the likelihood of incidents in these areas.

5.7 Environmental

A preliminary quantitative assessment of the future 'on-road' road traffic noise section is being undertaken by Arup and included in the Development Application report. This noise assessment focuses on the increased number of buses on roads with currently very low or negligible heavy vehicle traffic such as Easty Street and Wilbow Street.

The walking and cycling infrastructure included in the project can encourage and move large numbers of people across dense environments. They also emit zero air pollution, greenhouse gas emissions and noise while improving the vibrancy of places.

5.8 On-site Circulation and Access Assessment

5.8.1 Bus Layover Circulation and Access – Phillip Oval

The circulation and access to Phillip Oval Layover includes the following characteristics:

- For buses travelling north through the Woden Transport Interchange, continuing north on Callam Street, turning left onto Launceston Street and entering via Launceston Street provides access to the layover.
- Buses travelling south through the Woden Transport Interchange will need to turn left onto Wilbow Street, left onto Easty Street, left onto Launceston Street before turning right into the Phillip Oval layover.

Depending on the direction that the buses will be required to take to/from the Woden Transport Interchange, via Phillip Oval Bus Layover, the following bus movements may be observed:

- **Buses travelling to/from north of Interchange:** If buses are travelling to and from the north via Launceston Street, they will be required to travel via Callam Street and Easty Street twice to make their return journey, as shown in Figure 5.18. These bus movements provide an inefficient route and should be further considered to optimise the Woden bus network planning.
- **Buses travelling to/from south of Interchange:** If buses are travelling to and from the south via Callam Street (south), they will be able to travel directly via Callam Street, as shown in Figure 5.19. These bus movements provide an efficient route to be considered for Woden bus network planning.
- **Buses travelling from north, to south of Interchange:** If buses are travelling from the north to reach the Interchange, then travelling south for its next route, the buses will be able to travel directly via Callam Street, as shown in Figure 5.20. These bus movements provide an efficient route to be considered for Woden bus network planning.
- **Buses travelling from south, to north of Interchange:** If buses are travelling from the south to reach the Interchange, then travelling north for its next route, the buses will need to travel via Wilbow Street and Easty Street, as shown in Figure 5.21.



Figure 5.18: Buses travelling to/from north of Interchange, via Phillip Oval Layover.

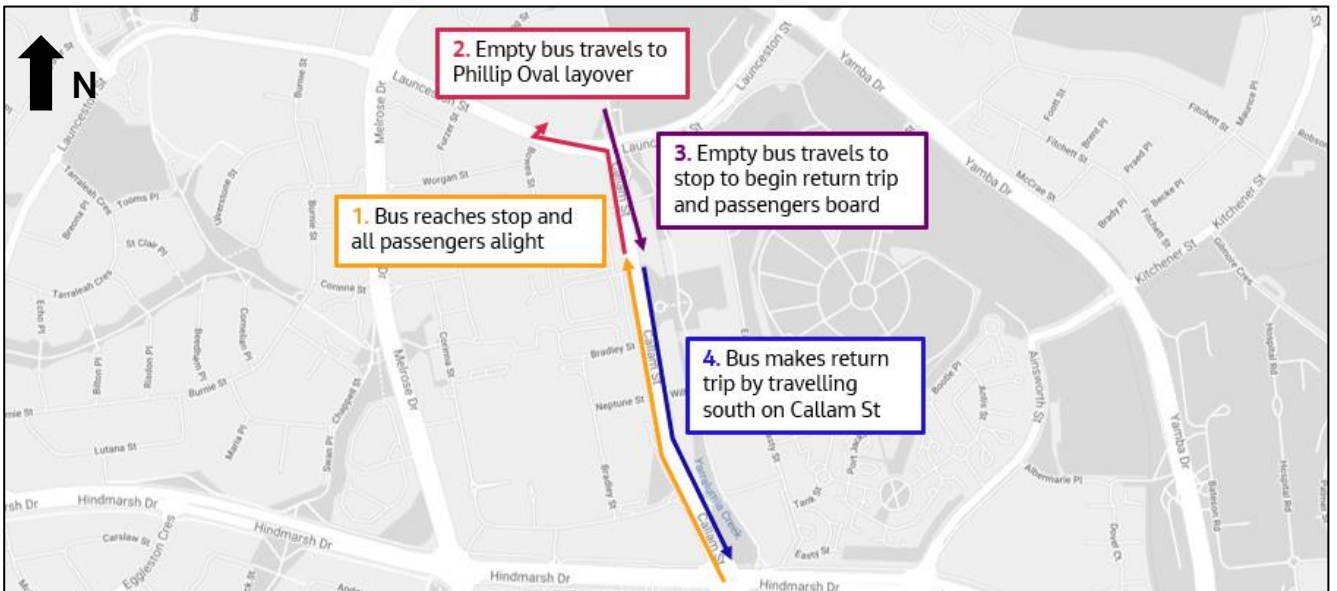


Figure 5.19: Buses travelling to/from south of Interchange, via Phillip Oval Layover.

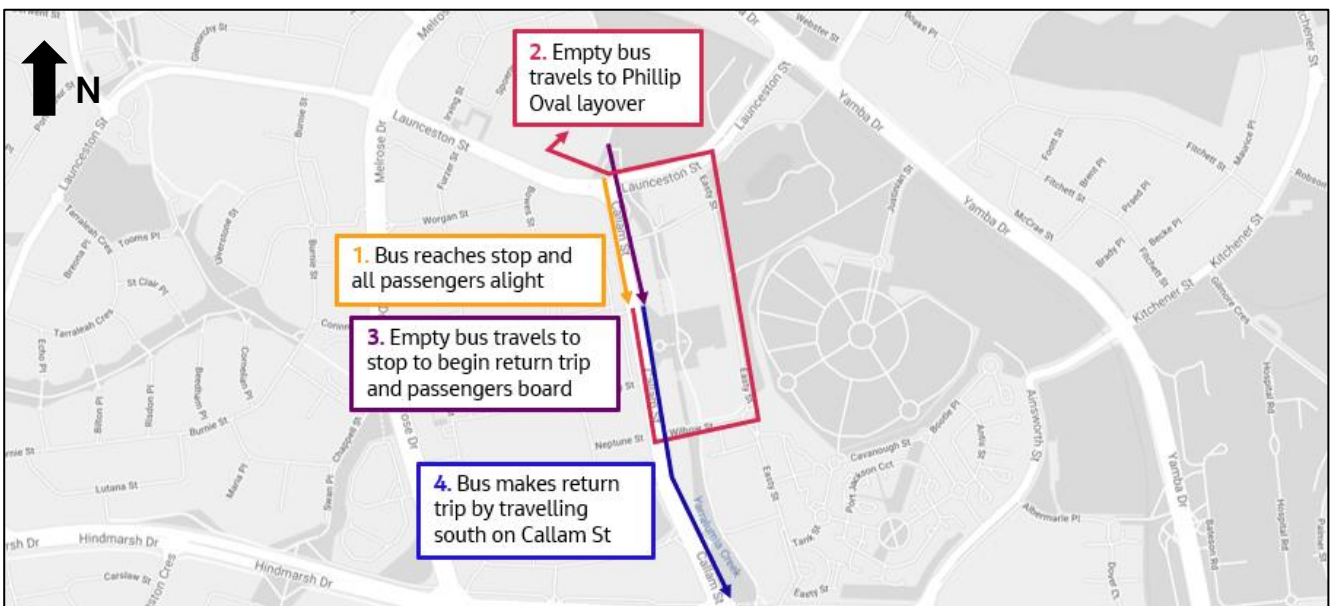


Figure 5.20: Buses travelling from north to south of Interchange, via Phillip Oval Layover.

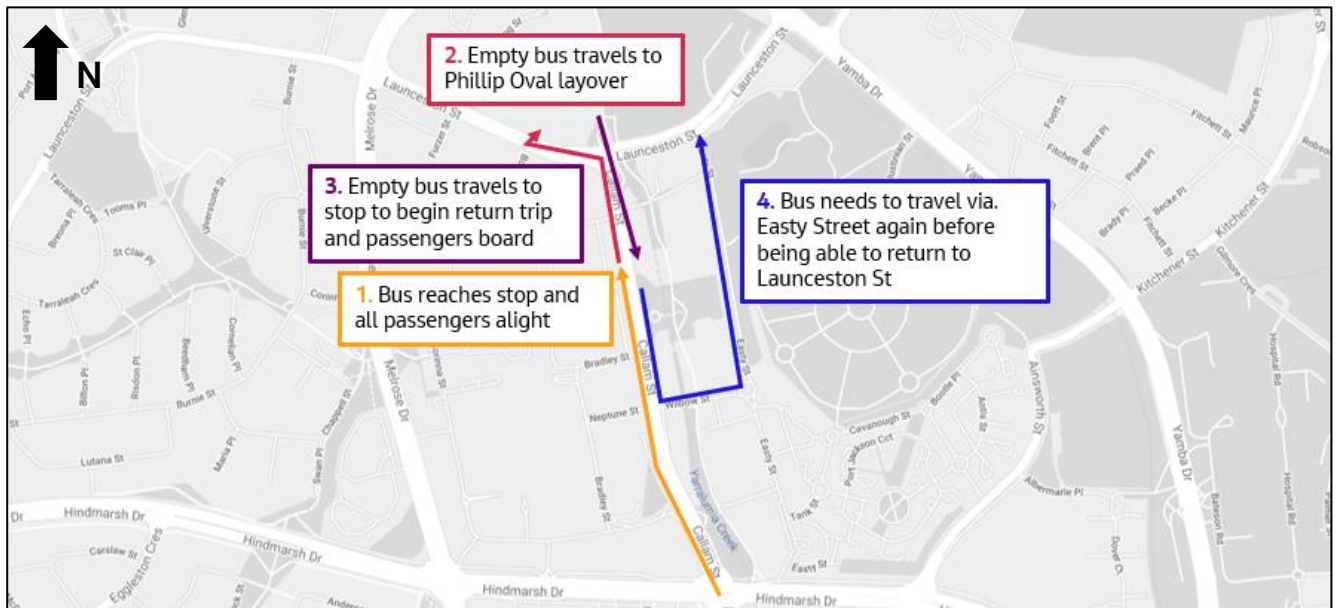


Figure 5.21: Buses travelling from south to north of Interchange, via Phillip Oval Layover

5.8.2 Bus Layover Circulation and Access – Easty Street

The circulation and access to Easty Street Layovers include the following characteristics:

- For buses travelling north through the Woden Transport Interchange, a right turn onto Launceston Street, then another right turn onto Easty Street enables buses to access the eastern layover.
- For buses travelling south through the Woden Transport Interchange, a left turn onto Wilbow Street, then another left turn onto Easty Street enables buses to access the western layover.

Depending on the direction that the buses will be required to take to/from the Woden Transport Interchange, via Easty Street Bus Layover, the following bus movements may be observed:

- **Buses travelling to/from north of Interchange:** If buses are travelling to and from the north via Launceston Street, they will be required to travel via Callam Street and Easty Street twice to make their return journey, as shown in Figure 5.22. These bus movements provide an inefficient route and should be further considered to optimise the Woden bus network planning.
- **Buses travelling to/from south of Interchange:** If buses are travelling to and from the south via Callam Street (south), they will be required to travel via Callam Street and Easty Street twice to make their return journey, as shown in Figure 5.23. These bus movements provide an inefficient route and should be further considered to optimise the Woden bus network planning.
- **Buses travelling from north, to south of Interchange:** If buses are travelling from the north to reach the Interchange, then travelling south for its next route, the buses will be able to travel directly via Callam Street, as shown in Figure 5.24. These bus movements provide an efficient route to be considered for Woden bus network planning.
- **Buses travelling from south, to north of Interchange:** If buses are travelling from the south to reach the Interchange, then travelling north for its next route, the buses will be able to travel directly via Callam Street, as shown in Figure 5.25. These bus movements provide an efficient route to be considered for Woden bus network planning.

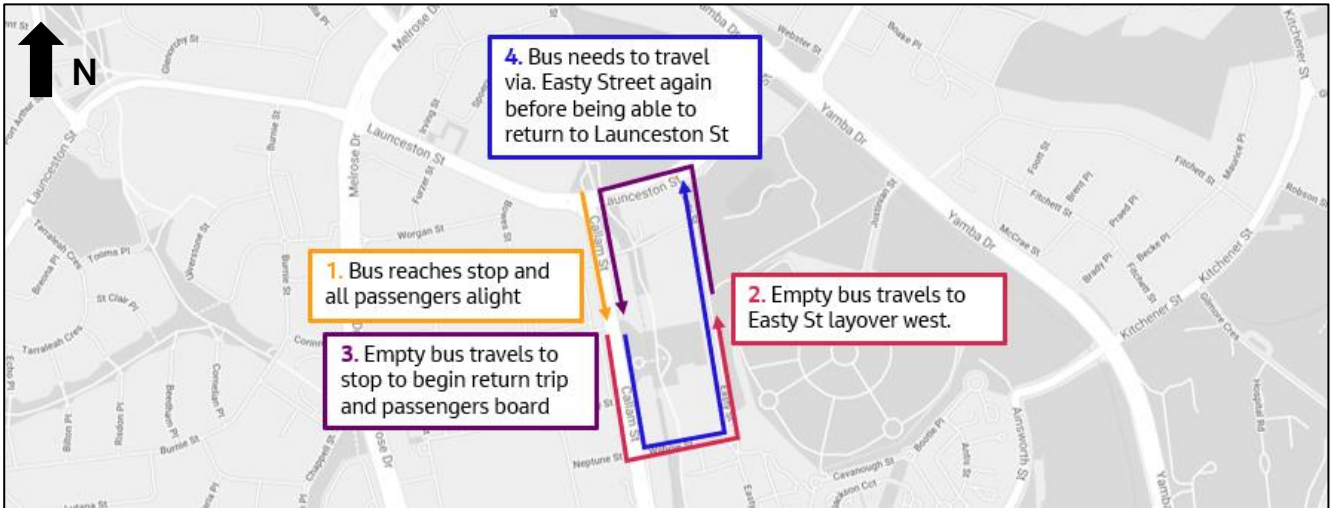


Figure 5.22: Buses travelling to/from north of Interchange, via Easty Street Layover west.

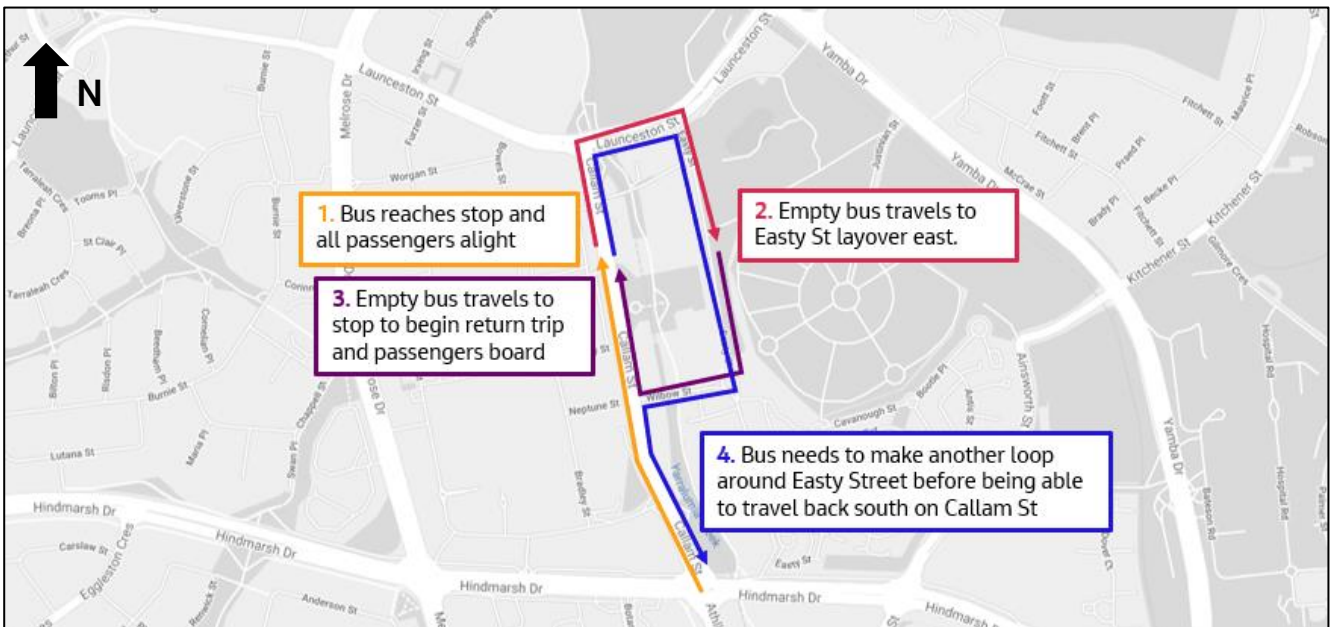


Figure 5.23: Buses travelling to/from south of Interchange, via Easty Street Layover east.

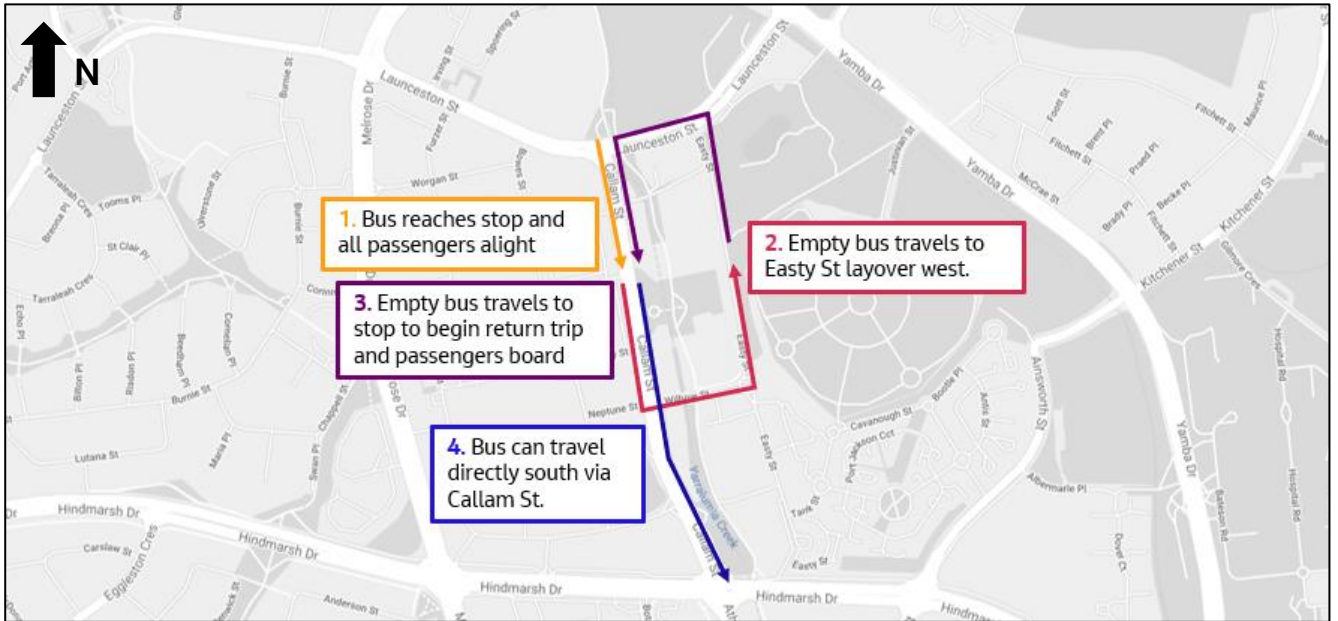


Figure 5.24: Buses travelling from north to south of Interchange, via Easty Street Layover west.

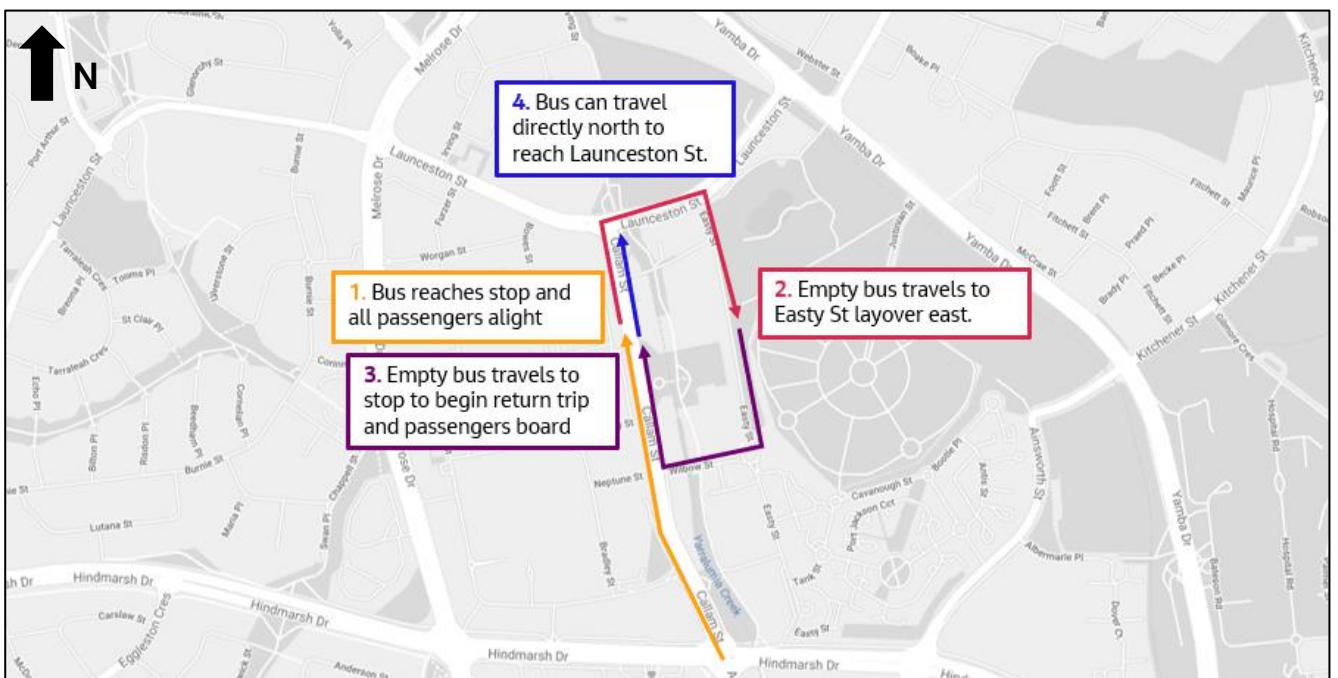


Figure 5.25: Buses travelling from south to north of Interchange, via Easty Street Layover east

As shown, the configuration of the interchange and layovers means that the routing of buses within the Woden study area can strongly influence the level of congestion experienced along key roads such as Callam Street, Wilbow Street and Easty Street. The bus routing is a contributing factor to the increase in bus travel times as observed in Section 5.2.1. Investigating maximising the use of efficient routes for each bus layover should be considered to minimise bus congestion anticipated in the area.

5.8.3 Callam Street Interchange

The proposed Woden Transport Interchange on Callam Street will include a total of 18 on-street, kerbside bus stops. 9 stops will be available in both the northbound and southbound direction along Callam Street, through stops on the eastern and western sides of the outer carriageways and a central, separated transit corridor, as shown in the typical cross section presented in Figure 5.26. Buses will traverse through the interchange in one-direction, with buses using the central transit corridor required to stop in-line with no ability to overtake each other. Bus stops along the outer carriageway are suited for use by local buses with the indented or off-line stopping provision enabling vehicles to overtake each other.

The design of the interchange provides for the future extension of light rail services to Woden along Callam Street, with Figure 5.27 demonstrating a typical cross section of the proposed Woden Interchange with light rail services. The central transit corridor is to be replaced by tracks in both directions to enable light rail operations, with local bus services retained in both the northbound and southbound direction along Callam Street.

The proposed configuration provides convenient access to commuters for future light rail services, with crossing provisions within the interchange to enable pedestrians to traverse between the eastern and western sides. The interchange is approximately 250m long between the northernmost and southernmost stops – a relatively long distance for transfers between services.

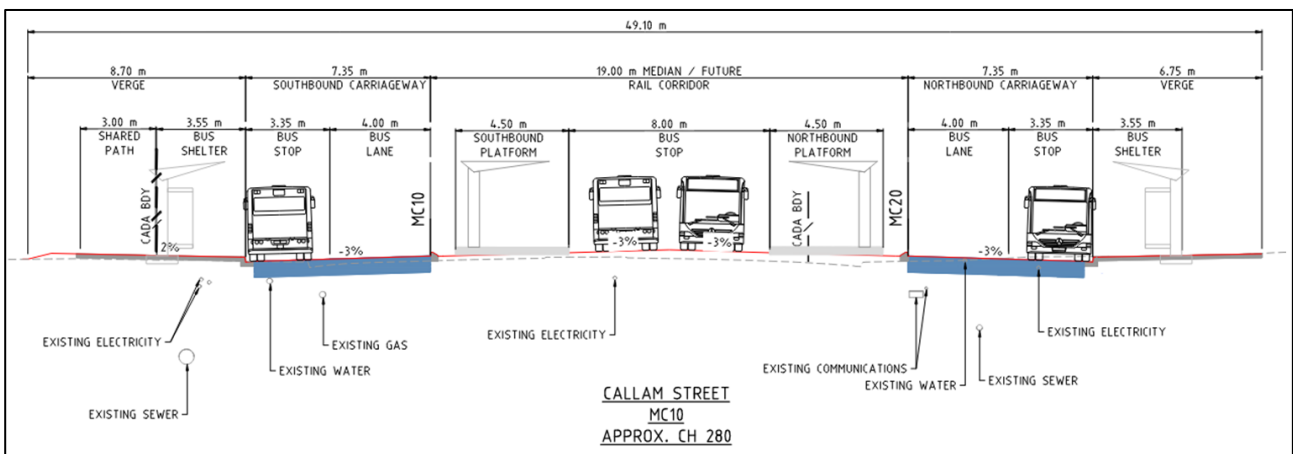


Figure 5.26: Callam Street Interchange Cross Section without Light Rail

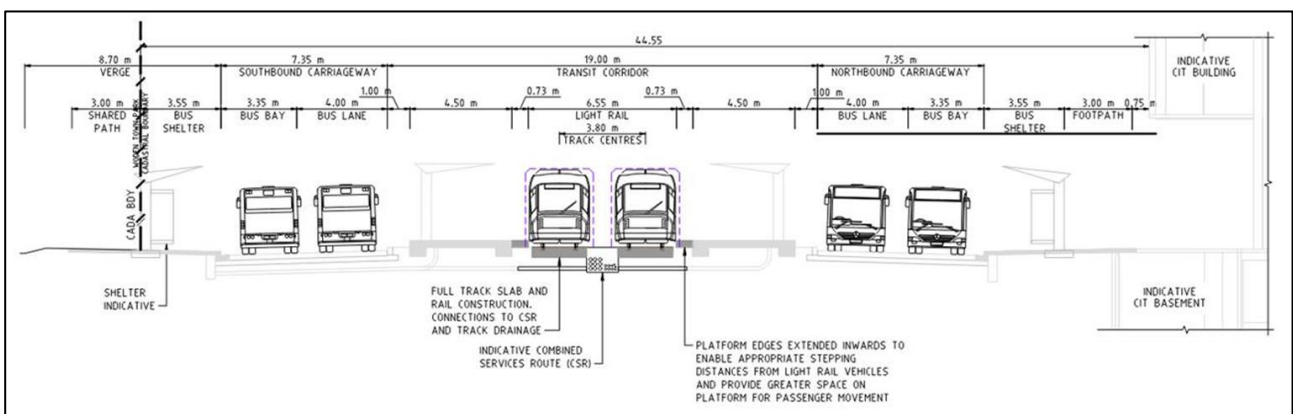


Figure 5.27: Callam Street Interchange Cross Section with Light Rail

5.8.4 CIT Building Internal Road Network

The design of the CIT Building integrates the physical transport infrastructure with Woden Town Centre, prioritising public and active transport over private-vehicle movements. The site plan overlaid with pedestrian and cyclist connections based on a rectangular building footprint with main frontage along Callam Street is presented in Figure 5.28. A new east-west pedestrian link (Link 1) will enable greater movement between the CIT campus and key hubs in Woden including the Town Square, commercial offices, civic facilities, Westfield, Yarralumla Creek cycleways the proposed Woden Interchange on Callam Street. Pedestrian access to the CIT Campus will also be facilitated via three new north-south pedestrian connections (Links 2, 5 and 6) linking Bowes Street, Westfield Eat Street and Bradley Street.

New and enhanced shared cycle ways are also proposed along Bowes Street (Link 4), Callam Street (Link 3) and Matilda Street to the north, providing greater connectivity to the existing cycle network. Shared zones will integrate cycle storage, seating and shelters to enhance active transport in the area.

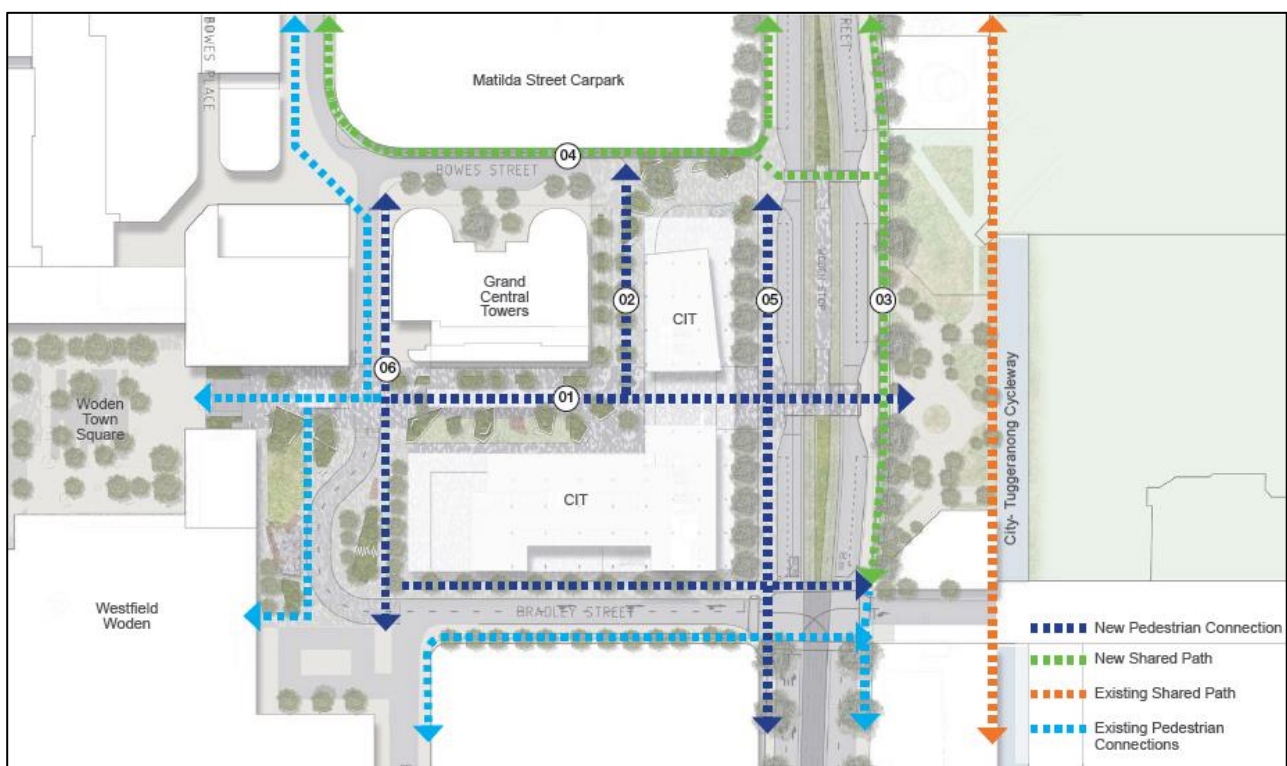


Figure 5.28: CIT Building site plan (building footprint) with key active travel routes (Source: CIT Design Report)

Although private vehicle use surrounding the campus is generally discouraged, Bradley Street will serve a broader function for vehicle access and deliveries to the CIT Campus. The existing bus stops along Bradley Street will be moved to Callam Street as part of the Woden Interchange, in part to facilitate these vehicle movements. Given the proposed closure of Callam Street to general traffic, vehicles will be diverted around the campus via Easty Street to the east or through the proposed Bowes and Bradley Street connection to the west. Strong public transport options facilitate a reduced number of parking spaces in the design of CIT.

6. Future Transport Network Function

The future transport network of Woden Town Centre should aspire to both respond to the place making priorities and movement requirements of the area. To meet the growing demand in Woden Town Centre, network development must be flexible and with a clear outlook of what is required in the future.

Traditional road hierarchy classifications fundamentally relate to the predominant function of a road and to that extent, it serves the two basic purposes of the road network; being the movement of traffic and access to property. Under the ACT Road Hierarchy, roads can be classified into four classifications: arterial road, major collector, minor collector and local access. This functional classification system groups roads and streets by their capacity to keep vehicles moving.

In recent years, there has been a revolution of thinking to better reflect the broader spectrum of transport and place outcomes. As discussed in the *ACT Transport Strategy 2020*, Canberra is looking at a strategic level to refocus network planning and design, increasing city building efforts by better integrated transport and land use. The Movement and Place (M&P) concept balances the dual function of streets, which is moving people and goods and enhancing the places they connect and pass through. The Movement and Place framework is shown below.

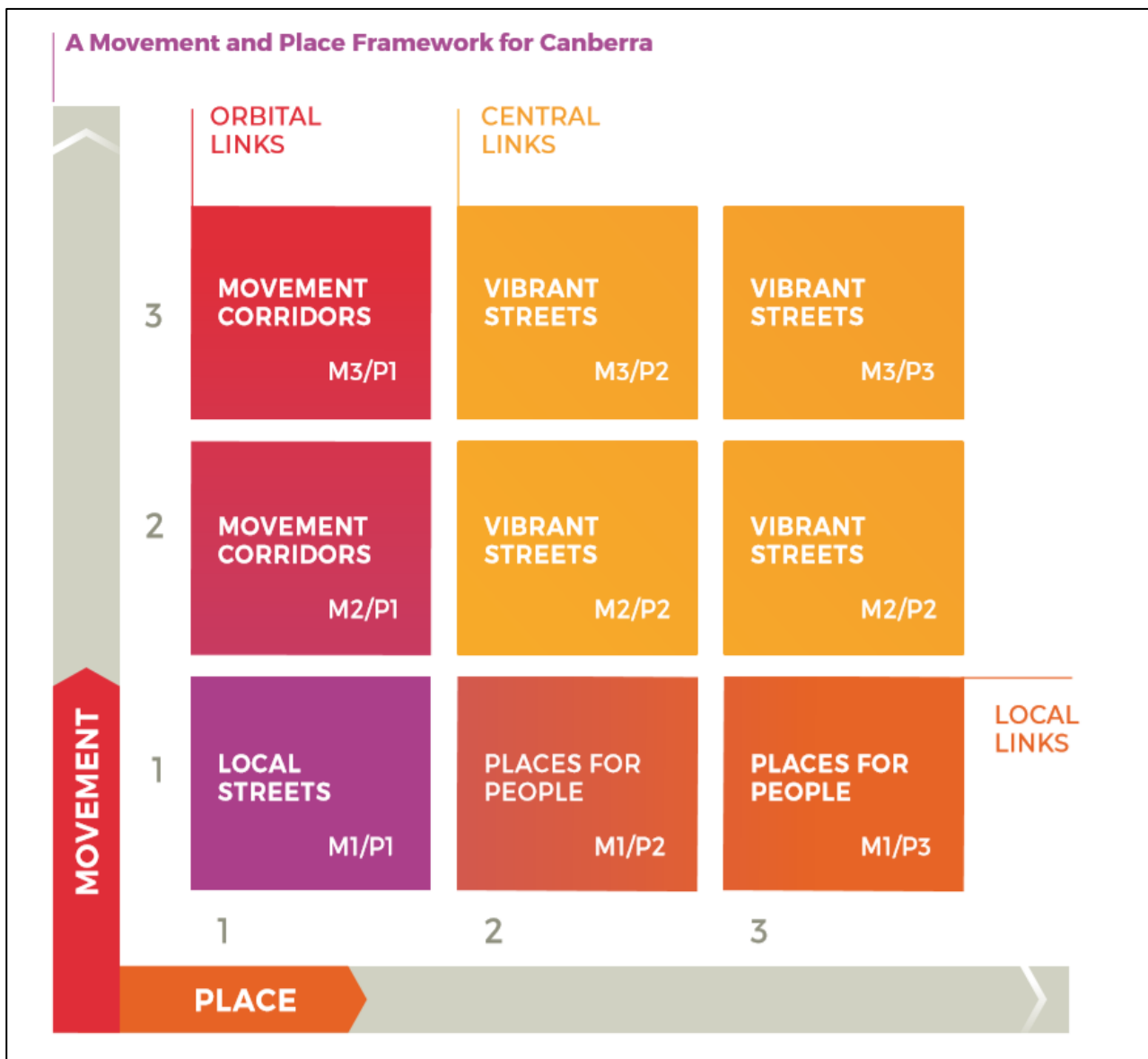


Figure 6.1: ACT Movement and Place Guide (Source: ACT Transport Strategy, 2020)

The Woden Town Centre network would greatly benefit from adopting the Movement and Place framework to guide future planning and design, allowing the Town Centre to move towards a more forward-thinking and innovative approach to integrated transport and landscape.

6.1 Proposed Classifications and Alignment

Based on the Movement and Place framework developed in *ACT Transport Strategy 2020*, an indicative M&P classification and corresponding road hierarchy classification has been proposed for key roads in the subject site, shown in Table 6.1. The logic behind these proposed classifications is explained broadly below:

- Given the proposed closure of Callam Street (between Matilda Street and Bradley Street) to general traffic, vehicles are anticipated to leverage alternative routes between Launceston Street and Hindmarsh Drive. The closure of Callam Street will result in a surcharge of traffic volume along Easty Street and consequently along Wilbow Street, with >200% increase in both peak periods from base conditions to 2026 before the implementation of the light rail. Additional traffic may also occur through Bowes Street to Launceston Street. Therefore, the proposed road classifications for these Local Access Roads has been nominated as Major Collectors to reflect their function as a movement corridor. Road improvement enabling works will be delivered as a part of the proposed works, however further mitigative measures are required to meet the new requirements of these roads.
- On Callam Street between Bradley Street and Matilda Street, the closure of Callam Street will result in peak hour traffic volumes decreasing significantly by 2026 before the implementation of light rail. Its proposed road classification has been reduced from a Major Collector to a Minor Collector. South of Bradley Street, where forecasted peak traffic volumes demonstrate an increase in vehicular traffic, classification as a Major Collector Road has been maintained.
- Under future conditions, the road hierarchy classifications of Launceston Road, Melrose Drive, Yamba Drive and Hindmarsh Drive are expected to meet their existing classifications as Major Collector and Arterial Roads. Local Access Roads which provide internal access to hubs within Woden Town Centre are expected to meet their existing classifications.

The anticipated road characteristics for 2026, including volumes, geometry and environment have been compared to the proposed M&P classification, to provide a greater understanding of what the alignment of the roads are at under 2026 conditions. As shown in Table 6.1, there is a clear disconnect between the strategic objective and traditional role function of most roads within Woden Town Centre. Most roads near the Woden CIT Interchange under 2026 No CIT conditions appear to have annual average daily traffic (AADT) volumes which exceed their proposed classifications and function. Further opportunities and mitigation measures should be explored to ensure the roads in Woden Town Centre align with its Movement and Place objectives. Some of these are described in Section 7.2.

Table 6.1: Current and Proposed Classifications

Road	Proposed M&P Classification		Current Road Hierarchy Classification	Proposed Road Hierarchy Classification	Do traffic volumes from 2026 CIT BB for this road align with its Proposed Classifications ¹	
					Does the road align?	Justification
Matilda Street	M1/P2 – Places for People	Places for people are streets with high demand for activities and lower levels of vehicle movement. They create places people enjoy, attract visitors, and are places community value. These links short trips within local areas, focused on walking and cycling. These links are highly integrated with places for meeting and interacting, such as the CIT building.	Local Access Street	Local Access Street 0-1000 veh/day	No	Expected AADT between 1001-3000 veh/day, aligning to a Minor Collector.
Bradley Street					No	Expected AADT between 3001-6000 veh/day, aligning to a Major Collector. Provides access to Woden CIT Interchange.
Bradley-Bowes Shared Zone Connection					Yes	Expected AADT around 1,000 veh/day, aligning to a Local Access Street.
Callam Street between Bradley Street and Matilda Street	M1/P3 – Places for People	Places for people are streets with high demand for activities and lower levels of vehicle movement. They create places people enjoy, attract visitors, and are places community value. This link is highly integrated with places for meeting and interacting and connects to the public transport network to support safe, accessible access. Note the M1 refers to vehicular traffic. For buses the link would have a proposed classification of M3.	Major Collector	Local Access Street 0-1000 veh/day	Yes	Expected AADT between <1000 veh/day (not including buses), aligning to a local access street. Lined with multiple signalised pedestrian crossings, promoting sense of place and active transport uptake.
Callam Street, south of Bradley Street	M2/P2 – Vibrant Streets	As a vibrant street, it needs to facilitate a high demand for movement as well as a sense of place, so need to balance varying demands with the available road space. Supports on the efficient movement between centres and urban intensification areas by public transport, walking and cycling.	Major Collector	Major Collector 3001-6000 veh/day	No	Expected AADT > 6000 veh/day, aligning to an Arterial Road.
Wilbow Street			Local Access Street	Major Collector 3001-6000 veh/day	No	Expected AADT > 6000 veh/day, aligning to an Arterial Road. The road provides access to a number of residential and government developments. A large number of buses

Road	Proposed M&P Classification		Current Road Hierarchy Classification	Proposed Road Hierarchy Classification	Do traffic volumes from 2026 CIT BB for this road align with its Proposed Classifications ¹	
					Does the road align?	Justification
						are expected to travel along Wilbow Street, due to the location of the Easty Street layover.
Easty Street			Local Access Street	Major Collector 3001-6000 veh/day	No	Expected AADT > 6000 veh/day, aligning to an Arterial Road. The road provides access to a number of residential and government developments. A large number of buses are expected to travel along Easty Street, due to the location of the Easty Street layover.
Bowes Street			Local Access Street	Major Collector 3001-6000 veh/day	No	Expected to have an AADT of > 6000 veh/day aligning to an Arterial Road. The road provides access to Grand Central Towers from Launceston Street. If the Bradley-Bowes connection is implemented, this road will also provide access to the CIT building.
Launceston Street	M2/P1 – Movement Corridors	Movement corridors provide safe, reliable and efficient movement of people and goods between regions and strategic centres. Supports on the efficient movement between centres and urban intensification areas by public transport, walking and cycling.	Major Collector	Major Collector 3001-6000 veh/day	No	Expected AADT > 6000 veh/day, aligning to an Arterial Road. A large number of buses are expected to travel along Launceston Street, due to the location of the Easty Street and Phillip Oval layovers.
Yamba Drive	M3/P1 – Movement Corridors	Movement corridors provide safe, reliable and efficient movement of people and goods between regions and strategic centres. Supports trips around and across the city, for private vehicles and freight.	Arterial Road	Arterial Road > 6000 veh/day	Yes	Expected AADT > 6000 veh/day, aligning to an Arterial Road.
Hindmarsh Drive					Yes	Expected AADT > 6000 veh/day, aligning to an Arterial Road.
Melrose Drive					Yes	Expected AADT > 6000 veh/day, aligning to an Arterial Road.

1. AADT estimates calculated as 10x the critical peak volumes from 2026 CIT BB detailed in Figure 5.7 and Figure 5.8

7. Summary of Impacts and Mitigation Measures

This section describes a summary of the impacts for the road network, public transport and active transport network on Woden Town Centre under future conditions, with the incorporation of the CIT Woden Interchange Project. To address the issues identified, mitigation measures have been outlined in this section to provide a pathway forward for Woden Town Centre. It should be noted that whilst these measures provide a pathway forward, they do not necessarily solve the issues identified. Further studies have been recommended, such as corridor studies and a wider Movement and Place study for Woden. Some measures can also be investigated further as part of the Aimsun modelling assessment, which is currently being undertaken.

7.1 Intersection Improvements

This traffic impact assessment found that by 2031, the model indicated the following key intersections directly located within the project area are expected to operate at an LoS E or worse:

- Callam Street/Wilbow Street/Neptune Street
- Callam Street/Bradley Street
- Wilbow Street Roundabout
- Launceston Street/Easty Street

As an example, a **double right turn out of Neptune Street at the Callam Street/Wilbow Street/Neptune Street intersection** should be considered, to allow more vehicles to exit the road and turn onto Callam Street. This network modification is expected to improve the performance of the intersection, with less delays experienced for the west approach of Neptune Street.

Further network and signal improvements may need to be considered in this area to allow the network to operate satisfactorily under 2031 conditions. It should be noted that the bus movements included in the Vissim model represent the worst-case scenario. Under normal operating conditions, the number of buses travelling from Woden Interchange to the layovers in the peak periods are expected to be significantly less during the peak periods than the modelled scenario. Therefore, the results shown in the peak periods from the model are unlikely to occur under actual conditions.

7.2 Mitigation Measures

7.2.1 Easty Street, Wilbow Street and Bowes Street Corridor Improvements

It is forecast that traffic volumes along Easty Street, Wilbow Street and Bowes Street will surge as a result of the road closure along Callam Street, operating as a movement corridor between Launceston Street, the southern end of Callam Street and Hindmarsh Drive. To mitigate the impacts from the heightened traffic along this corridor, there is the opportunity to provide the following treatments:

- **Local area management and traffic calming devices** to discourage through movement. Implementation of a lower speed limit that supports the use of the space as 'Vibrant Streets' under Movement and Place classification would improve safety outcomes in pedestrian environments. Speed limit reduction provide a disincentive for road users to use this corridor, potentially preferring the faster speed environment which could be maintained on Yamba Drive or Melrose Drive. Clear and effective signage and speed enforcement would support the development of an appropriate environment.
- **Duplication of lanes on Easty Street and Wilbow Street** in both directions. This measure would support vehicle trips through the corridor and encourage greater movement, however, this may not align with Movement and Place objectives to develop the area east of Woden Town Centre as 'Vibrant Streets'.
- **Extension of Bradley Street to Bowes Street** to alleviate the increased vehicle movements towards Launceston Street. This measure has been tested as part of the traffic impact assessment.

Further investigation and development of Easty Street, Wilbow Street and Bowes Street corridors and their strategic objectives would be beneficial in determining the appropriate treatment/s to apply on these roads. A future piece of work such as conducting a Corridor Strategy/ Movement and Place investigation will be beneficial in determining a range of solutions to better align the transport network with its desired function.

7.2.2 Yamba Drive, Melrose Drive, Hindmarsh Drive, Launceston Street Corridor Improvements

It is also forecast that the closure of Callam Street will place extra stress on the parallel north-south routes such as Yamba Drive and Melrose Drive, and motorists seek alternative routes away from Woden Town Centre. Additionally, extra stress will be placed on key east-west routes such as Hindmarsh Drive and Launceston Street, particularly at the key intersections bookending Yamba Drive and Melrose Drive. To mitigate the impacts from the heightened traffic along this corridor, there is the opportunity to provide the following treatments:

- **Capacity upgrades of key north-south arterials roads** on Yamba Drive and Melrose Drive and **capacity/ intersection upgrades of key east-west arterials roads** on Hindmarsh Drive and Launceston Street. These measures would encourage through traffic to travel on the arterial road network which are defined as movement corridors to reduce the prevalence of 'rat-running' through 'Vibrant Streets' through the Woden Town Centre and through local access streets to reach their destination.

Further investigation and development of the key corridor strategies for the arterial road network (precinct wide investigation rather than isolated corridors) would be beneficial in determining the key movement corridors within Woden. A future piece of work such as conducting a Precinct Road Network Strategy/ Movement and Place investigation will be beneficial in determining a range of solutions to better align the transport network with its desired function.

7.2.3 Wider Movement and Place study for Woden

The preliminary Movement and Place assessment undertaken as part of this traffic impact assessment shows that many of the roads situated within Woden Town Centre do not align with their road hierarchy classifications, or with their proposed Movement and Place classifications. A wider Movement and Place study for Woden Town Centre (at a precinct level), should be undertaken to establish and agree on the role of different roads within Woden and establish an implementation plan to ensure the roads correctly align with their proposed classification.

7.2.4 Network Modification Opportunities

Within the urban environment, traffic signals are considered the gatekeeper to keeping traffic moving throughout the transport network. To better align the operation of traffic signals within Woden Town Centre, the following network modification opportunities have been identified, which can be investigated:

- **Traffic signal corridor optimisation** using SCATS across the Woden Town Centre network should be considered to ensure that the operation of the traffic signals align with the relative modal priorities as suggested by the Movement and Place framework.

As an example, for Callam Street/Wilbow Street/Neptune Street, there is the opportunity to provide the following signal timing modifications to improve network performance:

- Add a 'bonus left' turn movement to run on the north approach of Callam Street, in the same phase as all movements from Wilbow Street East.
- Amend the phase sequence to allow improved overlap of vehicle movements for Callam Street/Wilbow Street.

- **Congestion management/ travel demand management strategies** should be considered using SCATS to help manage the flow of traffic within the network.

Due to the significant changes occurring within the Woden Town Centre, network optimisation should occur frequently (annual or every 2 years) to ensure that the traffic signals are configured in a way to respond to changes in travel patterns and demands to ensure the network can continue operating satisfactorily.

7.3 Public Transport

The project facilitates an opportunity to significantly improve bus services and enhance the public transport connectivity to the area. Strategic goals set out in *Transport for Canberra 2012-2031* outline that priority for public transport along rapid spines is required to ensure an efficient and cost-effective network.

Upon completion of the Woden CIT Interchange Project, approximately 191 bus movements are expected in the peak hour by 2026 prior to the implementation of light rail services, including movements from three Rapid routes services (R4, R5 & R6) stopping at the Woden Interchange. Currently in the area surrounding Woden Town Centre, priority bus lane facilities are only provided at the Callam Street/Hindmarsh Drive/Athllon Drive intersection.

Further upgrades to improve the efficiency of public transport in the area include:

- Bus priority at key intersections, including bus jump lanes, priority signal phases and 'B' lanterns, with a particular focus on improving the efficiency of buses entering and exiting the Woden transport interchange and layovers to and
- Greater number of 'bus only' lanes providing dedicated bus facilities along the key road corridors within Woden
- Investigate and implement intelligent transport systems, such as real-time information relating to the bus bay availability at layovers to ensure drivers can efficiently travel to the most suitable layover from the Interchange
- Conduct a light rail corridor strategy once the light rail comes online in Woden to ensure it is well integrated with the bus and surrounding network.

Ongoing investment in strategic network modifications are likely to strengthen and enhance public transport outcomes for the wider community.

7.3.1 Bus network planning opportunities

As shown in the on-site circulation evaluation of the bus layovers (see section 5.8), there are a number of bus network planning opportunities to ensure a more efficient use of bus layovers to be used by buses travelling to/from the Woden Transport Interchange. The following bus movements provide the most efficient routes for buses arriving at the layover, in terms of minimising the total distance travelled:

- **Easty Street East:** Most suitable for buses which are arriving from the south and departing to the north.
- **Easty Street West:** Most suitable for buses which are arriving from the north and departing to the south.
- **Phillip Oval:** Most suitable for buses which are arriving to/from the south.

Investigating maximising the use of efficient routes for each bus layover should be considered to minimise bus congestion anticipated in the area.

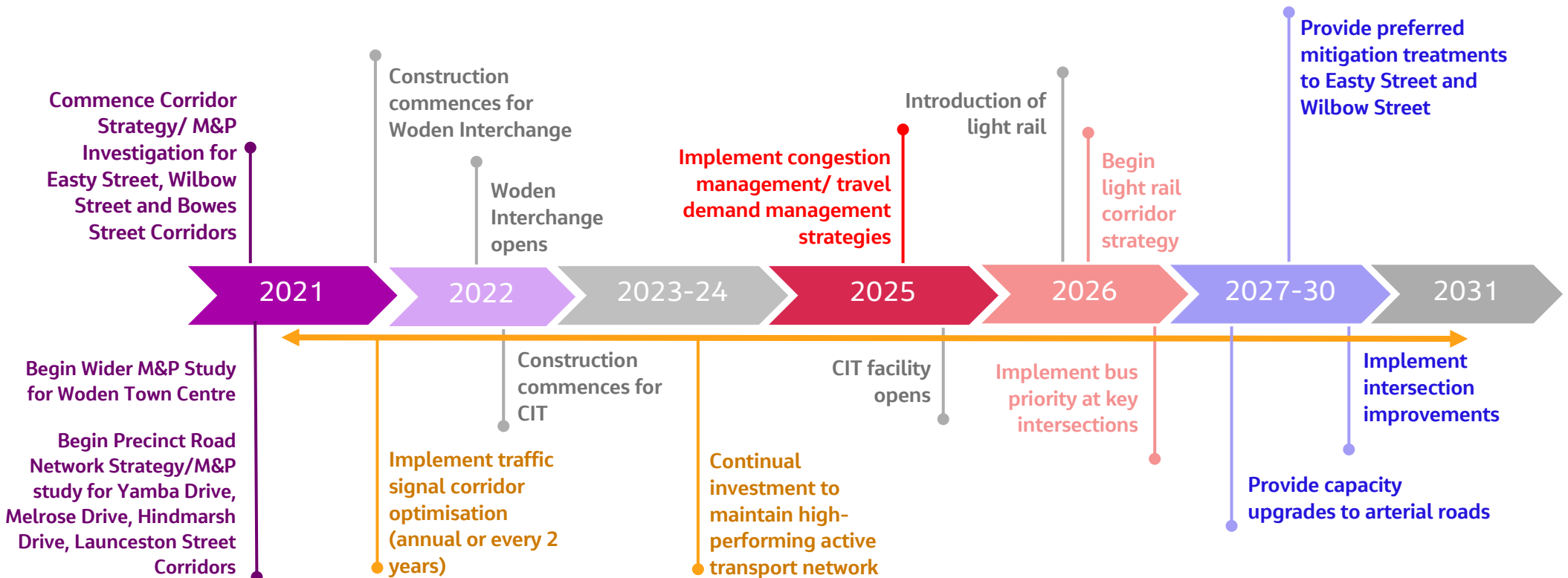
7.4 Active Transport

The project provides the opportunity to enhance the pedestrian and cycling environment around the subject site and Woden Town Centre. The CIT Woden Interchange will be designed to accommodate higher levels of pedestrian activity safely and efficiently.

In order to maintain a high-performing active transport network in Woden, continual investment across the Town Centre and surrounding suburbs is required, now and into the future. Provision for future cycle and pedestrian infrastructure should be consistent with the targets set out in ACT strategic documents and encourage a diverse range of the community to easily access the centre by walking or cycling. Further network modifications can take the form of improvements to existing local and main community routes for shared use, as well as the provision of additional paths between key community facilities, the suburbs and the hospital.

7.5 Proposed Measures

The summary of proposed measures and an indicative timeline is shown below. In general, the planning activities such as the Movement and Place assessments or corridor strategies can be commenced immediately, and it is recommended that the MPC and TCCS accelerate the planning work, to determine a range of solutions to better align the transport network within Woden Town Centre with its desired function. Intersection improvements and other infrastructure upgrades are recommended to be implemented prior to 2031. Network optimisation should occur frequently (annual or every 2 years) to ensure that the traffic signals are configured in a way to respond to changed travel patterns and demands.



8. Conclusion

This report sets out an assessment of the anticipated transport implications of the proposed CIT Woden Interchange. Based on the analysis and discussions presented within this report, the following conclusions are made:

- The road network was found to operate satisfactorily with the incorporation of the CIT Woden Interchange project under 2022 Day One and 2026 conditions. Further investigation will be required to address issues on the road network in Woden to allow the network to operate efficiently under 2031 conditions.
- It is forecast that traffic volumes along Easty Street and Wilbow Street will increase significantly as a result of the road closure along Callam Street, operating as a movement corridor between Launceston Street, the southern end of Callam Street and Hindmarsh Drive.
- Traffic volumes along Bowes Street are also expected to increase, with increased traffic to/from the CIT building and surrounding Woden Town Centre developments, under future conditions.
- The bus performance assessment found that overall, the increased number of trips to/from Woden, combined with the network modifications, may impact the overall performance of bus services operating within the study area. Whilst the bus interchange and layover areas will allow for increased services, the overall traffic growth within the Woden network means buses may experience increased delays compared to the base case.
- The proposed developments provide additional active transport infrastructure within the subject site, enhancing the local network through the provision of numerous additional pedestrian crossings and shared use facilities. Bicycle parking cages are also proposed on either side of Callam Street at the Interchange.
- A parking assessment undertaken by MPC demonstrated there will be a demand of 150 car parking spaces for the use of CIT. As part of the Easty Street layover works, approximately 65 parking spaces may be impacted, and these will be managed by TCCS on a case-by-case basis depending on surrounding development intensity and timing.
- The closure of Callam Street between Matilda Street and Bradley Street may see benefits to road safety, with improvements to safety for pedestrians travelling in the area.
- The movement and place assessment undertaken as part of this traffic impact assessment shows that many of the roads situated within Woden Town Centre do not align with their road hierarchy classifications, or with their proposed movement and place classifications.

Based on the findings from the assessment, a number of opportunities and mitigation measures could be considered for future investigation:

- Intersection improvements by 2031 should be considered at the following key intersections which are expected to operate at an LoS E or worse:
 - Callam Street/Wilbow Street/Neptune Street
 - Callam Street/Bradley Street
 - Wilbow Street Roundabout
 - Launceston Street/Easty Street
- To mitigate the impacts from the heightened traffic along the Easty Street and Wilbow Street Corridor, there is the opportunity to provide the following treatments:
 - Local area management and traffic calming devices
 - Duplication of lanes on Easty Street and Wilbow Street
- To mitigate the impacts from the Yamba Drive, Melrose Drive, Hindmarsh Drive, Launceston Street Corridor, there is the opportunity to provide capacity upgrades of key north-south arterials roads such as Yamba Drive and Melrose Drive and capacity upgrades of key east-west arterials roads such as Hindmarsh Drive and Launceston Street.

- A wider Movement and Place study for Woden Town Centre (at a precinct level), should be undertaken to establish and agree on the role of different roads within Woden and establish an implementation plan to ensure the roads correctly align with their proposed classification.
- To better align the operation of traffic signals within Woden Town Centre, the following network modification opportunities have been identified, which can be investigated:
 - Traffic signal corridor optimisation using SCATS across the Woden Town Centre network should be considered to ensure that the operation of the traffic signals align with the relative modal priorities as suggested by the Movement and Place framework.
 - Congestion management/ travel demand management strategies should be considered using SCATS to help manage the flow of traffic within the network.
- Further upgrades to improve the efficiency of public transport in the area include:
 - Bus priority at key intersections, including bus jump lanes, priority signal phases and 'B' lanterns, with a particular focus on improving the efficiency of buses entering and exiting the Woden transport interchange and layovers.
 - Greater number of 'bus only' lanes providing dedicated bus facilities along the key road corridors within Woden
 - Investigate and implement intelligent transport systems, such as real-time information relating to the bus bay availability at layovers to ensure drivers can efficiently travel to the most suitable layover from the Interchange
 - Conduct a light rail corridor strategy once the light rail comes online in Woden to ensure it is well integrated with the bus network.
- Continual investment across the Town Centre and surrounding suburbs is required, now and into the future, to maintain a high-performing active transport network in Woden.

Appendix A. Woden Traffic Modelling Report (Jacobs, 2020)

Appendix B. CIT Woden Interchange Report (VLC, 2020)

Appendix C. Parking Utilisation (Austraffic, 2019)

Appendix D. Concept Designs

Appendix E. Trip Generation and Distribution

Appendix F. Vissim Results

Appendix G. Queue Length Comparison



Figure G.1: 2022 Day One Option 1 – Average Queues AM Peak



Figure G.2: 2022 Day One Option 1 – Average Queues PM Peak

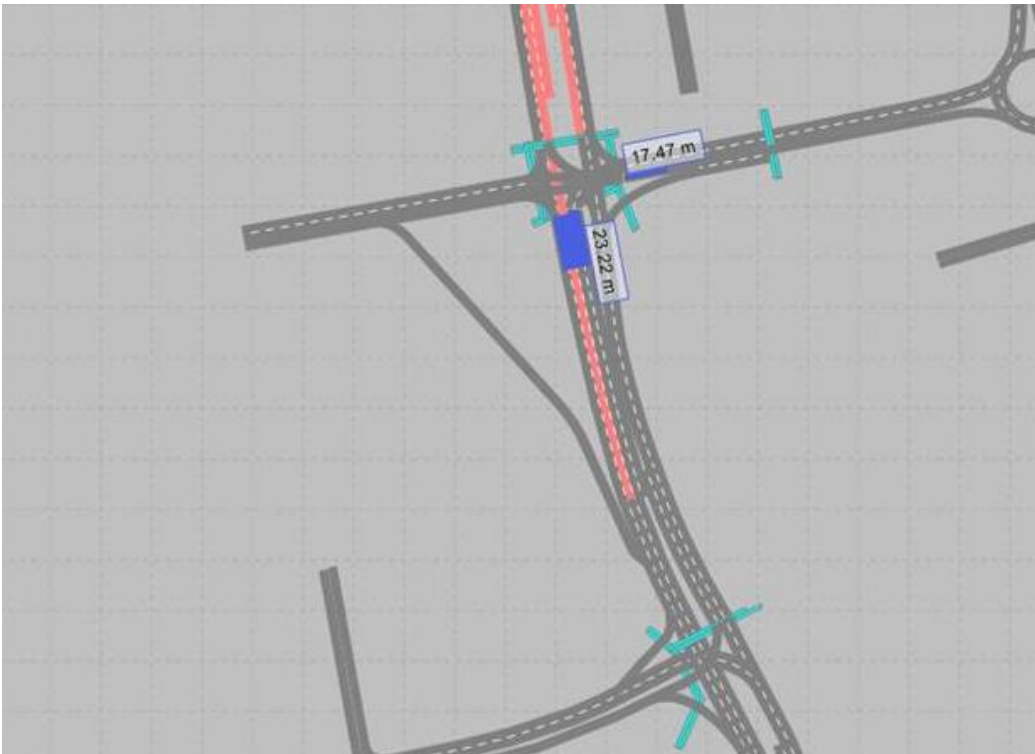


Figure G.3: 2022 Day One Option 2 – Average Queues AM Peak

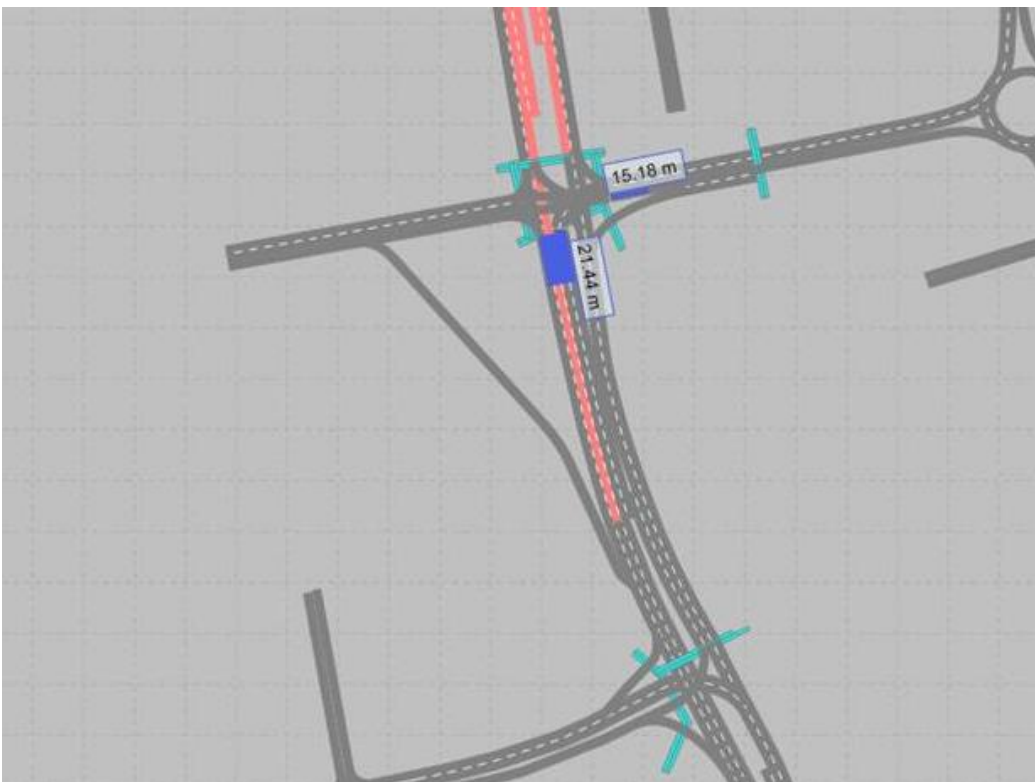


Figure G.4: 2022 Day One Option 2 – Average Queues PM Peak



Figure G.5: 2022 Day One Option 1 – Maximum Queues AM Peak



Figure G.6: 2022 Day One Option 1 – Maximum Queues PM Peak



Figure G.7: 2022 Day One Option 2 – Maximum Queues AM Peak



Figure G.8: 2022 Day One Option 2 – Maximum Queues PM Peak