Wallgrove Business Hub

Traffic Impact Assessment

Western Sydney Parklands Trust

12th May 2025

Gold Coast
Suite 26, 58 Riverwalk Avenue
Robina QLD 4226

P: (07) 5562 5377

Brisbane
Level 2, 428 Upper Edward Street
Spring Hill QLD 4000

P: (07) 3831 4442

Sydney
Studio 203, 3 Gladstone Street
Newtown NSW 2042

P: (02) 9557 6202

W: www.bitziosconsulting.com.au

E: admin@bitziosconsulting.com.au

Document Issue History

Report File Name	Prepared	Reviewed	Issued	Date	Issued to
P6072.001R Wallgrove Business Hub TIA	S. Eshghi, R. Jain	A. Grey	A. Grey	25/08/2023	Tim.Colless@gsp.nsw.gov.au
P6072.002R Wallgrove Business Hub TIA	R. Jain	A. Grey	A. Grey	07/03/2024	Tim.Colless@gsp.nsw.gov.au
P6072.003R Wallgrove Business Hub TIA	R. Jain	A. Grey	A. Grey	22/03/2024	Tim.Colless@gsp.nsw.gov.au
P6072.004R Wallgrove Business Hub TIA	R. Jain	A. Grey	A. Grey	11/06/2024	Tim.Colless@gsp.nsw.gov.au
P6072.005R Wallgrove Business Hub TIA	R. Jain	A. Grey	A. Grey	02/07/2024	Tim.Colless@gsp.nsw.gov.au
P6072.006R Wallgrove Business Hub TIA	R. Jain	A. Eke	A. Eke	07/04/2025	rod.pascoe@gsp.nsw.gov.au
P6072.007R Wallgrove Business Hub TIA	R. Jain	A. Grey	A. Grey	17/04/2025	rod.pascoe@gsp.nsw.gov.au
P6072.008R Wallgrove Business Hub TIA	A. Hu	A. Grey	A. Grey	08/05/2025	rod.pascoe@gsp.nsw.gov.au
P6072.009R Wallgrove Business Hub TIA	A. Hu	A. Grey	A. Grey	12/06/2025	rod.pascoe@gsp.nsw.gov.au

CONTENTS

Tables

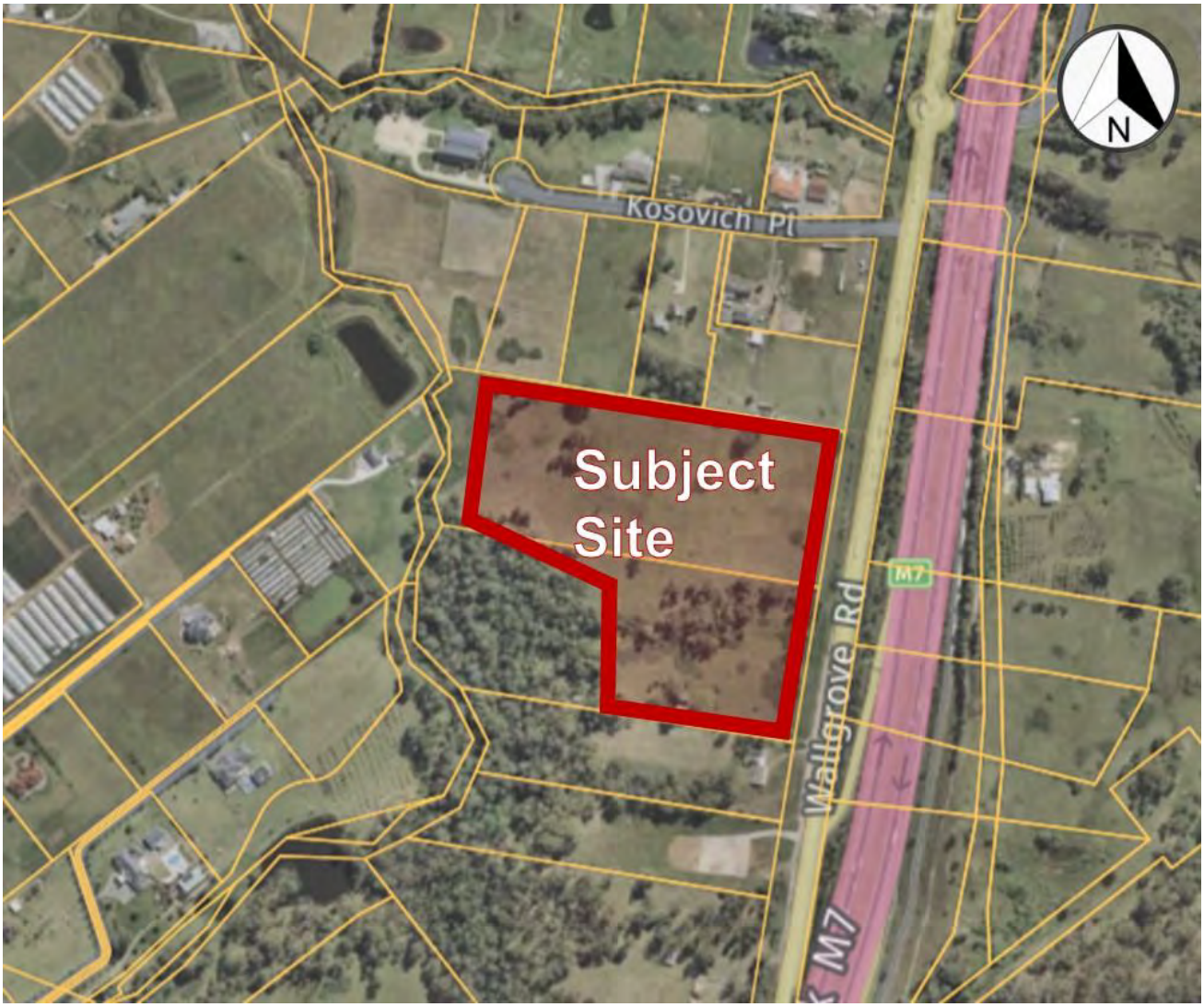
Figures

Appendices

1. INTRODUCTION

1.1 Background

Bitzios Consulting has been engaged by Western Sydney Parklands Trust (WSPT) to undertake a Traffic Impact Assessment (TIA) as part of a State Significant Development Application (SSDA) for the Wallgrove Industrial Business Hub. The site is located at 97-151 Wallgrove Road, Cecil Park and has an estimated site area of 72,000m^2. The subject site location is shown in Figure 1.1.



Adapted from Nearmap

Figure 1.1: Subject Site Location

1.2 SEARs

The Planning Secretary released its Environmental Assessment Requirements (i.e. SEARs) for this development on 16th December 2022. Table 1.1 details the SEARs relevant to traffic and transport considerations along with where they are addressed in this report.

Table 1.1: SEARs Items and Response Locations

SEARS Requirement	Addressed Report/Section
Details of all daily and peak traffic volumes likely to be generated during all key stages of construction and operation (including the fully developed estate), including a description of key access / haul routes, vehicle types and potential queuing impacts	Preliminary CTMP (To be submitted separately)
An assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts on existing performance levels of nearby intersections, using SIDRA or a similar traffic model	TIA Sections 5.2, 6
Consideration of the development's relationship to the proposed M12 Motorway project, including any works/widening proposed to Wallgrove Road, access/leasing arrangements with TfNSW and sight distances on the realigned Wallgrove Road to the south of the development	TIA Sections 3, 5.5
Details and plans of any proposed internal road network, loading dock servicing and provisions, on-site parking provisions, and sufficient pedestrian and cyclist facilities, in accordance with the relevant Australian Standards	TIA Section 5
Details of the largest vehicle using the site, including swept path analysis depicting vehicles entering, exiting and manoeuvring throughout the site	TIA Section 5.7
Details of the ownership of the Estate Road infrastructure	TIA Section 4.1
Details of road upgrades, infrastructure works, or new roads or access points required for the development, if necessary.	TIA Sections 3, 5.1, 5.2

2. EXISTING CONDITIONS

2.1 Road Network

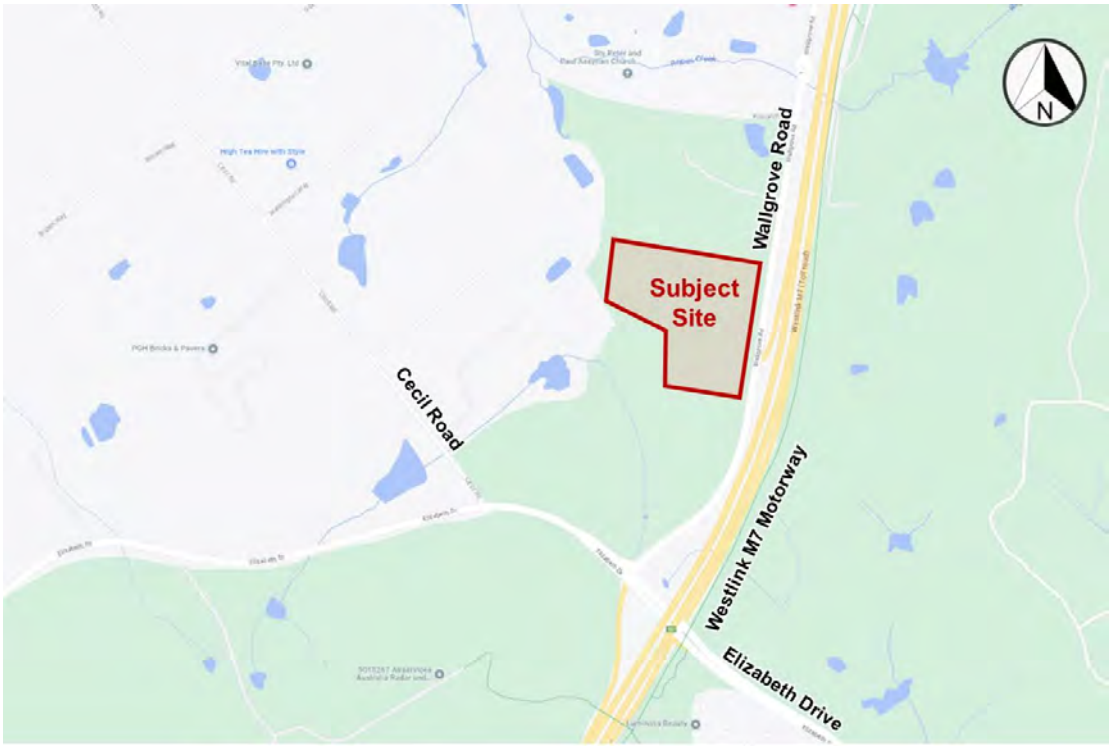
The subject site is within the Fairfield City Council Local Government Area (LGA) and is surrounded by prominent roads that serve as the primary north-south and east west movements along Elizabeth Drive and the Westlink M7 Motorway respectively. Additionally, in the vicinity of the subject site are Cecil Road and Wallgrove Road which play a crucial role in providing access to these major roads, contributing to the overall transport network.

Key characteristics of the surrounding road network are summarised below in Table 2.1.

Table 2.1: Key Roads

Road Name	Classification	Hierarchy	Cross-Section	Speed Limit
Wallgrove Road	State	Arterial	2-way, 2-lane, divided	80km/h
Elizabeth Drive	State	Highway	2-way, divided, East of Westlink M7: 4-lane West of Westlink M7: 2-lane	70km/h
Westlink M7 Motorway	State	Highway	2-way, 4-lane, divided	100km/h (subject to variable speed limit digital signs)
Cecil Road	Local	Collector	2-way, 2-lane, divided	60km/h
M12	State	Highway	2-way, 4-lane, divided	100km/h

The overall road network surrounding the subject site is shown below in Figure 2.1.



Adapted from Google Maps

Figure 2.1: Surrounding Road Network

2.1.1 Wallgrove Road

Wallgrove Road, a two-way road, stretches north-south and connects Cecil Park with Minchinbury. This road extends between Great Western Highway to the north and Elizabeth Drive to the south. Access to the subject site is proposed via Wallgrove Road (further discussed in Section 5.1). A typical cross-section of Wallgrove Road is illustrated in Figure 2.2.

Source: Google Street View

Figure 2.2: Typical Cross-section of Wallgrove Road

2.1.2 Elizabeth Drive

Elizabeth Drive is a two-way state road running east-west between Luddenham to Cabramatta. Elizabeth Drive is a two-lane road west of the Westlink M7 Motorway, whereas to the east of the Westlink M7 Motorway it consists of four lanes with a 6.5m-wide raised median separating eastbound and westbound traffic. It is located approximately 800m south of the subject site. A typical cross-section of Elizabeth Drive is illustrated in Figure 2.3.

Source: Google Street View

Figure 2.3: Typical Cross-section of Elizabeth Drive

2.1.3 Westlink M7 Motorway

Westlink M7 Motorway is a major north-south road running parallel to Wallgrove Road, connecting Dean Park in the north with Casula in the south. It has 2 lanes in each direction that are separated by a 16m-wide median. The Motorway consists of an overpass passing over Elizabeth Drive. Though, the speed limit along the M7 Dual Freeway is 100 km/h, this can vary as there are variable speed limit digital signs provided along the motorway. A typical cross-section of Westlink M7 Motorway is illustrated in Figure 2.4.

Source: Google Street View

Figure 2.4: Typical Cross-section of M7 Dual Freeway

2.1.4 Cecil Road

Cecil Road, a local road, has the primary function of connecting access roads in Cecil Park with Elizabeth Drive. It should be noted that the extent of this road is near the bend north of Selkirk Avenue, beyond which the road name changes to Lincoln Road. A typical cross-section of Cecil Road is illustrated in Figure 2.5.

Source: Google Street View

Figure 2.5: Typical Cross-section of Cecil Road

2.2 Public Bus Network

Public bus stops in the vicinity of the subject site are primarily located along Cecil Road and Elizabeth Drive. These bus stops are summarised below in Table 2.2.

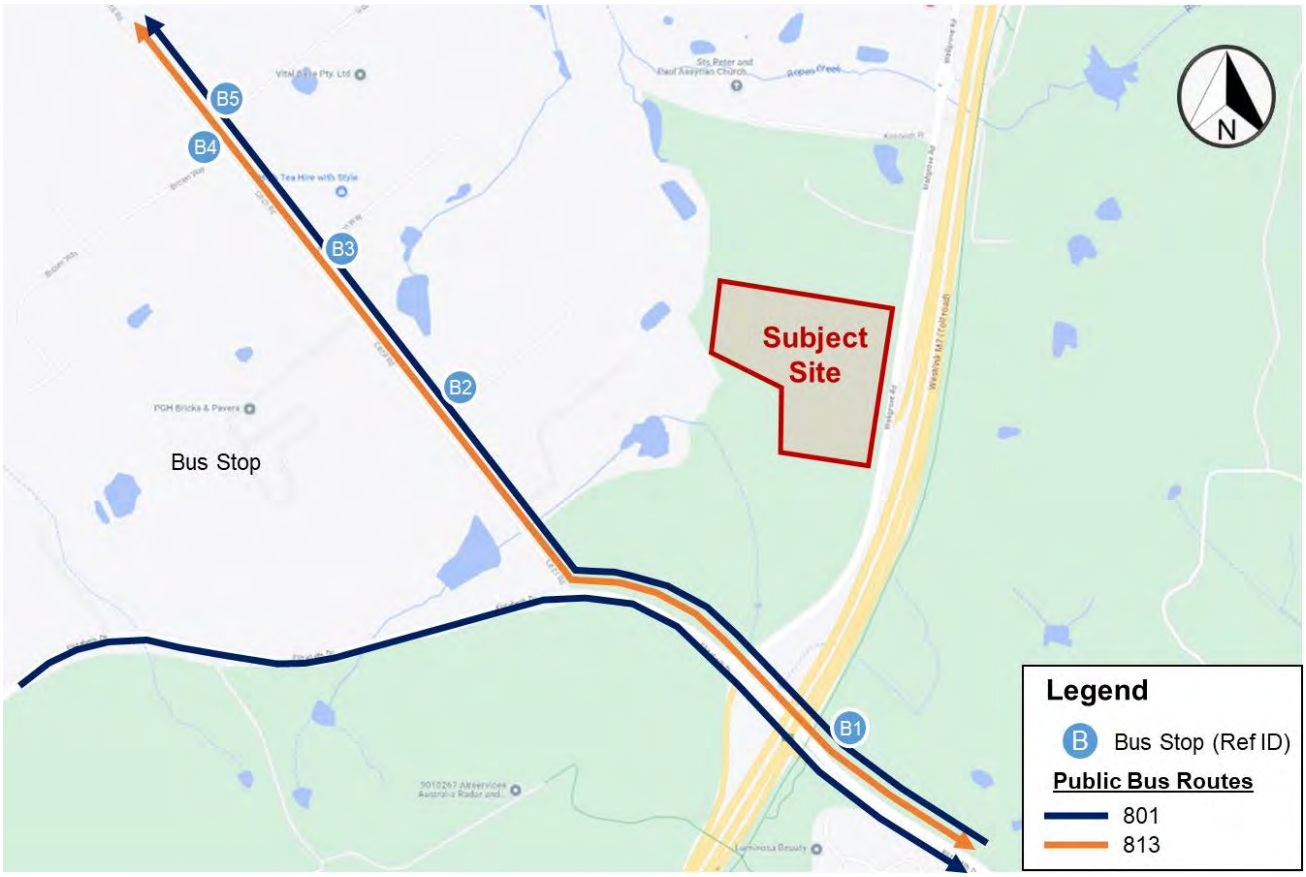
Table 2.2: Public Bus Stop Summary near Subject Site

Reference ID	Stop ID	Stop Name
B1	2176314	Elizabeth Dr after M7
B2	217179	102 Cecil Rd
B3	217829	Cecil Rd after Washington Way [Virtual]
B4	217156	Cecil Rd opp Goodrich Rd
B5	217178	Cecil Rd before Goodrich Rd

These bus stops are serviced by two public bus routes running along Elizabeth Drive and Cecil Road. Bus route destinations and service frequencies are summarised in Table 2.3 and shown in Figure 2.6.

Table 2.3: Public Bus Routes and Frequency near Subject Site

Route No.	Destination	Direction	Frequency
801	Badgerys Creek to Liverpool	Both Directions	9:10 & 16:30 (Monday to Friday)
813	Bonnyrigg and Western Sydney Parklands to Fairfield	Both Directions	30min

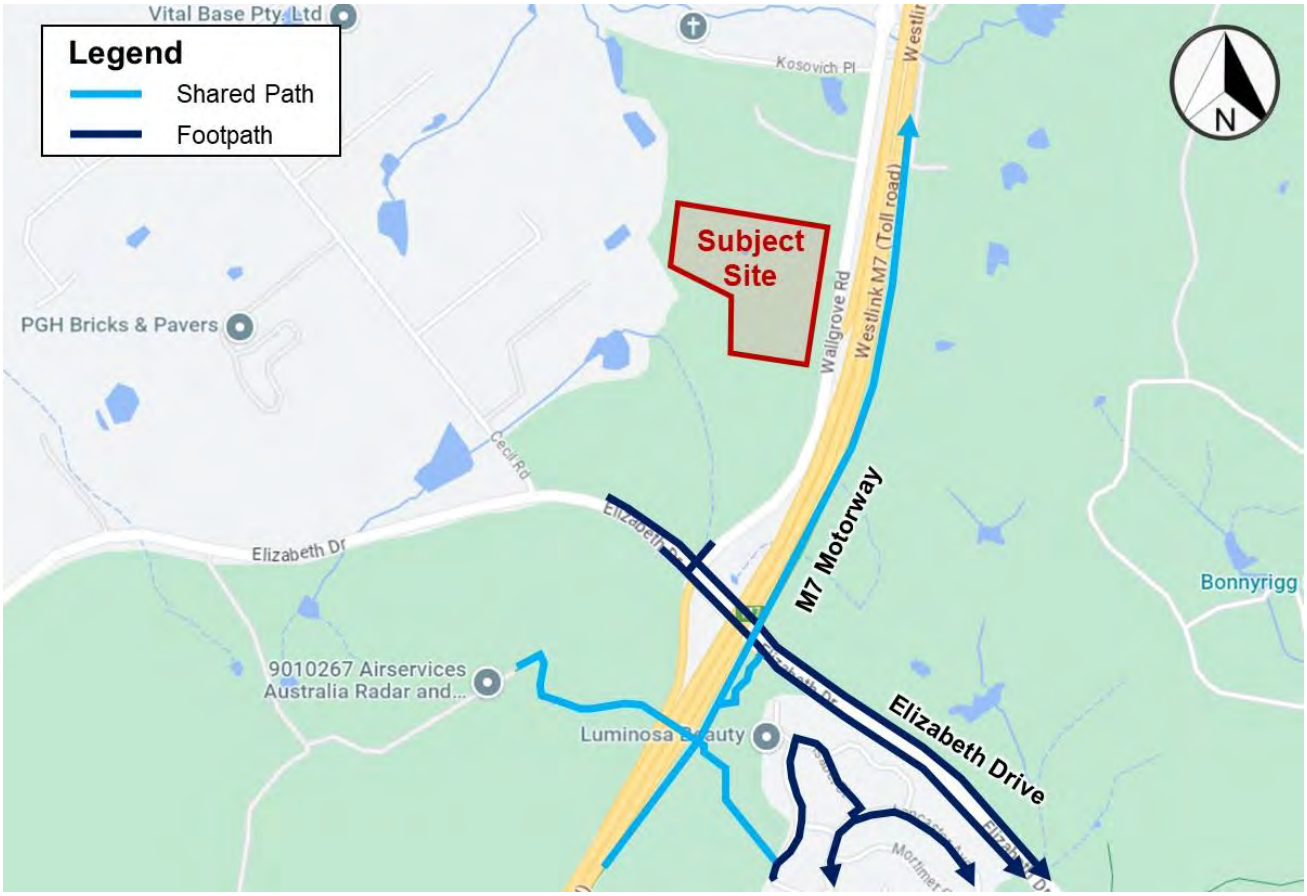


Adapted from Google Maps
Bus Stop (Ref ID) – Refer to Table 2.2

Figure 2.6: Public Bus Routes near Subject Site

2.3 Walking and Cycling Networks

There are limited pedestrian footpaths or cycling facilities provided in the vicinity of the site with a pedestrian footpath and shared path provided along Elizabeth Drive and the M7 Road respectively. However, none of these facilities provide connection with the subject site. The closest footpath to the subject is near the Elizabeth Drive / Wallgrove Road intersection. A shared path is available along the eastern side of the Westlink M7 Motorway, and south of Elizabeth Drive where a shared path bridge is available to cross the Motorway. The existing walking and cycling networks are shown below in Figure 2.7.



Adapted from Google Maps

Figure 2.7: Existing Walking and Cycling Network near the Subject Site

2.4 Crash Data Analysis

2.4.1 Overview

The most recent five years of crash data within the vicinity of the subject site, dated between 2017 and 2021, was obtained from Transport for NSW (TfNSW).

During the five-year period, a total of 50 crashes were reported, equating to an average of 10 crashes per year. The crash data was mapped by crash severity in GIS and is shown below in Figure 2.8.

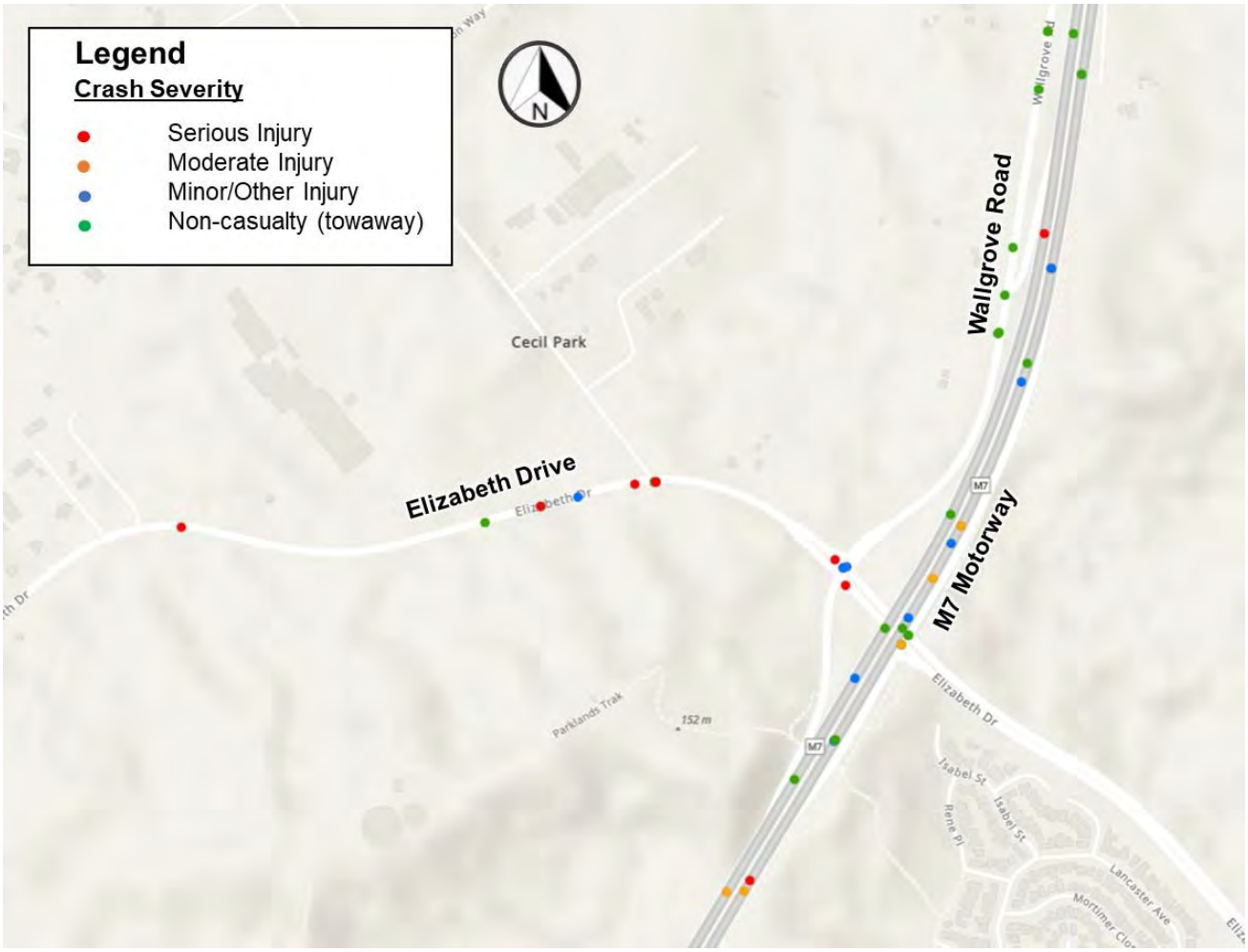


Figure 2.8: Crash Locations based on Severity

Detailed information on crash severity and type (by road user movement) is provided in **Appendix A**.

Figure 2.9 shows the trends in the number of crashes per year between 2017 and 2021 aggregated across all locations reviewed. Years during which there were significant number of crashes reported include 2017, 2019 and 2020. The number of crashes reduced overall by 50% during the five-year period.

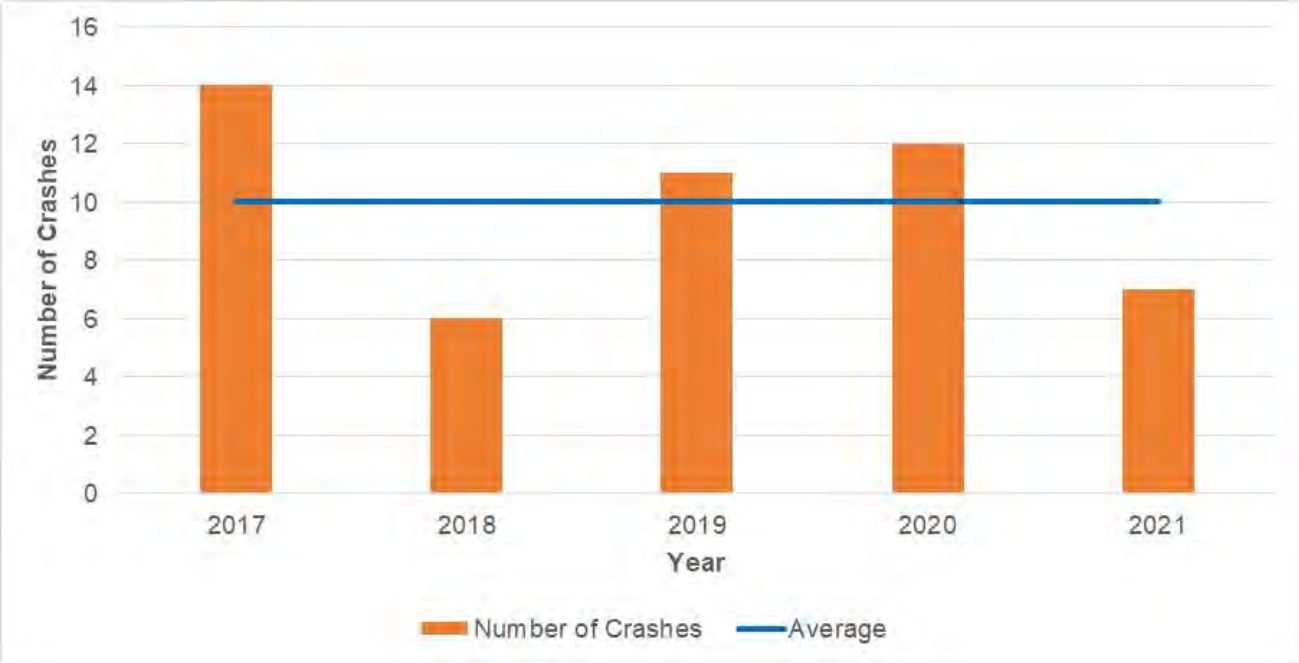


Figure 2.9: Summary of Reported Crashes between 2017 and 2021

All crashes on Wallgrove Road were non-casualty type. Furthermore, as part of this analysis a more focused study area was selected comprising of Elizabeth Drive and Wallgrove Road. Within this focused study area, crashes were investigated to determine involvement of any heavy vehicles and patterns in crash type and direction. These crashes were mapped by RUM (Road User Movement) code and are shown below in Figure 2.10.

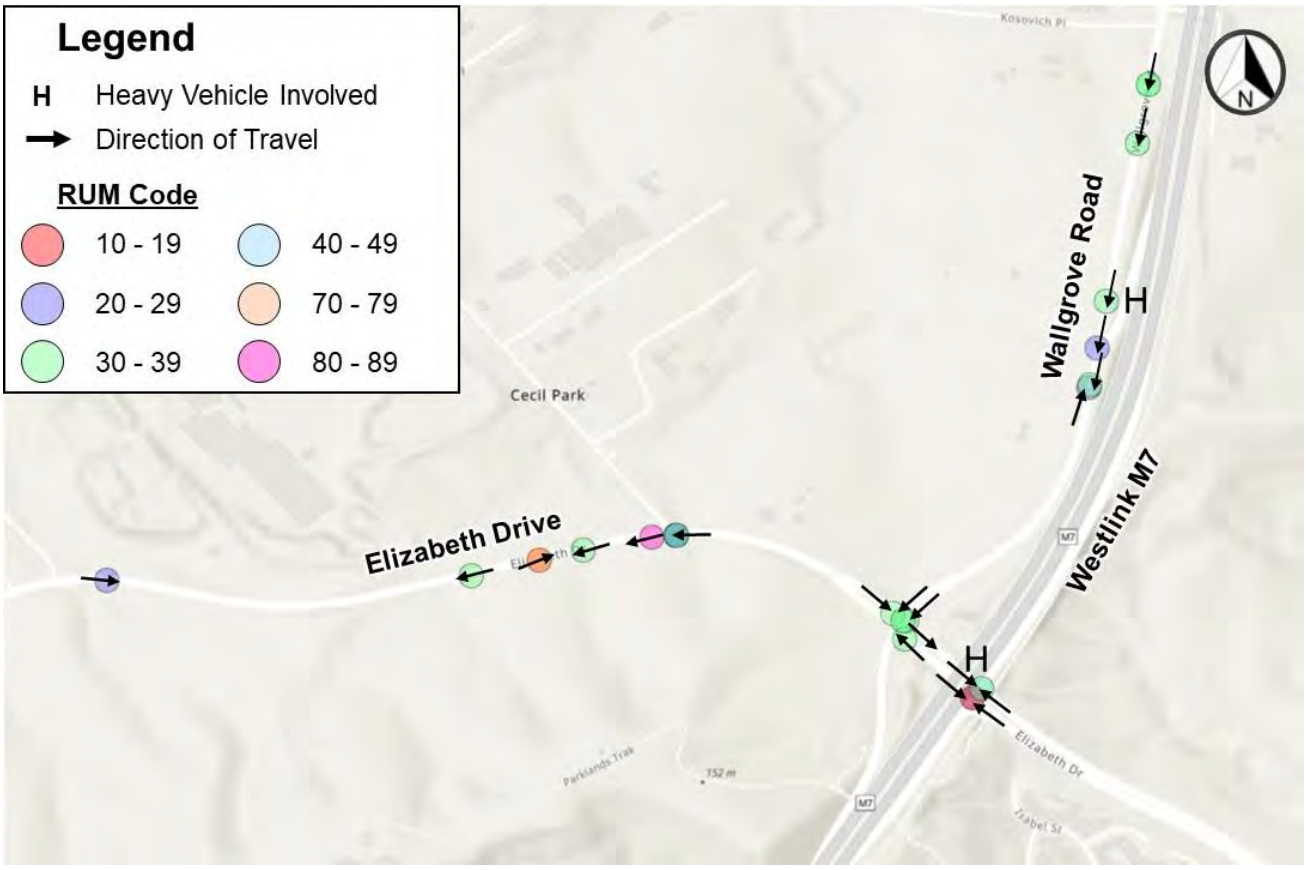


Figure 2.10: Crash Type – Wallgrove Road and Elizabeth Drive

Key outcomes from Figure 2.10 include the following:

- Along both Wallgrove Road and Elizabeth Drive, the most common crash type was associated with a RUM code ranging between 30 and 39 (i.e. vehicles from the same direction)
- The Elizabeth Drive / Wallgrove Road intersection is the most critical site with the most number of reported crashes
- Most crashes along Wallgrove Road occur in the southbound direction
- There were two crashes reported involving a heavy vehicle:
  - One at the Elizabeth Drive and Westlink M7 Southbound Off-ramp intersection
  - One along Wallgrove Road approximately 600m north of Elizabeth Drive.

2.4.2 Casualties

Table 2.4 summarises the crash severity and number of crashes within the study area.

Table 2.4: Crash Severity and Number of Casualties

Crash Severity	No. of Crashes	%
Fatal	0	0%
Serious Injury	10	20%
Moderate Injury	6	12%
Minor/Other Injury	11	22%
Non-casualty (towaway)	23	46%
Total	50	100%

2.4.3 Crash Type

Table 2.5 provides a breakdown of all crash types which occurred in the study area including the number of crashes. Between 2017 and 2021, the most common type of crash was ‘rear end’, which amounted to 26 crashes and reflected 52% of all reported crashes.

Table 2.5: Crash Type and Number of Casualties

Crash Type	No. of Crashes	%
Rear End	26	52%
U Turn	1	2%
Struck Object on Carriageway other	1	2%
Right Thru	1	2%
Out Of Control on Carriageway	1	2%
Lane Side Swipe	2	4%
Right Rear	3	6%
Left Off Carriageway into Object/ Parked Veh.	3	6%
Head On (Not Overtaking)	3	6%
Accident Or Broken Down	1	2%
Other Opposing rear	1	2%
Lane Change Left	1	2%
Off Carriageway to Left	1	2%
Cross Traffic	1	2%
Right Turn Side Swipe other	1	2%
Lane Change Right (Not Overtaking)	1	2%
Off Carriageway to Right	1	2%
Left Rear	1	2%
Total	50	100%

2.4.4 Road–Specific Data

2.4.4.1 Elizabeth Drive

There was a total of 18 crashes along the Elizabeth Drive. Eight of these crashes resulted in serious injury.

The most common type of crash was ‘Rear End’ (comprising five crashes) after which ‘Right Rear’ (comprising of three crashes) and ‘Head On – Not Overtaking’ (comprising of two crashes) were the most frequent crash types. 12 crashes occurred in the daylight, one during dusk and four in the dark.

Most crashes occurred near intersections along Elizabeth Drive:

- Four near the Wallgrove Road intersection
- Four near the M7 Westlink Ramp intersection
- Four near the Cecil Road intersection.

Based on Figure 2.10, the most critical site in the study area is located at the Wallgrove Road intersection with the greatest number of crashes all occurring resulting in ‘Rear Ends’.

Most crashes along Elizabeth Drive occurred in the westbound direction (approximately 55%) with a significant number of crashes occurring in the eastbound direction (approximately 39%).

Additionally, there was one crash reported involving a heavy vehicle at the M7 Westlink Ramp intersection where a rear-end crash occurred in the eastbound direction.

2.4.4.2 Wallgrove Road

There was a total of eight (8) crashes reported along the Wallgrove Road. Only one of these crashes resulted in minor/other injury and one other in moderate injury. The rest of the crashes resulted in non-casualty (towaway).

The most common type of crash was 'Rear End' (comprising of five crashes). The remaining two crashes resulted in 'Head On – not overtaking' and 'other – opposing rear'. Six (6) crashes occurred in the daylight, one during dusk and one in the dark.

50% of the crashes (i.e. four crashes) along Wallgrove Road were reported near the M7 Westlink Off-ramp intersection.

Only one crash occurred at the Elizabeth Drive / Wallgrove Road intersection which resulted in a 'Rear End' crash.

Additionally, there was one crash reported involving a heavy vehicle near the M7 Westlink Off-ramp intersection where a rear-end crash occurred in the southbound direction.

2.4.4.3 Westlink M7 Motorway

There was a total of 23 crashes reported along the Westlink M7 Motorway. Two of these crashes resulted in serious injury while the majority of the rest resulted in either moderate injury or minor/other injury.

The most common type of crash was 'Rear End' (comprising of 14 crashes) after which 'Lane Side Swipe' (comprising of two crashes) and 'Left Off Carriageway' (comprising of two crashes) were the most frequent crash types. 14 crashes occurred in the daylight and six during dusk.

2.4.4.4 Cecil Road

Only one crash was reported along the Cecil Road and that resulted in a non-casualty (towaway). This was a 'Rear End' crash which occurred in the dark close to the Cecil Road / Elizabeth Drive intersection.

3. PLANNED NETWORK UPGRADES

3.1 Overview

In the vicinity of the subject site there are number of road works planned as part of the upgrades to the existing road network including associated with the construction of the new M12 Motorway and widening of the Westlink M7 Motorway. The following section outlines the extent of road works associated with the M12 Motorway construction and the Westlink M7 widening, and its impacts on the surrounding road network such as the re-alignment and widening of Wallgrove Road, and upgrades to existing nearby intersections (e.g. Wallgrove Road / Cecil Road intersection).

Overall, impacts to the road network before and after construction works associated with the network upgrades are shown below in Figure 3.1.

Adapted from Nearmap

Figure 3.1: Overall Impact of Network Upgrades near the Subject Site

3.2 M12 Motorway Construction

The federal and NSW state government are working in collaboration to expand the existing Sydney motorway network with the construction of the new M12 Motorway as part of the Western Sydney Infrastructure Plan (WSIP) road investment program. The Motorway will serve as a new 16km-long east-west route between the M7 Motorway, Cecil Park and The Northern Road, Luddenham, providing direct access to the new Western Sydney International Airport at Badgerys Creek.

Key impacts on the road network surrounding the subject site include:

- Realignment of Wallgrove Road
- Realignment of Elizabeth Drive
- Realignment of shared path along the Westlink M7 Motorway
- Expansion of the M7 Motorway and Wallgrove Interchange.
- The construction footprint of the M12 Motorway is shown below in Figure 3.2.

Adapted from Source: M12 Motorway Environmental Impact Statement Appendix F Transport and Traffic Assessment Report (TfNSW, October 2919), Figure 6-10

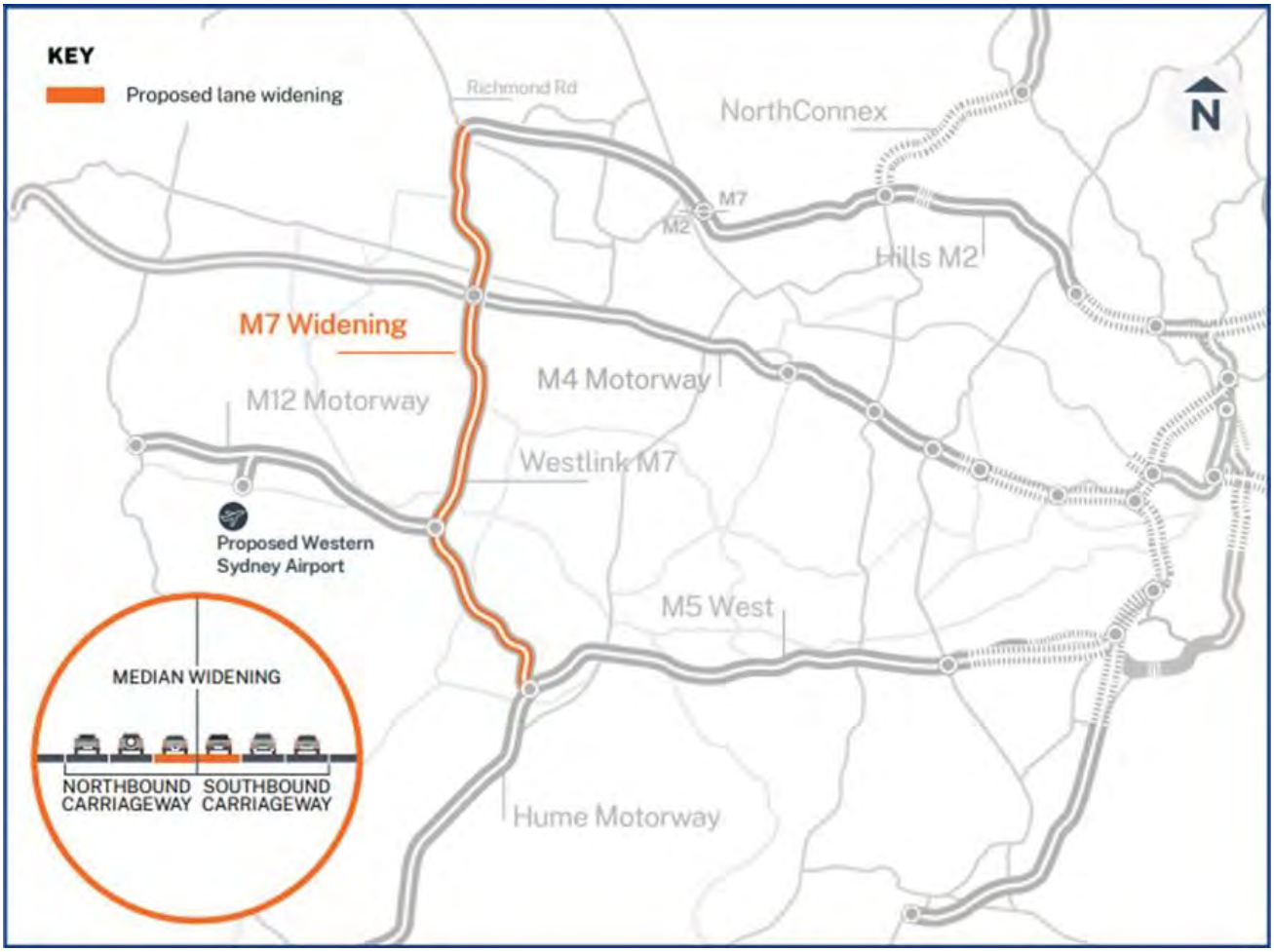
Figure 3.2: Construction Footprint of the M12 Motorway near the Subject Site

3.3 Westlink M7 Widening

TfNSW has also commissioned the proposal to widen the Westlink M7 Motorway to 6-lane road. The proposal seeks to widen a 26km-long section of the Westlink M7 Motorway between the M5 Motorway interchange at Prestons and Richmond Road at Oakhurst/Glendenning. Widening the Westlink M7 will support the new M12 Motorway since the construction of the M12 Motorway involves enhancing the M7-M12 interchange and the connection between Elizabeth Drive and the M12 Motorway. Other key features of this proposal include:

- Dedicated northbound and southbound entry lanes connected with the M4 Motorway
- Expansion of existing bridges
- Location changes to toll gantries, variable speed limit signs and variable message signs.

A map of the extent of the widening of the Westlink M7 Motorway is shown below in Figure 3.3.



Source: Westlink M7 Widening Modification Report (NSW Government, August 2022), Map of proposed Westlink M7 widening

Figure 3.3: Proposed Westlink M7 Widening

3.4 Wallgrove Road Upgrades

TfNSW has approved various upgrades along Wallgrove Road. These upgrades include the widening of the Road from a 2-lane road to a 4-lane road. As previously mentioned, Wallgrove Road is planned for a major realignment as part of the M12 East/Elizabeth Drive Connection Project for the M12 Motorway Construction. Additionally, the widening of Wallgrove Road would involve the set back of the property frontage of the subject site to accommodate adequate road reserve space for the Road.

Additionally, as part of the improving access to the future St Peters and Pauls Assyrian School on Kosovich Place, TfNSW has approved the upgrading of the Wallgrove Road / Kosovich Place intersection to include the following features:

- Banning of the eastbound right-turn movement
- New dedicated southbound right-turn bay
- New northbound left-turn pocket.

The proposed northbound left-turn pocket at Kosovich Place, might conflict with the required acceleration lane turn treatment north of the proposed driveway for the Business Hub.

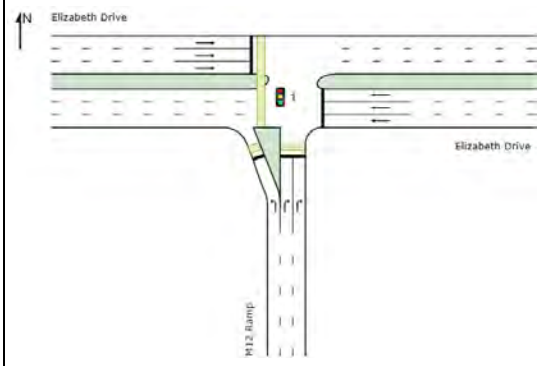
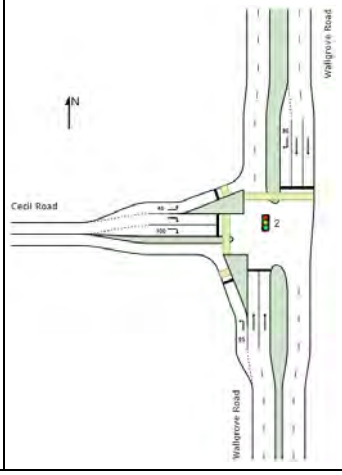
3.5 Intersection Upgrades

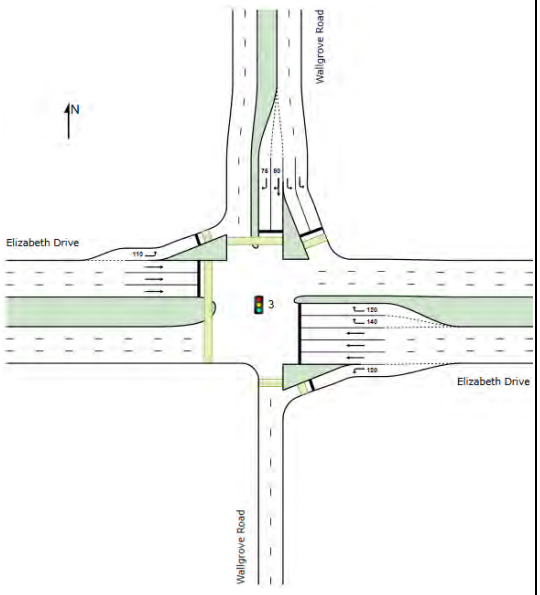
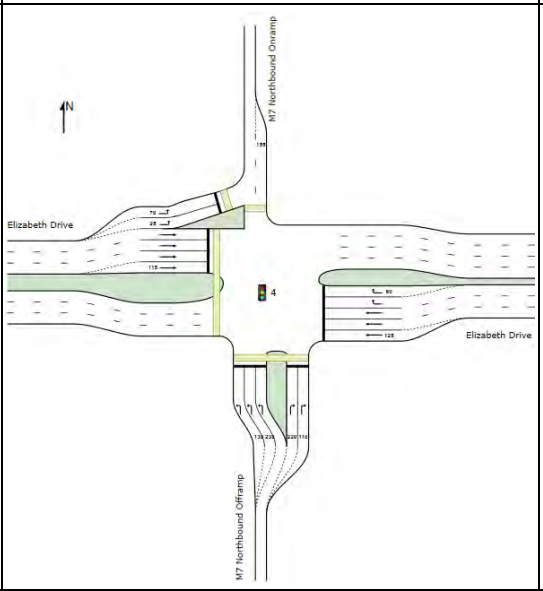
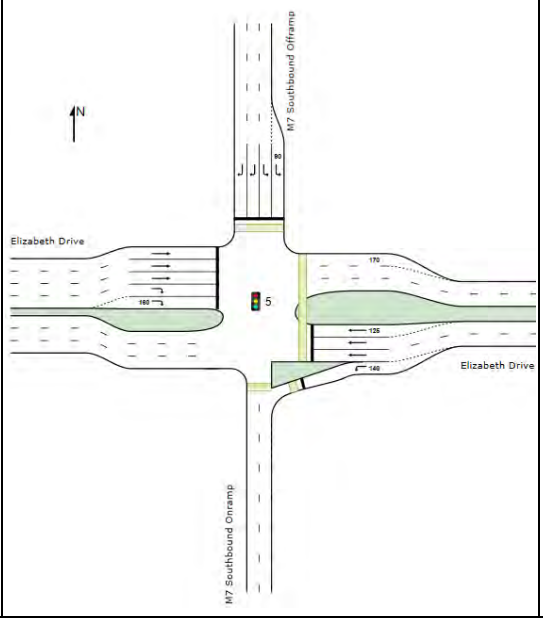
In 2021, WSP undertook traffic modelling using SIDRA 9.0 for the five (5) to be developed intersections surrounding the subject site, to assess the impact on the existing road network. The study area was bounded by:

- Wallgrove Road / Cecil Road in the north
- M12 Motorway in the south
- The intersections of Elizabeth Drive with the M12 on-ramp and M7 southbound on-ramp to the west and east respectively.

The upgraded intersections for this project are summarised in Table 3.1.

Table 3.1: Development Site Intersection Upgrades Relevant to Our Study Area

Intersection	Description of Upgrades	SIDRA Layout	Comments
Elizabeth Drive / M12 Western Exit Ramp	▪ Western and eastern approaches: three through lanes ▪ Southern approach: upgrades to two right-turning lanes and one left-turn slip lane.		Upgrades for 2026 and 2036
Wallgrove Road / Cecil Road	▪ New intersection added, connecting Wallgrove Road and Cecil Road.		Upgrades for 2026 and 2036

Intersection	Description of Upgrades	SIDRA Layout	Comments
Elizabeth Drive / Wallgrove Road	▪ North approach: two left-turn lanes and two right-turn lanes with one being right and through movement. ▪ East approach: additional through lane ▪ West approach: additional through lane and one short left-turn slip lane ▪ South departure: two lanes.		Upgrades for 2026 and 2036
Elizabeth Drive / M7 Northbound Exit/Entry Ramps	▪ North departure: one through lane and one short through lane ▪ East approach: two through lanes and one right-turn only lane, one short right-turn lane and one short through lane ▪ West approach: three through lanes, one short through lane and two short left-turn slip lanes ▪ South approach: one main left lane, two short left-turn lanes and two short right-turn lanes.		Upgrades for 2026 and 2036
Elizabeth Drive / M7 Southbound Exit/Entry Ramps	▪ North approach: two right-turn lanes, one left turn lane and one short left-turn lane ▪ East approach: two through lanes, one short through lane and one short slip left-turn lane ▪ West: three through lanes, one right-turn lane and one short right-turn lane ▪ South departure: two lanes.		Upgrades for 2026 and 2036

4. DEVELOPMENT PROPOSAL DETAILS

4.1 Development Description

At the subject site, a staged redevelopment is proposed to construct the Wallgrove Industrial Business Hub which will include two buildings accommodating various land uses with light industrial, warehouse and distribution facilities and ancillary office facilities. Across the different buildings/tenancies there is a total floorspace of approximately 36,375m^2. Key features of the Business Hub include:

- An internal road (i.e. Estate Road) with a turning head (on the northern side of the site) accessible via Wallgrove Road at the northern boundary of the site
- Warehouse Building 1: setback west of Wallgrove Road with approximately 10,335m^2 of industrial/warehouse floorspace as well as ancillary office spaces
- Warehouse Building 2: situated next to Wallgrove Road with approximately 26,040m^2 of industrial/warehouse floorspace as well as ancillary office spaces
- Two car park areas
- Two truck hardstand areas, one servicing each warehouse.

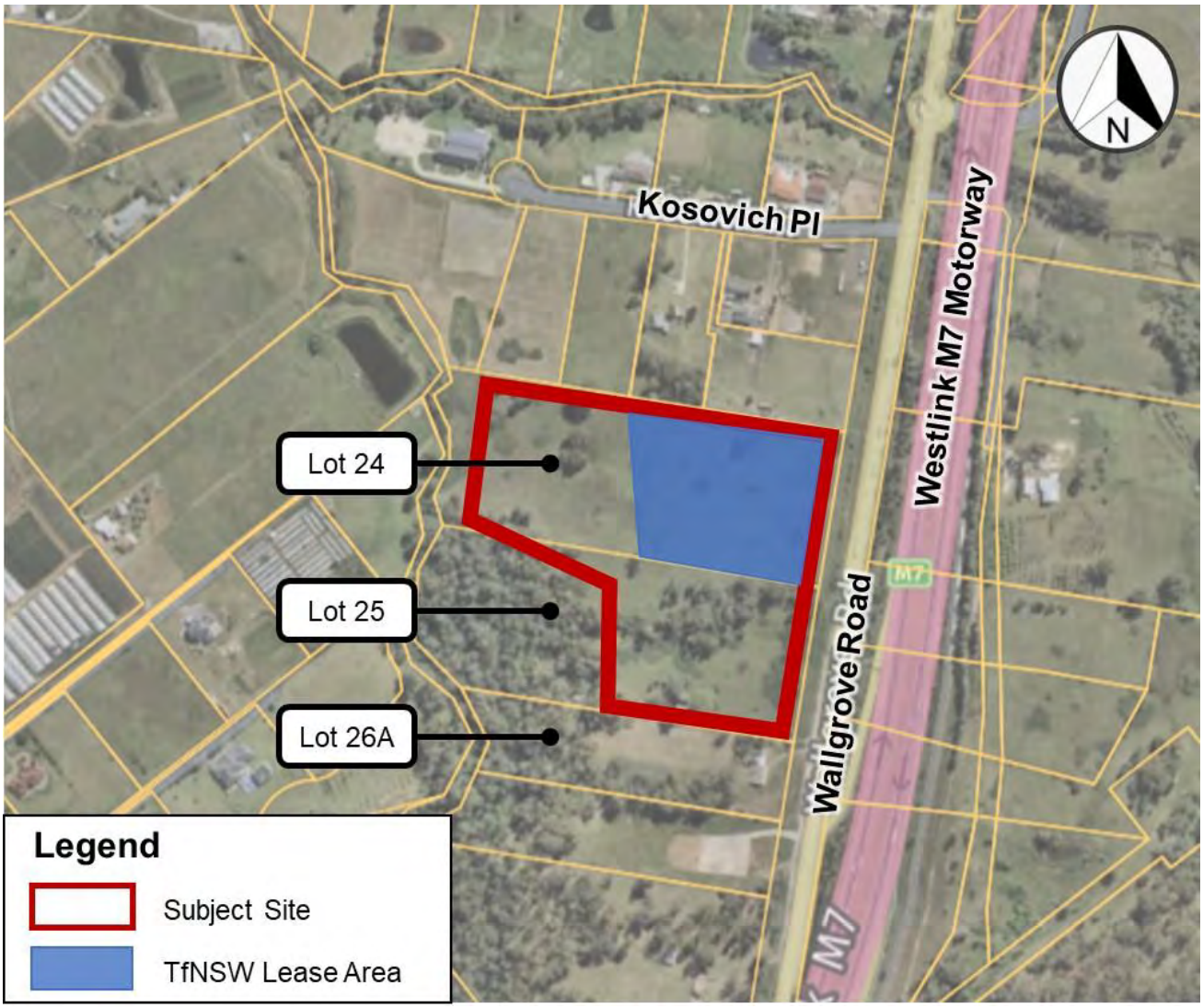
The proposed Wallgrove Industrial Business Hub site concept plan is shown below in Figure 4.1.

Source: Wallgrove Business Hub Concept Master Plan (Nettleton Tribe, 31/03/2025), Drawing No. 13103_DA001, Issue 3

Figure 4.1: Proposed Plan – Wallgrove Business Hub

As part of the M12 Motorway project, TfNSW has leased a portion of the area within lot 24 DP1152887 for construction purposes. This lease area will be used for construction purposes until full project completion. Additionally, as part of this project, TfNSW will be providing access to lot 26A DP387529 via lot 25 Section 4 DP 2954 in agreement with WSPT. No portion of lot 25 is leased for construction or acquired for freeway purposes and is thus still within WSPT control. However, further details of the portion lot 25 used for access and access arrangement will be confirmed at a later stage. It should also be noted that the area leased in lot 24 will be directly controlled by TfNSW until the construction of the M12 Motorway commences, after which control of the site will be transferred to the Contractor.

The area within the subject site leased by TfNSW is shown below in Figure 4.2.



Adapted from Nearmap

Figure 4.2: TfNSW Lease Area within Subject Site

4.2 Active Transport Facilities

Limited pedestrian facilities are provided within the site with 1.5m-wide footpaths proposed to enable pedestrian access to the offices on-site adjacent to the internal road. However, there are no cyclist facilities provided on-site. Additionally, no cyclist facilities are provided on-site (e.g. bicycle racks). As previously discussed in Section 2.3, there is limited cycling infrastructure in the vicinity of the subject site, none of which provides connectivity nor direct access with the proposed industrial

hub. Furthermore, given that the location of the industrial hub is in an industrial/rural area, development of a Green Travel Plan for the site seems unnecessary.

4.3 Traffic Generation

The Trip Generation Surveys Business Parks and Industrial Estates Analysis Report, provide rates to assist in determining appropriate rates of vehicle traffic generation during the AM and PM peak hours for a Business Park with a GFA of up to 200,000m^2 in Table 3.3 of the Report. This table is shown below in Figure 4.3.

Survey Area	Period	R^2	Relationship
Estate Peak Hours			
Person Trips	AM	0.92	Y = 0.0095x – 57
	PM	0.89	Y = 0.0096x – 22
	Daily	0.96	Y = 0.0841x – 124
All Vehicle Trips	AM	0.92	Y = 0.0085x – 62
	PM	0.91	Y = 0.0082x - 30
	Daily	0.94	Y = 0.0741x – 46
Road Network Peak Hours			
Person Trips	AM	0.93	Y = 0.0096x – 79
	PM	0.85	Y = 0.0068x + 17
Vehicle Trips	AM	0.92	Y = 0.0086x – 79
	PM	0.88	Y = 0.0052x + 19

Where Y = Number of trips x = Total Gross Floor Area, m^2

Adapted from source: Trip Generation Surveys Business Parks and Industrial Estates Analysis Report (TfNSW, December 2020), Table 3.3

Figure 4.3: Roads and Maritime Services Trip Generation Surveys

Table 4.1 presents a comprehensive analysis of the trip generation from each individual building within the site, as well as the overall vehicle trip generation for the site. Given that the regression formula removes a constant volume of trips, trips generated by both warehouses have been calculated collectively and proportionally applied as outlined in Table 4.1.

Table 4.1: Development Traffic Generation

Building Type	GFA (m^2)	GFA Proportion	Trip Generation Relationships	Traffic Generated
Warehouse 1	10,335m^2	28.4%	AM = ((0.0086 x 36,375) -79)*28.4%	66
			PM = ((0.0052 x 36,375) +19)*28.4%	59
Warehouse 2	26,040m^2	71.6%	AM = ((0.0086 x 36,375) -79)*71.6%	168
			PM = ((0.0052 x 36,375) +19)*71.6%	149
Total	36,375m^2	100%	AM = (0.0086 x 36,375) -79	234
			PM = (0.0052 x 36,375) +19	208

Considering the land use is a warehouse area, we have estimated the vehicle distribution to comprise of 70% light vehicles and 30% heavy vehicles.

4.4 Traffic Distribution

A 70/30 'IN:OUT' split assumption was adopted for this assessment to estimate the distribution of the development traffic onto the surrounding road network. The adopted 'IN:OUT' splits for the development are summarised in Table 4.2.

Table 4.2: Development Traffic Directionality Splits

Land Use	AM Trip Split		PM Trip Split		AM Trip (veh/h)		PM Trip (veh/h)	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Warehouse	70%	30%	30%	70%	164	70	62	146

The traffic distribution onto Wallgrove Road for the upcoming development was determined based on the access routes drivers are likely to choose to reach the main distribution points within the road network.

Therefore, it is assumed that all the traffic after exiting the site will head south towards the Westlink M7 and future M12 Motorways and Elizabeth Drive.

4.5 Peak Traffic Volumes

Based on the directionality splits in Table 4.2, the estimated traffic distribution (for trips generated due to the proposed development) onto the surrounding road network was developed and illustrated below in Figure 4.4.

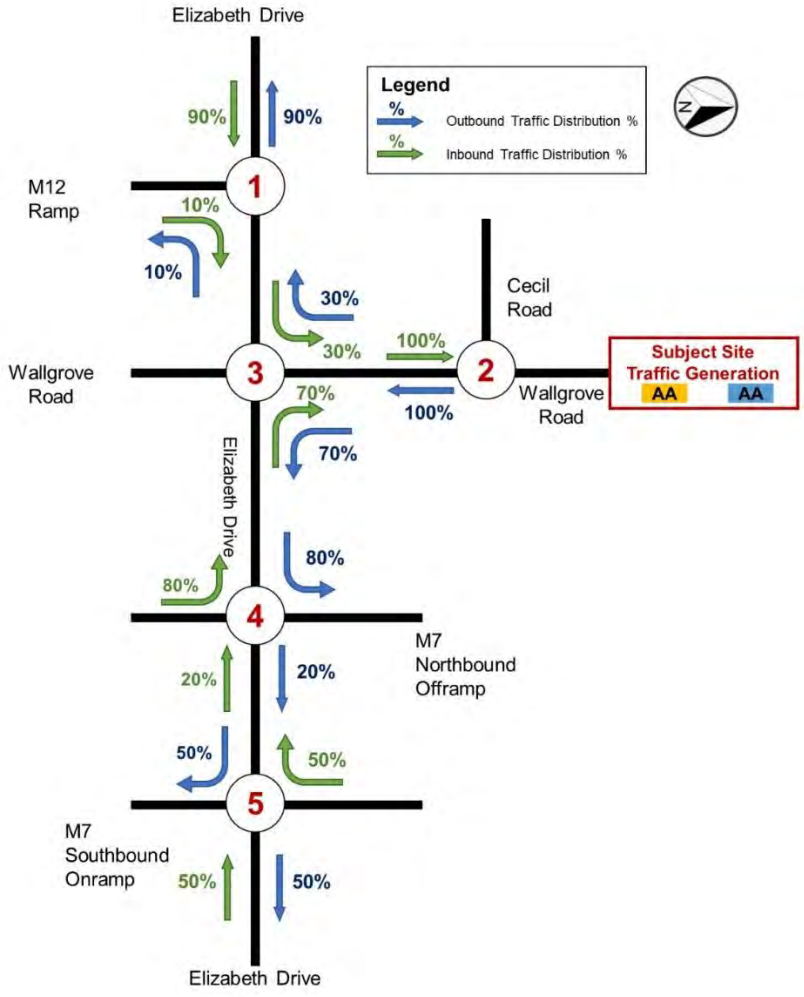


Figure 4.4: Estimated Development Traffic Distribution

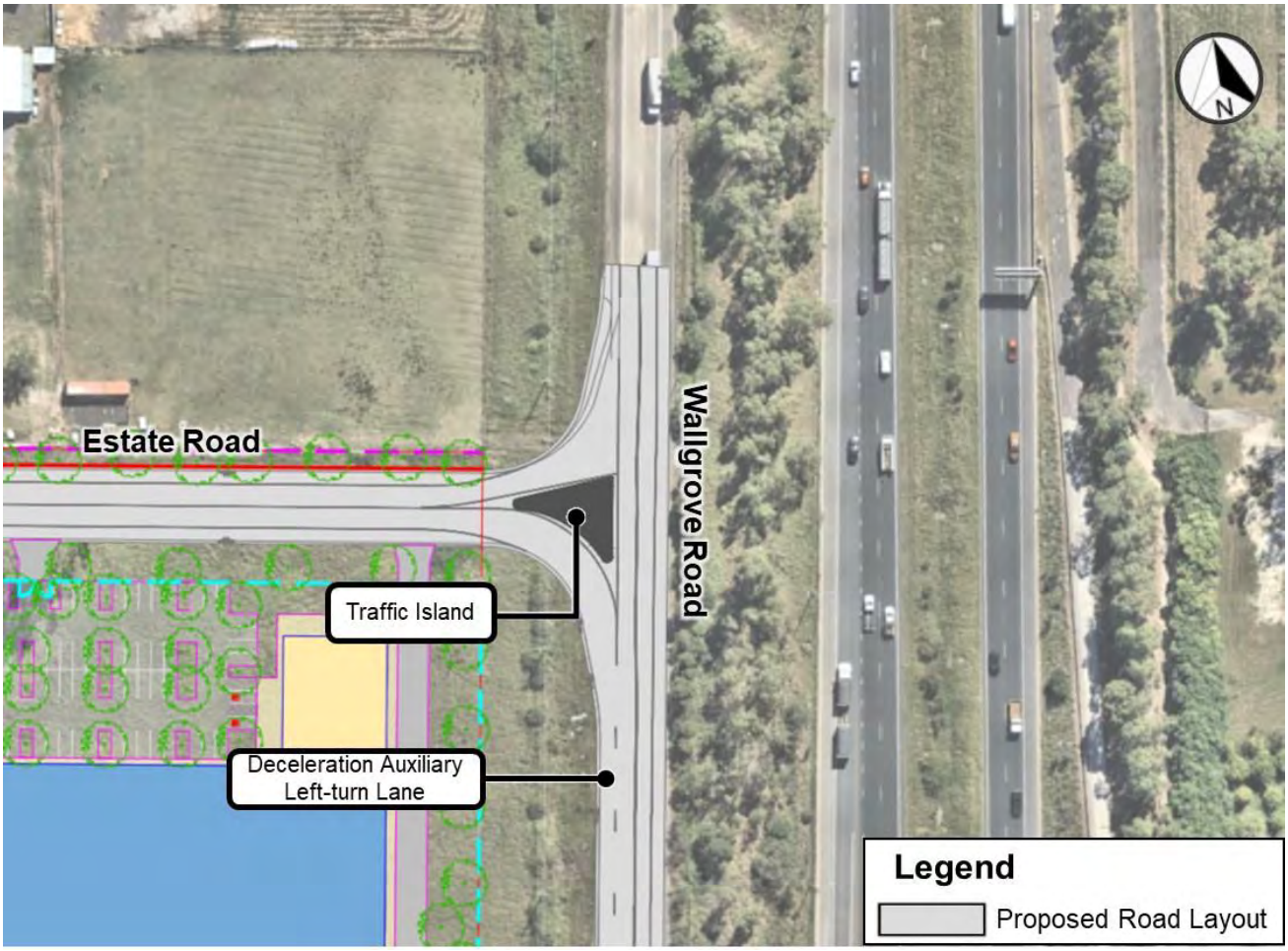
5. VEHICLE ACCESS AND PARKING

5.1 Site Access

The primary vehicle access to the site is proposed to be via Wallgrove Road. Access arrangement will consist of construction of a new intersection. Key features of the new intersection include the provision of a northbound deceleration auxiliary lane and a traffic island to support and geometrically channelise a 'left-in / left-out' arrangement.

Recommendation of the proposed access arrangement is included as part of the concept plan of the proposed Wallgrove Industrial Hub site, with detailed design plans to be developed at a later stage. Furthermore, a Works Authorisation Deed (WAD) will be required since works will be carried within Wallgrove Road which is a state road.

The proposed access arrangement, as recommended within the concept plan, is shown in Figure 5.1.



Adapted from Nearmap and Source: Wallgrove Business Hub Concept Master Plan (Nettleton Tribe, 31/03/2025), Drawing No. 13103_DA001, Issue 3

Figure 5.1: Proposed Access Arrangement

Design of the proposed access arrangement was assessed in accordance with the requirements of Austroads' *Guide to Road Design Part 4A Unsignalised and Signalised Intersection*. The assessment of the auxiliary left-turn lanes is provided below in Table 5.1.

Table 5.1: Access Arrangement Assessment

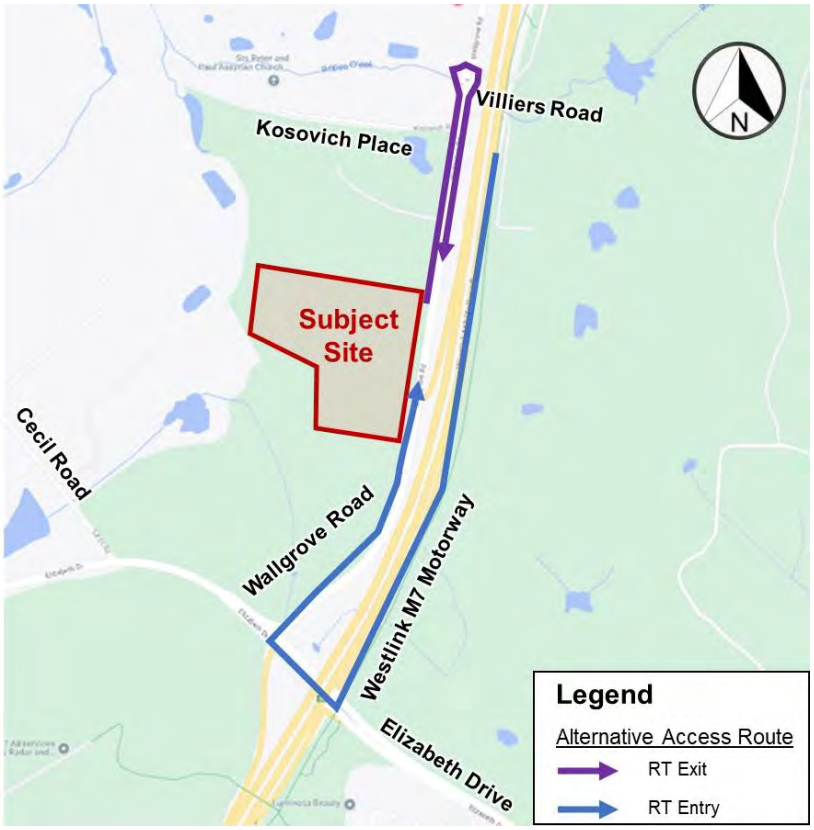
Lane Type	Design Speed (km/h)	Taper Length (m)		Lane Length (m)		Requirements Met?
		Proposed	Required	Proposed	Required	
Deceleration						
Auxiliary Left-turn	90	25	25	125	125	Y
Acceleration						
Auxiliary Left-turn	90	-	80	-	1500	N/A

There are issues associated with the construction of a compliant acceleration lane. As previously mentioned in Section 3.4, TfNSW has approved a new access arrangement for the Wallgrove Road / Kosovich Place intersection. Provision of this acceleration lane would conflict with northbound left-turn movements at the Kosovich Place intersection and raise safety issues. Furthermore, 1500m is noted to be rather extensive for an acceleration lane. Thus, it is recommended that the acceleration lane be subject to further investigation and discussion with TfNSW. The concept plan of the Wallgrove Industrial Hub which includes the access arrangement, subject to change in light of the outcome of the investigation and discussion, is provided in **Appendix B**.

5.2 Development of Site Access Design

The initial access arrangement designs included a channelised southbound right-turn lane and allowed right-turning access / egress movements. However, TfNSW raised safety concerns with regards to right-turning vehicles as Wallgrove Road has a posted speed limit of 80km/h. Furthermore, since the development is expected to generate a significant volume of heavy vehicle trips, specific turning lane treatments would be required (e.g. channelised right-turn lane). This would require widening Wallgrove Road which is not feasible due to road width and geometry limitations.

Consequently, through discussion and assessments undertaken by Bitzios Consulting, WSPT prepared a concept plan incorporating a 'left-in / left-out' arrangement which is assessed for this assessment. Banning right-turn access / egress movements are expected to have significant implications for the route choice of right-turning vehicles (particularly on heavy vehicles). Thus, Bitzios Consulting undertook an assessment of this arrangement and summarised its findings in *Wallgrove Business Hub Alternative Access Arrangement Technical Note* (provided in **Appendix C**). The assessment concluded the left-in and left-out arrangement would be feasible as alternative routes would be available with the M7 Motorway southbound off-ramp to Elizabeth Drive and the Wallgrove Road / Villiers Road roundabout (north of Kosovich Place) shown below in Figure 5.2.



Adapted from Google Maps

Figure 5.2: Alternative Routes – Right-turn Access / Egress

5.3 Internal Access Road Layout

Assessment of the on-site internal access road layout has been undertaken with reference to Table 4.3 of the Austroads' Guide to Road Design Part 3 Geometric Design, shown below in Figure 5.3, which outlines appropriate urban arterial road widths. Based on the site layout and that high truck volumes are expected to access the site, 4.2m was determined to be the appropriate lane width of the internal access road on-site.

Element	Lane width (m)	Comments
General traffic lane	3.5	General traffic lane widths to be used for all roads
	3.0–3.4	For use on low speed roads with low truck volumes
Service road lane	3.4–5.5	Range of lane widths on service roads (refer to Section 4.12)
Wide kerbside lane	4.2	Locations where there are high truck volumes (additional width provided for trucks)
	4.2–4.5	Locations where motorists and cyclists use the same lane (refer Section 4.9.11 and Commentary 6)
HOV lane	3.5–4.5	Bus lane (refer Section 4.10.2)
	3.3	Tram/light rail vehicle lane (refer Section 4.10.3)
Minimum width between kerb and channel (to provide for passing of broken down vehicles)	5.0(1)–6.5(2)	Width of a single lane suitable for use in a left turn slip lane, or two lane, two way divided road with a raised median
	2 × 4.0 (8.0)	Width of two lanes that provide for two lines of traffic to (slowly) pass a broken down vehicle.

Adapted from Source: Guide to Road Design Part 3: Geometric Design (Austroads, February 2021), Table 4.3

Figure 5.3: Urban Arterial Road Widths

The provided internal road has a width of 13.5m. Assuming the road will accommodate two-lane traffic, the internal road layout complies with the relevant requirements of AS2890.2:2018 and Austroads. It should be noted that the internal road layout also includes a turning head in the middle of the site which is assessed with swept path analysis (refer to Section 5.7).

5.4 Parking Provision

Parking provision requirements are provided by Fairfield City Wide Development Control Plan 2024 (Council DCP 2024) and TfNSW's *Guide to Transport Impact Assessment Technical guidance for transport practitioners TS 00085 | Version 1.1 2024 (GTTIA 2024)*. These requirements are summarised below in Table 5.2.

Table 5.2: Car Parking Rates

Use/Activity	Minimum Number of Car Spaces Required	Source
Warehouse	1 space per 70m² GLA with a minimum 3 spaces	Fairfield City Wide DCP 2024 Chapter 12 Table 1, Rural Industry
	1 space per 300m² GFA	TfNSW's GTTIA 2024 Chapter 8.5.4, Warehouse or distribution centre

It should be noted that the parking provision requirement provided within Council DCP 2024 is typically used for more industrial spaces with higher staff numbers (e.g. factories). Given the nature of the proposed industrial development is for warehouse and distribution purposes, TfNSW's GTTIA 2024 rate of 1 space per 300m² GFA is deemed more appropriate rate when compared to the rates provided in other DCPs of other Councils. Hence, the rate of 1 space per 300m² was adopted for this assessment.

Additionally, provision of Persons With Disabilities (PWD) spaces were assessed against the Building Code of Australia Volume 1 2007 (BCA). In summary, the amount of parking provision on-site is summarised below in Table 5.3.

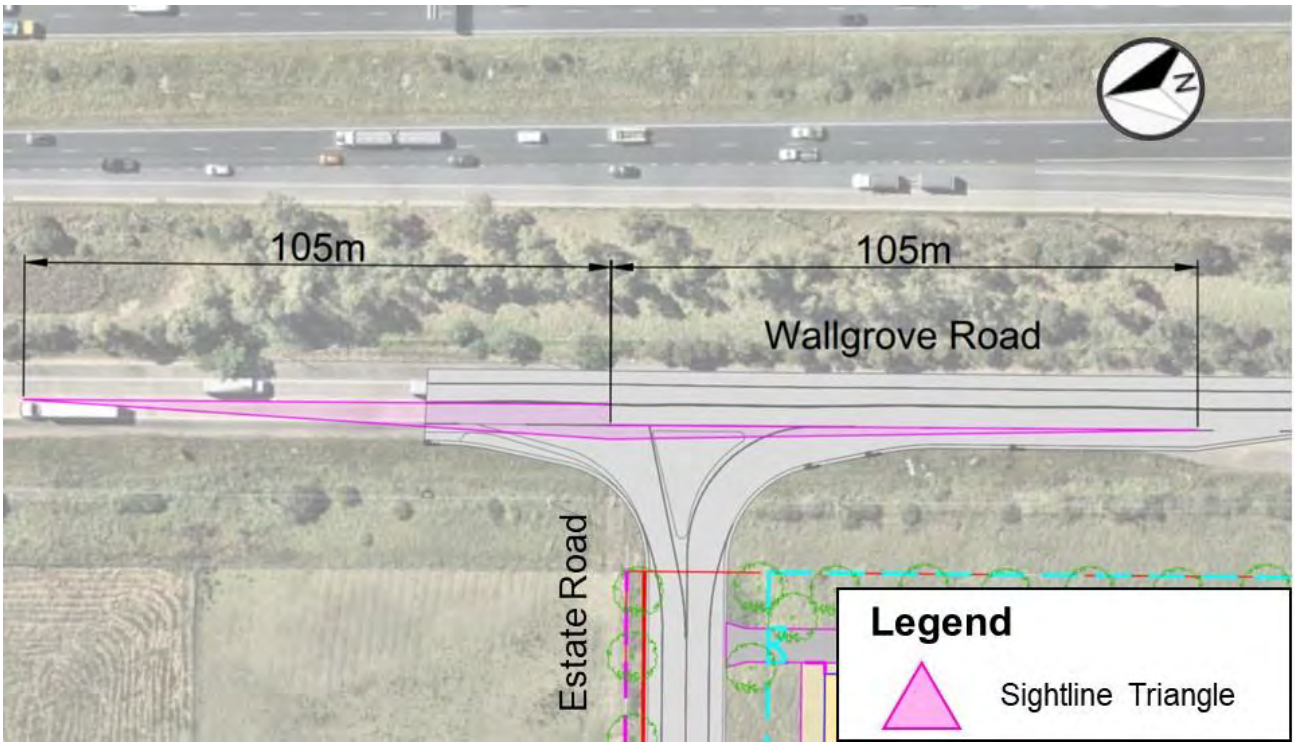
Table 5.3: Requirements for Car Parking Provision

Parking Type	Parking Rate	Floorspace / Parking	Parking Required	Parking Provision
Cars				
Warehouse Building 1	1 space per 300m² of GFA (TfNSW's GTTGD Chapter 5.11.2)	10,335m² GFA	34	57
Warehouse Building 2		26,040m² GFA	87	119
Total			121	176
PWD				
Warehouse Building 1	1 space per 100 car spaces or part thereof (BCA Table D3.5 Class 7 Building)	57 car spaces	1	1
Warehouse Building 2		119 car spaces	2	2
Total			3	3

In summary, the total parking provision of cars and PWDs complies with the requirements outlined in TfNSW's *GTTIA 2024* and the BCA.

5.5 Sightline Assessment

As per AS2890.1, Figure 3.2, the resulting minimum safe sight distance requirement is 105m from the driveway (for an 80km/h road). As such, Figure 5.4 illustrates the vehicle sightline envelope from the driveway on Wallgrove Road.



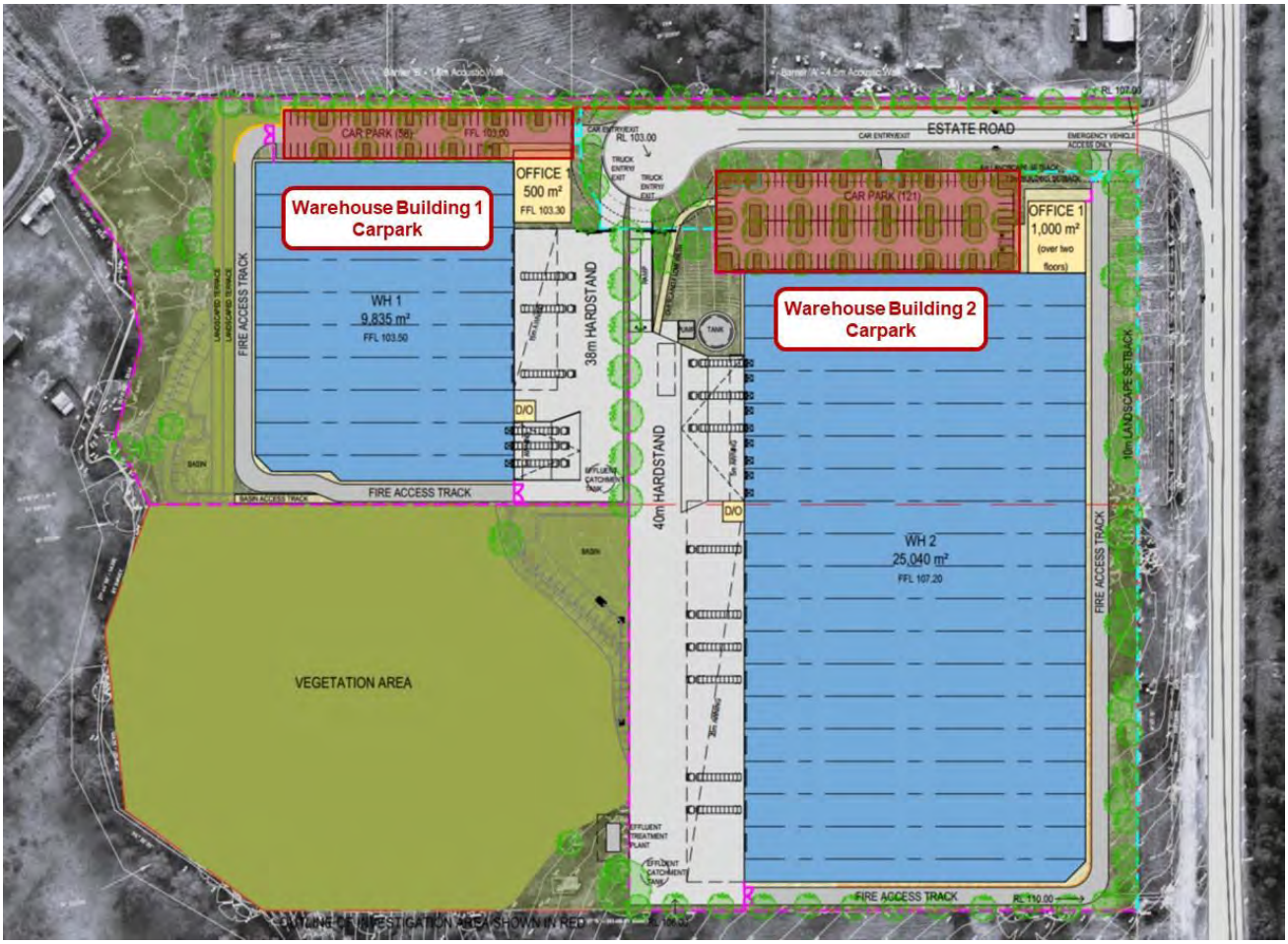
Adapted from Nearmap and Source: Wallgrove Business Hub Concept Master Plan (Nettleton Tribe, 31/03/2025), Drawing No. 13103_DA001, Issue 3

Figure 5.4: Vehicle Sightline Assessment

Figure 5.4 shows the vehicle sightline on Wallgrove Road is not obstructed by any of the surrounding elements (e.g. trees, bushes, etc.). It should be further noted that the extents of the vehicle sightline south of the internal road does not reach the southern boundary of the proposed development and by extension nowhere near the proposed curved alignment of Wallgrove Road due to the M12 Motorway construction (refer to Section 3.2). Thus, no safety issues are expected to arise in regard to the vehicle sightlines from the proposed access point (i.e. Internal Road) to the future curved alignment of Wallgrove Road south of the proposed development. Further details of the sightline assessment are provided **Appendix D**.

5.6 Parking Layout

Car park areas provided on-site are shown below in Figure 5.5.



Adapted from Source: Wallgrove Business Hub Concept Master Plan (Nettleton Tribe, 31/03/2025), Drawing No. 13103_DA001, Issue 3

Figure 5.5: Proposed On-Site Car Parks – Wallgrove Business Hub

The proposed parking arrangement was assessed against requirements set out in the Australian Standard AS2890. The assessment of the proposed parking arrangement is summarised below in Table 5.4.

Table 5.4: Parking Assessment

Item	Requirement (mm) (AS2890)	Provision (mm)	Compliance
Warehouse Building 1			
Parking Space Dimensions			
Parking Spaces	2400 x 5400 (min.)	2500 x 5400	Compliant
Parking Space (adjacent blind aisle)	2700 x 5400 (min.)	3000 x 5400	Compliant
PWD Parking Space	2400 x 5400 (min.)	2500 x 5400	Compliant
PWD Shared Area	2400 x 5400 (min.)	2500 x 5400	Compliant
Aisle Dimension			
Aisle Width	5800 (min.) (as per AS2890.1-2004 Figure 2.2)	6200	Compliant
Blind Parking Aisle	1000 (min.) (as per AS2890.1-2004 Figure 2.4.2)	3000	Compliant
Access & Egress Driveway			
Width	3000 (min.)	6200	Compliant
Warehouse Building 2			
Parking Space Dimensions			
Parking Spaces	2400 x 5400 (min.)	2500 x 5400	Compliant
PWD Parking Space	2400 x 5400 (min.)	2500 x 5400	Compliant
PWD Shared Area	2400 x 5400 (min.)	2500 x 5400	Compliant
Aisle Dimension			
Aisle Width	5800 (min.) (as per AS2890.1-2004 Figure 2.2)	6200	Compliant
Blind Parking Aisle	1000 (min.) (as per AS2890.1-2004 Figure 2.4.2)	N/A	N/A
Access & Egress Driveway			
Width	3000 (min.)	6200	Compliant

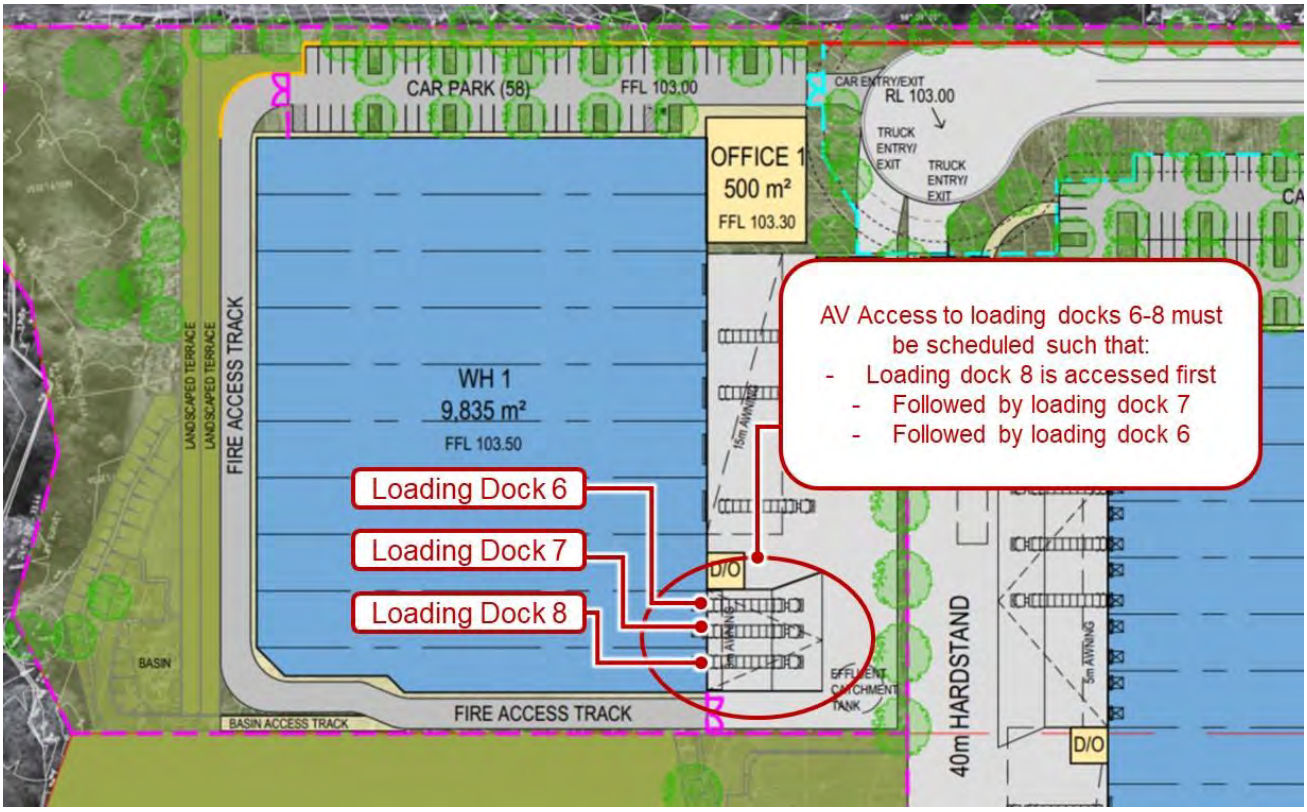
Further to the above, it should be noted that for warehouse building 1 carpark, a turnaround area of 2600mm x 5400mm is provided adjacent to the 3m-long blind aisle. Thus, the carpark for warehouse building 1 is deemed to be compliant with the requirements to support turnaround manoeuvres.

Overall, the proposed parking layouts for warehouse buildings 1 and 2 comply with the requirements outlined in AS2890.

5.7 Swept Path Analysis

Swept path analysis was undertaken to assess the access of the 20m articulated vehicle (AV) to the provided hardstand areas, as well as the access of the 12.5m heavy rigid vehicle (HRV) to the fire track access.

Results of the swept path analysis for the 20m AV showed that there is generally sufficient space provided within the proposed hardstand and internal road for the vehicle to safely perform reverse-in manoeuvres into and forward-out manoeuvres out of the recessed loading docks. It should be noted that the swept path analysis demonstrated that the AV access to the three (3) loading docks at the southern end of the warehouse 1 hardstand must be scheduled to avoid potential vehicle conflicts and property damage. Furthermore, no schedule is required for the egress movements. The sequence of AV access movements the schedule must support is shown in Figure 5.6



Adapted from Source: Wallgrove Business Hub Concept Master Plan (Nettleton Tribe, 31/03/2025), Drawing No. 13103_DA001, Issue 3

Figure 5.6: Schedule for AV Access to loading Docks to Warehouse Building 1 (South Side)

Results of the swept path analysis for the 12.5m HRV showed that there is generally sufficient space provided to access the fire access track. Furthermore, based on these results, two possible options are available to amend the north-eastern driveway for the fire access track:

- **Option 1**: Increase the splay of the north-eastern driveway of the fire access track
- **Option 2**: Ban left-turn movements into the north-eastern driveway of the fire access track.

Further details on the swept path analysis are provided in **Appendix E**.

6. TRAFFIC CAPACITY ASSESSMENT

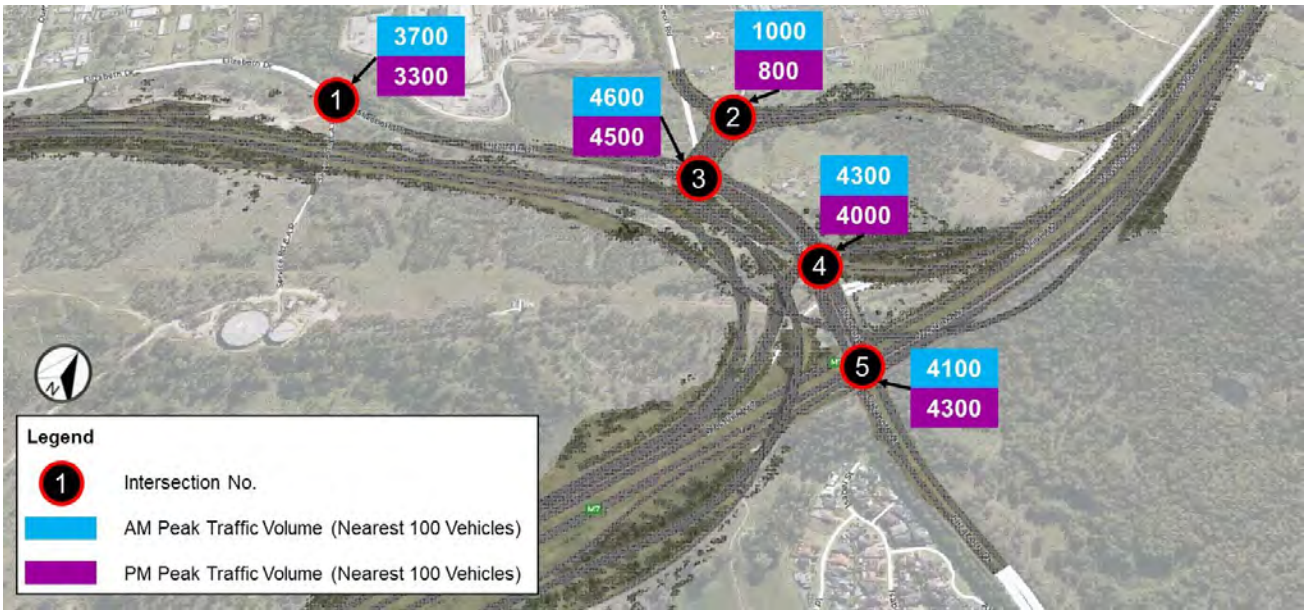
6.1 Background Traffic

Traffic volumes generated during the future years of 2026 and 2036 were assessed for this TIA. Traffic volumes, consisting of strategic model forecasts, were provided by WSP. It should be noted that these traffic volumes were originally sourced from the SIDRA model developed by Jacobs for TfNSW. Traffic volumes were classified into light vehicles and articulated trucks.

The model represents traffic conditions at the intersections listed below in Table 6.1. The 2026 and 2036 intersection throughput volumes for the peak one hour in the weekday morning (AM) and evening (PM) peak periods are summarised in Figure 6.1 and Figure 6.2 respectively.

Table 6.1: Intersection Traffic Count Locations

No.	Intersection	Control Type
1	Elizabeth Drive / M12 Western Exit Ramp	Signalised
2	Wallgrove Road / Cecil Road	Signalised
3	Elizabeth Drive / Wallgrove Road	Signalised
4	Elizabeth Drive / M7 Northbound Exit/Entry Ramps	Signalised
5	Elizabeth Drive / M7 Southbound Exit/Entry Ramps	Signalised



Adapted from Nearmap

Figure 6.1: Study Area – 2026 Background Traffic Assessment

Adapted from Nearmap

Figure 6.2: Study Area – 2036 Background Traffic Assessment

The provided traffic volumes were classified into two scenarios: Scenario 2 representing 2026 Ultimate model forecasts and Scenario 3 representing 2036 Ultimate model forecasts. Further details on these volumes are provided in **Appendix F**.

6.2 Methodology

6.2.1 Overview

SIDRA analysis software (version 9.1) was used to model and assess the operation of the following intersections:

- Elizabeth Drive / M12 Western Exit Ramp
- Wallgrove Road / Cecil Road
- Elizabeth Drive / Wallgrove Road
- Elizabeth Drive / M7 Northbound Exit/Entry Ramps
- Elizabeth Drive / M7 Southbound Exit/Entry Ramps.

For the traffic capacity assessment, a base case scenario and development case scenario were developed for the future years 2026 and 2036. In the base case scenario, the background traffic volumes (refer to Section 6.1) were solely considered. While in the development case scenario, the sum of the background traffic and the traffic generated due to the proposed development (refer to Sections 4.5) was considered.

A set of capacity impact criteria (refer to Section 6.2.2) was adopted to assess the performance of the above intersections.

6.2.2 Capacity Impact Criteria

The capacity impact criteria adopted for this assessment consists of Level of Service and Degree of Saturation measures.

Level of Service (LOS) is a measure of an intersection's operational performance and is related to the average number of seconds vehicles are delayed at an intersection or on each approach. Table 6.2 shows the standard criteria adopted by Roads and Maritime in assessing the LOS of signalised intersections.

Table 6.2: TfNSW Level of Service Criteria for Signalised Intersections

Level of Service	Average Delay per vehicles (sec/veh)	Traffic Signals
A	<14	Good operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity, incidents will cause excessive delays
F	>70	Flow breakdown; forced flow

Source: Guide to Transport Impact Assessment Technical guidance for transport practitioners TS 00085 | Version 1.1 (TfNSW, 2024) Appendix F – Levels of service for intersections

Degree of Saturation (DoS) is a measure of an intersection's operating capacity (volume/capacity ratio). The TfNSW Traffic Modelling Guidelines (2013) state that the maximum practical DoS for signalised intersections should be 0.90.

6.3 2026 Base Case Analysis

6.3.1 Traffic Volumes

Total traffic volumes for 2026 Base Case modelled in SIDRA are shown below in Figure 6.5.

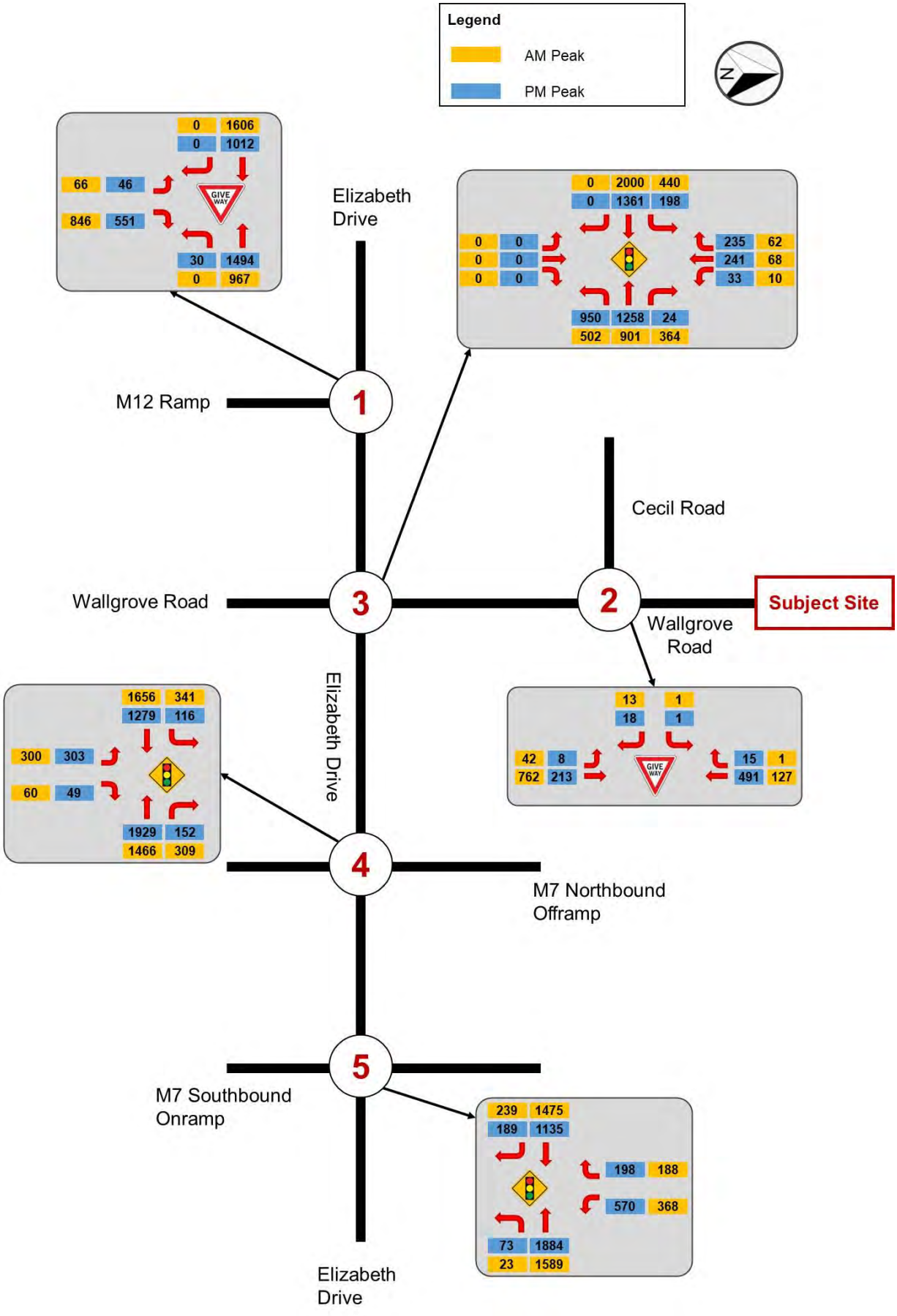


Figure 6.3: 2026 Base Case Traffic Volumes

6.3.2 Intersection Performance Summary

Table 6.5 summarises the 2026 AM and PM peak base intersection performance results.

Table 6.3: Intersection SIDRA Results Summary – 2026 Base

Intersection	AM Peak				PM Peak			
	DoS	Average Delay	LOS	95 the Percentile Queue	DoS	Average Delay	LOS	95 the Percentile Queue
Elizabeth Drive / M12 Western Exit Ramp	0.621	25.9	LOS B	111.6	0.505	18.1	LOS B	72.6
Wallgrove Road / Cecil Road	0.293	9.1	LOS A	36.2	0.241	6.9	LOS A	32.1
Elizabeth Drive / Wallgrove Road	0.652	18.7	LOS B	119.8	1.034	34.2	LOS C	209.7
Elizabeth Drive / M7 Northbound Exit/Entry Ramps	0.464	21.5	LOS B	73.8	0.542	18.4	LOS B	75.8
Elizabeth Drive / M7 Southbound Exit/Entry Ramps	0.579	23.6	LOS B	99.9	0.792	25.2	LOS B	124

The above results indicate that overall network performs at a satisfactory level with the worst LOS performance occurring during the PM peak hour at the Elizabeth Drive / Wallgrove Road intersection where an LOS C was resulted. It should be noted that this intersection is slightly over capacity with a DoS of 1.034 due to the heavy right-turning and through volumes from the northern approach on Wallgrove Road.

6.4 2036 Base Case Analysis

6.4.1 Traffic Volumes

Total traffic volumes for 2036 Base Case modelled in SIDRA are shown below in Figure 6.6.

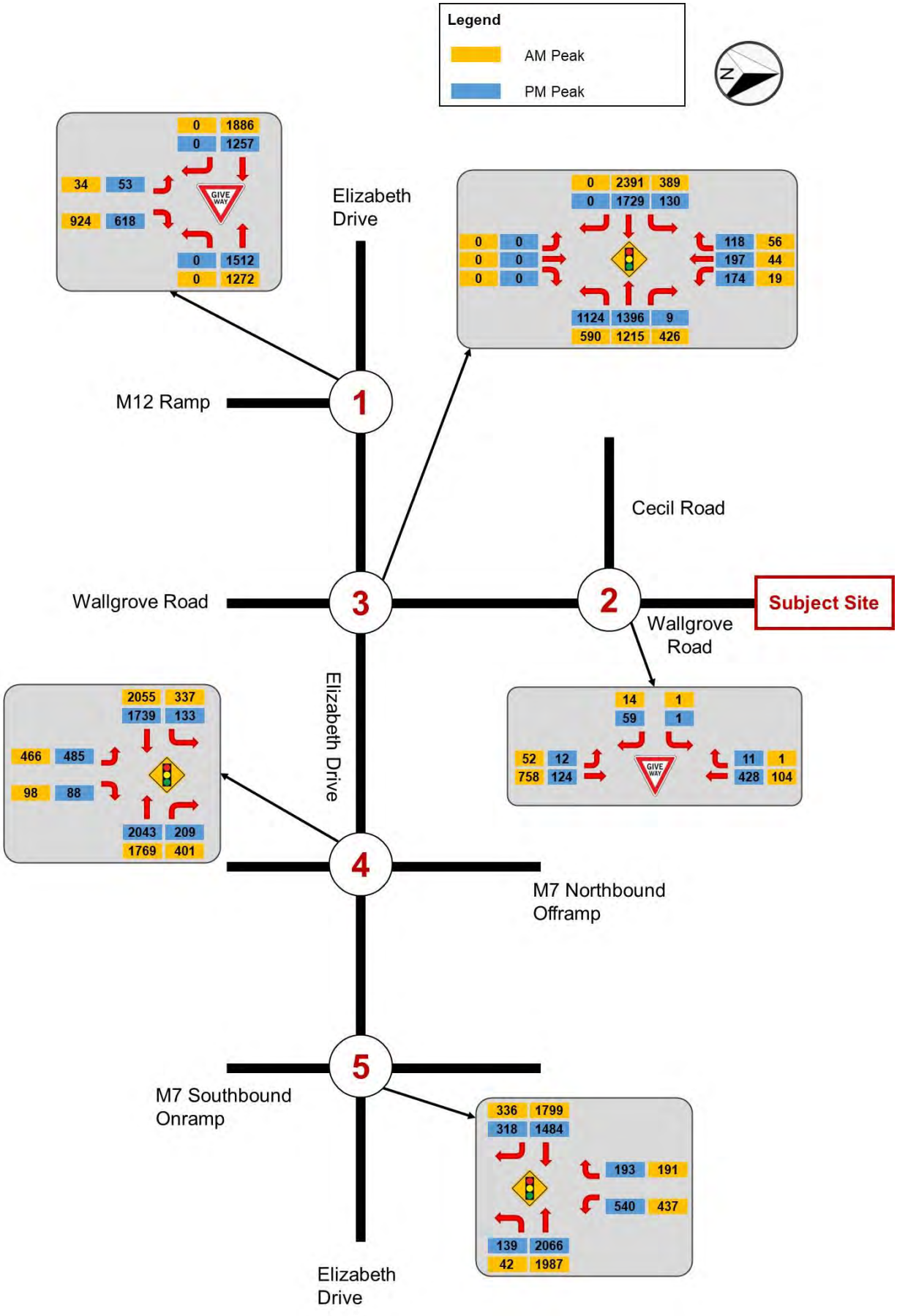


Figure 6.4: 2036 Base Case Traffic Volumes

6.4.2 Intersection Performance Summary

Table 6.5 summarises the 2036 AM and PM peak base intersection performance results.

Table 6.4: Intersection SIDRA Results Summary – 2036 Base

Intersection	AM Peak				PM Peak			
	DoS	Average Delay	LOS	95 the Percentile Queue	DoS	Average Delay	LOS	95 the Percentile Queue
Elizabeth Drive / M12 Western Exit Ramp	0.699	27.2	LOS B	105.5	0.525	20.1	LOS B	79.5
Wallgrove Road / Cecil Road	0.299	10.7	LOS A	38.6	0.296	16.1	LOS B	43.4
Elizabeth Drive / Wallgrove Road	0.774	24.3	LOS B	181.2	1.046	45.7	LOS D	254
Elizabeth Drive / M7 Northbound Exit/Entry Ramps	0.652	28.0	LOS B	116.8	0.691	23.9	LOS B	197.8
Elizabeth Drive / M7 Southbound Exit/Entry Ramps	0.723	29.3	LOS C	135.7	1.026	62.5	LOS E	334.9

The above results indicate that the overall network performs mostly at a satisfactory level as well as the following key findings:

- During the PM peak hour, the Elizabeth Drive / Wallgrove Road intersection performs near capacity at LOS D in 2036 with a DoS slightly over 1 due to the heavy right-turning and through volumes from the northern approach on Wallgrove Road
- During the PM peak hour, the Elizabeth Drive / M7 Southbound Exit/Entry Ramps intersection performs at an LOS E which is below desirable standards and is slightly over-capacity with a DoS of 1.026. This indicates a significant deterioration in traffic conditions in 2036 and is mainly due to the heavy southbound right-turning and westbound through-movement vehicles trying to enter Elizabeth Drive (West).

6.5 2026 Development Case Analysis

6.5.1 Traffic Volumes

Total traffic volumes for 2026 Development Case modelled in SIDRA are shown below in Figure 6.6.

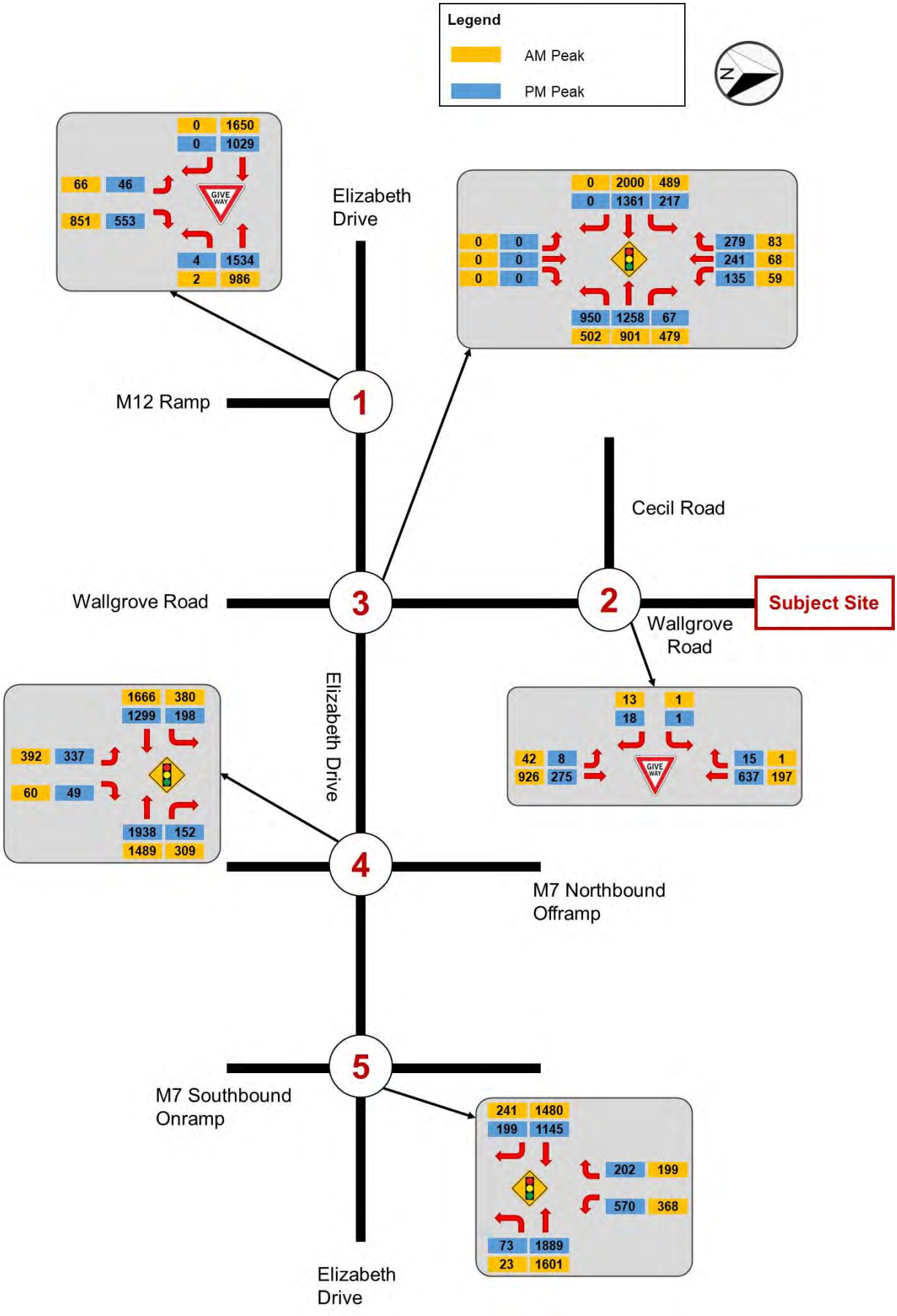


Figure 6.5: 2026 Development Case Traffic Volumes

6.5.2 Intersection Performance Summary

Table 6.5 summarises the 2026 AM and PM peak "With Development" intersection performance results.

Table 6.5: Intersection SIDRA Results Summary – 2026 With Development

Intersection	AM Peak				PM Peak			
	DoS	Average Delay	LOS	95 the Percentile Queue	DoS	Average Delay	LOS	95 the Percentile Queue
Elizabeth Drive / M12 Western Exit Ramp	0.640	226.1	LOS B	116.7	0.507	18.1	LOS B	74.1
Wallgrove Road / Cecil Road	0.366	8.7	LOS A	49.1	0.318	7.1	LOS A	72.0
Elizabeth Drive / Wallgrove Road	0.868	20.8	LOS B	120.0	1.144	44.7	LOS D	205.6
Elizabeth Drive / M7 Northbound Exit/Entry Ramps	0.614	22.5	LOS B	74.6	0.600	18.8	LOS B	74.4
Elizabeth Drive / M7 Southbound Exit/Entry Ramps	0.584	23.8	LOS B	101.3	0.792	25.3	LOS B	124.6

In comparison with the 2026 Base case results, the network generally performs at similar level LOS levels and average delays, except at the Elizabeth Drive / Wallgrove Road intersection. This intersection experiences the largest increase in average delay, particularly in the PM period. In the PM period, the intersection worsens from an average delay of 34.2 seconds to 44.7 seconds (i.e. 10.5-second increase in average delay) which deteriorates the intersection performance from LOS C to LOS D. Worsening of this intersection is due to the heavy right-turning and through volumes from the northern approach on Wallgrove Road.

6.6 2036 Development Case Analysis

6.6.1 Traffic Volumes

Total traffic volumes for 2036 Development Case modelled in SIDRA are shown below in Figure 6.6.

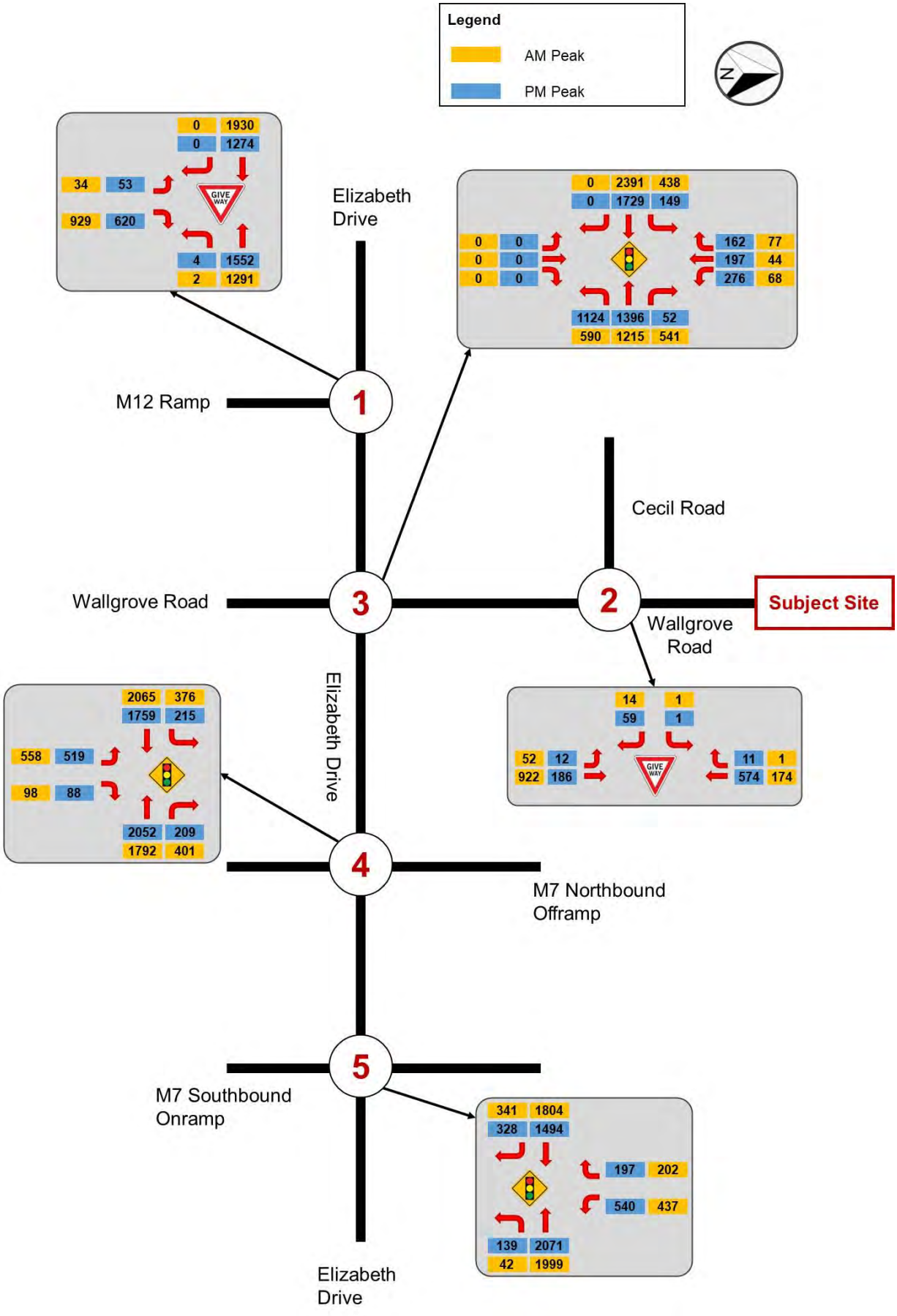


Figure 6.6: 2036 Development Case Traffic Volumes

6.6.2 Intersection Performance Summary

Table 6.5 summarises the 2036 AM and PM peak base plus development intersection performance results.

Table 6.6: Intersection SIDRA Results Summary – 2036 With Development

Intersection	AM Peak				PM Peak			
	DoS	Average Delay	LOS	95 the Percentile Queue	DoS	Average Delay	LOS	95 the Percentile Queue
Elizabeth Drive / M12 Western Exit Ramp	0.715	28.0	LOS B	139.9	0.537	20.5	LOS B	87.7
Wallgrove Road / Cecil Road	0.376	10.3	LOS A	52.6	0.407	17.2	LOS B	64.3
Elizabeth Drive / Wallgrove Road	0.842	26.3	LOS B	186.7	1.047	46.1	LOS D	254.0
Elizabeth Drive / M7 Northbound Exit/Entry Ramps	0.801	29.2	LOS C	119.9	0.711	24.0	LOS B	197.3
Elizabeth Drive / M7 Southbound Exit/Entry Ramps	0.723	30.1	LOS C	138.8	1.038	66.3	LOS E	347.7

In comparison with the 2036 Base case results, the network generally performs at similar level LOS levels and average delays, with variations in average delay in the negligible range of 2 seconds. It should be noted that at the Elizabeth Drive / M7 Northbound Exit Entry Ramps intersection, LOS level deteriorates from LOS B to LOS C. However, this due to the average delays experienced at the intersection being close to the average delay of 29 seconds which is the threshold for intersections to perform at LOS C.

6.7 Comparison Summary of Intersection Performance

Comparison of the base and development case scenarios for the 2026 and 2036 years in terms of the performance measures of average delay and LOS is summarised below in Table 6.7.

Table 6.7: SIDRA Results Comparison – Average Delay and Level of Service

Intersection Name	Base Case				Development Case			
	AM Peak		PM Peak		AM Peak		PM Peak	
	2026	2036	2026	2036	2026	2036	2026	2036
Elizabeth Drive / M12 Western Exit Ramp	25.9 (B)	27.2 (B)	18.1 (B)	20.1 (B)	26.1 (B)	28.0 (B)	18.1 (B)	20.5 (B)
Wallgrove Road / Cecil Road	9.1 (A)	10.7 (A)	6.9 (A)	16.1 (B)	8.7 (A)	10.3 (A)	7.1 (A)	17.2 (B)
Elizabeth Drive / Wallgrove Road	18.7 (B)	24.3 (B)	34.2 (E)	45.7 (D)	20.8 (B)	26.3 (B)	44.7 (D)	46.1 (D)
Elizabeth Drive / M7 Northbound Exit/Entry Ramps	21.5 (B)	28.0 (B)	18.4 (B)	23.9 (B)	22.5 (B)	29.2 (C)	18.8 (B)	24.0 (B)
Elizabeth Drive / M7 Southbound Exit/Entry Ramps	23.6 (B)	29.3 (E)	25.2 (B)	62.5 (E)	23.8 (B)	30.1 (C)	25.3 (B)	66.3 (E)

The above results indicate that:

- Given traffic volumes generated due to proposed development is relatively low compared to the background traffic (approximately 4% of the total background traffic), it is expected that proposed development will have an insignificant effect on the traffic performance on the surrounding intersections
- The most significant impact due to the proposed development is observed for the Elizabeth Drive / Wallgrove Road intersection during the 2026 PM peak hour. There is an increase in average delay of 10 seconds, resulting in a transition of the LOS performance from C to D.

The intersection of Wallgrove Road / Cecil Road is noted to improve in performance despite the increase in traffic. This is due to the increase in traffic along well-coordinated turning movements with delays lower than the intersection average. This marginally increases the delay for that movement, however as the proportion of vehicles at the intersection experiencing low delays increases, the overall delay of the intersection decreases. This is the case for the vehicles travelling northbound and southbound through the intersection along Wallgrove Road.

Overall, the intersection analysis results demonstrate that the proposed development will not result in a considerable worsening of the intersection performance that would warrant the need for mitigation measures to be implemented. Detailed SIDRA modelling outputs are provided in **Appendix G**.

7. EXTERNAL CONSULTATION

7.1 Overview

A consultation meeting was undertaken on the 5th October 2023 to discuss general planning matters (including traffic-related matters) of the concept proposal for the Wallgrove Business Hub with Fairfield City Council. Attendants at the meeting included representatives from Fairfield City Council, Bitzios Consulting and Keylan Consulting. Main traffic-related outcomes of the meeting included that access arrangement and reconfiguration of Wallgrove Road (including interaction with approved road alignment of Kosovich Place) require further advice from TfNSW.

The draft TIA has been issued to TfNSW for comment. TfNSW provided a series of comments on 16th November 2023 with respect to the proposed development's traffic impacts and alignment with TfNSW's future road network planning for the region. The comments' primary concern related to the safety for increased demand for right-turning access/egress movements at the site, and that 'left-in / left-out' design is preferrable. As such, a 'left-in / left-out' access arrangement was adopted and assessed. Findings of that assessment are summarised in Bitzios Consulting's *Alternative Access Arrangement Technical Note* (refer to **Appendix B**). However, safety concerns related to the northbound acceleration lane are still pending further discussion and investigation.

Further detailed consultation is therefore required to address TfNSW's requirements with respect to the proposed development and its impacts to the state road network. Additionally, it should be noted that WSPT is committed to ongoing discussions with TfNSW, and that any outstanding matters will be addressed accordingly at the exhibition phase.

7.2 SSDA Submission and RFIs

As part of the previous correspondence on the submissions made in support of the Wallgrove Industrial Business Hub development, items for clarification have been identified. Specifically, TfNSW, Council and the Department of Planning, Housing and Infrastructure (DPHI) have identified items, relating to the submissions and Requests for Information (RFIs). A summary of these items, dated 3rd December 2024, was recently provided.

As such, summary of the items relevant to Bitzios Consulting and our responses to them are provided in Table 7.1.

Table 7.1: SSDA Submissions and RFI – Query Items

Item	Item Description	Bitzios Response
SSDA Submissions (Council)		
1.1	Further investigation with TfNSW on intersection is required	Noted
1.2	Issues raised by TfNSW to be addressed prior SSDA determination	Noted
1.3	Vehicular access off Wallgrove Road requires support and approval from TfNSW	Noted
1.4	Approval for construction of new intersection to be provided TfNSW	Noted
1.5	Provide an Operation Traffic Management Plan (OTMP) detailing management of peak hour traffic volumes and plan to not impact external road network	Noted as a condition for SSDA approval
1.6	Parking provision assessment to be in accordance with Fairfield City Wide DCP 2024 and Council parking requirements	Refer to Section 5.4 for further discussion
1.7	Submit a Loading Management Plan detailing for heavy vehicle volumes and types expected on an hourly basis	Noted as a condition for SSDA approval
1.8	Undertake Road Safety Audit (RSA) and complete corrective actions	Noted as a condition for SSDA approval
1.9	Internal access road not adequate to accommodate 2-way heavy vehicle traffic	Based on swept path analysis using latest site plan, the internal access road can accommodate 2-way heavy vehicle traffic. Refer to Section 5.7 for further details
1.10	**Appendix B** of TIA report to demonstrate 19m semi-trailer can enter, exit and manoeuvre within the site.	Based on swept path analysis (refer to Section 5.7 and **Appendix B**) using latest site plan, the site can accommodate all required 20m AV manoeuvres.
1.11	Construction Traffic Management Plan (CTMP) to show assessment of construction impacts on adjacent road network.	Details of expected construction traffic volumes and required TGSs scenarios are yet to be provided. Once provided, CTMP will be updated accordingly to detail traffic impacts.
RFI (DPHI)		
2.1	Update parking assessment to incorporate ancillary office spaces	Parking assessment updated accordingly. Refer to Section 5.4 for further details
2.2	Justification of light to heavy vehicle ratio of 80:20 (instead of 70:30 which is used for similar estates) is to be provided. Analysis of additional traffic due to 70:30 to also be provided.	Light to heavy vehicle ratio updated to 70:30. Refer to Section 4.3 for further details
2.3	Revision to trip generation calculations is required as there is a large discrepancy between the two warehouses	Refer to Section 4.3 for revised calculations and further details

8. CONCLUSION

The key findings of the traffic impact assessment for the proposed development located at 97-151 Wallgrove Road, Cecil Park are as follows:

- The proposed development is an industrial/warehouse space comprising of two (2) main buildings:
  - Building 1 which has a floorspace of approximately 10,335m^2
  - Building 2 which has a floorspace of approximately 26,040m^2
- Access to the proposed development accessible solely via Wallgrove Road
- Vehicle sightlines from the proposed driveway are not obstructed
- The proposed parking layout is compliant with AS2890.1
- Swept path analysis shows that 20m articulated vehicle can safely manoeuvre the necessary movements to access the loading docks. However, it should be noted that AV access to the three southernmost loading docks of warehouse building 1 must be scheduled to avoid vehicle conflicts
- Swept path analysis shows that 12.5m heavy rigid vehicle can generally safely access/egress the fire access track. However, recommendations to amend the north-eastern driveway to the fire access track are proposed. These include either banning left-turn into the driveway or increasing the splay of the driveway
- Safety concerns, after the latest engagement with TfNSW, raised on the initial access arrangement designs relating to the permitted right-turn access / egress are addressed with the latest concept plan which incorporates a 'left-in / 'left-out' arrangement. This arrangement has been deemed feasible and is not expected to have detrimental impacts on the surrounding road network performance.
- Further investigation is required for the proposed access arrangement (i.e. the Wallgrove Road / Internal Road intersection) with particular discussion on the proposed northbound acceleration lane. Furthermore, WSPT is committed to ongoing discussions with TfNSW, and willing to address any outstanding matters accordingly at the exhibition phase
- There is a lack of active transport network in the surrounding network connecting to the proposed development
- Given the location of the proposed development and lack of cyclist facilities proposed on-site, preparing a Green Travel Plan would not be warranted for the proposed development
- The following intersections in the vicinity of the proposed development between 2026 and 2036 include:
  - Elizabeth Drive / M12 Western Exit Ramp
  - Wallgrove Road / Cecil Road
  - Elizabeth Drive / Wallgrove Road
  - Elizabeth Drive / M7 Northbound Exit/Entry Ramps
  - Elizabeth Drive / M7 Southbound Exit/Entry Ramps
- The site is estimated to generate the following trip numbers during the following peak hour periods:
  - AM: 234 trip per hour
  - PM: 208 trips per hour
- Based on an assessment conducted using the SIDRA model, the proposed development is expected to have an overall insignificant impact on the surrounding road network.

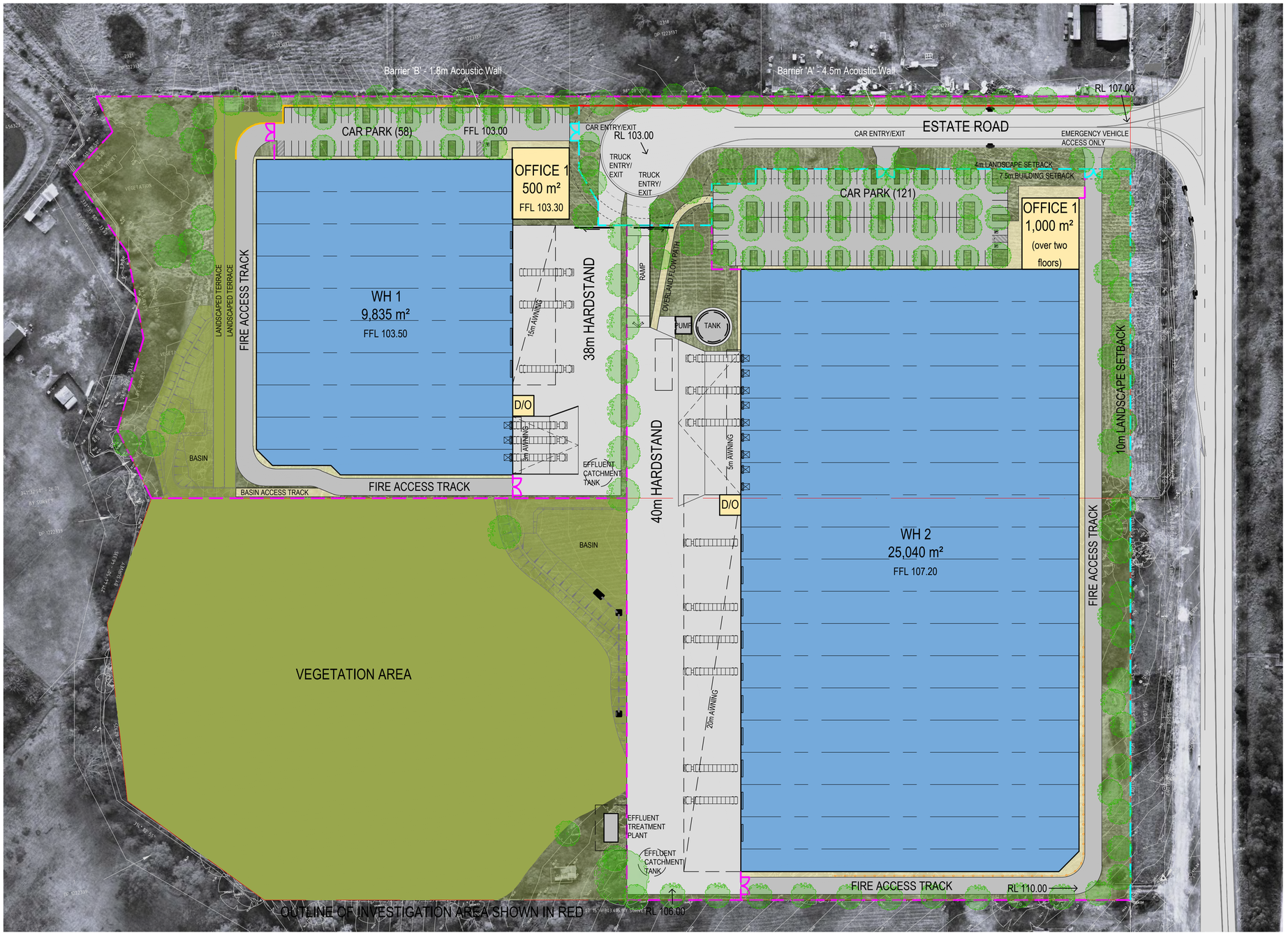
Appendix A: Crash Data

P6072 Wallgrove Business Hub TIA

Crash Data

Crash ID	Degree of crash - detailed	RUM - code	RUM - description	Year of crash	Surface c	Weather	Natural lighting	Type of location	Latitude	Longitude
1124253	Non-casualty (towaway)	30	Rear end	2017	Dry	Fine	Darkness	T-junction	-33.874737	150.838878
1125982	Non-casualty (towaway)	40	U turn	2017	Dry	Fine	Daylight	T-junction	-33.877098	150.843567
1127881	Minor/Other Injury	30	Rear end	2017	Dry	Fine	Daylight	Dual freeway	-33.871463	150.846208
1137460	Minor/Other Injury	30	Rear end	2017	Dry	Fine	Dusk	X-intersection	-33.876046	150.842417
1141422	Serious Injury	30	Rear end	2017	Dry	Fine	Daylight	Divided road	-33.875933	150.842207
1142245	Non-casualty (towaway)	66	Object on road	2017	Dry	Fine	Daylight	Dual freeway	-33.87869	150.842204
1143365	Non-casualty (towaway)	21	Right through	2017	Dry	Overcast	Daylight	T-junction	-33.877241	150.843436
1145681	Minor/Other Injury	30	Rear end	2017	Dry	Fine	Daylight	Dual freeway	-33.871463	150.846208
1149138	Serious Injury	88	Out of cont on bend	2017	Dry	Fine	Darkness	2-way undivided	-33.874767	150.83851
1151805	Non-casualty (towaway)	30	Rear end	2017	Dry	Fine	Dawn	Dual freeway	-33.868496	150.84676
1152175	Non-casualty (towaway)	30	Rear end	2017	Dry	Fine	Daylight	Dual freeway	-33.876985	150.843441
1155014	Minor/Other Injury	30	Rear end	2017	Dry	Fine	Daylight	Dual freeway	-33.876831	150.843553
1155605	Non-casualty (towaway)	30	Rear end	2017	Dry	Fine	Daylight	2-way undivided	-33.86873	150.845962
1156214	Serious Injury	33	Lane sideswipe	2017	Dry	Fine	Darkness	Dual freeway	-33.87093	150.846063
1159810	Non-casualty (towaway)	30	Rear end	2018	Dry	Fine	Daylight	Dual freeway	-33.872923	150.845755
1165843	Minor/Other Injury	30	Rear end	2018	Dry	Fine	Dawn	Dual freeway	-33.875685	150.84436
1176140	Minor/Other Injury	30	Rear end	2018	Dry	Fine	Daylight	X-intersection	-33.876057	150.842364
1179240	Non-casualty (towaway)	32	Right rear	2018	Dry	Fine	Darkness	T-junction	-33.874737	150.838878
1181375	Minor/Other Injury	30	Rear end	2018	Dry	Unknown	Daylight	2-way undivided	-33.874965	150.837456
1187766	Minor/Other Injury	30	Rear end	2018	Dry	Fine	Daylight	Dual freeway	-33.878715	150.842185
1191235	Non-casualty (towaway)	71	Off rd left => obj	2019	Dry	Fine	Darkness	Dual freeway	-33.868496	150.84676
1194795	Serious Injury	20	Head on	2019	Dry	Fine	Daylight	2-way undivided	-33.875434	150.830126
1195059	Non-casualty (towaway)	30	Rear end	2019	Dry	Fine	Daylight	2-way undivided	-33.871155	150.845484
1198243	Non-casualty (towaway)	30	Rear end	2019	Dry	Fine	Daylight	Dual freeway	-33.875242	150.844347
1205479	Serious Injury	30	Rear end	2019	Dry	Fine	Daylight	Divided road	-33.876332	150.842392
1208677	Non-casualty (towaway)	62	Accident	2019	Dry	Fine	Daylight	Dual freeway	-33.87869	150.842204
1209503	Non-casualty (towaway)	29	Other opposing	2019	Dry	Fine	Darkness	2-way undivided	-33.872472	150.845225
1214404	Minor/Other Injury	33	Lane sideswipe	2019	Dry	Fine	Darkness	Dual freeway	-33.873205	150.845648
1215084	Non-casualty (towaway)	30	Rear end	2019	Dry	Fine	Daylight	2-way undivided	-33.87244	150.845231
1215541	Non-casualty (towaway)	35	Lane change left	2019	Dry	Fine	Daylight	Dual freeway	-33.867872	150.84661
1223584	Non-casualty (towaway)	70	Off road to left	2020	Dry	Fine	Darkness	2-way undivided	-33.875119	150.836772
1223662	Serious Injury	71	Off rd left => obj	2020	Dry	Fine	Darkness	2-way undivided	-33.875119	150.836772
1224333	Serious Injury	32	Right rear	2020	Dry	Fine	Daylight	T-junction	-33.874737	150.838882
1224506	Moderate Injury	30	Rear end	2019	Dry	Fine	Daylight	Dual freeway	-33.876215	150.844
1225804	Moderate Injury	10	Cross traffic	2020	Dry	Fine	Dawn	T-junction	-33.877241	150.843436
1233231	Serious Injury	30	Rear end	2020	Dry	Overcast	Dawn	Dual freeway	-33.880842	150.840642
1233936	Non-casualty (towaway)	36	Right turn sideswipe	2020	Dry	Fine	Daylight	T-junction	-33.877098	150.843567
1234105	Non-casualty (towaway)	30	Rear end	2020	Wet	Raining	Dusk	2-way undivided	-33.875358	150.835729
1236058	Non-casualty (towaway)	20	Head on	2020	Dry	Fine	Daylight	Divided road	-33.871872	150.845343
1240730	Serious Injury	32	Right rear	2020	Unknown	Unknown	Daylight	T-junction	-33.874737	150.838882
1246700	Non-casualty (towaway)	34	Lane change right	2020	Dry	Fine	Daylight	Dual freeway	-33.876985	150.843138
1248509	Moderate Injury	72	Off road to right	2020	Dry	Fine	Daylight	Dual freeway	-33.87541	150.844534
1253805	Moderate Injury	30	Rear end	2020	Dry	Fine	Daylight	Dual freeway	-33.881029	150.840203
1254938	Minor/Other Injury	30	Rear end	2021	Dry	Fine	Darkness	Dual freeway	-33.877757	150.842578
1257131	Moderate Injury	30	Rear end	2021	Dry	Fine	Daylight	2-way undivided	-33.867838	150.846135
1260048	Serious Injury	20	Head on	2021	Wet	Raining	Daylight	T-junction	-33.874737	150.838882
1266658	Non-casualty (towaway)	30	Rear end	2021	Dry	Fine	Daylight	2-way undivided	-33.867838	150.846135
1272051	Minor/Other Injury	31	Left rear	2021	Dry	Fine	Daylight	T-junction	-33.876057	150.842363
1277714	Non-casualty (towaway)	71	Off rd left => obj	2021	Dry	Fine	Darkness	Dual freeway	-33.879301	150.841457
1279086	Moderate Injury	30	Rear end	2021	Wet	Raining	Darkness	Dual freeway	-33.881006	150.840523

Appendix B: Concept Plan



WALLGROVE BUSINESS HUB	
31-Mar-25	
DA001[3]	
INVESTIGATION AREA (sqm)	**98,895**
CONSTRAINTS	**AREA (sqm)**
Vegetation Area	21,207
SUBJECT SITE	**77,688**
BUILDING AREAS	**AREA (sqm)**
Warehouse 1	9,835
Office 1 (incl. D/O)	550
Warehouse 2	25,040
Office 2 (incl. D/O)	1,050
TOTAL WAREHOUSE AREA	**34,875**
TOTAL OFFICE AREA	**1,600**
TOTAL BUILDING AREA	**36,475**
FSR	**0.47:1**
TOTAL CARPARKING PROVIDED	**179**

Fencing Legend

- 1,800mm high black PVC chainlink fencing with 3 rows of barbed wire over (total height 2100mm).
- 2,100mm high black powdercoated palisade style fencing.
- 1,800mm acoustic wall with retaining.
- 4,500mm acoustic wall with retaining.

1 WH1 LEVEL GF
1 : 750

Client

Western Sydney Parklands

Issue	Description	Date
1	MASTER PLAN LAYOUT UPDATED	07/03/2025

Builder

Project Name
WALLGROVE BUSINESS HUB

Project Address
97 - 151 WALLGROVE ROAD, CECIL PARK NSW

Key Plan
0 15000 37500

Drawing Title:
CONCEPT MASTER PLAN

Author:	Checker:	Sheet Size:	Scale:
IG	-	A1	1:750

Drawing Number: **13103_DA001**
Issue: **3**

nettleton tribe partnership pty ltd ABN 58 161 683 122
117 Willoughby Road, Crows Nest, NSW 2065
t +61 2 9431 6431
e: sydney@nettletontribe.com.au w: nettletontribe.com.au

6/09/2023 5:03:37 PM C:\REVIT LOCAL 2019\13103_WALLGROVE BUSINESS HUB_AB_ARCH_meganhanning.rvt

Appendix C: Alternative Access Arrangement Technical Note

Issue History Table (Internal Use Only)

File Name	Version	Prepared	Reviewed	Date Issued	Issued to
P6072.001T Wallgrove Business Hub Alternative Access Arrangement Technical Note	001	R. Jain	A. Grey	23/05/2024	rod.pascoe@gsp.nsw.gov.au
P6072.002T Wallgrove Business Hub Alternative Access Arrangement Technical Note	002	R. Jain	A. Grey	17/06/2024	rod.pascoe@gsp.nsw.gov.au

WALLGROVE BUSINESS HUB

Alternative Access Arrangement Technical Note

1. Introduction

1.1 Background

Bitzios Consulting has prepared a Traffic Impact Assessment (TIA), as part of a Development Application (DA) for the proposed Industrial Business Hub at Wallgrove Road, north of Elizabeth Drive. The subject site location is shown below in Figure 1.1.

Adapted from Google Maps

Figure 1.1: Subject Site Location

The proposed access driveway did not consider any limitations for the access and egress of the vehicular via Wallgrove Road, therefore, all turning movements were considered in designing the turning lane treatments at the concept level in the TIA report. TfNSW have raised safety concerns with regards to the increased demand for the right turn movements in and out of the subject site at Wallgrove Road. The Wallgrove Road has an 80km/h posted speed limit along both directions and heavy vehicles entry and exit via right-turn movements would require provision of specific turning lane treatments at Wallgrove Road. Provision of right-turn movement turning lane treatments would require road widening at Wallgrove Road in front of the property which would not be possible due to the road width and geometry limitations at this location. Therefore, Western Sydney Parklands Trust (WSPT), have considered a 'left-in / left-out' access as an alternative to the 'all movements' access arrangement. The alternative access arrangement would be expected to impact trucks route choice and affect the future performance of the surrounding road network as per the initial assessment in the traffic impact assessment report.

This technote outlines the impacts of the proposed alternative 'left-in / left-out' access arrangement on the heavy vehicles access routes and the traffic impacts on the road network surrounding the proposed Business Hub at Wallgrove Road. This technote should be read in conjunction with the Traffic Impact Assessment (TIA) report for the subject development prepared by Bitzios Consulting.

2. Alternative Access

2.1 Site Access

Two (2) left turn treatment lanes were proposed at concept level in the TIA report comprising a 133m acceleration auxiliary lane north of the driveway and a 95m deceleration auxiliary lane for access to the site. The proposed auxiliary left-turning and acceleration lanes should be retained for the purpose of the alternative access arrangement; however, the proposed southbound channelised right-turning lane along Wallgrove Road should be removed.

Note: The length of the proposed acceleration lane, along the northbound, is still subject to further investigation and discussion with TfNSW due to its sub-standard length determined by the geometry limitations along this section of Wallgrove Road.

Furthermore, to ensure access / egress to the site are restricted to left-turning movements only, a traffic island is proposed at the site access road. At the concept level, the proposed traffic island is based on a swept path analysis of left-turning access / egress movements for 19m semi-trailers.

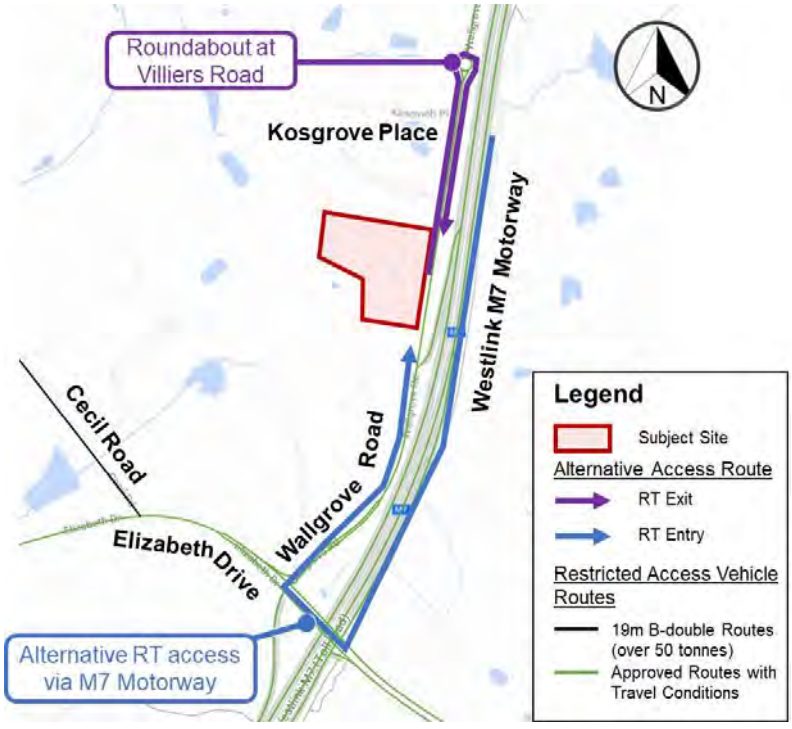
The interim concept plan (including the supporting swept path analysis) of the proposed left turning lane and acceleration lane treatments is provided in **Attachment A**. It should be noted that the plan would be subject to change considering the outcomes of negotiations with TfNSW.

2.2 Alternative Route Choice

The proposed 'left-in / left-out' access arrangement would change the initial route choice forecast for the vehicles accessing the development particularly those approaching the development from Wallgrove north or exiting the site to the south.

These alternative routes should be able to accommodate heavy vehicles (i.e. 19m semi-trailers) as the site (i.e. a warehouse area) would be expected to generate a significant portion of heavy vehicle trips. The alternative routes were assessed using the *Restricted Access Vehicle* map. These routes include using the Westlink M7 Motorway southbound off-ramp as part of the alternative access route for the vehicles approaching from north and the roundabout at Villiers Road (north of Kosovich Place) for the vehicles intending to travel south after exiting the site.

The alternative routes are shown below in Figure 2.1.



Adapted from Source: Restricted Access Vehicle Map (Transport for NSW, 2023)

Figure 2.1: Alternative Routes for Right-turning Vehicles

A swept path analysis for a semi-trailer demonstrated that a 19m semi-trailer can perform a U-turn from the southern leg of the Wallgrove Road / Villiers Road roundabout. The semi-trailer swept path drawing is provided in **Attachment B**. The other alternative route is part of an approved heavy vehicle route and wouldn't warrant any further assessment.

Furthermore, as discussed previously in the *Wallgrove Business Hub TIA*, the surrounding road network is planned for significant road network upgrades including: the M12 Motorway construction, M7 Motorway widening, as well as the re-alignment and widening of Wallgrove Road. These road network upgrades are expected to have a negligible impact on the above proposed alternative routes for right-turning vehicles. The alternative routes for the right-turning vehicles before and after construction works associated with the road network upgrades are shown below in Figure 2.2.

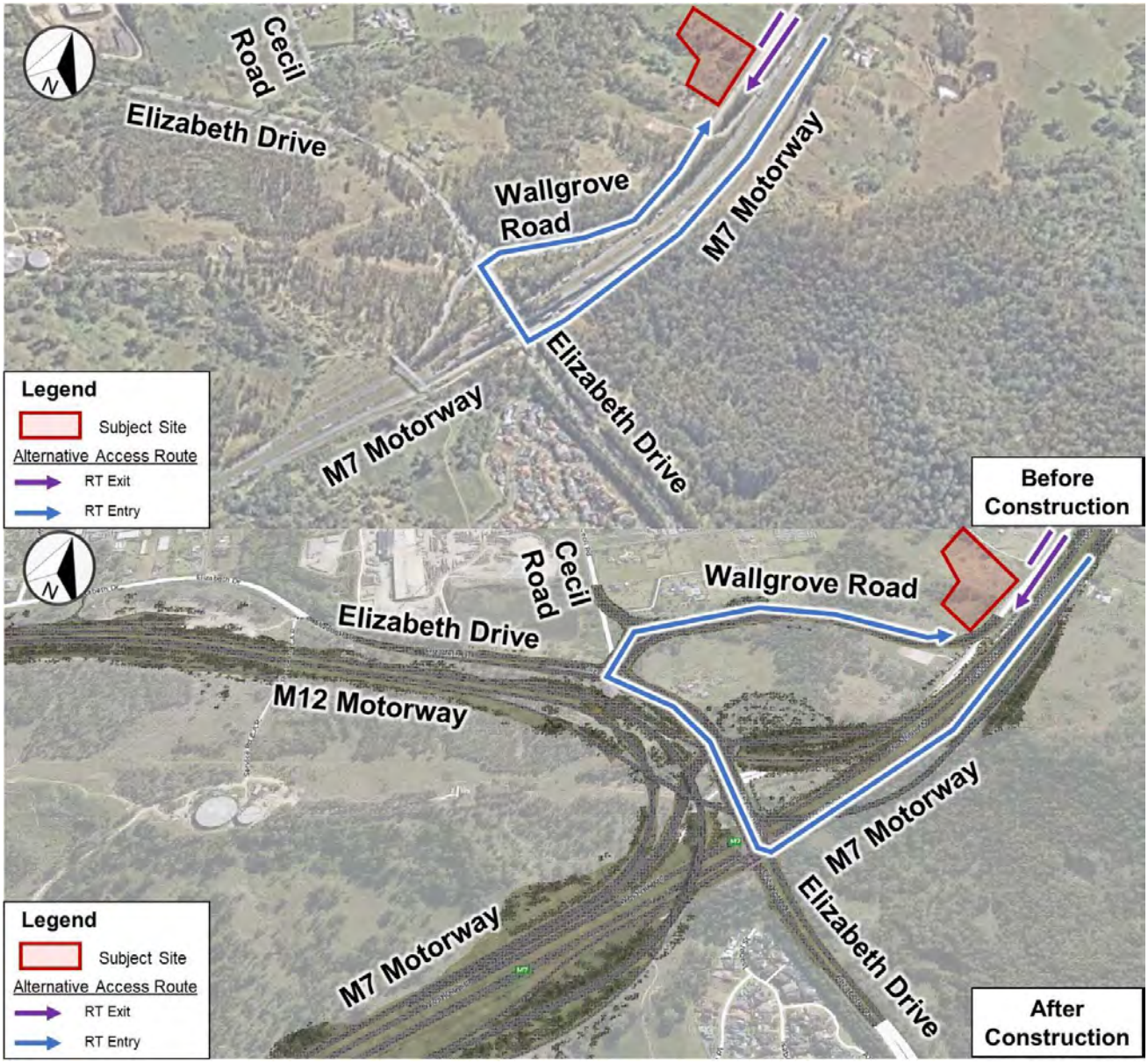


Figure 2.2: Overall Impact of Road Network Upgrades on Alternative Routes

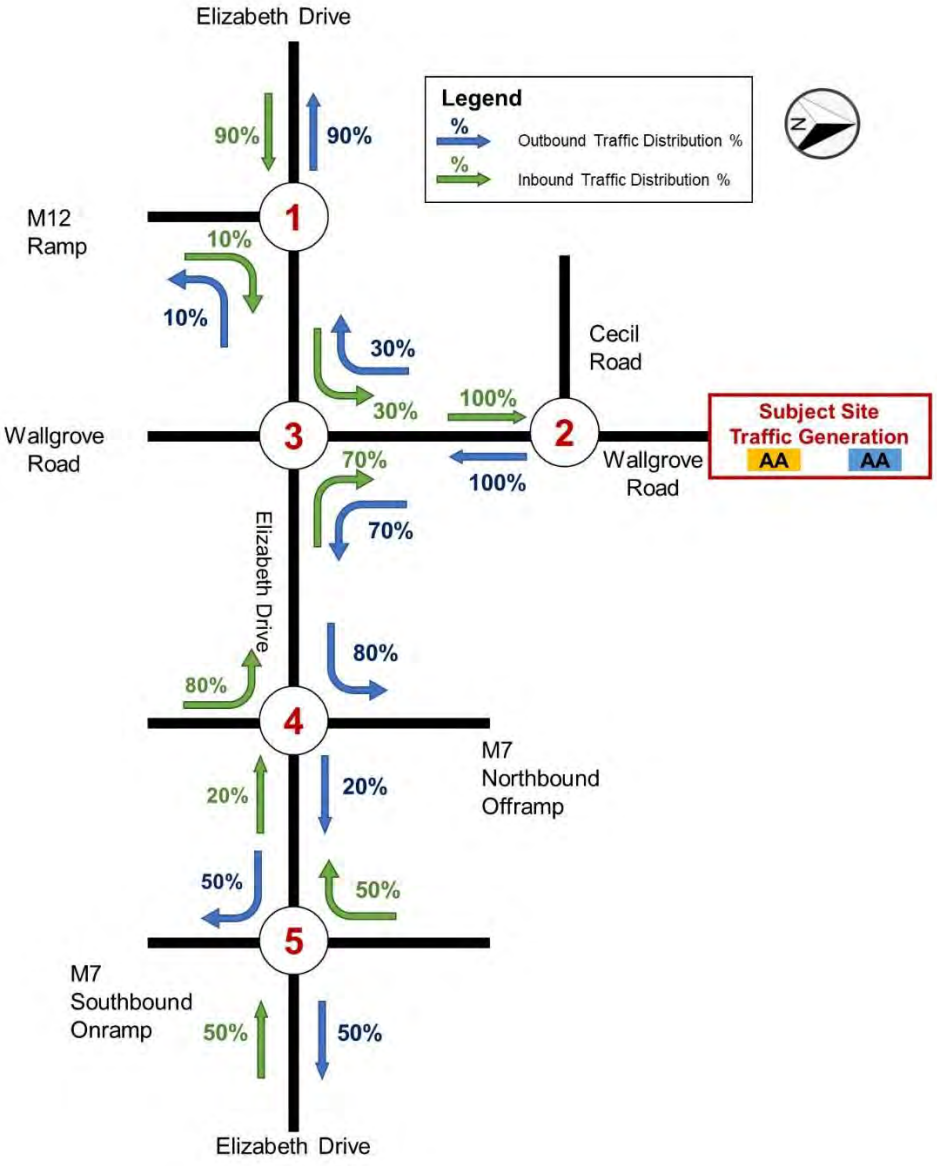
3. Traffic Assessment

3.1 Overview

As part of traffic assessment in the *Wallgrove Business Hub TIA*, a worst-case scenario was assessed for the distribution of the in/outbound traffic generated by the site as follows:

- 100% of inbound traffic enters via the southern approach on Wallgrove Road (i.e. entry via left-turning movements)
- 100% of outbound traffic exits southbound onto Wallgrove Road (i.e. exit via right-turning movements).

The initial access/egress considered right turning movements "in" and "out" of the site; however, all forecast trip generation of the proposed business hub was assigned to the major future intersections south of the site along Elizabeth Drive to assess the worst-case scenarios in terms of development impacts on the future road network. The study road network and associated trip distribution of the previous traffic assessment is shown in Figure 3.1.



Source: Wallgrove Business Hub TIA (Bitzios Consulting, 2023), Figure 4.4

Figure 3.1: Development Traffic Distribution – Previous Assessment

Thus, further traffic assessment (e.g. SIDRA network modelling) would not be required as the previous trip distribution (undertaken in the TIA report) and the study road network adopted in the previous assessment have already considered a full assignment of the forecast trip to the south. Based on the previous SIDRA network analysis scenarios for "2026 with Development" and "2036 with Development", it is projected that the surrounding road network and the future intersections would have ample capacity to accommodate the trips generated by the proposed industrial development. A comprehensive SIDRA network analysis has been undertaken in Section 6 of the TIA report.

4. Summary and Conclusion

Bitzios Consulting has undertaken further assessment of the road layout geometry and the surrounding road network performance due to the proposed alternative "left-in and left-out" access/egress arrangement for the proposed business hub at Wallgrove Road.

It was concluded that the proposed "left-in and left-out" access/egress arrangement would have no detrimental impacts on the surrounding road network performance and the alternative access/egress route would accommodate heavy vehicles as big as a semi-trailer. A swept path analysis has been included in **Attachment B** for the U-turn movement of a semi-trailer at the roundabout north of Kosovich Place.

A holistic SIDRA analysis undertaken in TIA report, has considered a worst-case scenario trip assignment. In other words, all forecast trips associated with the proposed development have been distributed to/from south of the proposed development. The trip distribution pattern applied for this modelling analysis would be in line with a "left-in and left-out" access arrangement. Therefore, no further modelling analysis would be required due to the alternative access arrangement. The SIDRA network analysis has been undertaken in Section 6 of the TIA report.

Furthermore, an updated turn treatment concept layout pertaining to the proposed "left-in and left-out" access/egress arrangement is included in **Attachment A**.

Attachment A:

Concept Plan – Alternative Access Arrangement

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Left-in / Left-out Access	R.J	24.05.2024
002	Left-in / Left-out Access - Median Island	R.J	24.05.2024

Scale @ A3 — 0 10 20 30 40 50 60 — 1:1250

Project: Wallgrove Business Hub TTS

Title: Alternative Access Arrangement Concept Plan

Design	Drawn	Checked
R.J	R.J	A.G

NOT FOR CONSTRUCTION

Date: 24.05.2024

Project Number	Sheet Number	Issue
P6072	1	002

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Left-in / Left-out Access	R.J	24.05.2024
002	Left-in / Left-out Access - Median Island	R.J	24.05.2024

Scale @ A3 0 10 20 30 40 50 60 1:1250

Project: Wallgrove Business Hub TTS

Title: Alternative Access Arrangement
Concept Plan - Swept Path Analysis

Design	Drawn	Checked
R.J	R.J	A.G

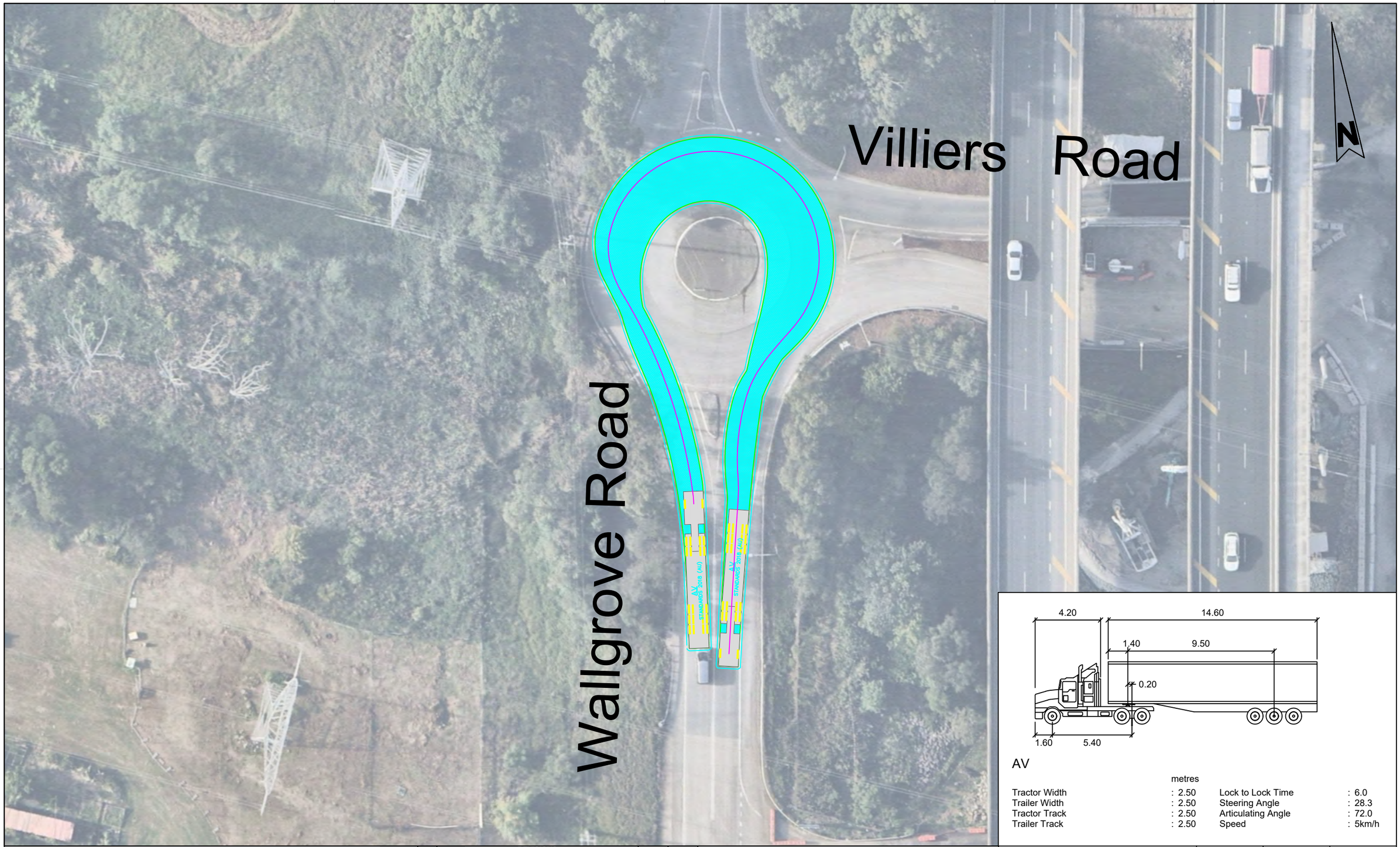
NOT FOR CONSTRUCTION

Date: 24.05.2024

Project Number	Sheet Number	Issue
P6072	2	002

Attachment B:

Swept Path Analysis



AV

metres

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis - U-turn Movement	R.J	20.05.2024
006	Vehicle Specification Update	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

Title: Swept Path Analysis
U-turn at Wallgrove Rd / Villiers Rd Roundabout
20m Articulated Vehicle

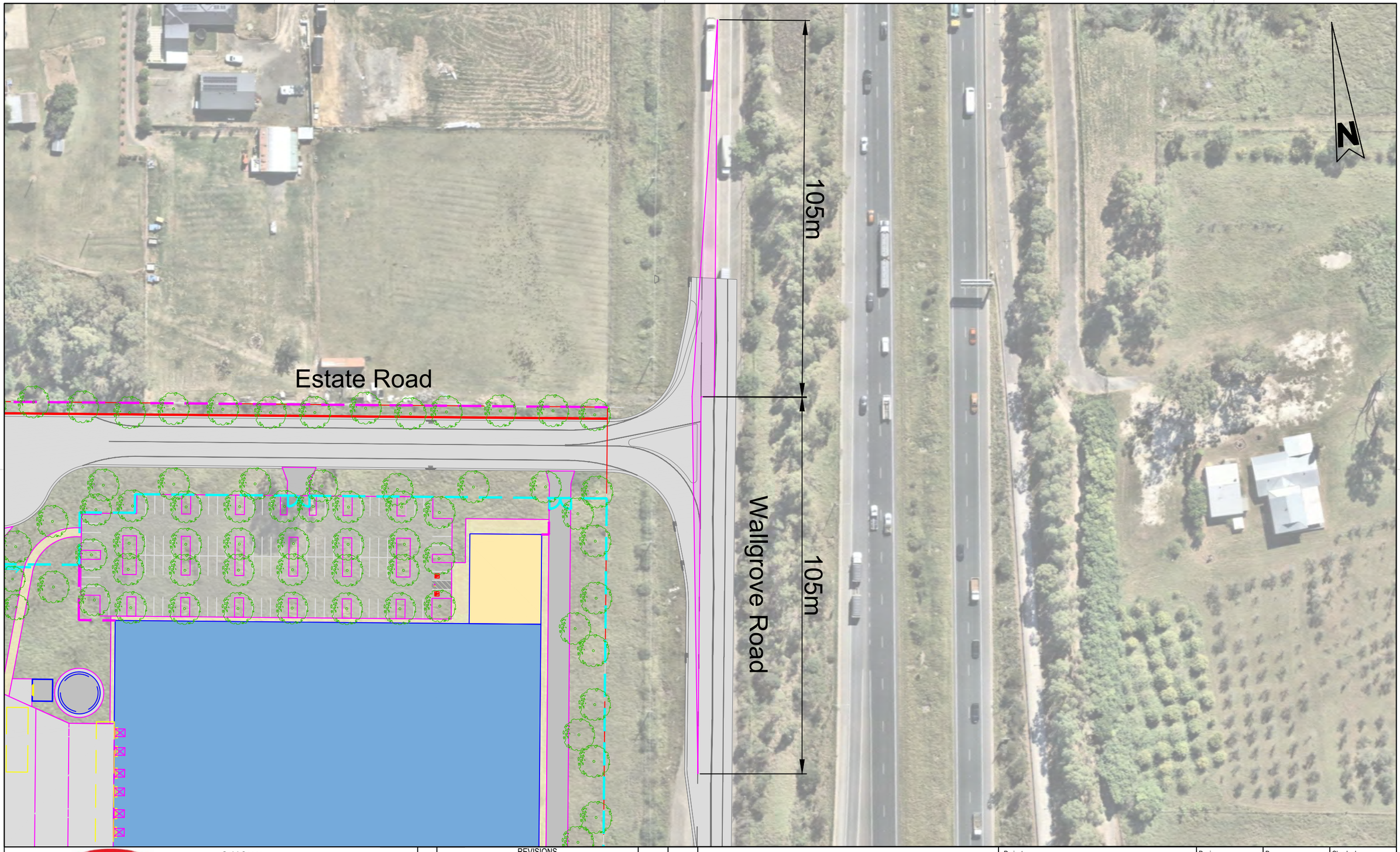
Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	1	006

Appendix D: Sightline Assessment



Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Sightline Assesment	R.J	28.07.2023
001	Sightline Assesment	R.J	05.03.2024
005	Updated Concept Plan	R.J	02.07.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

Title: Sightline Assessment

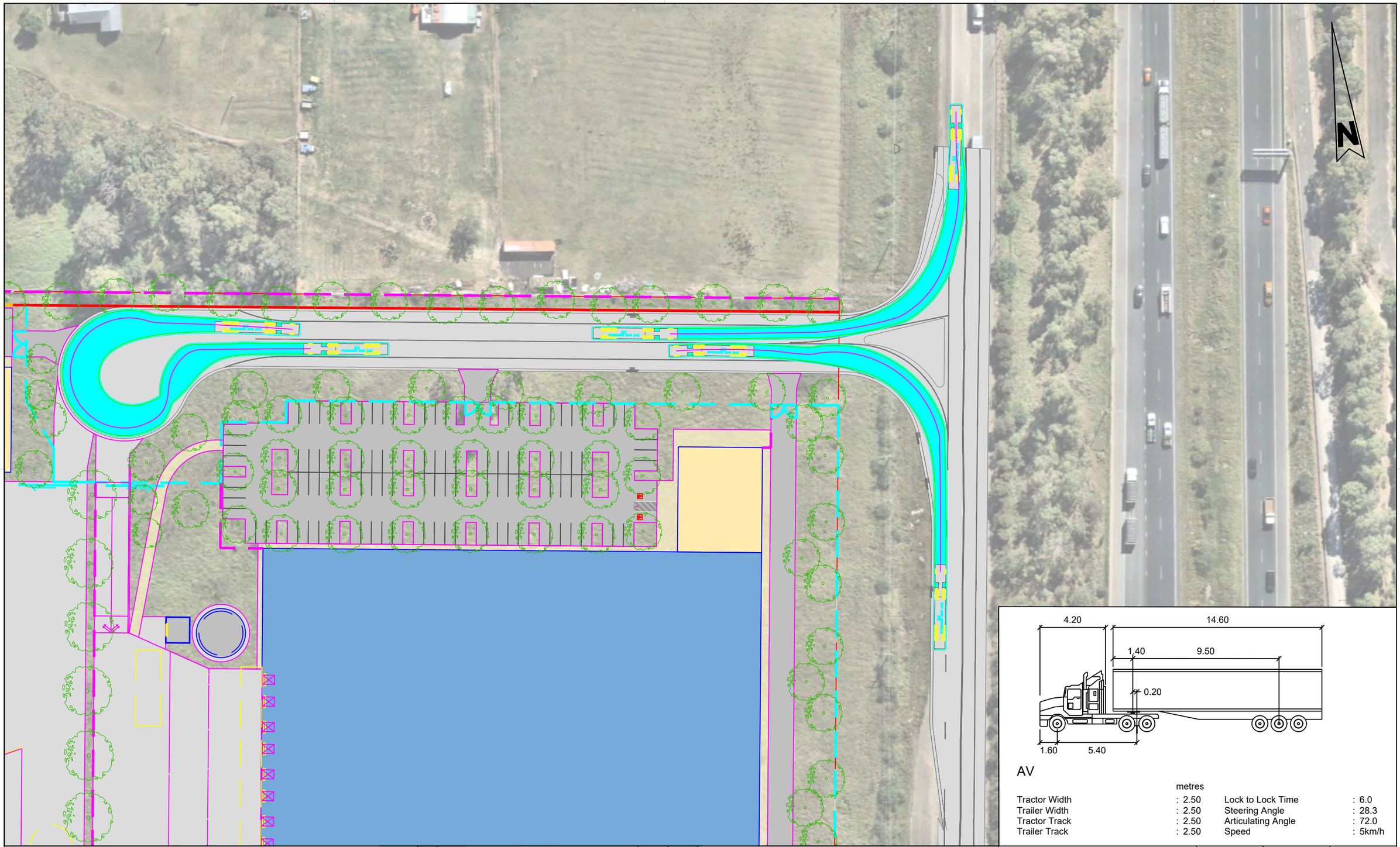
Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 02.07.2024

Project Number	Sheet Number	Issue
P6072	1	006

Appendix E: Swept Path Analysis



AV

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

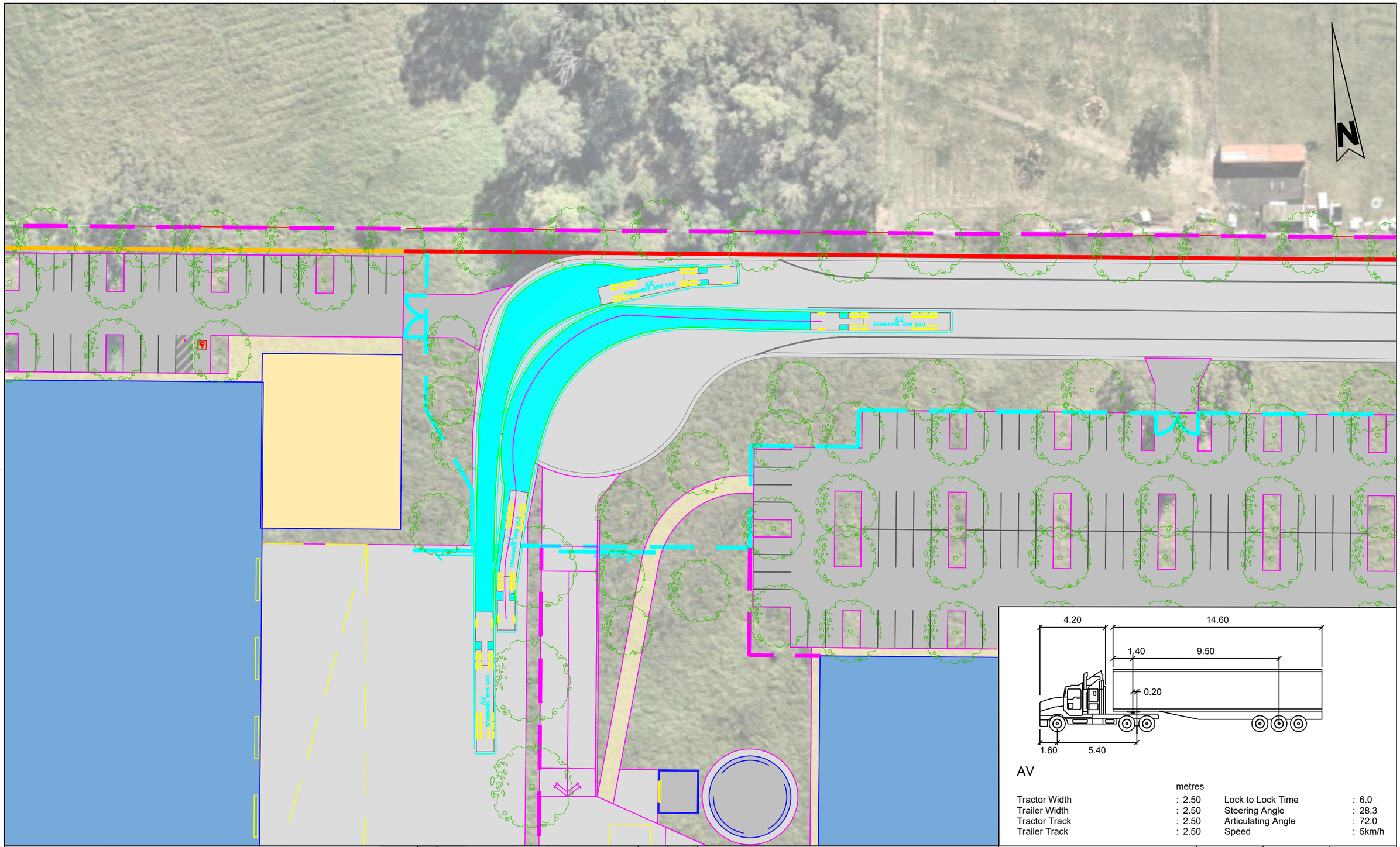
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	1	006



AV

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

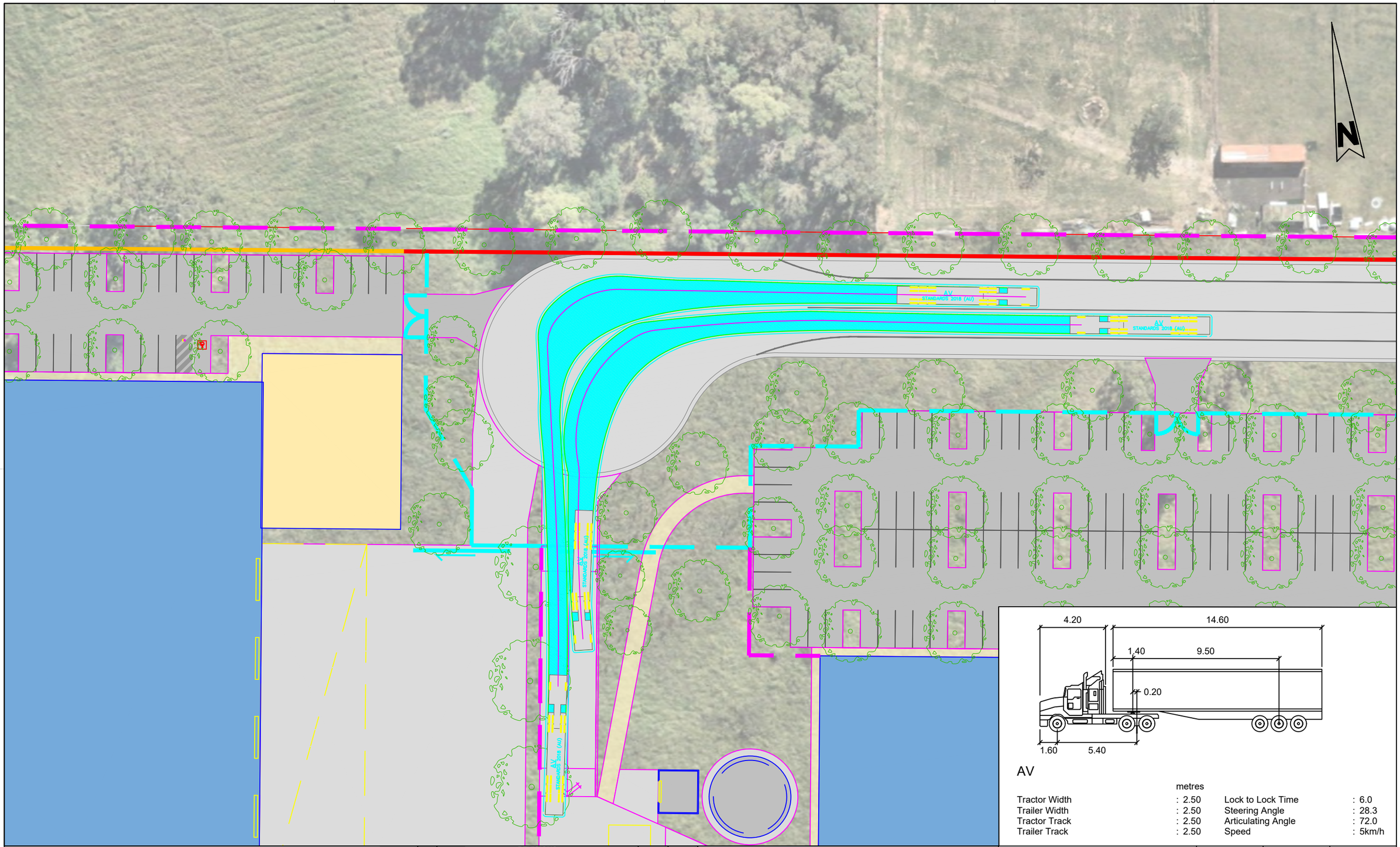
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	2	006



AV

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

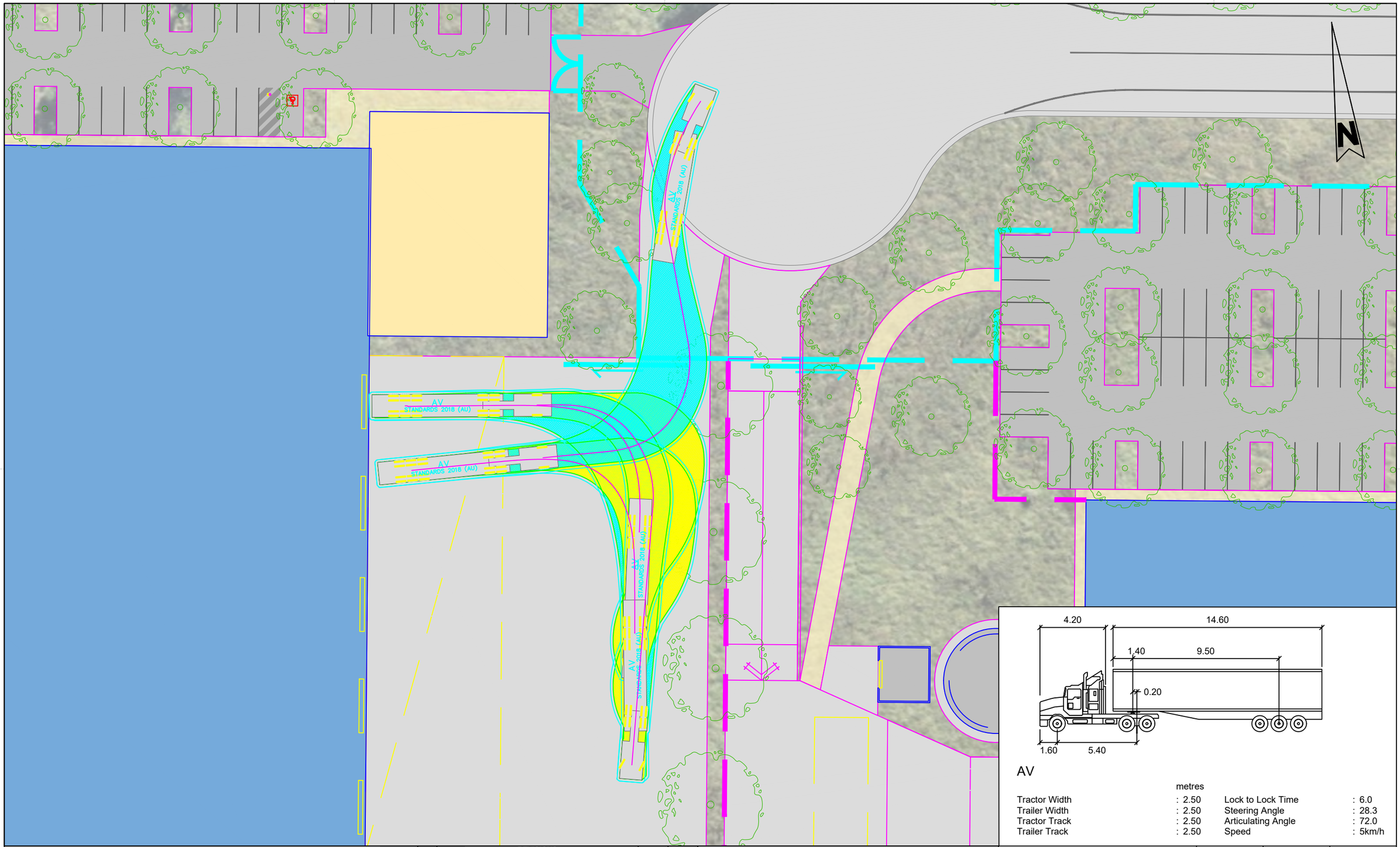
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	3	006



AV

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

BITZIOS consulting

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

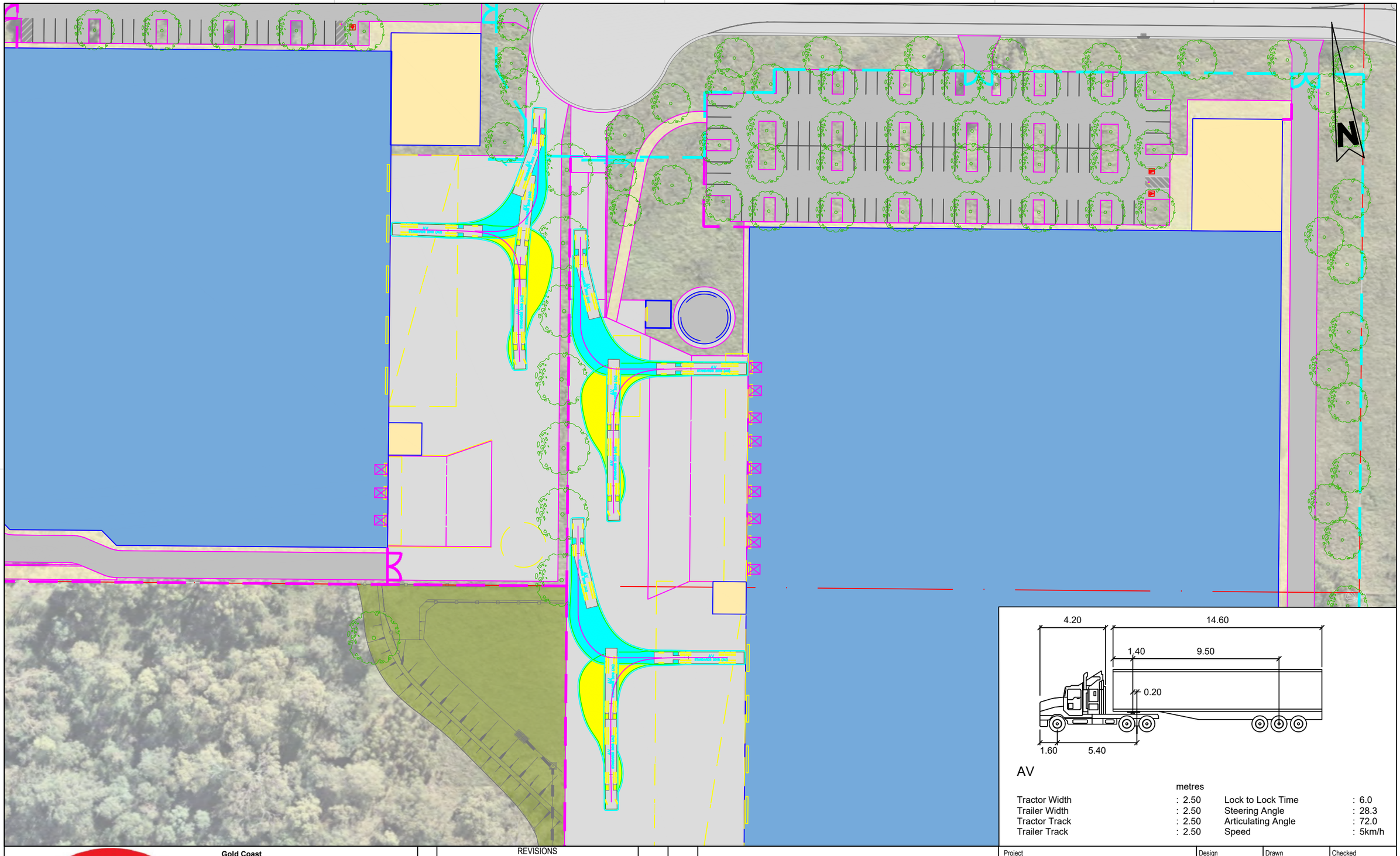
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	4	006



AV

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

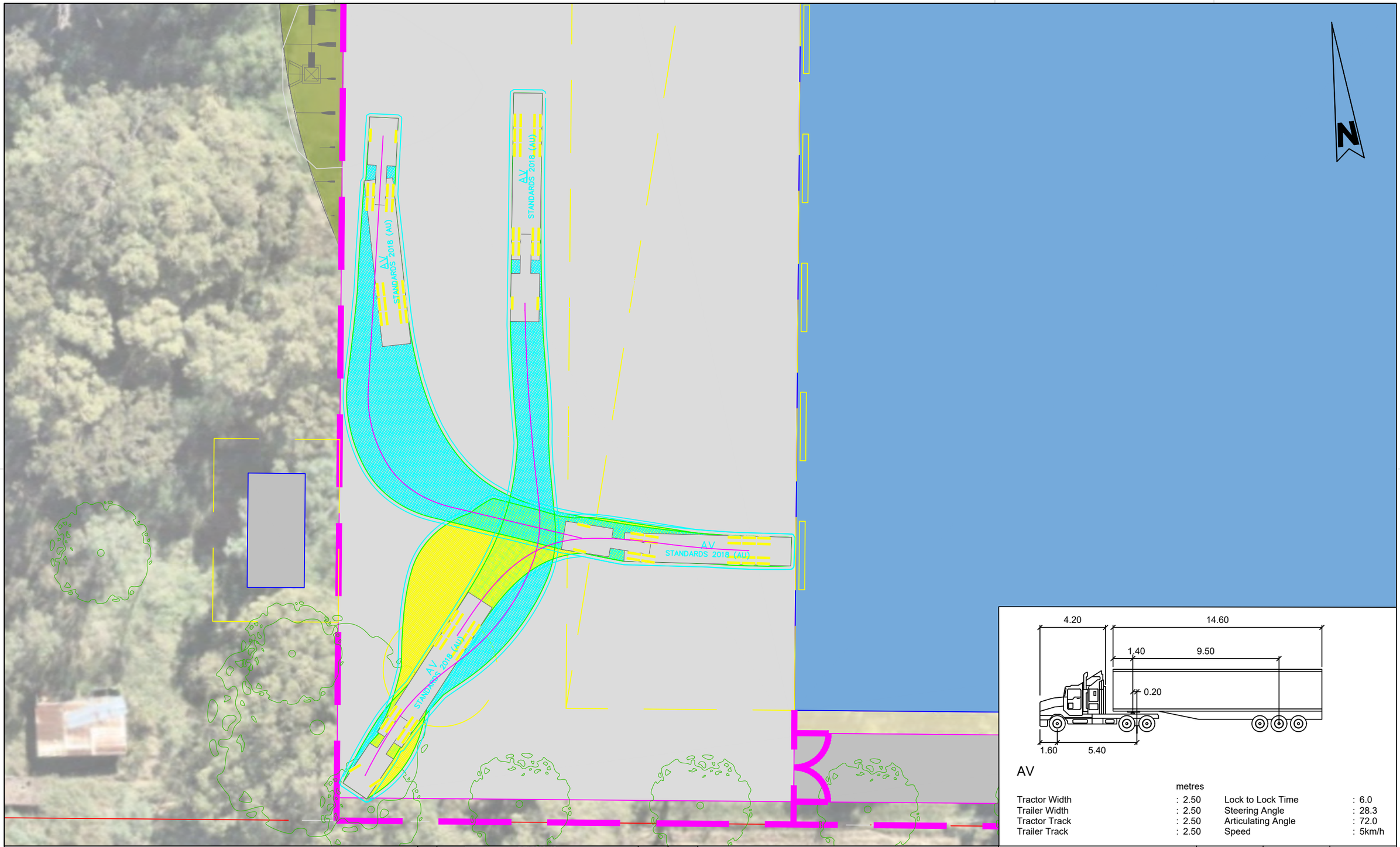
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	5	006



AV

metres

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

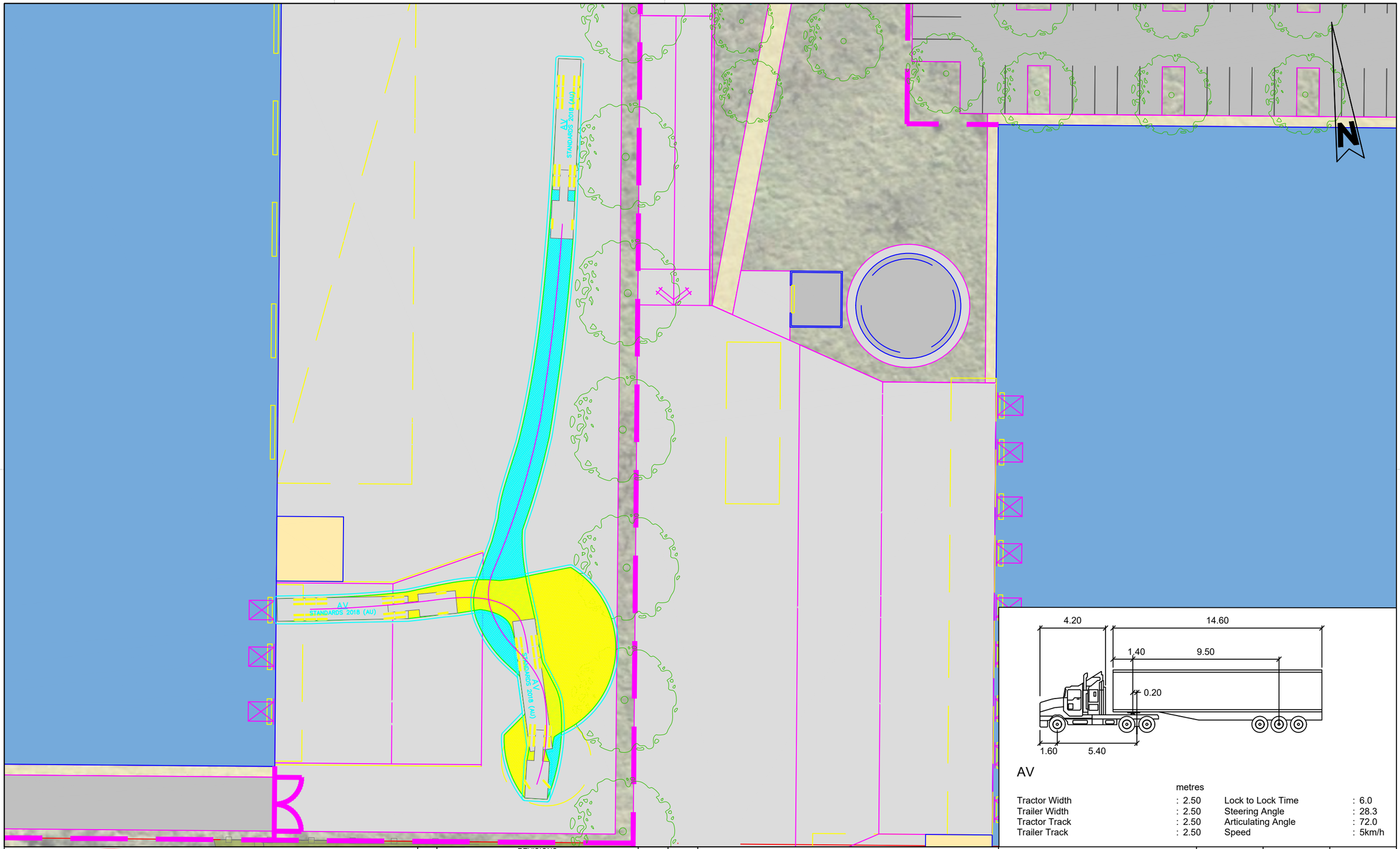
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	6	006



AV

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

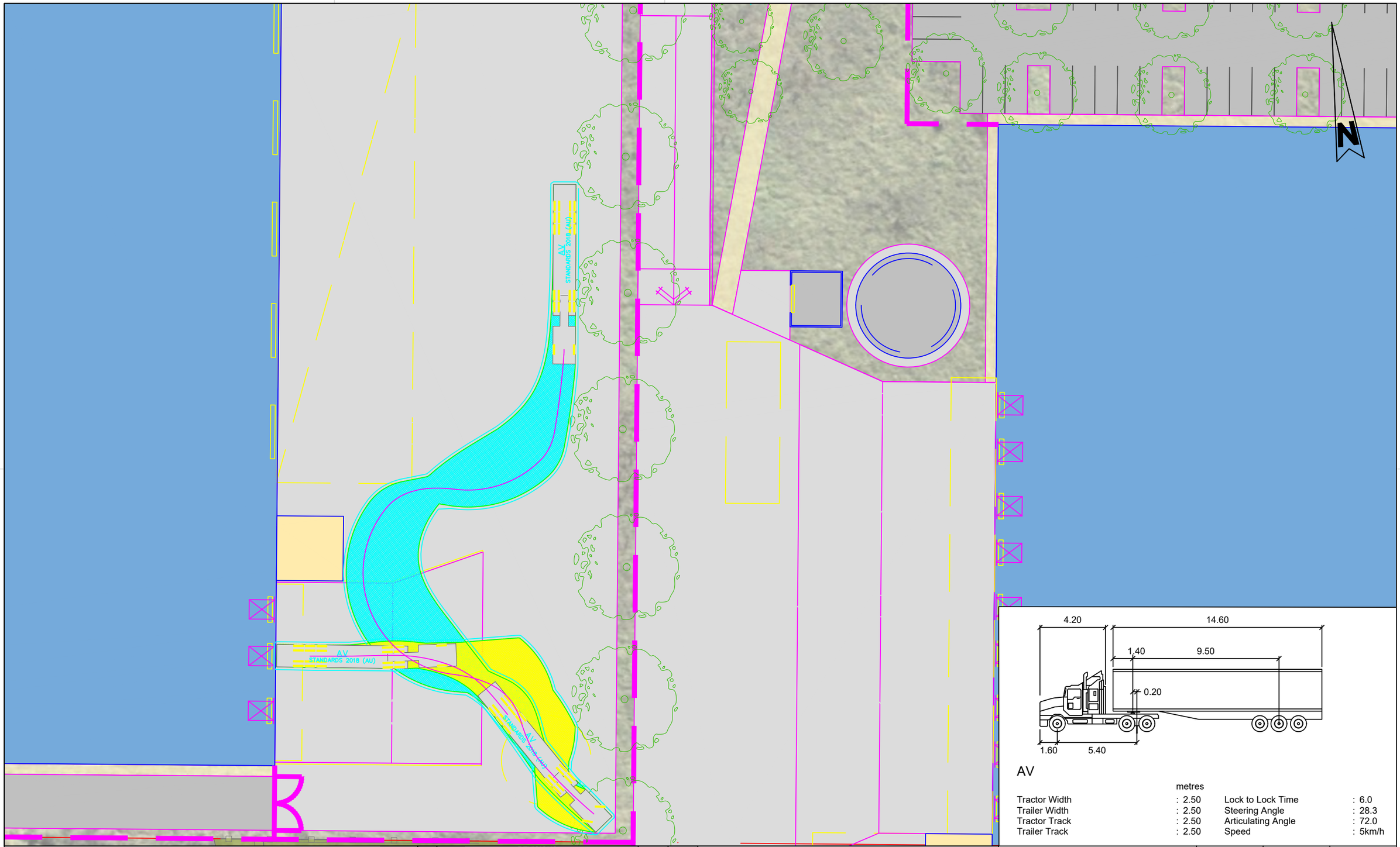
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	7	006



AV

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

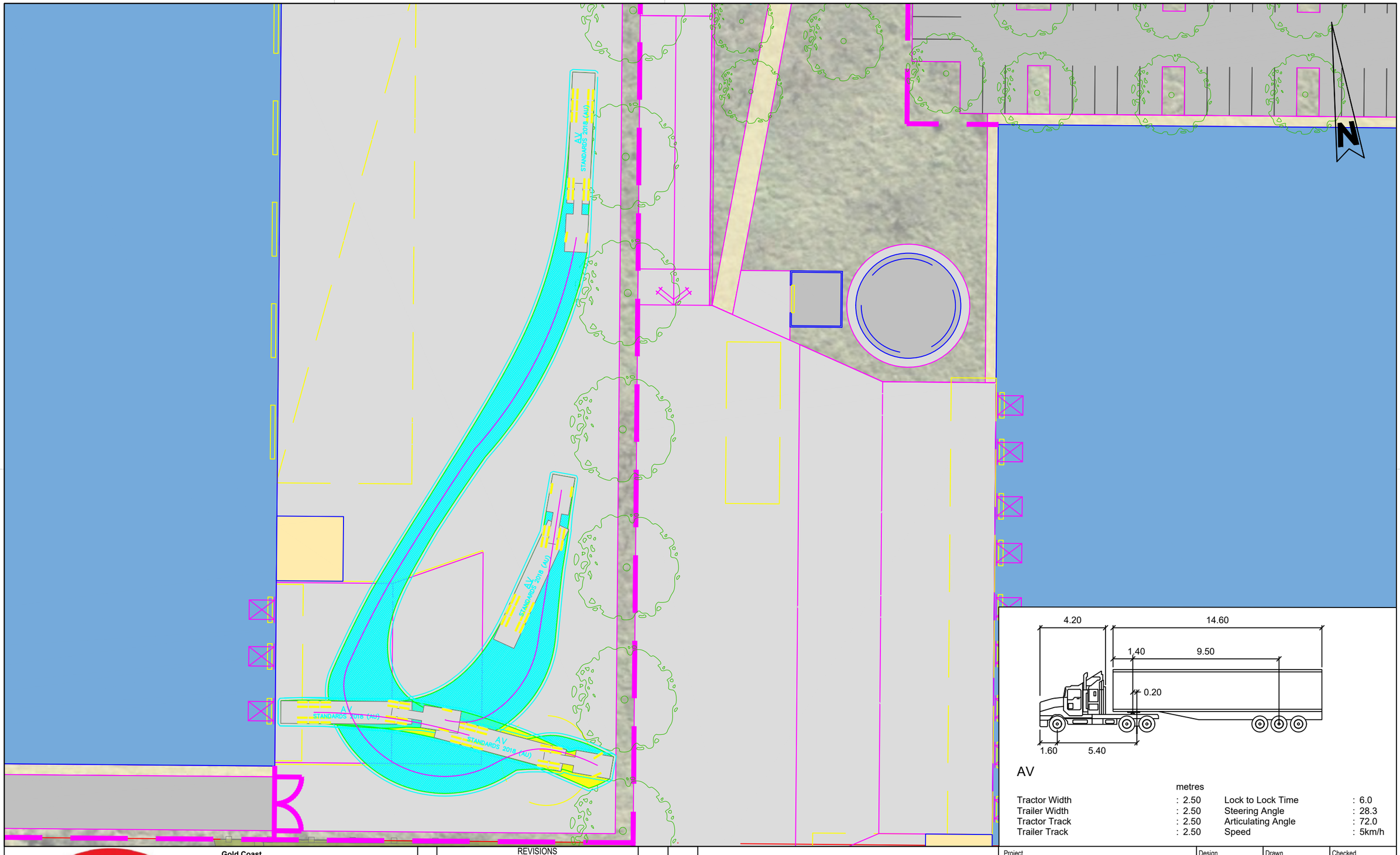
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	8	006



AV

	metres		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50	Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

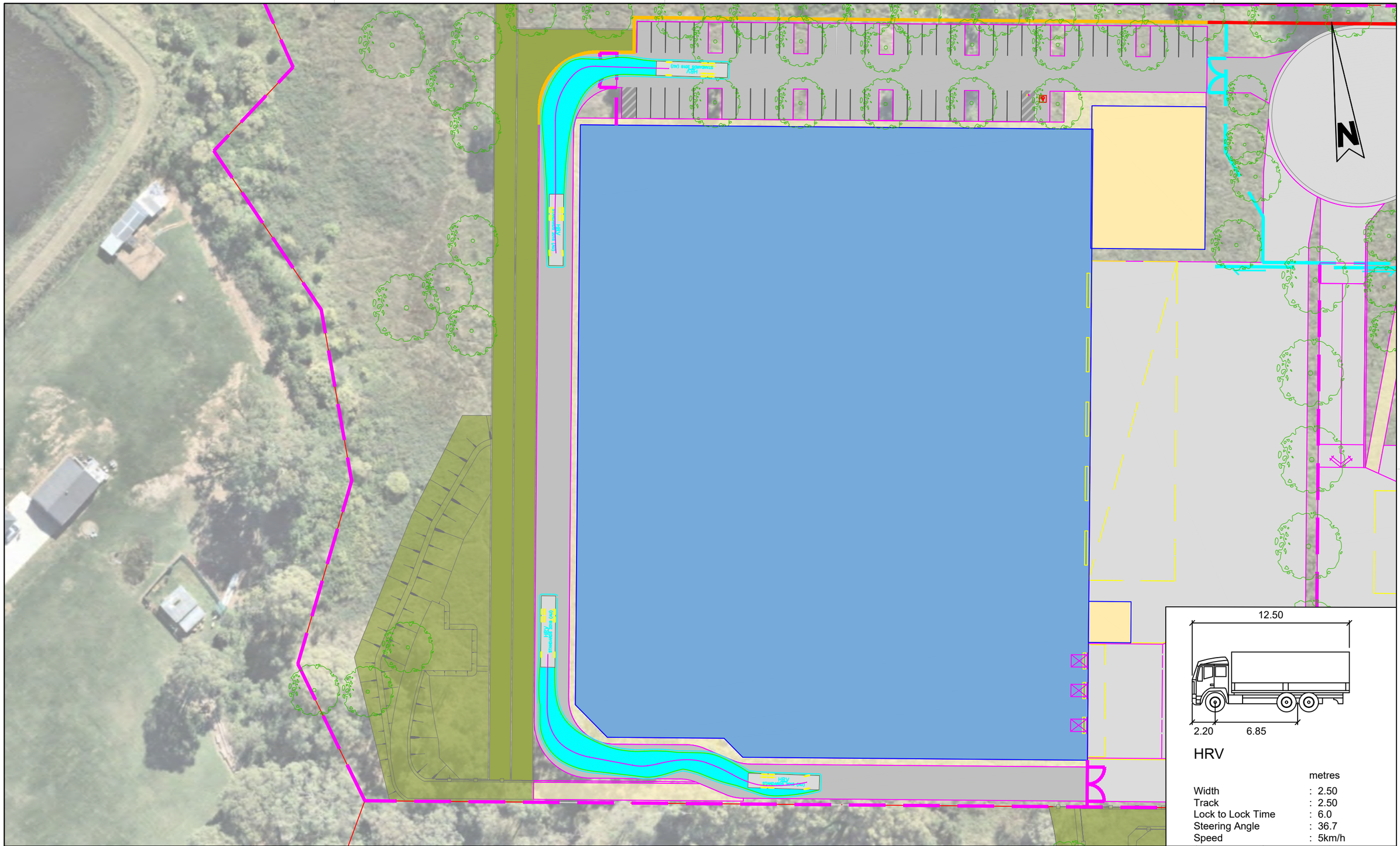
Title: Swept Path Analysis
20m Articulated Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	9	006



BITZIOS consulting

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

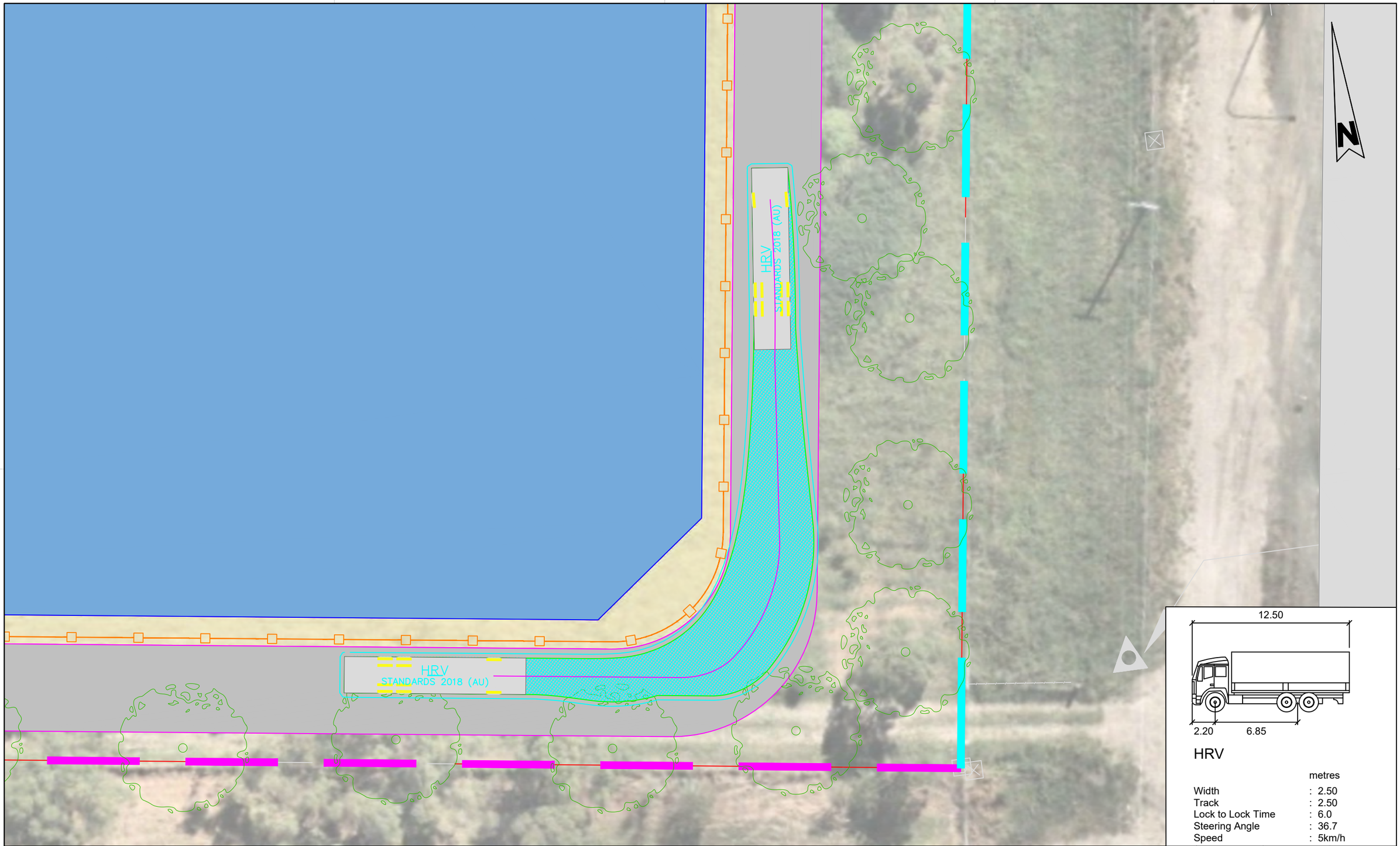
Title: Swept Path Analysis
12.5m Heavy Rigid Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	10	006



HRV

	metres
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7
Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

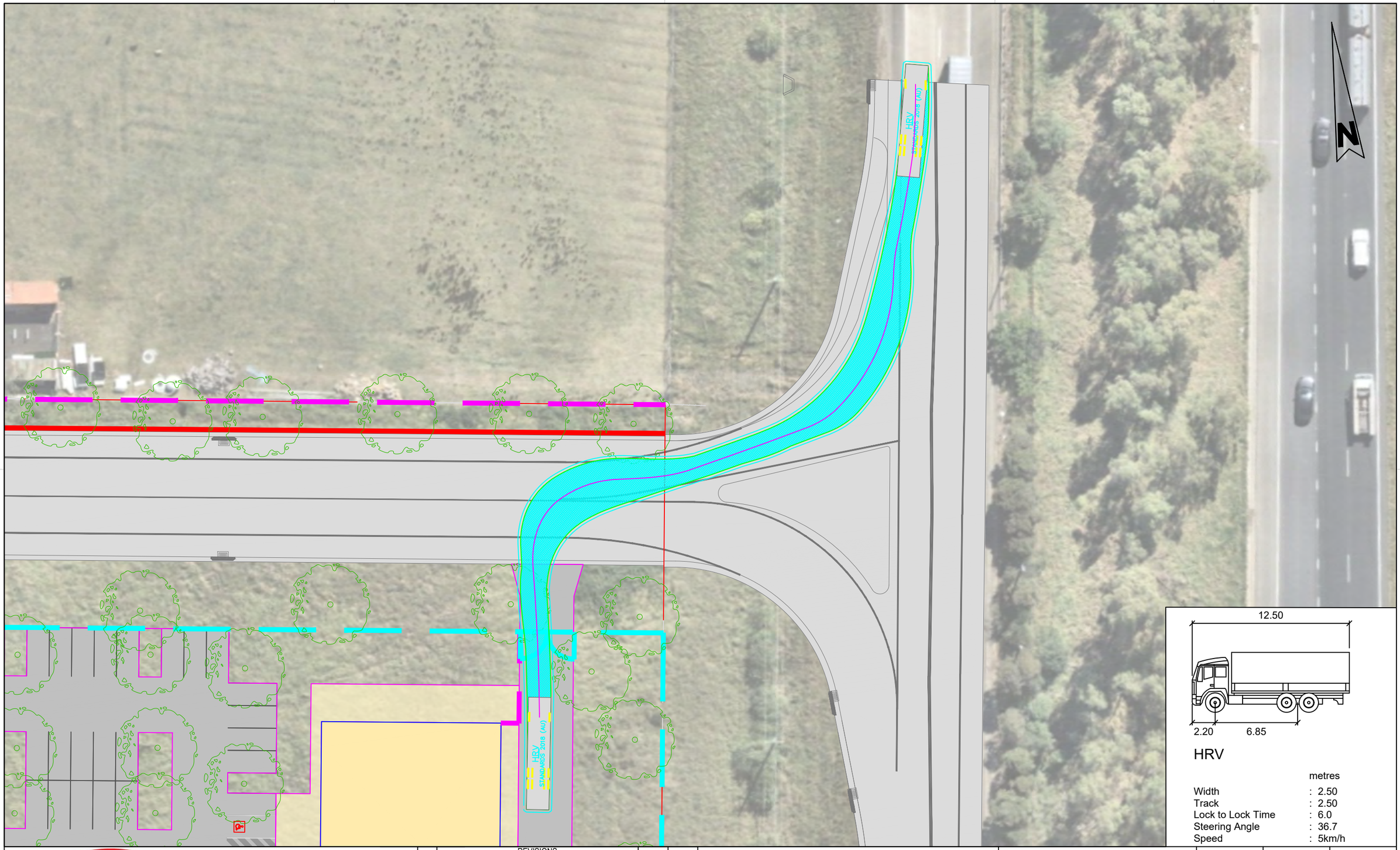
Title: Swept Path Analysis
12.5m Heavy Rigid Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	11	006



HRV

	metres
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7
Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

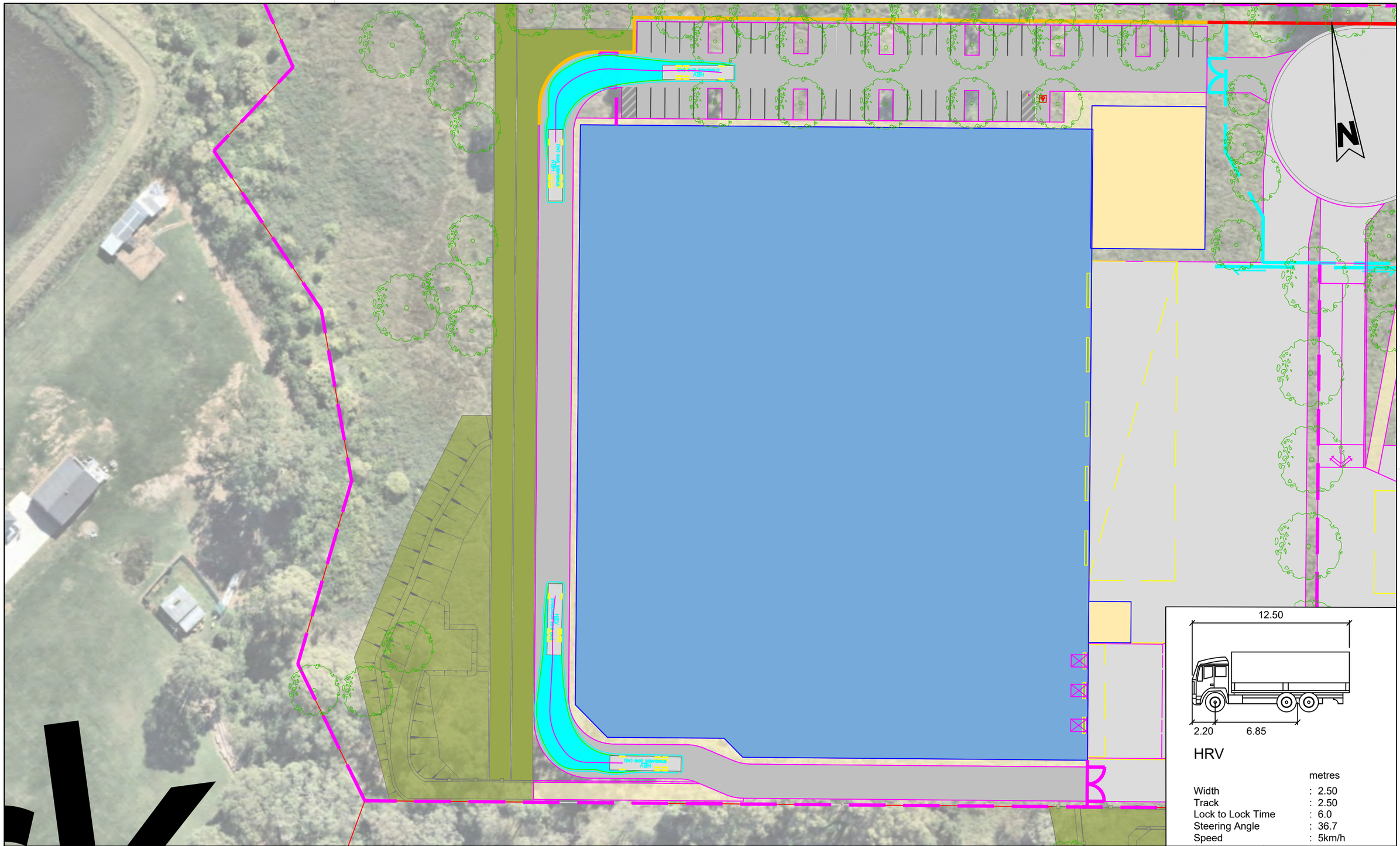
Title: Swept Path Analysis
12.5m Heavy Rigid Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	12	006



HRV

	metres
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7
Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

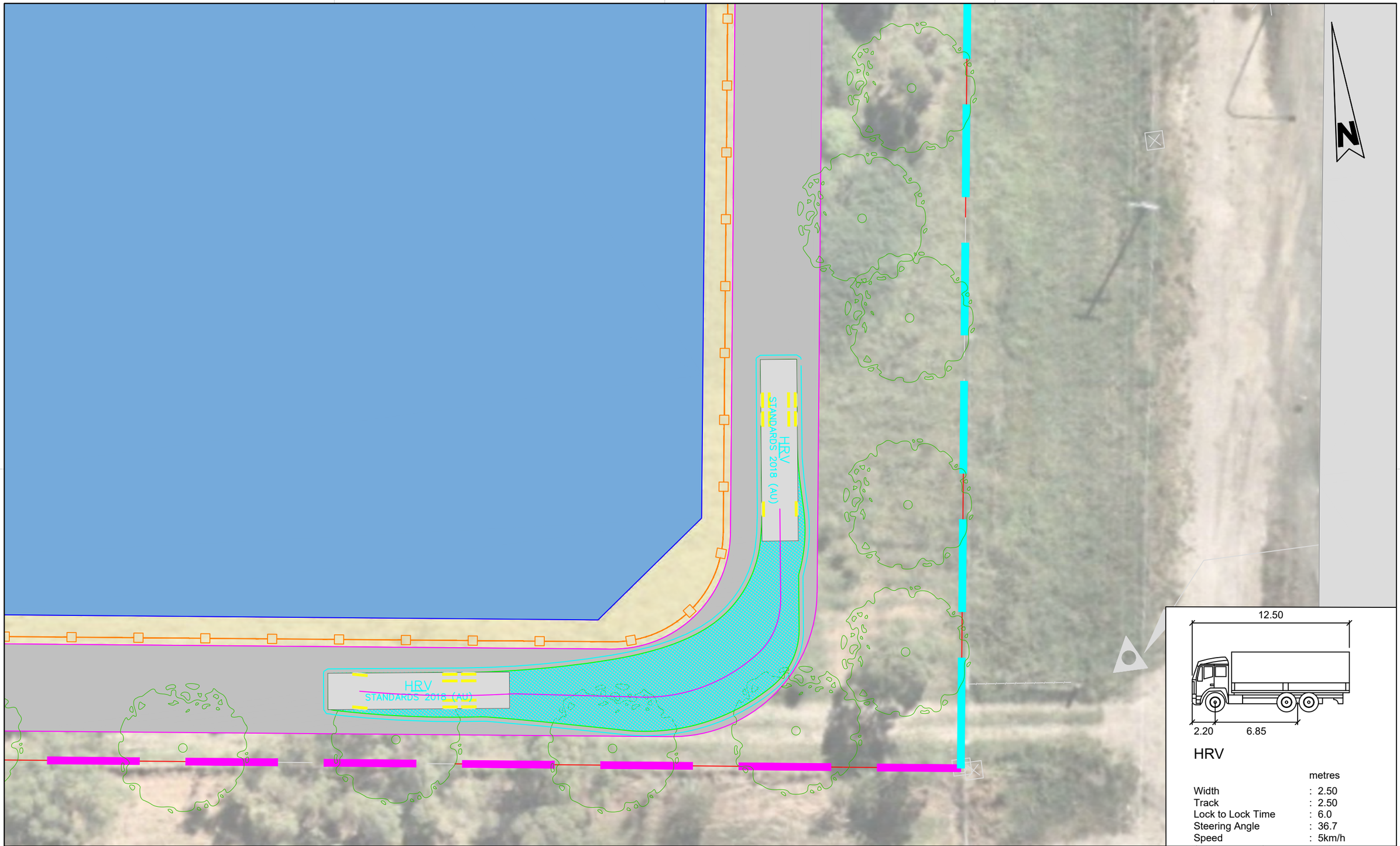
Title: Swept Path Analysis
12.5m Heavy Rigid Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	13	006



HRV

	metres
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7
Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

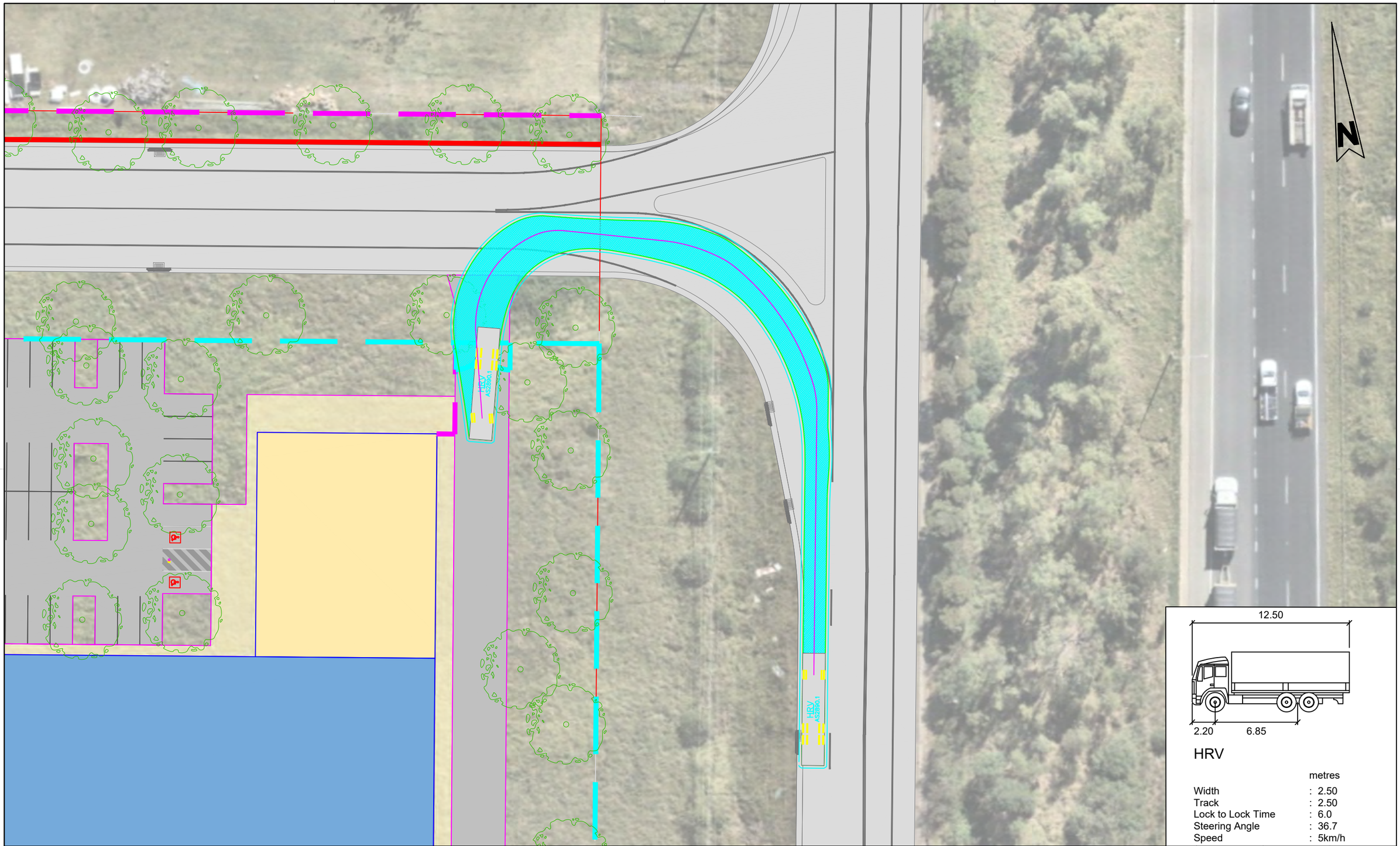
Title: Swept Path Analysis
12.5m Heavy Rigid Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	14	006



HRV

	metres
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7
Speed	: 5km/h

Gold Coast
Suite 26, 58 Riverwalk Avenue, Robina QLD 4226
P: (07) 5562-5377
W: www.bitziosconsulting.com.au
Brisbane
Level 2, 428 Upper Edward Street, Spring Hill 4000
P: (07) 3831-4442
E: admin@bitziosconsulting.com.au
Sydney
Studio 203, 3 Gladstone Street, Newtown NSW 2042
P: (02) 9557 6202

REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Path Analysis	A.L	28.07.2023
002	Swept Path Analysis	R.J	05.03.2024
006	Updated Concept Plan (dated 31/03/2025)	R.J	07.04.2025

Project: Wallgrove Business Hub TTS

Title: Swept Path Analysis
12.5m Heavy Rigid Vehicle

Design	Drawn	Checked
R.J	R.J	A.E

NOT FOR CONSTRUCTION

Date: 07.04.2025

Project Number	Sheet Number	Issue
P6072	15	006

Appendix F: WSP 2026 & 2036 Traffic Counts

2. DATA SOURCES

2.1 VOLUMES

WSP received traffic volume data from TfNSW, which are strategic model forecasts, via the Aimsun model developed by Jacobs. The following sets of data were received:

- Scenario 2: 2026 Ultimate model forecasts
- Scenario 3: 2036 Ultimate model forecasts

Figures showing traffic volumes for the AM and PM peak hours for each volume scenario are provided as Figures 2.1 to 2.6.

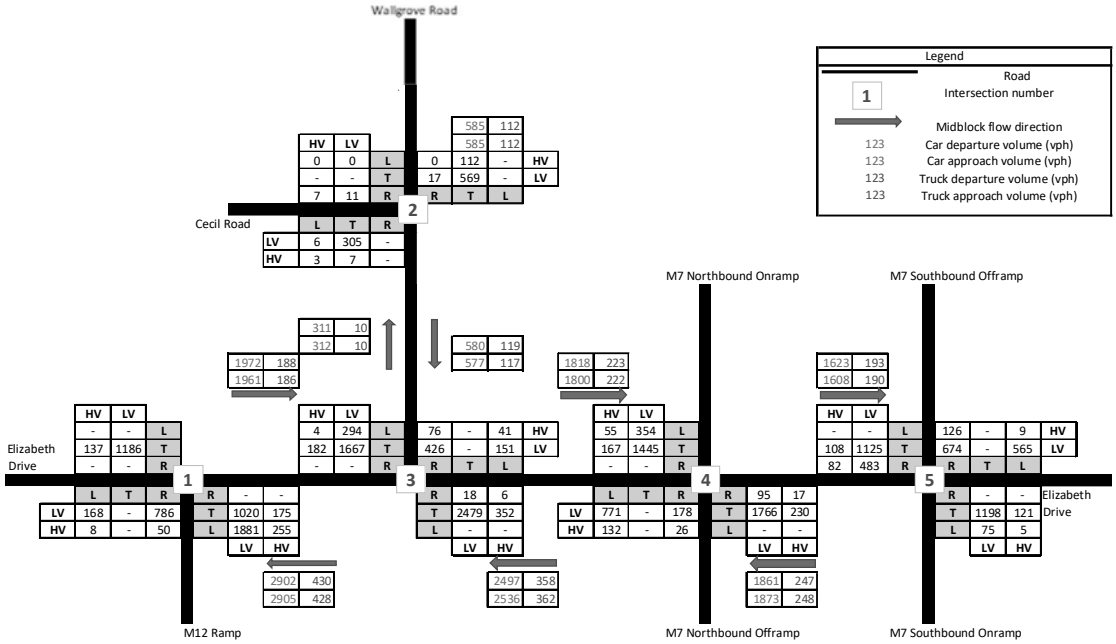


Figure 2.2 Scenario 1: 2026 Interim without the M7 / M12 system interchange - PM Peak Hour Traffic Volumes (vehicles per hour)

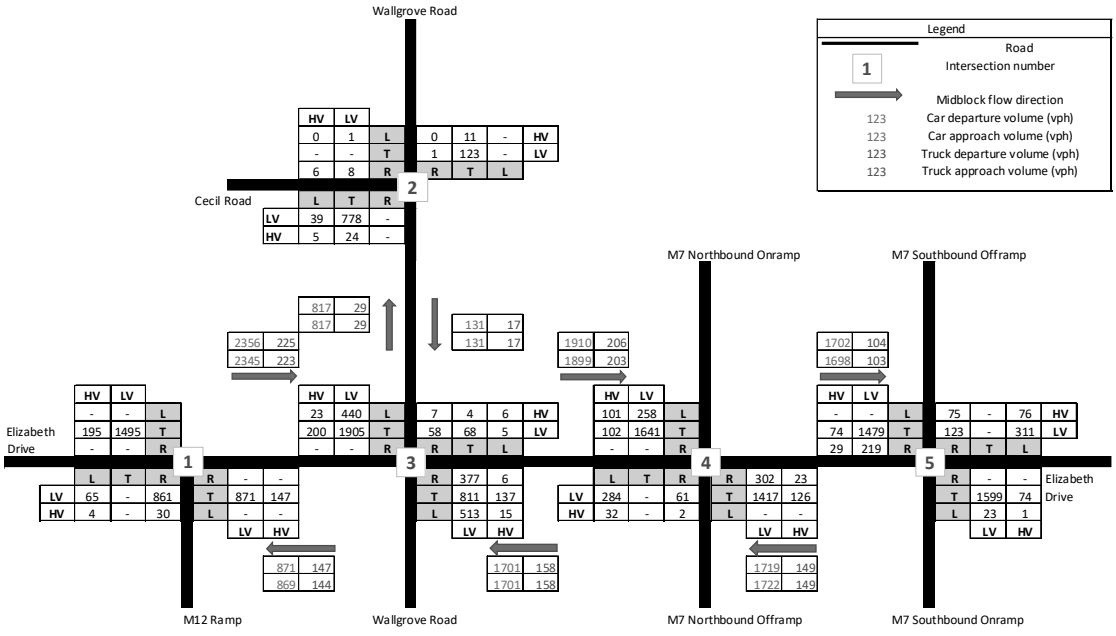


Figure 2.3 Scenario 2: 2026 Ultimate AM Peak Hour Traffic Volumes (vehicles per hour)

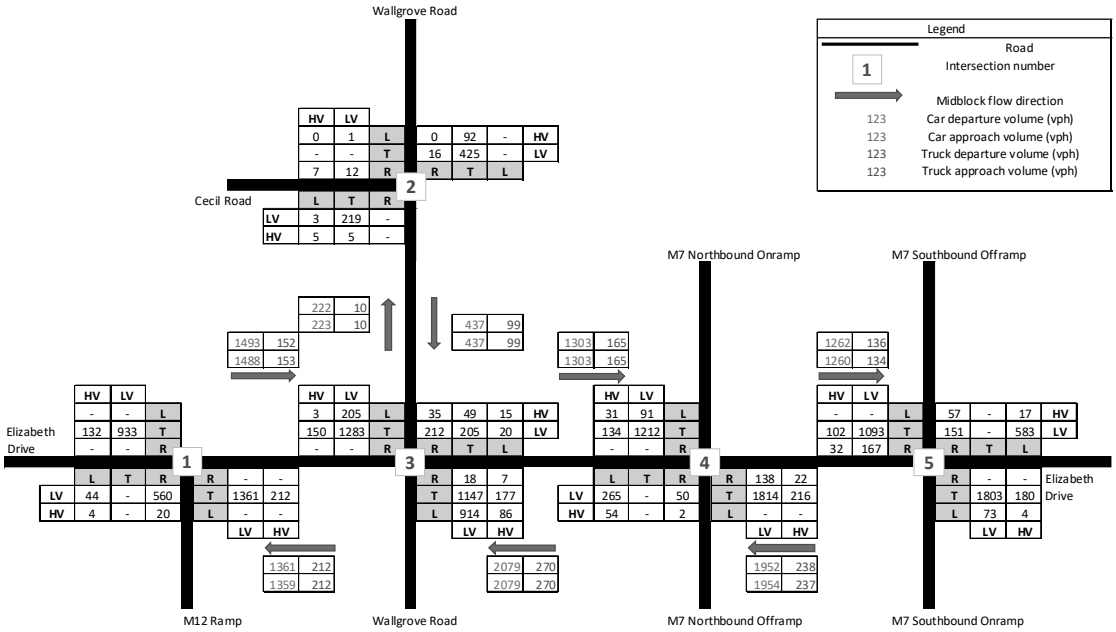


Figure 2.4 Scenario 2: 2026 Ultimate PM Peak Hour Traffic Volumes (vehicles per hour)

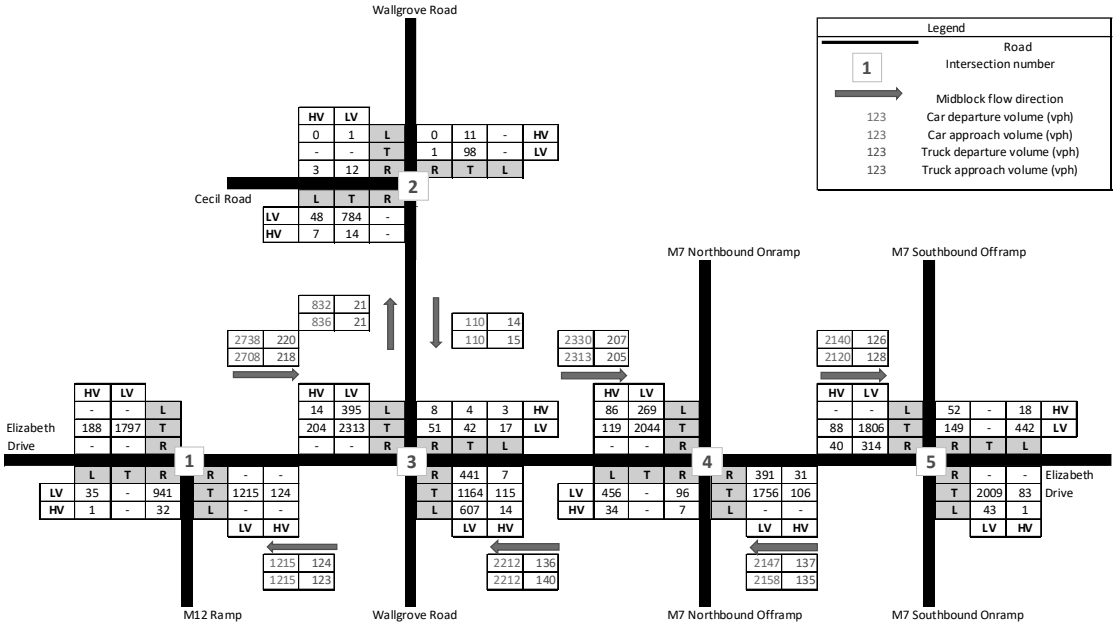


Figure 2.5 Scenario 3: 2036 Ultimate AM Peak Hour Traffic Volumes (vehicles per hour)

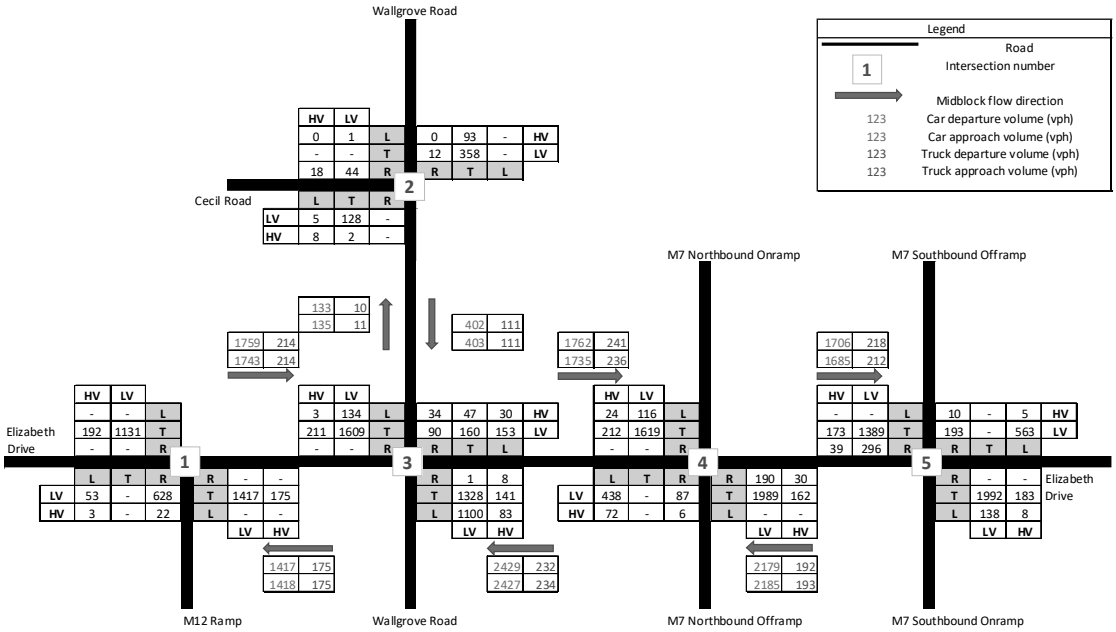


Figure 2.6 Scenario 3: 2036 Ultimate PM Peak Hour Traffic Volumes (vehicles per hour)

2.2 DESIGN LAYOUT

Concept designs showing basic layout of each intersection for the Interim and Ultimate scenarios are provided as Attachment A.

Appendix G: SIDRA Model Results

P6072 Wallgrove Business Hub TIA

SIDRA Model Results - 2026 AM Base Case

Site 1: Elizabeth Drive / M12 Western Exit Ramp

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: M12 Ramp														
1	L2	All MCs	69	5.8	69	5.8	0.097	31.2	LOS C	1.5	11.3	0.66	0.73	0.66
3	R2	All MCs	891	3.4	891	3.4	* 0.614	37.8	LOS C	12.6	91	0.85	0.84	0.85
Approach			960	3.5	960	3.5	0.614	37.4	LOS C	12.6	91	0.84	0.84	0.84
East: Elizabeth Drive														
5	T1	All MCs	1018	14.4	1018	14.4	0.381	19.7	LOS B	7.4	58.4	0.66	0.58	0.66
Approach			1018	14.4	1018	14.4	0.381	19.7	LOS B	7.4	58.4	0.66	0.58	0.66
West: Elizabeth Drive														
11	T1	All MCs	1691	11.5	1691	11.5	* 0.621	23.2	LOS B	14.5	111.6	0.78	0.7	0.78
Approach			1691	11.5	1691	11.5	0.621	23.2	LOS B	14.5	111.6	0.78	0.7	0.78
All Vehicles			3668	10.3	3668	10.3	0.621	25.9	LOS B	14.5	111.6	0.76	0.7	0.76

Site 2: Wallgrove Road / Cecil Road

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: Wallgrove Road														
1	L2	All MCs	44	11.4	44	11.4	* 0.238	60.6	LOS E	1.5	11.5	0.95	0.74	0.95
2	T1	All MCs	802	3	802	3	* 0.293	6.4	LOS A	5	36.2	0.39	0.34	0.39
Approach			846	3.4	846	3.4	0.293	9.2	LOS A	5	36.2	0.42	0.36	0.42
North: Wallgrove Road														
8	T1	All MCs	134	8.2	134	8.2	0.044	2.2	LOS A	0.4	3.3	0.2	0.16	0.2
9	R2	All MCs	1	0	1	0	* 0.011	67.3	LOS E	0	0.3	0.97	0.59	0.97
Approach			135	8.1	135	8.1	0.044	2.7	LOS A	0.4	3.3	0.21	0.16	0.21
West: Cecil Road														
10	L2	All MCs	1	0	1	0	0.005	55.7	LOS D	0	0.2	0.91	0.59	0.91
12	R2	All MCs	14	42.9	14	42.9	0.044	57.8	LOS E	0.2	2.2	0.92	0.66	0.92
Approach			15	39.8	15	39.8	0.044	57.6	LOS E	0.2	2.2	0.92	0.65	0.92
All Vehicles			996	4.6	996	4.6	0.293	9.1	LOS A	5	36.2	0.39	0.34	0.39

Site 3: Elizabeth Drive / Wallgrove Road

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
East: Elizabeth Drive														
4	L2	All MCs	528	2.8	528	2.8	0.342	8.6	LOS A	3.9	28	0.23	0.66	0.23
5	T1	All MCs	948	14.5	948	14.5	0.292	11.8	LOS A	5.3	41.7	0.51	0.44	0.51
6	R2	All MCs	383	1.6	383	1.6	* 0.544	54.5	LOS D	6.3	44.7	0.95	0.81	0.95
Approach			1860	8.5	1860	8.5	0.544	19.7	LOS B	6.3	44.7	0.52	0.58	0.52
North: Wallgrove Road														
7	L2	All MCs	11	54.5	11	54.5	0.013	36.8	LOS C	0.1	1.3	0.72	0.65	0.72
8	T1	All MCs	72	5.6	72	5.6	* 0.652	64.3	LOS E	2.7	19.9	1	0.81	1.1
9	R2	All MCs	65	10.8	65	10.8	0.649	70.4	LOS E	2.5	19	1	0.81	1.11
Approach			147	11.4	147	11.4	0.652	65.1	LOS E	2.7	19.9	0.98	0.79	1.08
West: Elizabeth Drive														
10	L2	All MCs	463	5	463	5	0.36	13.5	LOS A	6.2	45.3	0.41	0.71	0.41
11	T1	All MCs	2105	9.5	2105	9.5	* 0.631	15.8	LOS B	15.8	119.8	0.69	0.63	0.69
Approach			2568	8.7	2568	8.7	0.631	15.4	LOS B	15.8	119.8	0.64	0.64	0.64
All Vehicles			4576	8.7	4576	8.7	0.652	18.7	LOS B	15.8	119.8	0.6	0.62	0.6

Site 4: Elizabeth Drive / M7 Northbound Exit/Entry Ramps

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: M7 Northbound Offramp														
1	L2	All MCs	316	10.1	316	10.1	* 0.456	60.3	LOS E	3.6	27.3	0.97	0.79	0.97
3	R2	All MCs	63	3.2	63	3.2	0.11	54.5	LOS D	1	7	0.89	0.72	0.89
Approach			379	9	379	9	0.456	59.4	LOS E	3.6	27.3	0.95	0.78	0.95
East: Elizabeth Drive														
5	T1	All MCs	1543	8.2	1543	8.2	0.362	3.5	LOS A	5.4	40.8	0.28	0.25	0.28
6	R2	All MCs	325	7.1	325	7.1	* 0.451	62.4	LOS E	6.2	46	1	0.86	1
Approach			1868	8	1868	8	0.451	13.7	LOS A	6.2	46	0.4	0.35	0.4
West: Elizabeth Drive														
10	L2	All MCs	359	28.1	359	28.1	0.247	25.5	LOS B	3.9	33.5	0.6	0.74	0.6
11	T1	All MCs	1743	5.9	1743	5.9	* 0.464	20.7	LOS B	10	73.8	0.7	0.62	0.7
Approach			2102	9.7	2102	9.7	0.464	21.6	LOS B	10	73.8	0.68	0.64	0.68
All Vehicles			4349	8.9	4349	8.9	0.464	21.5	LOS B	10	73.8	0.59	0.53	0.59

Site 5: Elizabeth Drive / M7 Southbound Exit/Entry Ramps

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
East: Elizabeth Drive														
4	L2	All MCs	24	4.2	24	4.2	0.062	46.6	LOS D	0.7	5	0.82	0.71	0.82
5	T1	All MCs	1673	4.4	1673	4.4	* 0.579	21.8	LOS B	13.8	99.9	0.75	0.67	0.75
Approach			1697	4.4	1697	4.4	0.579	22.2	LOS B	13.8	99.9	0.75	0.67	0.75
North: M7 Southbound Offramp														
7	L2	All MCs	387	19.6	387	19.6	* 0.572	55.9	LOS D	6.6	53.8	0.94	0.82	0.94
9	R2	All MCs	198	37.9	198	37.9	0.312	51.3	LOS D	3	28.1	0.88	0.78	0.88
Approach			585	25.8	585	25.8	0.572	54.3	LOS D	6.6	53.8	0.92	0.81	0.92
West: Elizabeth Drive														
11	T1	All MCs	1553	4.8	1553	4.8	0.552	6.7	LOS A	5.9	42.7	0.27	0.24	0.27
12	R2	All MCs	248	11.7	248	11.7	* 0.511	67	LOS E	4.5	35	1	0.83	1
Approach			1801	5.7	1801	5.7	0.552	15.1	LOS B	5.9	42.7	0.37	0.32	0.37
All Vehicles			4083	8.1	4083	8.1	0.579	23.6	LOS B	13.8	99.9	0.61	0.54	0.61

P6072 Wallgrove Business Hub TIA

SIDRA Model Results - 2026 PM Base Case

Site 1: Elizabeth Drive / M12 Western Exit Ramp

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: M12 Ramp														
1	L2	All MCs	48	8.3	48	8.3	0.087	38.1	LOS C	1.2	9.1	0.73	0.73	0.73
3	R2	All MCs	580	3.4	580	3.4	* 0.505	43.1	LOS D	8.5	61	0.87	0.82	0.87
Approach			628	3.8	628	3.8	0.505	42.7	LOS D	8.5	61	0.86	0.82	0.86
East: Elizabeth Drive														
5	T1	All MCs	1573	13.5	1564	13.5	* 0.499	11.3	LOS A	9.3	72.6	0.52	0.47	0.52
Approach			1573	13.5	1564	13.5	0.499	11.3	LOS A	9.3	72.6	0.52	0.47	0.52
West: Elizabeth Drive														
11	T1	All MCs	1065	12.4	1065	12.4	0.337	13.7	LOS A	6.5	50.3	0.56	0.49	0.56
Approach			1065	12.4	1065	12.4	0.337	13.7	LOS A	6.5	50.3	0.56	0.49	0.56
All Vehicles			3266	11.3	3258	11.3	0.505	18.1	LOS B	9.3	72.6	0.6	0.54	0.6

Site 2: Wallgrove Road / Cecil Road

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: Wallgrove Road														
1	L2	All MCs	8	62.5	8	62.5	0.061	58.6	LOS E	0.3	3	0.91	0.68	0.91
2	T1	All MCs	224	2.2	224	2.2	* 0.087	6.3	LOS A	1.3	9.4	0.32	0.26	0.32
Approach			233	4.4	233	4.4	0.087	8.2	LOS A	1.3	9.4	0.34	0.28	0.34
North: Wallgrove Road														
8	T1	All MCs	517	17.8	517	17.8	0.241	2.7	LOS A	4	32.1	0.24	0.22	0.24
9	R2	All MCs	16	0	16	0	* 0.085	61.2	LOS E	0.5	3.7	0.94	0.7	0.94
Approach			533	17.3	533	17.3	0.241	4.4	LOS A	4	32.1	0.27	0.23	0.27
West: Cecil Road														
10	L2	All MCs	1	0	1	0	0.005	55.7	LOS D	0	0.2	0.91	0.59	0.91
12	R2	All MCs	19	36.8	19	36.8	* 0.079	58.8	LOS E	0.4	3.9	0.93	0.68	0.93
Approach			20	34.9	20	34.9	0.079	58.7	LOS E	0.4	3.9	0.93	0.68	0.93
All Vehicles			785	13.9	785	13.9	0.241	6.9	LOS A	4	32.1	0.31	0.26	0.31

Site 3: Elizabeth Drive / Wallgrove Road

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
East: Elizabeth Drive														
4	L2	All MCs	1000	8.6	1000	8.6	* 0.856	24.5	LOS B	27.9	209.7	0.82	0.79	0.85
5	T1	All MCs	1324	13.4	1324	13.4	0.469	26	LOS B	12.1	94.3	0.81	0.63	0.81
6	R2	All MCs	25	28	25	28	0.043	43.2	LOS D	0.3	2.7	0.72	0.67	0.72
Approach			2349	11.5	2349	11.5	0.856	25.5	LOS B	27.9	209.7	0.82	0.7	0.82
North: Wallgrove Road														
7	L2	All MCs	35	42.9	35	42.9	0.032	28.8	LOS C	0.4	3.5	0.62	0.67	0.62
8	T1	All MCs	254	19.3	254	19.3	* 1.034	118.9	LOS F	11.3	92	1	1.25	1.77
9	R2	All MCs	247	14.2	247	14.2	1.034	125	LOS F	11.7	92	1	1.19	1.77
Approach			536	18.5	536	18.5	1.034	115.8	LOS F	11.7	92	0.98	1.18	1.69
West: Elizabeth Drive														
10	L2	All MCs	208	1.4	208	1.4	0.158	14	LOS A	3	21.2	0.44	0.65	0.44
11	T1	All MCs	1433	10.5	1433	10.5	0.498	20.8	LOS B	12.8	97.6	0.72	0.62	0.72
Approach			1641	9.3	1641	9.3	0.498	19.9	LOS B	12.8	97.6	0.69	0.62	0.69
All Vehicles			4526	11.6	4526	11.6	1.034	34.2	LOS C	27.9	209.7	0.79	0.73	0.88

Site 4: Elizabeth Drive / M7 Northbound Exit/Entry Ramps

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: M7 Northbound Offramp														
1	L2	All MCs	319	16.9	319	16.9	* 0.539	61.6	LOS E	4.1	33.1	0.98	0.79	0.98
3	R2	All MCs	52	3.8	52	3.8	0.09	54.3	LOS D	0.8	5.8	0.89	0.72	0.89
Approach			371	15.1	371	15.1	0.539	60.6	LOS E	4.1	33.1	0.97	0.78	0.97
East: Elizabeth Drive														
5	T1	All MCs	2031	10.6	2031	10.6	* 0.542	4	LOS A	9.7	74.4	0.34	0.31	0.34
6	R2	All MCs	160	13.8	160	13.8	0.317	64	LOS E	3.1	24	1	0.81	1
Approach			2191	10.8	2191	10.8	0.542	8.4	LOS A	9.7	74.4	0.39	0.35	0.39
West: Elizabeth Drive														
10	L2	All MCs	122	25.4	122	25.4	0.074	29.3	LOS C	1.8	15.2	0.82	0.56	0.82
11	T1	All MCs	1346	10	1346	10	0.329	22.1	LOS B	10	75.8	0.78	0.54	0.78
Approach			1468	11.3	1468	11.3	0.329	22.7	LOS B	10	75.8	0.78	0.54	0.78
All Vehicles			4029	11.4	4029	11.4	0.542	18.4	LOS B	10	75.8	0.59	0.46	0.59

Site 5: Elizabeth Drive / M7 Southbound Exit/Entry Ramps

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
East: Elizabeth Drive														
4	L2	All MCs	77	5.2	77	5.2	0.198	48.2	LOS D	2.3	16.6	0.86	0.76	0.86
5	T1	All MCs	1983	9.1	1983	9.1	* 0.653	20.1	LOS B	16.4	124	0.76	0.69	0.76
Approach			2060	9	2060	9	0.653	21.2	LOS B	16.4	124	0.76	0.69	0.76
North: M7 Southbound Offramp														
7	L2	All MCs	600	2.8	600	2.8	* 0.792	59.8	LOS E	11.3	80.9	0.99	0.87	1.06
9	R2	All MCs	208	27.4	208	27.4	0.31	51	LOS D	3.2	27.5	0.88	0.78	0.88
Approach			808	9.1	808	9.1	0.792	57.6	LOS E	11.3	80.9	0.97	0.85	1.02
West: Elizabeth Drive														
11	T1	All MCs	1195	8.5	1195	8.5	0.402	2.7	LOS A	1.7	12.5	0.07	0.06	0.07
12	R2	All MCs	199	16.1	199	16.1	* 0.551	69.4	LOS E	3.7	29.4	1	0.82	1
Approach			1394	9.6	1394	9.6	0.551	12.2	LOS A	3.7	29.4	0.2	0.17	0.2
All Vehicles			4262	9.2	4262	9.2	0.792	25.2	LOS B	16.4	124	0.62	0.55	0.63

P6072 Wallgrove Business Hub TIA

SIDRA Model Results - 2036 AM Base Case

Site 1: Elizabeth Drive / M12 Western Exit Ramp

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: M12 Ramp														
1	L2	All MCs	36	2.8	36	2.8	0.051	31.9	LOS C	0.8	5.7	0.66	0.71	0.66
3	R2	All MCs	973	3.3	973	3.3	* 0.699	40.6	LOS C	14.7	105.5	0.9	0.86	0.9
Approach			1008	3.3	1008	3.3	0.699	40.3	LOS C	14.7	105.5	0.9	0.85	0.9
East: Elizabeth Drive														
5	T1	All MCs	1339	9.3	1339	9.3	0.47	24.5	LOS B	11.7	88.7	0.8	0.64	0.8
Approach			1339	9.3	1339	9.3	0.47	24.5	LOS B	11.7	88.7	0.8	0.64	0.8
West: Elizabeth Drive														
11	T1	All MCs	1691	9.5	1691	9.5	* 0.594	21.5	LOS B	13.9	105.4	0.75	0.68	0.75
Approach			1691	9.5	1691	9.5	0.594	21.5	LOS B	13.9	105.4	0.75	0.68	0.75
All Vehicles			4038	7.9	4038	7.9	0.699	27.2	LOS B	14.7	105.5	0.8	0.71	0.8

Site 2: Wallgrove Road / Cecil Road

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: Wallgrove Road														
1	L2	All MCs	55	12.7	55	12.7	* 0.257	58.7	LOS E	1.8	14.2	0.94	0.75	0.94
2	T1	All MCs	798	1.8	798	1.8	* 0.299	7.6	LOS A	5.4	38.6	0.42	0.37	0.42
Approach			853	2.5	853	2.5	0.299	10.8	LOS A	5.4	38.6	0.45	0.39	0.45
North: Wallgrove Road														
8	T1	All MCs	109	10.1	109	10.1	0.038	2.8	LOS A	0.4	3.1	0.23	0.18	0.23
9	R2	All MCs	1	0	1	0	* 0.011	67.3	LOS E	0	0.3	0.97	0.59	0.97
Approach			111	10	111	10	0.038	3.4	LOS A	0.4	3.1	0.23	0.18	0.23
West: Cecil Road														
10	L2	All MCs	1	0	1	0	0.005	53.6	LOS D	0	0.2	0.89	0.59	0.89
12	R2	All MCs	15	20	15	20	0.036	55	LOS D	0.2	1.9	0.9	0.66	0.9
Approach			16	18.7	16	18.7	0.036	54.9	LOS D	0.2	1.9	0.9	0.65	0.9
All Vehicles			979	3.6	979	3.6	0.299	10.7	LOS A	5.4	38.6	0.43	0.37	0.43

Site 3: Elizabeth Drive / Wallgrove Road

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
East: Elizabeth Drive														
4	L2	All MCs	621	2.3	621	2.3	0.396	9.4	LOS A	6.7	47.7	0.33	0.61	0.33
5	T1	All MCs	1279	9	1279	9	0.375	18.7	LOS B	10.7	80.5	0.75	0.5	0.75
6	R2	All MCs	448	1.6	448	1.6	* 0.637	45.7	LOS D	6.9	48.7	0.89	0.81	0.89
Approach			2348	5.8	2348	5.8	0.637	21.4	LOS B	10.7	80.5	0.67	0.59	0.67
North: Wallgrove Road														
7	L2	All MCs	20	15	20	15	0.02	37.5	LOS C	0.3	2	0.74	0.67	0.74
8	T1	All MCs	46	8.7	46	8.7	* 0.514	63.1	LOS E	2	15.4	1	0.75	1
9	R2	All MCs	59	13.6	59	13.6	0.514	69	LOS E	2	15.4	1	0.75	1
Approach			125	12	125	12	0.514	61.8	LOS E	2	15.4	0.96	0.74	0.96
West: Elizabeth Drive														
10	L2	All MCs	409	3.4	409	3.4	0.311	27.3	LOS B	9.3	66.7	0.69	0.54	0.69
11	T1	All MCs	2517	8.1	2517	8.1	* 0.774	24.7	LOS B	24.2	181.2	0.88	0.73	0.88
Approach			2926	7.4	2926	7.4	0.774	25.1	LOS B	24.2	181.2	0.86	0.71	0.86
All Vehicles			5400	6.8	5400	6.8	0.774	24.3	LOS B	24.2	181.2	0.78	0.65	0.78

Site 4: Elizabeth Drive / M7 Northbound Exit/Entry Ramps

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: M7 Northbound Offramp														
1	L2	All MCs	491	6.9	491	6.9	* 0.652	61.5	LOS E	5.8	42.7	1	0.82	1.02
3	R2	All MCs	103	6.8	103	6.8	0.175	54.4	LOS D	1.6	11.9	0.9	0.75	0.9
Approach			594	6.9	594	6.9	0.652	60.3	LOS E	5.8	42.7	0.98	0.81	1
East: Elizabeth Drive														
5	T1	All MCs	1862	5.7	1862	5.7	0.44	3.6	LOS A	6.9	50.6	0.29	0.26	0.29
6	R2	All MCs	422	7.3	422	7.3	* 0.586	64.4	LOS E	8.1	60.1	1	0.88	1
Approach			2284	6	2284	6	0.586	14.8	LOS B	8.1	60.1	0.42	0.37	0.42
West: Elizabeth Drive														
10	L2	All MCs	355	24.2	355	24.2	0.246	35.6	LOS C	5	42.4	0.79	0.7	0.79
11	T1	All MCs	2163	5.5	2163	5.5	* 0.601	31.8	LOS C	15.9	116.8	0.89	0.73	0.89
Approach			2518	8.1	2518	8.1	0.601	32.3	LOS C	15.9	116.8	0.88	0.72	0.88
All Vehicles			5396	7.1	5396	7.1	0.652	28	LOS B	15.9	116.8	0.7	0.59	0.7

Site 5: Elizabeth Drive / M7 Southbound Exit/Entry Ramps

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
East: Elizabeth Drive														
4	L2	All MCs	44	2.3	44	2.3	0.132	50	LOS D	1.3	9.5	0.87	0.73	0.87
5	T1	All MCs	2092	4	2092	4	* 0.704	22.7	LOS B	18.7	135.7	0.81	0.74	0.81
Approach			2136	4	2136	4	0.704	23.3	LOS B	18.7	135.7	0.81	0.74	0.81
North: M7 Southbound Offramp														
7	L2	All MCs	460	3.9	460	3.9	* 0.723	77.8	LOS F	8.4	61	0.99	0.84	1.02
9	R2	All MCs	201	25.9	201	25.9	0.35	54.8	LOS D	3.2	27.5	0.92	0.78	0.92
Approach			661	10.6	661	10.6	0.723	70.8	LOS F	8.4	61	0.97	0.82	0.99
West: Elizabeth Drive														
11	T1	All MCs	1894	4.6	1894	4.6	0.651	14.5	LOS A	4.9	35.5	0.12	0.11	0.12
12	R2	All MCs	354	11.3	354	11.3	* 0.650	67.8	LOS E	6.5	49.8	1	0.86	1.01
Approach			2247	5.7	2247	5.7	0.651	22.9	LOS B	6.5	49.8	0.26	0.23	0.26
All Vehicles			5044	5.6	5044	5.6	0.723	29.3	LOS C	18.7	135.7	0.59	0.52	0.59

P6072 Wallgrove Business Hub TIA

SIDRA Model Results - 2036 PM Base Case

Site 1: Elizabeth Drive / M12 Western Exit Ramp

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: M12 Ramp														
1	L2	All MCs	56	5.4	56	5.4	0.091	35.9	LOS C	1.3	9.8	0.71	0.73	0.71
3	R2	All MCs	651	3.4	651	3.4	* 0.525	41.2	LOS C	9.3	67.3	0.86	0.83	0.86
Approach			706	3.6	706	3.6	0.525	40.8	LOS C	9.3	67.3	0.84	0.82	0.84
East: Elizabeth Drive														
5	T1	All MCs	1592	11	1592	11	* 0.522	13.9	LOS A	10.4	79.5	0.59	0.53	0.59
Approach			1592	11	1592	11	0.522	13.9	LOS A	10.4	79.5	0.59	0.53	0.59
West: Elizabeth Drive														
11	T1	All MCs	1323	14.5	1323	14.5	0.443	16.5	LOS B	9.2	72	0.63	0.56	0.63
Approach			1323	14.5	1323	14.5	0.443	16.5	LOS B	9.2	72	0.63	0.56	0.63
All Vehicles			3621	10.8	3621	10.8	0.525	20.1	LOS B	10.4	79.5	0.65	0.6	0.65

Site 2: Wallgrove Road / Cecil Road

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: Wallgrove Road														
1	L2	All MCs	13	61.5	13	61.5	0.031	45.7	LOS D	0.4	4.3	0.93	0.71	0.93
2	T1	All MCs	131	1.5	131	1.5	* 0.075	8.7	LOS A	0.6	4.3	0.27	0.21	0.27
Approach			143	6.8	143	6.8	0.075	11.9	LOS A	0.6	4.3	0.33	0.26	0.33
North: Wallgrove Road														
8	T1	All MCs	451	20.6	451	20.6	0.296	13.4	LOS A	5.3	43.4	0.54	0.47	0.54
9	R2	All MCs	12	0	12	0	* 0.075	63.4	LOS E	0.4	2.8	0.95	0.68	0.95
Approach			462	20.1	462	20.1	0.296	14.7	LOS B	5.3	43.4	0.55	0.47	0.55
West: Cecil Road														
10	L2	All MCs	1	0	1	0	0.002	33.7	LOS C	0	0.2	0.7	0.58	0.7
12	R2	All MCs	62	29	62	29	* 0.084	35.8	LOS C	1	8.9	0.73	0.69	0.73
Approach			63	28.5	63	28.5	0.084	35.7	LOS C	1	8.9	0.73	0.69	0.73
All Vehicles			668	18	668	18	0.296	16.1	LOS B	5.3	43.4	0.52	0.45	0.52

Site 3: Elizabeth Drive / Wallgrove Road

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
East: Elizabeth Drive														
4	L2	All MCs	1183	7	1183	7	* 1.038	96	LOS F	34.2	254	1	1.22	1.52
5	T1	All MCs	1469	9.6	1469	9.6	0.485	21.6	LOS B	12.1	91.6	0.72	0.61	0.72
6	R2	All MCs	9	88.9	9	88.9	0.022	49	LOS D	0.1	1.7	0.81	0.65	0.81
Approach			2662	8.7	2662	8.7	1.038	54.8	LOS D	34.2	254	0.85	0.88	1.08
North: Wallgrove Road														
7	L2	All MCs	183	16.4	183	16.4	0.154	38	LOS C	2.5	20.2	0.82	0.76	0.82
8	T1	All MCs	207	22.7	207	22.7	* 1.046	123.4	LOS F	10.8	90.2	1	1.16	1.68
9	R2	All MCs	124	27.4	124	27.4	0.685	69.9	LOS E	4.7	40.4	1	0.85	1.04
Approach			515	21.6	515	21.6	1.046	80.1	LOS F	10.8	90.2	0.94	0.95	1.22
West: Elizabeth Drive														
10	L2	All MCs	137	2.2	137	2.2	0.104	21.2	LOS B	2.6	18.4	0.57	0.56	0.57
11	T1	All MCs	1820	11.6	1820	11.6	0.614	24.4	LOS B	17.4	133.9	0.8	0.68	0.8
Approach			1957	10.9	1957	10.9	0.614	24.2	LOS B	17.4	133.9	0.79	0.67	0.79
All Vehicles			5134	10.9	5134	10.9	1.046	45.7	LOS D	34.2	254	0.83	0.81	0.98

Site 4: Elizabeth Drive / M7 Northbound Exit/Entry Ramps

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
South: M7 Northbound Offramp														
1	L2	All MCs	511	14.1	511	14.1	* 0.691	60	LOS E	7.1	56.1	0.99	0.84	1.05
3	R2	All MCs	93	6.5	93	6.5	0.13	50.2	LOS D	1.4	10.1	0.86	0.74	0.86
Approach			603	12.9	603	12.9	0.691	58.5	LOS E	7.1	56.1	0.97	0.83	1.02
East: Elizabeth Drive														
5	T1	All MCs	2151	7.5	2151	7.5	* 0.646	6.6	LOS A	26.5	197.8	0.47	0.44	0.47
6	R2	All MCs	220	13.6	220	13.6	0.487	66.8	LOS E	4.3	33.4	1	0.83	1
Approach			2371	8.1	2371	8.1	0.646	12.2	LOS A	26.5	197.8	0.52	0.47	0.52
West: Elizabeth Drive														
10	L2	All MCs	140	17.1	140	17.1	0.086	32.6	LOS C	2	16.2	0.81	0.61	0.81
11	T1	All MCs	1831	11.6	1831	11.6	0.482	27	LOS B	13.8	106.5	0.83	0.64	0.83
Approach			1971	12	1971	12	0.482	27.4	LOS B	13.8	106.5	0.83	0.63	0.83
All Vehicles			4944	10.2	4944	10.2	0.691	23.9	LOS B	26.5	197.8	0.7	0.58	0.71

Site 5: Elizabeth Drive / M7 Southbound Exit/Entry Ramps

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	Demand Flows HV] %	Arrival Flows [Total veh/h]	Arrival Flows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh]	Aver. Back Of Queue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles
East: Elizabeth Drive														
4	L2	All MCs	146	5.5	146	5.5	0.468	55.4	LOS D	4.8	35.2	0.95	0.8	0.95
5	T1	All MCs	2175	8.4	2175	8.4	* 1.026	98.7	LOS F	44.6	334.9	1	1.43	1.56
Approach			2321	8.2	2321	8.2	1.026	96	LOS F	44.6	334.9	1	1.39	1.52
North: M7 Southbound Offramp														
7	L2	All MCs	568	0.9	568	0.9	* 0.917	78	LOS F	12.5	88	1	0.96	1.26
9	R2	All MCs	203	4.9	203	4.9	0.323	54.9	LOS D	3.2	23.6	0.92	0.78	0.92
Approach			772	2	772	2	0.917	71.9	LOS F	12.5	88	0.98	0.91	1.17
West: Elizabeth Drive														
11	T1	All MCs	1562	11.1	1562	11.1	0.511	6	LOS A	3.2	24.9	0.09	0.08	0.09
12	R2	All MCs	335	11.6	335	11.6	* 0.781	72.1	LOS F	6.3	48.8	1	0.89	1.09
Approach			1897	11.2	1897	11.2	0.781	17.6	LOS B	6.3	48.8	0.25	0.23	0.27
All Vehicles			4989	8.4	4989	8.4	1.026	62.5	LOS E	44.6	334.9	0.71	0.88	0.99

MOVEMENT SUMMARY

Site: 1 [Elizabeth Drive / M12 Ramp - AM (Site Folder: 2026 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: M12 Ramp															
1	L2	All MCs	69	6.1	69	6.1	0.098	31.2	LOS C	1.5	11.3	0.66	0.73	0.66	44.6
3	R2	All MCs	896	3.5	896	3.5	* 0.618	37.9	LOS C	12.7	91.9	0.86	0.84	0.86	30.5
Approach			965	3.7	965	3.7	0.618	37.4	LOS C	12.7	91.9	0.84	0.84	0.84	31.9
East: Elizabeth Drive															
5	T1	All MCs	1038	14.7	1038	14.7	0.389	19.8	LOS B	7.6	59.9	0.66	0.58	0.66	52.5
Approach			1038	14.7	1038	14.7	0.389	19.8	LOS B	7.6	59.9	0.66	0.58	0.66	52.5
West: Elizabeth Drive															
11	T1	All MCs	1737	12.0	1737	12.0	* 0.640	23.5	LOS B	15.1	116.7	0.79	0.71	0.79	37.0
Approach			1737	12.0	1737	12.0	0.640	23.5	LOS B	15.1	116.7	0.79	0.71	0.79	37.0
All Vehicles			3740	10.6	3740	10.6	0.640	26.1	LOS B	15.1	116.7	0.77	0.71	0.77	41.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M12 Ramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P1B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		158	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

MOVEMENT SUMMARY

Site: 2 [Cecil Road / Wallgrove Road - AM (Site Folder: 2026 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wallgrove Road															
1	L2	All MCs	44	11.9	44	11.9	*0.238	60.6	LOS E	1.5	11.6	0.95	0.74	0.95	23.8
2	T1	All MCs	975	7.8	975	7.8	*0.366	6.9	LOS A	6.6	49.1	0.41	0.37	0.41	64.4
Approach			1019	8.0	1019	8.0	0.366	9.2	LOS A	6.6	49.1	0.44	0.39	0.44	59.9
North: Wallgrove Road															
8	T1	All MCs	207	15.7	207	15.7	0.072	2.2	LOS A	0.7	5.6	0.21	0.17	0.21	73.0
9	R2	All MCs	1	0.0	1	0.0	*0.011	67.3	LOS E	0.0	0.3	0.97	0.59	0.97	31.4
Approach			208	15.7	208	15.7	0.072	2.6	LOS A	0.7	5.6	0.21	0.17	0.21	72.1
West: Cecil Road															
10	L2	All MCs	1	0.0	1	0.0	0.005	55.7	LOS D	0.0	0.2	0.91	0.59	0.91	28.1
12	R2	All MCs	15	42.9	15	42.9	0.048	57.8	LOS E	0.2	2.3	0.92	0.66	0.92	19.8
Approach			16	40.0	16	40.0	0.048	57.7	LOS E	0.2	2.3	0.92	0.66	0.92	20.5
All Vehicles			1243	9.7	1243	9.7	0.366	8.7	LOS A	6.6	49.1	0.41	0.35	0.41	60.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Wallgrove Road											
P1B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: Wallgrove Road											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Cecil Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 3 [Elizabeth Drive / Wallgrove Road - AM (Site Folder: 2026 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Elizabeth Drive															
4	L2	All MCs	528	2.8	528	2.8	0.341	8.6	LOS A	3.9	28.0	0.23	0.66	0.23	53.4
5	T1	All MCs	948	14.5	948	14.5	0.292	11.8	LOS A	5.3	41.7	0.51	0.44	0.51	38.4
6	R2	All MCs	504	8.4	504	8.4	* 0.750	59.1	LOS E	9.0	67.4	1.00	0.87	1.08	13.8
Approach			1981	9.8	1981	9.8	0.750	23.0	LOS B	9.0	67.4	0.56	0.61	0.58	32.9
North: Wallgrove Road															
7	L2	All MCs	63	26.7	63	26.7	0.067	37.5	LOS C	0.8	6.9	0.74	0.71	0.74	9.7
8	T1	All MCs	72	5.9	72	5.9	* 0.868	71.3	LOS F	3.6	28.4	1.00	0.93	1.40	22.5
9	R2	All MCs	87	48.2	87	48.2	0.868	78.5	LOS F	3.6	28.8	1.00	0.94	1.45	5.3
Approach			222	28.4	222	28.4	0.868	64.5	LOS E	3.6	28.8	0.93	0.87	1.23	13.2
West: Elizabeth Drive															
10	L2	All MCs	515	7.6	515	7.6	0.408	13.8	LOS A	7.2	54.0	0.43	0.72	0.43	50.0
11	T1	All MCs	2105	9.5	2105	9.5	* 0.632	15.8	LOS B	15.9	120.0	0.69	0.63	0.69	48.0
Approach			2620	9.1	2620	9.1	0.632	15.4	LOS B	15.9	120.0	0.64	0.65	0.64	48.3
All Vehicles			4823	10.3	4823	10.3	0.868	20.8	LOS B	15.9	120.0	0.62	0.64	0.64	40.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Wallgrove Road											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
East: Elizabeth Drive											
P2B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: Wallgrove Road											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P3B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											

P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		316	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

MOVEMENT SUMMARY

Site: 4 [Elizabeth Drive / M7 Northbound Offramp - Onramp - AM (Site Folder: 2026 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: M7 Northbound Offramp															
1	L2	All MCs	413	14.8	413	14.8	*0.614	62.0	LOS E	4.8	38.1	0.99	0.81	1.00	21.9
3	R2	All MCs	63	3.3	63	3.3	0.110	54.5	LOS D	1.0	7.1	0.89	0.72	0.89	24.3
Approach			476	13.3	476	13.3	0.614	61.0	LOS E	4.8	38.1	0.98	0.80	0.99	22.2
East: Elizabeth Drive															
5	T1	All MCs	1567	8.5	1567	8.5	0.369	3.6	LOS A	5.7	42.8	0.28	0.25	0.28	53.7
6	R2	All MCs	325	7.1	325	7.1	*0.451	62.5	LOS E	6.2	46.0	1.00	0.86	1.00	25.1
Approach			1893	8.3	1893	8.3	0.451	13.7	LOS A	6.2	46.0	0.41	0.36	0.41	37.0
West: Elizabeth Drive															
10	L2	All MCs	401	28.3	401	28.3	0.276	25.9	LOS B	4.4	38.2	0.61	0.74	0.61	36.6
11	T1	All MCs	1754	6.1	1754	6.1	*0.467	20.8	LOS B	10.1	74.6	0.70	0.62	0.70	28.6
Approach			2155	10.2	2155	10.2	0.467	21.7	LOS B	10.1	74.6	0.68	0.64	0.68	31.3
All Vehicles			4523	9.7	4523	9.7	0.614	22.5	LOS B	10.1	74.6	0.60	0.54	0.60	31.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M7 Northbound Offramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: M7 Northbound Onramp											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 5 [Elizabeth Drive / M7 Southbound Onramp - Offramp - AM (Site Folder: 2026 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Elizabeth Drive															
4	L2	All MCs	24	4.3	24	4.3	0.062	46.6	LOS D	0.7	5.0	0.82	0.71	0.82	35.6
5	T1	All MCs	1686	4.6	1686	4.6	* 0.584	21.9	LOS B	13.9	101.3	0.75	0.68	0.75	38.4
Approach			1711	4.6	1711	4.6	0.584	22.3	LOS B	13.9	101.3	0.75	0.68	0.75	38.3
North: M7 Southbound Offramp															
7	L2	All MCs	387	19.6	387	19.6	* 0.571	55.9	LOS D	6.6	53.8	0.94	0.82	0.94	33.8
9	R2	All MCs	211	37.5	211	37.5	0.332	51.5	LOS D	3.2	30.0	0.89	0.78	0.89	25.5
Approach			598	25.9	598	25.9	0.571	54.4	LOS D	6.6	53.8	0.92	0.81	0.92	31.5
West: Elizabeth Drive															
11	T1	All MCs	1558	4.9	1558	4.9	0.554	6.8	LOS A	5.9	43.0	0.27	0.24	0.27	61.9
12	R2	All MCs	254	12.0	254	12.0	* 0.523	67.1	LOS E	4.6	35.8	1.00	0.84	1.00	23.5
Approach			1812	5.9	1812	5.9	0.554	15.2	LOS B	5.9	43.0	0.37	0.33	0.37	50.3
All Vehicles			4120	8.3	4120	8.3	0.584	23.8	LOS B	13.9	101.3	0.61	0.54	0.61	41.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M7 Southbound Onramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
East: Elizabeth Drive											
P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P2B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: M7 Southbound Offramp											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 1 [Elizabeth Drive / M12 Ramp - PM (Site Folder: 2026 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: M12 Ramp															
1	L2	All MCs	48	8.7	48	8.7	0.087	38.1	LOS C	1.2	9.1	0.73	0.73	0.73	40.8
3	R2	All MCs	582	3.4	582	3.4	* 0.507	43.1	LOS D	8.5	61.2	0.87	0.82	0.87	28.2
Approach			631	3.8	631	3.8	0.507	42.7	LOS D	8.5	61.2	0.86	0.82	0.86	29.4
East: Elizabeth Drive															
5	T1	All MCs	1616	13.9	1579	13.9	* 0.504	11.3	LOS A	9.5	74.1	0.52	0.47	0.52	58.8
Approach			1616	13.9	1579	13.9	0.504	11.3	LOS A	9.5	74.1	0.52	0.47	0.52	58.8
West: Elizabeth Drive															
11	T1	All MCs	1083	12.7	1083	12.7	0.344	13.8	LOS A	6.6	51.5	0.56	0.49	0.56	46.0
Approach			1083	12.7	1083	12.7	0.344	13.8	LOS A	6.6	51.5	0.56	0.49	0.56	46.0
All Vehicles			3329	11.6	3292	11.8	0.507	18.1	LOS B	9.5	74.1	0.60	0.54	0.60	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M12 Ramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P1B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		158	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

MOVEMENT SUMMARY

Site: 2 [Cecil Road / Wallgrove Road - PM (Site Folder: 2026 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wallgrove Road															
1	L2	All MCs	8	62.5	8	62.5	0.061	58.4	LOS E	0.3	3.0	0.91	0.68	0.91	21.1
2	T1	All MCs	289	8.4	289	8.4	0.117	8.8	LOS A	2.5	18.6	0.44	0.33	0.44	61.0
Approach			298	9.9	298	9.9	0.117	10.2	LOS A	2.5	18.6	0.46	0.34	0.46	57.9
North: Wallgrove Road															
8	T1	All MCs	671	20.6	671	20.6	* 0.318	2.9	LOS A	8.7	72.0	0.27	0.24	0.27	71.2
9	R2	All MCs	16	0.0	16	0.0	0.085	61.2	LOS E	0.5	3.7	0.94	0.70	0.94	33.2
Approach			686	20.1	686	20.1	0.318	4.2	LOS A	8.7	72.0	0.28	0.25	0.28	67.8
West: Cecil Road															
10	L2	All MCs	1	0.0	1	0.0	0.005	55.7	LOS D	0.0	0.2	0.91	0.59	0.91	28.1
12	R2	All MCs	19	38.9	19	38.9	* 0.080	58.9	LOS E	0.4	3.9	0.93	0.68	0.93	19.5
Approach			20	36.8	20	36.8	0.080	58.7	LOS E	0.4	3.9	0.93	0.68	0.93	20.2
All Vehicles			1004	17.4	1004	17.4	0.318	7.1	LOS A	8.7	72.0	0.35	0.29	0.35	61.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Wallgrove Road											
P1B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: Wallgrove Road											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Cecil Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

MOVEMENT SUMMARY

Site: 3 [Elizabeth Drive / Wallgrove Road - PM (Site Folder: 2026 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Elizabeth Drive															
4	L2	All MCs	1000	8.6	1000	8.6	* 0.853	23.7	LOS B	27.4	205.6	0.81	0.79	0.83	42.3
5	T1	All MCs	1324	13.4	1324	13.4	0.469	25.6	LOS B	12.0	93.5	0.80	0.63	0.80	25.8
6	R2	All MCs	71	29.9	71	29.9	0.120	44.4	LOS D	0.9	8.1	0.75	0.71	0.75	17.3
Approach			2395	11.9	2395	11.9	0.853	25.3	LOS B	27.4	205.6	0.81	0.70	0.81	33.3
North: Wallgrove Road															
7	L2	All MCs	142	33.3	142	33.3	0.124	30.2	LOS C	1.6	14.3	0.66	0.72	0.66	11.7
8	T1	All MCs	255	19.4	255	19.4	* 1.144	204.3	LOS F	11.3	92.0	1.00	1.47	2.24	9.8
9	R2	All MCs	294	16.8	294	16.8	1.144	210.4	LOS F	11.5	92.0	1.00	1.39	2.24	2.1
Approach			691	21.2	691	21.2	1.144	171.1	LOS F	11.5	92.0	0.93	1.28	1.91	6.0
West: Elizabeth Drive															
10	L2	All MCs	227	3.7	227	3.7	0.175	14.2	LOS A	3.3	24.0	0.45	0.65	0.45	49.5
11	T1	All MCs	1433	10.5	1433	10.5	0.498	20.8	LOS B	12.8	97.5	0.72	0.62	0.72	43.6
Approach			1660	9.6	1660	9.6	0.498	19.9	LOS B	12.8	97.5	0.68	0.62	0.68	44.3
All Vehicles			4745	12.4	4745	12.4	1.144	44.7	LOS D	27.4	205.6	0.78	0.76	0.93	26.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Wallgrove Road											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
East: Elizabeth Drive											
P2B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: Wallgrove Road											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P3B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		316	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

MOVEMENT SUMMARY

Site: 4 [Elizabeth Drive / M7 Northbound Offramp - Onramp - PM (Site Folder: 2026 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: M7 Northbound Offramp															
1	L2	All MCs	355	18.1	355	18.1	* 0.600	62.3	LOS E	4.6	37.3	0.99	0.81	1.00	21.8
3	R2	All MCs	53	4.0	53	4.0	0.092	54.4	LOS D	0.8	5.9	0.89	0.72	0.89	24.4
Approach			407	16.3	407	16.3	0.600	61.3	LOS E	4.6	37.3	0.98	0.79	0.99	22.1
East: Elizabeth Drive															
5	T1	All MCs	2039	10.7	2039	10.7	* 0.541	4.1	LOS A	9.7	74.4	0.34	0.31	0.34	52.0
6	R2	All MCs	160	13.8	160	13.8	0.317	64.1	LOS E	3.1	24.0	1.00	0.81	1.00	24.2
Approach			2199	10.9	2199	10.9	0.541	8.4	LOS A	9.7	74.4	0.39	0.35	0.39	42.3
West: Elizabeth Drive															
10	L2	All MCs	208	27.3	208	27.3	0.128	28.2	LOS B	2.8	24.6	0.77	0.61	0.77	35.5
11	T1	All MCs	1367	10.3	1367	10.3	0.335	21.2	LOS B	9.6	73.5	0.76	0.54	0.76	28.3
Approach			1576	12.6	1576	12.6	0.335	22.2	LOS B	9.6	73.5	0.76	0.55	0.76	30.1
All Vehicles			4182	12.1	4182	12.1	0.600	18.8	LOS B	9.7	74.4	0.59	0.47	0.59	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M7 Northbound Offramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: M7 Northbound Onramp											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 5 [Elizabeth Drive / M7 Southbound Onramp - Offramp - PM (Site Folder: 2026 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2026 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Elizabeth Drive															
4	L2	All MCs	77	5.5	77	5.5	0.198	48.2	LOS D	2.3	16.6	0.86	0.76	0.86	34.9
5	T1	All MCs	1988	9.2	1988	9.2	* 0.655	20.2	LOS B	16.5	124.6	0.76	0.69	0.76	39.8
Approach			2065	9.0	2065	9.0	0.655	21.2	LOS B	16.5	124.6	0.76	0.69	0.76	39.4
North: M7 Southbound Offramp															
7	L2	All MCs	600	2.8	600	2.8	* 0.792	59.9	LOS E	11.3	80.9	0.99	0.87	1.06	33.9
9	R2	All MCs	212	27.4	212	27.4	0.314	51.0	LOS D	3.2	28.0	0.88	0.78	0.88	25.6
Approach			812	9.2	812	9.2	0.792	57.6	LOS E	11.3	80.9	0.97	0.85	1.02	32.3
West: Elizabeth Drive															
11	T1	All MCs	1205	8.6	1205	8.6	0.406	2.8	LOS A	1.7	12.9	0.07	0.06	0.07	67.8
12	R2	All MCs	209	16.6	209	16.6	* 0.582	69.7	LOS E	3.9	31.1	1.00	0.82	1.00	22.7
Approach			1415	9.8	1415	9.8	0.582	12.7	LOS A	3.9	31.1	0.21	0.17	0.21	52.3
All Vehicles			4292	9.3	4292	9.3	0.792	25.3	LOS B	16.5	124.6	0.62	0.55	0.63	40.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M7 Southbound Onramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
East: Elizabeth Drive											
P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P2B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: M7 Southbound Offramp											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 1 [Elizabeth Drive / M12 Ramp - AM (Site Folder: 2036 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: M12 Ramp															
1	L2	All MCs	36	2.9	36	2.9	0.051	31.9	LOS C	0.8	5.7	0.66	0.71	0.66	44.6
3	R2	All MCs	978	3.4	978	3.4	* 0.704	40.7	LOS C	14.8	106.4	0.91	0.86	0.91	29.2
Approach			1014	3.4	1014	3.4	0.704	40.4	LOS C	14.8	106.4	0.90	0.86	0.90	29.9
East: Elizabeth Drive															
5	T1	All MCs	1359	9.6	1359	9.6	0.478	25.1	LOS B	12.1	92.0	0.81	0.64	0.81	49.2
Approach			1359	9.6	1359	9.6	0.478	25.1	LOS B	12.1	92.0	0.81	0.64	0.81	49.2
West: Elizabeth Drive															
11	T1	All MCs	2031	10.0	2031	10.0	* 0.715	23.7	LOS B	18.4	139.9	0.83	0.75	0.83	36.9
Approach			2031	10.0	2031	10.0	0.715	23.7	LOS B	18.4	139.9	0.83	0.75	0.83	36.9
All Vehicles			4403	8.3	4403	8.3	0.715	28.0	LOS B	18.4	139.9	0.84	0.74	0.84	40.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M12 Ramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P1B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		158	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

Organisation: BITZIOS CONSULTING | Licence: NETWORK / 1PC | Processed: Wednesday, 11 June 2025 5:18:55 PM
Project: P:\P6072 Wallgrove Business Hub TTS\Technical\Models\SIDRA\P6072.009M Wallgrove Business Hub TTS SIDRA Model - Development.sip9

MOVEMENT SUMMARY

Site: 2 [Cecil Road / Wallgrove Road - AM (Site Folder: 2036 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wallgrove Road															
1	L2	All MCs	56	13.2	56	13.2	*0.263	58.7	LOS E	1.9	14.5	0.94	0.75	0.94	24.2
2	T1	All MCs	971	6.8	971	6.8	*0.376	8.1	LOS A	7.1	52.6	0.45	0.40	0.45	62.2
Approach			1026	7.2	1026	7.2	0.376	10.9	LOS A	7.1	52.6	0.48	0.42	0.48	57.3
North: Wallgrove Road															
8	T1	All MCs	182	17.9	182	17.9	0.066	2.9	LOS A	0.7	5.6	0.23	0.19	0.23	71.2
9	R2	All MCs	1	0.0	1	0.0	*0.011	67.3	LOS E	0.0	0.3	0.97	0.59	0.97	31.4
Approach			183	17.8	183	17.8	0.066	3.2	LOS A	0.7	5.6	0.24	0.19	0.24	70.2
West: Cecil Road															
10	L2	All MCs	1	0.0	1	0.0	0.005	53.6	LOS D	0.0	0.2	0.89	0.59	0.89	28.6
12	R2	All MCs	15	21.4	15	21.4	0.037	55.0	LOS D	0.2	2.0	0.90	0.66	0.90	20.3
Approach			16	20.0	16	20.0	0.037	54.9	LOS D	0.2	2.0	0.90	0.65	0.90	21.1
All Vehicles			1225	8.9	1225	8.9	0.376	10.3	LOS A	7.1	52.6	0.45	0.39	0.45	57.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Wallgrove Road											
P1B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: Wallgrove Road											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Cecil Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 3 [Elizabeth Drive / Wallgrove Road - AM (Site Folder: 2036 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Elizabeth Drive															
4	L2	All MCs	621	2.4	621	2.4	0.396	9.3	LOS A	6.4	45.5	0.32	0.62	0.32	52.8
5	T1	All MCs	1279	9.0	1279	9.0	0.375	18.0	LOS B	10.3	78.0	0.73	0.50	0.73	31.1
6	R2	All MCs	568	7.6	568	7.6	* 0.842	52.1	LOS D	10.1	75.2	0.98	0.89	1.08	15.2
Approach			2468	7.0	2468	7.0	0.842	23.6	LOS B	10.3	78.0	0.68	0.62	0.71	32.1
North: Wallgrove Road															
7	L2	All MCs	72	26.5	72	26.5	0.079	38.4	LOS C	0.9	8.0	0.76	0.71	0.76	9.5
8	T1	All MCs	46	9.1	46	9.1	* 0.638	64.4	LOS E	2.5	19.4	1.00	0.80	1.09	23.9
9	R2	All MCs	81	18.2	81	18.2	0.638	70.4	LOS E	2.5	19.4	1.00	0.80	1.10	5.9
Approach			199	19.0	199	19.0	0.638	57.5	LOS E	2.5	19.4	0.91	0.77	0.98	12.5
West: Elizabeth Drive															
10	L2	All MCs	461	6.4	461	6.4	0.358	29.3	LOS C	11.3	83.6	0.75	0.52	0.75	43.7
11	T1	All MCs	2517	8.1	2517	8.1	* 0.782	25.9	LOS B	24.9	186.7	0.90	0.74	0.90	41.6
Approach			2978	7.8	2978	7.8	0.782	26.4	LOS B	24.9	186.7	0.88	0.71	0.88	39.6
All Vehicles			5645	7.9	5645	7.9	0.842	26.3	LOS B	24.9	186.7	0.79	0.67	0.81	35.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Wallgrove Road											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
East: Elizabeth Drive											
P2B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: Wallgrove Road											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P3B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		316	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

MOVEMENT SUMMARY

Site: 4 [Elizabeth Drive / M7 Northbound Offramp - Onramp - AM (Site Folder: 2036 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: M7 Northbound Offramp															
1	L2	All MCs	587	10.8	587	10.8	* 0.801	66.7	LOS E	7.4	56.6	1.00	0.90	1.17	20.7
3	R2	All MCs	103	7.1	103	7.1	0.175	54.4	LOS D	1.6	11.9	0.90	0.75	0.90	24.4
Approach			691	10.2	691	10.2	0.801	64.9	LOS E	7.4	56.6	0.98	0.87	1.13	21.2
East: Elizabeth Drive															
5	T1	All MCs	1886	6.0	1886	6.0	0.447	3.7	LOS A	7.2	52.9	0.29	0.27	0.29	53.2
6	R2	All MCs	422	7.2	422	7.2	* 0.586	64.5	LOS E	8.1	60.1	1.00	0.88	1.00	24.6
Approach			2308	6.2	2308	6.2	0.586	14.8	LOS B	8.1	60.1	0.42	0.38	0.42	35.9
West: Elizabeth Drive															
10	L2	All MCs	396	24.7	396	24.7	0.276	34.7	LOS C	5.5	46.3	0.77	0.72	0.77	34.2
11	T1	All MCs	2174	5.6	2174	5.6	* 0.605	32.2	LOS C	16.3	119.9	0.90	0.73	0.90	22.1
Approach			2569	8.6	2569	8.6	0.605	32.6	LOS C	16.3	119.9	0.88	0.73	0.88	24.5
All Vehicles			5568	7.8	5568	7.8	0.801	29.2	LOS C	16.3	119.9	0.70	0.60	0.72	26.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M7 Northbound Offramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: M7 Northbound Onramp											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 5 [Elizabeth Drive / M7 Southbound Onramp - Offramp - AM (Site Folder: 2036 AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Elizabeth Drive															
4	L2	All MCs	44	2.4	44	2.4	0.132	51.0	LOS D	1.3	9.5	0.87	0.73	0.87	34.3
5	T1	All MCs	2104	4.2	2104	4.2	*0.714	23.1	LOS B	19.1	138.8	0.82	0.75	0.82	37.5
Approach			2148	4.1	2148	4.1	0.714	23.7	LOS B	19.1	138.8	0.82	0.75	0.82	37.3
North: M7 Southbound Offramp															
7	L2	All MCs	460	3.9	460	3.9	*0.723	79.3	LOS F	8.4	61.0	0.99	0.84	1.02	33.6
9	R2	All MCs	213	26.2	213	26.2	0.371	55.1	LOS D	3.4	29.3	0.92	0.78	0.92	24.3
Approach			673	11.0	673	11.0	0.723	71.7	LOS F	8.4	61.0	0.97	0.83	0.99	31.2
West: Elizabeth Drive															
11	T1	All MCs	1899	4.7	1899	4.7	0.653	15.5	LOS B	4.9	35.7	0.12	0.11	0.12	67.2
12	R2	All MCs	360	11.7	360	11.7	*0.663	68.1	LOS E	6.6	51.0	1.00	0.87	1.01	23.3
Approach			2259	5.8	2259	5.8	0.663	23.9	LOS B	6.6	51.0	0.26	0.23	0.27	51.6
All Vehicles			5080	5.8	5080	5.8	0.723	30.1	LOS C	19.1	138.8	0.59	0.53	0.60	41.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M7 Southbound Onramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
East: Elizabeth Drive											
P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P2B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: M7 Southbound Offramp											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 1 [Elizabeth Drive / M12 Ramp - PM (Site Folder: 2036 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: M12 Ramp															
1	L2	All MCs	56	5.7	56	5.7	0.091	35.9	LOS C	1.3	9.9	0.71	0.73	0.71	42.2
3	R2	All MCs	653	3.5	653	3.5	*0.527	41.3	LOS C	9.4	67.7	0.86	0.83	0.86	29.0
Approach			708	3.7	708	3.7	0.527	40.8	LOS C	9.4	67.7	0.85	0.82	0.85	30.3
East: Elizabeth Drive															
5	T1	All MCs	1634	11.5	1634	11.5	*0.537	15.0	LOS B	11.4	87.7	0.62	0.56	0.62	55.9
Approach			1634	11.5	1634	11.5	0.537	15.0	LOS B	11.4	87.7	0.62	0.56	0.62	55.9
West: Elizabeth Drive															
11	T1	All MCs	1341	14.7	1341	14.7	0.450	16.6	LOS B	9.3	73.4	0.63	0.56	0.63	43.0
Approach			1341	14.7	1341	14.7	0.450	16.6	LOS B	9.3	73.4	0.63	0.56	0.63	43.0
All Vehicles			3683	11.1	3683	11.1	0.537	20.5	LOS B	11.4	87.7	0.67	0.61	0.67	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M12 Ramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P1B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		158	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

Organisation: BITZIOS CONSULTING | Licence: NETWORK / 1PC | Processed: Wednesday, 11 June 2025 5:19:06 PM
Project: P:\P6072 Wallgrove Business Hub TTS\Technical\Models\SIDRA\P6072.009M Wallgrove Business Hub TTS SIDRA Model - Development.sip9

MOVEMENT SUMMARY

Site: 2 [Cecil Road / Wallgrove Road - PM (Site Folder: 2036 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wallgrove Road															
1	L2	All MCs	14	61.5	14	61.5	0.033	45.6	LOS D	0.4	4.7	0.93	0.71	0.93	24.0
2	T1	All MCs	195	10.8	195	10.8	0.119	14.5	LOS A	1.7	13.2	0.45	0.36	0.45	53.0
Approach			208	14.1	208	14.1	0.119	16.5	LOS B	1.7	13.2	0.48	0.39	0.48	49.1
North: Wallgrove Road															
8	T1	All MCs	604	23.0	604	23.0	* 0.403	14.5	LOS B	7.7	64.3	0.58	0.51	0.58	49.3
9	R2	All MCs	12	0.0	12	0.0	0.075	63.4	LOS E	0.4	2.8	0.95	0.68	0.95	32.5
Approach			616	22.6	616	22.6	0.403	15.5	LOS B	7.7	64.3	0.59	0.52	0.59	48.4
West: Cecil Road															
10	L2	All MCs	1	0.0	1	0.0	0.002	33.7	LOS C	0.0	0.2	0.70	0.58	0.70	33.8
12	R2	All MCs	62	28.8	62	28.8	* 0.084	35.8	LOS C	1.0	8.9	0.73	0.69	0.73	25.7
Approach			63	28.3	63	28.3	0.084	35.7	LOS C	1.0	8.9	0.73	0.69	0.73	25.9
All Vehicles			887	21.0	887	21.0	0.403	17.2	LOS B	7.7	64.3	0.58	0.50	0.58	45.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Wallgrove Road											
P1B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: Wallgrove Road											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Cecil Road											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

MOVEMENT SUMMARY

Site: 3 [Elizabeth Drive / Wallgrove Road - PM (Site Folder: 2036 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Elizabeth Drive															
4	L2	All MCs	1183	7.0	1183	7.0	* 1.039	95.6	LOS F	34.2	254.0	1.00	1.22	1.53	20.5
5	T1	All MCs	1469	9.6	1469	9.6	0.485	21.1	LOS B	11.9	90.0	0.71	0.61	0.71	29.5
6	R2	All MCs	55	40.4	55	40.4	0.099	47.9	LOS D	0.8	7.3	0.81	0.71	0.81	16.3
Approach			2707	9.1	2707	9.1	1.039	54.2	LOS D	34.2	254.0	0.84	0.88	1.07	21.8
North: Wallgrove Road															
7	L2	All MCs	291	21.4	291	21.4	0.252	42.2	LOS C	4.4	36.6	0.90	0.76	0.90	8.8
8	T1	All MCs	207	22.8	207	22.8	* 1.047	124.0	LOS F	10.8	90.5	1.00	1.17	1.68	14.8
9	R2	All MCs	169	28.0	169	28.0	0.938	82.6	LOS F	7.1	61.3	1.00	0.99	1.32	5.0
Approach			667	23.5	667	23.5	1.047	77.9	LOS F	10.8	90.5	0.96	0.95	1.25	11.0
West: Elizabeth Drive															
10	L2	All MCs	158	6.0	158	6.0	0.124	21.3	LOS B	3.0	22.2	0.58	0.56	0.58	47.1
11	T1	All MCs	1820	11.6	1820	11.6	0.615	24.4	LOS B	17.4	133.6	0.80	0.68	0.80	42.0
Approach			1978	11.2	1978	11.2	0.615	24.2	LOS B	17.4	133.6	0.78	0.67	0.78	41.1
All Vehicles			5353	11.7	5353	11.7	1.047	46.1	LOS D	34.2	254.0	0.83	0.81	0.99	25.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Wallgrove Road											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
East: Elizabeth Drive											
P2B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: Wallgrove Road											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P3B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		316	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

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

MOVEMENT SUMMARY

Site: 4 [Elizabeth Drive / M7 Northbound Offramp - Onramp - PM (Site Folder: 2036 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: M7 Northbound Offramp															
1	L2	All MCs	546	8.1	546	8.1	*0.711	60.4	LOS E	7.7	57.6	1.00	0.85	1.07	22.3
3	R2	All MCs	93	13.6	93	13.6	0.137	50.5	LOS D	1.4	10.8	0.86	0.74	0.86	25.7
Approach			639	8.9	639	8.9	0.711	58.9	LOS E	7.7	57.6	0.98	0.84	1.04	22.7
East: Elizabeth Drive															
5	T1	All MCs	2160	7.6	2160	7.6	*0.649	7.2	LOS A	26.5	197.3	0.50	0.46	0.50	43.4
6	R2	All MCs	220	13.4	220	13.4	0.486	66.8	LOS E	4.3	33.3	1.00	0.83	1.00	23.6
Approach			2380	8.1	2380	8.1	0.649	12.7	LOS A	26.5	197.3	0.54	0.49	0.54	36.0
West: Elizabeth Drive															
10	L2	All MCs	226	21.9	226	21.9	0.143	31.1	LOS C	3.1	25.7	0.77	0.65	0.77	35.6
11	T1	All MCs	1853	11.8	1853	11.8	0.488	25.5	LOS B	13.5	103.8	0.81	0.64	0.81	25.7
Approach			2079	12.9	2079	12.9	0.488	26.1	LOS B	13.5	103.8	0.80	0.64	0.80	27.2
All Vehicles			5098	10.2	5098	10.2	0.711	24.0	LOS B	26.5	197.3	0.70	0.60	0.71	28.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M7 Northbound Offramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: M7 Northbound Onramp											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
West: Elizabeth Drive											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P4B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 5 [Elizabeth Drive / M7 Southbound Onramp - Offramp - PM (Site Folder: 2036 PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [2036 - PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Elizabeth Drive															
4	L2	All MCs	146	5.8	146	5.8	0.469	55.4	LOS D	4.8	35.3	0.95	0.80	0.95	32.7
5	T1	All MCs	2180	8.5	2180	8.5	* 1.038	107.0	LOS F	46.3	347.7	1.00	1.48	1.62	14.3
Approach			2326	8.3	2326	8.3	1.038	103.8	LOS F	46.3	347.7	1.00	1.43	1.58	14.9
North: M7 Southbound Offramp															
7	L2	All MCs	568	0.9	568	0.9	* 0.917	78.7	LOS F	12.5	88.0	1.00	0.96	1.26	30.2
9	R2	All MCs	207	5.6	207	5.6	0.332	55.0	LOS D	3.3	24.3	0.92	0.78	0.92	24.2
Approach			776	2.2	776	2.2	0.917	72.4	LOS F	12.5	88.0	0.98	0.91	1.17	29.1
West: Elizabeth Drive															
11	T1	All MCs	1573	11.2	1573	11.2	0.515	6.4	LOS A	3.3	25.0	0.09	0.08	0.09	67.6
12	R2	All MCs	345	12.2	345	12.2	* 0.808	73.0	LOS F	6.6	51.0	1.00	0.90	1.11	22.3
Approach			1918	11.4	1918	11.4	0.808	18.4	LOS B	6.6	51.0	0.26	0.23	0.28	49.4
All Vehicles			5020	8.5	5020	8.5	1.038	66.3	LOS E	46.3	347.7	0.71	0.89	1.02	24.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: M7 Southbound Onramp											
P1	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
East: Elizabeth Drive											
P2	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
P2B	Slip/ Bypass	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
North: M7 Southbound Offramp											
P3	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91
All Pedestrians		211	54.3	LOS E	0.2	0.2	0.95	0.95	220.9	200.0	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.