TraffixGroup

Traffic Engineers and Transport Planners

Report Prepared for the Panel Hearing for Amendment C162 to the Melton Planning Scheme

Implementation of the Mt Atkinson & Tarneit Plains Precinct Structure Plan

Hearing to Commence 12 September, 2016

Date of Report: 2 September, 2016
G14857R-04B

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Amendment C162 of the Melton Planning Scheme

Implementation of the Mt Atkinson & Tarneit Plains Precinct Structure Plan

Document Control

Issue No.	Type	Date	Prepared By	Approved By
B	Final	02/09/2016	D. Robertson	R. Thomson

Our Reference: G14857R-04B

Executive Summary

The Mt Atkinson & Tarneit Plains Precinct ("the Precinct") covers an area of 1,532 ha located approximately 34 km to the west of the Melbourne CBD. The Precinct is bounded by Western Freeway to the north, Hopkins Road to the east, Middle Road to the south and the Outer Metropolitan Ring (OMR) road reservation to the west.

Amendment C162 of the Melton Planning Scheme seeks to implement the development of the land within the Precinct in accordance with the *Mt Atkinson & Tarneit Precinct Structure Plan, April 2016* ("the Mt Atkinson & Tarneit Plains PSP") by introducing Schedule 9 to the Urban Growth Zone (UGZ9) and rezoning the majority of land within the Precinct area to UGZ9. The new zoning will enable residential, commercial and industrial uses in areas identified in the future urban structure and in accordance with the vision of urban growth outlined in the Mt Atkinson & Tarneit Plains PSP and the Western Growth Corridor Plan.

My report specifically addresses vehicle access to the land at 2-50 Meskos Road (and the abutting properties further to the west) at the northern boundary of the Precinct. In particular, I have reviewed the proposed accesses in the context of the constraints placed on the site's access by virtue of its shape (elongated in the east-west direction) and its location between Western Freeway to the north, the Melbourne-Ballarat Railway Line to the south, Hopkins Road to the east and the OMR road reservation to the west.

In reviewing the number and types of accesses to the land at 2-50 Meskos Road and the abutting properties further to the west I have adopted land uses and intensities in accordance with the PSP.

It is my opinion that:

a) The proposed Precinct Infrastructure projects IT01 and IT02 are necessary to provide appropriate access to the northern section of the Mt Atkinson & Tarneit Plans Precinct Structure Plan area.

b) IT01 and IT02 are appropriately included as part of the Infrastructure Contributions Plan as they are interim works, with both intersections requiring future upgrades to accommodate the duplication of Hopkins Road, the reconfiguration of the outbound on ramp to accommodate the OMR and traffic generated by the future Warrawee Precinct Structure Plan.

c) In 2026, both intersections IT01 and IT02 will operate well in the AM and PM peak periods with the adopted intersection layout detailed in this report.

d) In 2026, both intersections IT01 and IT02 will be able to accommodate significant development within the property at 2-50 Meskos Road, Rockbank and the abutting properties to the west.

e) The form and location of the intersection of the secondary access to the Precinct and the freeway on ramp is appropriately finalised as detailed plans and proposals are prepared for developments within the area accessed via this intersection.

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1 Introduction

I have been engaged by MSA Properties Pty Ltd to prepare a traffic engineering review of Amendment C162 of the Melton Planning Scheme.

Amendment C162 of the Melton Planning Scheme seeks to implement the development of the land within the Mt Atkinson & Tarneit Plains Precinct ("the Precinct") in accordance with the Mt Atkinson & Tarneit Precinct Structure Plan, April 2016 ("the PSP"). The amendment introduces Schedule 9 to the Urban Growth Zone (UGZ9) and rezones the majority of land within the Precinct area to UGZ9. The new zoning will enable residential, commercial and industrial uses in areas identified in the future urban structure and in accordance with the vision of urban growth outlined in the Mt Atkinson & Tarneit Plains PSP and the Western Growth Corridor Plan.

The Precinct covers an area of 1,532 ha located approximately 34 km to the west of the Melbourne CBD. The Precinct is bounded by Western Freeway to the north, Hopkins Road to the east, Middle Road to the south and the Outer Metropolitan Ring (OMR) Road reservation to the west.

I have visited the site, made various assessments and perused relevant documentation and plans.

2 Statement of Witness

2.1 Qualifications and Experience

My name is Donald James Robertson. I am Senior Consultant with Traffix Group Pty Ltd, practicing from Suite 8, 431 Burke Road, Glen Iris.

My educational qualifications and membership of professional associations are as follows:

- Bachelor of Engineering, University of Melbourne, 1980;
- Graduate Diploma of Municipal Engineering, Footscray Institute of Technology, 1988;
- Master of Transport and Traffic, Monash University, 2003; and
- Member, Victorian Planning & Environmental Law Association.

I have over 34 years' experience as a Traffic Engineer and Transport Planner, including:

- Over 9 years with Local Government in Victoria and Queensland;
- 3 years with the Road Traffic Authority; and
- Over 22 years as a consultant.

I have substantial experience and expertise in traffic engineering and transport planning, including development traffic and parking impact assessment, traffic management, road design, car park design, Local Area Traffic Management, road safety, bicycle planning, policy development and general traffic engineering.

A copy of my CV is attached at Appendix A.

2.2 Project Team

Ross Thomson (Associate, Traffix Group) assisted with various assessments and the preparation of this report.

2.3 Scope of Work

This report provides an assessment of the traffic engineering implications of the proposed changes arising from Amendment C162 of the Melton Planning Scheme as they apply to the access to the property at 2-50 Meskos Road.

2.3.1 Key Tasks

Based on the available information, the scope of my engagement has included the following tasks:

- Inspection of the site and surrounding environs;
- Review of Amendment C162 documentation;
- Review of third party submissions;
- Completion of a traffic impact assessment of the two proposed intersections on Hopkins Road at the Western Freeway outbound ramps (IT01) and at Sheahan Road (IT02); and
- Preparation and giving of Expert Evidence in accordance with Planning Panels Victoria Guideline No. 2 - Guide to Expert Evidence.

2.3.2 Experiments

An inspection of the site and surrounding area has been undertaken as part of my evidence.

Traffic volumes have been derived for the design years of 2026 and 2046 for “base” traffic volumes and for site-generated traffic volumes.

Capacity analyses have been undertaken using SIDRA Intersection 7.0.

2.3.3 Reference Documents

I have reviewed the following documents as part of my assessment:

- Melton Planning Scheme Amendment C162 documentation;
- Mt Atkinson & Tarneit Plains Precinct Structure Plan, April 2016;
- Mt Atkinson & Tarneit Plains Precinct Structure Plan Background Report, April 2016;
- Planning Permit PA2014/4405 at 2-50 Meskos Road, Rockbank;
- Various submissions to Planning Panels Victoria; in particular, the submissions by MPA Properties Pty Ltd, VicRoads and Melton City Council;
- Derrimut Road Corridor Planning Study, VicRoads;
- Guide to Traffic Generating Developments, October 2002, RTA NSW;
- PSP 1082 Mt Atkinson and PSP 1-85 Tarneit Plans Transport Modelling Assessment, 4 July 2016, Jacobs;
- Consultants Advice Notice CAN001, 19 August 2016, Cardno;

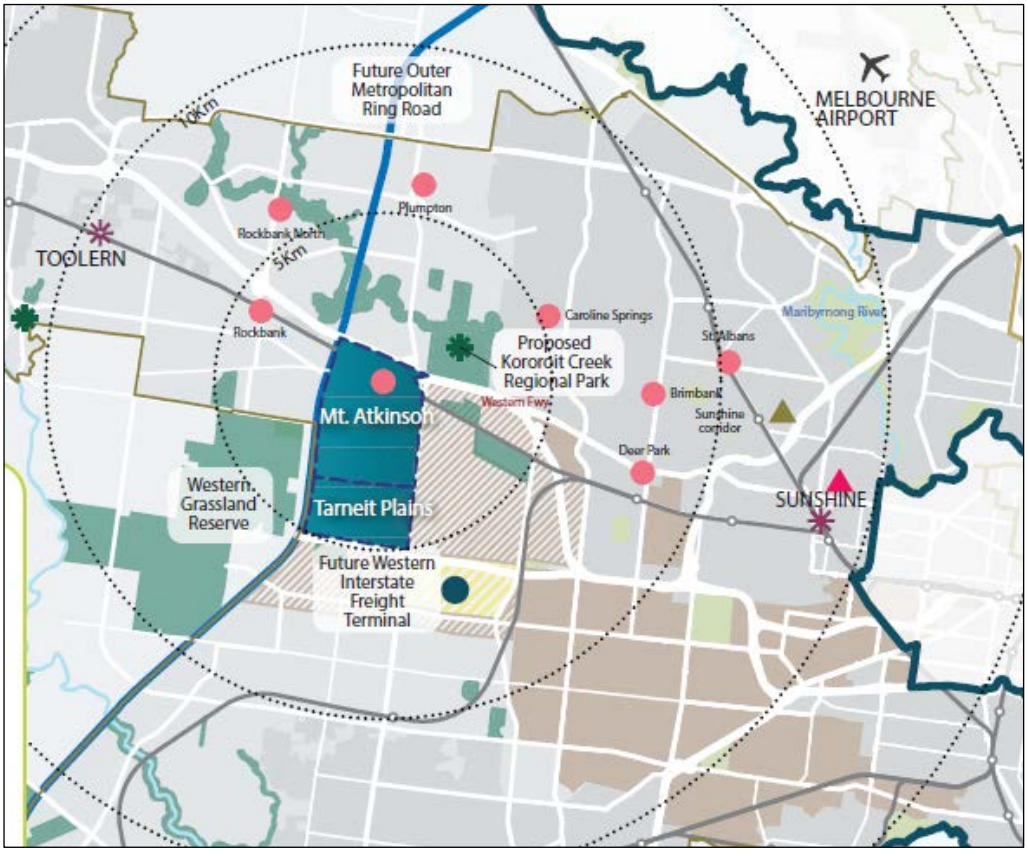
- Consultants Advice Notice CAN002, 16 August 2016, Cardno; and
- Plan prepared by the Metropolitan Planning Authority in September, 2015 and provided to Tract Consultants, showing (for discussion purposes) broad land use areas in the northern part of the Precinct.

3 Proposal and Background

3.1 The Precinct Location

The Mt Atkinson & Tarneit Plains Precinct ("the Precinct") covers an area of 1,532 ha located approximately 34 km to the west of the Melbourne CBD. The Precinct is bounded by Western Freeway to the north, Hopkins Road to the east, Middle Road to the south and the Outer Metropolitan Ring (OMR) Road reservation to the west.

The broader location of the PSP area is shown in Figure 1, which is part of Plan 1 - Regional Context Plan from the PSP.



Source: Mt Atkinson & Tarneit Plains Precinct Structure Plan, April 2016, MPA

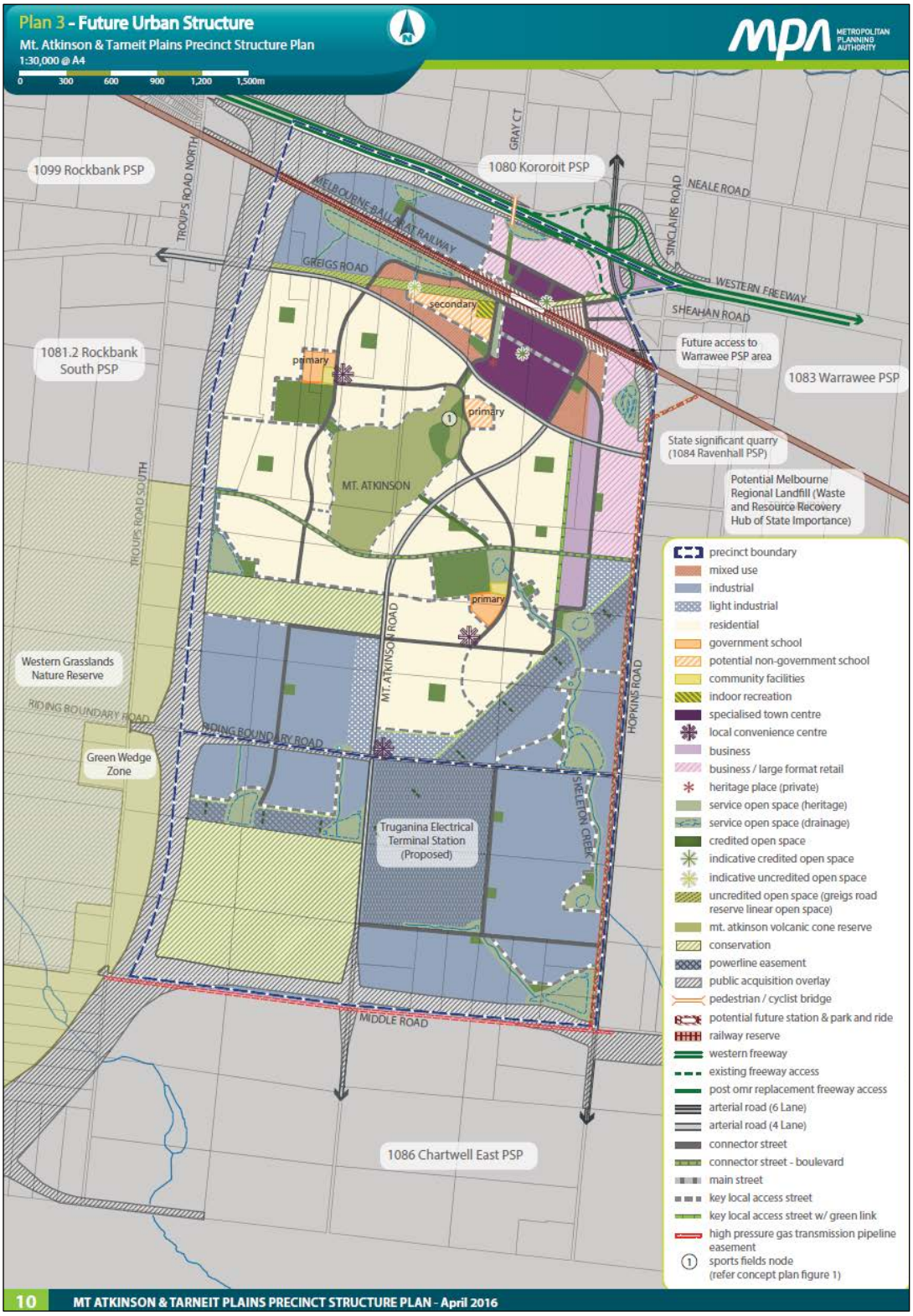
Figure 1: Locality Plan

3.2 Amendment C162

3.2.1 General

Amendment C162 of the Melton Planning Scheme seeks to implement the development of the land within the Mt Atkinson & Tarneit Plains Precinct ("the Precinct") in accordance with the Mt Atkinson & Tarneit Precinct Structure Plan, April 2016 ("the PSP"). The amendment introduces Schedule 9 to the Urban Growth Zone (UGZ9) and rezones the majority of land within the Precinct area to UGZ9. The new zoning will enable residential, commercial and industrial uses in areas identified in the future urban structure and in accordance with the vision of urban growth outlined in the Mt Atkinson & Tarneit Plains PSP and the Western Growth Corridor Plan.

The Precinct is illustrated in Figure 2, which shows Plan 3 - Future Urban Structure from the PSP.

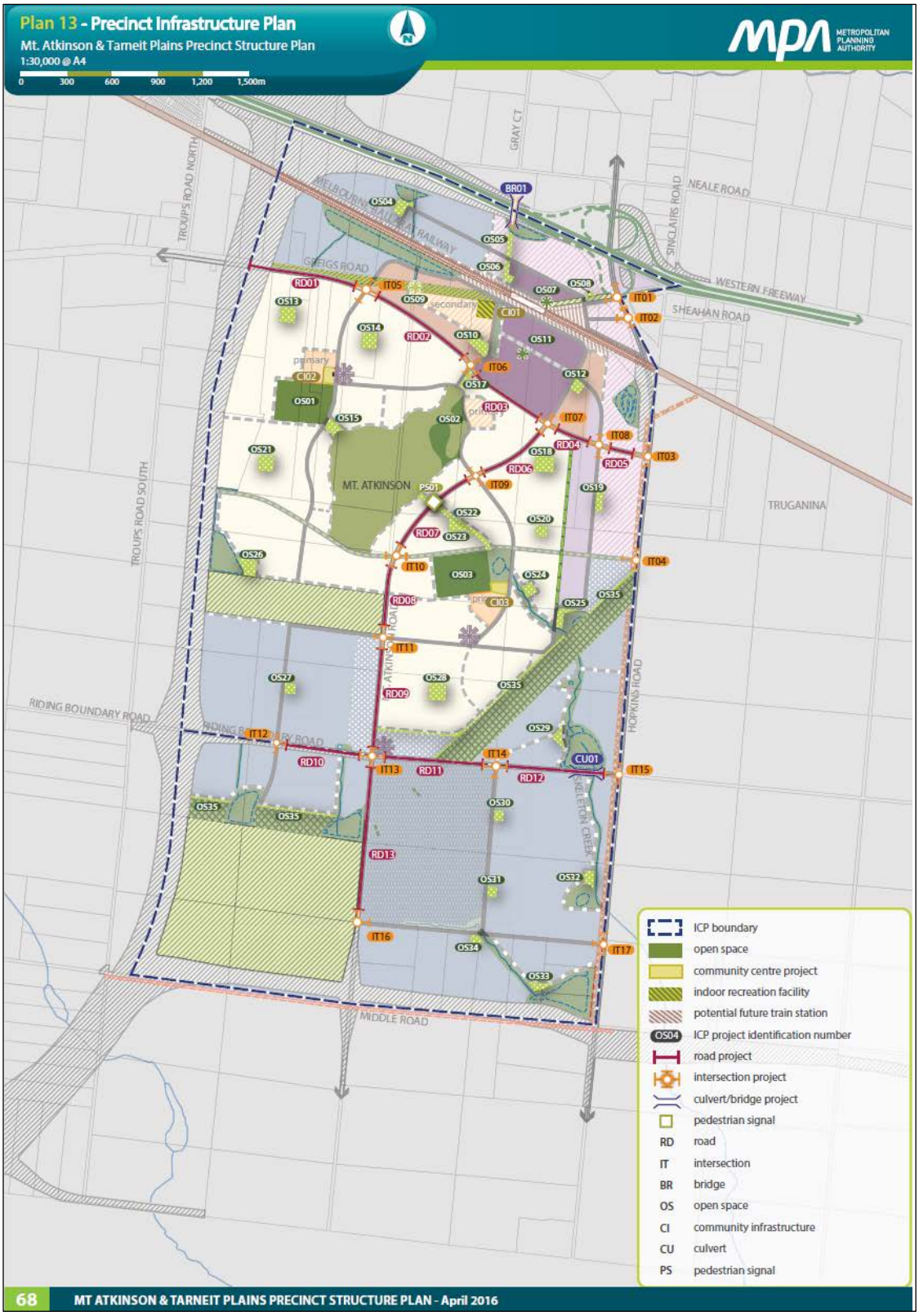


Source: Mt Atkinson & Tarneit Plains Precinct Structure Plan, April 2016, MPA

Figure 2: Future Urban Structure

3.2.2 Precinct Infrastructure

Figure 3 shows Plan 13 - Precinct Infrastructure from the PSP.



Source: Mt Atkinson & Tarneit Plains Precinct Structure Plan, April 2016, MPA

Figure 3: Precinct Infrastructure Plan

Of note, the Precinct Infrastructure Plan includes the following items:

- IT01: Intersection of Hopkins Road/Western Freeway westbound ramps; and
- IT02: Intersection of Hopkins Road/Sheahan Road.

3.3 2-50 Meskos Road, Rockbank

MSA Properties Pty Ltd owns 2-50 Meskos Road, Rockbank, located as shown in Figure 4.

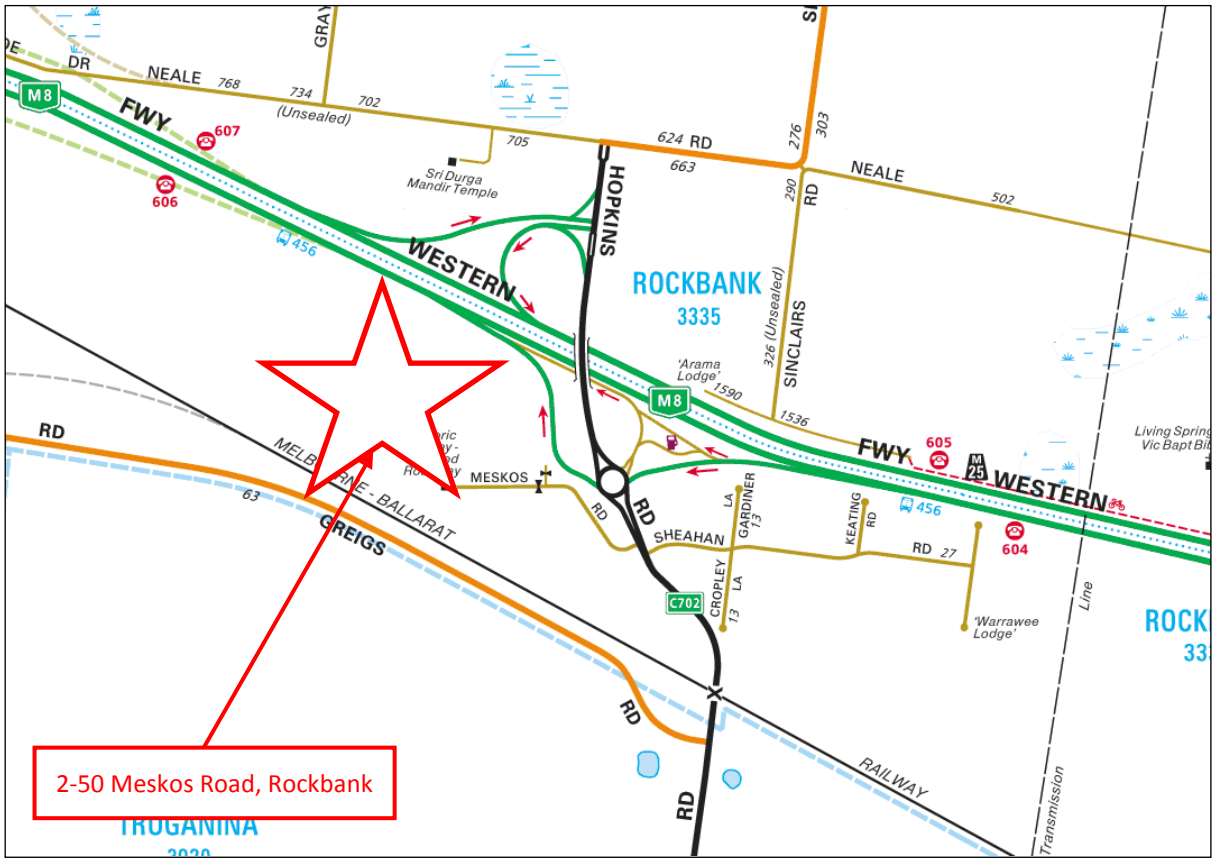


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Figure 4: Locality Plan - 2-50 Meskos Road, Rockbank

The location of 2-50 Meskos Road, Rockbank in relation to the PSP is shown in Figure 5.

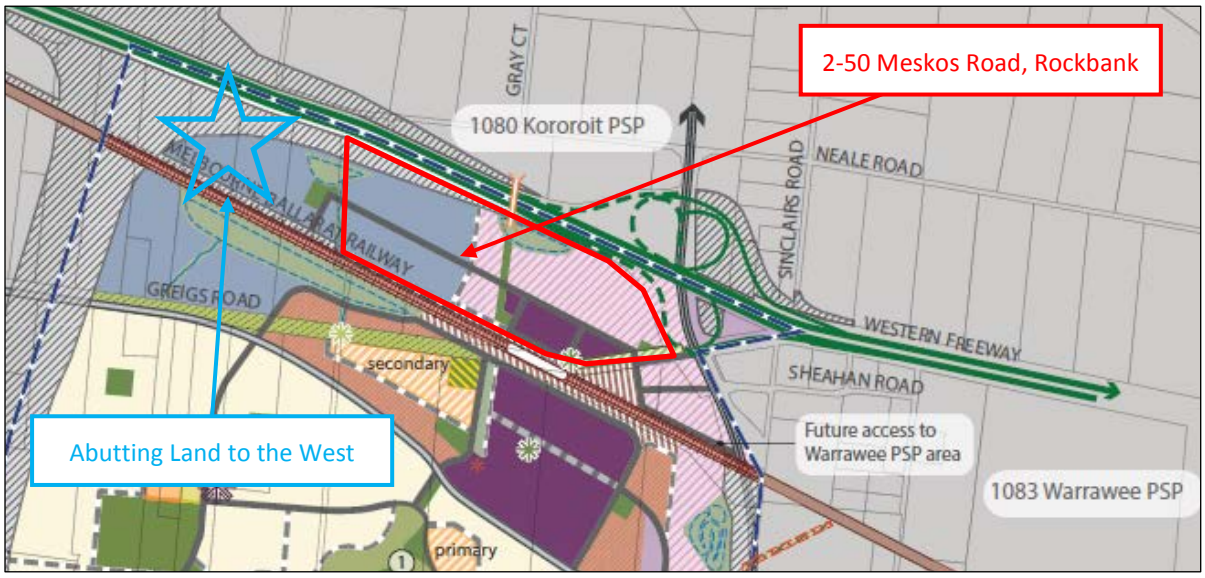


Figure 5: 2-50 Meskos Road, Rockbank

2-50 Meskos Road, Rockbank currently accommodates a rock crushing facility and a wholesale nursery business and associated buildings. Vehicle access to the site from the wider road network is provided via Meskos Road, which in turn intersects with Hopkins Road at a T-intersection.

Planning Permit PA2014/4405 was issued on 5 August, 2015 for the use and development of the land for materials recycling (rock crushing), concrete batching and landscape gardening supplies, a reduction in the car parking required under Clause 52.06 and a reduction in the bicycle parking required under Clause 52.34.

3.4 MSA Properties Pty Ltd Submission

Tract Consultants Pty Ltd, on behalf of MSA Properties Pty Ltd, made a submission dated 20 May, 2016 to the Metropolitan Planning Authority. In its submission, Tract stated "We believe that these matters are in the most part, clerical but important to deliver the intended PSP policy framework". I note that I have not been instructed to address any of the matters raised in the submission of MSA Properties Pty Ltd; rather, I am instructed to respond to concerns raised in other submissions relevant to matters within my area of expertise.

3.5 Instructions

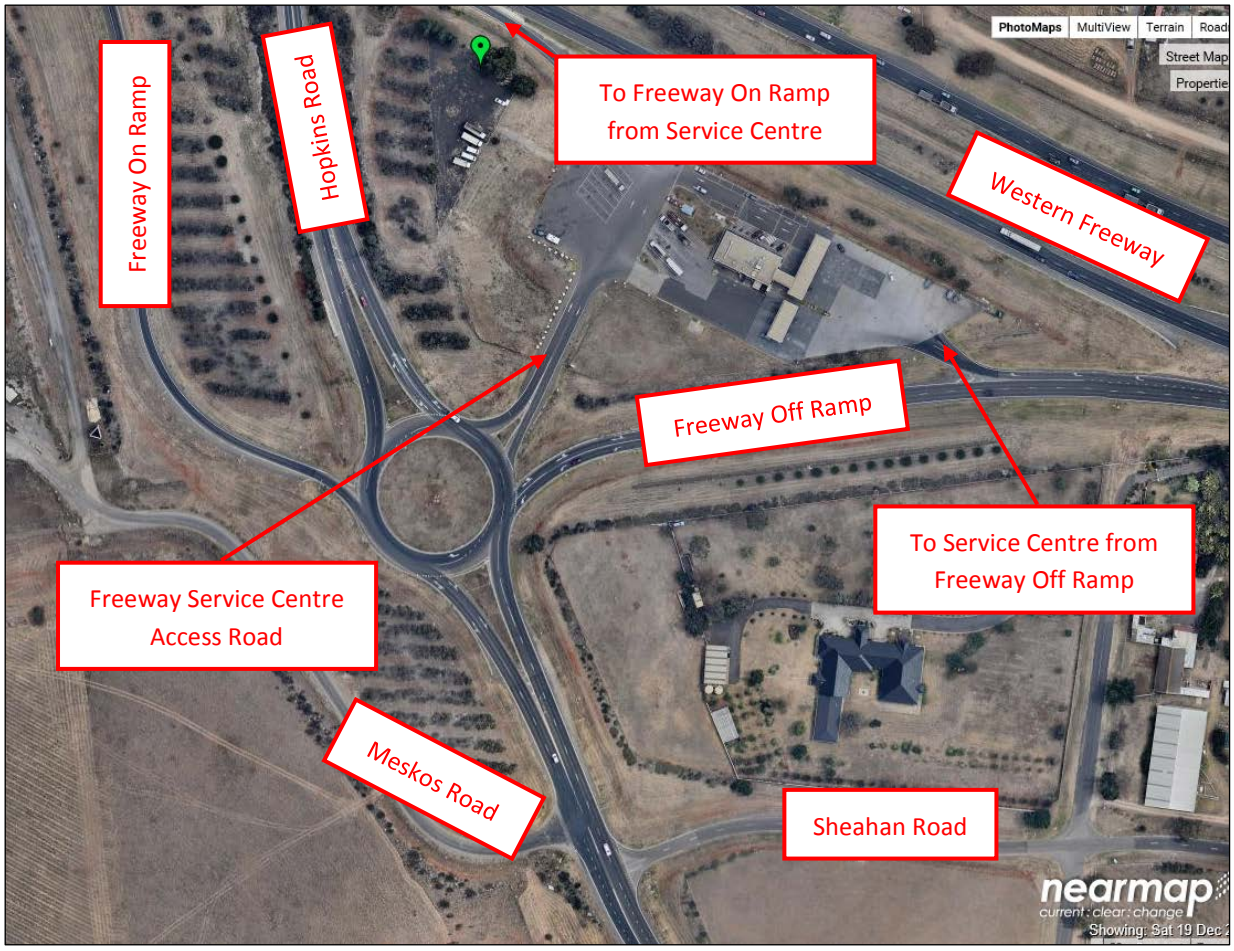
I have been instructed by Best Hooper Lawyers to specifically respond to the following matters:

- VicRoads' submission in relation to the proposed access points to Hopkins Road at Sheehan Road and the Western Freeway outbound on/off ramp.
- Melton City Council's submission in relation to the proposed traffic network as it relates to 2-50 Meskos Road, Rockbank.

4 Road Network

4.1 Existing

An aerial photograph of the road network in the vicinity of the Hopkins Road/Western Freeway outbound ramps intersection is shown in Figure 6.



Source: Nearmap

Figure 6: Road Network

Hopkins Road is in the Road Zone Category 1 under the Melton Planning Scheme and is under the control of VicRoads. Hopkins Road is generally aligned in a north-south direction between Neale Road in the north and Boundary Road in the south, where it continues as Derrimut Road.

Adjacent to Meskos Road, Hopkins Road typically provides a four lane carriageway (two lanes in each direction). Direct access to the Western Freeway is available via Hopkins Road for all movements. Further towards the south, Hopkins Road provides for a single traffic lane in each direction with sealed shoulders along either side.

A two lane roundabout is located at the Hopkins Road intersection with the Western Freeway outbound ramps (on and off the freeway). The roundabout also provides two way access (ie ingress and egress) to the freeway service centre. It is a five-leg roundabout.

Sheahan Road intersects with Hopkins Road as a T-intersection approximately 25m south of Meskos Road. In effect, Meskos Road and Sheahan Road form a staggered T-intersection with Hopkins Road.

A speed limit of 70km/h applies to Hopkins Road in the vicinity of Meskos Road.

Meskos Road is a local road which extends in a westerly direction from Hopkins Road and provides a connection between Hopkins Road and the property at 2-50 Meskos Road, Rockbank.

Meskos Road was constructed as an alternate access when vehicle access to the subject site from Western Highway was removed. It is configured with a 6.2m wide sealed carriageway with formed (crushed rock) shoulders approximately 1-1.5m wide (minimum) along each side. The existing configuration typically provides a through traffic lane in each direction.

The default urban speed limit of 50km/h applies to Meskos Road.

Access to the **freeway service centre** is available as follows:

- Outbound freeway off ramp - one way ingress;
- Hopkins Road/Western Freeway outbound ramps roundabout - two way access (ie ingress and egress); and
- Outbound freeway on ramp - one way egress.

4.2 Future

The VicRoads Derrimut Road Corridor Planning Study identified that Hopkins Road will ultimately be a six-lane divided road.

The PSP shows a reconfiguration of the Western Freeway outbound on ramp such that it runs through the existing freeway service centre and loops underneath Hopkins Road. I understand that one of the key reasons for reconfiguring the westbound freeway entry ramp is to increase the spacing between that entry ramp and the exit ramp to the future freeway-to-freeway interchange at the Outer Metropolitan Ring Road.

5 IT01 and IT02 Infrastructure Projects - Traffic Engineering Assessment

5.1 General

As noted in Section 3.2.2, the Precinct Infrastructure Plan identifies the following projects:

- IT01: Intersection of Hopkins Road/Western Freeway westbound ramps; and
- IT02: Intersection of Hopkins Road/Sheahan Road.

VicRoads in their submission dated 26 May, 2016 expressed concerns with these intersection arrangements.

MSA Properties Pty Ltd has had on-going discussion with VicRoads, Victorian Planning Authority and Melton City Council in relation to these infrastructure projects. There is now general agreement (subject to appropriate detailed analysis) to the following approach:

- Hopkins Road/Western Freeway outbound ramps:
  - Conversion of the existing roundabout to a signalised intersection.
  - The intersection's primary function is to distribute freeway traffic.
  - The intersection's secondary function is to provide limited additional access to the Precinct.
    - This will be achieved by creating a new intersection on the outbound freeway on ramp.
- Hopkins Road/Sheahan Road:
  - A signalised intersection as the main entry to the Precinct.
  - Also provides access to Hopkins Road from the future Warrawee Precinct Structure Plan area to the east of Hopkins Road.

These arrangements are shown in Figure 7.

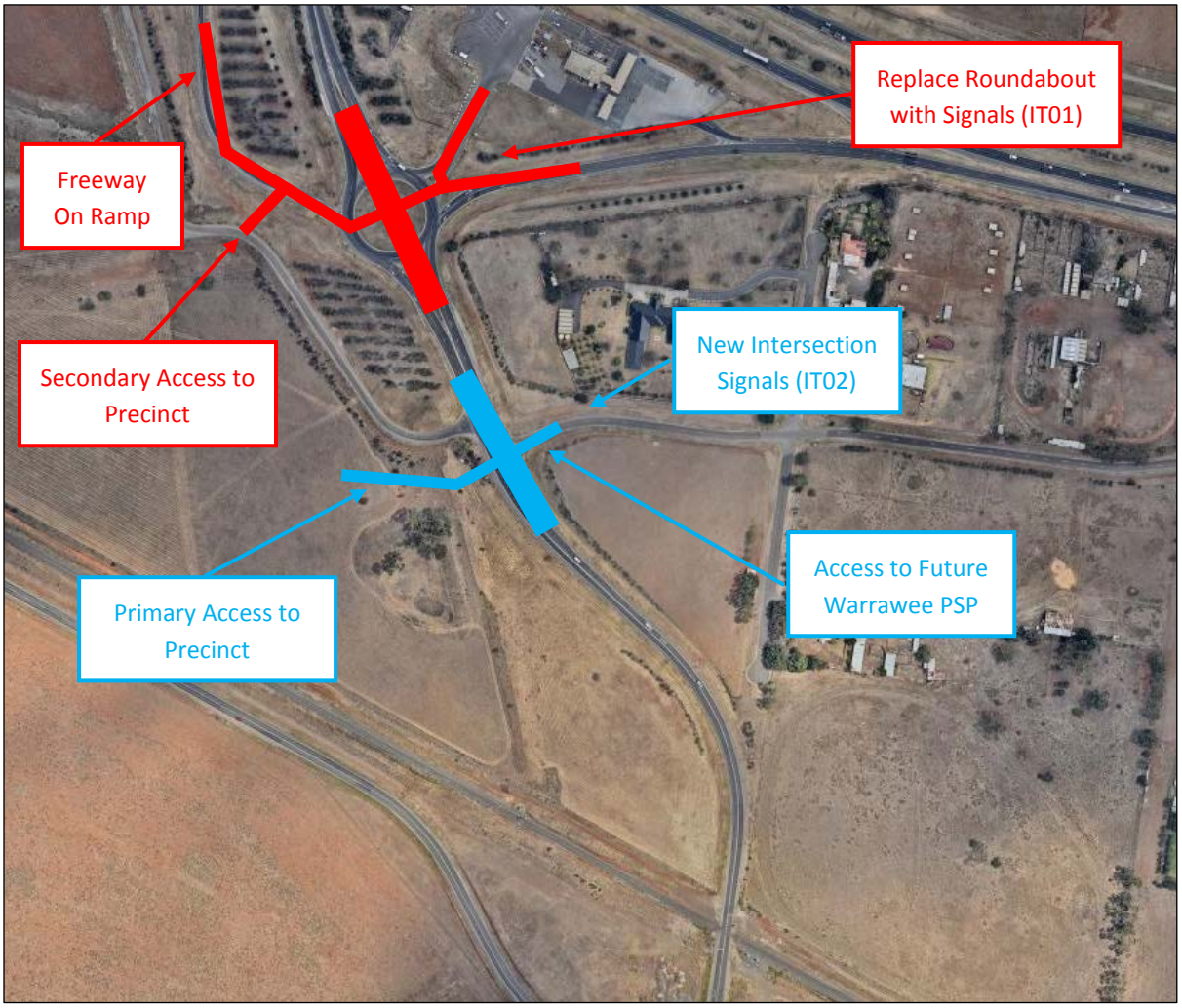


Figure 7: Concept Intersection Arrangements - IT01 and IT02

These works are considered to be interim works that form part of the Infrastructure Contributions Plan. They are interim as the Hopkins Road/Western Freeway outbound ramps intersection will need to be upgraded to accommodate the future duplication of Hopkins Road and the future reconfiguration of the outbound on ramp to accommodate the OMR. Also, the Hopkins Road/Sheahan Road intersection will need to be upgraded to accommodate the future duplication of Hopkins Road and traffic generated by the future Warrawee Precinct Structure Plan.

I note that the form of the intersection of the secondary access to the Precinct and the freeway on ramp is yet to be determined. This is appropriately finalised as detailed plans and proposals are prepared for developments within the area accessed via this intersection.

5.2 Design Years

Two design years have been adopted for the assessment of the traffic impact of the proposed access arrangements to the portion of the Precinct to the north of the Melbourne-Ballarat Railway Line - 2026 and 2046.

5.3 Future Base Traffic Volumes

Jacobs and Cardno have each undertaken traffic modelling work for the Victorian Planning Authority. In particular, AM peak hour volumes were sourced from the Cardno work (as peak hour volumes are not provided in the Jacobs modelling). Traffix Group has used this information to derive future base (or external) traffic volumes for 2026 and 2046.

I note that strategic modelling does not produce PM peak hour outputs. Therefore, PM peak hour volumes have been derived by "inverting" AM peak hour volumes, adjusting for the configuration of the road network.

I also note that the base volumes in this instance do not include traffic generated from the Mt Atkinson & Tarneit Plains PSP in 2026. The VPA has accepted these volumes on the basis that, as I understand it, the base volumes include traffic from the broader area, including adjacent PSP areas where the 2026 modelling assumes those areas are 75% developed. The VPA believes this level of assumed development in adjacent PSP areas is conservatively high, which balances the traffic that would be generated by the Mt Atkinson & Tarneit Plains PSP.

In deriving the base traffic volumes, a small discount of 10% of the development generated traffic volume associated with the C1Z and C2Z uses has been applied to the base traffic volume on the network to account for linked trips. These represent minor diversions to and from the site as part of another trip and would include, for example, a motorist calling into the centre to visit shops on their way home from work.

Diagrams showing the projected base traffic volumes for the two Hopkins Road intersections incorporating the discount for linked trips are presented in Tables 1 to 4. The intersections have been identified as follows:

- IT01: North intersection; and
- IT02: South intersection.

Table 1: 2026 Base Traffic Volumes at North Intersection

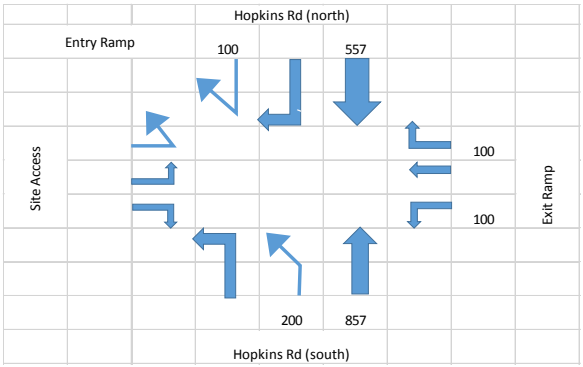
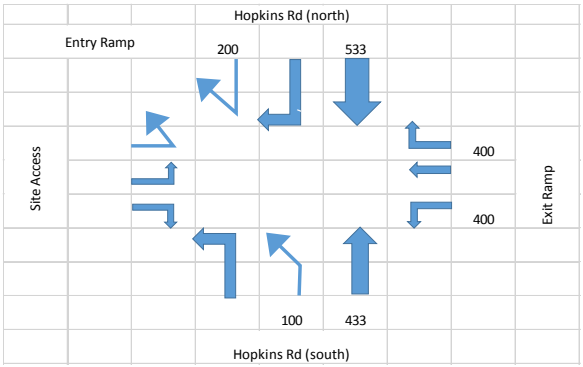
North Intersection AM Peak Hour 2026 Base Traffic Volumes	North Intersection PM Peak Hour 2026 Base Traffic Volumes
	

Table 2: 2026 Base Traffic Volumes at South Intersection

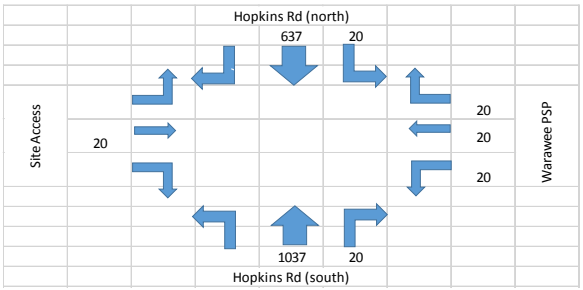
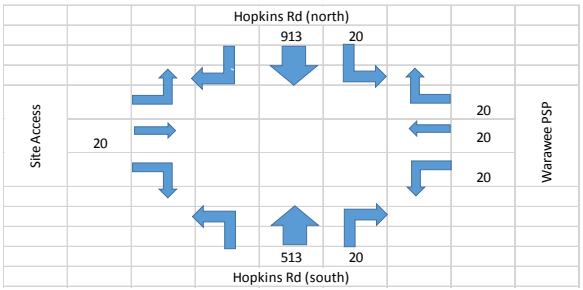
South Intersection AM Peak Hour 2026 Base Traffic Volumes	South Intersection PM Peak Hour 2026 Base Traffic Volumes
	

Table 3: 2046 Base Traffic Volumes at North Intersection

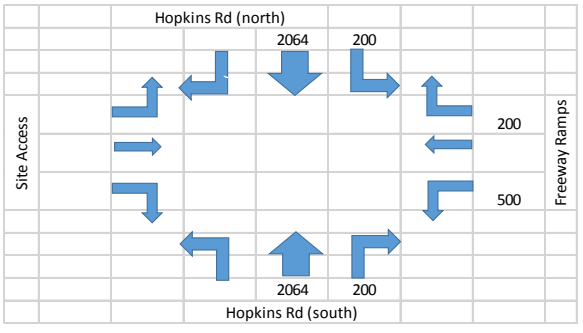
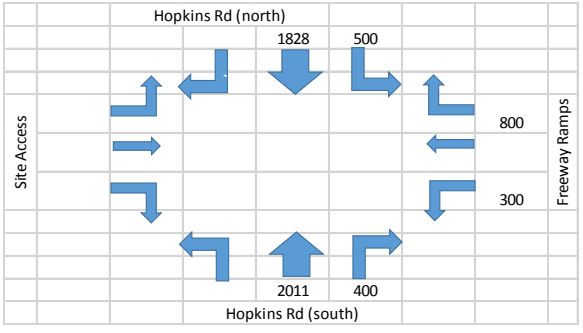
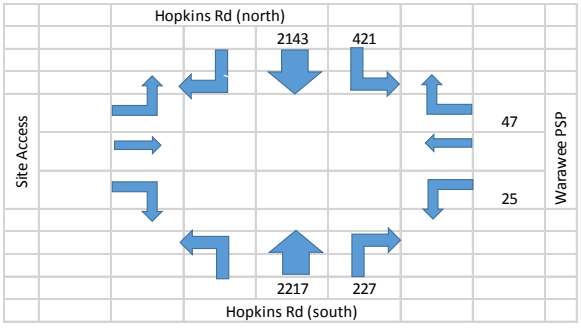
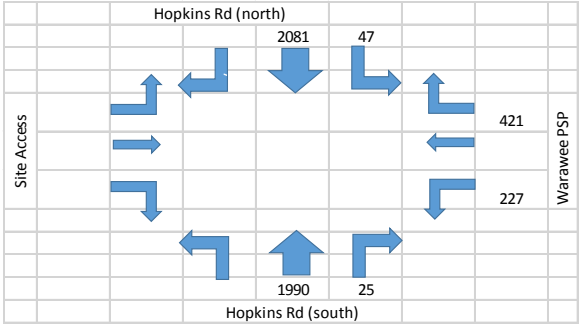
North Intersection AM Peak Hour 2046 Base Traffic Volumes	North Intersection PM Peak Hour 2046 Base Traffic Volumes
	

Table 4: 2046 Base Traffic Volumes at South Intersection

South Intersection AM Peak Hour 2046 Base Traffic Volumes	South Intersection PM Peak Hour 2046 Base Traffic Volumes
	

5.4 Development Traffic Volumes

5.4.1 Land Use

In September, 2015 the Metropolitan Planning Authority provided Tract Consultants with the plan attached at Appendix B, showing (for discussion purposes) broad land use areas in the northern part of the Precinct. Scaling off areas, assuming a single level of construction and applying general rules of thumbs for floor area to land area ratios for various uses Tract Consultants produced the gross leasable floor areas shown in Table 5. These areas have been used as the basis for the on-going discussions with VPA, VicRoads and Council.

Table 5: Assumed Usage Breakdown by Gross Leasable Floor Area

Land Use	Land Area (m^2)	GLFA %	GLFA (m^2)
Commercial 1 Zone (C1Z)	54,800	40%	21,920
Commercial 2 Zone (C2Z)	185,300	40%	74,120
Industrial Zone (IND)	312,000	50%	156,000
TOTAL	**551,100**		**252,040**

5.4.2 Traffic Generation

The estimated ultimate traffic generation of the potential development is described in Table 6.

The adopted traffic generated rates are based on generic land uses as described in the RTA NSW Guide to Traffic Generating Developments as discussed below:

- The Commercial 1 Zone is assumed to consist of retail uses with a higher rate applying to the initial 10,000m^2 of floor area (core area) and lesser rates applying to the peripheral areas;
- The Commercial 2 Zone is assumed to consist predominantly of bulky goods retail uses and also include some office uses; and
- The IND Zone is assumed to consist of a combination of factories and warehouses.

Table 6: Projected Site-Based Traffic Generation

Use	Floor Area (m^2)	PM Peak Generation		AM Peak Generation	
		Generation Rate (per $100m^2$)	Peak Hour Generation (veh)	Generation Rate (per $100m^2$)	Peak Hour Generation (veh)
C1Z ($0m^2$ - $10,000m^2$)	10,000	12.5	1,250	2.5	250
C1Z ($10,000m^2$ - $20,000m^2$)	10,000	6.7	670	1.34	134
C1Z ($20,000m^2$ - $30,000m^2$)	1,920	5.9	113	1.18	23
C2Z (Bulky goods)	58,320	2.7	1,575	0.54	315
C2Z (Office)	15,800	2.0	316	2.0	316
IND	156,000	0.75	1,170	0.8	1,170
TOTAL	**252,040**	**-**	**5,094**	**-**	**2,208**

The PM peak hour rate has been adopted based on the Thursday PM peak hour as described in the RTA Guide, with an AM peak hour rate adopted as 20% of the PM peak rate for all uses apart from the office and industrial uses, noting that there is minimal activity typically associated with retail activity during the AM peak hour. Overall the site is projected to generate in the order of 5094 vehicle movements during the PM peak hour and 2,208 vehicle movements during the AM peak hour.

I note that these figures are conservatively high as they do not take into account multi-purpose trips, where more than one facility is visited as part of a trip (for example, combining visits to shops with trips to employment within the business park).

The traffic volumes shown in Table 2 are for the "full" development of the northern part of the Precinct and have been used in the capacity analysis for 2046. For the traffic analysis for 2026, it has been assumed that the factory, warehouse and office uses have not been developed (ie $80,240m^2$ of retail and bulky goods has been developed).

5.4.3 Traffic Distribution

Traffic distribution has been adopted based on the following splits for traffic entering and exiting the site:

- 80% entering and 20% exiting the site for all uses during the AM peak hour period; and
- 50% entering and 50% exiting the site for all uses apart from the office/commercial use during the PM peak period, which typically has 10% of traffic entering and 90% exiting during this time.

The adopted directional distribution for all site generated traffic is as follows:

- 45% of traffic to/from the east along the Western Freeway;
- 15% of traffic to/from the west along the Western Freeway;
- 35% of traffic to/from the south along Hopkins Road; and
- 5% of traffic to/from the north along Hopkins Road.

These adopted traffic distributions are generally based on the proximity of the site in each direction to land within the Urban Growth Boundary. The lower distributions to the north and west of the site reflect the relatively close proximity in those directions to the Urban Growth Boundary.

Diagrams showing the projected site-generated traffic volumes for the two Hopkins Road intersections are presented in Tables 7 to 10.

Table 7: 2026 Site-Based Traffic Volumes at North Intersection

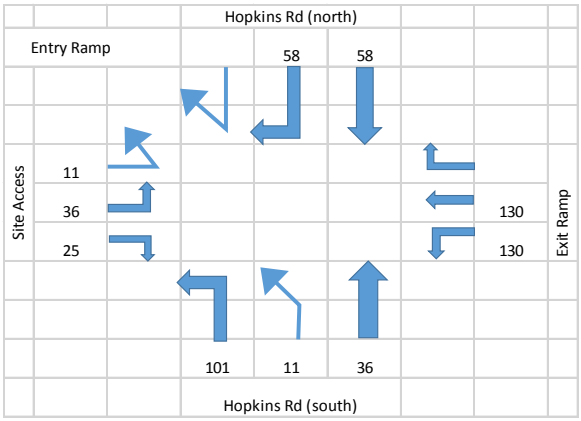
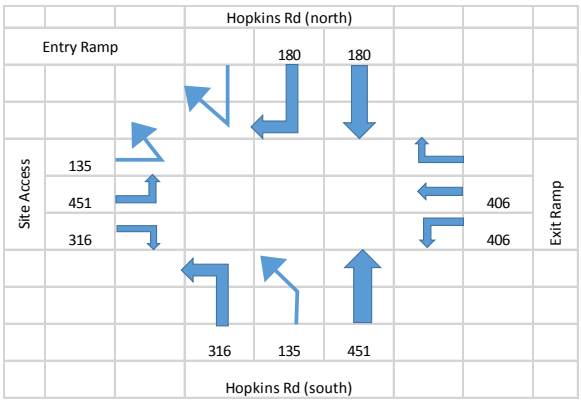
North Intersection AM Peak Hour 2026 Site-Based Traffic Volumes	North Intersection PM Peak Hour 2026 Site-Based Traffic Volumes
	

Table 8: 2026 Site-Based Traffic Volumes at South Intersection

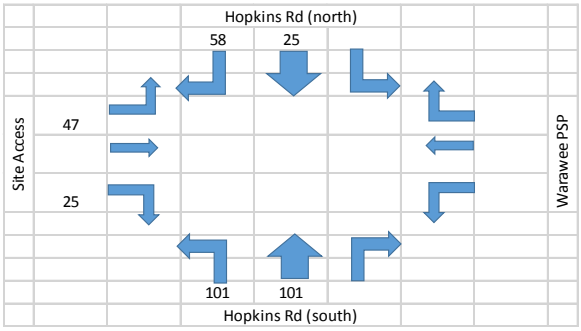
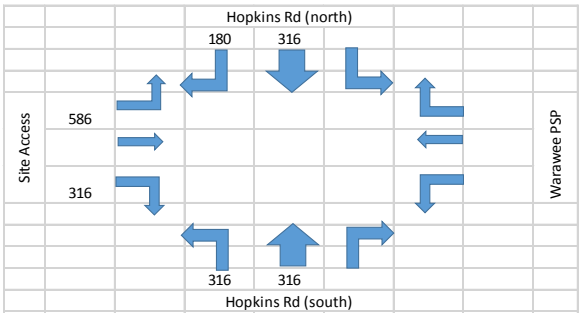
South Intersection AM Peak Hour 2026 Site-Based Traffic Volumes	South Intersection PM Peak Hour 2026 Site-Based Traffic Volumes
	

Table 9: 2046 Site-Based Traffic Volumes at North Intersection

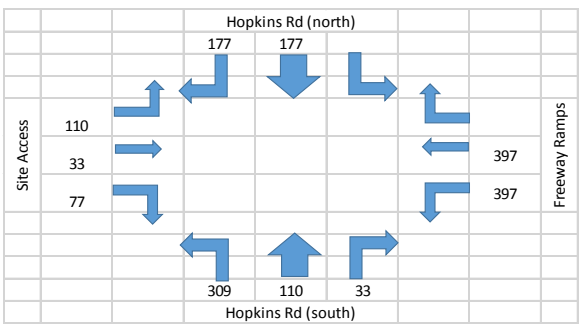
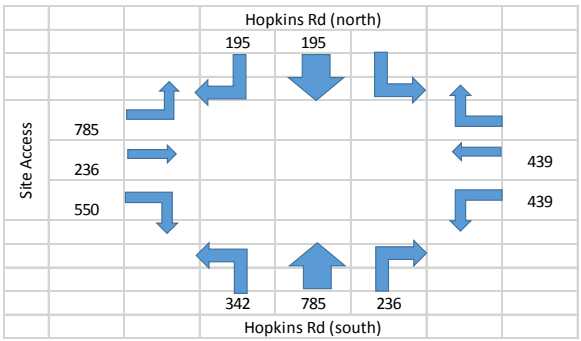
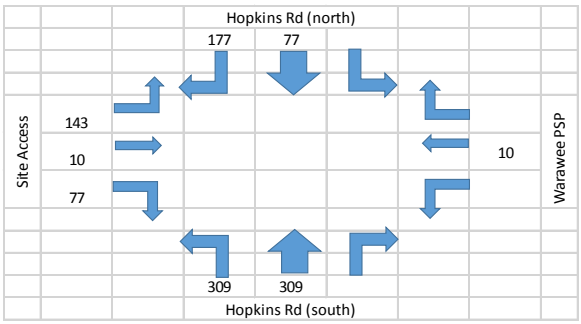
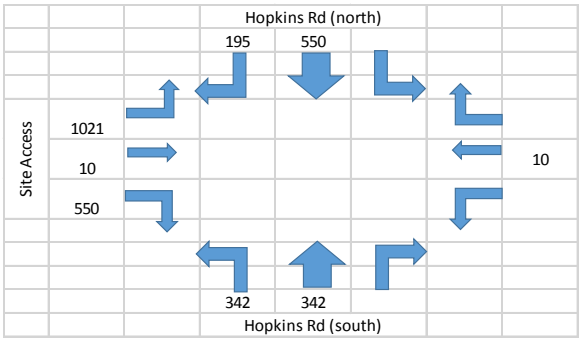
North Intersection AM Peak Hour 2046 Site-Based Traffic Volumes	North Intersection PM Peak Hour 2046 Site-Based Traffic Volumes
	

Table 10: 2046 Site-Based Traffic Volumes at South Intersection

South Intersection AM Peak Hour 2046 Site-Based Traffic Volumes	South Intersection PM Peak Hour 2046 Site-Based Traffic Volumes
	

5.5 Design Traffic Volumes

The design traffic volumes are obtained by combining the base traffic volumes and the site-based traffic volumes, as shown in Tables 11 to 14.

Table 11: 2026 Design Traffic Volumes at North Intersection

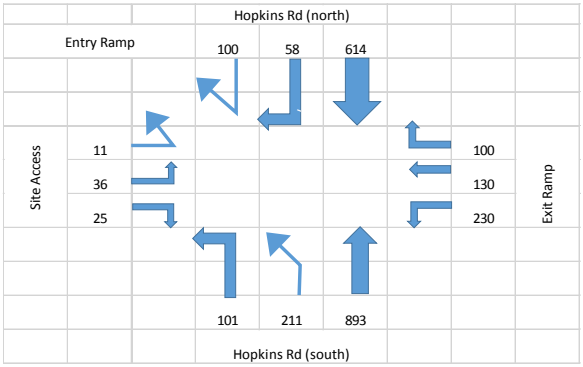
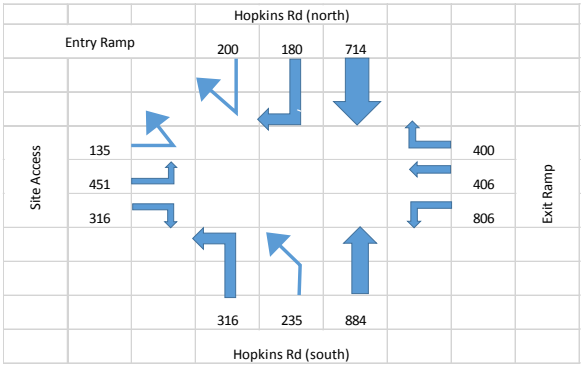
North Intersection AM Peak Hour 2026 Design Traffic Volumes	North Intersection PM Peak Hour 2026 Design Traffic Volumes
	

Table 12: 2026 Design Traffic Volumes at South Intersection

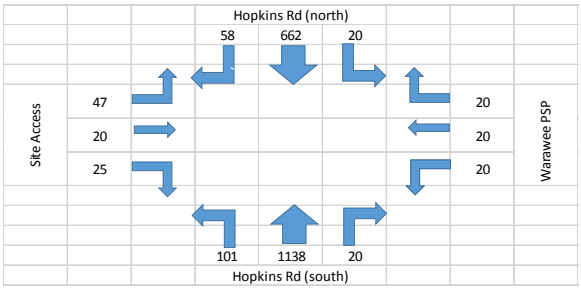
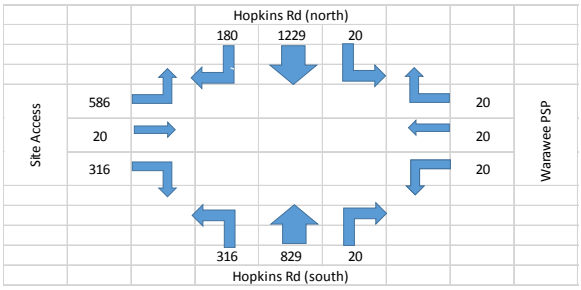
South Intersection AM Peak Hour 2026 Design Traffic Volumes	South Intersection PM Peak Hour 2026 Design Traffic Volumes
	

Table 13: 2046 Design Traffic Volumes at North Intersection

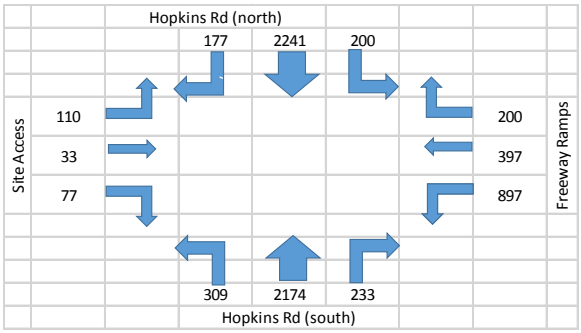
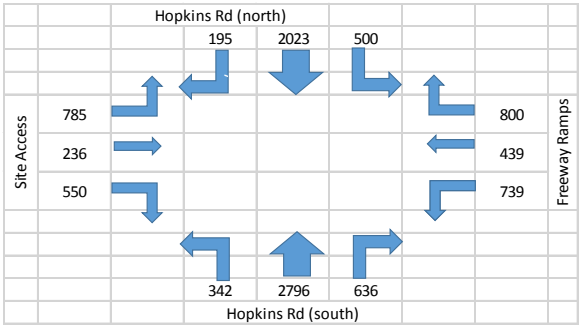
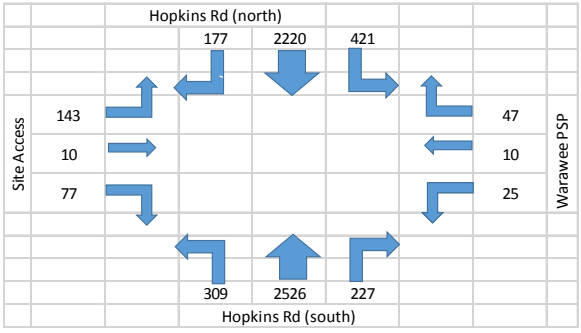
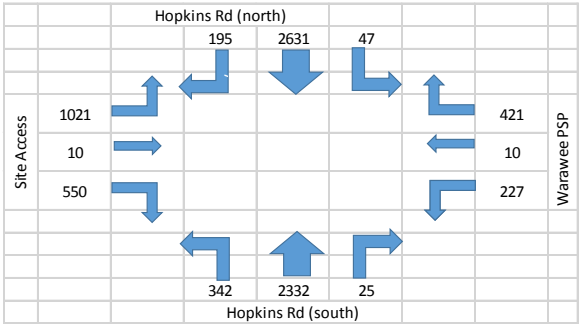
North Intersection AM Peak Hour 2046 Design Traffic Volumes	North Intersection PM Peak Hour 2046 Design Traffic Volumes
	

Table 14: 2046 Site-Based Traffic Volumes at South Intersection

South Intersection AM Peak Hour 2046 Design Traffic Volumes	South Intersection PM Peak Hour 2046 DesignTraffic Volumes
	

5.6 Intersection Capacity Assessment

An intersection capacity analysis has been undertaken for the design years of 2026 and 2046 using SIDRA Intersection 7.0. The two intersections were modelled as a network considering the close spacing between the two intersections and the coordination of the signal phasing.

5.6.1 2026

The adopted intersection layout for 2026 is shown in Figure 8.

Signal phasing has been adopted in the model based on a standard arterial road cross-intersection incorporating fully controlled diamond right turn phases that operate in advance of the through traffic phases on Hopkins Road, with right turns permitted to extend in the dominant direction. A split phasing arrangement has been adopted for the east and west approaches at the southern intersection, whilst a leading/lagging right turn arrangement has been adopted for the east and west approaches at the northern intersection.

A 70 second cycle time has been assumed for the AM peak period, whereas a longer 80 second cycle time has been assumed for the PM peak due to the greater traffic movements that need to be accommodated during this period.

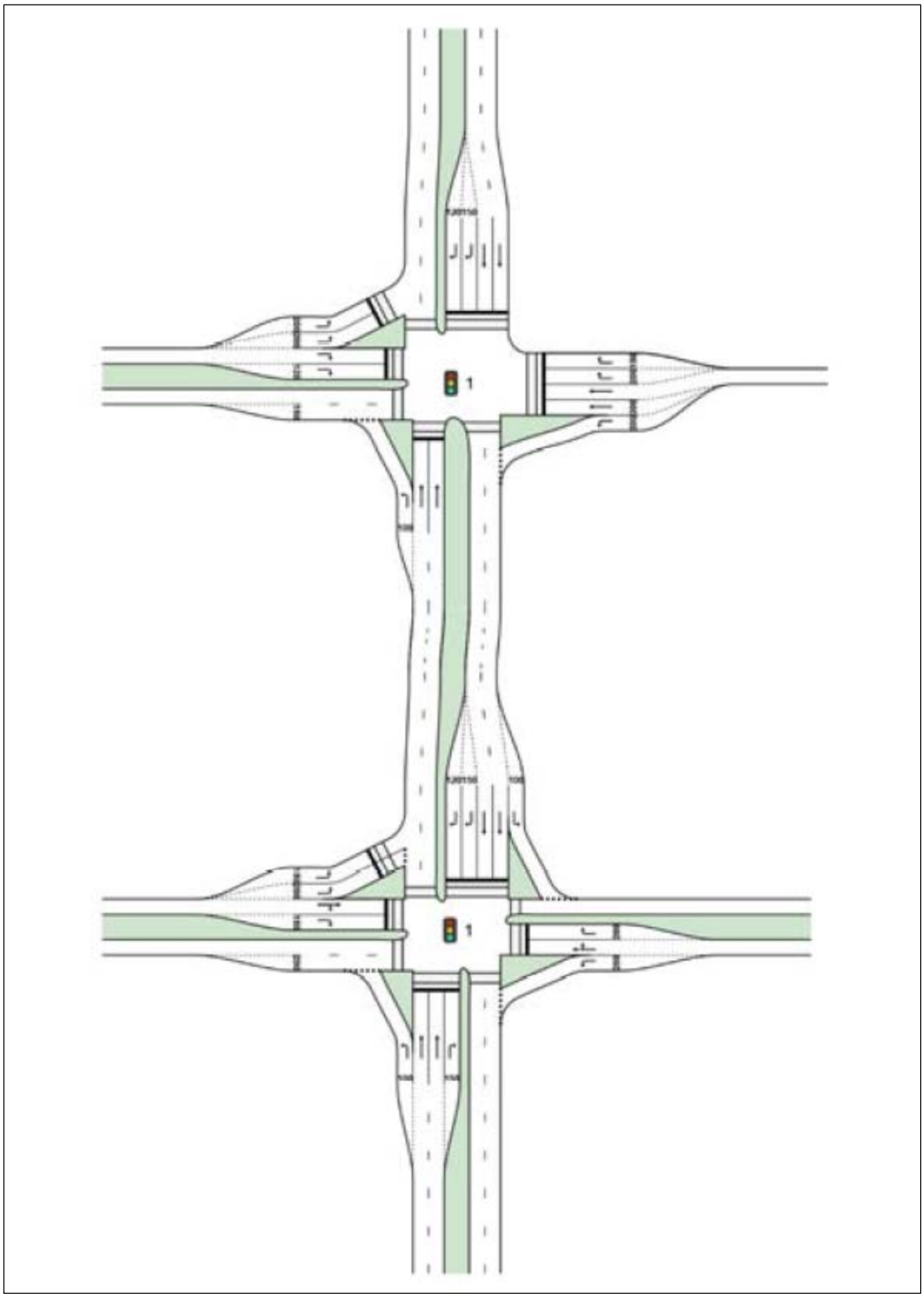


Figure 8: Adopted Intersection Layout - 2026

A summary of the key SIDRA outputs during both peak periods assuming development of the site as detailed in Section 5.4.2 in the year 2026 is presented in Table 15, with the full set of SIDRA results attached at Appendix C.

Table 15: Peak Period Operating Conditions - 2026

Approach	Degree of Saturation		Average Delay (s)		95th Percentile Queue Length (m)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
North Intersection						
Hopkins Road South Approach	0.65	0.86	10	19	73	130
Western Freeway Westbound Exit Ramp (East Approach)	0.46	0.82	22	26	19	106
Hopkins Road North Approach	0.59	0.81	10	18	24	68
Meskos Road Site Access (West Approach)	0.07	0.82	28	33	3	53
South Intersection						
Hopkins Road South Approach	0.79	0.56	13	10	113	64
Warrawee PSP (East Approach)	0.13	0.15	27	33	5	6
Hopkins Road North Approach	0.46	0.81	12	17	42	133
Southern Site Access (West Approach)	0.15	0.79	32	39	6	77

Table 15 shows that the two intersections will function well in 2026 during the AM and PM peak periods.

5.6.2 2046

The adopted intersection layout for 2046 is shown in Figure 9.

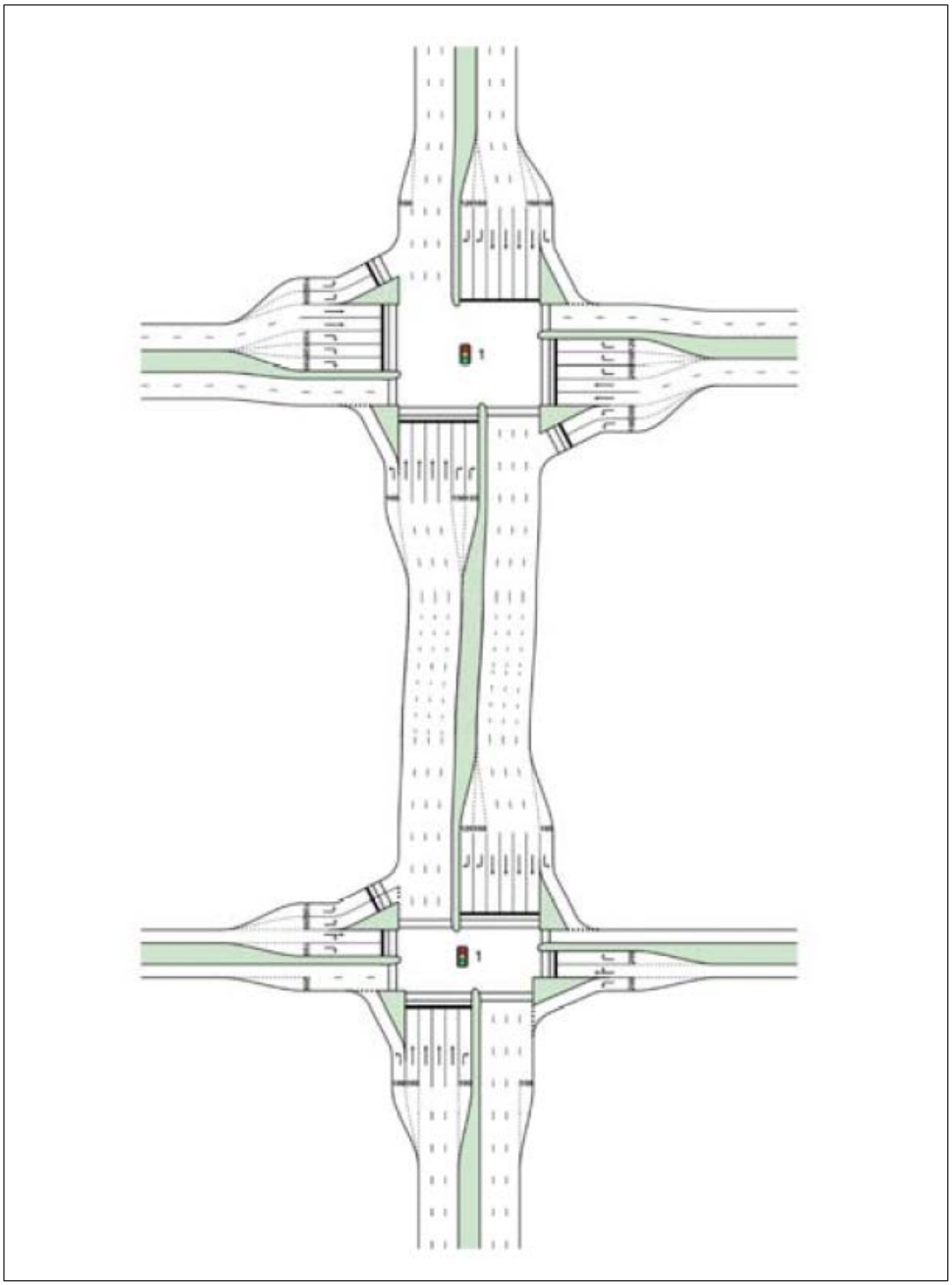


Figure 9: Adopted Intersection Layout - 2046

Signal phasing has been adopted into the model based on a standard arterial road cross-intersection incorporating fully controlled diamond right turn phases that operate in advance of the through traffic phases in each direction, with right turns permitted to extend in the dominant direction apart from the east and west approaches at the southern intersection where a split phasing arrangement has been adopted.

An 80 second cycle time has been assumed for the AM peak period, whereas a longer 145 second cycle time has been assumed for the PM peak due to the greater traffic movements that need to be accommodated during this period.

A summary of the key SIDRA outputs during both peak periods assuming development of the site as detailed in Section 5.4.2 in the year 2046 is presented in Table 16, with the full set of SIDRA results attached at Appendix D.

Table 16: Peak Period Operating Conditions - 2046

Approach	Degree of Saturation		Average Delay (s)		95th Percentile Queue Length (m)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
North Intersection						
Hopkins Road South Approach	0.83	0.88	19	19	140	179
Western Freeway Westbound Exit Ramp (East Approach)	0.81	0.99	38	78	138	177
Hopkins Road North Approach	0.83	0.76	19	21	143	159
Meskos Road Site Access (West Approach)	0.20	0.98	23	95	14	302
South Intersection						
Hopkins Road South Approach	0.89	0.90	20	49	174	364
Warrawee PSP (East Approach)	0.22	0.96	34	72	9	147
Hopkins Road North Approach	0.80	0.81	15	8	132	95
Southern Site Access (West Approach)	0.34	0.94	35	81	16	344

Table 16 shows that the two intersections will operate close to full capacity with the adopted layouts in 2046 during the PM peak period.

6 Conclusions

Having undertaken an assessment of the traffic engineering implications of the proposed changes of Amendment C162 of the Melton Planning Scheme as they apply to the access to the property at 2-50 Meskos Road and the abutting properties to the west, I am of the opinion that:

a) The proposed Precinct Infrastructure projects IT01 and IT02 are necessary to provide appropriate access to the northern section of the Mt Atkinson & Tarneit Plans Precinct Structure Plan area.

b) IT01 and IT02 are appropriately included as part of the Infrastructure Contributions Plan as they are interim works, with both intersections requiring future upgrades to accommodate the duplication of Hopkins Road, the reconfiguration of the outbound on ramp to accommodate the OMR and traffic generated by the future Warrawee Precinct Structure Plan.

c) In 2026, both intersections IT01 and IT02 will operate well in the AM and PM peak periods with the adopted intersection layout detailed in this report.

d) In 2026, both intersections IT01 and IT02 will be able to accommodate significant development within the property at 2-50 Meskos Road, Rockbank and the abutting properties to the west.

e) The form and location of the intersection of the secondary access to the Precinct and the freeway on ramp is appropriately finalised as detailed plans and proposals are prepared for developments within the area accessed via this intersection.

DON ROBERTSON
SENIOR CONSULTANT
TRAFFIX GROUP

Appendix A: CV

CURRICULUM VITAE

DON ROBERTSON

Traffic Engineers and Transport Planners

Position:	Senior Consultant
Qualifications:	Bachelor of Engineering, University of Melbourne, 1980 Graduate Diploma of Municipal Engineering, Footscray Institute of Technology, 1988 Master of Transport and Traffic, Monash University, 2003
Professional Affiliations:	Member, Victorian Planning and Environmental Law Association

Professional History:

Since January 2004: Traffix Group Pty Ltd

Don joined Traffix Group as Senior Associate in January 2004 and was appointed a Director at the end of 2004. He is now Senior Consultant with the firm. He has over 34 years' experience as a Traffic Engineer and Transport Planner, comprising:

- Over 9 years with Local Government in Victoria and Queensland;
- 3 years with the Road Traffic Authority; and
- Over 22 years as a consultant.

Don has substantial experience and expertise in traffic engineering and transport planning, including:

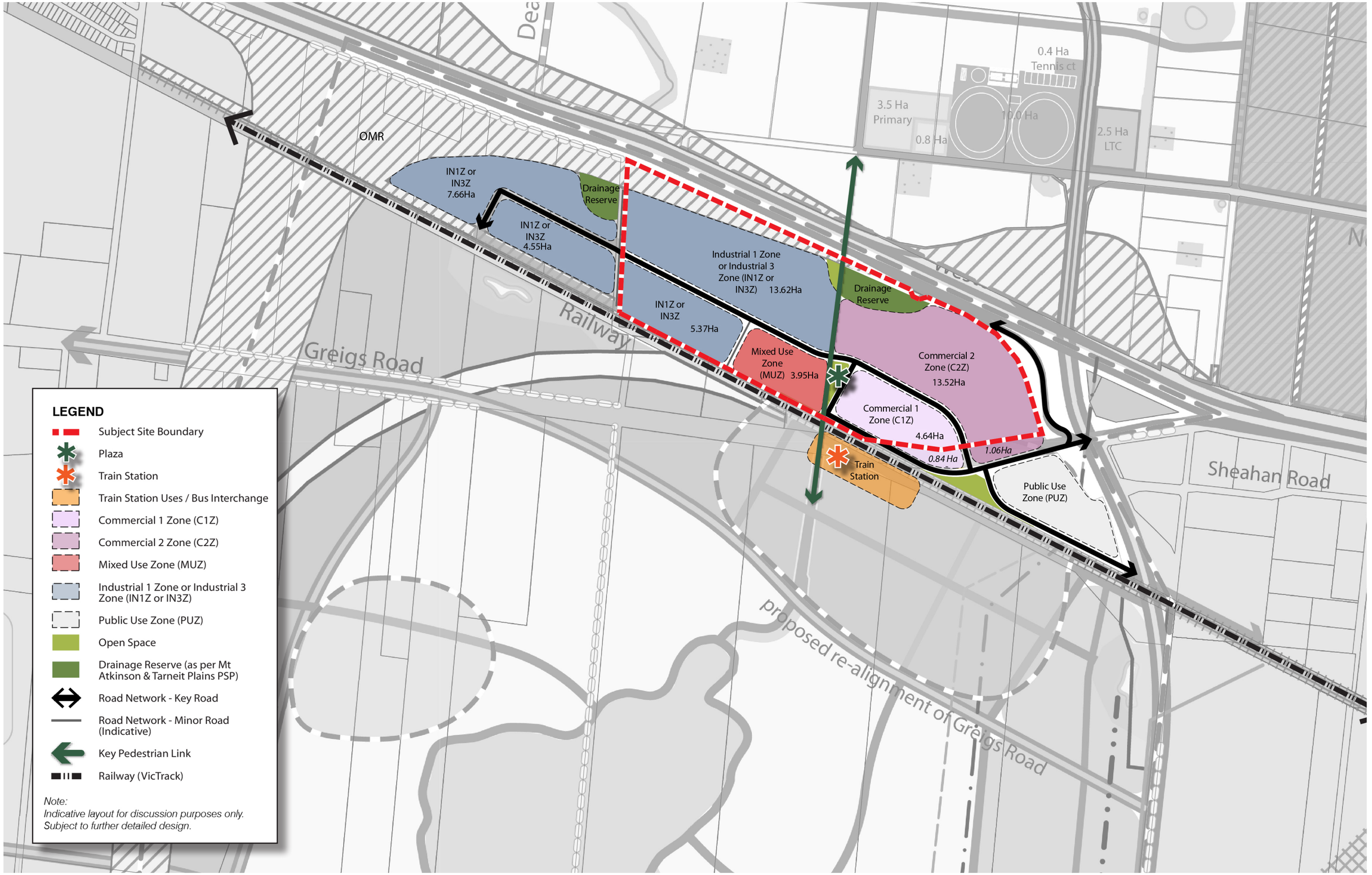
- Development traffic and parking impact assessment;
- Road and car park design;
- Local Area Traffic Management;
- Road safety;
- Bicycle planning;
- Policy development; and
- General traffic engineering.

Don regularly provides expert evidence to VCAT and at Panel Hearings on various land use proposals.

Prior to January 2004:

▪ Grogan Richards Pty Ltd	Senior Traffic Engineer Associate
▪ PPK Environment and Infrastructure	Principal Traffic Engineer
▪ Redland Shire Council	Manager Transportation and Traffic Planning
▪ City of Ringwood	Special Projects Engineer
▪ Gutteridge Haskins and Davey Pty Ltd	Senior Traffic Engineer
▪ City of Heidelberg	Senior Engineer Traffic and Transportation
▪ City of Kew	Traffic Engineer
▪ Road Traffic Authority	Traffic Engineer - Rural Design Senior Engineer Works Co-Ordination - Traffic Programs Group Traffic Engineer - Traffic Design Group
▪ City of Waverley	Traffic Engineer
▪ Shire of Stawell	Assistant Engineer

Appendix B: MPA Plan - Broad Land Uses in Northern Part of Precinct



A3
SCALE: 1:10000
0 250 500m

MPA DISCUSSION - MPA CONCEPT

Meskos Road Rockbank

PROJ/DRG NO 0313-0509 50 10 REV 01 DRWN DG CHKD JS DATE 20.01.2016

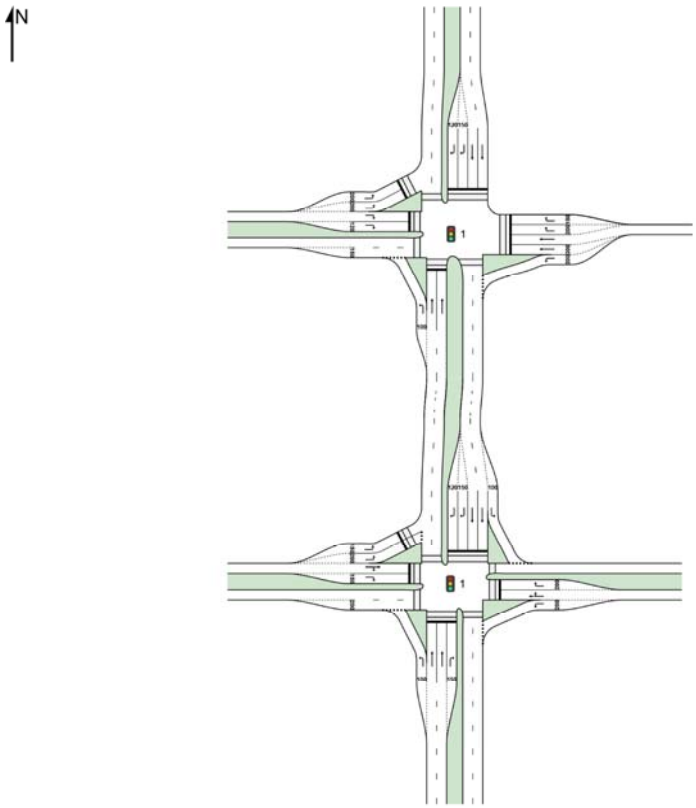
Tract

Appendix C:
SIDRA Outputs - 2026

NETWORK LAYOUT

Network: N101 [PM Interim - 80,000m2 Retail/Bulky Goods]

New Network

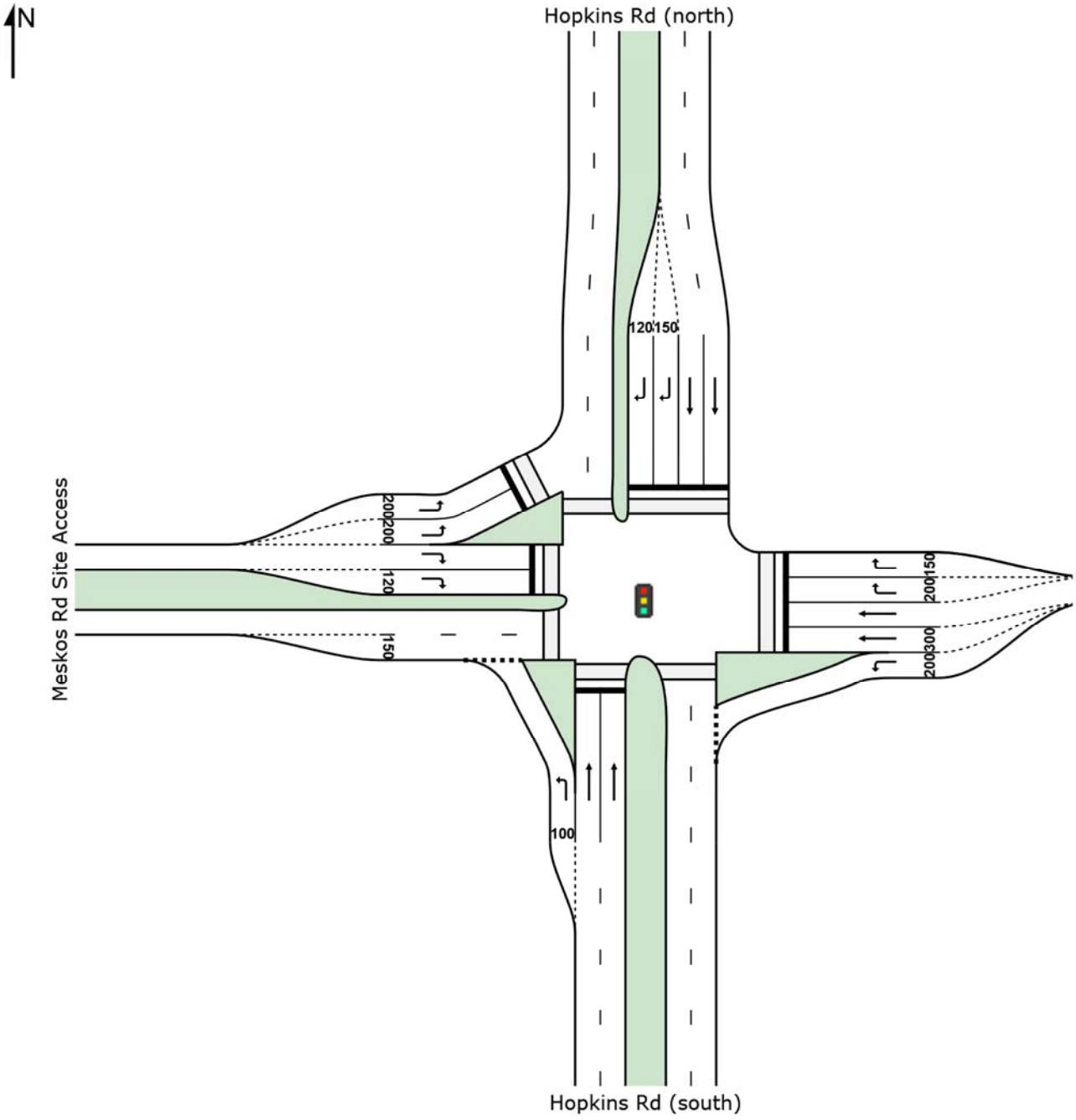


SITES IN NETWORK	
Site ID	**Site Name**
1	PM Peak - 2026 Interim North Intersection - 80,000m2 Retail/Bulky Goods
1	PM Peak - 2026 Interim, South Intersection - 80,000m2 Retail/Bulky Goods

SITE LAYOUT

Site: 1 [PM Peak - 2026 Interim North Intersection - 80,000m2 Retail/Bulky Goods]

New Site
Signals - Fixed Time Coordinated



PHASING SUMMARY

Site: 1 [AM Peak - 2026 Interim North Intersection - 80,000m2 Retail/Bulky Goods]

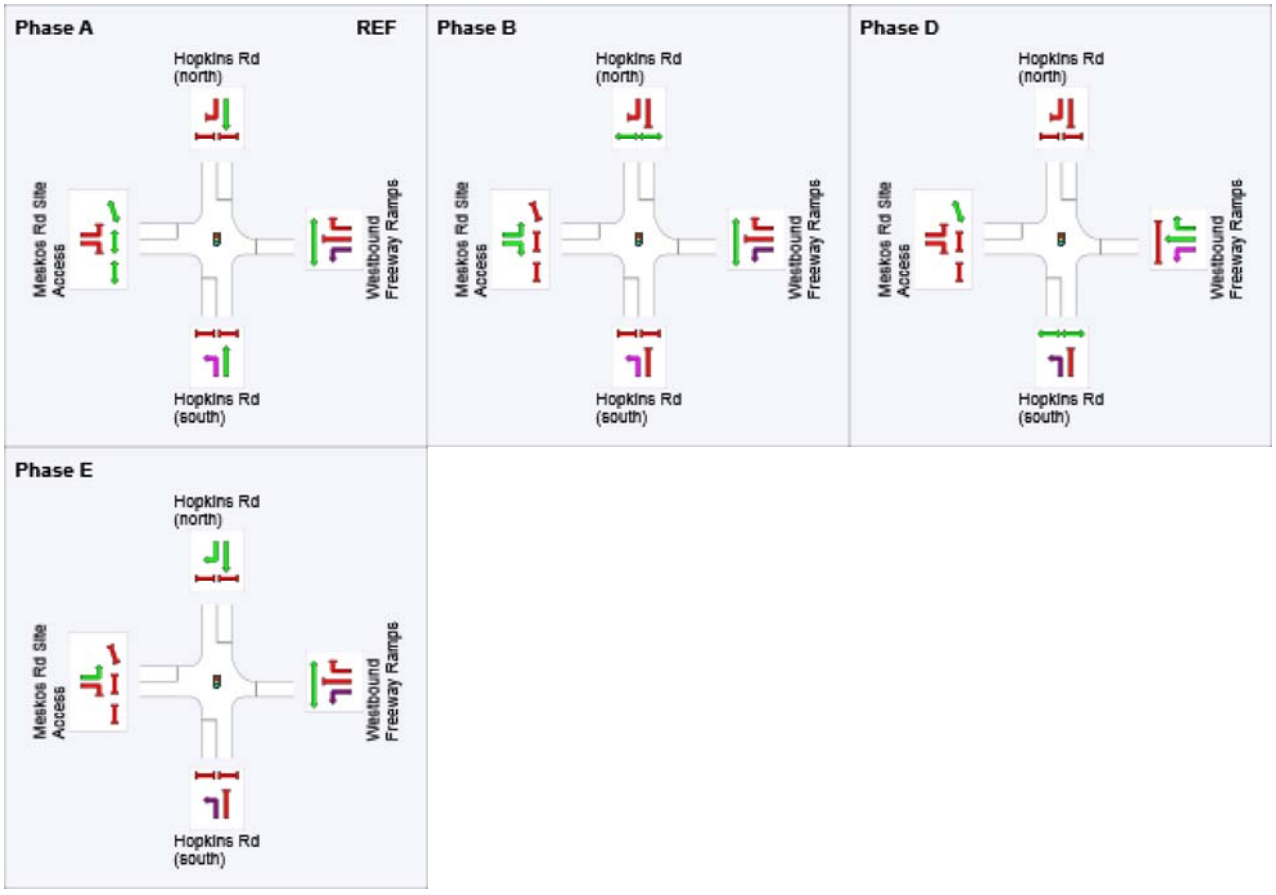
Network: N101 [AM Interim - 80,000m2 Retail/Bulky Goods]

New Site
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Cycle Time - Program)

Phase times determined by the program
Sequence: Variable Phasing (phase reduction applied)
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, E
Output Sequence: A, B, D, E

Phase Timing Results

Phase	A	B	D	E
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	33	46	58
Green Time (sec)	27	7	6	6
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	33	13	12	12
Phase Split	47%	19%	17%	17%



Normal Movement		Permitted/Opposed	
Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane	
Stopped Movement		Turn On Red	
Other Movement Class Running		Other Movement Class Stopped	
Mixed Running & Stopped Movement Classes			
Undetected Movement		Phase Transition Applied	

MOVEMENT SUMMARY

Site: 1 [AM Peak - 2026 Interim North Intersection - 80,000m2 Retail/Bulky Goods]

Network: N101 [AM Interim - 80,000m2 Retail/Bulky Goods]

New Site
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Cycle Time - Program)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins Rd (south)													
1	L2	328	5.0	328	5.0	0.241	5.8	LOS A	0.2	1.5	0.03	0.56	51.3
2	T1	940	5.0	940	5.0	0.645	11.2	LOS B	9.9	72.6	0.65	0.57	47.0
Approach		1268	5.0	1268	5.0	0.645	9.8	LOS A	9.9	72.6	0.49	0.57	48.0
East: Westbound Freeway Ramps													
4	L2	242	5.0	242	5.0	0.187	6.5	LOS A	1.0	7.1	0.23	0.61	49.5
5	T1	137	5.0	137	5.0	0.457	35.3	LOS D	2.6	19.0	0.99	0.75	38.1
6	R2	105	5.0	105	5.0	0.342	40.7	LOS D	1.8	13.4	0.98	0.74	35.5
Approach		484	5.0	484	5.0	0.457	22.0	LOS C	2.6	19.0	0.61	0.68	40.4
North: Hopkins Rd (north)													
8	T1	646	5.0	646	5.0	0.307	1.4	LOS A	1.1	8.0	0.11	0.09	57.4
9	R2	166	5.0	166	5.0	0.588	41.7	LOS D	3.3	23.8	1.00	0.78	35.3
Approach		813	5.0	813	5.0	0.588	9.7	LOS A	3.3	23.8	0.29	0.23	47.4
West: Meskos Rd Site Access													
10	L2	38	5.0	38	5.0	0.057	20.8	LOS C	0.4	2.8	0.85	0.68	44.3
12	R2	26	5.0	26	5.0	0.073	37.9	LOS D	0.4	3.1	0.93	0.68	27.1
Approach		64	5.0	64	5.0	0.073	27.8	LOS C	0.4	3.1	0.88	0.68	38.0
All Vehicles		2629	5.0	2629	5.0	0.645	12.4	LOS B	9.9	72.6	0.46	0.49	45.7

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	29.3	LOS C	0.1	0.1	0.92	0.92
P12	South Stage 2	53	29.3	LOS C	0.1	0.1	0.92	0.92
P2	East Full Crossing	53	4.8	LOS A	0.0	0.0	0.37	0.37
P31	North Stage 1	53	29.3	LOS C	0.1	0.1	0.92	0.92
P32	North Stage 2	53	29.3	LOS C	0.1	0.1	0.92	0.92
P41	West Stage 1	53	14.5	LOS B	0.1	0.1	0.64	0.64
P42	West Stage 2	53	14.5	LOS B	0.1	0.1	0.64	0.64
P4S	West Slip/Bypass Lane Crossing	53	6.0	LOS A	0.0	0.0	0.59	0.59
All Pedestrians		421	19.6	LOS B			0.74	0.74

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.

PHASING SUMMARY

Site: 1 [PM Peak - 2026 Interim North Intersection - 80,000m2 Retail/Bulky Goods]

Network: N101 [PM Interim - 80,000m2 Retail/Bulky Goods]

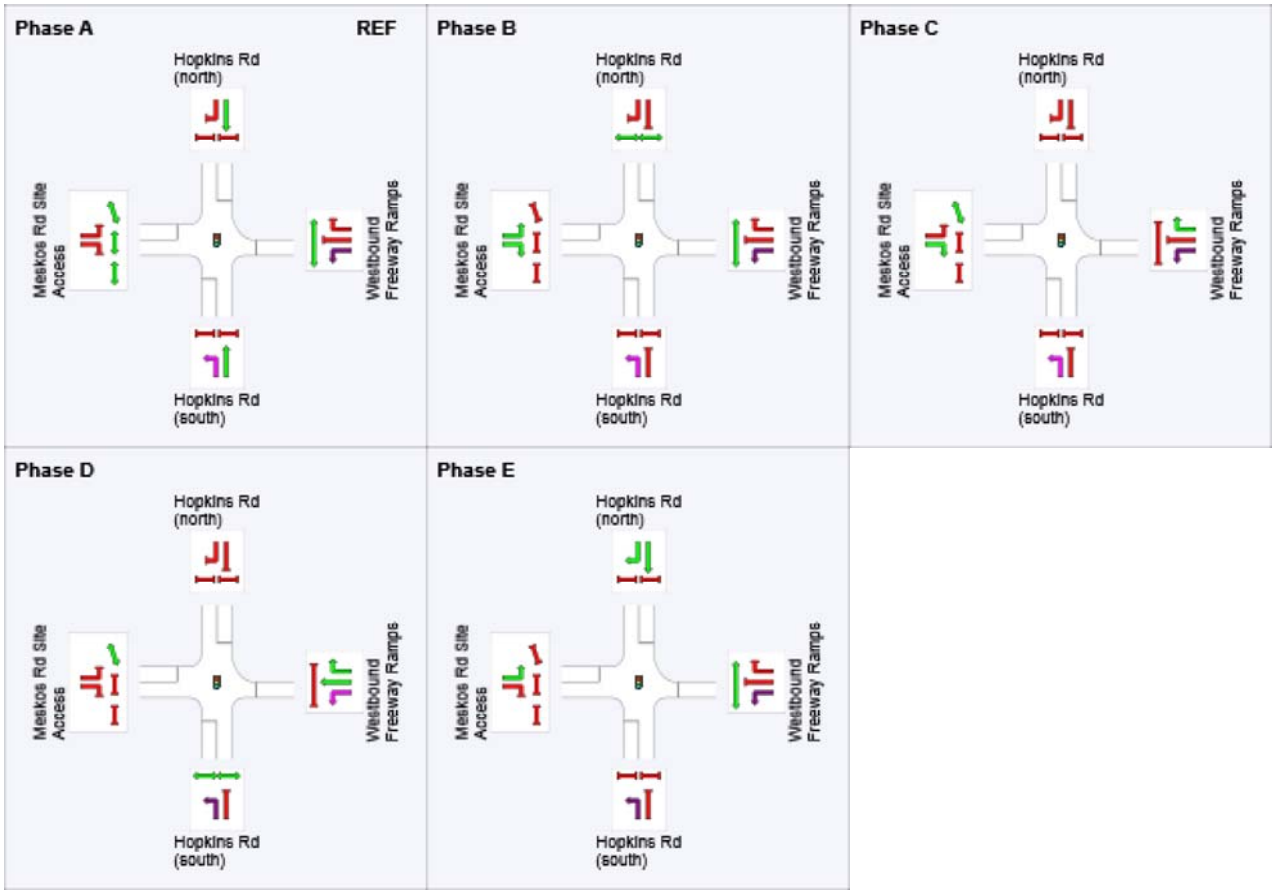
New Site
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Cycle Time - Program)

Phase times determined by the program
Sequence: Variable Phasing
Movement Class: All Movement Classes
Input Sequence: A, B, C, D, E
Output Sequence: A, B, C, D, E

Phase Timing Results

Phase	A	B	C	D	E
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	0	29	43	44	62
Green Time (sec)	23	8	***	12	12
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	29	14	1	18	18
Phase Split	36%	18%	1%	23%	23%

*** No green time has been calculated for this phase because the next phase starts during its intergreen time.
This occurs with overlap phasing where there is no single movement connecting this phase to the next, or where the only such movement is a dummy movement with zero minimum green time specified.
If a green time is required for this phase, specify a dummy movement with a non-zero minimum green time.



Normal Movement
Permitted/Opposed
Slip/Bypass-Lane Movement
Opposed Slip/Bypass-Lane
Stopped Movement
Turn On Red
Other Movement Class Running
Other Movement Class Stopped
Mixed Running & Stopped Movement Classes

MOVEMENT SUMMARY

Site: 1 [PM Peak - 2026 Interim North Intersection - 80,000m2 Retail/Bulky Goods]

Network: N101 [PM Interim - 80,000m2 Retail/Bulky Goods]

New Site
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Cycle Time - Program)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins Rd (south)													
1	L2	580	5.0	580	5.0	0.518	8.9	LOS A	5.6	41.0	0.31	0.65	48.0
2	T1	931	5.0	931	5.0	0.857	25.6	LOS C	17.8	129.8	0.94	0.91	36.7
Approach		1511	5.0	1511	5.0	0.857	19.2	LOS B	17.8	129.8	0.70	0.81	40.4
East: Westbound Freeway Ramps													
4	L2	848	5.0	848	5.0	0.725	9.9	LOS A	14.6	106.2	0.63	0.77	45.4
5	T1	427	5.0	427	5.0	0.815	39.6	LOS D	9.9	72.1	1.00	0.92	36.5
6	R2	421	5.0	421	5.0	0.722	43.1	LOS D	8.4	61.7	1.00	0.88	34.7
Approach		1697	5.0	1697	5.0	0.815	25.6	LOS C	14.6	106.2	0.81	0.83	38.4
North: Hopkins Rd (north)													
8	T1	752	5.0	752	5.0	0.388	3.8	LOS A	3.2	23.3	0.23	0.20	53.5
9	R2	400	5.0	400	5.0	0.808	45.1	LOS D	9.3	67.7	1.00	0.90	34.1
Approach		1152	5.0	1152	5.0	0.808	18.2	LOS B	9.3	67.7	0.50	0.45	41.5
West: Meskos Rd Site Access													
10	L2	475	5.0	475	5.0	0.529	21.0	LOS C	5.1	36.9	0.91	0.80	44.1
12	R2	333	5.0	333	5.0	0.824	49.9	LOS D	7.3	53.2	1.00	0.95	23.0
Approach		807	5.0	807	5.0	0.824	32.9	LOS C	7.3	53.2	0.95	0.86	35.6
All Vehicles		5166	5.0	5166	5.0	0.857	23.2	LOS C	17.8	129.8	0.73	0.74	39.0

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

Movement Performance - Pedestrians

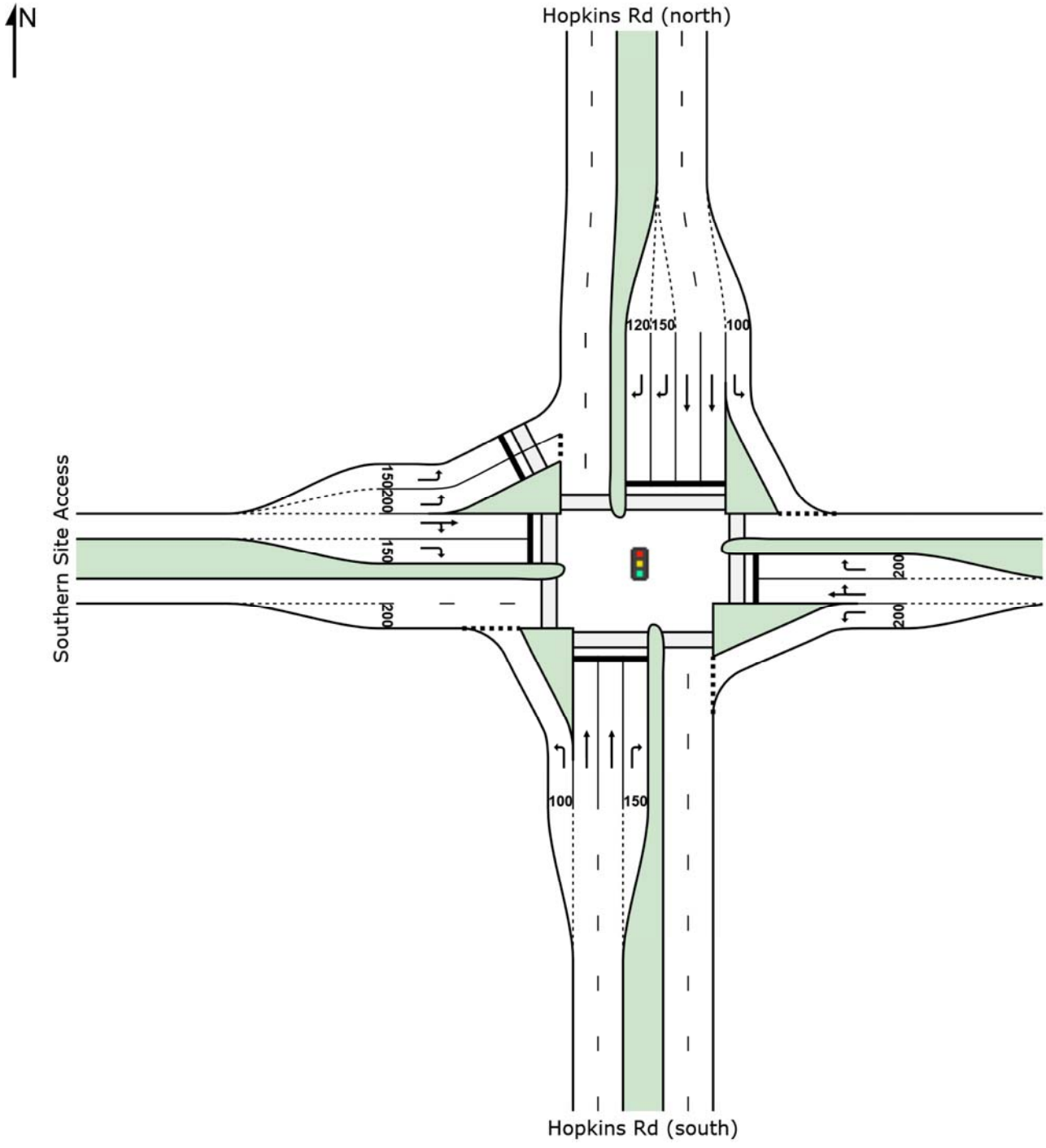
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	30.7	LOS D	0.1	0.1	0.88	0.88
P12	South Stage 2	53	30.7	LOS D	0.1	0.1	0.88	0.88
P2	East Full Crossing	53	6.8	LOS A	0.0	0.0	0.41	0.41
P31	North Stage 1	53	34.3	LOS D	0.1	0.1	0.93	0.93
P32	North Stage 2	53	34.3	LOS D	0.1	0.1	0.93	0.93
P41	West Stage 1	53	21.8	LOS C	0.1	0.1	0.74	0.74
P42	West Stage 2	53	21.8	LOS C	0.1	0.1	0.74	0.74
P4S	West Slip/Bypass Lane Crossing	53	7.7	LOS A	0.0	0.0	0.61	0.61
All Pedestrians		421	23.5	LOS C			0.76	0.76

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.

SITE LAYOUT

Site: 1 [PM Peak - 2026 Interim, South Intersection - 80,000m2 Retail/Bulky Goods]

New Site
Signals - Fixed Time Coordinated



PHASING SUMMARY

Site: 1 [AM Peak - 2026 Interim, South Intersection - 80,000m2 Retail/Bulky Goods]

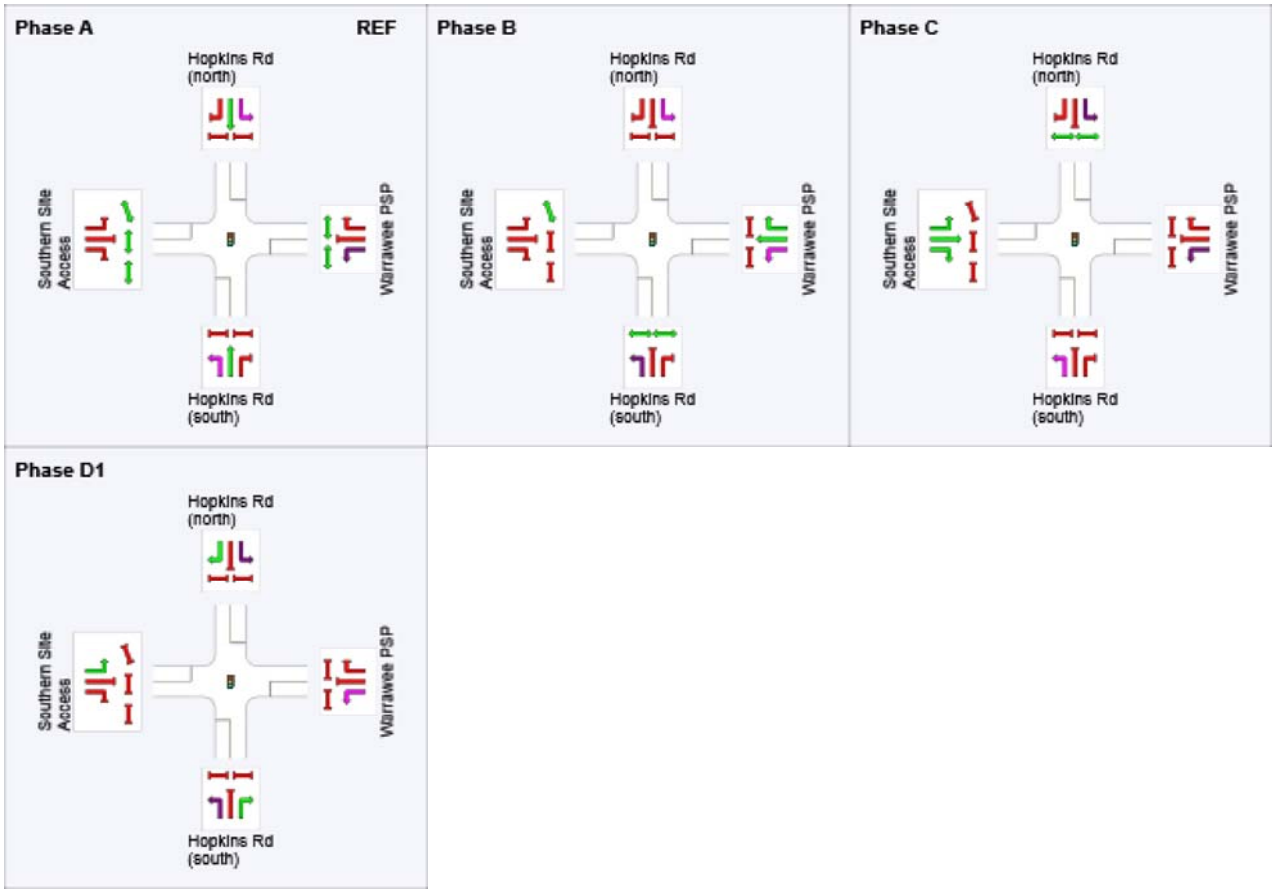
Network: N101 [AM Interim - 80,000m2 Retail/Bulky Goods]

New Site
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Cycle Time - Program)

Phase times determined by the program
Sequence: Variable Phasing (phase reduction applied)
Movement Class: All Movement Classes
Input Sequence: A, B, C, D1, D3
Output Sequence: A, B, C, D1

Phase Timing Results

Phase	A	B	C	D1
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	0	34	46	58
Green Time (sec)	28	6	6	6
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	34	12	12	12
Phase Split	49%	17%	17%	17%



MOVEMENT SUMMARY

Site: 1 [AM Peak - 2026 Interim, South Intersection - 80,000m2 Retail/Bulky Goods]

Network: N101 [AM Interim - 80,000m2 Retail/Bulky Goods]

New Site
Signals - Fixed Time Coordinated Cycle Time = 70 seconds (Network Cycle Time - Program)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins Rd (south)													
1	L2	106	5.0	106	5.0	0.074	6.4	LOS A	0.4	2.8	0.21	0.60	53.4
2	T1	1198	5.0	1198	5.0	0.793	12.8	LOS B	15.5	113.2	0.76	0.71	42.6
3	R2	21	5.0	21	5.0	0.137	39.6	LOS D	0.7	5.2	0.95	0.70	35.8
Approach		1325	5.0	1325	5.0	0.793	12.7	LOS B	15.5	113.2	0.72	0.70	43.6
East: Warrawee PSP													
4	L2	21	5.0	21	5.0	0.021	7.1	LOS A	0.1	0.9	0.27	0.60	52.9
5	T1	21	5.0	21	5.0	0.134	33.9	LOS C	0.7	5.3	0.95	0.67	38.7
6	R2	21	5.0	21	5.0	0.134	39.6	LOS D	0.7	5.3	0.95	0.70	26.6
Approach		63	5.0	63	5.0	0.134	26.9	LOS C	0.7	5.3	0.73	0.66	39.2
North: Hopkins Rd (north)													
7	L2	21	5.0	21	5.0	0.014	6.0	LOS A	0.0	0.2	0.09	0.56	51.0
8	T1	697	5.0	697	5.0	0.461	9.3	LOS A	5.8	42.3	0.51	0.44	48.7
9	R2	61	5.0	61	5.0	0.199	42.5	LOS D	1.1	8.0	1.00	0.72	28.8
Approach		779	5.0	779	5.0	0.461	11.8	LOS B	5.8	42.3	0.54	0.47	46.3
West: Southern Site Access													
10	L2	49	5.0	49	5.0	0.054	26.9	LOS C	0.6	4.7	0.78	0.69	32.3
11	T1	21	5.0	21	5.0	0.151	34.0	LOS C	0.8	6.0	0.96	0.68	38.4
12	R2	26	5.0	26	5.0	0.151	39.7	LOS D	0.8	6.0	0.96	0.70	36.2
Approach		97	5.0	97	5.0	0.151	31.9	LOS C	0.8	6.0	0.87	0.69	35.3
All Vehicles		2264	5.0	2264	5.0	0.793	13.6	LOS B	15.5	113.2	0.66	0.62	43.8

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	29.3	LOS C	0.1	0.1	0.92	0.92
P12	South Stage 2	53	29.3	LOS C	0.1	0.1	0.92	0.92
P21	East Stage 1	53	13.9	LOS B	0.1	0.1	0.63	0.63
P22	East Stage 2	53	12.6	LOS B	0.1	0.1	0.60	0.60
P31	North Stage 1	53	29.3	LOS C	0.1	0.1	0.92	0.92
P32	North Stage 2	53	29.3	LOS C	0.1	0.1	0.92	0.92
P41	West Stage 1	53	13.9	LOS B	0.1	0.1	0.63	0.63
P42	West Stage 2	53	13.9	LOS B	0.1	0.1	0.63	0.63
P4S	West Slip/Bypass Lane Crossing	53	7.3	LOS A	0.0	0.0	0.46	0.46

PHASING SUMMARY

Site: 1 [PM Peak - 2026 Interim, South Intersection - 80,000m2 Retail/Bulky Goods]

Network: N101 [PM Interim - 80,000m2 Retail/Bulky Goods]

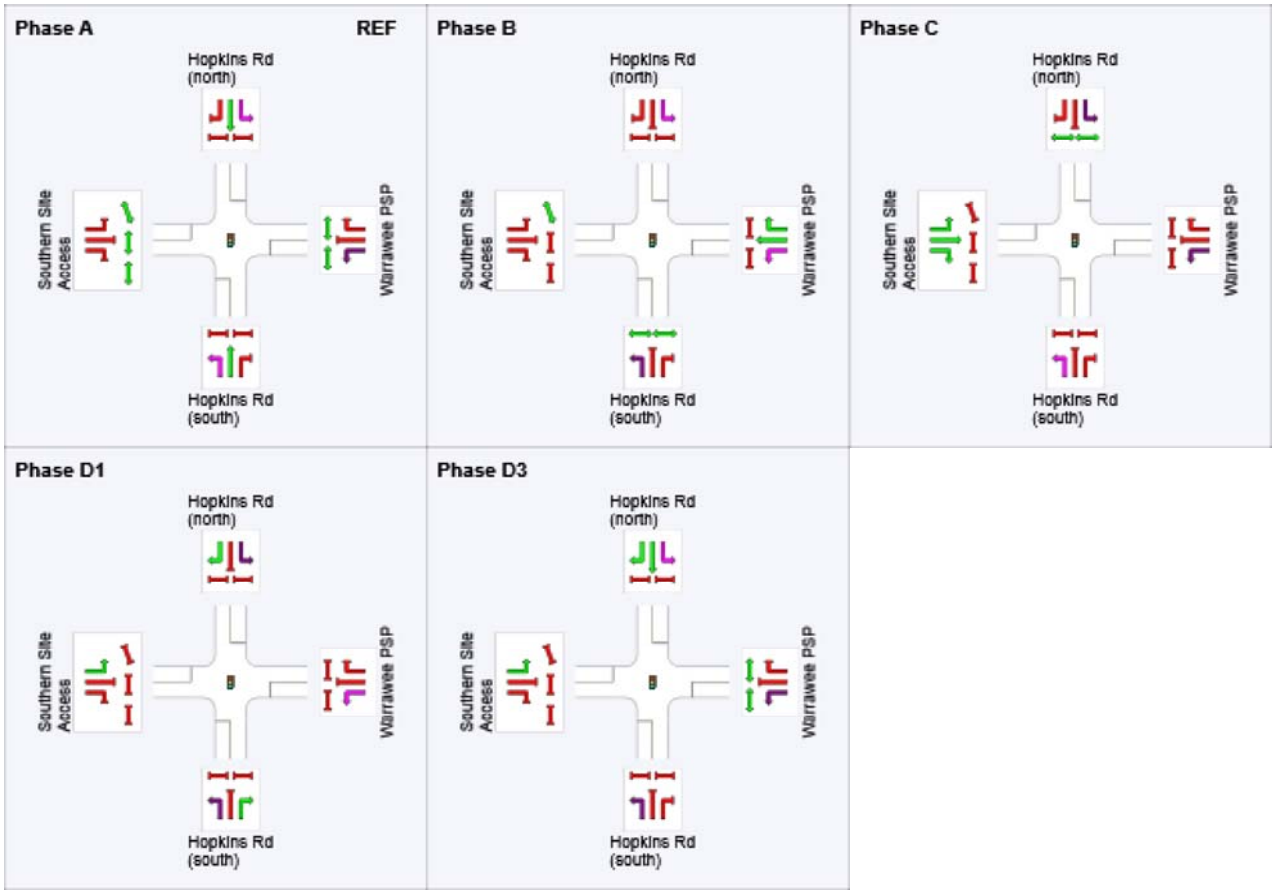
New Site
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Cycle Time - Program)

Phase times determined by the program
Sequence: Variable Phasing
Movement Class: All Movement Classes
Input Sequence: A, B, C, D1, D3
Output Sequence: A, B, C, D1, D3

Phase Timing Results

Phase	A	B	C	D1	D3
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	0	39	51	67	79
Green Time (sec)	33	6	10	6	***
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	39	12	16	12	1
Phase Split	49%	15%	20%	15%	1%

*** No green time has been calculated for this phase because the next phase starts during its intergreen time.
This occurs with overlap phasing where there is no single movement connecting this phase to the next, or where the only such movement is a dummy movement with zero minimum green time specified.
If a green time is required for this phase, specify a dummy movement with a non-zero minimum green time.



MOVEMENT SUMMARY

Site: 1 [PM Peak - 2026 Interim, South Intersection - 80,000m2 Retail/Bulky Goods]

Network: N101 [PM Interim - 80,000m2 Retail/Bulky Goods]

New Site
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Cycle Time - Program)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins Rd (south)													
1	L2	333	5.0	333	5.0	0.234	7.0	LOS A	2.2	16.1	0.28	0.63	53.0
2	T1	873	5.0	873	5.0	0.560	10.3	LOS B	8.7	63.6	0.54	0.47	45.1
3	R2	21	5.0	21	5.0	0.157	45.4	LOS D	0.8	6.0	0.97	0.70	33.9
Approach		1226	5.0	1226	5.0	0.560	10.0	LOS B	8.7	63.6	0.48	0.52	47.7
East: Warrawee PSP													
4	L2	21	5.0	21	5.0	0.031	12.9	LOS B	0.3	2.4	0.50	0.64	48.8
5	T1	21	5.0	21	5.0	0.153	39.6	LOS D	0.8	6.1	0.97	0.68	36.5
6	R2	21	5.0	21	5.0	0.153	45.4	LOS D	0.8	6.1	0.97	0.70	24.6
Approach		63	5.0	63	5.0	0.153	32.7	LOS C	0.8	6.1	0.81	0.67	36.6
North: Hopkins Rd (north)													
7	L2	21	5.0	21	5.0	0.014	6.2	LOS A	0.1	0.5	0.17	0.58	50.6
8	T1	1294	5.0	1294	5.0	0.806	12.8	LOS B	18.3	133.4	0.73	0.69	45.5
9	R2	189	5.0	189	5.0	0.604	49.5	LOS D	4.0	28.9	1.00	0.79	26.6
Approach		1504	5.0	1504	5.0	0.806	17.3	LOS B	18.3	133.4	0.76	0.70	41.8
West: Southern Site Access													
10	L2	617	5.0	617	5.0	0.598	32.6	LOS C	10.6	77.2	0.91	0.82	29.5
11	T1	21	5.0	21	5.0	0.787	41.9	LOS D	7.5	55.0	1.00	0.93	34.0
12	R2	333	5.0	333	5.0	0.787	47.6	LOS D	7.5	55.0	1.00	0.93	33.5
Approach		971	5.0	971	5.0	0.787	37.9	LOS D	10.6	77.2	0.95	0.86	31.5
All Vehicles		3764	5.0	3764	5.0	0.806	20.5	LOS C	18.3	133.4	0.72	0.68	39.8

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

Movement Performance - Pedestrians

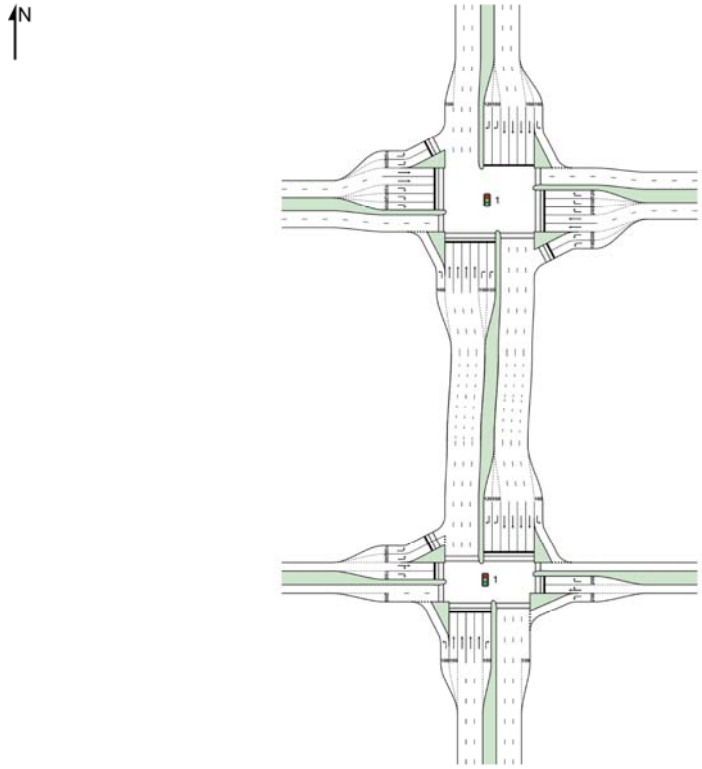
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	34.3	LOS D	0.1	0.1	0.93	0.93
P12	South Stage 2	53	34.3	LOS D	0.1	0.1	0.93	0.93
P21	East Stage 1	53	14.4	LOS B	0.1	0.1	0.60	0.60
P22	East Stage 2	53	13.3	LOS B	0.1	0.1	0.58	0.58
P31	North Stage 1	53	34.3	LOS D	0.1	0.1	0.93	0.93
P32	North Stage 2	53	30.7	LOS D	0.1	0.1	0.88	0.88
P41	West Stage 1	53	15.0	LOS B	0.1	0.1	0.61	0.61
P42	West Stage 2	53	15.0	LOS B	0.1	0.1	0.61	0.61
P4S	West Slip/Bypass Lane Crossing	53	8.6	LOS A	0.1	0.1	0.46	0.46

Appendix D:
SIDRA Outputs - 2046

NETWORK LAYOUT

Network: N101 [PM Ultimate Network]

New Network

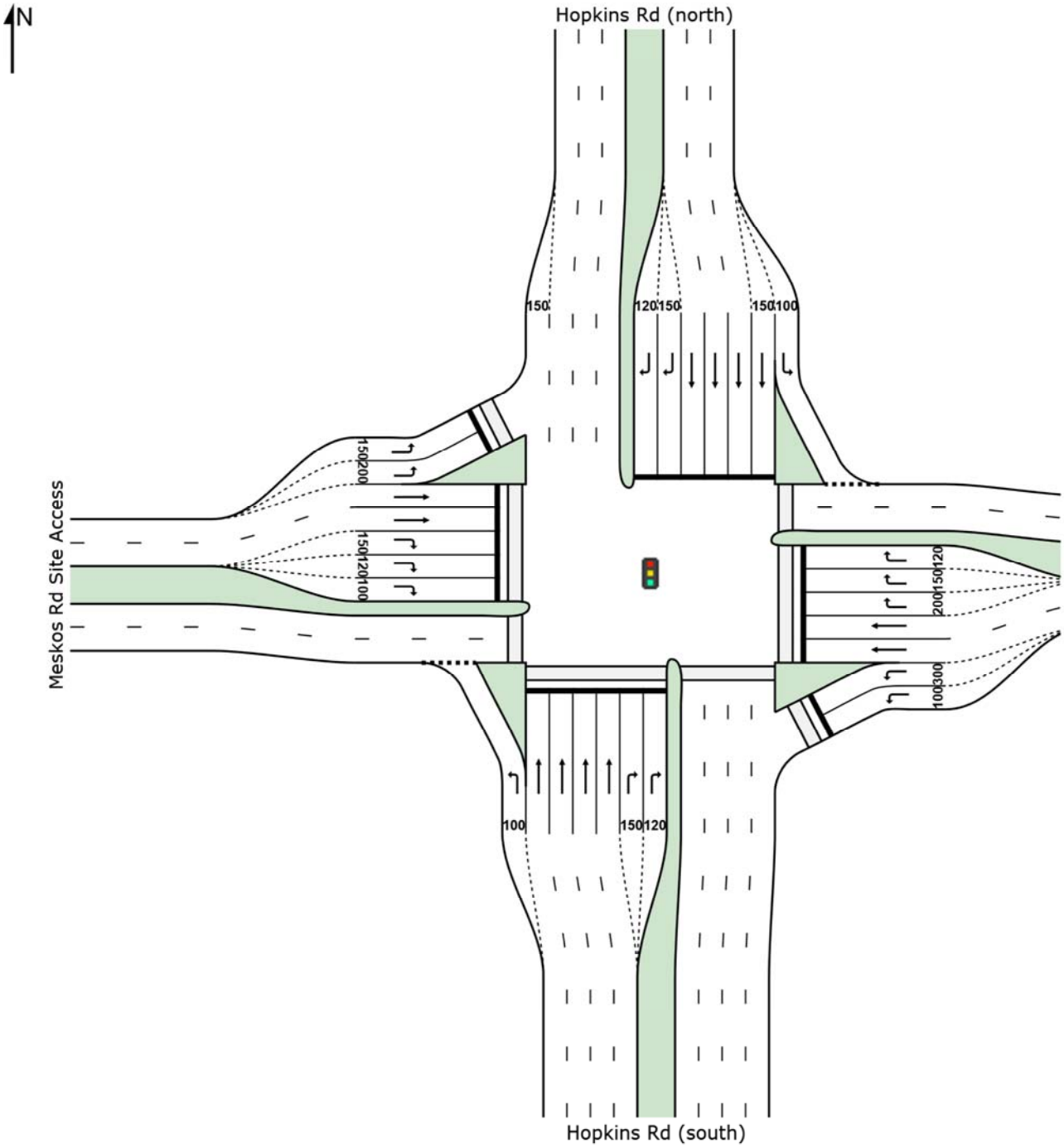


SITES IN NETWORK	
Site ID	**Site Name**
1	PM Peak - Ultimate Development, North Intersection - 4 lane
1	PM Peak - Ultimate Development, South Intersection - 4 lane

SITE LAYOUT

Site: 1 [PM Peak - Ultimate Development, North Intersection - 4 lane]

New Site
Signals - Fixed Time Coordinated



PHASING SUMMARY

Site: 1 [AM Peak - Ultimate Development, North Intersection - 4 lane]

Network: N101 [AM Ultimate Network]

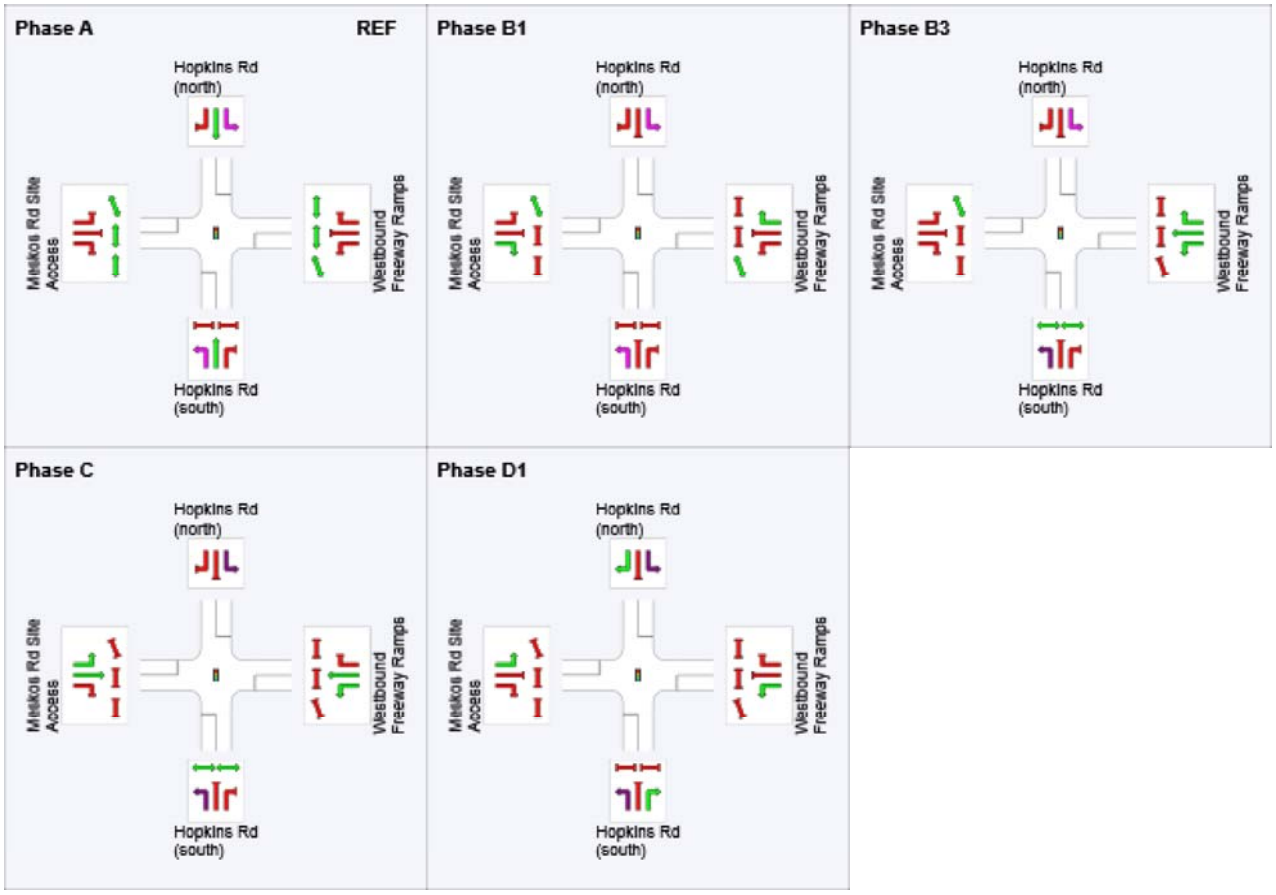
New Site
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Cycle Time - Program)

Phase times determined by the program
Sequence: Variable Phasing
Movement Class: All Movement Classes
Input Sequence: A, B1, B3, C, D1
Output Sequence: A, B1, B3, C, D1

Phase Timing Results

Phase	A	B1	B3	C	D1
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	0	36	48	54	66
Green Time (sec)	30	6	***	6	8
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	36	12	6	12	14
Phase Split	45%	15%	8%	15%	18%

*** No green time has been calculated for this phase because the next phase starts during its intergreen time.
This occurs with overlap phasing where there is no single movement connecting this phase to the next, or where the only such movement is a dummy movement with zero minimum green time specified.
If a green time is required for this phase, specify a dummy movement with a non-zero minimum green time.



MOVEMENT SUMMARY

Site: 1 [AM Peak - Ultimate Development, North Intersection - 4 lane]

Network: N101 [AM Ultimate Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Cycle Time - Program)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins Rd (south)													
1	L2	325	5.0	325	5.0	0.259	7.3	LOS A	1.8	13.2	0.19	0.61	50.0
2	T1	2288	5.0	2288	5.0	0.827	16.8	LOS B	19.2	140.4	0.82	0.77	43.1
3	R2	245	5.0	245	5.0	0.684	49.9	LOS D	5.1	37.6	1.00	0.82	27.8
Approach		2859	5.0	2859	5.0	0.827	18.6	LOS B	19.2	140.4	0.76	0.75	41.7
East: Westbound Freeway Ramps													
4	L2	944	5.0	944	5.0	0.810	37.3	LOS D	18.9	138.1	0.98	0.94	27.5
5	T1	418	5.0	418	5.0	0.738	38.5	LOS D	8.5	61.9	1.00	0.89	37.1
6	R2	211	5.0	211	5.0	0.261	39.3	LOS D	2.5	18.4	0.92	0.75	36.6
Approach		1573	5.0	1573	5.0	0.810	37.9	LOS D	18.9	138.1	0.98	0.90	32.2
North: Hopkins Rd (north)													
7	L2	211	5.0	211	5.0	0.152	7.1	LOS A	1.5	10.7	0.27	0.62	52.9
8	T1	2359	5.0	2359	5.0	0.833	17.7	LOS B	19.6	142.9	0.84	0.80	38.7
9	R2	186	5.0	186	5.0	0.519	44.9	LOS D	3.7	26.9	0.99	0.77	34.8
Approach		2756	5.0	2756	5.0	0.833	18.7	LOS B	19.6	142.9	0.81	0.79	39.5
West: Meskos Rd Site Access													
10	L2	116	5.0	116	5.0	0.139	31.0	LOS C	1.9	14.0	0.81	0.73	39.4
11	T1	35	5.0	35	5.0	0.123	39.4	LOS D	0.7	4.9	0.96	0.67	36.8
12	R2	81	5.0	81	5.0	0.201	45.7	LOS D	1.1	7.7	0.97	0.71	24.7
Approach		232	5.0	232	5.0	0.201	37.4	LOS D	1.9	14.0	0.89	0.71	34.5
All Vehicles		7419	5.0	7419	5.0	0.833	23.3	LOS C	19.6	142.9	0.83	0.79	38.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	34.3	LOS D	0.1	0.1	0.93	0.93
P12	South Stage 2	53	34.3	LOS D	0.1	0.1	0.93	0.93
P21	East Stage 1	53	22.5	LOS C	0.1	0.1	0.75	0.75
P22	East Stage 2	53	16.9	LOS B	0.1	0.1	0.65	0.65
P2S	East Slip/Bypass Lane Crossing	53	10.0	LOS B	0.1	0.1	0.50	0.50
P41	West Stage 1	53	22.5	LOS C	0.1	0.1	0.75	0.75
P42	West Stage 2	53	16.9	LOS B	0.1	0.1	0.65	0.65
P4S	West Slip/Bypass Lane Crossing	53	7.2	LOS A	0.1	0.1	0.43	0.43

PHASING SUMMARY

Site: 1 [PM Peak - Ultimate Development, North Intersection - 4 lane]

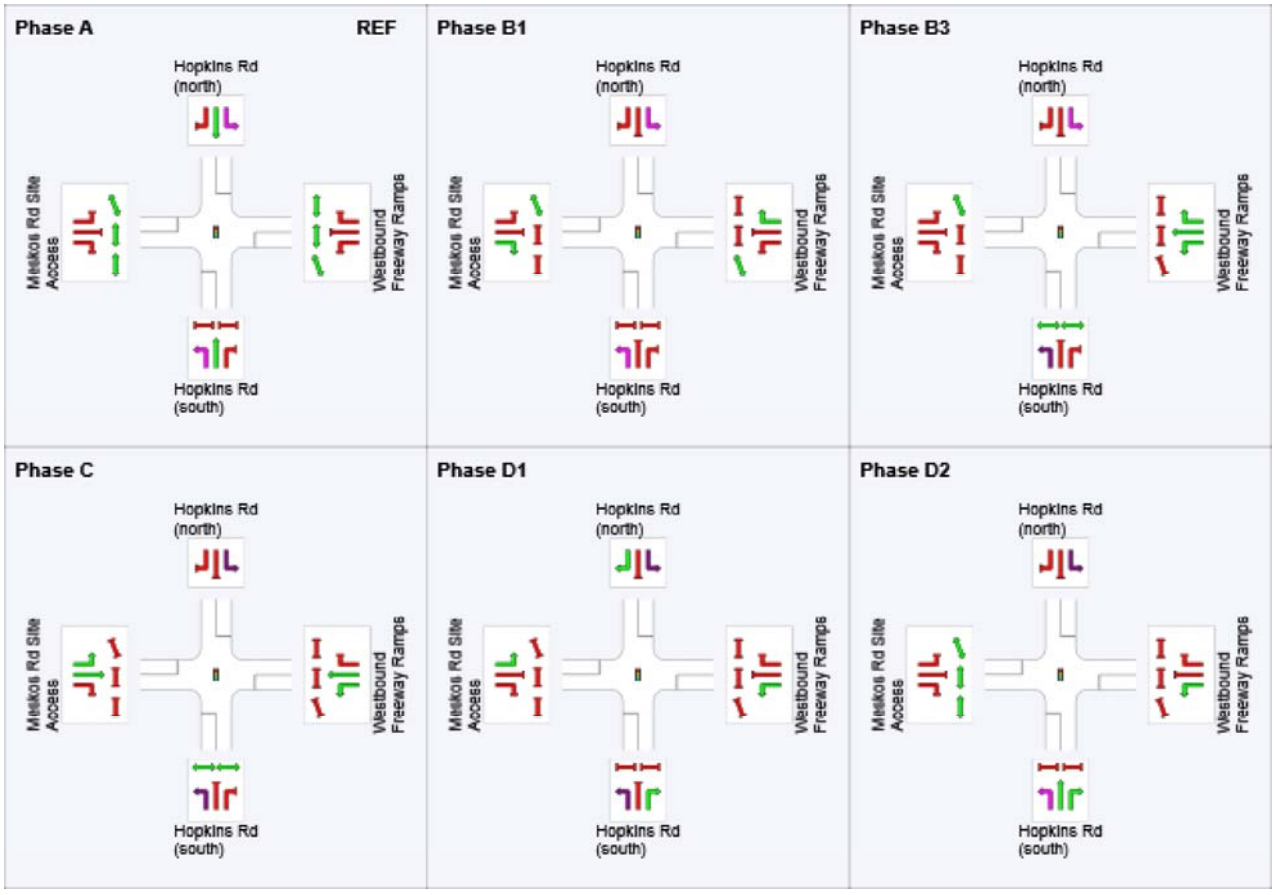
Network: N101 [PM Ultimate Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 145 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Variable Phasing
Movement Class: All Movement Classes
Input Sequence: A, B1, B3, C, D1, D2
Output Sequence: A, B1, B3, C, D1, D2

Phase Timing Results

Phase	A	B1	B3	C	D1	D2
Reference Phase	Yes	No	No	No	No	No
Phase Change Time (sec)	0	60	82	90	106	133
Green Time (sec)	54	16	2	10	21	6
Yellow Time (sec)	4	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2	2
Phase Time (sec)	60	22	8	16	27	12
Phase Split	41%	15%	6%	11%	19%	8%



Normal Movement
Slip/Bypass-Lane Movement
Stopped Movement
Other Movement Class Running
Mixed Running & Stopped Movement Classes
Undetected Movement
Permitted/Opposed
Opposed Slip/Bypass-Lane
Turn On Red
Other Movement Class Stopped
Phase Transition Applied

MOVEMENT SUMMARY

Site: 1 [PM Peak - Ultimate Development, North Intersection - 4 lane]

Network: N101 [PM Ultimate Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 145 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins Rd (south)													
1	L2	360	5.0	360	5.0	0.274	11.4	LOS B	8.8	64.5	0.42	0.68	46.3
2	T1	2943	5.0	2943	5.0	0.877	7.5	LOS A	24.5	178.6	0.45	0.42	51.1
3	R2	669	5.0	669	5.0	0.820	75.1	LOS E	24.0	175.5	1.00	0.89	21.8
Approach		3973	5.0	3973	5.0	0.877	19.2	LOS B	24.5	178.6	0.54	0.52	41.3
East: Westbound Freeway Ramps													
4	L2	778	5.0	778	5.0	0.552	42.0	LOS D	21.1	154.0	0.83	0.82	25.7
5	T1	462	5.0	462	5.0	0.986	106.4	LOS F	21.4	156.5	1.00	1.17	22.2
6	R2	842	5.0	842	5.0	0.946	95.2	LOS F	24.2	177.0	1.00	1.05	23.6
Approach		2082	5.0	2082	5.0	0.986	77.8	LOS E	24.2	177.0	0.94	0.99	23.6
North: Hopkins Rd (north)													
7	L2	526	5.0	526	5.0	0.444	17.0	LOS B	15.1	109.9	0.51	0.77	46.4
8	T1	2129	5.0	2129	5.0	0.757	17.2	LOS B	21.8	159.3	0.63	0.56	39.0
9	R2	205	5.0	205	5.0	0.395	67.1	LOS E	6.7	48.8	0.95	0.78	28.8
Approach		2861	5.0	2861	5.0	0.757	20.8	LOS C	21.8	159.3	0.63	0.62	39.2
West: Meskos Rd Site Access													
10	L2	826	5.0	826	5.0	0.974	84.7	LOS F	41.4	302.4	1.00	1.00	25.0
11	T1	248	5.0	248	5.0	0.954	96.2	LOS F	10.6	77.7	1.00	1.06	23.6
12	R2	579	5.0	579	5.0	0.975	108.8	LOS F	17.5	127.9	1.00	1.11	13.6
Approach		1654	5.0	1654	5.0	0.975	94.9	LOS F	41.4	302.4	1.00	1.05	21.0
All Vehicles		10569	5.0	10569	5.0	0.986	43.0	LOS D	41.4	302.4	0.72	0.72	30.5

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

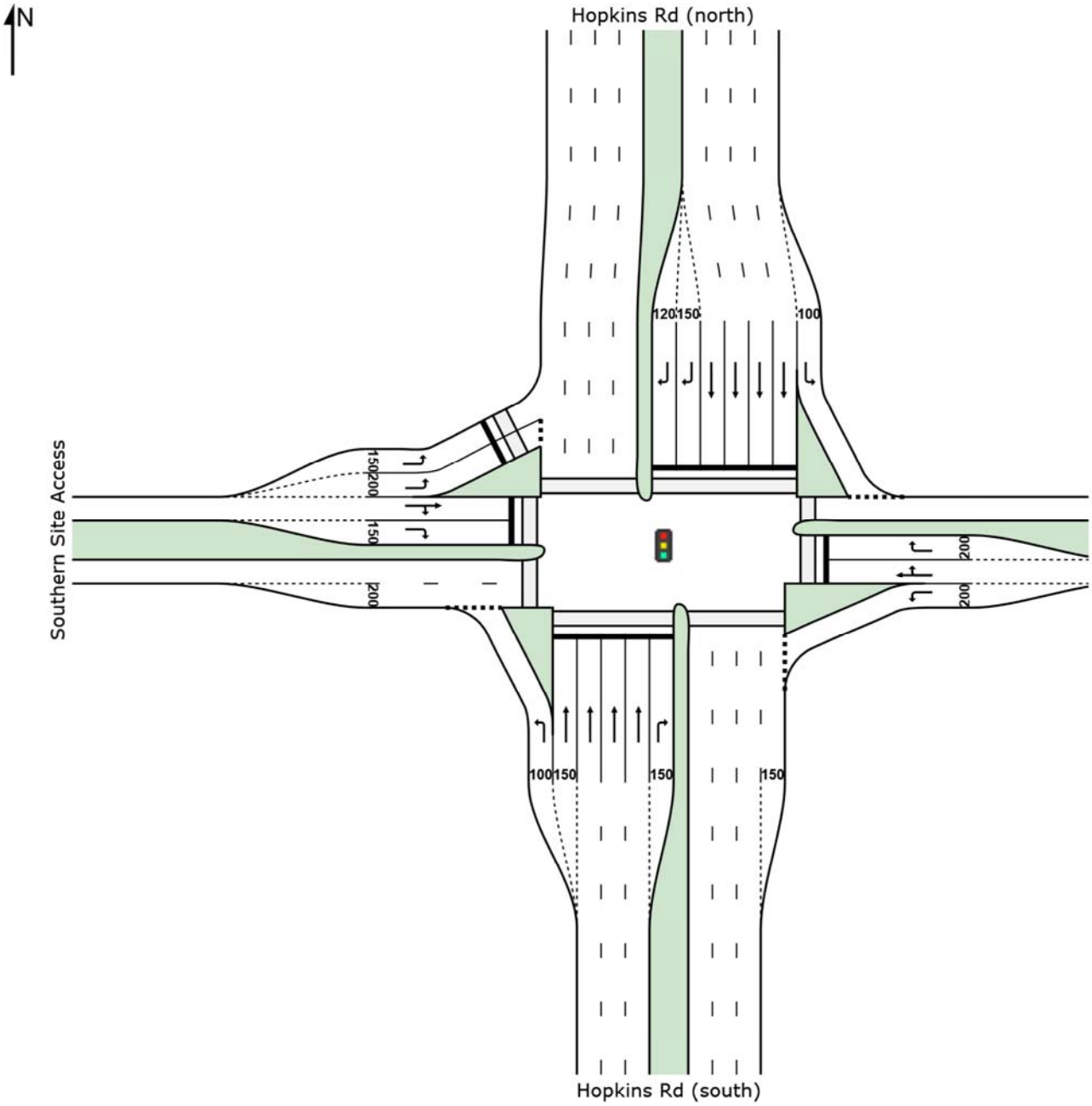
Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	66.8	LOS F	0.2	0.2	0.96	0.96
P12	South Stage 2	53	63.9	LOS F	0.2	0.2	0.94	0.94
P21	East Stage 1	53	36.7	LOS D	0.2	0.2	0.71	0.71
P22	East Stage 2	53	31.2	LOS D	0.1	0.1	0.66	0.66
P2S	East Slip/Bypass Lane Crossing	53	18.4	LOS B	0.1	0.1	0.50	0.50
P41	West Stage 1	53	28.6	LOS C	0.1	0.1	0.63	0.63
P42	West Stage 2	53	23.8	LOS C	0.1	0.1	0.57	0.57
P4S	West Slip/Bypass Lane Crossing	53	9.7	LOS A	0.1	0.1	0.37	0.37

SITE LAYOUT

Site: 1 [PM Peak - Ultimate Development, South Intersection - 4 lane]

New Site
Signals - Fixed Time Coordinated



PHASING SUMMARY

Site: 1 [AM Peak - Ultimate Development, South Intersection - 4 lane]

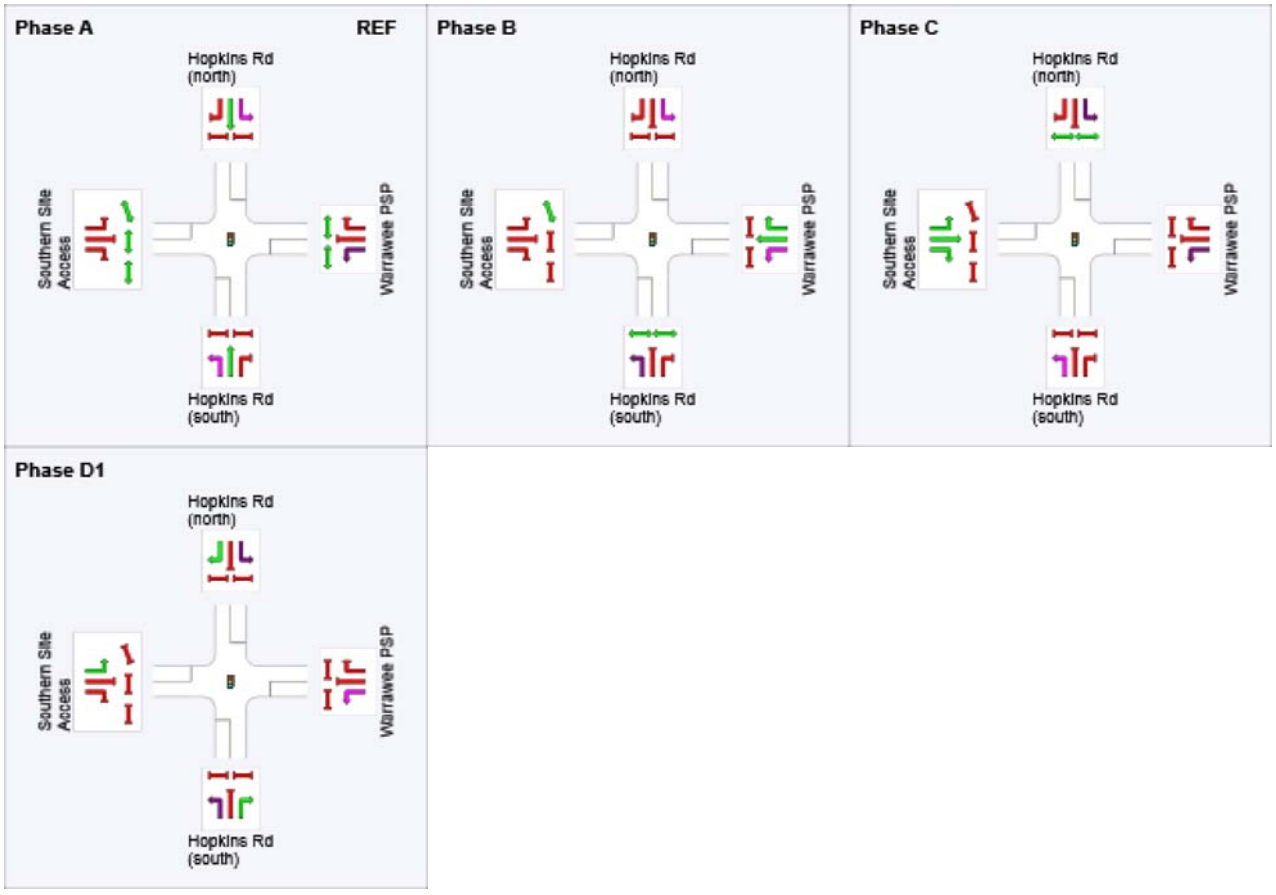
Network: N101 [AM Ultimate Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Cycle Time - Program)

Phase times determined by the program
Sequence: Variable Phasing (phase reduction applied)
Movement Class: All Movement Classes
Input Sequence: A, B, C, D1, D3
Output Sequence: A, B, C, D1

Phase Timing Results

Phase	A	B	C	D1
Reference Phase	Yes	No	No	No
Phase Change Time (sec)	67	25	37	49
Green Time (sec)	32	6	6	12
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	38	12	12	18
Phase Split	48%	15%	15%	23%



MOVEMENT SUMMARY

Site: 1 [AM Peak - Ultimate Development, South Intersection - 4 lane]

Network: N101 [AM Ultimate Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 80 seconds (Network Cycle Time - Program)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins Rd (south)													
1	L2	325	5.0	325	5.0	0.232	6.8	LOS A	2.0	14.5	0.26	0.63	53.1
2	T1	2659	5.0	2659	5.0	0.880	18.8	LOS B	23.9	174.4	0.87	0.87	37.5
3	R2	239	5.0	239	5.0	0.888	53.2	LOS D	11.1	81.3	1.00	1.04	31.9
Approach		3223	5.0	3223	5.0	0.888	20.1	LOS C	23.9	174.4	0.82	0.86	38.6
East: Warrawee PSP													
4	L2	26	5.0	26	5.0	0.034	10.2	LOS B	0.3	2.4	0.41	0.63	50.6
5	T1	11	5.0	11	5.0	0.221	40.0	LOS D	1.2	8.6	0.97	0.71	35.2
6	R2	49	5.0	49	5.0	0.221	45.8	LOS D	1.2	8.6	0.97	0.71	24.9
Approach		86	5.0	86	5.0	0.221	34.2	LOS C	1.2	8.6	0.80	0.69	33.8
North: Hopkins Rd (north)													
7	L2	443	5.0	443	5.0	0.346	8.6	LOS A	5.5	40.5	0.44	0.68	48.6
8	T1	2337	5.0	2337	5.0	0.803	14.0	LOS B	18.1	132.0	0.75	0.69	45.1
9	R2	186	5.0	186	5.0	0.346	44.7	LOS D	3.7	27.1	1.00	0.78	28.9
Approach		2966	5.0	2966	5.0	0.803	15.1	LOS B	18.1	132.0	0.72	0.70	44.0
West: Southern Site Access													
10	L2	151	5.0	151	5.0	0.140	27.8	LOS C	2.2	15.8	0.77	0.73	31.8
11	T1	11	5.0	11	5.0	0.338	40.7	LOS D	1.8	13.4	0.98	0.73	34.7
12	R2	81	5.0	81	5.0	0.338	46.4	LOS D	1.8	13.4	0.98	0.73	34.2
Approach		242	5.0	242	5.0	0.338	34.6	LOS C	2.2	15.8	0.85	0.73	33.1
All Vehicles		6518	5.0	6518	5.0	0.888	18.6	LOS B	23.9	174.4	0.77	0.78	40.7

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	34.3	LOS D	0.1	0.1	0.93	0.93
P12	South Stage 2	53	34.3	LOS D	0.1	0.1	0.93	0.93
P21	East Stage 1	53	15.7	LOS B	0.1	0.1	0.63	0.63
P22	East Stage 2	53	14.4	LOS B	0.1	0.1	0.60	0.60
P31	North Stage 1	53	34.3	LOS D	0.1	0.1	0.93	0.93
P32	North Stage 2	53	34.3	LOS D	0.1	0.1	0.93	0.93
P41	West Stage 1	53	15.7	LOS B	0.1	0.1	0.63	0.63
P42	West Stage 2	53	15.7	LOS B	0.1	0.1	0.63	0.63
P4S	West Slip/Bypass Lane Crossing	53	9.0	LOS A	0.1	0.1	0.48	0.48

PHASING SUMMARY

Site: 1 [PM Peak - Ultimate Development, South Intersection - 4 lane]

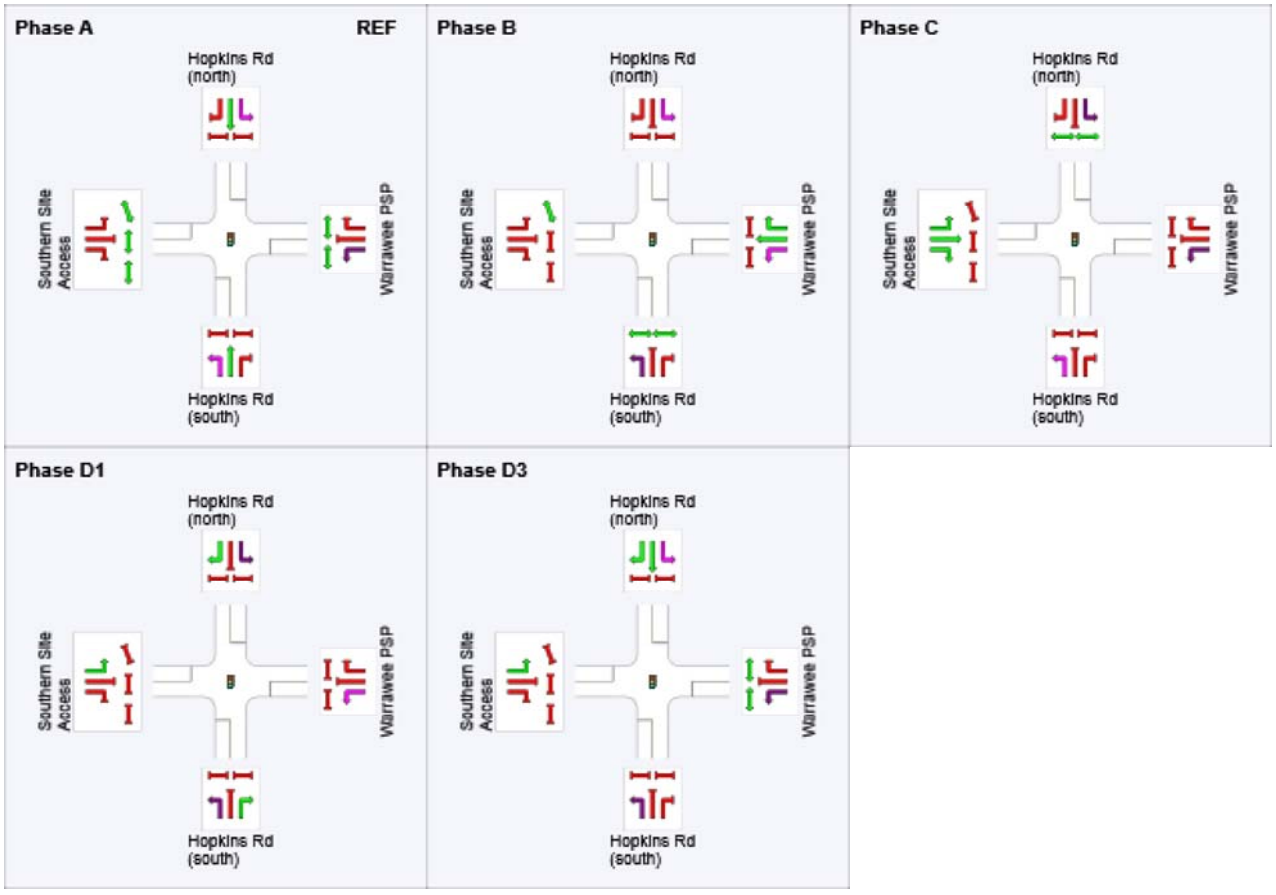
Network: N101 [PM Ultimate Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 145 seconds (User-Given Phase Times)

Phase times specified by the user
Sequence: Variable Phasing
Movement Class: All Movement Classes
Input Sequence: A, B, C, D1, D3
Output Sequence: A, B, C, D1, D3

Phase Timing Results

Phase	A	B	C	D1	D3
Reference Phase	Yes	No	No	No	No
Phase Change Time (sec)	119	38	64	97	109
Green Time (sec)	58	20	27	6	4
Yellow Time (sec)	4	4	4	4	4
All-Red Time (sec)	2	2	2	2	2
Phase Time (sec)	64	26	33	12	10
Phase Split	44%	18%	23%	8%	7%



MOVEMENT SUMMARY

Site: 1 [PM Peak - Ultimate Development, South Intersection - 4 lane]

Network: N101 [PM Ultimate Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 145 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins Rd (south)													
1	L2	360	5.0	360	5.0	0.242	6.9	LOS A	3.3	24.1	0.20	0.61	53.1
2	T1	2455	5.0	2455	5.0	0.899	54.9	LOS D	49.8	363.5	0.97	0.99	21.8
3	R2	26	5.0	26	5.0	0.355	83.5	LOS F	1.9	14.1	1.00	0.71	25.2
Approach		2841	5.0	2841	5.0	0.899	49.1	LOS D	49.8	363.5	0.87	0.94	25.1
East: Warrawee PSP													
4	L2	239	5.0	239	5.0	0.446	18.3	LOS B	9.1	66.6	0.61	0.76	45.6
5	T1	11	5.0	11	5.0	0.956	94.9	LOS F	20.7	145.0	1.00	1.08	22.9
6	R2	443	5.0	443	5.0	0.956	101.1	LOS F	20.7	145.0	1.00	1.08	14.4
Approach		693	5.0	693	5.0	0.956	72.4	LOS E	20.7	147.3	0.87	0.97	22.1
North: Hopkins Rd (north)													
7	L2	49	5.0	49	5.0	0.032	6.0	LOS A	0.2	1.4	0.10	0.57	51.3
8	T1	2769	5.0	2769	5.0	0.812	4.0	LOS A	13.1	95.3	0.26	0.24	54.8
9	R2	205	5.0	205	5.0	0.519	79.8	LOS E	7.4	54.0	1.00	0.79	20.7
Approach		3024	5.0	3024	5.0	0.812	9.2	LOS A	13.1	95.3	0.31	0.28	49.2
West: Southern Site Access													
10	L2	1075	5.0	1075	5.0	0.943	81.2	LOS F	47.1	344.1	1.00	1.02	16.7
11	T1	11	5.0	11	5.0	0.882	73.6	LOS E	23.0	167.6	1.00	0.97	26.3
12	R2	579	5.0	579	5.0	0.882	79.3	LOS E	23.0	167.6	1.00	0.97	26.2
Approach		1664	5.0	1664	5.0	0.943	80.5	LOS F	47.1	344.1	1.00	1.00	20.6
All Vehicles		8222	5.0	8222	5.0	0.956	42.7	LOS D	49.8	363.5	0.69	0.71	28.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
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SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	61.1	LOS F	0.2	0.2	0.92	0.92
P12	South Stage 2	53	58.4	LOS E	0.2	0.2	0.90	0.90
P21	East Stage 1	53	22.7	LOS C	0.1	0.1	0.56	0.56
P22	East Stage 2	53	21.6	LOS C	0.1	0.1	0.55	0.55
P31	North Stage 1	53	57.5	LOS E	0.2	0.2	0.89	0.89
P32	North Stage 2	53	52.3	LOS E	0.2	0.2	0.85	0.85
P41	West Stage 1	53	28.6	LOS C	0.1	0.1	0.63	0.63
P42	West Stage 2	53	28.6	LOS C	0.1	0.1	0.63	0.63
P4S	West Slip/Bypass Lane Crossing	53	14.6	LOS B	0.1	0.1	0.45	0.45