Melton Amendment C162 Mt Atkinson and Tarneit Plains PSP

Expert Evidence – Traffic and Transport

CG151009

Prepared for
VPA

2 September 2016

Cardno
Shaping the Future

1 Qualifications and Expertise

In accordance with the Guide to Expert Evidence prepared by Planning Panels Victoria, my qualifications and expertise to undertake this work are summarised below:-

Name:

Christopher James Butler

Address:

Cardno

Level 4, 501 Swanston Street

Melbourne Vic 3000

Professional Qualifications:

> Bachelor of Civil Engineering (Honours), University of Melbourne.

Professional Experience:

> Cardno Victoria 2007 – Present

> Grogan Richards Pty Ltd 1988 – 2007

> Road Traffic Authority and RJ Nairn and Partners Pty Ltd 1985 - 1988

Areas of Expertise:

> Car parking, traffic and transportation.

> Traffic advice and assessment of land uses and development proposals in relation to shopping centre developments, both new and expansions, office developments, local government and government authorities, residential and recreational developments, hospitals, schools, retirement villages and aged care facilities.

> Preparation and presentation of evidence before VCAT and Planning Panels.

Expertise to Prepare this Report:

My training and experience including involvement with all forms of development over the past 31 years qualifies me to comment on the traffic implications of the proposal.

Instructions which Defined the Scope of this Report:

I have been retained by Victorian Planning Authority (VPA) to provide expert evidence at the forthcoming Panel Hearing for Amendment C162 to the Melton Planning Scheme.

My brief is to consider the traffic capacity during interim (2026) and ultimate (2046) stages at the intersections of Hopkins Road / Western Freeway and Hopkins Road / Sheahans Road / Meskos Road based on development yields and road network constraints.

Road network constraints include queuing to the existing roundabout, pedestrian/bicycle accessibility to future railway station and standard intersection templates currently adopted by VPA/VicRoads for PSP areas.

Two Consultant Advice Notices prepared by my staff form the basis of my submission.

Facts, Matters and Assumptions Relied Upon:

> Growth Area Network Planning Guidance and Policy Principles prepared by VicRoads dated 3rd July 2015

> Consultant Advice Note CAN 001 prepared by Cardno (dated 19 August 2016)

> Consultant Advice Note CAN 002 prepared by Cardno (dated 16 August 2016)

> Traffic Engineering Assessment for proposed Aurora Business Park prepared by Traffix Group (dated February 2016)

> VITM modelling 2026 and 2046 prepared by Jacobs (dated 17/6/2016)

Identity of Persons Undertaking the Work:

Chris Butler, assisted by Tim McKinley, Cardno Victoria.

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

Chris Butler

Senior Principal

for **Cardno**

Expert Evidence – Traffic and Transport

APPENDIX A

CONSULTANT ADVICE NOTES

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Consultants Advice Notice - CAN001

Project No: CG151009 **Date:** 19 August 2016

Project: Mt Atkinson and Tarneit Plains PSP

Subject: Interim Traffic Modelling

To: Ben Hawkins	**Company:** MPA	**Email/Fax:** Ben.Hawkins@mpa.vic.gov.au
From: Margeaux Hawkins	**Phone:** 03 8415 7709	**Email:** Margeaux.Hawkins@cardno.com.au

CC	Attention	Company	Email/Fax
☐			
☐			
☐			
☐			

☐ **Urgent** ☐ **For your review** ☐ **Reply ASAP** ☐ **Please comment** ☐ **Original in mail**

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Attachments: ☐ ☐

An analysis of the intersection of Hopkins Road / Sheahan Road has been undertaken to assess the intersection's capacity in the interim timeframe, subject to varying degrees of development and intersection configurations. The following provides a summary of the traffic modelling for your review. This is a preliminary draft, provided without prejudice for discussion with relevant stakeholders.

Interim Intersection Layout

The analysed interim intersection layout is shown below (based on the standard MPA/VicRoads Industrial Connector intersection), with the following features:

- Two through lanes on the north and south approaches (Hopkins Road).
- Single through lanes on the east and west approaches (Sheahans Road and Meskos Road, respectively).
- Single left turn slip lanes with 60m storage on all approaches.
- Single right turn lanes with 60m storage on all approaches.

Refer to Figure 1.

Traffic Volumes

Traffic volumes for the purpose of this analysis were obtained through a combination of sources, including VITM through traffic volume estimates for the morning and afternoon peak periods (2026), MPA specified lot yield and employment yield. Furthermore, an arbitrary 20 vehicle movements per hour have been estimated to occur on each movement to and from Warrawee.

Level	Generation Rate Peak (vph)	MPA Defined Yield	Traffic Volume (vph)
C1Z (Retail)	12.5 per 100m^2	Scen 1 – 0 Scen 2 – 5000m^2	0 625
Residential	0.9 per dwelling	130 dwellings	117
IND	0.9 per job	350 jobs	315
Warrawee PSP	nil	nil	Arbitrary

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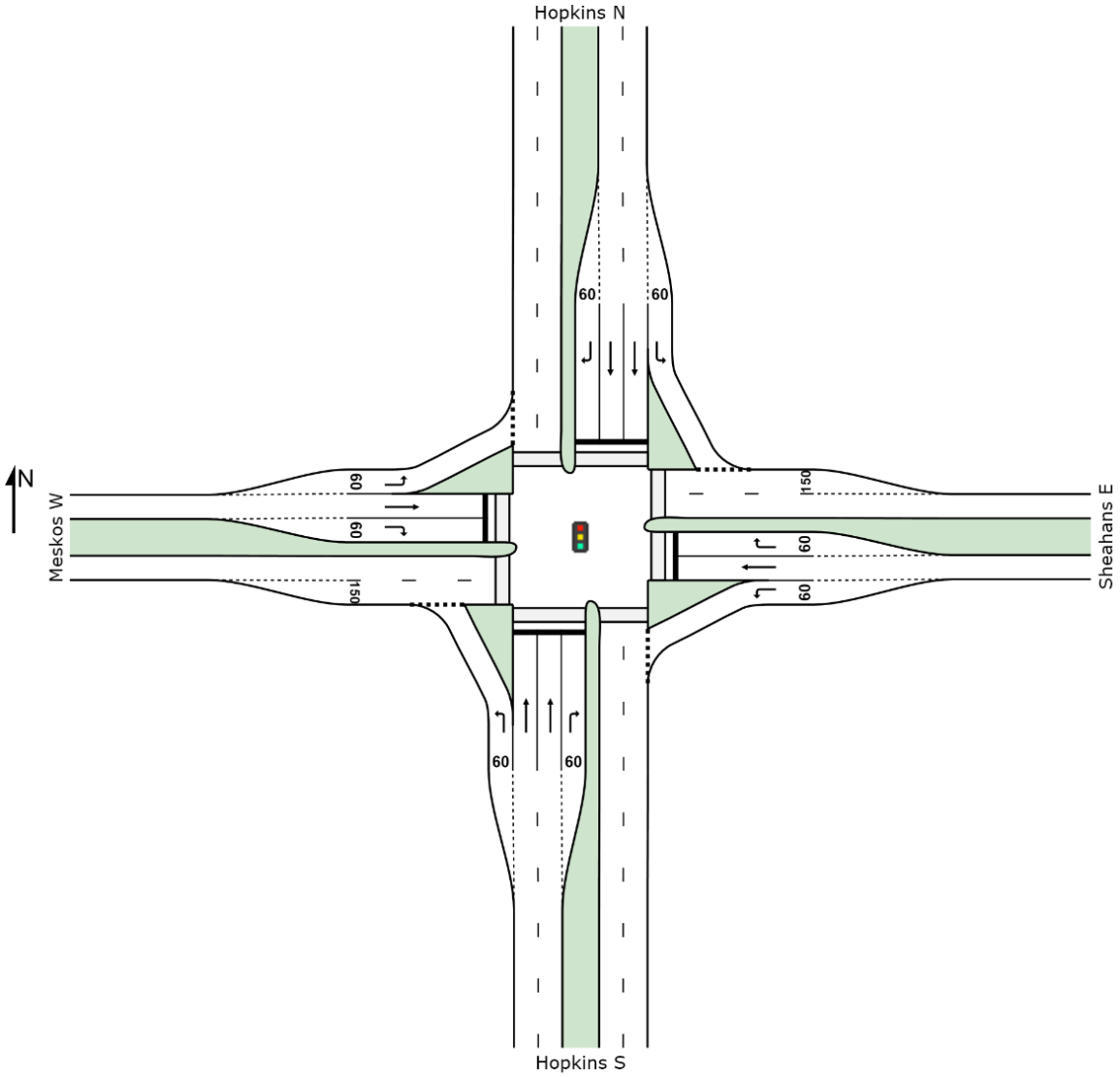
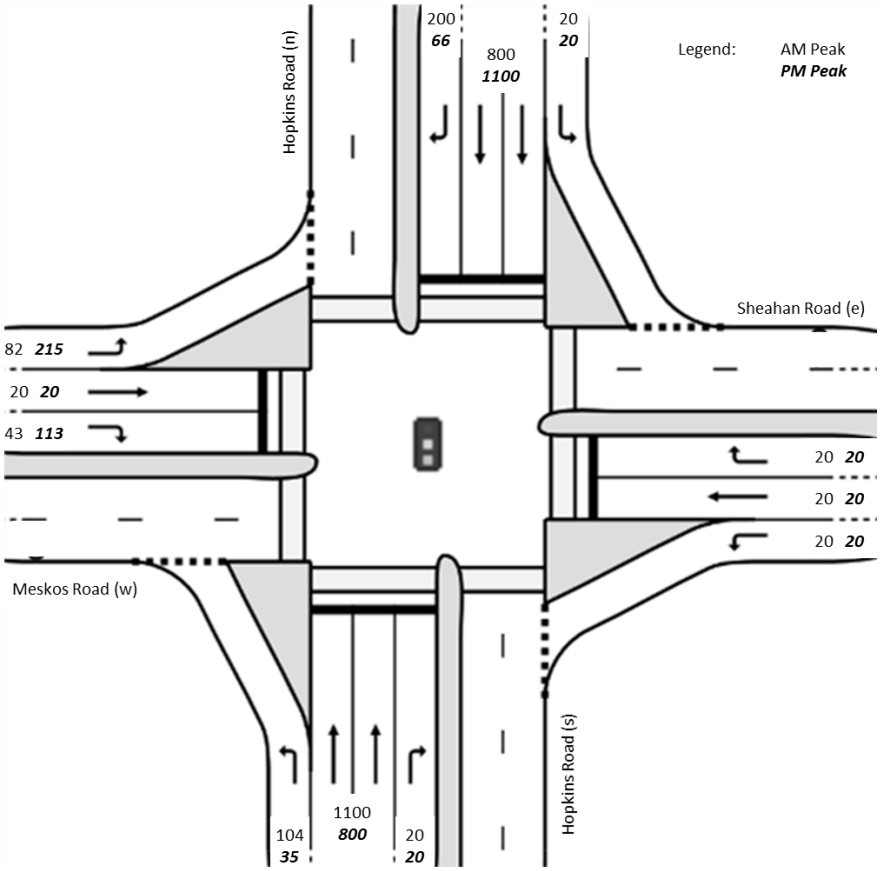
Figure 1: Interim Intersection Layout (as analysed)



Scenario 1 – Base Case

The traffic volumes as sourced from the MPA are summarised in Figure 2. These volumes include 130 dwellings and employment for 350 people via Meskos Road.

Figure 2: Scenario 1 Traffic Volumes – 130 dwellings + 350 jobs



The results of the analysis are summarised in Table 1.

Table 1: Scenario 1 Analysis Results

Period	Approach	Degree of Saturation	95th %ile Queue	Average Delay
AM Peak	Hopkins Road (n)	0.488	68.4 m	10.3 sec
	Sheahan Road (e)	0.143	6.9 m	35.6 sec
	Hopkins Road (s)	0.480	106.3 m	10.7 sec
	Meskos Road (w)	0.307	15.3 m	27.4 sec
	Intersection	**0.488**	**106.3 m**	**12.1 sec**
PM Peak	Hopkins Road (n)	0.512	117.2 m	11.9 sec
	Sheahan Road (e)	0.086	6.3 m	31.0 sec
	Hopkins Road (s)	0.356	72 m	10.6 sec
	Meskos Road (w)	0.488	38.5 m	22.8 sec
	Intersection	**0.512**	**117.2 m**	**13.5 sec**

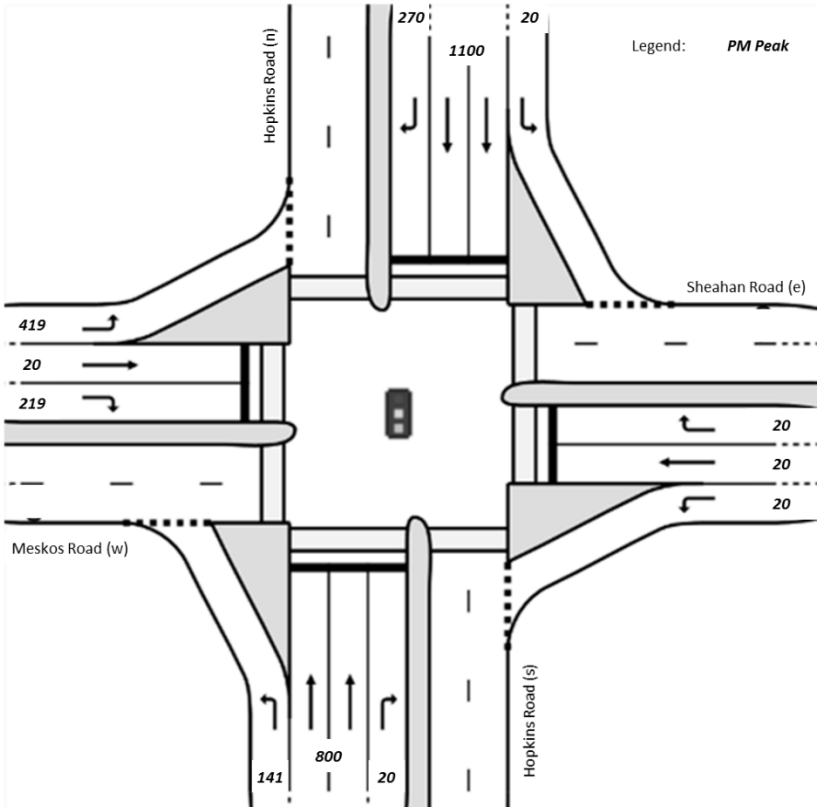
The results of the analysis show that the intersection will operate well within capacity, with queues and average delays of a magnitude consistent with an intersection operating with Level of Service A.

Furthermore, our analysis and work undertaken by other consultants confirms that the afternoon peak is the critical design period for the intersection.

Scenario 2 – Sensitivity Assessment (5,000m^2 commercial)

The Scenario 2 traffic volumes include the base volumes of Scenario 1 plus **5,000 square metres** of commercial facilities have been introduced in order to assess the intersection operation under higher demand flows. Scenario 2 volumes are shown in Figure 3.

Figure 3: Scenario 2 Traffic Volumes – 130 dwellings + 350 jobs + 5,000m^2 commercial



The results of the analysis are summarised below, noting that phasing is a leading right turn on the north/south approaches, with filter turns available for all right turn movements within the other two phases.

Table 1: Intersection 1 Analysis Results

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins S											
1	L2	148	0.0	0.144	8.4	LOS A	1.2	8.5	0.39	0.66	52.2
2	T1	842	0.0	0.475	16.6	LOS A	11.5	80.5	0.75	0.65	47.2
3	R2	21	0.0	0.060	16.2	LOS A	0.3	2.3	0.71	0.68	46.6
Approach		1012	0.0	0.475	15.4	LOS A	11.5	80.5	0.70	0.65	47.9
East: Sheahans E											
4	L2	21	0.0	0.034	11.8	LOS A	0.3	1.9	0.54	0.65	49.8
5	T1	21	0.0	0.047	26.3	LOS A	0.6	4.5	0.81	0.58	42.0
6	R2	21	0.0	0.061	32.3	LOS A	0.7	4.6	0.81	0.69	38.9
Approach		63	0.0	0.061	23.4	LOS A	0.7	4.6	0.72	0.64	43.1
North: Hopkins N											
7	L2	21	0.0	0.014	6.2	LOS A	0.1	0.5	0.17	0.58	53.7
8	T1	1158	0.0	0.725	19.0	LOS C	20.4	142.5	0.84	0.75	45.8
9	R2	284	0.0	0.662	17.3	LOS B	5.5	38.4	0.83	0.81	46.0
Approach		1463	0.0	0.725	18.4	LOS C	20.4	142.5	0.83	0.76	46.0
West: Meskos W											
10	L2	441	0.0	0.470	9.9	LOS A	7.5	52.6	0.55	0.73	50.9
11	T1	21	0.0	0.047	26.3	LOS A	0.6	4.5	0.81	0.58	42.0
12	R2	231	0.0	0.673	38.2	LOS B	8.7	61.2	0.97	0.86	36.6
Approach		693	0.0	0.673	19.8	LOS B	8.7	61.2	0.70	0.77	44.8
All Vehicles		3231	0.0	0.725	17.9	LOS C	20.4	142.5	0.76	0.73	46.2

The results of the analysis show that the intersection will operate within capacity, with the intersection operating with a DoS of 0.725 during the afternoon peak. It is noted that the right turn movements on the north and west approaches which both have DoS in the order of 0.67 and queues of 38m and 61m respectively which are reasonably close to the turn lane lengths.

The southbound through movement on Hopkins Road has a Dos of 0.72. However, this represents the queuing (at the 95th percentile level) for southbound through traffic in the PM peak of 142m, which is effectively the distance between the signals and the roundabout. Any further traffic generation may queue into the roundabout.

It is also of note that the commercial traffic has been considered as retail in this analysis, with a 50/50 split between inbound and outbound movements. Should the commercial use be for a lower traffic generating use or different directional split, then a different development yield could be considered.

Implications

Based on the preceding:

- The interim intersection of Hopkins Road / Sheahan Road / Meskos Road will be sufficient to accommodate commercial (retail) development of up to 5,000 square metres or the equivalent for other uses.
- The turning lane lengths based on the standard intersection templates are generally acceptable, however through traffic on the north approach has limited storage capacity for approximately 20 vehicles per lane.
- Should additional through lanes be provided on the north approach, this will increase storage capacity and additional yield could be realised.

If through queuing was ignored and the focus solely on the right turn lane queuing along Hopkins Road (north approach), then a commercial (retail) development of up to 9,000 square metres would result in a right turn queue of approximately 120m and a through queue of approximately 180m.

Consultants Advice Notice - CAN002

Project No: CG151009 **Date:** 16 August 2016

Project: Mt Atkinson and Tarneit Plains PSP

Subject: Ultimate Traffic Modelling

To: Ben Hawkins	**Company:** MPA	**Email/Fax:** Ben.Hawkins@mpa.vic.gov.au
From: Margeaux Hawkins	**Phone:** 03 8415 7709	**Email:** Margeaux.Hawkins@cardno.com.au

CC	Attention	Company	Email/Fax
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Attachments: ☐ ☐

An analysis of the Hopkins Road / Sheahan Road / Meskos Road and Hopkins Road / Western Freeway intersections has been undertaken to assess the intersection's capacity in the nominal "ultimate" timeframe, being 2046. The following provides a summary of the traffic modelling for your review. This is a preliminary draft, provided without prejudice for discussion with relevant stakeholders

Intersection Layouts

The intersection layouts for this analysis have been based upon MPA standard cross sections, with reference to the document "Growth Area Network Planning Guidance & Policy Principles" dated 3rd July 2015.

Generally speaking, the layouts assume that Hopkins Road has been fully duplicated to a three through lane configuration, both northbound and southbound, whereas the eastern and western approaches vary. Furthermore, the following design features have been assumed:

Hopkins Road / Sheahan Road / Meskos Road

- Three through lanes both northbound and southbound on Hopkins Road.
- Two full right turn lanes on both of the Hopkins Road approaches, nominated at 170 metres from the south and 120m from the north due to the proximity of the adjacent intersection.
- Single through lanes on the east and west approaches (Sheahan Road and Meskos Road, respectively, based on Industrial Connector Roads
- Single right turn lanes on the east and west approaches, at 100 metres each.
- Left turn slip lanes with 100 metres of storage on all approaches.

Refer to Figure 1.

Hopkins Road / Western Freeway / Meskos Secondary Arterial

- Three through lanes both northbound and southbound on Hopkins Road.
- Two full right turn lanes on both of the Hopkins Road approaches, nominated at 170 metres from the north and 120m from the south due to the proximity of the adjacent intersection.
- Two through lanes on the western approach.

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- A single 200 metre right turn lane on the western approach.
- Three through lanes on the eastern approach, merging into two lanes to the east of the intersection (assumed Western Freeway off-ramp as primary arterial standard).
- Two full right turn lanes on the eastern approach, nominated at 170 metres each.
- Left turn slip lanes with 100 metres of storage on all approaches.

Refer to Figure 2.

Figure 1: Hopkins Road / Sheahan Road / Meskos Road

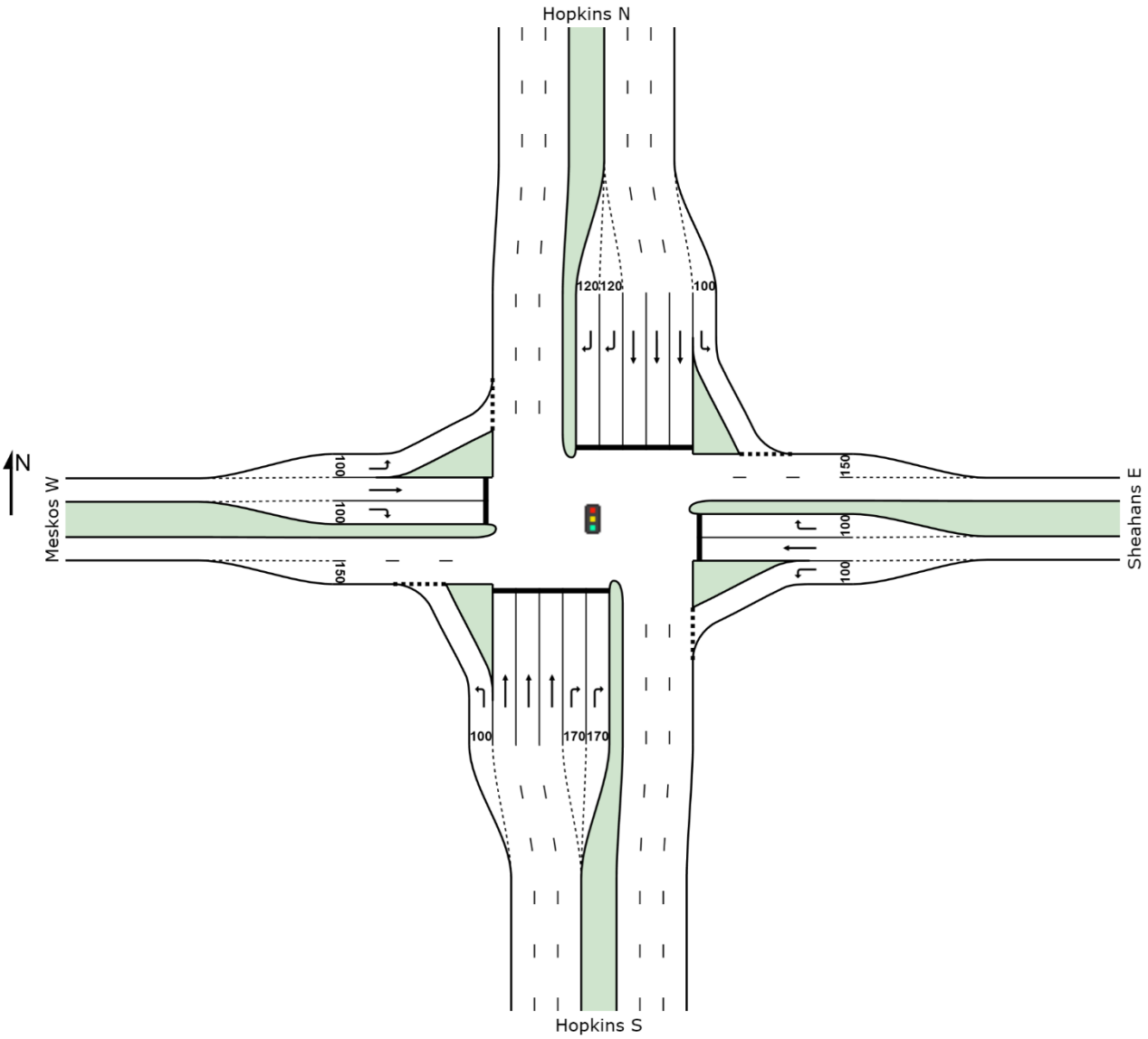
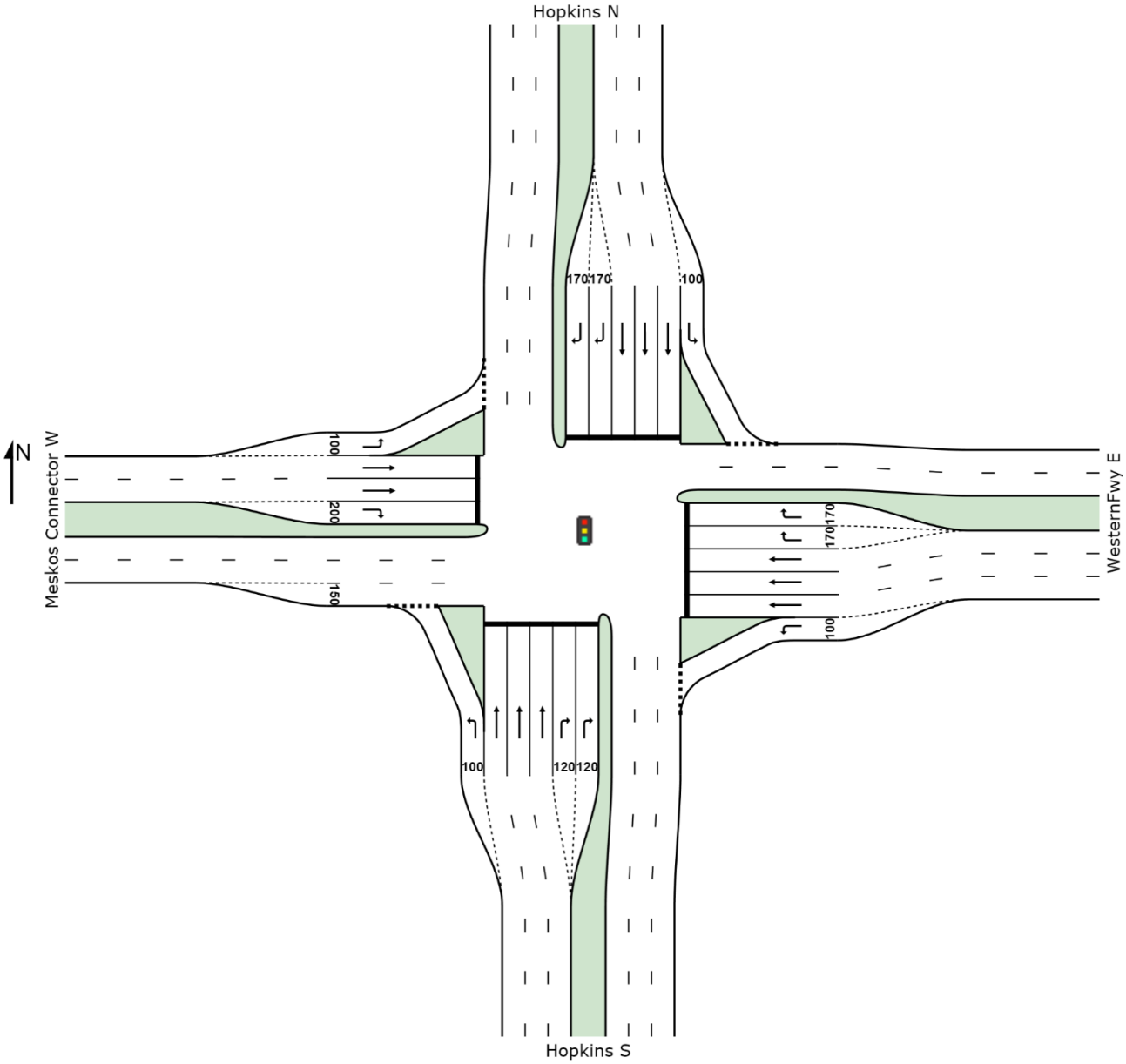


Figure 2: Hopkins Road / Western Freeway / Meskos Road SA



External Traffic Volumes

Traffic volumes for the purpose of this analysis were obtained through a combination of sources, including VITM through traffic volume estimates for the morning and afternoon peak periods, and MPA specified lot yield and employment yield.

It is noted that through volumes on Hopkins Road are substantially higher for this analysis than the volumes utilised by Traffix Group for their previous modelling of the intersections in question, due to the higher VITM volumes sourced.

The analysis has been undertaken to assume that there are no pedestrian movements through the intersection, as SIDRA Intersection would assume that the pedestrian phases would run in all applicable phases in every cycle, which is only typically true for inner city locations with very high pedestrian volumes. As the area is anticipated to have a much lower pedestrian demand, it is considered more applicable to run the analysis with no pedestrians, but ensuring that phase green times would be sufficient to enable the pedestrian phase to run when required.

Generated Traffic Volumes

The generated traffic volumes for the development sites were based on the data provided by MPA and are generally consistent with the Traffix report. The PM peak is considered to be the critical peak for the land uses anticipated.

A comparison of the input areas is shown below:

Table 1-1 Mt Atkinson Traffic Generation (PM Peak)

Level	Generation Rate (per 100m2)	MPA Defined Yield	MPA Volumes	Traffix Report Yield	Traffix Volumes
C1Z (Office)	12.5	10,000m^2	1,250	10,000m^2	1,250
C2Z (Office)	6.7	10,000m^2	670	10,000m^2	670
C1Z (Retail)	5.9	1,920m^2	113	1,920m^2	113
C2Z (Large Format Retail)	2.7	15,000 m^2	405	58,320m^2	1,575
Residential	0.9 per dwelling	170 dwellings	153	nil	nil
MUZ	2.0	nil	nil	15,800m^2	316
IND	0.75	156,000 m^2	1,170	156,000 m^2	1,170
Warrawee PSP (Industrial)	0.9	800 jobs*	720	undefined	nil
Total Traffic Volumes (PM)			**4,483vph**		**5,094vph**
Including VITM			**4,943vph**		

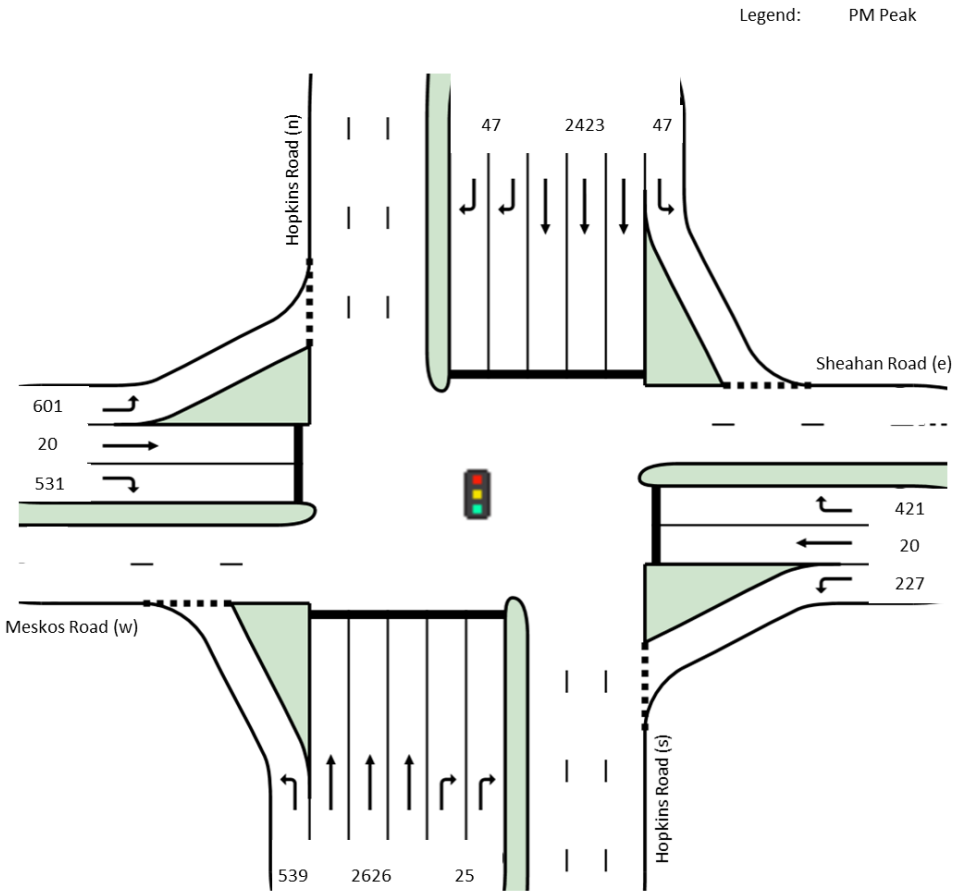
* Two-thirds of Warrawee PSP expected to use Hopkins Road access

All other inputs such as broad traffic distributions and signal phasing have been applied consistently with the Traffix report. It is also noted that an additional 500 vehicle movements were incorporated within the VITM modelling to the Mt Atkinson PSP site, which therefore makes the total traffic volumes used in both scenarios similar (i.e. within 200vph). These additional volumes have not been assigned to any particular land use.

Intersection 1 – Hopkins Road / Sheahan Road / Meskos Road

The traffic volumes for the intersection are summarised in Figure 3.

Figure 3: Hopkins Road / Sheahan Road / Meskos Road



The results of the analysis are summarised in Table 1.

Table 1: Intersection 1 Analysis Results

Period	Approach	Degree of Saturation	95th %ile Queue	Average Delay
PM Peak	Hopkins Road (n)	0.761	67.7 m	4.0 sec
	Sheahan Road (e)	1.312	519.6 m	236.2 sec
	Hopkins Road (s)	0.826	243.3 m	13.7 sec
	Meskos Road (w)	2.754	1366.4 m	166.0 sec
	Intersection	**2.754**	**1366.4 m**	**206.6 sec**

The results of the analysis show that the intersection will experience congestion if operating under the MPA standard cross sections, with queues and delays exceeding acceptable limits.

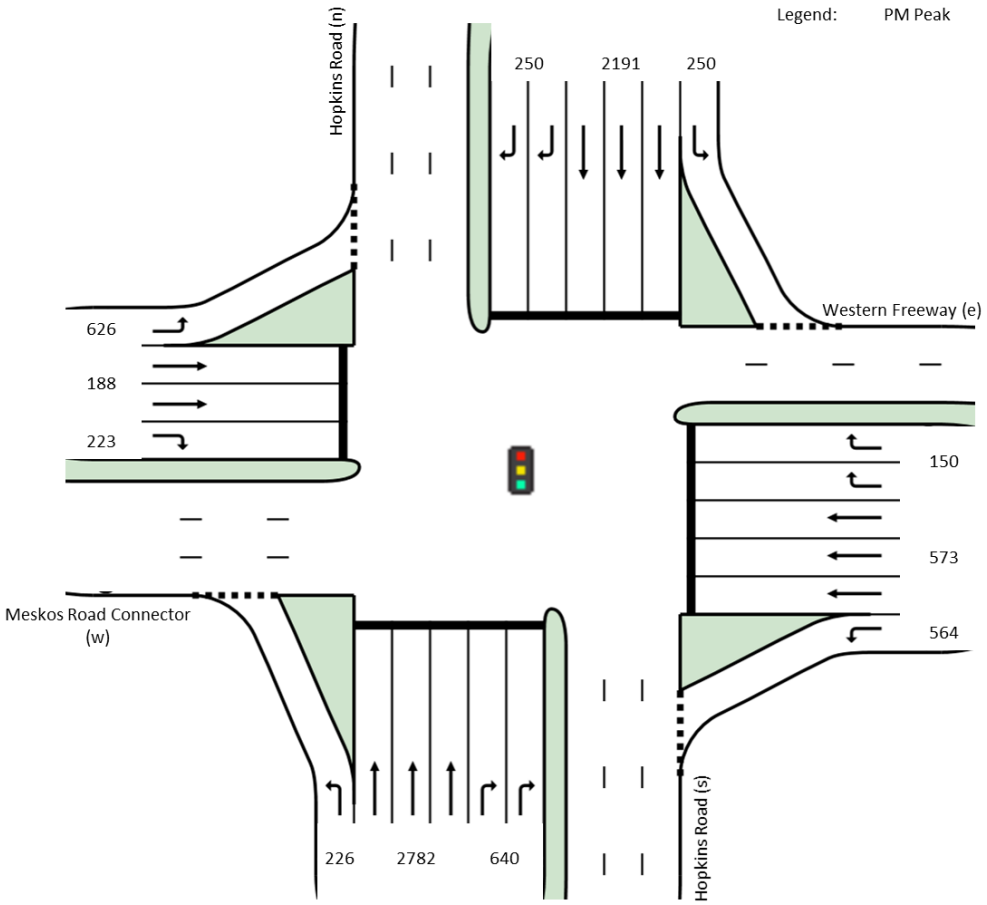
However, it is noted that the through movements on both the Hopkins Road approaches will operate within capacity, with a DoS of 0.761 for southbound traffic and a DoS of 0.826 for northbound traffic. The queue on the north approach is at 67.7m.

The most critical movements are on Meskos Road, with a DoS of 2.754 for the left turn, and a DoS of 1.655 for the right turn out. It is noted that under the analysed layout there is only one left turn lane and one right turn lane on Meskos, which are factors to consider in attempting to increase capacity.

Intersection 2 – Hopkins Road / Western Freeway / Meskos Road Connector

The traffic volumes for the intersection are summarised in Figure 4.

Figure 4: Hopkins Road / Western Freeway / Meskos Road Connector



The results of the analysis are summarised in Table 2.

Table 2: Intersection 2 Analysis Results

Period	Approach	Degree of Saturation	95th %ile Queue	Average Delay
PM Peak	Hopkins Road (n)	1.202	290 m	44.4 sec
	Western Freeway (e)	1.146	178.6 m	107.1 sec
	Hopkins Road (s)	1.077	245.4 m	31.0 sec
	Meskos Road Connector/SA	1.251	516.9 m	165.1 sec
	Intersection	**1.251**	**516.9 m**	**62.5 sec**

The results of the analysis show that the intersection will be experiencing congested traffic conditions. It is noted that through traffic on Hopkins Road will operate within capacity, with a DoS of 0.911 for southbound traffic and a Dos of 0.901 for northbound traffic. The queue on the south approach for through traffic will be in the order of 83 metres, however the right turn manoeuvre on the south approach will exceed the available queue distance.

Critical movements were the right turn from south to west, with a DoS of 1.077, and the right turn from west to south with a DoS of 1.251.

The Way Forward

Given the results of the analysis, if development yields are to remain at the minimum levels suggested by MPA, further consideration should be given to improving capacity at the intersection, possibly by deviating away from standard MPA cross sections which would allow the following features to be considered:

- Increasing the number of right turn lanes on the Secondary Arterial or Connector Road.
- Increasing the number of left turn lanes on Secondary Arterial or Connector Road.
- Increasing through lanes on Hopkins Road from three to four.
- Modifying phasing to suit updated layouts.
- Further review of traffic distribution, which may be affected by congested conditions (drivers will often change behaviour to avoid congestion).

Referencing the ultimate design for Hopkins Road/Western Freeway/ Meskos presented in the Traffix report, additional lanes were added to the following legs:

- Additional left lane on the western approach (double left).
- Additional right lane on the western approach (double right).
- Additional right lane on the eastern approach (triple right).

Summary

Based on the preceding:

- The two intersections will operate outside of capacity if constructed according to MPA standards for the traffic volumes outlined. This means that there will be congestion at the intersections during the peak hours.
- Through movements on Hopkins Road in both directions and for both intersections are within capacity, suggesting that the three lane cross section for Hopkins Road is appropriate for the ultimate traffic volumes predicted.
- The majority of capacity issues are on the side roads, indicating that consideration should be given to improving capacity, through the introduction of additional turning lanes, reconfiguration of lane movements and phasing.

MOVEMENT SUMMARY

Site: **HoShPMUltMPA - MPA areas - No Peds - Shorter turn lanes

Hopkins Sheahans PM Ultimate MPA volumes
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins S											
1	L2	567	0.0	0.362	6.3	LOS A	3.5	24.3	0.19	0.61	53.6
2	T1	2764	0.0	0.826	14.7	LOS C	34.8	243.3	0.71	0.65	48.4
3	R2	26	0.0	0.152	67.6	LOS A	0.8	5.9	0.98	0.68	28.3
Approach		3358	0.0	0.826	13.7	LOS C	34.8	243.3	0.62	0.65	48.9
East: Sheahans E											
4	L2	239	0.0	0.343	26.4	LOS A	7.3	51.4	0.65	0.81	41.6
5	T1	21	0.0	0.046	38.0	LOS A	0.9	6.6	0.80	0.58	37.2
6	R2	443	0.0	1.312	358.7	LOS F	74.2	519.6	1.00	1.90	8.8
Approach		703	0.0	1.312	236.2	LOS F	74.2	519.6	0.87	1.49	12.4
North: Hopkins N											
7	L2	49	0.0	0.030	6.0	LOS A	0.2	1.2	0.12	0.58	53.9
8	T1	2551	0.0	0.761	2.7	LOS C	9.7	67.7	0.21	0.20	57.5
9	R2	49	0.0	0.286	68.5	LOS A	1.6	11.3	0.99	0.71	28.1
Approach		2649	0.0	0.761	4.0	LOS C	9.7	67.7	0.23	0.21	56.3
West: Meskos W											
10	L2	633	0.0	2.754	1645.3	LOS F	195.2	1366.4	1.00	2.82	2.2
11	T1	21	0.0	0.046	38.0	LOS A	0.9	6.6	0.80	0.58	37.2
12	R2	559	0.0	1.655	666.1	LOS F	128.2	897.7	1.00	2.46	5.1
Approach		1213	0.0	2.754	1166.0	LOS F	195.2	1366.4	1.00	2.61	3.0
All Vehicles		7923	0.0	2.754	206.6	LOS F	195.2	1366.4	0.57	0.88	13.7

Level of Service (LOS) Method: Degree of Saturation (SIDRA METHOD).
Vehicle movement LOS values are based on degree of saturation per movement
Intersection and Approach LOS values are based on worst degree of saturation for any vehicle movement.
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.
The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

MOVEMENT SUMMARY

Site: **HoWFPMUltMPA - Meskos SA - MPA areas - No Peds - Shorter turn lanes

Hopkins WesternFwy PM Ultimate MPA volumes
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Hopkins S											
1	L2	238	0.0	0.166	8.9	LOS A	3.3	23.2	0.29	0.63	51.7
2	T1	2928	0.0	0.901	3.8	LOS D	11.8	82.7	0.19	0.19	56.5
3	R2	674	0.0	1.077	157.1	LOS F	35.1	245.4	1.00	1.36	16.9
Approach		3840	0.0	1.077	31.0	LOS F	35.1	245.4	0.34	0.43	39.9
East: WesternFwy E											
4	L2	594	0.0	0.803	41.3	LOS C	25.5	178.6	0.95	1.07	35.6
5	T1	603	0.0	1.146	183.7	LOS F	25.1	175.4	1.00	1.43	15.2
6	R2	158	0.0	0.421	62.3	LOS A	4.5	31.5	0.98	0.77	29.8
Approach		1355	0.0	1.146	107.1	LOS F	25.5	178.6	0.98	1.20	21.9
North: Hopkins N											
7	L2	263	0.0	0.206	11.2	LOS A	5.0	35.2	0.39	0.66	50.1
8	T1	2306	0.0	0.911	23.2	LOS D	41.4	290.0	0.82	0.82	43.7
9	R2	263	0.0	1.202	263.6	LOS F	17.9	125.6	1.00	1.46	11.3
Approach		2833	0.0	1.202	44.4	LOS F	41.4	290.0	0.80	0.87	34.9
West: Meskos Connector W											
10	L2	659	0.0	1.082	147.1	LOS F	73.8	516.9	1.00	1.40	17.6
11	T1	198	0.0	0.548	58.4	LOS A	5.8	40.4	1.00	0.78	30.9
12	R2	235	0.0	1.251	305.6	LOS F	35.1	245.4	1.00	1.74	10.1
Approach		1092	0.0	1.251	165.1	LOS F	73.8	516.9	1.00	1.36	16.3
All Vehicles		9119	0.0	1.251	62.5	LOS F	73.8	516.9	0.65	0.79	29.8

Level of Service (LOS) Method: Degree of Saturation (SIDRA METHOD).
Vehicle movement LOS values are based on degree of saturation per movement
Intersection and Approach LOS values are based on worst degree of saturation for any vehicle movement.
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.