



asongroup

Construction Traffic Impact Assessment

Mamre Road and Abbots Road Upgrade Project

Mamre Road Precinct

1/09/2023

P2264r02



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Appendix A. Traffic Flows

Appendix B. SIDRA Results

Glossary

Acronym	Description
AVD	Average Vehicle Delay
AARU	Abbotts Road and Aldington Road corridor upgrades
Council	Penrith City Council
CTIA	Construction Traffic Impact Assessment
CTMP	Construction Traffic Management Plan
DA	Development Application
DCP	Development Control Plan
DoS	Degree of Saturation
DPE	Department of Planning and Environment
EIS	Environmental Impact Statement
GFA	Gross Floor Area
LOG-E	Land Owners Group East
LoS	Level of Service
MRP	Mamre Road Precinct
Project	Mamre Road / Abbotts Road intersection upgrade
SSD	State Significant Development
TfNSW	Transport for New South Wales
REF	Review of Environmental Factors
VPA	Voluntary Planning Agreement
veh/hr	Vehicle movements per hour (1 vehicle in & out = 2 movements)

1 Introduction

1.1 Background

Ason Group has been engaged by the Land Owners Group East (LOG-E) to prepare a Construction Traffic Impact Assessment (CTIA) in support of the Review of Environmental Factors (REF) required. The REF relates to the proposed upgrade of the Mamre Road / Abbotts Road intersection (the Project).

The Mamre Road Precinct (MRP) that was rezoned in June 2020 to provide for additional industrial land supporting the Western Sydney Employment Area and the planned new Western Sydney (Nancy-Bird Walton) International Airport.

The NSW Department of Planning and Environment (DPE) adopted a precinct-wide Development Control Plan on 19 November 2021 (herein referred to as the MRP DCP). The Project is required to support development of the MRP and is consistent with the requirements of the MRP DCP.

The MRP Structure Plan map (June 2020) from the MRP DCP is displayed in **Figure 1**.

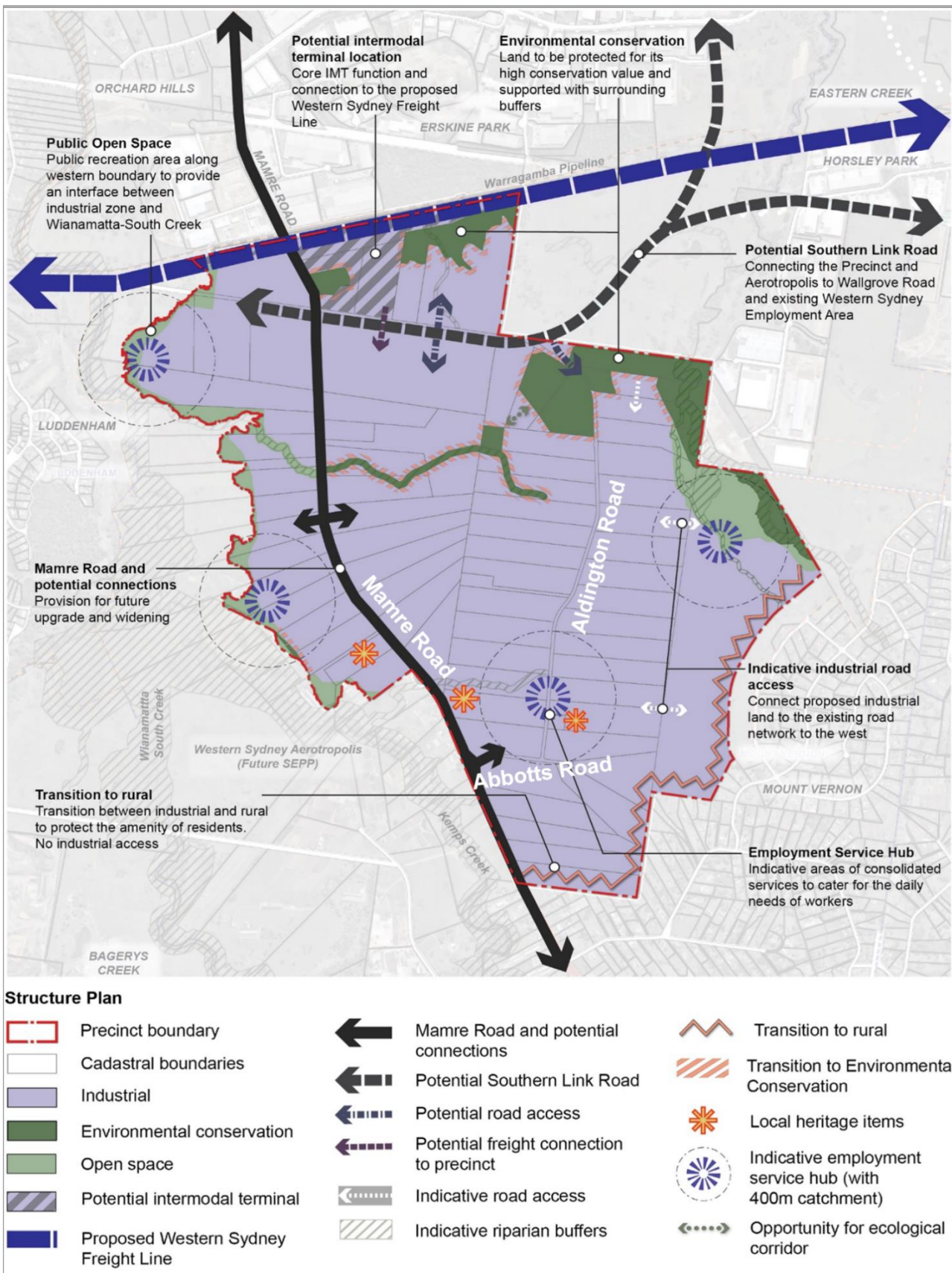


Figure 1: Mamre Road Precinct Structure Plan Map, June 2020¹

¹ [NSW DPE MRP DCP website](#)

1.2 Project History

1.2.1 Background

LOG-E are represented by ESR Australia, Fife Kemps Creek, and Frasers Property Industrial, who are each developing parcels of land within the MRP, being the following:

- ESR Australia (ESR) – the Westlink Estate located at 290-308 Aldington Road, 59-62 and 63 Abbots Road;
- Fife Kemps Creek (FKC) – the 200 Aldington Road Estate and 90 Aldington Road; and
- Frasers Property Industrial (Frasers) – two parcels of land, each located at:
 - 99-111 Aldington Road (Frasers North); and
 - 155-217 Aldington Road (Frasers South).

The relevant LOG-E sites within the MRP are shown below, in **Figure 2**.

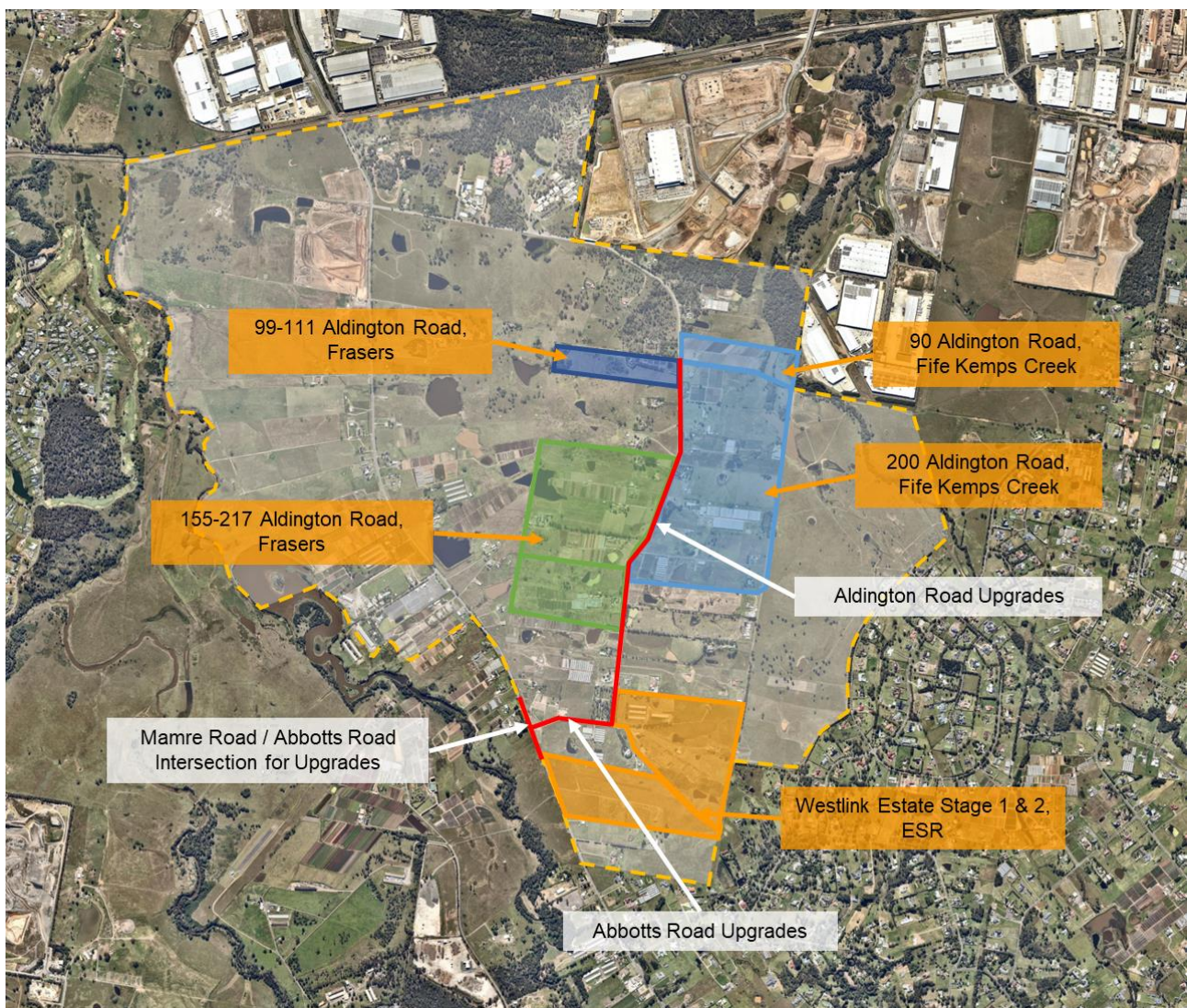


Figure 2: LOG-E Development Sites

While the MRP DCP identified the ultimate road network (by 2036), no staging strategy for delivery was identified. Therefore, as part of the development application process for each of the relevant sites, LOG-E are proposing upgrades to the Aldington Road and Abbots Road corridor as well as the Project.

Ason Group has worked on behalf of LOG-E to deliver the modelling assessment of the proposed road network which forms part of the relevant applications. The results of this operational modelling assessment have been documented within the following report:

- Ason Group, *P1815 – Mamre Road Precinct – LOG East – Revised Modelling*, P1815m02_v4 MRP_LOG East 2026 Revised Modelling, 19 September 2022 (LOG-E Modelling Memo).

Transport for New South Wales (TfNSW) endorsed this modelling assessment and, on 21 April 2023, Stage 1 of the Westlink Estate (SSD-9138102²) was approved by DPE.

The upgrades will be delivered through joint Voluntary Planning Agreements (VPA) associated with the approved Stage 1 of the Westlink Estates. The VPAs will be between LOG-E and Penrith City Council (Council) for Aldington Road and Abbots Road; and DPE for the Project.

1.2.2 LOG-E Development Works

Table 1 provides the key information for each of the LOG-E developments, inclusive of Gross Floor Areas (GFA) in m².

TABLE 1: LOG-E ON-SITE DEVELOPMENT WORKS		
LOG-E Site	Reference	Yield (GFA, m²)
ESR – Westlink Estate Stage 1	SSD-9138102	81,317
ESR – Westlink Estate Stage 2	SSD-46983729	39,651
FKC – 200 Aldington Road Estate	SSD-10479	50,930
FKC – 90 Aldington Road¹	SD-220530	0
Frasers North	N/A (forthcoming application)	12,334
Frasers South	SSD-17552047	64,080

Note: 1) FKC 90 Aldington Road will be constructed as part of the 200 Aldington Road Industrial Estate and will not increase the programmed duration of construction traffic.

² <https://www.planningportal.nsw.gov.au/major-projects/projects/westlink-industrial-estate-stage-1>

1.3 Mamre Road Precinct Road Network Requirements

1.3.1 Strategic Road Network Requirements

The background traffic modelling which identified the road network layout required to support the MRP, was finalised in late 2021. The results of this modelling assessment have underpinned the road network layout detailed within the MRP DCP (as per Figure 3).

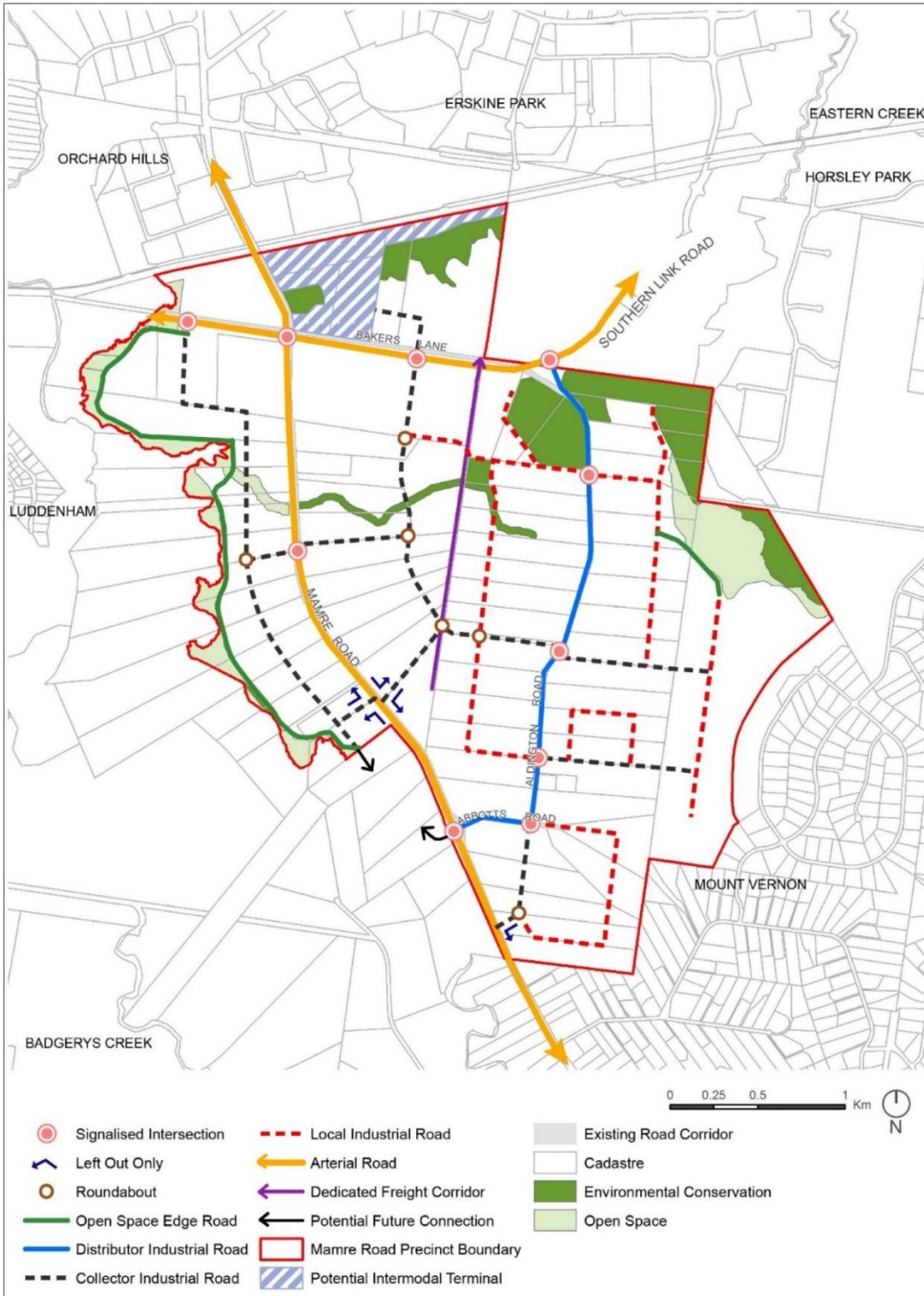


Figure 3: Mamre Road Planned Future Road Network Hierarchy

Ason Group worked with DPE and TfNSW to collectively deliver this modelling assessment.

It is notable that the LOG-E development sites were all considered in the MRP Modelling Assessment undertaken for the assessment years of 2031 and 2036.

1.3.2 2026 Road Network Requirements

As noted above, Ason Group delivered the modelling assessment on behalf of LOG-E for the 2026 assessment year. The road network which was adopted for the LOG-E modelling assessment (reported in the LOG-E Modelling Memo), forms part of the relevant State Significant Developments, as shown in **Figure 4**.

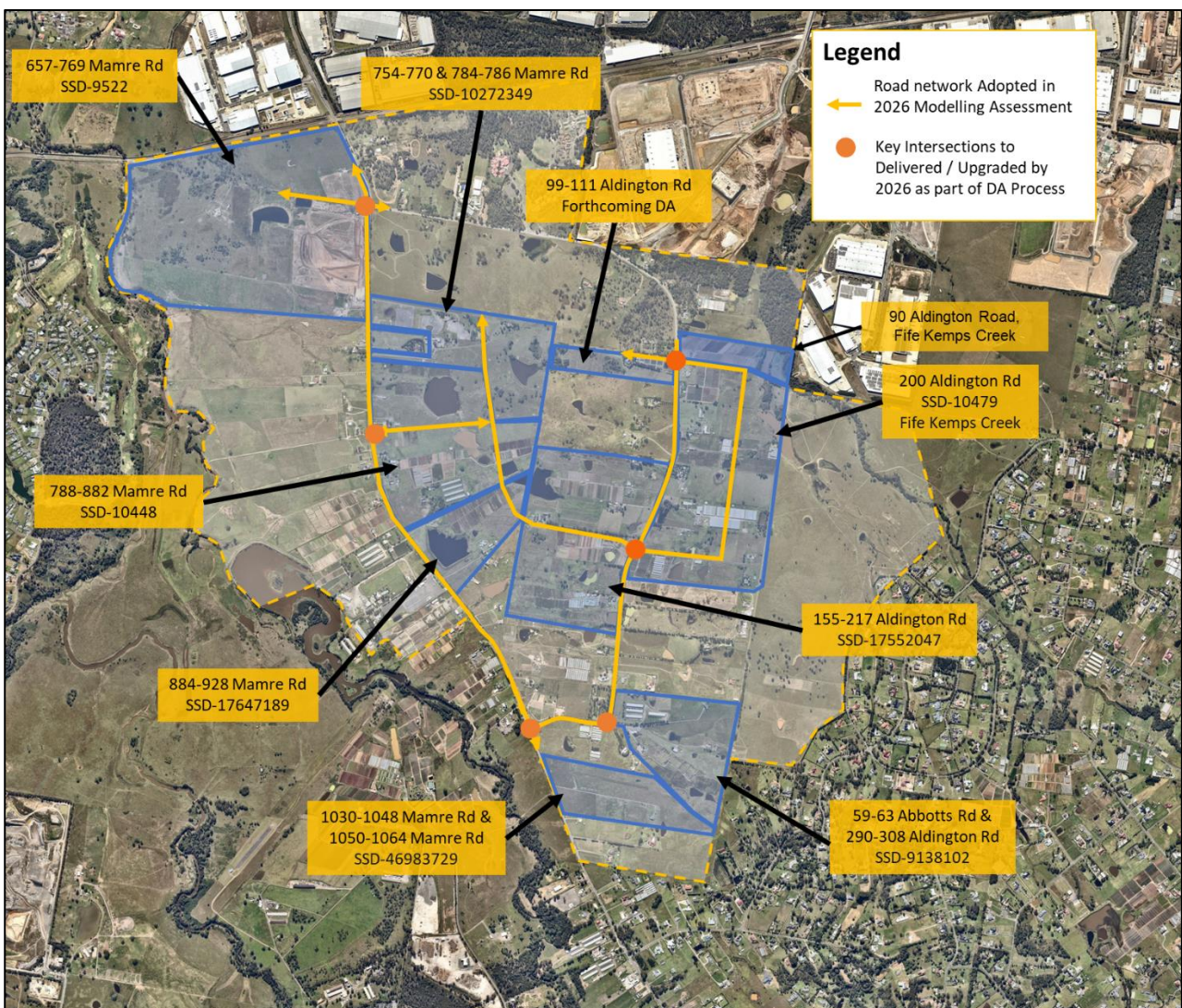


Figure 4: 2026 Modelling Assessment Road Network

With reference to the modelling assessment documented in the LOG-E Modelling Memo, 2 scenarios were established for the 2026 network.

The assessment adopted the following key modelling inputs:

- Modelling AM and PM time periods:
 - AM: 6:00am – 10:00am; and
 - PM: 3:00pm – 7:00pm.
- Trip generation:
 - AM peak hour: 0.23 trips/100m²;
 - PM peak hour: 0.24 trips/100m²; and
 - Daily trips: 2.91 trips/100m².

Scenario 1 assessed 990,215m² of the total GFA within the MRP. The results of Scenario 1 are provided in **Table 2**. The proposed intersections along the Aldington Road corridor complied with the TfNSW threshold for both the delays and practical capacity.

TABLE 2: SCENARIO 1 – SIDRA RESULTS

ID	Intersection	Control	Approach	AM			TfNSW Guidelines Compliance	PM			TfNSW Guidelines Compliance
				DOS	LOS	Queue		DOS	LOS	Queue	
1	Aldington Road / Fife Kemps Creek (North)	Signal	S	0.06	C	10	✓	0.11	D	12	✓
			E	0.13	C	20	✓	0.16	C	31	✓
			N	0.26	B	33	✓	0.16	C	17	✓
			W	0.18	D	20	✓	0.12	C	5	✓
			Overall	0.26	B	33	✓	0.16	C	31	✓
2	Aldington Road / Fife Kemps Creek (South)	Signal	S	0.15	C	17	✓	0.28	C	47	✓
			E	0.14	C	29	✓	0.28	C	54	✓
			N	0.06	D	7	✓	0.10	C	14	✓
			W	0.14	C	24	✓	0.15	D	13	✓
			Overall	0.15	C	29	✓	0.28	C	54	✓
3	Aldington Road / Abbots Road	Signal	E	0.04	A	7	✓	0.07	A	13	✓
			N	0.03	D	3	✓	0.05	D	6	✓
			W	0.13	A	27	✓	0.27	B	56	✓
			Overall	0.13	B	27	✓	0.27	B	56	✓

Scenario 2 assessed 1,291,584m² of the total GFA within the MRP. The results of Scenario 2 are provided in **Table 3**. Under the increase GFA yield, the proposed intersections along the Aldington Road corridor maintained compliance with the TfNSW threshold for both the delays and practical capacity.

TABLE 3: SCENARIO 2 – SIDRA RESULTS

ID	Intersection	Control	Approach	AM			TfNSW Guidelines Compliance	PM			TfNSW Guidelines Compliance
				DOS	LOS	Queue		DOS	LOS	Queue	

1	Aldington Road / Fife Kemps Creek (North)	Signal	S	0.05	C	9	✓	0.20	C	33	✓
			E	0.20	D	29	✓	0.25	C	42	✓
			N	0.29	B	40	✓	0.13	B	22	✓
			W	0.10	D	11	✓	0.11	D	15	✓
			Overall	0.29	B	40	✓	0.25	C	42	✓
2	Aldington Road / Fife Kemps Creek (South)	Signal	S	0.21	D	35	✓	0.43	D	74	✓
			E	0.23	C	39	✓	0.41	C	76	✓
			N	0.03	C	5	✓	0.18	C	29	✓
			W	0.12	D	18	✓	0.24	D	36	✓
			Overall	0.23	C	39	✓	0.42	C	76	✓
3	Aldington Road / Abbots Road	Signal	E	0.21	B	24	✓	0.10	A	18	✓
			N	0.04	D	4	✓	0.19	D	23	✓
			W	0.21	B	48	✓	0.46	B	113	✓
			Overall	0.21	B	48	✓	0.46	B	113	✓

1.4 Report Purpose

Noting that the operational performance of the proposed intersections has already been assessed by the LOG-E Modelling Memo, the key purpose of this CTIA is to assess the cumulative impacts associated with the construction traffic relating to the Project; as well as the upgrade to the Abbots Road and Aldington Road corridor and the on lot works for each of the LOG-E sites.

This report has been prepared to support the REF relating to the Project.




2 Existing Conditions

2.1 Existing Road Network

2.1.1 Key Roads

The existing road network providing access to the Intersection is detailed **Table 4** below.

TABLE 4: KEY ROAD NETWORK

Road	Description	Typical Road Characteristics
Mamre Road	<p>An arterial road which runs north-south between the Great Western Highway and M4, and Elizabeth Drive respectively.</p> <p>In the vicinity of the Site, Mamre Road has a posted speed limit of 80km/h.</p>	
Aldington Road	<p>A local access that runs north-south (to the east of Mamre Road) and currently provides access for a number of rural residential properties. It connects with Bakers Lane to the north and Abbots Road to the south.</p> <p>It provides 1 traffic lane in each direction and has a posted speed limit of 60km/h.</p>	
Abbots Road	<p>A local access road that runs east-west connecting to Mamre Road (to the east of Mamre Road) and currently provides access for a number of rural residential properties. Abbots Road provides 1 traffic lane in each direction and has a posted speed limit of 60km/h.</p>	

2.1.2 Key intersection

The intersection, which is the subject of this report, being the Mamre Road / Abbots Road intersection, forms the key intersection under consideration.

The existing configuration for the Mamre Road / Abbots Road intersection is shown in **Figure 5**. The existing intersection is currently subject to a restriction to right-out movements from Abbots Road for all vehicles during the AM and PM peak periods.



Figure 5: Existing Mamre Road / Abbots Road intersection

2.1.3 Existing Traffic Flows

Ason Group conducted AM and PM peak period traffic surveys in Mamre Road south of James Erskine Drive. The flows found by the surveys are shown in **Table 5**.

TABLE 5: 2022 MAMRE ROAD TRAFFIC FLOWS

Peak Period	Total Volumes	Directional Volumes
AM	1,619	NB: 801 vph
		SB: 818 vph
PM	1,721	NB: 794 vph
		SB: 927 vph

Light and heavy vehicle volumes per the survey is shown in **Figure 6** below.

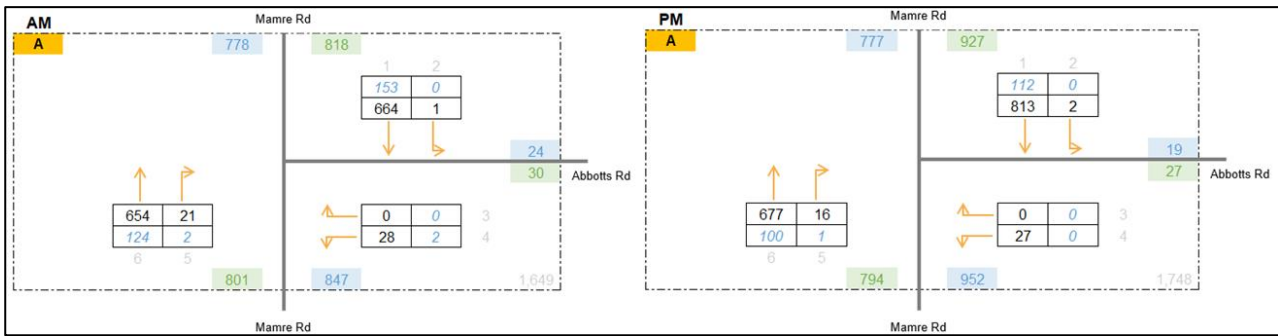


Figure 6: 2022 Surveyed Flow at Mamre Road / Abbotts Road Intersection

2.1.4 Baseline SIDRA Performance Testing

SIDRA intersection modelling has been undertaken to establish the baseline performance of the key intersection using SIDRA Intersection 9.0. In this regard, SIDRA modelling outputs a range of performance measures relevant to this assessment, including:

- Average Vehicle Delay (AVD): AVD (or average delay per vehicle in seconds) for intersections is used to determine an intersection’s Level of Service (see below). For signalised intersections, the AVD reported relates to the average of all vehicle movements through the intersection.
- Degree of Saturation (DoS): DoS is defined as the ratio of demand (arrival) flow to capacity.
- Level of Service (LoS): LoS is a comparative measure that provides an indication of the operating performance, based on AVD.

Table 6 provides the SIDRA recommended criteria for the assessment of intersections with reference to the RMS Guide.

TABLE 6: SIDRA LEVEL OF SERVICE CRITERIA

LoS	Average Delay per Vehicle (s)	Traffic Signals & Roundabout	Give Way & Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

2.1.5 Existing Intersection Operation

The existing performance of the key intersection has been determined based on the above methodology and validated through our on-site observations and knowledge of the operation of local roads and intersections. The results of the SIDRA analysis of existing operations are summarised in **Table 7**, with detailed modelling outputs provided in **Appendix B**.

TABLE 7: 2022 BASELINE INTERSECTION OPERATIONS

Intersection	Configuration	Period	AVD	DoS	LoS
Mamre Road / Abbotts Road	Priority	AM	19	0.41	B
		PM	22	0.40	B

With reference to **Table 7**:

- The Mamre Road / Abbotts Road intersection operates with satisfactory levels of performance under its existing configuration and background traffic during both AM and PM peak periods.
- It is observed that the northbound right turn movement is the critical movement in both peak periods, and vehicles queuing are wholly contained within the associated lane.

3 Proposed Works

3.1 Project upgrades

The proposed upgrades to the Mamre Road / Abbotts Road intersection for the 2026 road network are shown in **Figure 7**. The upgrades are proposed to represent the final configuration of the Abbotts Road leg, as per TfNSW's directive for the ultimate road network to be delivered.

Acquisition of Lot 1 DP250002 (adjacent to the Mamre Road / Abbotts Road intersection) to support the additional intersection widening is currently being facilitated by ESR for the 2026 intersection and road upgrade.

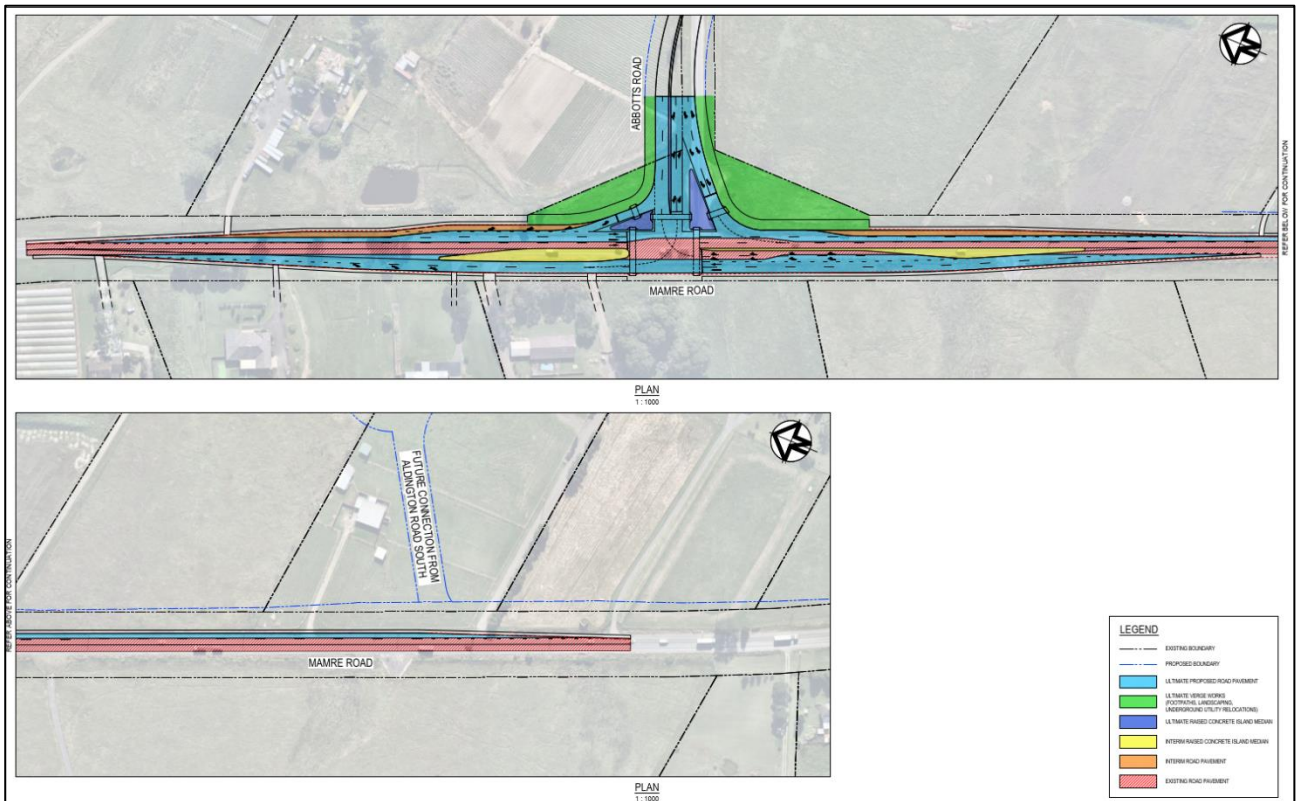


Figure 7: Mamre Road / Abbotts Road Intersection - Currently Proposed 2026 Geometry

Source: Ason Group, "P1323r06v02 TMAP Stage 1 Westlink, Issue.pdf", 19 October 2022

3.2 Other Works

Further to the proposed Project, LOG-E are also proposing Abbotts Road and Aldington Road corridor upgrades (AARU). **Figure 8** demonstrates the extent of the AARU, with the subsequent figures demonstrating the intersections in more detail. The proposed AARU is consistent with Council requirements.

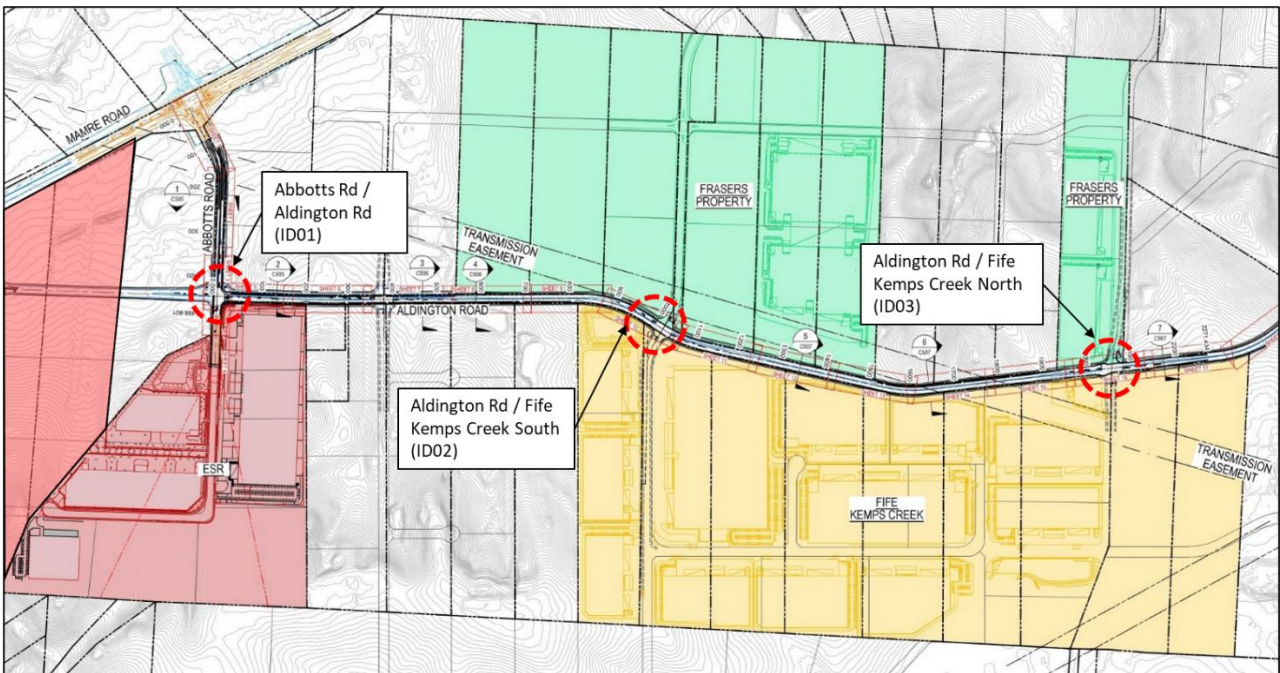


Figure 8: AARU – General Arrangement (Prepared by AT&L)

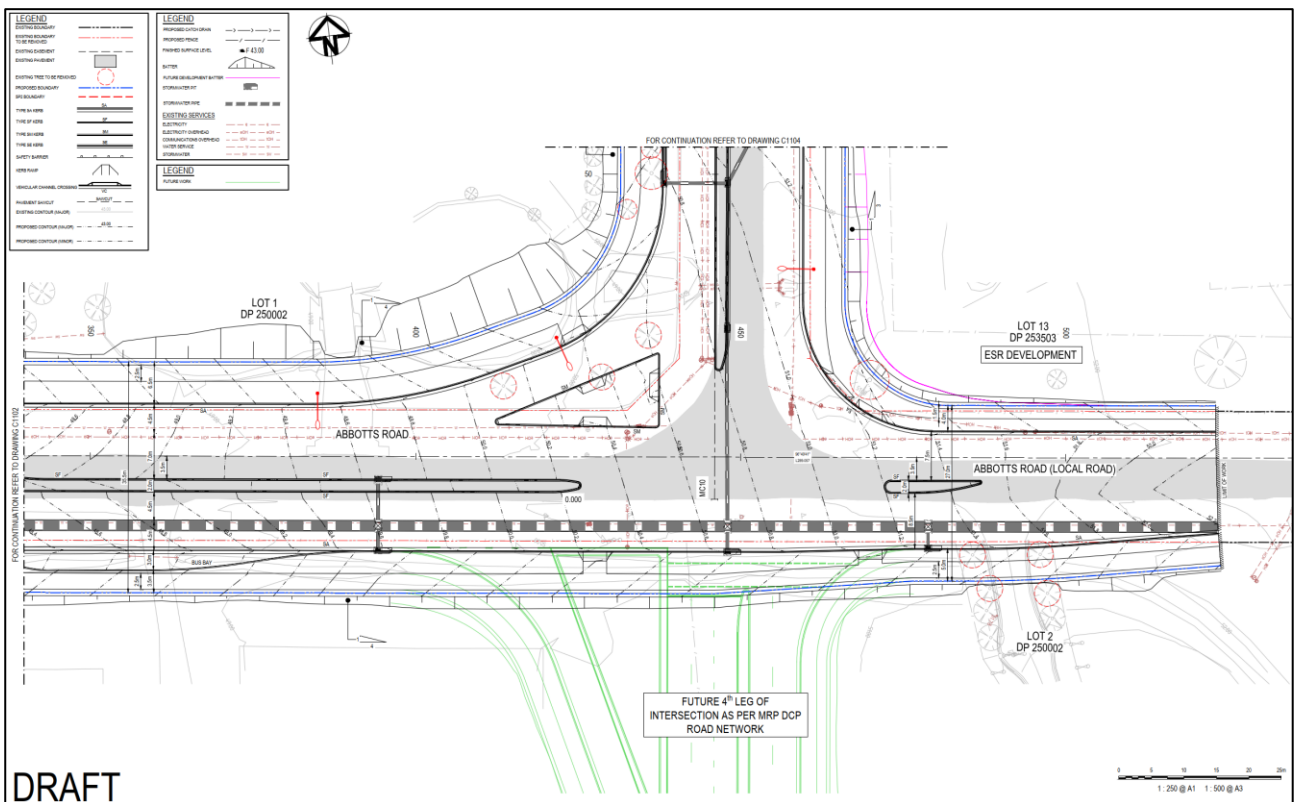


Figure 9: AARU 50% Design Drawing - Abbots Road / Aldington Road Intersection

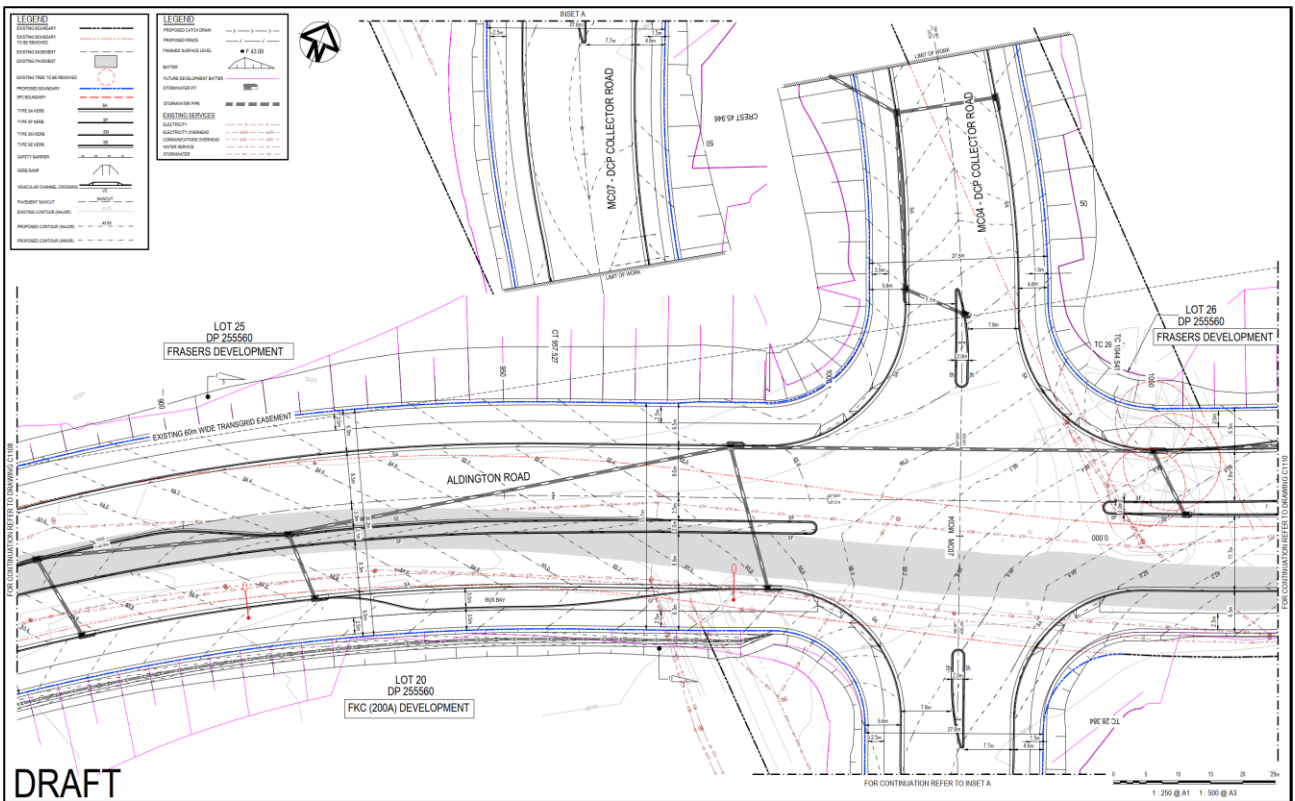


Figure 10: AARU 50% Design Drawing - Aldington Road / MC07 DCP Collector Road (Fraser's South)

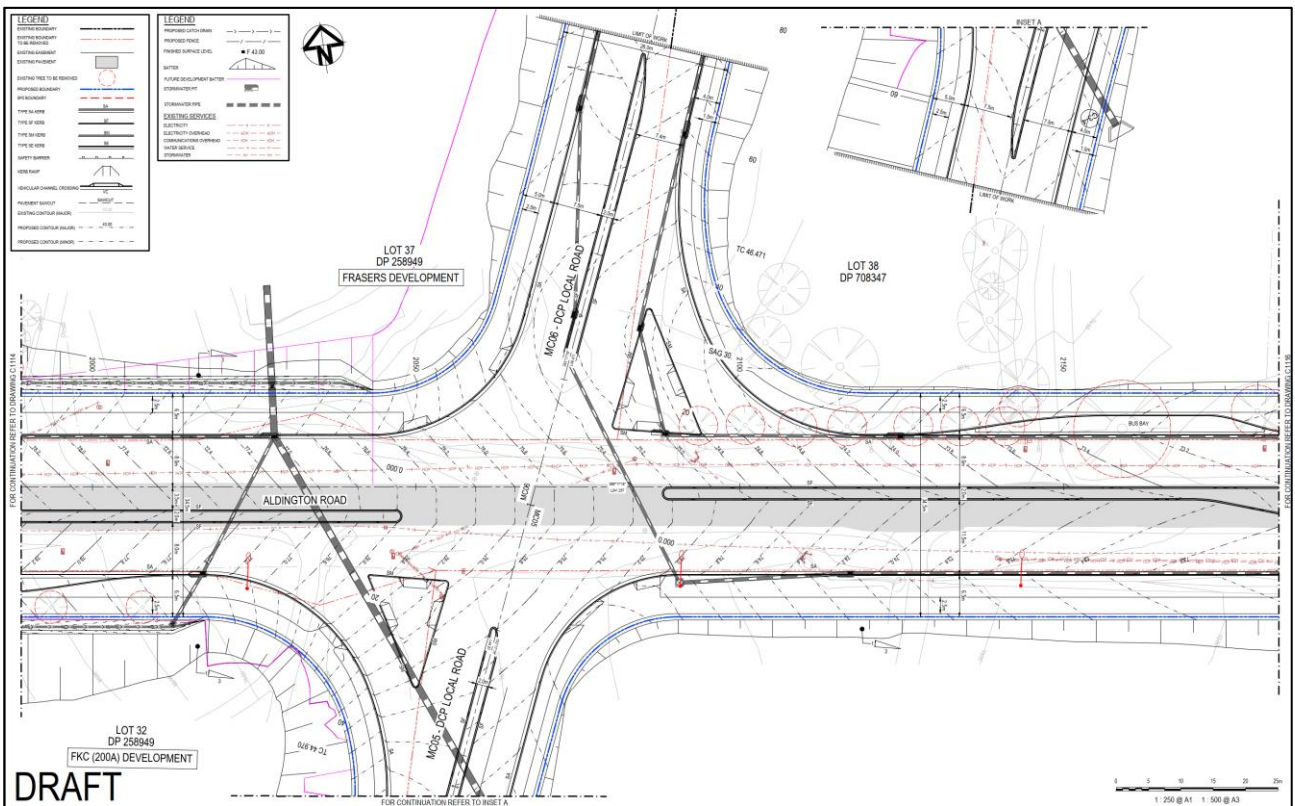


Figure 11: AARU 50% Design Drawing - Aldington Road / MC06 DCP Local Road (Fraser's North)

Finally, it is noted that LOG-E on-lot works will also be occurring for each of the respective sites. However, it is critical to recognise that at this stage, the construction programme for each site is currently unknown as it is subject to the relevant Development Application (DA) and approval processes.

3.3 Construction Methodology

3.3.1 Construction Staging – Works Phases

The works periods identified below are for construction of the Project as a whole and represent a consolidation of the construction activities identified in the construction programme provided by the LOG-E. It is anticipated that construction of the Project would be conducted over three construction works periods, as listed below:

- Stage 1: Mamre road – construction of median and northbound carriageway, widening of southbound carriageway, left-in turn lane and traffic island. Abbots Road – construction of the eastbound carriageway, right-out turn lanes and median. Two-way traffic to remain on the existing pavement (refer **Figure 12**).
- Stage 2: Mamre Road – construction of median and southbound carriageway, two-way traffic to be on new pavement. Abbots Road – construction of westbound turn lanes and traffic island. Two-way traffic to remain on existing pavement (refer **Figure 13**).
- Stage 3: Mamre Road – construction of southbound carriageway. Abbots Road – completion of westbound turn lanes and traffic island. Two-way traffic to be on new pavement (refer **Figure 14**).

Some out-of-hours shift work will also be required for culvert road crossings and asphalt paving, in addition to all the above.

3.3.2 Construction Staging – Intersection Layouts

The following intersection layout for each construction stage of the Mamre Road / Abbots Road Upgrade have been provided to Ason Group. Reduce scaled copies of the intersections are demonstrated in figures below.

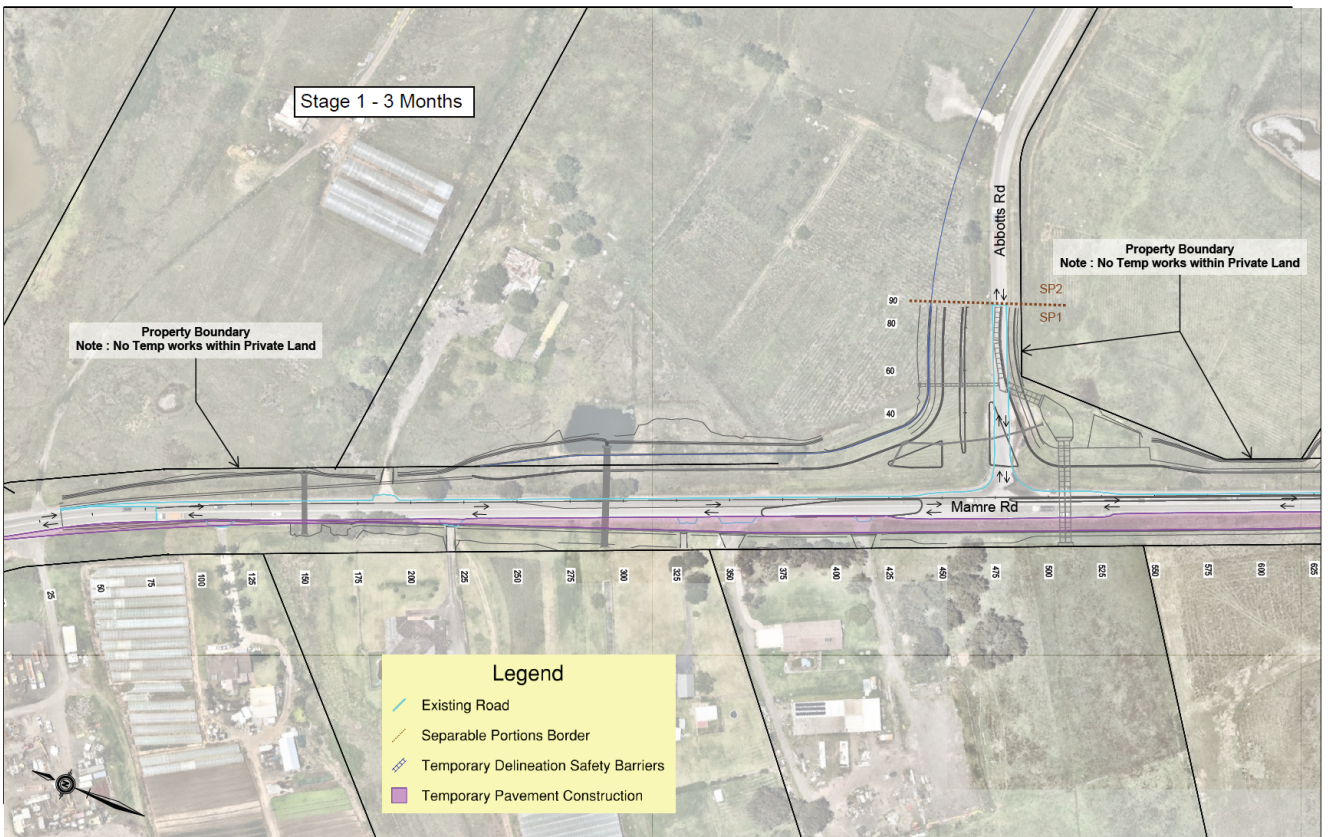


Figure 12: Mamre Road / Abbotts Road Upgrade - Construction Stage 1 - Refer to Robson Staging Plan

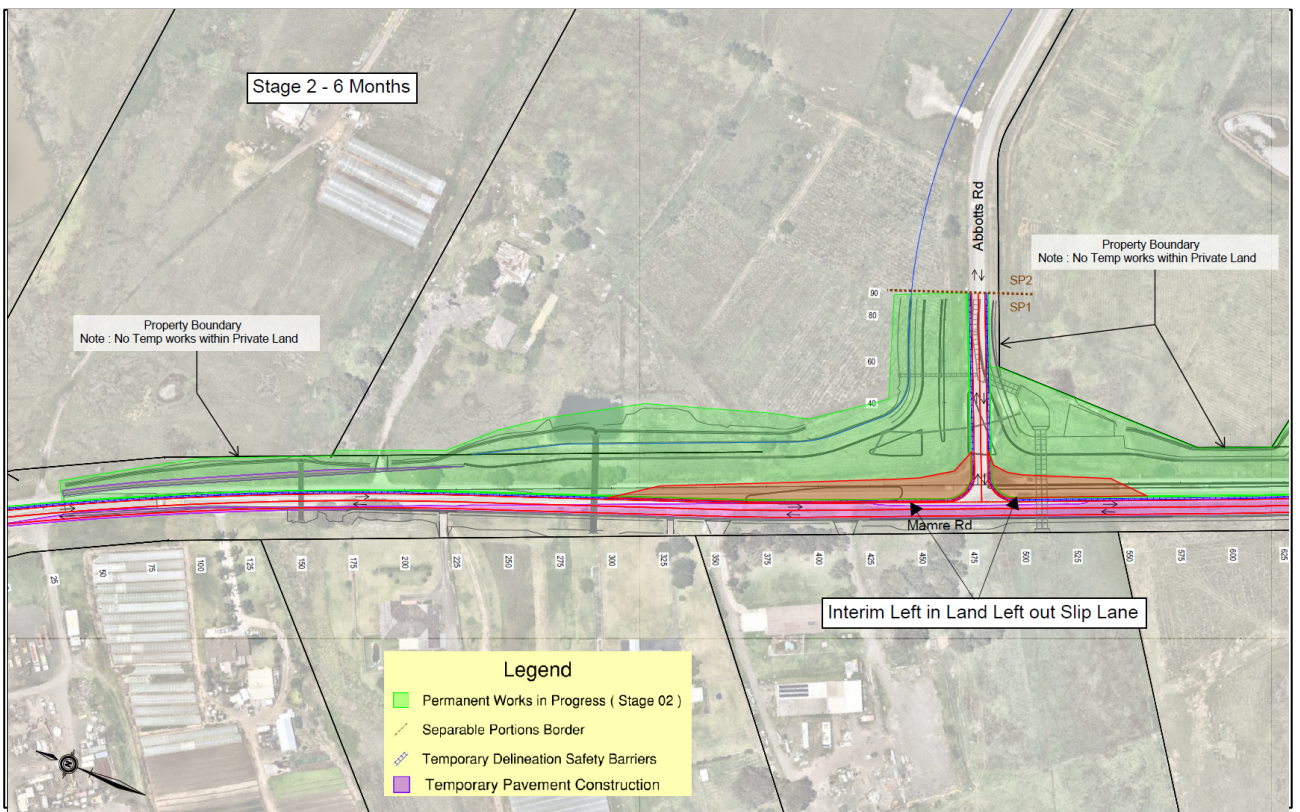


Figure 13: Mamre Road / Abbotts Road Upgrade - Construction Stage 2 - Refer to Robson Staging Plan

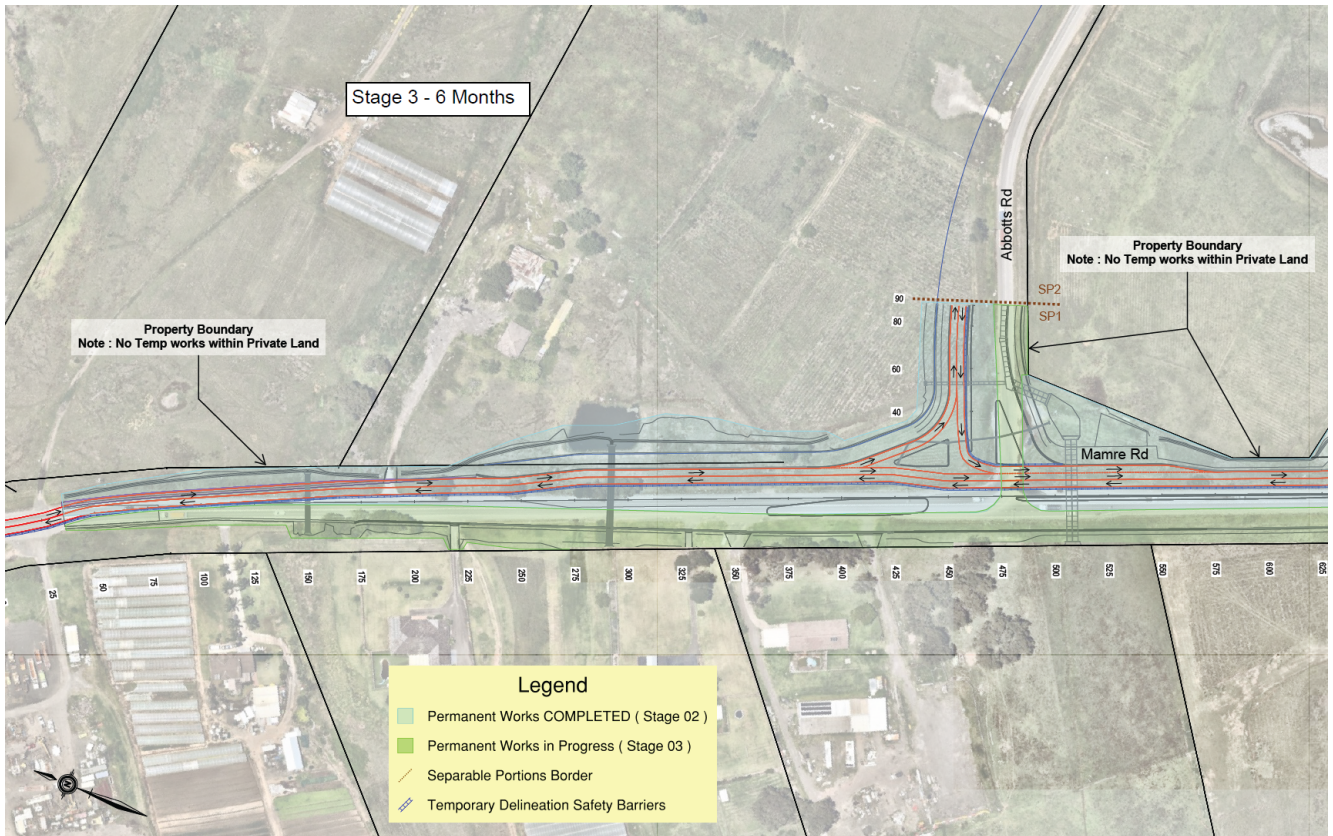


Figure 14: Mamre Road / Abbotts Road Upgrade - Construction Stage 3 - Refer to Robson Staging Plan

3.3.3 Construction Programme and Activities – Mamre Road / Abbotts Road Upgrade

Construction of the Project is planned to commence in March 2024, with the total period of construction works (of the three stages) anticipated to be approximately 15 months. The overall construction timeframe of the Project, alongside the upgrades of Aldington Road and the LOG-E development sites, are to occur across approximately 23 months. Detailed construction works and the cumulative construction programme are provided in section 3.3.4 below.

The indicative construction programme (subject to relevant approvals) of the Project is indicated in **Table 8** below.

TABLE 8: PROJECT CONSTRUCTION PROGRAMME

Stage	Estimated Commencement	Estimated Completion	Duration
1	June 2024	September 2024	3 months
2	September 2024	February 2025	6 months
3	February 2025	August 2025	6 months

3.3.4 Construction Programme and Activities – LOG-E Works and AARU

Further to the above works, it is also noted that each of the LOG-E sites may be subject to construction works relating to the on-lot developments, as well as works commencing on the AARU. The current construction timeframes for the AARU and LOG-E sites are provided below in **Table 9**. Note that this is subject to change relating to the relevant approvals processes.

TABLE 9: LOG-E DEVELOPMENT PROJECT CONSTRUCTION PROGRAMMES

Site	Estimated Commencement	Estimated Completion	Duration
Abbotts Road Upgrade	December 2023	September 2024	10 months
Aldington Road Upgrade	October 2023	April 2025	18 months
Frasers North	April 2024	June 2025	15 months
Frasers South	July 2024	August 2025	14 months
ESR	October 2023	July 2025	21 months
FKC	October 2023	November 2024	14 months

3.4 Site Access

It is noted that construction traffic management is to be subject to the relevant Construction Traffic Management Plans (CTMP) implemented at the time construction commences. However, it has been well established that construction traffic is not to utilise Bakers Lane. Therefore, all construction traffic will access each of the sites via the Mamre Road / Abbots Road intersection.

The following access routes are to be applied for construction of the Project as well as the AARU and LOG-E development sites.

- Stage 1:
 - All construction vehicle, including light and heavy vehicles, access to and from the Project site is expected to occur via left-in left-out movements only at the Mamre Road / Abbots Road intersection during Stage 1 of the construction. No right-in movements from Mamre Road are allowed for construction vehicles.
 - Local traffic access from Mamre Road to Abbots Road may allow right-in movement subject to TfNSW agreement and the existing traffic rules, as abovementioned in **Section 2.1.2**, apply. However if safety is a concern, left-in left-out movements may be restricted to local traffic. They have the ability to turn right at the Bakers Lane intersection further north if required.
- Stage 2 and 3
 - During construction Stage 2 and 3, all construction vehicles will be limited to left-in left-out movements only at the Mamre Road / Abbots Road intersection.
 - Right-in movement from Mamre Road may be allowed for local traffic subject to TfNSW agreement. Similar mitigation to be applied for Stage 2 and 3 as stated in Stage 1 access arrangement

The heavy vehicle access routes are shown in the figure below.

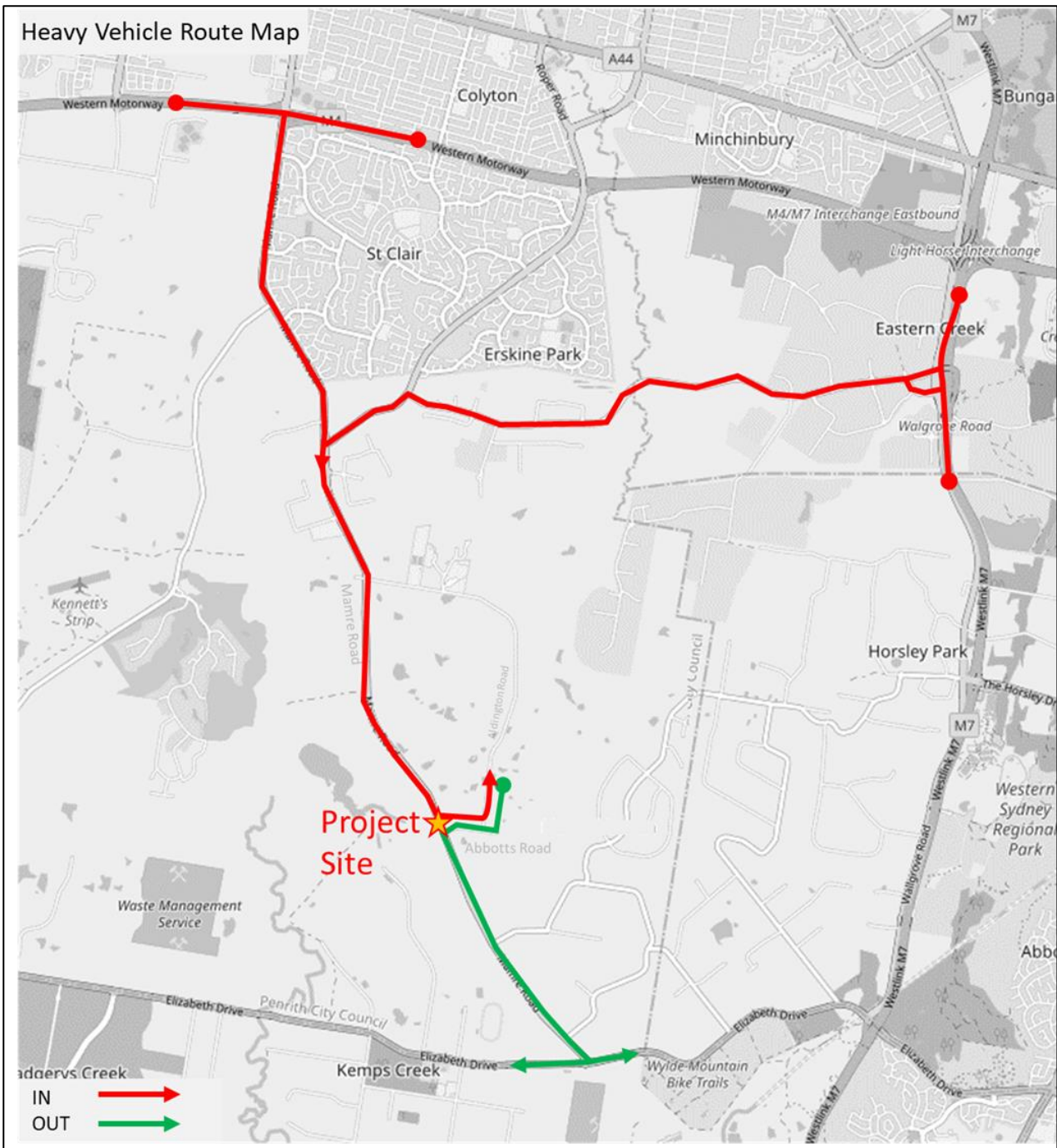


Figure 15: Stage 2 and 3 Heavy Vehicle Site Access Route

4 Traffic Generation Assessment

4.1 Construction Traffic Generation

Construction traffic demand for each of the associated LOG-E developments, as well as the infrastructure construction traffic, have been provided by respective developers / contractors to inform this assessment. Construction vehicle type, its associated volumes and daily profile has been provided for each construction stage of the Project (as per **Section 3.3**).

The construction traffic forecasts for each site provided have been overlaid to establish the peak cumulative *construction* period, with peak flows (movement/hour or movement/day) for each of the construction stage demonstrated in tables below.

The peak construction period for Stage 1 is expected to occur during June 2024.

TABLE 10: PEAK CUMULATIVE TRAFFIC MOVEMENTS – Stage 1

Site	AM	PM	Daily
Mamre Road Upgrade	30	18	284
Abbotts Road Upgrade	40	20	332
Aldington Road Upgrade	40	22	358
Frasers North	15	15	76
Frasers South	0	0	0
ESR Stage 1	46	18	248
ESR Stage 2	56	26	424
FKC	14	14	100
Total	241	133	1,822

The peak construction period for Stage 2 is expected to occur during September 2024.

TABLE 11: PEAK CUMULATIVE TRAFFIC MOVEMENTS – Stage 2

Site	AM	PM	Daily
Mamre Road Upgrade	30	18	284
Abbotts Road Upgrade	0	0	0
Aldington Road Upgrade	40	22	358
Frasers North	47	30	288
Frasers South	25	35	158
ESR Stage 1	46	18	248
ESR Stage 2	56	26	424
FKC	0	0	0
Total	244	149	1,760

The peak construction period for Stage 3 is expected to occur during February 2025.

TABLE 12: PEAK CUMULATIVE TRAFFIC MOVEMENTS – Stage 3

Site	AM	PM	Daily
Mamre Road Upgrade	30	18	284
Abbotts Road Upgrade	0	0	0
Aldington Road Upgrade	40	22	358
Frasers North	32	15	212
Frasers South	57	50	370
ESR Stage 1	0	0	0
ESR Stage 2	46	18	298
FKC	0	0	0
Total	205	123	1,522

4.2 Trip Distribution

The vehicular classification, based on the information provided, is shown in **Table 13**.

TABLE 13: VEHICLE TYPE SPLIT FOR CONSTRUCTION VEHICLE TRIPS

Stage	Period	Light Vehicle	Heavy Rigid	Heavy Articulated
Stage 1	AM	209	16	16
	PM	61	38	34
Stage 2	AM	210	18	16
	PM	83	30	36
Stage 3	AM	185	12	8
	PM	69	22	32

The distribution of traffic from the Site has been based on the surveyed traffic volumes. The subsequent trip distribution profiles for each of the assessment scenarios (see **Section 5.2.2**) are presented in **Appendix A**.

5 Construction Traffic Impact Assessment

5.1 Introduction

To assess the impacts of the construction traffic generation outlined in **Section 3.4**, a SIDRA modelling assessment has been undertaken. The following sections outline the inputs and assumptions which have been adopted for the modelling assessment, as well as summarising the results of the traffic modelling assessment.

The key works associated with this CTIA relate to the modelling of the temporary intersection arrangements during the key construction stages.

5.2 Modelling Inputs

5.2.1 SIDRA Intersection Layout

With reference to Section 3.3.2, the following intersection geometry have been adopted for SIDRA modelling and are shown in **Figure 16** and **Figure 17**.

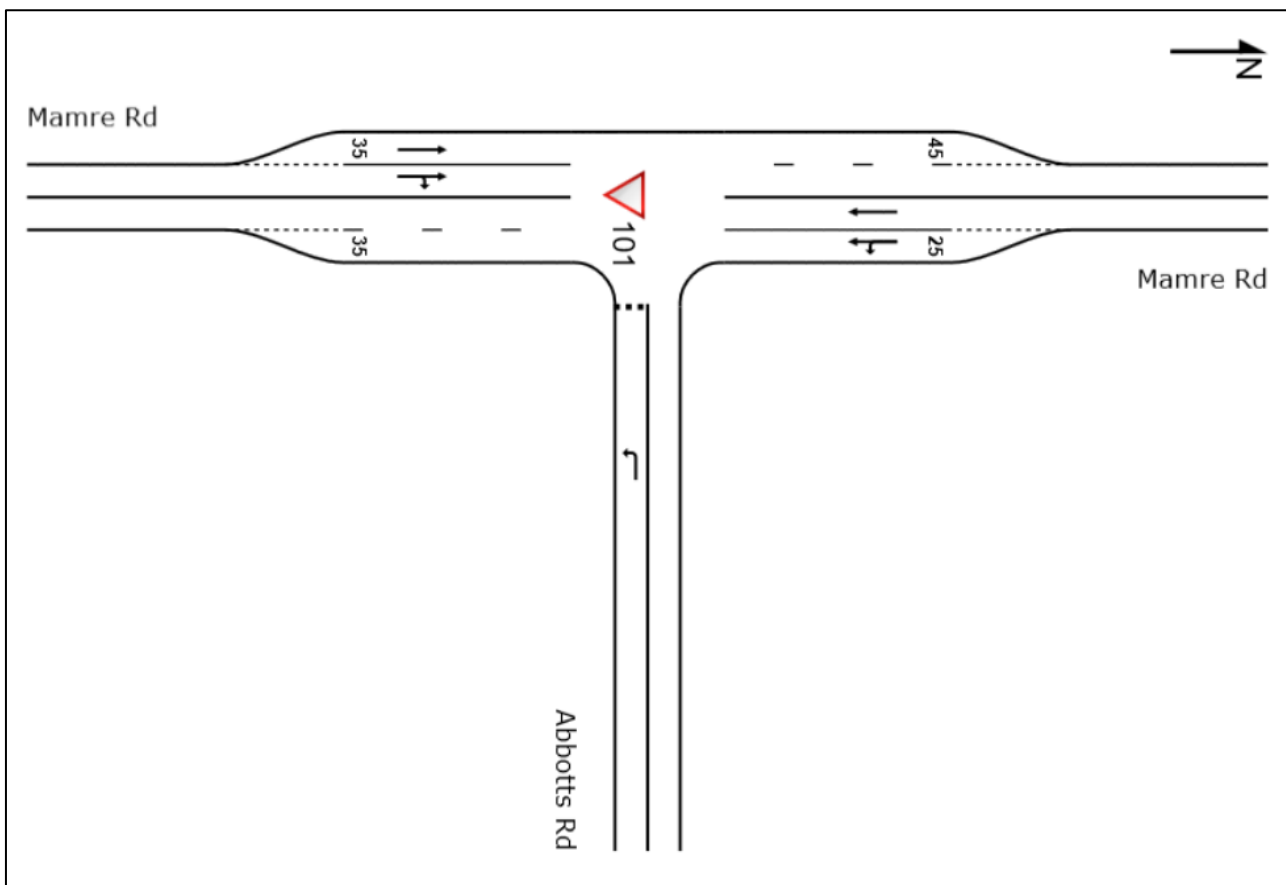


Figure 16: Mamre Road / Abbots Road Upgrade Layout - Construction Stage 1¹

Note: 1) Right-in movement from Mamre Road allowed for local traffic only subject to TfNSW agreement

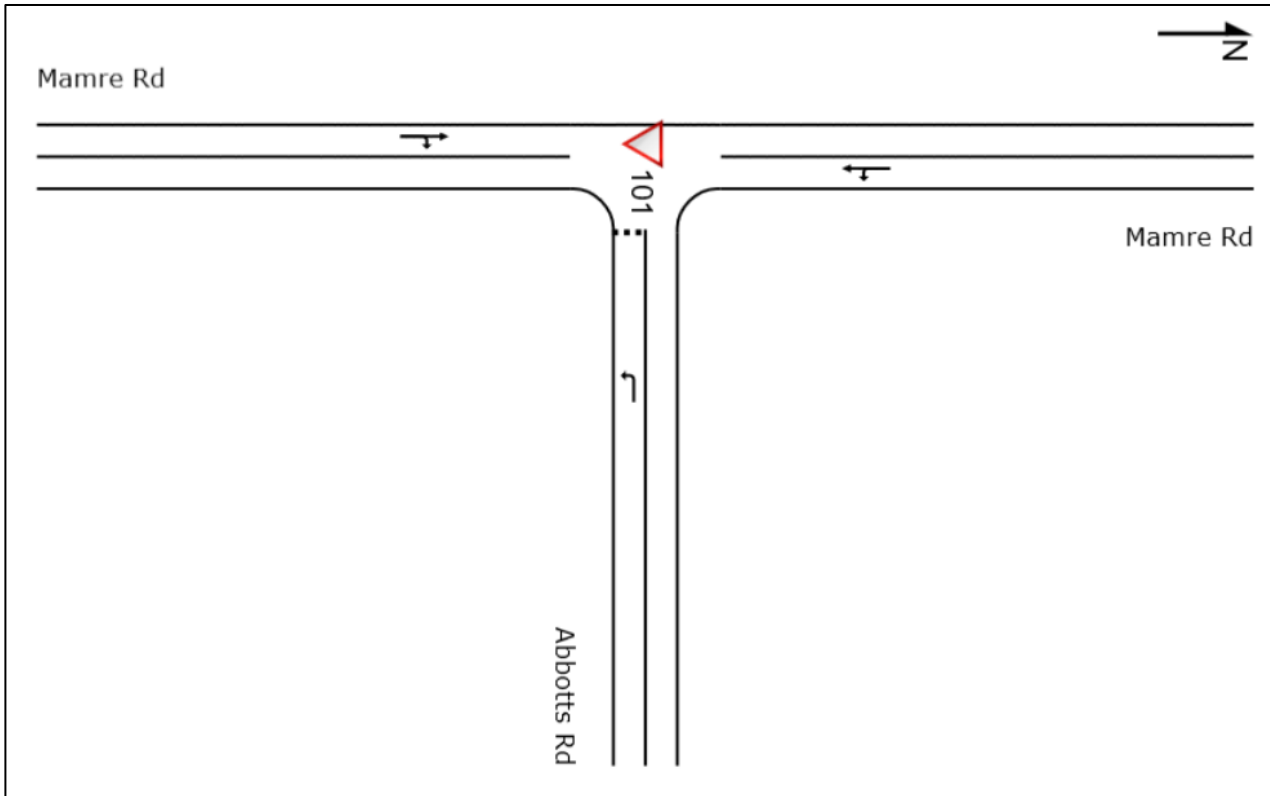


Figure 17: Mamre Road / Abbotts Road Upgrade Layout - Construction Stage 2 & 3¹

Note: 1) Right-in movement from Mamre Road allowed for local traffic only subject to TfNSW agreement

5.2.2 Assessment Scenarios

Construction traffic flow and infrastructure scenarios for the forecasted construction phasings, have been developed for this assessment.

The following scenarios have been assessed to consider for all three phases of construction for the Mamre Road / Abbotts Road intersection upgrade project:

- Scenario 1: Base 2024 + Construction Stage 1 – Base 2024 traffic flows (i.e., with background traffic growth to 2024 without construction traffic) plus peak cumulative construction traffic flows (associated LOG-E developments and surrounding infrastructure upgrades) during Stage 1 Mamre Road / Abbotts Road Upgrade.
- Scenario 2: Base 2024 + Construction Stage 2 – Base 2024 traffic flows plus peak cumulative construction traffic flows during Stage 2 Mamre Road / Abbotts Road Upgrade.
- Scenario 3: Base 2024 + Construction Stage 3 – Base 2024 traffic flows plus peak cumulative construction traffic flows during Stage 3 Mamre Road / Abbotts Road Upgrade.

With reference to Figure 16 and Figure 17, it is noted that the intersection geometry of Stage 3, as it relates to SIDRA modelling input, is identical to that of Stage 2. Further, the Stage 3 peak cumulative construction flow presents a reduced traffic volume compared to Stage 2.

Therefore, assessment of Phases 1 and 2 has been undertaken. Assessment of Stage 3 is not considered necessary, noting that volumes would be less than under Stage 2.

5.2.3 Background Traffic Growth

To establish the relevant 2024 baseline traffic flows, linear growth rate of 3% has been adopted. The baseline flows, along with the development flows, are presented in **Appendix A**.

5.3 Base Intersection Operations

5.3.1 Scenario 1 – Base 2024 + Construction Stage 1

This scenario captures the future 2024 baseline volume and the addition of peak cumulative construction volume during Stage 1 of the Project. The SIDRA intersection outputs for Scenario 1 for Mamre Road / Abbotts Road intersection for both AM and PM peak periods are summarised in **Table 14**, detailed SIDRA modelling outputs are provided in Appendix B.

TABLE 14: SCENARIO 1 – SIDRA RESULTS					
Intersection	Configuration	Period	Delay (s)	DoS	LoS
Mamre Road / Abbotts Road	Priority-controlled	AM Construction Stage 1	41	0.58	C
		PM Construction Stage 1	29	0.45	C
		AM Existing	19	0.41	B
		PM Existing	22	0.40	B

With reference to the above, the SIDRA intersection modelling indicates that the intersection is able to satisfactorily accommodate the forecasted background volumes as well as the forecasted cumulative construction traffic.

A comparison of the intersection performance between the existing operation and the anticipated Stage 1 construction, indicates that the addition of the traffic generated by construction activities within vicinity of the site has minor increase in the AVD and DoS on the operation of the study network during construction of Stage 1 of the Project.

It is noted that the LoS at Mamre Road / Abbotts Road intersection is anticipated to deteriorate from LOS B to C during both peaks. However, performance is still within acceptable levels; and, noting that this would be for a temporary period during construction of the Project, and is deemed to be acceptable.

5.3.2 Scenario 2 – Base 2024 + Construction Stage 2

This scenario includes the construction traffic associated with the peak cumulative construction traffic during Stage 2 of the Project. The SIDRA intersection outputs for Scenario 2 for Mamre Road / Abbotts Road intersection are summarised in **Table 15** below, with detailed SIDRA modelling outputs provided in Appendix B.

TABLE 15: SCENARIO 2 – SIDRA RESULTS

Intersection	Configuration	Period	Delay (s)	DoS	LoS
Mamre Road / Abbotts Road	Priority-controlled	AM Construction Stage 2	51	0.72	D
		PM Construction Stage 2	31	0.57	C
		AM Construction Stage 1	41	0.58	C
		PM Construction Stage 1	29	0.45	C
		AM Existing	19	0.41	B
		PM Existing	22	0.40	B

With reference to the above, it is noted that a deterioration in the intersection performance is anticipated during Stage 2 construction as a result of the change in intersection geometry. The new configuration includes one lane for both right-turn and through movement, and no longer supports the bypass of through movements.

The cumulative construction traffic during Stage 2 will have minor impacts on the PM peak intersection performance, where LoS C is maintained and an increase of 2 seconds in overall delay is anticipated when compared against Stage 1 construction.

During Stage 2 AM peak, a higher DoS of 0.72 and LoS of D are anticipated due to the increase in delay of the south approach movement. The significant increase in the left-turn in movements, from 64 during the PM peak to 231 during the AM peak, would result in the increased delay of the south approach right-turn in movement, and subsequently the through movement. It is important to note that the volume of right-turn in movements during the Stage 2 AM peak is of a low volume of 22 movements, and the Stage 2 construction is expected to have a duration of 4 months.

Nevertheless, the intersection is able to satisfactorily accommodate the anticipated cumulative construction traffic volume during Stage 2 construction for both AM and PM peaks with additional capacity.

It is anticipated that the intersection will operate with similar LoS or better during Stage 3 of the construction due to reduced traffic volume.

Therefore, it is concluded that the Mamre Road / Abbotts Road intersection will be able to satisfactorily accommodate the cumulative construction traffic associated with the infrastructure upgrade and LOG-E development within vicinity of the Project, during all phases of the construction.

Further to the above intersection performance, it is noted that each of the projects documented would be subject to construction traffic management measures (i.e. Traffic Controllers). These measures are to be detailed in the relevant CTMPs to be implemented at the time of construction. As such, it is evident that the proposed construction activities can occur without having an impact on network performance and road safety.

6 Conclusions

Ason Group has been engaged by LOG-E (represented by ESR, FKC, and Frasers) to prepare a Construction Traffic Impact Assessment in relation to the proposed Mamre Road and Abbotts Road upgrade project (the project).

Further to the detailed assessment of the relevant construction traffic impacts, the following are the summary and conclusions:

- LOG-E are proposing to deliver an upgrade to the Mamre Road / Abbotts Road intersection (the subject of this report) as well as the Abbotts Road and Aldington Road corridor upgrade (AARU), to support development of the Mamre Road Precinct (MRP).
- The Project will be delivered through a joint Voluntary Planning Agreement between LOG-E and DPE. The upgrades to Abbotts Road and Aldington Road will also be delivered via a VPA between LOG-E and Council.
- The operational performance of the proposed road network has been assessed separately as part of the relevant State Significant Developments for each of the LOG-E sites. The assessment found satisfactory performance in the assessment year of 2026 for each of the intersections to be delivered / upgraded (including the Project).

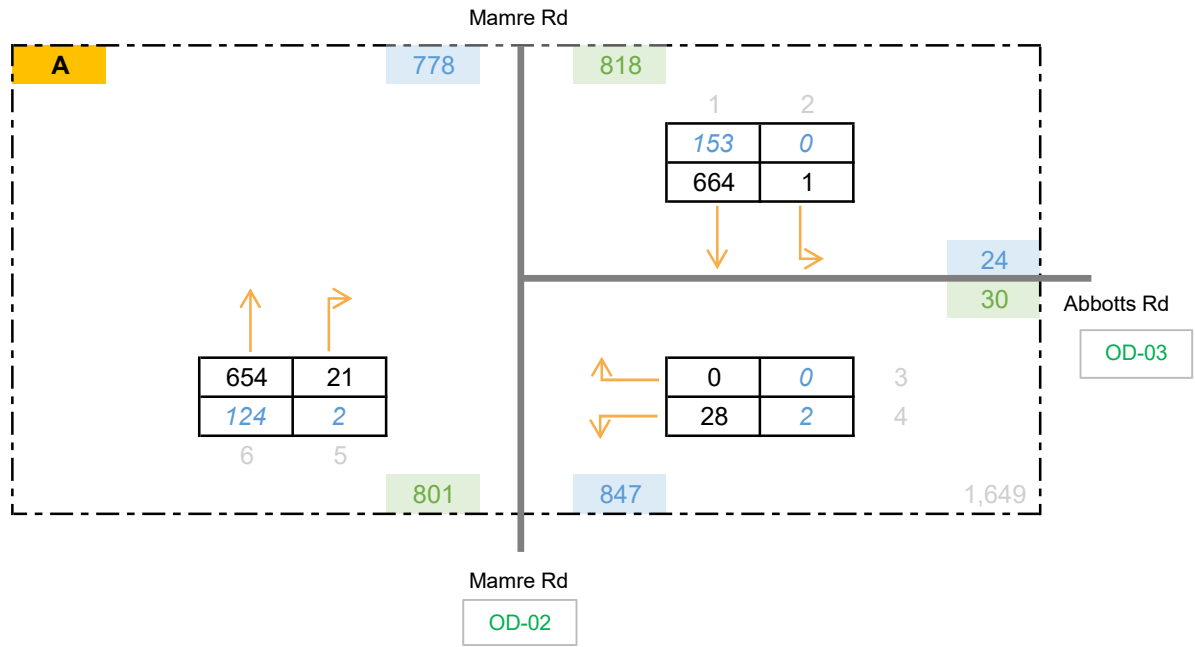
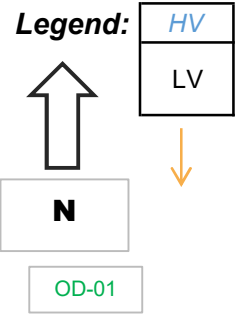
Therefore, the key purpose of this report was to assess the traffic impacts associated with the cumulative construction traffic of the Project.

- The peak cumulative construction is expected to be during June 2024, when works are expected to be occurring on the Project, the AARU as well as the LOG-E sites.
- SIDRA intersection analysis found that the Mamre Road / Abbotts Road intersection would be able to satisfactorily accommodate the forecasted background traffic volumes, as well as the cumulative construction traffic, for both the AM and PM peak periods.
- Overall, during all phases of construction, the Mamre Road / Abbotts Road intersection is able to satisfactorily accommodate the cumulative construction traffic associated with the infrastructure upgrade and LOG-E developments within the MRP.

Appendix A. Traffic Flows

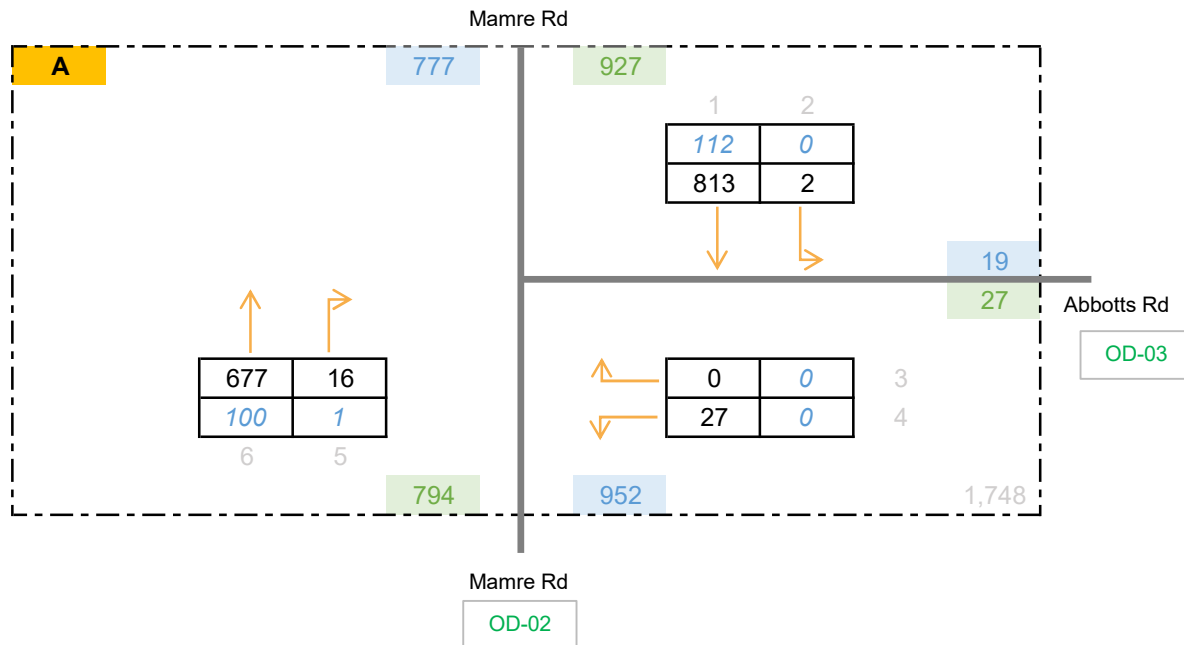
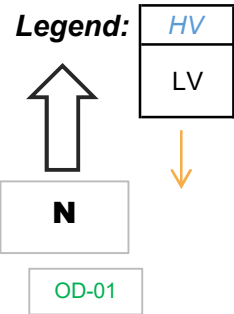
Peak Period: AM

Scenario: Existing



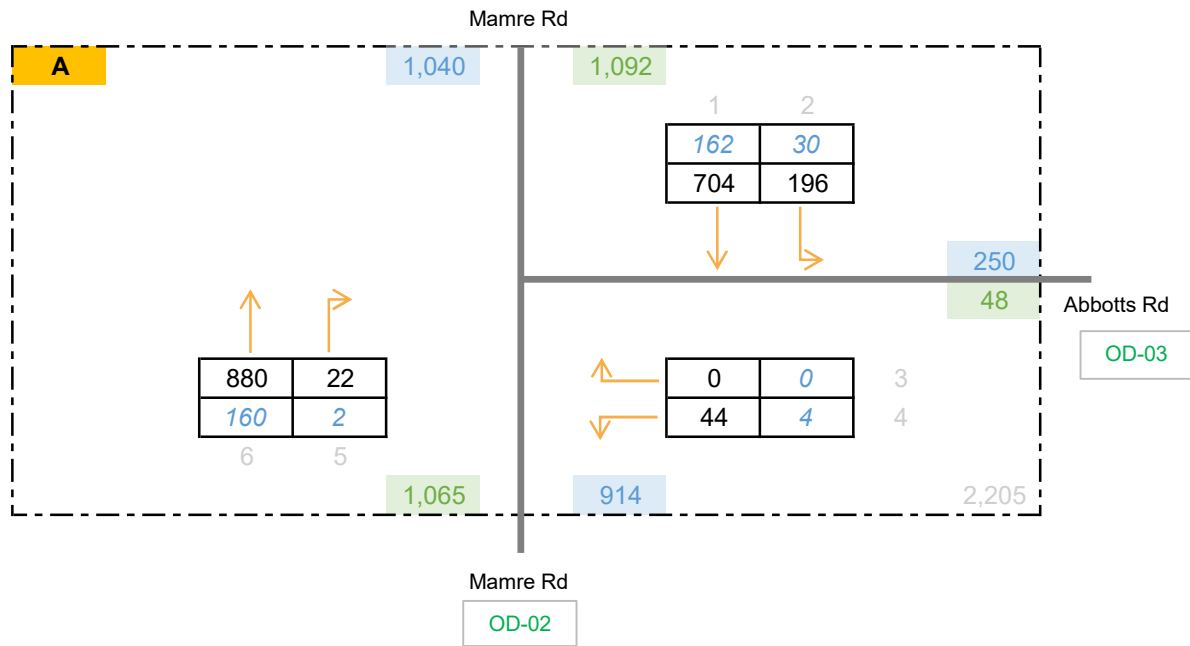
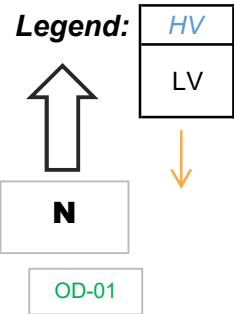
Peak Period: **PM**

Scenario: **Existing**



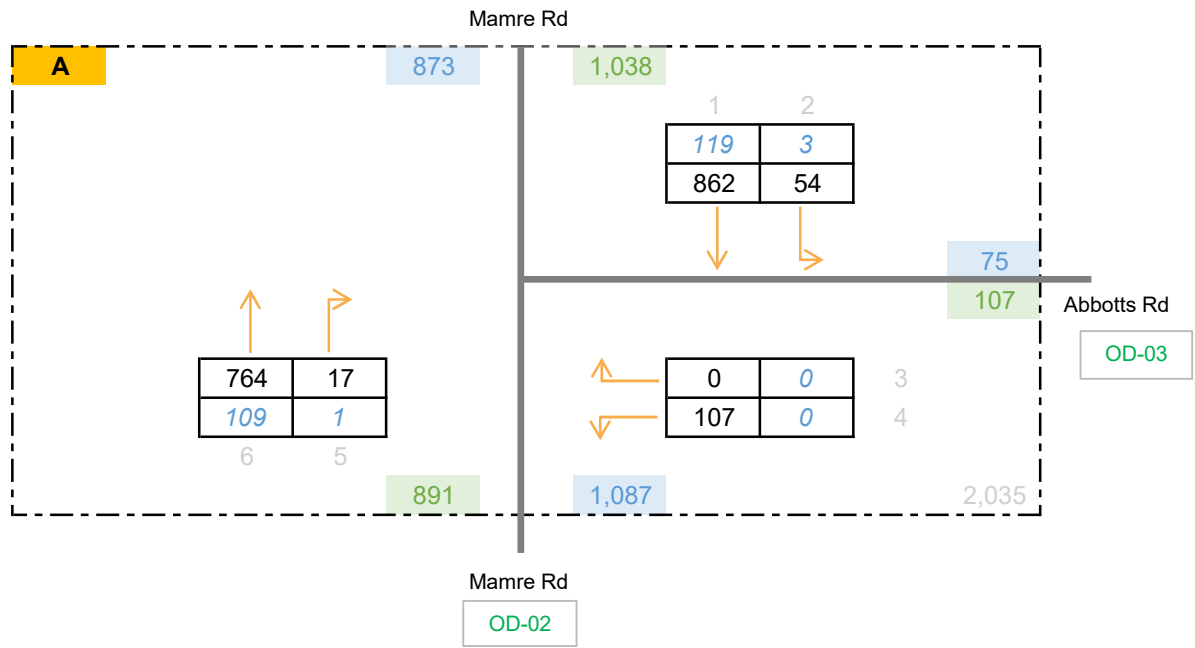
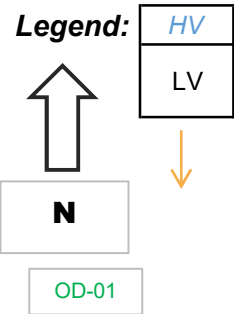
Peak Period: AM

Scenario: Project Case - Stage 1



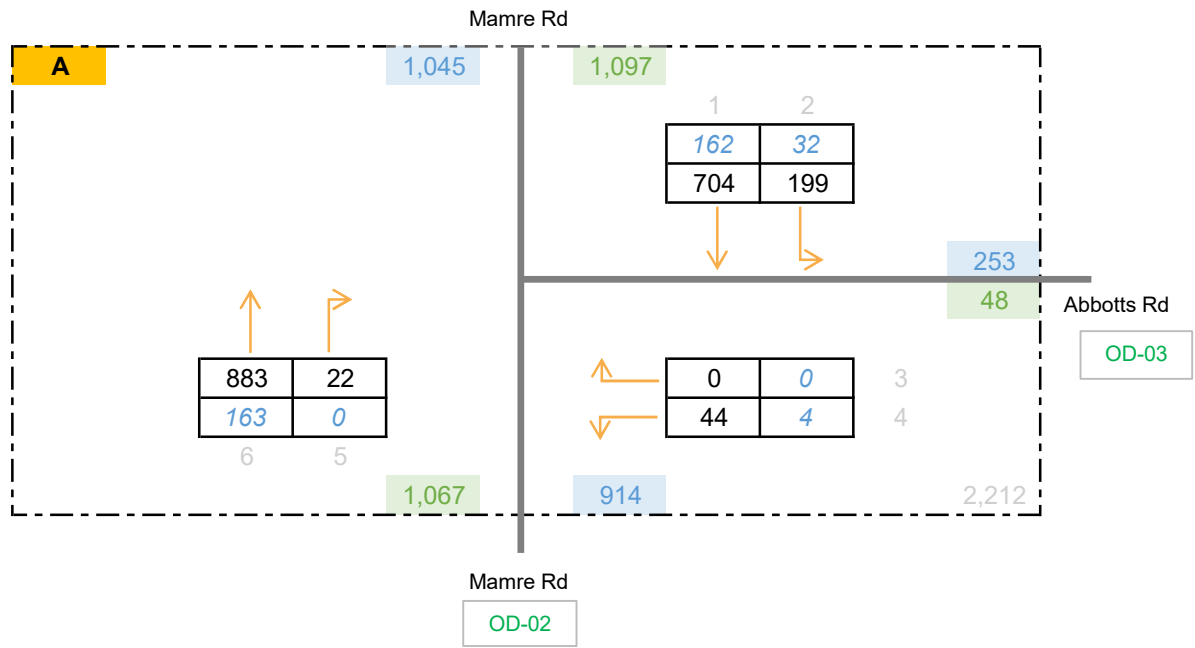
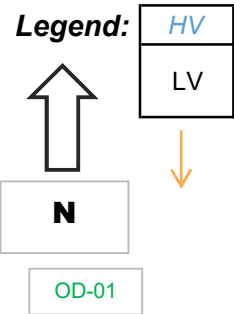
Peak Period: **PM**

Scenario: **Project Case - Stage 1**



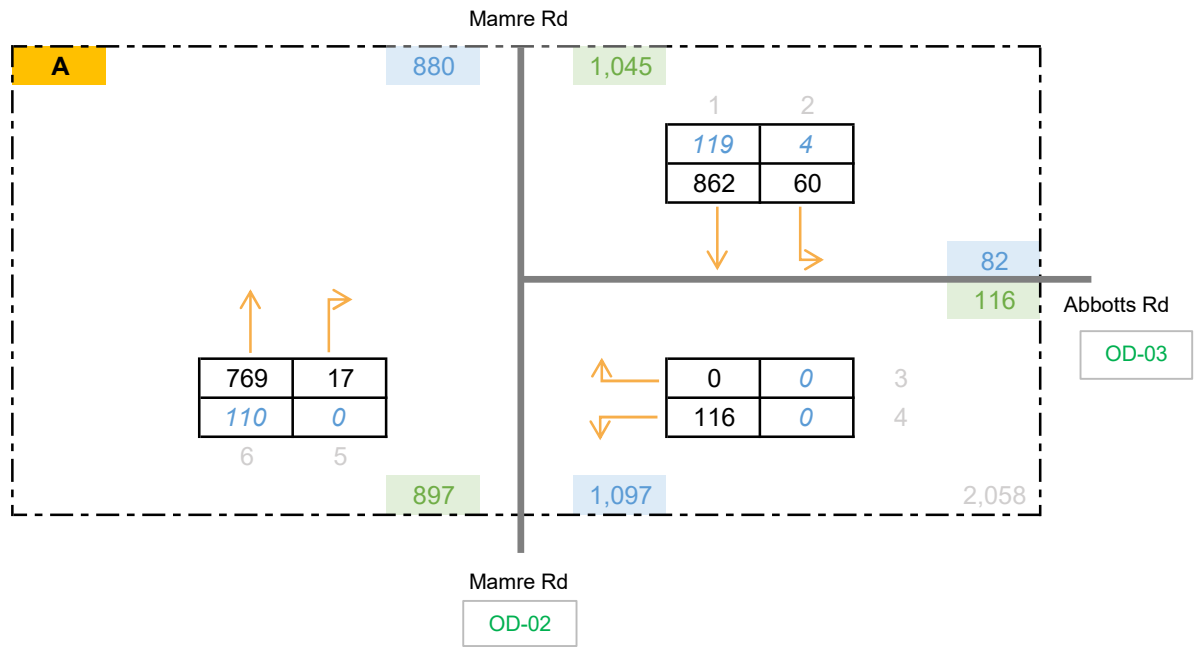
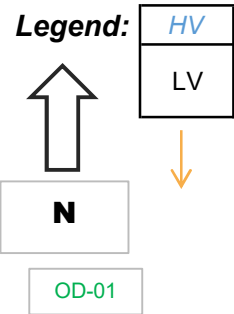
Peak Period: AM

Scenario: Project Case - Stage 2



Peak Period: **PM**

Scenario: **Project Case - Stage 2**



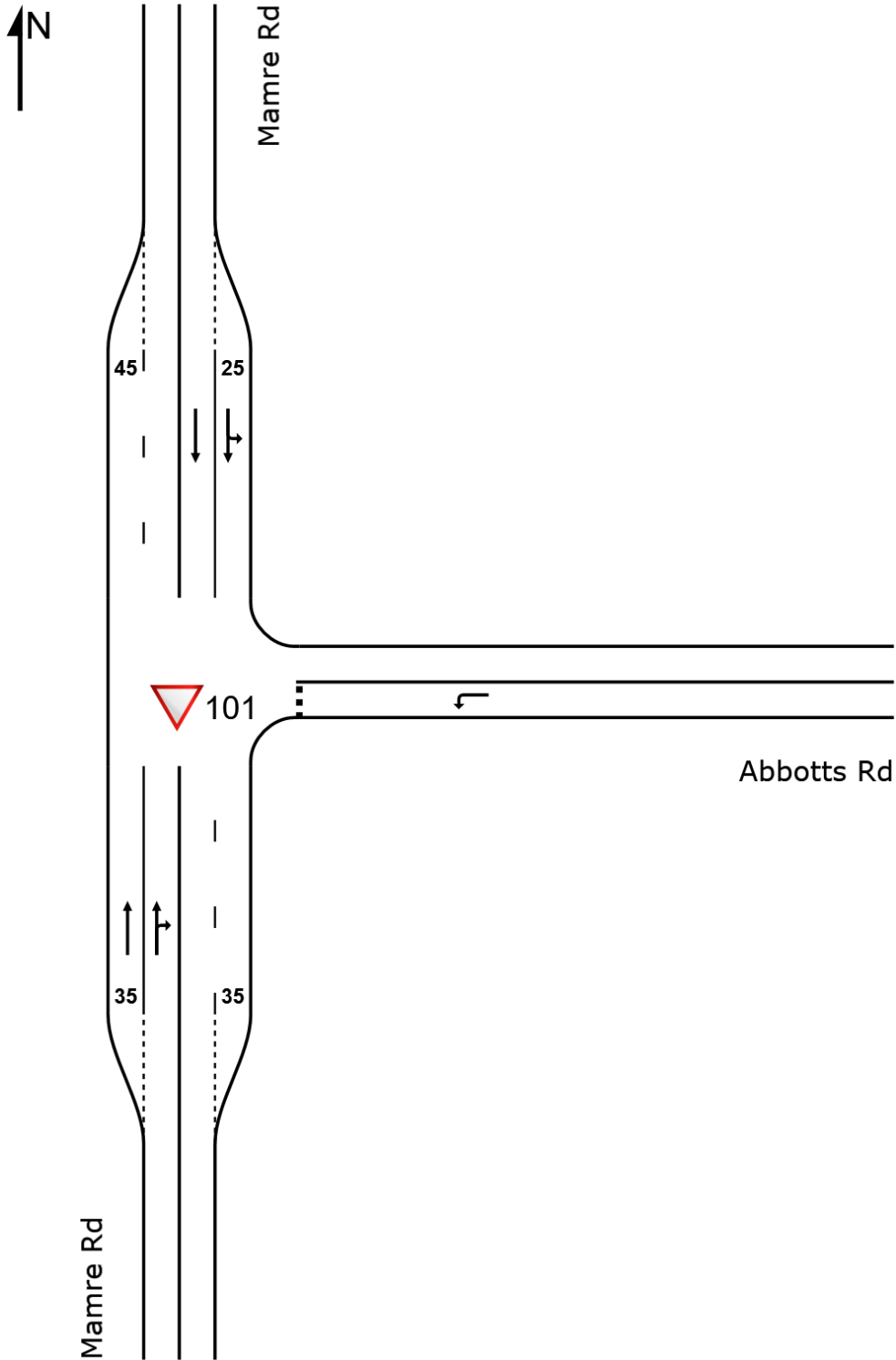
Appendix B. SIDRA Results

SITE LAYOUT

▼ Site: 101 [Baseline - AM (Site Folder: Base)]

Mamre Rd/Abbotts Rd
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Baseline - AM (Site Folder: Base)]

Mamre Rd/Abbotts Rd

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] veh/h	[Total veh/h]	[HV] %				[Veh. veh]	[Dist] m				
South: Mamre Rd														
2	T1	778	124	819	15.9	0.409	1.7	LOS A	1.4	11.1	0.12	0.02	0.17	58.3
3	R2	23	2	24	8.7	0.409	19.4	LOS B	1.4	11.1	0.16	0.03	0.23	55.3
Approach		801	126	843	15.7	0.409	2.2	NA	1.4	11.1	0.12	0.02	0.17	58.2
East: Abbotts Rd														
4	L2	30	2	32	6.7	0.029	8.4	LOS A	0.1	0.7	0.25	0.56	0.25	52.2
Approach		30	2	32	6.7	0.029	8.4	LOS A	0.1	0.7	0.25	0.56	0.25	52.2
North: Mamre Rd														
7	L2	1	0	1	0.0	0.097	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.2
8	T1	817	153	860	18.7	0.398	0.5	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		818	153	861	18.7	0.398	0.5	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles		1649	281	1736	17.0	0.409	1.5	NA	1.4	11.1	0.06	0.02	0.09	58.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\Users\AngelaJi\Ason Group\Ason Group Team Site - 2264\Projects\Modelling\p2264m01v1_Mamre_Abbotts_2026.sip9

MOVEMENT SUMMARY

Site: 101 [Baseline - PM (Site Folder: Base)]

Mamre Rd/Abbotts Rd

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV veh/h]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Mamre Rd														
2	T1	777	100	818	12.9	0.395	1.6	LOS A	1.2	9.7	0.11	0.01	0.15	58.4
3	R2	17	1	18	5.9	0.395	21.8	LOS B	1.2	9.7	0.14	0.02	0.19	55.6
Approach		794	101	836	12.7	0.395	2.1	NA	1.2	9.7	0.11	0.01	0.15	58.3
East: Abbotts Rd														
4	L2	28	0	29	0.0	0.027	8.9	LOS A	0.1	0.6	0.25	0.57	0.25	52.4
Approach		28	0	29	0.0	0.027	8.9	LOS A	0.1	0.6	0.25	0.57	0.25	52.4
North: Mamre Rd														
7	L2	2	0	2	0.0	0.106	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.2
8	T1	925	112	974	12.1	0.434	0.6	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		927	112	976	12.1	0.434	0.7	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles		1749	213	1841	12.2	0.434	1.4	NA	1.2	9.7	0.05	0.02	0.07	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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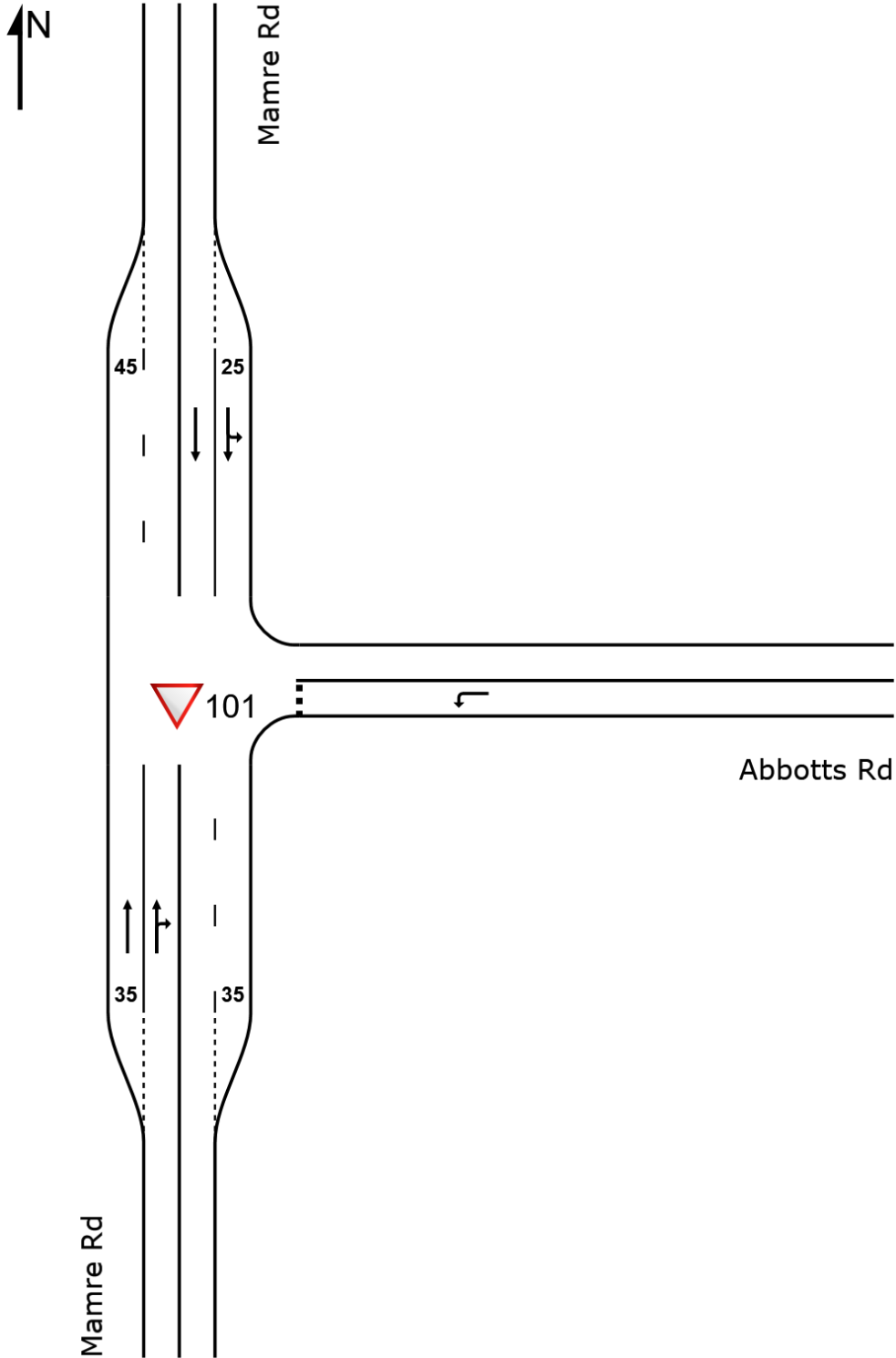
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SITE LAYOUT

▽ Site: 101 [Scenario 1 - AM (Site Folder: Construction - Stage 1)]

Mamre Rd/Abbotts Rd
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Scenario 1 - AM (Site Folder: Construction - Stage 1)]

Mamre Rd/Abbotts Rd
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Mamre Rd														
2	T1	1040	160	1095	15.4	0.575	4.9	LOS A	14.0	110.7	0.74	0.03	0.86	55.5
3	R2	24	2	25	8.3	0.575	41.2	LOS C	14.0	110.7	1.00	0.03	1.16	51.7
Approach		1064	162	1120	15.2	0.575	5.7	NA	14.0	110.7	0.74	0.03	0.87	55.4
East: Abbotts Rd														
4	L2	48	4	51	8.3	0.039	8.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.9
Approach		48	4	51	8.3	0.039	8.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.9
North: Mamre Rd														
7	L2	226	30	238	13.3	0.140	5.7	LOS A	0.0	0.0	0.00	0.57	0.00	52.6
8	T1	866	162	912	18.7	0.524	0.3	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach		1092	192	1149	17.6	0.524	1.4	NA	0.0	0.0	0.00	0.12	0.00	58.0
All Vehicles		2204	358	2320	16.2	0.575	3.6	NA	14.0	110.7	0.36	0.08	0.42	56.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Scenario 1 - PM (Site Folder: Construction - Stage 1)]

Mamre Rd/Abbotts Rd
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] veh/h	[Total veh/h]	[HV] %				[Veh. veh]	[Dist] m				
South: Mamre Rd														
2	T1	873	109	919	12.5	0.453	2.5	LOS A	2.0	15.7	0.13	0.01	0.19	57.6
3	R2	18	1	19	5.6	0.453	28.8	LOS C	2.0	15.7	0.17	0.02	0.25	54.5
Approach		891	110	938	12.3	0.453	3.1	NA	2.0	15.7	0.13	0.01	0.19	57.5
East: Abbotts Rd														
4	L2	107	0	113	0.0	0.098	9.8	LOS A	0.3	2.4	0.24	0.57	0.24	52.5
Approach		107	0	113	0.0	0.098	9.8	LOS A	0.3	2.4	0.24	0.57	0.24	52.5
North: Mamre Rd														
7	L2	57	3	60	5.3	0.118	5.6	LOS A	0.0	0.0	0.00	0.17	0.00	56.4
8	T1	981	119	1033	12.1	0.486	0.7	LOS A	0.0	0.0	0.00	0.02	0.00	59.4
Approach		1038	122	1093	11.8	0.486	1.0	NA	0.0	0.0	0.00	0.03	0.00	59.2
All Vehicles		2036	232	2143	11.4	0.486	2.3	NA	2.0	15.7	0.07	0.05	0.10	58.1

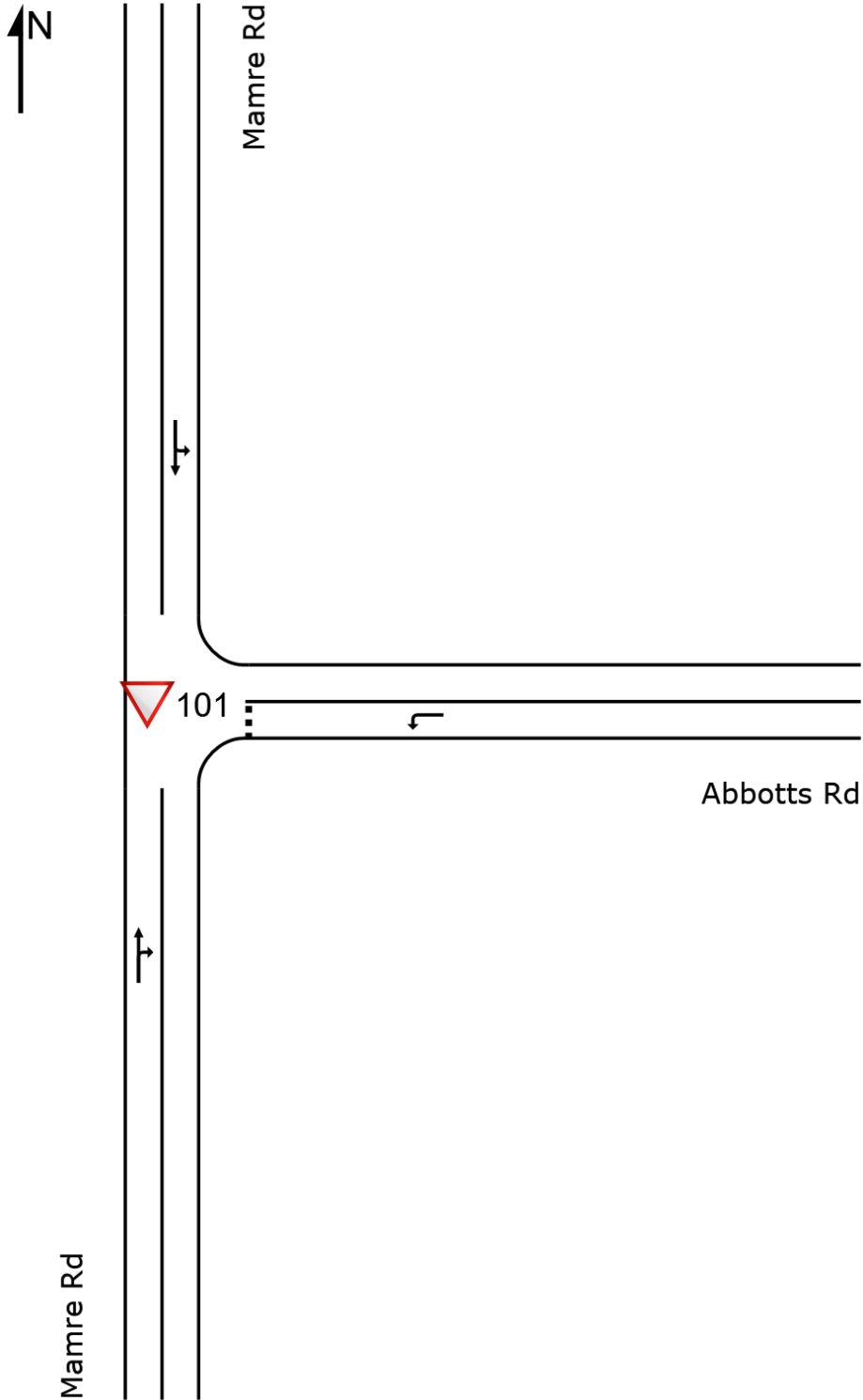
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

▼ Site: 101 [Scenario 2 - AM (Site Folder: Construction - Stage 2)]

Mamre Rd/Abbotts Rd
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Scenario 2 - AM (Site Folder: Construction - Stage 2)]

Mamre Rd/Abbotts Rd
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] veh/h	[Total veh/h]	[HV] %				[Veh. veh]	[Dist] m				
South: Mamre Rd														
2	T1	1046	163	1101	15.6	0.717	4.5	LOS A	15.1	119.8	1.00	0.03	1.18	55.1
3	R2	22	0	23	0.0	0.717	50.8	LOS D	15.1	119.8	1.00	0.03	1.18	52.8
Approach		1068	163	1124	15.3	0.717	5.4	NA	15.1	119.8	1.00	0.03	1.18	55.0
East: Abbotts Rd														
4	L2	48	4	51	8.3	0.125	13.7	LOS A	0.4	2.8	0.77	0.90	0.77	47.0
Approach		48	4	51	8.3	0.125	13.7	LOS A	0.4	2.8	0.77	0.90	0.77	47.0
North: Mamre Rd														
7	L2	231	32	243	13.9	0.668	6.1	LOS A	0.0	0.0	0.00	0.12	0.00	55.7
8	T1	866	162	912	18.7	0.668	0.5	LOS A	0.0	0.0	0.00	0.12	0.00	58.0
Approach		1097	194	1155	17.7	0.668	1.7	NA	0.0	0.0	0.00	0.12	0.00	57.5
All Vehicles		2213	361	2329	16.3	0.717	3.7	NA	15.1	119.8	0.50	0.09	0.59	56.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Scenario 2 - PM (Site Folder: Construction - Stage 2)]

Mamre Rd/Abbotts Rd
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV] veh/h	[Total veh/h]	[HV] %				[Veh. veh]	[Dist] m				
South: Mamre Rd														
2	T1	879	110	925	12.5	0.569	1.9	LOS A	1.9	14.8	0.15	0.01	0.23	57.6
3	R2	17	0	18	0.0	0.569	31.2	LOS C	1.9	14.8	0.15	0.01	0.23	55.3
Approach		896	110	943	12.3	0.569	2.5	NA	1.9	14.8	0.15	0.01	0.23	57.6
East: Abbotts Rd														
4	L2	116	0	122	0.0	0.340	16.9	LOS B	1.2	8.1	0.84	0.98	1.01	45.3
Approach		116	0	122	0.0	0.340	16.9	LOS B	1.2	8.1	0.84	0.98	1.01	45.3
North: Mamre Rd														
7	L2	64	4	67	6.3	0.609	5.9	LOS A	0.0	0.0	0.00	0.04	0.00	57.0
8	T1	981	119	1033	12.1	0.609	0.3	LOS A	0.0	0.0	0.00	0.04	0.00	59.0
Approach		1045	123	1100	11.8	0.609	0.7	NA	0.0	0.0	0.00	0.04	0.00	58.9
All Vehicles		2057	233	2165	11.3	0.609	2.4	NA	1.9	14.8	0.11	0.08	0.16	57.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.