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Prepared for
MIRVAC

Transport Assessment

State Significant Development Application

Lots 54 – 58 Mamre Road, Kemps Creek

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1 Introduction

1.1 Overview

Ason Group has been engaged by Mirvac Projects Pty Ltd (Mirvac) to prepare a Transport Assessment to support a State Significant Development Application (SSDA) in relation to a proposed industrial estate to be known as Aspect Industrial Estate (the Estate / AIE).

The Estate (the Site) is located east of Mamre Road, Kemps Creek within the Penrith Local Government Area (LGA).

The Department of Planning, Industry and Environment (DPIE) rezoned Mamre Road Precinct (the MR Precinct), including the Site, in June 2020 under the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP). The rezoning of this precinct responds to the demand for industrial land in Western Sydney. The Site is primarily zoned IN1 General Industrial with a small sliver of land zoned E2 Environmental Conservation.

Consistent with the above, this report has been prepared to support a Development Application under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) for the purpose of:

- A Concept Masterplan for the site comprising 11 industrial buildings, internal road network layout, building locations, gross floor area (GFA), car parking, concept landscaping, building heights, setbacks and built form parameters.
- Stage 1 development of the site including:
  - The demolition, removal of existing rural structures and remediation works;
  - Heritage salvage works (if applicable);
  - Clearing of existing vegetation on the subject site and associated dam dewatering and decommissioning;
  - Realignment of existing creek and E2 Environmental Conservation zone;
  - Onsite bulk earthworks including any required ground dewatering;
  - The importation, placement and compaction of spoil material, consisting of:
  - Virgin Excavated Natural material (VENM) within the meaning of the POEO Act; and/or
    - Excavated Natural material (ENM) within the meaning of the NSW Environmental Protection Authority's (EPA) Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the POEO (Waste) Regulation 2014 – The Excavated Natural Material Order 2014; and/or
    - Materials covered by a specific NSW EPA Resource Recovery Order and Exemption which are suitable for their proposed use.

- Boundary retaining walls;
- Catchment level stormwater infrastructure, trunk services connections, utility infrastructure, roads and access infrastructure (signalised intersection with Mamre
- Road) associated with Stage 1;
- Construction, fit out and 24 hours a day/ 7 days per week use of warehouse and distribution centre within Stage 1;
- Detailed on lot earthworks, stormwater, services and utility infrastructure associated with the construction of warehouse and distribution centre within Stage 1;
- Boundary stormwater management, fencing and landscaping; and
- Staged subdivision of Stage 1.

Full details of the Stage 1 and Concept Masterplan Proposal are provided in the Environmental Impact Statement (EIS) which this TA accompanies. A reduce copy of the staging plan, prepared by SBA Architects, is provided as **Figure 2**.

Figure 1: SSDA Stage 1 Plan

1.2 Transport Assessment Objectives

The key objectives of this SSDA TA are as follows:

- To establish that the development of the Site further to the Stage 1 Proposal is compliant and consistent with the access, traffic and parking principles outlined in the site-specific DCP (the Draft AIE DCP) submitted as part of this SSDA.
- To establish that the trip generation of the Stage 1 Proposal and the Estate can appropriately be accommodated by completed/committed upgrades to the local road network.
- To demonstrate that there is an appropriate and sustainable provision of car parking across the Site.
- To demonstrate that the proposed access driveways, internal roads, car parks and service facilities can provide a design compliant with the relevant Australian Standards.
- To demonstrate that the construction of Stage 1 can be undertaken in an efficient and safe manner, and that construction vehicles can be appropriately accommodated by completed/committed upgrades to the local road network in the short term.

From the outset, it is noted that this SSDA TA provides revisions to the earlier SSDA TA prepared by Ason Group (1029r02v5 TA Mirvac Mamre Road, July 2020) which accompanied a draft EIS submitted for a Test of Adequacy (TOA). These revisions have resulted from:

- Minor changes to the GFA to be provided as part of Stage 1, resulting in part from ongoing discussions between Mirvac and Transport for NSW (TfNSW) in regard to road reserve provisions within the MR Precinct;
- Revised trip rates, again further to ongoing discussions with TfNSW;
- Reference to the most recent information available in regard to the broader MR Precinct, including its recent rezoning and updated Structure Plan; and
- Information requests from TfNSW.

In regards to this last item, it is noted that the information requested by TfNSW essentially mirrors the Secretary's Environmental Assessment Requirements (SEARs) as detailed in Section 1.3, and as an appropriate response to each has been provided in this SSDA TA.

Ason Group acknowledges the assistance provided by TfNSW officers in providing updated information in regard to the MR Precinct rezoning, and in regard to the current work being undertaken by TfNSW and others in regard to ongoing detailed planning of the MR Precinct.

1.3 Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements (SEARs) were issued by the DPIE on 30 April 2020 regarding the Stage 1 Proposal and the broader Estate, and include both general DPIE SEARs and more specific Transport for NSW (TfNSW) SEARs.

The DPIE SEARs relating to transport issues are outlined in **Table 1** below, while the TfNSW SEARs are outlined in **Table 2**; in both tables, Ason Group has provided a summary response to each SEAR, and reference to the section of this SSDA TA providing a more detailed analysis of each SEAR.

Table 1: Department of Planning, Industry & Environment SEARs

SEARs	TA Summary Response	SSDA TA Section Reference
details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes. Traffic flows are to be shown diagrammatically to a level of detail sufficient for easy interpretation	Operational traffic flows have been determined with a breakdown to light and heavy vehicle movements at the key intersection of Mamre Road & Access Road 1 in clear figures. Construction traffic flows cannot be determined at this time; however, the anticipated construction vehicle mix, Site access provisions and potential haul routes have been clearly identified.	Section 7.1 Appendix B
an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model. This is to include the identification and consideration of approved and proposed developments/planning proposals/road upgrades in the vicinity. The assessment needs to consider the impact on Mamre Road for the duration of the works because traffic growth in this area is expected to increase more quickly than standard growth rates	The operation of the key intersection of Mamre Road & Site has been examined in detailed utilising the SIDRA model, with Mamre Road traffic flows adopted from the Mamre Road Upgrade technical reports. As discussed with Transport for NSW, the broader operation of the MR Precinct is currently being assessed as part of the development of a Precinct specific Development Control Plan, which will identify additional network requirements further to the development of the broader MR Precinct.	Section 7.7
consideration of the draft SP2 Infrastructure zone and draft Transport Infrastructure Investigation Area within the Draft Mamre Road Precinct Rezoning Package for SEPP WSEA, in consultation with Transport for NSW	SP2 zone within the WSEA SEPP maps has been considered during development of the AIE Concept Masterplan.	Section 4.3
addressing the detailed design comments by Transport for NSW regarding the Mamre Road/development intersection and the future Mamre Road alignment	A response in regard to the design of the intersection of Mamre Road & Access Road 1, as well as the future alignment of Mamre Road, has been prepared by AT&L, and is provided within the broader SSDA submission which this TA accompanies	N/A

detailing how the proposed development connects to adjoining sites to facilitate their future development for their intended purposes	As discussed above, TfNSW is currently developing a Mamre Precinct DCP, which includes detailed modelling of the MR Precinct holistically, including the future road network structure and the development of sites across the MR Precinct. As discussed and agreed with TfNSW, future connections between the Site and adjoining sites will be determined as part of this DCP process, though it is noted that the Stage 1 Proposal specifically provides for future connectivity between the intersection of Mamre Road & Road 1 and future sites to the north, south and east of the Site.	Section 7
plans demonstrating how all vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network	The Stage 1 Proposal plans have been assessed with reference to the appropriate Australian Standards to ensure that all loading, servicing and queuing can be accommodated on-site rather than generating on-street parking or queuing.	Section 9.4
detailed plans of the site access and proposed layout of the internal road and pedestrian network and parking on site in accordance with the relevant Australian Standards and Council's DCP	The Stage 1 Proposal plans have been assessed with reference to the appropriate Australian Standards to ensure that the design of internal roads, parking and servicing areas acre compliant. It is anticipated that a future Condition of Consent will necessarily ensure such compliance with the Australian Standards. The pedestrian network within the Site has been developed in accordance with the Draft Site-Specific DCP, and references the pedestrian provisions detailed in the Mamre West DCP and integration with the Mamre Road Upgrade pedestrian network.	Section 9
swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site	Swept path plans have been prepared to illustrate heavy vehicle movements along the internal roads, as well as to and from the Stage 1 access driveways and on-site service areas. It is anticipated that a future Condition of Consent will necessarily ensure such compliance with the Australian Standards, and that such compliance would extend to all future road and access infrastructure within the Site.	Section 9
details of road upgrades, infrastructure works or new roads or access points required for the development	A response in regard to the design of road upgrades, infrastructure works and new roads and access points has been prepared by AT&L, and is provided within the broader SSDA submission which this TA accompanies.	N/A
details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the site	The provision of public and access transport services and infrastructure has been specifically developed to provide integration with the public and active transport provisions detailed for the Mamre Road Upgrade. This includes the provision of bus capable roads, with the potential for internal routing further to the development of the broader MR Precinct road network; and shared and pedestrian paths across the Site and connecting to Mamre Road and the future sub-regional active transport network. However, until such a time that the active and public transport network has been established, there is little benefit to developing a Draft Green Travel Plan. The Site has been designed to respond to changes in the transport system and measures to encourage non-car travel will be implemented at a time that is appropriate, in consultation with the tenants of the specific buildings.	Section 5

details of the adequacy of existing public transport or any future public transport infrastructure within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development	Further to the above, there are no adequate public or active transport services or infrastructure in the vicinity of the Site at this time. However, the Stage 1 development provides for full integration with the future public and active provisions detailed for the Mamre Road Upgrade. These include the operation of local and sub-regional bus services providing connectivity to railway stations and other public transport interchanges; and shared paths along Mamre Road connecting to the future sub-regional shared (cycle) path network.	Section 5
measures to integrate the development with the existing/future public transport network.	As discussed above, the Stage 1 Proposal provides for full integration with the future public and active provisions detailed for the Mamre Road Upgrade.	Section 4 Section 5

Table 2: Transport for NSW SEARs

SEARs	TA Summary Response	TA Section Reference
Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections on Mamre Road, and the need/associated funding for upgrading or road improvement works (if required).	Operational traffic flows have been determined with a breakdown to light and heavy vehicle movements at the key intersection of Mamre Road & Access Road 1. The operation of this has then been examined in detailed utilising the SIDRA model, with Mamre Road traffic flows adopted from the Mamre Road Upgrade technical reports. As discussed with Transport for NSW, the broader operation of the MR Precinct is currently being assessed as part of the development of a Precinct specific Development Control Plan, which will identify additional network requirements further to the development of the broader MR Precinct; it is noted that the Stage 1 Proposal specifically provides for future connectivity between the intersection of Mamre Road & Road 1 and future sites to the north, south and east of the Site.	Section 7
Details of the cumulative impact of the construction traffic from this development and the surrounding development should be assessed.	Construction traffic flows cannot be determined at this time; however, anticipated the anticipated construction vehicle mix, Site access provisions and potential haul routes have been clearly identified. In addition, sensitivity testing based on a range of potential trip generation scenarios has been undertaken to examine the operation of the Mamre Road & Access Road 1 intersection through the Stage 1 construction period. Further to the discussion above, it is anticipated that the Construction Traffic Management Plan detailing construction vehicle routes and network operations will be revised as required further to additional details of road network operations be made available by TfNSW as part of the DCP development process.	Appendix B
Details of the proposed site access and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc).	Refer to Section 8.	Section 8

Detailing vehicle circulation, proposed number of car parking spaces and compliance with the appropriate parking codes.	Parking rates for the individual sites within Stage 1 have been adopted from the Draft AIE DCP, which itself references parking rates adopted by Penrith City Council for other major industrial precincts across the Western Sydney Employment Lands. All access driveways, parking and service areas have been designed to provide compliance with the appropriate Australian Standards; it is It is anticipated that a future Condition of Consent will necessarily such compliance with the Australian Standards.	Section 8.1
Details of light and heavy vehicle movements (including vehicle type and likely arrival and departure times).	Operational traffic flows have been determined with a breakdown to light and heavy vehicle movements at the key intersection of Mamre Road & Access Road 1. As discussed with Transport for NSW, the broader operation of the MR Precinct is currently being assessed as part of the development of a MR Precinct specific Development Control Plan, which will identify additional network requirements further to the development of the broader MR Precinct.	Section 7.1
To ensure that the above requirements are fully addressed, the transport and traffic study must properly ascertain the cumulative study area traffic impacts associated with the development (and any other known approved/proposed developments/planning proposals/road upgrades in the area). The traffic analysis/modelling needs to consider the impact on Mamre Road for the duration of the works because traffic growth in this area is expected to increase more quickly than standard growth rates. This process provides an opportunity to identify a package of traffic and transport infrastructure measures required to support future development. Regional and local intersection and road improvements, vehicular access options for adjoining sites, public transport needs, the timing and cost of infrastructure works and the identification of funding responsibilities associated with the development should be identified.	As discussed, and agreed with Transport for NSW, the broader operation of the MR Precinct is currently being assessed as part of the development of a Precinct specific Development Control Plan, which will identify additional network requirements further to the development of the broader MR Precinct. As noted in the SEARs, the traffic modelling being undertaken by TfNSW as part of the DCP development process provides the opportunity to identify the broader package of traffic and transport infrastructure measures required to support future development across the MR Precinct. This modelling will specifically consider regional and local intersection and road improvements; vehicular access options for adjoining sites; public transport needs; the timing and cost of infrastructure works; and the identification of funding responsibilities associated with the provision of such infrastructure/services.	Section 4.3 Section 7.7
Details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the site;	The provision of public and access transport services and infrastructure has been specifically developed to provide integration with the public and active transport provisions detailed for the Mamre Road Upgrade. This includes the provision of bus capable roads, with the potential for internal routing further to the development of the broader MR Precinct road network; and shared and pedestrian paths across the Site and connecting to Mamre Road and the future sub-regional active transport network. However, until such a time that the public and active transport network is established, there would be little benefit in implementing a tool such as a Green Travel Plan at this stage in the development of the MR Precinct. The site has been designed to respond to the with the changing travel behaviours resulting from improving public transport. Therefore, a measure such as a GTP would be considered for implementation at an appropriate time, in consultation with the tenants of the Site.	Section 5

The proposed walking and cycling access arrangements and connections to public transport services;	The Stage 1 Proposals provides pedestrian and shared paths throughout the Site, as well as the essential connectivity to the future Mamre Road active transport infrastructure as detailed for the Mamre Road Update. These Mamre Road active transport upgrades will in turn provide active transport access across the sub-region, including links to key transport interchanges.	Section 5
The adequacy of existing public transport or any future public transport infrastructure within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development;	Further to the above, there are no adequate public or active transport services or infrastructure in the vicinity of the Site at this time. However, the Stage 1 development provides for full integration with the future public and active provisions detailed for the Mamre Road Upgrade. These include the operation of local and sub-regional bus services providing connectivity to railway stations and other public transport interchanges; and shared paths along Mamre Road connecting to the future sub-regional shared (cycle) path network.	Section 5
Measures to integrate the development with the existing/future public transport network;	As discussed above, the Stage 1 Proposal provides for full integration with the future public and active provisions detailed for the Mamre Road Upgrade.	Section 5
The preparation of a preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) to demonstrate the proposed management of the impact in relation to construction traffic addressing the following: assessment of cumulative impacts associated with other construction activities (if any); an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity; details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process; details of anticipated peak hour and daily construction vehicle movements to and from the site; details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle; details of temporary cycling and pedestrian access during construction	A preliminary Construction Traffic Management Plan (CTMP) is provided as **Appendix B**	Appendix B

1.4 Consultation

During the preparation of this SSDA TA, Ason Group has had the opportunity to discuss key local transport issues and the scope of this SSDA TA with TfNSW officers. This has specifically included consideration of:

- Current investigations being undertaken by TfNSW and DPIE in regard to the rezoning of the broader Mamre Road Precinct (the MR Precinct) in with the Estate lies.
- An appropriate level of traffic modelling within the SSDA TA, acknowledging that TfNSW is currently commencing detailed modelling of the MR Precinct, including future connections to the external road network; the internal MR Precinct road network; and road network upgrades required to appropriately provide for the rezoning of the MR Precinct.
- Ultimately, an agreed Scope of Work to be provided in this SSDA TA.

Ason Group acknowledges the insights and advice provided by TfNSW officers in this regard.

1.5 Test of Adequacy

In August 2020 the DPIE provided comment on the draft EIS package which was submitted for a preliminary TOA review.

The comment received from this review relating to transport issues are outlined in **Table 3** below, with the Ason Group summary response to each also provided.

Table 3: DPIE TOA Preliminary Comments

Comment	Summary Response
It is acknowledged that the Mamre Road Precinct road network plan is currently being prepared. Please clarify the road typology and function of Access Road 1 and update the EIS and TIA accordingly.	As acknowledged, the road network plan is still being prepared. However, based on the most update to information, Access road 1 and the remainder of the internal road network will be industrial (local) access roads and will ultimately be dedicated to Council. Based on the most recent information, the internal industrial roads shall comprise a 23.0 metre road reserve to include a 15.5m carriageway, comprising 9.5m for travel lanes (two-way) and 3.0m parking lanes on each side of the road.
Please clarify whether the Traffic Impact Assessment considers the construction and operational traffic impacts of the Stage 1 development and the concept proposal when fully developed, including cumulative impacts from current and future neighbouring developments.	Operational impacts of the Stage 1 proposal and the wider Concept Masterplan have been discussed in Section 7. The preliminary CTMP (Appendix B) covers construction of the Stage 1 warehouses and all earthworks being proposed under Stage 1 (as described in the EIS). Construction of subsequent stages will be undertaken in a similar fashion to the strategy described by the Preliminary CTMP. Given the unknown timing of subsequent stages, traffic impacts associated with construction will be assessed at the appropriate time.

Please include SIDRA modelling of the Concept Proposal traffic generation impacts on the proposed Mamre Road/Access Road 1 intersection.	See Section 7.8.3.
Please clearly state whether the draft AIE DCP parking rate is consistent with the rate specified in the RMS Guide to Traffic Generating Developments 2002. The parking rate and requirements must consider all of the proposed uses, including warehousing, office, and retail/food and drink premises.	The parking rates adopted for the warehouse and office spaces are consistent with RMS Guide. The Proposal includes a small 122m^2 café within the Warehouse 1 Lot. The rate provided within the Draft AIE DCP for the café use is consistent with rates provided within the Penrith DCP.
Please include swept path diagrams in the TIA as required by the SEARs.	See Appendix C.

1.6 Reference Documents

1.6.1 Penrith City Council Development Controls

The Site lies within the Penrith City Council LGA; as such, Ason Group has referenced the following key Council controls in preparing this SSDA TA:

- Penrith City Council Local Environmental Plan 2010 (Penrith LEP).
- Penrith City Council Development Control Plan 2014 (Penrith DCP).

1.6.2 General Policies & Guidelines

Ason Group has referenced the following additional policies and guidelines relevant to the assessment of the Proposal:

- Roads and Maritime Services (Roads and Maritime) Guide to Traffic Generating Developments, October 2002 (RMS Guide).
- Roads and Maritime Guide to Traffic Generating Developments Updated Traffic Surveys, August 2013 (RMS Guide Update).
- Department of Planning & Environment (DPE) Western Sydney Aerotropolis Land Use and Infrastructure Implementation Plan Stage 1: Initial Precincts (WSA Stage 1 Plan).
- State Environmental Planning Policy (West Sydney Employment Area) 2009 (WSEA SEPP).
- DPE Mamre West Land Investigation Area Development Control Plan 2016 (Mamre West DCP).
- Australian Standard 2890.1:2004 Parking Facilities – Off-Street Car Parking (AS2890.1).
- Australian Standard 2890.2:2018 Parking Facilities – Off-Street Commercial Vehicle Facilities (AS2890.2).
- Australian Standard 2890.6:2009 Parking Facilities – Off-Street Parking for People with a Disability (AS 2890.6).

1.6.3 Reference Reports

Finally, Ason Group has specifically referenced the most recent assessments available in regard to the recent rezoning of the MR Precinct, including:

- NSW Government Mamre Road Precinct Rezoning Exhibition Discussion Paper, November 2019 (MRP Rezoning Paper).
- NSW Government Mamre Road Precinct Rezoning Finalisation Report, June 2020 (MRP Finalisation Report).
- Roads & Maritime Mamre Road Upgrades Kerrs Road to M4 Motorway, November 2017 (MR Upgrade Report).
- Roads & Maritime Mamre Road Upgrade Community Consultation Report May 2019 (MR Upgrade CC Report).
- Numerous reports prepared by Ason Group and others for similar industrial development within the Mamre West, Kemps Creek and Erskine Park industrial precincts.

2 The Existing Site

2.1 Location

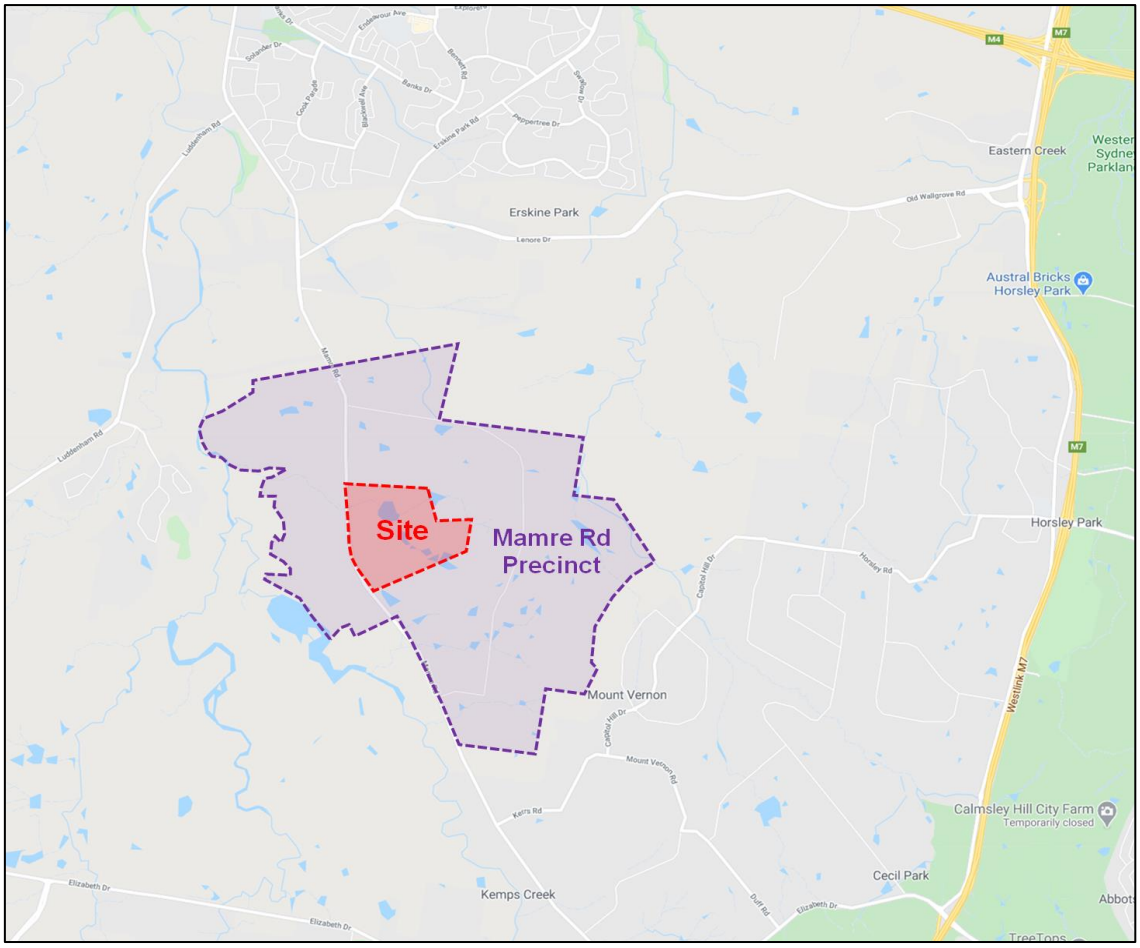
The Site is legally described as Lots 54 – 58 in DP 259135, Mamre Road Kemps Creek, and has an area of approximately 56.3 hectares (ha).

The Site has approximately 950m of direct frontage to Mamre Road with a proposed intersection providing vehicular access via Mamre Road to the M4 Motorway and Great Western Highway to the north and Elizabeth Drive to the south.

The Site is located approximately 4km north-west of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 13km south-east of the Penrith CBD and 40km west of the Sydney CBD.

The Site is shown in its sub-regional context in **Figure 2**, as well as the broader MR Precinct Structure Plan area in which it lies.

Figure 2: Site Location



2.2 Current Site Land Usage

The Site currently provides for a number of rural residential properties, as well as for small scale agricultural industries businesses.

2.3 Site Access

The Site has approximately 950m of direct frontage to Mamre Road, and at present provides numerous private driveways for access to adjacent sites. From Mamre Road, access is available north to the M4 Motorway, Great Western Highway, Lenore Drive and M7 Motorway; and south to Elizabeth Drive, the M7 Motorway and the future M12 Motorway.

2.4 Traffic Generation

The existing Site generates only a small number of trips during the AM and PM peak periods (and daily); based on the minimal trips demands of the current land uses, it is estimated that the Site would generate no more than 10 vehicle trips per hour (vph) in the AM and PM peak periods.

3 The Existing Road Network

3.1 Key Roads

The existing road network providing access to the Site is also shown in **Figure 2**, and detailed further below.

3.1.1 Mamre Road

Mamre Road is an arterial road which runs north-south between the Great Western Highway and M4, and Elizabeth Drive respectively. In the vicinity of the Site, Mamre Road provides 1 traffic lane in each direction, and has a posted speed limit of 80km/h.

3.1.2 Erskine Park Road

Erskine Park Road is a sub-arterial road which generally runs north-south between the Great Western Highway and M4, and Mamre Road respectively; it also links east to the M7 via Lenore Drive. Erskine Park Road provides 2 traffic lanes in each direction, and has a posted speed limit of 70km/h.

3.1.3 Bakers Lane

Bakers Lane is a local access that runs east-west (to the east of Mamre Road) and currently provides access for a number of rural residential, educational and retirement sites. Bakers Lane provides 1 traffic lane in each direction and has a posted speed limit of 60km/h, with School Zone restrictions (40km/h during school peaks) adjacent to the Trinity Primary School and Emmaus College.

3.1.4 Elizabeth Drive

Elizabeth Drive is a sub-arterial road that runs east-west between Hume Highway and M7, and Mamre Road and The Northern Road respectively. In the vicinity of Mamre Road, Elizabeth Drive provides 1 - 2 traffic lanes in each direction, and has a posted speed limit of 80km/h.

3.2 Mamre Road Traffic Flows

Ason Group conducted AM and PM peak period traffic surveys in Mamre Road south of Bakers Lane in 2018; based on the minimum number of traffic generating developments in the vicinity of the Site, these flows provide a good representation of current traffic flows in Mamre Road adjacent to the Site.

The results of the surveys, and the corresponding Level of Service (LoS) for the directional flows (based on RMS Level of Service criteria (as detailed in the RMS Guide) are shown in **Table 4**.

Table 4: 2018 Mamre Road Traffic Flows

Peak Period	Total Volumes	Directional Volumes	Level of Service
AM	1,391	NB: 782 vph	D
		SB: 609 vph	D
PM	1,541	NB: 678 vph	D
		SB: 863 vph	D

With reference to **Table 4**, Mamre Road is currently operating satisfactorily but with little spare capacity, an issue known to TfNSW and as such one of the key drivers of the proposed Mamre Road Upgrade (see also **Section 4.4**).

4 Mamre Road Precinct Rezoning

4.1 Overview

In June 2020, the NSW Government released the MRP Finalisation Report addressing the rezoning of the MR Precinct, and subsequently the rezoning was fast-tracked in response to current COVID-19 conditions.

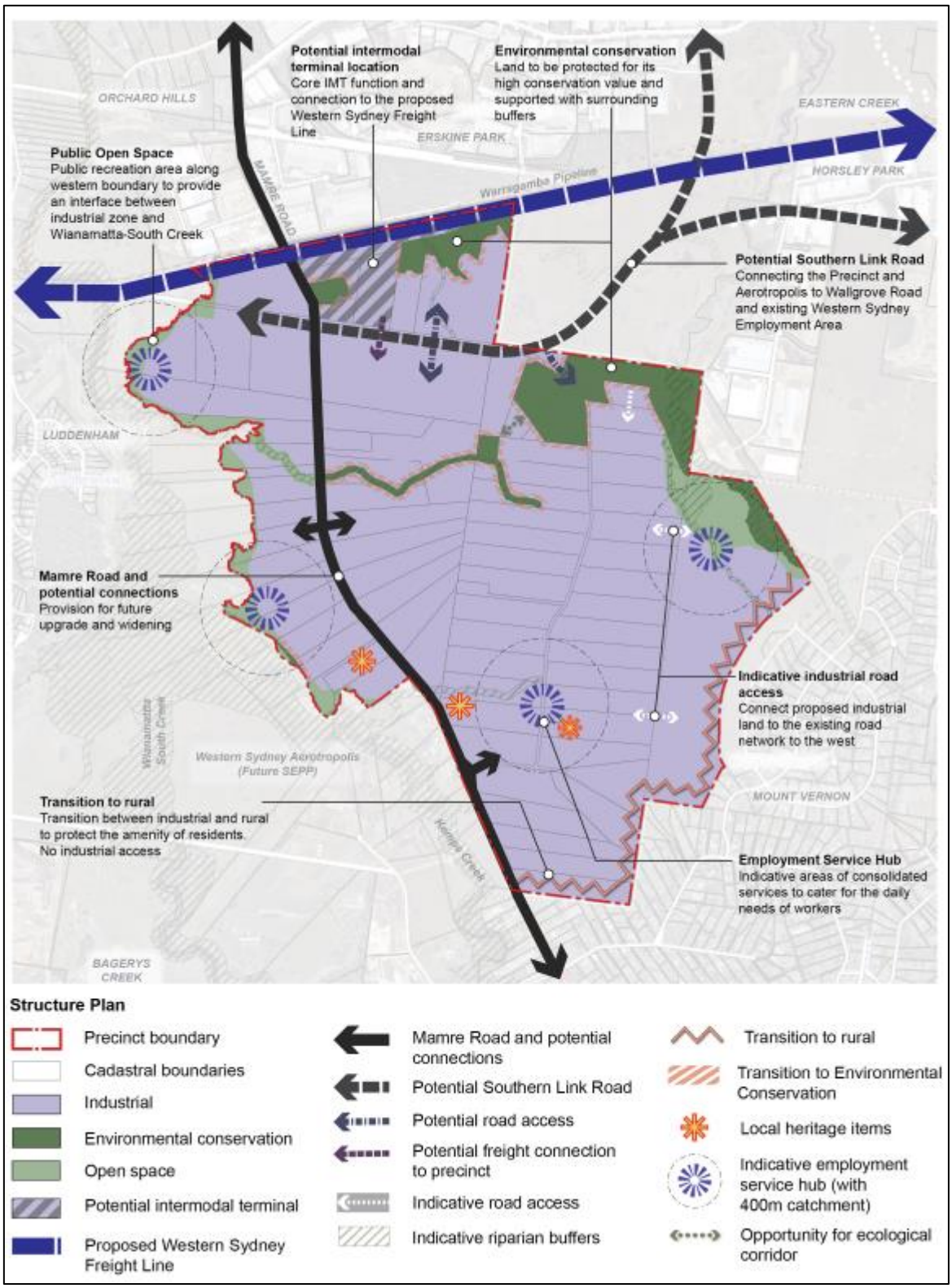
As detailed in the MRP Finalisation Report, the rezoning:

- Responds to the demand for industrial land in Western Sydney, as well as the future freight, logistics and industrial needs of Greater Sydney
- Facilitates the NSW Government's vision for the Western Parkland City.
- Facilities the opportunities provided for a 30-minute city as detailed in the Western City District Plan recognises the opportunity to deliver a 30-minute city. The draft MR Precinct rezoning package was exhibited between 20 November and 18 December 2019. The MR Precinct has been rezoned under the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP).

The rezoning is anticipated to provide approximately 850 hectares of industrial land with an approximate capacity of 17,000 jobs, and the creation of new environmental conservation areas and public open space.

The Mamre Road Precinct Structure Plan (the MRP Structure Plan) is shown in **Figure 3**.

Figure 3: Mamre Road Precinct Structure Plan



Source: NSW Government

4.2 Strategic Context

4.2.1 Strategic Policies

The rezoning the MR Precinct fits within the strategic development of the WSEA and Broader Western Sydney Employment Area (BWSEA); in the context of the MR Proposal, key planning policies and strategies relevant to the MR Precinct rezoning include:

- **A Plan for Growing Sydney** sets out the State Government's strategies for accommodating Sydney's future population growth over the next 20 years; it provides goals, directions and actions that provide a framework for strengthening the global competitiveness of Sydney and delivering strong investment and jobs growth, particularly in Western Sydney.
- The **NSW Long Term Transport Master Plan** provides a framework for delivering an integrated, modern transport system by identifying transport actions and investment priorities across NSW for the next 20 years. Section 5.6 of the Long Term Transport Master Plan specifically identifies Mamre Road (from St Marys to Kemps Creek) as a corridor for future investigation.
- The **NSW Freight and Ports Plan** targets specific challenges associated with the forecast doubling of the NSW freight task by 2031. Providing a road network that minimises congestion will support economic growth and productivity and encourage regional development; in this context, the F&P Strategy identifies the need to develop and maintain capacity for freight on the road network, and of course the provision of additional Intermodal capacity, noting that a new Intermodal is identified in the MRP Rezoning Paper.
- The **NSW Road Safety Strategy 2012 - 2021** establishes the direction of road safety in NSW for 10 years from 2012, and specifically supports a targeted reduction in the annual number of fatalities and serious injuries by at least 30% by the end of 2021. The Safety Strategy places particular importance on the design of safe roads and roadsides and recognises that the ongoing development and upgrade of the NSW road network is essential to improving road safety; these goals will be integral to the development of the MR Precinct road network.

4.2.2 Strategic Constraints & Opportunities

The MRP Rezoning Paper – drawing from the policies outlined above and the broader demands on an ever-growing Western Sydney – identifies the following key constraints within the region, and the opportunities provided by the Rezoning to respond to these constraints.

- **Industrial Land Shortfall:** There is a growing demand for industrial land in Western Sydney, the provision of such which is essential, so supply is maintained despite increasing take-up rates. The most critical shortage at this time is an increasing warehouse and logistic demands to meet the existing and future e-commerce demand.

- **Freight and Logistics:** The WSEA is strategically located with proximity to key freight and logistic corridors including the M4 and M7 Motorways, and provides land and economies of scale that give Western Sydney's industrial land a comparative advantage over other parts of Sydney.
- **Intermodal Terminal:** As discussed, the NSW Freight and Ports Plan identifies moving an increasing percentage of goods by rail to international gateways, and TfNSW has identified an urgent need to plan for and protect intermodal capacity within the Aerotropolis. The Aerotropolis LUIIP specifically identifies the MR Precinct as a potential Intermodal location from a freight and logistics perspective.
- **Western Sydney Airport:** Further to the above, the need for land focused on freight and logistics will be further increased once the Western Sydney Airport becomes operational. The Aerotropolis LUIIP again identifies the MR Precinct as providing warehousing and logistics uses to support the development of the Western Sydney Airport (and broader Aerotropolis).
- **Western Parkland City:** The Western City District Plan has as a key objective the delivery of a 30-minute city, where people can reach their nearest metropolitan and strategic centres within 30 minutes, seven days a week by public transport, which includes expansive industrial and urban services land. The development of land within the MR Precinct will provide for Greater Sydney's long-term freight and logistics and industrial needs and is an opportunity to deliver jobs closer to people's homes quickly and contribute to the NSW economy.

4.3 Mamre Road Precinct Transport and Movement Outcomes

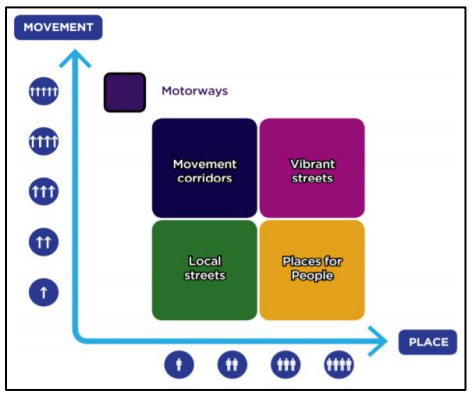
4.3.1 Overview

Achieving the vision and objectives for the MR Precinct will be dependent on the development of a coherent MR Precinct wide transport structure, which will necessarily be underpinned by a road network with appropriate capacity and augmented by strong public and active transport networks.

As discussed, TfNSW is currently in the process of more detailed investigations into the transport network infrastructure required for the rezoning of the MR Precinct, and specifically road network requirements. The TfNSW investigations include detailed traffic modelling of the MR Precinct and its connectivity to the broader regional road network, a task which will also inform the MR Precinct specific Development Control Plan (the Precinct DCP) also being prepared by TfNSW and DPIE.

4.3.2 Objectives

Noting that the development of the MR Precinct will result in significant traffic demands, it is anticipated that the road network will be grounded in the core principles of integrated land use (for example, the opportunities to internalise vehicle movements generated by the future Intermodal) and the Movement and Place framework.



Adherence to these principles is anticipated to provide for the development of a MR Precinct road network that provides:

- An interconnected, legible, urban-scale grid road pattern;
- Capacity to support demand;
- An understanding on the function of different roads, and indeed different parts of the same road, according to movement and place functions;
- Protection for sensitive land uses such as schools located along Bakers Lane;
- Maximum safety and efficiency through design;
- Well defined public transport links;
- A permeable network for pedestrian and cyclists; and
- Ultimately, the integration of all modes of travel across the road network.

4.3.3 Key Infrastructure

- **Mamre Road:** Mamre Road will provide the central north-west access corridor to/through the MR Precinct, with the MRP Rezoning Paper indicating an upgrade of Mamre Road (between the M4 Motorway and Kerrs Road) in line with that outlined in the Mamre Upgrade Report (see also **Section 4.4** below).

  The recent WSEA SEPP amendments have now rezoned the widened Mamre Road as SP2 Infrastructure (Classified Road).

- **Southern Link Road:** The Southern Link Road is a proposed east-west link from Wallgrove Road to Mamre Road, connecting the MR Precinct to the existing WSEA lands (Oakdale, Eastern Creek etc).

  TfNSW is currently finalising a concept design for the Southern Link Road, which along with an assessment of environmental opportunities and constraints analysis, will also investigate the potential for a further extension to the west (of Mamre Road).

- **Future Internal Roads:** As previously discussed, TfNSW has commenced detailed traffic modelling for the MR Precinct, focusing on its external connections to the regional road network, and the

internal road network within the MR Precinct. This process is outlined in the MR Precinct Rezoning Paper, which states:

Future planning as part WSEA Road Network Strategy and planning for the Western Sydney Aerotropolis will identify additional regional transport connections to the precinct. This planning is to include modelling to estimate the traffic generation and distribution of trips to and from the future Western Sydney intermodal terminal.

Local roads will need to be designed to accommodate heavy vehicles whilst ensuring that access to regional and sub-arterial roads is achieved in a controlled and efficient manner. The Department will continue work with RMS and Council to determine appropriate road hierarchy and ongoing maintenance of major roads within the precinct.

Importantly again, the design of Stage 1 and the broader Estate provides for full integration with the future internal MR Precinct road network, noting changes since the previous SSDA proposal to specifically account for future road corridors and Site connections to those corridors.

- **Active & Public Transport:** As discussed further in **Section 5.2** below, there is very little active transport infrastructure within the MR Precinct at this time. The MRP Rezoning Paper cites ongoing discussions with local Councils and TfNSW to deliver a cycle network connecting the Precinct to existing urban areas, the future Aerotropolis and WSEA. In this regard, the primary active transport corridor is expected to be designed around Mamre Road itself, with the MR Upgrade proposing a shared path along its full length, and cycle paths branching along creek lines and into the central portions of the MR Precinct.

  It is noted that the MRP Rezoning Paper does not provide any commentary in regard to public transport; however, the MR Upgrade provides more certainty in this regard, as do broader regional public transport strategies. These public transport proposals and strategies are discussed in more detail in **Section 5**.

4.4 Mamre Road Upgrade

4.4.1 Overview

The MR Upgrade Report details the proposed MR Upgrade (the MR Upgrade) between the M4 Motorway and Kerrs Road (south of the Site, and north of Elizabeth Drive). The objectives of the MR Upgrade – which essentially mirror those of the broader MRP Rezoning Paper - are stated as:

- Meeting the future transport demand associated with the Western Sydney Priority Growth Area and the Western Sydney Airport at Badgerys Creek;
- Reducing future road transport costs by improving corridor performance;
- Improving liveability and sustainability and support economic growth and productivity by providing road capacity for projected freight and general traffic volumes;

- Improving road safety in line with the NSW Road Safety Strategy;
- Improving quality of service, sustainability and liveability by providing facilities for walking and cycling and future public transport needs;
- Delivering good urban design outcomes; and
- Minimising environmental and community impacts.

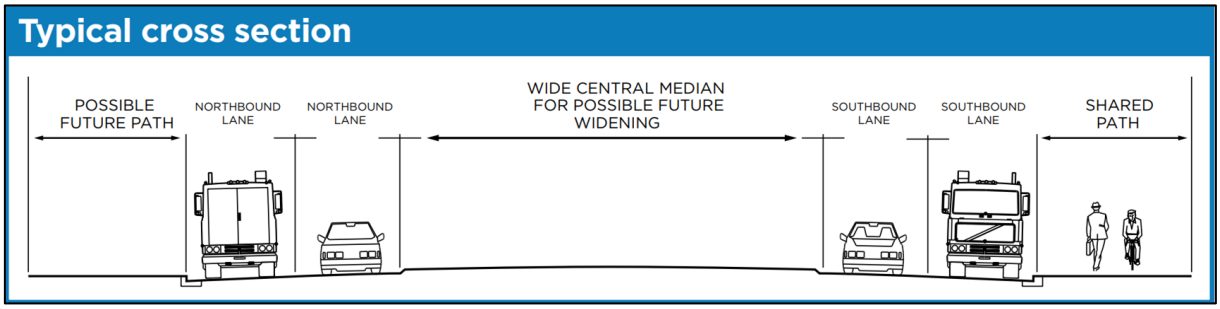
4.4.2 Mamre Road Upgrade Design Components

The MR Upgrade provides the following key infrastructure proposals:

- **A typical cross section** that includes:
  - 2 traffic lanes in each direction with a wide central median between the M4 Motorway and Kerrs Road;
  - Provisions for the central median to provide third traffic lane in each direction to meet growing demand; and
  - Shared bicycle and pedestrian paths to promote active transport.
- **New or upgraded intersections** including:
  - Signalised U-turn facilities at key intersections in the short term pending full development of the area (noting that one of the identified U-turn sites is the proposed location of the primary Site intersection);
  - A new signalised intersection with turn-around facility at Abbotts Road;
  - A new signalised intersection between Abbotts Road and Bakers Lane, fronting the proposed AIE;
  - An upgrade of the signalised intersection at Bakers Lane, with provisions for U-turn and local access;
  - An upgrade of the signalised intersection at Erskine Park Road;
  - An upgrade of the signalised intersection at James Erskine Drive, with provisions for future access to development on the western side of Mamre Road (a temporary arrangement is currently in place);
  - Left in / left out access at Mandalong Close;
  - Left in / left out access at McIntyre Avenue;
  - A new signalised intersection at Luddenham Road;
  - A new signalised intersection at Solander Drive; and
  - An upgrade of the signalised intersection at Banks Drive.

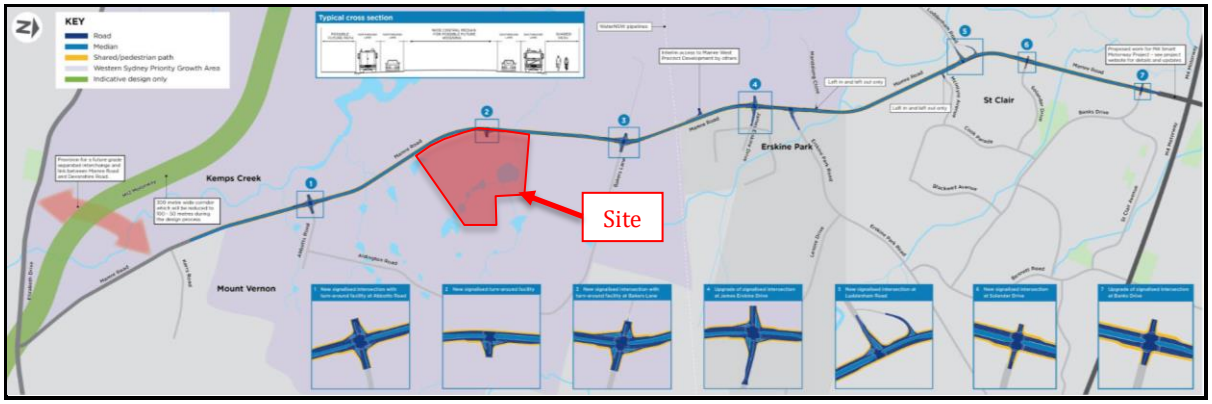
The typical future Mamre Road cross-section is shown in **Figure 4** while the broader MR Upgrade proposal (per the MR Upgrade Report) is shown in **Figure 5.**

Figure 4: Mamre Road Upgrade Typical Cross Section



Source: Mamre Road Upgrade Report

Figure 5: Mamre Road Upgrade

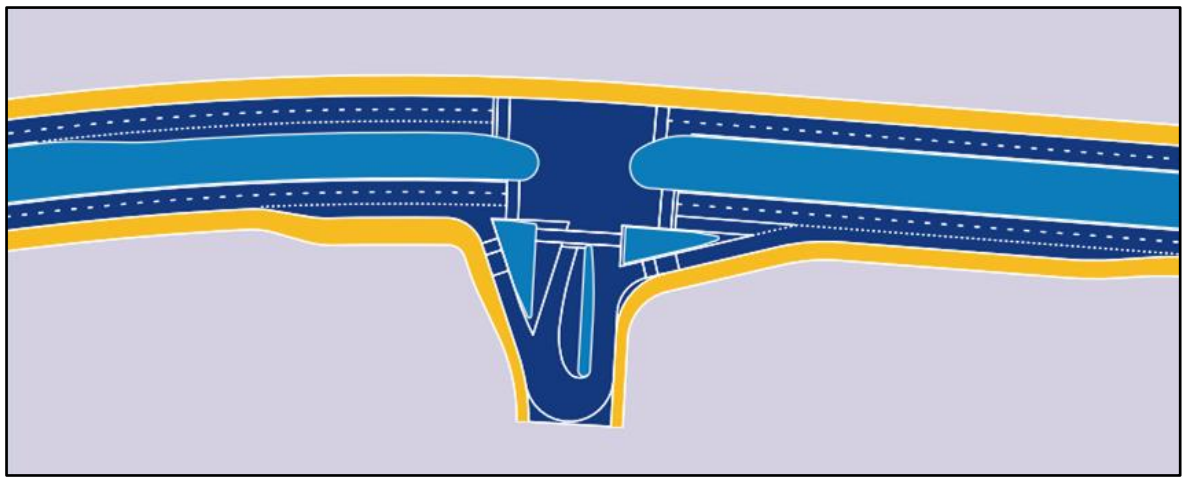


Source: Mamre Road Upgrade Report

4.4.3 Mamre Road Site Intersection

The MR Upgrade Report indicates a future signalised intersection immediately adjacent to the Site (which has been specifically considered in Site planning). The intersection design is reproduced in **Figure 6** below, noting that no western approach is proposed at this time (to MR Precinct land to the west of Mamre Road).

Figure 6: Mamre Road Upgrade at Site



Source: Mamre Road Upgrade Report

4.5 Mamre Road Precinct Rezoning Status

As discussed, the MR Precinct has been recently rezoned, and based on our discussions with key authorities, it is anticipated that a Precinct DCP will be released in the near future which responds to the rezoning and provides governance for the future growth across the MR Precinct. Concurrently, the detailed traffic modelling of the MR Precinct being undertaken by TfNSW will specifically determine:

- Sub-regional connections to the regional road network, with a specific focus on Mamre Road and Southern Link Road;
- The road network within the MR Precinct to ensure efficient and equality of access to these sub-regional connectors;
- Road and intersection upgrade requirements and the timing of such in line with the staged development of the MR Precinct; and
- An appropriate apportionment of infrastructure costs.

5 Public & Active Transport Opportunities

5.1 Public Transport

It is evident that the Site is not directly serviced by public transport at this time; notwithstanding, opportunities for future connections have been identified, noting again that the MR Upgrade specifically provides for new bus stops along its entire route.

The planning of bus services in Sydney is governed by the *NSW Service Planning Guidelines,* which aim to establish Strategic Transport Corridors and a hierarchy of bus route types that:

- Link to regional centres (such as Penrith and Mt Druitt);
- Pass through patronage generators such as district centres, TAFE colleges, hospitals and universities;
- Connect with other transport modes (trains, ferries and other buses);
- Are multifunctional (serving journeys to work, education, shopping and recreation);
- Are direct and frequent; and
- Meet the network planning principles.

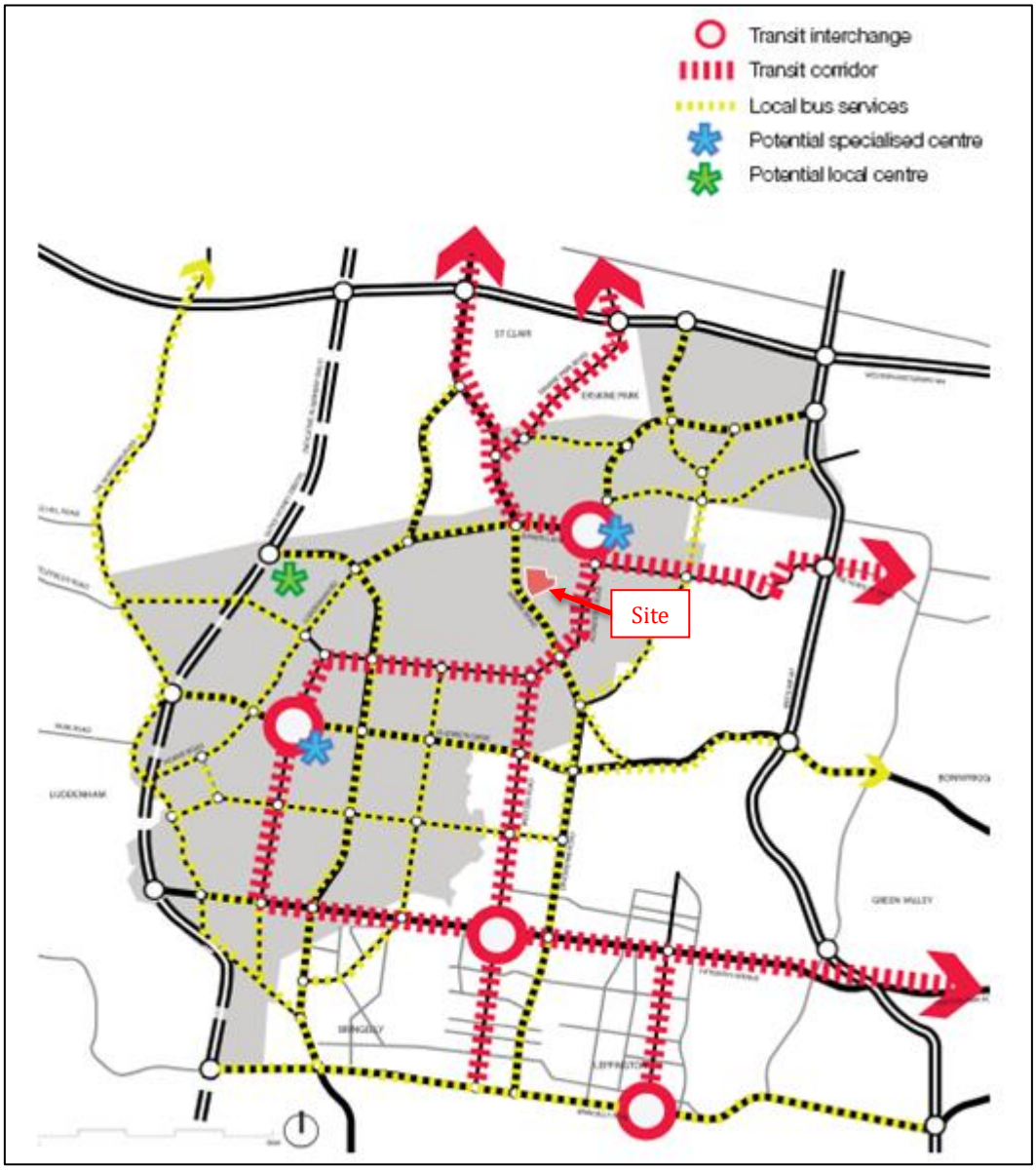
It is also the case that the establishment of public transport services as early as possible in the development stages of the MR Precinct is important to achieve a culture of public transport use from the outset. To make public transport a viable choice in the study area, the services will ideally:

- Integrate with existing bus services in the area;
- Connect to regional centres of Penrith, Mt Druitt and Blacktown; and
- In the long term, connect to areas such as Leppington in the South West Growth Centre, Prairiewood and the Liverpool to Parramatta T-Way.

While the internal MR Precinct road network will be finalised further to the outcomes of the TfNSW modelling, it is anticipated that internal roads – which would already provide greater width to accommodate heavy vehicle movements – would also therefore be bus capable. There are significant opportunities therefore to provide sub-regional services along Mamre Road, as well as services within the MR Precinct itself to maximise the number of sites that lies within 400m of a viable bus service.

Key bus routes identified in the BWSEA Structure Plan are shown in **Figure 7**.

Figure 7: BWSEA Cycle Routes



Source: BWSEA Structure Plan

5.2 Cycling

At present, shared paths (pedestrian and cycle) are provided along Erskine Park Road and sections of Mamre Road to the north of the Site, but there is little cycling (or pedestrian) infrastructure in Mamre Road between Distribution Drive to the north and Elizabeth Drive to the south.

The BWSEA Structure Plan provides a detailed outline of future active transport objectives and strategies, acknowledging that the provision of such will be essential to encourage the use of active transport from the outset. In this regard, the BWSEA provides the following key objectives:

- Provide quality pedestrian and cycling environments around transit corridors and facilities.
- Understand the key walking and cycling needs in the region and the need for the separation of pedestrians and cyclists from motor vehicle traffic.
- Recognise that all trips involve walking at either the beginning or end of the journey, resulting in the need for connections between parking and public transport areas and destinations.
- Recognise that walking and cycling paths can form key routes between destinations.
- Understand that walking and cycling trips perform a variety of functions, not only travel from an origin to a destination, but such trips are also undertaken for recreation and/or health benefits, which can be influenced by the amenity of the route.

Key active transport routes identified in the BWSEA Structure Plan are shown in **Figure 8**, noting again that the MR Upgrade will provide shared paths along at least one side of the road for its entire length.

Figure 8: BWSEA Active Transport Network

Source: BWSEA Structure Plan

6 The Proposal

6.1 Overview

Full details of the Stage 1 and Concept Masterplan Proposal are provided in the EIS, prepared by Urbis, which this TA accompanies.

As stated, the SSDA Proposal seeks approval for:

- A Concept Masterplan for the site comprising 11 industrial buildings, internal road network layout, building locations, car parking, concept landscaping, building heights, setbacks and built form parameters with the following GFAs:
  - Warehouse: 239,530m^2;
  - Office (including dock office): 11,510m^2
  - Café: 122m^2.
- A Stage 1 development of the site including the construction, fit out and 24 hours a day/ 7 days per week use of warehouse and distribution centre within Stage 1;
- A Stage 1 with the following GFAs:
  - Warehouse 1: A total of 36,842m^2 GFA, including:
    - 35,060m^2 warehouse floorspace;
    - 1,660m^2 ancillary & dock office floorspace; and
    - A 122m^2 Café.
  - Warehouse 3: A total of 21,535m^2 GFA, including:
    - 20,735m^2 warehouse floorspace; and
    - 800m^2 ancillary & dock office floorspace.
- A new signalised intersection to Mamre Road to accommodate Stage 1 traffic.

A reduced version of the AIE Concept Masterplan is shown in **Figure 9**.

Figure 9: Aspect Industrial Estate Concept Masterplan

Source: SBA Architects

7 Traffic Assessment

7.1 Trip Rates

The assessment of industrial development within Western Sydney has generally – in recent years – referenced the trip generation rates provided in the RMS Guide Update, and specifically sites displaying the similar characteristics of (large scale) industrial development, including the Erskine Park Industrial Estate, and the Wonderland Business Park, Eastern Creek Roads & Maritime survey sites (as detailed in the RMS Guide Update).

However, as reference, Ason Group is currently working with TfNSW with regard to the wider precinct modelling in regard to traffic generation assumptions for the MRP. The trip rates that have been agreed through this process as suitable for adoption in the assessment of developments in the MRP are shown by **Table 5**. To ensure consistency with the background MRP assessment being undertaken separately, these rates have been adopted for the purposes of this assessment.

Table 5: TfNSW Agreed Trip Rates

Time Period	Rate per 100m^2
Daily Trips	2.91
Local Road AM Peak (7am – 8am)	0.23
Local Road PM Peak (4pm – 5pm)	0.24
Site Maximum Generation Rate (All Vehicles)	0.26
Site Maximum Generation Rate (Heavy Vehicles)	0.07

7.2 Traffic Generation

7.2.1 Stage 1 Traffic Generation

Further to the adoption of the trip rate as described above, **Table 6** provides a summary of the Site's peak hour traffic generation further to the Stage 1 Proposal, while a breakdown of the Site's daily traffic profile, based on the significant survey data available, is shown in **Table 7**; it is noted that there are minor differences between the peak hour volumes reported in Table 6 and those reported in Table 7 further to minor rounding changes.

Table 6: Stage 1 Traffic Generation

Lot	GFA (m^2)	AM Trip Rate	AM Trips	PM Trip Rate	PM Trips
Warehouse 1	36,720	0.23	84	0.24	88
Warehouse 3	21,535		50		52
Total	**58,255**		**134**		**140**

Table 7: Stage 1 Daily Traffic Profile

Start Time	Light Vehicle	Rigid	Semi-trailer	B-double	Total
0:00	10	2	1	0	13
1:00	8	2	1	0	11
2:00	9	2	1	0	12
3:00	11	3	1	0	16
4:00	39	10	4	1	54
5:00	73	18	7	2	100
6:00	86	22	8	3	119
7:00	98	25	9	3	136
8:00	78	20	7	3	107
9:00	60	15	6	2	82
10:00	55	14	5	2	75
11:00	58	15	6	2	81
12:00	71	18	7	2	98
13:00	74	19	7	2	102
14:00	111	28	10	4	153
15:00	86	22	8	3	119
16:00	98	25	9	3	136
17:00	62	16	6	2	86
18:00	35	9	3	1	49
19:00	21	5	2	1	29
20:00	15	4	1	1	21
21:00	23	6	2	1	31
22:00	29	7	3	1	41
23:00	20	5	2	1	27
Total	**1,230**	**309**	**116**	**41**	**1,696**

7.2.2 Concept Masterplan Generation

Further to the adoption of the trip rates as described above, **Table 8** provides a summary of the Site's traffic generation further to the Concept Masterplan Proposal, while a breakdown of the Site's daily traffic profile, again based on the significant survey data available, in shown in **Table 9**; it is noted that there are minor differences between the peak hour volumes reported in Table 8 and those reported in Table 9 further to minor rounding changes.

Table 8: Concept Masterplan Traffic Generation

Lot	GFA (m^2)	AM Trip Rate (per 100m^2)	AM Trips	PM Trip Rate (per 100m^2)	PM Trips
Concept Masterplan	251,040	0.23	577	0.24	602

Table 9: Concept Masterplan Site Daily Traffic Profile

Start Time	Light Vehicle	Rigid	Semi-trailer	B-double	Total
0:00	42	11	4	1	58
1:00	35	9	3	1	48
2:00	39	10	4	1	54
3:00	49	12	5	2	68
4:00	169	43	16	6	234
5:00	313	79	30	10	432
6:00	371	93	35	12	511
7:00	424	107	40	14	584
8:00	335	84	32	11	462
9:00	257	65	24	9	354
10:00	236	59	22	8	325
11:00	252	63	24	8	347
12:00	305	77	29	10	421
13:00	318	80	30	11	438
14:00	477	120	45	16	657
15:00	371	93	35	12	511
16:00	424	107	40	14	584
17:00	268	67	25	9	370
18:00	152	38	14	5	209
19:00	90	23	8	3	124
20:00	65	16	6	2	89
21:00	98	25	9	3	136
22:00	127	32	12	4	175
23:00	85	21	8	3	118
Total	**5,299**	**1,333**	**500**	**177**	**7,310**

7.3 Adjacent Sites – Cumulative Assessment

While the Stage 1 Proposal relates to only 2 buildings (with a total GFA of 58,255m^2) within the AIE, Ason Group has also assessed future traffic generation further to the completion of the AIE, as well as the immediately adjacent land parcels that will similarly be developed for industrial development.

While timeframes for development of this land is unknown, it is likely to be developed in a similar fashion to the Estate; with reference to the above, information provided by Mirvac suggests that the Estate alone once complete would provide a total GFA of approximately 251,040m^2, while information provided by Mirvac suggests that adjacent landholdings could provide total GFA of over 200,000m^2 GFA based on the developable area of this land.

On this basis, **Table 10** summarises the future cumulative traffic generation of the AIE and the adjacent development sitesTable 11.

Table 10: AIE + Adjacent Sites Traffic Generation

Cumulative Sites	GFA (m^2)	AM Trip Rate (per 100m^2)	AM Trips	PM Trip Rate (per 100m^2)	PM Trips
Aspect Estate	251,040	0.23	577	0.24	602
Adjacent Sites	200,000		460		480
Total	**451,040**		**1,037**		**1,082**

However, while it is recognised that the additional GFA beyond that proposed for Stage 1 could be developed at some point in the future, the key purpose of this TA is to assess the traffic impacts of Stage 1.

While the background traffic modelling is being completed by TfNSW, it is not known what configuration the intersection is required to be. Therefore, this assessment has identified the interim intersection arrangement required to accommodate the currently anticipated 2026 background traffic flows and the Stage 1 development to be delivered at the time of development of Stage 1.

Critically, the background traffic modelling being undertaken will take account of the both the AIE Site and the adjacent sites and therefore the ultimate intersection to be delivered by TfNSW will have sufficient capacity to accommodate the cumulative traffic generation. While the detailed SIDRA analysis reported below includes consideration of the AIE, as requested, it is reiterated therefore that the key focus from a traffic impact perspective is the Stage1 development.

7.4 Trip Distribution

7.4.1 Arrival & Departure Distribution

The arrival and departure distribution of trips to and from the Site during the AM and PM peak periods has considered the following:

- Journey to Work (JTW) data;
- Ason Group surveys of local industrial sites; and
- The RMS Guide and RMS Guide Update.

The resulting adopted arrival and departure distribution for the assessment is shown in the tables below. Further to this analysis, the following arrival and departure distribution has been adopted:

- AM Peak Hour:
  - 70% arrival; and
  - 30% departure.
- PM Peak Hour:
  - 30% arrival; and
  - 70% departure.

7.4.2 Directional Distribution

The proposed future sub-regional road infrastructure, and particularly the Southern Link Road to the north and the M12 Motorway to the south, and of course new development across Western Sydney, will change directional distribution patterns in the sub-region over time.

As requested by TfNSW, Ason Group has therefore assessed a number of distribution scenarios to ensure that the future intersection of Mamre Road & Road 1 has the flexibility to accommodate such changes. In this regard, the follows scenarios have been assessed:

- **Scenario 1:** Stage 1 – 60% of trips to/from the north in both peak periods.
- **Scenario 1a:** AIE – 60% of trips to/from the north in both peak periods.
- **Scenario 2:** Stage 1 – 60% of trips to/from the south in both peak periods.
- **Scenario 2a:** AIE – 60% of trips to/from the south in both peak periods.
- **Scenario 3:** Stage 1 – 50% of trips to the north and 50% of trips to the south in both peak periods.
- **Scenario 3a:** AIE – 50% of trips to the north and 50% of trips to the south in both peak periods

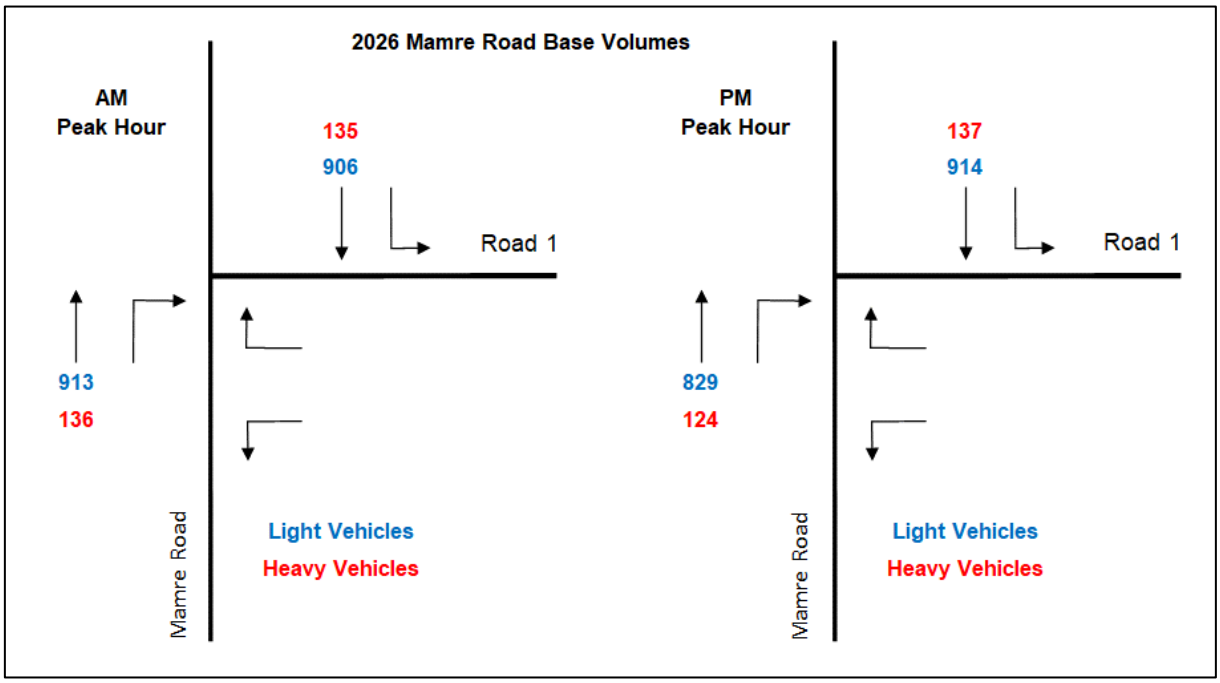
7.5 Forecast Background Traffic Volumes

In order to determine future base traffic flows in Mamre Road, Ason Group has been provided with 2018 output data from the RMS Sydney Traffic Forecasting Model (STFM) for the forecast year 2026. As discussed with TfNSW, these forecast volumes are based on 2016 land-use inputs, which are currently

being revised by TfNSW; notwithstanding, TfNSW has specifically confirmed that these volumes still provide an appropriate basis for the assessment of short-medium term Mamre Road volumes.

The STFM base flows in Mamre Road adjacent to the Site are summarised in **Figure 10**, including a breakdown to light and heavy vehicles based on existing vehicle classification data for Mamre Road and other similar sub-regional roads.

Figure 10: 2026 Mamre Road Base Flows



Further to the above, it is notable that the TfNSW assessment team has requested that forecasting past 2026 (i.e. when additional development would occur across the Estate and the wider MR Precinct) be conducted. However, it is noted that this simply isn't practical at this time, as future conditions by 2036 will be significantly altered by MR Precinct Rezoning, as a result of higher development yields and new external connections to the regional road network and internal roads within the MR Precinct; the potential for an Intermodal Terminal will also have a significant bearing on the operation of the future road network.

As described previously, TfNSW is current commencing detailed traffic modelling of the MR Precinct investigating a number of development yields, road network and Intermodal location scenarios. The outcomes of this modelling will be crucial to the requirements of the intersection of Mamre Road & Access Road 1, and further would take account of traffic relating to the development of the MR Precinct, including the AIE. Therefore, a key purpose of this report is to assess the Stage 1 Proposal and the interim upgrades required. Any forecasting beyond that should be considered as part of any future detailed applications relating the future AIE stages. It is noteworthy the upgrades and road network required to service the whole of MR Precinct is expected to be understood by the end of 2020.

As stated, the design of the Estate as proposed in the AIE Concept Masterplan provides for future connectivity to the north, south and west of the Site should such connectivity be recommended further to the TfNSW modelling.

7.6 Trip Assignment

7.6.1 Stage 1

With reference to sections above, the figures below provide a summary of the future trip generation of Stage 1 at the key intersection of Mamre Road & Road 1 for the different distribution scenarios detailed in **Section 7.4.2**, noting that volumes have been rounded in some instances.

Figure 11: Scenario 1: 2026 Base + 60% Site Trips to/from the North

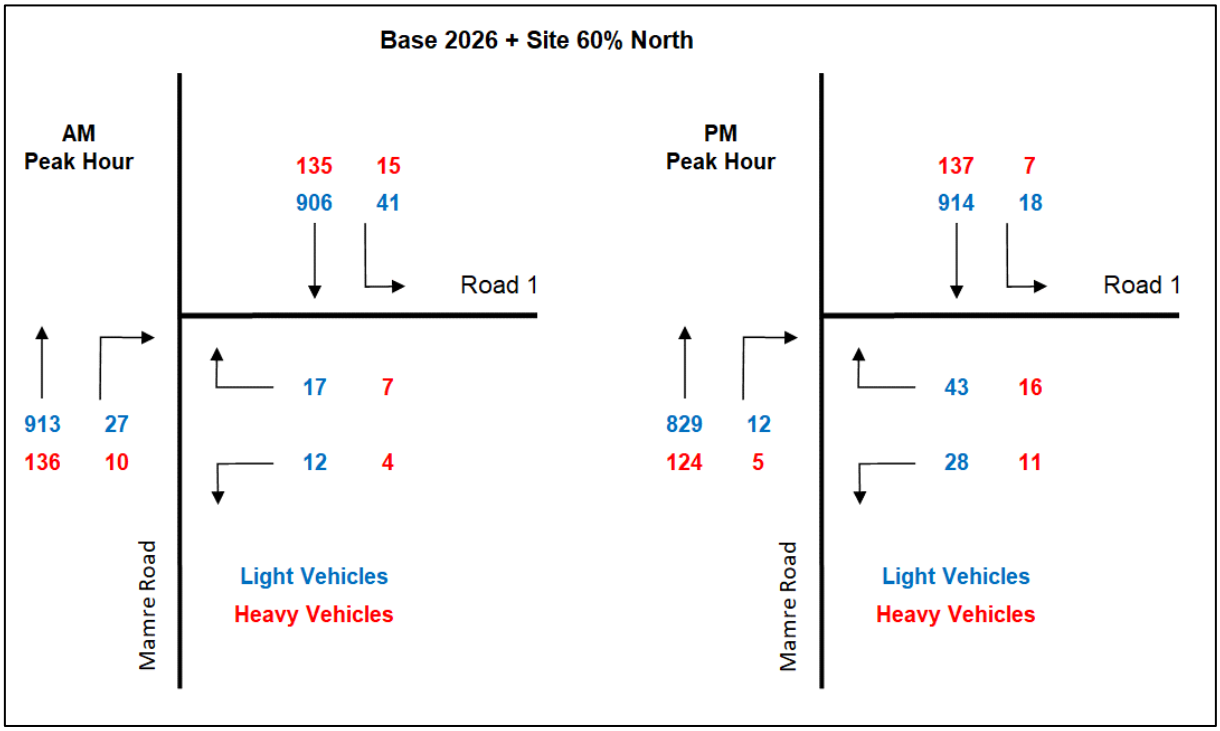


Figure 12: Scenario 2: 2026 Base + 60% Site Trips to/from the South

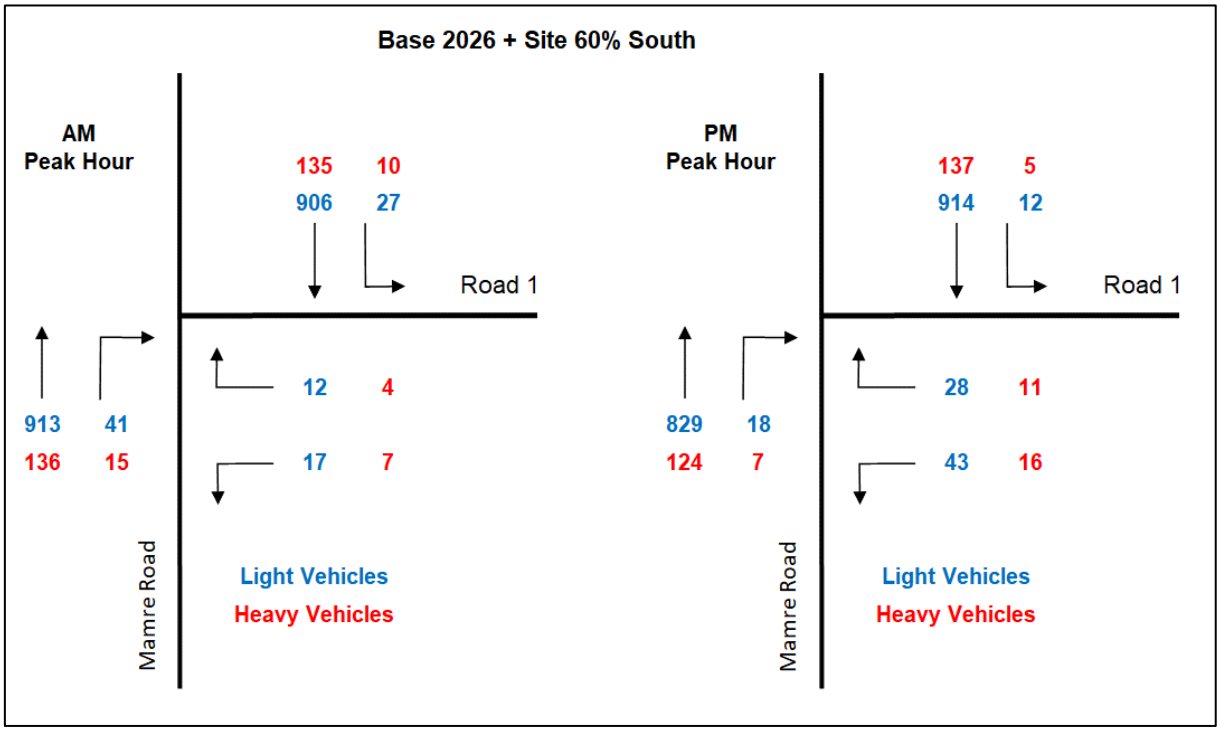
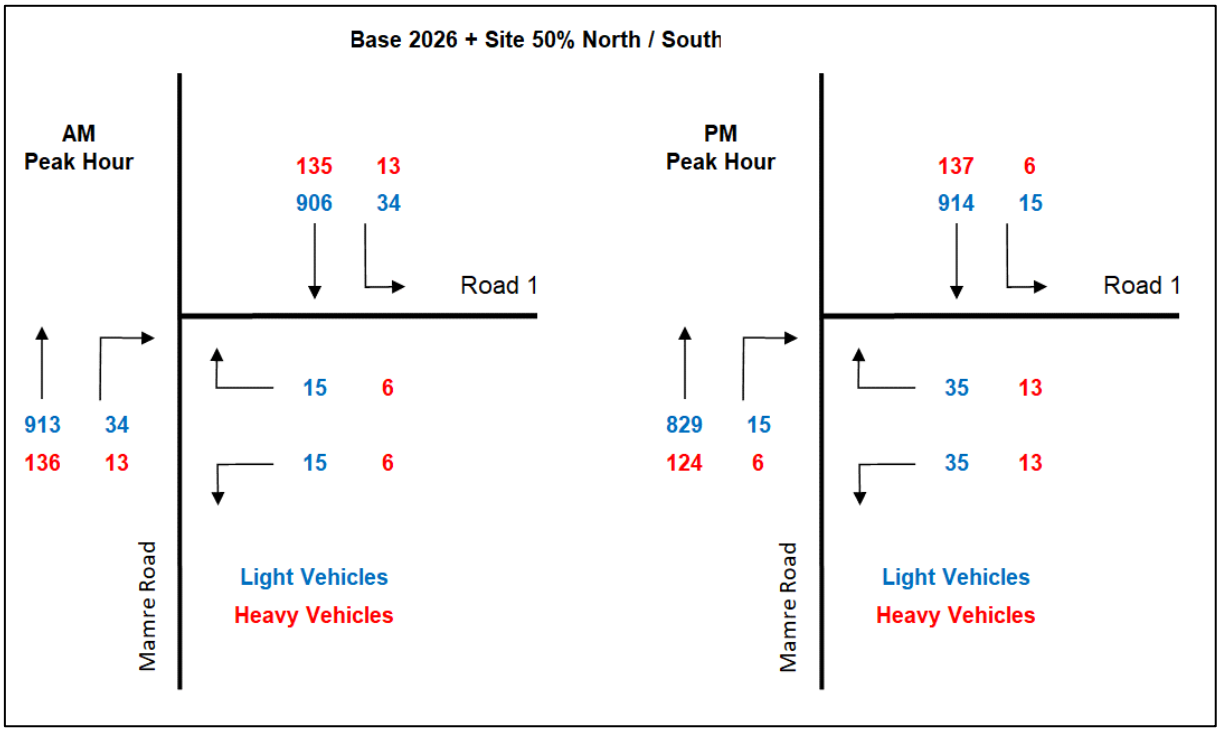


Figure 13: Scenario 3: 2026 Base + 50% of Site Trips to the North and South



7.6.2 AIE Concept Masterplan

With reference to sections above, the figures below provide a summary of the future trip generation of the whole AIE Concept Masterplan at the key intersection of Mamre Road & Road 1 for the different distribution scenarios detailed in **Section 7.4.2**, noting that volumes have been rounded in some instances.

Figure 14: Scenario 1a: 2026 Base + 60% Site Trips to/from the North

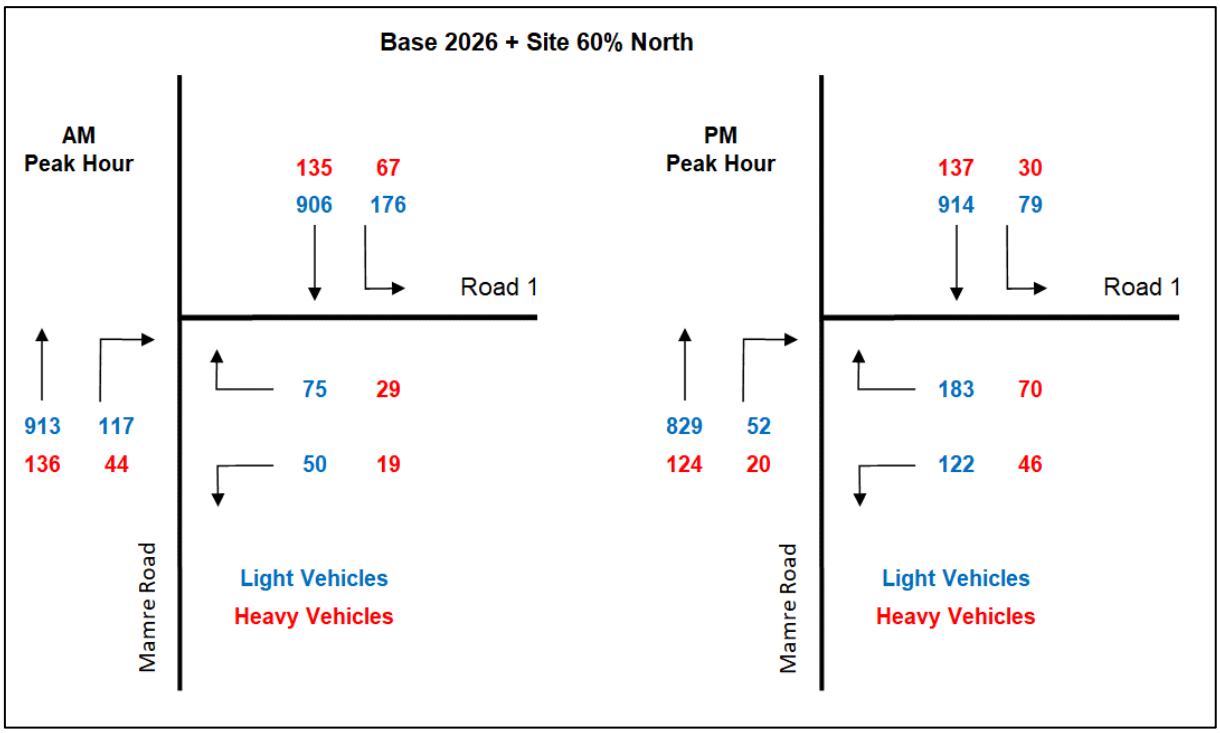


Figure 15: Scenario 2a: 2026 Base + 60% Site Trips to/from the South

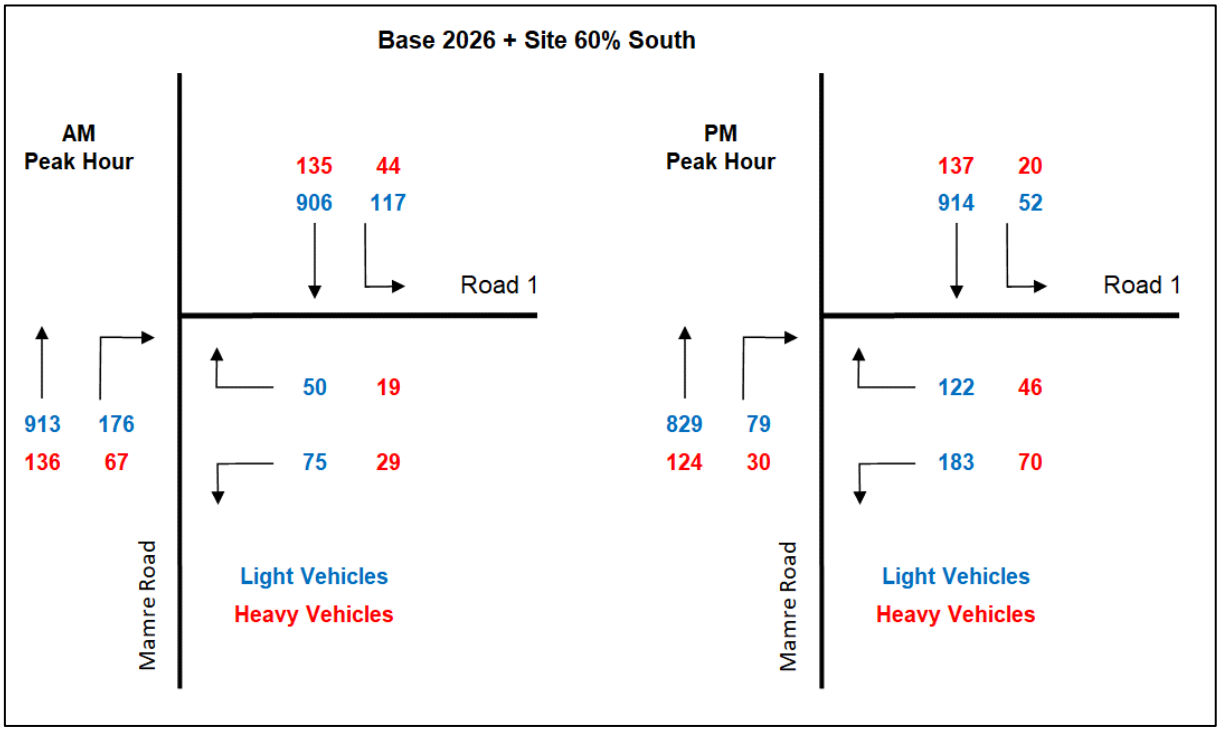
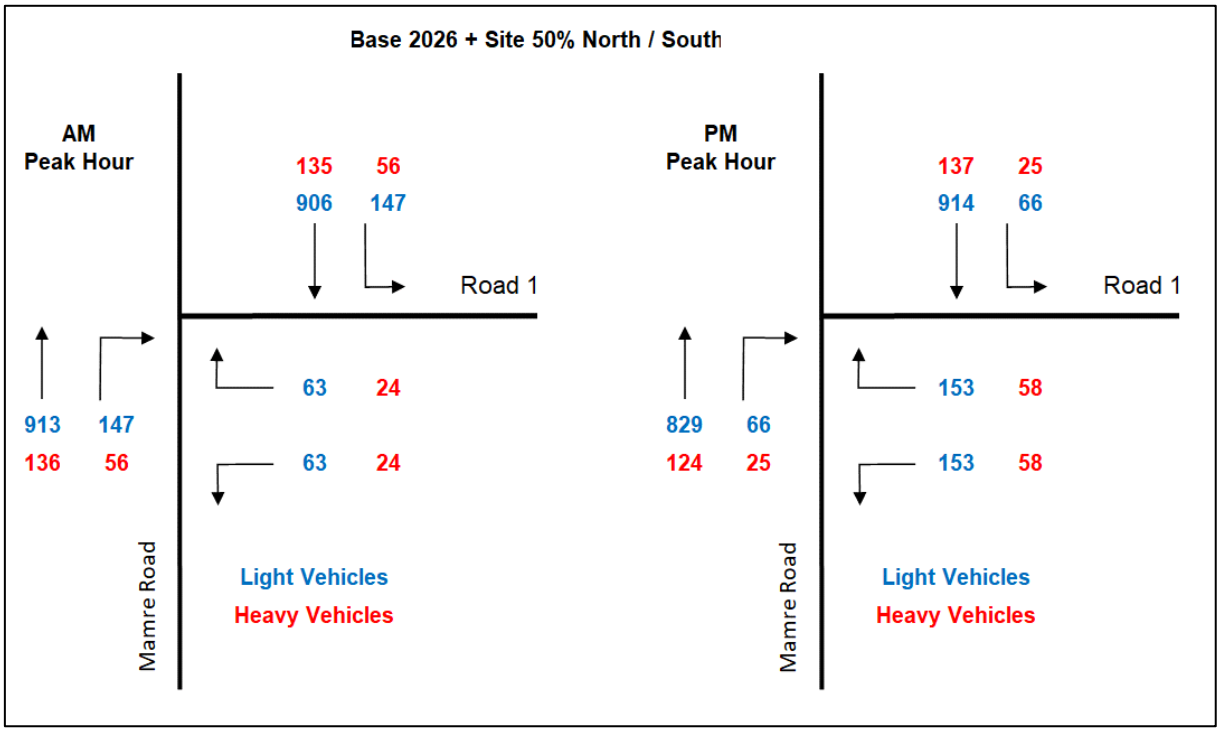


Figure 16: Scenario 3a: 2026 Base + 50% of Site Trips to the North and South



7.7 Intersection Warrants

As shown in **Figure 6**, a signalised intersection into the Site is currently proposed as part of the MR Upgrade. With regard to the Estate, and further to consultation with TfNSW, it is understood that should the 5-year horizon warrant it, the signalised intersection could be provided prior to the traffic generation of the Estate specifically warranting it.

It is critical to note that further to the Estate, this intersection will provide access to development sites around it as well and will be a key access points from Mamre Road to the internal MR Precinct road network, and indeed is designated as a signalised intersection in the MR Upgrade; as such, it is clear that signals at the intersection are warranted.

Nevertheless, the time at which the signals are required, with regard to the 5-year horizon, has been assessed against the general warrants for the installation of traffic signals, as provided in the Roads & Maritime *Traffic Signal Design Guidelines: Section 2, Warrants* (TSDG: 2).

From the outset, it is critical to note that warrants are provided as a guide only, with the TSDG:2 specifically detailing the numerous additional considerations in determining whether signals are appropriate or not. In this regard, it is worth noting the following, taken directly from Section 2.2 of TSDG:2 – *Factors Influencing the Provision of Traffic Signals*:

Traffic signals are usually installed at an intersection:

> *To provide traffic control at a site with a traffic capacity or road safety problem*
> *To control conflicting movement with high traffic volumes*
> *To facilitate access to and from local areas in a major/minor road system, including pedestrian movement*
> *As part of an area wide system of traffic management.*

Notwithstanding, Section 2.3 (a) of the TSDG:2 outlines warrant criteria for vehicle movements. The warrants as reproduced below.

"2.3 (a) Traffic Demand: For each of four one-hour periods of an average day:

i. The major road flow exceeds 600 vehicles/hour in each direction; and

ii. The minor road flow exceeds 200 vehicles/hour in one direction

While it is clear that the flows on Mamre Road will meet these warrants, the traffic generation associated with Stage 1, with 40 vehicles exiting the Site in the AM peak hour and 98 vehicles exiting the Site in the PM peak hour, would not meet the warrants.

However, as per **Section 7.3**, the forecast cumulative traffic generation of the entire AIE, alongside the adjacent lands would meet the warrants. This cumulative traffic generation is summarised in **Table 11**.

Table 11: AIE + Adjacent Sites Traffic Generation

Cumulative Sites	GFA (m^2)	AM Trips	PM Trips
Aspect Estate	251,040	577	602
Adjacent Sites	200,000	460	480
Total	**451,040**	**1,037**	**1,082**

As shown in **Table 11**, the traffic utilising this intersection to access Mamre Road from the internal MR Precinct is anticipated to be in the order of 1,037 – 1,082 vehicles per hour. This could equate to:

- Over 300 vph exiting Road 1 via the intersection in the AM peak hours; and
- Over 700 vph exiting Road 1 via the intersection in the PM peak hours.

Therefore, it is clear that a signalised intersection in this location will be warranted.

For operational purposes of Stage 1, the following section details the requirements for the signalised intersection, during the interim period, based on SIDRA analysis. The interim intersection would be delivered with due reference to the design requirements for the ultimate intersection that would be required to service the MR Precinct.

7.8 Traffic Assessment – Stage 1

7.8.1 Intersection Design

In order to determine the design of the intersection required to accommodate the Stage 1 Site trips, Ason Group has previously undertaken an iterative assessment, where additional lane infrastructure was provided as required, considering a wide range of development series. It is noted that for the scenarios assessed as part of this Proposal (detailed in **Section 7.4.2**), the intersection in fact would only require one through lane on Mamre Road in each direction.

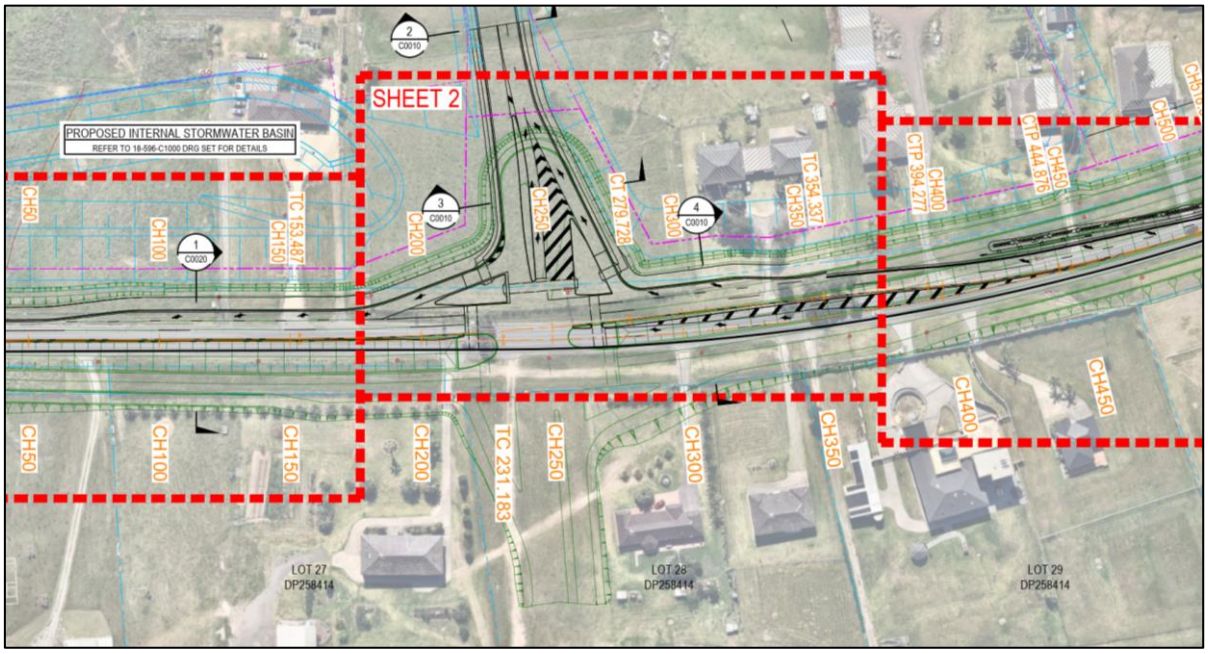
However, the intersection currently proposed, which has been designed by AT&L, has been developed based on the future requirements for intersection upgrades and discussion with TfNSW. The interim signalised intersection design matches the Mamre Road Strategic Design along the eastern verge. The western verge is created in the existing reserves noting future Mamre Road upgrade on the western verge is subject to land acquisition from TFNSW. The interim signalised intersection has been prepared and will also be finalised in consultation with TFNSW.

Figure 17 illustrates the AT&L designed intersection, which has been extracted from the AT&L drawing set submitted with this application.

Therefore, while (with reference to **Section 7.8.3** below) this level of infrastructure would not be required for Stage 1, the design of the intersection is consistent with the eastern side of the proposed MR strategic design and would not preclude for further upgrades, including the provision of a third traffic lane in each direction as identified in the MR Upgrade Report.

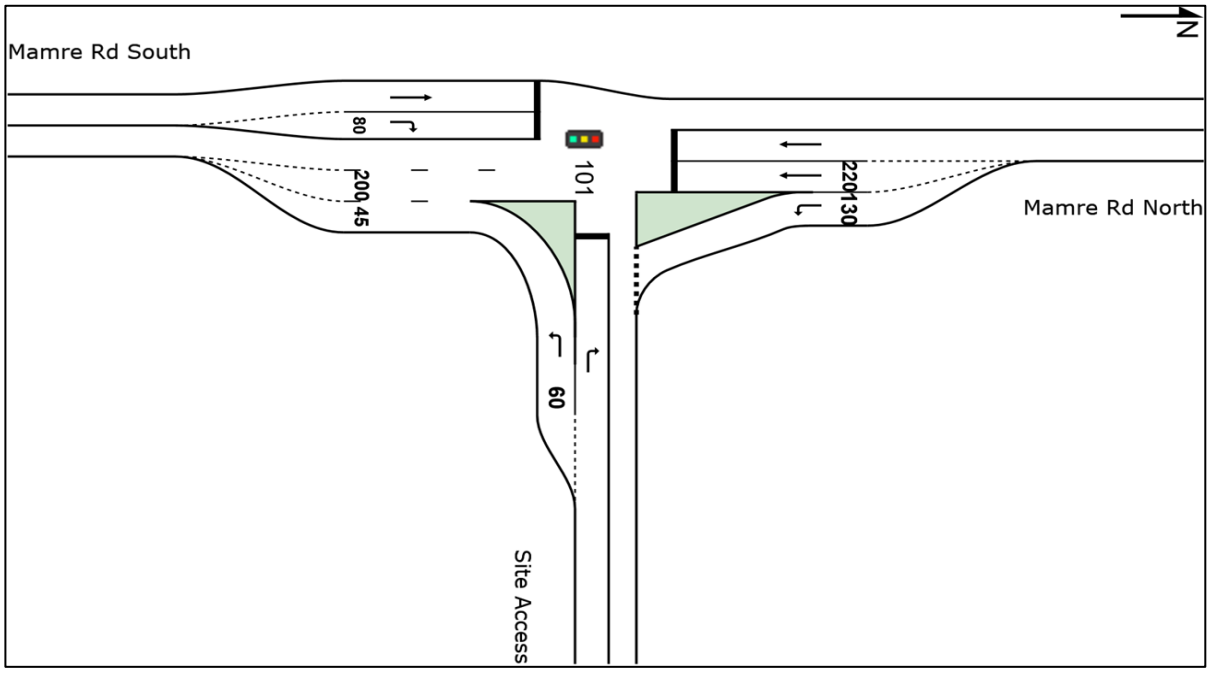
Further to this process, **Figure 18** illustrates the SIDRA layout assessed (based on the AT&L intersection design in Figure 17), which can appropriately accommodate the Stage 1 traffic volumes in the forecast year 2026; it is noted that this design would provide appropriate operations for all of the distribution scenarios detailed in **Section 7.4.2** (see **Table 13** below).

Figure 17: Stage 1 2026 Intersection Design



Source: AT&L

Figure 18: Stage 1 2026 SIDRA Intersection Layout



7.8.2 SIDRA Intersection Model

The future operation of the proposed signalised intersection of Mamre Road & Road 1 has been assessed using the Roads & Maritime approved SIDRA intersection model. The SIDRA model provides a number of outputs by which to measure the performance of an intersection, 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 12 provides the SIDRA recommended criteria for the assessment of intersections with reference to the RMS Guide.

Table 12: SIDRA Level of Service Criteria

Level of Service	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.

7.8.3 Intersection Operations

Further to modelling of the different distribution scenarios using SIDRA, **Table 13** provides a summary of the forecast operation of the intersection of Mamre Road & Road 1, subject to Stage 1, and Table 14 provides the summary of the performance associated with AIE (noting that it is not anticipated that the whole of the AIE would be developed by this time). The detailed SIDRA outputs are provided in **Appendix A**.

Table 13: Base 2026 + Stage 1 Intersection Operations

Distribution Scenario	Peak Period	Level of Service	Average Delay (s)	Degree of Saturation
60% North	AM	A	6.5	0.703
	PM	A	7.3	0.647
60% South	AM	A	7.4	0.709
	PM	A	6.2	0.631
50% North & 50% South	AM	A	7.0	0.710
	PM	A	6.6	0.645

With reference to **Table 13**; regardless of the trip distribution, the intersection will operate at LOS A, with small delays and satisfactory operation for both the AM and PM peaks.

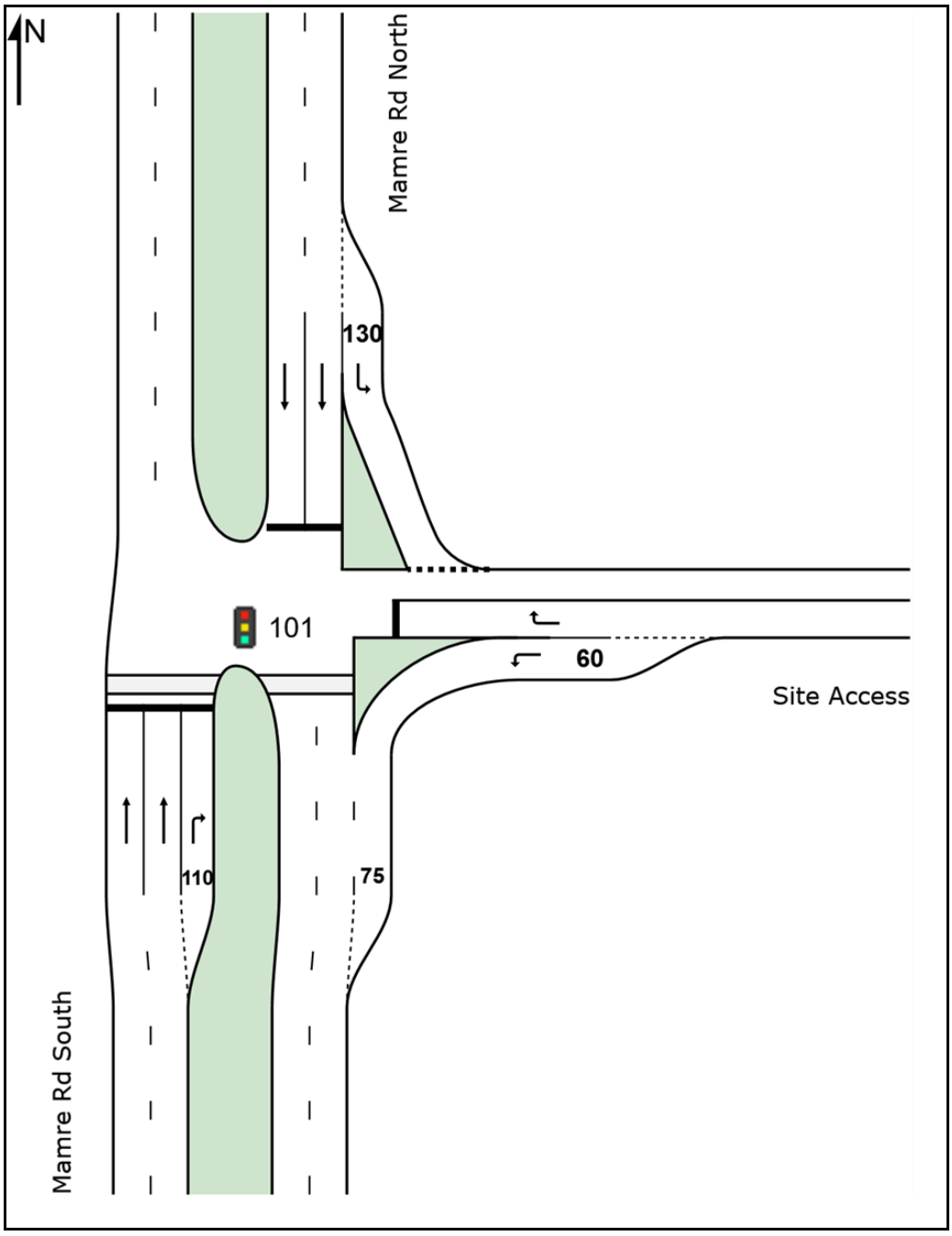
Table 14: Base 2026 + AIE Concept Masterplan Intersection Operations

Distribution Scenario	Peak Period	Level of Service	Average Delay (s)	Degree of Saturation
60% North	AM	B	15.7	0.827
	PM	B	23.3	0.861
60% South	AM	B	16.8	0.852
	PM	B	17.2	0.783
50% North & 50% South	AM	B	16.4	0.844
	PM	B	17.5	0.788

With reference to **Table 14**; regardless of the trip distribution, the intersection will operate at LOS B, with small delays and satisfactory operation for both the AM and PM peaks. It is worthy of note here that, one of TfNSW's currently key transport movement and outcome is to achieve a LOS E or better for the MR Precinct intersections. Therefore, it is clear that the interim intersection, which is forecast to operate at LOS B under the AIE Concept Masterplan scenario assessed, has sufficient capacity to cater for additional traffic which could be generated by the adjacent sites.

Finally, the intersection has been specifically designed so as to allow for a future upgrade of the intersection to TfNSW's currently preferred ultimate design (as per the MR Upgrade design), which is shown in **Figure 19**. It is noted that this design may be revised in the future, further to the current TfNSW modelling of the whole MR Precinct, but again any such revisions are anticipated to be compatible with the Stage 1 design shown in **Figure 17**.

Figure 19: Mamre Road & Site Access Ultimate Design



8 Parking Assessment

8.1 Car Parking

8.1.1 Draft AIE DCP Parking Rates

It is proposed that parking for the Site be provided with reference to the site-specific Draft AIE DCP, which itself has been prepared with reference to the Penrith DCP and the Mamre West DCP. There is no information to suggest that these parking rates, which have been adopted at similar sites across the WSEA, would not also be adopted in the Draft AIE DCP.

The Draft AIE DCP minimum parking rates applicable to the Proposal are shown by **Table 15**. Council's DCP also provides site-specific rates for the Oakdale South Industrial Estate (located immediately to the north-east of the Site), which are consistent with the rates contained within the RMS Guide, as shown by Table 15.

Table 15: Penrith DCP & RMS Guide Parking Rates

Land Use	Minimum Parking Rate
Draft AIE DCP Proposed Rates	
Warehouse	1 space per 300m^2
Office	1 space per 40m^2
Café	1 space per 10m^2
Penrith DCP	
Warehouses or distribution centres, including ancillary office	1 space per 100m^2
Warehouses or distribution centres, including ancillary office	1 space per 100m^2
Oakdale South Industrial Estate (Other Site Specific Requirements defined in DCP)	Warehouse – space per 300m^2 Office –1 space per 40m^2
Retail Premises Shop	1 space per 10m^2
RMS Guide	
Warehouse	1 space per 300m^2
Factory	1.3 spaces per 100m^2
Office	1 space per 40m^2

8.1.2 Parking Requirements

Table 16 details the requirements for Stage 1 and the remainder of the Concept Masterplan, based on the Draft AIE DCP minimum parking rates detailed in Table 15.

As per Table 16, the Stage 1 development requires 260 parking spaces and 322 parking spaces are provided, exceeding the requirements of the adopted parking rate. Similarly, the remainder of the Concept Masterplan requires a total of 839 parking spaces, with 940 currently provided. Therefore, the Proposal can provide full compliance with the adopted rates.

Table 16: Proposed Car Parking Rates & Provision

Stage	Land Use	GFA (m^2)	Requirement (spaces)	Currently Proposed
1	Warehouse	55,795	161	322
	Office	2,460	63	
	Café	122	12	
	Sub Total	**58,377**	**260**	
Concept Masterplan Balance	Warehouse	183,735	613	940
	Office	9,050	226	
	Sub Total	**192,785**	**839**	
Total	-	**375,555**	**1,099**	**1,262**

8.2 Additional Parking Considerations

8.2.1 Accessible Parking

The Draft AIE DCP provides the following in regard to accessible parking:

a) *Accessible parking must be provided in accordance with the provisions of the Building Code of Australia and relevant Australian Standards.*

In this regard, 2 accessible parking spaces are to be provided per every 100 spaces, therefore providing compliance with the Disability (Access to Premises – Buildings) Standards 2010 from the BCA, as well as the accessible parking requirements provided in Appendix B of AS 2890.6.

8.2.2 Bicycle Parking

The Draft AIE DCP provides the following in regard to accessible parking:

8. *Consideration is to be given to the delivery of infrastructure and / or the implementation of management measures that encourage the use of alternative forms of transport, which could include:*
    a. *Safe storage/parking areas for bicycle facilities.*
    b. *Shower and change room facilities for staff.*

In this regard, it is recommended that each operator within the Site be required to prepare a Workplace Travel Plan so as to identify the potential to encourage the use of public and active transport.

9 Access, Parking and Servicing Design

9.1 Design Standards

While the Proposal is largely at Concept Masterplan stage, the Site's access, car park and loading areas have been designed with reference to the following Australian Standards:

- AS2890.1:2004 for car parking areas;
- AS2890.2:2018 for commercial vehicle loading areas; and
- AS2890.6:2009 for accessible (disabled) parking.

9.2 Access Driveways

All access driveways (to the internal road network) are to be designed with reference to AS2890.1 and AS2890.2, with service driveways to provide for vehicles up to and including a 26m B-Double. It is anticipated that full access driveway design compliance with AS 2890.1 and AS 2890.2 would form a standard Condition of Consent further to approval.

9.3 Parking Areas

All parking areas, including access aisles and parking modules, are to be designed with reference to AS2890.1 and AS2890.6. It is anticipated that full parking area design compliance with the relevant standards would form a standard Condition of Consent further to approval.

9.4 Service Areas

All service areas are to be designed with reference to AS 2890.2, and again provide for the movement of vehicles up to and including a 26m B-Double. It is anticipated that service area design compliance with AS 2890.2 would form a standard Condition of Consent further to approval.

9.5 Design Summary

The concept design for the internal configuration of the Site (including light and heavy vehicular access, servicing areas and car parking) has been designed with regard to the requirements of the relevant Australian Standards (AS2890.1, AS2890.2 and AS2890.6). While detailed design is still being developed, it is clear that each of the proposed warehouse lots are cable of being designed in accordance with these standards, and it is expected that a standard Condition of Consent would be implemented that requires it.

10 Conclusions

Ason Group has been engaged by Mirvac to prepare a Transport Assessment to support a SSDA for industrial development across Lots 54 – 58 in DP 259135, Mamre Road Kemps Creek. Further to a detailed assessment of all relevant traffic and transport issues, Ason Group provides the following conclusions:

- The Site is well located for industrial development, with excellent existing and future connections to the sub-regional and regional network, as well as key growth centres across Western Sydney.
- Access to the Site will be provided via a new signalised intersection to Mamre Road, of which the location and eastern section is consistent with the TfNSW Strategic design for the MR Upgrade.
- The trip generation rate adopted for the assessment is the currently agreed rate for the MR Precinct background traffic modelling being undertaken by TfNSW. There is the possibility that these may be further refined through the current detailed MR Precinct modelling being undertaken by TfNSW.
- SIDRA analysis has identified the required configuration of the future intersection for Mamre Road & Site. The analysis indicates that an interim intersection design – providing single turning lanes and 3 lanes in Mamre Road (2 lanes southbound / 1 lane northbound) – would more than provide for the development of the Stage 1 Proposal, which is forecast to operate with a LOS of A. This proposed interim signalised intersection is also capable of servicing the entire AIE Concept Masterplan under a 2026 scenario with a LOS B.

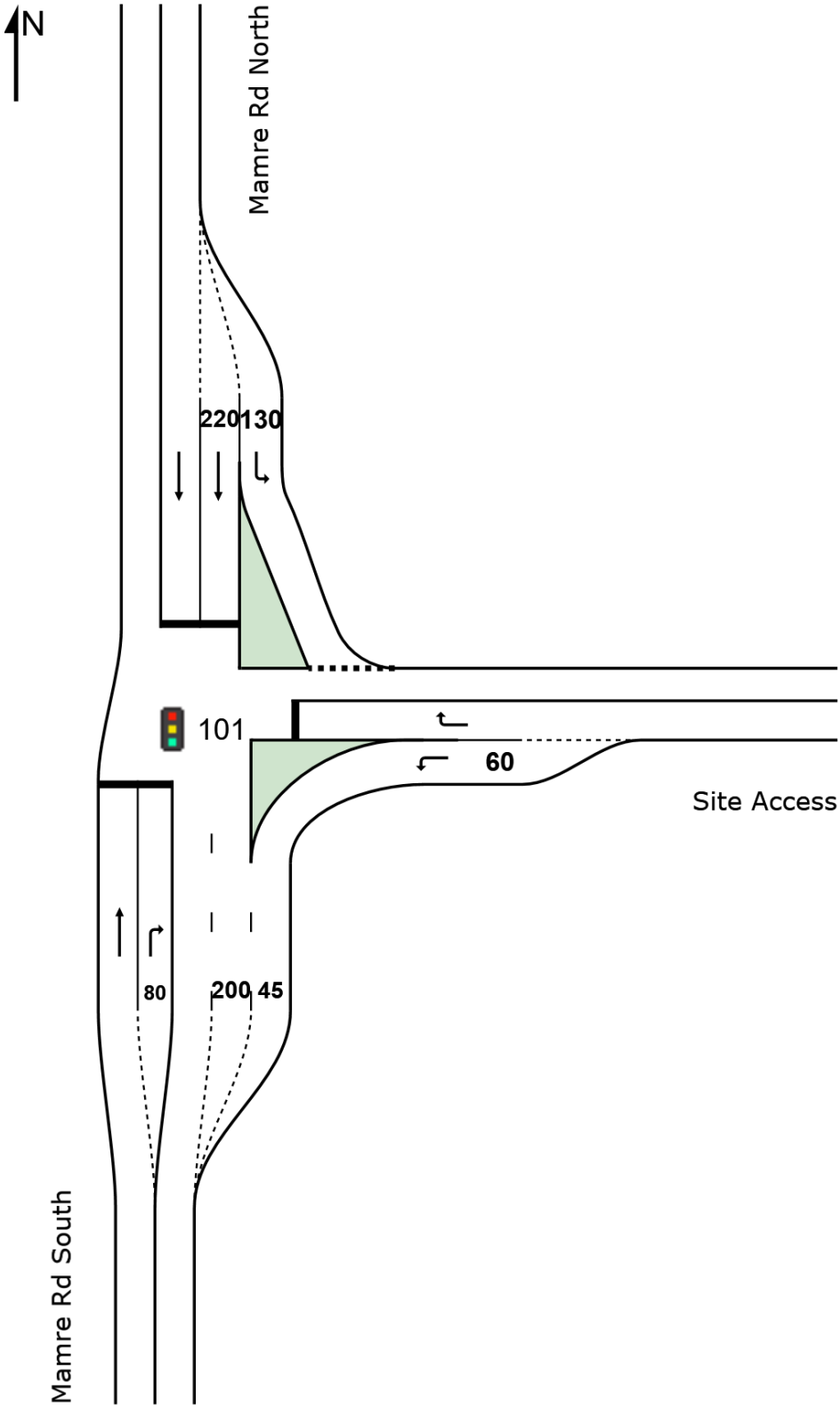
  As noted above, the intersection also operates at a good level of service using the higher trip rates as adopted in the June 2020 SSDA TA. The requirements for the ultimate intersection will be confirmed as part of the wider MR Precinct road network planning.
- All internal roads have been designed with reference to the Draft AIE DCP and provide for vehicles up to and including a 26m B-Double.
- Parking has been provided in accordance with the rates detailed Draft AIE DCP and includes an appropriate allocation of accessible parking spaces.
- All future operators will be encouraged to maximise the use of public and active transport, noting the future pedestrian, cycle and bus provisions included in the MR Upgrade design.
- The concept for all access driveways, parking areas and service areas have been designed with reference to the appropriate Australian Standards. It is anticipated that full design compliance with the relevant Australian Standards can be achieved for each lot and would form a standard Condition of Consent further to approval, which will also provide for design development to be continued as each stage is developed.

Appendix A

SIDRA Output Summaries

SITE LAYOUT

Site: 101 [Layout Mamre Rd x Site Access 2026 Stage 1 - 2 T lanes]



50:50 Distribution

MOVEMENT SUMMARY

Site: 101 [[AM] Mamre Rd x Site Access 2026 Stage 1 - 2 T lanes_50% North]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1104	13.0	0.710	3.0	LOS A	23.2	180.2	0.35	0.33	0.35	57.2
6	R2	49	27.7	0.402	75.2	LOS F	3.4	29.2	0.99	0.75	0.99	25.0
Approach		1154	13.6	0.710	6.1	LOS A	23.2	180.2	0.37	0.35	0.37	54.5
East: Site Access												
7	L2	22	28.6	0.013	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	22	28.6	0.323	81.3	LOS F	1.6	13.8	1.00	0.71	1.00	23.8
Approach		44	28.6	0.323	43.6	LOS D	1.6	13.8	0.50	0.61	0.50	33.0
North: Mamre Rd North												
10	L2	49	27.7	0.035	6.4	LOS A	0.3	2.2	0.12	0.57	0.12	52.1
11	T1	1096	13.0	0.392	6.5	LOS A	12.9	100.4	0.38	0.35	0.38	54.2
Approach		1145	13.6	0.392	6.5	LOS A	12.9	100.4	0.37	0.36	0.37	54.1
All Vehicles		2343	13.9	0.710	7.0	LOS A	23.2	180.2	0.37	0.36	0.37	53.7

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.
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 SUMMARY

Site: 101 [[PM] Mamre Rd x Site Access 2026 Stage 1 - 2 T lanes_50% North]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1003	13.0	0.645	3.1	LOS A	18.6	145.1	0.35	0.33	0.35	57.1
6	R2	22	28.6	0.284	69.7	LOS E	1.3	11.7	1.00	0.71	1.00	26.1
Approach		1025	13.3	0.645	4.5	LOS A	18.6	145.1	0.37	0.34	0.37	55.8
East: Site Access												
7	L2	51	27.1	0.031	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	51	27.1	0.626	72.0	LOS F	3.2	27.5	1.00	0.79	1.12	25.5
Approach		101	27.1	0.626	39.0	LOS C	3.2	27.5	0.50	0.65	0.56	34.6
North: Mamre Rd North												
10	L2	22	28.6	0.015	6.3	LOS A	0.1	0.7	0.11	0.56	0.11	52.1
11	T1	1106	13.0	0.396	5.6	LOS A	11.3	87.6	0.38	0.35	0.38	54.9
Approach		1128	13.3	0.396	5.6	LOS A	11.3	87.6	0.38	0.35	0.38	54.9
All Vehicles		2255	14.0	0.645	6.6	LOS A	18.6	145.1	0.38	0.36	0.38	54.0

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.
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 SUMMARY

Site: 101 [[AM] Mamre Rd x Site Access 2026 AIE - 2 T lanes_50% North]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1104	13.0	0.844	4.7	LOS A	27.2	211.2	0.47	0.44	0.47	55.7
6	R2	214	27.6	0.564	49.5	LOS D	11.1	96.5	0.93	0.82	0.93	31.0
Approach		1318	15.3	0.844	12.0	LOS A	27.2	211.2	0.54	0.50	0.54	49.8
East: Site Access												
7	L2	92	27.6	0.056	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	92	27.6	0.759	71.0	LOS F	5.8	50.1	1.00	0.88	1.22	25.7
Approach		183	27.6	0.759	38.4	LOS C	5.8	50.1	0.50	0.69	0.61	34.8
North: Mamre Rd North												
10	L2	214	27.6	0.178	8.3	LOS A	2.5	22.0	0.27	0.62	0.27	50.6
11	T1	1096	13.0	0.551	19.6	LOS B	20.9	162.6	0.71	0.64	0.71	45.4
Approach		1309	15.4	0.551	17.8	LOS B	20.9	162.6	0.64	0.64	0.64	46.1
All Vehicles		2811	16.1	0.844	16.4	LOS B	27.2	211.2	0.59	0.58	0.59	46.8

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.
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 SUMMARY

Site: 101 [[PM] Mamre Rd x Site Access 2026 AIE - 2 T lanes_50% North]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1003	13.0	0.788	9.2	LOS A	32.2	250.8	0.61	0.57	0.61	52.2
6	R2	96	27.5	0.523	61.9	LOS E	5.5	47.6	0.99	0.79	0.99	27.8
Approach		1099	14.3	0.788	13.7	LOS A	32.2	250.8	0.64	0.59	0.64	48.8
East: Site Access												
7	L2	222	27.5	0.135	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	222	27.5	0.730	57.8	LOS E	12.8	111.0	0.99	0.87	1.07	28.7
Approach		444	27.5	0.730	31.9	LOS C	12.8	111.0	0.50	0.69	0.53	37.4
North: Mamre Rd North												
10	L2	96	27.5	0.071	6.6	LOS A	0.6	5.2	0.14	0.57	0.14	51.9
11	T1	1106	13.0	0.516	16.3	LOS B	19.3	149.9	0.65	0.59	0.65	47.3
Approach		1202	14.2	0.516	15.6	LOS B	19.3	149.9	0.61	0.58	0.61	47.6
All Vehicles		2745	16.4	0.788	17.5	LOS B	32.2	250.8	0.61	0.60	0.61	46.2

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.
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.

60% North (40% South) Distribution

MOVEMENT SUMMARY

Site: 101 [[AM] Mamre Rd x Site Access 2026 Stage 1 - 2 T lanes_60% North]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1104	13.0	0.703	3.0	LOS A	23.2	180.2	0.35	0.33	0.35	57.2
6	R2	39	27.0	0.385	77.5	LOS F	2.7	23.3	1.00	0.74	1.00	24.6
Approach		1143	13.4	0.703	5.5	LOS A	23.2	180.2	0.37	0.34	0.37	54.9
East: Site Access												
7	L2	17	25.0	0.010	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.5
9	R2	25	29.2	0.370	81.6	LOS F	1.8	15.9	1.00	0.72	1.00	23.8
Approach		42	27.5	0.370	51.3	LOS D	1.8	15.9	0.60	0.64	0.60	30.6
North: Mamre Rd North												
10	L2	59	26.8	0.041	6.4	LOS A	0.3	2.4	0.12	0.57	0.12	52.2
11	T1	1096	13.0	0.385	5.8	LOS A	12.2	94.6	0.36	0.33	0.36	54.8
Approach		1155	13.7	0.385	5.8	LOS A	12.2	94.6	0.35	0.34	0.35	54.7
All Vehicles		2340	13.8	0.703	6.5	LOS A	23.2	180.2	0.36	0.35	0.36	54.1

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.
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 SUMMARY

Site: 101 [[PM] Mamre Rd x Site Access 2026 Stage 1 - 2 T lanes_60% North]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1003	13.0	0.647	3.5	LOS A	20.7	160.9	0.36	0.34	0.36	56.7
6	R2	18	29.4	0.250	75.3	LOS F	1.2	10.3	1.00	0.70	1.00	25.0
Approach		1021	13.3	0.647	4.8	LOS A	20.7	160.9	0.38	0.35	0.38	55.6
East: Site Access												
7	L2	41	28.2	0.025	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	62	27.1	0.626	75.1	LOS F	4.1	35.8	1.00	0.80	1.09	25.0
Approach		103	27.6	0.626	47.6	LOS D	4.1	35.8	0.60	0.68	0.65	31.7
North: Mamre Rd North												
10	L2	26	28.0	0.018	6.3	LOS A	0.1	0.8	0.11	0.56	0.11	52.2
11	T1	1106	13.0	0.394	5.9	LOS A	12.0	93.2	0.38	0.34	0.38	54.7
Approach		1133	13.4	0.394	5.9	LOS A	12.0	93.2	0.37	0.35	0.37	54.7
All Vehicles		2257	14.0	0.647	7.3	LOS A	20.7	160.9	0.38	0.36	0.39	53.5

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.
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 SUMMARY

Site: 101 [[AM] Mamre Rd x Site Access 2026 AIE - 2 T lanes_60% North]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1104	13.0	0.827	5.2	LOS A	28.5	221.3	0.49	0.46	0.49	55.3
6	R2	169	27.3	0.518	52.1	LOS D	9.0	77.5	0.94	0.81	0.94	30.3
Approach		1274	14.9	0.827	11.5	LOS A	28.5	221.3	0.55	0.51	0.55	50.2
East: Site Access												
7	L2	73	27.5	0.044	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	109	27.9	0.818	72.5	LOS F	7.1	61.2	1.00	0.92	1.31	25.5
Approach		182	27.7	0.818	45.9	LOS D	7.1	61.2	0.60	0.76	0.78	32.2
North: Mamre Rd North												
10	L2	256	27.6	0.205	7.7	LOS A	2.7	23.2	0.25	0.62	0.25	51.0
11	T1	1096	13.0	0.526	17.6	LOS B	19.8	153.7	0.67	0.61	0.67	46.6
Approach		1352	15.7	0.526	15.7	LOS B	19.8	153.7	0.59	0.61	0.59	47.3
All Vehicles		2807	16.1	0.827	15.7	LOS B	28.5	221.3	0.58	0.57	0.59	47.2

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.
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 SUMMARY

Site: 101 [[PM] Mamre Rd x Site Access 2026 AIE - 2 T lanes_60% North]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1003	13.0	0.861	18.4	LOS B	44.5	346.3	0.79	0.76	0.82	46.1
6	R2	76	27.8	0.581	66.6	LOS E	4.6	39.4	1.00	0.79	1.03	26.8
Approach		1079	14.0	0.861	21.8	LOS B	44.5	346.3	0.80	0.76	0.83	44.0
East: Site Access												
7	L2	177	27.4	0.107	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	266	27.7	0.861	63.0	LOS E	16.7	144.4	0.98	0.95	1.24	27.4
Approach		443	27.6	0.861	40.2	LOS C	16.7	144.4	0.59	0.78	0.74	34.1
North: Mamre Rd North												
10	L2	115	27.5	0.087	6.7	LOS A	0.7	5.8	0.16	0.58	0.16	51.9
11	T1	1106	13.0	0.557	19.7	LOS B	21.2	165.0	0.72	0.64	0.72	45.3
Approach		1221	14.4	0.557	18.5	LOS B	21.2	165.0	0.66	0.64	0.66	45.8
All Vehicles		2743	16.4	0.861	23.3	LOS B	44.5	346.3	0.71	0.71	0.74	42.9

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.
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.

40% North (60% South) Distribution

MOVEMENT SUMMARY

Site: 101 [[AM] Mamre Rd x Site Access 2026 Stage 1 - 2 T lanes_60% South]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1104	13.0	0.709	2.8	LOS A	23.1	179.8	0.32	0.31	0.32	57.4
6	R2	59	26.8	0.401	77.4	LOS F	4.2	36.3	0.98	0.76	0.98	24.6
Approach		1163	13.7	0.709	6.6	LOS A	23.1	179.8	0.36	0.33	0.36	54.1
East: Site Access												
7	L2	25	29.2	0.015	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.3
9	R2	17	25.0	0.258	86.4	LOS F	1.3	10.9	1.00	0.70	1.00	23.0
Approach		42	27.5	0.258	38.1	LOS C	1.3	10.9	0.40	0.59	0.40	35.0
North: Mamre Rd North												
10	L2	39	27.0	0.027	6.5	LOS A	0.2	1.9	0.12	0.57	0.12	52.1
11	T1	1096	13.0	0.394	7.1	LOS A	14.0	108.8	0.39	0.35	0.39	53.7
Approach		1135	13.5	0.394	7.1	LOS A	14.0	108.8	0.38	0.36	0.38	53.7
All Vehicles		2340	13.8	0.709	7.4	LOS A	23.1	179.8	0.37	0.35	0.37	53.4

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.
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 SUMMARY

Site: 101 [[PM] Mamre Rd x Site Access 2026 Stage 1 - 2 T lanes_60% South]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1003	13.0	0.631	2.6	LOS A	18.6	144.5	0.30	0.29	0.30	57.5
6	R2	26	28.0	0.393	81.9	LOS F	1.9	16.4	1.00	0.72	1.00	23.8
Approach		1029	13.4	0.631	4.7	LOS A	18.6	144.5	0.32	0.30	0.32	55.7
East: Site Access												
7	L2	62	27.1	0.038	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	41	28.2	0.598	83.3	LOS F	3.0	26.2	1.00	0.77	1.09	23.5
Approach		103	27.6	0.598	36.7	LOS C	3.0	26.2	0.40	0.62	0.43	35.5
North: Mamre Rd North												
10	L2	18	29.4	0.012	6.3	LOS A	0.1	0.6	0.10	0.56	0.10	52.1
11	T1	1106	13.0	0.378	4.8	LOS A	11.2	87.2	0.33	0.30	0.33	55.6
Approach		1124	13.3	0.378	4.8	LOS A	11.2	87.2	0.33	0.30	0.33	55.6
All Vehicles		2257	14.0	0.631	6.2	LOS A	18.6	144.5	0.33	0.32	0.33	54.3

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.
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 SUMMARY

Site: 101 [[AM] Mamre Rd x Site Access 2026 AIE - 2 T lanes_60% South]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1104	13.0	0.852	4.1	LOS A	24.8	193.0	0.42	0.40	0.43	56.2
6	R2	256	27.6	0.593	46.9	LOS D	13.1	113.5	0.92	0.83	0.92	31.8
Approach		1360	15.7	0.852	12.2	LOS A	24.8	193.0	0.52	0.48	0.52	49.6
East: Site Access												
7	L2	109	27.9	0.067	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	73	27.5	0.774	73.5	LOS F	4.7	40.5	1.00	0.88	1.28	25.3
Approach		182	27.7	0.774	32.9	LOS C	4.7	40.5	0.40	0.66	0.51	37.0
North: Mamre Rd North												
10	L2	169	27.3	0.146	8.6	LOS A	2.2	18.6	0.28	0.62	0.28	50.3
11	T1	1096	13.0	0.569	21.1	LOS B	21.7	168.6	0.74	0.66	0.74	44.6
Approach		1265	14.9	0.569	19.4	LOS B	21.7	168.6	0.68	0.66	0.68	45.2
All Vehicles		2807	16.1	0.852	16.8	LOS B	24.8	193.0	0.58	0.57	0.59	46.6

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.
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 SUMMARY

Site: 101 [[PM] Mamre Rd x Site Access 2026 AIE - 2 T lanes_60% South]

Mamre Rd x Site Access
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Mamre Rd South												
5	T1	1003	13.0	0.783	8.0	LOS A	30.1	234.4	0.57	0.53	0.57	53.0
6	R2	115	27.5	0.516	59.0	LOS E	6.4	55.7	0.97	0.79	0.97	28.5
Approach		1118	14.5	0.783	13.2	LOS A	30.1	234.4	0.61	0.56	0.61	49.1
East: Site Access												
7	L2	266	27.7	0.162	5.9	LOS A	0.0	0.0	0.00	0.51	0.00	53.4
9	R2	177	27.4	0.775	64.7	LOS E	10.8	93.5	1.00	0.89	1.16	27.1
Approach		443	27.6	0.775	29.4	LOS C	10.8	93.5	0.40	0.66	0.46	38.6
North: Mamre Rd North												
10	L2	76	27.8	0.058	7.0	LOS A	0.6	4.8	0.18	0.59	0.18	51.6
11	T1	1106	13.0	0.524	17.0	LOS B	19.7	152.9	0.66	0.60	0.66	46.9
Approach		1182	14.0	0.524	16.3	LOS B	19.7	152.9	0.63	0.60	0.63	47.2
All Vehicles		2743	16.4	0.783	17.2	LOS B	30.1	234.4	0.59	0.59	0.60	46.3

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.
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.

Appendix B

Preliminary Construction Traffic Management Plan

Prepared for

MIRVAC PROJECTS PTY LTD

Preliminary Construction Traffic Management Plan

Lot 54 – 58 Mamre Road, Kemps Creek

Ref: 1029r03v1
30/07/2020

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Document Control

Project No: 1029

Project: Lot 54 – 58 Mamre Road, Kemps Creek

Client: Mirvac Projects Pty Ltd

File Reference: 1029r03v1 Draft CTMP_Mamre Road

Revision History

Revision	Date	Details	Author	Approved by
-	15/05/2020	Draft	V. Cheng	A. Reisch
I	29/05/2020	Final	V. Cheng A. Reisch	A. Reisch

Table of Contents

Appendices

1 Introduction

1.1 Overview

Ason Group has been engaged by Mirvac Projects (Mirvac) to prepare a Draft Construction Traffic Management Plan (CTMP) in regard to the future construction of the Aspect Industrial Estate (AIE) at Lots 54 – 58 Mamre Road, Kemps Creek (the Site).

This CTMP details the proposed construction management strategies which would provide for the safe and efficient completion of the proposed works while minimising construction traffic impacts on the surrounding road network and public road network users.

From the outset, it is noted that the this CTMP is designed to be updated over time as additional details in regard to the construction proposal are revised / finalised as is standard in any major construction project, noting that all such updates would be completed in consultation with Penrith City Council (Council) in whose Local Government Area (LGA) the Site lies; and / or with the relevant authorities such as Transport for NSW (TfNSW) where special road occupancy or the like are required.

Importantly, Ason Group has been responsible for the preparation of this CTMP, which has been prepared with reference to all available information in regard to the construction program, and all relevant CTMP preparation guidelines. The implementation of the recommendations and strategies detailed in this CTMP are the strict responsibility of Mirvac and / or Mirvac's designated construction Project Manager.

1.2 Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements (SEARs, dated 30 April 2020) have been received from the Department of Planning, Industry & Environment (DPIE); these include general SEARs provided by DPIE, as well as more detailed SEARs provided by TfNSW, a number of which speak directly to the scope of work required in this CTMP.

A summary of the TfNSW SEARs is provided in Table 1 below; where relevant, Ason Group has provided a summary response to each SEAR, and reference to the section of this CTMP providing a more detailed assessment of each SEAR.

Table 1: TfNSW Requirements Compliance Table

Reference	Requirement	Response
1.11	The preparation of a preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) to demonstrate the proposed management of the impact in relation to construction traffic addressing the following:	
1.11.1	assessment of cumulative impacts associated with other construction activities (if any);	This preliminary CTMP has considered the cumulative construction impacts of future development across the Mamre Road Precinct, including the Mamre Road Upgrade and key connections to the existing and future regional road network. This is discussed further in **Section 4.3.** Due to uncertainties in regard to the timing of development across the Mamre Road Precinct, the modelling of the Site access intersection includes background traffic growth to 2022, by which time it is expected that the construction task will be completed. It is noted that TfNSW has recently commenced a detailed traffic modelling assessment of the broader Mamre Road Precinct; the outcomes of this assessment will be instrumental to future revisions to this CTMP as required.
1.11.2	an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity;	An assessment of the existing crash data is provided in **Section 2.3**. An assessment of potential heavy vehicle impacts is provided in **Section 4.4**. As heavy vehicles will only utilise TfNSW Restricted Access Vehicle routes - routes which have little pedestrian activity – there is no expectation of any impacts on pedestrian safety.
1.11.3	details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process;	See **Section 3.1** and **3.2**.
1.11.4	details of anticipated peak hour and daily construction vehicle movements to and from the site;	See **Section 4.1**
1.11.5	details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle;	See **Section 3.3** and **4.6**.
1.11.6	details of temporary cycling and pedestrian access during construction	See **Section 3.3.3**.

2 The Site

2.1 Site Location

The Site is legally described as Lots 54 – 58 in DP 259135, Mamre Road Kemps Creek, and has an area of approximately 56.3 hectares (ha). The Site is located approximately 6.5km north-east of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 13.5km south-east of the Penrith CBD and 40km west of the Sydney CBD.

The Site in its sub-regional context is shown in **Figure 1**, as well as the broader Mamre Road Precinct as designated by DPIE.

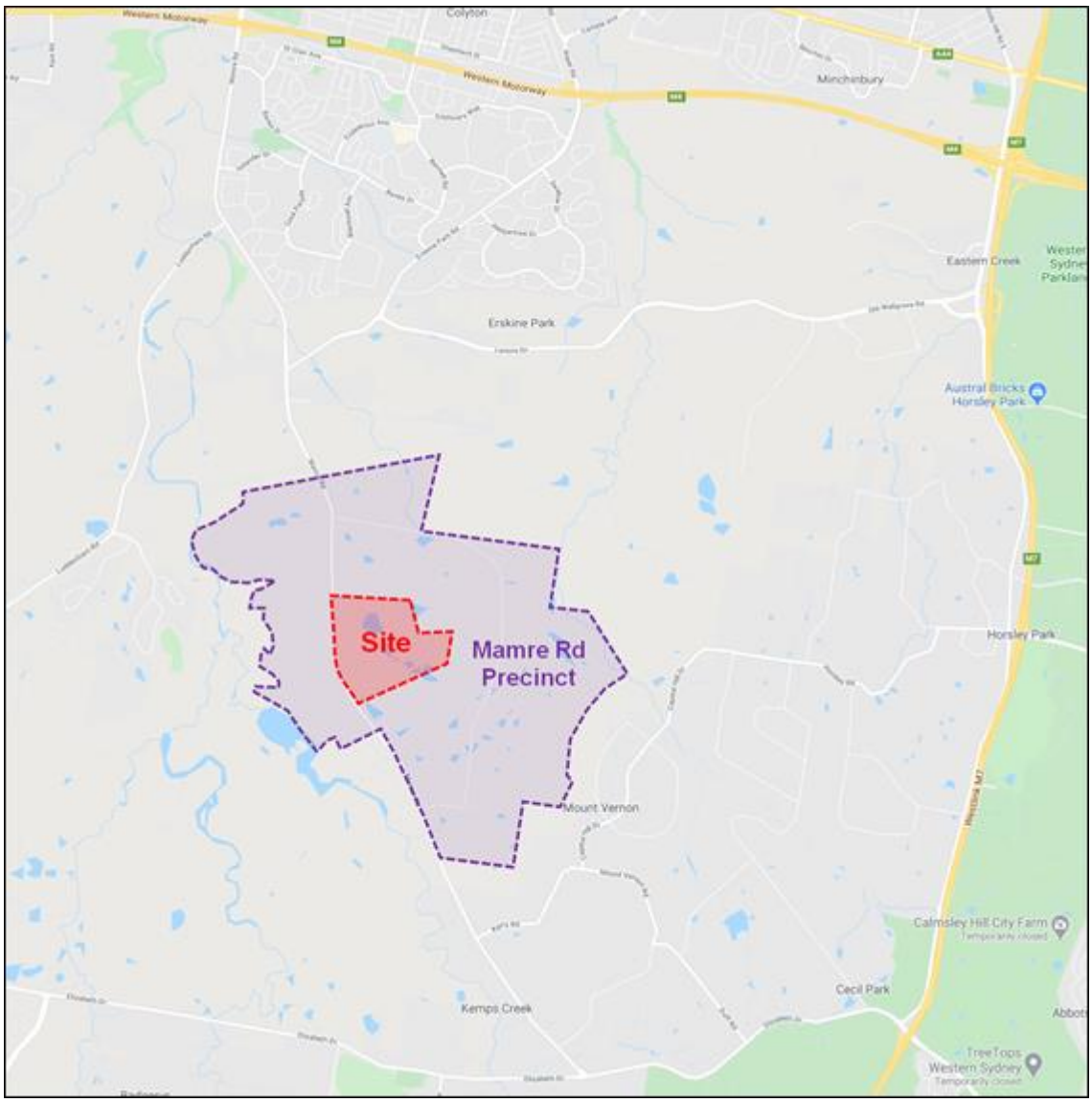


Figure 1: Site Location

2.2 Road Network

Key roads in the vicinity of the Site are shown in **Figure 1**, and include:

- **Westlink M7 Motorway:** M7 Motorway is a high capacity road link of state significance and was built to accommodate future traffic growth in the Western Sydney region. It provides a key north-south link between the M2 Motorway to the north and the M5 Motorway to the south as part of the Sydney orbital road network. A major interchange between the M7 Motorway and M4 Western Motorway is located approximately 3.5 km north of the Site, which connects the Sydney CBD and western Sydney suburbs. The M7 Motorway provides 4 lanes (2 lanes per direction, divided carriageway) and has a posted speed limit of 100 km/h
- **(Future) M12 Motorway**: A proposed 16km motorway generally running in an east-west between the existing M7 motorway and the Northern Road. It is expected to run in parallel with Elizabeth Drive and is to have 2 lanes in each direction separated by a central median. Construction is expected to commence in 2020.
- **Wallgrove Road:** Wallgrove Road is an arterial road that runs in a north-south direction to the east of the Site and parallel (to the west of) the M7, functioning as a service road. The 2-lane, two-way road provides a link between the Great Western Highway to the north and Elizabeth Drive to the south. As with the M7, Wallgrove Road connects to the M4 motorway approximately 2.5 kilometres to the north of the Site.
- **Elizabeth Drive:** An TfNSW classified main road (MR 535) that runs in an east-west direction to the south of the site. Elizabeth Drive in the vicinity of the site generally provides 2 lanes (1 lane per direction) and has a posted speed limit of 80km/h. This road forms the Site's southern frontage and provides a vital link between Westlink M7 Motorway and The Northern Road.
- **The Northern Road:** The Northern Road is TfNSW classified main road (MR 154) that runs in a north-south direction to the west of the site. The Northern Road section near the vicinity of the site generally provides 3 lanes (1 to 2 lanes per direction) and has a posted speed limit of 80km/h. Currently, The Northern Road is undergoing multiple stages of road upgrades by RMS, including a realignment of the road in the south. The road upgrades between The Old Northern Road, Narellan and Peter Brock Drive, Oran Park, has been completed.
- **Mamre Road:** Mamre Road is an arterial road servicing traffic between the Great Western Highway and M4 to the north and Elizabeth Drive to the south. In the vicinity of the Site, Mamre Road generally provides 2 lanes for two-way traffic, with additional through movement and turning infrastructure at key intersections to the north through the Erskine Park and Mamre West industrial precincts, and at Elizabeth Drive to the south. Mamre Road has a posted speed limit of 80km/h in the vicinity of the Site. TfNSW has confirmed road upgrades will be undertaken for Mamre Road between Elizabeth Drive and Luddenham Road.

Further to the above, it is clear that the Site is well located in regard to immediate access to the local and sub-regional road network, as shown in **Figure 2** with specific reference to TfNSW Restricted Access Vehicle (RAC) routes, which allow for up to 25m/26m B-Double combinations.

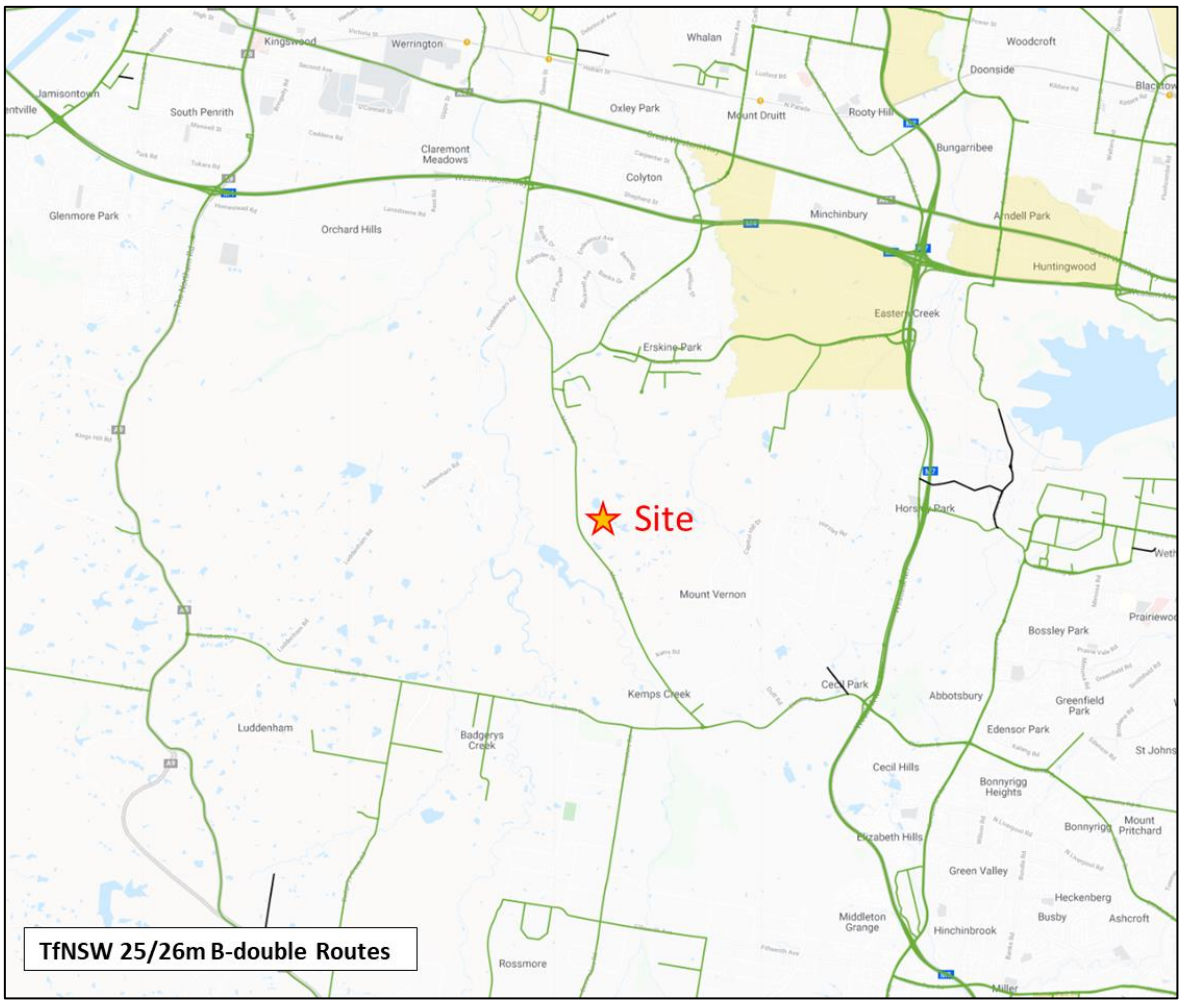


Figure 2: TfNSW Approved 25/26m B-Double Routes

2.3 Crash Data at Key Intersections

Mamre Road will be the key road to access the Site for heavy vehicles. As such, a crash history of the road and nearby key intersections of Mamre Road / Bakers Lane and Mamre Road / Abbotts Road have been reviewed using TfNSW Centre for Road Safety's crash statistics between 2014 – 2018. **Figure 3** below details all crashes identified by TfNSW, while

Table 2 details the severity of each of these crashes.

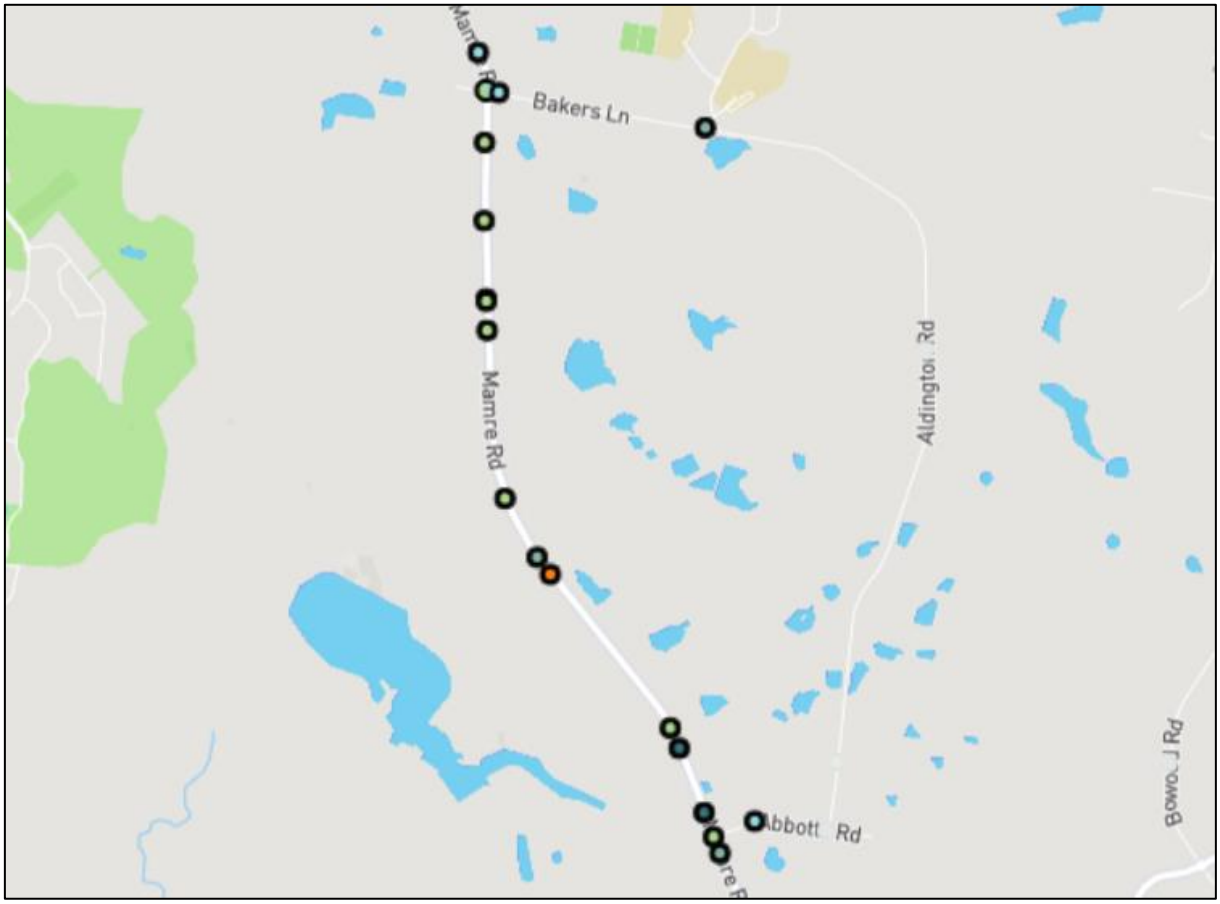


Figure 3: Crash History along Mamre Road

Table 2: Historical Crash Data

Year	Degree of Crash	RUM Code	RUM Description
Mamre Road / Bakers Lane			
2014	Minor/Other Injury	30	Rear end
2017	Non-casualty	19	Other adjacent
2017	Minor/Other Injury	39	Other same direction
Mamre Road			
2014	Minor/Other Injury	30	Rear end
2014	Non-casualty	71	Left off carriageway into object / parked vehicle
2014	Serious Injury	71	Left off carriageway into object / parked vehicle
2015	Moderate Injury	71	Left off carriageway into object / parked vehicle
2015	Non-casualty	83	Off carriageway right on right bend into object / parked vehicle
2016	Non-casualty	30	Rear end
2017	Non-casualty	39	Other same direction
2017	Non-casualty	32	Right rear
2017	Serious Injury	49	Other maneuvering
2017	Non-casualty	30	Rear end
2017	Fatal	20	Head on
Mamre Road / Abbotts Road			
2015	Moderate Injury	59	Other overtaking
2016	Non-Casualty	19	Other adjacent

As shown in **Table 2**, there has only been one fatality in the vicinity of the Site (2017) and no crashes are reported in the vicinity of the Site during 2018.

3 Overview of Construction Works

3.1 Staging and Duration of Works

Based on information provided to Ason Group by Mirvac, it is anticipated that construction works would commence in Start 2021 and be completed over a duration between 2-3 years, subject to authority approvals and inclement weather delays.

The following summarises key aspects of the construction stages:

- Demolition works are set to have a duration for 8-12 weeks commencing Start 2021.
- Excavation activities would continue for 12-18 months commencing Start 2021 finishing Mid-Late 2022.
- General Construction works are estimated to continue concurrently to excavation activities for 12-24 months commencing Mid-End 2021.

3.2 Construction Hours

The type of work being undertaken will remain consistent throughout the duration of construction and associated activities. All works will be undertaken within the following hours:

- Monday to Friday (other than Public Holidays): 7:00am – 6:00pm.
- Saturday: 8:00am – 1:00pm
- Sunday & Public Holidays: No works to be undertaken.

Any work to be undertaken outside of the standard construction hours will be required to obtain an Out of Hours (OOH) approval; any such works would necessarily be undertaken in accordance with the appropriate OOH protocols and approval processes.

3.3 Site Access

3.3.1 Construction Vehicle Access

All construction vehicles will enter and depart the Site from / to Mamre Road via a temporary access driveway, which be constructed on the alignment of the future Access Road 1.

It is anticipated that the largest vehicle accessing the Site would be a 19.6m Truck & Dog combination, which the temporary access driveway will be designed for. It is expected that two-way heavy vehicle flow would be enabled along Mamre Road. Regardless, construction management protocols will require that the vehicle entering site access road will have right of way in order to ensure that there is no queueing on Mamre Road.

It is anticipated that for the first stages of construction (at least), access to and from the Site onto Mamre Road will be restricted to left-in and left-out movements; this is discussed further in **Section 4**. The following **Figure 4** shows the indicative Site access location.

Further to this restriction, **Figure 5** details the likely key access strategy into the routes between the Site and the regional road network.

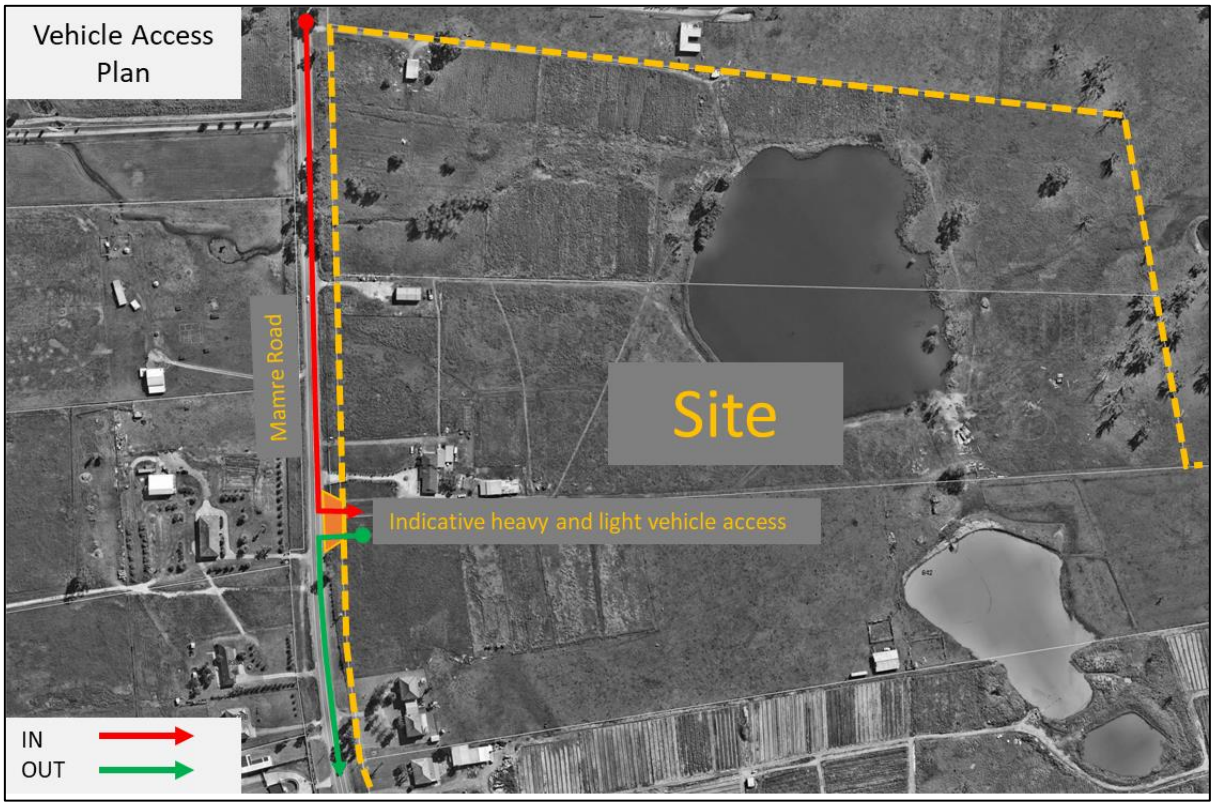


Figure 4: Indicative Vehicle Access Plan

3.3.2 Emergency Vehicle Access

Emergency vehicle access to and from the Site will be available at all times while the Site is occupied by construction workers; emergency protocols during the works will be developed by the Project Manager for inclusion within the final CTMP.

3.3.3 Pedestrian Access

There are currently no pedestrian amenities or footpaths along Mamre Road adjacent to the Site. However, the grassed verge on both sides of the road remains usable for any pedestrian that may wish to walk along Mamre Road.

Further to the above, while there is no expectation of pedestrians crossing the future construction access road (at Mamre Road), pedestrian safety will be managed through the provision of appropriate signage and pedestrian barriers. Construction personnel will also be able to access the Site by foot via a secure access gate along the temporary access road, though with all construction staff (and vehicle) parking to be provided within the Site there is again little potential for such pedestrian demand.

3.4 Construction Vehicle Access Routes

As discussed, all construction vehicles will enter and exit the Site via Mamre Road.

It is anticipated that all heavy vehicles will access Site via the approved RAV routes shown in **Figure 2**, though the following routes are expected to provide for the majority of construction vehicle trips:

- Arrival Trips:
  - Route 1: From M4 Western Motorway, southbound along Mamre Road and left into the Site.
  - Route 2: From Westlink M7, westbound on Old Wallgrove Road, Lenore Drive and Erskine Park Road, then south along Mamre Road and left into the Site.
- Departure Trips:
  - Route 1: From the Site, left onto Mamre Road then south to Elizabeth Drive and left to the M7 Motorway and sub-regional routes to the east.
  - Route 2: From the Site, left onto Mamre Road then south to Elizabeth Drive and right to Badgerys Creek and The Northern Road to the west.

These routes are shown in **Figure 5**.

A copy of the approved routes will be distributed by the Project Manager to all drivers as part of their induction process.

In the event that an oversized or over-mass vehicles is required to travel to and / or from the Site, a permit from Roads and Maritime Services and / or the National Heavy Vehicle Register (NHVR) will be required prior to arrival to the site. Notwithstanding, this CTMP relates to general construction which does not seek the use of oversize vehicles; a separate application would be submitted if such access is required.

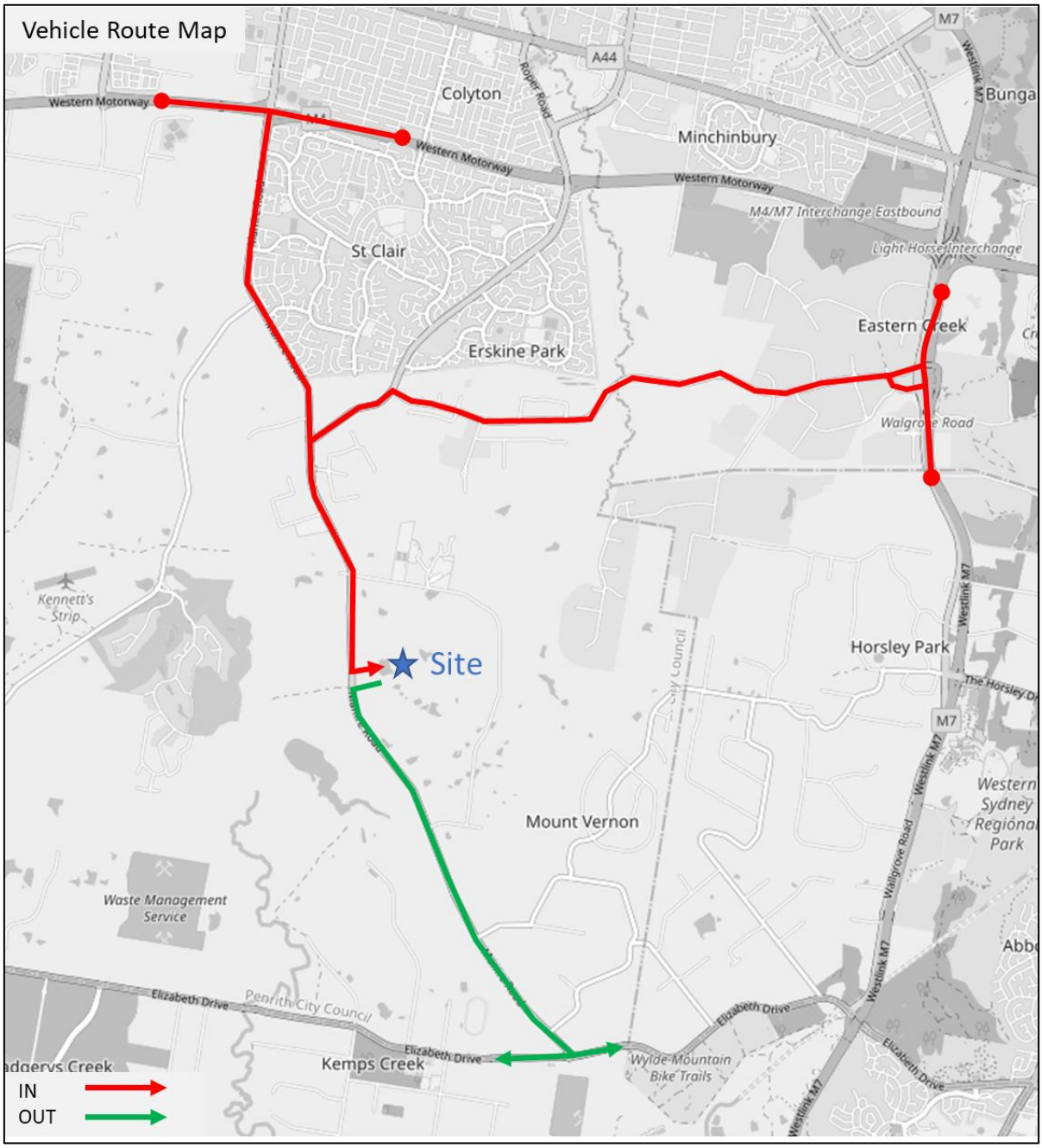


Figure 5: Construction Vehicle Routes

3.5 Fencing Requirements

Security fencing will be erected along the entire boundary of the Site and will be maintained for the duration of the construction works to ensure that unauthorised persons are kept out of the Site. The fencing will either be ATF or 2.4m chain wires.

Site access gates would be provided at the temporary driveway which would remain closed at all times outside of the permitted construction hours.

3.6 Materials Handling

All material loading will be undertaken wholly within the Site, and all construction equipment, materials and waste will similarly be strictly kept within the Site.

While not anticipated, should any materials handling (or other constructed related activity) be required from the public roadway (i.e. Mamre Road) then prior approval shall be sought and obtained from the appropriate authorities.

3.7 Additional Site Management

Although it is not expected, in the event that any Site construction traffic management outside of that described in this CTMP is required, the Project Manager will be required to notify adjacent properties of any temporary traffic restrictions (or the like) at least fourteen (14) days in advance.

3.8 Road Occupancy

The potential exists for future road occupancy requirements to facilitate the construction of the temporary driveway, and then any further upgrades to the intersection of Mamre Road. Road occupancy permits will necessarily be procured prior to starting intersection construction works, while a detailed intersection-specific CTMP would be prepared in consultation with Council and Roads & Maritime to ensure traffic along Mamre Road would continue to operate adequately during any such occupancy period.

3.9 CTMP – Monitoring & Review Process

This CTMP has been prepared referencing the existing Site conditions and information provided by Mirvac. Consultation with Council, Roads and Maritime and neighbouring developments will continue to be undertaken to ensure that the cumulative traffic impacts of construction within the area do not adversely impact the operations of the neighbouring developments or the local road network.

4 Assessment of Traffic & Transport Impacts

4.1 Construction Vehicle Traffic Generation

Table 3 provides a breakdown of potential vehicle movements throughout the proposed works (as provided by Mirvac):

Table 3: Movement Overview

Stage	Demolition	Excavation	General Construction
Worker Numbers (Maximum on-site at any one time)	50 - 100	50 – 200	50 – 400
Truck Frequency (Maximum movements per day)	100 (50 in / 50 out)	600 (300 in / 300 out)	600 (300 in / 300 out)
Peak Hour Heavy Vehicle Movements	50 (25 in / 25 out)	120 (60 in / 60 out)	120 (60 in / 60 out)
Largest Vehicle Size	Truck & Dog	Truck & Dog	Truck & Dog

4.1.1 Light Vehicle Movements

It is anticipated that a peak construction workforce of up to 400 workers on-site at any one time (based on the specific constructions tasks being undertaken). Light vehicle traffic generation would generally be associated with construction staff movements to and from the Site, including Project Managers, trade and general employees.

With respect to the potential impacts of light vehicle traffic, the overwhelming majority of trips would occur in the short workforce arrival and departure periods, being (based on the proposed construction hours) 6:30am – 7:00am and 6:00pm – 6:30pm respectively; as such, these movements would occur outside of the existing (commuter) peak periods in the local network.

4.1.2 Heavy Vehicle Movements

As indicated in **Table 3**, the construction works are estimated to generate a peak demand for up to 600 truck movements per day (300 vehicles arriving / 300 vehicles departing). To provide a conservative assessment of intersection operations, a peak hour truck generation of up to 120 movements (60 vehicles arriving / 60 vehicles departing) has been assigned; on average, it is expected there would be approximately 60 truck movements per hour (30 vehicles arriving / 30 vehicles departing).

For modelling purposes, it is expected that there will be a 50% / 50% arrival and departure profile in the AM peak, and 50% / 50% arrival and departure profile in the PM peak.

4.2 Mamre Road & Site Access Road Geometry

As discussed, all construction vehicles will use the temporary access road to Mamre Road for access to / from the Site, with movements restricted to left in / left out only. This access intersection will design such that arriving vehicles are able to immediate enter the Site so as to remove the potential for queuing back to Mamre Road.

4.3 Mamre Road & Site Access Road Operations

4.3.1 Future Intersection Volumes

For the assessment of the Mamre Road & Site Access Road operations, Mamre Road traffic volumes for a forecast year 2023 have been developed with reference to the Mamre Road Upgrade traffic assessments; these flows represent average annual growth of between 4% and 8% during the peak periods for northbound and southbound through movements.

As discussed previously, a peak of 120 truck trips per hour (60 arrivals and 60 departures) has then been assigned to provide a worst-case assessment. The resulting intersection volumes during the AM and PM peak hours are shown in **Figure 6**.

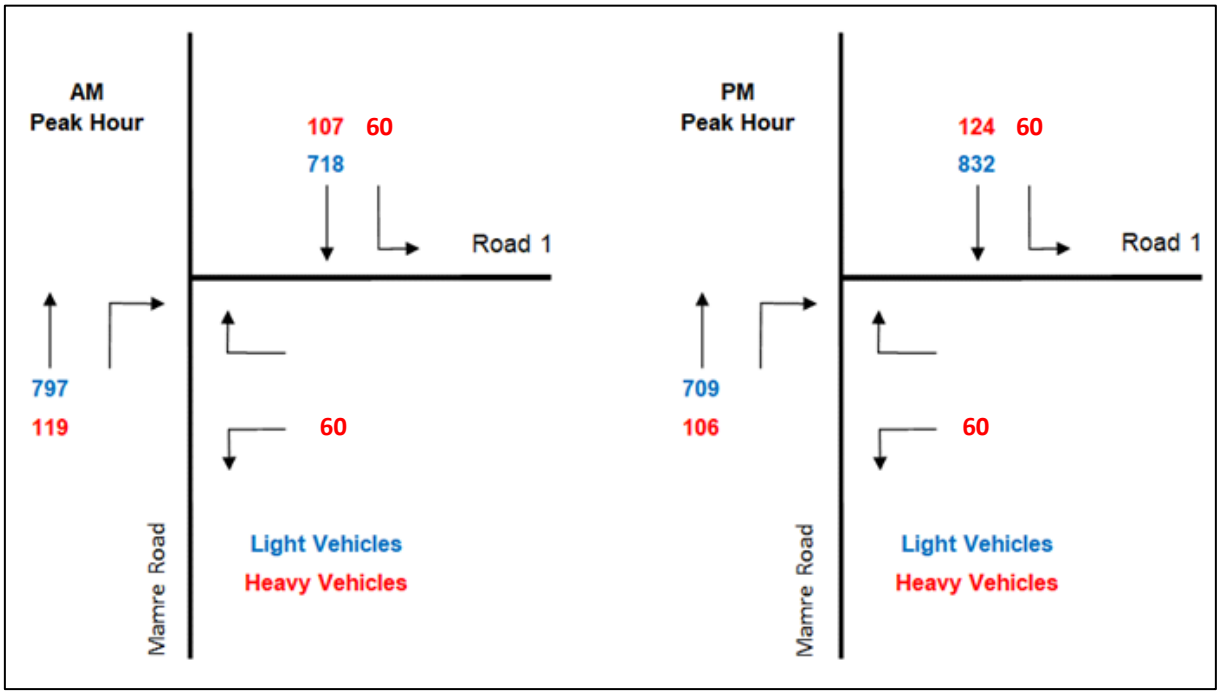


Figure 6: Future Site Intersection Flows

4.3.2 SIDRA Modelling

SIDRA intersection modelling has been undertaken to establish the existing performance of key intersections in the vicinity of the Site so as to provide an appropriate baseline against which the relative impacts of the works can be measured.

In this regard, SIDRA modelling outputs a range of performance measures relevant to this assessment, including:

- *Degree of Saturation (DOS)* – The DOS is used to measure the performance of intersections where a value of 1.0 represents an intersection at theoretical capacity. As the performance of an intersection approaches DOS of 1.0, queue lengths and delays increase rapidly. It is recommended that DOS to be less than 0.9, with satisfactory intersection operation generally achieved with a DOS below 0.8.
- *Average Vehicle Delay (AVD)* – The AVD (or average delay per vehicle in seconds) for intersections also provides a measure of the operational performance and 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. For priority (Give Way, Stop & Roundabout controlled) intersections, the AVD reported is that for the movement with the highest AVD.
- *Level of Service (LOS)* – This is a comparative measure that provides an indication of the operating performance, based on AVD.

Table 4 below provides a summary of the RMS LOS criteria.

Table 4: Level of Service Criteria for Intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and 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.

4.3.3 Future Intersection Operation

Further to the above, the results of the SIDRA analysis of future operations are summarised in **Table 5** below.

Table 5: Future Intersection Performance

Intersection	Control Type	Period	Intersection Delay	Level of Service
Mamre Road & Site Access Road	Priority (Left-in & Left-out)	AM	25.0	B
		PM	54.7	D

With reference to **Table 5,** the SIDRA analysis indicates that the peak construction trip generation of the Site can be accommodated at the Mamre Road access intersection. Important, the reported delays primarily relate to vehicles departing the Site, not to Mamre Road [southbound] through movements.

4.4 Future Road Safety

It is noted that there will be an increased number of heavy vehicles along Mamre Road during the construction period. However, the heavy vehicles will be travelling along approved RAV routes which would mitigate road safety impacts along local roads and heavily pedestrianised areas. Traffic control plans at the Site's access will be designed to minimise pedestrian and cyclists impacts along Mamre Road.

4.5 Vehicle Management – Principles

In accordance with TfNSW requirements, all vehicles transporting loose materials would have the entire load covered and/or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during travel to and from the Site.

Further to covering/securing the load to prevent deposits onto the roadway, a Shaker Grid is proposed and installed at the point of vehicle egress to minimise the risk of dirt tracking out onto Mamre Road. The responsibility of the driver to ensure that the Shaker Grid is driven over would be included as part of the Driver Code of conduct; this requirement, and indeed all driver requirements, will be detailed during an induction process for all drivers prior to commencing work at the Site, and will be further detailed in the Driver Code of Conduct, a copy of which included in **Appendix A**.

4.6 Construction Staff Parking

All construction staff and contractors will be required to park wholly within the Site, noting that there will be significant area available (at all times) to meet the peak parking demand.

5 Traffic Control

5.1 Traffic Control

The RMS guide “Traffic Control at Worksites” (TCAW) manual contains standard traffic control plans (TCPs) for a range or work activities. The manual’s objective is to maximise safety by ensuring traffic control at worksites complies with best practice.

The RMS TCAW outlines the requirements for a Vehicle Movement Plan (VMP) for construction works such as proposed; a VMP is a diagram showing the preferred travel paths for vehicles associated with a work site entering, leaving or crossing the through traffic stream. A VMP should also show travel paths for trucks at key points on routes remote from the work site such as places to turn around, accesses, ramps and side roads.

Regarding construction work on roads with an average daily total (ADT) in excess of 1,500 vehicles, approach speeds of between 60 km/hr and 80 km/hr, with truck movements > 20 veh/shift, and sight distance is less than 2d, (where d equals the posted speed limit and in this instance the sight distance is required to be up to 120 metres), it would be expected for the following to be required by the RMS TCAW:

- A detailed Traffic Control Plan (TCP) with Traffic controllers
- A VMP.
- Warning Signs required during shifts.

With regard to the proposed temporary access road, a site-specific version of TCP 195 (as shown in **Appendix B**) would be implemented for the duration of the works.

5.2 Authorised Traffic Controller

An authorised Traffic Controller(s) is to be present on-site throughout the proposed works. Responsibilities of the Traffic Controller will include:

- The supervision of all construction vehicle movements into and out of site at all times,
- The supervision of all loading and unloading of construction materials during the deliveries in the construction phase of the project, and
- Pedestrian management, to ensure that adverse conflicts between vehicle movements and pedestrians do not occur, while maintaining radio communication with construction vehicles at all times.

6 Monitoring and Communication Strategies

6.1 Development of Monitoring Program

The development of a program to monitor the effectiveness of this CTMP shall be established by the Project Manager and should consider scheduled reviews as well as additional reviews should construction characteristics be substantially changed (from those outlined in the Final CTMP). All and any reviews of the CTMP should be documented, with key considerations expected to include:

- Tracking heavy vehicle movements against the estimated heavy vehicle flows during the Stage 1 works.
- The identification of any shortfalls in the CTMP, and the development of revised strategies / action plans to address such issues.
- Ensuring that all TCPs are updated (if necessary) by "Prepare a Work Zone Traffic Management Plan" card holders to ensure they remain consistent with the set-up on-site.
- Regular checks to ensure all loads are departing the Site covered as outlined within this CTMP.

6.2 Communications Strategy

A Communications Strategy shall be established by the Project Manager for implementation throughout the construction works; this strategy will outline the most effective communication methods to ensure adequate information within the community and assist the Project Team to ensure the construction works have minimal disruption on the road network. The Communications Strategy will include:

- The erection of appropriate signage providing advanced notice of works and any traffic control measures to be implemented.
- Written notices to surrounding landowners (and tenants) likely to be directly affected by the works, prior to commencement.

Ongoing communication is also required so that all stakeholders are kept up to date of works and potential impacts.

7 Summary

This CTMP has been prepared to ensure appropriate traffic management is undertaken during the proposed industrial development.

Ultimately, this CTMP report has been prepared with regard to the management principles outlined in the RMS Traffic Control at Worksites Manual (2018) and AS1742.3, and per the detailed strategies outlined in the CTMP is recommended for adoption at the Site.

In summary though – and further to a determination that the proposal's construction traffic will not impact the local road network - the following measures are recommended to minimise the potential traffic impacts associated with the proposal:

- Traffic control would be required to manage and regulate construction vehicle traffic movements to and from the Site during construction.
- All vehicles transporting loose materials will have the load covered and/or secured to prevent any items depositing onto the roadway during travel to and from the Site.
- All vehicles are to enter and depart the Site in a forward direction, with reverse movements to occur only within the Site boundary.
- All contractor parking is to be contained wholly within the Site, and.
- Pedestrian and cyclist traffic along the Site frontage will be managed appropriately at all times.

In summary, the CTMP report is proposed in accordance with the RMS TCAW.

Appendix A

Driver Code of Conduct

- Driver Code of Conduct -

Drivers Code of Conduct

Safe Driving Policy for the Lots 54 – 58 Mamre Road, Kemps Creek

Objectives of the Drivers Code of conduct

- To minimise the impact of earthworks and construction on the local and regional road network;
- Minimise conflict with other road users;
- Minimise road traffic noise; and
- Ensure truck drivers use specified routes

Code of Conduct

All vehicle operators accessing the site must:

- Take reasonable care for his or her own personal health and safety.
- Not adversely, by way of actions or otherwise, impact on the health and safety of other persons.
- Notify their employer if they are not fit for duty prior to commencing their shift.
- Obey all applicable road rules and laws at all times.
- In the event an emergency vehicle behind your vehicle, pull over and allow the emergency vehicle to pass immediately.
- Obey the applicable driving hours in accordance with legislation and take all reasonable steps to manage their fatigue and not drive with high levels of drowsiness.
- Obey all on-site signposted speed limits and comply with directions of traffic control supervisors in relation to movements in and around temporary or fixed work areas.
- Ensure all loads are safely restrained, as necessary.
- Drive over cattle grids – located at the Site's access – to vibrate off any loose material attached to construction vehicles.
- Operate their vehicles in a safe and professional manner, with consideration for all other road users.
- Hold a current Australian State or Territory issued driver's licence.
- Notify their employer or operator immediately should the status or conditions of their driver's license change in any way.

- Comply with other applicable workplace policies, including a zero tolerance of driving while under the influence of alcohol and/or illicit drugs.
- Not use mobile phones when driving a vehicle or operating equipment. If the use of a mobile device is required, the driver shall pull over in a safe and legal location prior to the use of any mobile device.
- Advise management of any situations in which you know, or think may, present a threat to workplace health and safety.
- Drive according to prevailing conditions (such as during inclement weather) and reduce speed, if necessary.
- Have necessary identification documentation at hand and ready to present to security staff on entry and departure from the site, as necessary, to avoid unnecessary delays to other vehicles.

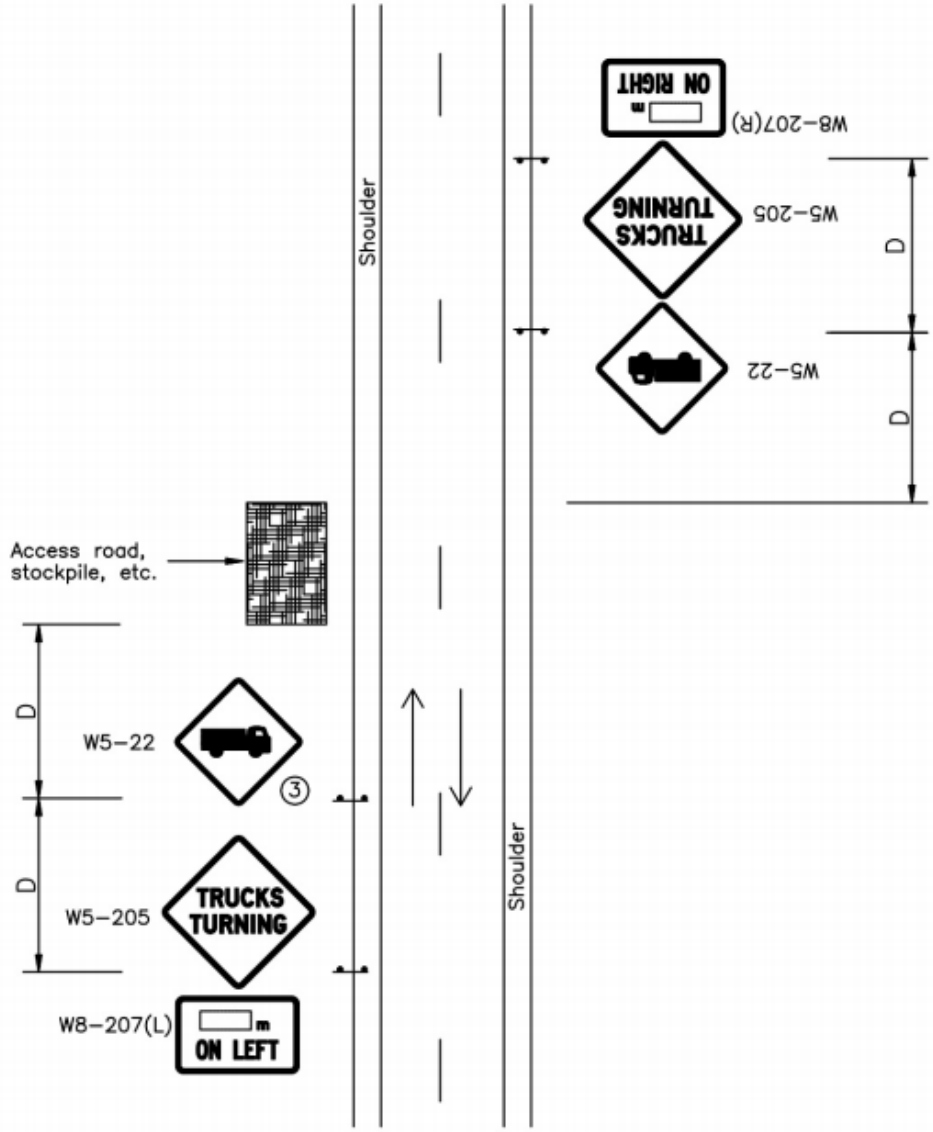
Crash or incident Procedure

- Stop your vehicle as close to it as possible to the scene, making sure you are not hindering traffic. Ensure your own safety first, then help any injured people and seek assistance immediately if required.
- Ensure the following information is noted:
  - Details of the other vehicles and registration numbers
  - Names and addresses of the other vehicle drivers
  - Names and addresses of witnesses
  - Insurers details
- Give the following information to the involved parties:
  - Name, address and company details
- If the damaged vehicle is not occupied, provide a note with your contact details for the owner to contact the company.
- Ensure that the police are contacted should the following circumstances occur:
  - If there is a disagreement over the cause of the crash.
  - If there are injuries.
  - If you damage property other than your own.
- As soon as reasonably practical, report all details gathered to your manager.

Appendix B

Traffic Control Plan(s)

TCP 195



NOTE:

① For use where roadside is generally undeveloped, ADT is more than 1,500 vehicles per day, sight distance is restricted and there are more than 20 truck movements per shift.

② See ***Traffic control at work sites,*** Section 7.7, ***Signs for depots, stockpiles, quarries, gravel pits etc.***

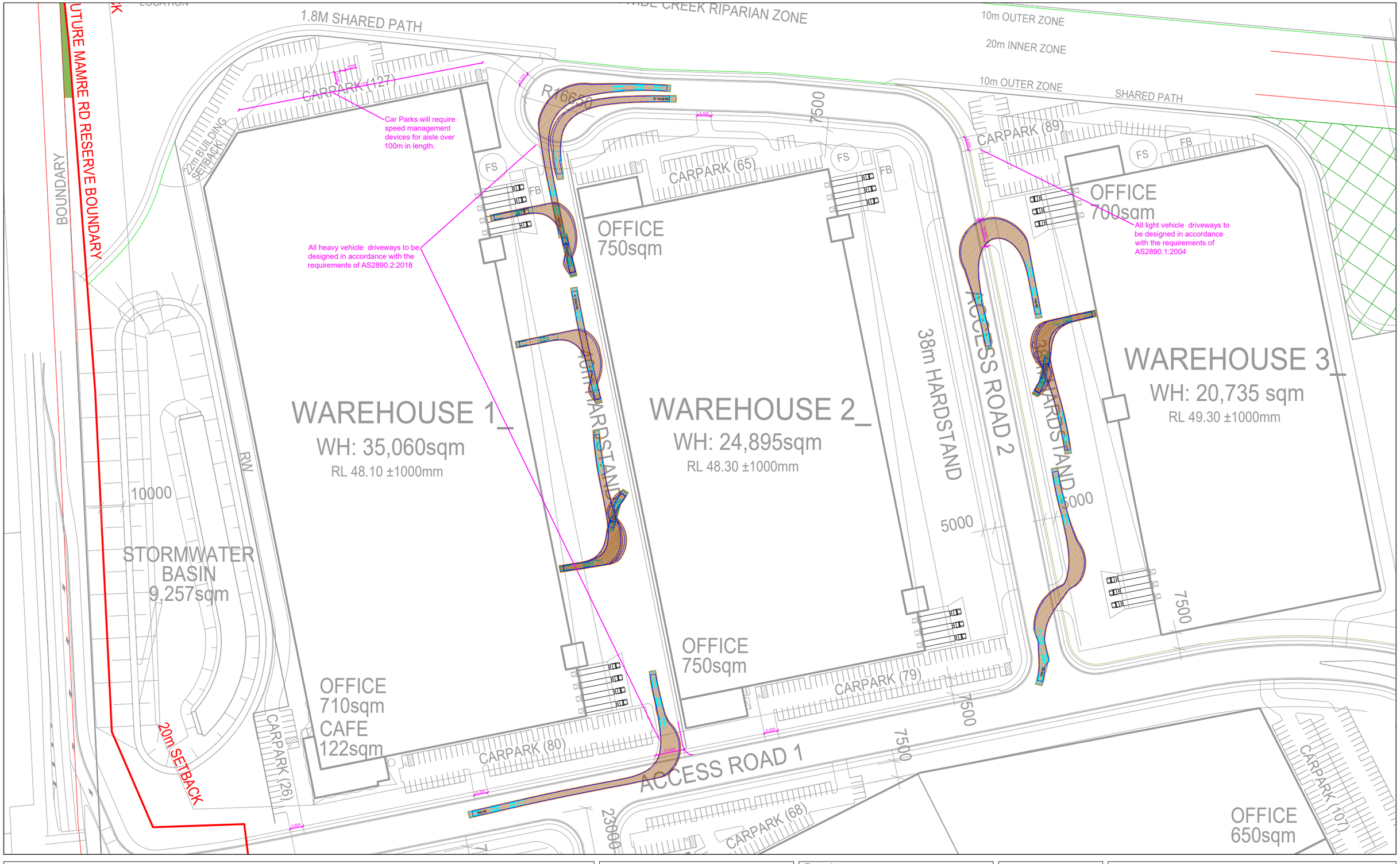
③ For short term works use T2–25.

ACCESS TO DEPOT, STOCKPILE, QUARRY, GRAVEL PIT ETC.
ALL ROADS
LONG TERM USE

T000195

Appendix C

Swept Path Analysis



Revision notes:

Rev:	Date:	Notes:

For information purposes only - not for construction

Drawn By: RBM	Project: 1029 Aspect Industrial Estate
Client: Mirvac	Drawing Title: Stage 1 Swept Path Analysis
Date: 09/10/2020	Scale @ A3: n/a
Drawing Number: 01	

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