asongroup

Prepared for

GOODMAN PROPERTY SERVICES (AUST) PTY LTD

Traffic Impact Assessment Report

Sigma Facility
Lot 3A, Oakdale South Industrial Estate, Horsley Park

Ref: 0240r01v2
31/08/2016

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1 Introduction

1.1 Study Objectives

Ason Group has been commissioned by Goodman Property Services Pty Ltd to prepare a Traffic Impact Assessment (**TIA**) report to support a Development Application for a proposed industrial development (the **Proposal**) on the subject site at Lot 3A, Oakdale South Industrial Estate, Horsley Park (the **Site**). The Proposal generally seeks approval for the following:

- A single story warehouse of approximately 40,090m² Gross Floor Area (**GFA**) to be occupied as a warehouse and distribution centre;
- Approximately 1,242m² GFA of ancillary office space over two floors;
- Approximately 230m^2 GFA of dock office space on one level;
- Supporting infrastructure and vehicle circulation areas; and
- A car park providing a total of 200 car parking spaces.

This TIA report addresses the relevant traffic, transport and parking implications of the development, including compliance with relevant State and Local Government controls and Australian Standards. In preparing this TIA report, Ason Group has referenced the following key planning documents that are relevant to development at the site:

- Penrith Development Control Plan 2014 (**PDCP2014**).
- State Environmental Planning Policy (Western Sydney Employment Area) 2009 (**SEPP WSEA**).
- Eastern Creek Precinct – *Employment Lands Precinct Plan* 2005 (**Eastern Creek Precinct Plan**)

This TIA report also references general access, traffic and parking guidelines, including:

- RMS Technical Direction TDT 2013/04a, *Guide to Traffic Generating Developments – Updated traffic surveys* (**RMS Guide Update**).
- Australian Standard 2890.1 (2004): *Off-street car parking* (**AS2890.1**).
- Australian Standard 2890.2 (2002): *Off-street commercial vehicle facilities* (**AS2890.2**).
- Australian Standard 2890.6 (2009): Off-street parking for people with disabilities (AS2890.6).

1.2 Planning Context

The application has been lodged having regard to the approved Oakdale South Estate (**OSE**) Masterplan Development (SSDA 6917) and the subsequent Section 96 Application currently being

considered by the Department of Planning and Environment (**DP&E**). The approved Masterplan and subsequent Section 96 sets out the development principles including estate infrastructure, warehouse / industrial floor space, car parking provision and the future access principles to the regional road network. The concept Masterplan as proposed to be modified is provided in **Figure 1** and generally includes:

Modifications to Master Plan

- Realignment of internal Estate Roads to facilitate access to new super lots;
- Alterations to the layout of Precincts 3, 4 & 5 resulting in the reduction in total GFA from 401,607m^2 to 335,832m^2

Modifications to Stage 1 DA

- Amendments to reflect the changes made to the Master Plan
- Amend the subdivision layout to reflect changes to the Master Plan
- Changes to the Estate Road works to reflect the amended road alignment including the deletion of Estate Road 5.

Reference should be made to the Environmental Impact Statement (EIS) which provides further clarification on the planning framework and approvals for the OSE.

1.3 Report Structure

The remainder of this report is structured as follows:

- Section 2 provides a summary of the proposed development.
- Section 3 describes the site, existing road network and accessibility to alternative transport modes.
- Section 4 describes the traffic impacts of the proposed development including projected trip generation and forecasted network performance.
- Section 5 describes the parking requirements of the proposed development.
- Section 6 outlines the sustainable travel plan that should be adopted by the future tenant.
- Section 7 describes the access, internal configuration of the proposed car parking and servicing facilities of the development.
- Section 8 responds the SEARS.
- Section 9 provides a conclusion of the key traffic and parking impacts.

Figure 1: Master Plan Layout

2 Overview of Proposed Development

The development for which approval is now sought is detailed in the EIS prepared by Urbis. The Proposal generally seeks approval for the construction of a warehouse and distribution facility for Sigma with the following characteristics:

- A single story warehouse of approximately 40,090m² GFA;
- 1,242m² GFA of ancillary office space over two levels;
- 230m² GFA of ancillary dock office space over one level;
- A car park providing a total of 200 car parking spaces including accessible parking.

Figure 2 below presents a plan illustrating the proposed development showing the general layout of the warehouse and associated traffic circulation, loading, and parking areas. This plan, prepared by SBA Architects, is also attached at reduced scale at **Appendix A**.

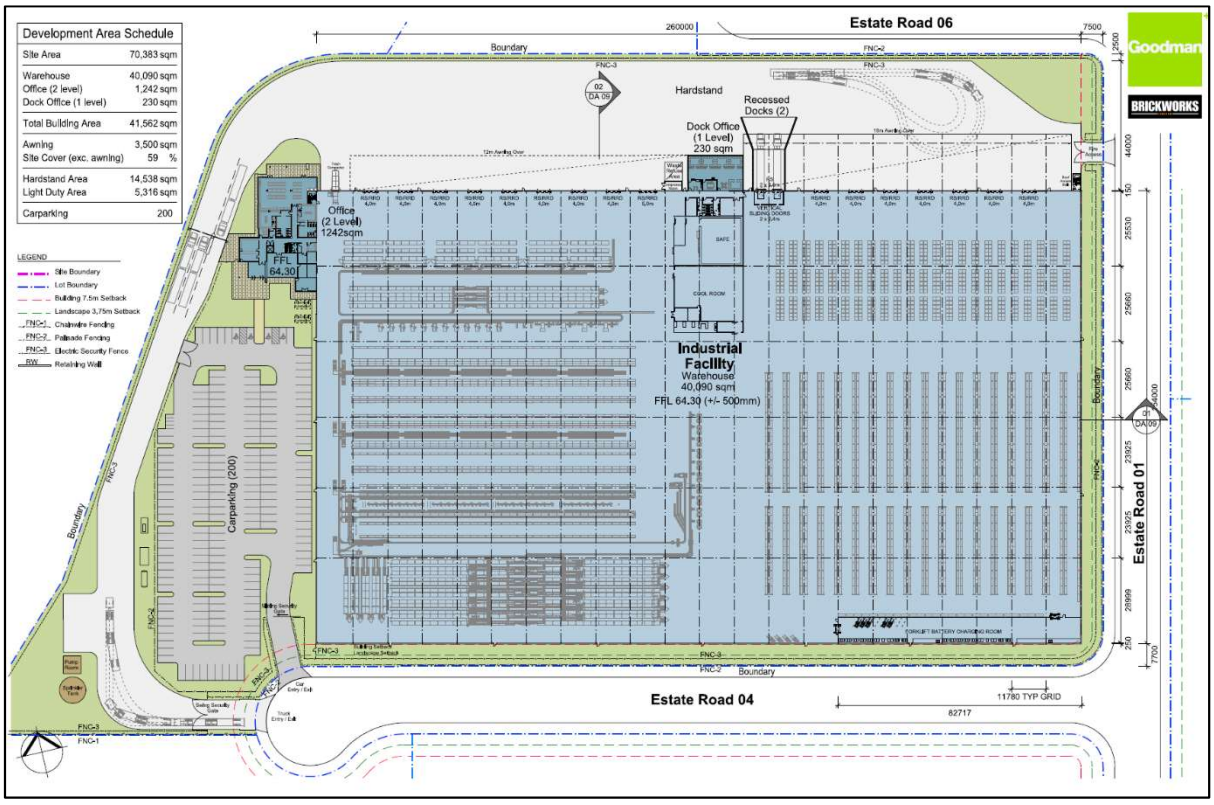

Figure 2: Proposed Development

3 Existing Conditions

3.1 Site Overview

The Oakdale Industrial Estate (the **Estate**) comprises some 421 hectares of industrial/employment-zoned land within the broader WSEA, and sits to the immediate south of the Sydney Water Pipeline (previously referenced as Lands South of Sydney Water Pipeline). The Estate is irregular in its configuration and is bisected by Ropes Creek and some smaller tributaries. Oakdale South is located within the overall Estate and adjoins other Oakdale Precincts to the west and north (Oakdale West and Oakdale Central, respectively). OSE and the broader Oakdale Estate in its local and regional context are shown in **Figure 3** and **Figure 4**.

Oakdale South currently forms the southern extent of the WSEA, with lands further south being rural and rural-residential in character. It is noted however that the current *Draft Structure Plan* for the WSEA proposes the inclusion of lands to the south of OSE at Kemps Creek in an expansion of the WSEA. Once implemented, it is anticipated that a future formal *Structure Plan* for an expanded 'Broader Western Sydney Employment Area' (**BWSEA**) would provide for changes in the land use zoning and character of these additional lands to an industrial/employment focus consistent with that of the existing WSEA.

Figure 3: Oakdale South Location, Local Context

Source: Urban Advisory Services

Figure 4: Oakdale Location, Sub-Regional Context

Source: Urban Advisory Services

At a regional level, the Site is located approximately 3 kilometres south of the nearest suburban area, Erskine Park, 18 kilometres west of Parramatta, and 37 kilometres west of the Sydney CBD. It is within the Local Government Area (**LGA**) of Penrith City Council, however is also subject to controls of the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (SEPP WSEA).

Lot 3A is located on the western side of the proposed Estate Road 1 and comprises a total site area of 70,383m^2. The site is generally rectangular in configuration with an eastern and western boundary of approximately 200m and a northern and southern boundary of approximately 300m.

3.2 Road Network

The existing/proposed road hierarchy in the vicinity of Oakdale South is shown in **Figure 5** and key roads and intersections providing access for Oakdale South are detailed below. From the outset, it is important to note that the SSDA will not rely on local connections to the south or west nor on a connection to the proposed Southern Link Road. All access will be provided via the Estate Road (formerly Milner Avenue) to Old Wallgrove Road (OWR) and thence via either OWR or the proposed North-South 'Red' Link Road to the north or via OWR to the south.

3.2.1 M7 Motorway

The M7 is a major arterial road a key orbital route around inner metropolitan Sydney and provides key linkages to the broader sub-regional and regional road network including key interchanges with the M4 and M5 motorways to the north and south respectively.

3.2.2 Erskine Park Link Road / Lenore Drive

Erskine Park Link Road (or Lenore Drive) is a newly constructed road (MR 629) that generally runs in an east west connection between Erskine Park Road in the west and continues into Old Wallgrove Road in the east.

3.2.3 Wallgrove Road

Wallgrove Road is a classified road (MR 515) that runs in a north-south direction (parallel to the M7) to the east of the Site. Wallgrove road carries approximately 25,000 vehicles per day and generally provides an alternate north – south route to the M7 Motorway.

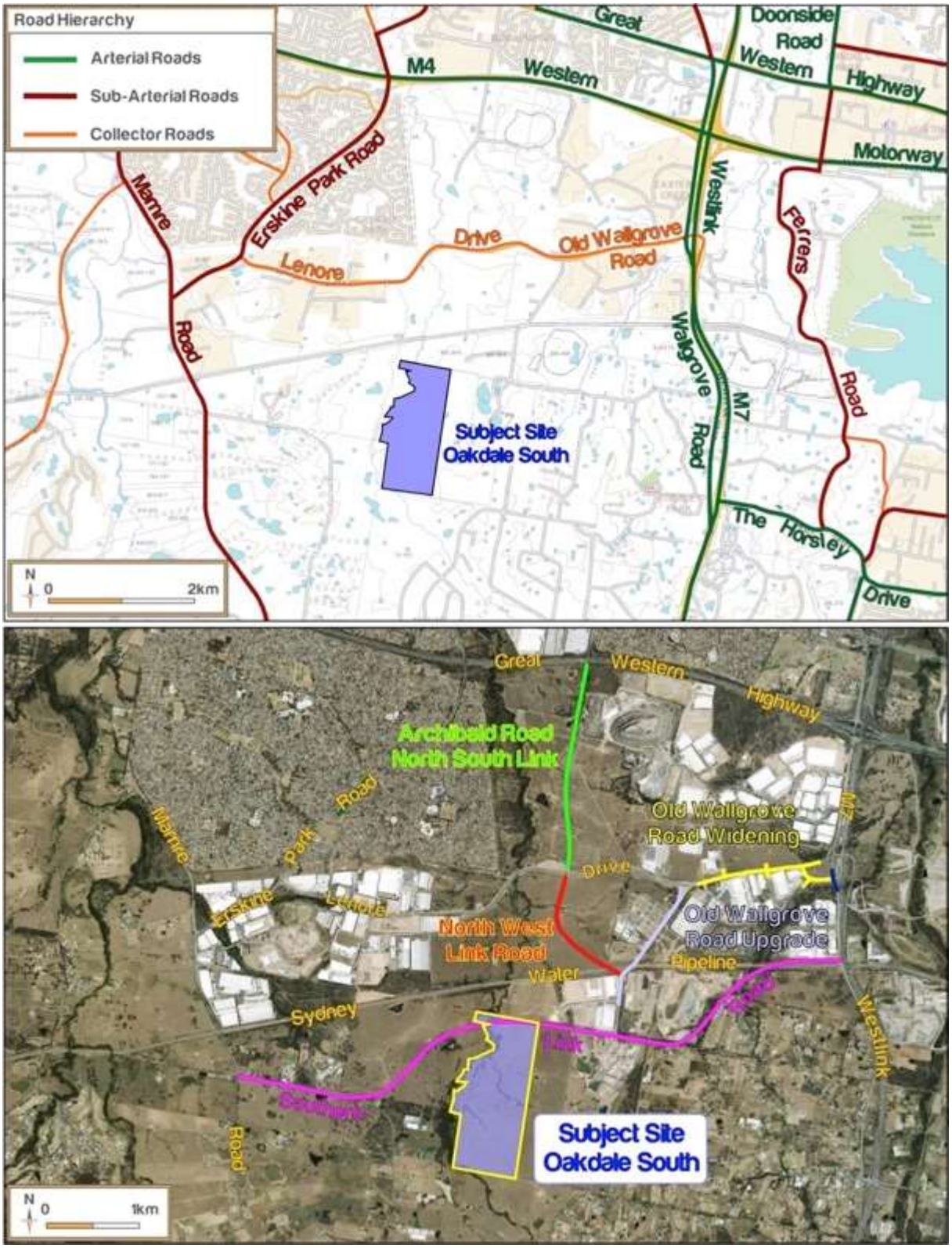

Figure 5: Road Hierarchy

3.2.4 Old Wallgrove Road

Old Wallgrove Road (OWR) generally runs from a south – east alignment and forms both a RMS Marin Road (MR 629) that generally forms an extension of the Erskine Park Link Road to the east and a local road (providing a collector road function) to the south. OWR is currently being upgraded, with the works due to be completed in November 2016. The upgrades include the following:

- Widening of OWR to two lanes in each direction between Roberts Road and Southridge Street with a central median to allow for three lanes in the future
- Widening of OWR to three lanes in each direction between Southridge Street and the M7 Motorway and Wallgrove Road interchanges
- Construction of a 400 metre link road with two lanes in each direction from Quarry Road to connect to Wallgrove Road and the northbound on and off ramps to the M7
- Provision of bus stops near each intersection on Old Wallgrove Road and installing traffic lights that give priority to buses

3.2.5 Lenore Drive

Lenore Drive is a recently upgraded sub-arterial route providing an east-west connection linking OWR to the east and Mamre Road to the west.

3.2.6 Milner Avenue

Milner Avenue connects west from OWR through Oakdale Central, at this time to a roundabout which is currently under construction at the southwest corner of Oakdale Central. Further to the SSDA, Milner Avenue will be extended to the south to provide all vehicle access to Oakdale South.

3.2.7 North-South 'Red' & Archbold Road Links

The RMS has recently commissioned detailed design assessments for a new north-south link road – known as the Red Link Road – between OWR (north of Estate Road) and the M4 Motorway. The potential exists for the future red link road to then connect to a further north-south extension of Archbold Road south from the M4.

3.2.8 Southern Link Road Network

The Southern Link Road (**SLR**) is a proposed east-west link generally running parallel to the Erskine Park Link Road (**EPLR**). The SLR will provide additional road infrastructure required to accommodate travel demand generated by employment areas within the South of Warragamba Pipeline area. The

indicative route alignment for the proposed road network was initially identified in the SEPP (WSEA) 2009 and has since been refined to the current alignment as shown in **Figure 6**.

The SLR network planning and development process is ongoing and is therefore potentially subject to change due to further refinement of the route alignment and access arrangements. It is expected however that a review of the staging options and the development of the concept design plans will be undertaken within the next 5 years. Whilst no completion date for the SLR has been made available at this time, it is generally expected that the road would be delivered by 2026.

The most recent assessment of the preferred route options and alignment was completed by Aecom in 2014 and detailed in the *Southern Link Road Network Strategic Transport Assessment Report* (the **Aecom Report**), which made the following key findings / recommendations:

- The SLR will form a future connection with an upgraded Mamre Road in the west. Traffic generated by the WSEA would use Mamre Road to connect to the wider road network to and from the north and south.
- No direct connection between the M7 and the SLR is proposed. All eastern access to the SLR will be via an upgraded Wallgrove Road Interchange.
- Access to Old Wallgrove Road is considered beneficial and that this should be extended to join with the Archbold Road extension, and
- All future intersections are to operate at an acceptable level of service ("D" or better) under the 2036 design year assuming full development of the WSEA.

Land reservations have been made in the OSE master plan for the future SLR. The SLR would provide a regional connection generally similar to that currently provided via the EPLR. It is noted that no direct access between Oakdale South and the SLR is proposed. Access to the SLR from the OSE would be provided from a new connection with the CSR Industrial Estate to the east OR via the Oakdale West Precinct to the west of the OSE as depicted in **Figure 6**.

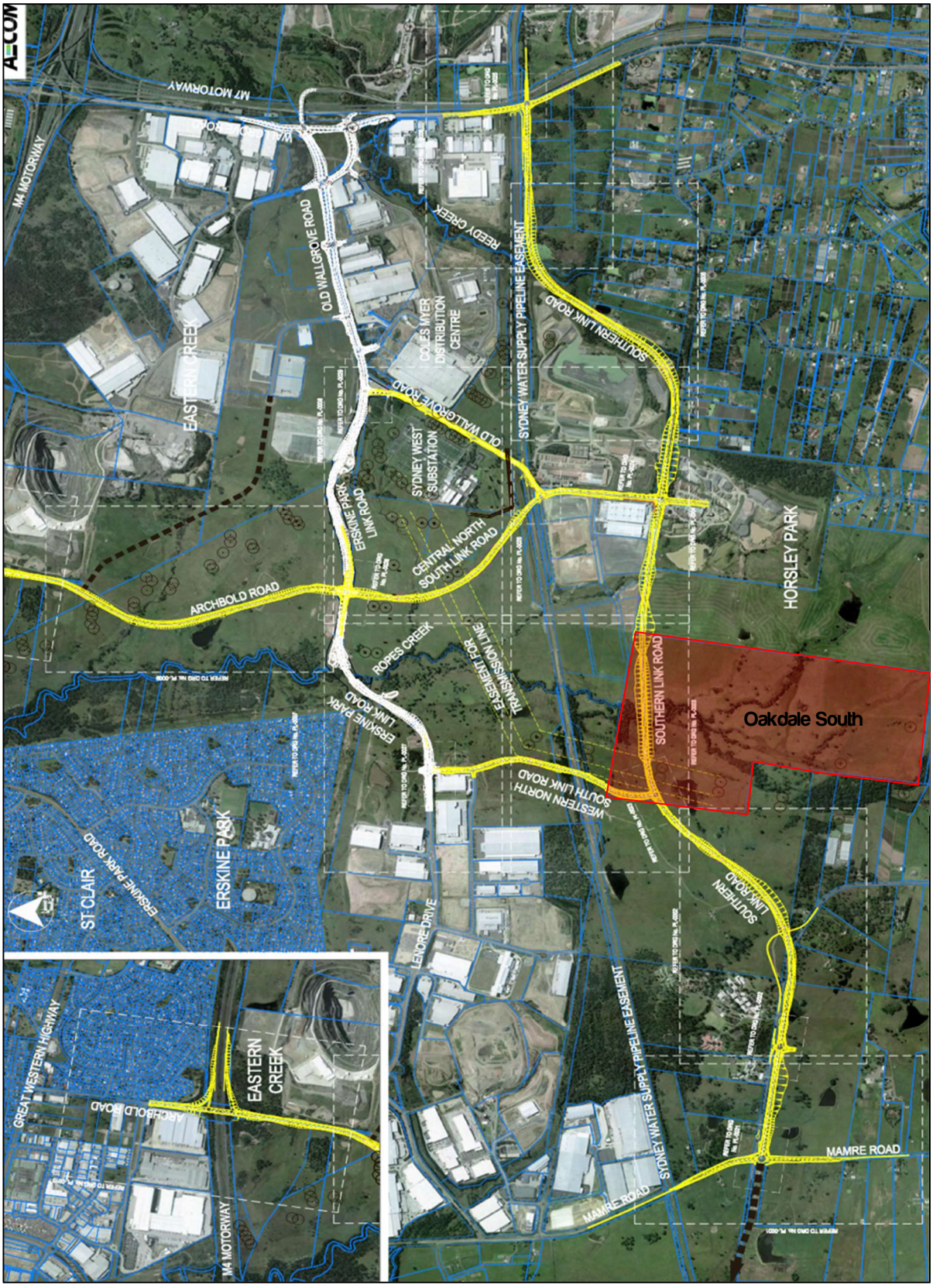

Figure 6: Proposed Southern Link Road Network and Alignment

Source: Western Sydney Employment Area – Southern Link Road Network Strategic Transport Assessment, AECOM, 2011

The concept SLR alignment (as proposed under the Aecom Report) has been revised as shown in **Figure 7**.

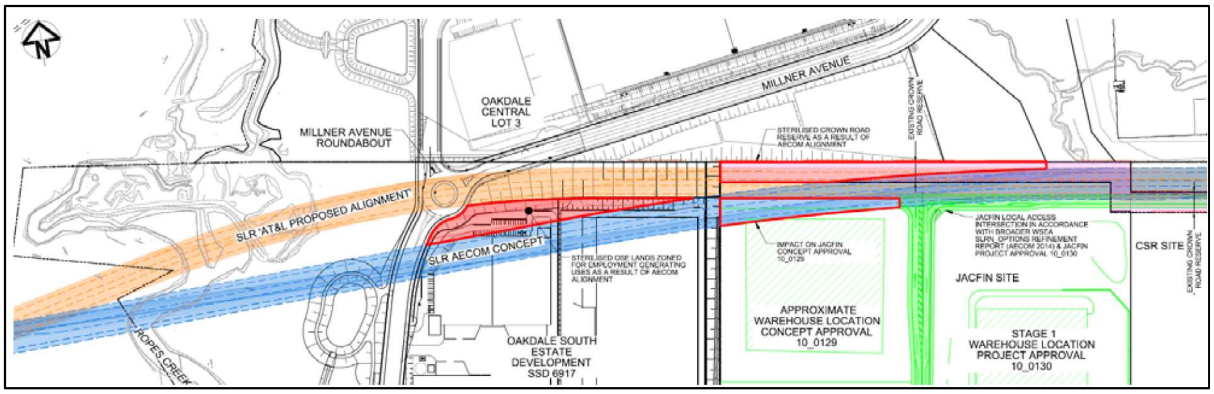

Figure 7: Comparison of Current SLR Alignment & Revised SLR Alignment

The alignment has been revised to continue along the northern boundary of OSE, the northern boundary of the neighbouring property (Jacfin Lands) and pass over the Milner Avenue roundabout. This would require the construction of a long span bridge over the Milner Avenue roundabout. Within the locality of OSE, the revised SLR alignment provides the following benefits:

- Better suit the surrounding topography,
- Avoid Crown Road reserve sterilisation,
- Avoid impacts on the approved Jacfin Concept Plan 10_0129 by better utilising the existing Crown Road reserve, and
- Ensure a more efficient use of the OSE lands zoned for employment generating uses.

A technical analysis was undertaken by GHD, which concluded that the construction of the SLR over the Milner Avenue roundabout was feasible. This option would utilise standard bridge construction techniques without having an adverse impact on cost, design or safety. As such, the revised alignment would result in an improved outcome compared to the current alignment, as proposed in the Aecom Report.

3.3 Public Transport

The OSE's proximity to public transport is shown in **Figure 8**, which demonstrates the locations and distances to bus services surrounding the Site. The services which travel in proximity to the Site include the 738 bus route, connecting Mt. Druitt Railway Station to Eastern Creek and Horsley Park, and the 835 bus route, connecting St. Mary's Railway Station to the Prairiewood T-Way Station. These services operate every 30 minutes during morning and evening periods, Monday to Friday.

3.4 Cycle Paths

The existing cycle network in the vicinity of the Site is also shown in **Figure 8**. The regional cycle routes include the Westlink M7 Shared Path, which extends along the western side of the Westlink M7 Motorway and connects to Prestons and Baulkham Hills, running through employment areas such as the Norwest Business Park and Eastern Creek. In addition, the cycle lanes on the M4 cater for regional bicycle travel.

As part of the upgrade of Old Wallgrove Road, which is currently underway, the existing off-road shared pathway along the northern side of Lenore Drive will be extended to continue to Wallgrove Road. This will provide a key connection to the existing regional pedestrian and cycle network.

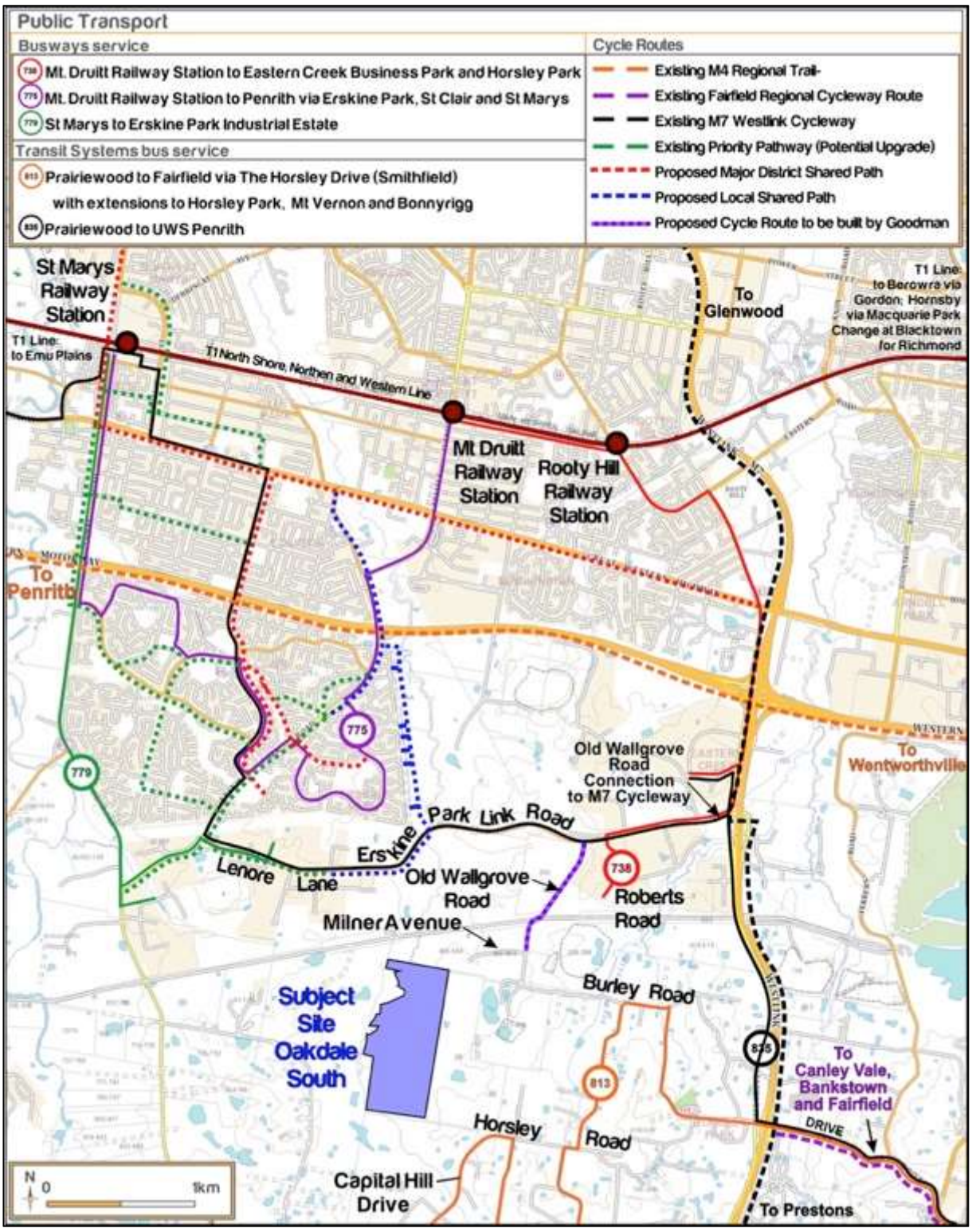

Figure 8: Existing and Proposed Public Transport and Cycle Links

3.5 Mode Share

Based on Journey to Work (JTW) data provided by the Bureau of Transport Statistics (BTS) of employee mode share for WSEA (Travel Zone 3477, 3479, 4045 and 5002) is shown in **Figure 9**. The data indicates that approximately 90% of employees travel to work via private vehicle transport with minimal usage of non-vehicle alternatives.

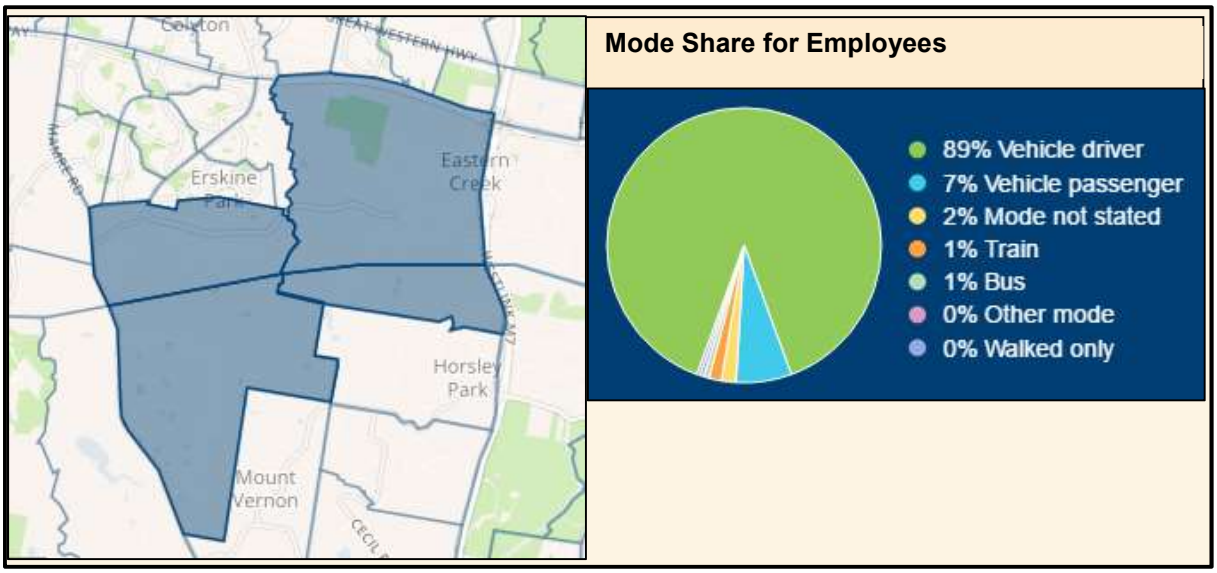

Figure 9: Journey to Work Data of Employee Mode Share

4 Traffic Impacts

4.1 Estate Masterplan Traffic Generation & Impacts

The traffic impacts of the Masterplan (for the approved and proposed modification) have been assessed having regard to the historic traffic generation assumptions that informed the local and regional infrastructure upgrades within the WSEA, including the Erskine Park Link Road, Old Wallgrove Road upgrade and Wallgrove Road upgrades. It has been established that the rates adopted for the broader infrastructure assessments are consistent with the rates published by the RMS in its *Technical Direction 04a: Traffic Generated Developments – Updated traffic surveys* (**RMS Guide Update**) being:

- 1.892 daily vehicle trips per 100m^2 of industrial GFA including ancillary office floor space.
- 0.163 peak hour vehicle trips per 100m^2 of industrial GFA including ancillary office floor space.

Application of the above rates to the areas approved under the Masterplan and the modification currently being considered are provided in **Table 1**.

Table 1: Oakdale South Estate Approved Precinct Peak Hour Generation Rates

Precinct	Approved GFA (m^2)	Modified GFA (m^2)	Approved Masterplan (vph)	Modified Masterplan (vph)
1	104,739	104,739	171	171
4	48,256	30,607	79	50
5	84,190	34,452	137	56
2, 3 & 6	164,422	166,034	268	271
Total	**401,607**	**335,832**	**655**	**548**

The comparative analysis demonstrates that the future traffic generation of the OSE is expected to reduce from 655 veh/hr (as approved) to 548 veh/hr under the proposed modification. Critically, this remains less than the estimated traffic generation adopted in all traffic modelling undertaken to date that underpins the package of sub-regional road upgrades within the broader WSEA both planned and approved. Furthermore, these rates are less than the assumed traffic generation that forms the basis of the design of the local access routes including the intersection of Milner Avenue with Old Wallgrove Road and Old Wallgrove Road with Erskine Park Link Road.

4.2 Operational Assumptions

Based on current NSW operational traffic data provided by the future occupants (Sigma), the following operational assumptions have been adopted for the Proposal by extrapolating the current data to the first year of operations – being 2020:

- Inbound (delivery) movements:
  - 30 x courier vans.
  - 14 x 3-tonne trucks.
  - 30 x 10-tonne rigid trucks.
  - 20 x semi-trailers and B-Double trucks.
- Outbound (dispatch) movements:
  - 162 x courier vans.
  - 6 x semi-trailers.
  - 4 x 10-tonne rigid trucks.
- Staff:
  - 150 warehouse team members over 2 shifts (Morning/afternoon shift – 60 staff, Late afternoon/night shift – 90 staff), and
  - 15 office-based workers (standard office hours; 8.30AM – 5.30PM).

4.3 Lot 3A Traffic Generation

4.3.1 Standard Traffic Generation Assessment

The application seeks approval for the development of 41,562m^2 of building area including 40,090m^2 of warehouse GFA. Application of the traffic generation rates established in Section 4.1 to the proposed area results in the following peak hourly and daily traffic movements:

Table 2: Lot 3A Traffic Generation Summary

Item	Area (m^2)	Peak Hour Generation (vph)	Daily Generation (vpd)
Lot 3A	41,562	68	786

Based on the use of the RMS Guide Update traffic generation rates, the future development is expected to generate in the order of 68 veh/hr during peak periods with approximately 54 in and 14 out in the morning peak, and vice versa during the evening peak hour. Of these, it is expected that roughly 10% of all movements will be associated with commercial vehicles equating to approximately 7 veh/hr during the morning and evening peak hour and 79 daily vehicle movements.

4.3.2 First Principles Traffic Generation Assessment

In comparison, the projected traffic volumes based on Sigma's current NSW movements are as follows:

- Operations – 266 movements per day (approximately 74 heavy vehicle movements).
- Staff – 330 movements per day.

Therefore, total vehicle movements would be 596 trips per day, which is lower than the daily trips forecast using the RMS Guide Update trip rates. Based upon the lower quantum of trips per day, it can be assumed that the peak hour trips would also be lower than the RMS Guide Update estimates. Notwithstanding, for the purpose of this assessment, the results of the 'Standard Traffic Generation Assessment' has been adopted as it represents a conservative or 'worst-case' scenario.

Finally, it is anticipated that minimal cycling, public transport and pedestrian trips would be generated during the operations of the development, which is evident by the mode share data published by the BTS and shown in **Figure 9**.

4.4 Traffic Impacts

Having regard for the known development of Lot 3B within Precincts 2, 3 and 6, the cumulative traffic impacts of Lot 3A and Lot 3B have been assessed against the approved Masterplan (and subsequent Section 96) traffic generation. The balance of the traffic generation, assumed for Precincts 2, 3 and 6 is outlined in **Table 3**.

Table 3: Oakdale South Estate Generation - Precincts 2, 3 & 6

Item	Area (m^2)	Peak Hour Generation (vph)	Daily Generation (vpd)
Approved	164,442	268	3,111
Lot 3A	41,562	68	786
Lot 3B	38,456	63	728
Balance	**84,424**	**137**	**1,597**

On the basis of the above, the traffic impacts of the proposal are consistent with that assessed under the Masterplan and subsequent Section 96 and is therefore acceptable. It is anticipated that the road and intersection upgrades that are currently being delivered would be more than adequate to cater for the traffic generated by the Proposal, which is consistent with the planning for the WSEA. Accordingly, no further road upgrades are considered to be required to support the proposed development.

4.5 Construction Traffic Impacts

Light vehicle traffic generation would be generally associated with staff movements to and from the Site. Staff would be comprised of project managers, various trades and general construction staff. Over the full construction period, the peak workforce represents the worst-case scenario for vehicle movements during the morning or evening road network peak hour. The workforce arrival and departure periods (6.30-7.00AM and 5.00-5.30PM) represent the peak construction traffic generation periods. It is anticipated that most, if not all, staff would travel by private vehicle with minimal cycling, public transport and pedestrian trips. This would be reflective of the nature of construction work, where staff must carry construction equipment and tools, which are necessary to undertake the required tasks.

Heavy vehicle traffic would mainly be generated by activities associated with the delivery of construction equipment and delivery of material for construction works. The heavy vehicle traffic associated with the removal of excavated material would be low having regard for the earthwork requirements.

As the construction programme has yet to be finalised, a worst-case scenario for heavy vehicle movements per day required for the delivery of construction materials to the Site cannot be accurately determined. However, these deliveries are likely to occur outside of the peak network traffic periods and would have limited (if any) impact on traffic on Wallgrove Road / Old Wallgrove Road intersections, which currently both have high proportions of heavy vehicles.

Most construction vehicles are expected to access the site via the M7 Motorway, M4 Motorway, Wallgrove Road, OWR and Milner Avenue and therefore would have impacts on intersections along this route.

Importantly, the construction traffic volumes are expected to be lower than the volumes anticipated for the proposed development once it becomes operational. Therefore, recognising that the key intersections are anticipated to perform satisfactorily once the Proposal is completed, it can be assumed that the intersection would satisfactorily accommodate the lower volumes of construction traffic.

5 Parking Requirements

5.1 Proposed Parking Provisions

The applicable parking rates relevant to the development are provided in the conditions of the approved master plan. The approval outlines the following minimum car parking rates:

- 1 space per 300m^2 of warehouse GFA; and
- 1 space per 40m^2 of office GFA.

Table 4 provides a summary of the parking spaces required for the proposed development based on the application of the approved master plan parking rates on the proposed warehouse and office floor areas.

Table 4: Proposed Parking Provisions

Land Use	Area (m^2)	Parking Rate	Parking Required	Parking Provided
Warehouse	40,090	1 space per 300m^2 GFA	133	200
Office	1,472	1 space per 40m^2 GFA	37	
Total	**41,562**		**170**	**200**

The application proposes the provision of 200 spaces, which exceeds the minimum requirements of 170 parking spaces as per the application of the approved master plan parking rates. Accordingly, the parking proposed will accommodate all future demands off-street and is consistent with relevant planning controls.

5.2 Accessible Parking

The approved master plan parking rates makes provisions for 2 disabled spaces for every 100 car parking spaces. In response, application of this rate to the proposed 200 parking spaces results in a requirement of 4 disabled spaces. In response, the development provides 4 accessible parking spaces for disabled users, thereby complying with the master plan approval.

5.3 Bicycle Parking and Facilities

Although it is anticipated that the majority of employees would arrive by private transport, end-of-trip cycling facilities (i.e. lockers, showers and change rooms) are provided on-site to accommodate and encourage cycling to work as an alternative to private vehicle travel.

6 Sustainable Travel Plan

6.1 Objectives

A Sustainable Travel Plan (**STP**) details a package of measures by which to promote alternative travel choices and reduce private vehicle usage of employees commuting to the Site. In particular, this STP identifies the pedestrian and cyclist facilities proposed to service the proposed development.

The objectives of this STP are to:

- Reduce the environmental footprint of the development;
- Promote the use of 'active transport' modes such as walking and cycling, particularly for short-medium distance journeys;
- Reduce reliance on the use of private vehicles for all journeys; and
- Encourage a healthier, happier and more active social culture.

Having regard for the above, this Plan adopts the following movement hierarchy with priority given to 'active transport' followed by mass public transport and lastly the use of private vehicles.

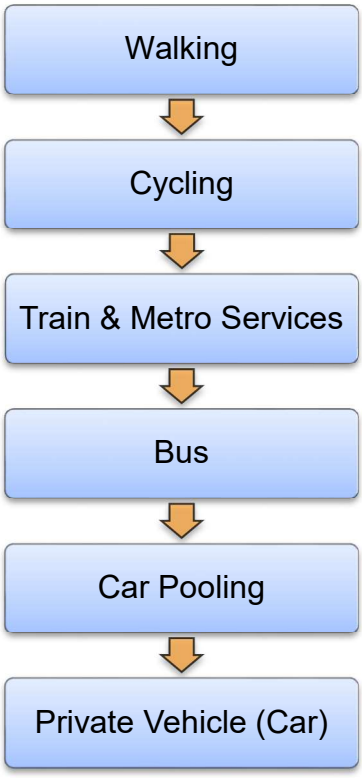

Figure 10: Movement Hierarchy

6.2 Mode Share Targets

With the objectives in mind, the mode share targets sought to be achieved is outlined in **Table 5**.

Table 5: Staff Mode Share Targets

Travel Mode	Existing	Target
Walking	0%	5%
Cycling	0%	5%
Train	1%	2%
Bus	1%	10%
Car Passenger	7%	5%
Car Driver	89%	73%
Other	2%	-

The targets provided in the above table would be considered realistic and achievable. It should be considered in the context of the ongoing development of WSEA and the provision of shared pedestrian / cycle paths (particularly along OWR and Lenore Drive) to support non-car travel modes. End of trip facilities, including showers and change facilities, have been provided to service cyclists and pedestrians. Direct footpath access has been provided to the building entrance. Furthermore, as the employee population of WSEA increases, it is anticipated that additional bus services would be provided and therefore would form a viable alternative.

6.3 Action Plan

The following specific actions, as shown in **Table 6**, have been identified to aid achievement of the targets outlined in the previous section.

Table 6: Action Plan Measures

Item No.		Action / Description	Responsibility
1. General			
	1.1	Establish a site specific transport committee which is to include (but not limited to) the Travel Plan Coordinator (TPC)	TPC
	1.2	Preparation and maintenance of a Transport Access Guide	TPC
	1.3	Provide 'Travel Welcome Pack' to new staff	TPC
	1.4	Include travel demand management as a regular item on the agenda for team meetings	Team Management

2. Walking			
	2.1	Promote participation in Walk to Work day activities	TPC
	2.2	Provide advice in relation to the location of key transport services within walking distance of the site	TPC
	2.3	Promote and provide marketing material (such as posters on noticeboards, flyers or pamphlets) regarding the health benefits of walking	TPC
3. Cycling			
	3.1	Improve bicycle connectivity on surrounding roads	Council
	3.2	Promote participation in the National Ride2Work Day activity	TPC
	3.3	Clearly signpost the location of on-site bicycle facilities from building entrances and position bicycle parking near the entrance for convenient access	TPC
	3.4	Ensure bicycle facilities are maintained in a clean condition	TPC
	3.6	Promote and provide marketing material (such as posters on noticeboards, flyers or pamphlets) regarding the health benefits of cycling. This can be combined with the marketing material for walking	TPC
4. Public Transport			
	4.1	Provide increased public transport services in response to increased industrial development associated with WSEA	TfNSW / Council
	4.2	Ongoing updates to the TAG to reflect changes to any bus routes and service times	TPC
	4.3	Advertise updated editions of the TAG with copies placed in a visible location, such as employee lunch areas.	TPC
5. Car Pooling			
	5.1	Advertise the benefits of ride sharing or carpooling and provide a contact point who will assist in connecting employees who could benefit from carpooling.	TPC
	5.2	Facilitate engagement between employees with a view to encourage ride sharing or carpooling.	TPC

6.4 Communication Strategy

6.4.1 Welcome Packs

Each new employee shall be provided with a 'welcome pack' which includes a Transport Access Guide and other information in relation to sustainable transport choices. This shall include a copy of the Transport Access Guide (TAG) as well as general information regarding the health and social benefits of active transport.

6.4.2 Accurate Transport Information

In addition to these 'welcome packs', a copy of the TAG shall be clearly displayed in communal areas of the site including (but not limited to):

- Staff lunch room;
- Lobby area and entrances to buildings; and
- Any marketing material associated with the site, such as websites and newsletters.

The TAG shall be presented in a form that is reflective of the commitment to achieving positive transport objectives. This may involve provision of a laminated cover or other protective frame. The TAG is not to be presented on loose paper.

6.5 Travel Plan Coordinator

A representative from the management team shall be designated as the overall Travel Plan Coordinator. This person(s) shall be responsible for:

- Implementation and promotion of the STP actions
- Monitoring the effectiveness of the STP and ongoing maintenance of the Plan
- Provide advice in relation to transport-related queries to employees as required.
- Liaise with external parties (i.e. Council, State Transit Authority and Transport for NSW) in relation to Travel Plan matters.

This role does not necessarily require full-time position; however it shall be clearly designated among the key responsibilities of management.

6.6 Resourcing

It is not anticipated that the maintenance of the STP will have significant ongoing cost implications. The majority of time, including surveys, will be undertaken by the TPC and therefore not necessarily require the service of external parties. However, a small budget should be set aside for regular updates to the TAG and other miscellaneous costs such as the preparation of welcome packs for new employees.

6.7 Plan Maintenance

This Plan shall be subject to ongoing review and will be updated accordingly. Regular reviews will be undertaken by the Travel Plan Coordinator. As a minimum, a review of the STP should occur on an annual basis. The following key considerations should be made upon each update:

- Update baseline conditions to reflect any changes to the transport environment in the vicinity of the site such as changes to bus services, new cycle routes, etc.
- Track progress against proposed travel mode targets
- Identify any shortfalls and develop an updated action plan to address issues
- Ensure travel mode targets are updated (if necessary) to ensure they are realistic and remain ambitious

7 Access and Internal Design Aspects

The site access, internal circulation and car parking arrangements have been developed with consideration of the requirements of Council's DCP and relevant Australian Standards (i.e. AS2890.1, AS2890.2 and AS2890.6). The following characteristics are noteworthy with regard to the design of the site access driveway, loading docks and on-grade car park.

7.1 Site Access

Access to the site is proposed via three operational driveways, as shown in the site plan which is attached at reduced scale at **Appendix A**. The Proposal includes:

- A two-way entry/exit driveway for commercial (heavy) vehicles only from Estate Road 04, located at the south-western corner of the site;
- A two-way entry/exit driveway for employee vehicles from Estate Road 04, located at the south western corner of the site; and
- A fire access driveway from cul-de-sac of Estate Road 06, located at northern side of the Site.

The proposed access arrangements have been developed to achieve the following desirable outcomes:

- To permit entry to and exit from the site in a forward gear;
- To separate commercial (heavy) vehicle and passenger vehicle traffic;
- To accommodate vehicles up to and including 26.0m B-Doubles;
- To minimise pedestrian crossing distances at the driveways; and
- To provide adequate sight distance to oncoming traffic or pedestrians on the public roadway or footpath.

7.2 Car Park Design

- All staff and employee parking is to be provided in accordance with AS2890.1 for a Class 1A user, which requires a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- All spaces located adjacent to obstructions greater than 150mm in height are to be provided with an additional width of 300mm. This includes any landscaping that exceeds 150mm.

- All accessible parking spaces are designed in accordance with AS2890.6. Spaces are provided with a clear width of 2.4m and located adjacent to a minimum shared area of 2.4m.

7.3 Commercial Facilities

The circulation areas for commercial (heavy) vehicles have been designed having regard for the operational requirements of the future tenant and the requirements of AS2890.2. In this regard, the following is noteworthy:

- Swept path analysis has been performed using a B-Double combination vehicle, to verify the design widths of the circulation roads and driveways. The results of this analysis, which are presented on plans attached as **Appendix B**, reveal that the necessary manoeuvres of the largest vehicle expected to access the site can be accommodated under the Proposal.
- In light of the above, the internal circulation road would also accommodate the BCA fire truck perimeter access requirements for large isolated buildings.

7.4 Design Summary

The internal configuration of the Site – including light and heavy vehicular access, car parking and servicing areas – has been designed generally in accordance with the requirements of Council's DCP and the relevant Australian Standards (AS2890.1, AS2890.2 and AS2890.6).

8 Response to SEARs

A Secretary's Environmental Assessment Requirements (SEARs) was issued by the DP&E on 21 July 2016 (included at **Appendix C**), which outlines the key areas for consideration in any SSD application. Relevant responses to the traffic and transport issues raised in the SEARs are outlined below:

A Traffic Impact Assessment detailing all daily and peak traffic and transport movements likely to be generated (vehicle, public transport, pedestrian and cycle trips) during construction and operation of the development, including a description of vehicle access routes and the impacts on nearby intersections;

Operational Traffic:

Details in relation to long-term operational traffic volumes are outlined in Section 4.2.

Application of the traffic generation rates provided in the RMS *Technical Direction 04a: Traffic Generated Developments – Updated traffic surveys* to the proposed building area results in the following peak hourly and daily traffic movements:

- 68 vehicles per hour during the morning and evening peak
- 786 vehicles per day

Based on Sigma's current NSW movements, a first principles assessment of the project traffic volumes indicates the following traffic movements generated by the development:

- Operations – 266 movements per day.
- Staff – 330 movements per day.

Therefore, total vehicle movements would be 596 trips per day, which is lower than the daily trips forecast using the RMS Guide Update trip rates. Based upon the lower quantum of trips per day, it can be assumed that the peak hour trips would also be lower than the RMS Guide Update estimates. As such, the network peak hour traffic generated by the development would be lower than that as estimated under the RMS Guide Update. Notwithstanding, for the purpose of this assessment, the results of the 'Standard Traffic Generation Assessment' has been adopted as it represents a conservative or 'worst-case' scenario.

The traffic impacts of the proposal are consistent with that assessed under the approved Masterplan and subsequent proposed Section 96 application. Therefore, the vehicle access routes and impacts on nearby intersections would be consistent of that previously assessed.

It is anticipated that minimal cycling, public transport and pedestrian trips would be generated during the operations of the development, which is evident by the mode share data published by the BTS. Notwithstanding, end-of-trip cycling facilities are provided on-site to accommodate and encourage cycling to work as an alternative to private vehicle travel. Shared paths will be provided along Old Wallgrove Road, connecting with the existing shared path along Lenore Drive, to accommodate pedestrian and cycling trips.

Construction Traffic:

Construction traffic volumes and vehicle access routes are discussed in Section 4.5.

The traffic and transport movements during the construction of the development are expected to be lower than the movements anticipated for the proposed development once it becomes operational. It is anticipated that most, if not all, traffic generated by staff would be private vehicles with minimal cycling, public transport and pedestrian trips. This would be reflective of the nature of construction work, where workers must carry construction equipment and tools, which are necessary to undertake the required tasks.

Most construction vehicles are expected to access the site via the M7/M4 Motorways, Wallgrove Road, OWR and Milner Avenue and therefore would have impacts on intersections along this route. However, recognising that the key intersections are anticipated to perform satisfactorily once the Proposal is completed, it can be assumed that the nearby intersections would satisfactorily accommodate the lower volumes of construction traffic.

Details demonstrating the proposal is consistent with the traffic impact assessment, traffic volumes and car parking provisions of SSD 6917;

As identified in Section 4.2, the site is expected to generate in the order of 68 vehicles per hour during peak periods. This is consistent with the traffic generation assumptions adopted for Precinct 3 under the Masterplan Application (SSD 6917) as established in Table 3.

On the basis of the above, the traffic generated by the development is less than that currently approved for Precincts 2, 3 and 6. A balance of 137 vph remains for use by future developments within the mentioned precincts, whereby traffic generation will be assessed in subsequent assessments. Notwithstanding, the forecast traffic volumes generated by the Site remains consistent with the Masterplan traffic report.

The proposed parking provisions are discussed in Section 5. The minimum approved car parking rates of 1 space per 300m^2 for warehouse GFA and 1 space per 40m^2 of office GFA has been applied to the Site. The application proposes the provision of 200 spaces, which exceeds the minimum

requirements of the approved car parking provisions for the OSE by 30 parking spaces. Accordingly, the car parking provisions is consistent with that of the Masterplan application.

Details of access to the site from the road network including intersection location, design and sight distance;

Details of access to the site from the road network can be found in Section 6.

Access to the site is proposed via three operational driveways, as shown in the site plan which is attached at reduced scale at Appendix A. The proposed access arrangements have been developed to achieve compliance with the relevant Australian Standards with consideration of appropriate intersection location, suitable access design to accommodate the intended use and adequate sight distance to vehicles and pedestrians on public roads.

An assessment of predicted impacts on road safety and the capacity of the road network to accommodate the development;

As discussed above, the Site is estimated to generate at most 68 vehicles per hour based on the application of the RMS Technical Direction, which is within the approved traffic generation of Precincts 2, 3 & 6. A balance of 137 vph remains for use by future developments within the mentioned precincts, whereby traffic generation will be assessed in subsequent assessments. In this regard, the traffic generated by the Site has been accounted for in the previous Masterplan application assessment. As such, the conclusions and recommendations of the detailed background traffic and transport assessments of key sub-regional intersections remain entirely relevant and valid. Therefore, further detailed analysis of road safety and capacity is not warranted.

Plans of any road upgrades or new roads required for the development, if necessary;

Recognising that the traffic generated by the Proposal is consistent with the approved Masterplan and subsequent Section 96 application, it is anticipated that the road and intersection upgrades that are currently being delivered are adequate to cater for the traffic generated by the Proposal and consistent with the planning for the WSEA. Accordingly, no further road upgrades are considered to be required to support the proposed development.

Detailed plans of the proposed layout of the internal road network and parking provision on-site in accordance with the relevant Australian Standards; and

The layout of the internal road network and on-site parking provisions can be seen in the proposed Site Plan presented in Figure 2 and included in Appendix A of this TIA report. The site access, internal circulation and car parking arrangements have been developed with consideration of the requirements of the relevant Australian Standards (i.e. AS2890.1, AS2890.2 and AS2890.6).

Details of any likely dangerous goods to be transported on arterial and local roads to/from the site, if any, and the preparation of an incident management strategy, if necessary.

An Incident Management Strategy has been prepared by Core Engineering and included within the EIS documentation. This document details the overarching goals and measures envisaged to manage incidents involving the transport of dangerous goods. Included in the report are details of the likely dangerous goods to be transported on arterial and local roads to/from the site.

9 Conclusions

The key findings of this Traffic Impact Assessment can be summarised as follows:

- The Site is located with the Western Sydney Employment Area (WSEA), which was established by the New South Wales Government to provide businesses in the region with land for industry and employment, including transport and logistics, warehousing and office space.
- The Proposal is consistent with the planning for the WSEA, seeking approval for an industrial warehouse with ancillary office space with a total GFA of approximately 41,562m², and associated infrastructure.
- The future development is expected to generate in the order of 68 veh/hr during peak periods and 786 daily vehicle movements based on application of the RMS generation rates. Of these, it is expected that roughly 10% of all movements will be associated with commercial vehicles equating to approximately 7 veh/hr during the morning and evening peak hour and 79 daily vehicle movements.
- The proposed generation is consistent with that assumed for the generation adopted in all traffic modelling undertaken to date that underpins the package of sub-regional road upgrades within the broader WSEA both planned and approved. Furthermore, these rates are less than the assumed traffic generation that forms the basis of the design of the local access routes including the intersection of Milner Avenue with Old Wallgrove Road and Old Wallgrove Road with Erskine Park Link Road
- The proposed level of on-site car parking (200 spaces) exceeds the minimum car space requirements of the RMS and therefore considered supportable. It is therefore anticipated that the Proposal would adequately accommodate the parking demand generated by the proposed development.
- The proposed access arrangements have been developed to permit entry to and exit from the site in a forward gear, separate commercial (heavy) vehicle and passenger vehicle traffic, and minimise pedestrian crossing distances at the driveways.

It is therefore concluded that the proposed development is supportable on traffic planning grounds.