



18 February 2015

Michael de Silva
Property Development Manager
Gazcorp Pty Ltd
PO Box 732
Gladesville NSW 2211

Our ref: 21/22381
Your ref: 206489

Dear Michael

813 - 913 Wallgrove Road Traffic Assessment Addendum

This letter addresses the issues relating to traffic and access raised by Department of Planning and Environment (DoPE) in their letter dated 24th July 2014, and by RMS in a meeting with Gazcorp on 15th September 2014, following the submission of the EIS for the proposed development at 813-913 Wallgrove Road. A copy of the letter from DoPE is provided at **Attachment 1**.

GHD prepared the traffic impact assessment report titled "*813-913 Wallgrove Road Traffic Impact Assessment*" (GHD report) that formed part of the Environmental Impact Statement (EIS) for the proposed 813-913 Wallgrove Road development in 2013.

This letter forms an addendum to the previous *813-913 Wallgrove Road Traffic Impact Assessment* report (GHD, 2013), and provides a summary an additional traffic and transport assessment of the revised site access and parking arrangements. An assessment of a proposed interim access arrangement to the Gazcorp site from the SLR is also provided.

Following comments from DoPE and RMS, the proposed site access arrangements have been amended to include access from the proposed Southern Link Road only. The revised site masterplan is provided at **Attachment 2**.

1 Proposed Site Access Arrangements

All of the access scenarios analysed in the previous Traffic Impact Assessment report (GHD, 2013) included a new access intersection with Wallgrove Road. However, following the EIS submission DoPE advised that vehicular access to the site should be from the proposed Southern Link Road (SLR) only, with no access provided at Wallgrove Road.

DoPE advised that access to the site from the SLR is preferred, as Wallgrove Road is the higher-order road and it is important to preserve the efficient functioning of Wallgrove Road by minimising the number of potential new intersections. The majority of the concerns identified in the DoPE letter (refer to **Attachment 1**) relate to the proximity of the proposed access intersection at Wallgrove Road and the future SLR/Wallgrove Road intersection. By changing the proposed access arrangements to provide access from SLR only, this revised access arrangement resolves most of the issues raised by DoPE.

The proposed Gazcorp development is expected to be completed before 2021, prior to the opening of the proposed SLR. The following access arrangements have been assumed for the 2021 and 2036 horizon years:

- For the 2021 interim assessment, it has been assumed that all vehicles would access the site from the western approach of the Wallgrove Road/SLR/Austral Bricks access.
- For the 2036 assessment, it has been assumed that all vehicles would access the development site via a signal controlled intersection with the SLR to the north of the development site.

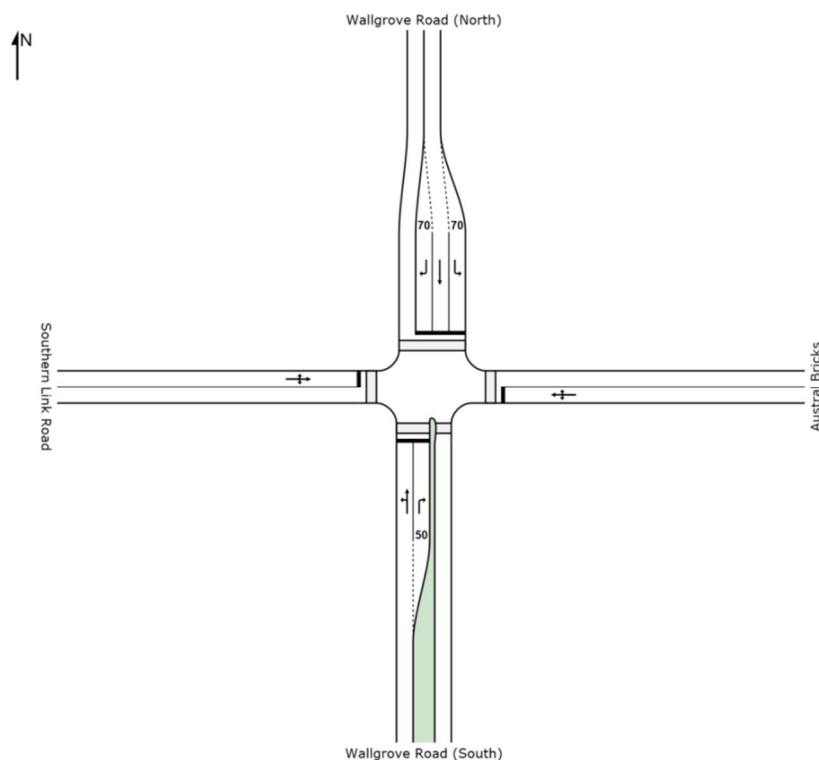
As the Gazcorp development would be fully operational by 2021, the site is not expected to generate any additional traffic between the future horizon years 2021 and 2036.

1.1 Interim Scenario-2021 Traffic Conditions

For the 2021 interim scenario, it has been assumed that the Gazcorp development is fully developed and the proposed Southern Link Road has not been constructed.

A temporary access driveway would provide access to the Gazcorp site, which would form the western approach of a signal controlled intersection with Wallgrove Road and the Austral Bricks access. The interim intersection arrangement assessed in the SIDRA analysis is shown diagrammatically at Figure 1.

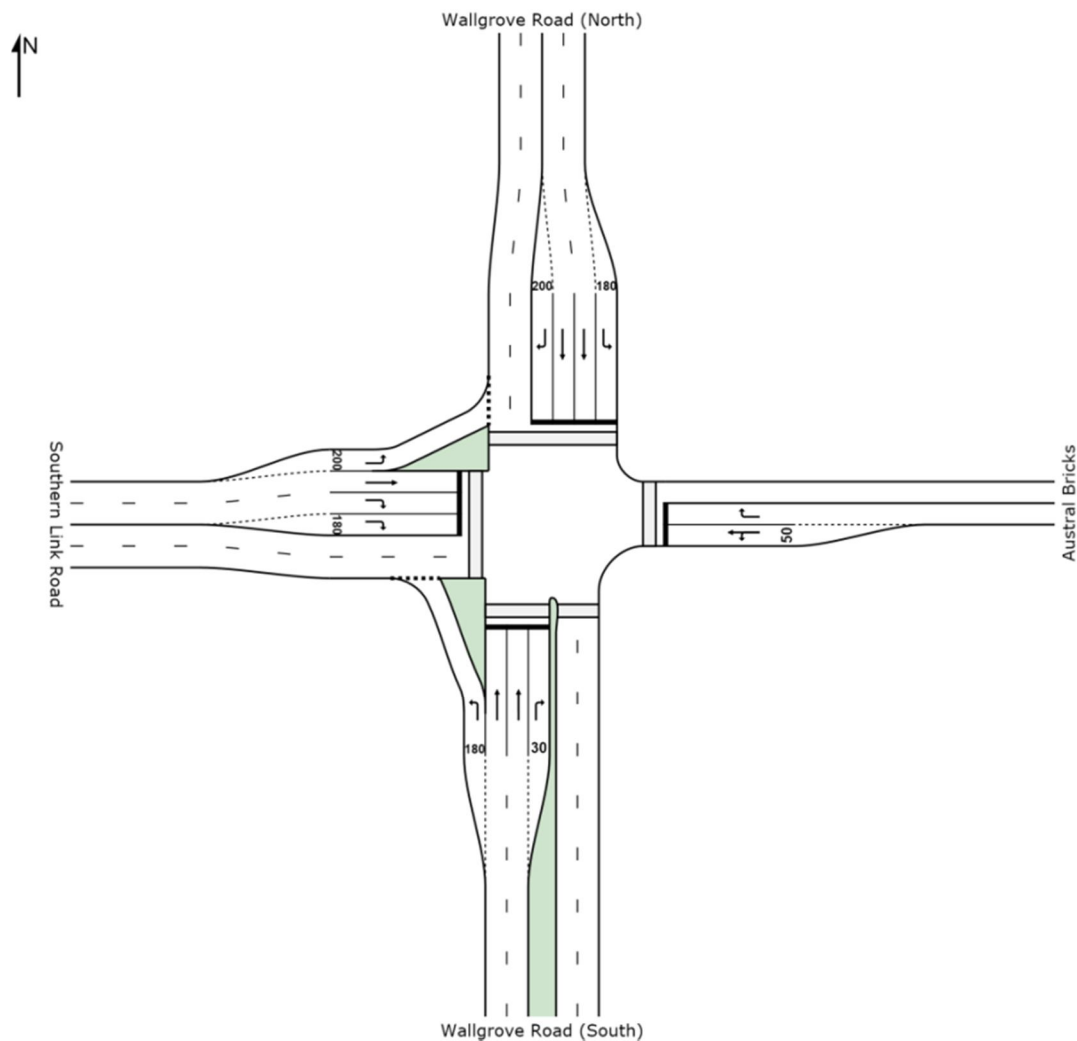
Figure 1 Interim (2021) Wallgrove Road/Gazcorp Access Intersection Layout



1.2 Ultimate Scenario – 2036 Traffic conditions

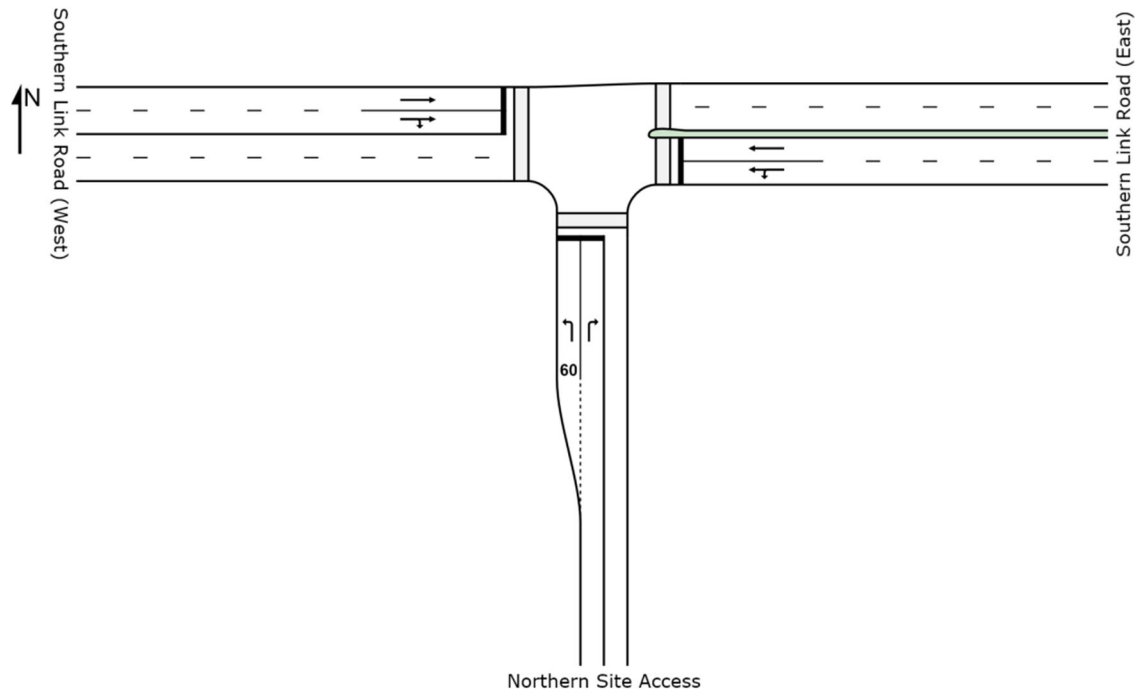
For the Ultimate Scenario assessment it was assumed that the SLR would be fully constructed and operational by year 2036. The ultimate intersection layout of Wallgrove Road/SLR/Austral Bricks access intersection was provided by AECOM and is diagrammatically shown in Figure 2.

Figure 2 Ultimate (2036) Wallgrove Road/SLR Intersection Layout



The proposed Gazcorp Access/SLR intersection is diagrammatically shown in Figure 3.

Figure 3 Ultimate (2036) Gazcorp Site Access/SLR Intersection Layout

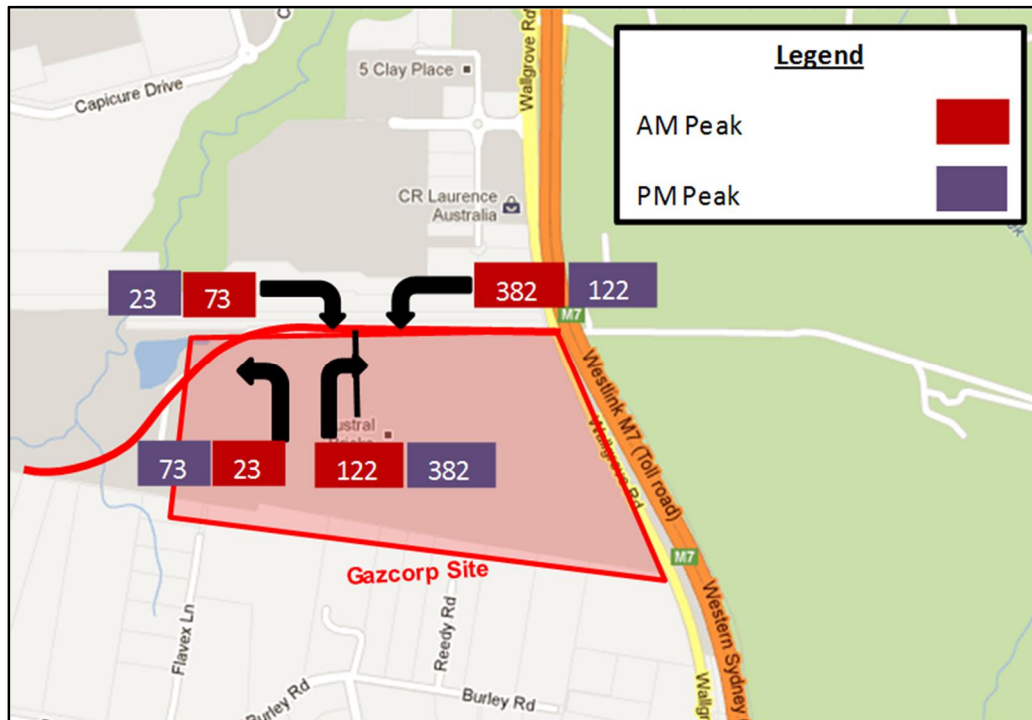


2 Traffic Generation

As detailed in the GHD report the proposed development of the Gazcorp site would generate approximately 600 two way trips during a peak hour. Approximately 57 percent are assumed to access the site from Wallgrove Road (north), with approximately 27 percent from Wallgrove Road (south) and 16 percent from the proposed SLR (west).

Figure 4 below shows the traffic generated by the development and its distribution during the weekday AM and PM peak hours.

Figure 4 Proposed trip generation for future year 2036

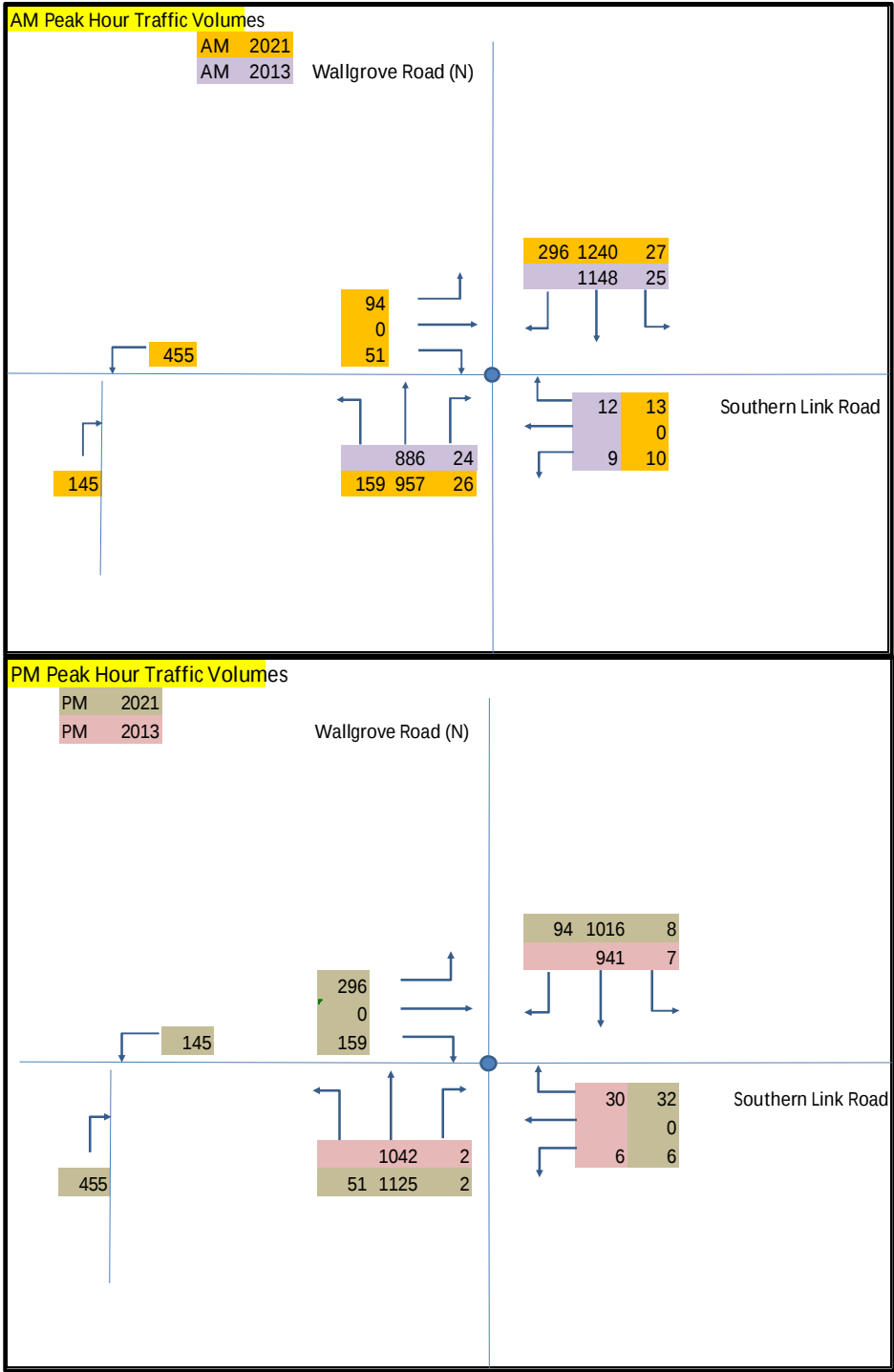


Source: Google Maps (2014), modified by GHD

2.1 Estimated Traffic for 2021 Interim Scenario

Weekday AM and PM peak traffic surveys were undertaken at the existing Wallgrove Road/Austral Bricks access intersection on Tuesday 30th April 2013. A growth rate of 1% per annum was applied to the surveyed traffic flows along Wallgrove Road in order to estimate the 2021 traffic volumes at this intersection. The traffic generated by the Gazcorp development was then added in order to calculate the 2021 turning traffic at the Wallgrove Road/SLR intersection. The surveyed (2013) forecast 2021 AM and PM peak hour traffic movements are shown in Figure 5.

Figure 5 Existing (2013) and Forecast (2021) Peak Hour Traffic Flows

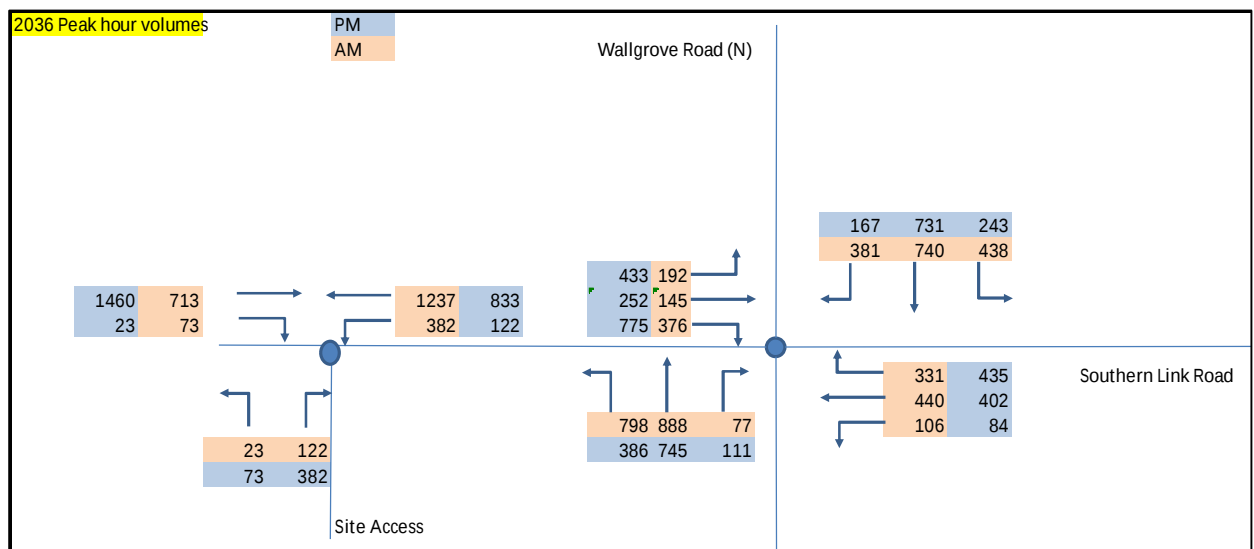


2.2 Estimated Traffic for the Ultimate Scenario

2036 turning volumes were extracted from the BWSEA Aimsun traffic model. The BWSEA model assumes that access to the Gazcorp is provided directly from Wallgrove Road. For this assessment, the Gazcorp site traffic was therefore re-distributed to calculate forecast 2036 traffic volumes, assuming that access to the site is provided from the proposed SLR.

Forecast 2036 AM and PM peak hour traffic movements at the Wallgrove Road/SLR/Austral Brick access intersection and the proposed Gazcorp Access/SLR intersection are shown in Figure 6.

Figure 6 Forecast Peak Hour Traffic Volumes for Ultimate Scenario (2036)



3 SIDRA Traffic Modelling Analysis

3.1 Interim Scenario Results (2021)

A summary of the AM and PM peak hour SIDRA results for the proposed interim Gazcorp site access/Wallgrove Road/Austral Bricks access intersection arrangement, under 2021 traffic conditions, is provided at Table 1.

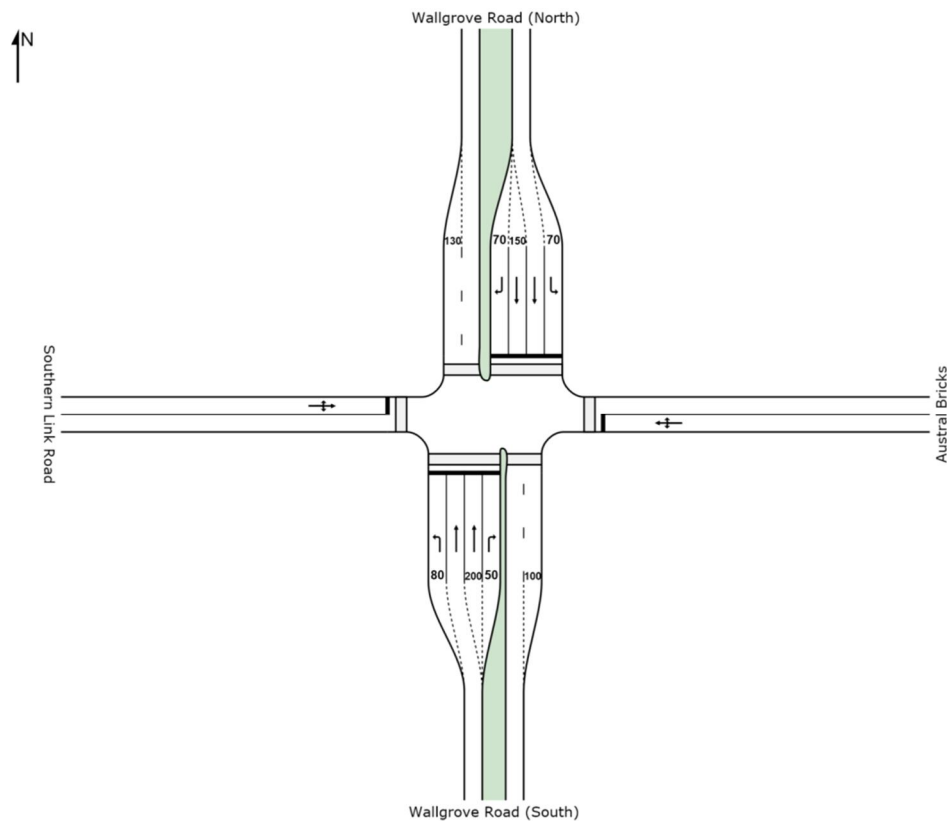
Table 1 SIDRA Results for Interim Scenario (2021) Traffic Conditions

Intersection	AM Peak			PM Peak		
	Av Delay (s)	LoS	DoS	Av Delay (s)	LoS	DoS
Interim Wallgrove Road/Gazcorp Access/Austral Bricks access	262	F	>1	128	F	>1

As shown in Table 1 the interim Wallgrove Road/Gazcorp site access intersection is expected to operate at LOS F for both AM and PM peak hour under the forecast 2021 traffic conditions.

A revised interim layout at Wallgrove Road/Gazcorp access/Austral Bricks access intersection has been assessed, which provides two lanes on the intersection departure for 100 metres in each direction along Wallgrove Road. This revised interim layout is shown in Figure 7. SIDRA analysis of this intersection arrangement showed that the intersection is expected to operate at an acceptable LOS C during both the AM and PM peak periods. The SIDRA outputs are provided in **Attachment 3**

Figure 7 Revised Wallgrove Road/SLR Interim Intersection Layout



3.2 Ultimate Scenario Results

A summary of the SIDRA results for the two intersections in the study area under 2036 AM and PM peak traffic conditions is provided in Table 2.

The proposed Gazcorp Access/SLR intersection is expected to operate satisfactorily at LoS A during the AM peak and LoS B during the PM peak. The SIDRA analysis also showed that queue lengths along the SLR would not continue back from the proposed Gazcorp access to Wallgrove Road.

The proposed Wallgrove Road/SLR/Austral Bricks access ultimate design intersection arrangement provided by AECOM is expected to perform at LOS F during both the AM and PM peak periods. This indicates that further improvements would be required at this intersection. SIDRA analysis of the proposed intersection arrangement without the re-distribution of Gazcorp traffic to the proposed SLR also showed that the intersection would operate at LOS F during both the AM and PM peak periods in 2036.

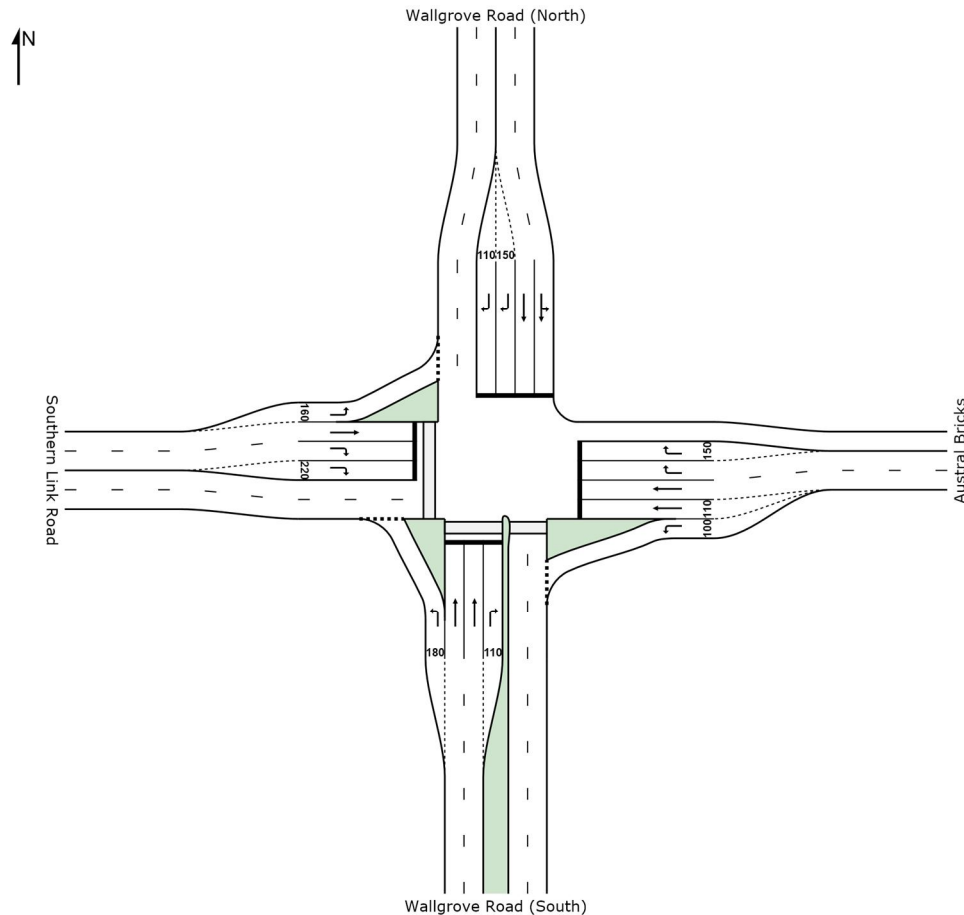
Table 2 SIDRA results for 2036 traffic conditions

Intersection	AM Peak			PM Peak		
	Av Delay (s)	LoS	DoS	Av Delay (s)	LoS	DoS
Gazcorp Access/SLR	9	A	0.67	24	B	0.84
Wallgrove Road/SLR	216	F	>1	243	F	>1

SIDRA modelling was undertaken of a revised intersection arrangement for the proposed Wallgrove Road/SLR intersection for the future year 2036 traffic conditions. The revised layout includes double right turn bays provided at the Wallgrove Road (north) and Southern Link Road (east) approaches.

The revised intersection layout is shown in Figure 8, with SIDRA modelling results provided in **Attachment 3**.

Figure 8 Revised Wallgrove Road/SLR intersection layout



SIDRA analysis was carried out with the revised Wallgrove Road/SLR intersection layout. The SIDRA results indicated that the Wallgrove Road/SLR intersection would operate satisfactorily, with a LoS D during both AM and PM peak hours as shown in Table 3. The SIDRA outputs are provided in **Attachment 3**.

Table 3 SIDRA results for 2036 traffic conditions – Revised Layout

Intersection	AM Peak			PM Peak		
	Av Delay (s)	LoS	DoS	Av Delay (s)	LoS	DoS
Wallgrove Road/SLR	44	D	0.87	48	D	0.90

The Gazcorp site access at SLR would be located approximately 350 metres to the west of Wallgrove Road. The SIDRA analysis showed that the 95th percentiles queue length along the SLR (west) approach of the revised Wallgrove Road/SLR intersection layout would be less than 100 metres during the AM peak hour. During the PM Peak, hour the 95th percentile queue is expected to be around 260 metres along the SLR (west) approach of the revised Wallgrove Road/SLR intersection.

This assessment indicates that the queuing along the SLR can be contained within the turn bays, and would not continue back to the proposed Gazcorp site access.

4 Development Car Parking

The Fairfield City Council *Development Control Plan, Chapter 12 Car Parking and Access Management Version 17* provides car parking requirements for Warehousing based on a gross leasable floor area (GLFA). Currently only the gross floor area (GFA) is known and not the GLFA therefore the RMS Guide to Traffic Generating Developments 2002 has been used as an alternative reference as it provides a warehouse rate for GFA.

The number of car parking spaces required to serve the proposed development is summarised in Table 4. As shown, a total of 917 spaces would be required for the ultimate development.

The proposed master plan allows for 1,500 parking spaces, which is in excess of those required for the site and is reduced from the 2,231 initially proposed in the EIS.

Table 4 Site Parking Requirements

Stage	Component	Area	Parking Requirements	No. Spaces Required
Ultimate	Warehouse and distribution facility	197,746 m ² GFA	1 space per 300 m ² GFA	660
	Office	10,248 m ² GFA	1 space per 40 m ² GFA	257
			<i>Ultimate Development Total</i>	<i>917</i>

5 Summary and conclusions

This letter forms an addendum to the previous Traffic Impact Assessment report (GHD, 2013) and provides an assessment of revised vehicular access arrangements, where access to the Gazcorp development site would be from the proposed SLR only.

A revised interim intersection arrangement for the Wallgrove Road/Gazcorp access/Austral Bricks access intersection has been assessed. The revised layout provides two lanes on the intersection departure for 100 metres in each direction along Wallgrove Road. SIDRA analysis of this intersection arrangement showed that the intersection is expected to operate at an acceptable LOS C during both the AM and PM peak periods under this revised arrangement.

A revised ultimate intersection arrangement for the proposed Wallgrove Road/SLR intersection for the future year 2036 traffic conditions has been assessed. The revised layout includes double right turn bays provided at the Wallgrove Road (north) and Southern Link Road (east) approaches. The SIDRA results indicated that the Wallgrove Road/SLR intersection would operate satisfactorily, with a LoS D during both AM and PM peak hours under the revised arrangement.

Based on the revised layouts discussed in this letter being implemented in both the interim and ultimate scenarios, the intersection of the SLR/Wallgrove Road would operate satisfactorily.

The development requires 917 parking spaces under the ultimate development. The master plan allows for 1,500 parking spaces which is in excess of the required parking spaces. This is also a reduction for the previous proposal for the site, which provided 2,231 parking spaces.

Should you have any queries regarding the content of this addendum please do not hesitate to call.

Regards

A handwritten signature in dark ink, appearing to read 'O.P.' or 'Owen Peel', is positioned above the printed name.

Owen Peel

Senior Transport Planner
02 9239 7299

Attachment 1

DoPE Letter



Gazcorp Pty Ltd
c/o Mr Tim Ward
JBA Urban Planning Consultants Pty Ltd
PO BOX 375
NORTH SYDNEY NSW 2059

Contact: Robert Byrne
Phone: 02 9228 6398
Email: robert.byrne@planning.nsw.gov.au
Our ref: SSD 5248
Your ref: 11730

Dear Mr Ward

Gazcorp Industrial Estate [SSD 5248] – Issues identified following the exhibition of the EIS

The exhibition of the Environmental Impact Statement (EIS) for the above proposal ended on 23 May 2014. All submissions received by the Department during the exhibition are available on the Department's website (at <http://www.planning.nsw.gov.au/page>), and submissions received from agencies have been provided to you.

The submission from the Rural Fire Service (RFS) is outstanding and will be forwarded to you and published on the Department's website when received.

In addition to the issues raised in the submissions, the Department's issues with the proposal as detailed in the EIS are provided at **Attachment A**. Would you please provide a response to the Department's issues and those raised in the submissions as soon as possible. Your response to submissions should also address the issues raised in the RFS submission, when received.

Clause 113(7) of the *Environmental Planning and Assessment Regulation 2000* provides that the days occurring between the date of this letter and the date on which you provide your response to submissions to the Department are not included in the deemed refusal period.

Offer to Enter into Planning Agreement, 26 March 2014

The Department has considered the above offer and provides the comments at **Attachment B** for your review. Please provide your review of those comments and any other changes in a final offer as soon as possible. The Department is preparing a draft Voluntary Planning Agreement based on the offer in liaison with Gazcorp's lawyers and will consider your review and any subsequent changes when received.

Your contact officer, Robert Byrne, can be contacted on the above details. Please mark all correspondence to Mr Byrne's attention.

Yours sincerely

Chris Ritchie
Manager
Industry, Key Sites and Social Projects

24/7/14

Attd. Attachments A and B.

Attachment A

ISSUES RAISED BY THE DEPARTMENT OF PLANNING AND ENVIRONMENT

Traffic and access

Gazcorp is proposing a permanent single access point off Wallgrove Road. Access to the site should be off the Southern Link Road (SLR), with only interim access off Wallgrove Road until such time as the SLR is constructed between the intersection of Wallgrove Road/ SLR and the Gazcorp access point off the SLR. Access to the site from the SLR is preferred as Wallgrove Road is the higher-order Road and it is important to preserve the efficient functioning of Wallgrove Road by minimising the number of potential new intersections.

Access off the SLR in preference to Wallgrove Road makes is preferred as it would appear to resolve many of the Department's issues identified below. These concerns arise principally from the relatively close proximity of the proposed access intersection off Wallgrove Road and the future SLR/Wallgrove Road intersection. Further, there is the likelihood that the proposed access off Wallgrove Road would be restricted by the Roads and Maritime Service once the SLR becomes operational.

The Department's issues in relation to the proposed access intersection are as follows:

Proposed signalised intersection on Wallgrove Road, 250m south of the proposed SLR/Wallgrove Road intersection:

- Spacing of 250m between signalised intersections is inconsistent with the preferred spacing/design standard of 400 m to 500 m (consistent with other parts of the SLR).
- The EIS modelling does not take into account the most recent SLR concept design (refer to **Figure 1**). The SLR/Wallgrove Road intersection will be based on the current SLR design and accompanying GHD traffic modelling.
- The EIS SIDRA modelling indicates that queues on the southern approach to the SLR/Wallgrove Road intersection would be in excess of 400 m in the 2031 PM peak. Queues of this length would extend beyond the Wallgrove Road/Gazcorp intersection. Note, however, that the latest SLR modelling (dated 25/2/2014) indicates shorter queue lengths of 100 m during peaks in the year 2036.
- The EIS SIDRA modelling indicates that queues on the northern approach to the Wallgrove Road/Gazcorp intersection would be 200 m in the 2031 AM peak. Queues of this length would extend close to the SLRN/Wallgrove Road intersection.
- The EIS traffic report indicates that a 100 m right hand turn (RHT) storage bay is required on the northern approach of the Wallgrove Road/Gazcorp intersection. This will require a bay length of 200 m to allow for queue and deceleration. The turn bay and deceleration provision on the northern approach to Wallgrove Road/ Gazcorp intersection may overlap with the RHT bay and deceleration provision proposed on southern approach to SLR/Wallgrove Road intersection (refer **Figure 2**). Whilst the schematic layout is provided in the traffic report (SIDRA output), the Department could not locate any detailed drawings demonstrating this intersection arrangement. Please provide such drawings.
- Whilst the Department does not have detailed or concept plans for Wallgrove Road or the Wallgrove Road /Gazcorp intersection, it appears that the intersection and site development is based on maintaining the existing property boundary along Wallgrove Road. If widening of the road reserve is required, future widening of Wallgrove Road and the proposed intersection extents need to be considered and accommodated by adjustment to property boundaries.

- The Department requires a review of proposed road and intersection designs to ensure that:
 - Wallgrove Road can be expanded to 2 lanes in each direction plus the median without the need to widen the existing road reserve;
 - the proposed intersections of SLR/Wallgrove Road and Wallgrove Road/Gazcorp site are accommodated by the proposed development; and
 - the proposed turn bays and approaches at SLR/Wallgrove Road and Wallgrove Road/Gazcorp site intersections are compatible with each other and accommodated by the footprint of the proposed development.
- Due to the latest design for the intersection layout (SLR/Wallgrove Road intersection), the road layout is now closer to the north-east corner of the Gazcorp proposal. Whilst the road works and 4.5m footway area can be provided outside the Gazcorp proposal, the landscaped “buffer zone” is reduced in this area. The Department requires that you address any changes required as a result of the landscaped buffer zone requirement.
- Whilst the intersection to the Gazcorp proposal (SLR/Wallgrove Road intersection and the proposed access point from Wallgrove Road to the Gazcorp site) has not been shown, there is approximately 120 m available for deceleration and storage. Please confirm that this intersection can be accommodated based on **Figures 2, 3 and 4**. The Department notes that the SLR has adopted an intersection spacing of approximately 400 to 500 m, consistent with RMS guidelines. This would be inconsistent with the 120 m proposed for deceleration and storage.

Figure 1

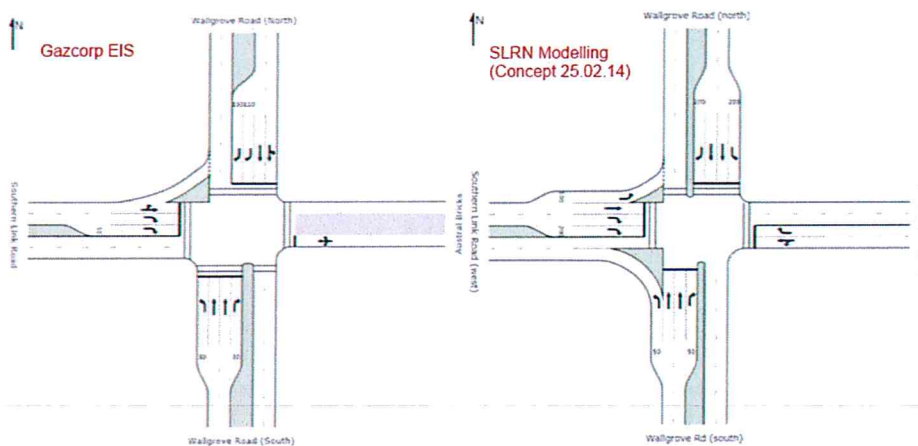


Figure 2

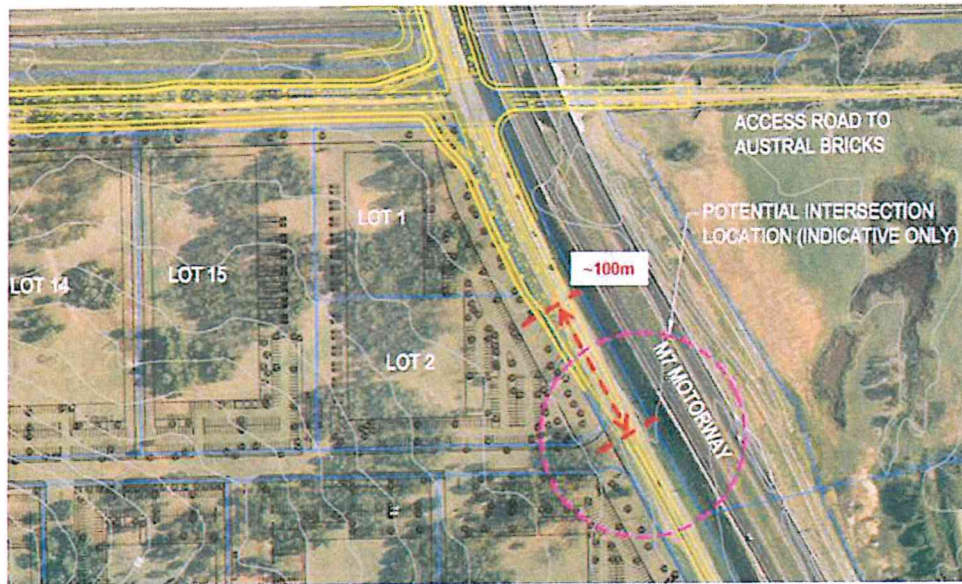


Figure 3

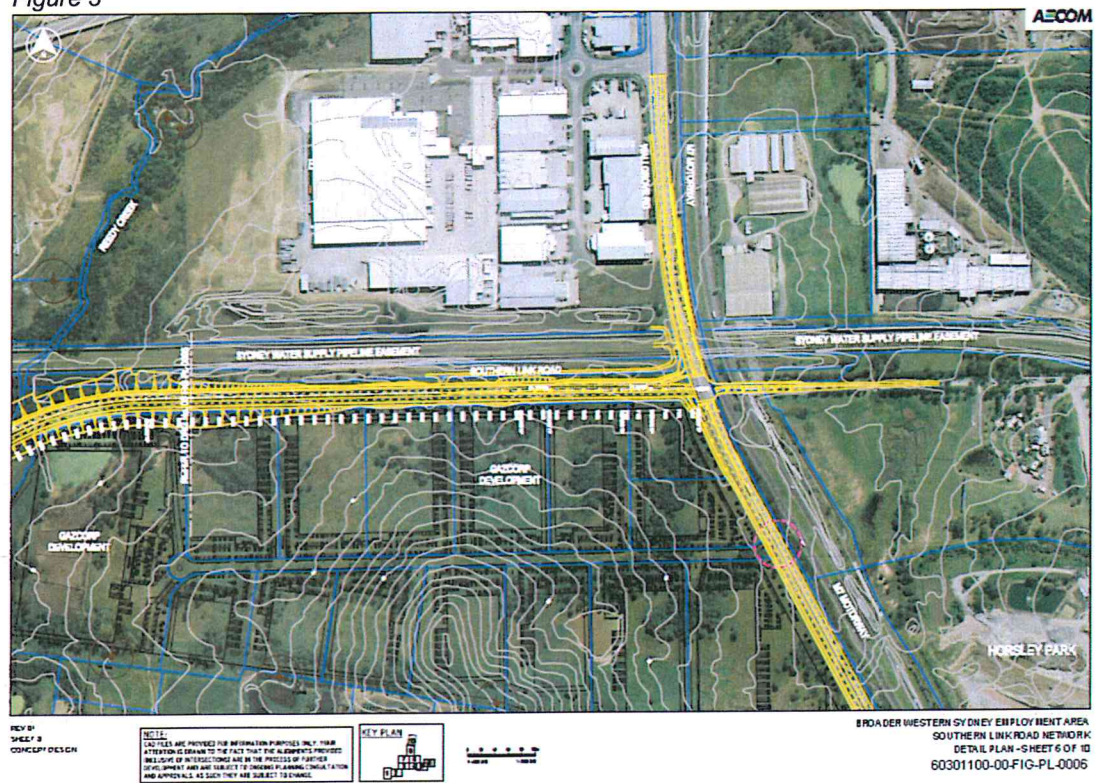
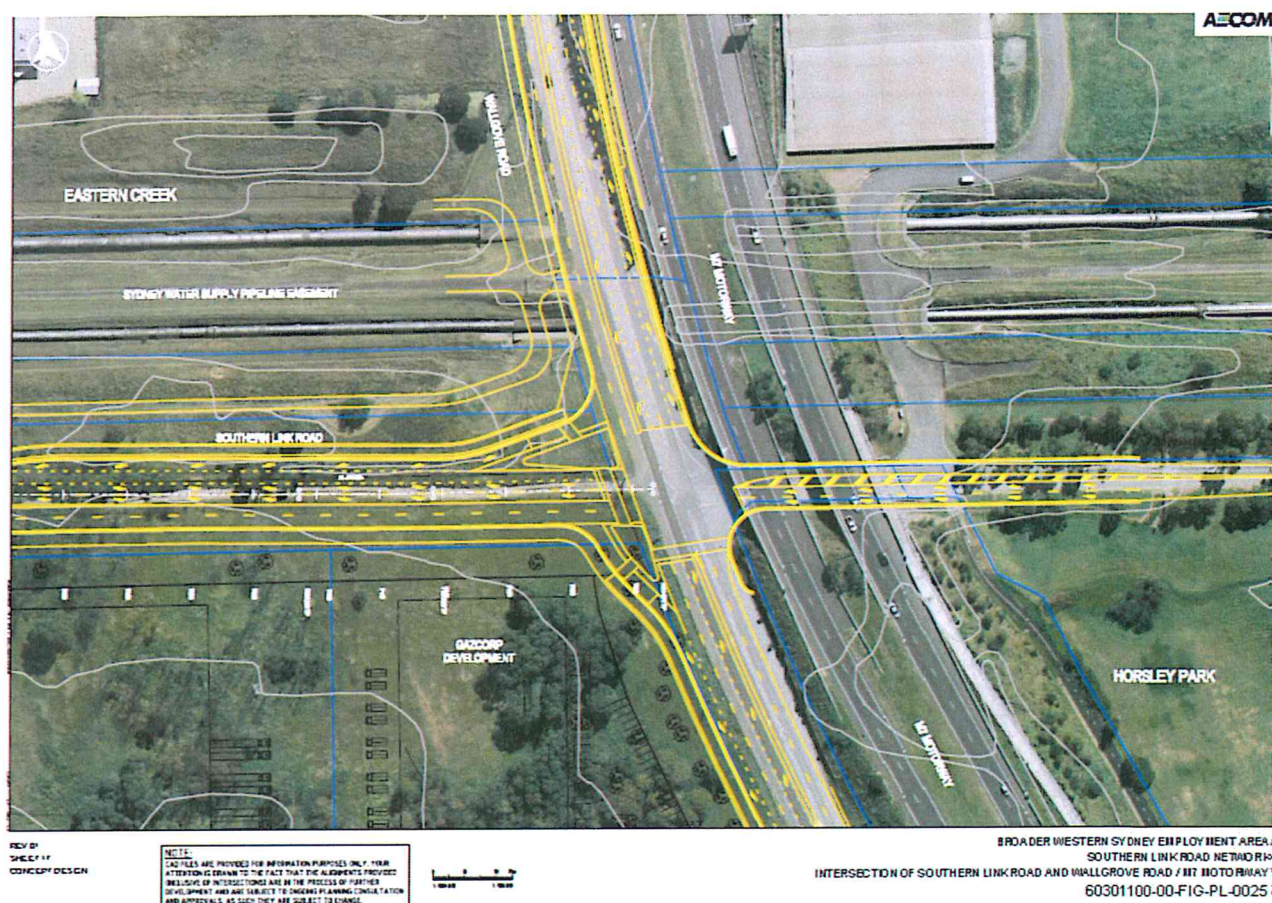


Figure 4



Residential amenity- mitigation of noise and visual impacts

Provide greater consideration to the interface of the proposal with the residential properties to the south of the site. Some of the residences are within 200 m of the site boundary.

The 3 m high colour bond acoustic fence proposed as part of Stage 1 is not considered visually appropriate for a residential interface and is required to be replaced with a boundary/fence treatment which is aesthetically acceptable when viewed from the residential properties. In this regard, consideration should be given to a boundary treatment which combines earth mounding, fencing and landscaping.

Amend the EIS to include a specific section addressing residential amenity. This section should identify and map the location of nearby residences using current aerial photography. Provide specific details of measures to preserve the visual and acoustic amenity of potentially affected residences.

Boundary design treatments, including fencing and landscaping should form a component of the site Development Control Plan required under clause 18 of the *State Environment Planning Policy (Western Sydney Employment Area) 2009* (WSEA SEPP).

Site Development Control Plan

A Development Control Plan for the site is required to be prepared. Clause 18(1) of the WSEA SEPP prevents the Minister from granting consent to the current proposal unless a DCP for the site has been prepared. The Department does not consider section 4.2 of the EIS to be an acceptable substitute for a DCP.

Clause 18(5) of the WSEA SEPP relates to the preparation of a DCP for part of a precinct only (as in the case with the subject proposal) and requires a DCP to integrate with planning for the whole of

the precinct and to take into account any other DCP applying to the precinct. In this regard, you should take into account the approved site DCP for the Jacfin Horsley Park approval (MP10_0129). The Jacfin DCP can be viewed on the Department's website at the following link:

<https://majorprojects.affinitylive.com/public/fd965638856c05ec4a1c2ffbda573b32/Appendix%20L.pdf>

Biodiversity offsets impacts on threatened ecological communities

The proposal involves the clearing of 13.1 ha of critically endangered Cumberland Plain Woodland and 1.4 ha of endangered ecological community River Flat Eucalypt Forest. The EIS indicates that the project will have a significant impact on threatened Ecological Communities listed under the *Threatened Species Conservation Act 1995*.

The proposal outlined in section 5.3.3 of the EIS to offset only 50 percent of the required ecosystem credits indicated in the bio banking assessment is not considered appropriate in this instance. The justification for the 50 percent discounting of the required offset ecosystem credits is not considered to be valid for the reasons outlined in the letter from the Office of Environment and Heritage dated 30 May 2014. Having regard to the extent of proposed site coverage and the relative absence of opportunities to avoid impacts under the current proposal, it is considered that no discount should be applied to the required ecosystem credits indicated in the bio banking assessment.

Attachment B - Letter of Offer, dated 26 March 2014 – DEPARTMENT OF PLANNING AND ENVIRONMENT COMMENTS

The Department supports land dedication and the proposed Works-in-Kind (WIK) for the SLRN corridor as they are considered consistent with other development proposals in the Western Sydney Employment Area. The extent of dedication and proposed WIK would be subject to a Voluntary Planning Agreement (VPA) to be agreed between the developer and the Department.

The Department provides the following comments on the above letter of offer which you should address in a final offer:

General:

The Department will not be liable for any costs or avoidable responsibilities and obligations as part of a VPA but will be an entity to hold the land until it is required, such that:

- there are no compensations to Gazcorp from the Department arising from the dedication;
- the Department is not liable for any construction or development costs;
- the management, maintenance and liability of the land remains with Gazcorp until its realisation as a road, or ownership by Roads and Maritime Services/Council, or until funds are made available to manage and maintain the land, and the Department is indemnified accordingly.

Term 2:

The Department supports the dedication of the land and the offsetting of the land value against the contribution amount. However, please note that Roads and Maritime Services has not formally committed to the Southern Link Road Network and will not be in a position to confirm whether it will become a regional road.

The words, "generally in accordance with" or similar should be added to provide flexibility for the future extent/location of the land to be dedicated.

Term 3:

The value of the land to be transferred should be determined at the time of the transfer.

Term 7:

Include provision for the timing of the land dedication to be agreed between the Minister for Planning and Gazcorp. This will address the scenario if there is no upfront dedication if development consent is issued for the SSD 5248 application.

Attachment 2

Site Masterplan



NOTES:

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ALL LEVELS AND DIMENSIONS TO BE VERIFIED PRIOR TO COMMENCEMENT OF WORK. USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

ALL WORK TO COMPLY WITH CURRENT REGULATIONS AND S.A.A. STANDARDS.

I	MC	16.12.14	Approval
H	MC	14.11.14	Approval
G	MC	15.10.14	Approval
F	MS	06.02.14	Approval
E	MS	24.01.14	Approval
D	SdO	21.10.13	Information
C	SdO	25.07.13	Information
B	SdO	25.05.13	Information
A	SdO	22.05.13	Information

No. Initial DATE REVISION / ISSUE DETAILS

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CLIENT

GAZCORP PTY LTD

STREET ADDRESS
SUBURB STATE AND POSTCODE

phone : (02) 0000 0000
fax : (02) 0000 0000
email: email address

PROJECT:

MOMENTUM M7
813-913 WALLGROVE ROAD
EASTERN CREEK NSW

SCALE:

1:2000 @A1

DATE:

16/12/2014 SdO

DRAWN BY:

GA: MS

DRAWING TITLE:

MASTER PLAN

JOB NO:

12026

DRAWING NUMBER:

DA-001

ISSUE:

I

Attachment 3

SIDRA Outputs

MOVEMENT SUMMARY



Site: 2021 AM INT- Scenario 4

New Site

Signals - Fixed Time Cycle Time = 146 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Wallgrove Road (South)											
1	L2	167	14.0	1.376	384.2	LOS F	192.1	1506.3	0.69	1.77	8.2
2	T1	1007	14.0	1.376	378.5	LOS F	192.1	1506.3	0.69	1.77	8.3
3	R2	27	58.0	0.420	22.1	LOS B	1.1	11.4	0.53	0.73	41.4
Approach		1202	15.0	1.376	371.2	LOS F	192.1	1506.3	0.68	1.75	8.4
East: Austral Bricks											
4	L2	11	100.0	0.310	79.7	LOS F	1.8	20.7	0.98	0.73	25.4
5	T1	1	0.0	0.310	73.6	LOS F	1.8	20.7	0.98	0.73	26.2
6	R2	14	58.0	0.310	79.8	LOS F	1.8	20.7	0.98	0.73	25.3
Approach		25	73.1	0.310	79.5	LOS F	1.8	20.7	0.98	0.73	25.4
North: Wallgrove Road (North)											
7	L2	28	32.0	0.023	8.8	LOS A	0.4	3.4	0.20	0.61	50.2
8	T1	1305	14.0	1.090	141.5	LOS F	170.0	1332.9	1.00	1.52	18.0
9	R2	312	14.0	1.418	467.9	LOS F	62.5	489.9	1.00	1.57	6.8
Approach		1645	14.3	1.418	201.0	LOS F	170.0	1332.9	0.99	1.51	13.9
West: Southern Link Road											
10	L2	99	14.0	0.894	90.0	LOS F	12.5	97.9	1.00	0.96	23.9
11	T1	1	0.0	0.894	84.2	LOS F	12.5	97.9	1.00	0.96	24.3
12	R2	54	14.0	0.894	89.9	LOS F	12.5	97.9	1.00	0.96	23.8
Approach		154	13.9	0.894	89.9	LOS F	12.5	97.9	1.00	0.96	23.8
All Vehicles		3026	15.1	1.418	262.0	LOS F	192.1	1506.3	0.87	1.57	11.3

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P11	South Stage 1	53	61.6	LOS F	0.2	0.2	0.92	0.92	
P12	South Stage 2	53	59.8	LOS E	0.2	0.2	0.91	0.91	
P2	East Full Crossing	53	11.5	LOS B	0.1	0.1	0.40	0.40	
P3	North Full Crossing	53	67.3	LOS F	0.2	0.2	0.96	0.96	
P4	West Full Crossing	53	11.5	LOS B	0.1	0.1	0.40	0.40	
All Pedestrians		263	42.4	LOS E			0.72	0.72	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: 2021 PM INT- Scenario 4

New Site

Signals - Fixed Time Cycle Time = 200 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Wallgrove Road (South)											
1	L2	54	14.0	1.130	172.8	LOS F	196.1	1537.1	1.00	1.44	15.8
2	T1	1184	14.0	1.130	167.1	LOS F	196.1	1537.1	1.00	1.44	16.0
3	R2	2	58.0	0.046	90.9	LOS F	0.2	2.0	0.88	0.67	23.2
Approach		1240	14.1	1.130	167.2	LOS F	196.1	1537.1	1.00	1.44	16.0
East: Austral Bricks											
4	L2	6	100.0	0.431	100.7	LOS F	3.9	42.4	0.98	0.77	22.1
5	T1	1	0.0	0.431	94.6	LOS F	3.9	42.4	0.98	0.77	22.7
6	R2	34	58.0	0.431	100.8	LOS F	3.9	42.4	0.98	0.77	22.1
Approach		41	63.0	0.431	100.6	LOS F	3.9	42.4	0.98	0.77	22.1
North: Wallgrove Road (North)											
7	L2	8	32.0	0.008	16.5	LOS B	0.3	2.3	0.33	0.62	45.4
8	T1	1069	14.0	0.930	30.3	LOS C	84.2	660.0	0.87	0.84	40.0
9	R2	99	14.0	1.119	176.6	LOS F	15.0	117.7	1.00	1.05	15.1
Approach		1177	14.1	1.119	42.5	LOS C	84.2	660.0	0.88	0.86	35.2
West: Southern Link Road											
10	L2	312	14.0	1.133	238.0	LOS F	79.0	618.8	1.00	1.20	12.1
11	T1	1	0.0	1.133	232.3	LOS F	79.0	618.8	1.00	1.20	12.2
12	R2	167	14.0	1.133	238.0	LOS F	79.0	618.8	1.00	1.20	12.1
Approach		480	14.0	1.133	238.0	LOS F	79.0	618.8	1.00	1.20	12.1
All Vehicles		2938	14.8	1.133	127.9	LOS F	196.1	1537.1	0.95	1.16	19.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate		
		ped/h	sec		Pedestrian ped	Distance m	per ped		
P11	South Stage 1	53	57.9	LOS E	0.2	0.2	0.76	0.76	
P12	South Stage 2	53	56.4	LOS E	0.2	0.2	0.75	0.75	
P2	East Full Crossing	53	16.4	LOS B	0.1	0.1	0.41	0.41	
P3	North Full Crossing	53	62.5	LOS F	0.2	0.2	0.79	0.79	
P4	West Full Crossing	53	16.4	LOS B	0.1	0.1	0.41	0.41	
All Pedestrians		263	41.9	LOS E			0.62	0.62	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 2021 PM INT- Scenario 4 _ProposedUpgrade**

SLR/Wallgrove Road Revised Interim Layout

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		veh	Distance m	per veh	km/h	
South: Wallgrove Road (South)											
1	L2	54	14.0	0.066	23.1	LOS B	1.6	12.9	0.56	0.69	42.3
2	T1	1184	14.0	0.820	21.8	LOS B	32.0	250.6	0.72	0.67	44.1
3	R2	2	58.0	0.024	65.0	LOS E	0.1	1.3	0.95	0.62	28.0
Approach		1240	14.1	0.820	22.0	LOS B	32.0	250.6	0.72	0.67	44.0
East: Austral Bricks											
4	L2	6	100.0	0.299	57.7	LOS E	2.3	24.4	0.93	0.75	29.9
5	T1	1	0.0	0.299	51.6	LOS D	2.3	24.4	0.93	0.75	31.1
6	R2	34	58.0	0.299	57.8	LOS E	2.3	24.4	0.93	0.75	30.0
Approach		41	63.0	0.299	57.7	LOS E	2.3	24.4	0.93	0.75	30.0
North: Wallgrove Road (North)											
7	L2	8	32.0	0.012	22.8	LOS B	0.2	2.2	0.54	0.64	42.1
8	T1	1069	14.0	0.812	26.5	LOS B	30.9	242.5	0.81	0.74	41.8
9	R2	99	14.0	0.879	77.5	LOS F	6.6	52.0	1.00	0.96	25.9
Approach		1177	14.1	0.879	30.7	LOS C	30.9	242.5	0.82	0.76	39.7
West: Southern Link Road											
10	L2	312	14.0	0.890	60.3	LOS E	31.7	248.1	1.00	0.98	29.6
11	T1	1	0.0	0.890	54.6	LOS D	31.7	248.1	1.00	0.98	30.2
12	R2	167	14.0	0.890	60.4	LOS E	31.7	248.1	1.00	0.98	29.7
Approach		480	14.0	0.890	60.3	LOS E	31.7	248.1	1.00	0.98	29.7
All Vehicles		2938	14.8	0.890	32.2	LOS C	32.0	250.6	0.81	0.76	39.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate		
		ped/h	sec		Pedestrian ped	Distance m	per ped		
P11	South Stage 1	53	36.1	LOS D	0.1	0.1	0.78	0.78	
P12	South Stage 2	53	32.3	LOS D	0.1	0.1	0.73	0.73	
P2	East Full Crossing	53	18.7	LOS B	0.1	0.1	0.56	0.56	
P3	North Full Crossing	53	42.6	LOS E	0.2	0.2	0.84	0.84	
P4	West Full Crossing	53	18.7	LOS B	0.1	0.1	0.56	0.56	
All Pedestrians		263	29.7	LOS C			0.69	0.69	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: 2021 AM INT- Scenario 4 _ProposedUpgrade**

SLR/Wallgrove Road Revised Interim Layout

Signals - Fixed Time Cycle Time = 142 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Wallgrove Road (South)											
1	L2	167	14.0	0.247	35.7	LOS C	7.6	59.6	0.71	0.76	37.0
2	T1	1007	14.0	0.891	45.9	LOS D	43.9	344.3	0.92	0.89	34.1
3	R2	27	58.0	0.493	85.0	LOS F	2.0	21.4	1.00	0.73	24.3
Approach		1202	15.0	0.891	45.4	LOS D	43.9	344.3	0.89	0.87	34.2
East: Austral Bricks											
4	L2	11	100.0	0.160	63.9	LOS E	1.6	17.8	0.90	0.73	28.5
5	T1	1	0.0	0.160	57.7	LOS E	1.6	17.8	0.90	0.73	29.5
6	R2	14	58.0	0.160	64.0	LOS E	1.6	17.8	0.90	0.73	28.6
Approach		25	73.1	0.160	63.7	LOS E	1.6	17.8	0.90	0.73	28.6
North: Wallgrove Road (North)											
7	L2	28	32.0	0.028	14.2	LOS A	0.6	5.7	0.35	0.64	46.8
8	T1	1305	14.0	0.854	15.9	LOS B	33.6	263.6	0.58	0.55	47.5
9	R2	312	14.0	0.595	49.2	LOS D	16.8	131.5	0.83	0.82	32.4
Approach		1645	14.3	0.854	22.2	LOS B	33.6	263.6	0.63	0.60	43.6
West: Southern Link Road											
10	L2	99	14.0	0.524	62.2	LOS E	9.7	76.2	0.95	0.81	29.2
11	T1	1	0.0	0.524	56.5	LOS E	9.7	76.2	0.95	0.81	29.7
12	R2	54	14.0	0.524	62.3	LOS E	9.7	76.2	0.95	0.81	29.3
Approach		154	13.9	0.524	62.2	LOS E	9.7	76.2	0.95	0.81	29.2
All Vehicles		3026	15.1	0.891	33.8	LOS C	43.9	344.3	0.75	0.72	38.3

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped	
P11	South Stage 1	53	57.8	LOS E	0.2	0.2	0.90	0.90	
P12	South Stage 2	53	53.4	LOS E	0.2	0.2	0.87	0.87	
P2	East Full Crossing	53	28.6	LOS C	0.1	0.1	0.64	0.64	
P3	North Full Crossing	53	65.3	LOS F	0.2	0.2	0.96	0.96	
P4	West Full Crossing	53	28.6	LOS C	0.1	0.1	0.64	0.64	
All Pedestrians		263	46.7	LOS E			0.80	0.80	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: 2036 AM - Scenario 4_Aimsunflows

New Site

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Degree of Saturation)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Northern Site Access											
1	L2	24	14.0	0.059	43.2	LOS D	1.1	8.5	0.80	0.70	34.4
3	R2	128	14.0	0.537	58.7	LOS E	7.2	56.5	0.98	0.80	29.9
Approach		153	14.0	0.537	56.3	LOS D	7.2	56.5	0.95	0.78	30.5
East: Southern Link Road (East)											
4	L2	402	14.0	0.734	15.7	LOS B	24.0	188.4	0.54	0.63	48.1
5	T1	1302	14.0	0.734	7.3	LOS A	24.0	188.4	0.43	0.44	52.9
Approach		1704	14.0	0.734	9.3	LOS A	24.0	188.4	0.46	0.49	51.7
West: Southern Link Road (West)											
11	T1	751	14.0	0.530	6.5	LOS A	16.6	130.4	0.45	0.42	54.1
12	R2	77	14.0	0.530	18.9	LOS B	3.2	25.0	0.75	0.73	45.4
Approach		827	14.0	0.530	7.6	LOS A	16.6	130.4	0.48	0.45	53.1
All Vehicles		2684	14.0	0.734	11.4	LOS A	24.0	188.4	0.49	0.49	50.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	9.6	LOS A	0.1	0.1	0.40	0.40
P2	East Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	53.3	LOS E	0.2	0.2	0.94	0.94
All Pedestrians		158	39.1	LOS D			0.77	0.77

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: 2036 PM - Scenario 4_Aimsunflows

New Site

Signals - Fixed Time Cycle Time = 85 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Northern Site Access											
1	L2	77	14.0	0.092	17.9	LOS B	1.7	13.1	0.56	0.68	45.7
3	R2	402	14.0	0.843	43.7	LOS D	18.1	141.7	0.99	0.95	34.0
Approach		479	14.0	0.843	39.6	LOS C	18.1	141.7	0.92	0.91	35.5
East: Southern Link Road (East)											
4	L2	128	14.0	0.780	35.0	LOS C	17.8	139.3	0.89	0.91	39.3
5	T1	877	14.0	0.780	27.5	LOS B	18.5	145.4	0.89	0.86	41.0
Approach		1005	14.0	0.780	28.5	LOS B	18.5	145.4	0.89	0.87	40.8
West: Southern Link Road (West)											
11	T1	1537	14.0	0.829	15.7	LOS B	25.1	196.9	0.75	0.78	47.7
12	R2	24	14.0	0.829	23.6	LOS B	18.3	143.1	0.79	0.89	44.8
Approach		1561	14.0	0.829	15.8	LOS B	25.1	196.9	0.75	0.78	47.6
All Vehicles		3045	14.0	0.843	23.7	LOS B	25.1	196.9	0.82	0.83	42.9

Level of Service (LOS) Method: Delay (RTA NSW).

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.

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	20.5	LOS C	0.1	0.1	0.70	0.70
P2	East Full Crossing	53	29.7	LOS C	0.1	0.1	0.84	0.84
P4	West Full Crossing	53	28.9	LOS C	0.1	0.1	0.83	0.83
All Pedestrians		158	26.4	LOS C			0.79	0.79

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: 2036 AM - Scenario 4

New Site

Signals - Fixed Time Cycle Time = 124 seconds (Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Wallgrove Road (South)											
1	L2	840	14.0	0.822	26.6	LOS B	30.3	237.5	0.85	0.98	41.2
2	T1	935	14.0	0.906	54.4	LOS D	33.4	262.1	0.96	1.00	31.8
3	R2	81	58.0	0.283	28.0	LOS B	2.5	26.4	0.84	0.76	39.2
Approach		1856	15.9	0.906	40.7	LOS C	33.4	262.1	0.90	0.98	35.8
East: Austral Bricks											
4	L2	112	100.0	1.875	867.5	LOS F	148.7	1213.7	1.00	3.22	4.0
5	T1	463	0.0	1.875	861.4	LOS F	148.7	1213.7	1.00	3.22	4.0
6	R2	348	58.0	1.827	826.8	LOS F	88.3	925.8	1.00	2.38	4.1
Approach		923	34.0	1.875	849.6	LOS F	148.7	1213.7	1.00	2.90	4.0
North: Wallgrove Road (North)											
7	L2	461	32.0	0.600	29.0	LOS C	19.6	174.9	0.76	0.82	39.3
8	T1	779	14.0	0.693	40.2	LOS C	20.7	162.2	0.94	0.82	36.3
9	R2	401	14.0	1.402	437.6	LOS F	74.2	581.6	1.00	1.88	7.3
Approach		1641	19.1	1.402	134.1	LOS F	74.2	581.6	0.90	1.08	18.7
West: Southern Link Road											
10	L2	202	14.0	0.251	23.5	LOS B	7.0	54.9	0.62	0.72	42.7
11	T1	153	0.0	0.441	49.6	LOS D	8.3	58.4	0.94	0.76	33.2
12	R2	396	14.0	0.807	67.4	LOS E	12.7	99.3	1.00	0.91	28.2
Approach		751	11.2	0.807	51.9	LOS D	12.7	99.3	0.89	0.83	32.1
All Vehicles		5171	19.4	1.875	216.3	LOS F	148.7	1213.7	0.92	1.33	13.2

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	48.0	LOS E	0.2	0.2	0.88	0.88
P12	South Stage 2	53	45.4	LOS E	0.2	0.2	0.86	0.86
P2	East Full Crossing	53	34.2	LOS D	0.1	0.1	0.74	0.74
P3	North Full Crossing	53	56.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	38.8	LOS D	0.1	0.1	0.79	0.79
All Pedestrians		263	44.5	LOS E			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: 2036 PM - Scenario 4

New Site

Signals - Fixed Time Cycle Time = 92 seconds (Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	v/c	sec		veh	m		per veh	km/h
South: Wallgrove Road (South)											
1	L2	406	14.0	0.375	8.7	LOS A	3.4	26.6	0.23	0.61	51.5
2	T1	784	14.0	1.170	213.8	LOS F	49.1	385.2	1.00	1.91	13.4
3	R2	117	58.0	1.364	392.0	LOS F	18.9	197.8	1.00	1.91	8.0
Approach		1307	17.9	1.364	166.0	LOS F	49.1	385.2	0.76	1.50	16.1
East: Austral Bricks											
4	L2	88	100.0	1.617	628.8	LOS F	106.8	858.5	1.00	3.20	5.3
5	T1	423	0.0	1.617	622.6	LOS F	106.8	858.5	1.00	3.20	5.4
6	R2	458	58.0	1.854	843.1	LOS F	110.4	1156.8	1.00	2.94	4.0
Approach		969	36.5	1.854	727.7	LOS F	110.4	1156.8	1.00	3.07	4.6
North: Wallgrove Road (North)											
7	L2	256	32.0	0.389	16.7	LOS B	5.3	47.1	0.72	0.77	45.3
8	T1	769	14.0	1.042	111.4	LOS F	31.1	243.7	1.00	1.51	21.3
9	R2	176	14.0	1.596	598.8	LOS F	35.8	280.5	1.00	2.25	5.6
Approach		1201	17.8	1.596	162.6	LOS F	35.8	280.5	0.94	1.46	16.4
West: Southern Link Road											
10	L2	456	14.0	0.621	23.7	LOS B	14.6	114.4	0.83	0.81	42.5
11	T1	265	0.0	0.569	33.7	LOS C	10.7	74.7	0.93	0.78	38.7
12	R2	816	14.0	1.010	97.1	LOS F	30.1	236.3	1.00	1.25	23.0
Approach		1537	11.6	1.010	64.4	LOS E	30.1	236.3	0.94	1.04	29.0
All Vehicles		5015	19.6	1.854	242.6	LOS F	110.4	1156.8	0.90	1.65	12.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P11	South Stage 1	53	33.1	LOS D	0.1	0.1	0.85	0.85
P12	South Stage 2	53	30.6	LOS D	0.1	0.1	0.82	0.82
P2	East Full Crossing	53	34.9	LOS D	0.1	0.1	0.87	0.87
P3	North Full Crossing	53	40.3	LOS E	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	40.3	LOS E	0.1	0.1	0.94	0.94
All Pedestrians		263	35.8	LOS D			0.88	0.88

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

LANE SUMMARY

 **Site: 2036 AM - Scenario 4_finalv1_RevD**

SLR/Wallgrove Road - Revised Layout

Signals - Fixed Time Cycle Time = 117 seconds (Optimum Cycle Time - Minimum Degree of Saturation)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Lane Use and Performance													
	Demand Flows			Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Veh	Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %	Cap. veh/h	v/c	%	sec							
South: Wallgrove Road (South)													
Lane 1	840	14.0	1042	0.806	100	18.9	LOS B	29.3	229.7	Short	180	0.0	27.2
Lane 2	467	14.0	626	0.746	100	36.5	LOS C	23.7	185.9	Full	500	0.0	0.0
Lane 3	467	14.0	626	0.746	100	36.5	LOS C	23.7	185.9	Full	500	0.0	0.0
Lane 4	81	58.0	101	0.802	100	72.5	LOS F	5.2	54.2	Short	110	0.0	0.0
Approach	1856	15.9		0.806		30.1	LOS C	29.3	229.7				
East: Austral Bricks													
Lane 1	112	100.0	500	0.223	100	23.3	LOS B	3.5	45.8	Short	100	0.0	0.0
Lane 2	232	0.0	300	0.772	100	55.1	LOS D	13.5	94.6	Short	110	0.0	0.0
Lane 3	232	0.0	300	0.772	100	55.1	LOS D	13.5	94.6	Full	500	0.0	0.0
Lane 4	174	58.0	202	0.862	100	70.6	LOS F	11.3	118.9	Full	500	0.0	0.0
Lane 5	174	58.0	202	0.862	100	70.6	LOS F	11.3	118.9	Short	150	0.0	0.0
Approach	923	34.0		0.862		57.1	LOS E	13.5	118.9				
North: Wallgrove Road (North)													
Lane 1	579	28.3	669	0.865	100	47.0	LOS D	34.5	299.9	Full	500	0.0	0.0
Lane 2	661	14.0	764	0.865	100	40.5	LOS C	38.4	301.1	Full	500	0.0	0.0
Lane 3	201	14.0	260	0.772	100	61.6	LOS E	11.8	92.9	Short	150	0.0	0.0
Lane 4	201	14.0	260	0.772	100	61.6	LOS E	11.8	92.9	Short	110	0.0	0.0
Approach	1641	19.1		0.865		47.9	LOS D	38.4	301.1				
West: Southern Link Road													
Lane 1	202	14.0	760	0.266	100	18.5	LOS B	5.6	44.0	Short	160	0.0	0.0
Lane 2	153	0.0	267	0.572	100	52.3	LOS D	8.4	58.7	Full	500	0.0	0.0
Lane 3	198	14.0	231	0.857	100	68.7	LOS E	12.6	98.4	Full	500	0.0	0.0
Lane 4	198	14.0	231	0.857	100	68.7	LOS E	12.6	98.4	Short	220	0.0	0.0
Approach	751	11.2		0.857		51.9	LOS D	12.6	98.4				
Intersection	5171	19.4		0.865		43.8	LOS D	38.4	301.1				

Level of Service (LOS) Method: Delay (RTA NSW).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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.

LANE SUMMARY

 **Site: 2036 PM - Scenario 4_finalv1_RevD**

SLR/Wallgrove Road - Revised Layout

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Degree of Saturation)

Lane Use and Performance													
	Demand Flows			Deg.	Lane	Average	Level of	95% Back of	Queue	Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Wallgrove Road (South)													
Lane 1	386	14.0	1244	0.310	100	9.1	LOS A	5.7	44.5	Short	180	0.0	0.0
Lane 2	370	14.0	551	0.671	100	39.1	LOS C	19.0	148.6	Full	500	0.0	0.0
Lane 3	370	14.0	551	0.671	100	39.1	LOS C	19.0	148.6	Full	500	0.0	0.0
Lane 4	111	58.0	131	0.845	100	74.7	LOS F	7.4	77.3	Short	110	0.0	0.0
Approach	1237	17.9		0.845		32.9	LOS C	19.0	148.6				
East: Austral Bricks													
Lane 1	84	100.0	411	0.205	100	21.7	LOS B	2.1	27.4	Short	100	0.0	0.0
Lane 2	201	0.0	244	0.825	100	61.8	LOS E	12.6	88.2	Short	110	0.0	0.0
Lane 3	201	0.0	244	0.825	100	61.8	LOS E	12.6	88.2	Full	500	0.0	0.0
Lane 4	218	58.0	318	0.685	100	52.7	LOS D	12.0	126.1	Full	500	0.0	0.0
Lane 5	218	58.0	318	0.685	100	52.7	LOS D	12.0	126.1	Short	150	0.0	0.0
Approach	921	36.5		0.825		53.8	LOS D	12.6	126.1				
North: Wallgrove Road (North)													
Lane 1	479	23.1	535	0.896	100	57.2	LOS E	30.8	258.0	Full	500	0.0	0.0
Lane 2	494	14.0	551	0.896	100	57.0	LOS E	33.0	258.9	Full	500	0.0	0.0
Lane 3	83	14.0	169	0.494	100	63.3	LOS E	4.8	37.9	Short	150	0.0	0.0
Lane 4	83	14.0	169	0.494	100	63.3	LOS E	4.8	37.9	Short	110	0.0	0.0
Approach	1140	17.8		0.896		58.0	LOS E	33.0	258.9				
West: Southern Link Road													
Lane 1	433	14.0	750	0.578	100	20.6	LOS B	15.3	119.9	Short	160	0.0	0.0
Lane 2	252	0.0	293	0.862	100	62.8	LOS E	16.2	113.5	Full	500	0.0	0.0
Lane 3	388	14.0	450	0.861	100	60.6	LOS E	24.6	193.1	Full	500	0.0	0.0
Lane 4	388	14.0	450	0.861	100	60.6	LOS E	24.6	193.1	Short	220	0.0	0.0
Approach	1460	11.6		0.862		49.1	LOS D	24.6	193.1				
Intersection	4758	19.6		0.896		47.9	LOS D	33.0	258.9				

Level of Service (LOS) Method: Delay (RTA NSW).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

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.