TRAFFIX

OAKDALE CENTRAL CONCEPT PLAN TRAFFIC IMPACT ASSESSMENT

AT

OLD WALLGROVE ROAD,

KEMPS CREEK AND HORSLEY PARK

Prepared on behalf of

GOODMAN INTERNATIONAL LIMITED

Prepared by

TRAFFIX

TRAFFIC AND TRANSPORT PLANNERS

Ref: 07098 CCP v4
May 2008

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CONTENTS

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1. INTRODUCTION

T R A F F I X has been commissioned by Goodman International to undertake a traffic impact assessment for a Concept Plan for a site referred to as "Oakdale Central." This Concept Plan application is made under the provisions of Section 75M of the EP&A Act and will be determined by the Minister for Planning. The site lies within the Penrith and Fairfield LGA's.

This report documents the findings of our investigations and should be read in the context of the overall Central Concept Plan Application prepared on behalf of Goodman International. The Concept Plan establishes a planning framework to guide the delivery of the Oakdale Central development.

The Oakdale Distribution Park comprises a total site of 421ha which forms the major part (64%) of DOP Site 8 of the Western Sydney Employment Hub, which has a total site area of 656ha. However, these 421ha include the existing Austral Quarry site which is located on the eastern part of the Park and while it is included in the Concept Plan area, the quarry will be operational under current approvals for the foreseeable future and will ultimately require rehabilitation before it can be redeveloped. An Oakdale Concept Plan has been separately prepared for the overall Oakdale Distribution Park covering a site area of 336.8ha, with a net developable area of 260.9ha. That report therefore focuses on the impacts associated with development on this site area and that report provides the context for the subject site as described below.

Specifically, the development area that is the subject of this report forms part of the overall Distribution Park and is known as "Oakdale Central". It has a site area of 61.2ha and a developable area of 52.8ha. Under SEPP (Infrastructure) 2007, the development will be referred to the RTA's Sydney Regional Development Advisory Committee.

The development proposed under the Concept Plan relates to predominantly warehousing/distribution and light industrial purposes and commercial office will be predominantly ancilliary to these uses.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Assesses the traffic impacts
- Section 5: Discusses internal design aspects
- Section 6: Presents the overall study conclusions.

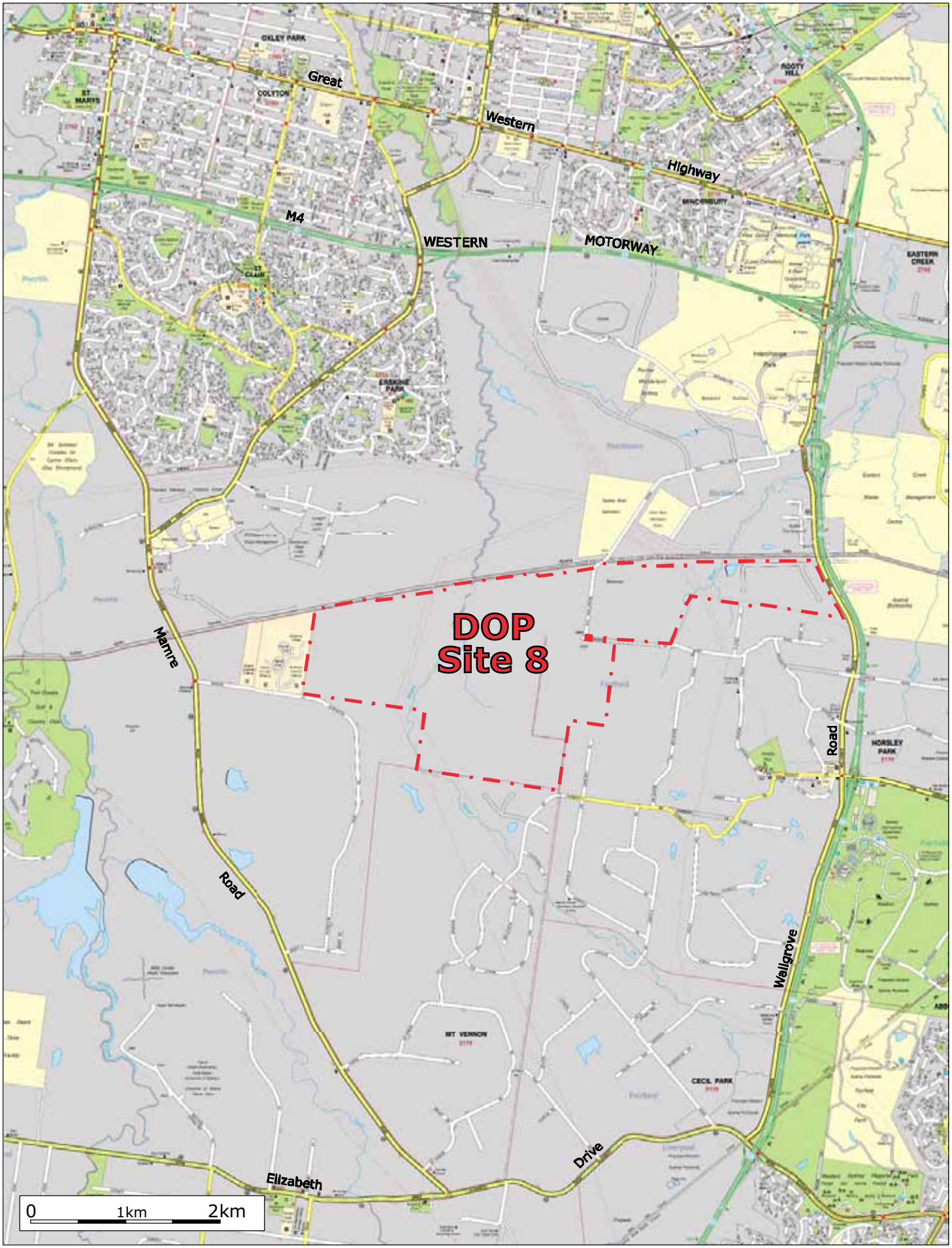
2. LOCATION AND SITE

The site is located within DOP Area 8 and is proposed to ultimately be accessed via a new east-west connecting public road linking Mamre Road in the west with Wallgrove Road in the east, traversing the southern side of the Sydney Water Supply pipeline. The eastern section of this road (i.e. east of the subject site) is on the existing alignment of Old Wallgrove Road, while the western section connects to Mamre Road on the alignment of Bakers Lane.

The eastern part of this new link road will provide the initial access for the subject Oakdale Central Concept Plan site. This new link road is about 5kms in length and provides the only viable access to land that is located to the south of the Sydney Water Supply pipeline, including the Central Concept Plan area. In this regard, it is only by virtue of the consolidated ownership of land within the study area by Goodman International that this new road link can be delivered in a timely fashion.

The subject site yields a developable area of 52.8ha. This land is dispersed along the southern side of the proposed new link road and access to lots is provided by a secondary road system. Two options are available for access via this secondary road system as discussed further below. These are shown in ***Appendix A*** which also depicts the extent of the site and the indicative building footprints.

The extent of the overall Oakdale Concept Plan area that contains the subject site is shown in ***Figures 1 and 2***. Figure 2 shows the Oakdale Central site I yellow, as well as the main east-west link road and interconnecting roads, comprising 6 new local road connections to the link road at full development.



Source: UBD 2006

OAKDALE CONCEPT PLAN TRAFFIC ASSESSMENT
OLD WALLGROVE ROAD, KEMPS CREEK AND ORCHARD HILLS PRECINCT

Prepared on behalf of Goodman International Limited

Figure 1 LOCATION

OAKDALE CONCEPT PLAN TRAFFIC ASSESSMENT
OLD WALLGROVE ROAD, KEMPS CREEK AND HORSLEY PARK

Prepared on behalf of Goodman International Limited

Figure **2** **SITE**

3. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the proposed development is provided in the Oakdale Central Concept Application Report prepared on behalf of Goodman International. This is based on the plans prepared by Goodman International as shown in ***Appendix A***. The development for which concept approval is now sought has a developable area of 52.8ha, including 7.5ha that is set aside for regional infrastructure, the majority of which relates to the Oakdale Link Road.

The nett developable area is therefore 39.2ha and this comprises three separate lots, as follows:

Lot 1	12.8ha	Sites 1A, 1B and 1C	(33% of area)
Lot 2:	15.3ha	Sites 2A, 2B; and	(39% of area)
Lot 3:	11.2ha	Single lot.	(28% of area)

The traffic and parking impacts arising from the development are discussed in Sections 5 and 6.

4. ASSESSMENT OF TRAFFIC IMPACTS

4.1 Warehouse Distribution Trip Rates

The rate of 15 trips per hectare has been adopted by the RTA in other comparable locations (including Eastern Creek and the M7 Business Hub), where there is a similar high proportion of warehouse and distribution facilities, with ancilliary offices and a small component of freestanding offices, such as regional corporate offices. The basis of this rate is not fully appreciated but it arguably does not take full account of public transport improvements that will underpin the 10% target set under SEPP 59. That is, it is a worst-case scenario which in the long term (pending implementation of public transport initiatives) is likely to overstate the traffic generation arising from Oakdale.

Application of this rate to the 39.3 ha of developable area results in 590 vehicle trips/hr in the morning peak and afternoon peak periods.

- 590 vehicle trips per hour in the morning peak (472 in, 118 out);
- 590 vehicle trips per hour in the evening peak (118 in, 472 out);

These trips are considered appropriate for adoption and are preferred to the RTA's generic rate. In addition, many of the development applications within Erskine Park and the M7 Business Hub have demonstrated trip rates that are lower than 15 trips/ha and this is a direct consequence of the following factors:

- Large warehouse developments typically operate 24 hours per day and 7 days per week, thereby spreading traffic loads and minimising peak period generation;
- Warehouse staff are usually rostered over this 24 hour shift with changeover times that do not generally coincide with the on-street peak period; and
- Peak period travel is usually associated with administrative staff, which is a small proportion of the overall workforce.

The RTA has also adopted this rate in the modelling undertaken for the Erskine Park Link Road Project Application. Accordingly, the adoption of 590 veh/hr is considered appropriate for assessment.

4.2 Impacts of Generated Traffic Based on Existing Network

The overall development of Oakdale Central will generate 590 veh/hr and these trips will be dispersed onto the two access roadways that connect to the Oakdale Link Road at Intersections 2 and 3 as shown in **Figure 2**. These intersections are also shown in **Appendix A**, with Intersection 2 proposed as a 'T' junction in a generally mid-block location along the Central Concept Plan area frontage; and intersection 3 located at the south-western corner of the Central Concept Plan area. In the short term, it is proposed to

construct the link road east of Intersection 3, to connect to Old Wallgrove Road and then to the M7 further to the east.

It is expected that traffic volumes will be distributed in proportion to the land area served by each road, as follows:

- Intersection 2 access 425 veh/hr (72% of traffic)
- Intersection 3 access 165 veh/hr (28% of traffic)

Conditions at Intersection 1

The southern approach to Intersection 1 will not be not relied upon for access to the Central Concept Plan area, other than to a minor extent during the first stage of development on Sites 1A and 2A which are the eastern-most lots within Lots 1 and 2. This will be the subject of a separate Project Application.

For the overall Central Concept Plan area, access will be provided through the construction of the section of the Oakdale Link Road that extends between Intersection 3 (the south-western limit of development) and the existing alignment of Old Wallgrove Road, upgraded as appropriate.

Accordingly, all trips will be accommodated via Intersections 2 and 3, with only through movements at Intersection 1 along the link road. Thus, maximum volumes along the link road will occur to the east of Intersection 2 (through Intersection 1) will be 590 veh/hr. This will equate to 472 veh/hr westbound (in) and 118 veh/hr eastbound (out) in the morning peak, with these flows reversed in the PM peak.

The southern section of Old Wallgrove Road (along the eastern boundary of the Central Concept Plan area) will continue to carry its existing volumes which principally relate to the existing quarrying activities associated with PGH Bricks (south of Burley Road) and Austral Bricks (opposite the site on Old Wallgrove Road). This site generates moderate volumes which are estimated to be about 30 veh/hr during peak periods. Accordingly, traffic volumes at Intersection 1 will be as follows during the AM Peak period:

AM PEAK

western approach	118 veh/hr through	0 veh/hr right
southern approach	0 veh/hr left	8 veh/hr right
eastern approach	472 veh/hr through	22 veh/hr left

PM PEAK

western approach	472 veh/hr through	0 veh/hr right
southern approach	0 veh/hr left	22 veh/hr left
eastern approach	118 veh/hr through	8 veh/hr left

It is evident that these volumes can be readily accommodated by a standard ‘T’ junction arrangement with single lanes on all approaches, but with a taper to facilitate the left turn from east top south. Operation will occur with Level of Service A during both peaks, assuming priority (stop) sign control at this ‘T’ junction.

Conditions at Intersection 2

Volumes at Intersection 2 will be as follows:

AM PEAK

western approach	33 veh/hr through	0 veh/hr right
southern approach	85 veh/hr right	0 veh/hr left
eastern approach	132 veh/hr through	340 veh/hr left

PM PEAK

western approach	32 veh/hr through	0 veh/hr right
southern approach	340 veh/hr right	0 veh/hr left
eastern approach	33 veh/hr through	85 veh/hr left

These results are moderate and the construction of a priority-controlled 'T' junction will result in operation with minimal delays and level of service A.

Conditions at Intersection 3

Traffic volumes at Intersection 3 will similarly occur as 'through' movements only with no turning movements (there being no construction of the link road west of this intersection). This will equate to 33 veh/hr eastbound and 132 veh/hr westbound in the AM Peak, with these flows reversed in the PM Peak. These flows are minimal and can readily be accommodated by a single lane in each direction.

Link Road Conditions East of Intersection 1

The through movement along Old Wallgrove Road immediately east of Intersection 1 will be about 620 veh/hr during peak periods (combined flow in both directions), comprising 590 veh/hr associated with the subject site; and 30 veh/hr associated with the PGH site. These volumes can be readily accommodated by Old Wallgrove Road, which has a mid-block capacity of about 1,200 veh/hr for a single undivided lane under interrupted flow conditions. Therefore a 7.0 metre wide undivided carriageway with one lane in each direction will readily accommodate the traffic generated under the Oakdale Central Concept Application.

This may require upgrading of sections of Old Wallgrove Road, subject to further detailed assessment. The bridge over the Sydney Water Pipeline will also need to provide a minimum 7m wide road carriageway and this appears to be achievable without widening the existing structure (subject to further detailed assessment). Local widening at bends may also be required to safely accommodate B Doubles and this will need to be assessed at the detailed design stage.

Conditions at the Intersection of Wallgrove Road with Old Wallgrove Road.

In order to assess current traffic volumes at this intersection, traffic volumes were undertaken during the PM peak period in May 2008. These showed that west of Wallgrove Road, Old Wallgrove presently carries a two-way hourly volume of 403 veh/hr, comprising 217 eastbound trips and 186 westbound trips. These would be reversed in the morning. These volumes are moderate and can be readily accommodated by a single lane in each direction. However, Old Wallgrove Road is presently constructed with two lanes in each direction for a distance of 220 metres west of Wallgrove Road, providing excess capacity.

The traffic volumes at this intersection are as follows during the critical PM peak period, with these volumes expected to be mirrored in the AM peak period.

AM PEAK

APPROACH	LEFT	THROUGH	RIGHT
Old Wallgrove Road West	110	27	49
Wallgrove Road South	75	747	5
M7 Ramps East	4	24	103
Wallgrove Road North	10	1017	118

PM PEAK

APPROACH	LEFT	THROUGH	RIGHT
Old Wallgrove Road West	118	24	75
Wallgrove Road South	49	1017	4
M7 Ramps East	5	27	10
Wallgrove Road North	103	747	110

The intersection was analysed using the aaSIDRA computer program and operates satisfactorily during both peak periods. The results of this analysis are presented in ***Appendix B1***.

The additional traffic generated by Oakdale Central Plan area (590 veh/hr) were superimposed onto the above volumes based on the same intersection directional splits that currently occur and the performance of the intersection has been reanalysed. The results are shown in ***Appendix B2***. The main issue relates to the right turn movement from Wallgrove Road into Old Wallgrove Road (north to west) which presently carries about 118 veh/hr and will increase to 373 veh/hr. This requires the construction of a 100m right turn bay in Wallgrove Road (north approach). It is also recommended that a single right turn lane be provided on the eastern (M7) approach), rather than two lanes as currently line-marked, due to the moderate volumes associated with this movement.

4.3 Impacts of Generated Traffic Based on Long Term Road Capacity

The Oakdale Central development will generate about 590 veh/hr (two-way) along Old Wallgrove Road to/from the M7. This represents a very small proportion of the 5,565 trips that are 'implicit in the planning for this road and it is concluded that the road system currently being developed (a 4 lane divided road with turn bays) will readily accommodate traffic generated by Oakdale Central (though with long term planning making provision for a 6 lane divided road within a 40 metre road reservation).

Specifically, traffic conditions along Old Wallgrove Road west of the M7 were previously assessed on the basis of the RTA's EMME2 outputs with an assumed 5,565 trips during both the morning and afternoon peaks, associated with the entire Eastern Creek Precinct, with 360ha of developable land. This was acknowledged as a significant increase over the 3,230 veh/hr and 3,656 veh/hr adopted in the original TMAP study. The various intersections along Old Wallgrove Road (Intersections C0 to C4) as well as with the M7 interchange were assessed on this basis, with 100% development completion of the Eastern Creek Precinct (anticipated in about 2016).

The traffic volumes shown in the overall Oakdale Concept and the balance of DOP Lot 8 indicate an additional 4,600 veh/hr along this eastern corridor (connecting to the M7), which will therefore increase total flows on approach to the M7 of about 10,165 veh/hr. This represents traffic associated with a total developable area of about 678ha, assuming a trip rate of 15 trips/ha.

On the basis that traffic planning along Old Wallgrove Road should be 'capped' at 5,565 veh/hr as is inherent in current planning (which underpins the proposed intersection layout at Old Wallgrove Road with the M7), it follows that the implicit development of up to 360ha can be accommodated that feeds into this intersection *wherever this may occur.* Expressed another way, the infrastructure that is already planned will accommodate 360/678 or slightly more than 50% of the overall developable lands within all areas under investigation (Eastern Creek Precinct, Oakdale and the balance of DOP Site 8). At that time, consideration will need to be given to:

- The construction of a new connection to the M7 south of Old Wallgrove Road; and/or
- The upgrading of the existing approved corridor and M7 interchange to provide increased road capacity.

This timeframe is however considered to be conservative as the development growth is likely to be slower. It will also need to be reviewed in the light of further modelling to be undertaken by the RTA.

In summary the traffic generated by this Concept Application can be readily accommodated with no significant external traffic improvements required, including the proposed works associated with the M7 Hub which are not relied upon.

4.4 Internal Road System

Traffic volumes have been reviewed on both internal roads accessing Intersections 2 and 3. Based on the volumes discussed in Section 4.2, provision of a single through lane in each direction will be acceptable with kerbside parking also permitted.

Conditions at the minor 'internal' 'T' intersection that separates lots 2 and 3 will also be satisfactory with priority (Give Way or Stop sign) control.

There is ample opportunity to access individual allotments from all estate roads and the proposed gentle road curvatures will provide satisfactory sight distances at driveways.

5. CONCLUSIONS

- *Based on the assumptions made, the traffic generation arising from the Oakdale Central Concept Plan Application can be accommodated on the road network as planned, with reliance made on a 2 lane undivided link road;*

- *Local improvements will be required to the intersection of Wallgrove Road with Old Wallgrove Road to provide a right turn bay (north to west);*

- *The road system underpinning Oakdale Central as proposed provides an efficient and logical road hierarchy which represents the staged construction of the link road between Intersection 3 and Old Wallgrove Road;*

- *The link road will be satisfactory with a 7 metre road carriageway along its length, subject to detailed assessment of the alignment at bends to accommodate B Doubles;*

- *The intersections that are created with link road will be priority-controlled 'T' junctions with single lane capacity on all approaches.*

- *The Oakdale Central Concept Plan Application is supported and provides a suitable basis for subsequent Project Applications.*

TRAFFIX

APPENDIX A:

Central Concept Plan

Site Area Schedule

	Central
Total Land Area	**61.2 ha**
Less: Restricted Areas	
Riparian/ 1:100 Flood Zone	8.4 ha
Easements	0.0 ha
Total Restricted Areas	(8.4 ha)
DEVELOPMENT Area	**52.8 ha**
Less: Regional infrastructure	
Sewer	0.0 ha
Water (Reservoir)	1.0 ha
Electricity (Substation)	1.0 ha
Regional Roads	
LINK "Oakdale "Road	5.5 ha
Total Regional Infrastructure	(7.5 ha)
Gross ESTATE Land Area	**45.3 ha**
Less: Estate Allocations	
Estate Road (#3)	0.9 ha
Detention Basin	3.6 ha
Sewerage Treatment	1.0 ha
Conservation (Ridge top)	0.5 ha
Total Estate Allocations	(6.0 ha)
Nett Development LOTS	**39.3 ha**
Development Lot 1	12.8 ha
Development Lot 2	15.3 ha
Development Lot 3	11.2 ha

Goodman

Extent of Old Wallgrove Road Upgrade via M7Hub

M7Hub

Bridge B1

Bridge B2

LINK Lot 1

Conservation & Recreation Lot

3

Conservation & Recreation Lot

1C

1B

1A

Estate Road 2

Estate Road 1

Estate Road 3

Services Lot 0.5ha

Water Reservoir Lot 1.0ha

Sub-station Lot 1.0ha

Sewerage Treatment Lot 1.0ha

2B

2A

Provision for future Link Road Option B

Provision for future Link Road Option A (or Estate Road)

DRAFT

Legend

- Proposed Boundary/ Road Reserve
- Existing Boundary
- Existing Road Reserve

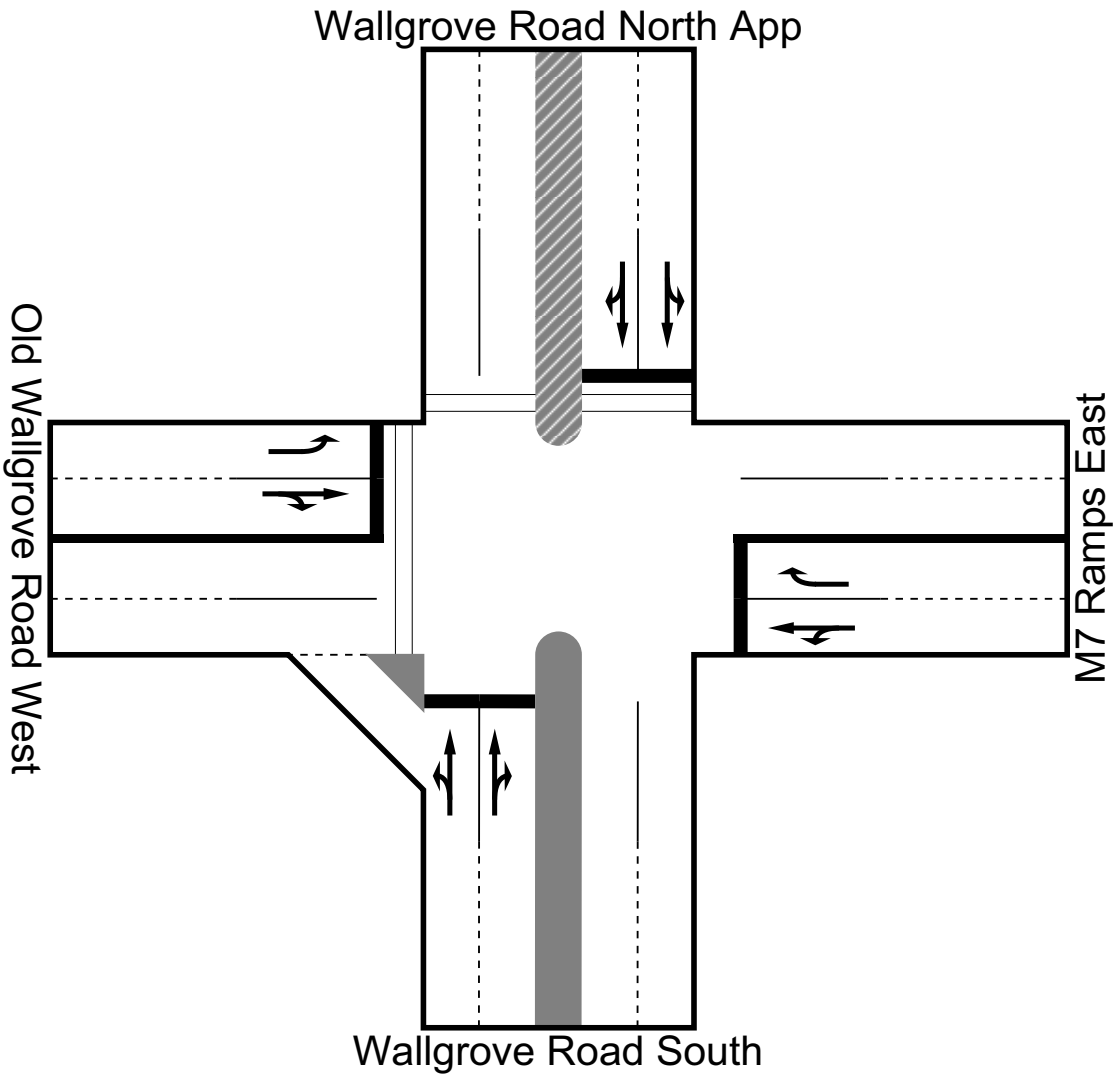
design+	Oakdale Horsley Park	*Oakdale CENTRAL Concept Plan (CP #1)* CENTRAL (Lot 2 DP120673)	**Scope of Application**	1:5000 @ A1 1:10000 @ A3 25 Jan 08 JH	SP DHL SK58 (B)

TRAFFIX

APPENDIX B1:

SIDRA MODELLING:

Existing Conditions



EXISTING GEOMETRY

SIDRA INTERSECTION

Movement Summary

Wallgoove/Old Wallgrove Existing

AM Peak

Signalised - Fixed time **Cycle Time = 50 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Wallgrove Road South										
1	L	79	7.6	0.501	17.3	LOS B	67	0.72	0.81	41.0
2	T	786	8.0	0.502	9.8	LOS A	68	0.74	0.64	47.2
3	R	5	16.7	0.504	18.8	LOS B	68	0.75	0.81	39.7
Approach		**871**	**8.0**	**0.502**	**10.6**	**LOS A**	**68**	**0.74**	**0.66**	**46.5**
M7 Ramps East										
4	L	4	20.0	0.059	23.0	LOS B	6	0.76	0.72	36.9
5	T	25	8.0	0.059	14.5	LOS A	6	0.76	0.56	42.9
6	R	108	8.3	0.311	26.3	LOS B	25	0.86	0.78	35.0
Approach		**139**	**8.6**	**0.311**	**24.0**	**LOS B**	**25**	**0.84**	**0.74**	**36.2**
Wallgrove Road North App										
7	L	11	9.1	0.849	28.2	LOS B	159	0.94	1.06	33.9
8	T	1071	8.0	0.848	21.2	LOS B	159	0.95	1.04	37.9
9	R	124	8.1	0.848	33.0	LOS C	111	0.97	1.09	31.6
Approach		**1206**	**8.0**	**0.848**	**22.5**	**LOS B**	**159**	**0.95**	**1.04**	**37.1**
Old Wallgrove Road West										
10	L	116	7.8	0.235	24.0	LOS B	24	0.81	0.77	36.3
11	T	28	7.1	0.181	15.3	LOS B	17	0.79	0.62	42.2
12	R	52	7.8	0.181	23.7	LOS B	17	0.79	0.76	36.5
Approach		**195**	**7.7**	**0.235**	**22.7**	**LOS B**	**24**	**0.80**	**0.74**	**37.1**
All Vehicles		**2411**	**8.0**	**0.849**	**18.3**	**LOS B**	**159**	**0.86**	**0.86**	**40.0**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	53	19.4	LOS B	0	0.88	0.88
P7	53	11.6	LOS B	0	0.68	0.68
All Peds	**106**	**15.5**	**LOS B**	**0**	**0.78**	**0.78**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 07098 W/OWR Existing AM
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SIDRA INTERSECTION

Movement Summary

Wallgoove/Old Wallgrove Existing

AM Peak

Signalised - Fixed time **Cycle Time = 50 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Wallgrove Road South										
1	L	52	7.8	0.673	19.6	LOS B	97	0.82	0.86	39.2
2	T	1127	8.0	0.674	11.4	LOS A	97	0.82	0.74	45.7
3	R	4	20.0	0.679	19.7	LOS B	96	0.82	0.85	39.1
Approach		**1183**	**8.0**	**0.675**	**11.8**	**LOS A**	**97**	**0.82**	**0.75**	**45.3**
M7 Ramps East										
4	L	5	16.7	0.067	23.0	LOS B	7	0.76	0.72	36.9
5	T	28	7.1	0.067	14.5	LOS B	7	0.76	0.56	42.9
6	R	11	9.1	0.032	24.7	LOS B	3	0.79	0.69	35.9
Approach		**45**	**8.9**	**0.067**	**18.1**	**LOS B**	**7**	**0.77**	**0.61**	**40.1**
Wallgrove Road North App										
7	L	108	8.3	0.817	25.6	LOS B	142	0.92	1.00	35.4
8	T	786	8.0	0.816	18.9	LOS B	142	0.93	0.97	39.5
9	R	116	7.8	0.816	33.6	LOS C	75	0.98	1.04	31.3
Approach		**1011**	**8.0**	**0.816**	**21.3**	**LOS B**	**142**	**0.94**	**0.98**	**37.9**
Old Wallgrove Road West										
10	L	124	8.1	0.252	24.1	LOS B	26	0.81	0.77	36.2
11	T	25	8.0	0.242	15.6	LOS B	22	0.81	0.64	42.0
12	R	79	7.6	0.242	24.0	LOS B	22	0.81	0.77	36.3
Approach		**228**	**7.9**	**0.252**	**23.1**	**LOS B**	**26**	**0.81**	**0.76**	**36.8**
All Vehicles		**2467**	**8.0**	**0.817**	**16.8**	**LOS B**	**142**	**0.87**	**0.84**	**41.1**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	53	19.4	LOS B	0	0.88	0.88
P7	53	11.6	LOS B	0	0.68	0.68
All Peds	**106**	**15.5**	**LOS B**	**0**	**0.78**	**0.78**

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x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 07098 W/OWR Existing PM
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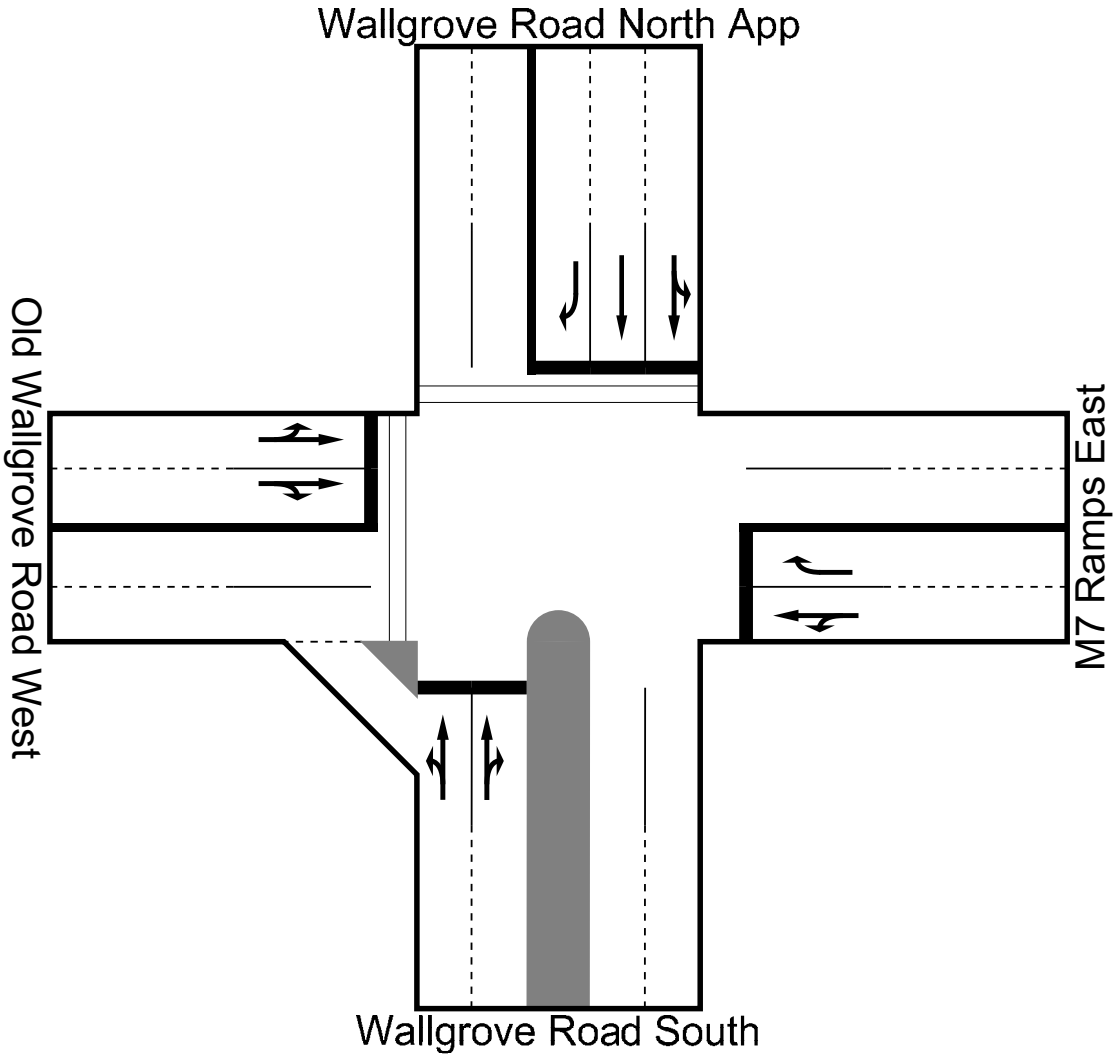
APPENDIX B2:

SIDRA MODELLING

Future Conditions



FUTURE LAYOUT

SIDRA INTERSECTION

Movement Summary

Wallgoove/Old Wallgrove Existing

AM Peak

Signalised - Fixed time **Cycle Time = 90 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Wallgrove Road South										
1	L	253	7.9	0.801	35.6	LOS C	165	0.96	0.94	30.5
2	T	786	8.0	0.801	30.5	LOS C	166	0.96	0.92	32.7
3	R	5	16.7	0.804	40.6	LOS C	166	0.97	0.95	28.4
Approach		**1044**	**8.0**	**0.801**	**31.8**	**LOS C**	**166**	**0.96**	**0.93**	**32.1**
M7 Ramps East										
4	L	4	20.0	0.084	16.2	LOS B	17	0.43	0.72	41.7
5	T	80	7.5	0.084	7.7	LOS A	17	0.43	0.35	49.5
6	R	108	8.3	0.141	17.5	LOS B	22	0.61	0.74	40.7
Approach		**194**	**8.2**	**0.141**	**13.5**	**LOS A**	**22**	**0.53**	**0.58**	**43.9**
Wallgrove Road North App										
7	L	11	9.1	0.427	15.5	LOS B	92	0.49	0.78	42.3
8	T	1071	8.0	0.431	7.0	LOS A	92	0.49	0.44	50.3
9	R	393	7.9	0.823	48.4	LOS D	142	1.00	0.98	25.8
Approach		**1474**	**8.0**	**0.823**	**18.1**	**LOS B**	**142**	**0.63**	**0.59**	**40.1**
Old Wallgrove Road West										
10	L	189	7.9	0.374	33.3	LOS C	67	0.81	0.81	31.4
11	T	47	8.3	0.374	29.7	LOS C	67	0.86	0.70	33.1
12	R	83	8.3	0.374	43.9	LOS D	42	0.92	0.79	27.2
Approach		**321**	**8.1**	**0.374**	**35.5**	**LOS C**	**67**	**0.84**	**0.78**	**30.4**
All Vehicles		**3033**	**8.0**	**0.823**	**24.3**	**LOS B**	**166**	**0.76**	**0.72**	**36.0**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	53	39.2	LOS D	0	0.93	0.93
P7	53	24.2	LOS C	0	0.73	0.73
All Peds	**106**	**31.7**	**LOS C**	**0**	**0.83**	**0.83**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

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SIDRA INTERSECTION

Movement Summary

Wallgoove/Old Wallgrove Existing

AM Peak

Signalised - Fixed time **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Wallgrove Road South										
1	L	83	8.3	0.801	32.6	LOS C	112	0.98	0.99	31.8
2	T	786	8.0	0.801	25.2	LOS B	112	0.98	0.97	35.5
3	R	5	16.7	0.800	34.2	LOS C	109	0.98	0.98	31.0
Approach		**876**	**8.1**	**0.801**	**26.0**	**LOS B**	**112**	**0.98**	**0.97**	**35.0**
M7 Ramps East										
4	L	4	20.0	0.048	11.9	LOS A	6	0.36	0.70	45.4
5	T	47	8.3	0.048	3.4	LOS A	6	0.36	0.26	54.7
6	R	108	8.3	0.164	15.7	LOS B	13	0.70	0.74	42.2
Approach		**162**	**8.6**	**0.164**	**11.9**	**LOS A**	**13**	**0.59**	**0.60**	**45.3**
Wallgrove Road North App										
7	L	11	9.1	0.560	19.3	LOS B	93	0.73	0.83	39.4
8	T	1071	8.0	0.565	10.8	LOS A	93	0.73	0.65	46.3
9	R	189	7.9	0.770	40.4	LOS C	58	1.00	0.92	28.5
Approach		**1271**	**8.0**	**0.770**	**15.3**	**LOS B**	**93**	**0.77**	**0.69**	**42.3**
Old Wallgrove Road West										
10	L	393	7.9	0.652	23.9	LOS B	95	0.86	0.84	36.3
11	T	101	7.9	0.652	17.2	LOS B	95	0.88	0.77	40.7
12	R	253	7.9	0.652	30.3	LOS C	70	0.93	0.86	32.8
Approach		**745**	**7.9**	**0.652**	**25.2**	**LOS B**	**95**	**0.88**	**0.84**	**35.6**
All Vehicles		**3054**	**8.1**	**0.801**	**20.6**	**LOS B**	**112**	**0.85**	**0.80**	**38.4**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate
P5	53	24.3	LOS C	0	0.90	0.90
P7	53	20.8	LOS C	0	0.83	0.83
All Peds	**106**	**22.6**	**LOS B**	**0**	**0.87**	**0.87**

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Following Degree of Saturation
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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

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