"KEMPS CREEK LOGISTICS" PROPOSED INDUSTRIAL ESTATE

BAKERS LANE, KEMPS CREEK

Supplementary Traffic Assessment

January 2012

Reference 10062

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Transportation, Traffic and Design Consultants
Suite 502, Level 5
282 Victoria Avenue
CHATSWOOD 2067
Telephone (02) 9411 5660
Facsimile (02) 9904 6622
Email ttpa@ttpa.com.au

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LIST OF ILLUSTRATIONS

1. INTRODUCTION

This report has been prepared to provide a supplementary traffic assessment responding to issues raised by Penrith City Council in relation to the Preferred Project Report for rezoning of land for a proposed new Industrial Estate on Bakers Lane at Kemps Creek (Figure 1).

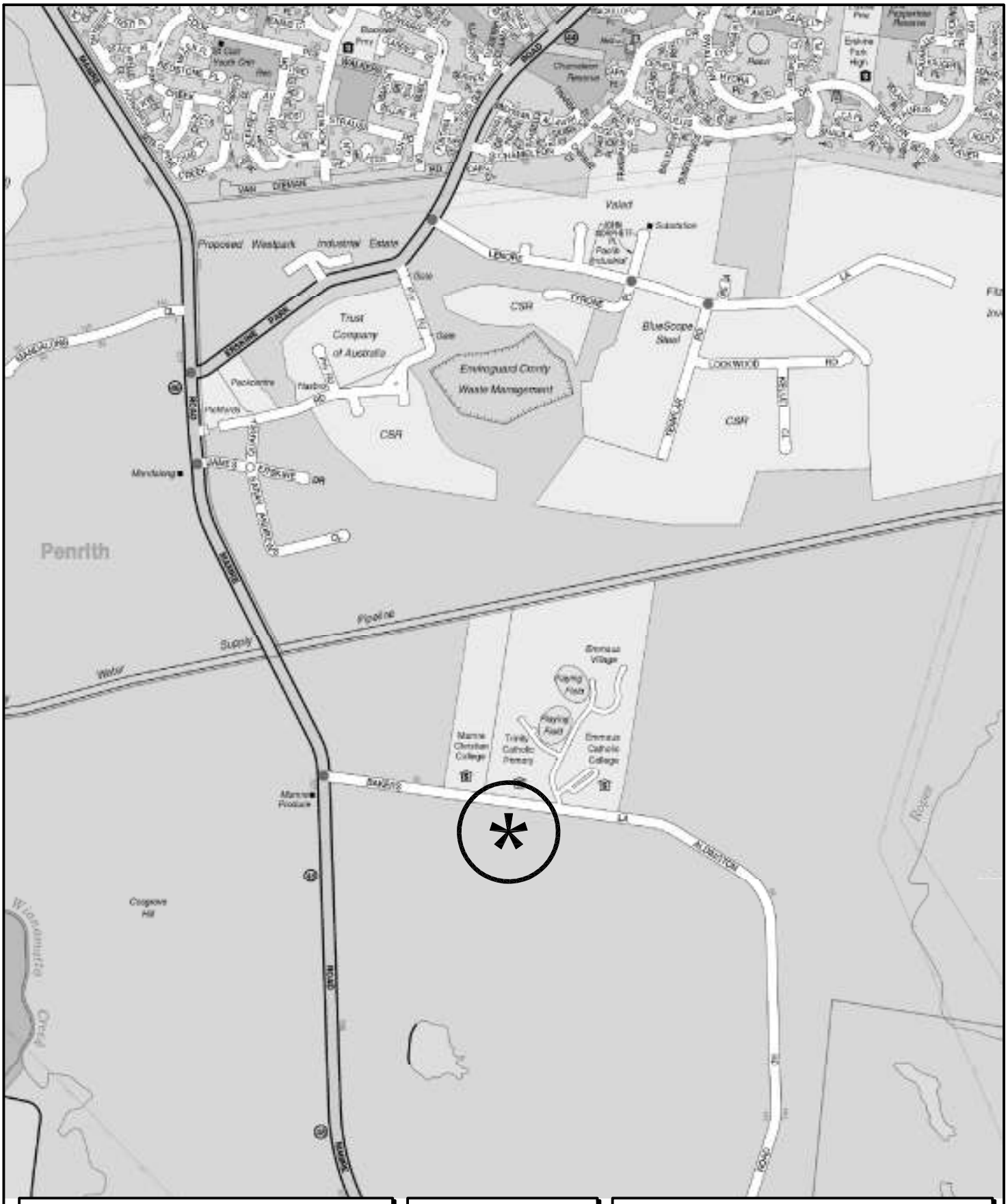
The site is located directly adjacent to the Western Sydney Employment Area (Area 8) and just to the south of the Erskine Park Employment Area (EPEA) which has developed as a major new industrial precinct on former grazing land extending between Mamre Road and Ropes Creek. The site is well located in relation to convenient access to both the existing and developing arterial road system and this is acting to encourage the proposed major warehouse and distribution facilities including the Goodman 'Oakdale Distribution Park' located immediately east of the site.

A Part 3A Application was submitted to the Department of Planning in 2010 as a Preferred Project Report for the rezoning of the 51.72 ha site to enable development of an integrated Industrial Estate. As part of the ongoing application process the preferred Project Report was forwarded to Council by the Department in October 2011 and Council responded by letter on November 2011 citing the following traffic related issues:

- Council previously opposed the conversion of Bakers Lane into a single arterial corridor

- All of the road infrastructure to support the development of the Western Sydney Employment Area will not be in place

- Consideration needs to be given to the future access requirements for development of the 2 lots on the northern side of Bakers Lane east of Mamre Road



LEGEND

N

LOCATION

FIG 1

- Council does not support the service road concept
- The intersections on the proposed Bakers Lane upgrade will not have sufficient capacity
- The outcome for the existing 40 kmph school zone on Bakers Lane is unclear
- The proposed new intersections will not adequately cater for the existing schools
- An off road shared pathway should be provided
- The Traffic Assessment which accompanied the Project Report needs to be updated

The purpose of this report is to:

- to provide an updated assessment to the Traffic Report which accompanied the Project Report
- describe the site and the proposed development scheme
- describe the existing and proposed road network serving the site
- describe the proposed vehicle access provisions
- assess the potential traffic implications
- respond to the traffic issues raised by Council

2. PROPOSED DEVELOPMENT SCHEME

2.1 SITE AND EXISTING USE

The development site (Figure 2) is Lot 1 in DP104958 located on the eastern side of Mamre Road being just to the south of the Sydney Water supply Line. The large rectangular shaped site, occupies an area of some 51.7 ha and has extensive frontages to the southern side of Bakers Lane and the eastern side of Mamre Road.

The site is largely vacant (apart from a rural residential dwelling), being former grazing land, and has some significant undulations which are also reflected on the alignment of the Bakers Lane roadway. The surrounding lands comprise:

- the rural residential lots to the south and east

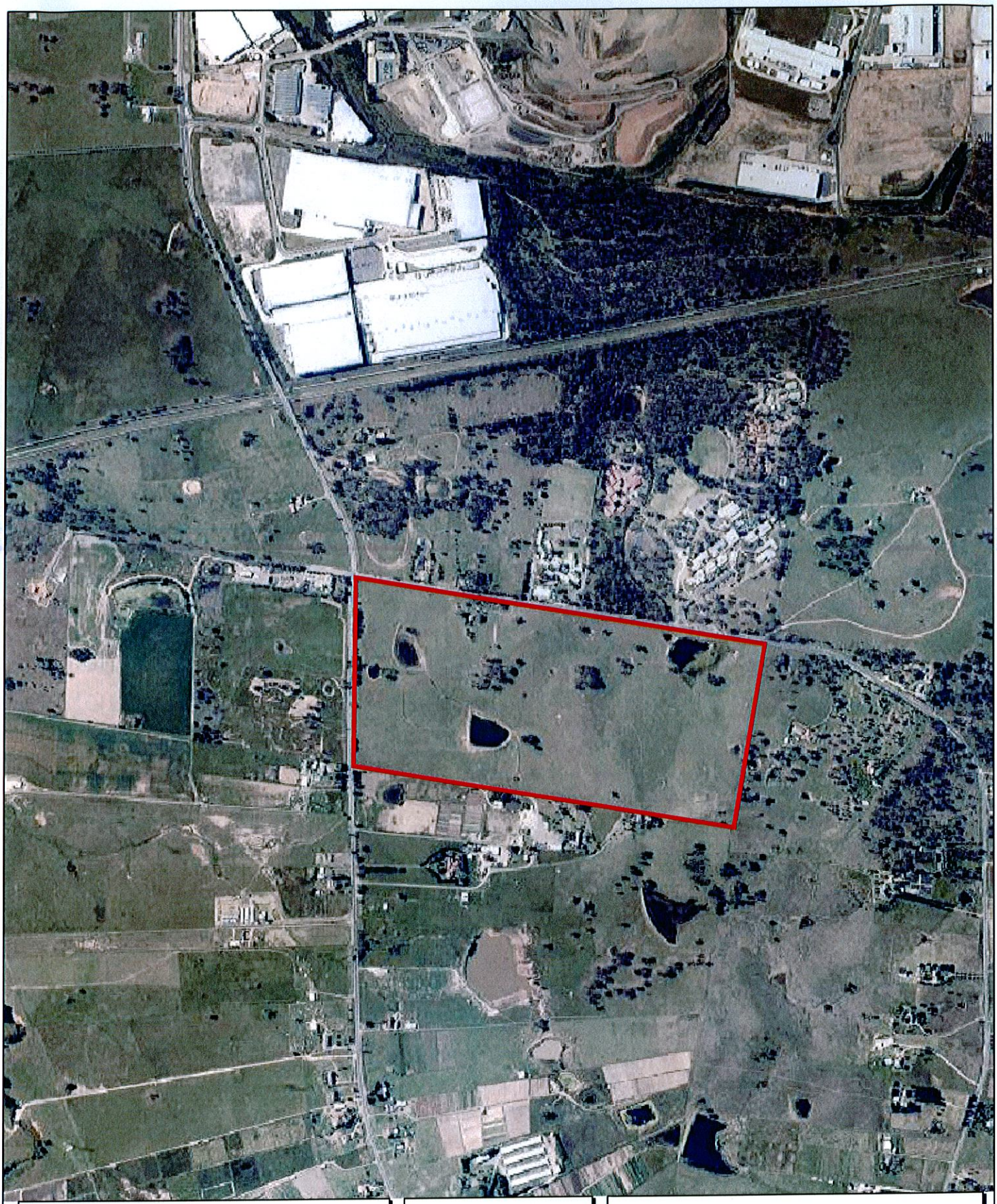
- the two rural residential lots on the northern side of Bakers Lane on the corner of Mamre Road

- the Christian and Catholic Colleges and Aged persons complex on the northern side of Bakers Lane opposite the eastern site

2.2 PLANNING CONTEXT

The site is shown in a planning context on Figure 3 where it is:

- located immediately to the south of the rapidly developing Erskine Park Employment area
- located adjoining the western side of the Western Sydney Employment Hub (DOP Area 8)

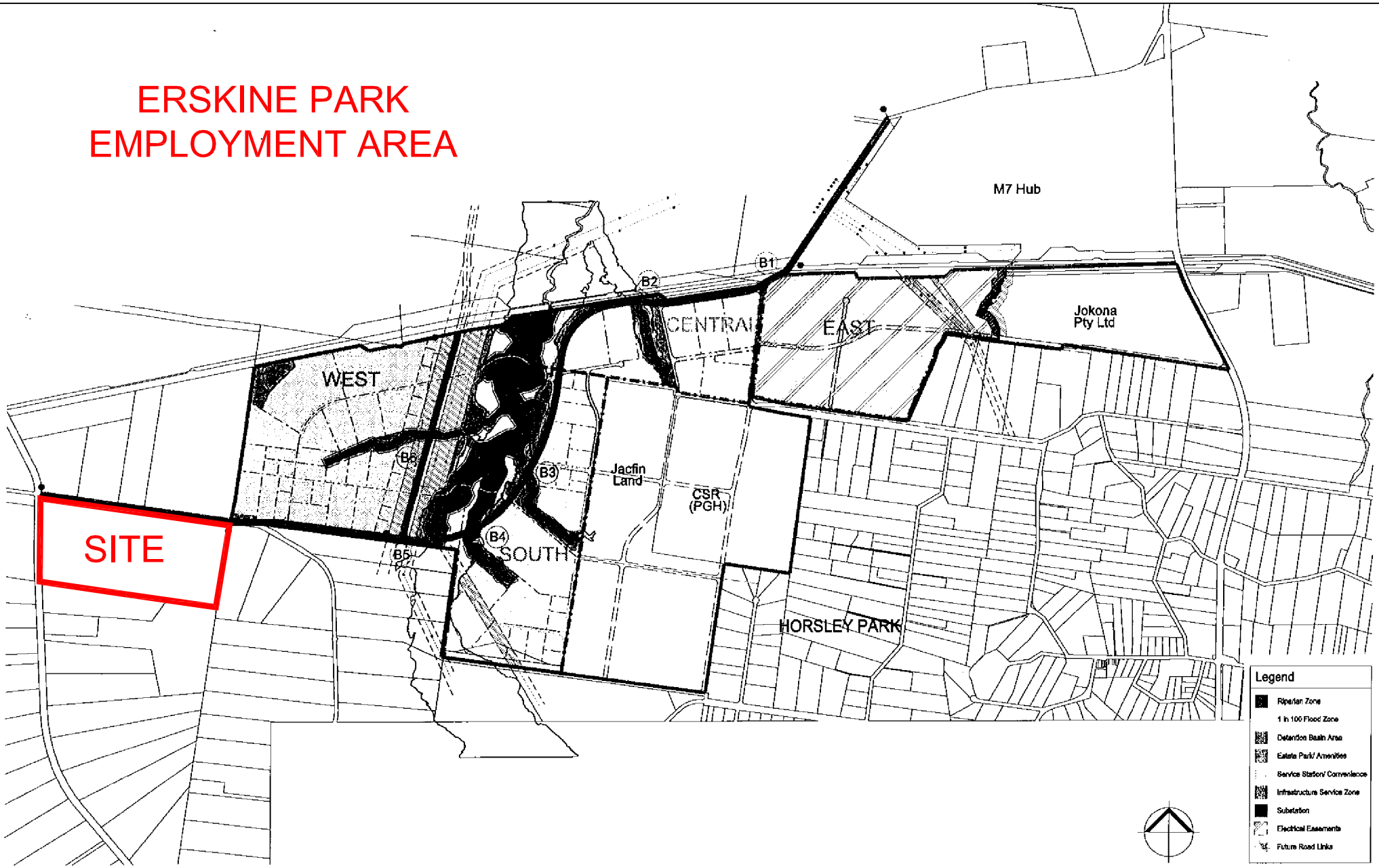


LEGEND

SITE

FIG 2

ERSKINE PARK EMPLOYMENT AREA



LEGEND

PLANNING CONTEXT

FIG 3

The western part and much of the central part of the WEA Hub is controlled by Goodman International with a nett developable area of some 162 ha. and a Concept Plan has been approved by the Minister For Planning for the Goodman site.

2.3 ENVISAGED DEVELOPMENT

The concept for development of the site subject to the rezoning comprises:

- two access roads connecting to Bakers Lane and a central east-west road through the centre of the site

- a total of 11 warehouse buildings located along the central access road with 5 along the Bakers Lane frontage and 6 along the southern boundary

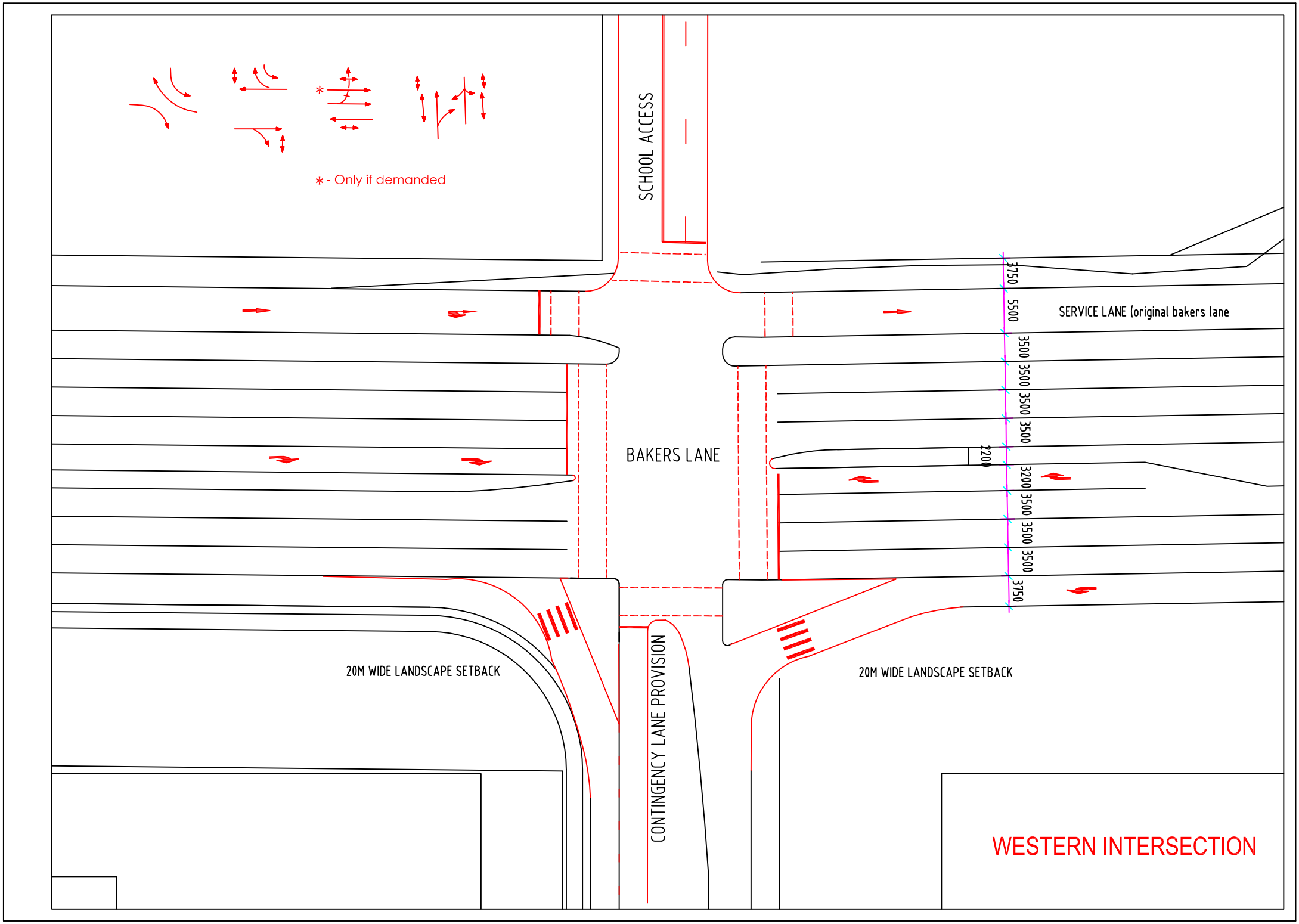
- a total building area of 260,000m^2 with a central estate service area of some 2,000m^2.

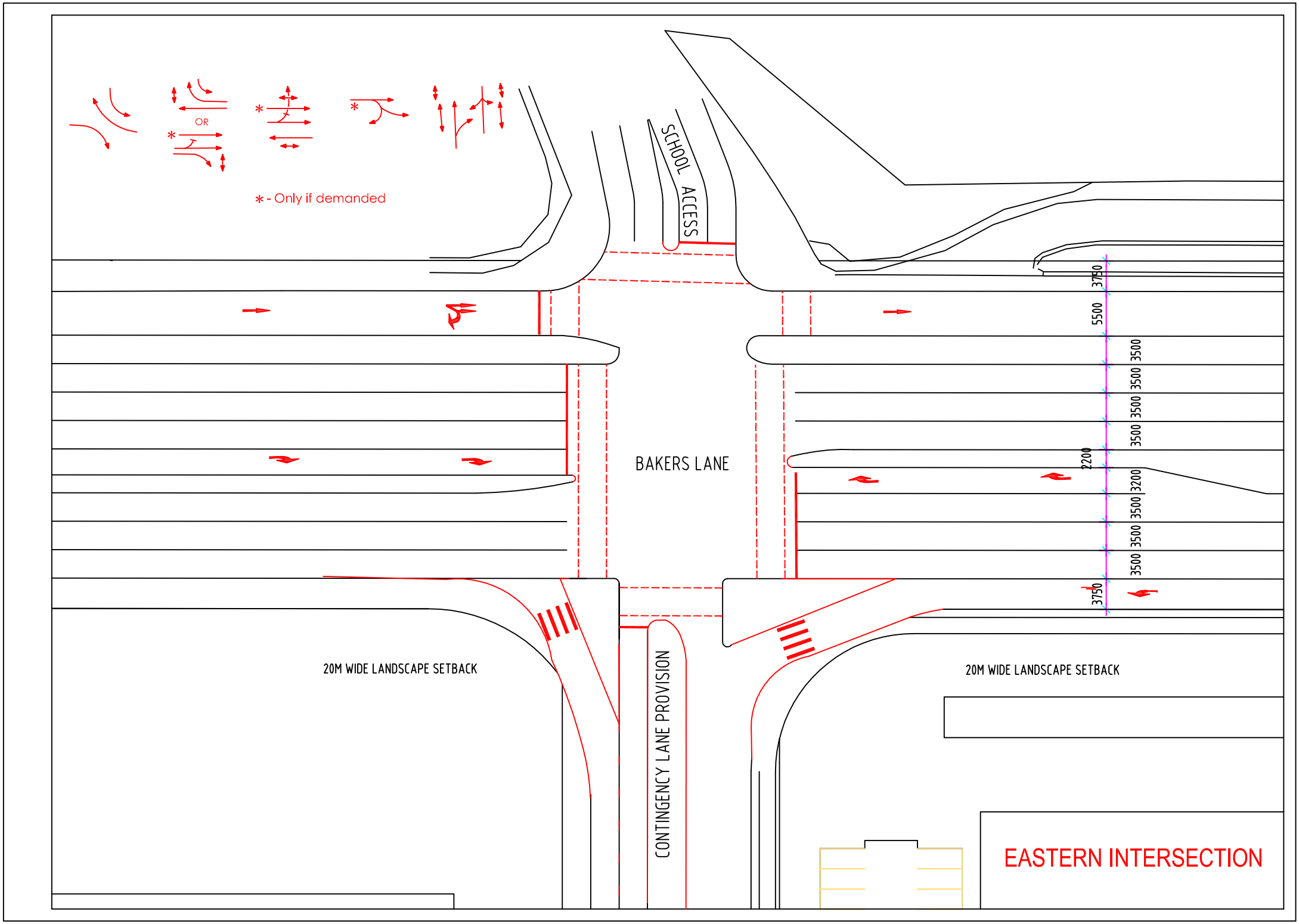
Details of the development concept are provided in the plans prepared by Axis Architecture which are reproduced in Appendix A.

Bakers Lane would be upgraded (widened and levelled in accordance with the RMS concept design) including upgrading of section of Mamre Road incorporating the Bakers Lane intersection. The two access road intersections on Bakers Lane would be traffic signal controlled and would incorporate connections for the properties along the northern side.

Concept design details for the envisaged access intersections, including traffic signal phasing, are provided overleaf. These concepts are based on the RMS scheme for the upgrading of Bakers Lane with a service road (one-way east) along the northern side.

The envisaged arrangement of the interactions incorporating the service road will simply reflect the traffic signal arrangements commonly provided at intersections involving a transitway running parallel to a major road. details of the submission to RMS and the subsequent reply advising on 'in principle' agreement are provided in Appendix B.


* - Only if demanded
SCHOOL ACCESS
BAKERS LANE
SERVICE LANE (original bakers lane
3750
5500
3500
3500
3500
3500
2200
3200
3500
3500
3500
3750
20M WIDE LANDSCAPE SETBACK
CONTINGENCY LANE PROVISION
20M WIDE LANDSCAPE SETBACK
WESTERN INTERSECTION


OR
* - Only if demanded
SCHOOL ACCESS
BAKERS LANE
3750
5500
3500
3500
3500
3500
2200
3200
3500
3500
3500
3750
20M WIDE LANDSCAPE SETBACK
CONTINGENCY LANE PROVISION
20M WIDE LANDSCAPE SETBACK
EASTERN INTERSECTION

3. ROAD NETWORK AND TRAFFIC CONDITIONS

3.1 ROAD NETWORK

The road network serving the Erskine Park area (Figure 4) comprises:

- *M4 Motorway* - a State Road and arterial route linking between Concord and Penrith

- *Great Western Highway* - a State Road and arterial road route which provides a connection between the City and the Blue Mountains crossing

- *Mamre* Road - a State Road and sub-arterial route linking between the Great Western Highway and Elizabeth Drive

- *Erskine Park Road* - a State Road and major collector route connecting between the M4 and Mamre Road continuing northward along Roper Road and Carlisle Avenue (Regional Road)

- *Lenore Drive, Bennett Road, Banks Drive and Swallow Drive* - collector road routes.

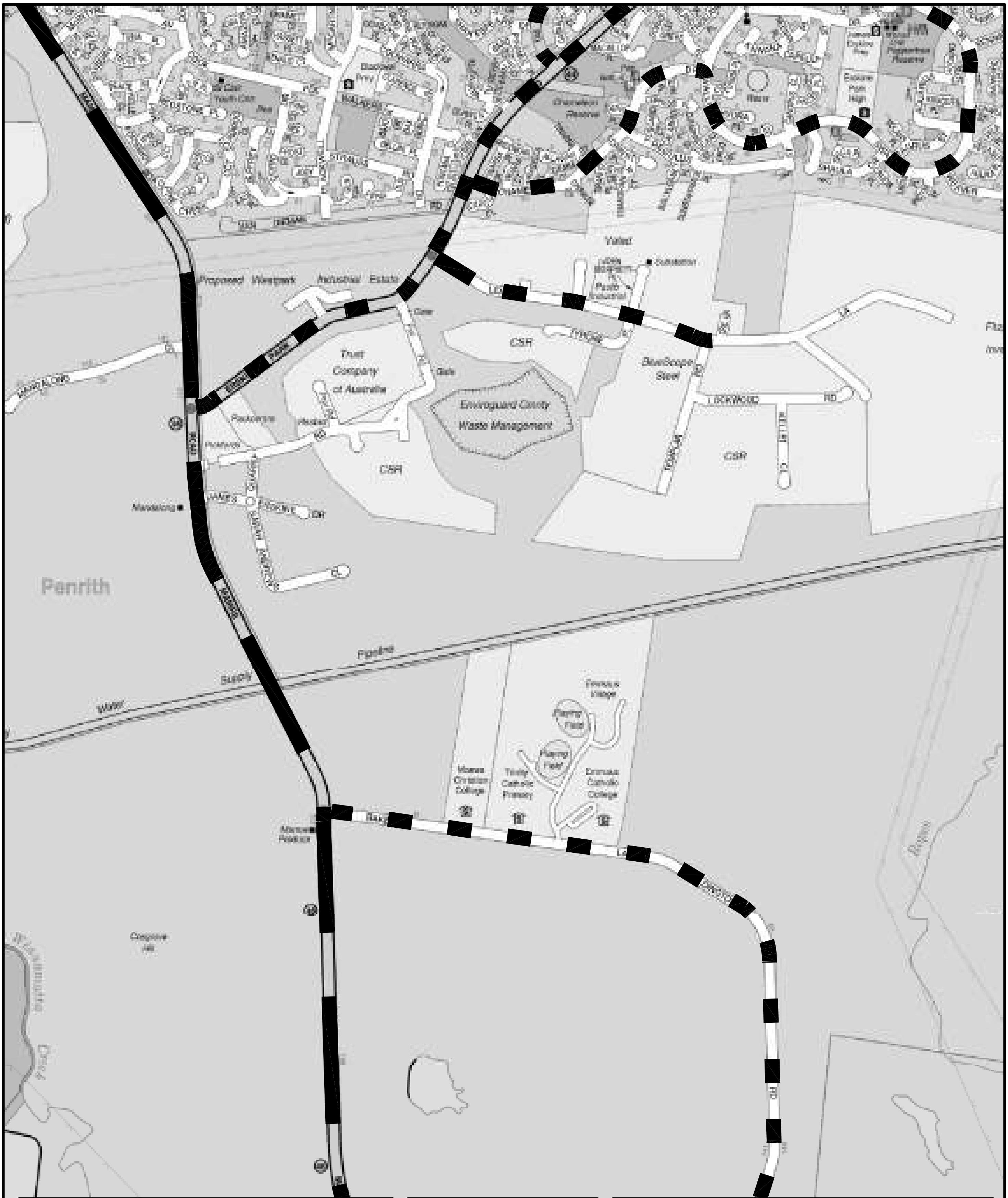
3.2 ROAD GEOMETRY AND TRAFFIC CONTROLS

The limited traffic controls which have been applied to the road system serving the site comprise:

- the traffic signals on Mamre Road at the James Erskine Drive intersection

- the traffic signals on Mamre Road at the Bakers Lane intersection

- the 80 kmph speed restriction on Mamre Road and 50 kmph restriction on Bakers Lane (with 40 kmph School Zone in part)



LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR

ROAD NETWORK

FIG 4

* the proposed traffic signals at the Mamre Road and Erskine Park Road intersection

3.3 TRAFFIC CONDITIONS

An indication of the traffic conditions on the road system serving the site is provided by data published by the RTA and surveys undertaken for this study. The data published by the RTA is expressed in terms of Annual Average Daily Traffic (AADT) and the most recent recorded volumes are provided in the following:

Location	AADT
Mamre Road at water pipeline	14,074
Erskine Park Road south of M4 Motorway	28,395

In order to establish the existing traffic circumstances on Bakers Lane surveys have been undertaken at the existing access connections for the Colleges and Aged Persons Complex. The results of those surveys are provided in Appendix A and are summarised in the following:

		AM	PM
Christian College			
West Access	RT IN	-	1
	LT IN	54	39
	RT OUT	67	48
	LT OUT	3	1
East Access	RT IN	2	1
	LT IN	33	29
	RT OUT	19	31
	LT OUT	-	1
U TURN BAY	(from East)	13	14
Emmaus	RT IN	20	12
	LT IN	180	100
	RT OUT	137	159
	LT OUT	12	19
U TURN BAY	(from East)	71	36

3.4 PUBLIC TRANSPORT

Public transport services in the vicinity of the site are provided by the Westbus Route 779 which runs along Mamre Road and Erskine Park Road on a 5 days a week basis linking to St Marys Railway Station. This service interconnects with Routes 772 and 774 provide connection to Mount Druitt Railway Station.

3.5 FUTURE CIRCUMSTANCES

Roads and Maritime Services are vested with the responsibility of undertaking the assessment for the future arterial road network servicing the WSEA (and the EPEA). RMS have completed much of that assessment process and the RMS preferred outcome includes the following road network features:

- A northern east-west route ('Erskine Park Link Road' as an extension of Lenore Lane) linking Erskine Park Road to the Old Wallgrove Road interchange with Wallgrove Road and the M7 Motorway;

- A southern east-west route ('southern route' commencing at Bakers Lane to the west) linking Mamre Road with Wallgrove Road and the M7 Motorway;

- Eastern and western north-south connections (Old Wallgrove Road and 'north-south link' respectively) linking both the north and south east-west link roads' and

- A northern access road to Archibold Road connecting the area to the M4 Motorway (at a new interchange with east facing ramps only) and the Great Western Highway.

The southern east-west route is to be constructed with a six lane divided carriageway widening at intersections to accommodate additional exclusive turning lanes.

Based on the RMS modelling analysis a schedule of external roads that require upgrading to accommodate the traffic demand generated by the planned development of the Western Sydney Employment Area has been identified as follows:

- Mamre Road: a four lane divided carriageway between Bakers Lane and the M4 Motorway including the duplication of the bridge over the Motorway and associated upgrading of the existing on and off ramps

- Archibold Road: a four lane divided carriageway between Great Western Highway and the M4 Motorway, where west facing ramps are to be provided

- Erskine Park Road: a four lane divided carriageway between Mamre Road and Coonawarra Drive

- M7 Motorway: an additional 2 southbound lanes and 1 northbound lane between the M4 Motorway and Old Wallgrove Road, including the widening of access ramps to and from Wallgrove road at Old Wallgrove Road

The upgrading of Mamre Road between Bakers Lane and the M4 Motorway encompasses a series of intersections including Erskine Park Road, which is proposed to be upgraded to provide additional auxiliary turning lanes and operate under traffic signal control.

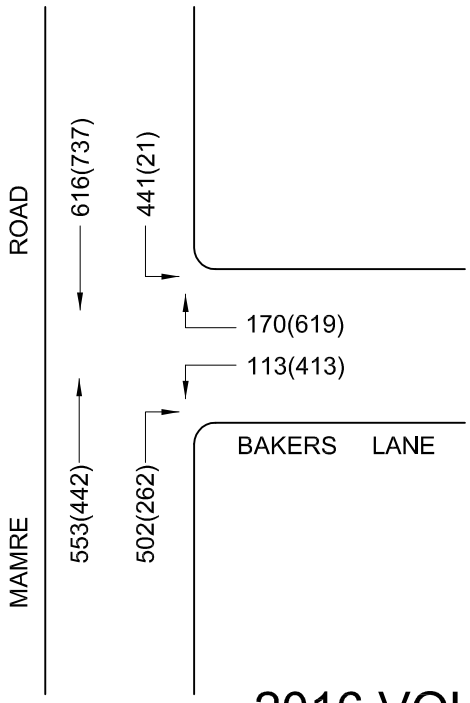
The results of strategic traffic modelling undertaken by RMS for the future road network serving the site are provided on the summary table overleaf of the projected 2016 and 2031 traffic volumes surrounding the subject site incorporating the planned development of the Western Sydney Employment Area.

PROJECTED FUTURE PEAK HOUR TRAFFIC VOLUMES				
	2016		**2031**	
	AM	**PM**	**AM**	**PM**
Bakers Lane				
Eastbound	943	283	2117	164
Westbound	283	1032	237	2257

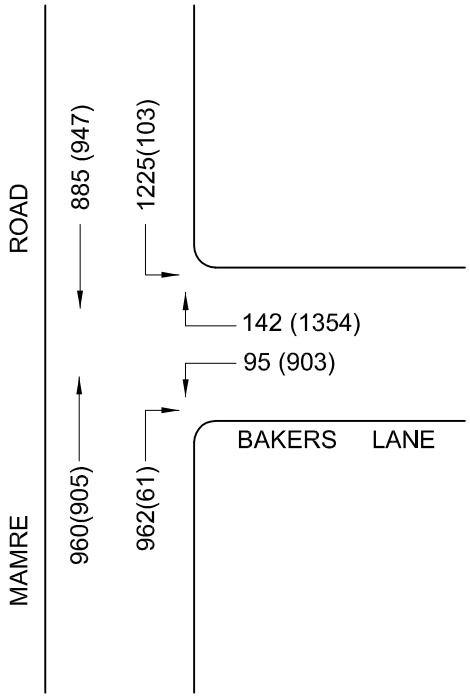
Mamre Road (south of Bakers Lane)				
Northbound	1074	704	1822	966
Southbound	729	1150	980	1850
Mamre Road (north of Bakers Lane)				
Northbound	723	1061	1102	2259
Southbound	1084	758	2140	1050

The 2031 traffic volume projections adopt the planned future road network associated with the redevelopment of the Western Sydney Employment Area whilst the 2016 projects assume the existing road network still prevails.

The future 2016 and 2031 peak hour movement volumes at the Mamre Road and Bakers Lane intersection have been extrapolated form the RMS strategic modelling data, and provided on Figure 5.



2016 VOLUMES



2031 VOLUMES

LEGEND

142 AM (1354) PM

PROJECTED FUTURE TRAFFIC VOLUMES

FIG 5

4. ASSESSMENT

The process which has been undertaken to establish the project peak vehicle demands at the two access intersections is as follows:

- identify the project 'background' morning and afternoon peak traffic demands from the RMS strategic modelling for 2016 and 2031
- distribute the established traffic generation of the education and aged persons uses on the northern side of Bakers Lane
- distribute the traffic generation of potential development on the subject site
- distribute the traffic generation of potential development on the two lots (some 20 ha) on the northern side of Bakers Lane

The traffic generation of the potential developments is based on the adopted RMS rate of 15 vtph per ha. in the peak periods. With the generation on the northern side of Bakers Lane being added for the 2031 circumstance with the distribution of all movements at that time having regard for the connective road system to the east. The generation and distribution circumstances for the potential site development are described in greater detail in the Traffic Report which accompanied the Part 3A Application. The projected traffic volume outcomes for 2016 and 2031 shown on figures 6 and 7 represent heightened "worst case" circumstance because:

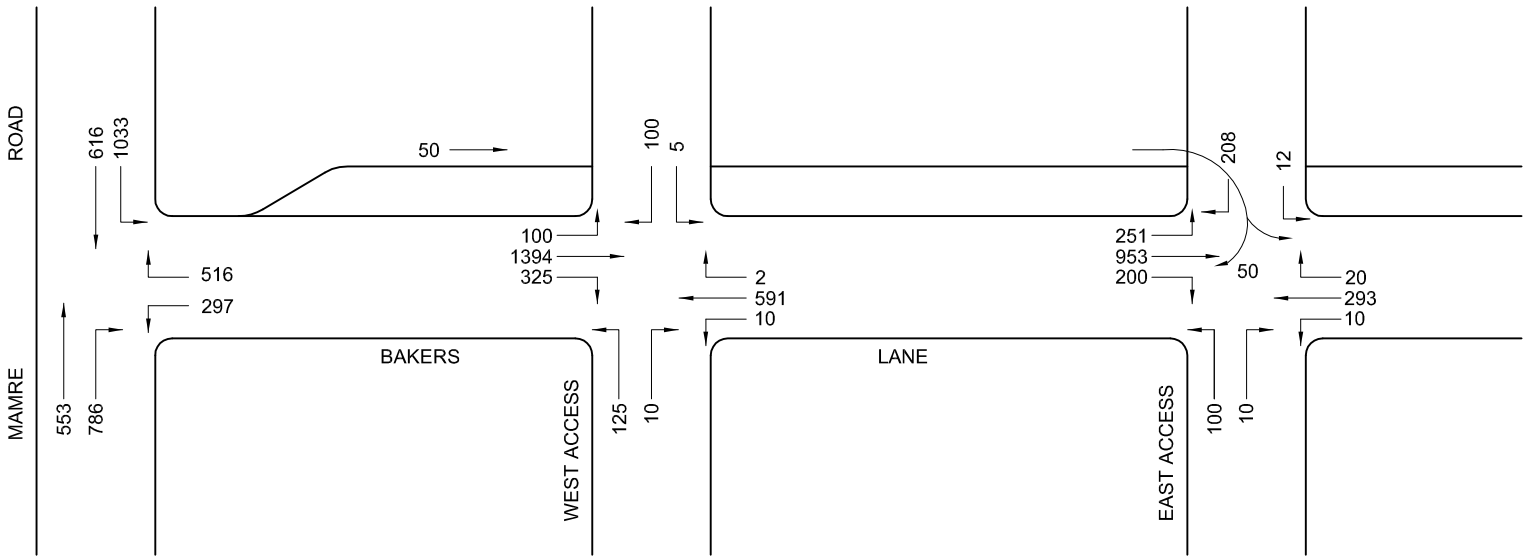
- the generation criteria of 15 vtph per ha is relatively high for the warehouse distribution uses which are envisaged and this is evident from the development outcomes at the Erskine Park Eastern Creek areas
- the traffic generation peaks are not generally concurrent (eg schools in the afternoon)
- the warehouse/distribution uses generally operate with 12 hour or other shifts which result in shift change overs outside of the normal on street peak hours

* there is no provision for “dual use” trips or “passing” trips

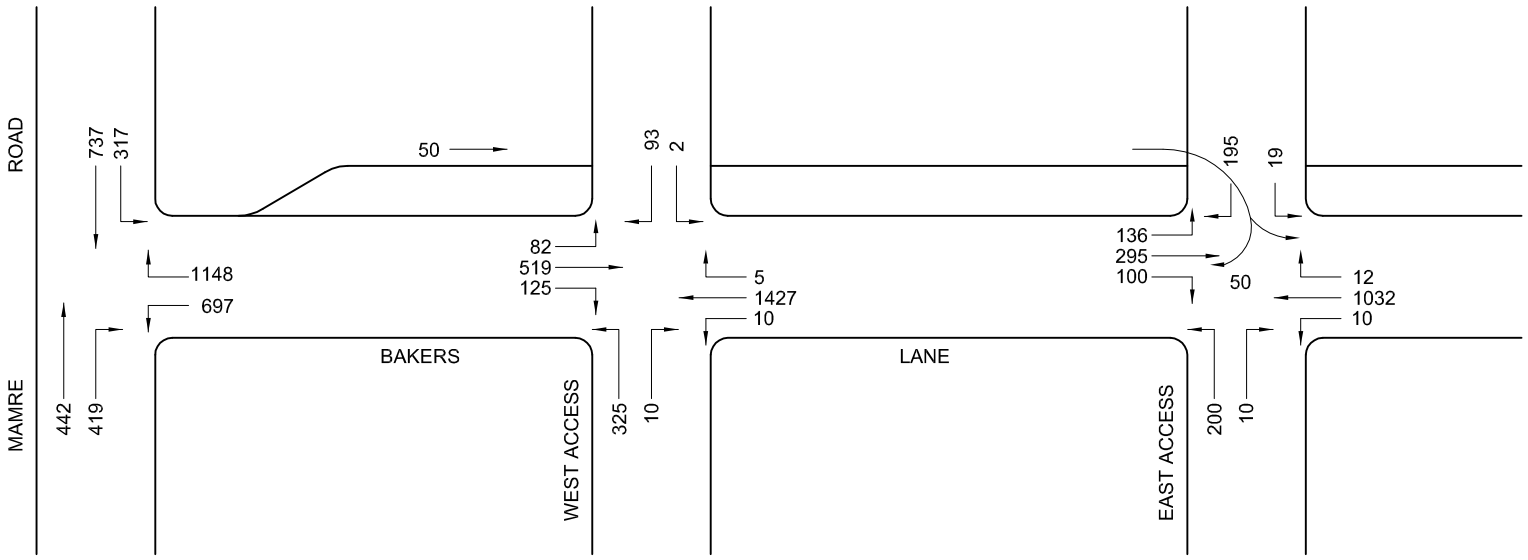
None the less operational performance analysis has been undertaken using SIDRA to assess the ability of the access intersections to operate satisfactorily. The results of that assessment are provided in Appendix B and are summarised in the following:

		WEST INTERSECTION		EAST INTERSECTION	
		LOS	**AVD**	**LOS**	**AVD**
2016	AM	B	17.2	B	26.2
	PM	A	14.5	B	21.7
2031	AM	B	14.6	B	17.3
	PM	B	18.2	B	19.5

The results of the assessment indicate that both intersections will operate with quite satisfactory levels of service for the various projected traffic flow circumstances with significant reserve capacities.



AM PEAK

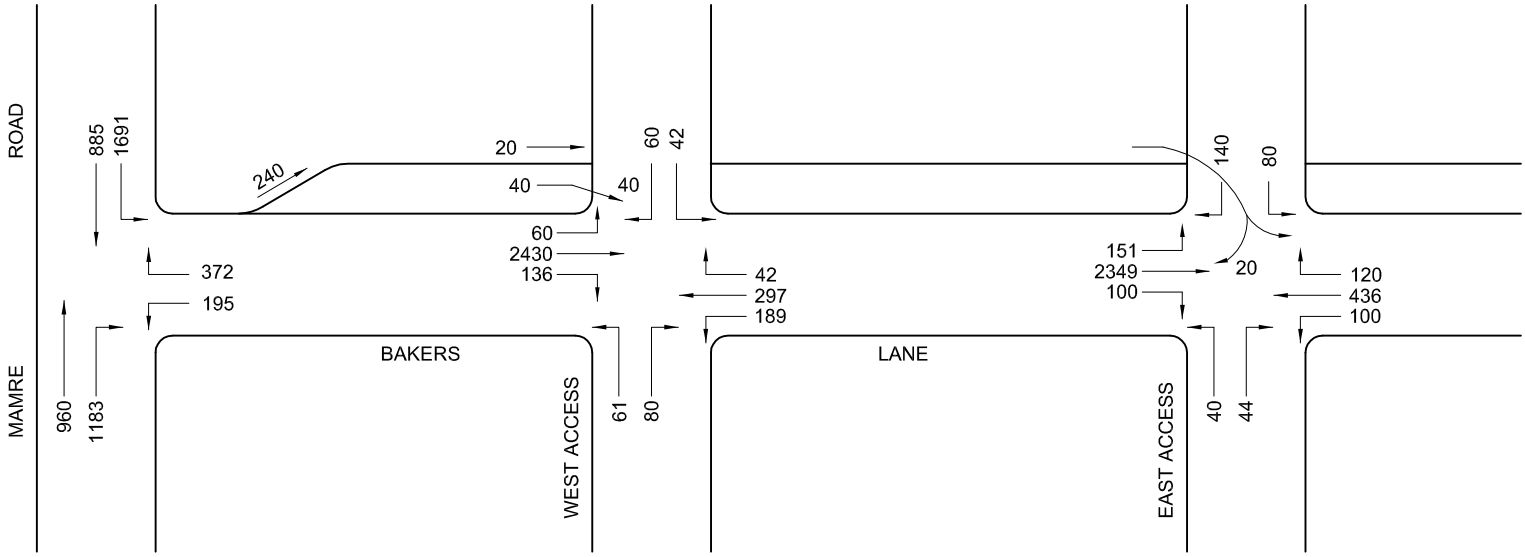


PM PEAK

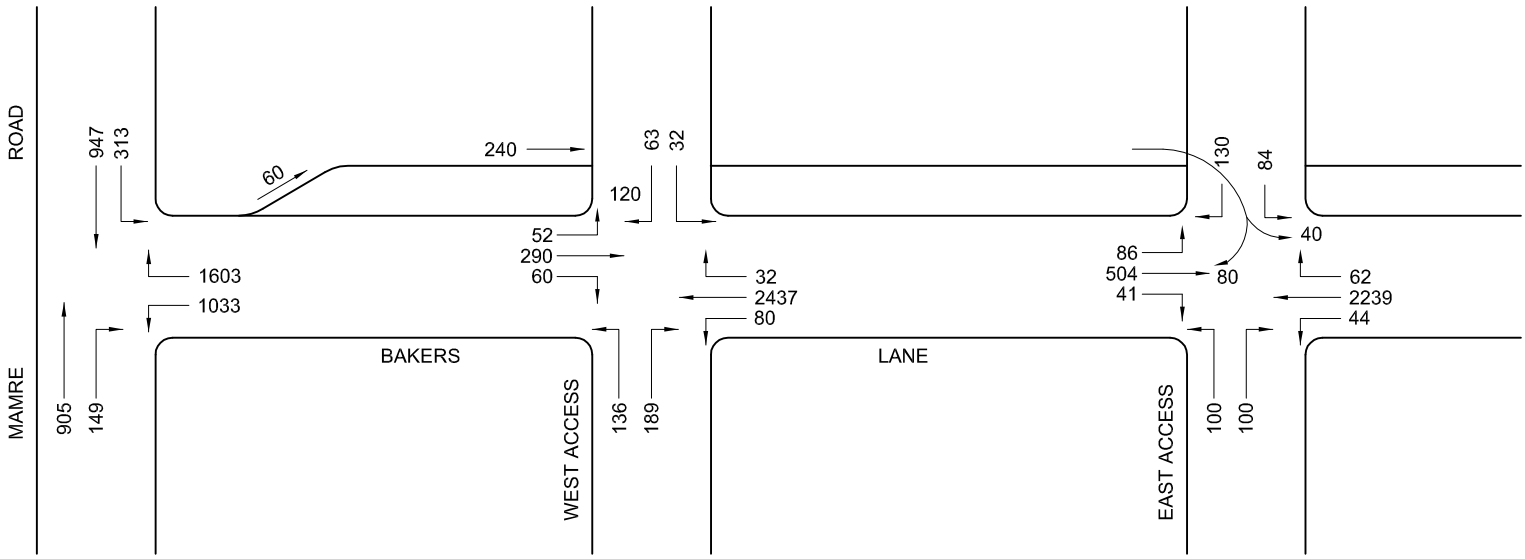
LEGEND

PROJECTED PEAK TRAFFIC VOLUMES 2016

FIG 6

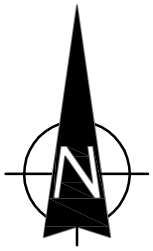


AM PEAK



PM PEAK

LEGEND



PROJECTED PEAK TRAFFIC VOLUMES 2031

FIG 7

5. ISSUES

The issues raised in Councils letter to the Department of Planning are addressed in the following:

Issue 1: Council previously opposed the conversion of Bakers Lane into a single arterial corridor

RMS is vested with the responsibility of establishing the road network to serve the WSEA and RMS has identified a future 6 lane road was for Bakers Lane with a service road running along the northern side. It is understood that this arrangement has been incorporated into the adjacent Goodman development scheme and a commitment has also been given to RMS by the developers of the subject site that sufficient land would be dedicated to RMS requirements for the future Bakers Lane roadway.

Issue 2: All of the road infrastructure to support the development of the Western Sydney Employment Area will not be in place

The development will be required to pay appropriate contributions for the development of the road system the same as developers in the WSEA. The implications of the timing of the road network upgrade for the site development will be consistent with that for all of the developable lands in the area.

Issue 3: Consideration needs to be given to the future access requirements for development of the 2 lots on the northern side of Bakers Lane east of Mamre Road

It is the RMS concept that the proposed service road will provide adequate access for the development of these Lots. It is also possible that a section of the service road west of the school could be 2 way allowing right turn access from the east.

Issue 4: Council does not support the service road concept

See Issue 1 response, the service road proposal is intrinsic in the RMS proposal for the development of Bakers Lane and Goodman have committed to this arrangement and have agreed to the dedication of land for it.

Issue 5: The intersections on the proposed Bakers Lane upgrade will not have sufficient capacity

The assessment provided in Section 4 of this report confirms that these intersections will operate quite satisfactorily with the future traffic demands.

Issue 6: The outcome for the existing 40 kmph school zone on Bakers Lane is unclear

RMS has confirmed that they do not wish to have a 40 kmph speed zone on the proposed 6 lane roadway and the provision of the service road will obviate this potential outcome.

Issue 7: The proposed new intersections will not adequately cater for the existing schools

The existing schools have on-site set down and pick up facilities while the traffic signals will:

- operate quite satisfactorily as confirmed in Section 4
- provide for pedestrian crossing movements
- provide safe controlled vehicle movements
- provide the optimum safety and operational outcome for the schools

Issue 8: An off-road shared pathway should be provided

This is a matter for RMS in detail design resolution for the Bakers Lane route.

Issue 9: The Traffic Assessment needs to be updated

This report provides the required updating.

6. CONCLUSION

A supplementary Traffic Assessment has been undertaken in relation to the Preferred Project Report for the proposed rezoning of land at the intersection of Mamre Road and Bakers Lane for a new Industrial estate. the purpose of the report has been to provide an update to the Traffic Report which accompanied the application and to assess and respond to issues raised by Council in correspondence with the Department of Planning.

The Supplementary Assessment has concluded that:

- the proposed traffic signal controlled access intersections will operate quite satisfactorily with the projected 2016 and 2031 traffic demands

- the proposed traffic signal controlled intersections will provide the optimum traffic management and safety outcome for the education and aged persons uses on the northern side of Bakers Lane

- the proposed arrangement of the future Bakers Lane roadway, service load and access intersections accords with the planning being undertaken by RMS

- the proposed arrangement of the future Bakers Lane will accommodate suitable access for future development of the two lots located on the northern side adjacent to Mamre Road

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Appendix A

DEVELOPMENT PLANS

LOGOS Property

LOGOS Kemps Creek Logistics Project

MAMRE ROAD & BAKERS LANE, KEMPS CREEK. NSW

AXIS architectural
2 / 107 Cronulla Street, Cronulla NSW 2230
p + 02 9523 7858 e + david@axisarchitects.com.au
nominated architect - David McDonald NSW ARB -7997

ESTATE LAYOUT PLAN OVERALL SITE

August 2010
1:3000 scale

100501/ LP-EP-DA

A 101 / G

NOTE: 1
SOLAR COLLECTOR PANEL SCREEN WALL TO CENTRAL PLANT AREA - 30 KW

NOTE: 2
SOLAR COLLECTOR PANELS TO CAFE ROOF AREA

SCHEDULE OF AREAS - LOT 1

SITE AREA - LOT AREA INCLUDING SETBACKS	492,485 sqm
BUILDING 1 - 23,500 warehouse + 2,100 office -2 storey	25,600 sqm
HARDSTAND AREA (including driveway)	7,450 sqm
CAR SPACES	131
CARPARKING AREA (includes driveways)	2,700 sqm
BUILDING 2 - 19,500 warehouse + 2,000 office -2 storey	21,500 sqm
HARDSTAND AREA (including driveway)	9,625 sqm
CAR SPACES	115
CARPARKING AREA (includes driveways)	2,600 sqm
BUILDING 3 - 23,500 warehouse + 2,000 office -2 storey	25,500 sqm
HARDSTAND AREA (including driveway)	6,470 sqm
CAR SPACES	128
CARPARKING AREA (includes driveways)	2,900 sqm
BUILDING 4 - 24,000 warehouse + 2,200 office -2 storey	26,200 sqm
HARDSTAND AREA (including driveway)	6,485 sqm
CAR SPACES	135
CARPARKING AREA	3,175 sqm
BUILDING 5 - 20,000 warehouse + 2,000 office -2 storey	22,000 sqm
HARDSTAND AREA (including driveway)	7,695 sqm
CAR SPACES	117
CARPARKING AREA (includes driveways)	3,800 sqm
BUILDING 6 - 15,000 warehouse + 1,500 office -2 storey	16,500 sqm
HARDSTAND AREA (including driveway)	6,985 sqm
CAR SPACES	88
CARPARKING AREA (includes driveways)	2,420 sqm
BUILDING 7 - 15,000 warehouse + 1,500 office -2 storey	16,500 sqm
HARDSTAND AREA (including driveway)	6,890 sqm
CAR SPACES	88
CARPARKING AREA (includes driveways)	2,430 sqm
BUILDING 8 - 19,000 warehouse + 1,900 office -2 storey	20,900 sqm
HARDSTAND AREA (including driveway)	6,925 sqm
CAR SPACES	111
CARPARKING AREA (includes driveways)	2,250 sqm
BUILDING 9 - 25,000 warehouse + 2,400 office -2 storey	27,400 sqm
HARDSTAND AREA (including driveway)	7,600 sqm
CAR SPACES	143
CARPARKING AREA (includes driveways)	3,270 sqm
BUILDING 10 - 26,000 warehouse + 2,400 office -2 storey	28,400 sqm
HARDSTAND AREA (including driveway)	12,500 sqm
CAR SPACES	147
CARPARKING AREA (includes driveways)	4,560 sqm
BUILDING 11 - 26,000 warehouse + 2,400 office -2 storey	28,400 sqm
HARDSTAND AREA (including driveway)	11,525 sqm
CAR SPACES	147
CARPARKING AREA (includes driveways)	2,955 sqm
CAFE BUILDING - single storey (30 parking spaces provided)	1,000 sqm
CENTRAL SERVICE MANGERS OFFICE BUILDING - single storey (8 vehicle spaces provided for staff & service vehicles)	100 sqm
TOTAL BUILDING AREAS	260,000 sqm
TOTAL AWNING AREAS	19,250 sqm
SITE COVER	52%
CENTRAL ESTATE SERVICE AREA (including 8 vehicle spaces provided for staff & service vehicles)	2,000 sqm
LANDSCAPE AREA (including setback areas)	75,000 sqm

LOGOS Property

LOGOS Kemps Creek Logistics Project

MAMRE ROAD & BAKERS LANE, KEMPS CREEK. NSW

AXIS architectural
2 / 107 Cronulla Street, Cronulla NSW 2230
p + 02 9523 7858 e + david@axisarchitects.com.au
nominated architect - David McDonald NSW ARB -7997

ESTATE PLAN - PART 1
SITE LAYOUT PLAN

August 2010
1:3000 scale

100501/ LP-EP-DA

A 103 / D

SCHEDULE OF AREAS - LOT 1

SITE AREA - LOT AREA INCLUDING SETBACKS	492,485 sqm
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HARDSTAND AREA (including driveway)	7,695 sqm
CAR SPACES	117
CARPARKING AREA (includes driveways)	3,800 sqm
BUILDING 6 - 15,000 warehouse + 1,500 office -2 storey	16,500 sqm
HARDSTAND AREA (including driveway)	6,985 sqm
CAR SPACES	88
CARPARKING AREA (includes driveways)	2,420 sqm
BUILDING 7 - 15,000 warehouse + 1,500 office -2 storey	16,500 sqm
HARDSTAND AREA (including driveway)	6,890 sqm
CAR SPACES	88
CARPARKING AREA (includes driveways)	2,430 sqm
BUILDING 8 - 19,000 warehouse + 1,900 office -2 storey	20,900 sqm
HARDSTAND AREA (including driveway)	6,925 sqm
CAR SPACES	111
CARPARKING AREA (includes driveways)	2,250 sqm
BUILDING 9 - 25,000 warehouse + 2,400 office -2 storey	27,400 sqm
HARDSTAND AREA (including driveway)	7,600 sqm
CAR SPACES	143
CARPARKING AREA (includes driveways)	3,270 sqm
BUILDING 10 - 26,000 warehouse + 2,400 office -2 storey	28,400 sqm
HARDSTAND AREA (including driveway)	12,500 sqm
CAR SPACES	147
CARPARKING AREA (includes driveways)	4,560 sqm
BUILDING 11 - 26,000 warehouse + 2,400 office -2 storey	28,400 sqm
HARDSTAND AREA (including driveway)	11,525 sqm
CAR SPACES	147
CARPARKING AREA (includes driveways)	2,955 sqm
CAFE BUILDING - single storey (30 parking spaces provided)	1,000 sqm
CENTRAL SERVICE MANGERS OFFICE BUILDING - single storey (8 vehicle spaces provided for staff & service vehicles)	100 sqm
TOTAL BUILDING AREAS	260,000 sqm
TOTAL AWNING AREAS	19,250 sqm
SITE COVER	52%
CENTRAL ESTATE SERVICE AREA (including 8 vehicle spaces provided for staff & service vehicles)	2,000 sqm
LANDSCAPE AREA (including setback areas)	75,000 sqm

LOGOS Property

LOGOS Kemps Creek Logistics Project

MAMRE ROAD & BAKERS LANE, KEMPS CREEK. NSW

AXIS architectural
2 / 107 Cronulla Street, Cronulla NSW 2230
p + 02 9523 7858 e + david@axisarchitects.com.au
nominated architect - David McDonald NSW ARB -7997

ESTATE PLAN - PART 2
SITE LAYOUT PLAN

August 2010
1:3000 scale

100501/ LP-EP-DA

A 104 / D

Appendix B

RMS CORRESPONDENCE

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES

A division of Monvale Pty Ltd ACN 060 653 125
ABN 44 060 653 125

29 September 2011
Ref: 10062

Mr Owen Hodgson
Senior Land Use Planner | Transport Planning
Roads and Traffic Authority
PO BOX 973
PARRAMATTA 2124

(Email: Owen_HODGSON@rta.nsw.gov.au)

cc: danny@dncproperty.com.au

Dear Owen

BAKERS LANE PROJECT

I refer to our meeting on 28/9/11 regarding the intersection design issues associated with the service road proposed by the RTA.

First of all, I must reiterate that:

* the service road is not proposed by the developer nor is it necessary in anyway for the development to occur

* the developer has agreed to dedicate the land required for the service road as specified by the RTA

* the reason for the service road is RTA's desire to avoid the need for a 40 kmph school speed restriction on Bakers Lane (this ability is yet to be confirmed)

* the development does not require 2 traffic signal controlled intersections, however, this eventuality has arisen as a result of the 2 school accesses and again the developer has agreed to this requirement

* the adjacent Goodman development has already been approved with a service road provision

Suite 502 Level 5 282 Victoria Avenue PO Box 1160 Chatswood NSW 2067 ph (02) 9411 5660 Fax (02) 9904 6622
Email ttpa@ttpa.com.au

* There remains three potential outcomes, namely:

    - the service road will not eventuate (apart from a limited section to serve the properties on the corner of Mamre Road)
    - the service road will not continue through and across the school accesses
    - the service road will be continuous

The decision on these options rests entirely with the RTA and is essentially not relevant to the proposed development (apart from the land dedication). As such the development can occur regardless of which option the Authority decides to pursue and development of this land is inevitable.

It is quite clear that the service road will attract very little traffic usage as the schools have existing SD/PU and bus facilities within their grounds. Traffic activity generated by the schools is limited to very short time periods on school days.

It is also apparent that the traffic signal arrangement necessary to accommodate the service road will be very similar to that now commonly employed for Transitways which run parallel to arterial roads. The attached signal design plan identifies the nature of these signal arrangements which are quite safe , flexible and operationally satisfactory.

The fact is that the envisaged arrangements at the subject intersections will be far less complex as the service road will only have one-way traffic with very light/infrequent vehicle movements.

I regret that the concept intersection plans provided earlier did not serve to clarify the envisaged control arrangements. Please find attached revised concept plans which help to clarify these arrangements. I am quite sure that any perceived signal display conflict issues can be satisfactory dealt with as they are at other locations such as that indicated on the attached signal plan.

The significant delay which has occurred in the Authority providing advice to the Department of Planning has had serious financial consequences for the developer. Your assistance in ensuring that advice is forwarded to the Department at the earliest opportunity would be appreciated.

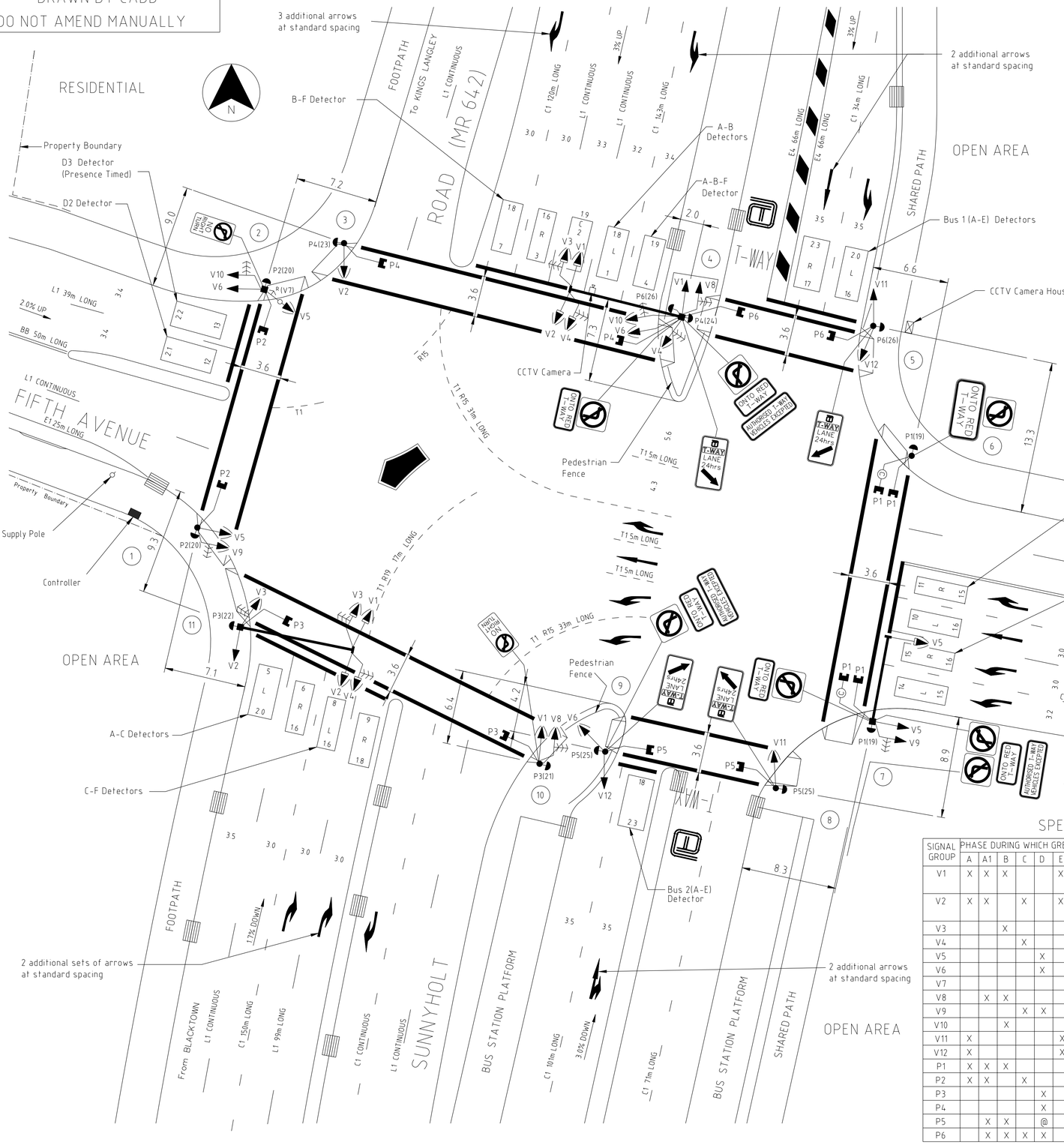
Yours faithfully

Ross Nettle
Director
Transport and Traffic Planning Associates

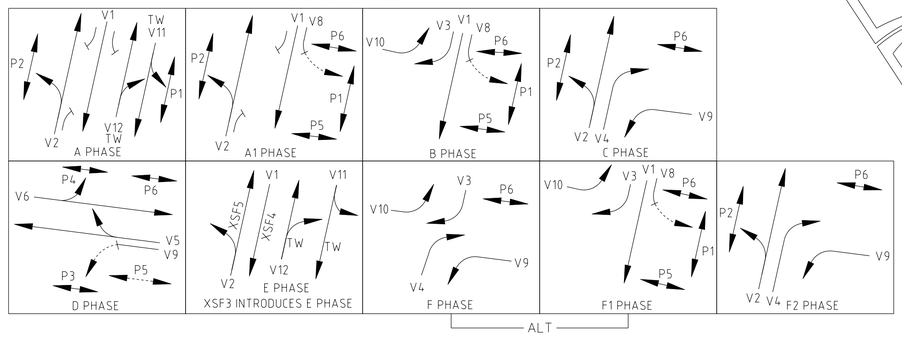
DRAWN BY CADD
DO NOT AMEND MANUALLY

DATE IN SERVICE : 07/07/77

7000.040.VV.1324



MOVEMENTS



POSTS

POST	TYPE	LENGTH	OFFSET	REMARKS
1	2	4.1	1.0	NEW
2	6	-	1.0	NEW
3	2	4.1	1.0	NEW
4	10	-	2.0	NEW (10m OUTREACH)
5	2	4.1	1.0	NEW
6	2	4.1	1.0	NEW
7	9	-	1.0	NEW (7m OUTREACH)
8	2	4.1	1.0	NEW
9	2	4.1	1.0	NEW
10	2	4.1	1.0	NEW
11	10	-	1.0	NEW (10m OUTREACH)

DETECTOR SPECIFICATION

DETECTOR	SPECIFICATIONS			
	FN	F2(PR)	D(E2)	F(E4)
D-F-F2	SG/PS	V8	D	F
	DS	C D	RED NEXT	RED NEXT

SPECIAL SIGNAL GROUP DISPLAY SEQUENCE CHART

SIGNAL GROUP	PHASE DURING WHICH GREEN DISPLAYED								OVERLAPS PERMITTED	OVERLAPS CONDITION	REMARKS
	A	A1	B	C	D	E	F	F1	F2			
V1	X	X	X			X		X		F1/A/A1/B, A/A1/F1, B/A *	*P1 NOT RUNNING	XSF2 ALLOWS INTRODUCTION IN 'E' PHASE
V2	X	X		X		X			X	F2/A/A1/C, A/A1/F2, C/A *	*P2 NOT RUNNING	XSF2 ALLOWS INTRODUCTION IN 'E' PHASE
V3			X				X	X		F/F1, B/F		
V4				X			X		X	F/F2, C/F		
V5					X							
V6					X							
V7												ARROW TIME PB ON POST 4 EXTENDS TIMER
V8		X	X					X		A/A1/B, F1/A *	*P1 NOT DEMANDED	
V9				X	X		X		X	C/D *F2/C, C/F/F2	*P3 NOT DEMANDED	ARROW TIME PB ON POST 11 EXTENDS TIMER
V10			X				X	X		B/D *F1/B, B/F/F1	P4 NOT DEMANDED	ARROW TIME PB ON POST 4 EXTENDS TIMER
V11	X					X				A/E		
V12	X					X				A/E		
P1	X	X	X					X		F1/A/B		
P2	X	X		X					X	F2/A/C		
P3					X							
P4					X							
P5		X	X		@			X		A/B/D/F1		@ ONLY IF P3 DEMANDED
P6		X	X	X	X		X	X	X	A/B/C/D/F/F1/F2		

NOTES

1. THIS SITE IS SCATS LINKED.
2. SPECIAL STOP SIGN R1-4 IS PLACED ON POSTS 2,5,7 & 9.
3. ALL PUSH BUTTONS ARE AUDIO TACTILE EXCEPT POST 4 WHICH IS TACTILE ONLY.
4. KERB RAMPS TO BE CONSTRUCTED AT ALL PEDESTRIAN CROSSINGS IN ACCORDANCE WITH MODEL DRAWING MD.R173.B01.A.
5. FOR DETAILS OF CIVIL ROAD WORKS, REFER TO DWG RF-2030705

ORIGINAL ISSUE

B issue 12.12.06
Altered: North-West kerb alignment at corner of SHR & Fifth Ave. Posts 2, 3 & respective pram ramps relocated. Linemarking and lane widths to suit new kerb alignment.
LCPL

C issue: 16/04/08
As directed by Mr.N.Leitch, network operations.
Added: CCTV camera and housing. Detector labelling.
K.I.

PUBLIC UTILITY LEGEND		REFERENCE PLANS	
HYDRANT	□	SYMBOLS/ABBS	VD003-6
STOP VALVE	▲	STD POSIT	VD001-5
GAS VALVE	⌗	DET SCHED EXP	VD018-10
SEWER MANHOLE	Ⓢ	PRES. DETECT	VC005-17
TELECOM PIT	◪	SSG DIS. SEQ.	VD018-8
ELECT LIGHT POLE	○		
POWER POLE	○		
STAY POLE	⊘		
TELEPHONE BOX	T	SURVEYOR LCPL	
TELECOM PILLAR	◪	DATE 2005	

U.B.D.Ref 168 P13
I.S.G. CO-ORDS E 291 858 N 1 262 576
DESIGNED B.A
CHECKED T.B
SITE CHECKED
RECOMMENDED

DESIGN APPROVAL
APPROVED
POSITION PROJECT MANAGER
DATE 27.07.06
DESIGN PREPARED BY
MAUNSELL AECOM
Maunsell Australia Pty Ltd. A.B.N. 20 093 846 925

RTA RECOMMENDED
RECOMMENDED
POSITION NETWORK OPERATIONS LEADER
DATE 4.9.06

RTA ACCEPTANCE
CONFIRMATION
POSITION
DATE
ACCEPTED
POSITION ROAD NETWORK MANAGER
DATE 5.9.06

Roads and Traffic Authority, N.S.W

BLACKTOWN CITY COUNCIL AREA
TRAFFIC SIGNALS AT
SUNNYHOLT RD(MR 642), FIFTH AVE, SACKVILLE ST, AND NORTH WEST T-WAY
BLACKTOWN (ULTIMATE)

DESIGN LAYOUT TCS No 1324

EXISTING ☐ PROPOSED ☒
CADD FILE: VV1324_16C.dgn
SCALE SCALE 1:200 2 0 2 4 6 8 10
ISSUE C
FILE 40 TS 106
SUPERSEDES SHEET/ISSUE 16B
REGN. 7000.040.VV.1324
SHEET 16

vv1324_16C.dgn 12/11/2008 2:18:51 PM

Our Reference:	RDC 10M620 SYD10/00785
Your Reference:	MP 10_0061, MP 10_0062
Contact:	Owen Hodgson
Telephone	8849 2012

NSW GOVERNMENT | Transport Roads & Traffic Authority

Phil Jones
PJEP Environmental Planning Pty Ltd
48 Marine Parade
Avalon NSW 2107

PROPOSED LOGISTICS FACILITY – WAREHOUSE AND DISTRIBUTION CENTRE AT 708 MAMRE ROAD, ERSKINE PARK

Dear Sir,

I refer to our meetings, emails and plans with regard to the above mentioned major project, which was referred to the Roads and Traffic Authority (RTA) for comment.

The RTA has reviewed the concept plans and grants in-principle agreement to Plan Nos. 1005/LP-EP-SK A 105/E, 1005/LP-EP-SK A 106/E, 1005/LP-EP-SK A 107/E.

Detail engineering plans and traffic signal plans are to be submitted to the RTA for approval prior to construction.

Any inquiries can be directed to me by telephone on 8849 2012, or facsimile 8849 2918.

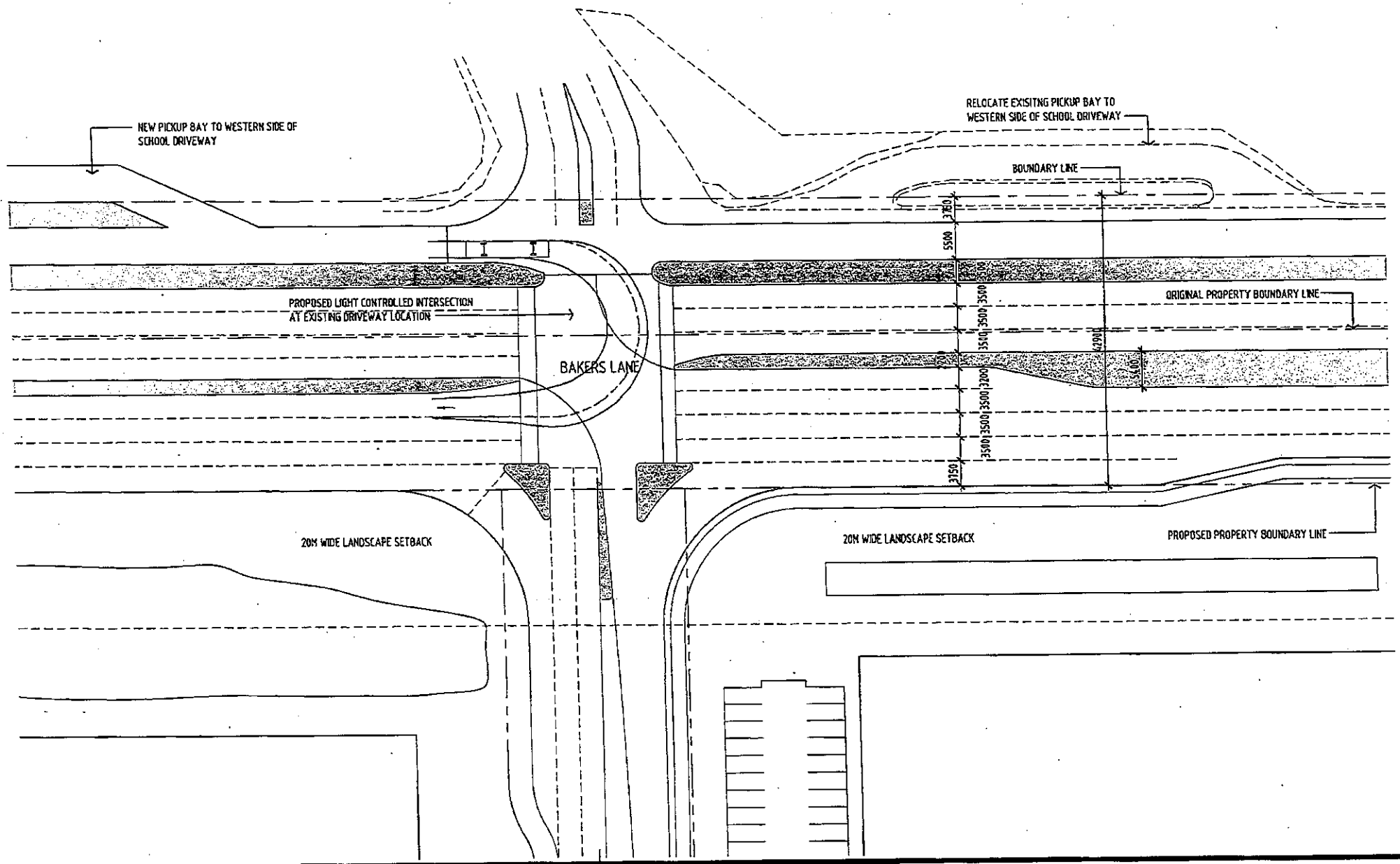
Yours sincerely,

O. Hodgson

Owen Hodgson
Senior Land Use Planner
Transport Planning, Sydney Region

14 October 2011

LEVEL 11, 27-31 ARGYLE STREET PARRAMATTA NSW 2150
PO BOX 973 PARRAMATTA CBD NSW 2150 DX 28555
www.rta.nsw.gov.au | 13 22 13



LOGOS Property

LOGOS Kemps Creek Logistics Project

MAMRE ROAD & BAKERS LANE, KEMPS CREEK. NSW

AXIS architectural
2 / 107 Cronulla Street, Cronulla NSW 2230
p + 02 9523 7858 e + david@axisarchitects.com.au
nominated architect - David McDonald NSW ARB -7997

BAKERS LANE ROAD UPGRADE
STAGE 1 ROAD LAYOUT
CATHOLIC SCHOOL INTERSECTION
100501/ LP-EP-DA

August 2010
1:500 scale
A 106 / E

Appendix C

TRAFFIC SURVEY RESULTS

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : T.T.P.A.

Job No/Name : 3892 KEMPS CREEK Bakers Lane

Day/Date : Monday 5th December 2011

All Vehicles

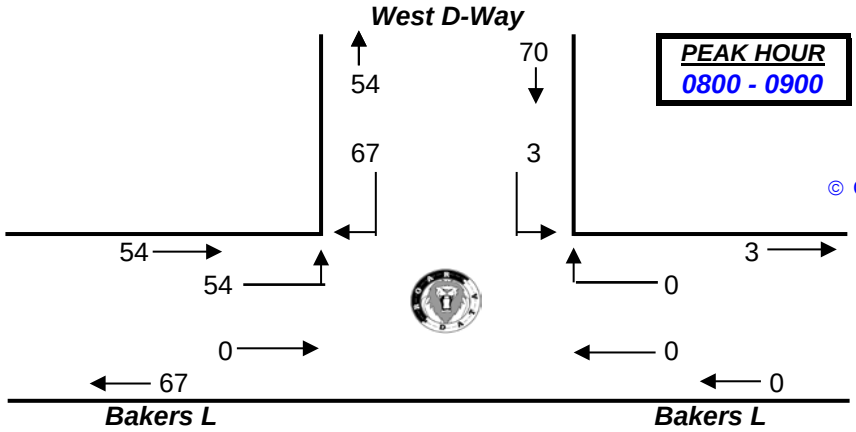
	WEST		NORTH		EAST		
	Bakers L		*West D-Way*		*Bakers L*		
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
0730 - 0745	0		2	0		0	**2**
0745 - 0800	3		5	1		0	**9**
0800 - 0815	11		8	0		0	**19**
0815 - 0830	10		15	2		0	**27**
0830 - 0845	25		30	1		0	**56**
0845 - 0900	8		14	0		0	**22**
0900 - 0915	7		7	0		0	**14**
0915 - 0930	2		5	1		0	**8**
Period End	**66**	**0**	**86**	**5**	**0**	**0**	**157**

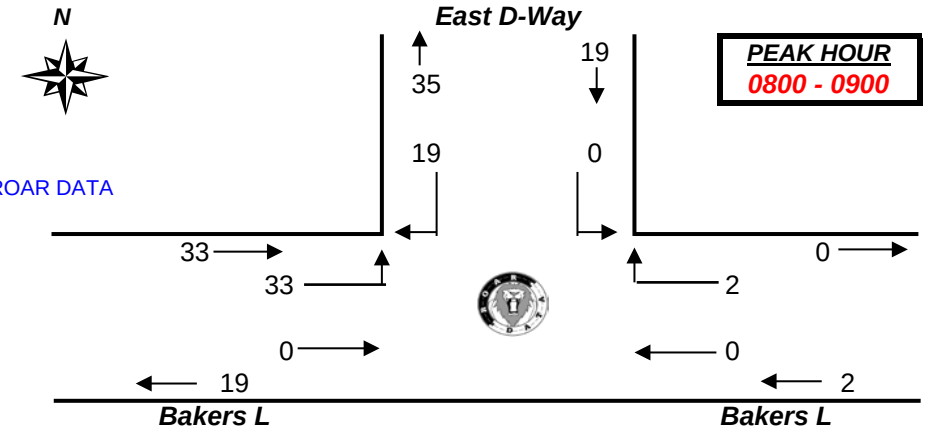
	WEST		NORTH		EAST		
	Bakers L		*West D-Way*		*Bakers L*		
Peak Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
0730 - 0830	24	0	30	3	0	0	**57**
0745 - 0845	49	0	58	4	0	0	**111**
0800 - 0900	54	0	67	3	0	0	**124**
0815 - 0915	50	0	66	3	0	0	**119**
0830 - 0930	42	0	56	2	0	0	**100**
PEAK HR	**54**	**0**	**67**	**3**	**0**	**0**	**124**

All Vehicles

	WEST		NORTH		EAST		
	Bakers L		*East D-Way*		*Bakers L*		
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
0730 - 0745	1		0	0		0	**1**
0745 - 0800	2		0	0		0	**2**
0800 - 0815	6		3	0		0	**9**
0815 - 0830	10		6	0		1	**17**
0830 - 0845	14		7	0		1	**22**
0845 - 0900	3		3	0		0	**6**
0900 - 0915	0		5	0		0	**5**
0915 - 0930	2		2	0		0	**4**
Period End	**38**	**0**	**26**	**0**	**0**	**2**	**66**

	WEST		NORTH		EAST		
	Bakers L		*East D-Way*		*Bakers L*		
Peak Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
0730 - 0830	19	0	9	0	0	1	**29**
0745 - 0845	32	0	16	0	0	2	**50**
0800 - 0900	33	0	19	0	0	2	**54**
0815 - 0915	27	0	21	0	0	2	**50**
0830 - 0930	19	0	17	0	0	1	**37**
PEAK HR	**33**	**0**	**19**	**0**	**0**	**2**	**54**





R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : T.T.P.A.
Job No/Name : 3892 KEMPS CREEK Bakers Lane
Day/Date : Monday 5th December 2011

College & School

All Vehicles

	U-BAY		
	Bakers L		
Time Per	**E-B**	**W-B**	**TOT**
0730 - 0745	0	0	**0**
0745 - 0800	1	0	**1**
0800 - 0815	3	0	**3**
0815 - 0830	7	0	**7**
0830 - 0845	2	0	**2**
0845 - 0900	0	0	**0**
0900 - 0915	0	0	**0**
0915 - 0930	0	0	**0**
Period End	**13**	**0**	**13**

All Vehicles

	U-BAY		
	Bakers L		
Peak Per	**E-B**	**W-B**	**TOT**
0730 - 0830	11	0	**11**
0745 - 0845	13	0	**13**
0800 - 0900	12	0	**12**
0815 - 0915	9	0	**9**
0830 - 0930	2	0	**2**
PEAK HR	**13**	**0**	**13**

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : T.T.P.A.

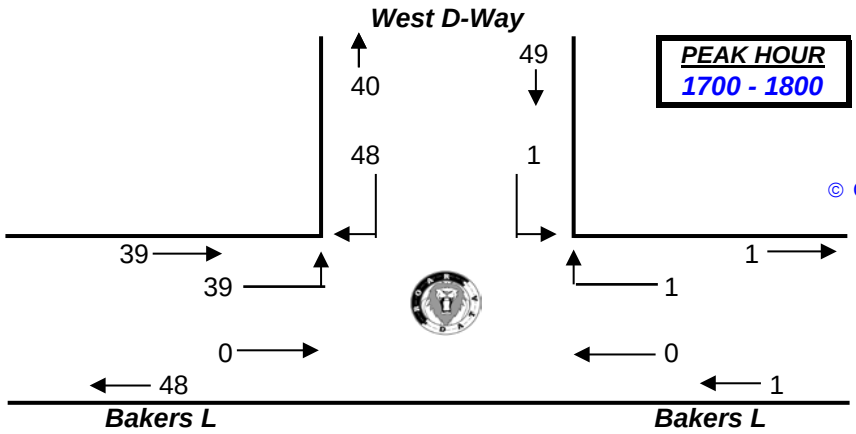
Job No/Name : 3892 KEMPS CREEK Bakers Lane

Day/Date : Monday 5th December 2011

All Vehicles

	WEST		NORTH		EAST		
	Bakers L		*West D-Way*		*Bakers L*		
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
1600 - 1615	0		2	0		0	**2**
1615 - 1630	0		0	0		0	**0**
1630 - 1645	0		0	0		0	**0**
1645 - 1700	7		0	0		0	**7**
1700 - 1715	16		0	0		0	**16**
1715 - 1730	12		32	1		0	**45**
1730 - 1745	8		9	0		1	**18**
1745 - 1800	3		7	0		0	**10**
Period End	**46**	**0**	**50**	**1**	**0**	**1**	**98**

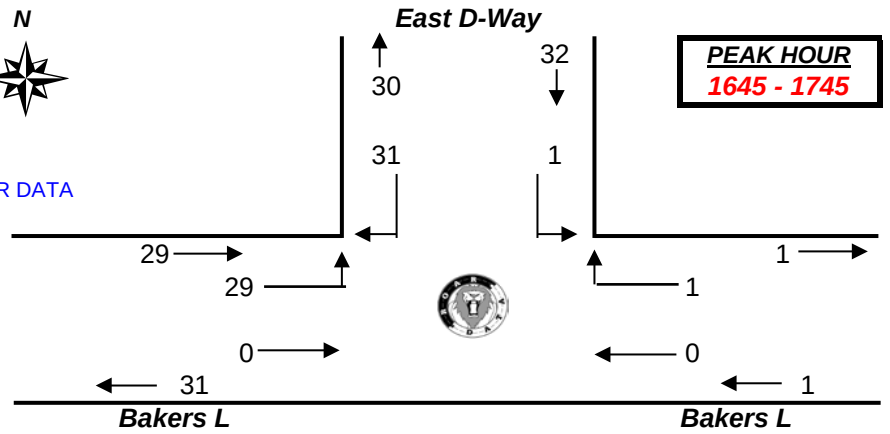
	WEST		NORTH		EAST		
	Bakers L		*West D-Way*		*Bakers L*		
Peak Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
1600 - 1700	7	0	2	0	0	0	**9**
1615 - 1715	23	0	0	0	0	0	**23**
1630 - 1730	35	0	32	1	0	0	**68**
1645 - 1745	43	0	41	1	0	1	**86**
1700 - 1800	39	0	48	1	0	1	**89**
PEAK HR	**39**	**0**	**48**	**1**	**0**	**1**	**89**



All Vehicles

	WEST		NORTH		EAST		
	Bakers L		*East D-Way*		*Bakers L*		
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
1600 - 1615	0		0	0		0	**0**
1615 - 1630	0		0	0		0	**0**
1630 - 1645	1		0	0		0	**1**
1645 - 1700	10		0	0		0	**10**
1700 - 1715	9		1	0		0	**10**
1715 - 1730	10		28	1		1	**40**
1730 - 1745	0		2	0		0	**2**
1745 - 1800	0		2	0		0	**2**
Period End	**30**	**0**	**33**	**1**	**0**	**1**	**65**

	WEST		NORTH		EAST		
	Bakers L		*East D-Way*		*Bakers L*		
Peak Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
1600 - 1700	11	0	0	0	0	0	**11**
1615 - 1715	20	0	1	0	0	0	**21**
1630 - 1730	30	0	29	1	0	1	**61**
1645 - 1745	29	0	31	1	0	1	**62**
1700 - 1800	19	0	33	1	0	1	**54**
PEAK HR	**29**	**0**	**31**	**1**	**0**	**1**	**62**



R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : T.T.P.A.
Job No/Name : 3892 KEMPS CREEK Bakers Lane
Day/Date : Monday 5th December 2011

College & School

All Vehicles

	U-BAY		
	Bakers L		
Time Per	**E-B**	**W-B**	**TOT**
1600 - 1615	0	0	**0**
1615 - 1630	0	0	**0**
1630 - 1645	0	0	**0**
1645 - 1700	1	0	**1**
1700 - 1715	0	0	**0**
1715 - 1730	8	0	**8**
1730 - 1745	5	0	**5**
1745 - 1800	0	0	**0**
Period End	**14**	**0**	**14**

All Vehicles

	U-BAY		
	Bakers L		
Peak Per	**E-B**	**W-B**	**TOT**
1600 - 1700	1	0	**1**
1615 - 1715	1	0	**1**
1630 - 1730	9	0	**9**
1645 - 1745	14	0	**14**
1700 - 1800	13	0	**13**

PEAK HR	**14**	**0**	**14**

R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : T.T.P.A.

Job No/Name : 3892 KEMPS CREEK Bakers Lane

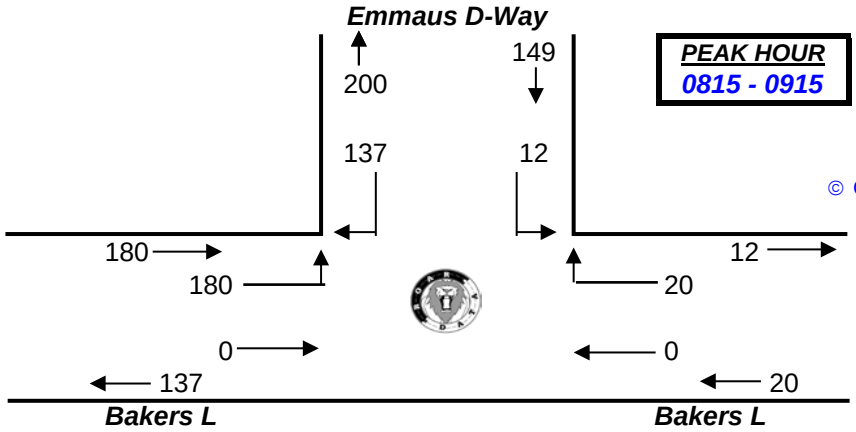
Day/Date : Monday 5th December 2011

All Vehicles

	WEST		NORTH		EAST		
	Bakers L		*Emmaus D-Way*		*Bakers L*		
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
0730 - 0745	15		3	0		1	**19**
0745 - 0800	19		1	0		3	**23**
0800 - 0815	42		11	2		6	**61**
0815 - 0830	53		26	1		8	**88**
0830 - 0845	60		34	5		7	**106**
0845 - 0900	37		31	2		2	**72**
0900 - 0915	30		46	4		3	**83**
0915 - 0930	8		26	0		0	**34**
Period End	**264**	**0**	**178**	**14**	**0**	**30**	**486**

	WEST		NORTH		EAST		
	Bakers L		*Emmaus D-*		*Bakers L*		
Peak Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
0730 - 0830	129	0	41	3	0	18	**191**
0745 - 0845	174	0	72	8	0	24	**278**
0800 - 0900	192	0	102	10	0	23	**327**
0815 - 0915	180	0	137	12	0	20	**349**
0830 - 0930	135	0	137	11	0	12	**295**

PEAK HR	**180**	**0**	**137**	**12**	**0**	**20**	**349**

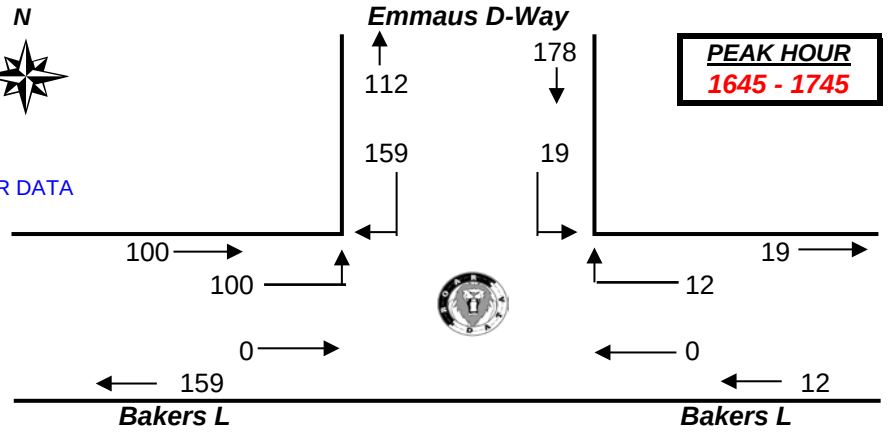


All Vehicles

	WEST		NORTH		EAST		
	Bakers L		*Emmaus D-Way*		*Bakers L*		
Time Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
1600 - 1615	5		6	0		0	**11**
1615 - 1630	14		1	0		2	**17**
1630 - 1645	18		5	0		1	**24**
1645 - 1700	56		5	1		10	**72**
1700 - 1715	24		100	14		0	**138**
1715 - 1730	12		26	3		2	**43**
1730 - 1745	8		28	1		0	**37**
1745 - 1800	3		22	1		1	**27**
Period End	**140**	**0**	**193**	**20**	**0**	**16**	**369**

	WEST		NORTH		EAST		
	Bakers L		*Emmaus D-*		*Bakers L*		
Peak Per	**L**	**T**	**R**	**L**	**T**	**R**	**TOTAL**
1600 - 1700	93	0	17	1	0	13	**124**
1615 - 1715	112	0	111	15	0	13	**251**
1630 - 1730	110	0	136	18	0	13	**277**
1645 - 1745	100	0	159	19	0	12	**290**
1700 - 1800	47	0	176	19	0	3	**245**

PEAK HOUR	**100**	**0**	**159**	**19**	**0**	**12**	**290**



R.O.A.R. DATA
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Client : T.T.P.A.
Job No/Name : 3892 KEMPS CREEK Bakers Lane
Day/Date : Monday 5th December 2011

Emmaus College & Retirement

All Vehicles

	U-BAY Bakers L		
Time Per	**E-B**	**W-B**	**TOT**
0730 - 0745	0	0	**0**
0745 - 0800	2	0	**2**
0800 - 0815	6	0	**6**
0815 - 0830	32	0	**32**
0830 - 0845	27	0	**27**
0845 - 0900	6	0	**6**
0900 - 0915	0	0	**0**
0915 - 0930	1	0	**1**
Period End	**74**	**0**	**74**

	U-BAY Bakers L		
Peak Per	**E-B**	**W-B**	**TOT**
0730 - 0830	40	0	**40**
0745 - 0845	67	0	**67**
0800 - 0900	71	0	**71**
0815 - 0915	65	0	**65**
0830 - 0930	34	0	**34**

PEAK HR	**71**	**0**	**71**

All Vehicles

	U-BAY Bakers L		
Time Per	**E-B**	**W-B**	**TOT**
1600 - 1615	0	0	**0**
1615 - 1630	1	0	**1**
1630 - 1645	8	0	**8**
1645 - 1700	4	0	**4**
1700 - 1715	19	0	**19**
1715 - 1730	5	0	**5**
1730 - 1745	1	0	**1**
1745 - 1800	1	0	**1**
Period End	**39**	**0**	**39**

	U-BAY Bakers L		
Peak Per	**E-B**	**W-B**	**TOT**
1600 - 1700	13	0	**13**
1615 - 1715	32	0	**32**
1630 - 1730	36	0	**36**
1645 - 1745	29	0	**29**
1700 - 1800	26	0	**26**

PEAK HR	**36**	**0**	**36**

Appendix D

SIDRA RESULTS

MOVEMENT SUMMARY

Site: East Access 2016 AM

East Access
Signals - Fixed Time Cycle Time = 60 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Access South											
1	L	105	5.0	0.089	8.4	LOS A	0.9	6.3	0.35	0.65	43.1
2	T	1	5.0	0.049	25.5	LOS B	0.5	3.6	0.90	0.61	28.9
3	R	11	5.0	0.049	32.2	LOS C	0.5	3.6	0.90	0.67	29.5
Approach		117	5.0	0.089	10.7	LOS A	0.9	6.3	0.41	0.65	41.2
East: Bakers East											
4	L	11	5.0	0.009	7.1	LOS A	0.0	0.1	0.05	0.58	49.1
5	T	308	5.0	0.462	26.1	LOS B	4.1	29.6	0.92	0.72	33.2
6	R	21	5.0	0.118	35.5	LOS C	0.9	6.6	0.91	0.70	29.4
Approach		340	5.0	0.462	26.1	LOS B	4.1	29.6	0.90	0.71	33.3
North: Access North											
7	L	14	0.0	0.027	23.4	LOS B	0.5	3.4	0.73	0.69	33.4
8	T	1	0.0	0.027	16.0	LOS B	0.5	3.4	0.73	0.51	34.0
9	R	219	0.0	0.888	44.5	LOS D	9.6	67.2	1.00	1.11	25.2
Approach		234	0.0	0.888	43.1	LOS D	9.6	67.2	0.98	1.08	25.6
North West: Service Rd West											
27	L	2	5.0	0.284	37.2	LOS C	2.4	17.7	0.96	0.74	29.3
29	R	54	5.0	0.286	38.0	LOS C	2.4	17.7	0.96	0.74	29.5
Approach		56	5.0	0.286	38.0	LOS C	2.4	17.7	0.96	0.74	29.5
West: Bakers West											
10	L	264	5.0	0.840	32.8	LOS C	14.1	103.0	0.97	0.97	31.2
11	T	1003	5.0	0.840	21.3	LOS B	14.1	103.0	0.95	0.90	35.5
12	R	211	5.0	0.465	28.6	LOS C	6.6	48.4	0.83	0.79	32.6
Approach		1478	5.0	0.839	24.4	LOS B	14.1	103.0	0.93	0.90	34.3
All Vehicles		2224	4.5	0.888	26.2	LOS B	14.1	103.0	0.91	0.87	33.1

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

MOVEMENT SUMMARY

Site: East Access 2016 PM

East Access
Signals - Fixed Time Cycle Time = 60 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Access South											
1	L	211	5.0	0.231	10.3	LOS A	3.0	21.9	0.51	0.70	41.5
2	T	1	5.0	0.046	24.4	LOS B	0.5	3.5	0.88	0.61	29.4
3	R	11	5.0	0.046	31.1	LOS C	0.5	3.5	0.88	0.68	29.9
Approach		222	5.0	0.231	11.4	LOS A	3.0	21.9	0.53	0.70	40.7
East: Bakers East											
4	L	11	5.0	0.008	7.0	LOS A	0.0	0.1	0.05	0.58	49.2
5	T	1086	5.0	0.759	19.3	LOS B	11.4	83.3	0.91	0.81	37.0
6	R	13	5.0	0.071	35.2	LOS C	0.5	4.0	0.90	0.68	29.6
Approach		1109	5.0	0.759	19.4	LOS B	11.4	83.3	0.90	0.81	37.0
North: Access North											
7	L	21	0.0	0.037	21.9	LOS B	0.7	4.8	0.70	0.70	34.1
8	T	1	0.0	0.037	14.6	LOS B	0.7	4.8	0.70	0.51	34.9
9	R	205	0.0	0.761	37.3	LOS C	8.2	57.5	1.00	0.94	27.4
Approach		227	0.0	0.761	35.8	LOS C	8.2	57.5	0.97	0.91	27.9
North West: Service Rd West											
27	L	2	5.0	0.284	37.2	LOS C	2.4	17.7	0.96	0.74	29.3
29	R	54	5.0	0.286	38.0	LOS C	2.4	17.7	0.96	0.74	29.5
Approach		56	5.0	0.286	38.0	LOS C	2.4	17.7	0.96	0.74	29.5
West: Bakers West											
10	L	143	5.0	0.322	27.9	LOS B	4.6	33.6	0.78	0.77	32.9
11	T	311	5.0	0.322	15.9	LOS B	4.6	33.6	0.71	0.57	39.8
12	R	105	5.0	0.581	37.7	LOS C	4.4	32.5	0.98	0.79	28.5
Approach		559	5.0	0.581	23.1	LOS B	4.6	33.6	0.78	0.67	35.4
All Vehicles		2174	4.5	0.761	21.7	LOS B	11.4	83.3	0.84	0.77	35.5

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

MOVEMENT SUMMARY

Site: East Access 2031 AM

East Access
Signals - Fixed Time Cycle Time = 100 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Access South											
1	L	42	5.0	0.038	7.7	LOS A	0.3	2.5	0.22	0.61	43.6
2	T	1	5.0	0.450	51.9	LOS D	3.5	25.3	1.00	0.74	21.0
3	R	46	5.0	0.443	58.7	LOS E	3.5	25.3	1.00	0.75	21.7
Approach		89	5.0	0.443	34.6	LOS C	3.5	25.3	0.63	0.68	28.5
East: Bakers East											
4	L	105	5.0	0.074	7.1	LOS A	0.3	2.0	0.06	0.58	49.1
5	T	459	5.0	0.229	15.8	LOS B	4.9	36.0	0.51	0.42	40.5
6	R	126	5.0	0.885	65.9	LOS E	8.7	63.5	1.00	0.96	20.6
Approach		691	5.0	0.885	23.6	LOS B	8.7	63.5	0.53	0.54	35.3
North: Access North											
7	L	85	0.0	0.206	41.0	LOS C	4.8	33.4	0.85	0.76	26.1
8	T	1	0.0	0.205	33.8	LOS C	4.8	33.4	0.85	0.67	26.3
9	R	147	0.0	0.860	64.2	LOS E	9.8	68.8	1.00	1.00	20.5
Approach		234	0.0	0.860	55.6	LOS D	9.8	68.8	0.94	0.91	22.3
North West: Service Rd West											
27	L	2	5.0	0.206	59.5	LOS E	1.8	13.2	0.98	0.71	22.4
29	R	22	5.0	0.207	60.1	LOS E	1.8	13.2	0.98	0.71	22.8
Approach		24	5.0	0.207	60.0	LOS E	1.8	13.2	0.98	0.71	22.7
West: Bakers West											
10	L	159	5.0	0.869	19.0	LOS B	26.8	195.9	0.60	1.00	40.0
11	T	2473	5.0	0.870	9.8	LOS A	26.8	195.9	0.56	0.56	45.1
12	R	105	5.0	0.223	38.7	LOS C	5.0	36.8	0.74	0.75	28.2
Approach		2737	5.0	0.870	11.5	LOS A	26.8	195.9	0.57	0.59	43.9
All Vehicles		3775	4.7	0.885	17.3	LOS B	26.8	195.9	0.59	0.60	39.0

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS E. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

MOVEMENT SUMMARY

Site: East Access 2031 PM

East Access
Signals - Fixed Time Cycle Time = 80 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Access South											
1	L	105	5.0	0.166	15.9	LOS B	2.9	21.5	0.61	0.72	37.6
2	T	1	5.0	0.925	59.7	LOS E	7.1	51.5	1.00	1.14	19.4
3	R	105	5.0	0.952	66.4	LOS E	7.1	51.5	1.00	1.14	20.2
Approach		212	5.0	0.952	41.2	LOS C	7.1	51.5	0.81	0.93	26.2
East: Bakers East											
4	L	46	5.0	0.031	7.0	LOS A	0.1	0.6	0.05	0.58	49.2
5	T	2357	5.0	0.890	15.2	LOS B	26.7	195.2	0.79	0.81	40.2
6	R	65	5.0	0.488	48.7	LOS D	3.7	27.3	0.98	0.75	24.8
Approach		2468	5.0	0.890	15.9	LOS B	26.7	195.2	0.78	0.80	39.7
North: Access North											
7	L	89	0.0	0.209	34.0	LOS C	4.1	28.6	0.84	0.76	28.5
8	T	1	0.0	0.207	26.8	LOS B	4.1	28.6	0.84	0.66	28.8
9	R	137	0.0	0.761	49.9	LOS D	7.4	52.1	1.00	0.90	23.7
Approach		227	0.0	0.761	43.6	LOS D	7.4	52.1	0.94	0.85	25.4
North West: Service Rd West											
27	L	43	5.0	0.879	57.4	LOS E	7.5	55.0	1.00	1.00	23.3
29	R	85	5.0	0.878	58.2	LOS E	7.5	55.0	1.00	1.00	23.3
Approach		128	5.0	0.878	57.9	LOS E	7.5	55.0	1.00	1.00	23.3
West: Bakers West											
10	L	91	5.0	0.236	15.9	LOS B	4.0	29.2	0.38	0.85	41.4
11	T	531	5.0	0.236	6.5	LOS A	4.0	29.2	0.31	0.26	49.5
12	R	43	5.0	0.318	47.8	LOS D	2.5	18.3	0.96	0.73	25.1
Approach		664	5.0	0.318	10.4	LOS A	4.0	29.2	0.36	0.37	45.5
All Vehicles		3700	4.7	0.952	19.5	LOS B	26.7	195.2	0.72	0.74	37.2

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS E. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

MOVEMENT SUMMARY

Site: West Access 2016 AM

Bakers Lane/West Access
Signals - Fixed Time Cycle Time = 70 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Access South											
1	L	132	5.0	0.100	8.4	LOS A	1.4	10.3	0.32	0.64	42.9
2	T	1	5.0	0.077	33.4	LOS C	0.7	4.8	0.95	0.65	28.6
3	R	12	4.5	0.077	40.0	LOS C	0.7	4.8	0.95	0.68	26.9
Approach		144	5.0	0.100	11.2	LOS A	1.4	10.3	0.38	0.64	40.8
East: Bakers East											
4	L	11	5.0	0.010	7.0	LOS A	0.0	0.1	0.05	0.58	49.1
5	T	622	5.0	0.634	26.4	LOS B	8.2	59.8	0.92	0.76	33.1
6	R	2	5.0	0.014	40.0	LOS C	0.1	0.8	0.91	0.61	27.7
Approach		635	5.0	0.634	26.1	LOS B	8.2	59.8	0.90	0.76	33.2
North: Access North											
7	L	6	0.0	0.021	32.0	LOS C	0.3	2.3	0.83	0.68	29.9
8	T	1	0.0	0.021	24.5	LOS B	0.3	2.3	0.83	0.56	32.6
9	R	105	0.0	0.613	43.2	LOS D	5.2	36.3	1.00	0.81	25.5
Approach		113	0.0	0.613	42.4	LOS C	5.2	36.3	0.99	0.80	25.8
North West: Service West											
27	L	54	5.0	0.321	43.1	LOS D	2.7	19.9	0.98	0.74	27.5
Approach		54	5.0	0.321	43.1	LOS D	2.7	19.9	0.98	0.74	27.5
West: Bakers West											
10	L	105	5.0	0.689	19.5	LOS B	13.1	95.9	0.69	0.92	39.9
11	T	1467	5.0	0.689	10.9	LOS A	13.1	95.9	0.67	0.59	43.8
12	R	342	5.0	0.389	17.0	LOS B	7.2	52.3	0.50	0.74	39.8
Approach		1915	5.0	0.689	12.5	LOS A	13.1	95.9	0.64	0.63	42.8
All Vehicles		2860	4.8	0.689	17.2	LOS B	13.1	95.9	0.71	0.67	38.8

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

MOVEMENT SUMMARY

Site: West Access 2016 PM

Bakers Lane/West Access
Signals - Fixed Time Cycle Time = 50 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Access South											
1	L	342	5.0	0.378	10.8	LOS A	5.3	38.6	0.62	0.75	41.0
2	T	1	5.0	0.054	22.1	LOS B	0.5	3.3	0.91	0.62	33.8
3	R	12	4.5	0.054	28.7	LOS C	0.5	3.3	0.91	0.67	31.2
Approach		355	5.0	0.378	11.4	LOS A	5.3	38.6	0.63	0.74	40.5
East: Bakers East											
4	L	11	5.0	0.008	7.1	LOS A	0.0	0.1	0.07	0.58	49.0
5	T	1502	5.0	0.691	8.9	LOS A	10.1	73.6	0.70	0.62	45.7
6	R	5	5.0	0.025	29.2	LOS C	0.2	1.3	0.86	0.64	32.3
Approach		1518	5.0	0.691	9.0	LOS A	10.1	73.6	0.69	0.62	45.7
North: Access North											
7	L	3	0.0	0.010	24.5	LOS B	0.1	0.9	0.80	0.66	34.2
8	T	1	0.0	0.010	16.6	LOS B	0.1	0.9	0.80	0.52	37.3
9	R	98	0.0	0.407	30.5	LOS C	3.4	24.1	0.97	0.76	29.9
Approach		102	0.0	0.407	30.2	LOS C	3.4	24.1	0.96	0.76	30.1
North West: Service West											
27	L	54	5.0	0.229	31.3	LOS C	1.9	14.0	0.94	0.74	32.2
Approach		54	5.0	0.229	31.3	LOS C	1.9	14.0	0.94	0.74	32.2
West: Bakers West											
10	L	86	5.0	0.696	29.5	LOS C	6.7	48.7	0.96	0.86	33.4
11	T	546	5.0	0.696	20.9	LOS B	6.7	48.9	0.95	0.81	35.7
12	R	132	5.0	0.519	30.5	LOS C	4.4	32.0	0.94	0.78	31.7
Approach		764	5.0	0.696	23.5	LOS B	6.7	48.9	0.95	0.81	34.7
All Vehicles		2793	4.8	0.696	14.5	LOS A	10.1	73.6	0.77	0.69	40.5

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

MOVEMENT SUMMARY

Site: West Access 2031 AM

Bakers Lane/West Access
Signals - Fixed Time Cycle Time = 90 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Access South											
1	L	64	5.0	0.044	7.6	LOS A	0.5	4.0	0.20	0.61	43.7
2	T	1	5.0	0.831	53.6	LOS D	5.9	42.8	1.00	0.93	22.5
3	R	85	4.9	0.833	60.4	LOS E	5.9	42.8	1.00	0.96	21.4
Approach		151	5.0	0.833	37.8	LOS C	5.9	42.8	0.66	0.81	27.4
East: Bakers East											
4	L	199	5.0	0.160	7.0	LOS A	0.4	3.2	0.06	0.59	49.1
5	T	313	5.0	0.410	35.9	LOS C	5.5	40.3	0.90	0.70	28.9
6	R	44	5.0	0.372	53.9	LOS D	2.9	21.1	0.98	0.73	23.4
Approach		556	5.0	0.410	27.0	LOS B	5.5	40.3	0.60	0.66	33.1
North: Access North											
7	L	45	0.0	0.130	39.6	LOS C	2.5	17.6	0.86	0.74	26.6
8	T	1	0.0	0.130	32.3	LOS C	2.5	17.6	0.86	0.65	28.9
9	R	63	0.0	0.474	53.6	LOS D	4.1	28.4	1.00	0.75	22.8
Approach		109	0.0	0.474	47.6	LOS D	4.1	28.4	0.94	0.74	24.3
North West: Service West											
27	L	64	5.0	0.494	55.3	LOS D	4.1	30.2	1.00	0.75	23.8
Approach		64	5.0	0.494	55.3	LOS D	4.1	30.2	1.00	0.75	23.8
West: Bakers West											
10	L	63	5.0	0.858	16.3	LOS B	22.1	161.2	0.53	1.06	42.3
11	T	2558	5.0	0.860	8.2	LOS A	22.1	161.2	0.52	0.52	46.9
12	R	143	5.0	0.132	12.0	LOS A	2.1	15.2	0.24	0.66	44.0
Approach		2764	5.0	0.860	8.6	LOS A	22.1	161.2	0.50	0.54	46.7
All Vehicles		3644	4.8	0.860	14.6	LOS B	22.1	161.2	0.55	0.58	41.1

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS E. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.

MOVEMENT SUMMARY

Site: West Access 2031 PM

Bakers Lane/West Access
Signals - Fixed Time Cycle Time = 70 seconds (Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Access South											
1	L	143	5.0	0.201	14.3	LOS A	3.6	26.6	0.61	0.73	38.5
2	T	1	5.0	0.837	37.3	LOS C	9.4	68.8	1.00	0.97	27.0
3	R	200	5.0	0.812	44.1	LOS D	9.4	68.8	1.00	1.00	25.4
Approach		344	5.0	0.812	31.7	LOS C	9.4	68.8	0.84	0.88	29.6
East: Bakers East											
4	L	84	5.0	0.059	7.0	LOS A	0.1	1.0	0.06	0.58	49.1
5	T	2565	5.0	0.896	12.4	LOS A	24.4	178.0	0.71	0.76	42.5
6	R	34	5.0	0.220	41.7	LOS C	1.7	12.5	0.94	0.72	27.1
Approach		2683	5.0	0.896	12.6	LOS A	24.4	178.0	0.69	0.75	42.4
North: Access North											
7	L	35	0.0	0.061	25.4	LOS B	1.3	9.3	0.73	0.72	32.2
8	T	1	0.0	0.061	18.1	LOS B	1.3	9.3	0.73	0.54	36.3
9	R	66	0.0	0.245	36.0	LOS C	3.0	21.3	0.91	0.75	27.9
Approach		102	0.0	0.245	32.2	LOS C	3.0	21.3	0.85	0.74	29.3
North West: Service West											
27	L	253	5.0	0.477	31.8	LOS C	9.1	66.4	0.89	0.82	32.0
Approach		253	5.0	0.477	31.8	LOS C	9.1	66.4	0.89	0.82	32.0
West: Bakers West											
10	L	55	5.0	0.444	36.8	LOS C	5.1	36.9	0.91	0.79	29.7
11	T	305	5.0	0.444	28.0	LOS B	5.1	37.1	0.90	0.71	32.1
12	R	63	5.0	0.407	42.6	LOS D	3.2	23.0	0.97	0.75	26.8
Approach		423	5.0	0.444	31.3	LOS C	5.1	37.1	0.91	0.72	30.9
All Vehicles		3805	4.9	0.896	18.2	LOS B	24.4	178.0	0.75	0.76	38.1

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (RTA NSW).
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on average delay for all vehicle movements.