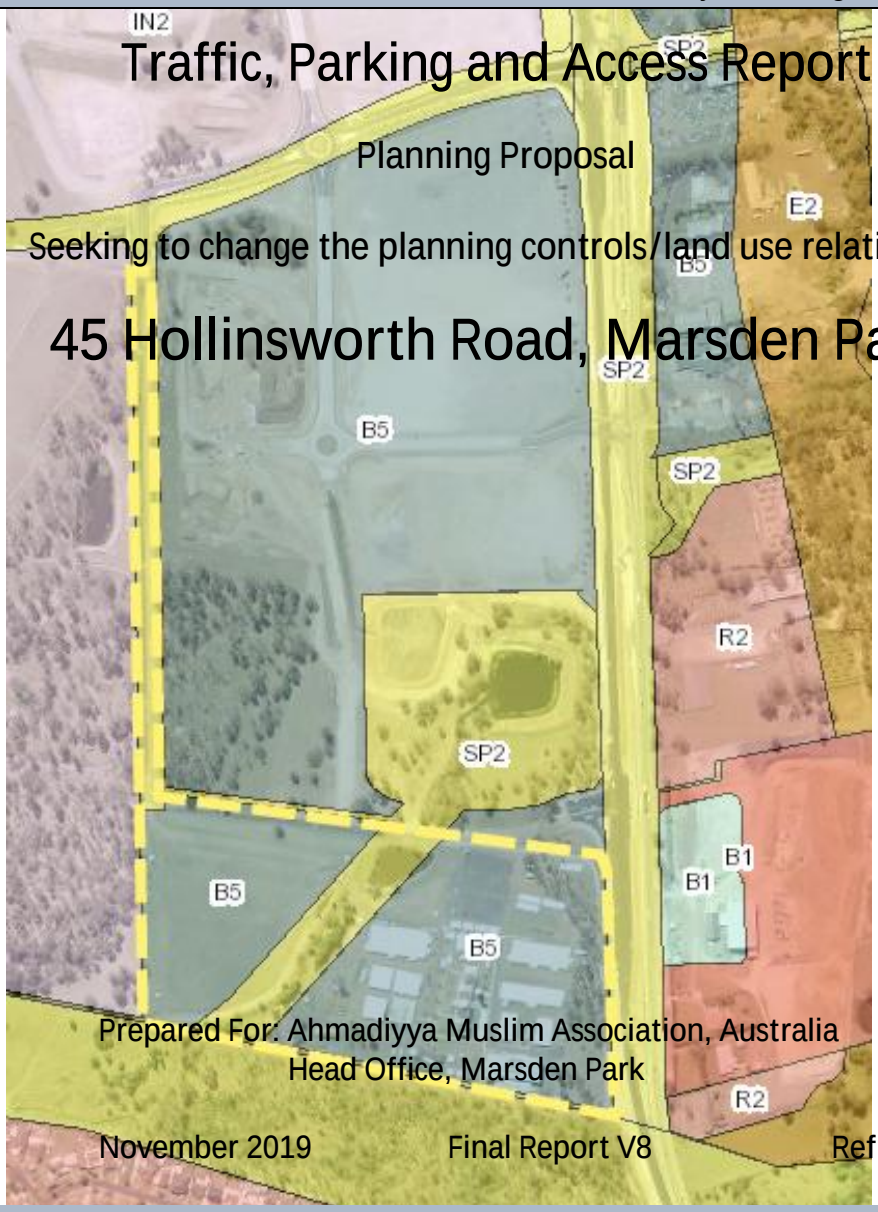
Civil – Traffic – Stormwater – Waste – Access – Project Management

Traffic, Parking and Access Report

Planning Proposal

Seeking to change the planning controls/land use relating to

45 Hollinsworth Road, Marsden Park



Prepared For: Ahmadiyya Muslim Association, Australia
Head Office, Marsden Park

November 2019 Final Report V8 Ref. Job 124

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Contents

1 Background - Introduction

MultiPro Consultants (MPC) Pty Ltd is undertaking the Traffic, Parking and Access Assessment study for the Ahmadiyya Muslim Association, Australia to amend *Blacktown Local Environmental Plan 2015* (the Blacktown LEP) to facilitate an amendment to *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* (the Growth Centres SEPP) to rezone land at 45 Hollinsworth Road, Marsden Park

The Marsden Park Industrial (Employment) Precinct (MPIP) is a major new employment precinct which is proposed to be developed over a total land area, in various ownerships, of approximately 550 hectares, generally on the western side of Bells Creek, to the north and west of the locality known as Colebee – Stonecutters Ridge.

The majority of the land in the precinct lies on the western side of Richmond Road and is bounded to the south by the future "Castlereagh Motorway" road reservation. There is currently no formal timeframe for the eventual future construction of this road and its need and timing is conceptually more related to the development of areas further to the west, eg in Penrith rather than in Blacktown LGA.

The State Government started planning for the Growth Centres in 2003 to streamline the supply of Greenfield land for urban development in Sydney. The strategic vision for the Growth Centre is set out in the North West Structure Plan, which was adopted by the NSW Government in 2006.

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 is the environmental planning instrument which sets controls for the North West and South West Growth Centres of Sydney.

The Marsden Park Industrial (Employment) Precinct is a *growth centre precinct* referred to as North West Growth Centre.

See Figure 1.

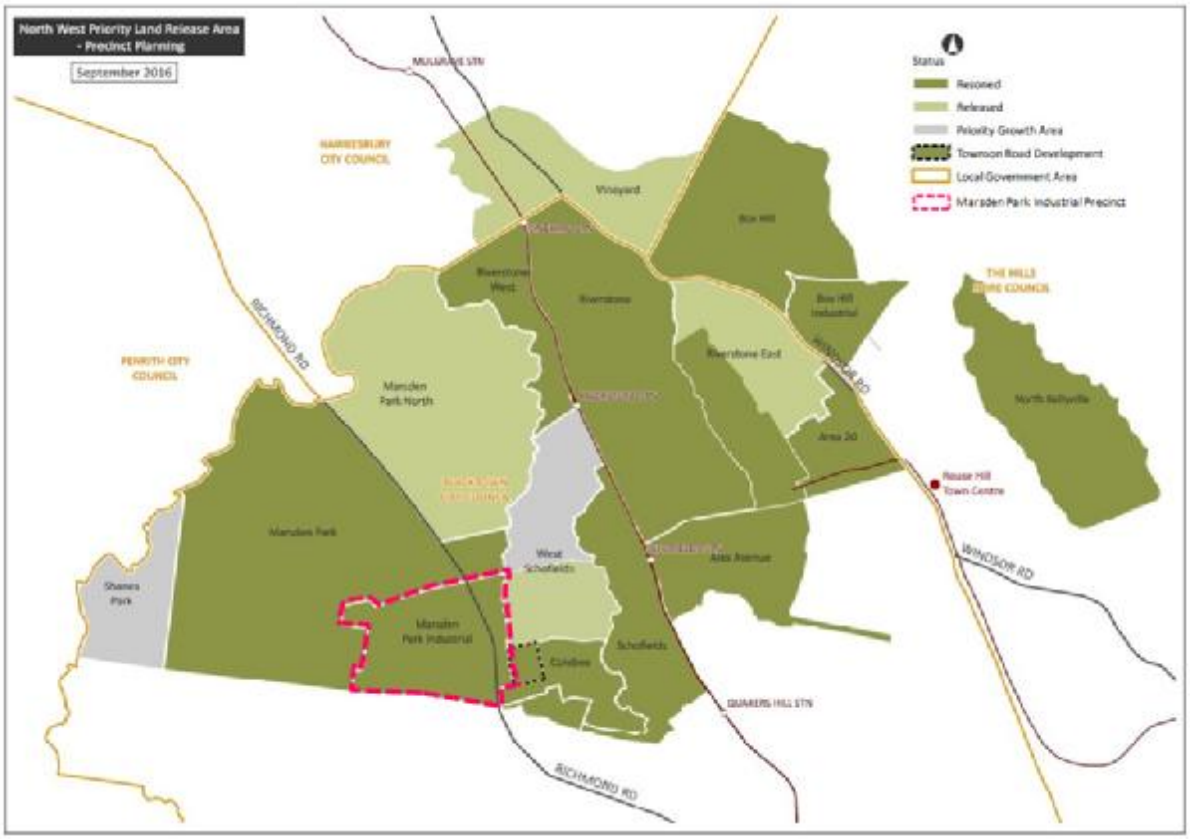


Figure 1 –Marsden Park Industrial (Employment) Precinct

At the time when the NSW Government rezoned the Marsden Park Industrial Precinct, the Ahmadiyya Muslim Association was not aware of the proposed zoning or future permissible development on its site at 45 Hollinsworth Road, Marsden Park. As a result this has disadvantaged the non-profit organisation in developing its land for its community for the future.

The Community (Ahmadiyya Muslim Association)

The Ahmadiyya Muslim Association, Australia's headquarters is located at 45Hollinsworth Road, Marsden Park (off Richmond Road). The Ahmadiyya Movement in Islam is an organization that promotes spiritual and moral values among its members. Its motto is 'Love for all hatred for none'. The Association is spread throughout the world, with branches in over 200 countries in Africa, North America, South America, Asia, Australasia, and Europe. At present, its total membership exceeds 200 million worldwide, and the numbers are increasing day by day.

The Ahmadiyya community in Australia was formed in the early part of the year 1980. The land for the mosque at Marsden Park was purchased in 1982. It is a non-commercial, self supporting association that entirely relies on the donations of its members. The Mosque at Lot 1 DP1176437, 45 Hollinsworth Road is the Australian head office of the Association.

Besides its services to help elevate moral and spiritual standards of its members, the community actively participates in humanitarian and community services around the globe. Through a large number of auxiliary organizations and projects, Ahmadiyya Muslim Movement Worldwide has set up a vast network of humanitarian and community programs around the world, particularly in poorer countries of the world and other communities in need. The assistance covers health, education and agricultural institutions and services particularly in African and other developing countries. Offering relief from the natural calamities whenever and wherever they happen globally is another area the worldwide Ahmadiyya community is very proud of.

Also, Australian Ahmadiyya community is actively contributing to community at large. Participations to Clean up Australia Day, National Tree Planting Day and Red Cross Door Knock Campaign are the permanent features of its ongoing contribution.

The Subject Land

The Associations' property at 45 Hollinsworth Road, Marsden Park Area is primarily zoned B5 (see Figure 2). The area of the property is approximately 114, 200 sq metres (28 acres). Access of the site is via Hollinsworth Road.

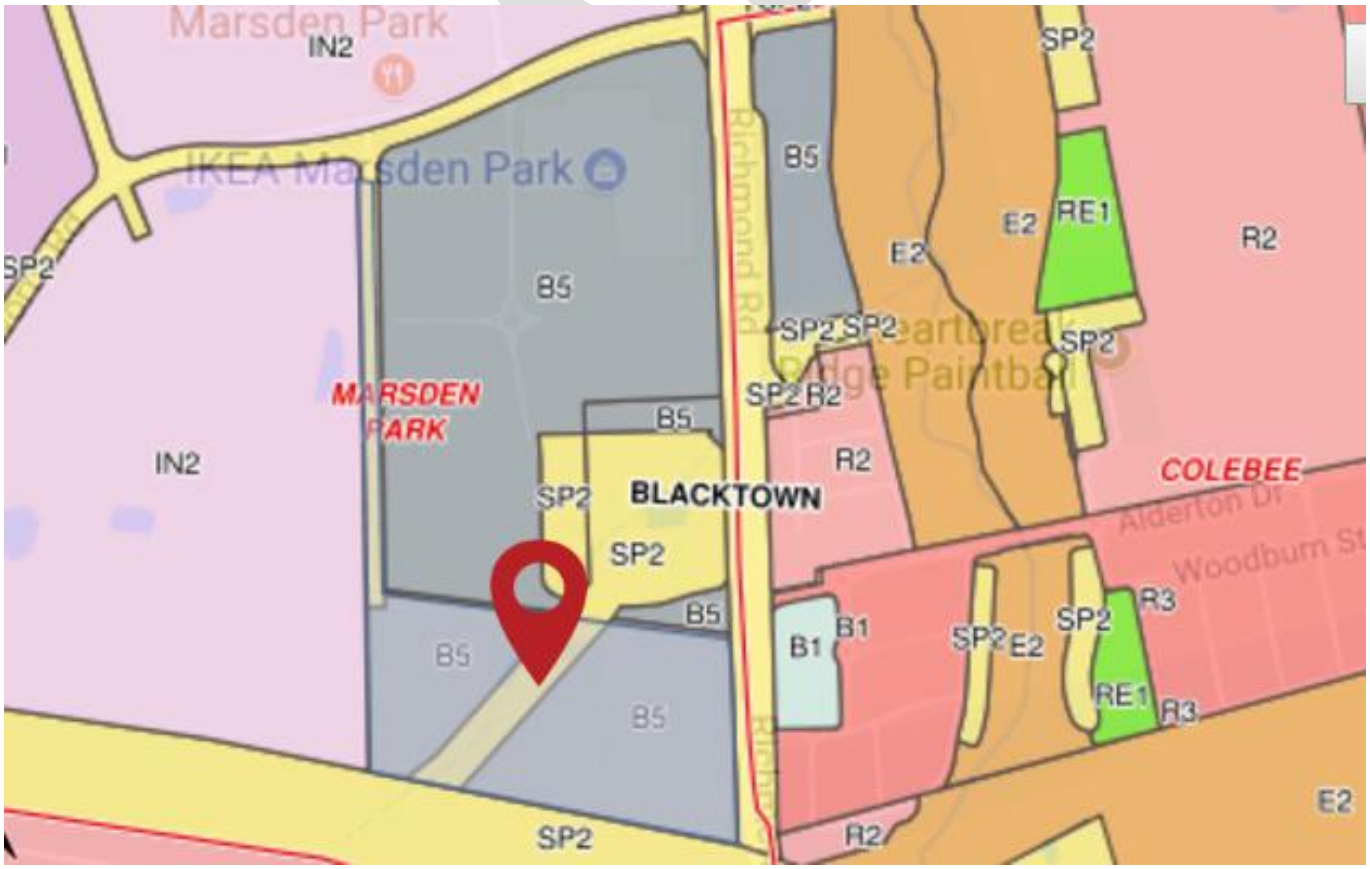


Figure 2 – Land Zoning

2 Existing Conditions

Within the site at 45 Hollinsworth Road, an area of approximately 28 acres the following buildings, structures and facilities are present:

- A mosque
- A Community hall
- Missionary's residence
- Storage
- Printing Room
- Rainwater tanks
- Cemetery
- Carpark
- Sports fields

2.1 Site

The subject land is located on the western side of Richmond Road, at 45 Hollinsworth Road, Marsden Park. The site has a street frontage of approximately 252 metres in length to Richmond Road and 417 metres in length to Hollinsworth Road.

The subject site is currently occupied by an existing mosque, and served by over 150 car spaces, accessed via Hollinsworth Road. See Figure 3.

Figure 3 Locality Plan

3 Master Planning

3.1 Marsden Park Industrial (Employment) Precinct

The Marsden Park Industrial (Employment) precinct currently contains mainly low intensity rural and rural industrial land uses, former quarries, some highway related commercial/industrial uses fronting Richmond Road and the caravan park and Mosque on sites near the southern edge of the precinct which are currently accessed via Hollinsworth Road.

The most likely future development of the precinct is now primarily employment/industrial land including significant commercial/business park areas for a future total workforce of up to 10,000 persons, together with a number of smaller areas of residential development (1,100 additional dwellings in total) which are to be mainly located at the northern end of the precinct where they will be close to the future Marsden Park Town Centre.

The initial transport and access investigations was undertaken as part of the precinct master planning by Arup, based on the results of a regional scale (Sydney Wide) NETANAL traffic network model prepared by Glen Varley of Road Delay Solutions Pty Ltd, which incorporated the full development of the precinct, together with all the other development precincts of the North West Growth Centre in the year 2036.

The Marsden Park Industrial (Employment) Precinct is the sixth of sixteen North West Growth Centre Precincts for which detailed precinct master planning was undertaken.

In concept, the Marsden Park Industrial (Employment) precinct is strategically well located with respect to future freight transport access to the M7 Motorway transport corridor and it will form one of three major future North Western Sydney employment centres representing almost one third of the predicted future total employment growth target (+38,000 jobs) which will provide the minimum desirable future target ratio of 60% local jobs vs households for the North West Growth Centre of Sydney (+63,500 dwellings).

When combined with the adjacent future Marsden Park Town Centre development to the north, which is located in the main “Marsden Park” precinct which is not actually part of the current precinct transport planning and master planning investigations, the combined future employment “centre” at Marsden Park will have a significant “critical mass” of related commercial and employment functions which will create a major future focus of public and private transport access routes in the area.

The existing bus service network is essentially limited to a single infrequent local bus route which follows a Crescentous route from Riverstone to Rooty Hill/Mount Druitt (Route 757).

The future prospects for heavy rail access for either passenger or freight transport to and from the Marsden Park area are not promising as the area is remote from the existing heavy rail network and proposals to date to improve heavy rail access to the area, eg the North West Heavy Rail or Metro Line or the various Intermodal Freight Terminal site options in the North West Region of Sydney, have been given low priority by the State and Federal Governments.

3.2 Ahmadiyya Muslim Association, Australia Master Planning for 45 Hollinsworth Road, Marsden Park

A Master Plan has been established to guide the Ahmadiyya Muslim Association, Australia at its head office at 45 Hollinsworth Road, Marsden Park for the next 20 years.

In summary the following proposal is included in the Master Plan (see Figure 4):

- Visitors Accommodation
- Administration Building
- Extension of Baitul Huda Mosque
- Recreational Facility (Basketball courts)
- Educational Facility (Jamia Ahmadiyya Australia (Missionary Training))
- Printing Room
- Mission House Extension
- Future Extension of Hall
- Storage Warehouse
- Sewer & Water Reticulation Upgrades
- School (Masroor Talimul Islam Academy)

The Ahmadiyya Muslim Association developed a Master Plan to make decisions regarding proposals that are required for the community for the next 20 years. This Plan is used by the association to ensure its member and public understand the community's long range plans and proposals for different land use within its property and to encourage plan implementation and funding.

Figure 4 Master Plan

The details of the master plan at 45 Hollinsworth Road, Marsden Park are as follows:

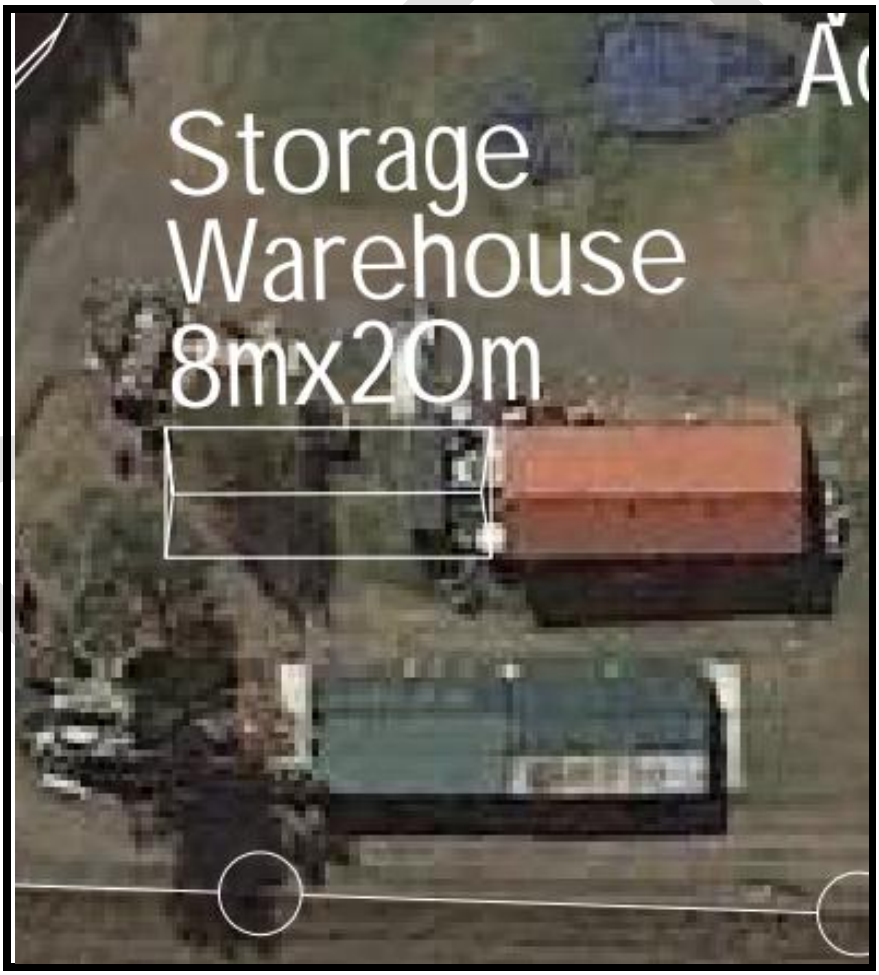
- Storage Warehouse

Description:

There are two sheds and a fenced area for storage. It is proposed that another Storage Warehouse type shed be constructed which can be used for storage of things such as maintenance equipment, books, chairs, tables, cutleries and general goods.

The building will have a footprint of 8m by 20m concrete slab and corrugated walls and high roof with steel beams (ie. Typical warehouse).

Design:



· Print Room (Masroor Printing Room)

Description:

The Shed is a historic building within the site. It has served the Association as the first building on site when the Association was initially established in Australia, it was used for prayers, congregation and accommodation for the missionary.

The aim is to retain this building footprint so that we could use it for the Printing Room and storage.

Design:

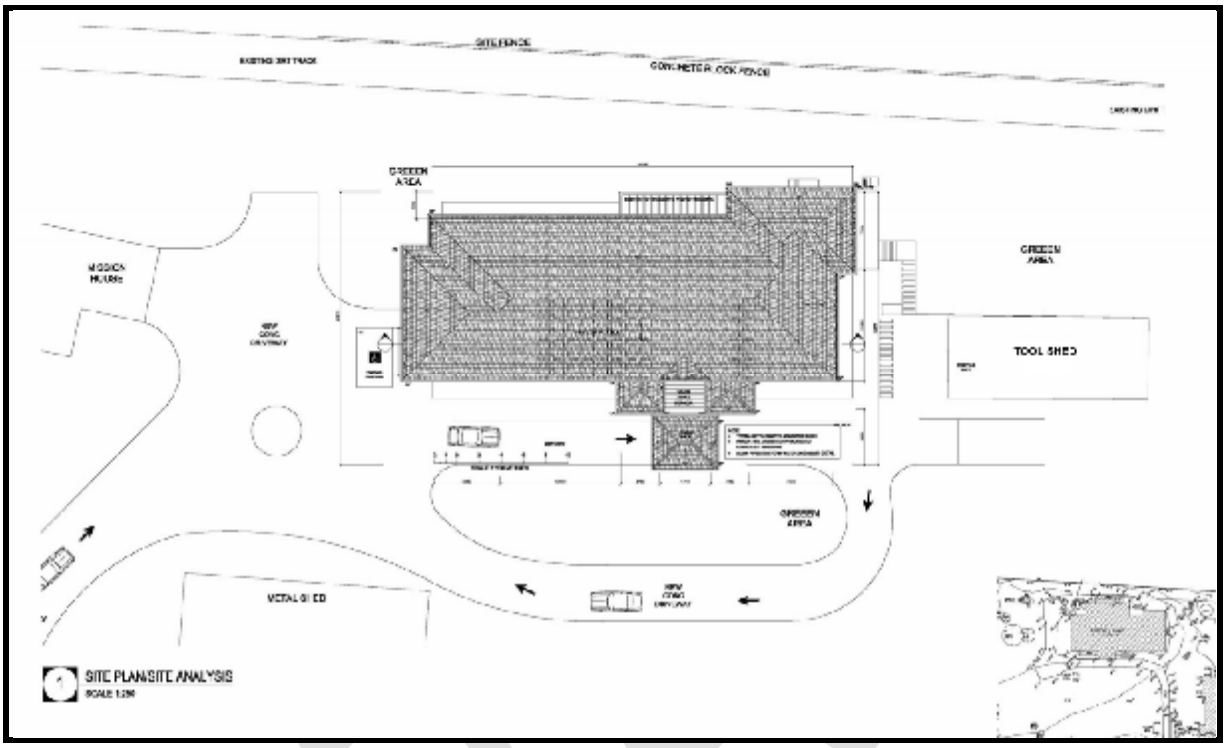
· Tourists & Visitors Accommodation ("Masroor Guest House")

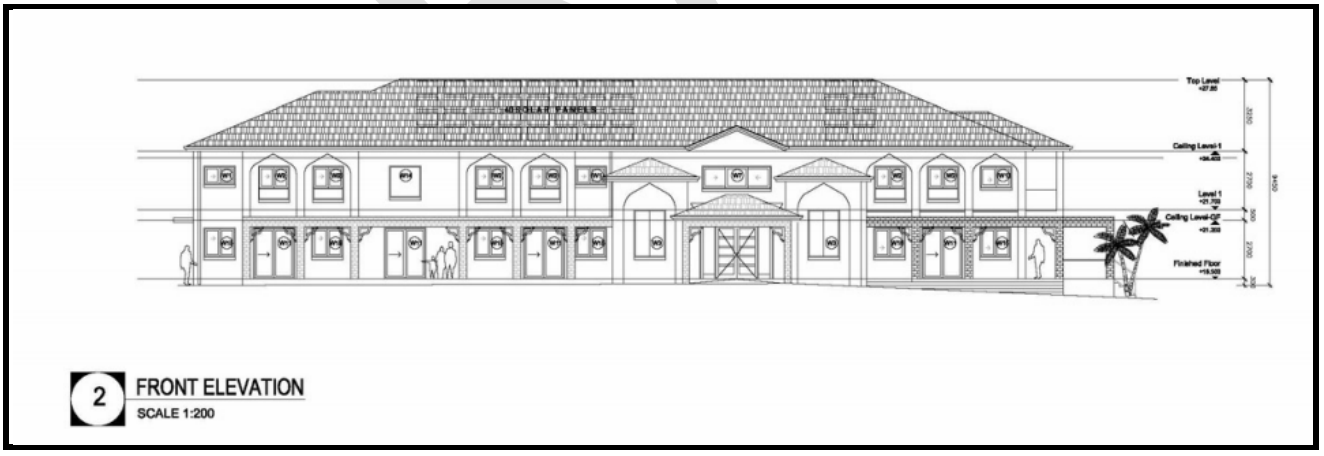
Description:

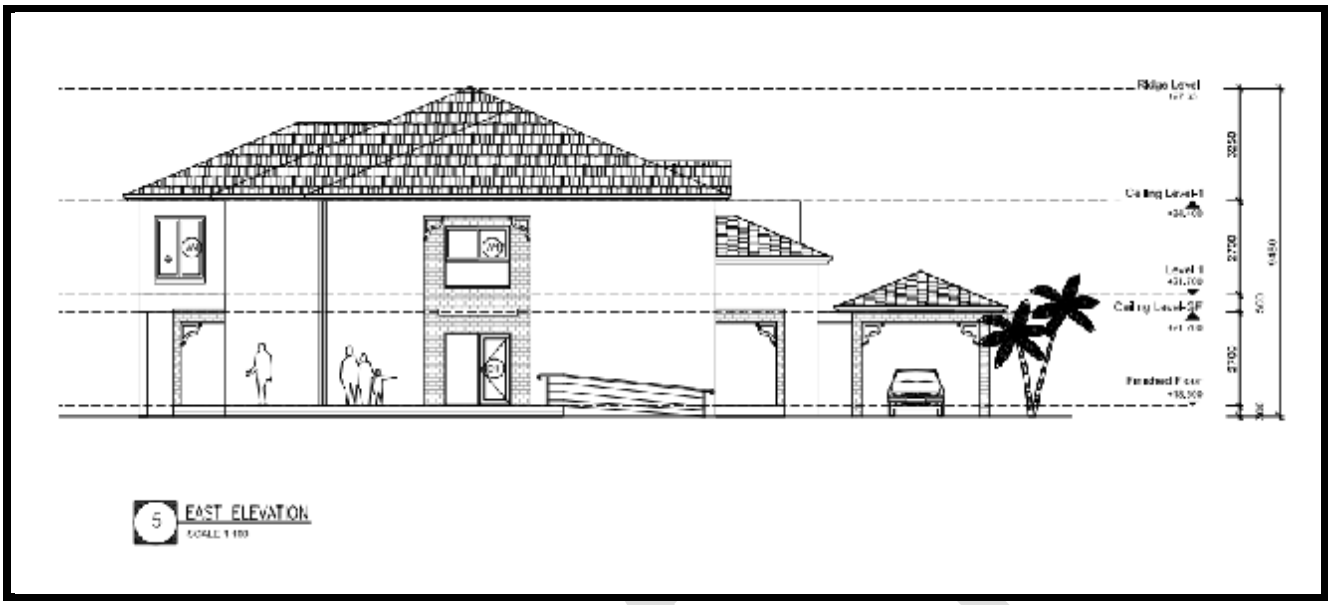
The development is proposed to the South West of the existing structure (Mosque) from Hollinsworth Road. The proposed development is an ancillary (to provide support to the operational activities) to the existing Mosque.

It will be a two storey building with spaces taken into consideration are: access for disabled people, fire exits at the end of corridor, communal dining areas and facility to prepare meals, living areas, suites, meeting hall, sick bay and administrative offices.

Design:

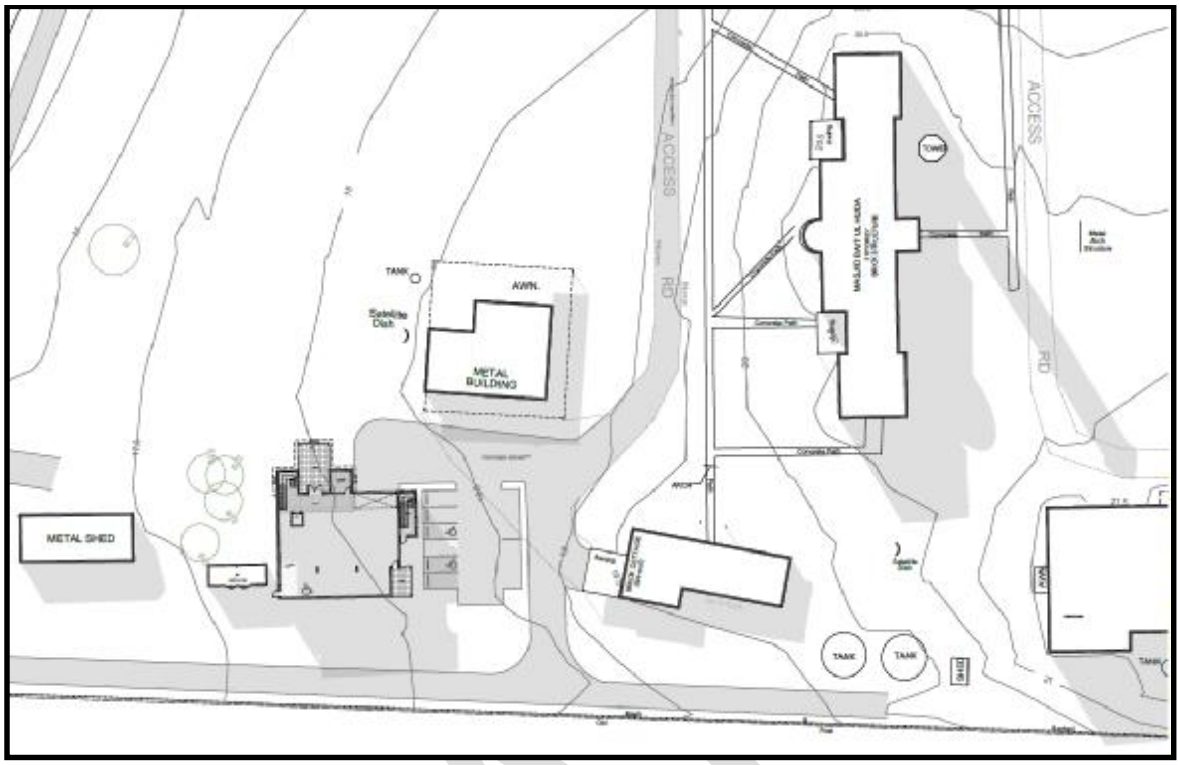

SITE PLAN/SITE ANALYSIS
SCALE 1:200
TOOL SHED


2
FRONT ELEVATION
SCALE 1:200



An application has been lodged with Council for a smaller ancillary building which is stage 1 of the above proposal.

See diagrams below.


ACCESS RD
TANK
AWN.
Satellite Dish
METAL BUILDING
METAL SHED
ACCESS RD
TANK
TANK


TILED ROOF
METAL SUN LOUVRE
ALUMINIUM FRAMED WINDOW
FEATURE WINDOW
TILED PORTICO
DECORATIVE NICHE
RENDERED EXTERNAL WALL
ALUMINIUM FRAMED WINDOW
COLUMN
TO ENGINEER'S SPECIFICATIC
SOLID CORE TIMBER EXTERN
PANEL LIFT DOOR
NORTH ELEVATION
1:100
TILED ROOF
METAL SUN LOUVRE
ALUMINIUM FRAMED WINDOW
MASONRY BALUSTRADE
DECORATIVE NICHE
RENDERED EXTERNAL WALL
ALUMINIUM FRAMED GLAZED SWING DOOR
WEST ELEVATION
1:100

· Mission House Extension

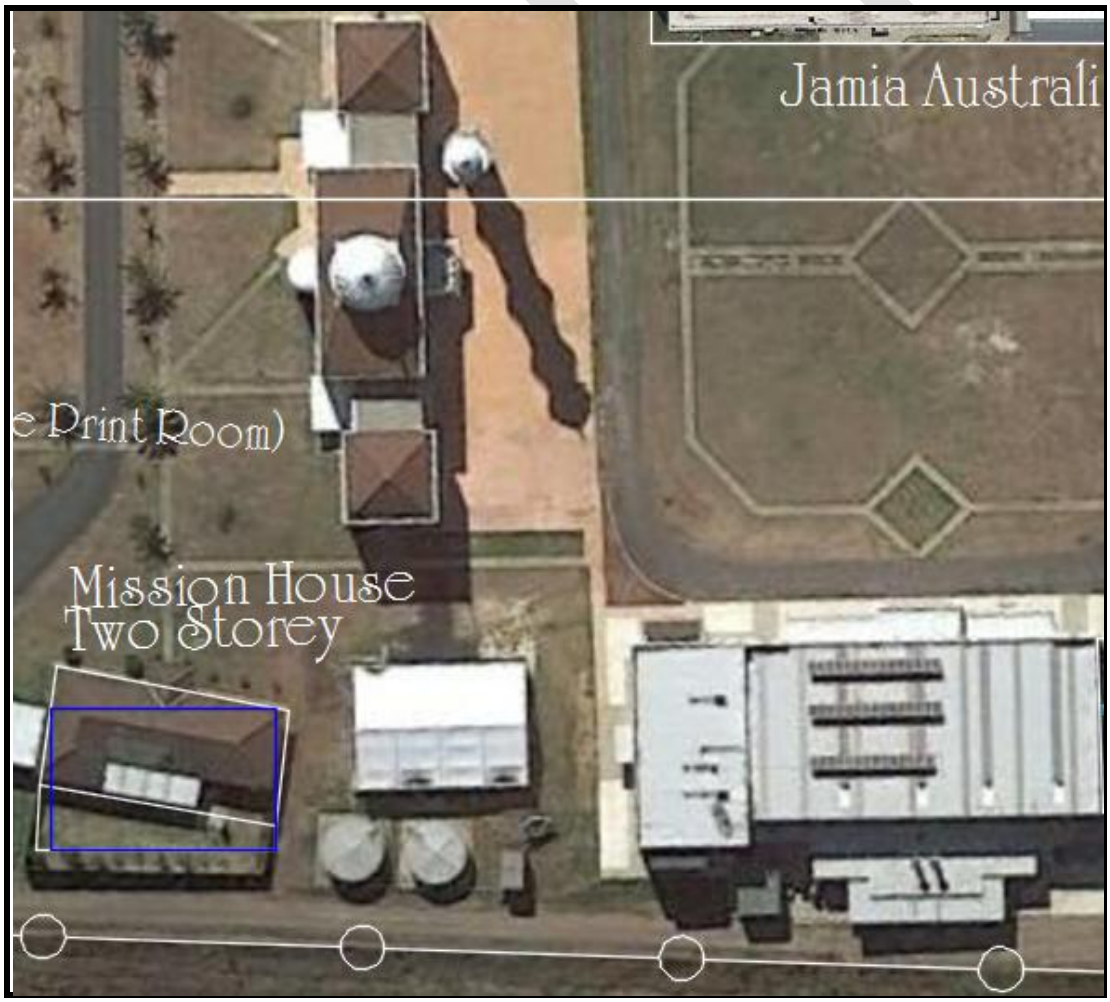
Description:

The current Mission House (President's residence) is small and its orientation has an offset towards Kaaba. *(Kaaba is a small shrine located near the centre of the Great Mosque in Mecca and considered by Muslims everywhere to be the most sacred spot on Earth. Muslims orient themselves toward this shrine during the five daily prayers)*

It is proposed to extend this building to a second floor, correcting the orientation. This residence could provide additional rooms to house visitors to Sydney.

There would be provision for future missionaries coming to Australia to be housed here. Rather than paying rental in other areas of Sydney, missionaries could utilise the space within this building.

Design:



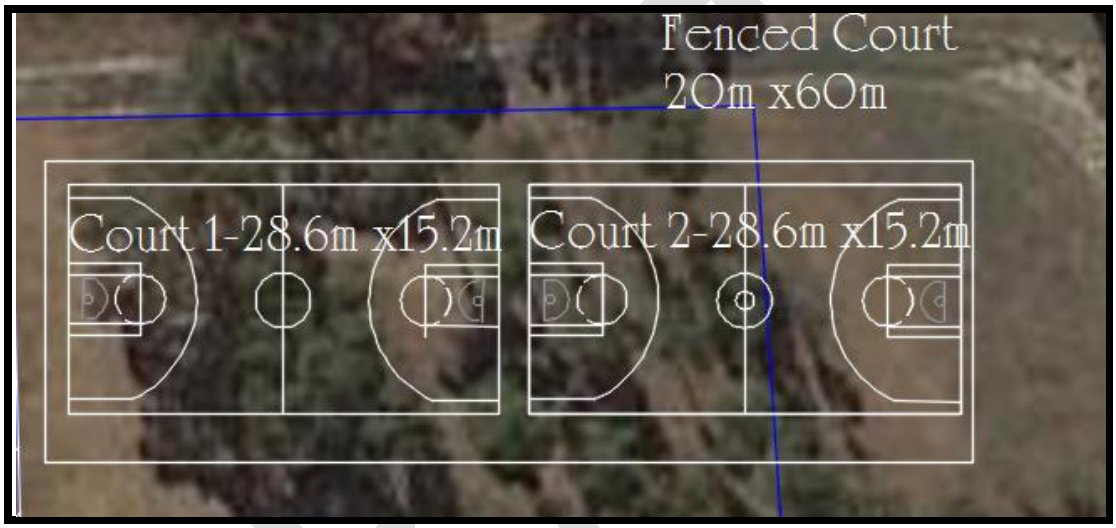
· Recreational Facility (Dual Basketball Courts)

Description:

As the numbers of youths (Khuddams) and community members are increasing, there is a need for recreational facility within site. It is proposed to construct a dual court next to the area near the carpark in the open space area.

The proposed court would be built to Australian Standards and the court sizes are in accordance with National Basketball Association.

Design:



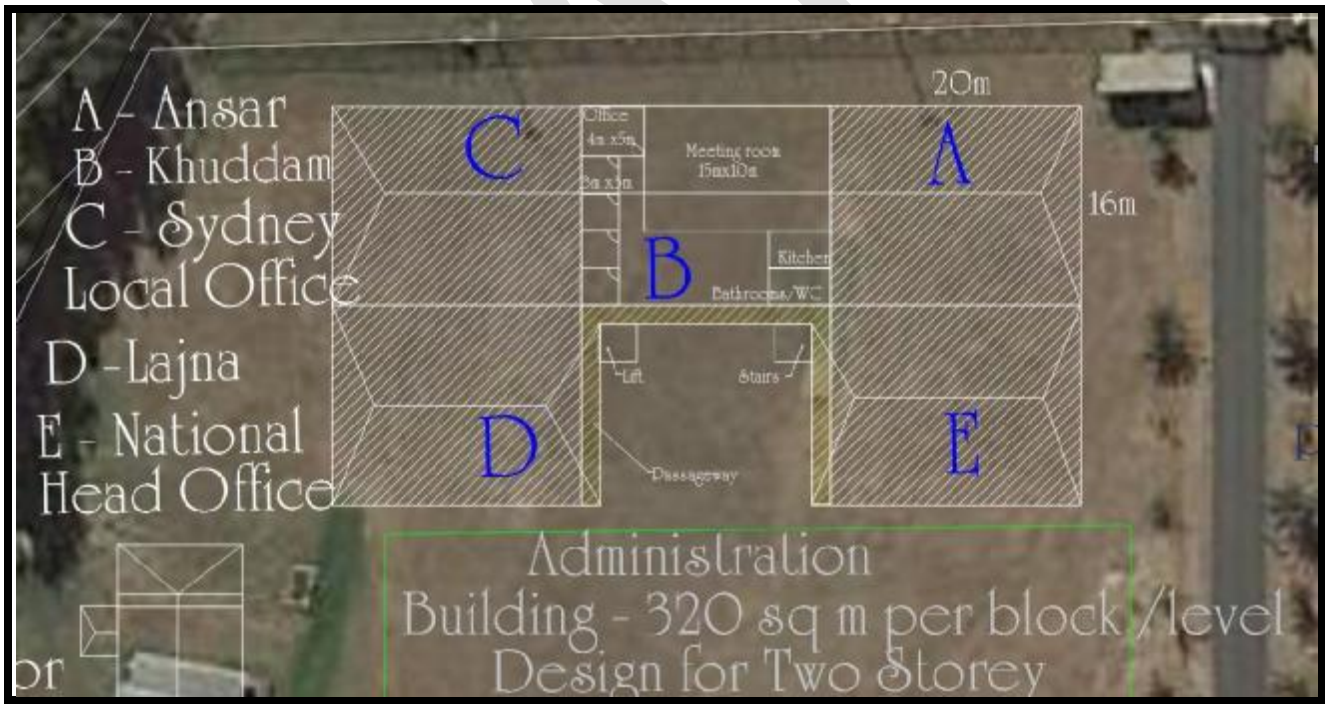
· Administration Building (Future Two Storey)

Description:

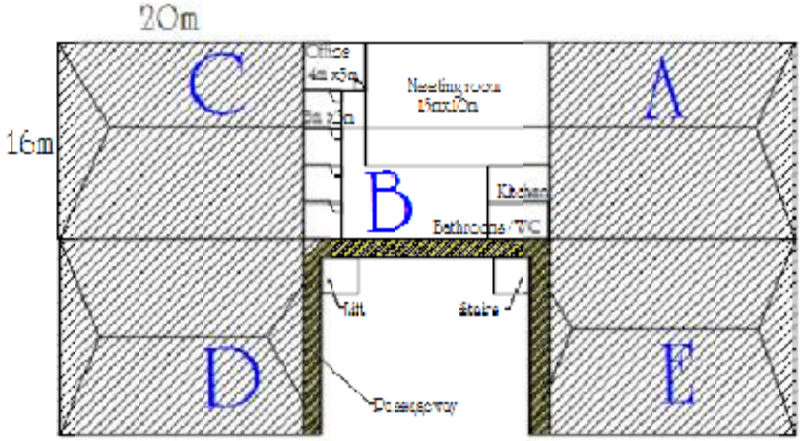
The proposal is to build an Administration Building to accommodate the demand of the following components:

- **v** Ansarullah *(*Ansarullah *is an auxiliary organization of the Ahmadiyya Muslim Community for men above forty years of age.)*
- **v** Khuddam *(It is the young men's branch of the community, particularly for those between the ages of 15 and 40.)*
- **v** Lajna*(It is the women's auxiliary organization of the Ahmadiyya Muslim Community)*
- **v** National Head Offices
- **v** Sydney Local Offices.

The main building will have 5 (Five) components for each of the above. One component (ie. building block) will have offices, meeting rooms, storage, etc. The building is proposed as single level with each block having an area of 320 square metres per level.



Administration Building - 320 sq m per block /level



A - Ansar
B - Khuddam
C Syd. Offices
D -Lajna
E NIIQ

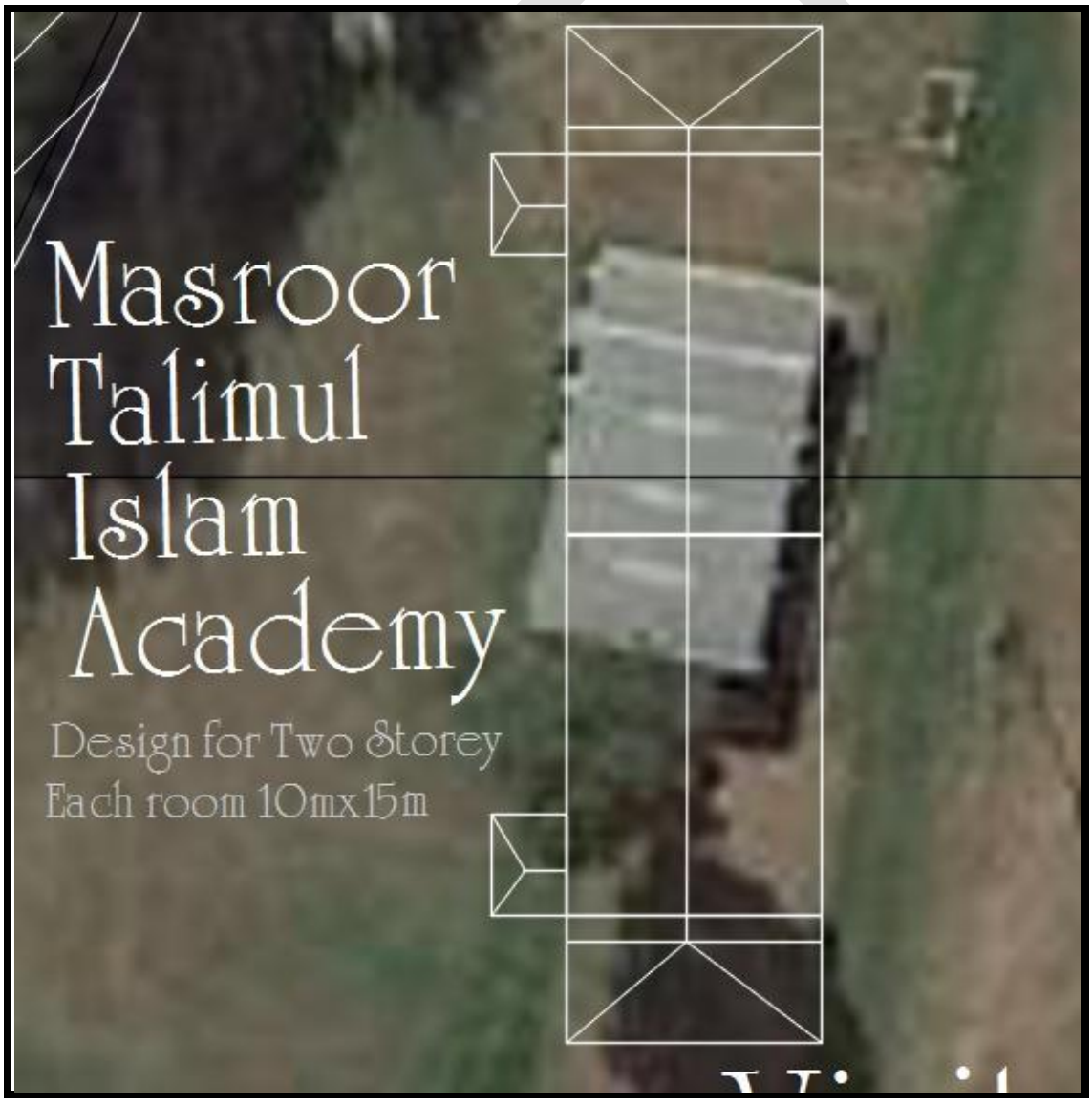
Design for Two Storey

- Education Establishment (Masroor Talimul Islam Academy & Jamia Ahmadiyya Australia)

Description:

This facility will provide classrooms for Islamic and general education for our youths and members of the community. As the Association is growing, we require rooms and space for educational (Talimul) purposes.

The proposed facility will include classrooms (2 on the ground floor and 2 on the first level), offices and toilets.
Design:



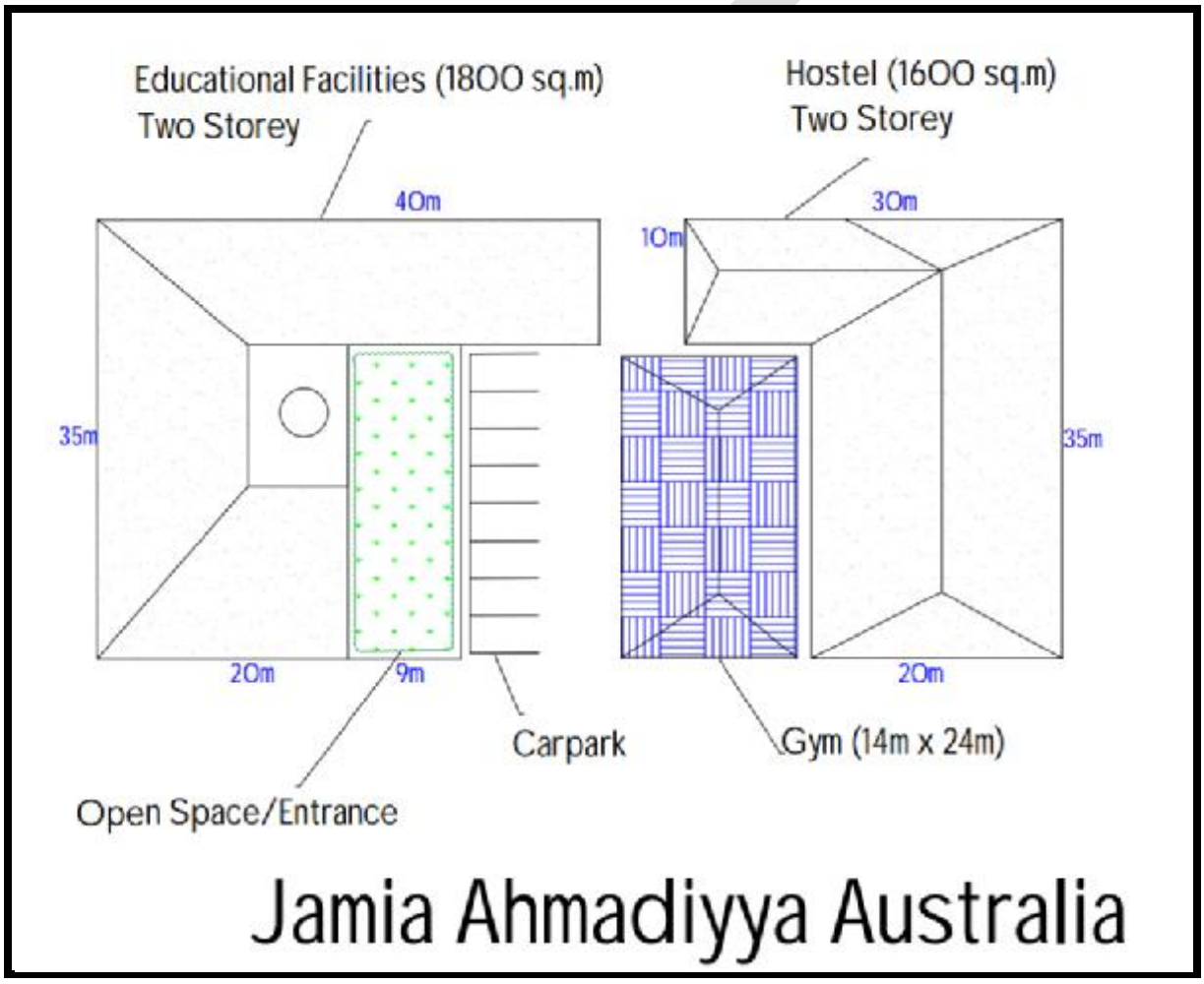
Description:

This Master Plan includes the provision of a Jamia *(*Jamia *is the Arabic word for gathering. It can also refer to more generally, a small university or education institute)* which will have two components:

- **v** Educational facility, and
- **v** Hostel / recreational facility

This building will be two storeys and will include separate car parking spaces.

Design:



· Extension of Baitul Huda Mosque

Description:

The existing building or mosque on site is two storey with prayer halls on both floors and includes Administration offices.

As the community is increasing the space is confined and on most occasions and events special arrangements are made elsewhere for overflows of members.

Phase 1 – Extension on the west of the existing building

The proposed extension area is approximately 764 square metres and will have similar building material to the existing mosque.

Phase 2 – Extension on the east (towards Richmond Road) of the existing building

The proposed extension area is approximately 671 square metres and will have similar building material to the existing mosque.

Design:

- Future Extension of Khilafat Hall (Community Hall)

Description:

There is an existing Community hall within this site know as the “Khilafat Hall”. The Khilafat Hall was built with pre-cast concrete walls. As the community is increasing the requirement for function area need to be facilitated for the future use.

The Hall can be extended in 10m components up to 3 sections.

Design:

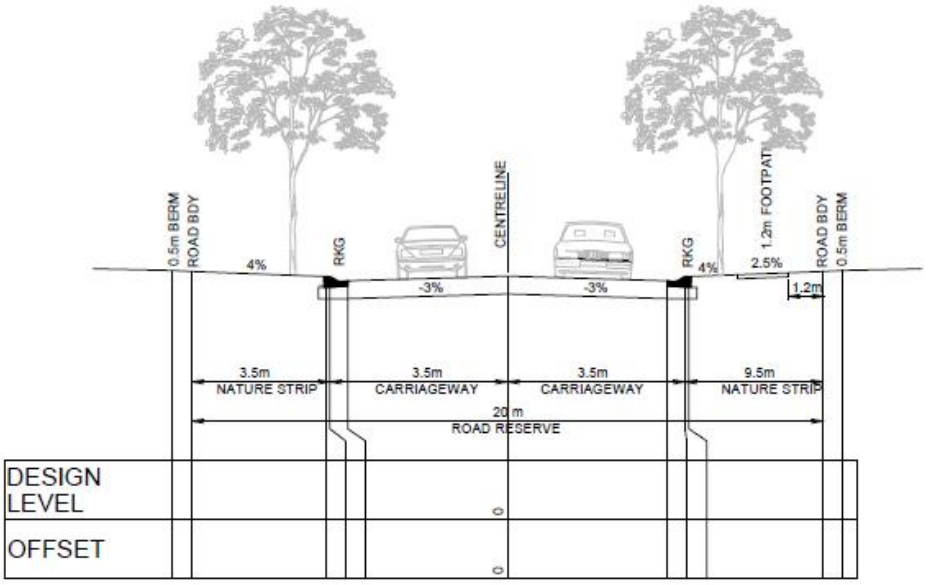
· Future Infrastructure

Description:

Internal infrastructure will include the driveway, sewer upgrade, water main upgrade and the carpark.

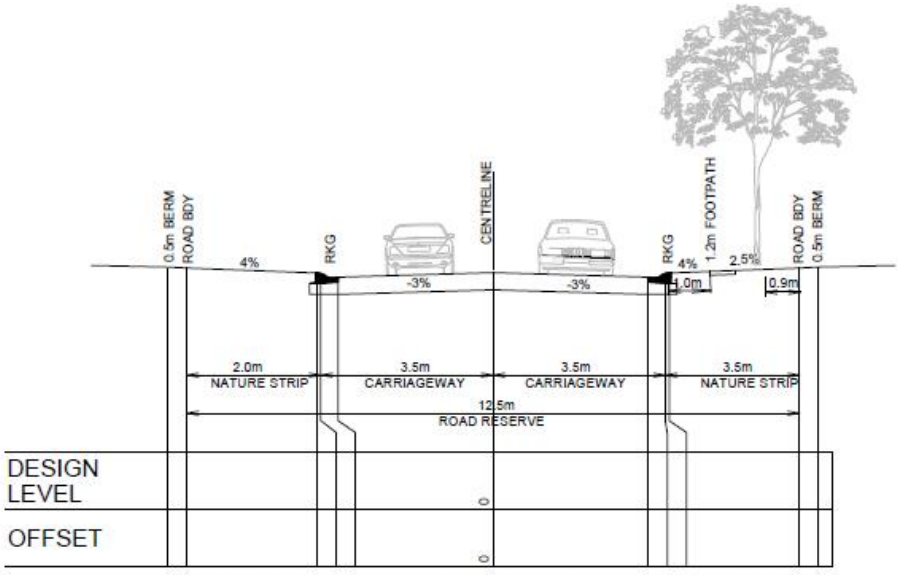

Langford Dr
7.0M WIDE ROAD
See Section B
Chifley Glade
INTERNAL DRIVEWAY
See Section A
7.0M. WIDE ROAD
Wholesale
The Good Gu
HOLLINSWORTH ROAD


Ahmadiyya Muslim Association of Aust
MASTERPLAN - Lot 1, 45 Hollinsworth
Marsden Park, NSW.
ROAD INFRASTRUCTURE PLAN
INTERNAL DRIVE WAY
Langford Dr
Langford
See Section A
7.0M. WIDE ROAD
See Section B
7.0M. WIDE ROAD



TYPICAL CROSS SECTION A - INTERNAL DRIVEWAY

SCALE - N.T.S



TYPICAL CROSS SECTION B - INTERNAL DRIVEWAY

SCALE - N.T.S


Ahmadiyya Muslim Association of Australia
MASTERPLAN - Lot 1, 45 Hollinsworth Road
Marsden Park, NSW
45 Hollinsworth Rd
Boundary Fence
Car Park
Cemetery
Recreational Facility
Mission House
Two Storey
Storage
Warehouse
Future Extension
Shipping Containers
Boundary Fence
Drawn By: Zulfi Khan

4 Existing Road Hierarchy and Traffic Volumes

The Existing Road Network and Hierarchy in this report are illustrated by the attached extract from the NSW Government Planning & Infrastructure *Marsden Park Industrial Precinct Indicative Layout Plan* in Figure 5.

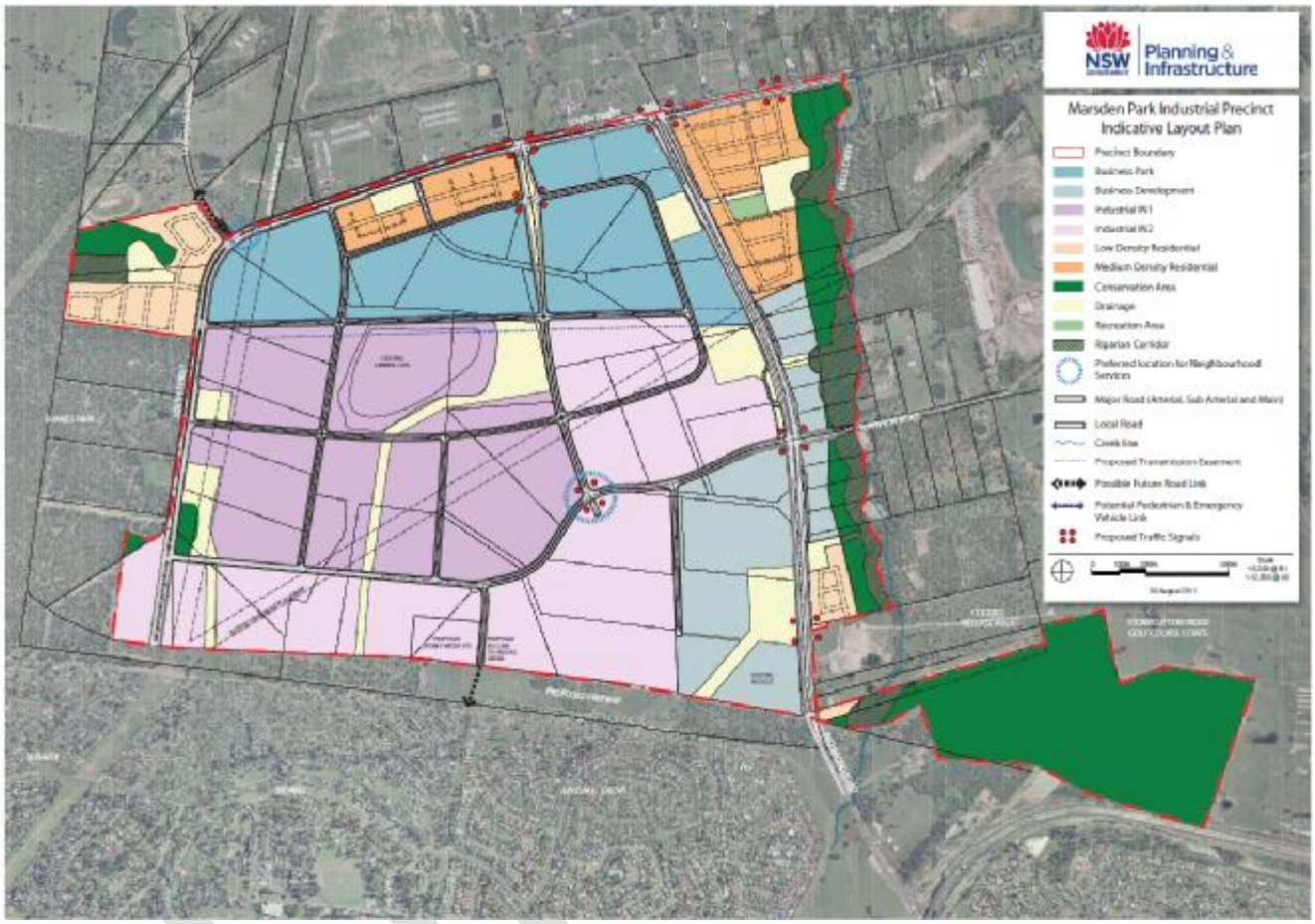


Figure 5 Marsden Park Industrial Precinct Indicative Layout Plan

The existing major arterial road access to the area is by Richmond Road, which connects with the M7 Motorway and Rooty Hill Road North, approximately 1 kilometre south east of the southern boundary of the MPIP area.

Richmond Road is a two lane road which has historically carried daily traffic volumes in the range of 20,000 to 22,000 vehicles per day over most of the past ten years but this daily traffic usage has recently increased to approximately 25,000 vehicles per day north of the M7, following the opening of the M7 Motorway.

See Figures 6 and 7.

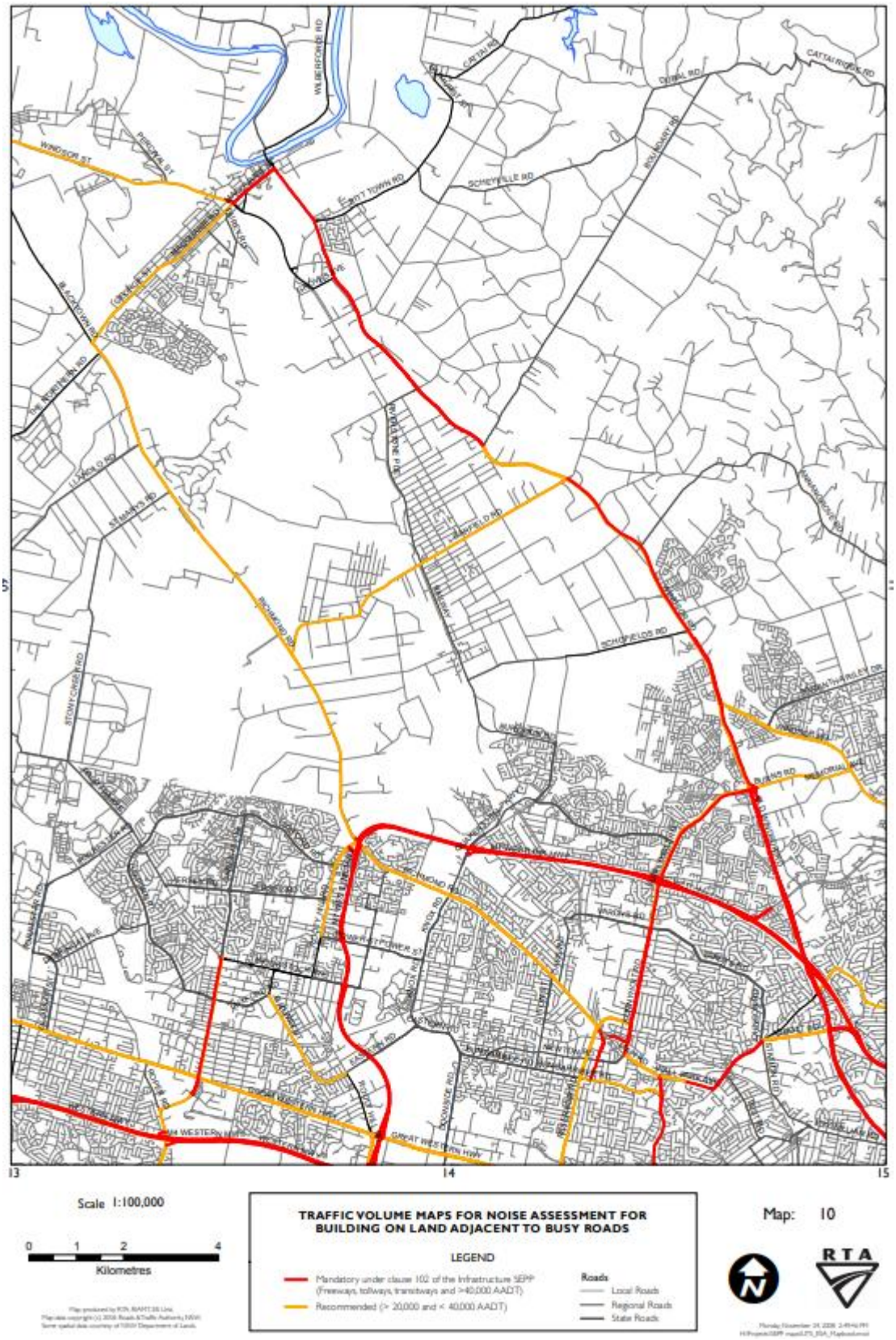


Figure 6 Marsden Park Industrial Precinct Road Layout

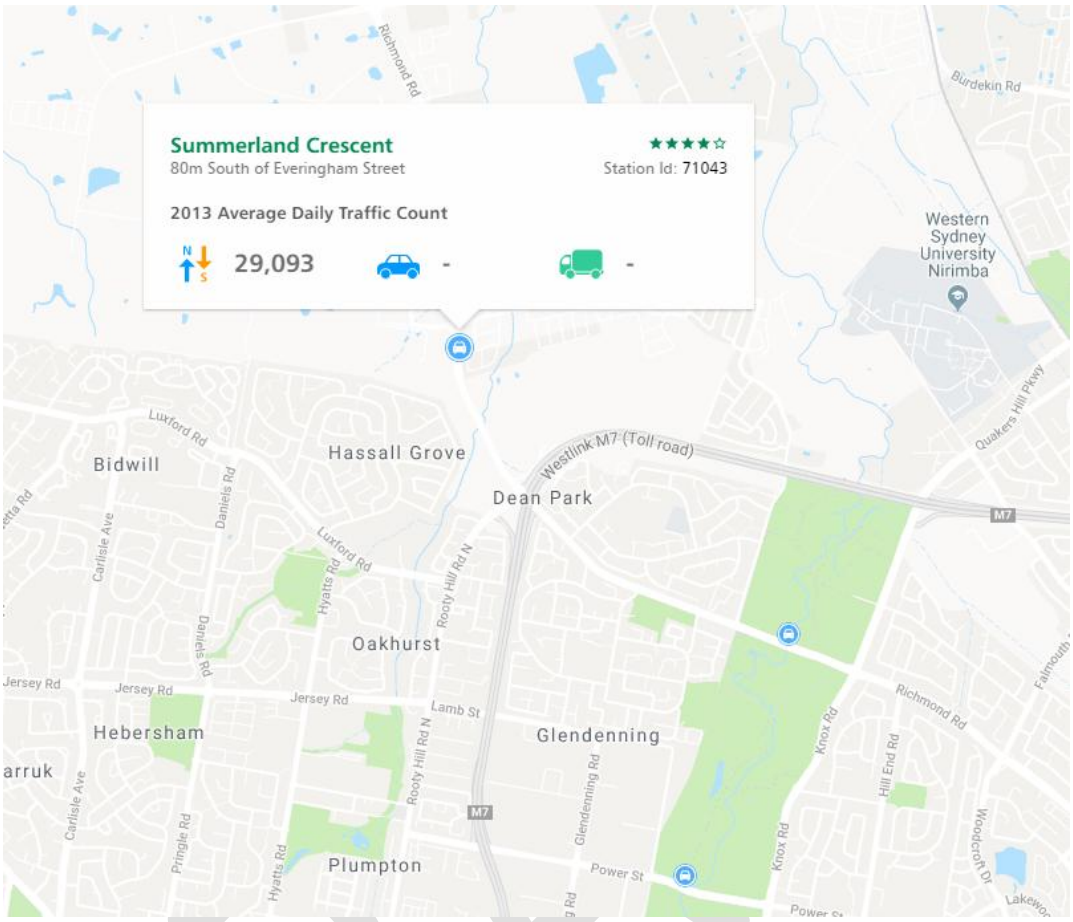


Figure 7 Traffic Volume on Richmond Road, Marsden Park

The RTA is currently upgrading the section of Richmond Road from the M7 Motorway/Rooty Hill Road North intersection to Grange Avenue at Marsden Park to four lanes, within the relatively short term future eg within the next five years and later to six lanes as part of the ultimate future traffic development scenario for the area.

The other relevant existing roads in the MPIP area are all local roads currently, ie South Street and Hollinsworth Road on the western side of Richmond Road and South Street and Townson Road on the eastern side of Richmond Road. These roads currently provide separate (non-interconnected) access to a range of existing rural sites in either the northern or the southern parts of the precinct.

See Figure 8.

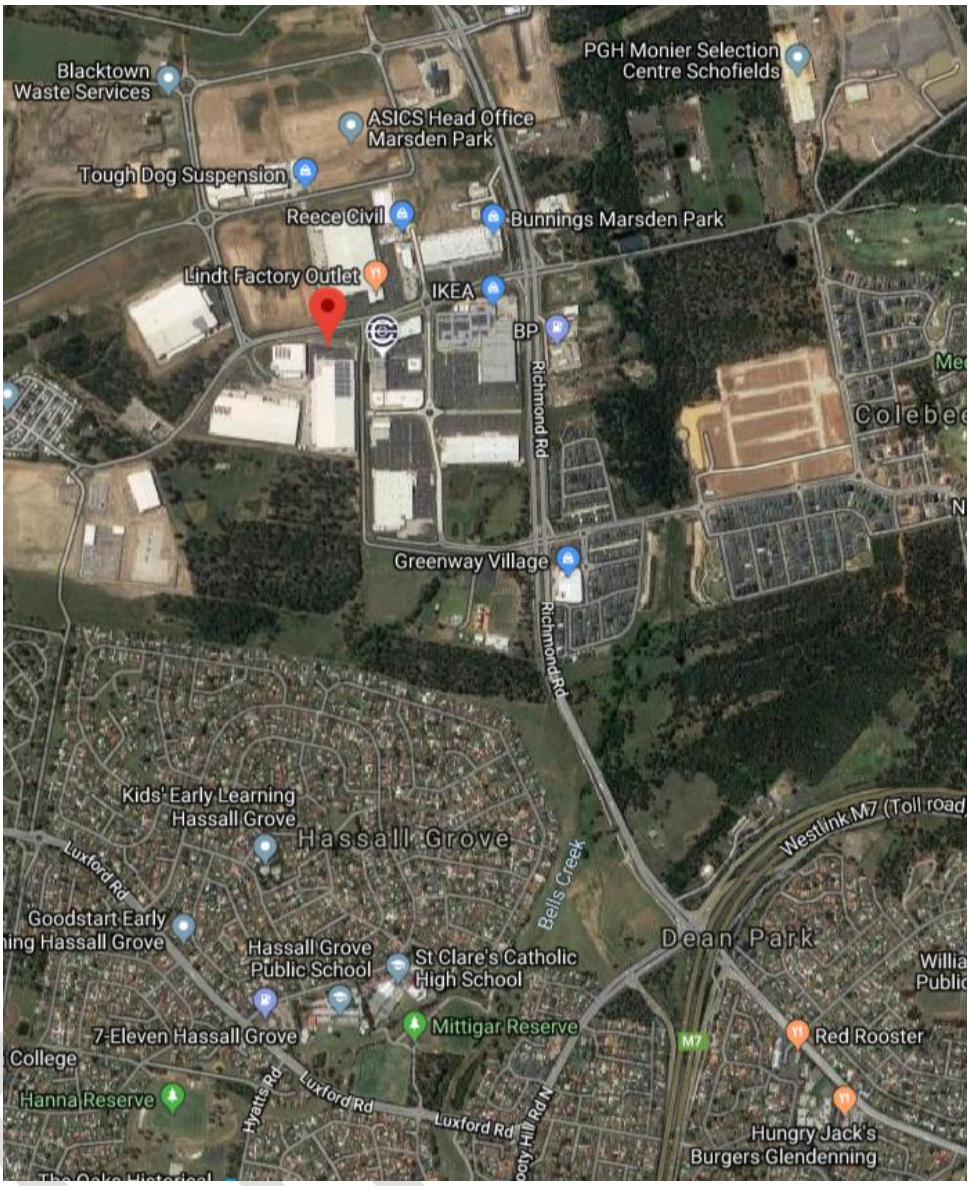


Figure 8 Road Network Map around the Proposed Site

Road Hierarchy

The classification of the road hierarchy in accordance with the Roads and Maritime Services (RMS) road hierarchy classifications in the vicinity of the 45 Hollinsworth Road are as follows:

- Richmond Road – Classified as Major Arterial Road (State Road) and provides the key north-south road link in the area, linking Blacktown and Bligh Park. Richmond Road has been upgraded from two lanes to four lanes between the M7 Motorway and Elara Boulevard. Roads and Maritime Services is proposing to continue the Richmond Road upgrade from Elara Boulevarde to Heritage Road. The upgrade would provide safer and improved access to fast growing residential developments in the Marsden Park precinct and future commercial and residential developments in Marsden Park North precinct. The existing major arterial road

access to the area is by Richmond Road, which connects with the M7 Motorway and Rooty Hill Road North.

The Daily traffic usage has recently increased to approximately 25,000 vehicles per day north of the M7, following the opening of the M7 Motorway. The road has a high percentage of heavy vehicles in the traffic flow, including many large trucks generated by the existing rural/industrial activity in the area.

The RTA has in place a concept design proposal to upgrade the section of Richmond Road from the M7 Motorway/Rooty Hill Road North intersection to Grange Avenue at Marsden Park to four lanes, within the relatively short term future eg within the next five years and later to six lanes as part of the ultimate future traffic development scenario for the area.

Provisional agreements are already in place between the RTA and the developers of land in the North West Growth Centre Precincts of "Colebee" and "Marsden Park Industrial" for the reconstruction and widening of the relevant adjacent sections of Richmond Road to be directly funded by the precinct land owners according to a timeframe to be agreed with the RTA.

Richmond Road has a posted speed limit of 80km/h.

- Hollinsworth Road – Classified as a local street with posted speed limit of 50k/hr. Traffic volumes available from the RMS traffic models showed traffic volume of 200 AADT in 2006 and the recent counts undertaken in October 2019 indicate that traffic volume is 6650 vehicles per day on the upgraded road. (Copy of data attached in the Appendix of this report)

  Hollinsworth Road provides vehicular access to frontage properties. It typically carries two vehicle lanes in each direction in the vicinity of the site. Kerbside parking is generally not restricted along both sides of the road. Access to the site is via Hollinsworth Road.

  Figures 9, 10, 11 & 12 show photos of the site and access.

Figure 9 Access to Site from Hollinsworth Road

Figure 10 Access (via Ahmadiyya Crescent) into the Site from Hollinsworth Road

Figure 11 Looking at the Site – Intersection of Langford Drive with Richmond Road

Figure 12 Looking at the Site from Richmond Road

Existing Traffic Management Controls & Land Use

The existing road network near the vicinity of the development site comprises the following important traffic management features.

- 80 km/h SPEED LIMIT which applies to Richmond Road in the vicinity of the site
- 50 km/h SPEED LIMIT default speed limit which applies to Hollinsworth Road
- TRAFFIC SIGNALS in Richmond Road where it intersects with Townson Road and with Hollinsworth Road
- ROUNDABOUT at the Langford Drive / Hollinsworth Road intersection
- T-INTERESCTION at the Access Road (Ahmadiyya Crescent) with Hollinsworth Road
- SPEED HUMPS at regular intervals along the access road connecting the subject site and Hollinsworth Road. See Figures 13 and 14.

Figure 13 Access Driveway from Hollinsworth Road (via Ahmadiyya Crescent)

Figure 14 Access Driveway into site

In concept, the Marsden Park Industrial (Employment) precinct is strategically well located with respect to future freight transport access to the M7 Motorway transport corridor and it will form one of three major future North Western Sydney employment centres representing almost one third of the predicted future total employment growth target (+38,000 jobs) which will provide the minimum desirable future target ratio of 60% local jobs vs households for the North West Growth Centre of Sydney (+63,500 dwellings).

All road networks has been modelled and designed by the Transport for NSW as part of the Sydney Business Park development.

However, as part of this study the following model is undertaken.

- Intersection of Hollinsworth Road with Ahmadiyya Crescent
- Intersection of Hollinsworth Road with Chifley Glade and Bells Glade, and
- Internally driveway to site.

The modelling is based on SIDRA software. Sidra Intersection is a micro-analytical traffic evaluation tool that employs lane-by-lane and vehicle drive cycle models mainly for intersections.

Refer to Figure 15.

Figure 15 Traffic Modelling Area

As part of this proposal it is proposed to remove the SP 2 – Infrastructure (Road) zone as per Figure 16, which is redundant road in the network and is an internal driveway to 45 Hollinsworth Road. Due to security and safety reasons, the Ahmadiyya Muslim Association would like to retain this access.

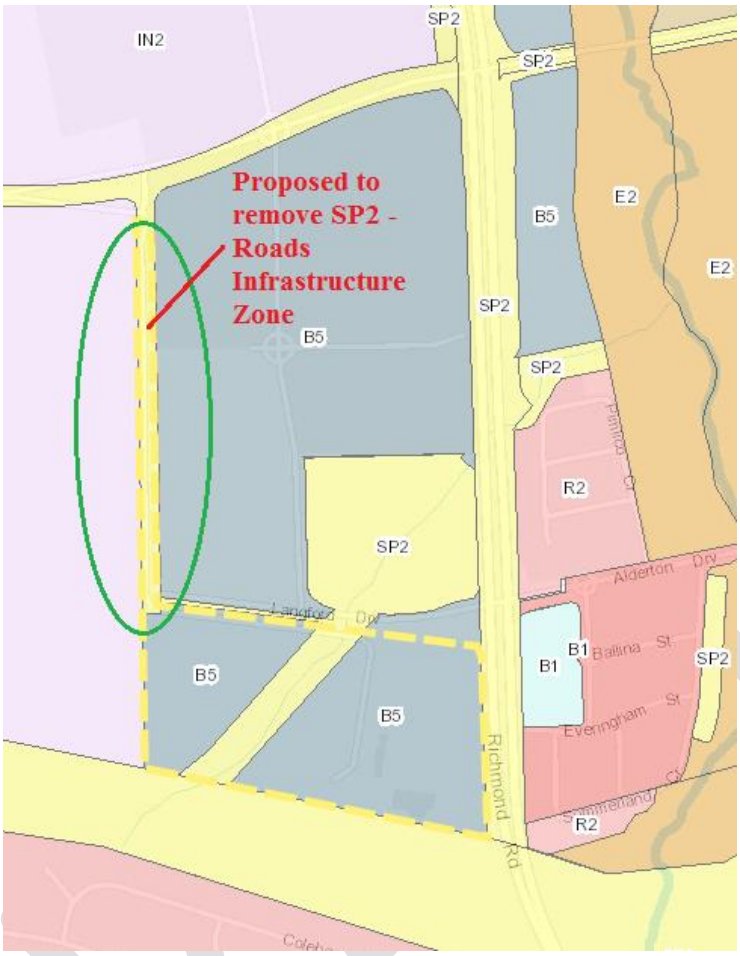


Figure 16 Proposed SP2 Infrastructure Road

4.1 Existing Intersection Performance

The performance of the existing road network is largely dependent on the operating performance of key intersections which are critical capacity control points on the road network.

The SIDRA software package has been used to assess the existing peak hour operating performance of the intersections of Hollinsworth Road with Ahmadiyya Crescent and Hollinsworth Road with Chifley Glade / Bells Glade:

Figure 17 Intersection of Hollinsworth Road with Ahmadiyya Crescent

For the purpose of this assessment, traffic turning movement counts at the above intersection was undertaken in October 2019. Details of the traffic volumes are shown in Tables 1 and 2 and full detail of the study is in the Appendix of this report.

Table 1 Existing AM (7.45am-8.45am) Turning Movement Count – Hollinsworth Road / Ahmadiyya Crescent

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT (Veh/Hr)
Hollinsworth Road - WB	110	177	-
Hollinsworth Road - EB	-	274	12
Ahmadiyya Crescent - NB	6	-	40

Notes: NB = Northbound, SB = Southbound, WB Westbound, LT = Left Turn, Th = Through, RT = Right Turn, Veh = Vehicle, Hr = Hour

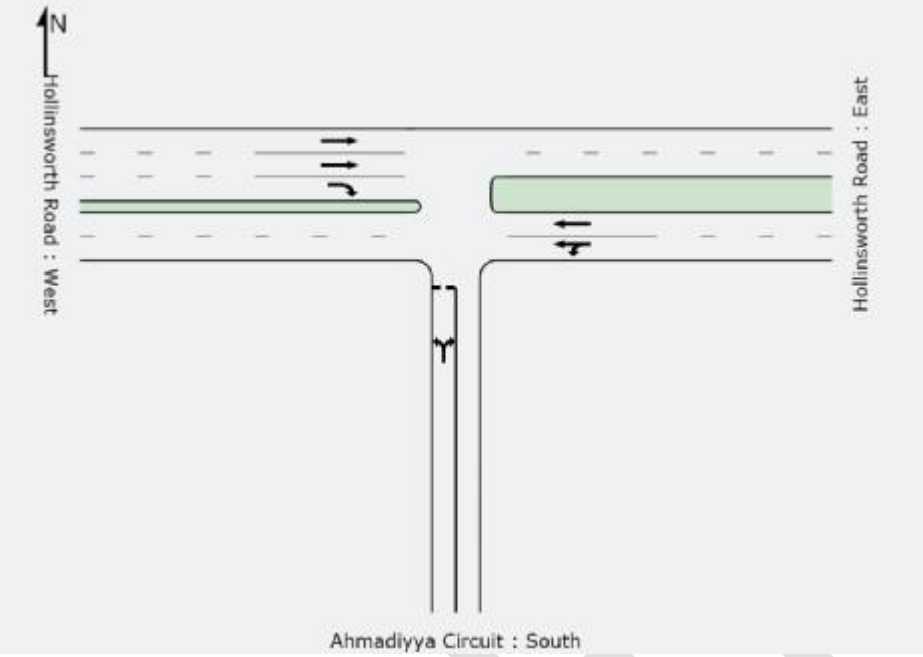


Table 2 Existing PM (4.30pm – 5.30pm) Turning Movement Count– Hollinsworth Road / Ahmadiyya Crescent

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT (Veh/Hr)
Hollinsworth Road - WB	43	205	-
Hollinsworth Road - EB	-	212	7
Ahmadiyya Crescent - NB	6	-	113

Notes: NB = Northbound, SB = Southbound, WB Westbound, LT = Left Turn, Th = Through, RT = Right Turn, Veh = Vehicle, Hr = Hour

The criteria for evaluating the operational performance of intersections are provided by the RMS Guidelines to Traffic Generating Developments which is shown in Table 3. The criteria are based on a qualitative measure or level of service that is applied to each corresponding average vehicle delay band.

Table 3 Operational Performance Criteria at Intersections

Level of Service	Average Delay (sec/veh)	Traffic Signal/Roundabout	Unsignalised Intersection
A	Less than 14	Good Operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and other accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays	At capacity and requires other control mode
F	Greater than 70	Roundabouts require other control mode	

The performance of the subject intersections resulting from the SIDRA analysis are presented in Table 4. Refer to Appendix B for the full SIDRA output.

Table 4 Existing Intersection Operational Performance – Hollinsworth Road / Ahmadiyya Crescent

Intersection	Peak Period	Average Delay [1] (sec)	Level of Service [2]	Degree of Saturation [3]
Hollinsworth Road with Ahmadiyya Crescent	AM	1.6	A	0.086
	PM	2.2	A	0.218

Intersection	Level of Service (AM) [2]	Level of Service (PM) [2]
Hollinsworth Road - WB	A	A
Hollinsworth Road - EB	A	A
Ahmadiyya Crescent - NB	A	A

Notes:

1. The average delay for sign controlled intersections is selected from the movement with the highest average delay.
2. The level of service for sign controlled intersections is based on the highest average delay per vehicle for the most critical movement during peak conditions.
3. The Degree of Saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

The results of the SIDRA analysis indicate that the intersection of Hollinsworth Road / Ahmadiyya Crescent is operating at a satisfactory level of service prior to development of the proposed site.

Similarly traffic survey was conducted at the intersection of Hollinsworth Road with Chifley Glade and Bells Glade. The traffic survey was undertaken in October 2019. Details of the traffic volumes are shown in Tables 5 and 6 and the full study data is available in the Appendix of this report.

Table 5 Existing AM (8.00am-9.00am) Turning Movement Count- Hollinsworth Road / Chifley Glade / Bells Glade

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT +UT (Veh/Hr)
Hollinsworth Road - WB	142	155	126
Hollinsworth Road - EB	14	119	172
Chifley Glade - NB	163	155	119
Bell's Glade - SB	27	22	13

Notes: NB = Northbound, SB = Southbound, WB Westbound, LT = Left Turn, Th = Through, RT = Right Turn, UT – U-Turn, Veh = Vehicle, Hr = Hour

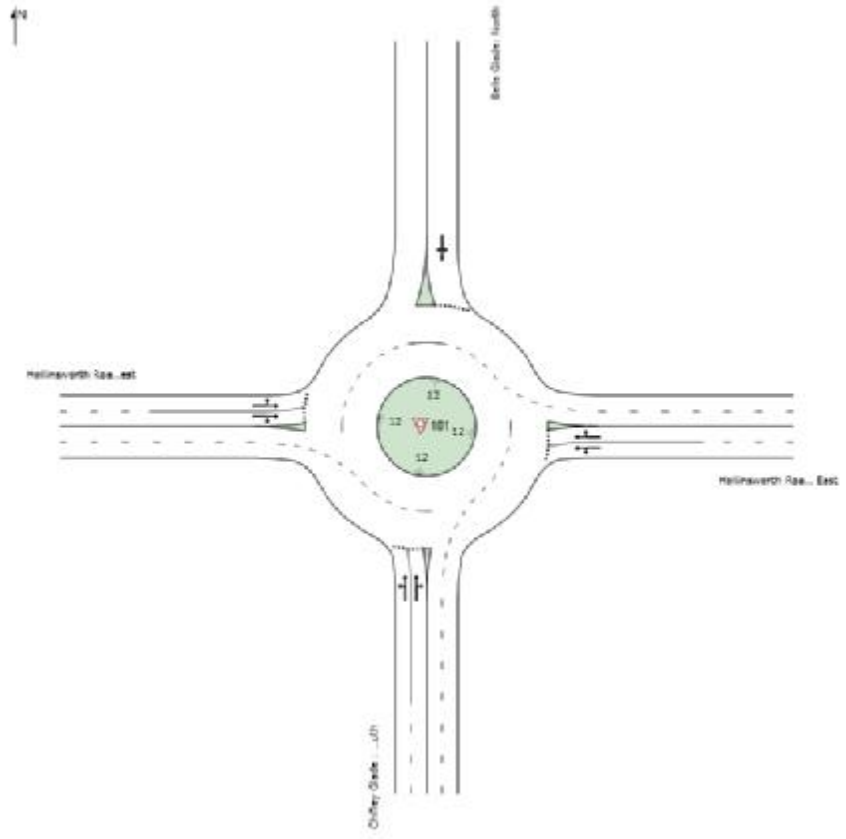


Table 6 Existing PM (4.30pm-5.30pm) Turning Movement Count- Hollinsworth Road / Chifley Glade / Bells Glade

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT +UT (Veh/Hr)
Hollinsworth Road - WB	186	60	95
Hollinsworth Road - EB	29	166	173
Chifley Glade - NB	175	132	372
Bell's Glade - SB	88	56	26

Notes: NB = Northbound, SB = Southbound, WB Westbound, LT = Left Turn, Th = Through, RT = Right Turn, UT – U-Turn, Veh = Vehicle, Hr = Hour

The criteria for evaluating the operational performance of intersections are provided by the RMS Guidelines to Traffic Generating Developments which is shown in Table 7. The criteria are based on a qualitative measure or level of service that is applied to each corresponding average vehicle delay band.

Table 7 Operational Performance Criteria at Intersections

Level of Service	Average Delay (sec/veh)	Traffic Signal/Roundabout	Unsignalised Intersection
A	Less than 14	Good Operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and other accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays	At capacity and requires other control mode
F	Greater than 70	Roundabouts require other control mode	

The performance of the subject intersections during the morning and evening peak periods resulting from the SIDRA analysis are presented in Table 8. Refer to Appendix B for the full SIDRA output.

Table 8 Existing Intersection Operational Performance – Hollinsworth Road / Chifley Glade / Bells Glade

Intersection	Peak Period	Average Delay [1] (sec)	Level of Service [2]	Degree of Saturation [3]
Hollinsworth Road with Chifley Glade and Bells Glade	AM	7.0	A	0.179
	PM	7.6	A	0.397

Intersection	Level of Service (AM) [2]	Level of Service (PM) [2]
Hollinsworth Road - WB	A	A
Hollinsworth Road - EB	A	A
Chifley Glade	A	A
Bells Glade	A	A

Notes:

1. The average delay for sign controlled intersections is selected from the movement with the highest average delay.
2. The level of service for sign controlled intersections is based on the highest average delay per vehicle for the most critical movement during peak conditions.
3. The Degree of Saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

The results of the SIDRA analysis indicate that the intersection of Hollinsworth Road with Chifley Glade and Bells Glade are operating at a satisfactory level of service prior to development of the proposed site.

4.2 Public Transport

4.2.1 Rail Services

The closest Railway Stations to the proposed development site are Riverstone and Quakers Hill Railway Stations. It is served by Sydney Trains T1 North Shore, Northern and Western Line and T5 Cumberland Line. A detail of the Sydney Train network map is shown in Figure 18.

Figure 18 Sydney Trains Network Map

4.2.1 Bus Services

Busways provides public transport services to the residents in the area. The following bus routes as per Figure 19 are available within the walking distance to the proposed development site:

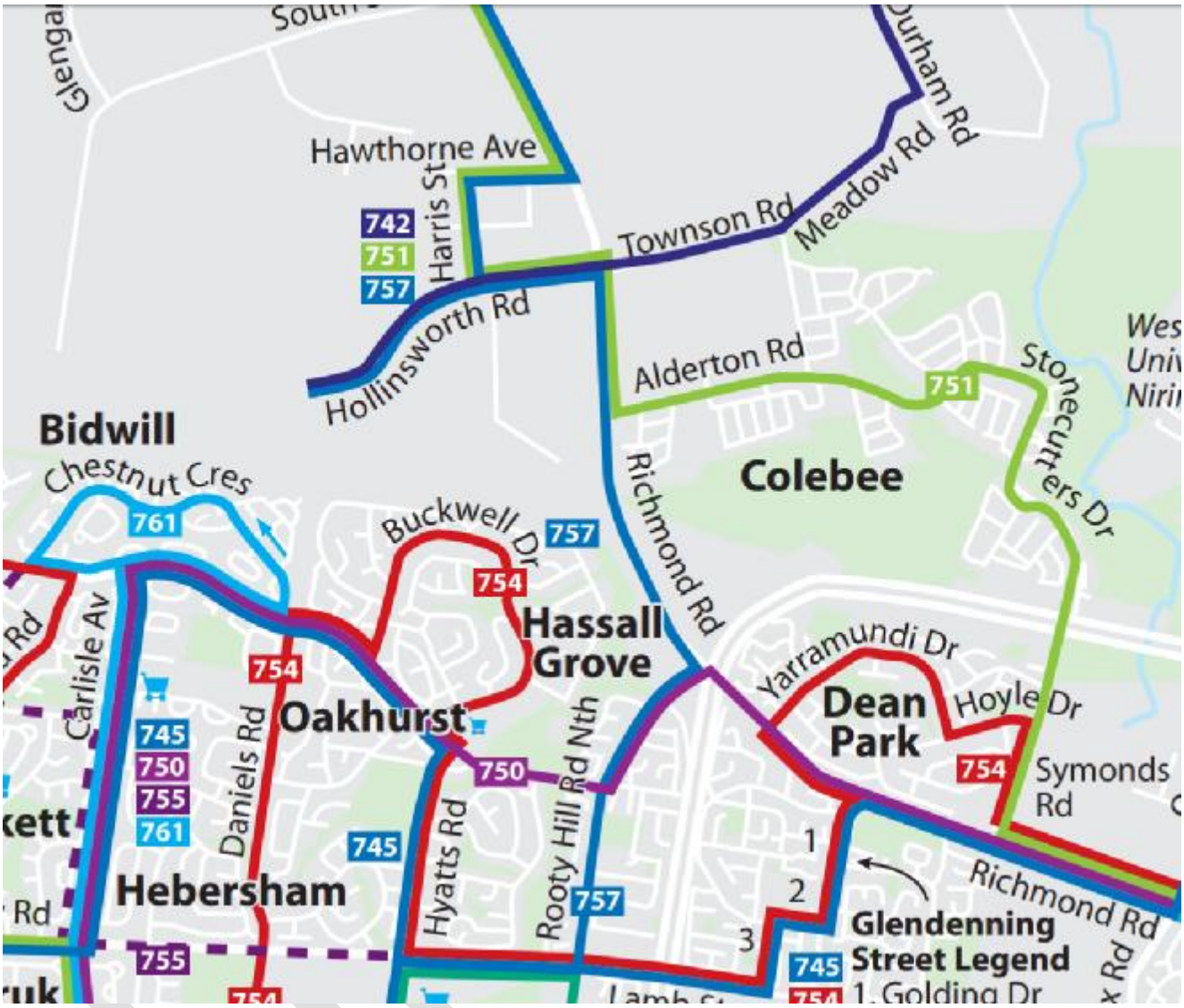


Figure 19 Bus Maps

- Route 742: Marsden Park to Rouse Hill
- Route 751: Rouse Hill Town Centre to Blacktown
- Route 757: Riverstone to Mount Druitt via Marsden Park & Rooty Hill

Master planning

As discussed earlier Table 9 provide details on activities that are either permitted or prohibited.

Table 9 Master Plan Activities and Planning Controls

Project	Planning Control	Comments
Sewer & Water Reticulation Upgrades	PERMITTED with Service Authority Approvals (Sydney Water)	This is permissible under current zoning and is required to as part of future development on our site.
Storage Warehouse	PERMITTED with consent	This is classified as ***Warehouse or distribution centres*** and is permissible with local Council approval.
Existing Shed (Future Masroor Printing Press)	PERMITTED with consent	This is permissible under current zoning. *Classified Use - Business premises*
Visitors Accommodation (Masroor Guest House)	Currently PROHIBITED, but likely approval would be negotiated with local Council.	Under planning controls, this activity is Prohibited, unless the development can be justified as ancillary use to existing buildings.
Mission House Extension	PERMITTED with consent	Current dwelling may require extension.
Recreational Facility (Dual Basketball Courts)	PERMITTED with consent	This is permissible under current zoning. *Classified Use* - recreation facility (outdoor)
Administration Building	PERMITTED with consent	Under planning controls, this activity is Prohibited Zoning for *office premises* required
Masroor Talimul Islam Academy	PERMITTED with consent	This is permissible under current zoning and will be subject to local Council approval. *Classified Use* - educational establishment
Extension of Baitul Huda Mosque	PERMITTED with consent	This is permissible under current zoning and will be subject to local Council approval. *Classified Use* - place of public worship
Jamia Ahmadiyya Australia	PERMITTED with consent	This is classified as an educational establishment and is permissible with local Council approval. *Classified Use* - educational establishment
Future Extension of Khilafat Hall	PERMITTED with consent	This is permissible under current zoning and will be subject to local Council approval. *Classified Use* - function centre

5 Parking and Site Access

5.1 Parking Requirements

Existing Kerbside Parking Restrictions
Given the relatively undeveloped nature of the surrounding local area, there are generally no kerbside restrictions in the vicinity of the subject site.

Off-Street Car Parking Provisions
The off-street car parking requirements applicable to the master plan proposal are specified in Blacktown Development Control Plan No. A – Introduction and General Guidelines. The Council's car parking code does not provide a car parking rate for some of the proposed uses.

However, we have used and compared a number of uses close to this type of development, both using Council and RMS rates and ensured the parking spaces proposed are met.

Car parking provision will be required to the requirements of the proposed master plan development in accordance with the requirements of RMS Guide to Traffic Generating Development & Blacktown City Council's DCP is provided in Tables 10 & 11.

Table 10 Off-Street Parking Requirements (RMS Guide to Traffic Generating Development)

Type	GFA (M^2)	Number Units / Dwellings/rooms	Rate	Parking Required	Provided
Storage Warehouse	160		1 space per 300m^2 GFA	1	
Print Room (Masroor Printing)	60		1 space per 40m^2 GFA	2	
Tourist and Visitor accommodation (Masroor Guest House) - *Casual accommodation*	1500	8 units, 4 employees	1 space for each unit + 1 space per 2 employees	10	
Mission House Extension - *Residential (Dwelling houses)*	860	1 dwelling	1-2 spaces per dwelling	2	
Recreational Facility (Dual Basketball Courts)	1200	2 courts	3 spaces per court	6	
Administration Building	3200		1.8 spaces per 100m2 gross leasable office	58	
Educational Est. (Masroor Talimul Islam Academy)	1200	100 students	0.1 per student	10	
Extension of Baitul Huda Mosque	2900		2 space per 100 m2 GFA	58	
Educational Est. (Jamia	1800	50 students (Staying in	0.1 per student	5	

Ahmadiyya Australia)		hostel)			
Hostel (Jamia Ahmadiyya Australia)	1600	25 rooms	1 space per 5 rooms	5	
Gym. (Jamia Ahmadiyya Australia)	340		4.5 spaces per 100m2 GFA	16	
Future Extension of Khilafat Hall	1200		1 space per 30m2 GFA	40	
Total				213	283

Note: Number of parking spaces has been rounded up

Table 11 Off-Street Parking Requirements (Council DCP)

Type	GFA (M2)	Number Units / Dwellings/rooms	Rate	Parking Required	Provided
Storage Warehouse	160		1 space per 45m2 GFA	4	
Print Room (Masroor Printing)	60		1 space per 30m2 GFA	2	
Tourist and Visitor accommodation (Masroor Guest House) - *Casual accommodation*	1500	8 units, 4 employees, 100m2 dining area	1 space for each unit + 1 space per 2 employees + 1 space per 10 m2 dining area + 1 space per 3 seats of function area	8+2+10= 20	
Mission House Extension - *Residential (Dwelling houses)*	860	1 dwelling	2 spaces per 3 or more bedroom 1 space for visitor	3	
Recreational Facility (Dual Basketball Courts)	1200	2 courts	3 spaces per court	6	
Administration Building	3200		1 space per 40m2 gross leasable office	80	
Educational Est. (Masroor Talimul Islam Academy)	1200	100 students (primary sch. Age), 5 staff	1 space per staff + 1 space per 100 students + 1 space for delivery vehicles, drop-off area and buses as appropriate	7	
Extension of Baitul Huda Mosque	2900	500 seats @ 1.5m2 = 750 m2	1 space per 4 seats or 1 space per 10m2 of seating area, whichever is greater	75	
Educational Est. (Jamia	1800	50 students	1 space per staff	3	

Ahmadiyya Australia)		(Staying in hostel)	+ 1 space per 100 students + 1 space for delivery vehicles, drop-off area and buses as appropriate		
Hostel (Jamia Ahmadiyya Australia)	1600	25 rooms	1 space per 5 rooms	5	
Gym. (Jamia Ahmadiyya Australia)	340		1 space per 25m2 GFA	14	
Future Extension of Khilafat Hall	1200		1 space per 30m2 GFA	40	
Total				259	283

The maximum number of parking spaces required as part of the Master Plan requirement is 259.

5.2 Existing Parking

There are currently 150 marked carpark spaces as per Figure 20 (Area A). But during major events at this site, over 500 car spaces are made available as per Figure 20 (Areas A, B and C).

Figure 20 On Site Carpark Provision

Carpark Provision:

- Area A – 150 spaces
- Area B – 300 spaces
- Area C – 50 spaces

Total Carpark Spaces – 500

The existing open space car park is shown in Figure 21

Figure 21 At-Grade Carpark Provision

5.3 Proposed Parking

It is proposed that additional 283 car park spaces will be constructed as part of the Master Plan development. See Table 12 and Figure 22.

The required car park spaces in accordance with the RMS *Guide to Traffic Generating Development* are 213 spaces and *Blacktown City Council DCP* is 259 spaces. There will be sufficient Car Park spaces available as part of the master plan development as per Table 12.

Area	Number of Proposed Carpark Spaces
Area A – Second level carpark	200
Area B – Next to the Proposed Courts	60
Area C – Next to the Education Building (Jamia)	8
Area D– Next to the Hall	15
TOTAL	283
Overflow Parking	
Area E – Open Ground	300

Table 12 Proposed Off-Street Parking as part of Master Plan

5.4 Access Requirements

Access to the site is via Ahmadiyya Crescent which intersects with Hollinsworth Road as shown on Figure 3. This is a sealed 5.0 metre road, approximately 800 metres to the carpark. The arrangement of this driveway is safe (and secured), convenient and easily accessible for the community. Previous discussions were held with the Sydney Business District clients on providing access off Langford Drive but the Ahmadiyya Muslim Association do not prefer this as there would be a higher risk in regards to safety, security and anti-social activities on its property.

As shown on Figure 2, the driveway has a SP2 zoning and as part of this planning proposal we are requesting that this SP2 zone be removed as the association would like that to remain as a private driveway.

As part of the Master Plan there is a proposal to upgrade this driveway.

Figure 22– Proposed Carpark Provision

6 Traffic Implications

6.1 Traffic Generation

The RMS 'Guide to Traffic Generating Developments' specifies traffic generation rates for various types of land uses. Site specific rates for temporary accommodation is not provided, as a conservative approach the rates for the Motels (Casual Accommodation) for tourist has been used for this analysis.

The potential traffic generation rate for the proposed master plan activities or development is provided in the RMS 'Guide to Traffic Generating Developments'. The proposed traffic generation of the developments is provided in Table 13 below.

Table 13 Traffic Generated from the Proposed Master Plan Development

Component	GFA (M_2)	Number Units / Dwellings/rooms	Daily Veh. Trips Rate	Weekday peak hour vehicle trips.	Traffic Generation Rate (vtph)		Traffic Generation (vtph)		Daily Traffic Generation (vpd)
					Peak Hour		Peak Hour		
					AM	PM	AM	PM	
Storage Warehouse	160		4 per 100m2 GFA	0.5 per 100m2 GFA	0.4 per 100m2 GFA	0.3 per 100m2 GFA	1	1	7
Print Room (Masroor Printing)	60		10/100m2 GFA	2/100m2 GFA	0.4 per 100m2 GFA	0.3 per 100m2 GFA	1	1	6
Tourist and Visitor accommodation (Masroor Guest House) - *Casual accommodation*	1500	8 units	3 per unit	0.4 per unit	0.4 per unit	0.4 per unit	4	4	24
Mission House Extension - *Residential (Dwelling houses)*	860	1 dwelling	9.0 per dwelling	0.85 per dwelling	1.8 per dwelling	1.6 per dwelling	2	2	9
Recreational Facility (Dual Basketball Courts)	1200	2 courts	5 per court	4 per court	0.6 per court	0.4 per court	2	1	10
Administration Building (Non-Commercial)	3200		2 per 100 m2 GFA	1 per 100 m2 GFA	0.4 per 100m2 GFA	0.3 per 100m2 GFA	13	10	64
Educational Est. (Masroor Talimul Islam Academy)	1200	100 students	0.35 per student	0.25 per student	0.2 per student	0.15 per student	20	15	35
Extension of Baitul Huda	2900		5 per 100 m2 GFA	2 per 100 m2 GFA	0.4 per 100 m2	0.3 per 100 m2	12	9	145

Mosque					GFA	GFA			
Educational Est. (Jamia Ahmadiyya Australia)	1800	50 students (Staying in hostel)	0.1 per student	0.1 per student	0.1 per student	0.1 per student	1	1	5
Hostel (Jamia Ahmadiyya Australia)	1600	25 rooms	1 per 4 rooms	0.2 per room	2 per 25 rooms	2 per 25 rooms	2	2	7
Gym. (Jamia Ahmadiyya Australia)	340		20 / 100m2 GFA			3 / 100m2 GFA	11	11	68
Future Extension of Khilafat Hall	1200		10 per 100 m2 GFA	2 per 100 m2 GFA	1.4 per 100 m2 GFA	1.2 per 100 m2 GFA	17	15	120
							86vph	72vph	500 vpd

Vph – Vehicle Per Hour

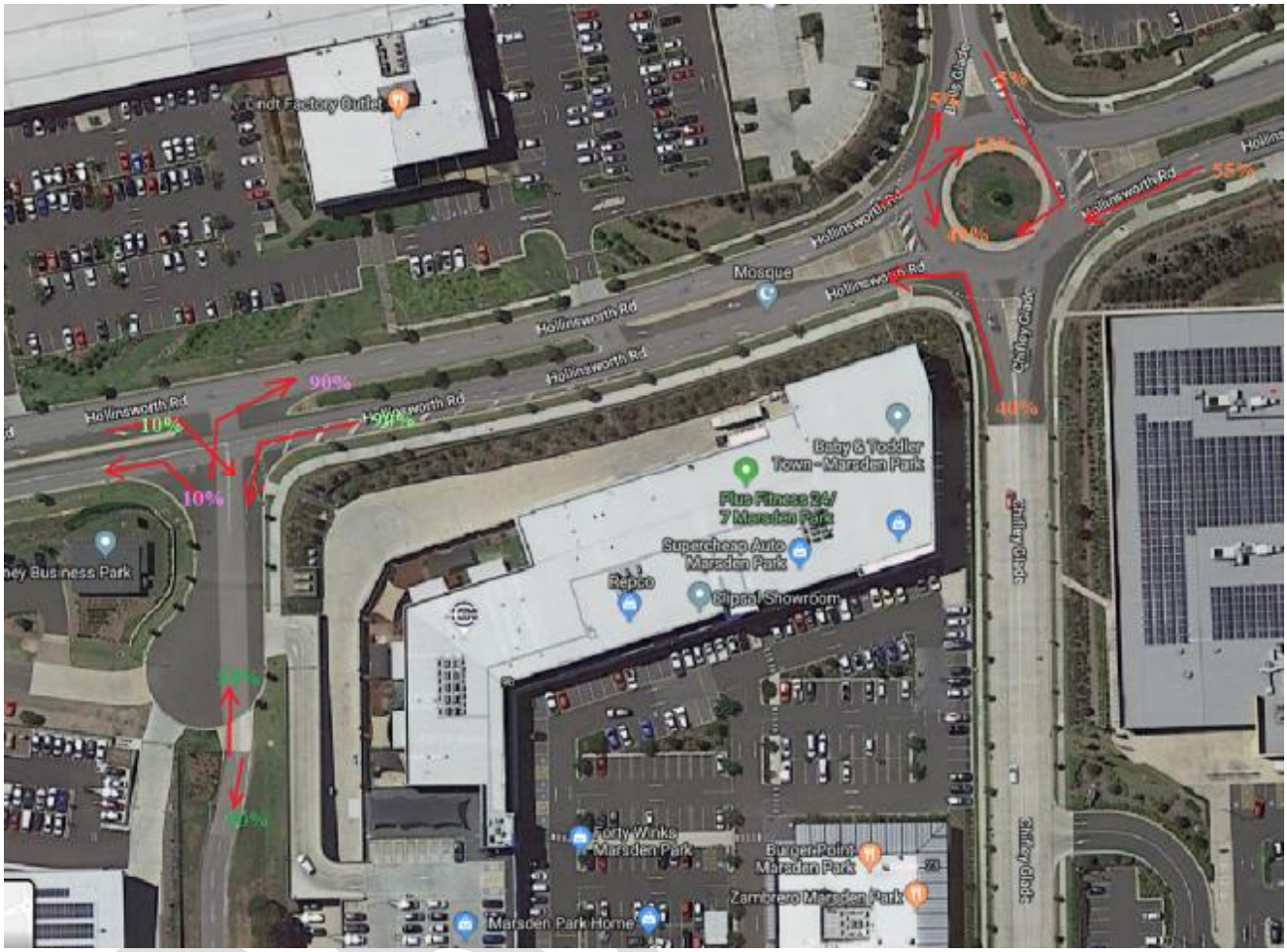
The proposed development as part of the Master Plan will generate 86 and 72 vehicle trips (two way) during AM and PM peak hours respectively.

The distribution of these trips is based on the travel behaviour currently on site, generated from the current land use. Although trip distribution will occur during the implementation of the Master Plan for the next 20 years, the traffic modelling will assume that all works will happen in the immediate future.

6.2 Traffic Assignment

Traffic generated by the proposed master plan development activities has been distributed onto the adjacent road network. For the purpose of this assessment in order to assess the worst case scenario, it has been assumed that all traffic generated by the proposed developments will be distributed as per Figure 23. This assumption is based on current travel behaviour generated from the site.

Figure 23 Trip Distribution



6.3 Existing Intersection/Road Performance

The assessment of the traffic impact will be based on intersection and road capacity performances.

The performance of the existing road network is largely dependent on the operating performance of key intersections which are critical capacity control points on the road network.

The RMS Guide to Traffic Generating Development has identified the Environmental Mid-Block Capacity of a road based on the impact of traffic, road and location aspects.

The SIDRA software package has been used to assess the existing peak hour operating performance of the intersections of Hollinsworth Road with Ahmadiyya Crescent and Hollinsworth Road with Chifley Glade / Bells Glade.

6.3.1 Intersection of Hollinsworth Road with Ahmadiyya Crescent

The traffic volumes for the intersection of Hollinsworth Road with Ahmadiyya Crescent were undertaken in October 2019.

Figure 24 shows the layout of Hollinsworth Road intersection with Ahmadiyya Crescent.

Figure 24 Intersection of Hollinsworth Road with Ahmadiyya Crescent

For the purpose of this assessment, traffic turning movement counts at the above intersection were undertaken in October 2019.

Details of the existing traffic volumes for Hollinsworth Road / Ahmadiyya Crescent were discussed under Section 4.1 of this report.

Full traffic survey data in attached in the Appendix E of this report.

The performance of the subject intersections resulting from the SIDRA analysis are presented in Table 14. Refer to Appendix B for the full SIDRA output.

Table 14 Existing Intersection Operational Performance – Hollinsworth Road / Ahmadiyya Crescent

Intersection	Peak Period	Average Delay [1] (sec)	Level of Service [2]	Degree of Saturation [3]
Hollinsworth Road with Ahmadiyya Crescent	AM	1.6	A	0.086
	PM	2.2	A	0.218

Intersection	Level of Service (AM) [2]	Level of Service (PM) [2]
Hollinsworth Road - WB	A	A
Hollinsworth Road - EB	A	A
Ahmadiyya Crescent - NB	A	A

Notes:

1. The average delay for sign controlled intersections is selected from the movement with the highest average delay.
2. The level of service for sign controlled intersections is based on the highest average delay per vehicle for the most critical movement during peak conditions.
3. The Degree of Saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

The results of the SIDRA analysis indicate that the intersection of Hollinsworth Road / Ahmadiyya Crescent is operating at a satisfactory level of service prior to development of the proposed site.

6.3.2 Intersection of Hollinsworth Road with Chifley Road / Bells Glade

Similarly the traffic volumes for the intersection of Hollinsworth Road / Chifley Glade / Bells Glade were also collected in October 2019.

Details of the existing traffic volumes for Hollinsworth Road intersection with Chifley Glade / Bells Glade were discussed under Section 4.1 of this report.

Full traffic survey data in attached in the Appendix of this report.

The performance of the subject intersections resulting from the SIDRA analysis are presented in Table 15. Refer to Appendix B for the full SIDRA output.

Table 15 Existing Intersection Operational Performance – Hollinsworth Road / Chifley Glade / Bells Glade

Intersection	Peak Period	Average Delay [1] (sec)	Level of Service [2]	Degree of Saturation [3]
Hollinsworth Road with Chifley Glade and Bells Glade	AM	7.0	A	0.179
	PM	7.6	A	0.397

Intersection	Level of Service (AM) [2]	Level of Service (PM) [2]
Hollinsworth Road - WB	A	A
Hollinsworth Road - EB	A	A
Chifley Glade	A	A
Bells Glade	A	A

Notes:

1. The average delay for sign controlled intersections is selected from the movement with the highest average delay.
2. The level of service for sign controlled intersections is based on the highest average delay per vehicle for the most critical movement during peak conditions.
3. The Degree of Saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

The results of the SIDRA analysis indicate that the intersection of Hollinsworth Road with Chifley Glade and Bells Glade are operating at a satisfactory level of service prior to development of the proposed site.

6.4 Environmental Mid-Block Capacity

The RMS Guide to Traffic Generating Development has identified the Environmental Mid-Block Capacity of a road based on the impact of traffic, road and location aspects. The recommended Environmental Capacity on local roads is defined in Table 16.

Table 16 Environmental Capacity Performance on Urban Roads (Hollinsworth Road)

Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Source: RMS Guide to Traffic Generating Development

A seven day traffic tube counts in October 2019 were undertaken on Hollinsworth Road near Ahmadiyya Crescent. The results indicate an Average Annual Daily Traffic (AADT) volume of 6650 vehicles/day, an 85th percentile speed of 60.6 km/h (i.e. 85% of the vehicles travelling along this section of roadway travelled at speed below 60.6 km/h) and the average vehicle speed of 52.9 km/h.

The result of the traffic data count is summarised in Table 17.

Table 17 Existing Traffic Flow on Hollinsworth Road, Marsden Park

Direction	W' Day (veh/day)	7 Day (veh/day)	Peak W' Day Flow (Veh/hr)	Peak 7 Day Flow (Veh/hr)
WB	3806	3336	304	277
EB	3737	3315	488	419
Combined	7542	6650	736	652

The traffic flow on Hollinsworth Road, post development would be as per Table 18.

The proposed development as part of the Master Plan will generate 86 vehicle trips (two way) during peak hour respectively.

Table 18 Existing Traffic Flow on Hollinsworth Road, Marsden Park

Direction	Peak W' Day Flow (Veh/hr)	Peak 7 Day Flow (Veh/hr)
WB	347	320
EB	531	462
Combined	822	738

As such, it can be concluded that the traffic generated by the proposed development which is shown in Table 18 (Median or inner lane Divided Road)) , the maximum peak hour traffic on Hollinsworth Road are less than the maximum acceptable traffic data set out by the RMS.

Similarly a seven day traffic tube counts in October 2019 were undertaken on Ahmadiyya Crescent and the internal driveway near Ahmadiyya Crescent. The results indicate the Average Annual Daily Traffic (AADT) volume and Speed data are shown in Tables 19, 20 and 22.
The proposed Average Annual Daily Traffic (AADT) volumes are also shown in Tables 21 and 23.

Table 19 Existing Annual Daily Traffic (AADT) volume and Speed data

Road	Annual Daily Traffic (AADT) volume (Veh/day)	Ave. Speed (km/hr)	85%ile. Speed (km/hr)
Ahmadiyya Crescent	1587	26.4	31.1
Internal Driveway	231	26.9	32.2

Table 20 Existing Traffic Flow on Ahmadiyya Crescent, Marsden Park

Direction	W' Day (veh/day)	7 Day (veh/day)	Peak W' Day Flow (Veh/hr)	Peak 7 Day Flow (Veh/hr)
NB	883	801	114	106
SB	866	787	101	77
Combined	1749	1587	150	124

Table 21 Proposed Traffic Flow on Ahmadiyya Crescent, Marsden Park

Direction	Peak W' Day Flow (Veh/hr)	Peak 7 Day Flow (Veh/hr)
NB	157	149
SB	144	120
Combined	236	210

Table 22 Existing Traffic Flow on Internal Driveway, Marsden Park

Direction	W' Day (veh/day)	7 Day (veh/day)	Peak W' Day Flow (Veh/hr)	Peak 7 Day Flow (Veh/hr)
NB	87	114	31	28
SB	92	117	24	23
Combined	179	231	45	42

Table 23 Proposed Traffic Flow on Internal Driveway, Marsden Park

Direction	W' Day (veh/day)	7 Day (veh/day)	Peak W' Day Flow (Veh/hr)	Peak 7 Day Flow (Veh/hr)
NB			74	71
SB			67	66
Combined			131	128

The RMS Guide to Traffic Generating Development has identified the Environmental Mid-Block Capacity of a local road based on the impact of traffic, road and location aspects. The recommended Environmental Capacity on local roads is defined in Table 24.

Table 24 Environmental Capacity Performance on Local Roads (Internal Driveway)

Environmental capacity performance standards on residential streets

Road class	Road type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

As such, it can be concluded that the traffic generated by the proposed development which is shown in Tables 21 and 23 (Local Road)) , the maximum peak hour traffic on Ahmadiyya Crescent and the Internal driveway are less than the maximum acceptable traffic data set out by the RMS.

6.5 Traffic Assignment & Post Development Intersection Operational Performance

The effects of additional traffic generated by the proposed land uses to the key intersections near the proposed site have been assessed. SIDRA traffic model was used to assess the operational performance of key intersections by superimposing the proposed development traffic demand on existing peak hour traffic volumes.

Traffic assignment or distribution was discussed under Section 6.5 of this report.

Traffic generated by the proposed master plan development activities were distributed onto the adjacent road network. This assumption is based on current travel behaviour generated from the site.

Tables 24 and 25 show the Traffic distribution (AM and PM) within the road network based on the traffic generation from the proposed Master Plan development.

Table 24 Traffic Distributions (Future) - AM

Road/ Intersection	LT (Veh/Hr)	Th (Veh/Hr)	RT (Veh/Hr)
Entrance to Site - NB	-	43 (50%)	-
Entrance to Site - SB	-	43 (50%)	-
Hollinsworth Road/Ahmadiyya Ct - NB	4(10%)	-	39(90%)
Hollinsworth Road/Ahmadiyya Ct - SB	39(90%)	-	4(10%)
Hollinsworth Road RA - EB	2(5%)	24(55%)	17(40%)

Hollinsworth Road RA - WB	-	24(55%)	-
Chifley Glade - NB	18(40%)	-	-
Bells Glade - SB	-	-	3(5%)

Table 25 Traffic Distribution (Future) - PM

Road/ Intersection	LT (Veh/Hr)	Th (Veh/Hr)	RT (Veh/Hr)
Entrance to Site - NB	-	36 (50%)	-
Entrance to Site - SB	-	36 (50%)	-
Hollinsworth Road/Ahmadiyya Ct - NB	4(10%)	-	32(90%)
Hollinsworth Road/Ahmadiyya Ct - SB	32(90%)	-	4(10%)
Hollinsworth Road RA - EB	2(5%)	20(55%)	14(40%)
Hollinsworth Road RA - WB	-	20(55%)	-
Chifley Glade - NB	15(40%)	-	-
Bells Glade - SB	-	-	2(5%)

Intersection of Hollinsworth Road / Ahmadiyya Crescent – Future Performance

Tables 26 and 27 show the proposed Traffic distribution at AM and PM peak flows at Hollinsworth Road with Ahmadiyya Crescent based on the traffic generation from the proposed Master Plan development.

Table 26 Proposed AM Turning Movement Count – Hollinsworth Road / Ahmadiyya Crescent

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT+UT (Veh/Hr)
Hollinsworth Road - WB	110+39 = 149	177	-
Hollinsworth Road - EB	-	274	12+4=16
Ahmadiyya Crescent - NB	6+4=10	-	40+39=79

Notes: NB = Northbound, SB = Southbound, WB Westbound, LT = Left Turn, Th = Through, RT = Right Turn, UT- U-turn, Veh = Vehicle, Hr = Hour

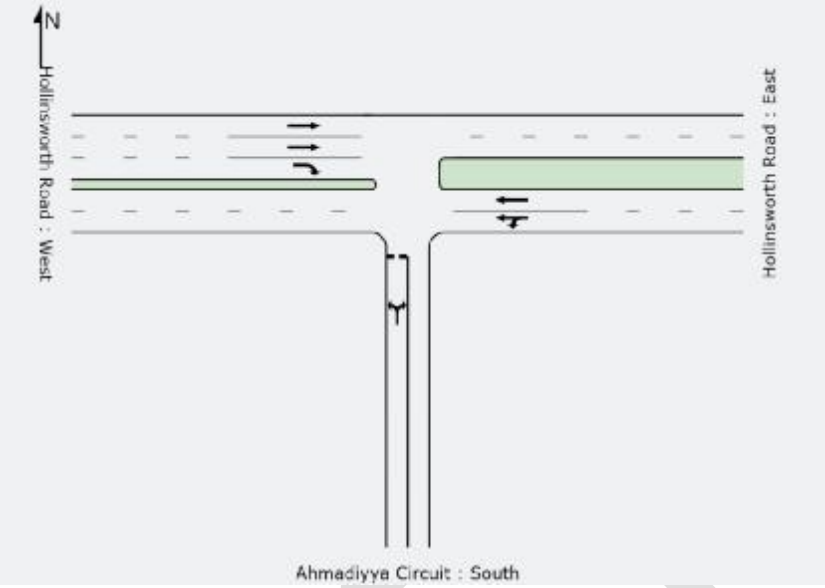


Table 27 Proposed PM Turning Movement Count– Hollinsworth Road / Ahmadiyya Crescent

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT +UT (Veh/Hr)
Hollinsworth Road - WB	43+32=75	205	-
Hollinsworth Road - EB	-	212	8+4=12
Ahmadiyya Crescent - NB	6+4=10	-	113+32=145

Notes: NB = Northbound, SB = Southbound, WB Westbound, LT = Left Turn, Th = Through, RT = Right Turn, UT- U-turn, Veh = Vehicle, Hr = Hour

The criteria for evaluating the operational performance of intersections are provided by the RMS Guidelines to Traffic Generating Developments which is shown in Table 28. The criteria are based on a qualitative measure or level of service that is applied to each corresponding average vehicle delay band.

Table 28 Operational Performance Criteria at Intersections

Level of Service	Average Delay (sec/veh)	Traffic Signal/Roundabout	Unsignalised Intersection
A	Less than 14	Good Operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and other accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays	At capacity and requires other control mode
F	Greater than 70	Roundabouts require other control mode	

The performance of the subject intersections during the morning and evening peak periods resulting from the SIDRA analysis are presented in Table 29. Refer to Appendix C for the full SIDRA output.

Table 29 Future Intersection Operational Performance (Based on full Master Plan development in year 1) – Hollinsworth Road / Ahmadiyya Crescent

Intersection	Peak Period	Average Delay [1] (sec)	Level of Service [2]	Degree of Saturation [3]
Hollinsworth Road with Ahmadiyya Crescent	AM	2.9	A	0.109
	PM	2.9	A	0.289

Intersection	Level of Service (AM) [2]	Level of Service (PM) [2]
Hollinsworth Road - WB	A	A
Hollinsworth Road - EB	A	A
Ahmadiyya Crescent - NB	A	A

Notes:

1. The average delay for sign controlled intersections is selected from the movement with the highest average delay.
2. The level of service for sign controlled intersections is based on the highest average delay per vehicle for the most critical movement during peak conditions.
3. The Degree of Saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

The results of the SIDRA analysis indicate that the intersection of Hollinsworth Road / Ahmadiyya Crescent is operating at a satisfactory level of service after proposed Master Plan development (Year 1 – full development).

Intersection of Hollinsworth Road / Chifley Glade / Bells Glade – Future Performance

Tables 30 and 31 show the proposed Traffic distribution at AM and PM peak flows at Hollinsworth Road / Chifley Glade / Bells Glade based on the traffic generation from the proposed Master Plan development.

Table 30 Proposed AM Turning Movement Count- Hollinsworth Road / Chifley Glade / Bells Glade

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT+UT (Veh/Hr)
Hollinsworth Road - WB	142	155+24=179	126
Hollinsworth Road - EB	14+2=16	119+24=143	172+17=189
Chifley Glade - NB	163+18=181	55	119
Bells Glade - SB	27	22	13+3=16

Notes: NB = Northbound, SB = Southbound, WB Westbound, LT = Left Turn, Th = Through, RT = Right Turn, UT- U-turn, Veh = Vehicle, Hr = Hour

Table 31 Proposed PM Turning Movement Count- Hollinsworth Road / Chifley Glade / Bells Glade

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT+UT (Veh/Hr)
Hollinsworth Road - WB	186	60+20=80	95
Hollinsworth Road - EB	29+2=31	166+20=186	173+14=187
Chifley Glade - NB	175+15=190	132	372
Bell's Glade - SB	88	56	26+2=28

Notes: NB = Northbound, SB = Southbound, WB Westbound, LT = Left Turn, Th = Through, RT = Right Turn, UT- U-turn, Veh = Vehicle, Hr = Hour

The performance of the subject intersections resulting from the SIDRA analysis are presented in Table 32 for Hollinsworth Road / Chifley Glade / Bells Glade intersection from Master Plan Development (full development in Year 1). Refer to Appendix C for the full SIDRA output.

Table 32 Future (Base Year) Intersection Operational Performance – Hollinsworth Road / Chifley Glade / Bells Glade from Master Plan Development

Intersection	Peak Period	Average Delay [1] (sec)	Level of Service [2]	Degree of Saturation [3]
Hollinsworth Road with Chifley Glade and Bells Glade	AM	7.1	A	0.192
	PM	7.1	A	0.406

Intersection	Level of Service (AM) [2]	Level of Service (PM) [2]
Hollinsworth Road - WB	A	A
Hollinsworth Road - EB	A	A
Chifley Glade	A	A
Bells Glade	A	A

Notes:

1. The average delay for sign controlled intersections is selected from the movement with the highest average delay.
2. The level of service for sign controlled intersections is based on the highest average delay per vehicle for the most critical movement during peak conditions.
3. The Degree of Saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

The results of the SIDRA analysis indicate that the intersection of Hollinsworth Road / Chifley Glade / Bells Glade will be operating at a satisfactory level of service after proposed Master Plan development (Year 1 – full development).

6.6 Post Development Intersection Operational Performance after 20 Years Scenario

The effects of additional traffic generated by the proposed land uses to the key intersections near the proposed site have been assessed. SIDRA traffic model was used to assess the operational performance of key intersections by superimposing the proposed development traffic demand on existing peak hour traffic volumes.

At a growth rate of 2%, existing traffic flows were project from a base zero (0) year to 20 years. Then the traffic generated from the proposed Master Plan was added to check the performance of the road network.

The projected 20 year flows are shown in Tables 33 and 34 for Hollinsworth Road with Ahmadiyya Crescent and Tables 35 and 36 for Hollinsworth Road with Chifley Glade / Bells Glade intersections.

Table 33 20 Year Proposed AM Turning Movement Count – Hollinsworth Road / Ahmadiyya Crescent

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT+UT (Veh/Hr)
Hollinsworth Road - WB	163+39 = 202	263	-
Hollinsworth Road - EB	-	407	18+4=22
Ahmadiyya Crescent - NB	9+4=13	-	59+39=98

Table 34 20 Year Proposed PM Turning Movement Count– Hollinsworth Road / Ahmadiyya Crescent

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT +UT (Veh/Hr)
Hollinsworth Road - WB	64+32=96	305	-
Hollinsworth Road - EB	-	315	12+4=16
Ahmadiyya Crescent - NB	9+4=13	-	168+32=200

Table 35 20 Year Proposed AM Turning Movement Count- Hollinsworth Road / Chifley Glade / Bells Glade

Th (Veh/Hr)	LT (Veh/Hr)		RT+UT (Veh/Hr)
Hollinsworth Road - WB	211	230+24=254	187
Hollinsworth Road - EB	21+2=23	177+24=201	256+17=273
Chifley Glade - NB	242+18=260	82	177
Bells Glade - SB	40	33	19+3=22

Table 36 20 Year Proposed PM Turning Movement Count- Hollinsworth Road / Chifley Glade / Bells Glade

Road	LT (Veh/Hr)	Th (Veh/Hr)	RT+UT (Veh/Hr)
Hollinsworth Road - WB	276	89+20=109	141
Hollinsworth Road - EB	43+2=45	247+20=267	257+14=271
Chifley Glade - NB	260+15=275	196	553
Bell's Glade - SB	131	83	39+2=41

The results of the SIDRA analysis for the 20 year traffic analysis are provided in Tables 37 and 38 for Hollinsworth Road / Ahmadiyya Crescent and Hollinsworth Road / Chifley Glade / Bells Glade intersection. Refer to Appendix D for the full SIDRA output.

Table 37 Future Intersection Operational Performance (Based on full Master Plan development in Year 20) – Hollinsworth Road / Ahmadiyya Crescent

Intersection	Peak Period	Average Delay [1] (sec)	Level of Service [2]	Degree of Saturation [3]
Hollinsworth Road with Ahmadiyya Crescent	AM	3.3	A	0.209
	PM	4.6	A	0.560

Intersection	Level of Service (AM) [2]	Level of Service (PM) [2]
Hollinsworth Road - WB	A	A
Hollinsworth Road - EB	A	A
Ahmadiyya Crescent - NB	A	A

Table 38 Future (Year 20) Intersection Operational Performance – Hollinsworth Road / Chifley Glade / Bells Glade from Master Plan Development

Intersection	Peak Period	Average Delay [1] (sec)	Level of Service [2]	Degree of Saturation [3]
Hollinsworth Road with Chifley Glade and Bells Glade	AM	7.7	A	0.304
	PM	9.2	A	0.646

Intersection	Level of Service (AM) [2]	Level of Service (PM) [2]
Hollinsworth Road - WB	A	A
Hollinsworth Road - EB	A	A
Chifley Glade	A	A
Bells Glade	A	A

Notes:

1. The average delay for sign controlled intersections is selected from the movement with the highest average delay.
2. The level of service for sign controlled intersections is based on the highest average delay per vehicle for the most critical movement during peak conditions.
3. The Degree of Saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.

The results of the SIDRA analysis indicate that the post development operations at Year 20 of the above intersections are at a satisfactory level of service. As such, it can be concluded that the proposed development will not have an adverse impact on the operation of traffic on the road network in the vicinity of the proposed development site.

7 Future Road Hierarchy and Traffic Volumes

The future regional road network hierarchy and traffic volumes for major roads both internal and external to the precinct was determined as part of the ARUP study for the Marsden Park Industrial (Employment) Precinct, based on the results of the year 2036 NETANAL traffic model for the precinct which was developed by Glen Varley of Road Delay Solutions Pty Ltd in an interactive manner with the precinct masterplan road network.

These future "full development" precinct road network daily traffic volumes for the year 2036 was used to determine both the internal and external future precinct road hierarchy in the Growth Centres Commission Development Code.

As such the Transport for NSW has strategized future roadwork development as part of Councils Section 94 Contribution Plan (Now called Section 7.11) and/or has built the road network.

8 Future Public Transport, Walking and Cycling Access

For future bus travel, including bus feeder access movement to the rail network, there are three future significant regional bus corridors identified where the future bus passenger demand from the MPIP precinct, in combination with other demand from adjoining precincts, would warrant the development of new bus routes and services, namely

- A new route to and from the East via South Street, to the New Schofields Station and the Rouse Hill Town Centre
- A new route to and from the South East, via Richmond Road, to and from the Blacktown Town Centre and Railway Station
- A new route to and from the South, preferably on a direct future route via Daniels Road, to and from the Mount Druitt Town Centre and Railway Station

9 Future Heavy Vehicle Routes and Volumes

On Richmond Road, there are already a high existing proportion of heavy vehicles in the traffic flow which is at least ten percent, based on the results of classified intersection traffic counts undertaken in the year 2007 at the Garfield Road and Richmond Road intersection by Transport for NSW.

In the future with the relatively high levels of employment generating industrial and commercial development which are proposed at Marsden Park and elsewhere in the NW Growth Centre, this high proportion of heavy vehicles in the traffic flow on Richmond Road is anticipated to continue.

Also with respect to the future potential development of any road connection between the Marsden Park Industrial (Employment) Precinct and Luxford Road to the south, the potential daily heavy vehicle traffic movements which could be generated in this direction by the employment precinct would be approximately 530 truck movements daily.

Because the areas surrounding Luxford Road are primarily residential in nature, any future road connection from the Precinct to Luxford Road should be a bus only link with provision for pedestrians and cyclists.

10 Future Section 94 Roadworks Plan

The future precinct Section 94 Contributions Plan for road works and traffic management was prepared by the Blacktown City Council based on an agreed schedule of items. Minor roads such as local industrial roads and local residential roads are not generally included in the Section 94 Roadworks Plan. The future alignment and construction of these roads will be in accordance with the alignments to be specified in the precinct DCP (and the ILP Masterplan) but will be subject to the discretion of the individual affected landowners where these roads are not specifically required for access to future development sites.

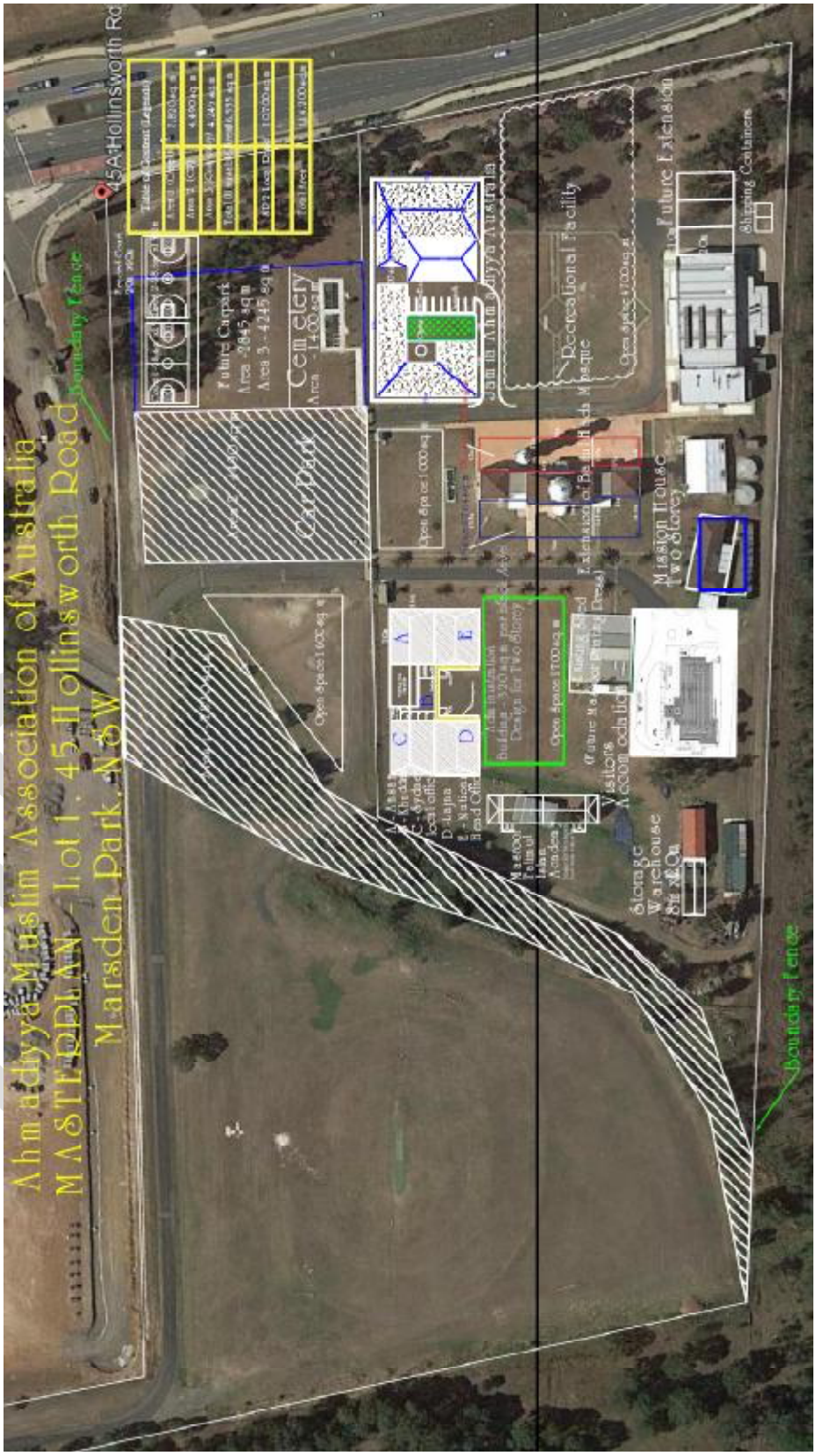
As part of this planning proposal and Master Plan development it has been demonstrated that there are no implication on the traffic efficiencies in the network, intersections or the road infrastructure. The site has minimal pedestrian or cyclist generations.

11 Conclusion

It can be concluded from the Traffic, Parking and Access Assessment study for the Ahmadiyya Muslim Association, Australia that the proposed planning proposal demonstrates the strategic merit as part of the proposal for its Master Plan development based on and including, that:

- the services and infrastructure that are available to meet the demands arising from the planning proposal
- give effect to a relevant local Blacktown City Council Strategic Planning & Infrastructure policies that has been endorsed by the Department or required as part of a regional or district plan or local strategic planning statement
- the existing uses, approved uses, and likely future uses of land at 45 Hollinsworth Road as part of the proposed Master Plan development by Ahmadiyya Muslim Association will have no traffic or access impact on the existing traffic network and on the future network. Detailed traffic modelling has been undertaken to demonstrate the parking and traffic generation from the proposed master plan development on the current network, on the future network both full development at base year and also using a growth rate of 2% for the next 20 years. The results conclude:
    - The Ahmadiyya Muslin Association as part of the proposed Master Plan will built sufficient car park infrastructure. The level of proposed on-site car parking provision is considered to be adequate for the proposed use of the site.
    - The road network, including keys intersections are currently operating at good level of service and in the future will continue to operate at good level of service.
    - The external impact of the traffic generated by the proposal Master Plan is considered to be satisfactory and will remain well within the Environmental capacity of the surrounding streets, with no adverse impacts on the amenity of the area.
    - The subject site is well served by public transport services in the form of buses services.
    - That the current access off Ahmadiyya Crescent (via) Hollinsworth Road is the better and safer arrangement for the Ahmadiyya Muslim Association
- That the SP 2 Road Infrastructure zoning for the access is no longer strategically required and shall be remove from the LEP.

Appendix A Master Plan



Appendix B SIDRA Results (Existing Conditions)

Hollinsworth Road / Ahmadiyya Crescent- AM

Existing

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Existing AM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Existing AM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Ahmadiyya Cr. NB												
1	L2	6	0.0	0.005	4.7	LOS A	0.0	0.1	0.09	0.50	0.09	46.4
3	R2	40	0.0	0.086	9.7	LOS A	0.3	2.1	0.54	0.74	0.54	44.1
Approach		46	0.0	0.086	9.1	LOS A	0.3	2.1	0.49	0.71	0.49	44.4
East: Hollinsworth Road WB												
4	L2	110	0.0	0.074	4.6	LOS A	0.0	0.0	0.00	0.42	0.00	47.2
5	T1	177	0.0	0.074	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	49.6
Approach		287	0.0	0.074	1.8	NA	0.0	0.0	0.00	0.20	0.00	48.6
West: Hollinsworth Road EB												
11	T1	274	0.0	0.070	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	12	0.0	0.011	5.6	LOS A	0.0	0.3	0.36	0.52	0.36	46.1
Approach		286	0.0	0.070	0.2	NA	0.0	0.3	0.01	0.02	0.01	49.8
All Vehicles		619	0.0	0.086	1.6	NA	0.3	2.1	0.04	0.16	0.04	48.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

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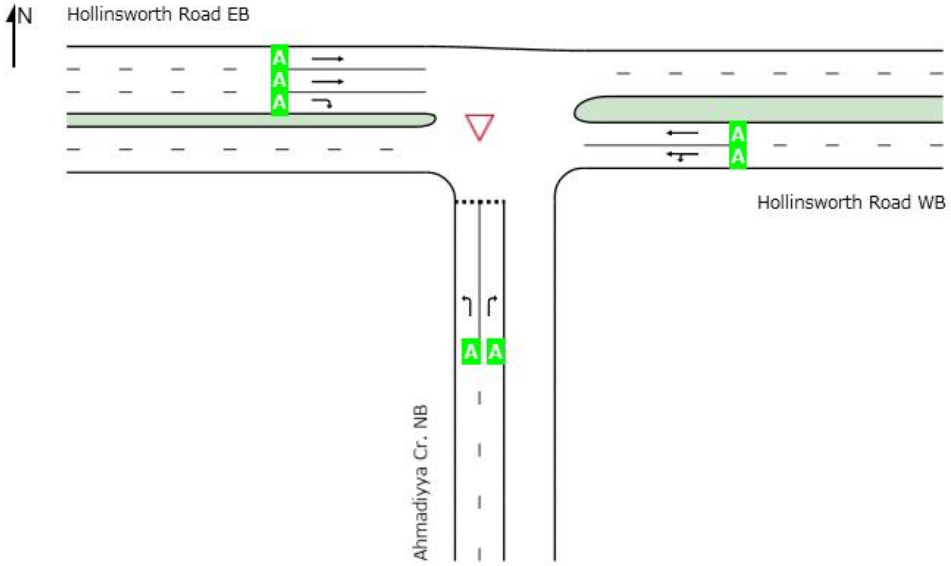
LANE LEVEL OF SERVICE

Lane Level of Service

▽ Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Existing AM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Existing AM
Site Category: (None)
Giveway / Yield (Two-Way)

	Approaches			Intersection
	South	East	West	
LOS	A	NA	NA	NA



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Hollinsworth Road / Ahmadiyya Crescent- PM

Existing

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Existing PM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Existing PM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Ahmadiyya Cr. NB												
1	L2	6	0.0	0.005	4.8	LOS A	0.0	0.1	0.16	0.49	0.16	46.2
3	R2	113	0.0	0.218	9.3	LOS A	0.8	5.8	0.55	0.77	0.55	44.4
Approach		119	0.0	0.218	9.0	LOS A	0.8	5.8	0.53	0.75	0.53	44.4
East: Hollinsworth Road WB												
4	L2	43	0.0	0.063	4.6	LOS A	0.0	0.0	0.00	0.19	0.00	48.5
5	T1	205	0.0	0.063	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	49.6
Approach		248	0.0	0.063	0.8	NA	0.0	0.0	0.00	0.09	0.00	49.4
West: Hollinsworth Road EB												
11	T1	212	0.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	8	0.0	0.007	5.4	LOS A	0.0	0.2	0.33	0.50	0.33	46.2
Approach		220	0.0	0.054	0.2	NA	0.0	0.2	0.01	0.02	0.01	49.8
All Vehicles		587	0.0	0.218	2.2	NA	0.8	5.8	0.11	0.20	0.11	48.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

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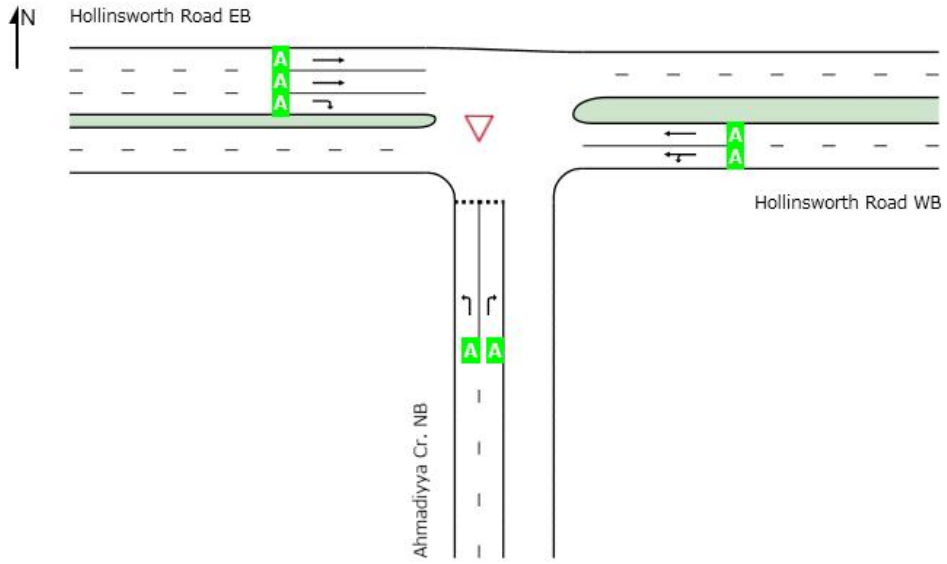
LANE LEVEL OF SERVICE

Lane Level of Service

▽ Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Existing PM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Existing PM
Site Category: (None)
Giveway / Yield (Two-Way)

	Approaches			Intersection
	South	East	West	
LOS	A	NA	NA	NA



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Hollinsworth Road / Chifley Glade / Bells Glade- AM

Existing

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Existing AM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chifley Glade : South												
1	L2	163	0.0	0.149	5.8	LOS A	0.6	4.5	0.39	0.60	0.39	53.0
2	T1	55	0.0	0.152	5.7	LOS A	0.7	4.7	0.38	0.65	0.38	52.7
3	R2	119	0.0	0.152	9.3	LOS A	0.7	4.7	0.38	0.65	0.38	52.4
Approach		337	0.0	0.152	7.0	LOS A	0.7	4.7	0.38	0.63	0.38	52.7
East: Hollinsworth Road: East												
4	L2	142	0.0	0.179	5.6	LOS A	0.9	6.0	0.35	0.55	0.35	53.1
5	T1	155	0.0	0.179	5.5	LOS A	0.9	6.0	0.35	0.59	0.35	53.7
6	R2	126	0.0	0.179	9.2	LOS A	0.9	6.0	0.35	0.62	0.35	52.7
Approach		423	0.0	0.179	6.6	LOS A	0.9	6.0	0.35	0.58	0.35	53.2
North: Bells Glade: North												
7	L2	27	0.0	0.061	5.6	LOS A	0.2	1.2	0.30	0.60	0.30	52.8
8	T1	22	0.0	0.061	5.5	LOS A	0.2	1.2	0.30	0.60	0.30	54.1
9	R2	13	0.0	0.061	9.2	LOS A	0.2	1.2	0.30	0.60	0.30	53.8
Approach		62	0.0	0.061	6.3	LOS A	0.2	1.2	0.30	0.60	0.30	53.5
West: Hollinsworth Road : West												
10	L2	14	0.0	0.126	5.9	LOS A	0.5	3.5	0.37	0.56	0.37	52.9
11	T1	119	0.0	0.126	5.7	LOS A	0.5	3.5	0.37	0.56	0.37	54.2
12	R2	172	0.0	0.150	9.3	LOS A	0.6	4.3	0.37	0.68	0.37	51.6
Approach		305	0.0	0.150	7.8	LOS A	0.6	4.3	0.37	0.63	0.37	52.7
All Vehicles		1127	0.0	0.179	7.0	LOS A	0.9	6.0	0.36	0.61	0.36	52.9

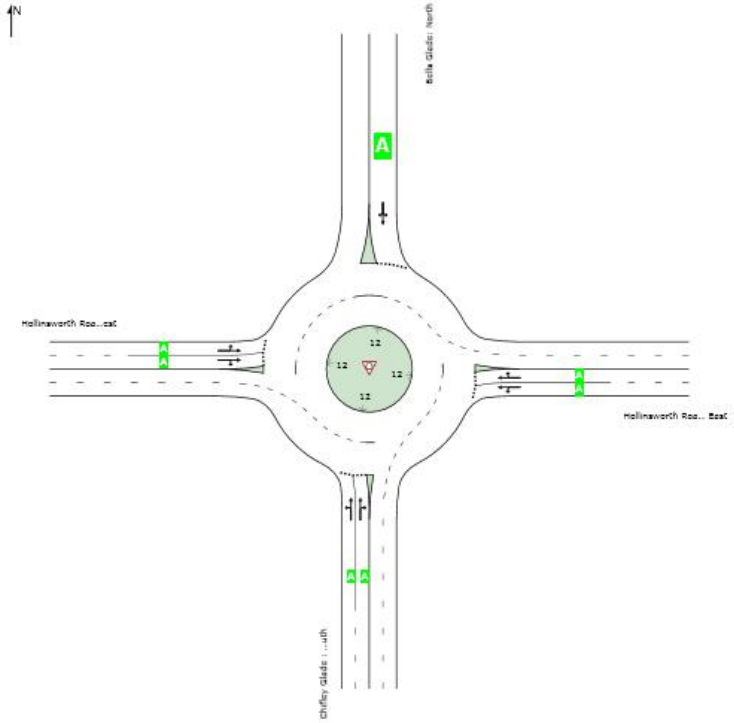
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
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 Level of Service

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Existing AM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.

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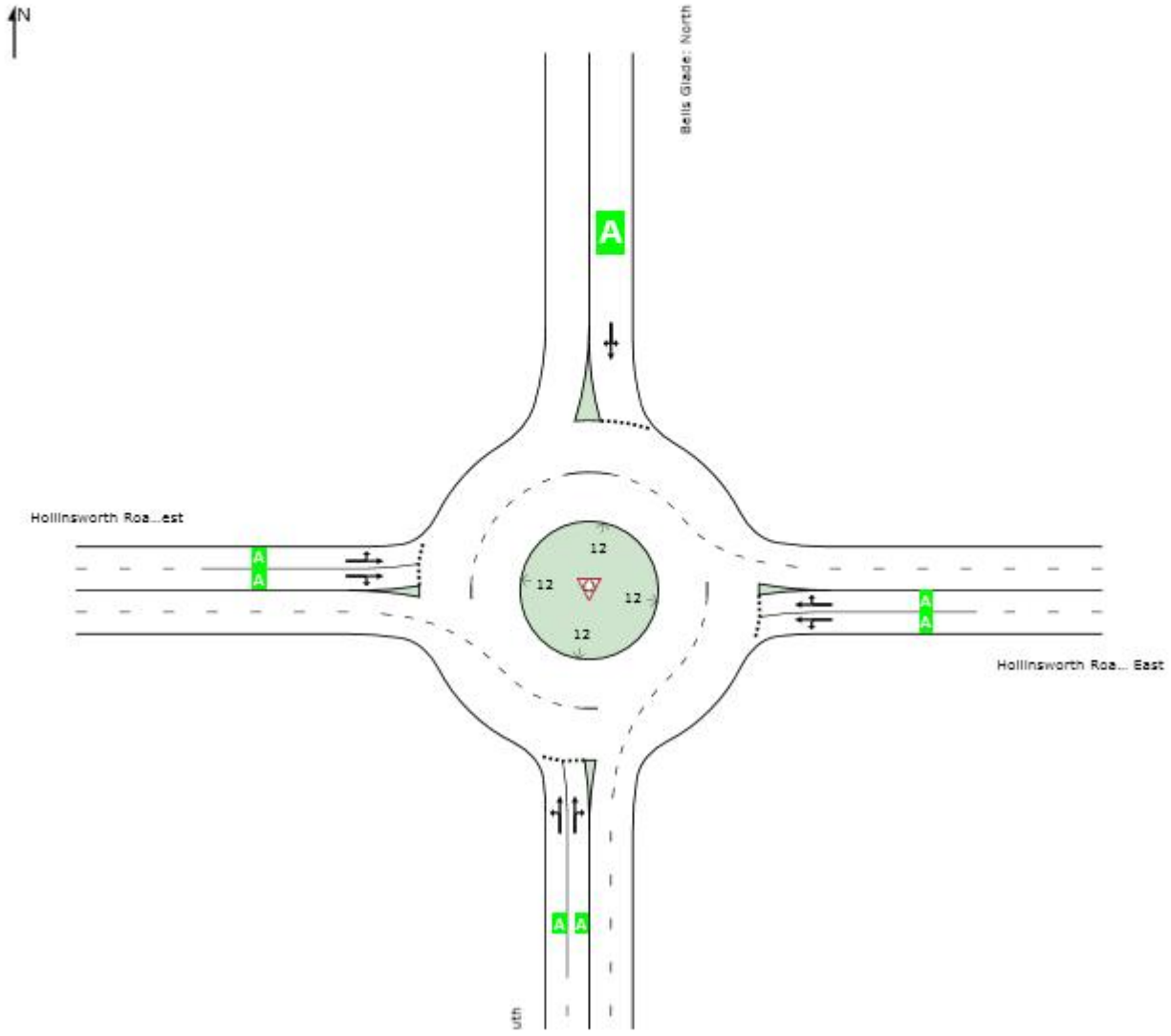
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Existing AM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Hollinsworth Road / Chifley Glade / Bells Glade- PM

Existing

LANE SUMMARY

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Existing PM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chifley Glade : South													
Lane 1	175	0.0	868	0.202	51[5]	6.0	LOS A	0.9	6.5	Full	500	0.0	0.0
Lane 2[d]	504	0.0	1269	0.397	100	8.2	LOS A	2.4	16.6	Full	500	0.0	0.0
Approach	679	0.0		0.397		7.7	LOS A	2.4	16.6				
East: Hollinsworth Road: East													
Lane 1[d]	186	0.0	1149	0.162	100	5.8	LOS A	0.8	5.5	Full	500	0.0	0.0
Lane 2	155	0.0	1079	0.144	89[5]	8.0	LOS A	0.7	4.7	Full	500	0.0	0.0
Approach	341	0.0		0.162		6.8	LOS A	0.8	5.5				
North: Bells Glade: North													
Lane 1[d]	170	0.0	872	0.195	100	7.2	LOS A	0.7	4.8	Full	500	0.0	0.0
Approach	170	0.0		0.195		7.2	LOS A	0.7	4.8				
West: Hollinsworth Road : West													
Lane 1[d]	191	0.0	956	0.200	100	6.8	LOS A	1.0	6.7	Full	500	0.0	0.0
Lane 2	177	0.0	886	0.200	100	10.6	LOS B	0.9	6.5	Full	500	0.0	0.0
Approach	368	0.0		0.200		8.6	LOS A	1.0	6.7				
Intersection	1558	0.0		0.397		7.6	LOS A	2.4	16.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
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.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

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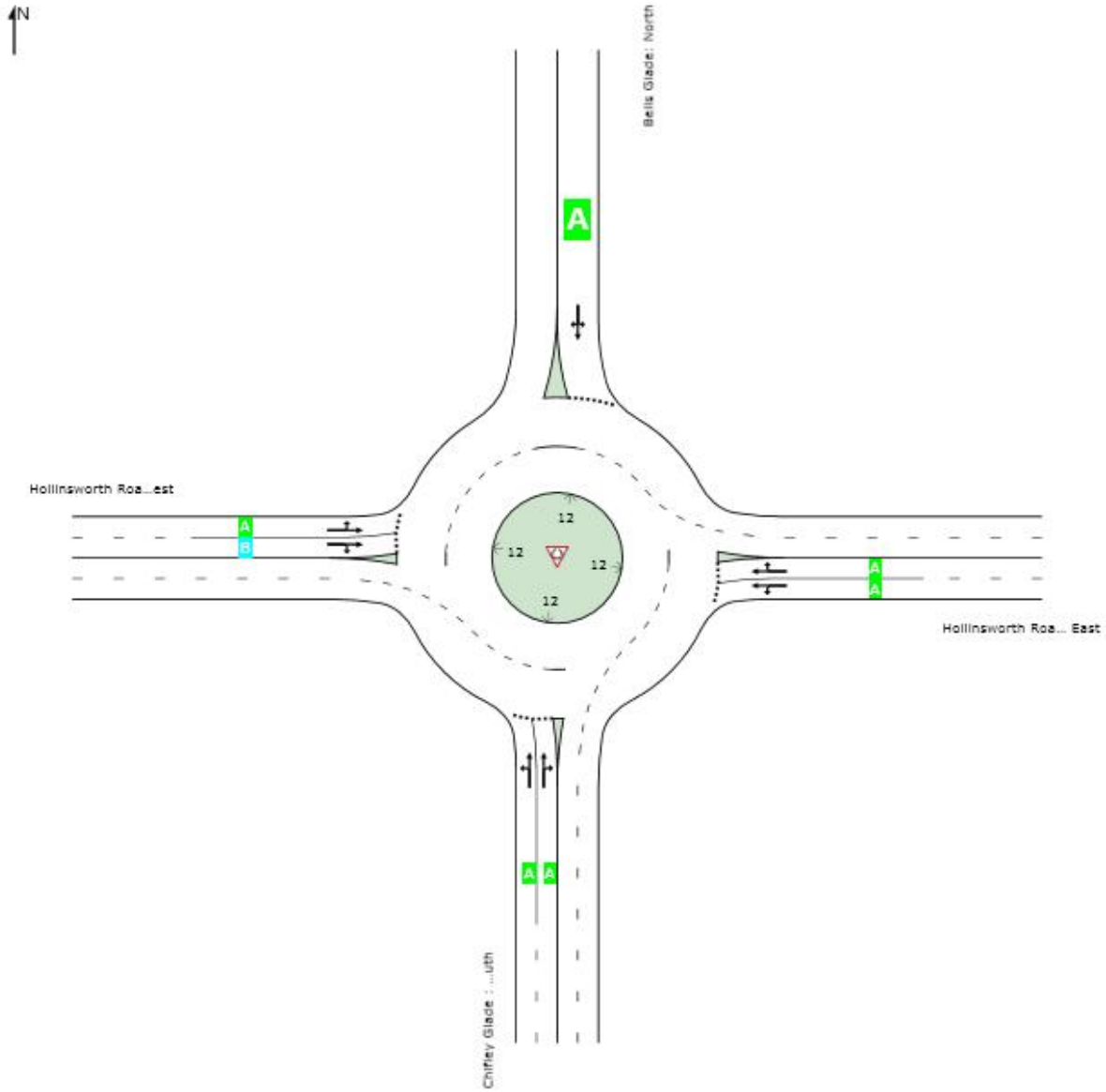
Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Existing PM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Appendix C SIDRA Results (Future Conditions)

Hollinsworth Road / Ahmadiyya Crescent- Future AM

Future

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Proposed Future AM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Proposed Future AM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Ahmadiyya Cr. NB												
1	L2	10	0.0	0.004	7.7	LOS A	0.0	0.2	0.15	0.89	0.15	45.0
3	R2	79	0.0	0.109	15.0	LOS C	0.7	5.1	0.61	1.00	0.61	43.3
Approach		89	0.0	0.109	14.2	LOS B	0.7	5.1	0.56	0.99	0.56	43.5
East: Hollinsworth Road WB												
4	L2	149	0.0	0.055	4.6	LOS A	0.0	0.0	0.00	0.37	0.00	47.9
5	T1	177	0.0	0.055	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	49.3
Approach		326	0.0	0.055	2.1	NA	0.0	0.0	0.00	0.25	0.00	48.7
West: Hollinsworth Road EB												
11	T1	274	0.0	0.053	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	16	0.0	0.008	5.8	LOS A	0.1	0.4	0.38	0.52	0.38	46.1
Approach		290	0.0	0.053	0.3	NA	0.1	0.4	0.02	0.03	0.02	49.8
All Vehicles		705	0.0	0.109	2.9	NA	0.7	5.1	0.08	0.25	0.08	48.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

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Project: E:\Multipro\Job124 45 Hollinsworth Road, Marsden Park\Planning Proposal\SIDRA\31102019\45 Hollinsworth Road, Marsden Park Planning Proposal Existing Conditions.sip8

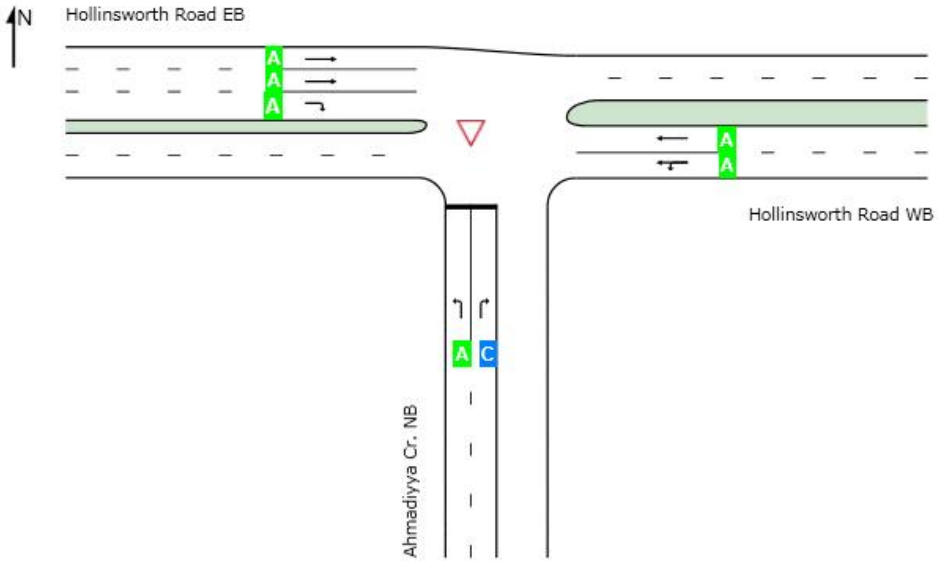
LANE LEVEL OF SERVICE

Lane Level of Service

▽ Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Proposed Future AM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Proposed Future AM
Site Category: (None)
Giveway / Yield (Two-Way)

	Approaches			Intersection
	South	East	West	
LOS	B	NA	NA	NA



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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Hollinsworth Road / Ahmadiyya Crescent- Future PM

Proposed

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Proposed Future PM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Future PM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Ahmadiyya Cr. NB												
1	L2	10	0.0	0.008	4.8	LOS A	0.0	0.2	0.14	0.50	0.14	46.3
3	R2	145	0.0	0.289	10.2	LOS B	1.2	8.7	0.58	0.82	0.65	43.8
Approach		155	0.0	0.289	9.9	LOS A	1.2	8.7	0.55	0.80	0.62	44.0
East: Hollinsworth Road WB												
4	L2	75	0.0	0.072	4.6	LOS A	0.0	0.0	0.00	0.29	0.00	47.9
5	T1	205	0.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	49.5
Approach		280	0.0	0.072	1.2	NA	0.0	0.0	0.00	0.14	0.00	49.0
West: Hollinsworth Road EB												
11	T1	212	0.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	12	0.0	0.011	5.6	LOS A	0.0	0.3	0.35	0.52	0.35	46.1
Approach		224	0.0	0.054	0.3	NA	0.0	0.3	0.02	0.03	0.02	49.8
All Vehicles		659	0.0	0.289	2.9	NA	1.2	8.7	0.14	0.26	0.15	48.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

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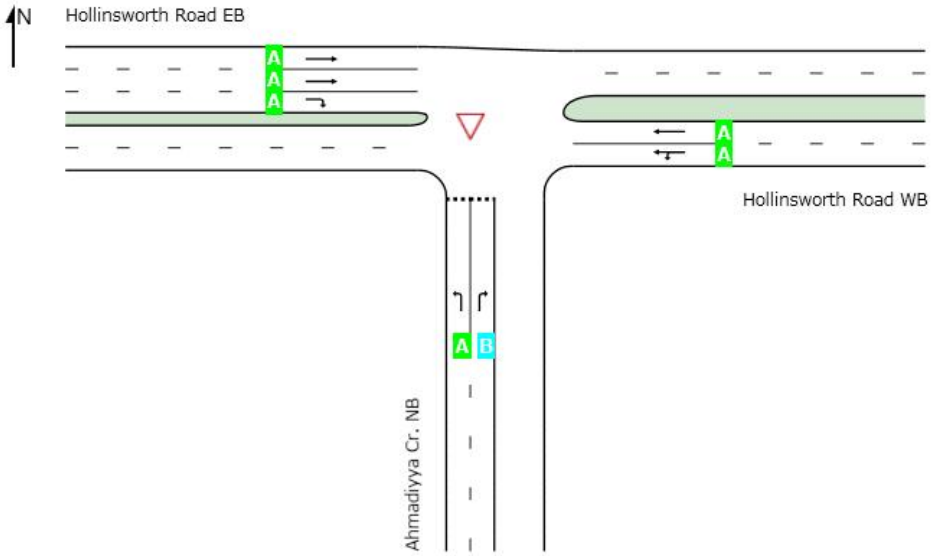
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Proposed Future PM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Future PM
Site Category: (None)
Giveway / Yield (Two-Way)

	Approaches			Intersection
	South	East	West	
LOS	A	NA	NA	NA



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Hollinsworth Road / Chifley Glade / Bells Glade- AM

Future Proposal

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Proposed AM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chifley Glade : South												
1	L2	181	0.0	0.161	5.8	LOS A	0.7	4.9	0.40	0.61	0.40	53.0
2	T1	55	0.0	0.161	5.8	LOS A	0.7	4.9	0.41	0.67	0.41	52.6
3	R2	119	0.0	0.161	9.5	LOS A	0.7	4.9	0.41	0.67	0.41	52.3
Approach		355	0.0	0.161	7.1	LOS A	0.7	4.9	0.40	0.64	0.40	52.7
East: Hollinsworth Road: East												
4	L2	142	0.0	0.192	5.7	LOS A	0.9	6.5	0.37	0.56	0.37	53.0
5	T1	179	0.0	0.192	5.6	LOS A	0.9	6.5	0.37	0.59	0.37	53.6
6	R2	126	0.0	0.192	9.3	LOS A	0.9	6.5	0.37	0.62	0.37	52.7
Approach		447	0.0	0.192	6.7	LOS A	0.9	6.5	0.37	0.59	0.37	53.2
North: Bells Glade: North												
7	L2	27	0.0	0.065	5.7	LOS A	0.2	1.3	0.32	0.62	0.32	52.6
8	T1	22	0.0	0.065	5.6	LOS A	0.2	1.3	0.32	0.62	0.32	54.0
9	R2	16	0.0	0.065	9.3	LOS A	0.2	1.3	0.32	0.62	0.32	53.6
Approach		65	0.0	0.065	6.5	LOS A	0.2	1.3	0.32	0.62	0.32	53.3
West: Hollinsworth Road : West												
10	L2	16	0.0	0.148	5.8	LOS A	0.6	4.3	0.38	0.56	0.38	52.9
11	T1	143	0.0	0.148	5.7	LOS A	0.6	4.3	0.38	0.56	0.38	54.2
12	R2	189	0.0	0.165	9.3	LOS A	0.7	4.8	0.38	0.69	0.38	51.6
Approach		348	0.0	0.165	7.7	LOS A	0.7	4.8	0.38	0.63	0.38	52.7
All Vehicles		1215	0.0	0.192	7.1	LOS A	0.9	6.5	0.38	0.62	0.38	52.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
Roundabout Capacity Model: SIDRA Standard.
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.

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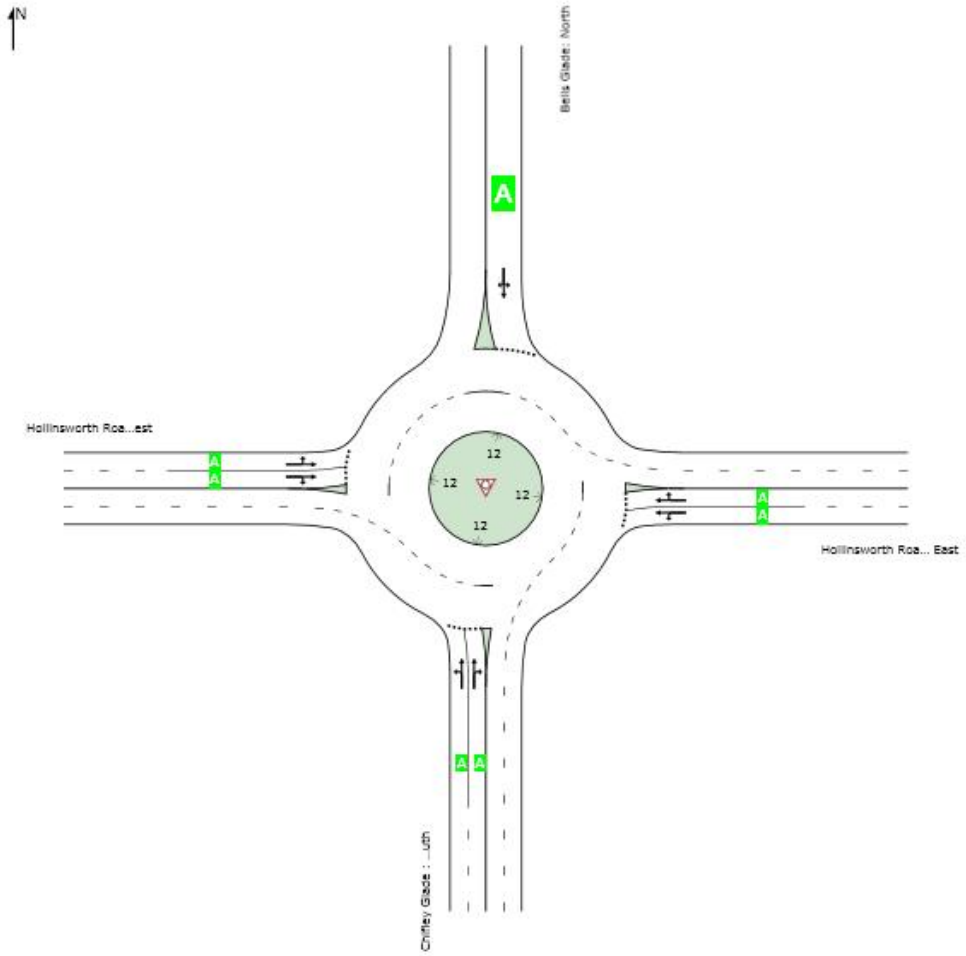
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Proposed AM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Hollinsworth Road / Chifley Glade / Bells Glade- PM

Future Proposal

LANE SUMMARY

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Proposed PM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chifley Glade : South													
Lane 1	190	0.0	880	0.216	53[5]	6.1	LOS A	1.0	7.1	Full	500	0.0	0.0
Lane 2[d]	504	0.0	1240	0.406	100	8.4	LOS A	2.5	17.2	Full	500	0.0	0.0
Approach	694	0.0		0.406		7.7	LOS A	2.5	17.2				
East: Hollinsworth Road: East													
Lane 1[d]	186	0.0	1134	0.164	100	5.8	LOS A	0.8	5.6	Full	500	0.0	0.0
Lane 2	175	0.0	1091	0.160	98[5]	7.8	LOS A	0.8	5.4	Full	500	0.0	0.0
Approach	361	0.0		0.164		6.8	LOS A	0.8	5.6				
North: Bells Glade: North													
Lane 1[d]	172	0.0	852	0.202	100	7.3	LOS A	0.7	5.1	Full	500	0.0	0.0
Approach	172	0.0		0.202		7.3	LOS A	0.7	5.1				
West: Hollinsworth Road : West													
Lane 1[d]	210	0.0	948	0.221	100	6.8	LOS A	1.1	7.5	Full	500	0.0	0.0
Lane 2	194	0.0	878	0.221	100	10.5	LOS B	1.1	7.4	Full	500	0.0	0.0
Approach	404	0.0		0.221		8.6	LOS A	1.1	7.5				
Intersection	1631	0.0		0.406		7.7	LOS A	2.5	17.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
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.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

Organisation: MULTIPRO CONSULTANTS | Processed: Thursday, 31 October 2019 9:04:37 PM
Project: E:\Multipro\Job124 45 Hollinsworth Road, Marsden Park\Planning Proposal\SIDRA\31102019\45 Hollinsworth Road, Marsden Park Planning Proposal Existing Conditions Hollinsworth Road Chifley Glade Bells Glade.sip8

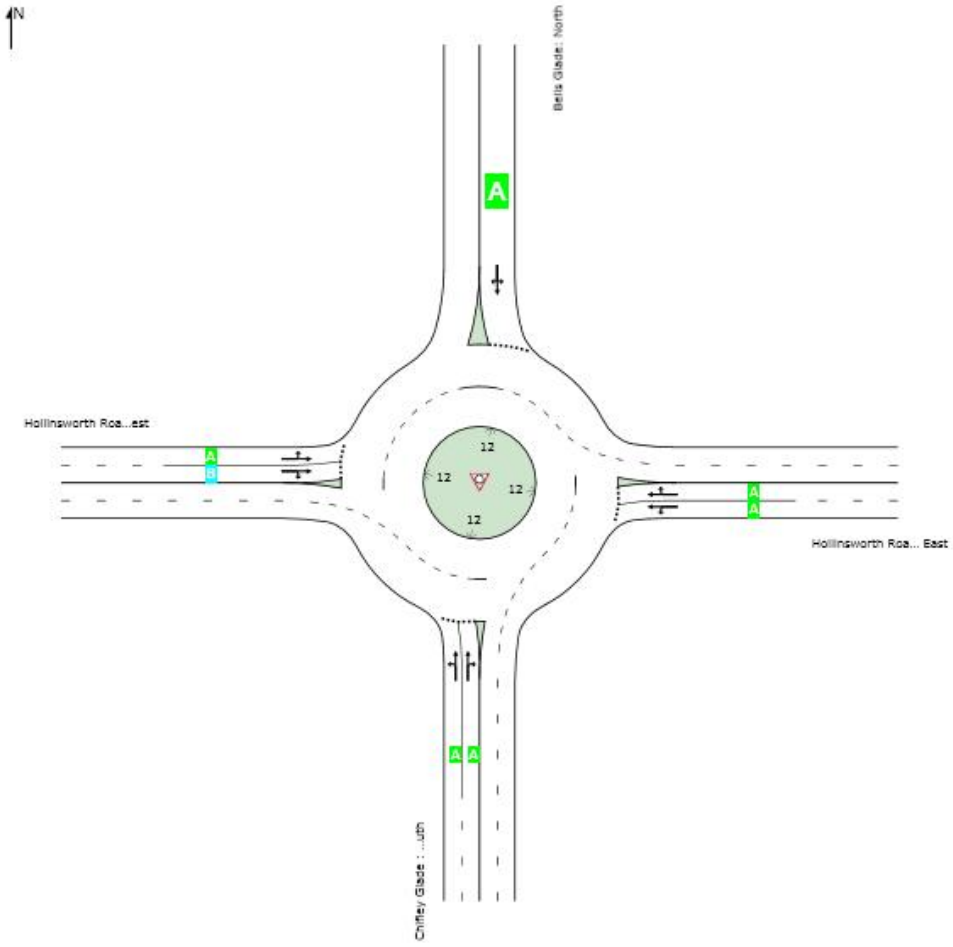
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Proposed PM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Appendix D SIDRA Results (20 Year Future Conditions)

Hollinsworth Road / Ahmadiyya Crescent- 20 Years AM

Future

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Proposed 20 Yrs Future AM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Proposed Future AM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Ahmadiyya Cr. NB												
1	L2	13	0.0	0.006	7.9	LOS A	0.0	0.3	0.20	0.87	0.20	45.0
3	R2	98	0.0	0.209	22.3	LOS C	1.4	10.0	0.80	1.02	0.86	40.6
Approach		111	0.0	0.209	20.6	LOS C	1.4	10.0	0.73	1.00	0.78	41.0
East: Hollinsworth Road WB												
4	L2	202	0.0	0.078	4.6	LOS A	0.0	0.0	0.00	0.36	0.00	48.0
5	T1	263	0.0	0.078	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	49.3
Approach		465	0.0	0.078	2.0	NA	0.0	0.0	0.00	0.23	0.00	48.7
West: Hollinsworth Road EB												
11	T1	407	0.0	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	22	0.0	0.012	6.6	LOS A	0.1	0.6	0.47	0.58	0.47	45.8
Approach		429	0.0	0.079	0.3	NA	0.1	0.6	0.02	0.03	0.02	49.8
All Vehicles		1005	0.0	0.209	3.3	NA	1.4	10.0	0.09	0.23	0.10	48.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

Organisation: MULTIPRO CONSULTANTS | Processed: Friday, 1 November 2019 4:46:18 PM
Project: E:\Multipro\Job124 45 Hollinsworth Road, Marsden Park\Planning Proposal\SIDRA\31102019\45 Hollinsworth Road, Marsden Park Planning Proposal Existing Conditions.sip8

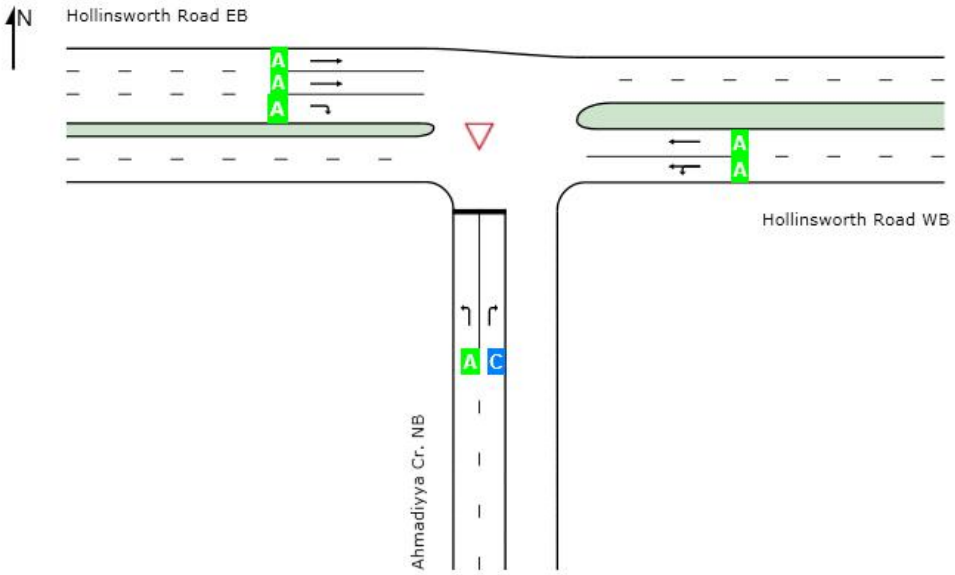
LANE LEVEL OF SERVICE

Lane Level of Service

▽ Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Proposed 20 Yrs Future AM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Proposed Future AM
Site Category: (None)
Giveway / Yield (Two-Way)

	Approaches			Intersection
	South	East	West	
LOS	C	NA	NA	NA



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Hollinsworth Road / Ahmadiyya Crescent- 20 Years Future PM Proposed

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Proposed 20 Yrs Future PM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Future PM
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Ahmadiyya Cr. NB												
1	L2	13	0.0	0.011	4.9	LOS A	0.0	0.3	0.19	0.50	0.19	46.2
3	R2	200	0.0	0.560	18.7	LOS C	3.1	22.0	0.79	1.07	1.31	39.8
Approach		213	0.0	0.560	17.9	LOS C	3.1	22.0	0.75	1.03	1.24	40.2
East: Hollinsworth Road WB												
4	L2	96	0.0	0.103	4.6	LOS A	0.0	0.0	0.00	0.26	0.00	48.1
5	T1	305	0.0	0.103	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	49.5
Approach		401	0.0	0.103	1.1	NA	0.0	0.0	0.00	0.13	0.00	49.1
West: Hollinsworth Road EB												
11	T1	315	0.0	0.080	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	16	0.0	0.017	6.2	LOS A	0.1	0.4	0.43	0.56	0.43	45.9
Approach		331	0.0	0.080	0.3	NA	0.1	0.4	0.02	0.03	0.02	49.8
All Vehicles		945	0.0	0.560	4.6	NA	3.1	22.0	0.18	0.30	0.29	47.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

Organisation: MULTIPRO CONSULTANTS | Processed: Friday, 1 November 2019 5:05:32 PM
Project: E:\Multipro\Job124 45 Hollinsworth Road, Marsden Park\Planning Proposal\SIDRA\31102019\45 Hollinsworth Road, Marsden Park Planning Proposal Existing Conditions.sip8

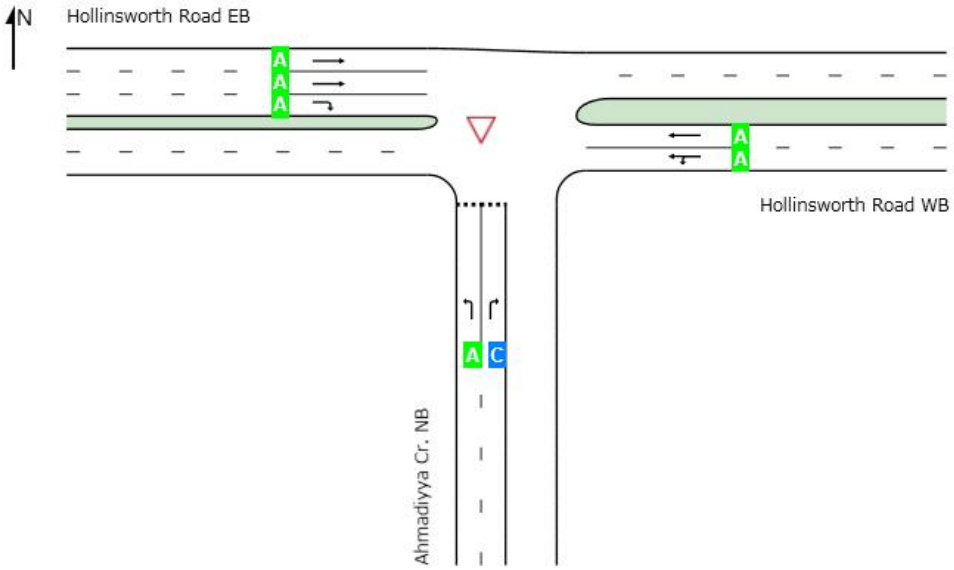
LANE LEVEL OF SERVICE

Lane Level of Service

▽ Site: 101 [Hollinsworth Road / Ahmadiyya Cr - Proposed 20 Yrs Future PM]

45 Hollinsworth Road, Marsden Park
Planning Propsal
Hollinsworth Road / Ahmadiyya Cr - Future PM
Site Category: (None)
Giveway / Yield (Two-Way)

	Approaches			Intersection
	South	East	West	
LOS	C	NA	NA	NA



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Hollinsworth Road / Chifley Glade / Bells Glade- 20 Year AM

Future 20 Year Proposal

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Proposed 20 Yrs Future AM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chifley Glade : South												
1	L2	260	0.0	0.253	6.4	LOS A	1.2	8.5	0.51	0.69	0.51	52.6
2	T1	82	0.0	0.264	6.4	LOS A	1.3	8.9	0.52	0.73	0.52	52.3
3	R2	177	0.0	0.264	10.1	LOS B	1.3	8.9	0.52	0.73	0.52	52.0
Approach		519	0.0	0.264	7.7	LOS A	1.3	8.9	0.52	0.71	0.52	52.4
East: Hollinsworth Road: East												
4	L2	211	0.0	0.304	6.3	LOS A	1.7	11.8	0.49	0.63	0.49	52.6
5	T1	254	0.0	0.304	6.2	LOS A	1.7	11.8	0.50	0.66	0.50	53.2
6	R2	187	0.0	0.304	9.9	LOS A	1.7	11.7	0.50	0.68	0.50	52.3
Approach		652	0.0	0.304	7.3	LOS A	1.7	11.8	0.50	0.66	0.50	52.7
North: Bells Glade: North												
7	L2	40	0.0	0.106	6.2	LOS A	0.3	2.4	0.42	0.68	0.42	52.3
8	T1	33	0.0	0.106	6.1	LOS A	0.3	2.4	0.42	0.68	0.42	53.6
9	R2	22	0.0	0.106	9.8	LOS A	0.3	2.4	0.42	0.68	0.42	53.3
Approach		95	0.0	0.106	7.0	LOS A	0.3	2.4	0.42	0.68	0.42	53.0
West: Hollinsworth Road : West												
10	L2	23	0.0	0.232	6.5	LOS A	1.0	7.1	0.48	0.63	0.48	52.5
11	T1	201	0.0	0.232	6.3	LOS A	1.0	7.1	0.48	0.63	0.48	53.8
12	R2	273	0.0	0.259	9.8	LOS A	1.2	8.2	0.48	0.75	0.48	51.3
Approach		497	0.0	0.259	8.3	LOS A	1.2	8.2	0.48	0.70	0.48	52.3
All Vehicles		1763	0.0	0.304	7.7	LOS A	1.7	11.8	0.49	0.68	0.49	52.5

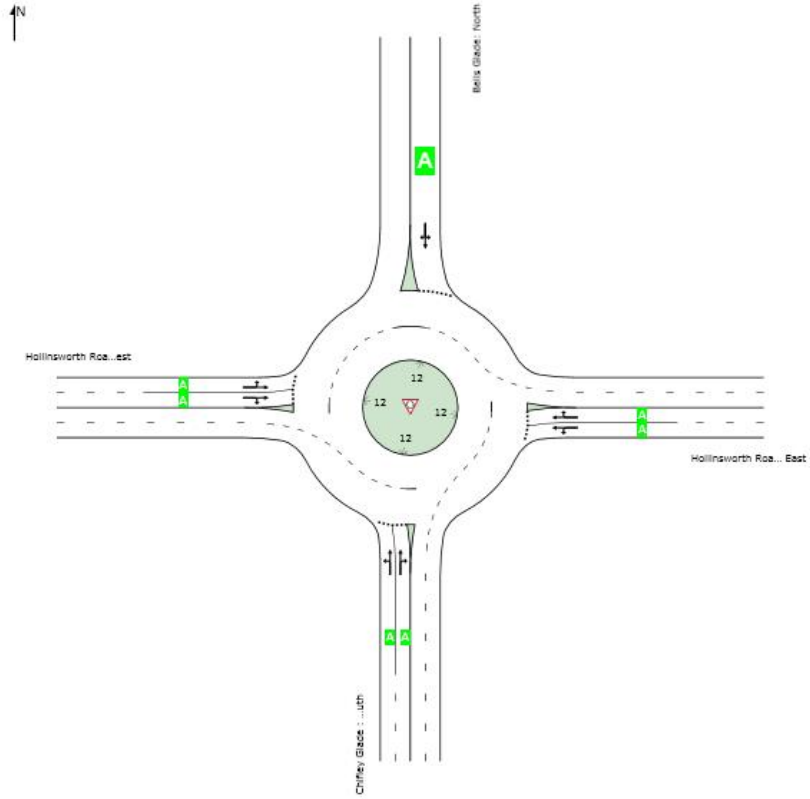
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
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.

Organisation: MULTIPRO CONSULTANTS | Processed: Friday, 1 November 2019 5:10:12 PM
Project: E:\Multipro\Job124 45 Hollinsworth Road, Marsden Park\Planning Proposal\SIDRA\31102019\45 Hollinsworth Road, Marsden Park Planning Proposal Existing Conditions Hollinsworth Road Chifley Glade Bells Glade.sip8

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Proposed 20 Yrs Future AM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.

Hollinsworth Road / Chifley Glade / Bells Glade- 20 Year PM

Future 20 Year Proposal

MOVEMENT SUMMARY

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Proposed 20 Yrs PM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Chifley Glade : South												
1	L2	275	0.0	0.343	7.0	LOS A	1.8	12.8	0.53	0.68	0.53	52.6
2	T1	196	0.0	0.646	7.2	LOS A	5.9	41.0	0.67	0.75	0.71	51.6
3	R2	553	0.0	0.646	10.8	LOS B	5.9	41.0	0.67	0.75	0.71	51.3
Approach		1024	0.0	0.646	9.1	LOS A	5.9	41.0	0.63	0.73	0.66	51.7
East: Hollinsworth Road: East												
4	L2	276	0.0	0.269	6.5	LOS A	1.5	10.6	0.54	0.67	0.54	52.6
5	T1	109	0.0	0.259	6.6	LOS A	1.4	9.9	0.54	0.71	0.54	52.4
6	R2	141	0.0	0.259	10.2	LOS B	1.4	9.9	0.54	0.71	0.54	52.1
Approach		526	0.0	0.269	7.5	LOS A	1.5	10.6	0.54	0.69	0.54	52.4
North: Bells Glade: North												
7	L2	131	0.0	0.382	9.0	LOS A	1.9	13.0	0.70	0.88	0.76	50.8
8	T1	83	0.0	0.382	8.9	LOS A	1.9	13.0	0.70	0.88	0.76	52.0
9	R2	41	0.0	0.382	12.6	LOS B	1.9	13.0	0.70	0.88	0.76	51.7
Approach		255	0.0	0.382	9.6	LOS A	1.9	13.0	0.70	0.88	0.76	51.3
West: Hollinsworth Road : West												
10	L2	45	0.0	0.423	8.9	LOS A	2.7	18.9	0.79	0.90	0.86	51.2
11	T1	267	0.0	0.423	8.8	LOS A	2.7	18.9	0.79	0.90	0.86	52.4
12	R2	271	0.0	0.423	13.1	LOS B	2.6	18.2	0.79	0.96	0.87	49.4
Approach		583	0.0	0.423	10.8	LOS B	2.7	18.9	0.79	0.93	0.86	50.9
All Vehicles		2388	0.0	0.646	9.2	LOS A	5.9	41.0	0.66	0.79	0.70	51.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
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.
Roundabout Capacity Model: SIDRA Standard.
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.

Organisation: MULTIPRO CONSULTANTS | Processed: Friday, 1 November 2019 5:14:04 PM
Project: E:\Multipro\Job124 45 Hollinsworth Road, Marsden Park\Planning Proposal\SIDRA\31102019\45 Hollinsworth Road, Marsden Park Planning Proposal Existing Conditions Hollinsworth Road Chifley Glade Bells Glade.sip8

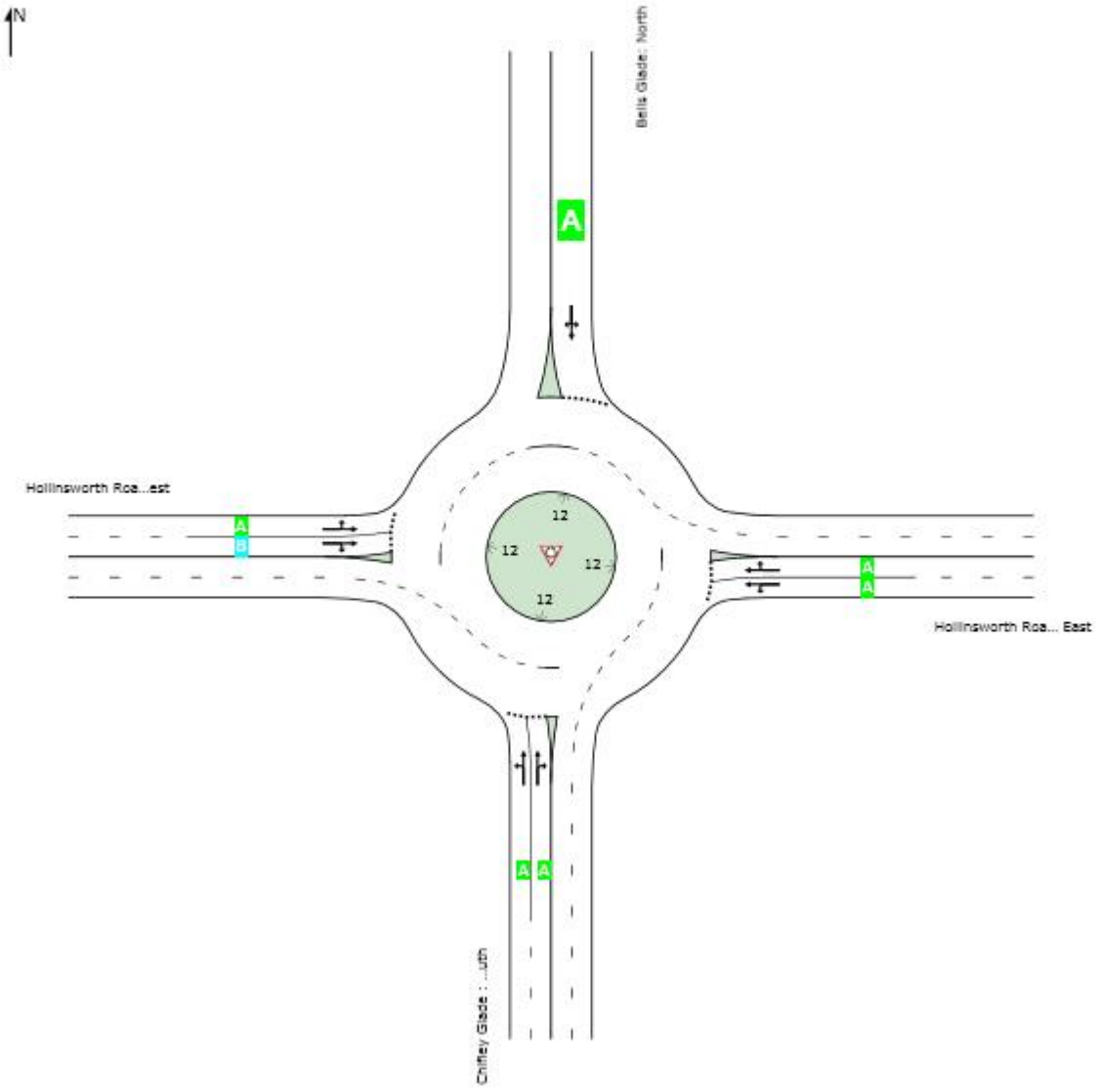
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 101 [Hollinsworth Road, Chifley Glade, Bells Glade Proposed 20 Yrs PM]

45 Hollinsworth Road, Marsden Park
Planning Proposal
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	B	A



Appendix E Traffic Survey Data

Hollinsworth Road, near Ahmadiyya Crescent, Marsden Park

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Hollinsworth Rd
Location	Marsden Park
Site No	1
Start Date	23-Oct-19
Description	Volume Summary
Direction	Combined

Menu

MATRIX Traffic and Transport Data

Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	546	579	602	623	587	385	370		
PM Peak	715	716	704	756	791	553	453	7542	6650
0:00	14	24	19	24	23	29	14	21	21
1:00	25	33	32	36	31	18	18	31	28
2:00	15	28	27	29	18	31	11	23	23
3:00	41	48	58	37	35	29	5	44	36
4:00	46	61	83	66	59	38	15	63	53
5:00	415	461	469	459	472	124	77	455	354
6:00	332	340	353	355	338	104	43	344	266
7:00	465	484	464	487	431	129	86	466	364
8:00	546	579	602	623	587	210	126	587	468
9:00	390	400	399	432	441	265	194	412	360
10:00	394	426	355	403	398	374	363	395	388
11:00	415	405	400	404	398	385	370	404	397
12:00	430	476	430	453	537	553	448	465	475
13:00	505	538	498	471	646	441	407	532	501
14:00	715	716	704	756	791	430	453	736	652
15:00	496	465	502	485	460	354	300	482	437
16:00	519	549	520	550	525	275	329	533	467
17:00	506	537	539	561	514	270	253	531	454
18:00	337	300	313	348	342	225	155	328	289
19:00	212	208	221	256	197	179	143	219	202
20:00	139	135	165	190	183	81	87	162	140
21:00	93	108	92	118	119	132	79	106	106
22:00	132	132	142	117	152	75	48	135	114
23:00	55	66	66	62	84	44	20	67	57
Total	7237	7519	7453	7722	7781	4795	4044	7542	6650

7-19	5718	5875	5726	5973	6070	3911	3484	5872	5251
6-22	6494	6666	6557	6892	6907	4407	3836	6703	5966
6-24	6681	6864	6765	7071	7143	4526	3904	6905	6136
0-24	7237	7519	7453	7722	7781	4795	4044	7542	6650

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Hollinsworth Rd
Location	Marsden Park
Site No	1
Start Date	23-Oct-19
Description	Volume Summary
Direction	EB

Menu

MATRIX Traffic and Transport Data

Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	267	315	302	322	316	189	185		
PM Peak	475	474	466	497	530	258	252	3737	3315
0:00	7	16	10	15	12	20	4	12	12
1:00	9	16	21	20	17	6	7	17	14
2:00	7	12	5	7	5	17	6	7	8
3:00	11	11	21	14	12	12	1	14	12
4:00	14	19	19	18	10	12	6	16	14
5:00	63	73	84	71	79	32	28	74	61
6:00	123	109	113	121	112	36	17	116	90
7:00	217	223	208	244	199	65	45	218	172
8:00	267	315	302	322	316	131	80	304	248
9:00	173	170	179	217	211	142	110	190	172
10:00	215	224	170	206	217	189	185	206	201
11:00	211	197	202	200	203	184	179	203	197
12:00	221	250	221	231	241	258	190	233	230
13:00	201	217	225	193	300	211	223	227	224
14:00	475	474	466	497	530	239	252	488	419
15:00	259	256	293	268	260	207	136	267	240
16:00	282	311	301	301	277	162	160	294	256
17:00	294	284	278	292	253	148	135	280	241
18:00	154	150	155	173	174	94	66	161	138
19:00	109	99	107	124	91	88	70	106	98
20:00	64	66	79	101	90	42	44	80	69
21:00	53	56	44	65	70	92	49	58	61
22:00	108	107	121	90	120	57	41	109	92
23:00	47	55	57	51	68	27	14	56	46
Total	3584	3710	3681	3841	3867	2471	2048	3737	3315
7-19	2969	3071	3000	3144	3181	2030	1761	3073	2737
6-22	3318	3401	3343	3555	3544	2288	1941	3432	3056
6-24	3473	3563	3521	3696	3732	2372	1996	3597	3193
0-24	3584	3710	3681	3841	3867	2471	2048	3737	3315

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Hollinsworth Rd
Location	Marsden Park
Site No	1
Start Date	23-Oct-19
Description	Volume Summary
Direction	WB

Menu

MATRIX Traffic and Transport Data

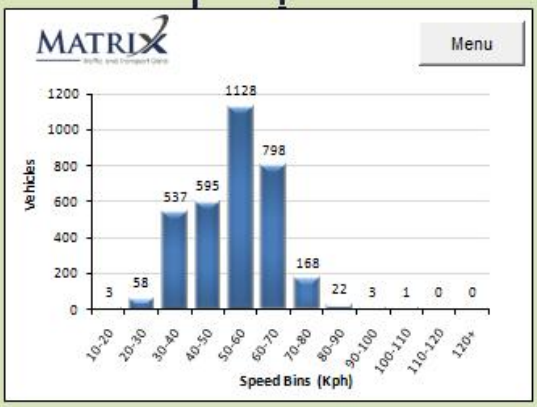
Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	352	388	385	388	393	201	191		
PM Peak	304	321	273	278	346	295	258	3806	3336
0:00	7	8	9	9	11	9	10	9	9
1:00	16	17	11	16	14	12	11	15	14
2:00	8	16	22	22	13	14	5	16	14
3:00	30	37	37	23	23	17	4	30	24
4:00	32	42	64	48	49	26	9	47	39
5:00	352	388	385	388	393	92	49	381	292
6:00	209	231	240	234	226	68	26	228	176
7:00	248	261	256	243	232	64	41	248	192
8:00	279	264	300	301	271	79	46	283	220
9:00	217	230	220	215	230	123	84	222	188
10:00	179	202	185	197	181	185	178	189	187
11:00	204	208	198	204	195	201	191	202	200
12:00	209	226	209	222	296	295	258	232	245
13:00	304	321	273	278	346	230	184	304	277
14:00	240	242	238	259	261	191	201	248	233
15:00	237	209	209	217	200	147	164	214	198
16:00	237	238	219	249	248	113	169	238	210
17:00	212	253	261	269	261	122	118	251	214
18:00	183	150	158	175	168	131	89	167	151
19:00	103	109	114	132	106	91	73	113	104
20:00	75	69	86	89	93	39	43	82	71
21:00	40	52	48	53	49	40	30	48	45
22:00	24	25	21	27	32	18	7	26	22
23:00	8	11	9	11	16	17	6	11	11
Total	3653	3809	3772	3881	3914	2324	1996	3806	3336

7-19	2749	2804	2726	2829	2889	1881	1723	2799	2514
6-22	3176	3265	3214	3337	3363	2119	1895	3271	2910
6-24	3208	3301	3244	3375	3411	2154	1908	3308	2943
0-24	3653	3809	3772	3881	3914	2324	1996	3806	3336

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Hollinsworth Rd
Location	Marsden Park
Site No	1
Start Date	23-Oct-19
Day	7 Day Ave
Direction	EB
Description	Speed Summary

Select Site: 1. Hollinsworth Rd

Select Day: 7 Day Ave Select Direction: EB



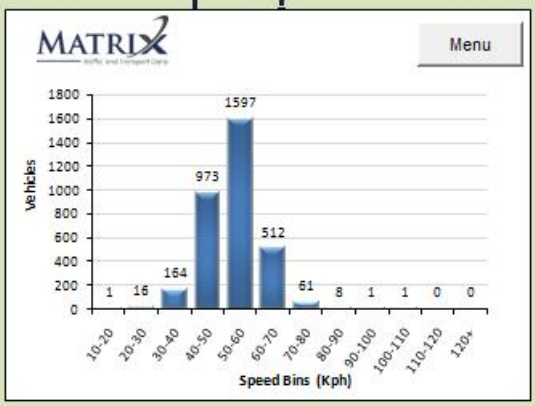
Bin Summary	
10-20	0.1%
20-30	1.7%
30-40	16.2%
40-50	17.9%
50-60	34.0%
60-70	24.1%
70-80	5.1%
80-90	0.7%
90-100	0.1%
100-110	0.0%
110-120	0.0%
120+	0.0%
53.2	64.5

Hour Starting	Vehicle Speed Bins (kph)												Speed	
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	0	3	2	3	4	1	0	0	0	0	0	53.6	65.8
1:00	0	0	6	2	3	2	0	0	0	0	0	0	49.0	57.9
2:00	0	0	1	1	4	3	1	0	0	0	0	0	56.5	65.4
3:00	0	0	1	2	4	4	1	0	0	0	0	0	54.9	65.3
4:00	0	0	1	1	5	5	1	0	0	0	0	0	56.9	67.7
5:00	0	1	6	7	24	17	5	1	0	0	0	0	55.4	65.9
6:00	0	0	6	14	29	28	10	2	0	0	0	0	59.3	70.1
7:00	0	1	13	22	58	59	16	2	0	0	0	0	57.9	68.0
8:00	0	2	21	40	91	77	15	2	0	0	0	0	56.2	66.1
9:00	0	3	25	29	66	41	7	1	0	0	0	0	53.7	64.1
10:00	0	4	21	34	84	47	9	1	0	0	0	0	54.0	63.7
11:00	0	3	29	36	72	47	7	1	0	0	0	0	52.9	63.9
12:00	1	7	34	43	85	49	10	1	0	0	0	0	52.2	63.5
13:00	0	4	43	38	78	49	9	2	0	0	0	0	52.2	64.1
14:00	1	9	83	100	138	74	13	1	0	0	0	0	50.4	62.4
15:00	0	5	48	47	76	54	9	1	0	0	0	0	51.8	63.9
16:00	0	4	50	52	83	54	11	2	0	0	0	0	51.5	63.2
17:00	0	3	50	42	72	59	14	1	0	0	0	0	52.6	65.2
18:00	0	2	21	22	47	34	10	1	0	0	0	0	54.4	66.1
19:00	0	2	14	17	35	25	4	1	0	0	0	0	53.6	64.4
20:00	0	1	15	11	23	16	3	1	0	0	0	0	52.2	64.2
21:00	0	4	17	9	18	11	3	0	0	0	0	0	49.7	62.8
22:00	0	1	9	12	25	35	9	2	0	0	0	0	58.1	68.2
23:00	0	2	18	12	6	5	2	0	0	0	0	0	45.8	60.1
Total	3	58	537	595	1128	798	168	22	3	1	0	0	53.2	64.5

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Hollinsworth Rd
Location	Marsden Park
Site No	1
Start Date	23-Oct-19
Day	7 Day Ave
Direction	WB
Description	Speed Summary

Select Site: 1. Hollinsworth Rd

Select Day: 7 Day Ave Select Direction: WB



Bin Summary	
10-20	0.0%
20-30	0.5%
30-40	4.9%
40-50	29.2%
50-60	47.9%
60-70	15.4%
70-80	1.8%
80-90	0.3%
90-100	0.0%
100-110	0.0%
110-120	0.0%
120+	0.0%
52.9	60.6

Hour	Vehicle Speed Bins (kph)												Speed	
Starting	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	0	1	1	3	3	0	0	0	0	0	0	55.3	65.1
1:00	0	0	0	3	6	3	1	1	0	0	0	0	56.6	64.5
2:00	0	0	1	6	5	1	1	0	0	0	0	0	50.6	59.4
3:00	0	0	1	9	10	3	1	0	0	0	0	0	52.5	60.9
4:00	0	0	2	8	18	9	2	0	0	0	0	0	54.3	63.7
5:00	0	1	5	57	163	61	4	1	0	0	0	0	54.8	62.0
6:00	0	0	6	47	88	30	4	0	0	0	0	0	53.2	60.3
7:00	0	1	9	62	90	27	3	0	0	0	0	0	52.0	60.1
8:00	0	1	12	64	104	33	4	1	0	0	0	0	53.1	60.8
9:00	0	2	11	64	84	23	3	1	0	0	0	0	51.9	59.9
10:00	0	2	16	66	78	22	3	0	0	0	0	0	51.0	59.3
11:00	0	2	15	68	91	21	2	0	0	0	0	0	51.1	59.0
12:00	0	1	15	90	107	28	3	1	0	0	0	0	51.5	59.2
13:00	0	1	15	86	129	40	5	1	0	0	0	0	52.7	60.3
14:00	0	1	12	71	110	33	5	0	0	0	0	0	52.6	60.2
15:00	0	1	12	57	95	29	4	0	0	0	0	0	52.9	60.3
16:00	0	0	7	55	106	37	4	1	0	0	0	0	53.9	61.9
17:00	0	1	8	52	109	39	4	1	0	0	0	0	54.1	61.8
18:00	0	1	5	37	79	25	4	0	0	0	0	0	54.0	61.1
19:00	0	0	5	34	47	15	2	0	0	0	0	0	52.6	60.3
20:00	0	0	1	18	36	13	2	0	0	0	0	0	54.2	61.1
21:00	0	0	1	11	21	9	1	0	0	0	0	0	54.5	62.6
22:00	0	0	1	5	11	4	1	0	0	0	0	0	54.9	63.2
23:00	0	0	0	3	4	3	0	0	0	0	0	0	54.0	62.0
Total	1	16	164	973	1597	512	61	8	1	1	0	0	52.9	60.6

Ahmadiyya Crescent near Hollinsworth Road, Marsden Park (bet. Cul-De-Sac & Hollinsworth Road)

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (before Cul-de-sac)
Location	Marsden Park
Site No	2
Start Date	23-Oct-19
Description	Volume Summary
Direction	Combined

Menu

MATRIX Traffic and Transport Data

Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	133	128	168	161	152	118	121		
PM Peak	156	165	162	180	233	176	172	1749	1587
0:00	4	8	5	5	3	9	0	5	5
1:00	1	11	14	13	12	4	2	10	8
2:00	2	1	0	2	0	3	1	1	1
3:00	13	13	16	14	18	13	0	15	12
4:00	11	15	17	20	13	15	2	15	13
5:00	73	93	82	85	80	19	19	83	64
6:00	59	62	58	58	60	11	5	59	45
7:00	111	128	138	112	115	17	8	121	90
8:00	133	126	168	161	152	33	17	148	113
9:00	85	87	100	95	110	73	40	95	84
10:00	52	74	99	72	74	94	121	74	84
11:00	66	89	81	72	61	118	103	74	84
12:00	83	85	103	100	181	176	132	110	123
13:00	92	77	82	93	233	136	96	115	116
14:00	156	165	162	180	219	131	172	176	169
15:00	110	100	117	116	93	105	73	107	102
16:00	129	155	119	138	150	96	64	138	122
17:00	156	146	160	154	136	63	55	150	124
18:00	65	69	67	74	77	53	27	70	62
19:00	45	50	45	56	39	35	41	47	44
20:00	39	35	55	40	64	23	27	47	40
21:00	32	12	21	22	53	54	37	28	33
22:00	17	16	16	13	28	6	15	18	16
23:00	37	38	33	41	55	10	11	41	32
Total	1571	1655	1758	1736	2026	1297	1068	1749	1587
7-19	1238	1301	1396	1367	1601	1095	908	1381	1272
6-22	1413	1460	1575	1543	1817	1218	1018	1562	1435
6-24	1467	1514	1624	1597	1900	1234	1044	1620	1483
0-24	1571	1655	1758	1736	2026	1297	1068	1749	1587

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (before Cul-de-sac)
Location	Marsden Park
Site No	2
Start Date	23-Oct-19
Description	Volume Summary
Direction	NB

Menu

MATRIX Traffic and Transport Data

Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	40	47	54	50	55	50	39		
PM Peak	113	106	111	114	144	86	102	883	801
0:00	2	7	3	4	2	7	0	4	4
1:00	1	10	13	13	11	2	1	10	7
2:00	1	1	0	1	0	3	1	1	1
3:00	3	2	3	2	4	4	0	3	3
4:00	0	1	3	4	1	3	0	2	2
5:00	9	18	13	10	12	8	10	12	11
6:00	14	16	17	15	18	1	1	16	12
7:00	31	41	43	36	32	4	3	37	27
8:00	40	37	54	50	55	12	5	47	36
9:00	34	35	44	43	48	28	13	41	35
10:00	23	34	44	25	37	34	36	33	33
11:00	31	47	46	34	32	50	39	38	40
12:00	44	46	53	54	54	86	57	50	56
13:00	42	32	40	45	134	64	55	59	59
14:00	102	98	110	114	144	69	102	114	106
15:00	63	60	72	75	60	72	38	66	63
16:00	84	106	82	88	95	69	32	91	79
17:00	113	98	111	103	91	41	41	103	85
18:00	39	47	45	48	31	16	10	42	34
19:00	19	25	23	34	16	15	15	23	21
20:00	21	14	26	18	34	12	18	23	20
21:00	24	5	12	15	34	48	31	18	24
22:00	9	11	12	9	22	2	15	13	11
23:00	37	37	33	40	51	8	9	40	31
Total	786	828	902	880	1018	658	532	883	801

7-19	646	681	744	715	813	545	431	720	654
6-22	724	741	822	797	915	621	496	800	731
6-24	770	789	867	846	988	631	520	852	773
0-24	786	828	902	880	1018	658	532	883	801

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (before Cul-de-sac)
Location	Marsden Park
Site No	2
Start Date	23-Oct-19
Description	Volume Summary
Direction	SB

Menu

MATRIX Traffic and transport Data

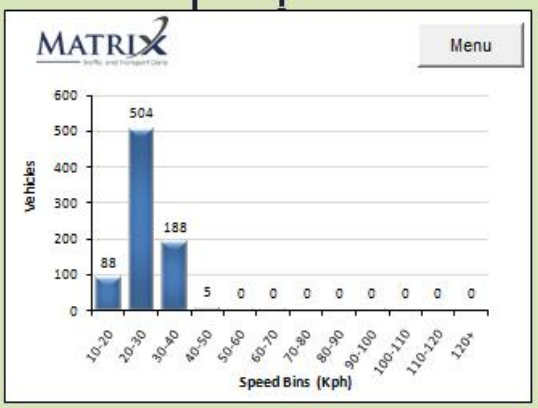
Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	93	89	114	111	97	68	85		
PM Peak	54	67	52	66	127	90	75	866	787
0:00	2	1	2	1	1	2	0	1	1
1:00	0	1	1	0	1	2	1	1	1
2:00	1	0	0	1	0	0	0	0	0
3:00	10	11	13	12	14	9	0	12	10
4:00	11	14	14	16	12	12	2	13	12
5:00	64	75	69	75	68	11	9	70	53
6:00	45	46	41	43	42	10	4	43	33
7:00	80	87	95	76	83	13	5	84	63
8:00	93	89	114	111	97	21	12	101	77
9:00	51	52	56	52	62	45	27	55	49
10:00	29	40	55	47	37	60	85	42	50
11:00	35	42	35	38	29	68	64	36	44
12:00	39	39	50	46	127	90	75	60	67
13:00	50	45	42	48	99	72	41	57	57
14:00	54	67	52	66	75	62	70	63	64
15:00	47	40	45	41	33	33	35	41	39
16:00	45	49	37	50	55	27	32	47	42
17:00	43	48	49	51	45	22	14	47	39
18:00	26	22	22	26	46	37	17	28	28
19:00	26	25	22	22	23	20	26	24	23
20:00	18	21	29	22	30	11	9	24	20
21:00	8	7	9	7	19	6	6	10	9
22:00	8	5	4	4	6	4	0	5	4
23:00	0	1	0	1	4	2	2	1	1
Total	785	827	856	856	1008	639	536	866	787

7-19	592	620	652	652	788	550	477	661	619
6-22	689	719	753	746	902	597	522	762	704
6-24	697	725	757	751	912	603	524	768	710
0-24	785	827	856	856	1008	639	536	866	787

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (before Cul-de-sac)
Location	Marsden Park
Site No	2
Start Date	23-Oct-19
Day	7 Day Ave
Direction	SB
Description	Speed Summary

Select Site: 2. Ahmadiyya Crescent (before Cul-de-sac)

Select Day: 7 Day Ave Select Direction: SB



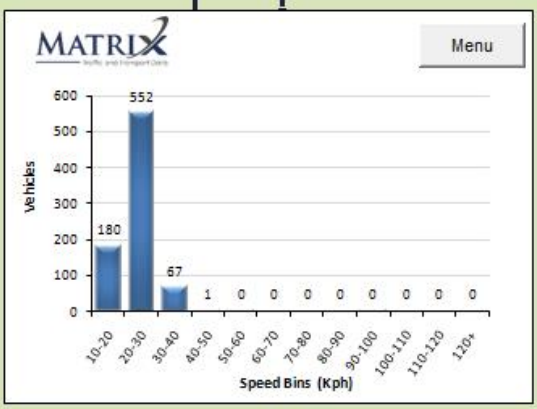
Bin Summary	
10-20	11.2%
20-30	64.1%
30-40	23.9%
40-50	0.7%
50-60	0.1%
60-70	0.0%
70-80	0.0%
80-90	0.0%
90-100	0.0%
100-110	0.0%
110-120	0.0%
120+	0.0%
26.4	31.1

Hour	Vehicle Speed Bins (kph)												Speed	
Starting	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	1	0	0	0	0	0	0	0	0	0	0	25.7	0
1:00	0	1	0	0	0	0	0	0	0	0	0	0	26.8	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	28.3	0
3:00	1	6	4	0	0	0	0	0	0	0	0	0	28.4	31.9
4:00	1	5	6	0	0	0	0	0	0	0	0	0	29.6	34.6
5:00	0	26	26	1	0	0	0	0	0	0	0	0	30.3	34.2
6:00	2	19	12	0	0	0	0	0	0	0	0	0	27.2	31.8
7:00	2	42	18	0	0	0	0	0	0	0	0	0	26.9	31.3
8:00	4	50	22	1	0	0	0	0	0	0	0	0	27.5	31.7
9:00	6	37	6	0	0	0	0	0	0	0	0	0	25.2	29.9
10:00	8	35	8	0	0	0	0	0	0	0	0	0	24.8	29.6
11:00	10	27	7	0	0	0	0	0	0	0	0	0	24.4	30.1
12:00	12	41	13	0	0	0	0	0	0	0	0	0	26.0	31.2
13:00	8	33	15	1	0	0	0	0	0	0	0	0	26.5	31.5
14:00	8	41	14	1	0	0	0	0	0	0	0	0	26.0	31.3
15:00	5	30	4	0	0	0	0	0	0	0	0	0	24.8	29.4
16:00	6	28	8	0	0	0	0	0	0	0	0	0	25.5	30.2
17:00	6	30	2	0	0	0	0	0	0	0	0	0	23.9	28.0
18:00	5	19	4	0	0	0	0	0	0	0	0	0	24.8	29.5
19:00	2	13	8	0	0	0	0	0	0	0	0	0	28.1	33.0
20:00	1	11	8	0	0	0	0	0	0	0	0	0	28.3	33.1
21:00	1	6	2	0	0	0	0	0	0	0	0	0	27.0	31.3
22:00	0	3	1	0	0	0	0	0	0	0	0	0	27.0	#DIV/0!
23:00	0	1	0	0	0	0	0	0	0	0	0	0	29.1	#DIV/0!
Total	88	504	188	5	0	0	0	0	0	0	0	0	26.4	31.1

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (before Cul-de-sac)
Location	Marsden Park
Site No	2
Start Date	23-Oct-19
Day	7 Day Ave
Direction	NB
Description	Speed Summary

Select Site: 2. Ahmadiyya Crescent (before Cul-de-sac)

Select Day: 7 Day Ave Select Direction: NB



Bin Summary	
10-20	22.5%
20-30	69.0%
30-40	8.4%
40-50	0.1%
50-60	0.1%
60-70	0.0%
70-80	0.0%
80-90	0.0%
90-100	0.0%
100-110	0.0%
110-120	0.0%
120+	0.0%
23.4	27.7

Hour	Vehicle Speed Bins (kph)												Speed	
Starting	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	3	1	0	0	0	0	0	0	0	0	0	25.1	0
1:00	0	6	1	0	0	0	0	0	0	0	0	0	24.9	29.5
2:00	0	1	0	0	0	0	0	0	0	0	0	0	22.1	0
3:00	0	2	0	0	0	0	0	0	0	0	0	0	24.3	0
4:00	1	1	0	0	0	0	0	0	0	0	0	0	26.3	0
5:00	1	9	1	0	0	0	0	0	0	0	0	0	25.2	27.9
6:00	4	7	0	0	0	0	0	0	0	0	0	0	22.4	25.3
7:00	7	19	1	0	0	0	0	0	0	0	0	0	21.4	26.0
8:00	11	25	1	0	0	0	0	0	0	0	0	0	21.8	25.9
9:00	11	23	2	0	0	0	0	0	0	0	0	0	21.9	25.3
10:00	8	23	2	0	0	0	0	0	0	0	0	0	22.6	25.9
11:00	9	26	4	0	0	0	0	0	0	0	0	0	23.4	27.9
12:00	14	37	5	0	0	0	0	0	0	0	0	0	23.9	28.4
13:00	16	40	3	0	0	0	0	0	0	0	0	0	22.8	26.8
14:00	22	76	8	0	0	0	0	0	0	0	0	0	23.5	27.9
15:00	16	41	6	0	0	0	0	0	0	0	0	0	23.2	28.2
16:00	15	56	8	0	0	0	0	0	0	0	0	0	23.7	28.1
17:00	16	62	8	0	0	0	0	0	0	0	0	0	23.7	27.9
18:00	9	23	2	0	0	0	0	0	0	0	0	0	23.2	27.2
19:00	3	16	2	0	0	0	0	0	0	0	0	0	24.6	29.7
20:00	3	14	4	0	0	0	0	0	0	0	0	0	24.6	29.5
21:00	9	13	2	0	0	0	0	0	0	0	0	0	23.6	27.4
22:00	3	8	1	0	0	0	0	0	0	0	0	0	23.6	29.7
23:00	2	22	6	0	0	0	0	0	0	0	0	0	26.0	30.8
Total	180	552	67	1	0	0	0	0	0	0	0	0	23.4	27.7

Ahmadiyya Crescent - Internal driveway into Place of Worship (45 Hollinsworth Road)

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (Internal Driveway)
Location	Marsden Park
Site No	3
Start Date	23-Oct-19
Description	Volume Summary
Direction	Combined

Menu

MATRIX Traffic and Transport Data

Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	6	8	13	7	6	25	52		
PM Peak	23	27	20	21	173	45	58	179	231
0:00	1	6	0	0	1	1	0	2	1
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	0	2	1	0	1	2	2	1	1
5:00	4	8	10	4	6	14	18	6	9
6:00	0	1	1	1	0	1	1	1	1
7:00	1	0	9	2	0	0	0	2	2
8:00	0	0	0	0	2	2	1	0	1
9:00	2	2	5	2	2	23	7	3	6
10:00	1	5	13	3	2	20	52	5	14
11:00	6	7	3	7	4	25	34	5	12
12:00	10	7	10	8	98	40	25	27	28
13:00	10	6	16	21	173	43	26	45	42
14:00	5	3	2	10	35	45	58	11	23
15:00	2	1	1	8	5	40	11	3	10
16:00	6	4	4	5	4	34	28	5	12
17:00	5	2	3	2	3	6	18	3	6
18:00	2	6	3	4	12	6	16	5	7
19:00	23	27	16	19	23	14	30	22	22
20:00	9	13	20	15	21	8	14	16	14
21:00	22	6	6	4	17	2	32	11	13
22:00	6	0	8	3	9	0	9	5	5
23:00	1	0	0	1	7	3	8	2	3
Total	116	106	131	119	425	329	390	179	231
7-19	50	43	69	72	340	284	276	115	162
6-22	104	90	112	111	401	309	353	164	211
6-24	111	90	120	115	417	312	370	171	219
0-24	116	106	131	119	425	329	390	179	231

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (Internal Driveway)
Location	Marsden Park
Site No	3
Start Date	23-Oct-19
Description	Volume Summary
Direction	NB

Menu

MATRIX Traffic and Transport Data

Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	2	6	6	2	4	8	13		
PM Peak	19	7	13	11	117	30	44	87	114
0:00	1	6	0	0	1	1	0	2	1
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0
5:00	2	5	5	2	4	8	10	4	5
6:00	0	1	1	0	0	0	0	0	0
7:00	0	0	3	1	0	0	0	1	1
8:00	0	0	0	0	0	0	0	0	0
9:00	1	0	2	0	0	3	1	1	1
10:00	1	1	6	0	1	3	9	2	3
11:00	1	4	1	2	2	4	13	2	4
12:00	3	2	3	1	4	18	7	3	5
13:00	8	5	13	11	117	22	19	31	28
14:00	2	2	0	10	32	27	44	9	17
15:00	1	0	0	6	4	30	4	2	6
16:00	3	2	2	2	2	27	6	2	6
17:00	2	1	2	1	1	5	11	1	3
18:00	0	3	1	0	2	4	2	1	2
19:00	3	7	6	7	10	6	12	7	7
20:00	5	2	9	9	6	5	10	6	7
21:00	19	4	4	4	8	1	30	8	10
22:00	3	0	8	3	9	0	9	5	5
23:00	1	0	0	0	7	2	7	2	2
Total	56	45	66	59	210	166	194	87	114

7-19	22	20	33	34	165	143	116	55	76
6-22	49	34	53	54	189	155	168	76	100
6-24	53	34	61	57	205	157	184	82	107
0-24	56	45	66	59	210	166	194	87	114

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (Internal Driveway)
Location	Marsden Park
Site No	3
Start Date	23-Oct-19
Description	Volume Summary
Direction	SB

Menu

MATRIX Traffic and Transport Data

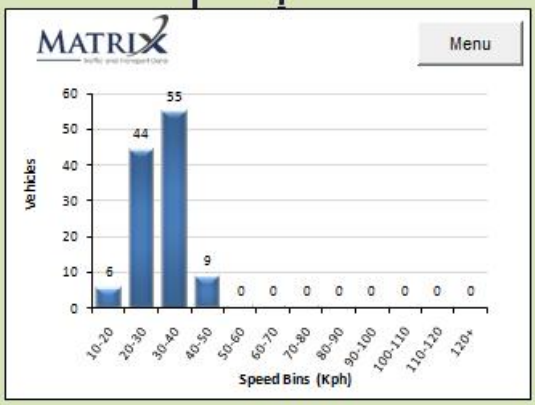
Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	28-Oct	29-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct		
AM Peak	5	4	7	5	2	21	43		
PM Peak	20	20	11	12	94	22	22	92	117
0:00	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	0	2	1	0	1	2	2	1	1
5:00	2	3	5	2	2	6	8	3	4
6:00	0	0	0	1	0	1	1	0	0
7:00	1	0	6	1	0	0	0	2	1
8:00	0	0	0	0	2	2	1	0	1
9:00	1	2	3	2	2	20	6	2	5
10:00	0	4	7	3	1	17	43	3	11
11:00	5	3	2	5	2	21	21	3	8
12:00	7	5	7	7	94	22	18	24	23
13:00	2	1	3	10	56	21	7	14	14
14:00	3	1	2	0	3	18	14	2	6
15:00	1	1	1	2	1	10	7	1	3
16:00	3	2	2	3	2	7	22	2	6
17:00	3	1	1	1	2	1	7	2	2
18:00	2	3	2	4	10	2	14	4	5
19:00	20	20	10	12	13	8	18	15	14
20:00	4	11	11	6	15	3	4	9	8
21:00	3	2	2	0	9	1	2	3	3
22:00	3	0	0	0	0	0	0	1	0
23:00	0	0	0	1	0	1	1	0	0
Total	60	61	65	60	215	163	196	92	117

7-19	28	23	36	38	175	141	160	60	86
6-22	55	56	59	57	212	154	185	88	111
6-24	58	56	59	58	212	155	186	89	112
0-24	60	61	65	60	215	163	196	92	117

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (Internal Driveway)
Location	Marsden Park
Site No	3
Start Date	23-Oct-19
Day	7 Day Ave
Direction	NB
Description	Speed Summary

Select Site: 3. Ahmadiyya Crescent (Internal Driveway)

Select Day: 7 Day Ave Select Direction: NB



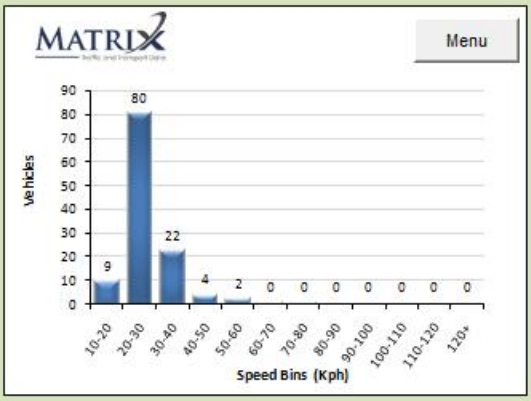
Bin Summary	
10-20	4.9%
20-30	38.8%
30-40	48.2%
40-50	7.5%
50-60	0.3%
60-70	0.1%
70-80	0.1%
80-90	0.0%
90-100	0.0%
100-110	0.0%
110-120	0.0%
120+	0.0%
31.6	37.2

Hour	Vehicle Speed Bins (kph)												Speed	
Starting	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	1	0	0	0	0	0	0	0	0	0	0	34.2	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0		0
2:00	0	0	0	0	0	0	0	0	0	0	0	0		0
3:00	0	0	0	0	0	0	0	0	0	0	0	0		0
4:00	0	0	0	0	0	0	0	0	0	0	0	0		0
5:00	0	3	2	0	0	0	0	0	0	0	0	0	30.8	30.4
6:00	0	0	0	0	0	0	0	0	0	0	0	0	20.1	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0	18.9	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0		0
9:00	0	0	1	0	0	0	0	0	0	0	0	0	31.5	0
10:00	0	1	1	0	0	0	0	0	0	0	0	0	31.1	0
11:00	0	2	2	0	0	0	0	0	0	0	0	0	31.9	39.2
12:00	0	1	3	1	0	0	0	0	0	0	0	0	33.3	38.7
13:00	3	15	9	1	0	0	0	0	0	0	0	0	30.8	36.3
14:00	1	7	8	1	0	0	0	0	0	0	0	0	30.3	37.4
15:00	0	3	3	0	0	0	0	0	0	0	0	0	30.6	35.4
16:00	0	2	4	1	0	0	0	0	0	0	0	0	33.1	38.4
17:00	0	1	2	0	0	0	0	0	0	0	0	0	32.5	40.4
18:00	0	1	1	0	0	0	0	0	0	0	0	0	33.8	0
19:00	0	2	4	1	0	0	0	0	0	0	0	0	32.9	39.9
20:00	0	2	4	1	0	0	0	0	0	0	0	0	33.3	37.8
21:00	0	3	6	0	0	0	0	0	0	0	0	0	32.2	38.1
22:00	0	1	3	1	0	0	0	0	0	0	0	0	33.5	0
23:00	0	1	1	0	0	0	0	0	0	0	0	0	32.7	0
Total	6	44	55	9	0	0	0	0	0	0	0	0	31.6	37.2

Job No	N5370 Marsden Park
Client	Multipro Consultants
Site	Ahmadiyya Crescent (Internal Driveway)
Location	Marsden Park
Site No	3
Start Date	23-Oct-19
Day	7 Day Ave
Direction	SB
Description	Speed Summary

Select Site: 3. Ahmadiyya Crescent (Internal Driveway)

Select Day: 7 Day Ave Select Direction: SB



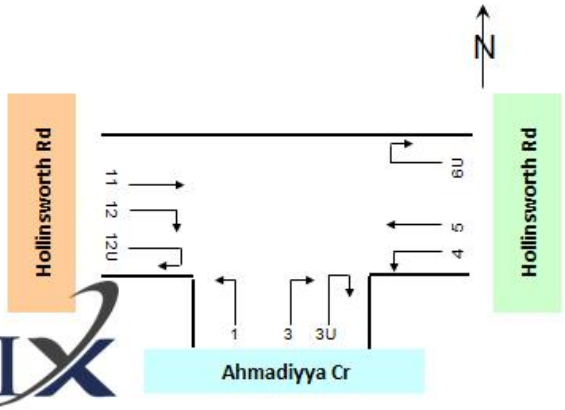
Bin Summary	
10-20	7.9%
20-30	68.3%
30-40	18.9%
40-50	3.0%
50-60	1.6%
60-70	0.1%
70-80	0.1%
80-90	0.0%
90-100	0.0%
100-110	0.0%
110-120	0.0%
120+	0.0%
26.9	32.2

Hour Starting	Vehicle Speed Bins (kph)												Speed	
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120+	Ave	85%ile
0:00	0	0	0	0	0	0	0	0	0	0	0	0		0
1:00	0	0	0	0	0	0	0	0	0	0	0	0		0
2:00	0	0	0	0	0	0	0	0	0	0	0	0		0
3:00	0	0	0	0	0	0	0	0	0	0	0	0		0
4:00	0	1	0	0	0	0	0	0	0	0	0	0	27.0	0
5:00	0	3	1	0	0	0	0	0	0	0	0	0	31.1	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0	27.2	0
7:00	0	1	0	0	0	0	0	0	0	0	0	0	21.5	0
8:00	0	1	0	0	0	0	0	0	0	0	0	0	26.0	0
9:00	1	4	1	0	0	0	0	0	0	0	0	0	25.9	30.0
10:00	1	7	2	0	0	0	0	0	0	0	0	0	23.9	30.8
11:00	0	6	2	0	0	0	0	0	0	0	0	0	26.7	32.1
12:00	2	17	3	1	0	0	0	0	0	0	0	0	27.1	31.6
13:00	1	10	3	1	0	0	0	0	0	0	0	0	26.0	31.1
14:00	0	3	1	0	0	0	0	0	0	0	0	0	27.2	43.1
15:00	0	2	1	0	0	0	0	0	0	0	0	0	27.6	37.1
16:00	1	4	1	0	0	0	0	0	0	0	0	0	26.9	29.9
17:00	0	2	0	0	0	0	0	0	0	0	0	0	24.1	0
18:00	1	3	1	0	0	0	0	0	0	0	0	0	26.2	30.9
19:00	1	9	4	0	1	0	0	0	0	0	0	0	28.8	33.1
20:00	0	6	2	0	0	0	0	0	0	0	0	0	27.4	30.0
21:00	0	2	1	0	0	0	0	0	0	0	0	0	28.2	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	32.1	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	25.5	0
Total	9	80	22	4	2	0	0	0	0	0	0	0	26.9	32.2

Intersection of Hollinsworth Road with Ahmadiyya Crescent, Marsden Park

Job No. : N5370
Client : Multipro Consunltants
Suburb : Marsden Park
Location : 2. Hollinsworth Rd / Ahmadiyya Cr

Day/Date : Wed, 23rd October 2019
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

	Approach	Ahmadiyya Cr			Hollinsworth Rd				Hollinsworth Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	
AM	7:45 to 8:45	45	1	**46**	243	44	**287**		239	47	**286**	**619**
PM	16:30 to 17:30	119	0	**119**	231	17	**248**		200	20	**220**	**587**

Approach	Ahmadiyya Cr			Hollinsworth Rd				Hollinsworth Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total		Lights	Heavies	Total	
7:00 to 8:00	38	0	**38**	197	54	**251**		151	32	**183**	**472**
7:15 to 8:15	43	0	**43**	209	51	**260**		184	33	**217**	**520**
7:30 to 8:30	44	0	**44**	226	44	**270**		220	43	**263**	**577**
7:45 to 8:45	45	1	**46**	243	44	**287**		239	47	**286**	**619**
8:00 to 9:00	42	1	**43**	252	46	**298**		227	50	**277**	**618**
AM Totals	**80**	**1**	**81**	**449**	**100**	**549**		**378**	**82**	**460**	**1,090**
16:00 to 17:00	81	0	**81**	201	20	**221**		204	25	**229**	**531**
16:15 to 17:15	100	0	**100**	219	20	**239**		206	24	**230**	**569**
16:30 to 17:30	119	0	**119**	231	17	**248**		200	20	**220**	**587**
16:45 to 17:45	118	0	**118**	235	14	**249**		175	24	**199**	**566**
17:00 to 18:00	111	0	**111**	242	17	**259**		165	22	**187**	**557**
PM Totals	**192**	**0**	**192**	**443**	**37**	**480**		**369**	**47**	**416**	**1,088**

Marsden Park IC - Traffic Flows

Search By Time and Classification

Day | Start Time | End Time | Classification

Volume Factoring

0 % = Original Survey Data

(e.g. input 20 for volume increase 20% or -20 for volume decrease 20%)

Turning Movements

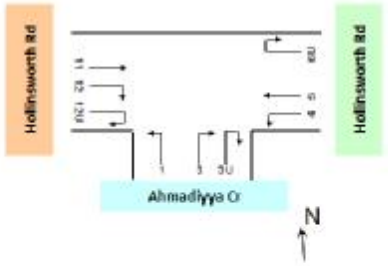
Flow-diagram

1 Site No

Job No.	: N5370
Client	: Multipro Consultants
Suburb	: Marsden Park
Location	: 2. Hollinsworth Rd / Ahmadiyya Cr
Day/Date	: Wed, 23rd October 2019
Weather	: Fine
Description	: Classified Intersection Count
	: 15 mins Data

Classifications	Class 1	Class 2
	Lights	Heavies

MATRIX Traffic and Transport Data



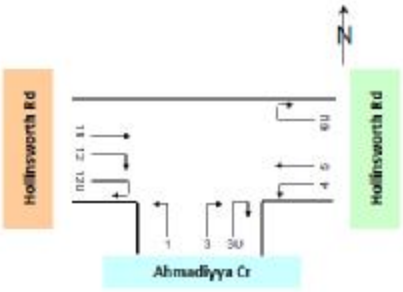
Approach	Ahmadiyya Cr									Hollinsworth Rd								
Direction	Direction 1 (Left Turn)				Direction 3 (Right Turn)			Direction 5U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6U (U Turn)		
Time Period	Lights	Heavies	Total		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 7:15	1	0	1		9	0	9	0	0	0	12	0	12	27	14	41	0	0	0
7:15 to 7:30	0	0	0		9	0	9	0	0	0	25	3	28	24	13	37	0	0	0
7:30 to 7:45	3	0	3		7	0	7	0	0	0	15	0	15	30	11	41	0	0	0
7:45 to 8:00	0	0	0		9	0	9	0	0	0	29	1	30	35	12	47	0	0	0
8:00 to 8:15	1	0	1		14	0	14	0	0	0	21	0	21	30	11	41	0	0	0
8:15 to 8:30	3	0	3		7	0	7	0	0	0	35	0	35	31	9	40	0	0	0
8:30 to 8:45	1	1	2		10	0	10	0	0	0	22	2	24	40	5	45	0	0	0
8:45 to 9:00	1	0	1		5	0	5	0	0	0	20	0	20	52	15	67	1	0	1
AM Totals	10	1	11		70	0	70	0	0	0	179	6	185	289	94	383	1	0	1
16:00 to 16:15	2	0	2		13	0	13	0	0	0	9	0	9	32	4	36	0	0	0
16:15 to 16:30	2	0	2		18	0	18	0	0	0	9	0	9	38	7	45	2	0	2
16:30 to 16:45	0	0	0		25	0	25	0	0	0	11	0	11	47	6	53	0	0	0
16:45 to 17:00	2	0	2		19	0	19	0	0	0	5	0	5	49	3	51	0	0	0
17:00 to 17:15	1	0	1		33	0	33	0	0	0	15	0	15	44	4	48	0	0	0
17:15 to 17:30	3	0	3		36	0	36	0	0	0	12	0	12	49	4	53	0	0	0
17:30 to 17:45	3	0	3		21	0	21	0	0	0	6	0	6	56	3	59	0	0	0
17:45 to 18:00	2	0	2		12	0	12	0	0	0	7	0	7	52	6	58	1	0	1
PM Totals	15	0	15		177	0	177	0	0	0	74	0	74	366	37	403	3	0	3

Approach		Hollinsworth Rd								
Direction		Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AM Totals		199	82	630	22	0	22	0	0	0
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PM Totals		357	47	404	11	0	11	1	0	1

Job No. : N5370
Client : Multipro Consultants
Suburb : Marsden Park
Location : 2. Hollinsworth Rd / Ahmadiyya Cr

Day/Date : Wed, 23rd October 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary

MATRIX Traffic and Transport Data



Approach	Ahmadiyya Cr									Hollinsworth Rd								
Direction	Direction 1 (Left Turn)				Direction 3 (Right Turn)			Direction 3U (U Turn)		Direction 4 (Left Turn)			Direction 5 (Through)				Direction 6U (U Turn)	
Time Period	Lights	Hearvies	Total		Lights	Hearvies	Total	Lights	Hearvies	Total	Lights	Hearvies	Total	Lights	Hearvies	Total	Lights	Hearvies	Total
7:00 to 8:00	4	0	4		34	0	34	0	0	0	81	4	85	116	50	166	0	0	0
7:15 to 8:15	4	0	4		39	0	39	0	0	0	90	4	94	119	47	166	0	0	0
7:30 to 8:30	7	0	7		37	0	37	0	0	0	100	1	101	126	43	169	0	0	0
7:45 to 8:45	5	1	6		40	0	40	0	0	0	107	3	110	136	41	177	0	0	0
8:00 to 9:00	6	1	7		36	0	36	0	0	0	98	2	100	153	44	197	1	0	1
AM Totals	10	1	11		70	0	70	0	0	0	179	6	185	269	94	363	1	0	1
16:00 to 17:00	6	0	6		75	0	75	0	0	0	94	0	94	165	20	185	2	0	2
16:15 to 17:15	5	0	5		95	0	95	0	0	0	40	0	40	177	20	197	2	0	2
16:30 to 17:30	6	0	6		113	0	113	0	0	0	43	0	43	188	17	205	0	0	0
16:45 to 17:45	5	0	5		109	0	109	0	0	0	38	0	38	197	14	211	0	0	0
17:00 to 18:00	3	0	3		102	0	102	0	0	0	40	0	40	201	17	218	1	0	1
PM Totals	15	0	15		177	0	177	0	0	0	74	0	74	386	37	483	3	0	3

Approach	Hollinsworth Rd								
Direction	Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Hearvies	Total	Lights	Hearvies	Total	Lights	Hearvies	Total
7:00 to 8:00	182	32	214	3	0	3	0	0	0
7:15 to 8:15	197	33	230	10	0	10	0	0	0
7:30 to 8:30	220	30	250	12	0	12	0	0	0
7:45 to 8:45	227	47	274	19	0	19	0	0	0
8:00 to 9:00	211	50	261	10	0	10	0	0	0
AM Totals	836	162	998	22	0	22	0	0	0
16:00 to 17:00	201	25	226	3	0	3	0	0	0
16:15 to 17:15	200	24	224	5	0	5	1	0	1
16:30 to 17:30	193	21	214	7	0	7	1	0	1
16:45 to 17:45	183	24	207	8	0	8	1	0	1
17:00 to 18:00	168	22	190	8	0	8	1	0	1
PM Totals	951	117	1068	31	0	31	3	0	3

Marsden Park IC - Traffic Flows

MATRIX

Search By Time and Classification

Day | Start Time | End Time | Classification

Volume Forecasting

0 %

Turning Movements

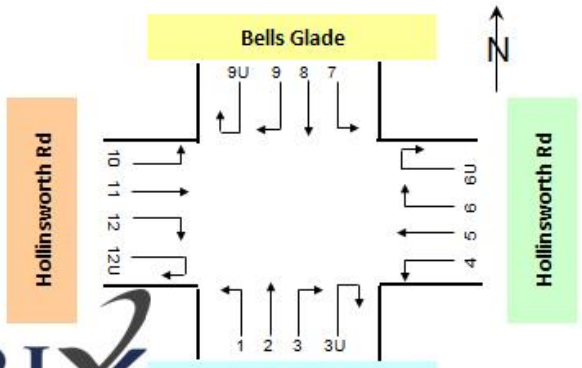
Flow diagram

1 Site No

Intersection of Hollinsworth Road with Chifley Glade / Bells Glade, Marsden Park

Job No. : N5370
Client : Multipro Consunltants
Suburb : Marsden Park
Location : 1. Hollinsworth Rd / Chiefly Glade

Day/Date : Wed, 23rd October 2019
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



MATRIX Traffic and Transport Data

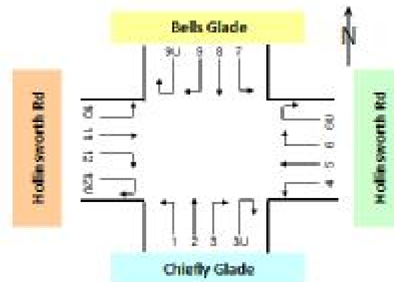
	Approach	Chiefly Glade			Hollinsworth Rd			Bells Glade			Hollinsworth Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
M	8:00 to 9:00	306	31	**337**	382	41	**423**	51	11	**62**	255	50	**305**	**1,127**
M	16:30 to 17:30	667	12	**679**	325	16	**341**	165	5	**170**	348	20	**368**	**1,558**

Approach	Chiefly Glade			Hollinsworth Rd			Bells Glade			Hollinsworth Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:00 to 8:00	224	32	**256**	240	46	**286**	14	9	**23**	176	32	**208**	**773**
7:15 to 8:15	236	28	**264**	276	45	**321**	17	4	**21**	208	31	**239**	**845**
7:30 to 8:30	244	31	**275**	314	36	**350**	21	7	**28**	242	43	**285**	**938**
7:45 to 8:45	278	33	**311**	357	38	**395**	34	10	**44**	267	46	**313**	**1,063**
8:00 to 9:00	306	31	**337**	382	41	**423**	51	11	**62**	255	50	**305**	**1,127**
AM Totals	**530**	**63**	**593**	**622**	**87**	**709**	**65**	**20**	**85**	**431**	**82**	**513**	**1,900**
16:00 to 17:00	587	17	**604**	364	19	**383**	174	6	**180**	314	24	**338**	**1,505**
16:15 to 17:15	632	14	**646**	351	16	**367**	178	4	**182**	336	24	**360**	**1,555**
16:30 to 17:30	667	12	**679**	325	16	**341**	165	5	**170**	348	20	**368**	**1,558**
16:45 to 17:45	677	7	**684**	326	15	**341**	164	3	**167**	319	25	**344**	**1,536**
17:00 to 18:00	690	7	**697**	326	19	**345**	150	4	**154**	297	23	**320**	**1,516**
PM Totals	**1,277**	**24**	**1,301**	**690**	**38**	**728**	**324**	**10**	**334**	**611**	**47**	**658**	**3,021**

Approach	Bells Glade												Hollinsworth Rd											
Direction	Direction 7 (Left turn)			Direction 8 (Through)			Direction 9 (Right turn)			Direction 10 (U turn)			Direction 11 (Left turn)			Direction 12 (Through)			Direction 13 (Right turn)			Direction 120 (U turn)		
Time Period	Lights	Elsewhere	Total	Lights	Elsewhere	Total	Lights	Elsewhere	Total	Lights	Elsewhere	Total	Lights	Elsewhere	Total	Lights	Elsewhere	Total	Lights	Elsewhere	Total	Lights	Elsewhere	Total
7:00 to 7:15	7	0	8	0	1	1	1	0	1	0	0	0	1	0	1	12	0	12	22	0	22	0	0	0
7:15 to 7:30	7	1	8	1	1	2	2	1	3	1	1	2	4	1	5	13	1	14	19	1	20	1	1	2
7:30 to 7:45	2	0	2	1	0	1	1	1	2	1	0	1	1	0	1	8	4	12	9	0	9	1	0	1
7:45 to 8:00	0	1	1	2	1	3	2	0	2	0	0	0	1	0	1	8	10	18	23	2	25	0	0	0
8:00 to 8:15	2	1	3	1	0	1	2	0	2	0	0	0	1	0	1	20	4	24	20	1	21	0	0	0
8:15 to 8:30	3	1	4	2	2	4	3	0	3	0	0	0	2	2	4	22	13	35	23	2	25	0	0	0
8:30 to 8:45	5	2	7	3	1	7	4	1	5	1	0	1	5	0	5	18	9	27	17	0	17	1	0	1
8:45 to 9:00	0	3	13	0	0	10	3	0	3	0	0	0	4	0	4	21	12	33	9	4	23	0	0	0
AM Totals	**26**	**13**	**39**	**21**	**5**	**26**	**17**	**2**	**19**	**1**	**0**	**1**	**18**	**2**	**20**	**127**	**63**	**190**	**286**	**17**	**303**	**0**	**0**	**0**
13:00 to 13:15	17	0	17	23	2	24	1	0	1	0	0	0	5	0	5	31	0	31	50	1	51	1	0	1
13:15 to 13:30	13	1	14	19	1	20	5	1	6	1	1	2	1	1	2	24	2	26	37	2	39	1	1	2
13:30 to 13:45	12	3	15	16	0	16	10	0	10	0	0	0	11	0	11	29	4	33	45	0	45	1	0	1
13:45 to 14:00	28	0	28	2	0	12	7	0	7	0	0	0	4	0	4	27	3	30	35	2	37	0	0	0
14:00 to 14:15	20	0	20	7	0	17	7	0	7	0	0	0	0	0	0	53	5	58	40	1	41	0	0	0
14:15 to 14:30	20	2	22	11	0	11	2	0	2	0	0	0	5	0	5	35	4	39	37	1	38	0	0	0
14:30 to 14:45	21	1	22	11	0	11	5	0	5	0	0	0	5	1	7	34	6	40	27	2	29	0	0	0
14:45 to 15:00	2	1	13	2	0	12	9	0	9	0	0	0	5	0	6	5	2	17	23	1	24	0	0	0
PM Totals	**152**	**8**	**160**	**122**	**2**	**124**	**50**	**0**	**50**	**0**	**0**	**0**	**51**	**1**	**52**	**259**	**36**	**295**	**298**	**10**	**308**	**3**	**0**	**3**

Job No. : N5370
Client : Multipro Consultants
Suburb : Marsden Park
Location : 1. Hollinsworth Rd / Chiefly Glade

Day/Date : Wed, 23rd October 2019
Weather : Fine
Description : Classified Intersection Count
: Hourly Summary



Approach	Chiefly Glade												Hollinsworth Rd											
Direction	Direction 1 (Left Turn)			Direction 2 (Through)			Direction 3 (Right Turn)			Direction 3U (U Turn)			Direction 4 (Left Turn)			Direction 5 (Through)			Direction 6 (Right Turn)			Direction 6U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 8:00	128	21	149	31	1	32	62	7	69	3	3	6	69	4	73	86	32	118	54	7	61	31	3	34
7:15 to 8:15	137	18	155	29	1	30	62	7	69	8	2	10	89	5	94	90	31	121	66	6	72	31	3	34
7:30 to 8:30	140	18	158	33	5	38	63	7	70	8	1	9	103	5	108	104	23	127	76	5	81	31	3	34
7:45 to 8:45	144	18	162	42	6	48	80	8	88	12	1	13	122	4	126	117	24	141	92	7	99	26	3	29
8:00 to 9:00	145	18	163	49	6	55	92	7	99	20	0	20	137	5	142	129	26	155	92	8	100	24	2	26
AM Totals	273	39	312	80	7	87	154	14	168	23	3	26	206	9	215	215	58	273	146	15	161	55	5	60
16:00 to 17:00	142	8	150	121	1	122	263	8	271	61	0	61	205	2	207	50	12	62	91	4	95	18	1	19
16:15 to 17:15	157	7	164	128	1	129	286	6	292	61	0	61	202	1	203	50	13	63	83	2	85	16	0	16
16:30 to 17:30	170	5	175	130	2	132	302	5	307	65	0	65	185	1	186	49	11	60	75	4	79	16	0	16
16:45 to 17:45	173	4	177	129	2	131	310	1	311	65	0	65	181	1	182	49	10	59	81	4	85	15	0	15
17:00 to 18:00	173	4	177	122	2	124	332	1	333	63	0	63	183	2	185	50	13	63	79	4	83	14	0	14
PM Totals	315	12	327	243	3	246	595	9	604	124	0	124	388	4	392	100	25	125	170	8	178	32	1	33

Approach	Bells Glade												Hollinsworth Rd											
Direction	Direction 7 (Left Turn)			Direction 8 (Through)			Direction 9 (Right Turn)			Direction 9U (U Turn)			Direction 10 (Left Turn)			Direction 11 (Through)			Direction 12 (Right Turn)			Direction 12U (U Turn)		
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total
7:00 to 8:00	6	[illegible]	12	2	[illegible]	4	[illegible]	1	6	1	0	1	[illegible]	0	0	[illegible]	[illegible]	71	131	[illegible]	138	0	0	0
7:15 to 8:15	7	2	9	[illegible]	1	4	[illegible]	1	7	1	0	1	[illegible]	0	[illegible]	34	[illegible]	70	140	7	155	0	0	0
7:30 to 8:30	8	3	11	5	3	8	7	1	8	1	0	1	5	2	7	[illegible]	3	94	174	[illegible]	184	0	0	0
7:45 to 8:45	11	5	18	11	4	15	11	1	12	1	0	1	9	2	11	[illegible]	[illegible]	109	[illegible]	[illegible]	193	0	0	0
8:00 to 9:00	21	[illegible]	[illegible]	[illegible]	[illegible]	22	[illegible]	1	[illegible]	1	1	[illegible]	[illegible]	2	14	[illegible]	[illegible]	113	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AM Totals	[illegible]	[illegible]	[illegible]	[illegible]	5	[illegible]	[illegible]	2	[illegible]	1	0	1	[illegible]	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0
16:00 to 17:00	75	4	[illegible]	[illegible]	2	[illegible]	27	0	27	0	0	0	25	0	25	[illegible]	[illegible]	105	170	5	175	[illegible]	0	[illegible]
16:15 to 17:15	82	4	86	65	[illegible]	66	30	0	30	0	0	0	25	0	25	141	[illegible]	160	[illegible]	5	173	2	0	2
16:30 to 17:30	83	5	88	[illegible]	[illegible]	58	28	0	28	0	0	0	[illegible]	0	29	[illegible]	[illegible]	168	[illegible]	[illegible]	172	1	0	1
16:45 to 17:45	[illegible]	[illegible]	[illegible]	[illegible]	1	51	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17:00 to 18:00	[illegible]	1	[illegible]	[illegible]	[illegible]	51	[illegible]	0	[illegible]	0	0	0	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0
PM Totals	152	0	[illegible]	122	2	124	50	0	50	0	0	0	51	1	52	[illegible]	[illegible]	[illegible]	[illegible]	10	[illegible]	[illegible]	0	[illegible]

Marsden Park IC - Traffic Flows

MATRIX
Traffic and Transport Data

Search by Time and Classification

Day | Start Time | End Time | Classification

Volume Forecasting

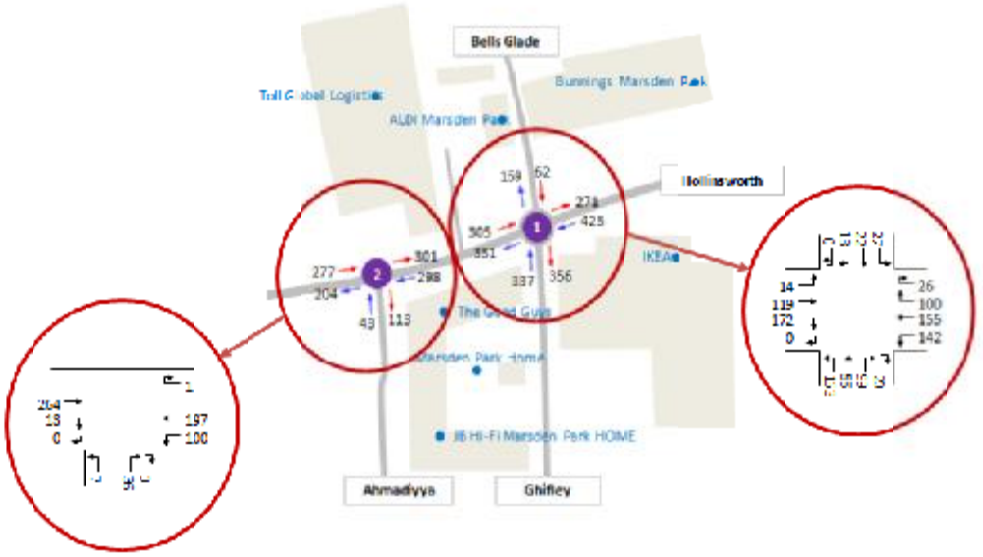
0 % * 0 = original survey data

(e.g. input 20 for volume increase 20% or -20 for volume decrease 20%)

Turning Movements

Flow diagram

1 Site No.



Marsden Park IC - Traffic Flows

MATRIX
Traffic and Transport Data

Search By Time and Classification

Day	Start Time	End Time	Classification
FX	15:00	17:00	All Vehicles

Volume Forecasting

0% (= original survey data)
(e.g. input 20 for volume increase 20% or -20 for volume decrease 20%)

Turning Movements

Flow-diagram

1 Site No.