TRAFFIC IMPACT ASSESSMENT

IN SUPPORT PLANNING PROPOSAL

PROPOSAL TO AMEND THE ORANGE LOCAL ENVIRONMENTAL PLAN 2011
IN RESPECT OF LAND AT LEEDS PARADE, CLERGATE

PREPARED FOR:

ROSEDALE GARDENS ESTATE PTY LTD

AUGUST 2019

GEOLYSE

POSTAL ADDRESS PO BOX 1963 ORANGE NSW 2800
LOCATION 154 PEISLEY STREET ORANGE NSW 2800
TELEPHONE 02 6393 5000 **FACSIMILE** 02 6393 5050
EMAIL ORANGE@GEOLYSE.COM **WEB SITE** WWW.GEOLYSE.COM

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The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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1.1 BACKGROUND AND PROPOSED DEVELOPMENT

Rosedale Gardens Estate Pty Ltd intends to develop a staged large lot residential subdivision on land consisting of the former Orange abattoir at the northern end of Leeds Parade, Orange.

In order to facilitate the subdivision an amendment to the Orange Local Environmental Plan 2011 is required to rezone the subject land from RU1 – Primary Production and IN1 – General Industrial to R5 – Large Lot Residential and E4 – Environmental Living.

The subject land is described in **Section 1.2** and has an overall area of approximately 290 hectares.

The subject land would be developed with internal local roads and these would be accessed from Leeds Parade in the south. At this time no further connections to existing roads are proposed however it anticipated that development of adjacent land in the future would facilitate an alternate access to Ophir Road. This does not however form part of this assessment. Additionally, an access to Pearce Lane has been considered but discounted at this time due to the costs associated with upgrading Pearce Lane and the Pearce Lane/Clergate Road and Clergate Road/Northern Distributor Road intersections.

A master plan for the site has been developed generating approximately 450 lots with a minimum size of 4,000 square metres.

A staging plan is predicated on the development commencing at the Leeds Parade intersection (south) and the release of 10-20 lots per year, to account for demand requirements, without over saturation.

This assessment is conducted on the development at completion, that is, the impact of vehicles generated by all 450 lots on the operation of the local road system.

1.2 SUBJECT SITE

The subject site is formed of:

- Lot 15 DP6694, 390 Clergate Road, Orange
- Lot 3 DP255983, 440 Clergate Road, Orange
- Lot 2 DP255983, 440 Clergate Road, Orange
- Lot 14 DP6694, 440 Clergate Road, Orange
- Lot 25 DP6694, 440 Clergate Road, Orange

The site is located approximately 5 kilometres north of Orange central business district (CBD) and 1.8 kilometres (3.5 kilometres by road) from the North Orange shopping centre. The site has an area of approximately 290 hectares and is bounded to the north by Pearce Lane, to the west by the Main Western Railway Line and to the south and east by private late. The southern portion of the site (Lot 15) is currently zoned IN1 – General Industrial with the remainder of the currently zoned RU1 – Primary Production.

The site is depicted in **Figure 1**.

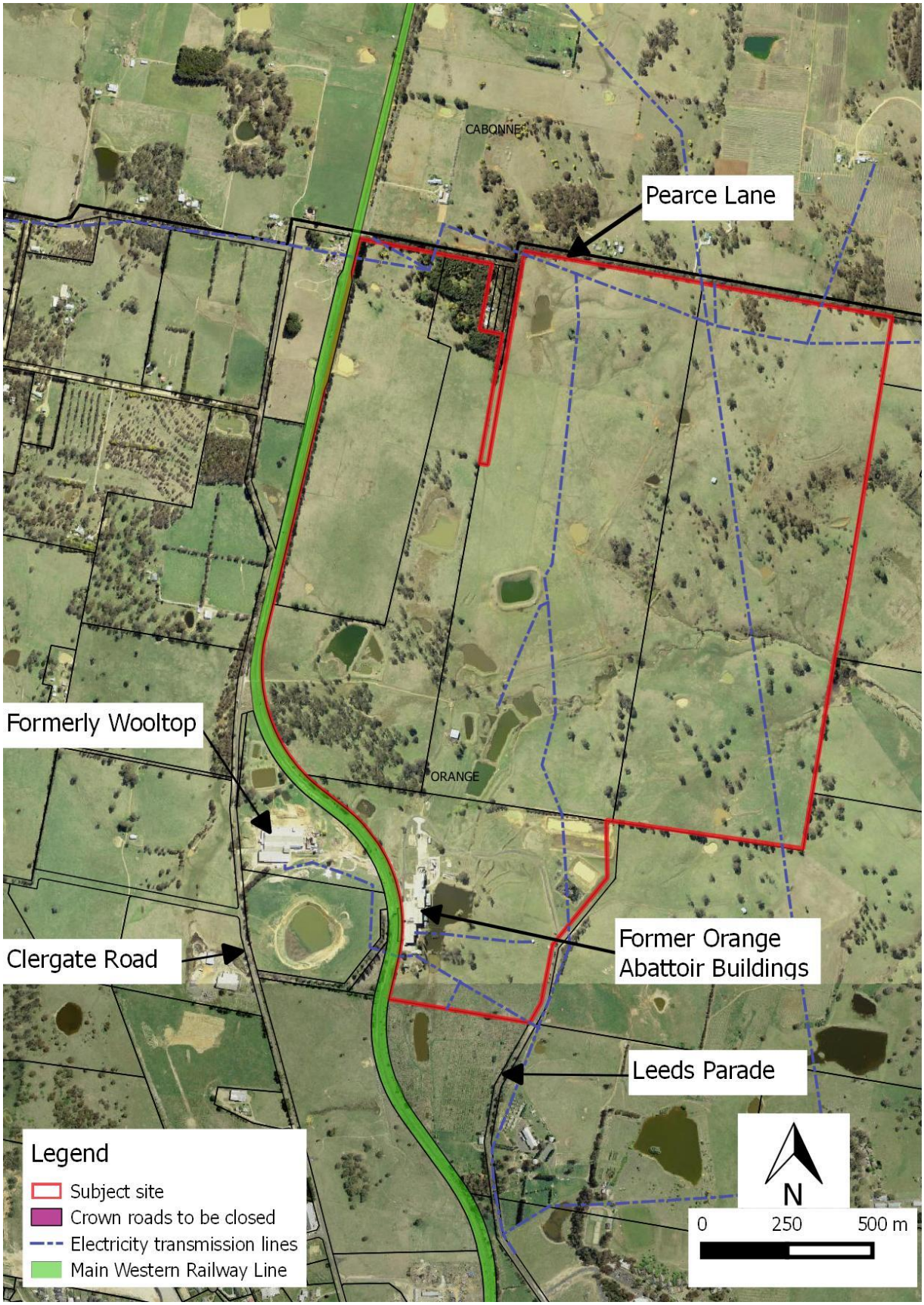

Figure 1: The subject site (Source: Six Maps)

1.3 METHODOLOGY

By reference to clause 104 of the *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP), the resulting proposed subdivision would be classified as a Schedule 1 traffic generating development in the basis that it proposes 300 or more lots. The matter is therefore referrable to the Roads and Maritime Services and a Traffic Impact Assessment (TIA) has been prepared to assist the development assessment process.

The proposal to rezone the land would result in the potential for the development of a large lot residential subdivision. This eventual subdivision would generate an increase in the volume of traffic movements onto the surrounding road network. The provision of safe and efficient means of access to the development will be necessary to ensure the satisfactory operation of the development.

This Traffic Impact Assessment (TIA) investigates the impact of the development on the surrounding road network. The TIA will determine if additional traffic management facilities are required to safely and efficiently control the movement of all vehicular traffic to and from the site.

This TIA will address the following specific issues:

- The potential levels of traffic generation as a result of the proposed rezoning;
- The capacity of the affected roads to accommodate additional traffic;
- Impact on safety and amenity of the surrounding road network; and
- Operation of specific affected intersections.

The methodology for preparing the TIA is outlined below:

i. Review of existing traffic volume data held by Council and available from external sources for roads surrounding the development site.

ii. Determination of the traffic generating potential of the rural residential subdivision development and calculation of the peak hour and peak daily traffic volumes to be added to the existing traffic volumes on the roads surrounding the development site.

iii. Determination/collation of traffic generation data for surrounding traffic generating developments (notably, the Bunnings hardware store and highway service centre both currently under development on Leeds Parade);

iv. Assessment of the impact of the additional traffic generated by the subdivision development on the surrounding road network through the use of SIDRA modelling, including the impacts associated with traffic generated by development in the surrounding area. The impact assessment will be carried out in terms of:

- Road capacity; and
- Level of Service.

In summary, this Traffic Impact Assessment will assess:

- the existing traffic movements on the existing road network, including Northern Distributor Road (both east and west of Leeds Parade) and Leeds Parade (both north and south of Northern Distributor Road);
- the expected traffic volumes generated by the proposed subdivision;
- the effect of the generated traffic on the surrounding roads; and
- review of the operation and design of existing intersections to determine whether anticipated volumes can be accommodated.

Existing Traffic Conditions

2.1 INTRODUCTION

Primary access to the site is from Leeds Parade in the south, with Leeds Parade transitioning into the sealed driveway that formerly provided heavy vehicle access to the abattoir buildings.

Historically abattoir staff are understood to have accessed the abattoir via a single lane bridge over the Main Western Railway Line, which staff used to walk over after parking on the land on the western side of the rail line. The bridge is accessed from private land owned by the applicant but not forming part of this application.

The site also currently benefits from a single lane rail crossing from Clergate Road and a number of gateway accesses to Pearce Lane in the north.

Figure 2 shows the south-western corner of the site and the three current (known) accesses into the property in this area.

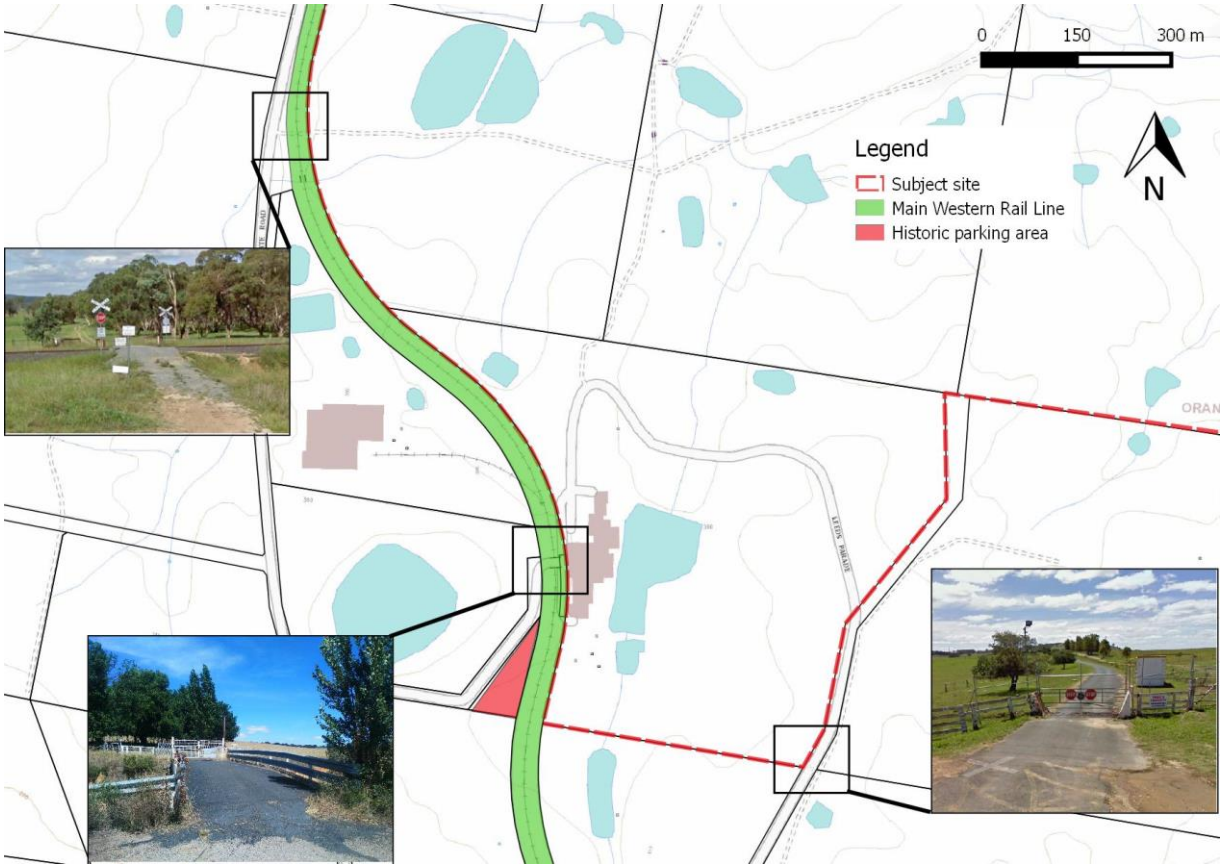

Figure 2: Existing site accesses in the southern extent

The connectivity provided by the alignment of Leeds Parade to Northern Distributor Road affords excellent links to the Orange CBD via Leeds Parade South, Bathurst and Sydney via Northern Distributor Road east and the North Orange Shopping Centre and onwards to Wellington, Dubbo, Parkes, Forbes and Cowra (and south to Melbourne) via Northern Distributor Road west.

As outlined in **Section 1.1** the design intention is to utilise Leeds Parade for all traffic into and out of the subdivision. Access to the site will be via an extension of Leeds Parade with a suitable gateway treatment to indicate the entry to the proposed subdivision. To assess the impact of the proposed subdivision on the surrounding road network the following roads and intersections will be studied:

- Leeds Parade – north of Northern Distributor Road;
- Leeds Parade – south of Northern Distributor Road;
- Northern Distributor Road – east of Leeds Parade.
- Northern Distributor Road – west of Leeds Parade.
- The Northern Distributor Road/Leeds Parade Intersection
- The University Access Intersection

2.2 ROAD NETWORK HIERARCHY

The Roads and Traffic Authority (2008) proposes four basic road classes as the basis for the functional hierarchy of a road network.

Functional classifications take into account the relative balance of the traffic mobility function and amenity/access functions of streets and roads and defines the purpose of a road within the context of an urban area.

The four road classes are motorways, arterial, sub-arterial and local roads and are defined below.

Motorways

This is the highest form of arterial road and is considered separately due primarily to traffic function and strict access control via grade separate interchanges. These roads provide for major inter-regional traffic movements in a safe and operationally efficient manner.

Arterial Roads

Roads whose main function is to carry through traffic from one region to another forming the principal means of communication for major traffic movements. Access to land should be limited.

Sub-Arterial Roads

Those roads which supplement the arterial roads in providing for through traffic movement to an individually determined limit that is sensitive to both roadway characteristics and adjoining land uses.

Local Roads

Roads that distribute traffic between the arterial roads and the local street system and provide access to adjoining property.

Based on the existing road network the functional classification of Leeds Parade and Northern Distributor Road (in the vicinity of the subject site) are:

Leeds Parade - south of NDR and from NDR to the University access:	Sub-Arterial Road.
Leeds Parade - north of the University access: Sub-Arterial Road:	Local Road.
Northern Distributor Road:	Sub-Arterial Road.

2.3 EXISTING ROADWAY CONDITIONS

2.3.1 LEEDS PARADE

Leeds Parade is a two way two lane bitumen sealed road with no kerb and guttering.

From the subject site to the University entrance Leeds Parade is approximately 6-6.5m wide with no line markings. The post speed limit is 50 km/hr

From the University Entrance to Northern Distributor Road, Leeds Parade is approximately 6.5–7.5m wide with line marked lanes approximately 3.2 m wide. The posted speed limit is 80 km/hr from Northern Distributor Road to approximately 200m south of the University Entrance where the posted speed limit drops down to 50 km/hr.

South of Northern Distributor Road, Leeds Parade is a two lane, two way road with line marking and a speed limit of 80km/hr for a distance of approximately 650 metres south of the Northern Distributor Road intersection, at which point the speed limit reduces to 50km/hr as it approaches residential and industrial areas of Orange.

There is a bicycle/pedestrian pathway running along the western side of Leeds Parade starting at the University entrance and running south to link into a path on Northern Distributor Road and then continuing south to link into the residential areas of Orange.

2.3.2 NORTHERN DISTRIBUTOR ROAD.

Northern Distributor Road is a two way, two lane bitumen sealed road. Northern Distributor Road has full line marking with average lane widths of 3.7m and sealed shoulders of variable widths

East of Leeds Parade the posted speed limit on Northern Distributor Road is 80 km/hr whilst the remainder has a posted speed limit of 70 km/hr.

There is a bicycle/pedestrian pathway on the southern side of Northern Distributor Road (west of Leeds Parade) that links up to the bicycle/pedestrian pathway in Leeds Parade and into the general urban bicycle/pedestrian pathway network to the west.

Northern Distributor Road acts as a distributor for traffic looking to access the areas of West Orange and North Orange, including the North Orange shopping centre, and the areas of East Orange, including homemaker centre, and onwards to Bathurst and Sydney.

2.4 EXISTING ROAD CAPACITY

Roads have varying capacities dependent on the function they are performing. The United States Highway Capacity Manual defines capacity as follows:

> *…the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under the prevailing roadway, traffic and control conditions.*

The physical characteristics of a roadway such as lane width, alignment, frequency of intersections etc. make up the prevailing roadway conditions.

Based upon its capacity and a driver's expectations of the operational characteristics of a traffic stream is a qualitative measure denoted as the level of service of a road.

Level of service definitions combine such factors as speed, travel time, safety, convenience and traffic interruptions and fall into six levels of service categories ranging from A down to F.

The *AUSTROADS Guide to Traffic Management, Part 3 – Traffic Studies and Analysis* describes Level of Service A as:

> *A condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.*

The categories are graduated from Level of Service A down through six levels to Level of Service F, being a zone of forced flow. The amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdowns occur and queuing and delays result.

The *AUSTROADS Guide to Traffic Management, Part 3 – Traffic Studies and Analysis* sets out typical mid-block capacities for various types of urban road with interrupted flow. Based on the physical configuration of Leeds Parade and Northern Distributor Road together with the rates given in the Guide the capacity of the surrounding roads can be determined as:

- Leeds Parade – Capacity of 900 vehicles per hour per lane;
- Northern Distributor Road - Capacity of 1,200 vehicles per hour per lane.

2.5 EXISTING TRAFFIC

Site specific traffic data was not collected on individual roads surrounding the subdivision site for the preparation of this TIA. However, Geolyse has been able to access traffic data from the Traffic Impact Assessment prepared by Transport and Traffic Planning Associates (T&TPA) for the approved Orange Bunnings development, located on the corner of Leeds Parade and Northern Distributor Road. This report provides traffic data for both existing and post development conditions following the development of the proposed Bunnings development. A copy of this report is included in **Appendix A.**

Based on the report by T&TPA, heavy vehicles account for approximately 5% of traffic on Leeds Parade and Northern Distributor Road. These figures are used for modelling purposes across all traffic movements with the exception of Hanrahan Place (Hanrahan Place is a newly constructed fifth leg off the Northern Distributor Road/Leeds Parade roundabout that provides access to the Finemore Depot and for the purposes of the existing traffic scenario it has been assumed that 100% of vehicles on this leg are heavy).

2.5.1 ANNUAL AVERAGE DAILY TRAFFIC

Annual Average Daily Traffic (AADT) is defined as the total volume of traffic passing a roadside observation point over a period of a year divided by the number of days in a year.

AADT data on Leeds Parade north is not available, however it has been predicted based on the peak hour figures provided within the T&TPA report. Assuming the peak hour traffic (PHT) volume represents 10% of the annual average daily traffic (AADT) (based on the ratio of PHT to AADT for surrounding roads), the peak hour traffic can be calculated as:

Annual Average Daily Traffic = 111/10%

= 1,110 vehicles/day

Existing AADT for Northern Distributor Road and Leeds Parade south was obtained from the T&TPA report and **Table 2.1** contains a summary of the AADT on the roads surrounding the subject site.

Table 2.1 – Existing Annual Average Daily Traffic (AADT)

Road Location	AADT (vehicles/day)
Northern Distributor Road	8,400
Leeds Parade (south of Northern Distributor Road)	3,500
Leeds Parade (north of Northern Distributor Road)	1,110

Source: T&TPA Report – Refer Appendix A

2.5.2 PEAK HOUR TRAFFIC

The T&TPA report contains existing peak hour traffic for both the weekday PM and the weekend midday peaks based on traffic counts undertaken at the roundabout at the intersection of Leeds Parade and Northern Distributor Road. The weekday PM peak occurred at 16:15 to 17:15 and was greater than the weekend midday peak and hence will be adopted as the critical time period for peak hour traffic assessment for the roundabout and surrounding roads.

A summary of the peak hour traffic on the roads surrounding the subject site is contained in **Table 2.2.**

Table 2.2 – Existing Peak Hour Traffic

Road Location	Lane	Weekday PM Peak Hour Traffic (vehicles/hour)
Northern Distributor Road (east of Leeds Parade)	Eastbound	241
	Westbound	321
TOTAL		**562**
Northern Distributor Road (west of Leeds Parade)	Eastbound	362
	Westbound	580
TOTAL		**942**
Leeds Parade (north of Northern Distributor Road)	Northbound	28
	Southbound	83
TOTAL		**111**
Leeds Parade (south of Northern Distributor Road)	Northbound	322
	Southbound	242
TOTAL		**564**

Source: T&TPA Report – Refer Appendix A

2.6 EXISTING INTERSECTION CONDITIONS

2.6.1 INTRODUCTION

Intersections are critical points which often control the capacity of the road network. This is due to the need for conflicting traffic movements to share the same road space at these locations. The operation of the intersections in the vicinity of the site have been analysed using SIDRA Intersection. SIDRA Intersection is a computerised traffic evaluation tool which is used in the assessment and design of intersection treatments in terms of capacity and operation. The program provides outputs which include delays, queue lengths, total capacities, travel times, and average speeds. SIDRA Intersection is the preferred intersection analysis tool of Roads and Maritime and many Local Government Authorities.

As part of the intersection analysis, the SIDRA Intersection model provides an "Average Control Delay" for each approach of the intersection. This control delay is the average delay per vehicle over the peak hour as a result of the intersection and is grouped into six bands labelled A through to F (with 'A' being best and 'F' being over capacity), termed Level of Service (LOS). The overall LOS for a 'Give Way' intersection is the LOS result for the worst case turning movement.

2.6.2 LEEDS PARADE AND NORTHERN DISTRIBUTOR ROAD

The intersection of Leeds Parade and Northern Distributor Road features a two lane roundabout for all directions with a 36 metre diameter island.

An assessment of the Leeds Parade/Northern Distributor Road intersection under existing weekday PM peak hour conditions was undertaken using SIDRA.

The following assumptions were included in the SIDRA analysis:

- Intersection traffic and turning movements: refer **Figure 3**
- Heavy Vehicle percentage refer **Figure 3**
- Control type: Give Way – all legs
- Lane widths assumed: 3.7m – all lanes
- Approach lengths on Northern Distributor Road
  - 500m westbound through (120m inside lane)
  - 500m eastbound through (60m inside lane + 20m left turn slip lane)
- Approach lengths on Leeds Parade
  - 500m southbound through (100m inside lane)
  - 500m northbound through (60m inside lane)
- Approach lengths on Hanrahan Place – 190m
- Approach and exit cruise speeds:
  - Northern Distributor Road east 70 kph
  - Northern Distributor Road west 80 kph
  - Leeds Parade (north and south) 80 kph
  - Hanrahan Place 50 kph

Based on the above assumptions, a SIDRA Intersection analysis was carried out for the intersection for the existing weekday PM peak. The movement summary output from the SIDRA assessment is shown in **Figure 4**. Full results of the SIDRA analysis are provided in **Appendix B**.

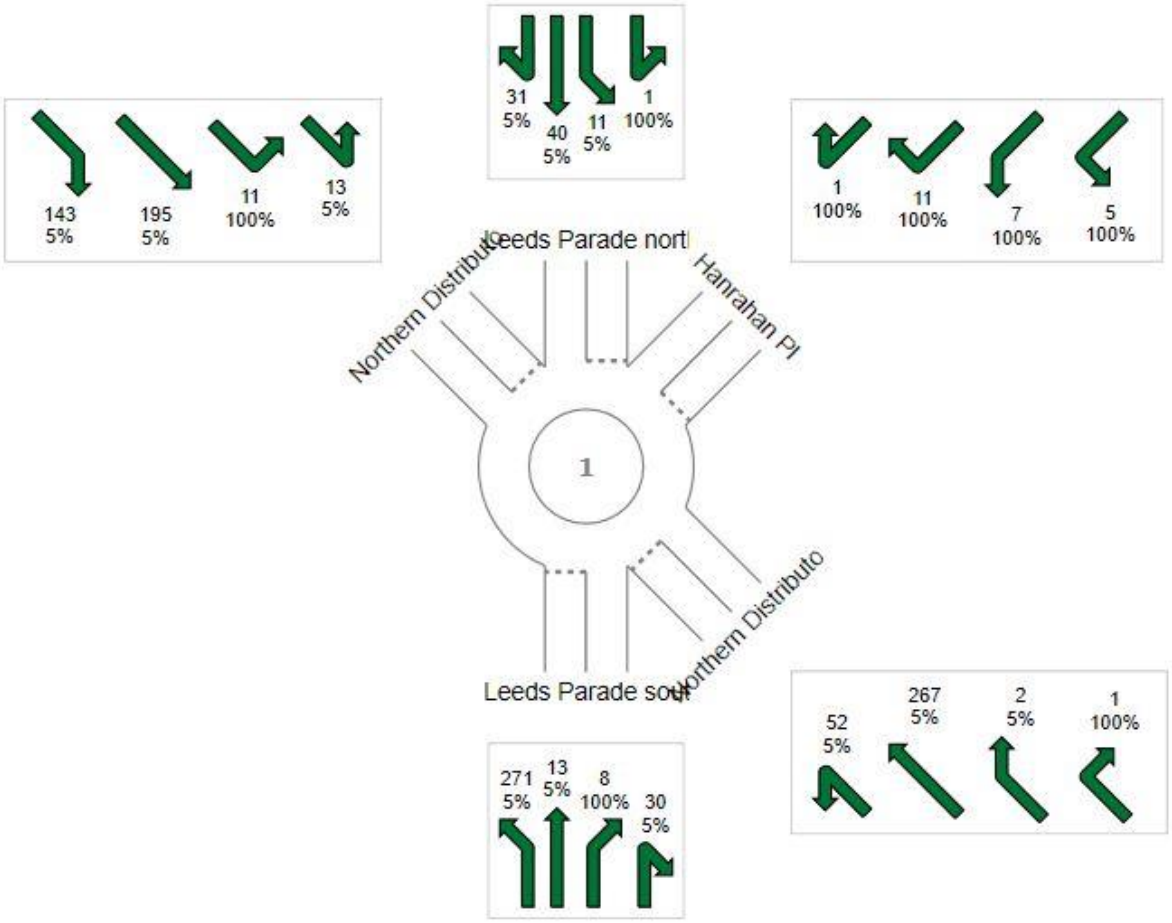

Figure 3: NDR/Leeds Prd Int – Existing weekday PM Peak hour traffic volumes

MOVEMENT SUMMARY

Site: WD PM (NDR/Leeds) - existing

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leeds Parade south											
1a	L1	271	5.0	0.217	9.8	LOS A	1.0	7.4	0.41	1.19	58.8
2	T1	13	5.0	0.072	22.3	LOS B	0.3	2.3	0.45	1.50	51.2
3a	R1	8	100.0	0.072	22.3	LOS B	0.3	2.3	0.45	1.50	51.2
3b	R3	30	5.0	0.072	22.3	LOS B	0.3	2.3	0.45	1.50	51.2
Approach		322	7.4	0.217	11.8	LOS A	1.0	7.4	0.42	0.62	57.2
SouthEast: Northern Distributor east											
21b	L3	52	5.0	0.032	15.1	LOS B	0.1	1.0	0.26	1.28	58.6
22	T1	267	5.0	0.093	9.7	LOS A	0.4	3.0	0.32	1.10	59.5
23a	R1	2	5.0	0.093	10.0	LOS A	0.4	2.9	0.33	1.12	59.2
23	R2	1	100.0	0.093	10.0	LOS A	0.4	2.9	0.33	1.12	59.2
Approach		322	5.3	0.093	10.5	LOS A	0.4	3.0	0.31	0.56	59.3
NorthEast: Hanrahan Pl											
24	L2	5	100.0	0.042	37.8	LOS C	0.2	2.0	0.50	1.48	49.2
24a	L1	7	100.0	0.042	37.8	LOS C	0.2	2.0	0.50	1.48	49.2
26	R2	11	100.0	0.042	37.8	LOS C	0.2	2.0	0.50	1.48	49.2
26b	R3	1	100.0	0.042	37.8	LOS C	0.2	2.0	0.50	1.48	49.2
Approach		24	100.0	0.042	37.8	LOS C	0.2	2.0	0.50	0.74	49.2
North: Leeds Parade north											
7b	L3	1	100.0	0.037	12.8	LOS A	0.1	1.1	0.39	1.23	59.7
7a	L1	11	5.0	0.037	12.8	LOS A	0.1	1.1	0.39	1.23	59.7
8	T1	40	5.0	0.037	14.0	LOS A	0.1	1.1	0.40	1.27	58.1
9b	R3	31	5.0	0.037	19.0	LOS B	0.1	1.1	0.41	1.46	52.2
Approach		83	6.1	0.037	15.7	LOS B	0.1	1.1	0.40	0.67	56.0
NorthWest: Northern Distributor west											
27b	L3	13	5.0	0.128	11.0	LOS A	0.6	4.9	0.18	1.07	57.6
27	L2	11	100.0	0.128	11.0	LOS A	0.6	4.9	0.18	1.07	57.6
28	T1	195	5.0	0.128	12.1	LOS A	0.6	4.9	0.18	1.12	56.8
29a	R1	143	5.0	0.128	17.5	LOS B	0.6	4.7	0.19	1.37	53.4
Approach		362	7.9	0.128	14.1	LOS A	0.6	4.9	0.19	0.61	55.4
All Vehicles		1113	8.8	0.217	14.8	LOS B	1.0	7.4	0.31	0.60	56.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Figure 4: NDR/Leeds Prd Int – Existing weekday PM Peak hour traffic movements

From the table in **Figure 4**, it can be seen that the current worst movement is for those vehicles exiting Hanrahan Place, with a LOS C and an average delay of 37.8 seconds. All other movements operate at a LOS A or B.

2.6.3 UNIVERSITY ENTRANCE

The intersection at the entrance to the University consists of a channelised right turn treatment with raised concrete medians.

An assessment of the Leeds Parade/University Entrance intersection under existing weekday PM peak hour conditions was undertaken using SIDRA. The following assumptions were included in the SIDRA analysis:

- Intersection traffic and turning movements: refer **Figures 5** (It was assumed only 1 vehicle per hour travelled past the University with all other traffic entering and leaving the University)
- Heavy Vehicle percentage refer **Figure 5**
- Control type: Give Way – University to Leeds Parade
- Lane widths assumed: 3m – all lanes
- Approach lengths on Leeds Parade
  - 500m northbound through (50m right turn lane)
- Approach length on University Entrance – 140m
- Approach and exit cruise speeds:
  - 50kph all roads

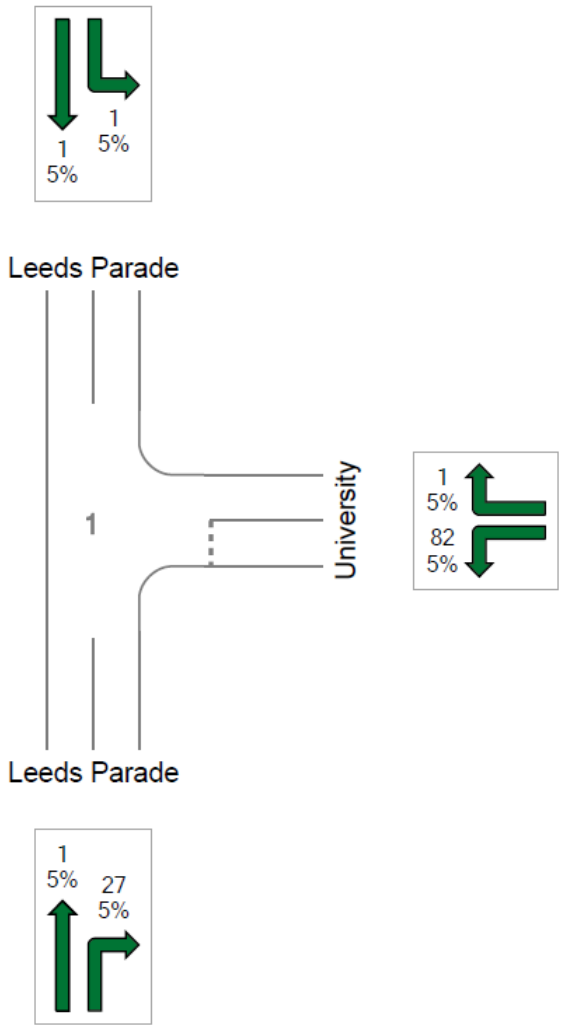

Figure 5: University Ent Int – Existing weekday PM Peak hour traffic volumes

Based on the above assumptions, a SIDRA Intersection analysis was carried out for the intersection for the existing weekday PM peak. The movement summary output from the SIDRA assessment is shown in **Figure 6**. Full results of the SIDRA analysis are provided in **Appendix B**.

MOVEMENT SUMMARY

Site: Uni existing PM

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leeds Parade											
2	T1	1	5.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
3	R2	27	5.0	0.015	8.0	LOS A	0.1	0.5	0.02	0.67	42.8
Approach		28	5.0	0.015	7.7	NA	0.1	0.5	0.02	0.65	43.0
East: University											
4	L2	82	5.0	0.052	7.5	LOS A	0.2	1.6	0.01	0.63	43.1
6	R2	1	5.0	0.052	7.5	LOS A	0.2	1.6	0.01	0.63	43.1
Approach		83	5.0	0.052	7.5	LOS A	0.2	1.6	0.01	0.63	43.1
North: Leeds Parade											
7	L2	1	5.0	0.001	3.7	LOS A	0.0	0.0	0.00	0.40	46.3
8	T1	1	5.0	0.001	3.7	LOS A	0.0	0.0	0.00	0.40	46.3
Approach		2	5.0	0.001	3.7	NA	0.0	0.0	0.00	0.40	46.3
All Vehicles		113	5.0	0.052	7.5	NA	0.2	1.6	0.01	0.63	43.1

Level of Service (LOS) Method: Delay (RTA NSW).
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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SIDRA INTERSECTION 6

Figure 6: University Ent Int - Existing weekday PM Peak hour traffic movements

From the table in **Figure 6**, it can be seen that all movements operate at a LOS A, with the worst average delay of 8.0 seconds for the right turn movement off Leeds Parade into the University.

In assessing the performance of the University entrance intersection it is likely that the weekday AM peak hour will be the critical time period with more vehicles attempting the right turn into the University. The T&TPA report did not contain traffic data for the weekday AM peak. In the absence of AM peak data, the PM figures have been reversed to provide representative statistics as shown in **Figure 7**.

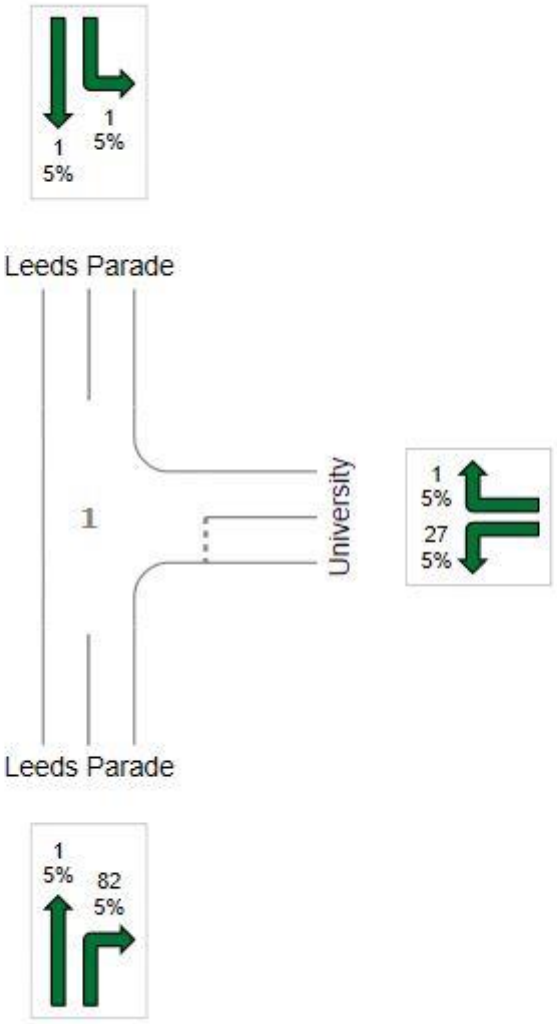

Figure 7: University Ent Int – Existing weekday AM Peak hour traffic volumes

Based on the above assumptions, a SIDRA Intersection analysis was carried out for the intersection for the existing weekday AM peak. The movement summary output from the SIDRA assessment is shown in **Figure 8**. Full results of the SIDRA analysis are provided in **Appendix B**.

MOVEMENT SUMMARY

Site: Uni existing AM

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leeds Parade											
2	T1	1	5.0	0.001	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
3	R2	82	5.0	0.047	8.0	LOS A	0.2	1.6	0.02	0.67	42.7
Approach		83	5.0	0.047	7.9	NA	0.2	1.6	0.02	0.66	42.8
East: University											
4	L2	27	5.0	0.018	7.5	LOS A	0.1	0.5	0.01	0.63	43.1
6	R2	1	5.0	0.018	7.5	LOS A	0.1	0.5	0.01	0.63	43.1
Approach		28	5.0	0.018	7.5	LOS A	0.1	0.5	0.01	0.63	43.1
North: Leeds Parade											
7	L2	1	5.0	0.001	3.7	LOS A	0.0	0.0	0.00	0.40	46.3
8	T1	1	5.0	0.001	3.7	LOS A	0.0	0.0	0.00	0.40	46.3
Approach		2	5.0	0.001	3.7	NA	0.0	0.0	0.00	0.40	46.3
All Vehicles		113	5.0	0.047	7.7	NA	0.2	1.6	0.02	0.65	43.0

Level of Service (LOS) Method: Delay (RTA NSW).
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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Figure 8: University Ent Int - Existing weekday AM Peak hour traffic movements

From the table in **Figure 8**, it can be seen that all movements operate at a LOS A, with the worst average delay of 8.0 seconds for the right turn movement off Leeds Parade into the University.

Whilst this is unchanged from the PM peak the overall average delay for all legs increased slightly from the PM peak confirming the AM peak is the critical time period.

Traffic Generation and Impacts

3.1 SURROUNDING DEVELOPMENT

Construction work is currently underway to provide widening to Leeds Parade immediately to the north of Northern Distributor Road to support the new Bunnings development on the western side of the road and a highway service centre on the eastern side of the road. Primary ingress and egress to the Bunnings development will be via Leeds Parade whilst egress only for the highway service centre will be via Leeds Parade (access via Hanrahan Place).

Traffic generated by these two developments will be included in the assessment of the future traffic generation and impacts on the surrounding road network.

3.2 TRAFFIC DISTRIBUTION ASSUMPTIONS

As noted elsewhere, the subject development is only one traffic generator in the locality that will affect the movement and distribution of traffic. Therefore, the assumptions determining how traffic would be distributed is set down in the following sections for each traffic generator.

3.2.1 PROPOSED SUBDIVISION

For the purposes of further assessment, the following assumptions have been made about traffic distribution from the proposed subdivision development:

For peak periods:

- Leeds Parade (north)
  - AM Peaks: 75% Southbound and 25% Northbound
  - PM Peaks: 75% Northbound and 25% Southbound

Traffic exiting and leaving the subdivision would be expected to distribute from the Leeds Parade/Northern Distributor Road intersection on the following basis:

- 60% of traffic travelling to/from the subdivision would originate from/travel to Leeds Parade south;
- 30% of the traffic would originate from/travel to Northern Distributor Road (west);
- 10% of traffic would originate from/travel to Northern Distributor Road (east); and

5% of traffic entering and leaving the university would originate from/travel to the new subdivision.

3.2.2 BUNNINGS

The distribution of traffic generated by the Bunnings development will be as detailed in the T&TPA report included in **Appendix A.**

3.2.3 HIGHWAY SERVICE CENTRE

For the purposes of further assessment, the following assumptions have been made about traffic distribution from the new service centre currently under construction:

For additional traffic generated:

- 25% of the traffic would originate from/travel to Northern Distributor Road (west);
- 25% of traffic would originate from/travel to Northern Distributor Road (east);

- 25% of traffic would originate from/travel to Leeds Parade (north); and
- 25% of traffic would originate from/travel to Leeds Parade (south)

For passing traffic (linked trips):

- 25% of the traffic would originate from Northern Distributor Road (west);
- 25% of traffic would originate from Northern Distributor Road (east);
- 25% of traffic would originate from Leeds Parade (north); and
- 25% of traffic would originate from Leeds Parade (south)

3.3 TRAFFIC GENERATION

3.3.1 PROPOSED SUBDIVISION

The Roads and Traffic Authority's *Guide to Traffic Generating Developments* publishes data on the traffic generating potential of various development ranging from residential subdivisions, commercial premises, retail premises and industrial developments.

The RTA first published the *Guide to Traffic Generating Developments* in 1991, before its revision in 2001. It is currently being further revised and as interim measure the Roads and Maritime has published updated traffic survey data for a range of development types. Of relevance to this TIA is data provided in relation to low density residential dwellings. The summary figures are provided for the Sydney area and regional areas. A total of five regional sites were surveyed, including one in the Calare area of Orange. The figures for regional areas are relevant to this TIA and are reproduced in **Table 3.1**.

Table 3.1 – Summary of land use traffic generation – low density residential

Rates	Regional Average (movements/dwelling)	Regional Range (movements/dwelling)
Daily vehicle trips per dwelling	6.34	5.16-7.12*
Peak- vehicle trips per dwelling	0.79	0.61-0.9

Source: RMS Guide to Traffic Generating Developments – updated traffic surveys August 2013

*** It is noted that the Orange (Calare) figures are the highest in the range at 7.12 but also that car occupancy for Orange was highest at 1.42 persons/vehicle (compared to average regional occupancy of 1.34) and also highest in the peak vehicle trips per dwelling at 0.9**

To be conservative, the Orange figures of 7.12/day and 0.9/peak hour have been used for the purposes of this TIA.

Based on the stated traffic generation rates and the assumed average yield, the traffic generated by the development of the proposed subdivision is:

Daily Vehicle Trips:

450 lots x 7.12 trips per lot per day = 3,204 vehicle trips per day

Peak Hour Trips:

450 lots x 0.9 trips per lot per hour = 405 vehicle trips per hour

3.3.2 BUNNINGS

Figures for the generation of traffic associated with the development of the Bunnings site on the corner of Leeds Parade and Northern Distributor Road will be as detailed in the T&TPA report included in **Appendix A.**

3.3.3 HIGHWAY SERVICE CENTRE

Traffic figures for the approved highway service centre have been determined by reference to the 2002 RTA *Guide to Traffic Generating Development*. The Guide identifies that peak hour traffic generation associated with a service station is determined by the formula:

0.04 A(S) + 0.3 A(F), where

A(S) = area of the site (m^2) and

A(F) = gross floor area of the convenience store

The area of the site is understood to be approximately 5,700m^2 and the area of the approved convenience store is 200m^2.

Therefore:

Peak Hour Trips (Service Station):

0.04*5700 + 0.3*200 = 288 vehicle trips per hour

The development also contains a drive in take away foot outlet. The Guide recommends adopting a figure of 100 vehicles for peak hour traffic generation for a KFC or equivalent. It is noted that MacDonalds has higher recommended rates however given the proximity of the North Orange MacDonalds, the likelihood that a MacDonalds would be developed here is low.

Therefore, the final traffic generation figure for the site becomes:

Peak Hour Trips (Service Centre Total):

288 + 100 = 388 vehicle trips per hour

The Guide notes the proportion of passing trade is typically 50%. Hence 194 vehicle trips per hour are new trips with the remaining 194 vehicle trips per hour coming from the existing traffic stream.

3.4 TRAFFIC IMPACTS

3.4.1 BASIS OF ASSESSMENT

The impact of the traffic generated by the development of the proposed subdivision on Leeds Parade and Northern Distributor Road will be assessed in terms of:

i. Traffic volume; and

ii. Intersection capacity.

The impact of the increased traffic on Leeds Parade and Northern Distributor Road will be assessed. The operational capacities of the roundabout at the intersection of Leeds Parade and Northern Distributor Road and the intersection on Leeds Parade at the University entrance will also be analysed and evaluated.

3.4.2 TRAFFIC VOLUME

The expected peak hour traffic volume generated from the subdivision will impact on the existing peak hour traffic volume on Leeds Parade and Northern Distributor Road. The increase in peak hour traffic volume on these two roads is summarised in **Table 3.2**.

Table 3.2 – Comparison of Existing & Post Development Weekday PM Peak Hour Traffic Volumes

Road Location	Lane	Weekday PM Peak Hour Traffic (vehicles/hour)		Increase
		Existing	Post Development	
Northern Distributor Road (east of Leeds Parade)	Eastbound	241	342	42%
	Westbound	321	459	43%
TOTAL		**562**	**801**	**43%**
Northern Distributor Road (west of Leeds Parade)	Eastbound	362	556	54%
	Westbound	580	768	32%
TOTAL		**942**	**1324**	**41%**
Leeds Parade (north of Northern Distributor Road)	Northbound	28	356	1,171%
	Southbound	83	208	151%
TOTAL		**111**	**564**	**408%**
Leeds Parade (south of Northern Distributor Road)	Northbound	322	652	102%
	Southbound	242	405	67%
TOTAL		**564**	**1057**	**87%**

As expected, the greatest percentage increase in the weekday PM peak hour traffic following the full development of the proposed subdivision occurs on the northbound lane of Leeds Parade (north) with an increase in traffic volume of approximately 1,171%.

Whilst the percentage increase in traffic volume on Leeds Parade (north) appears extremely excessive it should be noted that this increase is from a very low existing traffic volume and the final post development traffic volume includes the traffic generated from the proposed Service Centre. Furthermore reference to **Section 2.4** of this report indicated that Leeds Parade has an existing capacity of 900 vehicles per hour per lane that is significantly more than the predicted post development peak traffic of 356 vehicles per hour.

Table 3.3 lists the peak hour traffic volume of the surrounding roads when compared against the existing capacity of the road.

Table 3.3 – Comparison of Post Development Weekday PM Peak Hour Traffic Volumes to Capacity

Road Location	Lane	Weekday PM Peak Hour Traffic (vehicles/hour)		Percentage of Capacity
		Post Development	Capacity	
Northern Distributor Road (east of Leeds Parade)	Eastbound	342	1,200	29%
	Westbound	459	1,200	38%
Northern Distributor Road (west of Leeds Parade)	Eastbound	556	1,200	46%
	Westbound	768	1,200	64%
Leeds Parade (north of Northern Distributor Road)	Northbound	356	900	40%
	Southbound	208	900	23%
Leeds Parade (south of Northern Distributor Road)	Northbound	652	900	72%
	Southbound	405	900	45%

It can be seen from **Table 3.3** that all roads are well below their capacity with the northbound lane of Leeds Parade (south) closest to capacity at 72%. Hence all roads are able to accommodate the increased additional peak hour traffic generated by the proposed development.

3.4.3 INTERSECTION ANALYSIS

3.4.3.1 Leeds Parade and Northern Distributor Road

Based on the assumptions outlined in **Section 2.6.2**, a SIDRA analysis was carried out for the Leeds Parade and Northern Distributor Road intersection under post development conditions during the weekday PM peak hour. The post development traffic and turning movements used in the SIDRA analysis is shown in **Figure 9**.

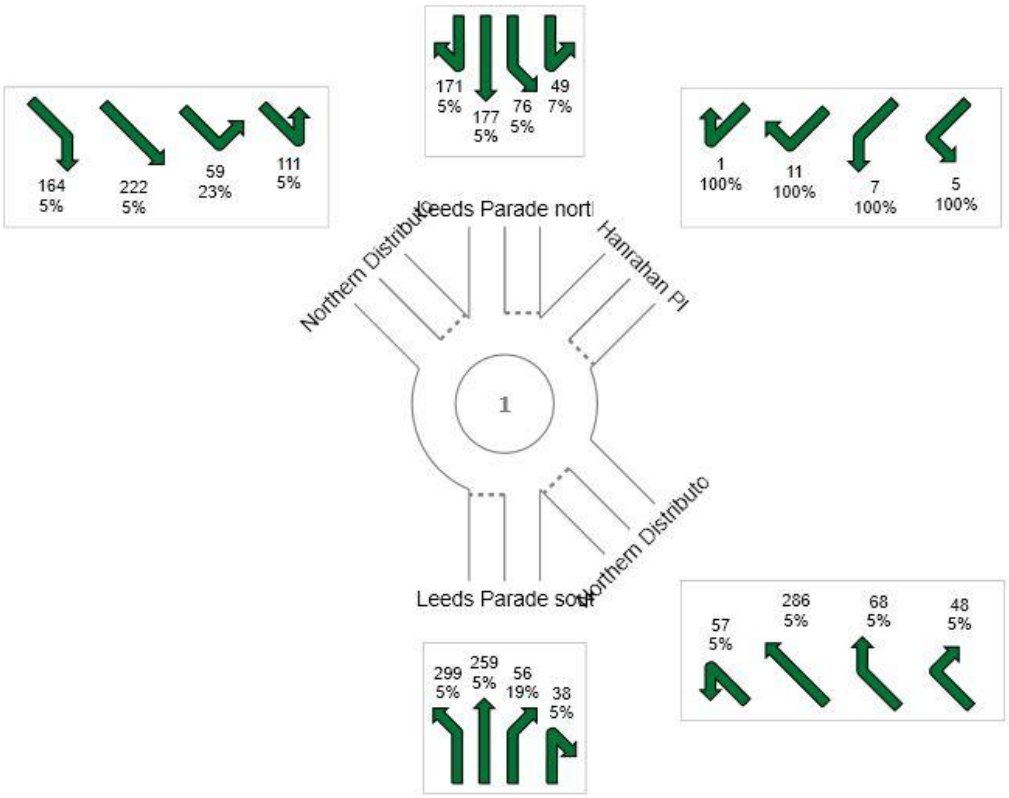


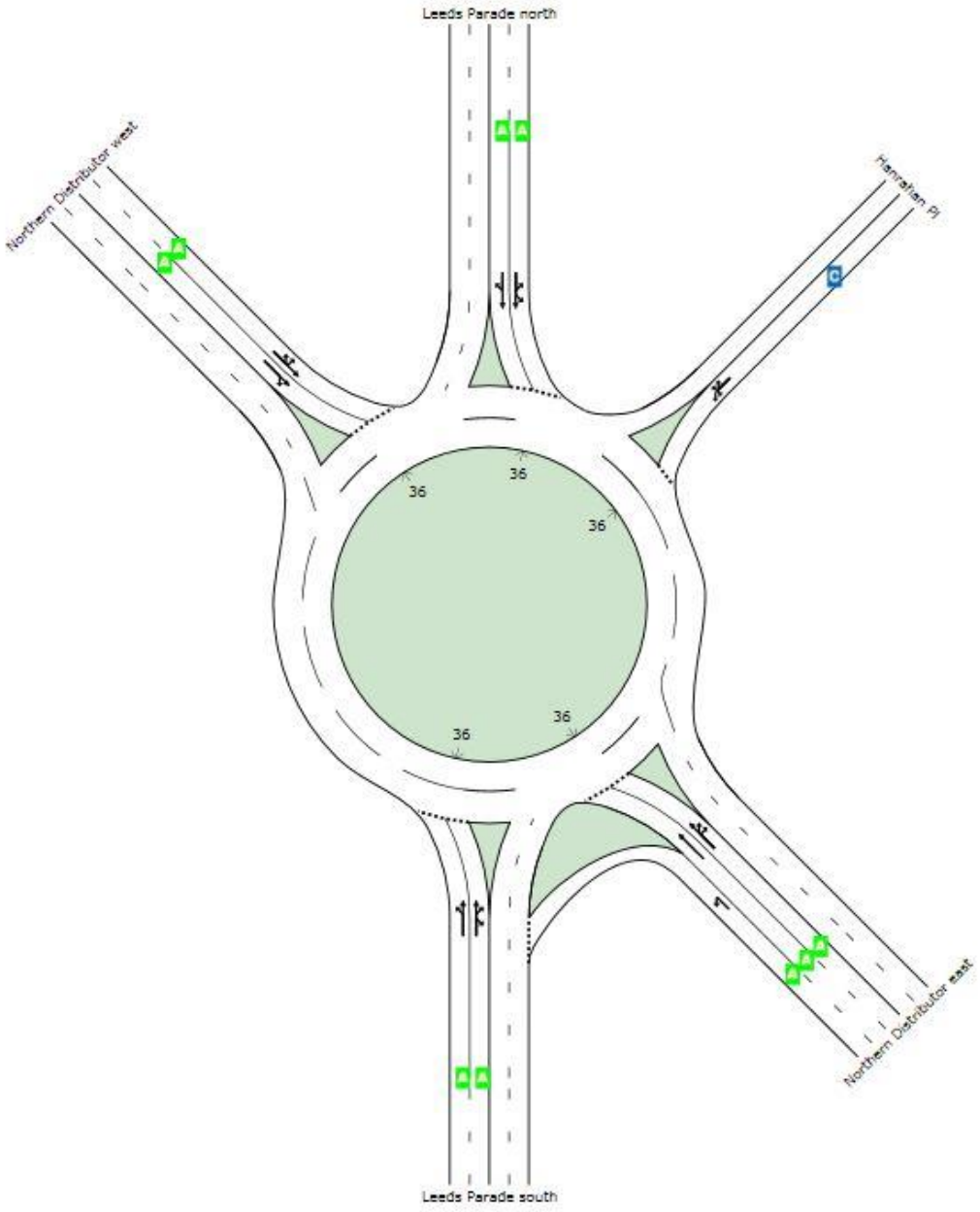
Figure 9: NDR/Leeds Prd Int – Post Development weekday PM Peak hour traffic volumes

Figure 10 illustrates the post development weekday PM peak hour Level of Service (LOS) for the Leeds Parade/Northern Distributor Road intersection and **Figure 11** provides the SIDRA movement summary. Full results of the SIDRA analysis are provided in **Appendix B**.

LEVEL OF SERVICE

Site: WD PM (NDR/Leeds) - proposed +bunnings + service centre

New Site
Roundabout



	South	Southeast	Northeast	North	Northwest	Intersection
LOS	A	A	C	A	A	A

Figure 10: NDR/Leeds Prd Int - Post Development weekday PM Peak LOS

MOVEMENT SUMMARY

Site: WD PM (NDR/Leeds) - proposed +bunnings + service centre

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leeds Parade south											
1a	L1	299	5.0	0.330	6.6	LOS A	1.7	12.4	0.58	1.08	49.6
2	T1	259	5.0	0.330	9.5	LOS A	1.7	12.4	0.60	1.35	48.1
3a	R1	56	19.0	0.330	10.4	LOS A	1.6	12.1	0.60	1.43	47.7
3b	R3	38	5.0	0.330	10.4	LOS A	1.6	12.1	0.60	1.43	47.7
Approach		652	6.2	0.330	8.3	LOS A	1.7	12.4	0.59	0.62	48.7
SouthEast: Northern Distributor east											
21b	L3	57	5.0	0.037	8.0	LOS A	0.2	1.2	0.36	1.10	49.3
22	T1	286	5.0	0.163	7.0	LOS A	0.8	6.1	0.51	1.05	49.4
23a	R1	68	5.0	0.163	11.5	LOS A	0.8	5.7	0.53	1.43	46.7
23	R2	48	5.0	0.163	11.5	LOS A	0.8	5.7	0.53	1.43	46.7
Approach		459	5.0	0.163	8.3	LOS A	0.8	6.1	0.49	0.57	48.6
NorthEast: Hanrahan Pl											
24	L2	5	100.0	0.057	32.2	LOS C	0.2	2.7	0.62	1.50	42.2
24a	L1	7	100.0	0.057	32.2	LOS C	0.2	2.7	0.62	1.50	42.2
26	R2	11	100.0	0.057	32.2	LOS C	0.2	2.7	0.62	1.50	42.2
26b	R3	1	100.0	0.057	32.2	LOS C	0.2	2.7	0.62	1.50	42.2
Approach		24	100.0	0.057	32.2	LOS C	0.2	2.7	0.62	0.75	42.2
North: Leeds Parade north											
7b	L3	49	7.0	0.240	7.1	LOS A	1.2	8.5	0.56	1.13	49.4
7a	L1	76	5.0	0.240	7.1	LOS A	1.2	8.5	0.56	1.13	49.4
8	T1	177	5.0	0.240	8.9	LOS A	1.2	8.5	0.56	1.25	48.1
9b	R3	171	5.0	0.240	14.5	LOS A	1.1	8.2	0.58	1.60	45.0
Approach		473	5.2	0.240	10.4	LOS A	1.2	8.5	0.57	0.67	47.2
NorthWest: Northern Distributor west											
27b	L3	111	5.0	0.271	8.6	LOS A	1.5	11.0	0.56	1.24	48.8
27	L2	59	23.0	0.271	8.6	LOS A	1.5	11.0	0.56	1.24	48.8
28	T1	222	5.0	0.271	9.7	LOS A	1.5	11.0	0.56	1.33	47.9
29a	R1	164	5.0	0.271	11.3	LOS A	1.4	10.3	0.57	1.46	46.9
Approach		556	6.9	0.271	9.8	LOS A	1.5	11.0	0.56	0.67	47.9
All Vehicles		2164	7.0	0.330	9.4	LOS A	1.7	12.4	0.56	0.64	47.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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.

Figure 11: NDR/Leeds Prd Int – Post Development weekday PM Peak hour traffic movements

From the table in **Figure 11**, it can be seen that the worst movement remains as the movement for vehicles existing Hanrahan Place, with a LOS C and a slightly lower average delay of 32.2 seconds.

The increase in traffic from the proposed development provides for a more even distribution of traffic entering and leaving the roundabout that in turn results in an increase in the LOS on some legs with no decrease in the LOS on any legs. The overall average delay at the roundabout decreases from 14.8 seconds under existing conditions to 9.5 seconds under post development conditions.

3.4.3.2 Leeds Parade and University Access

Based on the assumptions outlined in **Section 2.6.3**, a SIDRA analysis was carried out for the Leeds Parade/University Entrance intersection under post development conditions during the weekday PM peak hour. The post development traffic and turning movements used in the SIDRA analysis is shown in **Figure 12**.

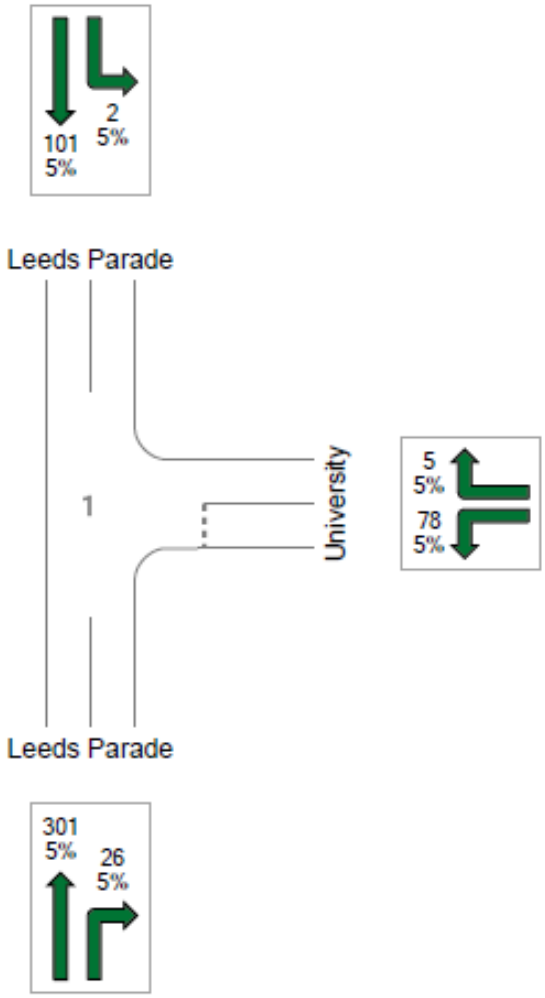


Figure 12: University Ent Int. – Post Development weekday PM Peak hour traffic volumes

Figure 13 illustrates the post development weekday PM peak hour Level of Service (LOS) for the Leeds Parade/University Entrance intersection and **Figure 14** provides the SIDRA movement summary. Full results of the SIDRA analysis are provided in **Appendix B**.

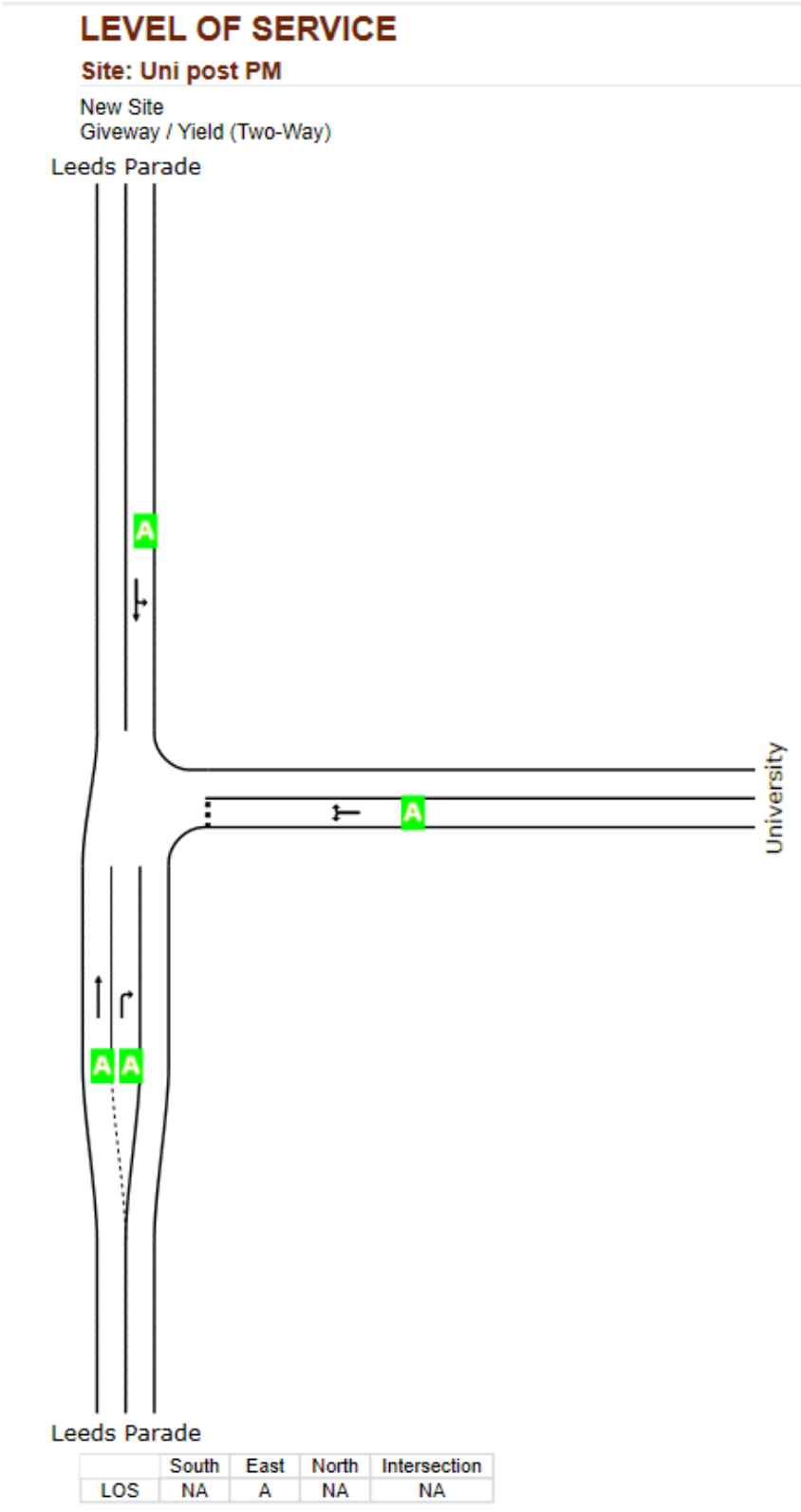


Figure 13: University Ent Int – Post Development weekday PM Peak LOS

MOVEMENT SUMMARY

Site: Uni post PM

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leeds Parade											
2	T1	301	5.0	0.159	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
3	R2	26	5.0	0.016	8.3	LOS A	0.1	0.5	0.21	0.61	42.2
Approach		327	5.0	0.159	0.7	NA	0.1	0.5	0.02	0.05	49.2
East: University											
4	L2	78	5.0	0.061	8.0	LOS A	0.2	1.8	0.20	0.60	42.5
6	R2	5	5.0	0.061	8.0	LOS A	0.2	1.8	0.20	0.60	42.5
Approach		83	5.0	0.061	8.0	LOS A	0.2	1.8	0.20	0.60	42.5
North: Leeds Parade											
7	L2	2	5.0	0.055	0.2	LOS A	0.0	0.0	0.00	0.02	49.8
8	T1	101	5.0	0.055	0.2	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		103	5.0	0.055	0.2	NA	0.0	0.0	0.00	0.02	49.8
All Vehicles		513	5.0	0.159	1.8	NA	0.2	1.8	0.04	0.13	48.1

Level of Service (LOS) Method: Delay (RTA NSW).
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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Figure 14: University Ent Int – Post Development weekday PM Peak hour traffic movements

From the table in **Figure 14**, it can be seen that all movements still operate at a LOS A, with the worst average delay of 8.3 seconds for the right turn movement off Leeds Parade into the University. The 95% back of vehicles is less than 1 vehicle indicating the existing right turn lane length is adequate.

As stated in **Section 2.6.3** it is expected that the weekday AM peak hour movements will be the critical time period with more vehicles attempting the right turn into the University. Based on the assumptions outlined in **Section 2.6.3**, a SIDRA analysis was carried out for the Leeds Parade/University Entrance intersection under post development conditions during the weekday AM peak hour. The post development traffic and turning movements used in the SIDRA analysis is shown in **Figure 15**.

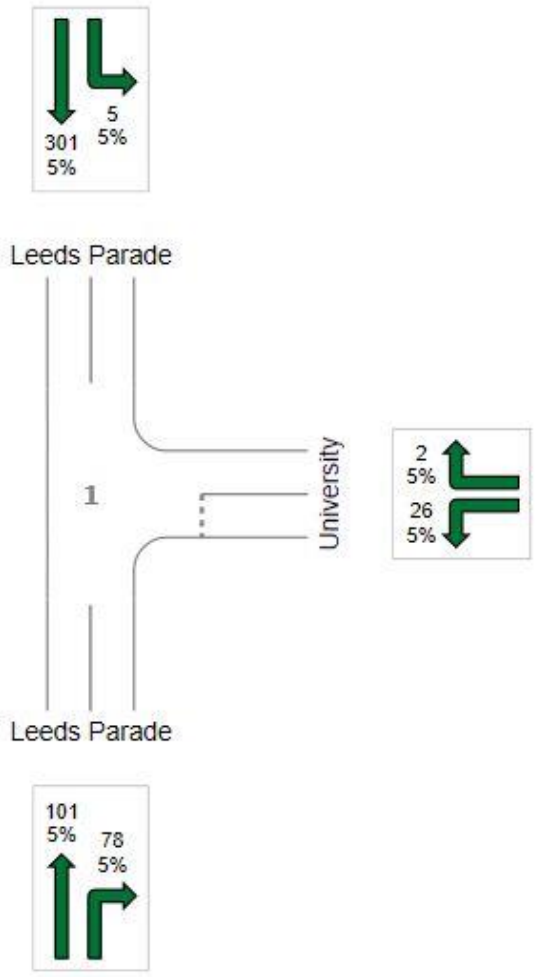
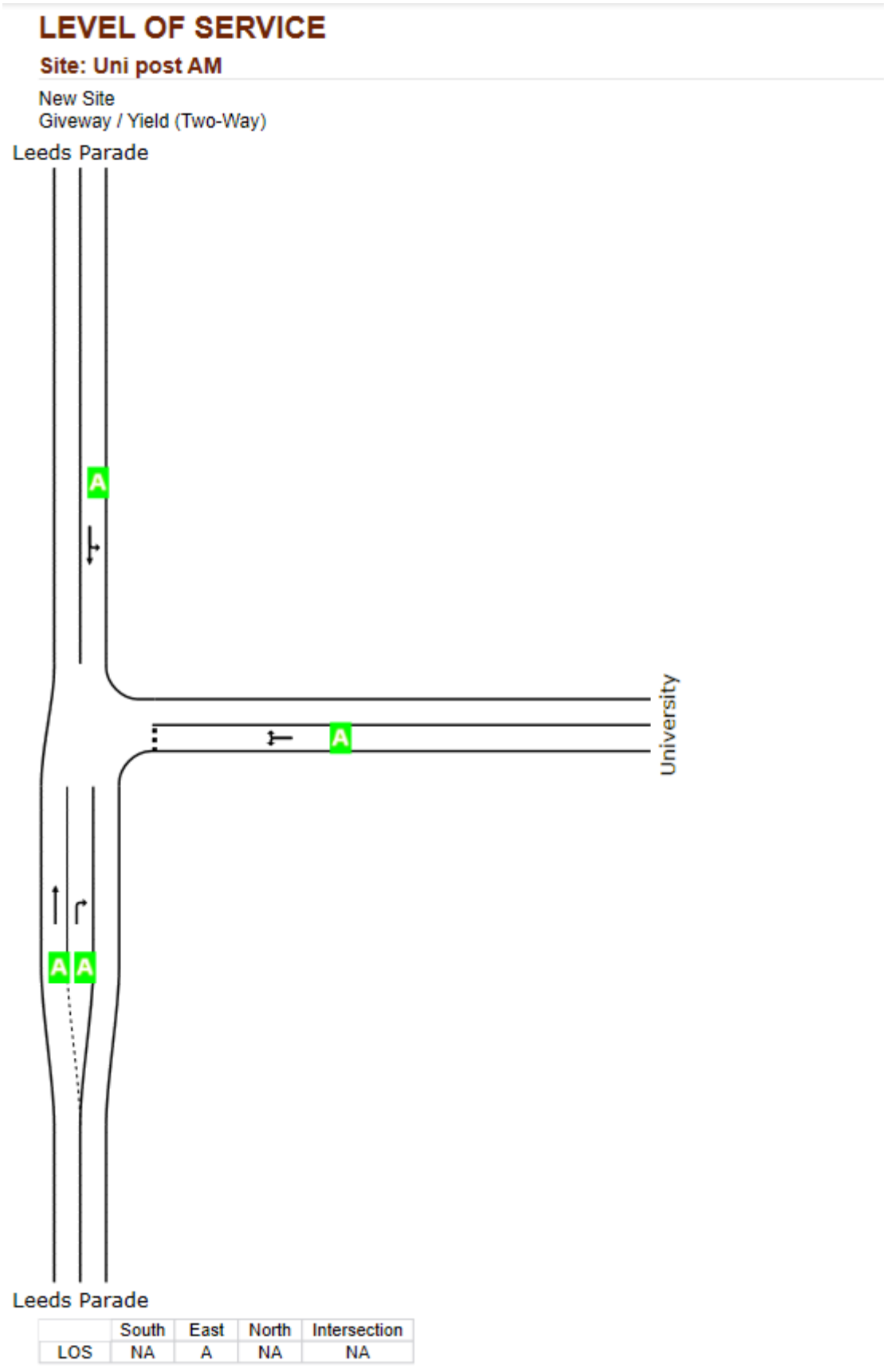


Figure 15: University Ent Int. – Post development weekday AM Peak hour traffic volumes

Figure 16 illustrates the post development weekday AM peak hour Level of Service (LOS) for the Leeds Parade/University Entrance intersection and **Figure 17** provides the SIDRA movement summary. Full results of the SIDRA analysis are provided in **Appendix B**.



	South	East	North	Intersection
LOS	NA	A	NA	NA

Figure 16: University Ent Int – Post Development weekday AM Peak LOS

MOVEMENT SUMMARY

Site: Uni post AM

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leeds Parade											
2	T1	101	5.0	0.053	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
3	R2	78	5.0	0.060	9.1	LOS A	0.3	1.9	0.40	0.66	41.6
Approach		179	5.0	0.060	4.0	NA	0.3	1.9	0.17	0.29	45.9
East: University											
4	L2	26	5.0	0.025	8.7	LOS A	0.1	0.7	0.38	0.63	41.8
6	R2	2	5.0	0.025	8.7	LOS A	0.1	0.7	0.38	0.63	41.8
Approach		28	5.0	0.025	8.7	LOS A	0.1	0.7	0.38	0.63	41.8
North: Leeds Parade											
7	L2	5	5.0	0.162	0.1	LOS A	0.0	0.0	0.00	0.02	49.8
8	T1	301	5.0	0.162	0.1	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		306	5.0	0.162	0.1	NA	0.0	0.0	0.00	0.02	49.8
All Vehicles		513	5.0	0.162	1.9	NA	0.3	1.9	0.08	0.15	47.9

Level of Service (LOS) Method: Delay (RTA NSW).
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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SIDRA INTERSECTION 6.0.1.3703
Project: O:\Synergy\Projects\215\215322\Out\Reports\Traffic\215322_university.sip6
8000782, GEOLYSE PTY LTD, PLUS / 1PC
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www.sidrasolutions.com
SIDRA INTERSECTION 6

Figure 17: University Ent Int – Post Development weekday AM Peak hour traffic movements

From the table in **Figure 17**, it can be seen that all movements still operate at a LOS A, with the worst average delay of 9.1 seconds for the right turn movement off Leeds Parade into the University. The 95% back of vehicles is less than 1 vehicle indicating the existing right turn lane length is adequate.

3.4.4 IMPACT SUMMARY

The assessment of the impact of the traffic generated by the development of the proposed subdivision on the surrounding road network has determined that the impact on:

i. Traffic Volume; and

ii. Intersection Capacity

The greatest increase in the weekday PM peak hour traffic following the development of the proposed subdivision occurred on the northbound lane of Leeds Parade (south) with an increase in traffic volume of approximately 1,171%.

Whilst the percentage increase in traffic volume on the northbound lane of Leeds Parade (north) appears extremely excessive, the total peak traffic volume of 356 vehicles per hour is significantly less than the existing capacity of 900 vehicles per hour per lane.

All roads assessed are well below their capacity with the northbound lane of Leeds Parade (south) closest to capacity at 72%. Hence all roads are able to accommodate the increased additional peak hour traffic generated by the proposed development.

The increase in traffic from the proposed development provides for a more even distribution of traffic entering and leaving the roundabout at the intersection of Leeds Parade and Northern Distributor Road. SIDRA analysis of the roundabout showed that this resulted in an increase in the LOS on some legs with no decrease in the LOS on any legs. The overall average delay at the roundabout decreased from 14.8 seconds under existing conditions to 9.5 seconds under post development conditions.

SIDRA analysis of the intersection on Leeds Parade at the University entrance showed that that all movements at the intersection operate at a LOS A under post development conditions, with the worst average delay of 9.1 seconds for the right turn movement off Leeds Parade into the University during the weekday AM peak hour. The 95% back of vehicles for this movement is less than 1 vehicle indicating the existing right turn lane length is adequate.

Whilst the expected increases in traffic volume are significant, the capacity of the existing surrounding roads and intersections analysed are sufficient to cater for the post development traffic volumes and to disperse such traffic into the surrounding road network.

Recommendations

This Traffic Impact Assessment has evaluated the traffic generating potential of a proposed 450 lot rural residential subdivision in North Orange and has assessed the impact of the additional traffic generated on the surrounding roads and intersections.

The TIA has found that whilst the expected increases in traffic volume are significant, the capacity of the existing surrounding roads and intersections analysed are sufficient to cater for the post development traffic volumes and to disperse such traffic into the surrounding road network.

In completing the assessment of the impact of the traffic generated by the proposed development, the following recommendations are made:

- The design of all internal roads within the proposed subdivision shall be carried out to appropriate standards and the requirements of Orange City Council;
- The design of the subdivision should include a threshold entry treatment on Leeds Parade to clearly indicate the beginning of the large lot residential subdivision;
- The existing bicycle/pedestrian path on Leeds Parade should be extended to and into the proposed subdivision;
- Consideration should be given to widening Leeds Parade to provide full line marking and sealed shoulders to improve road safety and minimise future maintenance costs.

References

AUSTROADS (2009) Guide to Road Design Part 4A. Unsignalised and Signalised Intersections

AUSTROADS (2013) Guide to Traffic Management Part 12. Traffic Impacts of Developments

AUSTROADS (2013) Guide to Traffic Management Part 3. Traffic Studies and Analysis.

AUSTROADS (2013) Guide to Traffic Management Part 6. Intersections, Interchanges and Crossings

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Ogden, K.W. and Bennett, D.W. (Eds) 1984) Traffic Engineering Practice. Third Edition. Dept of Civil Engineering Monash University.

Roads and Maritime Services (2013) Guide to Traffic Generating Developments

Roads and Traffic Authority (2002) Guide to Traffic Generating Developments.

Transport and Traffic Planning Associates (2013) Proposed Bunnings Warehouse - Assessment of Traffic and Parking Implications

Appendix A

T&TPA TRAFFIC REPORT

PROPOSED
BUNNINGS WAREHOUSE
CNR NORTHERN DISTRIBUTOR ROAD
AND LEEDS PARADE, ORANGE

Assessment of Traffic and Parking Implications

May 2013

Reference 12084

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

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

This report has been prepared to accompany a Development Application to Orange City Council for a proposed new Bunnings Warehouse on a site with frontages to Northern Distributor Road and Leeds Parade at Orange (Figure 1).

The recent completion of the Northern Distributor Road providing a bypass to the Orange Town Centre has enabled upgraded vehicle access for urban development in the area to the north of the Town Centre.

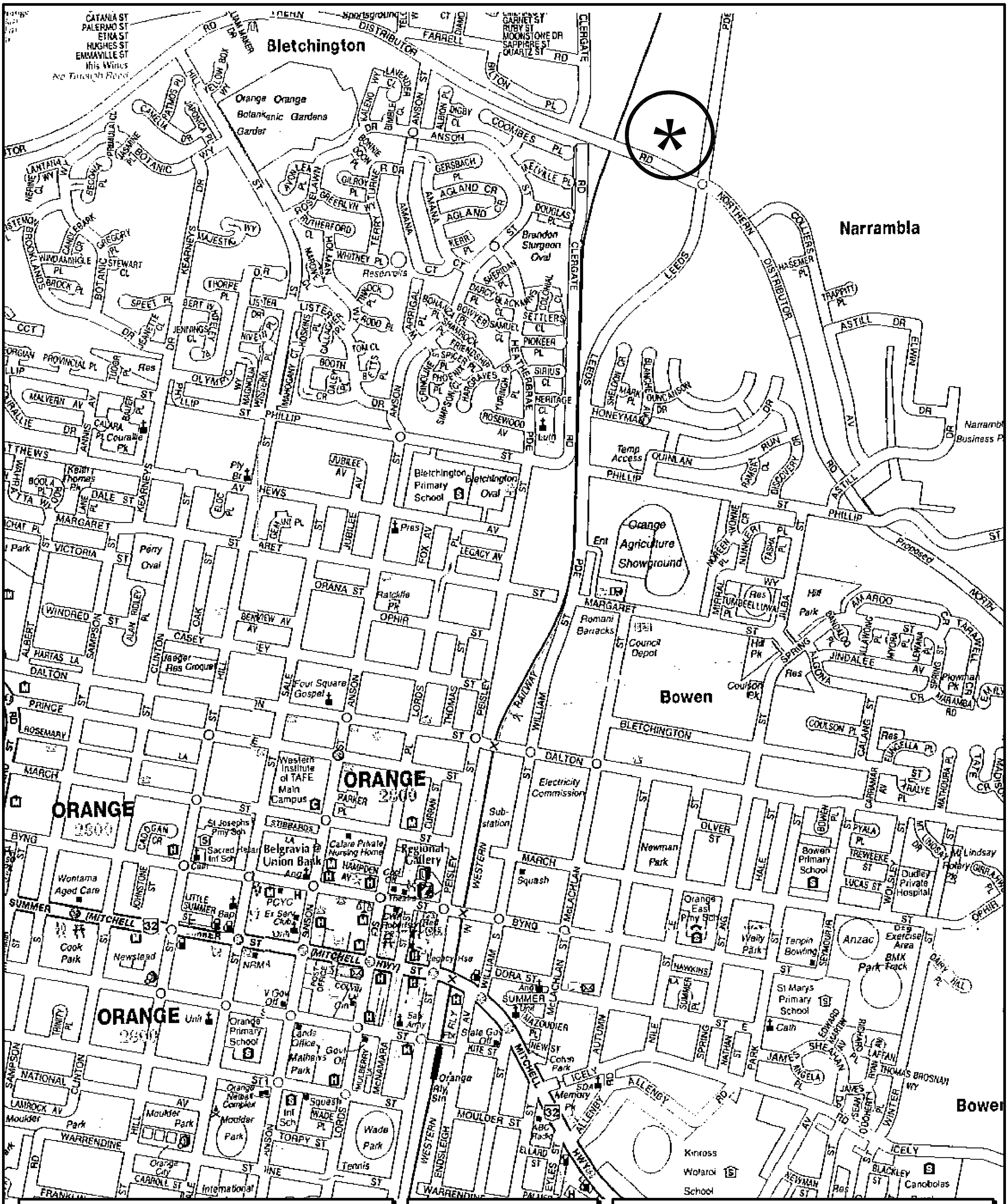
The Bunnings development site is grassed farmland and the proposed scheme will enable replacement of the small existing Bunnings store which is located to the southeast of the Town Centre.

The proposed development will be a contemporary Bunnings warehouse comprising:

Warehouse	9,490 m^2
Trade Area	4,780 m^2
Nursery and bagged goods	3,020 m^2
Total Retail Area	17,290 m^2
Carparking	330 spaces

The purpose of this report is to:

* describe the site and the proposed development scheme
* describe the existing road network and traffic conditions
* assess the adequacy of the proposed parking provision
* assess the traffic potential implications of the development
* assess the proposed access, internal circulation and servicing arrangements.



Legend

Location

Fig 1

2. PROPOSED DEVELOPMENT SCHEME

2.1 SITE, CONTEXT AND EXISTING USE

The development site (Figure 2) is part of a consolidation of lots being an irregular shaped area of some 44,798m^2 within a total lot area of 8.58 ha. The site has a frontage to the northern side of Northern Distributor Road and to the western side of Leeds Parade and is located some 2.5 kms to the north of the City Centre.

The site, which is grassed farm land with a residence and out buildings, is bounded to the west by the Main Western Railway Line.

The surrounding uses comprise:

- the industrial site just to the west and bus depot just to the east
- the Orange Marketplace Centre further to the west
- the new residential development to the west extending along both sides of NDR
- the farmland extending to the north
- the Orange Grove Homemakers Centre to the southeast

2.2 PROPOSED DEVELOPMENT

The development scheme involves some cut and fill of the site to provide level platforms for building and hardstand areas. The new Bunnings warehouse building will occupy the central and northern part of the site with the nursery located on the western side and carparking along the southern frontage area.

The proposed development scheme will comprise a single warehouse level with at grade carparking as follows:

Warehouse	-	9,490m^2
Trade area	-	4,780m^2
Nursery and bagged goods	-	3,020m^2
Total Retail Area:		**17,290m^2**

LEGEND

N

SITE

FIG 2

A total of 330 parking spaces will be provided with vehicle access comprising:

- ingress and egress for the carpark on Northern Distributor (left turn IN/OUT only)
- ingress and egress for the carpark on Leeds Parade towards the centre of the site
- ingress and egress for service vehicles on Leeds Parade in the northern part of the frontage

Details of the proposed development scheme are provided on the plans prepared by John R Brogan and Associates which accompany the Development Application and are reproduced in part overleaf.

AREA ANALYSIS
PROPOSED BUNNINGS ORANGE

	WAREHOUSE	
	Warehouse	9 100 m2
	Mezzanine	300 m2
	Main Entry	90 m2
	TOTAL WAREHOUSE AREA	**9 490 m2**
	Timber Trade Sales	2660 m2
	Landscape & Building Materials Yard	930 m2
	Bulk Trade Area	1190 m2
	TOTAL TRADE AREA	**4780 m2**
	Outdoor Nursery	1390 m2
	Bagged Goods Canopy	1630 m2
	TOTAL NURSERY AREA	**3 020 m2**
	TOTAL BUNNINGS AREA	**17 290 m2**
	Bunnings Parking Provided	330 CARS
	Carparking Ratio	1/52 m2
	Land Size - APPROX. FIGURES TBC (m2)	
	MAIN LOT - SOUTH	**37 750 m2**
	CONSOLIDATE CORNER LOT	**8 050m2**
	Proposed BUNNINGS Lot	**45 800 m2**
	SURPLUS LOT - NORTH (INCL DAM)	**38 000 m2**
	TOTAL LAND	**85 800m2**

NOT FOR CONSTRUCTION
THE INTENT OF THIS DRAWING IS TO CONVEY THE DESIGN CONCEPT, ALL AREAS, DIMENSIONS, LEVELS & DETAILS SUBJECT TO CONFIRMATION BY WAY OF DISCUSSION WITH AUTHORITIES & DESIGN DEVELOPMENT.

NO.	AMENDMENT	DATE	NO.	AMENDMENT	DATE
P1	PRELIMINARY	30.01.13			
P2	PRELIMINARY	14.03.13			
P3	PRELIMINARY	13.05.13			

CLIENT
BUNNINGS warehouse

JOHN R. BROGAN & ASSOCIATES
PTY. LIMITED
ARCHITECTS, PLANNERS & COMMERCIAL INTERIOR DESIGNERS
EST · 1927
37 PITT ST. SYDNEY NSW 2000
PH: (02) 9 221 2833 FAX: (02) 9 251 4741
EMAIL: jrb@brogans.com.au
A.B.N. 93 003 284 759

PROPOSED BUNNINGS WAREHOUSE ORANGE
NORTHERN DISTRIBUTOR RD & LEEDS PDE
ORANGE NSW 2800

SITE PLAN - INCL CORNER LOT
CONCEPT C

SCALE : 1:750
DATE : JUL 12
PROJ. NO. 1311
DRG. NO. K031
AMD NO. P3

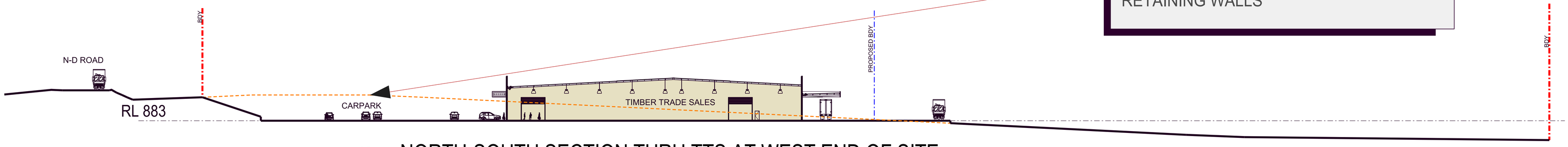
CAD REF : Microstation V8i S1 PROPOSED BUNNINGS WAREHOUSE ORANGE NSW 1311- PLOTTED 13/05/2013

EXISTING BOUNDARY PROFILE
AT SITE WEST END

EXISTING GROUND LINE SHOWN DOTTED
WAREHOUSE SET AT RL 883
NOTE CUT AT WEST END OF SITE & LIKELY
RETAINING WALLS

04 NORTH-SOUTH SECTION THRU TTS AT WEST END OF SITE
LOOKING WEST TOWARDS RAILWAY

EXISTING GROUND LINE SHOWN DOTTED
WAREHOUSE SET AT RL 883
NOTE CUT AT WEST END OF SITE & LIKELY
RETAINING WALLS

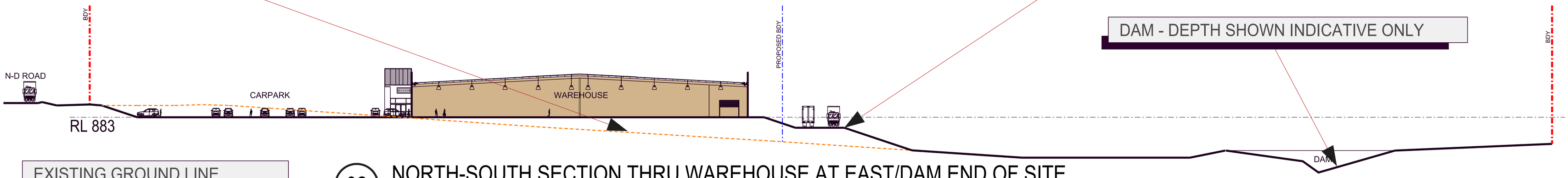


03 NORTH-SOUTH SECTION THRU TTS AT WEST END OF SITE
LOOKING WEST TOWARDS RAILWAY

EXISTING GROUND LINE DOTTED
WAREHOUSE SET AT RL 883
NOTE FILL AT EAST END OF SITE

SERVICE ROAD BELOW
WAREHOUSE LEVEL TO MEET LEEDS PDE
LIFT REQD TO SERVE NURSERY UNLOADING

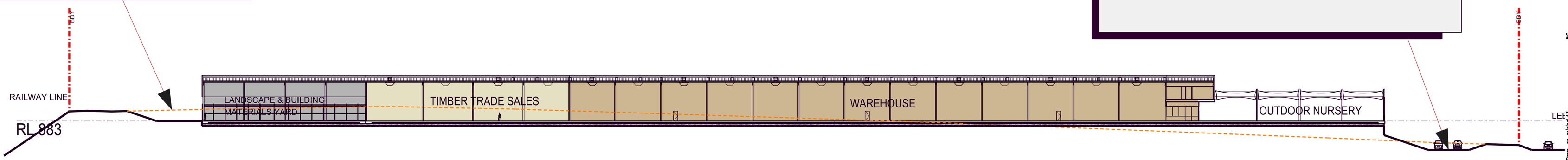
DAM - DEPTH SHOWN INDICATIVE ONLY



02 NORTH-SOUTH SECTION THRU WAREHOUSE AT EAST/DAM END OF SITE
LOOKING WEST TOWARDS RAILWAY

EXISTING GROUND LINE
SHOWN DOTTED
WAREHOUSE SET AT RL 883

LEEDS PDE PROPOSED ENTRY LEVEL



01 EAST-WEST SECTION THRU WAREHOUSE
LOOKING NORTH

0m 10 20 30 40 50m

NOT FOR CONSTRUCTION
THE INTENT OF THIS DRAWING IS TO CONVEY THE DESIGN CONCEPT, ALL AREAS, DIMENSIONS, LEVELS & DETAILS SUBJECT TO CONFIRMATION BY WAY OF DISCUSSION WITH AUTHORITIES & DESIGN DEVELOPMENT.

NO.	AMENDMENT	DATE
P1	PRELIMINARY	19.03.13
P2	PRELIMINARY	13.05.13

CLIENT
BUNNINGS warehouse

JOHN R. BROGAN & ASSOCIATES
PTY. LIMITED
ARCHITECTS, PLANNERS & COMMERCIAL INTERIOR DESIGNERS
EST · 1927
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PH: (02) 9 221 2833 FAX: (02) 9 251 4741
EMAIL: jrb@brogans.com.au
A.B.N. 93 003 284 759

PROPOSED BUNNINGS WAREHOUSE ORANGE
NORTHERN DISTRIBUTOR RD & LEEDS PDE
ORANGE NSW 2800

CONCEPT C
SITE SECTIONS

SCALE : 1:420
DATE : JUL 12

PROJ. NO. 1311
DRG. NO. K121
AMD NO. P2

50mm on original A3

CAD REF : Microstation V8i S1 PROPOSED BUNNINGS WAREHOUSE ORANGE NSW 1311- PLOTTED 13/05/2013

3. ROAD NETWORK AND TRAFFIC CONTROLS

3.1 ROAD NETWORK

- *Mitchell Highway* – a principal State Highway route extending northwest from Bathurst through Orange

- *Northern Distributor Road* – a new major collector road linking between the Mitchell Highway and providing a bypass around the Orange City Centre

- *William Street/Leeds Parade* – a collector road route connecting northwards from the Orange Centre

- *Burrendong Way, Escourt Way, Cargo Road and Forest Road* – major collector routes radiating from Orange Centre

- *Hill Street and Phillip Street etc* – collector roads serving the north Orange area

3.2 TRAFFIC CONTROLS

The few traffic controls which have been applied to the road system (Figure 4) in the vicinity of the site comprise:

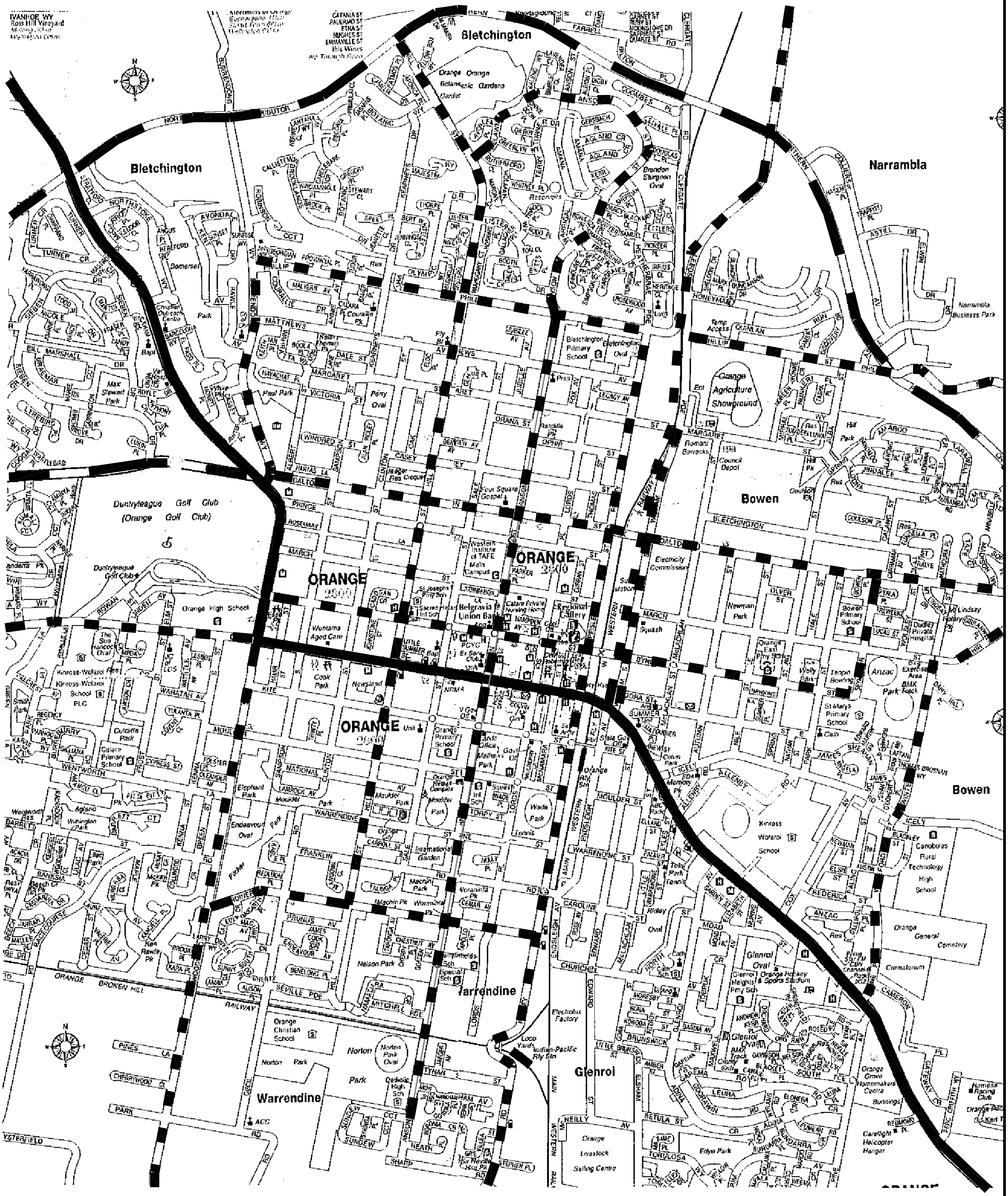
- the large roundabout at the Northern Distributor Road and Leeds Parade intersection

- the large roundabout at the Mitchell Highway and Northern Distributor Road intersection

- the 70 kmph speed limit on NDR and 50 kmph the local and collector roads

- the marked footcrossing on Hibberson Street west of Gribble Street

- the approved B Double Route along Mitchell Highway and NDR

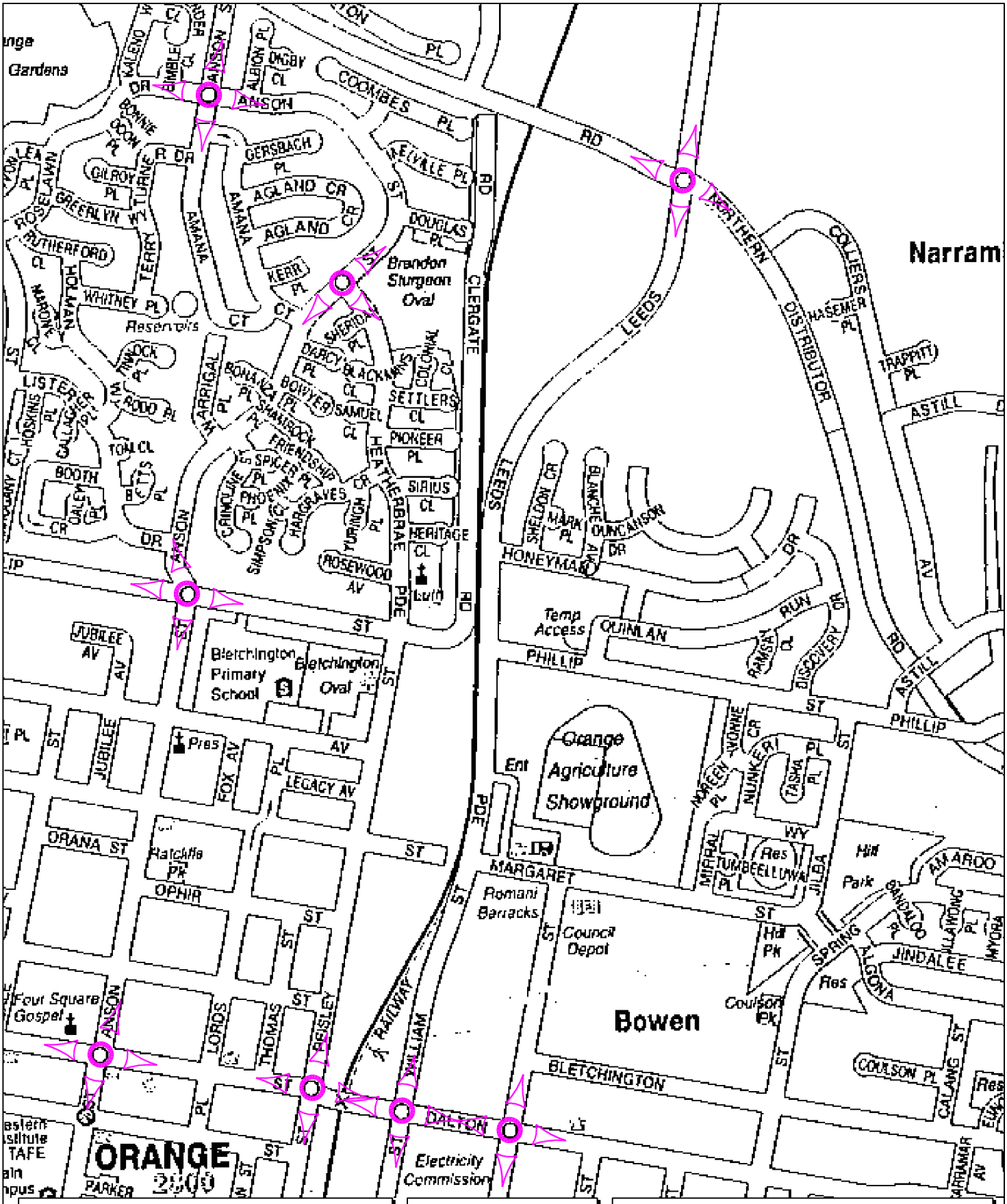


LEGEND

- ARTERIAL
- SUB-ARTERIAL
- COLLECTOR

ROAD NETWORK

FIG 3


Gardens
ANSON
COOMBES PL
RD
NORTHERN DISTRIBUTOR
Narram
AGLAND CR
AGLAND
GERSBACH PL
GILROY PL
GREENLYN WY
RUTHERFORD CL
WHITNEY PL
Reservoirs
Brandon Sturgeon Oval
CLERGATE RD
LEEDS ST
DOUGLAS PL
KERR PL
SHERIDA PL
DARCY PL
BLACKMANS CL
SETTLERS CL
PIONEER PL
SIRIUS CL
HERITAGE CL
Luth
ROSEWOOD AV
PDE
LISTER CL
HOSKINS PL
BOOTH CR
BETTS PL
TOM CL
ARRIGAL PL
SHAMROCK PL
FRIENDSHIP PL
SPICER PL
PHOENIX PL
HARGRAVES CR
TURNIGH PL
HEATHERBRAE CR
SIMPSON CR
CAIRNGLEN PL
SHELDON CR
MARK PL
BLANCHE DUNCANSON DR
HONEYMAN DR
TRAPPITT PL
ASTILL
COLLIERS HASEMER PL
AV
JUBILEE AV
Bletchington Primary School
Bletchington Oval
Pres
FOX AV
LEGACY AV
ORANA ST
Ratcliffe PK
OPHIR
Temp Access
QUINLAN
PHILLIP
RAMSAY RUN
DISCOVERY RD
Orange Agriculture Showground
Ent
MARGARET
Romani Barracks
Council Depot
Hill Pk
Hill Park
Res
MIRTUMBEELUWA
JILBA
NUNKERI
TASHA
NOREEN
YVONNE
AMAROO
BANDALO
ILLAWONG
MYORA
SPRING
ALGONA
JINDALEE
Coulson Pk
COULSON PL
CALANG
Four Square Gospel
LORDS
THOMAS
WESLEY
WILLIAM
RAILWAY
Bowen
BLETCHINGTON
DALTON
ORANGE 2800
PARKER
Electricity Commission
Eastern Institute TAFE
LEGEND
TRAFFIC SIGNAL CONTROL
ROUNDABOUT
RESTRICTED TURNING MOVEMENT
N
TRAFFIC CONTROLS
FIG 4

3.3 TRAFFIC CONDITIONS

An indication of the traffic conditions on the road system in the vicinity of the site is contained in the results of traffic surveys undertaken by Council which are provided in Appendix A and surveys undertaken during the weekday afternoon and weekend midday periods. The Council data is summarised in the following for total (2-way) traffic follows:

North Distributor Road

AWDT	8,400 vph
AM peak	670 vph
PM peak	920 vph
SAT MD	640 vph

Leeds Parade (south of NDR)

AWT	3,500 vpd
AM peak	360 vph
PM peak	380 vph
SATMD	280 vph

The results of the traffic surveys undertaken at the intersection are provided in Appendix B and summarised in the following:

		WDPM	**WEMD**
Northern Distributor Road	EB	195	137
	RT	143	145
	LT	13	3
	WB	267	113
	RT	2	1
	LT	52	11

Leeds Parade	NB	13	9
	RT	30	16
	LT	271	190
	SB	40	10
	RT	31	2
	LT	11	2

There is also an access road for a bus depot which connects into the roundabout however the traffic movements on this access are only minor.

Traffic conditions on the road network in the area during the peak periods, including the weekend, are quite free flowing and satisfactory with no congestion or delay. The site benefits, in traffic terms, from:

- the roundabout controlled access available through the Northern Distributor Road and Leeds Parade intersection
- the absence of any major traffic generator in the near vicinity

4. ACCESS

The proposed vehicle access arrangements comprise:

- separate adjacent ingress and egress connections for the carpark located on the Northern Distributor Road frontage. There will be a central median island provided in Northern Distributor Road to restrict access movements to left turn IN/OUT with a deceleration lane for the ingress movement

- a combined ingress/egress connection for the carpark located on the Leeds Parade frontage with left turn deceleration lane

- a combined ingress/egress connection for service/delivery vehicles located on the Leeds Parade frontage to the north of the building

Minor road works will be undertaken to enable the provision of these proposed accesses and they will be located where there will be good sight distances available and sufficiently away from the intersection.

5. TRAFFIC

Bunnings stores have somewhat unique traffic generation characteristics (compared to other retail type uses) and the circumstances in Country Regional stores are also quite different to those in Capital City Metropolitan Area stores. In order to establish the country regional characteristics TTPA undertook surveys and research at existing Bunnings stores at Tamworth, Bathurst and Coffs Harbour.

The results of this survey data in relation to the peak traffic generation circumstances are and summarised in the following:

	Weekday 4-5pm			**Saturday Midday**		
	IN	**OUT**	**Total**	**IN**	**OUT**	**Total**
Tamworth	124	165	289	186	201	387
Bathurst	74	88	162	111	107	218
Coffs Harbour	108	104	212*	202	180	382*

** The existing Coffs Harbour store has a total GFA of 8,523m^2 indicating*
PM peak – 2.5 vtph/100 m^2
WE peak – 4.5 vtph/100 m^2

RMS are in the process of updating their Guide for Traffic Generating Development and engaged consultants to undertake studies of Large Format Hardware stores. The results of that study for the single large non-metropolitan site (9,948m^2) are as follows:

TRAFFIC GENERATION PER 100 M^2 GFA

AM Peak Hour	1.09 vtph
PM Peak Hour	1.99 vtph
Weekend Peak Hour	4.28 vtph

A very pertinent traffic generation characteristic of "large format Hardware" uses is that the larger the floor area the lower the traffic generation rate per 100 m^2 GFA and of the 17,290m^2 proposed some 5,000m^2 will be for building materials storage, landscape yard and trade area.

The assessed potential traffic generation rates for the proposed development having particular regard for the large floor area (ie twice that of the surveyed Bunnings Coffs Harbour and the site surveyed for RMS) are:

WD PM	1.8 vtph per 100 m^2
WE MD	3.5 vtph per 100 m^2

Application of these rates to the proposed development would indicate the following peak traffic generation:

PM			WEMD		
IN	**OUT**	**TOTAL**	**IN**	**OUT**	**TOTAL**
130	180	310	300	300	600

As is normal for significant retail developments there will be a "passing trade" element (ie. vehicles already travelling along the Northern Distributor Road) particularly vehicles travelling to/from the existing Bunnings store to the south. The passing trade will not be as significant as that for a Metropolitan area site (ie. 20 to 30%), however, it is assessed that some 15% will be passing trade on weekdays and some 10% on weekends.

Passing Trade	PMWD	44 vtph
	WEMD	60 vtph

The projected directional distribution will be:

East	20%
West	40%
South	40%

In order to take account of future traffic growth (10 years) 10% will be added to the existing major vehicle movements. The projected future peak vehicle movements with the completed development are as follows:

		WDPM	**WEMD**
Northern Distributor Road	EB	209	141
	RT	153	150
	LT	13	3
	WB	288	105
	RT	40	77
	LT	57	11
Leeds Parade	NB	82	141
	RT	30	16
	LT	295	189
	SB	87	142
	RT	84	134
	LT	39	78

The operational performance of the intersection with these projected future volumes has been modelled using SIDRA and the results indicating a satisfactory performance are provided in Appendix C and summarised in the following:

	WDPM	**WEMD**
Level of Service	A	A
Av. Vehicle Delay	9.1	9.5

6. PARKING

Orange City Council's Parking Code specifies a parking provision in relation to the proposed development of 1 space per 50m^2 GFA.

Survey and research of 6 existing Bunnings warehouse stores provides a comprehensive indication of the intrinsic parking demands for Bunnings outlets. The peak demands occur on weekends and it is apparent (as with traffic generation) that the parking demand per 100m^2 generally decreases as the floorspace increases. The established peak parking demand characteristics are summarised in the following:

Thomastown	10,625m^2	1.37 spaces per 100m^2
Minchinbury	11,932m^2	2.0 spaces per 100m^2
Penrith	13,500m^2	1.17 spaces per 100m^2
Hoopers Crossing	11,169m^2	1.74 spaces per 100m^2
Mornington	10,599m^2	2.39 spaces per 100m^2
Box Hill	13,762m^2	1.41 spaces per 100m^2

The recent RMS sponsored study of Non Metropolitan Area Large Format Hardware outlets reveals a maximum parking demand of 1.53 spaces per 100m^2 (ie 1 space per 65m^2)

The proposed new Orange store of some 17,290m^2 will have 330 parking spaces which equates to 1 space per 52.4m^2. It is apparent that this provision will be quite adequate, particularly given the significant areas used for storage, and is generally compliant with Council's code. The proposed provision includes 10 suitable and designated spaces for disabled drivers while cars with trailers will be able to park in tandem spaces.

7. INTERNAL CIRCULATION AND SERVICING

Internal Circulation

The circulation and carpark areas are designed to accord to the design requirements of AS 2890.1 and AS 2890.6 with generous parking bay and aisle provisions. A flexible circulation arrangement will be available throughout the carpark with ability for vehicles to travel to/from either of the external access points.

Servicing

The Bunnings delivery and service vehicles will ingress on Leeds Parade and travel along the northern side of the building to turn and egress. The Bunnings deliveries will involve semi-trailer and potentially B Double vehicles with some vans and MRV's and the very extensive queuing length available will ensure that there is no possibility on waiting trucks affecting the movement of cars to/from the carpark. Similarly, the provisions in the goods pick-up area will be more than adequate to accommodate demands even at peak seasonal times. Details of the turning path implications of the movements of the largest articulated vehicles are provided in Appendix D indicating a satisfactory provision for access and circulation.

The frequency of delivery vehicle movements for Bunnings will vary from day to day with the projected maximum daily visitation of 1-2 articulated trucks and 2-4 smaller vehicles (HRV and MRV).

8. CONCLUSION

The proposed Bunnings warehouse development at Orange (replacing the existing store) will utilise the relatively large site which has convenient access to the arterial road system. This assessment has concluded that the design of the development in terms of vehicle access, circulation, parking and servicing is appropriate and that there will not be any adverse traffic impacts on the road system serving the site.

Appendix A

AUTOMATIC TRAFFIC SURVEYS

MetroCount Traffic Executive
Vehicle Counts

VehicleCount-385 -- English (ENA)

Datasets:

Site:	**[35/08] Leeds Parade north of Honeyman Drive**
Direction:	7 - North bound A>B, South bound B>A. **Lane:** 0
Survey Duration:	8:32 Tuesday, 9 September 2008 => 11:09 Wednesday, 8 October 2008
Zone: .	
File:	0808Oct2008.EC0 (Plus)
Identifier:	M333VRCW MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm:	Factory default (v3.21 - 15275)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**8:33 Tuesday, 9 September 2008 => 11:09 Wednesday, 8 October 2008**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Speed range:	10 - 160 km/h.
Direction:	North, East, South, West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (ARX)
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)
In profile:	Vehicles = 91165 / 91207 (99.95%)

* Tuesday, 9 September 2008 - Total=1760 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	0	0	0	0	44	251	340	347	359	160	99	63	44	41	12	
-	-	-	-	-	-	-	-	-	0	0	0	0	0	58	75	88	102	52	28	28	8	15	3	7
-	-	-	-	-	-	-	-	-	0	0	0	0	0	58	97	90	87	41	27	11	13	8	5	2
-	-	-	-	-	-	-	-	0	0	0	0	0	0	53	86	87	88	36	30	11	11	11	2	4
-	-	-	-	-	-	-	-	0	0	0	0	0	44	82	82	82	82	31	14	13	12	7	2	2

PM Peak 1615 - 1715 (361), PM PHF=0.88

* Wednesday, 10 September 2008 - Total=3790, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
15	5	8	12	10	38	120	197	373	254	212	243	250	260	295	353	334	348	185	126	57	48	31	16	
7	3	1	1	3	1	19	41	73	66	59	50	50	75	63	84	83	95	59	25	20	15	12	5	1
2	0	1	4	3	4	25	40	98	80	46	63	61	59	95	86	79	87	62	33	10	12	6	4	6
4	2	2	3	1	12	25	54	97	50	58	68	66	72	65	102	88	102	39	27	15	12	6	3	6
2	0	4	4	3	21	51	62	105	58	49	62	73	54	72	81	84	64	25	41	12	9	7	4	6

AM Peak 0800 - 0900 (373), AM PHF=0.89 PM Peak 1645 - 1745 (368), PM PHF=0.90

* Thursday, 11 September 2008 - Total=3970, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
19	20	8	10	12	44	150	203	388	303	233	229	234	253	269	352	382	354	205	113	93	50	31	15	
1	9	1	0	1	5	25	44	73	85	59	57	63	69	72	82	119	96	51	43	37	17	13	6	1
6	4	1	3	5	6	33	43	93	83	46	62	54	65	67	93	82	92	56	27	17	16	7	3	3
6	3	0	5	3	13	25	48	101	64	66	48	50	59	68	89	102	95	48	17	17	11	6	4	4
6	4	6	2	3	20	67	68	121	71	62	62	67	60	62	88	79	71	50	26	22	6	5	2	3

AM Peak 0815 - 0915 (400), AM PHF=0.83 PM Peak 1545 - 1645 (391), PM PHF=0.82

* Friday, 12 September 2008 - Total=4004, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
11	13	7	8	7	32	122	217	350	313	247	235	277	280	310	353	326	330	225	112	103	64	36	26	
1	3	1	4	0	4	16	46	82	98	73	65	72	62	68	78	87	91	77	42	22	17	10	9	5
3	5	0	1	2	6	22	45	79	77	50	52	76	76	73	89	73	86	60	26	36	20	12	6	3
4	3	3	2	3	8	24	59	90	57	61	58	62	73	89	81	87	90	48	20	25	14	9	7	4
3	2	3	1	2	14	60	67	99	81	63	60	67	69	80	105	79	63	40	24	20	13	5	4	3

AM Peak 0815 - 0915 (366), AM PHF=0.92 PM Peak 1515 - 1615 (362), PM PHF=0.86

* Saturday, 13 September 2008 - Total=2724, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
15	12	9	4	8	16	68	92	201	252	284	230	228	189	204	208	172	149	127	81	59	41	36	39	
5	2	5	1	1	3	15	14	34	64	67	66	61	49	60	52	42	35	39	28	12	10	11	8	2
3	3	0	0	1	3	9	23	42	53	61	55	53	46	50	45	44	41	33	18	17	9	8	15	2
4	4	2	2	4	4	16	25	47	66	73	60	62	37	39	58	39	41	34	17	16	14	11	9	1
3	3	2	1	2	6	28	30	78	69	83	49	52	57	55	53	47	32	21	18	14	8	6	7	1

AM Peak 1000 - 1100 (284), AM PHF=0.86 PM Peak 1200 - 1300 (228), PM PHF=0.92

* Sunday, 14 September 2008 - Total=1897, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
6	7	4	4	7	11	14	37	58	126	182	179	187	144	196	197	162	138	95	60	43	23	10	7	
2	2	0	1	2	2	3	9	9	23	42	38	70	42	53	48	43	34	36	25	12	8	2	1	2
2	4	1	2	1	2	3	7	14	33	47	34	35	29	48	50	44	40	24	10	10	3	3	2	1
1	0	2	0	3	5	5	6	16	36	43	40	53	39	52	61	41	31	24	13	14	5	3	3	0
1	1	1	1	1	2	3	15	19	34	50	67	29	34	43	38	34	33	11	12	7	7	2	1	1

AM Peak 1145 - 1245 (225), AM PHF=0.80 PM Peak 1445 - 1545 (202), PM PHF=0.83

* Monday, 15 September 2008 - Total=3251, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
4	1	4	6	8	48	123	213	348	242	191	175	228	213	208	279	302	295	159	81	56	43	16	8	
2	0	1	0	2	2	21	33	67	92	40	46	53	52	50	47	67	81	51	19	24	14	3	3	3
1	0	1	1	3	10	24	55	87	50	46	34	54	50	39	71	76	81	46	23	9	16	5	2	1
0	1	0	2	2	13	22	52	93	44	50	37	58	58	49	82	81	69	24	20	14	8	6	1	1
1	0	2	3	1	23	56	73	101	56	55	58	63	53	70	79	78	64	38	19	9	5	2	2	1

AM Peak 0815 - 0915 (373), AM PHF=0.92 PM Peak 1630 - 1730 (321), PM PHF=0.99

* Tuesday, 16 September 2008 - Total=3478, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
6	2	4	10	10	47	131	209	349	267	228	198	209	229	202	290	324	329	186	89	85	33	28	13	
3	0	0	1	3	3	19	46	86	86	48	62	47	61	45	54	85	91	49	24	33	3	11	3	0
1	0	1	3	3	9	24	43	88	70	56	47	56	68	45	72	74	94	63	17	13	15	3	5	8
1	1	1	2	2	11	30	55	89	55	58	47	56	51	48	83	79	76	45	27	25	7	7	4	1
1	1	2	4	2	24	58	65	86	56	66	42	50	49	64	81	86	68	29	21	14	8	7	1	1

AM Peak 0800 - 0900 (349), AM PHF=0.98 PM Peak 1630 - 1730 (350), PM PHF=0.93

* Wednesday, 17 September 2008 - Total=3534, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
10	6	5	10	3	46	132	210	354	270	244	175	235	245	189	286	353	336	180	113	56	46	24	6	
0	4	1	2	1	1	22	34	97	85	59	36	41	69	45	70	85	110	55	29	18	13	7	3	4
8	2	0	2	0	9	17	54	72	73	62	37	47	57	46	71	88	91	49	26	16	15	4	2	1
1	0	1	2	1	13	28	44	116	60	61	40	72	53	47	71	88	68	45	34	11	4	6	0	1
1	0	3	4	1	23	65	78	69	52	62	62	75	66	51	74	92	67	31	24	11	14	7	1	2

AM Peak 0745 - 0845 (363), AM PHF=0.78 PM Peak 1630 - 1730 (381), PM PHF=0.87

* Thursday, 18 September 2008 - Total=3667, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
8	5	4	7	9	41	118	204	355	270	245	210	225	241	285	309	355	327	190	112	49	54	27	17	
4	2	3	0	0	3	20	52	78	88	47	60	56	74	76	68	96	84	62	34	15	19	8	7	3
1	0	0	3	1	9	21	51	87	57	70	51	62	53	73	81	99	84	39	23	12	16	8	3	2
1	2	0	1	4	10	23	37	90	69	66	42	54	58	67	76	81	84	46	28	11	9	7	3	3
2	1	1	3	4	19	54	64	100	56	62	57	53	56	69	84	79	75	43	27	11	10	4	4	1

AM Peak 0815 - 0915 (365), AM PHF=0.91 PM Peak 1545 - 1645 (360), PM PHF=0.91

* Friday, 19 September 2008 - Total=3712, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
9	6	7	4	11	39	127	225	360	250	226	254	232	274	265	334	353	280	191	87	60	58	45	15	
3	0	1	0	3	4	21	36	71	65	51	68	41	63	56	78	92	71	65	29	15	11	15	6	8
2	1	2	0	1	8	25	55	95	48	59	64	58	77	80	74	81	78	44	21	12	14	12	3	7
3	3	3	3	3	7	25	71	93	66	66	58	52	64	58	95	94	73	47	18	22	21	9	3	2
1	2	1	1	4	20	56	63	101	71	50	64	81	70	71	87	86	58	35	19	11	12	9	3	4

AM Peak 0800 - 0900 (360), AM PHF=0.89 PM Peak 1530 - 1630 (355), PM PHF=0.93

* Saturday, 20 September 2008 - Total=2556, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
21	10	6	6	5	21	48	102	165	214	251	234	215	204	203	179	153	162	101	91	55	47	48	15	
8	4	2	0	1	2	6	16	32	50	58	48	49	54	46	44	39	37	37	25	13	12	11	6	3
7	4	1	2	2	6	10	23	39	51	64	65	53	46	53	53	39	52	22	24	18	10	10	3	4
2	2	1	2	2	5	12	29	37	47	57	63	58	50	51	42	35	32	26	18	11	12	12	4	3
4	0	2	2	0	8	20	34	57	66	72	58	55	54	53	40	40	41	16	24	13	13	15	2	4

AM Peak 1000 - 1100 (251), AM PHF=0.87 PM Peak 1215 - 1315 (220), PM PHF=0.95

* Sunday, 21 September 2008 - Total=2497, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
14	8	8	5	1	5	25	47	102	159	203	207	260	235	222	239	238	187	130	74	64	31	22	11	
3	6	4	2	0	2	6	10	24	38	41	58	61	47	59	68	69	55	43	20	13	10	11	2	1
4	0	1	2	0	2	6	8	27	32	42	44	64	54	52	60	61	41	36	30	18	5	4	3	1
3	2	1	1	0	0	4	12	27	42	53	48	67	58	49	59	57	52	33	16	18	11	3	3	0
4	0	2	0	1	1	9	17	24	47	67	57	68	76	62	52	51	39	18	8	15	5	4	3	1

AM Peak 1145 - 1245 (249), AM PHF=0.93 PM Peak 1200 - 1300 (260), PM PHF=0.96

* Monday, 22 September 2008 - Total=3292, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	3	6	3	5	39	133	220	364	277	197	237	231	193	209	294	309	274	133	65	32	30	24	11	
1	1	4	0	2	5	24	33	64	96	45	55	48	49	44	53	85	85	50	25	13	8	6	4	2
1	0	1	1	1	8	23	43	97	66	44	57	63	42	38	70	82	57	29	18	10	5	8	3	2
0	1	0	0	2	10	28	61	95	63	50	65	54	53	59	86	77	73	29	10	4	7	4	1	0
1	1	1	2	0	16	58	83	108	52	58	60	66	49	68	85	65	59	25	12	5	10	6	3	1

AM Peak 0815 - 0915 (396), AM PHF=0.92 PM Peak 1530 - 1630 (338), PM PHF=0.98

* Tuesday, 23 September 2008 - Total=3364, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	5	4	10	5	49	132	175	350	253	222	214	214	207	227	314	329	287	149	87	49	42	23	12	
2	3	0	0	1	7	21	38	68	79	52	52	42	51	51	84	92	84	45	32	16	12	9	6	2
2	0	3	6	0	13	20	33	82	68	54	42	62	43	43	72	80	82	54	22	13	8	4	2	1
0	1	0	2	3	13	37	40	96	52	49	62	54	56	65	93	89	61	29	18	14	12	4	3	3
1	1	1	2	1	16	54	64	104	54	67	58	56	57	68	65	68	60	21	15	6	10	6	1	1

AM Peak 0815 - 0915 (361), AM PHF=0.87 PM Peak 1530 - 1630 (330), PM PHF=0.89

* Wednesday, 24 September 2008 - Total=3614, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
7	5	6	7	8	54	120	236	315	249	204	228	238	240	250	315	352	327	170	106	79	52	35	11	
2	2	0	0	2	5	17	48	63	61	50	45	64	79	64	82	94	81	59	36	25	13	10	5	2
1	0	3	1	0	13	17	53	78	61	38	56	69	53	63	70	80	93	53	28	18	13	12	4	1
3	2	1	3	3	11	26	62	85	59	58	56	47	52	63	93	90	69	38	29	22	11	6	1	0
1	1	2	3	3	25	60	73	89	68	58	71	58	56	60	70	88	84	20	13	14	15	7	1	3

AM Peak 0800 - 0900 (315), AM PHF=0.88 PM Peak 1600 - 1700 (352), PM PHF=0.94

* Thursday, 25 September 2008 - Total=3506, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
6	3	5	5	7	49	122	193	379	254	203	195	204	225	230	334	342	302	182	117	79	29	29	12	
2	1	2	2	2	6	15	44	69	85	48	48	44	60	57	70	93	101	68	37	26	8	9	5	4
1	0	0	1	0	9	22	52	98	60	53	58	67	54	59	88	81	68	39	33	18	8	8	5	5
0	1	3	1	2	10	20	40	100	53	45	51	48	66	51	98	86	66	42	30	18	9	5	1	0
3	1	0	1	3	24	65	57	112	56	57	38	45	45	63	78	82	67	33	17	17	4	7	1	0

AM Peak 0815 - 0915 (395), AM PHF=0.88 PM Peak 1515 - 1615 (357), PM PHF=0.91

* Friday, 26 September 2008 - Total=3815, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
9	8	3	5	6	47	138	237	352	288	264	249	227	275	265	340	316	275	186	115	97	42	46	25	
4	2	1	3	0	3	25	46	69	72	59	60	55	76	56	90	101	79	63	28	27	8	10	6	7
5	4	0	0	2	12	22	51	91	78	64	62	50	50	70	87	82	67	56	28	17	17	6	5	5
0	1	0	1	1	8	30	59	98	72	60	59	62	67	73	85	68	62	35	32	31	10	18	4	5
0	1	2	1	3	24	61	81	94	66	81	68	60	82	66	78	65	67	32	27	22	7	12	10	1

AM Peak 0815 - 0915 (355), AM PHF=0.91 PM Peak 1515 - 1615 (351), PM PHF=0.87

* Saturday, 27 September 2008 - Total=2572, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
18	12	8	10	5	12	52	99	153	186	265	252	239	184	188	175	187	158	130	74	42	50	43	30	
7	2	0	4	0	2	7	23	30	44	72	55	65	54	38	45	57	36	37	29	12	8	13	7	7
5	5	1	3	2	4	4	20	29	50	60	71	56	40	48	43	42	44	31	15	8	17	12	9	2
5	3	2	2	2	2	14	30	54	46	65	55	63	44	52	41	44	39	30	15	11	14	11	8	5
1	2	5	1	1	4	27	26	40	46	68	71	55	46	50	46	44	39	32	15	11	11	7	6	0

AM Peak 1000 - 1100 (265), AM PHF=0.92 PM Peak 1200 - 1300 (239), PM PHF=0.92

* Sunday, 28 September 2008 - Total=2193, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
14	11	1	6	7	8	25	54	94	137	164	227	199	194	209	199	189	159	119	77	31	35	18	16	
7	5	0	3	3	1	1	6	16	35	34	64	55	39	54	56	54	37	44	24	9	11	6	6	1
2	3	1	1	3	1	6	5	22	24	47	59	53	49	38	56	49	45	35	17	6	9	8	5	1
5	2	0	0	1	3	8	21	32	31	37	51	49	55	58	39	48	34	22	20	14	7	2	3	1
0	1	0	2	0	3	10	22	24	47	46	53	42	51	59	48	38	43	18	16	2	8	2	2	0

AM Peak 1100 - 1200 (227), AM PHF=0.89 PM Peak 1430 - 1530 (229), PM PHF=0.97

* Monday, 29 September 2008 - Total=3290, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	6	3	7	5	54	118	238	289	237	245	237	213	218	249	255	315	262	148	74	48	37	16	13	
1	2	1	0	1	3	21	52	63	57	51	58	51	58	59	59	73	74	46	28	11	13	8	2	1
1	2	1	2	0	8	19	51	79	61	63	61	44	62	65	59	89	71	47	16	12	13	4	5	1
1	0	0	2	1	14	20	63	74	59	77	63	47	50	72	71	76	70	29	21	9	6	2	3	1
0	2	1	3	3	29	58	72	73	60	54	55	71	48	53	66	77	47	26	9	16	5	2	3	1

AM Peak 0800 - 0900 (289), AM PHF=0.91 PM Peak 1615 - 1715 (316), PM PHF=0.89

* Tuesday, 30 September 2008 - Total=3533, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
4	5	4	6	9	48	149	209	310	253	250	243	230	215	266	293	316	306	185	103	51	49	21	8	
1	2	1	2	0	2	19	47	76	75	47	56	60	39	55	65	91	93	49	42	12	9	3	3	2
1	1	0	0	3	12	29	55	79	70	75	65	56	51	63	73	70	89	55	27	16	6	10	2	1
1	1	1	3	2	9	27	52	72	54	74	62	56	60	78	81	79	60	45	19	15	25	4	2	0
1	1	2	1	4	25	74	55	83	54	54	60	58	65	70	74	76	64	36	15	8	9	4	1	2

AM Peak 0800 - 0900 (310), AM PHF=0.93 PM Peak 1630 - 1730 (337), PM PHF=0.91

* Wednesday, 1 October 2008 - Total=3425, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	3	11	5	7	49	125	218	271	253	205	206	237	262	216	280	331	297	200	89	62	46	29	18	
2	1	2	1	3	4	14	46	70	85	56	45	67	71	50	65	77	100	73	22	20	13	10	5	3
1	0	2	0	0	8	23	58	68	63	57	58	47	74	47	66	88	72	46	16	13	9	4	5	0
0	1	3	2	2	8	32	54	63	57	43	51	57	58	53	93	84	70	46	26	15	18	5	4	1
2	1	4	2	2	29	56	60	70	48	49	52	66	59	66	56	82	55	35	25	14	6	10	4	1

AM Peak 0815 - 0915 (286), AM PHF=0.84 PM Peak 1615 - 1715 (354), PM PHF=0.89

* Thursday, 2 October 2008 - Total=3575, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	5	8	5	9	53	129	224	286	248	245	235	264	258	273	294	325	276	170	106	54	52	31	20	
3	1	2	0	1	4	18	56	58	67	58	53	72	66	63	69	73	80	57	29	17	10	12	5	3
0	2	3	1	3	10	13	54	75	71	62	57	67	67	53	70	73	75	45	31	12	15	4	6	2
1	1	2	0	2	15	34	49	70	56	66	54	63	61	69	77	81	69	35	23	10	16	9	5	3
1	1	1	4	3	24	64	65	83	54	59	71	62	64	88	78	98	52	33	23	15	11	6	4	2

AM Peak 0815 - 0915 (295), AM PHF=0.89 PM Peak 1630 - 1730 (334), PM PHF=0.85

* Friday, 3 October 2008 - Total=3436, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
10	11	5	4	11	50	104	177	267	262	266	246	259	282	233	278	283	237	165	87	86	57	32	24	
3	4	0	0	2	7	18	38	61	65	59	74	73	76	56	70	85	67	50	23	19	14	12	8	6
2	3	1	1	5	9	16	46	63	66	73	57	71	53	57	58	73	70	43	25	23	13	10	7	7
3	3	1	0	2	9	23	45	66	69	63	48	62	72	60	70	68	47	36	22	26	16	2	6	2
2	1	3	3	2	25	47	48	77	62	71	67	53	81	60	80	57	53	36	17	18	14	8	3	1

AM Peak 1015 - 1115 (281), AM PHF=0.95 PM Peak 1530 - 1630 (308), PM PHF=0.91

* Saturday, 4 October 2008 - Total=2339, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
16	8	13	4	8	15	41	83	165	209	216	230	196	179	165	174	159	143	96	74	46	46	28	25	
6	2	5	1	2	3	7	13	27	43	65	52	52	36	37	46	41	35	24	27	15	8	10	11	0
7	1	3	0	1	4	8	12	38	46	44	58	60	49	36	52	36	30	27	12	11	13	8	6	5
2	4	3	0	5	3	13	23	43	54	57	64	42	36	46	36	40	41	15	16	13	18	5	4	7
1	1	2	3	0	5	13	35	57	66	50	56	42	58	46	40	42	37	30	19	7	7	5	4	4

AM Peak 0945 - 1045 (232), AM PHF=0.88 PM Peak 1200 - 1300 (196), PM PHF=0.82

* Sunday, 5 October 2008 - Total=1693, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
16	5	7	8	5	14	15	44	91	120	155	179	176	144	130	167	111	72	73	75	37	21	19	9	
0	0	2	2	2	2	1	7	24	22	31	45	40	42	30	54	26	17	23	21	15	6	9	3	2
5	1	2	1	1	2	3	10	26	30	40	50	48	34	23	46	29	21	17	24	10	4	1	2	1
7	3	1	1	1	5	3	14	17	25	41	37	44	38	41	34	39	21	19	13	7	4	6	3	2
4	1	2	4	1	5	8	13	24	43	43	47	44	30	36	33	17	13	14	17	5	7	3	1	1

AM Peak 1030 - 1130 (179), AM PHF=0.90 PM Peak 1215 - 1315 (178), PM PHF=0.93

* Monday, 6 October 2008 - Total=2149, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
6	3	4	3	20	20	21	48	88	176	204	210	218	194	186	190	193	125	88	59	42	28	18	5	
2	1	1	1	3	3	6	5	21	38	48	51	57	44	54	59	57	28	31	24	13	8	11	0	1
1	1	1	0	4	1	7	9	18	37	43	53	70	51	45	46	47	27	22	13	12	6	6	2	2
2	0	0	1	8	10	4	17	20	44	60	54	42	56	38	43	46	38	20	8	10	7	1	2	2
1	1	2	1	5	6	4	17	29	57	53	52	49	43	49	42	43	32	15	14	7	7	0	1	0

AM Peak 1130 - 1230 (233), AM PHF=0.83 PM Peak 1200 - 1300 (218), PM PHF=0.78

* Tuesday, 7 October 2008 - Total=3625, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	6	3	8	42	101	220	268	222	279	270	271	285	237	299	290	333	185	114	75	54	26	20	12	
1	0	1	2	6	20	46	55	56	63	61	71	83	54	75	82	108	63	38	21	17	7	6	5	2
2	2	1	1	7	19	50	66	58	53	60	79	72	52	66	63	76	46	37	11	13	9	6	2	0
2	1	0	2	9	26	51	66	51	79	70	51	69	71	78	81	85	39	18	26	15	4	5	3	3
0	3	1	3	20	36	73	81	57	84	79	70	61	60	80	64	64	37	21	17	9	6	3	2	3

AM Peak 1030 - 1130 (299), AM PHF=0.95 PM Peak 1545 - 1645 (333), PM PHF=0.77

* Wednesday, 8 October 2008 - Total=904 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
8	3	5	9	34	93	199	302	251	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	0	2	2	1	9	41	65	74	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	1	2	2	7	19	51	75	71	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	0	2	5	20	44	83	52	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	1	3	21	45	63	79	54	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix B

INTERSECTION SURVEYS

R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Client : T.T.P.A.
Job No/Name : 4578 ORANGE Leeds Pde
Day/Date : Friday 5th April 2013

	NORTH				NORTHEAST				EAST				SOUTH				WEST				
	Leeds Pde				*Bus Depot*				*Northern Distributor*				*Leeds Pde*				*Northern Distributor*				
Time Per	R	T	L	HL	HR	R	T	L	HR	R	T	L	HR	R	T	L	R	T	L	HL	TOT
1500 - 1515	2	7	4	0	0	1	1	0	0	1	39	5	14	5	6	25	23	32	0	0	**165**
1515 - 1530	5	9	2	1	0	1	0	1	0	1	48	15	7	0	8	47	35	45	0	1	**226**
1530 - 1545	5	7	4	0	0	0	1	0	1	0	55	10	9	0	5	60	50	38	1	0	**246**
1545 - 1600	5	9	7	0	0	1	1	0	0	1	23	8	12	3	6	77	32	41	1	7	**234**
1600 - 1615	9	8	2	0	0	1	0	0	0	1	50	9	8	3	3	78	50	55	5	5	**287**
1615 - 1630	7	10	2	0	0	2	1	1	0	2	50	10	8	0	3	55	45	32	5	3	**236**
1630 - 1645	5	7	2	1	0	2	1	1	0	0	50	10	11	0	2	57	32	57	2	3	**243**
1645 - 1700	5	6	0	0	0	2	3	1	0	0	73	9	9	5	7	77	36	61	2	5	**301**
1700 - 1715	14	17	7	0	0	5	2	2	0	0	94	23	2	3	1	82	30	45	2	2	**331**
1715 - 1730	5	10	3	0	0	3	2	1	0	0	43	7	1	0	0	65	41	39	2	0	**222**
1730 - 1745	7	2	1	0	0	3	5	0	0	0	53	5	3	1	5	64	25	27	2	0	**203**
1745 - 1800	5	7	1	0	0	2	0	0	1	0	47	3	6	5	3	41	28	47	0	1	**197**
Period End	**74**	**99**	**35**	**2**	0	23	17	7	2	6	625	114	90	25	49	728	**427**	**519**	**22**	**27**	**2891**

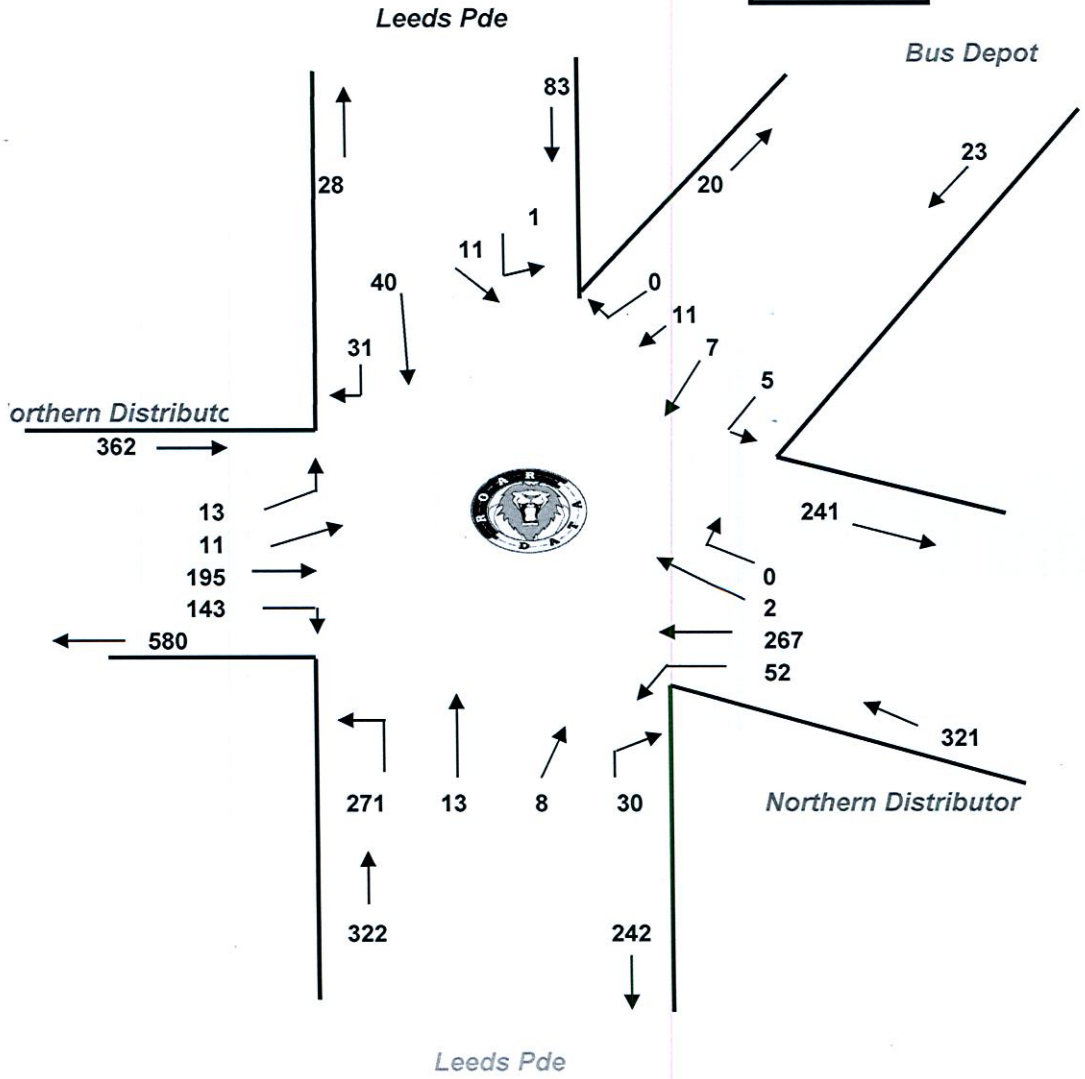
	NORTH				NORTHEAST				EAST				SOUTH				WEST				
	Leeds Pde				*Bus Depot*				*Northern Distributor*				*Leeds Pde*				*Northern Distributor*				
Peak Time	R	T	L	HL	HR	R	T	L	HR	R	T	L	HR	R	T	L	R	T	L	HL	TOT
1500 - 1600	17	32	17	1	0	3	3	1	1	3	165	38	42	8	25	209	140	156	2	8	**871**
1515 - 1615	24	33	15	1	0	3	2	1	1	3	176	42	36	6	22	262	167	179	7	13	**993**
1530 - 1630	26	34	15	0	0	4	3	1	1	4	178	37	37	6	17	270	177	166	12	15	**1003**
1545 - 1645	26	34	13	1	0	6	3	2	0	4	173	37	39	6	14	267	159	185	13	18	**1000**
1600 - 1700	26	31	6	1	0	7	5	3	0	3	223	38	36	8	15	267	163	205	14	16	**1067**
1615 - 1715	31	40	11	1	0	11	7	5	0	2	267	52	30	8	13	271	143	195	11	13	**1111**
1630 - 1730	29	40	12	1	0	12	8	5	0	0	260	49	23	8	10	281	139	202	8	10	**1097**
1645 - 1745	31	35	11	0	0	13	12	4	0	0	263	44	15	9	13	288	132	172	8	7	**1057**
1700 - 1800	31	36	12	0	0	13	9	3	1	0	237	38	12	9	9	252	124	158	6	3	**953**

PEAK HOUR	**31**	**40**	**11**	**1**	0	11	7	5	0	2	267	52	30	8	13	271	**143**	**195**	**11**	**13**	**1111**

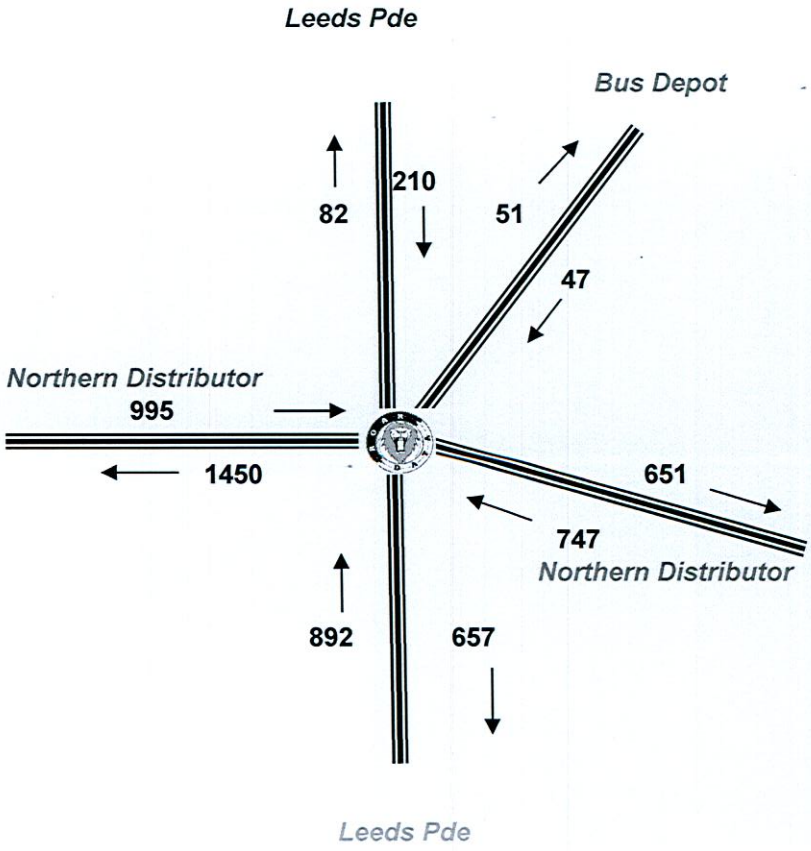
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : T.T.P.A.
Job No/Name : 4578 ORANGE Leeds Pde
Day/Date : Friday 5th April 2013

PEAK HOUR
1615 - 1715



TOTAL VOLUMES FOR PERIODS COUNTED



R.O.A.R. DATA

Reliable, Original & Authentic Results

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

Client : T.T.P.A.
Job No/Name : 4578 ORANGE Leeds Pde
Day/Date : Saturday 6th April 2013

	NORTH				NORTHEAST				EAST				SOUTH				WEST				
	Leeds Pde				*Bus Depot*				*Northern Distributor*				*Leeds Pde*				*Northern Distributor*				
Time Per	**R**	**T**	**L**	**HL**	**HR**	**R**	**T**	**L**	**HR**	**R**	**T**	**L**	**HR**	**R**	**T**	**L**	**R**	**T**	**L**	**HL**	**TOT**
1100 - 1115	3	5	0	0	0	1	0	1	0	0	28	4	3	0	2	33	33	31	1	3	**148**
1115 - 1130	2	2	0	0	0	1	0	2	0	1	26	3	1	2	2	36	33	34	0	1	**146**
1130 - 1145	2	4	0	0	0	1	0	2	1	0	20	0	4	0	1	41	25	29	2	0	**132**
1145 - 1200	1	2	0	0	0	2	0	0	0	0	32	3	5	0	0	46	18	24	0	0	**133**
1200 - 1215	0	1	1	0	0	0	0	0	0	0	30	3	8	1	3	36	45	42	0	2	**172**
1215 - 1230	0	2	0	0	0	0	0	0	0	0	32	3	5	0	4	55	30	41	2	1	**175**
1230 - 1245	1	4	1	0	0	0	2	0	0	0	33	3	1	0	0	53	32	34	0	0	**164**
1245 - 1300	1	3	0	0	0	1	0	0	0	1	18	2	2	0	2	46	38	20	0	0	**134**
1300 - 1315	1	1	1	0	0	1	3	0	0	0	30	3	2	2	2	51	29	28	2	2	**158**
1315 - 1330	3	3	0	0	0	2	1	1	0	0	35	3	5	1	3	36	27	29	0	0	**149**
1330 - 1345	0	3	0	0	0	1	0	1	0	0	30	3	0	0	2	55	32	37	1	3	**168**
1345 - 1400	0	3	0	0	0	0	0	0	0	0	48	4	4	3	1	34	30	30	1	2	**160**
Period End	**14**	**33**	**3**	**0**	**0**	**10**	**6**	**7**	**1**	**2**	**362**	**34**	**40**	**9**	**22**	**522**	**372**	**379**	**9**	**14**	**1839**

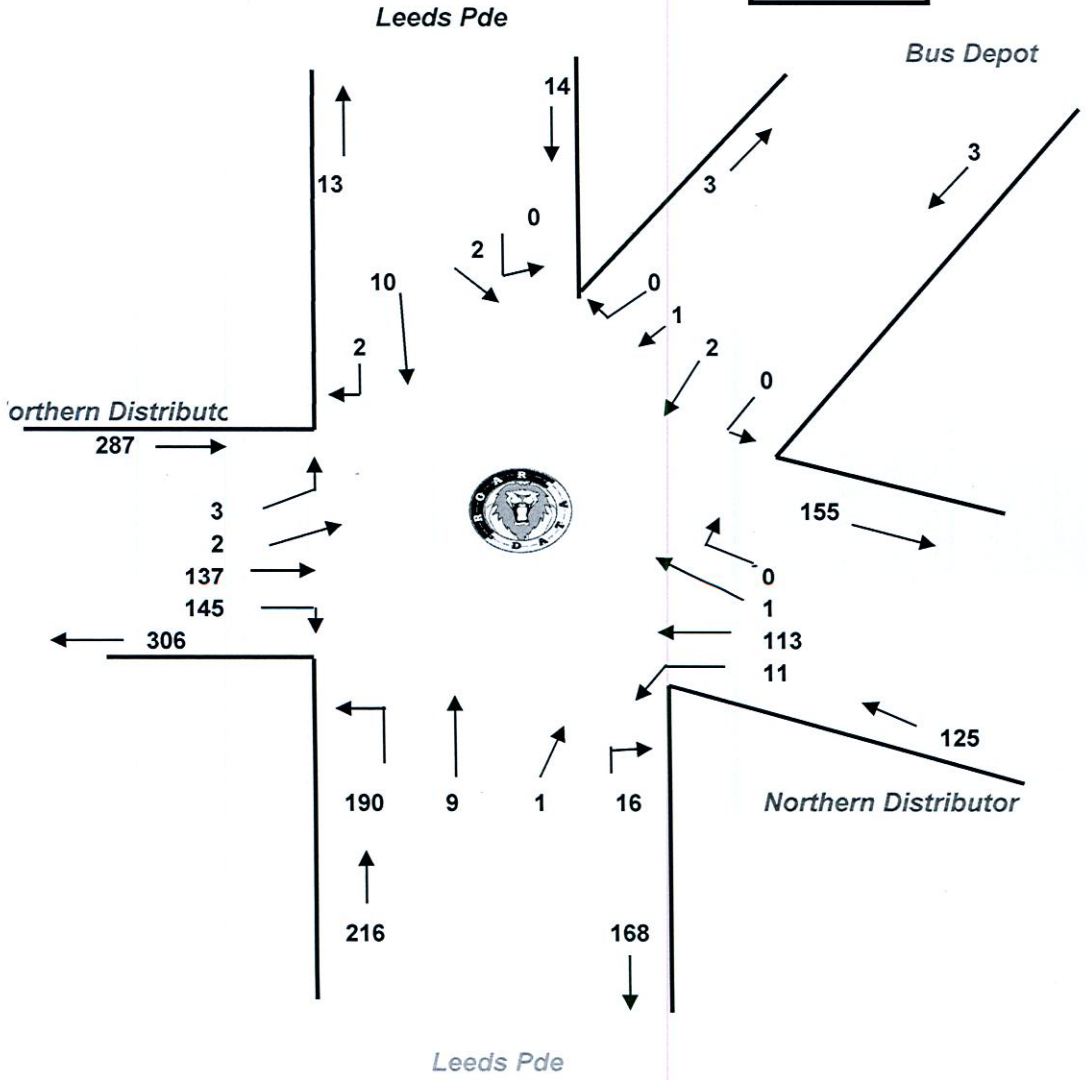
	NORTH				NORTHEAST				EAST				SOUTH				WEST				
	Leeds Pde				*Bus Depot*				*Northern Distributor*				*Leeds Pde*				*Northern Distributor*				
Peak Time	**R**	**T**	**L**	**HL**	**HR**	**R**	**T**	**L**	**HR**	**R**	**T**	**L**	**HR**	**R**	**T**	**L**	**R**	**T**	**L**	**HL**	**TOT**
1100 - 1200	8	13	0	0	0	5	0	5	1	1	106	10	13	2	5	156	109	118	3	4	**559**
1115 - 1215	5	9	1	0	0	4	0	4	1	1	108	9	18	3	6	159	121	129	2	3	**583**
1130 - 1230	3	9	1	0	0	3	0	2	1	0	114	9	22	1	8	178	118	136	4	3	**612**
1145 - 1245	2	9	2	0	0	2	2	0	0	0	127	12	19	1	7	190	125	141	2	3	**644**
1200 - 1300	2	10	2	0	0	1	2	0	0	1	113	11	16	1	9	190	145	137	2	3	**645**
1215 - 1315	3	10	2	0	0	2	5	0	0	1	113	11	10	2	8	205	129	123	4	3	**631**
1230 - 1330	6	11	2	0	0	4	6	1	0	1	116	11	10	3	7	186	126	111	2	2	**605**
1245 - 1345	5	10	1	0	0	5	4	2	0	1	113	11	9	3	9	188	126	114	3	5	**609**
1300 - 1400	4	10	1	0	0	4	4	2	0	0	143	13	11	6	8	176	118	124	4	7	**635**

PEAK HOUR	**2**	**10**	**2**	**0**	**0**	**1**	**2**	**0**	**0**	**1**	**113**	**11**	**16**	**1**	**9**	**190**	**145**	**137**	**2**	**3**	**645**

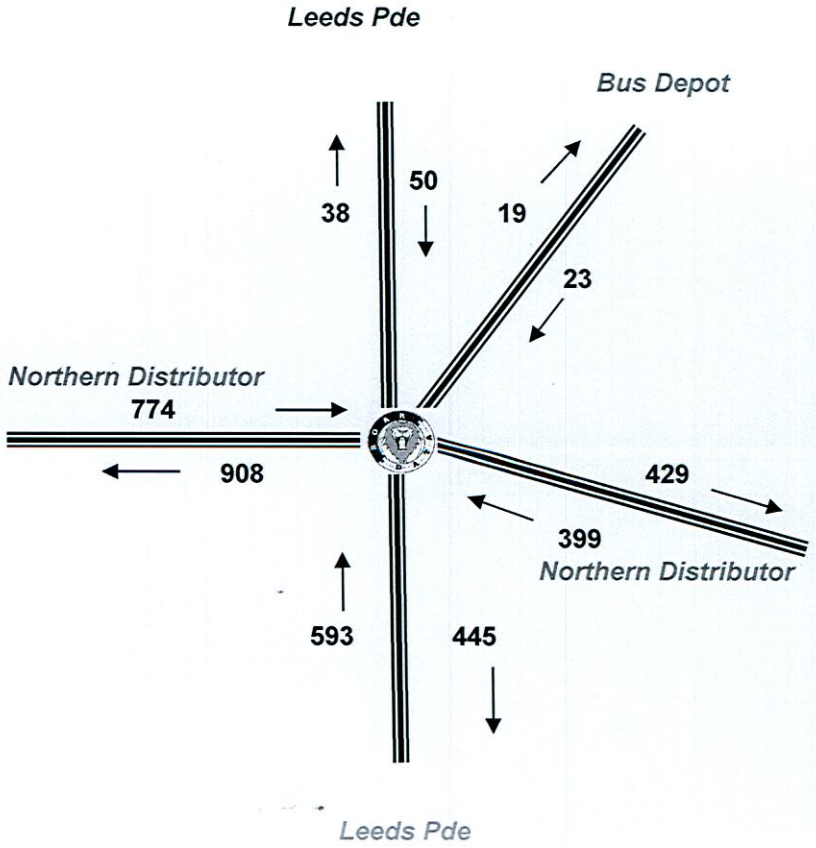
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : T.T.P.A.
Job No/Name : 4578 ORANGE Leeds Pde
Day/Date : Saturday 6th April 2013

PEAK HOUR
1200 - 1300



TOTAL VOLUMES FOR PERIODS COUNTED



Appendix C

SIDRA RESULTS

MOVEMENT SUMMARY

Site: Northern Distributor WD PM

Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leeds Pde											
1	L	311	5.0	0.256	7.3	LOS A	1.3	9.2	0.49	0.56	55.0
2	T	86	5.0	0.152	8.1	LOS A	0.6	4.9	0.49	0.61	54.4
3	R	40	25.0	0.152	17.3	LOS B	0.6	4.9	0.49	0.90	48.7
Approach		437	6.8	0.256	8.3	LOS A	1.3	9.2	0.49	0.60	54.2
South East: Northern Dist											
21	L	60	5.0	0.049	8.0	LOS A	0.2	1.1	0.30	0.54	54.9
22	T	303	5.0	0.157	6.9	LOS A	0.8	5.6	0.40	0.53	55.5
23	R	42	5.0	0.157	13.1	LOS A	0.8	5.6	0.40	0.81	51.5
Approach		405	5.0	0.157	7.7	LOS A	0.8	5.6	0.39	0.56	55.0
North East: Bus Depot											
24	L	13	100.0	0.072	16.8	LOS B	0.2	3.2	0.59	0.77	48.1
26	R	12	100.0	0.072	24.2	LOS B	0.2	3.2	0.59	0.92	45.1
Approach		24	100.0	0.072	20.4	LOS B	0.2	3.2	0.59	0.84	46.6
North: Leeds Pde											
7	L	29	8.4	0.063	7.9	LOS A	0.2	1.8	0.45	0.60	55.3
8	T	81	5.0	0.119	7.3	LOS A	0.5	3.6	0.44	0.55	54.8
9	R	88	5.0	0.119	16.2	LOS B	0.5	3.6	0.43	0.81	48.9
Approach		199	5.5	0.119	11.3	LOS A	0.5	3.6	0.44	0.67	51.9
North West: Northern Dist											
27	L	25	48.5	0.154	10.2	LOS A	0.7	5.2	0.33	0.64	54.9
28	T	233	5.0	0.195	6.7	LOS A	1.0	7.0	0.32	0.48	56.1
29	R	172	5.0	0.195	12.8	LOS A	1.0	7.0	0.31	0.72	51.0
Approach		429	7.6	0.195	9.3	LOS A	1.0	7.0	0.32	0.58	53.8
All Vehicles		1495	7.9	0.256	9.1	LOS A	1.3	9.2	0.41	0.60	53.8

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

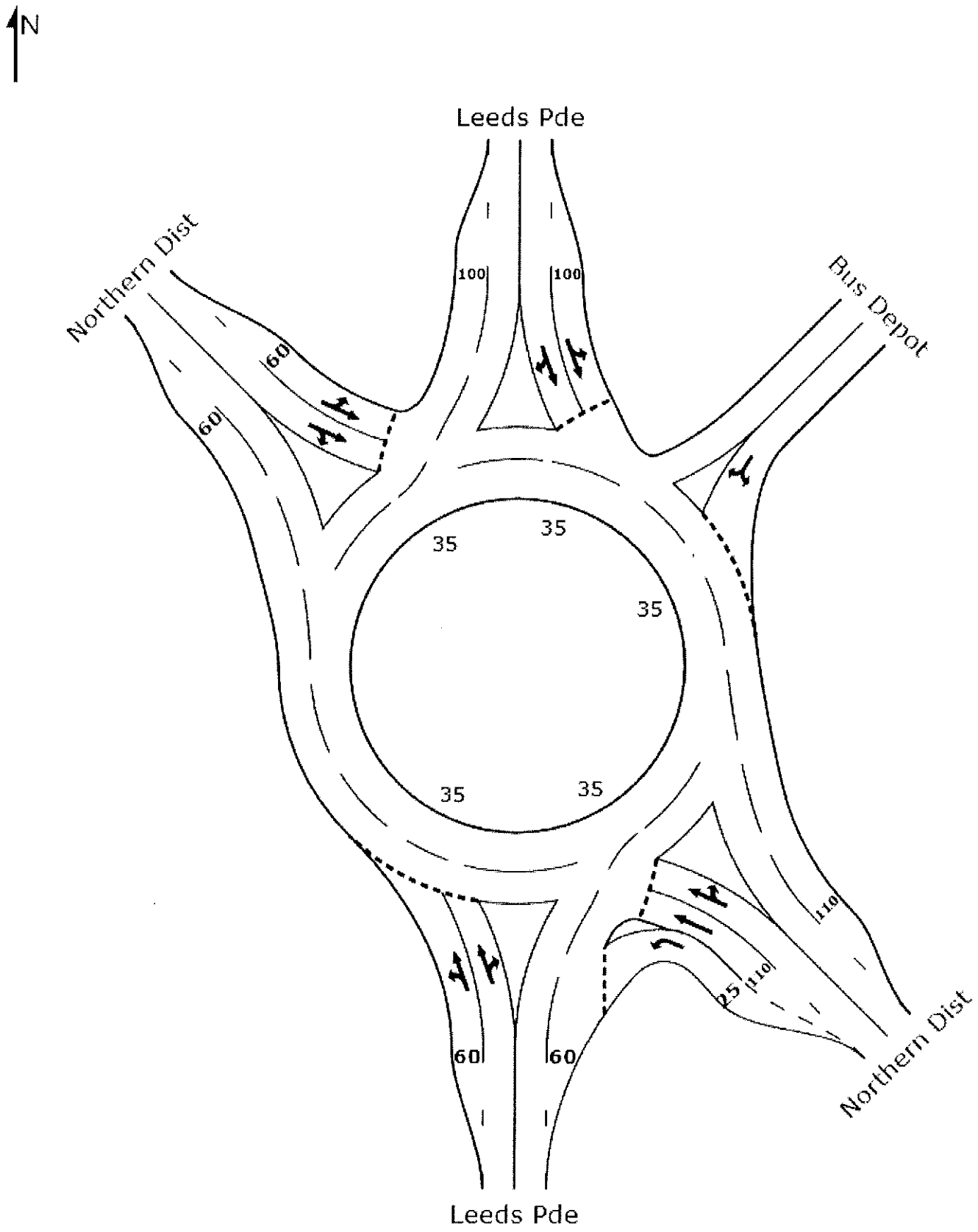
MOVEMENT SUMMARY

Site: Northern Distributor WE MD

Roundabout

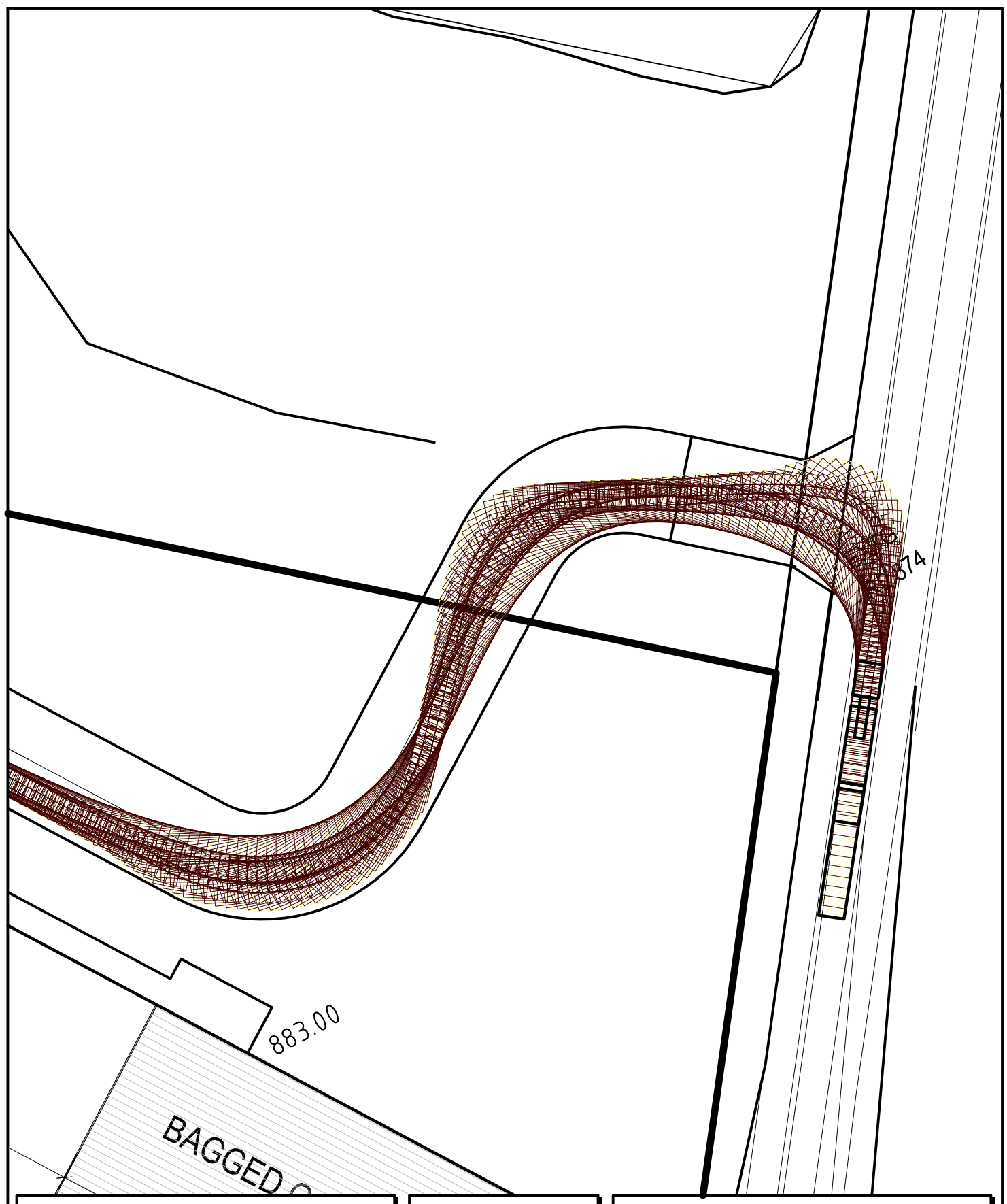
Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Leeds Pde											
1	L	199	5.0	0.155	6.9	LOS A	0.7	5.1	0.39	0.53	55.8
2	T	148	5.0	0.149	7.1	LOS A	0.7	4.8	0.41	0.55	55.5
3	R	18	10.6	0.149	16.2	LOS B	0.7	4.8	0.41	0.90	49.6
Approach		365	5.3	0.155	7.4	LOS A	0.7	5.1	0.40	0.56	55.3
South East: Northern Dist											
21	L	12	5.0	0.009	8.1	LOS A	0.0	0.2	0.33	0.53	54.7
22	T	111	5.0	0.091	7.2	LOS A	0.4	3.2	0.44	0.54	54.9
23	R	81	5.0	0.091	13.3	LOS A	0.4	3.2	0.44	0.74	50.7
Approach		203	5.0	0.091	9.6	LOS A	0.4	3.2	0.43	0.62	53.1
North East: Bus Depot											
24	L	2	100.0	0.010	16.3	LOS B	0.0	0.4	0.59	0.66	48.7
26	R	1	100.0	0.010	24.4	LOS B	0.0	0.4	0.59	0.85	45.4
Approach		3	100.0	0.010	19.0	LOS B	0.0	0.4	0.59	0.73	47.5
North: Leeds Pde											
7	L	51	5.0	0.101	7.4	LOS A	0.4	2.9	0.43	0.57	55.5
8	T	139	5.0	0.189	7.1	LOS A	0.8	6.2	0.43	0.54	54.9
9	R	141	5.0	0.189	16.1	LOS B	0.8	6.2	0.42	0.81	49.0
Approach		331	5.0	0.189	11.0	LOS A	0.8	6.2	0.43	0.66	52.1
North West: Northern Dist											
27	L	5	43.0	0.134	10.2	LOS A	0.6	4.4	0.37	0.67	54.8
28	T	180	5.0	0.169	6.9	LOS A	0.8	5.9	0.36	0.51	55.8
29	R	189	5.0	0.169	13.1	LOS A	0.8	5.9	0.36	0.70	50.5
Approach		375	5.5	0.169	10.1	LOS A	0.8	5.9	0.36	0.61	52.9
All Vehicles		1277	5.5	0.189	9.5	LOS A	0.8	6.2	0.40	0.61	53.3

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.


N
Leeds Pde
Northern Dist
Bus Depot
Northern Dist
Leeds Pde
100
100
60
60
35
35
35
35
60
60
110
110
25

Appendix D

TURNING PATH ASSESSMENT



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 25m ARTICULATED VEHICLE ENTERING THE SITE

SP 1

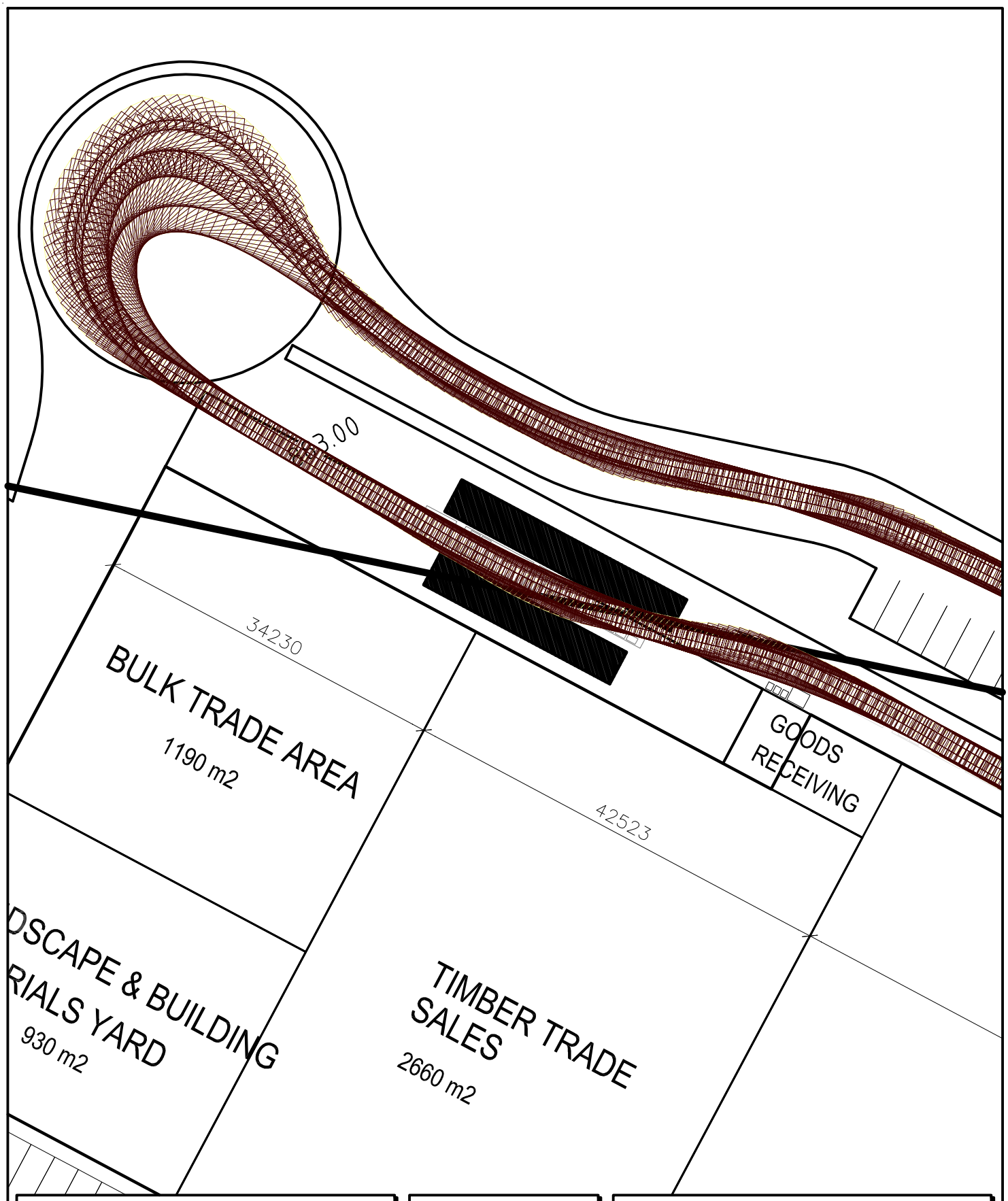
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 25m ARTICULATED VEHICLE

SP 2



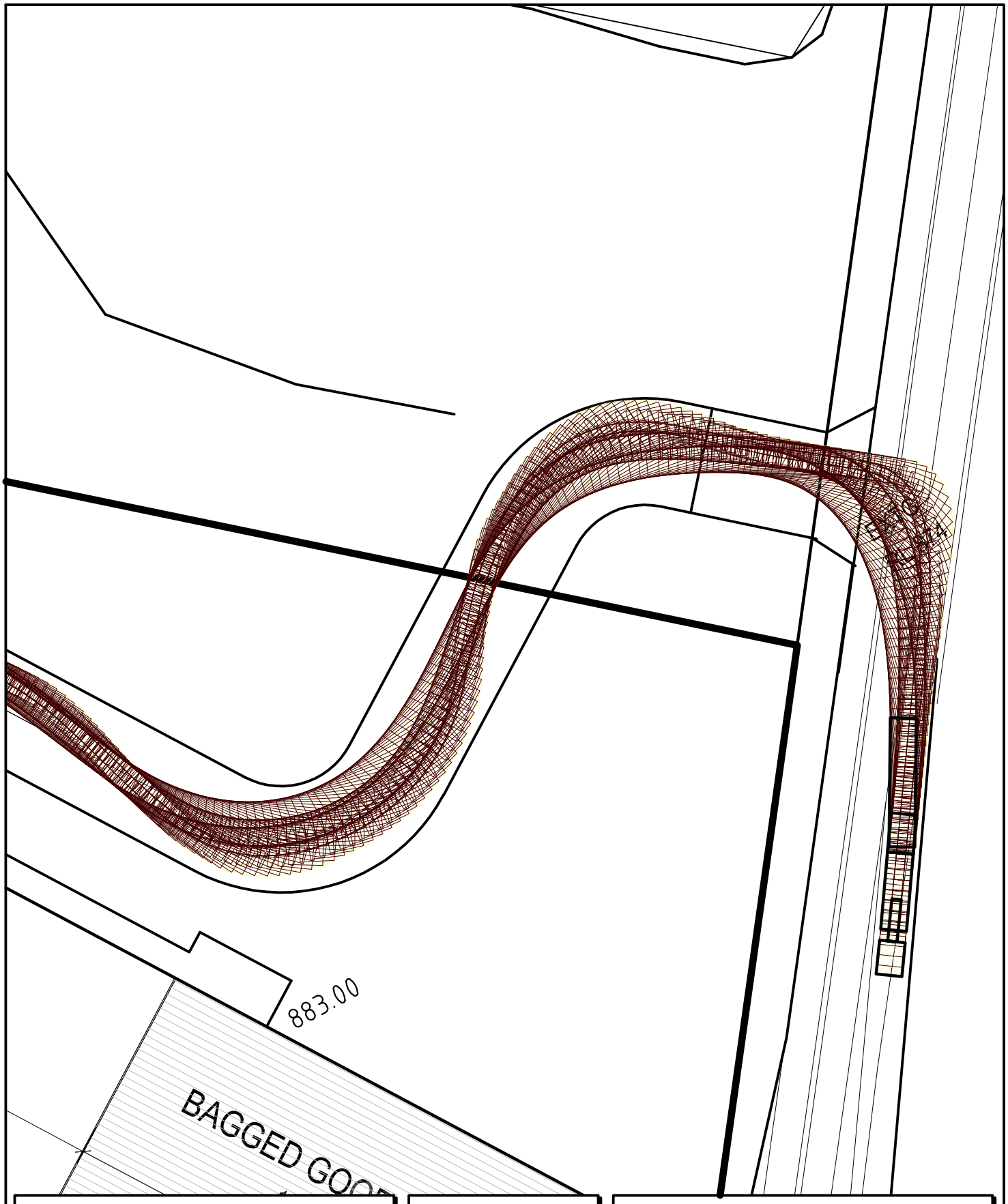
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 25m ARTICULATED VEHICLE

SP 3



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V9.21 in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF A 25m ARTICULATED VEHICLE EXITING THE SITE

SP 4

Appendix B

SIDRA ANALYSIS DATA

DETAILED OUTPUT

Site: WD PM (NDR/Leeds) - proposed +bunnings + service centre

New Site
Roundabout

OUTPUT TABLE LINKS

Roundabouts

Roundabout Basic Parameters
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

Intersection ID: 1
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width
m	m	m	m	deg			m
South: Leeds Parade south							
36.0	10.0	56.0	20.0	30.0	2	2	3.70
SouthEast: Northern Distributor east							
36.0	10.0	56.0	20.0	30.0	2	3	3.70
NorthEast: Hanrahan Pl							
36.0	10.0	56.0	20.0	30.0	2	1	3.70
North: Leeds Parade north							
36.0	10.0	56.0	20.0	30.0	2	2	3.70
NorthWest: Northern Distributor west							
36.0	10.0	56.0	20.0	30.0	2	2	3.70

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

Intersection ID: 1
Roundabout

Dest Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed km/h	In-Bunch Headway sec	Prop. Bunched
South: Leeds Parade south												

```
  NW  L1   1 Dominant       585  1.03   605    0.0    0.0    N     0.947    34.4    1.16    0.349
  N   T1   1 Dominant       585  1.03   605    0.0    0.0    N     0.947    34.4    1.16    0.349
  N   T1   2 Subdominant    585  1.03   605    0.0    0.0    N     0.947    34.4    1.16    0.349
  NE  R1   2 Subdominant    585  1.03   605    0.0    0.0    N     0.947    34.4    1.16    0.349
  SE  R3   2 Subdominant    585  1.03   605    0.0    0.0    N     0.947    34.4    1.16    0.349
-------------------------------------------------------------------------------------------------
SouthEast: Northern Distributor east
  S   L3   1 Excl. Slip     348  1.03   360    0.0    0.0    N     0.975    35.0    1.14    0.220
  NW  T1   2 Dominant       531  1.04   553    0.0    0.0    N     0.950    32.3    1.36    0.368
  NW  T1   3 Subdominant    531  1.04   553    0.0    0.0    N     0.950    32.3    1.36    0.368
  N   R1   3 Subdominant    531  1.04   553    0.0    0.0    N     0.950    32.3    1.36    0.368
  NE  R2   3 Subdominant    531  1.04   553    0.0    0.0    N     0.950    32.3    1.36    0.368
-------------------------------------------------------------------------------------------------
NorthEast: Hanrahan Pl
  SE  L2   1 Dominant       848  1.02   869    0.0    0.0    N     0.937    35.4    1.16    0.460
  S   L1   1 Dominant       848  1.02   869    0.0    0.0    N     0.937    35.4    1.16    0.460
  NW  R2   1 Dominant       848  1.02   869    0.0    0.0    N     0.937    35.4    1.16    0.460
  N   R3   1 Dominant       848  1.02   869    0.0    0.0    N     0.937    35.4    1.16    0.460
-------------------------------------------------------------------------------------------------
North: Leeds Parade north
  NE  L3   1 Dominant       587  1.04   611    0.0    0.0    N     0.936    33.5    1.10    0.335
  SE  L1   1 Dominant       587  1.04   611    0.0    0.0    N     0.936    33.5    1.10    0.335
  S   T1   1 Dominant       587  1.04   611    0.0    0.0    N     0.936    33.5    1.10    0.335
  S   T1   2 Subdominant    587  1.04   611    0.0    0.0    N     0.936    33.5    1.10    0.335
  NW  R3   2 Subdominant    587  1.04   611    0.0    0.0    N     0.936    33.5    1.10    0.335
-------------------------------------------------------------------------------------------------
NorthWest: Northern Distributor west
  N   L3   1 Dominant       470  1.03   486    0.0    0.0    N     0.948    35.3    1.54    0.365
  NE  L2   1 Dominant       470  1.03   486    0.0    0.0    N     0.948    35.3    1.54    0.365
  SE  T1   1 Dominant       470  1.03   486    0.0    0.0    N     0.948    35.3    1.54    0.365
  SE  T1   2 Subdominant    470  1.03   486    0.0    0.0    N     0.948    35.3    1.54    0.365
  S   R1   2 Subdominant    470  1.03   486    0.0    0.0    N     0.948    35.3    1.54    0.365
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: SIDRA Standard
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout

-------------------------------------------------------------------------
Dest  Turn  Lane  Lane                              Critical Gap
             No.  Type      In-Bunch  Priority  --------------  Follow-up
                            Headway   Sharing   Headway   Dist  Headway
                              sec                 sec       m     sec
-------------------------------------------------------------------------
South: Leeds Parade south
Environment Factor: 1.00
Entry/Circ. Flow Adjustment: Medium
  NW   L1    1 Dominant       1.16       N        3.38    32.3     2.13
  N    T1    1 Dominant       1.16       N        3.38    32.3     2.13
  N    T1    2 Subdominant    1.16       N        3.89    37.1     2.45
  NE   R1    2 Subdominant    1.16       N        4.15    39.6     2.61
  SE   R3    2 Subdominant    1.16       N        3.89    37.1     2.45
-------------------------------------------------------------------------
SouthEast: Northern Distributor east
Environment Factor: 1.00
Entry/Circ. Flow Adjustment: Medium
  S    L3    1 Excl. Slip     1.14       N        3.06    29.7     1.84
  NW   T1    2 Dominant       1.36       Y        2.84    25.4     1.77
  NW   T1    3 Subdominant    1.36       Y        3.56    31.9     2.22
  N    R1    3 Subdominant    1.36       Y        3.56    31.9     2.22
  NE   R2    3 Subdominant    1.36       Y        3.56    31.9     2.22
-------------------------------------------------------------------------
NorthEast: Hanrahan Pl
Environment Factor: 1.00
Entry/Circ. Flow Adjustment: Medium
  SE   L2    1 Dominant       1.16       N        5.38    52.9     3.52
  S    L1    1 Dominant       1.16       N        5.38    52.9     3.52
  NW   R2    1 Dominant       1.16       N        5.38    52.9     3.52
  N    R3    1 Dominant       1.16       N        5.38    52.9     3.52
-------------------------------------------------------------------------
North: Leeds Parade north
Environment Factor: 1.00
Entry/Circ. Flow Adjustment: Medium
  NE   L3    1 Dominant       1.10       N        3.41    31.8     2.15
  SE   L1    1 Dominant       1.10       N        3.38    31.4     2.13
  S    T1    1 Dominant       1.10       N        3.38    31.4     2.13
  S    T1    2 Subdominant    1.10       N        3.87    36.1     2.44
  NW   R3    2 Subdominant    1.10       N        3.87    36.1     2.44
-------------------------------------------------------------------------
NorthWest: Northern Distributor west
Environment Factor: 1.00
Entry/Circ. Flow Adjustment: Medium
  N    L3    1 Dominant       1.54       Y        3.52    34.5     2.17
  NE   L2    1 Dominant       1.54       Y        3.83    37.6     2.37
  SE   T1    1 Dominant       1.54       Y        3.52    34.5     2.17
```

```
  SE    T1    2 Subdominant    1.54       Y        3.98    39.0     2.46
  S     R1    2 Subdominant    1.54       Y        3.98    39.0     2.46
-------------------------------------------------------------------------
  Roundabout Capacity Model: SIDRA Standard
  Priority sharing means Follow-up Headway plus Intra-bunch Headway
  is larger than the Critical Gap.

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

Go to Table Links (Top)

Roundabout Flow Rates
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout


CIRCULATING LANE FLOW RATES

--------------------------------------
  Lane        Circulating Flow Rates
  No.         veh/h   pcu/h   Percent
--------------------------------------
  South: Leeds Parade south
  1            230     236     39.0%
  2            355     370     61.0%
  Total        585     606
--------------------------------------
  SouthEast: Northern Distributor east
  1            133     137     24.7%
  2            398     417     75.3%
  Total        531     554
--------------------------------------
  NorthEast: Hanrahan Pl
  1            336     344     39.6%
  2            512     525     60.4%
  Total        848     869
--------------------------------------
  North: Leeds Parade north
  1            328     345     56.5%
  2            259     266     43.5%
  Total        587     611
--------------------------------------
  NorthWest: Northern Distributor west
  1             61      62     12.8%
  2            409     424     87.2%
  Total        470     486
--------------------------------------


APPROACH LANE FLOW RATES

--------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
--------------------------------------
  South: Leeds Parade south
  1           299       61      360
  2             0      292      292
  Total       299      353      652
--------------------------------------
  SouthEast: Northern Distributor east
  1            57        0       57
  2             0      230      230
  3             0      172      172
  Total        57      402      459
--------------------------------------
  NorthEast: Hanrahan Pl
  1             5       19       24
  Total         5       19       24
--------------------------------------
  North: Leeds Parade north
  1            49      209      258
  2             0      215      215
  Total        49      424      473
--------------------------------------
  NorthWest: Northern Distributor west
  1           111      186      297
  2             0      259      259
  Total       111      445      556
--------------------------------------


EXITING LANE FLOW RATES

----------------------------------
  Lane        Exiting Flow Rates
```

No.	veh/h	pcu/h	Percent
SouthEast: Northern Distributor east			
1	140	147	40.9%
2	208	213	59.1%
Total	348	360	

Go to Table Links (Top)

Movements

Intersection Negotiation Data
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

Intersection ID: 1
Roundabout

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius m	Negn Speed km/h	Negn Dist. m	Appr. Dist. m	Downstream m	Distance User Spec?
South: Leeds Parade south								
	NorthWest	L1	68.6	41.9	39.9	500	177	No
	North	T1	68.6	41.9	53.2	500	197	No
	NorthEast	R1	22.0	27.2	69.1	500	303	No
	SouthEast	R3	22.0	27.2	103.7	500	234	No
SouthEast: Northern Distributor east								
	South	L3	33.0	31.7	11.0	500	181	No
	NorthWest	T1	68.6	41.9	53.2	500	213	No
	North	R1	22.0	27.2	69.1	500	216	No
	NorthEast	R2	22.0	27.2	86.4	500	232	No
NorthEast: Hanrahan Pl								
	SouthEast	L2	46.6	36.2	21.6	500	1088	No
	South	L1	68.6	41.9	39.9	500	1209	No
	NorthWest	R2	22.0	27.2	86.4	500	972	No
	North	R3	22.0	27.2	103.7	500	989	No
North: Leeds Parade north								
	NorthEast	L3	30.6	30.8	11.0	500	168	No
	SouthEast	L1	68.6	41.9	39.9	500	185	No
	South	T1	68.6	41.9	53.2	500	217	No
	NorthWest	R3	22.0	27.2	103.7	500	254	No
NorthWest: Northern Distributor west								
	North	L3	30.6	30.8	11.0	500	165	No
	NorthEast	L2	42.9	35.0	21.7	500	335	No
	SouthEast	T1	68.6	41.9	53.2	500	211	No
	South	R1	22.0	27.2	69.1	500	214	No

Maximum Negotiation (Design) Speed = 50.0 km/h

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay sec
South: Leeds Parade south										
1a	L1	60.0	41.9	41.9	60.0	20.8		49.6	49.6	4.7
2	T1	60.0	41.9	41.9	60.0	20.0		48.3	48.1	4.7
3a	R1	60.0	27.2	27.2	60.0	19.7		47.9	47.7	14.7
3b	R3	60.0	27.2	27.2	60.0	19.7		47.9	47.7	14.2
SouthEast: Northern Distributor east										
21b	L3	60.0	31.7	31.7	60.0	27.1		49.3	49.3	7.3
22	T1	60.0	41.9	41.9	60.0	23.2		49.4	49.4	4.7
23a	R1	60.0	27.2	27.2	60.0	21.4		46.7	46.7	11.7
23	R2	60.0	27.2	27.2	60.0	21.4		46.7	46.7	12.9
NorthEast: Hanrahan Pl										
24	L2	60.0	36.2	36.2	60.0	20.1		42.2	42.2	23.4
24a	L1	60.0	41.9	41.9	60.0	20.1		42.2	42.2	18.2

```
 26  R2      60.0  27.2   27.2  60.0    20.1            42.2    42.2    32.2
26b  R3      60.0  27.2   27.2  60.0    20.1            42.2    42.2    33.4
--------------------------------------------------------------------------------
 North: Leeds Parade north
 7b  L3      60.0  30.8   30.8  60.0    20.7            49.4    49.4     8.0
 7a  L1      60.0  41.9   41.9  60.0    20.7            49.4    49.4     4.7
  8  T1      60.0  41.9   41.9  60.0    20.4            48.1    48.1     4.7
 9b  R3      60.0  27.2   27.2  60.0    19.5            45.0    45.0    14.2
--------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
27b  L3      60.0  30.8   30.8  60.0    23.0            48.8    48.8     7.5
 27  L2      60.0  35.0   35.0  60.0    23.0            48.8    48.8     9.9
 28  T1      60.0  41.9   41.9  60.0    22.4            47.9    47.9     4.7
29a  R1      60.0  27.2   27.2  60.0    21.7            46.9    46.9    11.7
--------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout


MOVEMENT CAPACITY PARAMETERS

----------------------------------------------------------------
 Mov Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID       Cl.  Arv           Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow          Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp     %      x
----------------------------------------------------------------
South: Leeds Parade south
 1a  L1   #     299    585    605     907   0.85    158  0.330*
  2  T1   #     259   1170   1211     785   0.85    158  0.330*
 3a  R1   #      56    585    605     170   0.85    158  0.330*
 3b  R3   #      38    585    605     115   0.85    158  0.330*
----------------------------------------------------------------
SouthEast: Northern Distributor east
21b  L3   #      57    348    360    1541   0.85   2198  0.037
 22  T1   #     286   1062   1107    1758   0.85    422  0.163
23a  R1   #      68    531    553     418   0.85    422  0.163
 23  R2   #      48    531    553     295   0.85    422  0.163
----------------------------------------------------------------
NorthEast: Hanrahan Pl
 24  L2   LV      0      0     0   0.000  0.000      0  0.85   ****   0.000
 24  L2   HV      5     88     0   0.000  0.000     88  0.85   1403   0.057
24a  L1   LV      0      0     0   0.000  0.000      0  0.85   ****   0.000
24a  L1   HV      7    124     0   0.000  0.000    124  0.85   1403   0.057
 26  R2   LV      0      0     0   0.000  0.000      0  0.85   ****   0.000
 26  R2   HV     11    194     0   0.000  0.000    194  0.85   1403   0.057
26b  R3   LV      0      0     0   0.000  0.000      0  0.85   ****   0.000
26b  R3   HV      1     18     0   0.000  0.000     18  0.85   1403   0.057
----------------------------------------------------------------
North: Leeds Parade north
 7b  L3   #      49    587    611     204   0.85    254  0.240
 7a  L1   #      76    587    611     317   0.85    254  0.240
  8  T1   #     177   1174   1222     738   0.85    254  0.240
 9b  R3   #     171    587    611     713   0.85    254  0.240
----------------------------------------------------------------
NorthWest: Northern Distributor west
27b  L3   #     111    470    486     410   0.85    214  0.271
 27  L2   #      59    470    486     218   0.85    214  0.271
 28  T1   #     222    940    972     820   0.85    214  0.271
29a  R1   #     164    470    486     606   0.85    214  0.271
----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

--------------------------------------------------------------------------------
 Mov Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID       Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-km/h)(veh-h/h) (km/h)
--------------------------------------------------------------------------------
South: Leeds Parade south
 1a  L1    0.03    0.03     6.6   1.08   324.3 11.92    378.1     7.6     49.6
  2  T1    0.03    0.03     9.5   1.35   350.4 11.20    335.9     7.0     48.1
 3a  R1    0.05    0.06    10.4   1.43    80.3  4.81     73.2     1.5     47.7
 3b  R3    0.01    0.01    10.4   1.43    54.5  4.09     49.7     1.0     47.7
--------------------------------------------------------------------------------
SouthEast: Northern Distributor east
21b  L3    0.01    0.01     8.0   1.10    62.9  2.07     72.5     1.5     49.3
 22  T1    0.02    0.03     7.0   1.05   299.2 10.05    366.8     7.4     49.4
23a  R1    0.01    0.02    11.5   1.43    97.1  3.82     91.4     2.0     46.7
 23  R2    0.01    0.01    11.5   1.43    68.5  3.10     64.5     1.4     46.7
```

```
-------------------------------------------------------------------------------
NorthEast: Hanrahan Pl
 24  L2    0.04    0.05    32.2   1.50     7.5  0.55     15.4     0.4     42.2
24a  L1    0.05    0.06    32.2   1.50    10.5  0.68     21.6     0.5     42.2
 26  R2    0.12    0.14    32.2   1.50    16.5  1.06     34.0     0.8     42.2
26b  R3    0.01    0.01    32.2   1.50     1.5  0.25      3.1     0.1     42.2
-------------------------------------------------------------------------------
North: Leeds Parade north
 7b  L3    0.01    0.01     7.1   1.13    55.6  3.48     62.1     1.3     49.4
 7a  L1    0.01    0.01     7.1   1.13    86.2  4.23     96.3     2.0     49.4
  8  T1    0.02    0.02     8.9   1.25   221.3  7.57    230.2     4.8     48.1
 9b  R3    0.04    0.05    14.5   1.60   274.3  8.88    239.6     5.3     45.0
-------------------------------------------------------------------------------
NorthWest: Northern Distributor west
27b  L3    0.01    0.02     8.6   1.24   137.9  6.05    141.0     2.9     48.8
 27  L2    0.04    0.05     8.6   1.24    73.3  4.39     74.9     1.5     48.8
 28  T1    0.02    0.02     9.7   1.33   296.2  9.58    287.7     6.0     47.9
29a  R1    0.03    0.04    11.3   1.46   238.9  8.50    218.1     4.7     46.9
-------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn       Cost     Fuel     CO2      CO       HC       NOX
 ID              Total    Total    Total    Total    Total    Total
                 $/h        L/h    kg/h     kg/h     kg/h     kg/h
-----------------------------------------------------------------
South: Leeds Parade south
 1a  L1          143.24   13.0     30.8     0.09    0.010    0.089
  2  T1          137.57   13.5     32.1     0.09    0.010    0.110
 3a  R1           30.64    3.1      7.3     0.02    0.002    0.026
 3b  R3           20.79    2.1      5.0     0.01    0.001    0.018
               ----------------------------------------------------
                 332.24   31.7     75.1     0.21    0.024    0.242
-----------------------------------------------------------------
SouthEast: Northern Distributor east
21b  L3           27.57    2.5      5.9     0.02    0.002    0.017
 22  T1          138.80   12.6     29.7     0.09    0.010    0.085
23a  R1           36.00    3.1      7.4     0.02    0.003    0.021
 23  R2           25.41    2.2      5.3     0.02    0.002    0.015
               ----------------------------------------------------
                 227.78   20.4     48.3     0.14    0.016    0.137
-----------------------------------------------------------------
NorthEast: Hanrahan Pl
 24  L2            9.33    2.0      5.2     0.01    0.001    0.030
24a  L1           13.06    2.7      7.2     0.01    0.001    0.042
 26  R2           20.52    4.3     11.4     0.02    0.001    0.066
26b  R3            1.87    0.4      1.0     0.00    0.000    0.006
               ----------------------------------------------------
                  44.78    9.4     24.8     0.03    0.003    0.143
-----------------------------------------------------------------
North: Leeds Parade north
 7b  L3           23.86    2.2      5.2     0.01    0.002    0.016
 7a  L1           37.01    3.4      8.1     0.02    0.003    0.024
  8  T1           89.65    8.1     19.2     0.05    0.006    0.056
 9b  R3           96.80    8.3     19.5     0.06    0.007    0.053
               ----------------------------------------------------
                 247.32   22.0     52.1     0.15    0.018    0.149
-----------------------------------------------------------------
NorthWest: Northern Distributor west
27b  L3           59.73    6.3     15.0     0.04    0.004    0.057
 27  L2           31.75    3.4      8.0     0.02    0.002    0.030
 28  T1          118.06   11.6     27.5     0.07    0.008    0.094
29a  R1           85.83    7.5     17.8     0.05    0.006    0.050
               ----------------------------------------------------
                 295.37   28.8     68.3     0.18    0.021    0.230
-----------------------------------------------------------------
 INTERSECTION:  1136.12  112.3    268.4     0.71    0.082    0.901
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn       Cost     Fuel      CO2      CO       HC       NOX
 ID              Rate     Rate     Rate     Rate     Rate     Rate
                 $/km    L/100km  g/km     g/km     g/km     g/km
-----------------------------------------------------------------
South: Leeds Parade south
 1a  L1            0.38     3.4     81.4     0.23    0.027    0.236
  2  T1            0.41     4.0     95.5     0.25    0.029    0.326
```

```
 3a  R1            0.42    4.2    99.7    0.26   0.030   0.353
 3b  R3            0.42    4.2    99.7    0.26   0.030   0.353
                ------------------------------------------------
                   0.40    3.8    89.8    0.25   0.028   0.289
---------------------------------------------------------------
SouthEast: Northern Distributor east
21b  L3            0.38    3.5    81.6    0.23   0.027   0.236
 22  T1            0.38    3.4    80.9    0.23   0.027   0.232
23a  R1            0.39    3.4    81.4    0.24   0.029   0.225
 23  R2            0.39    3.4    81.4    0.24   0.029   0.225
                ------------------------------------------------
                   0.38    3.4    81.1    0.23   0.028   0.231
---------------------------------------------------------------
NorthEast: Hanrahan Pl
 24  L2            0.60   12.7   335.0    0.45   0.036   1.930
24a  L1            0.60   12.7   335.0    0.45   0.036   1.930
 26  R2            0.60   12.7   335.0    0.45   0.036   1.930
26b  R3            0.60   12.7   335.0    0.45   0.036   1.930
                ------------------------------------------------
                   0.60   12.7   335.0    0.45   0.036   1.930
---------------------------------------------------------------
North: Leeds Parade north
 7b  L3            0.38    3.6    84.1    0.24   0.028   0.253
 7a  L1            0.38    3.6    84.1    0.24   0.028   0.253
  8  T1            0.39    3.5    83.4    0.24   0.028   0.244
 9b  R3            0.40    3.5    81.6    0.24   0.029   0.220
                ------------------------------------------------
                   0.39    3.5    82.9    0.24   0.028   0.237
---------------------------------------------------------------
NorthWest: Northern Distributor west
27b  L3            0.42    4.5   106.6    0.27   0.030   0.403
 27  L2            0.42    4.5   106.6    0.27   0.030   0.403
 28  T1            0.41    4.0    95.6    0.25   0.029   0.326
29a  R1            0.39    3.5    81.6    0.24   0.028   0.227
                ------------------------------------------------
                   0.41    4.0    94.7    0.25   0.029   0.319
---------------------------------------------------------------
 INTERSECTION:     0.66    6.6   156.6    0.42   0.048   0.526
---------------------------------------------------------------
```

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Lanes

Lane Performance and Capacity Information
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout


LANE PERFORMANCE

-----------------------------------------------------------------
                                          Q u e u e
          Flow   Cap  Deg.  Aver.  Eff.    95% Back      Lane
 Lane              Satn  Delay  Stop  ------------   Length
 No.      veh/h veh/h   x    sec   Rate    veh     m       m
-----------------------------------------------------------------
 South: Leeds Parade south
 1         360  1091 0.330    6.6  0.54    1.7   12.4     60.0
 2         292   887 0.330   10.4  0.72    1.6   12.1    500.0
-----------------------------------------------------------------
 SouthEast: Northern Distributor east
 1          57  1541 0.037    8.0  0.55    0.2    1.2     20.0
 2         230  1414 0.163    5.9  0.48    0.8    6.1    120.0
 3         172  1057 0.163   11.5  0.71    0.8    5.7    500.0
-----------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1          24   424 0.057   32.2  0.75    0.2    2.7    190.0
-----------------------------------------------------------------
 North: Leeds Parade north
 1         258  1076 0.240    7.1  0.57    1.2    8.5    100.0
 2         215   895 0.240   14.5  0.80    1.1    8.2    500.0
-----------------------------------------------------------------
 NorthWest: Northern Distributor west
 1         297  1097 0.271    8.6  0.62    1.5   11.0     60.0
 2         259   958 0.271   11.3  0.73    1.4   10.3    500.0
-----------------------------------------------------------------


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
        (veh/h)  veh/h veh/h    x     %
----------------------------------------
```

```
 South: Leeds Parade south
 1        360     150  1091  0.330  100
 2        292     150   887  0.330  100
----------------------------------------
 SouthEast: Northern Distributor east
 1         57      57  1541  0.037  100
 2        230     150  1414  0.163  100
 3        172     150  1057  0.163  100
----------------------------------------
 NorthEast: Hanrahan Pl
 1         24      24   424  0.057  100
----------------------------------------
 North: Leeds Parade north
 1        258     150  1076  0.240  100
 2        215     150   895  0.240  100
----------------------------------------
 NorthWest: Northern Distributor west
 1        297     150  1097  0.271  100
 2        259     150   958  0.271  100
----------------------------------------

  The capacity value for priority and continuous movements is obtained by
  adjusting the basic saturation flow for heavy vehicle and turning vehicle
  effects.  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane Delays
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout


LANE DELAYS

------------------------------------------------------------------------------
                        ----------------  Delay (seconds/veh)  ----------------
         Deg.  Prog.    Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  Factor   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x            d1    d2   dSL   dn    dq   dqm    di    dig   dic
------------------------------------------------------------------------------
 South: Leeds Parade south
 1      0.330  1.000    1.9   0.0   1.9   4.0   0.0   0.0   0.0   4.7    6.6
 2      0.330  1.000    2.5   0.0   2.5   3.5   0.2   0.0   0.2   7.9   10.4
------------------------------------------------------------------------------
 SouthEast: Northern Distributor east
 1      0.037  1.000    0.6   0.0   0.6   2.1   0.0   0.0   0.0   7.3    8.0
 2      0.163  1.000    1.2   0.0   1.2   3.5   0.0   0.0   0.0   4.7    5.9
 3      0.163  1.000    1.7   0.0   1.7   2.6   0.0   0.0   0.0   9.8   11.5
------------------------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1      0.057  1.000    5.9   0.0   5.9  12.3   0.0   0.0   0.0  26.3   32.2
------------------------------------------------------------------------------
 North: Leeds Parade north
 1      0.240  1.000    1.7   0.0   1.7   3.7   0.0   0.0   0.0   5.3    7.1
 2      0.240  1.000    2.2   0.0   2.2   2.7   0.0   0.0   0.0  12.3   14.5
------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
 1      0.271  1.000    1.8   0.0   1.8   3.5   0.0   0.0   0.0   6.8    8.6
 2      0.271  1.000    2.1   0.0   2.1   2.9   0.0   0.0   0.0   9.2   11.3
------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay


LANE DELAY PERCENTILES

---------------------------------------------------------------
        Deg.                 Percentile Delay
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
---------------------------------------------------------------
 South: Leeds Parade south
 1     0.330    6.6    6.9    7.5    7.8    8.1    8.4    8.6
 2     0.330   10.4   10.8   11.6   12.0   12.4   12.8   13.0
---------------------------------------------------------------
 SouthEast: Northern Distributor east
 1     0.037    8.0    8.1    8.3    8.4    8.5    8.6    8.6
 2     0.163    5.9    6.1    6.5    6.6    6.8    7.0    7.1
 3     0.163   11.5   11.8   12.4   12.6   12.9   13.2   13.3
---------------------------------------------------------------
```

```
 NorthEast: Hanrahan Pl
 1     0.057   32.2   33.3   35.0   35.9   36.9   37.7   38.3
-----------------------------------------------------------------
 North: Leeds Parade north
 1     0.240    7.1    7.4    7.9    8.2    8.5    8.7    8.9
 2     0.240   14.5   14.9   15.6   15.9   16.3   16.6   16.8
-----------------------------------------------------------------
 NorthWest: Northern Distributor west
 1     0.271    8.6    8.9    9.4    9.7   10.0   10.2   10.4
 2     0.271   11.3   11.7   12.3   12.6   13.0   13.2   13.5
-----------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queues
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout


LANE QUEUES (VEHICLES)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.     Back of Queue (veh)      Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   -------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade south
 1     0.330  1.000    0.0     0.7    0.0    0.7    1.7   0.08    0.0  100.0    0.2     0.3
 2     0.330  1.000    0.0     0.7    0.0    0.7    1.6   0.01    0.0  100.0    0.2     0.4
-------------------------------------------------------------------------------------------------
 SouthEast: Northern Distributor east
 1     0.037  1.000    0.0     0.1    0.0    0.1    0.2   0.02    0.0  100.0    0.0     0.0
 2     0.163  1.000    0.0     0.3    0.0    0.3    0.8   0.02    0.0  100.0    0.1     0.1
 3     0.163  1.000    0.0     0.3    0.0    0.3    0.8   0.00    0.0  100.0    0.1     0.2
-------------------------------------------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1     0.057  1.000    0.0     0.1    0.0    0.1    0.2   0.01    0.0  100.0    0.0     0.1
-------------------------------------------------------------------------------------------------
 North: Leeds Parade north
 1     0.240  1.000    0.0     0.5    0.0    0.5    1.2   0.03    0.0  100.0    0.1     0.2
 2     0.240  1.000    0.0     0.5    0.0    0.5    1.1   0.01    0.0  100.0    0.1     0.2
-------------------------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
 1     0.271  1.000    0.0     0.6    0.0    0.6    1.5   0.07    0.0  100.0    0.1     0.3
 2     0.271  1.000    0.0     0.6    0.0    0.6    1.4   0.01    0.0  100.0    0.2     0.3
-------------------------------------------------------------------------------------------------



LANE QUEUES (DISTANCE)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.     Back of Queue (m)        Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   -------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade south
 1     0.330  1.000    0.0     5.0    0.0    5.0   12.4   0.08    0.0  100.0    1.4     2.5
 2     0.330  1.000    0.0     4.9    0.0    4.9   12.1   0.01    0.0  100.0    1.5     2.8
-------------------------------------------------------------------------------------------------
 SouthEast: Northern Distributor east
 1     0.037  1.000    0.0     0.5    0.0    0.5    1.2   0.02    0.0  100.0    0.1     0.1
 2     0.163  1.000    0.0     2.4    0.0    2.4    6.1   0.02    0.0  100.0    0.6     1.0
 3     0.163  1.000    0.0     2.3    0.0    2.3    5.7   0.00    0.0  100.0    0.6     1.1
-------------------------------------------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1     0.057  1.000    0.0     1.1    0.0    1.1    2.7   0.01    0.0  100.0    0.5     0.9
-------------------------------------------------------------------------------------------------
 North: Leeds Parade north
 1     0.240  1.000    0.0     3.4    0.0    3.4    8.5   0.03    0.0  100.0    0.9     1.7
 2     0.240  1.000    0.0     3.3    0.0    3.3    8.2   0.01    0.0  100.0    1.0     1.8
-------------------------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
 1     0.271  1.000    0.0     4.4    0.0    4.4   11.0   0.07    0.0  100.0    1.1     2.0
 2     0.271  1.000    0.0     4.2    0.0    4.2   10.3   0.01    0.0  100.0    1.1     2.0
-------------------------------------------------------------------------------------------------
```

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Lane Queue Percentiles
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout
```

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
South: Leeds Parade south								
1	0.330	0.7	0.9	1.2	1.4	1.7	1.9	2.0
2	0.330	0.7	0.8	1.2	1.4	1.6	1.8	1.9
SouthEast: Northern Distributor east								
1	0.037	0.1	0.1	0.1	0.1	0.2	0.2	0.2
2	0.163	0.3	0.4	0.6	0.7	0.8	0.9	1.0
3	0.163	0.3	0.4	0.6	0.7	0.8	0.9	0.9
NorthEast: Hanrahan Pl								
1	0.057	0.1	0.1	0.2	0.2	0.2	0.2	0.2
North: Leeds Parade north								
1	0.240	0.5	0.6	0.9	1.0	1.2	1.3	1.4
2	0.240	0.4	0.6	0.8	1.0	1.1	1.2	1.3
NorthWest: Northern Distributor west								
1	0.271	0.6	0.8	1.1	1.2	1.5	1.6	1.7
2	0.271	0.6	0.7	1.0	1.2	1.4	1.6	1.7

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (metres) 50%	70%	85%	90%	95%	98%	100%
South: Leeds Parade south								
1	0.330	5.0	6.4	9.1	10.5	12.4	13.7	14.7
2	0.330	4.9	6.3	8.9	10.3	12.1	13.4	14.4
SouthEast: Northern Distributor east								
1	0.037	0.5	0.6	0.9	1.0	1.2	1.3	1.4
2	0.163	2.4	3.2	4.5	5.2	6.1	6.8	7.3
3	0.163	2.3	2.9	4.2	4.8	5.7	6.3	6.8
NorthEast: Hanrahan Pl								
1	0.057	1.1	1.4	2.0	2.3	2.7	3.0	3.2
North: Leeds Parade north								
1	0.240	3.4	4.4	6.3	7.2	8.5	9.5	10.2
2	0.240	3.3	4.3	6.0	6.9	8.2	9.1	9.7
NorthWest: Northern Distributor west								
1	0.271	4.4	5.7	8.1	9.4	11.0	12.2	13.1
2	0.271	4.2	5.4	7.6	8.8	10.3	11.5	12.3

Go to Table Links (Top)

Lane Stops
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

Intersection ID: 1
Roundabout

Lane No.	Deg. Satn x	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Queue Total Stops H	Total Move-up Rate hqm	Queue Move-ups Hqm	Prop. Queued pq
South: Leeds Parade south										
1	0.330	1.000	0.39	0.00	0.15	0.54	195.1	0.00	0.0	0.58
2	0.330	1.000	0.50	0.00	0.22	0.72	209.7	0.00	0.0	0.60
SouthEast: Northern Distributor east										
1	0.037	1.000	0.21	0.00	0.34	0.55	31.5	0.00	0.0	0.36
2	0.163	1.000	0.29	0.00	0.18	0.48	109.6	0.00	0.0	0.50
3	0.163	1.000	0.41	0.00	0.30	0.71	122.8	0.00	0.0	0.53
NorthEast: Hanrahan Pl										
1	0.057	1.000	0.50	0.00	0.25	0.75	17.9	0.00	0.0	0.62
North: Leeds Parade north										
1	0.240	1.000	0.38	0.00	0.19	0.57	146.5	0.00	0.0	0.56
2	0.240	1.000	0.51	0.00	0.29	0.80	172.2	0.00	0.0	0.58
NorthWest: Northern Distributor west										

```
 1     0.271  1.000   0.41  0.00  0.21   0.62    184.3    0.00     0.0   0.56
 2     0.271  1.000   0.46  0.00  0.27   0.73    188.9    0.00     0.0   0.57
-------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout


TOTAL FLOW RATES (ALL MOVEMENT CLASSES)

-----------------------------------------------------------------
 From SOUTH To:                NW      N       NE      SE
 Turn:                         L1      T1      R1      R3     TOT
 Flow Rate                  299.0   259.0    56.0    38.0   652.0
 %HV (all designations)       5.0     5.0    19.0     5.0     6.2
-----------------------------------------------------------------
 From SOUTHEAST To:             S       NW      N       NE
 Turn:                         L3      T1      R1      R2     TOT
 Flow Rate                  57.0   286.0    68.0    48.0   459.0
 %HV (all designations)       5.0     5.0     5.0     5.0     5.0
-----------------------------------------------------------------
 From NORTHEAST To:            SE      S       NW      N
 Turn:                         L2      L1      R2      R3     TOT
 Flow Rate                   5.0     7.0    11.0     1.0    24.0
 %HV (all designations)    100.0   100.0   100.0   100.0   100.0
-----------------------------------------------------------------
 From NORTH To:                NE      SE      S       NW
 Turn:                         L3      L1      T1      R3     TOT
 Flow Rate                  49.0    76.0   177.0   171.0   473.0
 %HV (all designations)       7.0     5.0     5.0     5.0     5.2
-----------------------------------------------------------------
 From NORTHWEST To:            N       NE      SE      S
 Turn:                         L3      L2      T1      R1     TOT
 Flow Rate                  111.0    59.0   222.0   164.0   556.0
 %HV (all designations)       5.0    23.0     5.0     5.0     6.9
-----------------------------------------------------------------
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout


FLOW RATES FOR Light Vehicles

-------------------------------------------------------------
 From SOUTH To:          NW      N       NE      SE
 Turn:                   L1      T1      R1      R3     TOT
-------------------------------------------------------------
 Flow Rate - Veh      284.0   246.1    45.4    36.1   611.6
 Mov Class %           95.0    95.0    81.0    95.0    93.8
 Flow Scale - Fixed    1.00    1.00    1.00    1.00
 Flow Scale - Var      1.00    1.00    1.00    1.00
 Peak Flow Factor      1.00    1.00    1.00    1.00
-------------------------------------------------------------
 From SOUTHEAST To:      S       NW      N       NE
 Turn:                   L3      T1      R1      R2     TOT
-------------------------------------------------------------
 Flow Rate - Veh       54.2   271.7    64.6    45.6   436.1
 Mov Class %           95.0    95.0    95.0    95.0    95.0
 Flow Scale - Fixed    1.00    1.00    1.00    1.00
 Flow Scale - Var      1.00    1.00    1.00    1.00
 Peak Flow Factor      1.00    1.00    1.00    1.00
-------------------------------------------------------------
 From NORTHEAST To:      SE      S       NW      N
 Turn:                   L2      L1      R2      R3     TOT
-------------------------------------------------------------
 Flow Rate - Veh        0.0     0.0     0.0     0.0     0.0
 Mov Class %            0.0     0.0     0.0     0.0     0.0
 Flow Scale - Fixed    1.00    1.00    1.00    1.00
 Flow Scale - Var      1.00    1.00    1.00    1.00
 Peak Flow Factor      1.00    1.00    1.00    1.00
-------------------------------------------------------------
 From NORTH To:          NE      SE      S       NW
 Turn:                   L3      L1      T1      R3     TOT
```

Flow Rate - Veh	45.6	72.2	168.1	162.4	448.4
Mov Class %	93.0	95.0	95.0	95.0	94.8
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From NORTHWEST To:	N	NE	SE	S	
Turn:	L3	L2	T1	R1	TOT
Flow Rate - Veh	105.4	45.4	210.9	155.8	517.6
Mov Class %	95.0	77.0	95.0	95.0	93.1
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

FLOW RATES FOR Heavy Vehicles

From SOUTH To:	NW	N	NE	SE	
Turn:	L1	T1	R1	R3	TOT
Flow Rate - Veh	14.9	12.9	10.6	1.9	40.4
Mov Class %	5.0	5.0	19.0	5.0	6.2
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From SOUTHEAST To:	S	NW	N	NE	
Turn:	L3	T1	R1	R2	TOT
Flow Rate - Veh	2.8	14.3	3.4	2.4	23.0
Mov Class %	5.0	5.0	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From NORTHEAST To:	SE	S	NW	N	
Turn:	L2	L1	R2	R3	TOT
Flow Rate - Veh	5.0	7.0	11.0	1.0	24.0
Mov Class %	100.0	100.0	100.0	100.0	100.0
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From NORTH To:	NE	SE	S	NW	
Turn:	L3	L1	T1	R3	TOT
Flow Rate - Veh	3.4	3.8	8.9	8.6	24.6
Mov Class %	7.0	5.0	5.0	5.0	5.2
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From NORTHWEST To:	N	NE	SE	S	
Turn:	L3	L2	T1	R1	TOT
Flow Rate - Veh	5.6	13.6	11.1	8.2	38.4
Mov Class %	5.0	23.0	5.0	5.0	6.9
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

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Lane Flow Rates
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

Intersection ID: 1
Roundabout

LANE FLOW RATES AT STOP LINE

From SOUTH To:	NW	N	NE	SE	
Turn:	L1	T1	R1	R3	TOT
Lane 1					
LV	284.0	57.6	*	*	341.7
HV	14.9	3.0	*	*	18.0
Total	299.0	60.6	*	*	359.6
Lane 2					
LV	*	188.4	45.4	36.1	269.9
HV	*	9.9	10.6	1.9	22.5
Total	*	198.4	56.0	38.0	292.4

Approach	299.0	259.0	56.0	38.0	652.0

From SOUTHEAST To:	S	NW	N	NE	
Turn:	L3	T1	R1	R2	TOT
Lane 1					
LV	54.2	*	*	*	54.2
HV	2.8	*	*	*	2.8
Total	57.0	*	*	*	57.0
Lane 2					
LV	*	218.5	*	*	218.5
HV	*	11.5	*	*	11.5
Total	*	230.1	*	*	230.1
Lane 3					
LV	*	53.2	64.6	45.6	163.4
HV	*	2.8	3.4	2.4	8.6
Total	*	55.9	68.0	48.0	171.9
Approach	57.0	286.0	68.0	48.0	459.0

From NORTHEAST To:	SE	S	NW	N	
Turn:	L2	L1	R2	R3	TOT
Lane 1					
HV	5.0	7.0	11.0	1.0	24.0
Total	5.0	7.0	11.0	1.0	24.0
Approach	5.0	7.0	11.0	1.0	24.0

From NORTH To:	NE	SE	S	NW	
Turn:	L3	L1	T1	R3	TOT
Lane 1					
LV	45.6	72.2	126.6	*	244.4
HV	3.4	3.8	6.7	*	13.9
Total	49.0	76.0	133.3	*	258.3
Lane 2					
LV	*	*	41.5	162.4	204.0
HV	*	*	2.2	8.6	10.7
Total	*	*	43.7	171.0	214.7
Approach	49.0	76.0	177.0	171.0	473.0

From NORTHWEST To:	N	NE	SE	S	
Turn:	L3	L2	T1	R1	TOT
Lane 1					
LV	105.4	45.4	120.4	*	271.3
HV	5.6	13.6	6.3	*	25.5
Total	111.0	59.0	126.7	*	296.7
Lane 2					
LV	*	*	90.5	155.8	246.3
HV	*	*	4.8	8.2	13.0
Total	*	*	95.3	164.0	259.3
Approach	111.0	59.0	222.0	164.0	556.0

* Movement not allocated to the lane

EXIT LANE FLOW RATES

Movement Class:	LV	HV
Exit: SOUTH		
Lane: 1	180.8	16.5
Lane: 2	197.3	10.4
Total	378.1	26.9
Exit: SOUTHEAST		
Lane: 1	192.6	15.1
Lane: 2	126.6	6.7
Total	319.2	21.8
Exit: NORTHEAST		
Lane: 1	182.0	30.0
Total	182.0	30.0
Exit: NORTH		
Lane: 1	163.1	8.6
Lane: 2	253.0	14.3
Total	416.1	22.9
Exit: NORTHWEST		
Lane: 1	502.6	26.5
Lane: 2	215.6	22.3
Total	718.2	48.8

* Movement not allocated to the lane

```
DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

---------------------------------
Movement Class:       LV      HV
---------------------------------
 Exit: SOUTH
Lane:  1           180.8    16.5
Lane:  2           197.3    10.4
Total              378.1    26.9
---------------------------------
 Exit: SOUTHEAST
Lane:  1           192.6    15.1
Lane:  2           126.6     6.7
Total              319.2    21.8
---------------------------------
 Exit: NORTHEAST
Lane:  1           182.0    30.0
Total              182.0    30.0
---------------------------------
 Exit: NORTH
Lane:  1           163.1     8.6
Lane:  2           253.0    14.3
Total              416.1    22.9
---------------------------------
 Exit: NORTHWEST
Lane:  1           502.6    26.5
Lane:  2           215.6    22.3
Total              718.2    48.8
---------------------------------
  *  Movement not allocated to the lane

Unit Time for Volumes =  60 minutes
Peak Flow Period =  30 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Go to Table Links (Top)

Other

Model Settings Summary
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

```
Intersection ID: 1
Roundabout

* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the left-hand side of the road
  Input data specified in Metric units
  Model Defaults: New South Wales
  Peak Flow Period (for performance): 30 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  SIDRA Standard Queue model used
  Level of Service based on: Delay (RTA NSW)
  Queue percentile: 95%
```

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Diagnostics
Site:WD PM (NDR/Leeds) - proposed +bunnings + service centre

Go to Table Links (Top)

DETAILED OUTPUT
Site: WD PM (NDR/Leeds) - existing

New Site
Roundabout

OUTPUT TABLE LINKS

Roundabouts

Roundabout Basic Parameters
Site:WD PM (NDR/Leeds) - existing

Intersection ID: 1
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width
m	m	m	m	deg			m
South: Leeds Parade south							
36.0	10.0	56.0	20.0	30.0	2	2	3.70
SouthEast: Northern Distributor east							
36.0	10.0	56.0	20.0	30.0	2	3	3.70
NorthEast: Hanrahan Pl							
36.0	10.0	56.0	20.0	30.0	2	1	3.70
North: Leeds Parade north							
36.0	10.0	56.0	20.0	30.0	2	2	3.70
NorthWest: Northern Distributor west							
36.0	10.0	56.0	20.0	30.0	2	2	3.70

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site:WD PM (NDR/Leeds) - existing

Intersection ID: 1
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed km/h	In-Bunch Headway sec	Prop. Bunched
South: Leeds Parade south													
NW	L1	1	Dominant	313	1.04	327	0.0	0.0	N	0.979	39.7	1.04	0.187

N	T1	2 Subdominant	313	1.04	327	0.0	0.0	N	0.979	39.7	1.04	0.187
NE	R1	2 Subdominant	313	1.04	327	0.0	0.0	N	0.979	39.7	1.04	0.187
SE	R3	2 Subdominant	313	1.04	327	0.0	0.0	N	0.979	39.7	1.04	0.187
SouthEast: Northern Distributor east												
S	L3	1 Excl. Slip	190	1.04	198	0.0	0.0	N	0.993	30.8	1.40	0.155
NW	T1	2 Dominant	233	1.06	248	0.0	0.0	N	0.993	30.2	1.53	0.205
NW	T1	3 Subdominant	233	1.06	248	0.0	0.0	N	0.993	30.2	1.53	0.205
N	R1	3 Subdominant	233	1.06	248	0.0	0.0	N	0.993	30.2	1.53	0.205
NE	R2	3 Subdominant	233	1.06	248	0.0	0.0	N	0.993	30.2	1.53	0.205
NorthEast: Hanrahan Pl												
SE	L2	1 Dominant	450	1.03	461	0.0	0.0	N	0.985	35.2	1.06	0.257
S	L1	1 Dominant	450	1.03	461	0.0	0.0	N	0.985	35.2	1.06	0.257
NW	R2	1 Dominant	450	1.03	461	0.0	0.0	N	0.985	35.2	1.06	0.257
N	R3	1 Dominant	450	1.03	461	0.0	0.0	N	0.985	35.2	1.06	0.257
North: Leeds Parade north												
NE	L3	1 Dominant	388	1.05	407	0.0	0.0	N	0.985	34.8	1.09	0.237
SE	L1	1 Dominant	388	1.05	407	0.0	0.0	N	0.985	34.8	1.09	0.237
S	T1	1 Dominant	388	1.05	407	0.0	0.0	N	0.985	34.8	1.09	0.237
S	T1	2 Subdominant	388	1.05	407	0.0	0.0	N	0.985	34.8	1.09	0.237
NW	R3	2 Subdominant	388	1.05	407	0.0	0.0	N	0.985	34.8	1.09	0.237
NorthWest: Northern Distributor west												
N	L3	1 Dominant	55	1.11	61	0.0	0.0	N	0.992	30.7	2.00	0.072
NE	L2	1 Dominant	55	1.11	61	0.0	0.0	N	0.992	30.7	2.00	0.072
SE	T1	1 Dominant	55	1.11	61	0.0	0.0	N	0.992	30.7	2.00	0.072
SE	T1	2 Subdominant	55	1.11	61	0.0	0.0	N	0.992	30.7	2.00	0.072
S	R1	2 Subdominant	55	1.11	61	0.0	0.0	N	0.992	30.7	2.00	0.072

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site:WD PM (NDR/Leeds) - existing

Intersection ID: 1
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Priority Sharing	Critical Gap Headway sec	Critical Gap Dist m	Follow-up Headway sec
South: Leeds Parade south								
Environment Factor: 1.00								
Entry/Circ. Flow Adjustment: Medium								
NW	L1	1	Dominant	1.04	N	3.73	41.1	2.24
N	T1	2	Subdominant	1.04	N	5.36	59.1	3.21
NE	R1	2	Subdominant	1.04	N	7.85	86.5	4.70
SE	R3	2	Subdominant	1.04	N	5.36	59.1	3.21
SouthEast: Northern Distributor east								
Environment Factor: 1.00								
Entry/Circ. Flow Adjustment: Medium								
S	L3	1	Excl. Slip	1.40	Y	3.26	27.9	1.91
NW	T1	2	Dominant	1.53	Y	3.20	26.8	1.89
NW	T1	3	Subdominant	1.53	N	3.89	32.6	2.30
N	R1	3	Subdominant	1.53	N	3.89	32.6	2.30
NE	R2	3	Subdominant	1.53	N	5.69	47.7	3.36
NorthEast: Hanrahan Pl								
Environment Factor: 1.00								
Entry/Circ. Flow Adjustment: Medium								
SE	L2	1	Dominant	1.06	N	6.11	59.7	3.75
S	L1	1	Dominant	1.06	N	6.11	59.7	3.75
NW	R2	1	Dominant	1.06	N	6.11	59.7	3.75
N	R3	1	Dominant	1.06	N	6.11	59.7	3.75
North: Leeds Parade north								
Environment Factor: 1.00								
Entry/Circ. Flow Adjustment: Medium								
NE	L3	1	Dominant	1.09	N	5.30	51.3	3.23
SE	L1	1	Dominant	1.09	N	3.62	35.0	2.20
S	T1	1	Dominant	1.09	N	3.62	35.0	2.20
S	T1	2	Subdominant	1.09	N	4.07	39.3	2.47
NW	R3	2	Subdominant	1.09	N	4.07	39.3	2.47
NorthWest: Northern Distributor west								
Environment Factor: 1.00								
Entry/Circ. Flow Adjustment: Medium								
N	L3	1	Dominant	2.00	Y	3.97	33.8	2.25
NE	L2	1	Dominant	2.00	N	5.80	49.5	3.30
SE	T1	1	Dominant	2.00	Y	3.97	33.8	2.25
SE	T1	2	Subdominant	2.00	Y	4.38	37.3	2.49
S	R1	2	Subdominant	2.00	Y	4.38	37.3	2.49

```
  Roundabout Capacity Model: SIDRA Standard
  Priority sharing means Follow-up Headway plus Intra-bunch Headway
  is larger than the Critical Gap.

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

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Roundabout Flow Rates
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


CIRCULATING LANE FLOW RATES

---------------------------------------
  Lane        Circulating Flow Rates
  No.         veh/h   pcu/h   Percent
---------------------------------------
  South: Leeds Parade south
  1             151     154     47.2%
  2             162     173     52.8%
  Total         313     327
---------------------------------------
  SouthEast: Northern Distributor east
  1              32      33     13.3%
  2             201     215     86.7%
  Total         233     248
---------------------------------------
  NorthEast: Hanrahan Pl
  1             207     212     46.0%
  2             243     249     54.0%
  Total         450     461
---------------------------------------
  North: Leeds Parade north
  1             214     229     56.2%
  2             174     179     43.8%
  Total         388     408
---------------------------------------
  NorthWest: Northern Distributor west
  1               0       0      0.0%
  2              55      61    100.0%
  Total          55      61
---------------------------------------


APPROACH LANE FLOW RATES

---------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
---------------------------------------
  South: Leeds Parade south
  1           271        0      271
  2             0       51       51
  Total       271       51      322
---------------------------------------
  SouthEast: Northern Distributor east
  1            52        0       52
  2             0      151      151
  3             0      119      119
  Total        52      270      322
---------------------------------------
  NorthEast: Hanrahan Pl
  1             5       19       24
  Total         5       19       24
---------------------------------------
  North: Leeds Parade north
  1             1       43       44
  2             0       39       39
  Total         1       82       83
---------------------------------------
  NorthWest: Northern Distributor west
  1            13      175      188
  2             0      174      174
  Total        13      349      362
---------------------------------------


EXITING LANE FLOW RATES

-----------------------------------
  Lane        Exiting Flow Rates
  No.       veh/h  pcu/h   Percent
-----------------------------------
  SouthEast: Northern Distributor east
```

```
  1            39     44     22.0%
  2           151    155     78.0%
  Total       190    199
-----------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation Data
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------------
                            Negn  Negn   Negn   Appr.   Downstream  Distance
 From      To               Radius Speed  Dist.  Dist.   --------------------
 Approach  Exit      Turn      m    km/h    m      m         m       User Spec?
-------------------------------------------------------------------------------
 South: Leeds Parade south
        NorthWest    L1       68.6   41.9   39.9    500     286          No
            North    T1       68.6   41.9   53.2    500     479          No
        NorthEast    R1       22.0   27.2   69.1    500     524          No
        SouthEast    R3       22.0   27.2  103.7    500     516          No
-------------------------------------------------------------------------------
 SouthEast: Northern Distributor east
            South    L3       33.0   31.7   11.0    500     445          No
        NorthWest    T1       68.6   41.9   53.2    500     289          No
            North    R1       22.0   27.2   69.1    500     446          No
        NorthEast    R2       22.0   27.2   86.4    500     331          No
-------------------------------------------------------------------------------
 NorthEast: Hanrahan Pl
        SouthEast    L2       46.6   36.2   21.6    500    2919          No
            South    L1       68.6   41.9   39.9    500    3040          No
        NorthWest    R2       22.0   27.2   86.4    500    1711          No
            North    R3       22.0   27.2  103.7    500    2820          No
-------------------------------------------------------------------------------
 North: Leeds Parade north
        NorthEast    L3       30.6   30.8   11.0    500     363          No
        SouthEast    L1       68.6   41.9   39.9    500     441          No
            South    T1       68.6   41.9   53.2    500     481          No
        NorthWest    R3       22.0   27.2  103.7    500     364          No
-------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
            North    L3       30.6   30.8   11.0    500     412          No
        NorthEast    L2       42.9   35.0   21.7    500     446          No
        SouthEast    T1       68.6   41.9   53.2    500     482          No
            South    R1       22.0   27.2   69.1    500     485          No
-------------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  50.0 km/h

  Downstream distance is distance travelled from the stopline until exit
  cruise speed is reached (includes negotiation distance).  Acceleration
  distance is weighted for light and heavy vehicles.  The same distance
  applies for both stopped and unstopped vehicles.


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-------------------------------------------------------------------------------
                                      Queue Move-up
           App. Speeds    Exit Speeds  -------------  Av. Section Spd  Geom
 Mov Turn  ------------   -----------    1st   2nd    ---------------  Delay
 ID        Cruise  Negn   Negn Cruise    Grn   Grn    Running Overall   sec
-------------------------------------------------------------------------------
 South: Leeds Parade south
 1a  L1      80.0  41.9   41.9  70.0    25.6            58.8    58.8     8.8
  2  T1      80.0  41.9   41.9  80.0    22.5            51.5    51.2    11.6
 3a  R1      80.0  27.2   27.2  50.0    22.5            51.5    51.2    95.5
 3b  R3      80.0  27.2   27.2  80.0    22.5            51.5    51.2    22.9
-------------------------------------------------------------------------------
 SouthEast: Northern Distributor east
21b  L3      80.0  31.7   31.7  80.0    31.7            58.6    58.6    14.7
 22  T1      80.0  41.9   41.9  70.0    30.5            59.5    59.5     8.9
23a  R1      80.0  27.2   27.2  80.0    29.0            59.2    59.2    19.9
 23  R2      80.0  27.2   27.2  50.0    29.0            59.2    59.2    23.8
-------------------------------------------------------------------------------
 NorthEast: Hanrahan Pl
 24  L2      50.0  36.2   36.2  80.0    23.9            49.2    49.2    34.5
24a  L1      50.0  41.9   41.9  80.0    23.9            49.2    49.2    26.5
 26  R2      50.0  27.2   27.2  70.0    23.9            49.2    49.2    38.1
26b  R3      50.0  27.2   27.2  80.0    23.9            49.2    49.2    47.4
-------------------------------------------------------------------------------
```

```
 North: Leeds Parade north
 7b  L3      80.0  30.8   30.8  50.0    23.8            59.7    59.7   117.7
 7a  L1      80.0  41.9   41.9  80.0    23.8            59.7    59.7    11.5
  8  T1      80.0  41.9   41.9  80.0    23.6            58.1    58.1    11.6
 9b  R3      80.0  27.2   27.2  70.0    22.5            52.2    52.2    19.3
--------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
27b  L3      70.0  30.8   30.8  80.0    40.7            57.6    57.6    13.7
 27  L2      70.0  35.0   35.0  50.0    40.7            57.6    57.6   131.9
 28  T1      70.0  41.9   41.9  80.0    39.0            56.8    56.8    10.3
29a  R1      70.0  27.2   27.2  80.0    29.8            53.4    53.4    18.8
--------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


MOVEMENT CAPACITY PARAMETERS

----------------------------------------------------------------
 Mov Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID       Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
----------------------------------------------------------------
South: Leeds Parade south
 1a  L1   #     271    313    327    1251   0.85    292  0.217*
  2  T1   #      13    313    327     181   0.85   1086  0.072
 3a  R1   LV      0      0      0   0.000  0.000      0  0.85   ****   0.000
 3a  R1   HV      8     37      0   0.000  0.000    112  0.85   1086   0.072
 3b  R3   #      30    313    327     419   0.85   1086  0.072
----------------------------------------------------------------
SouthEast: Northern Distributor east
21b  L3   #      52    190    198    1652   0.85   2600  0.031
 22  T1   #     267    466    496    2871   0.85    814  0.093
23a  R1   #       2    233    248      22   0.85    814  0.093
 23  R2   LV      0      0      0   0.000  0.000      0  0.85   ****   0.000
 23  R2   HV      1     11      0   0.000  0.000     11  0.85    814   0.093
----------------------------------------------------------------
NorthEast: Hanrahan Pl
 24  L2   LV      0      0      0   0.000  0.000      0  0.85   ****   0.000
 24  L2   HV      5    118      0   0.000  0.000    118  0.85   1903   0.042
24a  L1   LV      0      0      0   0.000  0.000      0  0.85   ****   0.000
24a  L1   HV      7    165      0   0.000  0.000    165  0.85   1903   0.042
 26  R2   LV      0      0      0   0.000  0.000      0  0.85   ****   0.000
 26  R2   HV     11    259      0   0.000  0.000    259  0.85   1903   0.042
26b  R3   LV      0      0      0   0.000  0.000      0  0.85   ****   0.000
26b  R3   HV      1     24      0   0.000  0.000     24  0.85   1903   0.042
----------------------------------------------------------------
North: Leeds Parade north
 7b  L3   LV      0      0      0   0.000  0.000      0  0.85   ****   0.000
 7b  L3   HV      1     27      0   0.000  0.000     27  0.85   2205   0.037
 7a  L1   #      11    388    407     298   0.85   2205  0.037
  8  T1   #      40    776    814    1085   0.85   2205  0.037
 9b  R3   #      31    388    407     841   0.85   2205  0.037
----------------------------------------------------------------
NorthWest: Northern Distributor west
27b  L3   #      13     55     61     101   0.85    564  0.128
 27  L2   LV      0      0      0   0.000  0.000      0  0.85   ****   0.000
 27  L2   HV     11     86      0   0.000  0.000     86  0.85    564   0.128
 28  T1   #     195    110    122    1522   0.85    564  0.128
29a  R1   #     143     55     61    1116   0.85    564  0.128
----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

--------------------------------------------------------------------------------
 Mov Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID       Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
       (veh-h/h)(pers-h/h)(sec)  Rate               (veh-km/h)(veh-h/h) (km/h)
--------------------------------------------------------------------------------
South: Leeds Parade south
 1a  L1    0.04    0.04     9.8   1.19   321.6  9.69    383.6     6.5     58.8
  2  T1    0.00    0.00    22.3   1.50    19.5  0.96     23.5     0.5     51.2
 3a  R1    0.22    0.26    22.3   1.50    12.0  0.91     14.5     0.3     51.2
 3b  R3    0.01    0.01    22.3   1.50    45.1  1.80     54.3     1.1     51.2
--------------------------------------------------------------------------------
SouthEast: Northern Distributor east
21b  L3    0.01    0.01    15.1   1.28    66.4  2.08     84.9     1.4     58.6
 22  T1    0.04    0.04     9.7   1.10   292.4  8.45    380.3     6.4     59.5
23a  R1    0.00    0.00    10.0   1.12     2.2  0.72      2.9     0.0     59.2
```

```
 23  R2    0.01    0.01    10.0   1.12     1.1  0.36      1.4     0.0     59.2
--------------------------------------------------------------------------------
NorthEast: Hanrahan Pl
 24  L2    0.05    0.06    37.8   1.48     7.4  0.85     28.8     0.6     49.2
24a  L1    0.06    0.07    37.8   1.48    10.4  1.11     40.3     0.8     49.2
 26  R2    0.13    0.15    37.8   1.48    16.3  1.74     63.3     1.3     49.2
26b  R3    0.01    0.02    37.8   1.48     1.5  0.28      5.8     0.1     49.2
--------------------------------------------------------------------------------
North: Leeds Parade north
 7b  L3    0.03    0.04    12.8   1.23     1.2  0.21      1.6     0.0     59.7
 7a  L1    0.00    0.00    12.8   1.23    13.5  0.61     18.0     0.3     59.7
  8  T1    0.01    0.01    14.0   1.27    50.9  1.61     65.2     1.1     58.1
 9b  R3    0.01    0.01    19.0   1.46    45.3  1.46     49.5     0.9     52.2
--------------------------------------------------------------------------------
NorthWest: Northern Distributor west
27b  L3    0.00    0.00    11.0   1.07    13.9  1.53     21.5     0.4     57.6
 27  L2    0.40    0.48    11.0   1.07    11.8  1.65     18.2     0.3     57.6
 28  T1    0.03    0.03    12.1   1.12   217.7  8.03    324.8     5.7     56.8
29a  R1    0.04    0.05    17.5   1.37   195.9  7.12    244.4     4.6     53.4
--------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Total   Total   Total   Total   Total   Total
                 $/h       L/h   kg/h    kg/h    kg/h    kg/h
-----------------------------------------------------------------
South: Leeds Parade south
 1a  L1          133.37   14.2    33.5    0.09   0.009   0.114
  2  T1           10.06    1.4     3.3    0.01   0.001   0.015
 3a  R1            6.19    0.8     2.0    0.00   0.000   0.009
 3b  R3           23.22    3.1     7.5    0.02   0.002   0.035
               ------------------------------------------------
                 172.84   19.5    46.3    0.11   0.012   0.174
-----------------------------------------------------------------
SouthEast: Northern Distributor east
21b  L3           31.39    3.6     8.5    0.02   0.002   0.032
 22  T1          131.13   14.2    33.5    0.09   0.009   0.116
23a  R1            1.00    0.1     0.3    0.00   0.000   0.001
 23  R2            0.50    0.1     0.1    0.00   0.000   0.000
               ------------------------------------------------
                 164.02   17.9    42.4    0.11   0.011   0.150
-----------------------------------------------------------------
NorthEast: Hanrahan Pl
 24  L2           15.85    3.6     9.4    0.01   0.001   0.053
24a  L1           22.20    5.0    13.1    0.02   0.001   0.075
 26  R2           34.88    7.8    20.6    0.03   0.002   0.118
26b  R3            3.17    0.7     1.9    0.00   0.000   0.011
               ------------------------------------------------
                  76.10   17.0    44.9    0.06   0.004   0.257
-----------------------------------------------------------------
North: Leeds Parade north
 7b  L3            0.60    0.1     0.2    0.00   0.000   0.001
 7a  L1            6.64    0.8     1.9    0.00   0.000   0.008
  8  T1           24.16    2.8     6.7    0.02   0.002   0.026
 9b  R3           18.76    1.9     4.4    0.01   0.001   0.015
               ------------------------------------------------
                  50.16    5.6    13.2    0.03   0.003   0.049
-----------------------------------------------------------------
NorthWest: Northern Distributor west
27b  L3            8.24    1.0     2.5    0.01   0.001   0.011
 27  L2            6.97    0.9     2.1    0.00   0.000   0.009
 28  T1          124.61   15.4    36.7    0.08   0.008   0.153
29a  R1           95.37   10.4    24.5    0.06   0.007   0.089
               ------------------------------------------------
                 235.19   27.7    65.8    0.15   0.016   0.261
-----------------------------------------------------------------
 INTERSECTION:   691.40   87.7   212.4    0.47   0.047   0.890
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Rate    Rate    Rate    Rate    Rate    Rate
                 $/km   L/100km  g/km    g/km    g/km    g/km
-----------------------------------------------------------------
South: Leeds Parade south
 1a  L1            0.35    3.7    87.3    0.23   0.024   0.298
```

```
  2  T1            0.43    5.8   138.9    0.29   0.029   0.650
 3a  R1            0.43    5.8   138.9    0.29   0.029   0.650
 3b  R3            0.43    5.8   138.9    0.29   0.029   0.650
               ------------------------------------------------
                   0.36    4.1    97.3    0.24   0.025   0.366
-------------------------------------------------------------
SouthEast: Northern Distributor east
21b  L3            0.37    4.2   100.4    0.25   0.025   0.379
 22  T1            0.34    3.7    88.1    0.23   0.024   0.306
23a  R1            0.35    3.8    89.8    0.23   0.024   0.318
 23  R2            0.35    3.8    89.8    0.23   0.024   0.318
               ------------------------------------------------
                   0.35    3.8    90.3    0.23   0.024   0.319
-------------------------------------------------------------
NorthEast: Hanrahan Pl
 24  L2            0.55   12.3   324.8    0.41   0.031   1.856
24a  L1            0.55   12.3   324.8    0.41   0.031   1.856
 26  R2            0.55   12.3   324.8    0.41   0.031   1.856
26b  R3            0.55   12.3   324.8    0.41   0.031   1.856
               ------------------------------------------------
                   0.55   12.3   324.8    0.41   0.031   1.856
-------------------------------------------------------------
North: Leeds Parade north
 7b  L3            0.37    4.5   105.7    0.25   0.025   0.423
 7a  L1            0.37    4.5   105.7    0.25   0.025   0.423
  8  T1            0.37    4.3   102.7    0.25   0.025   0.399
 9b  R3            0.38    3.8    89.9    0.24   0.027   0.296
               ------------------------------------------------
                   0.37    4.2    98.4    0.24   0.026   0.365
-------------------------------------------------------------
NorthWest: Northern Distributor west
27b  L3            0.38    4.8   115.4    0.26   0.026   0.490
 27  L2            0.38    4.8   115.4    0.26   0.026   0.490
 28  T1            0.38    4.7   112.9    0.26   0.026   0.470
29a  R1            0.39    4.2   100.4    0.25   0.027   0.366
               ------------------------------------------------
                   0.39    4.6   108.1    0.25   0.026   0.429
-------------------------------------------------------------
 INTERSECTION:     0.63    8.0   193.8    0.43   0.043   0.812
-------------------------------------------------------------
```

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Lanes

Lane Performance and Capacity Information
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


LANE PERFORMANCE

-------------------------------------------------------------
                                        Q u e u e
          Flow   Cap  Deg.  Aver.  Eff.    95% Back      Lane
 Lane              Satn  Delay  Stop  ------------   Length
 No.      veh/h veh/h   x    sec   Rate    veh     m       m
-------------------------------------------------------------
 South: Leeds Parade south
 1         271  1251 0.217    9.8  0.59    1.0    7.4     60.0
 2          51   712 0.072   22.3  0.75    0.3    2.3    500.0
-------------------------------------------------------------
 SouthEast: Northern Distributor east
 1          52  1652 0.031   15.1  0.64    0.1    1.0     20.0
 2         151  1619 0.093    9.4  0.54    0.4    3.0    120.0
 3         119  1284 0.093   10.0  0.56    0.4    2.9    500.0
-------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1          24   566 0.042   37.8  0.74    0.2    2.0    190.0
-------------------------------------------------------------
 North: Leeds Parade north
 1          44  1199 0.037   12.8  0.61    0.1    1.1    100.0
 2          39  1052 0.037   19.0  0.73    0.1    1.1    500.0
-------------------------------------------------------------
 NorthWest: Northern Distributor west
 1         188  1466 0.128   11.0  0.53    0.6    4.9     60.0
 2         174  1360 0.128   17.5  0.69    0.6    4.7    500.0
-------------------------------------------------------------


LANE FLOW AND CAPACITY INFORMATION

-----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
        (veh/h)  veh/h veh/h    x     %
```

```
----------------------------------------
 South: Leeds Parade south
 1        271     150  1251  0.217  100
 2         51      51   712  0.072   33P
----------------------------------------
 SouthEast: Northern Distributor east
 1         52      52  1652  0.031  100
 2        151     150  1619  0.093  100
 3        119     119  1284  0.093  100
----------------------------------------
 NorthEast: Hanrahan Pl
 1         24      24   566  0.042  100
----------------------------------------
 North: Leeds Parade north
 1         44      44  1199  0.037  100
 2         39      39  1052  0.037  100
----------------------------------------
 NorthWest: Northern Distributor west
 1        188     150  1466  0.128  100
 2        174     150  1360  0.128  100
----------------------------------------
  P  Lane under-utilisation found by the "Program".  This includes cases where
     the value of lane under-utilisation due to downstream effects has been
     modified by the program during lane flow calculations (e.g. a de facto
     exclusive lane has been found).

  The capacity value for priority and continuous movements is obtained by
  adjusting the basic saturation flow for heavy vehicle and turning vehicle
  effects.  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane Delays
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------
                      ---------------  Delay (seconds/veh)  ----------------
         Deg.  Prog.    Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  Factor   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x            d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------
 South: Leeds Parade south
 1      0.217  1.000    1.0   0.0   1.0   2.9   0.0   0.0   0.0   8.8    9.8
 2      0.072  1.000    2.2   0.0   2.2   2.8   0.3   0.0   0.3  20.1   22.3
-------------------------------------------------------------------------------
 SouthEast: Northern Distributor east
 1      0.031  1.000    0.4   0.0   0.4   1.5   0.0   0.0   0.0  14.7   15.1
 2      0.093  1.000    0.5   0.0   0.5   2.1   0.0   0.0   0.0   8.9    9.4
 3      0.093  1.000    0.8   0.0   0.8   2.3   0.0   0.0   0.0   9.2   10.0
-------------------------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1      0.042  1.000    3.4   0.0   3.4   9.9   0.0   0.0   0.0  34.4   37.8
-------------------------------------------------------------------------------
 North: Leeds Parade north
 1      0.037  1.000    1.0   0.0   1.0   2.8   0.0   0.0   0.0  11.8   12.8
 2      0.037  1.000    1.3   0.0   1.3   1.9   0.0   0.0   0.0  17.7   19.0
-------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
 1      0.128  1.000    0.2   0.0   0.2   1.4   0.0   0.0   0.0  10.8   11.0
 2      0.128  1.000    0.2   0.0   0.2   0.9   0.0   0.0   0.0  17.3   17.5
-------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay


LANE DELAY PERCENTILES

---------------------------------------------------------------
        Deg.                  Percentile Delay
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
---------------------------------------------------------------
 South: Leeds Parade south
 1     0.217    9.8   10.0   10.3   10.5   10.7   10.8   10.9
 2     0.072   22.3   22.7   23.3   23.6   24.0   24.3   24.5
---------------------------------------------------------------
```

```
 SouthEast: Northern Distributor east
 1     0.031   15.1   15.1   15.2   15.3   15.4   15.4   15.5
 2     0.093    9.4    9.5    9.7    9.8    9.9    9.9   10.0
 3     0.093   10.0   10.1   10.3   10.5   10.6   10.7   10.8
-------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1     0.042   37.8   38.4   39.4   39.9   40.5   41.0   41.3
-------------------------------------------------------------
 North: Leeds Parade north
 1     0.037   12.8   13.0   13.3   13.4   13.6   13.8   13.9
 2     0.037   19.0   19.2   19.6   19.8   20.0   20.2   20.3
-------------------------------------------------------------
 NorthWest: Northern Distributor west
 1     0.128   11.0   11.1   11.1   11.2   11.2   11.2   11.3
 2     0.128   17.5   17.5   17.6   17.6   17.7   17.7   17.7
-------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queues
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


LANE QUEUES (VEHICLES)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.      Back of Queue (veh)      Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   ------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade south
 1     0.217  1.000    0.0     0.4    0.0    0.4    1.0   0.05    0.0  100.0    0.1     0.1
 2     0.072  1.000    0.0     0.1    0.0    0.1    0.3   0.00    0.0  100.0    0.0     0.1
-------------------------------------------------------------------------------------------------
 SouthEast: Northern Distributor east
 1     0.031  1.000    0.0     0.1    0.0    0.1    0.1   0.02    0.0  100.0    0.0     0.0
 2     0.093  1.000    0.0     0.2    0.0    0.2    0.4   0.01    0.0  100.0    0.0     0.0
 3     0.093  1.000    0.0     0.2    0.0    0.2    0.4   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1     0.042  1.000    0.0     0.1    0.0    0.1    0.2   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 North: Leeds Parade north
 1     0.037  1.000    0.0     0.1    0.0    0.1    0.1   0.00    0.0  100.0    0.0     0.0
 2     0.037  1.000    0.0     0.1    0.0    0.1    0.1   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
 1     0.128  1.000    0.0     0.3    0.0    0.3    0.6   0.03    0.0  100.0    0.0     0.0
 2     0.128  1.000    0.0     0.3    0.0    0.3    0.6   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------



LANE QUEUES (DISTANCE)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.      Back of Queue (m)        Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   ------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade south
 1     0.217  1.000    0.0     3.0    0.0    3.0    7.4   0.05    0.0  100.0    0.6     1.0
 2     0.072  1.000    0.0     0.9    0.0    0.9    2.3   0.00    0.0  100.0    0.3     0.5
-------------------------------------------------------------------------------------------------
 SouthEast: Northern Distributor east
 1     0.031  1.000    0.0     0.4    0.0    0.4    1.0   0.02    0.0  100.0    0.0     0.1
 2     0.093  1.000    0.0     1.2    0.0    1.2    3.0   0.01    0.0  100.0    0.2     0.3
 3     0.093  1.000    0.0     1.2    0.0    1.2    2.9   0.00    0.0  100.0    0.2     0.3
-------------------------------------------------------------------------------------------------
 NorthEast: Hanrahan Pl
 1     0.042  1.000    0.0     0.8    0.0    0.8    2.0   0.00    0.0  100.0    0.3     0.5
-------------------------------------------------------------------------------------------------
 North: Leeds Parade north
 1     0.037  1.000    0.0     0.4    0.0    0.4    1.1   0.00    0.0  100.0    0.1     0.2
 2     0.037  1.000    0.0     0.4    0.0    0.4    1.1   0.00    0.0  100.0    0.1     0.2
-------------------------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
 1     0.128  1.000    0.0     2.0    0.0    2.0    4.9   0.03    0.0  100.0    0.1     0.1
 2     0.128  1.000    0.0     1.9    0.0    1.9    4.7   0.00    0.0  100.0    0.1     0.1
-------------------------------------------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queue Percentiles
Site:WD PM (NDR/Leeds) - existing

Intersection ID: 1
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
South: Leeds Parade south								
1	0.217	0.4	0.5	0.7	0.9	1.0	1.1	1.2
2	0.072	0.1	0.1	0.2	0.2	0.3	0.3	0.3
SouthEast: Northern Distributor east								
1	0.031	0.1	0.1	0.1	0.1	0.1	0.1	0.2
2	0.093	0.2	0.2	0.3	0.4	0.4	0.5	0.5
3	0.093	0.2	0.2	0.3	0.3	0.4	0.4	0.5
NorthEast: Hanrahan Pl								
1	0.042	0.1	0.1	0.1	0.1	0.2	0.2	0.2
North: Leeds Parade north								
1	0.037	0.1	0.1	0.1	0.1	0.1	0.2	0.2
2	0.037	0.1	0.1	0.1	0.1	0.1	0.2	0.2
NorthWest: Northern Distributor west								
1	0.128	0.3	0.3	0.5	0.6	0.6	0.7	0.8
2	0.128	0.3	0.3	0.5	0.5	0.6	0.7	0.8

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (metres) 50%	70%	85%	90%	95%	98%	100%
South: Leeds Parade south								
1	0.217	3.0	3.8	5.4	6.3	7.4	8.2	8.8
2	0.072	0.9	1.2	1.7	2.0	2.3	2.6	2.8
SouthEast: Northern Distributor east								
1	0.031	0.4	0.5	0.7	0.8	1.0	1.1	1.1
2	0.093	1.2	1.6	2.2	2.6	3.0	3.3	3.6
3	0.093	1.2	1.5	2.2	2.5	2.9	3.3	3.5
NorthEast: Hanrahan Pl								
1	0.042	0.8	1.1	1.5	1.7	2.0	2.2	2.4
North: Leeds Parade north								
1	0.037	0.4	0.6	0.8	0.9	1.1	1.2	1.3
2	0.037	0.4	0.5	0.8	0.9	1.1	1.2	1.3
NorthWest: Northern Distributor west								
1	0.128	2.0	2.6	3.6	4.2	4.9	5.5	5.9
2	0.128	1.9	2.4	3.4	4.0	4.7	5.2	5.6

Go to Table Links (Top)

Lane Stops
Site:WD PM (NDR/Leeds) - existing

Intersection ID: 1
Roundabout

Lane No.	Deg. Satn x	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Queue Total Stops H	Total Move-up Rate hqm	Queue Move-ups Hqm	Prop. Queued pq
South: Leeds Parade south										
1	0.217	1.000	0.29	0.00	0.31	0.59	160.8	0.00	0.0	0.41
2	0.072	1.000	0.33	0.00	0.42	0.75	38.3	0.00	0.0	0.45
SouthEast: Northern Distributor east										
1	0.031	1.000	0.12	0.00	0.52	0.64	33.2	0.00	0.0	0.26
2	0.093	1.000	0.17	0.00	0.36	0.54	80.7	0.00	0.0	0.31
3	0.093	1.000	0.20	0.00	0.36	0.56	67.2	0.00	0.0	0.33
NorthEast: Hanrahan Pl										
1	0.042	1.000	0.39	0.00	0.35	0.74	17.8	0.00	0.0	0.50

```
 North: Leeds Parade north
 1     0.037  1.000   0.25  0.00  0.37   0.61     27.1    0.00     0.0   0.39
 2     0.037  1.000   0.27  0.00  0.46   0.73     28.3    0.00     0.0   0.41
-------------------------------------------------------------------------------
 NorthWest: Northern Distributor west
 1     0.128  1.000   0.07  0.00  0.47   0.53    100.3    0.00     0.0   0.18
 2     0.128  1.000   0.07  0.00  0.61   0.69    119.3    0.00     0.0   0.19
-------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


TOTAL FLOW RATES (ALL MOVEMENT CLASSES)

-----------------------------------------------------------------
 From SOUTH To:                NW      N       NE      SE
 Turn:                         L1      T1      R1      R3     TOT
 Flow Rate                  271.0    13.0     8.0    30.0   322.0
 %HV (all designations)       5.0     5.0   100.0     5.0     7.4
-----------------------------------------------------------------
 From SOUTHEAST To:            S       NW      N       NE
 Turn:                         L3      T1      R1      R2     TOT
 Flow Rate                  52.0   267.0     2.0     1.0   322.0
 %HV (all designations)       5.0     5.0     5.0   100.0     5.3
-----------------------------------------------------------------
 From NORTHEAST To:            SE      S       NW      N
 Turn:                         L2      L1      R2      R3     TOT
 Flow Rate                   5.0     7.0    11.0     1.0    24.0
 %HV (all designations)    100.0   100.0   100.0   100.0   100.0
-----------------------------------------------------------------
 From NORTH To:                NE      SE      S       NW
 Turn:                         L3      L1      T1      R3     TOT
 Flow Rate                   1.0    11.0    40.0    31.0    83.0
 %HV (all designations)    100.0     5.0     5.0     5.0     6.1
-----------------------------------------------------------------
 From NORTHWEST To:            N       NE      SE      S
 Turn:                         L3      L2      T1      R1     TOT
 Flow Rate                  13.0    11.0   195.0   143.0   362.0
 %HV (all designations)       5.0   100.0     5.0     5.0     7.9
-----------------------------------------------------------------
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout


FLOW RATES FOR Light Vehicles

-------------------------------------------------------------
 From SOUTH To:          NW      N       NE      SE
 Turn:                   L1      T1      R1      R3     TOT
-------------------------------------------------------------
 Flow Rate - Veh      257.5    12.4     0.0    28.5   298.3
 Mov Class %           95.0    95.0     0.0    95.0    92.6
 Flow Scale - Fixed    1.00    1.00    1.00    1.00
 Flow Scale - Var      1.00    1.00    1.00    1.00
 Peak Flow Factor      1.00    1.00    1.00    1.00
-------------------------------------------------------------
 From SOUTHEAST To:      S       NW      N       NE
 Turn:                   L3      T1      R1      R2     TOT
-------------------------------------------------------------
 Flow Rate - Veh       49.4   253.6     1.9     0.0   304.9
 Mov Class %           95.0    95.0    95.0     0.0    94.7
 Flow Scale - Fixed    1.00    1.00    1.00    1.00
 Flow Scale - Var      1.00    1.00    1.00    1.00
 Peak Flow Factor      1.00    1.00    1.00    1.00
-------------------------------------------------------------
 From NORTHEAST To:      SE      S       NW      N
 Turn:                   L2      L1      R2      R3     TOT
-------------------------------------------------------------
 Flow Rate - Veh        0.0     0.0     0.0     0.0     0.0
 Mov Class %            0.0     0.0     0.0     0.0     0.0
 Flow Scale - Fixed    1.00    1.00    1.00    1.00
```

Flow Scale - Var	1.00	1.00	1.00	1.00
Peak Flow Factor	1.00	1.00	1.00	1.00

From NORTH To:	NE	SE	S	NW	
Turn:	L3	L1	T1	R3	TOT
Flow Rate - Veh	0.0	10.4	38.0	29.5	77.9
Mov Class %	0.0	95.0	95.0	95.0	93.9
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From NORTHWEST To:	N	NE	SE	S	
Turn:	L3	L2	T1	R1	TOT
Flow Rate - Veh	12.4	0.0	185.2	135.9	333.4
Mov Class %	95.0	0.0	95.0	95.0	92.1
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

FLOW RATES FOR Heavy Vehicles

From SOUTH To:	NW	N	NE	SE	
Turn:	L1	T1	R1	R3	TOT
Flow Rate - Veh	13.6	0.6	8.0	1.5	23.7
Mov Class %	5.0	5.0	100.0	5.0	7.4
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From SOUTHEAST To:	S	NW	N	NE	
Turn:	L3	T1	R1	R2	TOT
Flow Rate - Veh	2.6	13.4	0.1	1.0	17.1
Mov Class %	5.0	5.0	5.0	100.0	5.3
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From NORTHEAST To:	SE	S	NW	N	
Turn:	L2	L1	R2	R3	TOT
Flow Rate - Veh	5.0	7.0	11.0	1.0	24.0
Mov Class %	100.0	100.0	100.0	100.0	100.0
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From NORTH To:	NE	SE	S	NW	
Turn:	L3	L1	T1	R3	TOT
Flow Rate - Veh	1.0	0.6	2.0	1.5	5.1
Mov Class %	100.0	5.0	5.0	5.0	6.1
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

From NORTHWEST To:	N	NE	SE	S	
Turn:	L3	L2	T1	R1	TOT
Flow Rate - Veh	0.6	11.0	9.8	7.2	28.5
Mov Class %	5.0	100.0	5.0	5.0	7.9
Flow Scale - Fixed	1.00	1.00	1.00	1.00	
Flow Scale - Var	1.00	1.00	1.00	1.00	
Peak Flow Factor	1.00	1.00	1.00	1.00	

Go to Table Links (Top)

Lane Flow Rates
Site:WD PM (NDR/Leeds) - existing

Intersection ID: 1
Roundabout

LANE FLOW RATES AT STOP LINE

From SOUTH To:	NW	N	NE	SE	
Turn:	L1	T1	R1	R3	TOT
Lane 1					
LV	257.5	*	*	*	257.5
HV	13.6	*	*	*	13.6
Total	271.0	*	*	*	271.0

Lane 2					
LV	*	12.4	*	28.5	40.8
HV	*	0.6	8.0	1.5	10.1
Total	*	13.0	8.0	30.0	51.0
Approach	271.0	13.0	8.0	30.0	322.0

From SOUTHEAST To:	S	NW	N	NE	
Turn:	L3	T1	R1	R2	TOT
Lane 1					
LV	49.4	*	*	*	49.4
HV	2.6	*	*	*	2.6
Total	52.0	*	*	*	52.0
Lane 2					
LV	*	143.0	*	*	143.0
HV	*	7.5	*	*	7.5
Total	*	150.6	*	*	150.6
Lane 3					
LV	*	110.6	1.9	*	112.5
HV	*	5.8	0.1	1.0	6.9
Total	*	116.4	2.0	1.0	119.4
Approach	52.0	267.0	2.0	1.0	322.0

From NORTHEAST To:	SE	S	NW	N	
Turn:	L2	L1	R2	R3	TOT
Lane 1					
HV	5.0	7.0	11.0	1.0	24.0
Total	5.0	7.0	11.0	1.0	24.0
Approach	5.0	7.0	11.0	1.0	24.0

From NORTH To:	NE	SE	S	NW	
Turn:	L3	L1	T1	R3	TOT
Lane 1					
LV	*	10.4	30.6	*	41.1
HV	1.0	0.6	1.6	*	3.2
Total	1.0	11.0	32.2	*	44.2
Lane 2					
LV	*	*	7.4	29.5	36.8
HV	*	*	0.4	1.5	1.9
Total	*	*	7.8	31.0	38.8
Approach	1.0	11.0	40.0	31.0	83.0

From NORTHWEST To:	N	NE	SE	S	
Turn:	L3	L2	T1	R1	TOT
Lane 1					
LV	12.4	*	155.6	*	168.0
HV	0.6	11.0	8.2	*	19.8
Total	13.0	11.0	163.8	*	187.8
Lane 2					
LV	*	*	29.6	135.9	165.5
HV	*	*	1.6	7.2	8.7
Total	*	*	31.2	143.0	174.2
Approach	13.0	11.0	195.0	143.0	362.0

* Movement not allocated to the lane

EXIT LANE FLOW RATES

Movement Class:	LV	HV
Exit: SOUTH		
Lane: 1	80.0	11.2
Lane: 2	143.2	7.5
Total	223.3	18.8
Exit: SOUTHEAST		
Lane: 1	166.1	13.7
Lane: 2	58.1	3.1
Total	224.2	16.8
Exit: NORTHEAST		
Lane: 1	*	21.0
Total	*	21.0
Exit: NORTH		
Lane: 1	12.4	0.6
Lane: 2	14.2	1.8
Total	26.6	2.4
Exit: NORTHWEST		
Lane: 1	400.5	21.1

```
Lane:  2           140.1    18.4
Total              540.5    39.5
--------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

--------------------------------
Movement Class:       LV      HV
--------------------------------
 Exit: SOUTH
Lane:  1            80.0    11.2
Lane:  2           143.2     7.5
Total              223.3    18.8
--------------------------------
 Exit: SOUTHEAST
Lane:  1           166.1    13.7
Lane:  2            58.1     3.1
Total              224.2    16.8
--------------------------------
 Exit: NORTHEAST
Lane:  1               *    21.0
Total                  *    21.0
--------------------------------
 Exit: NORTH
Lane:  1            12.4     0.6
Lane:  2            14.2     1.8
Total               26.6     2.4
--------------------------------
 Exit: NORTHWEST
Lane:  1           400.5    21.1
Lane:  2           140.1    18.4
Total              540.5    39.5
--------------------------------
  *  Movement not allocated to the lane

Unit Time for Volumes =  60 minutes
Peak Flow Period =  30 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Go to Table Links (Top)

Other

Model Settings Summary
Site:WD PM (NDR/Leeds) - existing

```
Intersection ID: 1
Roundabout

* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the left-hand side of the road
  Input data specified in Metric units
  Model Defaults: New South Wales
  Peak Flow Period (for performance): 30 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  SIDRA Standard Queue model used
  Level of Service based on: Delay (RTA NSW)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site:WD PM (NDR/Leeds) - existing

Go to Table Links (Top)

DETAILED OUTPUT

Site: Uni post PM

New Site
Giveway / Yield (Two-Way)

OUTPUT TABLE LINKS

Movements

Intersection Negotiation Data
Site:Uni post PM

Intersection ID: 1
Give-Way Sign Controlled Intersection

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius m	Negn Speed km/h	Negn Dist. m	Appr. Dist. m	Downstream Distance m	User Spec?
South: Leeds Parade								
	North	T1	S	50.0	10.0	500	157	No
	East	R2	6.6	17.2	10.4	500	105	No
East: University								
	South	L2	10.0	20.2	15.7	500	108	No
	North	R2	6.6	17.2	10.4	500	103	No
North: Leeds Parade								
	East	L2	10.0	20.2	15.7	500	72	No
	South	T1	S	50.0	10.0	500	159	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay sec
South: Leeds Parade										
2	T1	50.0	50.0	50.0	50.0			50.0	50.0	0.0
3	R2	50.0	17.2	17.2	50.0	17.2		42.2	42.2	8.0
East: University										
4	L2	50.0	20.2	20.2	50.0	19.9		42.5	42.5	7.5
6	R2	50.0	17.2	17.2	50.0	19.9		42.5	42.5	8.0
North: Leeds Parade										

```
  7  L2      50.0  20.2   20.2  50.0                   49.8    49.8     7.5
  8  T1      50.0  50.0   50.0  50.0                   49.8    49.8     0.0
-------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.
```

Go to Table Links (Top)

Gap Acceptance Parameters
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

-------------------------------------------------------------------------------
                         Critical Gap                        Intra
                  Opng   ------------   Foll-up   Entry    Bunch   Propn
  Opd     Dest    Flow   Hdwy    Dist   Headway    HV      Hdwy    Bnchd
  Lane            pcu/h   sec     m       sec     Equiv     sec
-------------------------------------------------------------------------------
 South: Leeds Parade
      2      E     106     4.10     0.0     2.05     1.03   1.80    0.011
-------------------------------------------------------------------------------
 East: University
      1      S     104+    4.10     0.0     2.25     1.02   1.80    0.011
      1      N     440+    5.43     0.0     3.07     1.02   1.11    0.045
-------------------------------------------------------------------------------
 North: Leeds Parade

  No opposed movements on this approach.
-------------------------------------------------------------------------------

  Values in this table are adjusted for heavy vehicles in the entry stream.
  Use the Pedestrians and Priorities input dialogs to specify opposing pedestrian movements.
  +  Percentage of exiting flow included in opposing vehicle flow
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID       Cl.  Arv           Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Leeds Parade
  2  T1   #     301      0      0    1889   0.98    515  0.159*
  3  R2   #      26      0      0    1599   0.98   5927  0.016
-----------------------------------------------------------------
East: University
  4  L2   #      78      0      0    1284   0.80   1217  0.061
  6  R2   #       5      0      0      82   0.80   1217  0.061
-----------------------------------------------------------------
North: Leeds Parade
  7  L2   #       2      0      0      37   0.98   1695  0.055
  8  T1   #     101      0      0    1850   0.98   1695  0.055
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------
 Mov Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID       Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-km/h)(veh-h/h) (km/h)
-------------------------------------------------------------------------------
South: Leeds Parade
  2  T1    0.00    0.00     0.0   0.00     0.0  3.48    173.9     3.5     50.0
  3  R2    0.00    0.00     8.3   0.61    16.0  0.45     15.1     0.4     42.2
-------------------------------------------------------------------------------
East: University
  4  L2    0.01    0.01     8.0   0.60    46.8  1.54     45.5     1.1     42.5
  6  R2    0.00    0.00     8.0   0.60     3.0  0.28      2.9     0.1     42.5
-------------------------------------------------------------------------------
North: Leeds Parade
  7  L2    0.00    0.00     0.2   0.02     0.0  0.03      1.2     0.0     49.8
  8  T1    0.00    0.00     0.2   0.02     2.2  1.18     58.4     1.2     49.8
-------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Total   Total   Total   Total   Total   Total
                 $/h       L/h   kg/h    kg/h    kg/h    kg/h
-------------------------------------------------------------
South: Leeds Parade
  2  T1          122.34   10.6    25.0    0.08   0.009   0.061
  3  R2           12.52    1.0     2.4    0.01   0.001   0.006
               ----------------------------------------------
               134.86   11.6    27.4    0.08   0.010   0.067
-------------------------------------------------------------
East: University
  4  L2           37.45    3.0     7.1    0.02   0.003   0.017
  6  R2            2.40    0.2     0.5    0.00   0.000   0.001
               ----------------------------------------------
                39.86    3.2     7.6    0.02   0.003   0.018
-------------------------------------------------------------
North: Leeds Parade
  7  L2            0.82    0.1     0.2    0.00   0.000   0.000
  8  T1           41.18    3.6     8.4    0.03   0.003   0.021
               ----------------------------------------------
                41.99    3.6     8.6    0.03   0.003   0.021
-------------------------------------------------------------
 INTERSECTION:  216.71   18.4    43.6    0.13   0.016   0.106
-------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Rate    Rate    Rate    Rate    Rate    Rate
                 $/km   L/100km  g/km    g/km    g/km    g/km
-------------------------------------------------------------
South: Leeds Parade
  2  T1            0.70    6.1   144.0    0.43   0.051   0.352
  3  R2            0.83    6.7   157.5    0.49   0.062   0.382
               ----------------------------------------------
                0.71    6.1   145.1    0.44   0.052   0.354
-------------------------------------------------------------
East: University
  4  L2            0.82    6.6   156.4    0.48   0.061   0.377
  6  R2            0.82    6.6   156.4    0.48   0.061   0.377
               ----------------------------------------------
                0.82    6.6   156.4    0.48   0.061   0.377
-------------------------------------------------------------
North: Leeds Parade
  7  L2            0.71    6.1   144.2    0.43   0.051   0.353
  8  T1            0.71    6.1   144.2    0.43   0.051   0.353
               ----------------------------------------------
                0.71    6.1   144.2    0.43   0.051   0.353
-------------------------------------------------------------
 INTERSECTION:   0.61    5.2   122.3    0.37   0.045   0.298
-------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE PERFORMANCE

-------------------------------------------------------------
                                        Q u e u e
          Flow   Cap  Deg.  Aver.  Eff.    95% Back      Lane
 Lane                 Satn  Delay  Stop  -----------   Length
 No.      veh/h veh/h   x     sec   Rate    veh     m       m
-------------------------------------------------------------
 South: Leeds Parade
 1         301  1889 0.159    0.0  0.00                  500.0
 2          26  1599 0.016    8.3  0.61    0.1    0.5     60.0T
```

```
------------------------------------------------------------
 East: University
 1          83  1367 0.061    8.0  0.60    0.2    1.8    140.0
------------------------------------------------------------
 North: Leeds Parade
 1         103  1887 0.055    0.2  0.02                   500.0
------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
        (veh/h)  veh/h veh/h    x     %
----------------------------------------
 South: Leeds Parade
 1        301     301  1889  0.159  100
 2         26       6  1599  0.016  100
----------------------------------------
 East: University
 1         83       6  1367  0.061  100
----------------------------------------
 North: Leeds Parade
 1        103     103  1887  0.055  100
----------------------------------------

  The capacity value for priority and continuous movements is obtained by
  adjusting the basic saturation flow for heavy vehicle and turning vehicle
  effects.  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane Delays
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE DELAYS

------------------------------------------------------------------------------
                      ----------------  Delay (seconds/veh)  ----------------
         Deg.  Prog.    Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  Factor   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x            d1    d2   dSL   dn    dq   dqm    di    dig   dic
------------------------------------------------------------------------------
 South: Leeds Parade
 1      0.159              0.0                              0.0    0.0
 2      0.016  1.000    0.3   0.0   0.3   0.7   0.0   0.0   0.0   8.0    8.3
------------------------------------------------------------------------------
 East: University
 1      0.061  1.000    0.5   0.0   0.5   0.8   0.0   0.0   0.0   7.5    8.0
------------------------------------------------------------------------------
 North: Leeds Parade
 1      0.055              0.0                              0.1    0.2
------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay


LANE DELAY PERCENTILES

------------------------------------------------------------
        Deg.                  Percentile Delay
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
------------------------------------------------------------
 South: Leeds Parade
 1      NA - Continuous Movement
 2     0.016    8.3    8.3    8.4    8.5    8.5    8.6    8.6
------------------------------------------------------------
 East: University
 1     0.061    8.0    8.1    8.3    8.3    8.4    8.5    8.5
------------------------------------------------------------
 North: Leeds Parade
 1      NA - Continuous Movement
------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queues
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE QUEUES (VEHICLES)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.     Back of Queue (veh)      Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   ------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade
 2     0.016  1.000    0.0     0.0    0.0    0.0    0.1   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 East: University
 1     0.061  1.000    0.0     0.1    0.0    0.1    0.2   0.01    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------------------------------------------



LANE QUEUES (DISTANCE)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.     Back of Queue (m)        Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   ------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade
 2     0.016  1.000    0.0     0.2    0.0    0.2    0.5   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 East: University
 1     0.061  1.000    0.0     0.7    0.0    0.7    1.8   0.01    0.0  100.0    0.1     0.1
-------------------------------------------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queue Percentiles
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE QUEUE PERCENTILES (VEHICLES)

-------------------------------------------------------------
        Deg.           Percentile Back of Queue (veh)
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
-------------------------------------------------------------
 South: Leeds Parade
 2     0.016    0.0    0.0    0.1    0.1    0.1    0.1    0.1
-------------------------------------------------------------
 East: University
 1     0.061    0.1    0.1    0.2    0.2    0.2    0.3    0.3
-------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------



LANE QUEUE PERCENTILES (DISTANCE)

-------------------------------------------------------------
        Deg.           Percentile Back of Queue (metres)
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
-------------------------------------------------------------
 South: Leeds Parade
 2     0.016    0.2    0.3    0.4    0.4    0.5    0.6    0.6
-------------------------------------------------------------
 East: University
 1     0.061    0.7    0.9    1.3    1.5    1.8    2.0    2.1
-------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------
```

Go to Table Links (Top)

Lane Stops
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

-------------------------------------------------------------------------------
                                                  Queue   Total
       Deg.  Prog.   -- Effective Stop Rate --   Total  Move-up  Queue   Prop.
 Lane   Satn  Factor              Geom. Overall  Stops   Rate  Move-ups Queued
 No.      x            he1   he2   hig     h       H      hqm     Hqm     pq
-------------------------------------------------------------------------------
 South: Leeds Parade
 1     0.159  1.000               0.00   0.00      0.0
 2     0.016  1.000   0.07  0.00  0.54   0.61     16.0    0.00     0.0   0.21
-------------------------------------------------------------------------------
 East: University
 1     0.061  1.000   0.09  0.00  0.51   0.60     49.8    0.00     0.0   0.20
-------------------------------------------------------------------------------
 North: Leeds Parade
 1     0.055  1.000               0.02   0.02      2.2
-------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


TOTAL FLOW RATES (ALL MOVEMENT CLASSES)

------------------------------------------------
 From SOUTH To:                N       E
 Turn:                         T1      R2     TOT
 Flow Rate                  301.0    26.0   327.0
 %HV (all designations)       5.0     5.0     5.0
------------------------------------------------
 From EAST To:                 S       N
 Turn:                         L2      R2     TOT
 Flow Rate                  78.0     5.0    83.0
 %HV (all designations)       5.0     5.0     5.0
------------------------------------------------
 From NORTH To:                E       S
 Turn:                         L2      T1     TOT
 Flow Rate                   2.0   101.0   103.0
 %HV (all designations)       5.0     5.0     5.0
------------------------------------------------
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


FLOW RATES FOR Light Vehicles

-----------------------------------------
 From SOUTH To:          N       E
 Turn:                   T1      R2     TOT
-----------------------------------------
 Flow Rate - Veh     286.0    24.7   310.7
 Mov Class %          95.0    95.0    95.0
 Flow Scale - Fixed   1.00    1.00
 Flow Scale - Var     1.00    1.00
 Peak Flow Factor     1.00    1.00
-----------------------------------------
 From EAST To:           S       N
 Turn:                   L2      R2     TOT
-----------------------------------------
 Flow Rate - Veh      74.1     4.8    78.8
 Mov Class %          95.0    95.0    95.0
 Flow Scale - Fixed   1.00    1.00
 Flow Scale - Var     1.00    1.00
 Peak Flow Factor     1.00    1.00
-----------------------------------------
```

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Flow Rate - Veh	1.9	95.9	97.8
Mov Class %	95.0	95.0	95.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

FLOW RATES FOR Heavy Vehicles

From SOUTH To:	N	E	
Turn:	T1	R2	TOT
Flow Rate - Veh	15.1	1.3	16.4
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

From EAST To:	S	N	
Turn:	L2	R2	TOT
Flow Rate - Veh	3.9	0.2	4.2
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Flow Rate - Veh	0.1	5.1	5.2
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

Go to Table Links (Top)

Lane Flow Rates
Site:Uni post PM

Intersection ID: 1
Give-Way Sign Controlled Intersection

LANE FLOW RATES AT STOP LINE

From SOUTH To:	N	E	
Turn:	T1	R2	TOT
Lane 1			
LV	286.0	*	286.0
HV	15.1	*	15.1
Total	301.0	*	301.0
Lane 2			
LV	*	24.7	24.7
HV	*	1.3	1.3
Total	*	26.0	26.0
Approach	301.0	26.0	327.0

From EAST To:	S	N	
Turn:	L2	R2	TOT
Lane 1			
LV	74.1	4.8	78.8
HV	3.9	0.2	4.2
Total	78.0	5.0	83.0
Approach	78.0	5.0	83.0

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Lane 1			
LV	1.9	95.9	97.8
HV	0.1	5.1	5.2
Total	2.0	101.0	103.0
Approach	2.0	101.0	103.0

* Movement not allocated to the lane

```
EXIT LANE FLOW RATES

--------------------------------
Movement Class:       LV      HV
--------------------------------
 Exit: SOUTH
Lane:  1           170.0     9.0
Total              170.0     9.0
--------------------------------
 Exit: EAST
Lane:  1            26.6     1.4
Total               26.6     1.4
--------------------------------
 Exit: NORTH
Lane:  1           290.7    15.3
Total              290.7    15.3
--------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

--------------------------------
Movement Class:       LV      HV
--------------------------------
 Exit: SOUTH
Lane:  1           170.0     9.0
Total              170.0     9.0
--------------------------------
 Exit: EAST
Lane:  1            26.6     1.4
Total               26.6     1.4
--------------------------------
 Exit: NORTH
Lane:  1           290.7    15.3
Total              290.7    15.3
--------------------------------
  *  Movement not allocated to the lane

Unit Time for Volumes =  60 minutes
Peak Flow Period =  30 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Go to Table Links (Top)

Other

Model Settings Summary
Site:Uni post PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

* Basic Parameters:
  Intersection Type: Unsignalised - Give Way
  Driving on the left-hand side of the road
  Input data specified in Metric units
  Model Defaults: New South Wales
  Peak Flow Period (for performance): 30 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  SIDRA Standard Queue model used
  Level of Service based on: Delay (RTA NSW)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site:Uni post PM

Go to Table Links (Top)

DETAILED OUTPUT

Site: Uni existing PM

New Site
Giveway / Yield (Two-Way)

OUTPUT TABLE LINKS

Movements

Intersection Negotiation Data
Site:Uni existing PM

Intersection ID: 1
Give-Way Sign Controlled Intersection

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius m	Negn Speed km/h	Negn Dist. m	Appr. Dist. m	Downstream Distance m	User Spec?
South: Leeds Parade								
	North	T1	S	50.0	10.0	500	157	No
	East	R2	6.6	17.2	10.4	500	105	No
East: University								
	South	L2	10.0	20.2	15.7	140	108	No
	North	R2	6.6	17.2	10.4	140	102	No
North: Leeds Parade								
	East	L2	10.0	20.2	15.7	500	95	No
	South	T1	S	50.0	10.0	500	181	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay sec
South: Leeds Parade										
2	T1	50.0	50.0	50.0	50.0			50.0	50.0	0.0
3	R2	50.0	17.2	17.2	50.0	17.2		42.8	42.8	8.0
East: University										
4	L2	50.0	20.2	20.2	50.0	20.1		35.3	35.3	7.5
6	R2	50.0	17.2	17.2	50.0	20.1		35.3	35.3	8.0
North: Leeds Parade										

```
  7  L2      50.0  20.2   20.2  50.0                   46.3    46.3     7.5
  8  T1      50.0  50.0   50.0  50.0                   46.3    46.3     0.0
--------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.
```

Go to Table Links (Top)

Gap Acceptance Parameters
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

--------------------------------------------------------------------------------
                        Critical Gap                        Intra
                  Opng  ------------   Foll-up   Entry    Bunch   Propn
  Opd     Dest    Flow  Hdwy    Dist   Headway    HV      Hdwy    Bnchd
  Lane            pcu/h  sec     m       sec     Equiv     sec
--------------------------------------------------------------------------------
 South: Leeds Parade
      2      E       2    4.10    0.0     2.05     1.02   1.80    0.000
--------------------------------------------------------------------------------
 East: University
      1      S      1+    4.10    0.0     2.26     1.03   1.80    0.000
      1      N     30+    5.43    0.0     3.07     1.02   1.43    0.004
--------------------------------------------------------------------------------
 North: Leeds Parade

  No opposed movements on this approach.
--------------------------------------------------------------------------------

  Values in this table are adjusted for heavy vehicles in the entry stream.
  Use the Pedestrians and Priorities input dialogs to specify opposing pedestrian movements.
  +  Percentage of exiting flow included in opposing vehicle flow
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


MOVEMENT CAPACITY PARAMETERS

----------------------------------------------------------------
 Mov Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID       Cl.  Arv           Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
----------------------------------------------------------------
South: Leeds Parade
  2  T1   #       1      0      0    1889   0.98   ****  0.001
  3  R2   #      27      0      0    1753   0.98   6263  0.015
----------------------------------------------------------------
East: University
  4  L2   #      82      0      0    1568   0.80   1430  0.052*
  6  R2   #       1      0      0      19   0.80   1430  0.052*
----------------------------------------------------------------
North: Leeds Parade
  7  L2   #       1      0      0     920   0.98   ****  0.001
  8  T1   #       1      0      0     920   0.98   ****  0.001
----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

--------------------------------------------------------------------------------
 Mov Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID       Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-km/h)(veh-h/h) (km/h)
--------------------------------------------------------------------------------
South: Leeds Parade
  2  T1    0.00    0.00     0.0   0.00     0.0  0.01      0.6     0.0     50.0
  3  R2    0.00    0.00     8.0   0.67    18.1  0.47     15.7     0.4     42.8
--------------------------------------------------------------------------------
East: University
  4  L2    0.01    0.01     7.5   0.63    51.8  1.00     18.3     0.5     35.3
  6  R2    0.00    0.00     7.5   0.63     0.6  0.18      0.2     0.0     35.3
--------------------------------------------------------------------------------
North: Leeds Parade
  7  L2    0.00    0.00     3.7   0.40     0.4  0.02      0.6     0.0     46.3
  8  T1    0.00    0.00     3.7   0.40     0.4  0.01      0.6     0.0     46.3
--------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Total   Total   Total   Total   Total   Total
                 $/h       L/h   kg/h    kg/h    kg/h    kg/h
-------------------------------------------------------------
South: Leeds Parade
  2  T1            0.41    0.0     0.1    0.00   0.000   0.000
  3  R2           12.84    1.0     2.5    0.01   0.001   0.006
               ----------------------------------------------
               13.25    1.1     2.5    0.01   0.001   0.006
-------------------------------------------------------------
East: University
  4  L2           19.43    1.7     3.9    0.01   0.001   0.012
  6  R2            0.24    0.0     0.0    0.00   0.000   0.000
               ----------------------------------------------
               19.67    1.7     4.0    0.01   0.001   0.012
-------------------------------------------------------------
North: Leeds Parade
  7  L2            0.44    0.0     0.1    0.00   0.000   0.000
  8  T1            0.44    0.0     0.1    0.00   0.000   0.000
               ----------------------------------------------
                0.88    0.1     0.2    0.00   0.000   0.000
-------------------------------------------------------------
 INTERSECTION:  33.80    2.8     6.7    0.02   0.003   0.019
-------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Rate    Rate    Rate    Rate    Rate    Rate
                 $/km   L/100km  g/km    g/km    g/km    g/km
-------------------------------------------------------------
South: Leeds Parade
  2  T1            0.70    6.1   144.0    0.43   0.051   0.352
  3  R2            0.82    6.6   156.5    0.48   0.061   0.381
               ----------------------------------------------
                0.82    6.6   156.0    0.48   0.061   0.380
-------------------------------------------------------------
East: University
  4  L2            1.06    9.0   213.5    0.60   0.079   0.669
  6  R2            1.06    9.0   213.5    0.60   0.079   0.669
               ----------------------------------------------
                1.06    9.0   213.5    0.60   0.079   0.669
-------------------------------------------------------------
North: Leeds Parade
  7  L2            0.76    6.3   149.5    0.46   0.056   0.364
  8  T1            0.76    6.3   149.5    0.46   0.056   0.364
               ----------------------------------------------
                0.76    6.3   149.5    0.46   0.056   0.364
-------------------------------------------------------------
 INTERSECTION:  0.78    6.5   154.5    0.45   0.058   0.440
-------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE PERFORMANCE

-------------------------------------------------------------
                                        Q u e u e
          Flow   Cap  Deg.  Aver.  Eff.    95% Back      Lane
 Lane                 Satn  Delay  Stop  -----------   Length
 No.      veh/h veh/h   x    sec   Rate    veh     m       m
-------------------------------------------------------------
 South: Leeds Parade
 1           1  1889 0.001    0.0  0.00                  500.0
 2          27  1753 0.015    8.0  0.67    0.1    0.5     60.0T
```

```
------------------------------------------------------------
 East: University
 1          83  1587 0.052    7.5  0.63    0.2    1.6    140.0
------------------------------------------------------------
 North: Leeds Parade
 1           2  1840 0.001    3.7  0.40                   500.0
------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
        (veh/h)  veh/h veh/h    x     %
----------------------------------------
 South: Leeds Parade
 1          1       1  1889  0.001  100
 2         27       6  1753  0.015  100
----------------------------------------
 East: University
 1         83       6  1587  0.052  100
----------------------------------------
 North: Leeds Parade
 1          2       2  1840  0.001  100
----------------------------------------

  The capacity value for priority and continuous movements is obtained by
  adjusting the basic saturation flow for heavy vehicle and turning vehicle
  effects.  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane Delays
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE DELAYS

------------------------------------------------------------------------------
                      ----------------  Delay (seconds/veh)  ----------------
         Deg.  Prog.    Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  Factor   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x            d1    d2   dSL   dn    dq   dqm    di    dig   dic
------------------------------------------------------------------------------
 South: Leeds Parade
 1      0.001              0.0                            0.0    0.0
 2      0.015  1.000    0.0   0.0   0.0   0.1   0.0   0.0   0.0   8.0    8.0
------------------------------------------------------------------------------
 East: University
 1      0.052  1.000    0.0   0.0   0.0   0.0   0.0   0.0   0.0   7.5    7.5
------------------------------------------------------------------------------
 North: Leeds Parade
 1      0.001              0.0                            3.7    3.7
------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay


LANE DELAY PERCENTILES

------------------------------------------------------------
        Deg.                  Percentile Delay
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
------------------------------------------------------------
 South: Leeds Parade
 1      NA - Continuous Movement
 2     0.015    8.0    8.0    8.0    8.0    8.0    8.0    8.0
------------------------------------------------------------
 East: University
 1     0.052    7.5    7.5    7.5    7.5    7.5    7.5    7.5
------------------------------------------------------------
 North: Leeds Parade
 1      NA - Continuous Movement
------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queues
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE QUEUES (VEHICLES)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.     Back of Queue (veh)      Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   ------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade
 2     0.015  1.000    0.0     0.0    0.0    0.0    0.1   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 East: University
 1     0.052  1.000    0.0     0.1    0.0    0.1    0.2   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------------------------------------------



LANE QUEUES (DISTANCE)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.     Back of Queue (m)        Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   ------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade
 2     0.015  1.000    0.0     0.2    0.0    0.2    0.5   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 East: University
 1     0.052  1.000    0.0     0.6    0.0    0.6    1.6   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queue Percentiles
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE QUEUE PERCENTILES (VEHICLES)

-------------------------------------------------------------
        Deg.           Percentile Back of Queue (veh)
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
-------------------------------------------------------------
 South: Leeds Parade
 2     0.015    0.0    0.0    0.1    0.1    0.1    0.1    0.1
-------------------------------------------------------------
 East: University
 1     0.052    0.1    0.1    0.2    0.2    0.2    0.2    0.3
-------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------



LANE QUEUE PERCENTILES (DISTANCE)

-------------------------------------------------------------
        Deg.           Percentile Back of Queue (metres)
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
-------------------------------------------------------------
 South: Leeds Parade
 2     0.015    0.2    0.3    0.4    0.4    0.5    0.6    0.6
-------------------------------------------------------------
 East: University
 1     0.052    0.6    0.8    1.2    1.3    1.6    1.7    1.9
-------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------
```

Go to Table Links (Top)

Lane Stops
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

-------------------------------------------------------------------------------
                                                 Queue   Total
       Deg.  Prog.   -- Effective Stop Rate --   Total  Move-up  Queue   Prop.
 Lane   Satn  Factor              Geom. Overall  Stops   Rate  Move-ups Queued
 No.      x            he1   he2   hig     h       H      hqm     Hqm     pq
-------------------------------------------------------------------------------
 South: Leeds Parade
 1     0.001  1.000               0.00   0.00      0.0
 2     0.015  1.000   0.00  0.00  0.67   0.67     18.1    0.00     0.0   0.02
-------------------------------------------------------------------------------
 East: University
 1     0.052  1.000   0.00  0.00  0.63   0.63     52.4    0.00     0.0   0.01
-------------------------------------------------------------------------------
 North: Leeds Parade
 1     0.001  1.000               0.40   0.40      0.8
-------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


TOTAL FLOW RATES (ALL MOVEMENT CLASSES)

-------------------------------------------------
 From SOUTH To:                N       E
 Turn:                         T1      R2     TOT
 Flow Rate                    1.0    27.0    28.0
 %HV (all designations)       5.0     5.0     5.0
-------------------------------------------------
 From EAST To:                 S       N
 Turn:                         L2      R2     TOT
 Flow Rate                   82.0     1.0    83.0
 %HV (all designations)       5.0     5.0     5.0
-------------------------------------------------
 From NORTH To:                E       S
 Turn:                         L2      T1     TOT
 Flow Rate                   1.0     1.0     2.0
 %HV (all designations)       5.0     5.0     5.0
-------------------------------------------------
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


FLOW RATES FOR Light Vehicles

-----------------------------------------
 From SOUTH To:          N       E
 Turn:                   T1      R2     TOT
-----------------------------------------
 Flow Rate - Veh        0.9    25.6    26.6
 Mov Class %           95.0    95.0    95.0
 Flow Scale - Fixed    1.00    1.00
 Flow Scale - Var      1.00    1.00
 Peak Flow Factor      1.00    1.00
-----------------------------------------
 From EAST To:           S       N
 Turn:                   L2      R2     TOT
-----------------------------------------
 Flow Rate - Veh       77.9     0.9    78.8
 Mov Class %           95.0    95.0    95.0
 Flow Scale - Fixed    1.00    1.00
 Flow Scale - Var      1.00    1.00
 Peak Flow Factor      1.00    1.00
-----------------------------------------
```

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Flow Rate - Veh	0.9	0.9	1.9
Mov Class %	95.0	95.0	95.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

FLOW RATES FOR Heavy Vehicles

From SOUTH To:	N	E	
Turn:	T1	R2	TOT
Flow Rate - Veh	0.1	1.4	1.4
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

From EAST To:	S	N	
Turn:	L2	R2	TOT
Flow Rate - Veh	4.1	0.1	4.2
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Flow Rate - Veh	0.1	0.1	0.1
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

Go to Table Links (Top)

Lane Flow Rates
Site:Uni existing PM

Intersection ID: 1
Give-Way Sign Controlled Intersection

LANE FLOW RATES AT STOP LINE

From SOUTH To:	N	E	
Turn:	T1	R2	TOT
Lane 1			
LV	0.9	*	0.9
HV	0.1	*	0.1
Total	1.0	*	1.0
Lane 2			
LV	*	25.6	25.6
HV	*	1.4	1.4
Total	*	27.0	27.0
Approach	1.0	27.0	28.0

From EAST To:	S	N	
Turn:	L2	R2	TOT
Lane 1			
LV	77.9	0.9	78.8
HV	4.1	0.1	4.2
Total	82.0	1.0	83.0
Approach	82.0	1.0	83.0

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Lane 1			
LV	0.9	0.9	1.9
HV	0.1	0.1	0.1
Total	1.0	1.0	2.0
Approach	1.0	1.0	2.0

* Movement not allocated to the lane

```
EXIT LANE FLOW RATES

--------------------------------
Movement Class:       LV      HV
--------------------------------
 Exit: SOUTH
Lane:  1            78.8     4.2
Total               78.8     4.2
--------------------------------
 Exit: EAST
Lane:  1            26.6     1.4
Total               26.6     1.4
--------------------------------
 Exit: NORTH
Lane:  1             1.9     0.1
Total                1.9     0.1
--------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

--------------------------------
Movement Class:       LV      HV
--------------------------------
 Exit: SOUTH
Lane:  1            78.8     4.2
Total               78.8     4.2
--------------------------------
 Exit: EAST
Lane:  1            26.6     1.4
Total               26.6     1.4
--------------------------------
 Exit: NORTH
Lane:  1             1.9     0.1
Total                1.9     0.1
--------------------------------
  *  Movement not allocated to the lane

Unit Time for Volumes =  60 minutes
Peak Flow Period =  30 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Go to Table Links (Top)

Other

Model Settings Summary
Site:Uni existing PM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

* Basic Parameters:
  Intersection Type: Unsignalised - Give Way
  Driving on the left-hand side of the road
  Input data specified in Metric units
  Model Defaults: New South Wales
  Peak Flow Period (for performance): 30 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  SIDRA Standard Queue model used
  Level of Service based on: Delay (RTA NSW)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site:Uni existing PM

Go to Table Links (Top)

DETAILED OUTPUT

Site: Uni post AM

New Site
Giveway / Yield (Two-Way)

OUTPUT TABLE LINKS

Movements

Intersection Negotiation Data
Site:Uni post AM

Intersection ID: 1
Give-Way Sign Controlled Intersection

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius m	Negn Speed km/h	Negn Dist. m	Appr. Dist. m	Downstream Distance m	User Spec?
South: Leeds Parade								
	North	T1	S	50.0	10.0	500	157	No
	East	R2	6.6	17.2	10.4	500	105	No
East: University								
	South	L2	10.0	20.2	15.7	500	108	No
	North	R2	6.6	17.2	10.4	500	103	No
North: Leeds Parade								
	East	L2	10.0	20.2	15.7	500	72	No
	South	T1	S	50.0	10.0	500	158	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay sec
South: Leeds Parade										
2	T1	50.0	50.0	50.0	50.0			50.0	50.0	0.0
3	R2	50.0	17.2	17.2	50.0	17.2		41.6	41.6	8.0
East: University										
4	L2	50.0	20.2	20.2	50.0	19.7		41.8	41.8	7.5
6	R2	50.0	17.2	17.2	50.0	19.7		41.8	41.8	8.0
North: Leeds Parade										

```
  7  L2      50.0  20.2   20.2  50.0                    49.8    49.8     7.5
  8  T1      50.0  50.0   50.0  50.0                    49.8    49.8     0.0
--------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.
```

Go to Table Links (Top)

Gap Acceptance Parameters
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

--------------------------------------------------------------------------------
                         Critical Gap                        Intra
                  Opng   ------------   Foll-up   Entry    Bunch   Propn
  Opd     Dest    Flow   Hdwy    Dist   Headway    HV      Hdwy    Bnchd
  Lane            pcu/h   sec     m       sec     Equiv     sec
--------------------------------------------------------------------------------
 South: Leeds Parade
      2      E     314    4.10    0.0     2.05     1.02    1.80    0.036
--------------------------------------------------------------------------------
 East: University
      1      S     309+   4.10    0.0     2.26     1.03    1.80    0.035
      1      N     495+   5.43    0.0     3.07     1.02    0.98    0.045
--------------------------------------------------------------------------------
 North: Leeds Parade

  No opposed movements on this approach.
--------------------------------------------------------------------------------

  Values in this table are adjusted for heavy vehicles in the entry stream.
  Use the Pedestrians and Priorities input dialogs to specify opposing pedestrian movements.
  +  Percentage of exiting flow included in opposing vehicle flow
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


MOVEMENT CAPACITY PARAMETERS

----------------------------------------------------------------
 Mov Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID       Cl.  Arv           Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
----------------------------------------------------------------
South: Leeds Parade
  2  T1   #     101      0      0    1889   0.98   1733  0.053
  3  R2   #      78      0      0    1298   0.98   1530  0.060
----------------------------------------------------------------
East: University
  4  L2   #      26      0      0    1046   0.80   3118  0.025
  6  R2   #       2      0      0      80   0.80   3118  0.025
----------------------------------------------------------------
North: Leeds Parade
  7  L2   #       5      0      0      31   0.98    504  0.162*
  8  T1   #     301      0      0    1856   0.98    504  0.162*
----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

--------------------------------------------------------------------------------
 Mov Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID       Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-km/h)(veh-h/h) (km/h)
--------------------------------------------------------------------------------
South: Leeds Parade
  2  T1    0.00    0.00     0.0   0.00     0.0  1.17     58.4     1.2     50.0
  3  R2    0.01    0.01     9.1   0.66    51.7  1.39     45.2     1.1     41.6
--------------------------------------------------------------------------------
East: University
  4  L2    0.00    0.00     8.7   0.63    16.3  0.53     15.2     0.4     41.8
  6  R2    0.00    0.00     8.7   0.63     1.3  0.11      1.2     0.0     41.8
--------------------------------------------------------------------------------
North: Leeds Parade
  7  L2    0.00    0.00     0.1   0.02     0.1  0.07      2.9     0.1     49.8
  8  T1    0.00    0.00     0.1   0.02     5.5  3.51    173.9     3.5     49.8
--------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Total   Total   Total   Total   Total   Total
                 $/h       L/h   kg/h    kg/h    kg/h    kg/h
-----------------------------------------------------------------
South: Leeds Parade
  2  T1           41.05    3.6     8.4    0.03   0.003   0.021
  3  R2           38.03    3.0     7.2    0.02   0.003   0.017
                -------------------------------------------------
               79.08    6.6    15.6    0.05   0.006   0.038
-----------------------------------------------------------------
East: University
  4  L2           12.65    1.0     2.4    0.01   0.001   0.006
  6  R2            0.97    0.1     0.2    0.00   0.000   0.000
                -------------------------------------------------
               13.62    1.1     2.6    0.01   0.001   0.006
-----------------------------------------------------------------
North: Leeds Parade
  7  L2            2.04    0.2     0.4    0.00   0.000   0.001
  8  T1          122.67   10.6    25.1    0.08   0.009   0.061
                -------------------------------------------------
              124.71   10.8    25.5    0.08   0.009   0.062
-----------------------------------------------------------------
 INTERSECTION:  217.40   18.5    43.6    0.13   0.016   0.106
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Rate    Rate    Rate    Rate    Rate    Rate
                 $/km   L/100km  g/km    g/km    g/km    g/km
-----------------------------------------------------------------
South: Leeds Parade
  2  T1            0.70    6.1   144.0    0.43   0.051   0.352
  3  R2            0.84    6.7   158.5    0.49   0.063   0.383
                -------------------------------------------------
               0.76    6.4   150.3    0.46   0.056   0.366
-----------------------------------------------------------------
East: University
  4  L2            0.83    6.7   157.5    0.49   0.062   0.379
  6  R2            0.83    6.7   157.5    0.49   0.062   0.379
                -------------------------------------------------
               0.83    6.7   157.5    0.49   0.062   0.379
-----------------------------------------------------------------
North: Leeds Parade
  7  L2            0.71    6.1   144.2    0.43   0.051   0.352
  8  T1            0.71    6.1   144.2    0.43   0.051   0.352
                -------------------------------------------------
               0.71    6.1   144.2    0.43   0.051   0.352
-----------------------------------------------------------------
 INTERSECTION:     0.61    5.2   122.5    0.37   0.045   0.299
-----------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE PERFORMANCE

-----------------------------------------------------------------
                                          Q u e u e
          Flow   Cap  Deg.  Aver.  Eff.    95% Back      Lane
 Lane                 Satn  Delay  Stop  ------------   Length
 No.      veh/h veh/h   x    sec   Rate    veh     m       m
-----------------------------------------------------------------
 South: Leeds Parade
 1         101  1889 0.053    0.0  0.00                   500.0
 2          78  1298 0.060    9.1  0.66    0.3    1.9     60.0T
```

```
------------------------------------------------------------
 East: University
 1          28  1126 0.025    8.7  0.63    0.1    0.7    140.0
------------------------------------------------------------
 North: Leeds Parade
 1         306  1887 0.162    0.1  0.02                   500.0
------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
        (veh/h)  veh/h veh/h    x     %
----------------------------------------
 South: Leeds Parade
 1        101     101  1889  0.053  100
 2         78       6  1298  0.060  100
----------------------------------------
 East: University
 1         28       6  1126  0.025  100
----------------------------------------
 North: Leeds Parade
 1        306     306  1887  0.162  100
----------------------------------------

  The capacity value for priority and continuous movements is obtained by
  adjusting the basic saturation flow for heavy vehicle and turning vehicle
  effects.  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane Delays
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE DELAYS

------------------------------------------------------------------------------
                      ----------------  Delay (seconds/veh)  ----------------
         Deg.  Prog.    Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  Factor   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x            d1    d2   dSL   dn    dq   dqm    di    dig   dic
------------------------------------------------------------------------------
 South: Leeds Parade
 1      0.053              0.0                              0.0    0.0
 2      0.060  1.000    1.1   0.0   1.1   1.4   0.0   0.0   0.0   8.0    9.1
------------------------------------------------------------------------------
 East: University
 1      0.025  1.000    1.2   0.0   1.2   1.5   0.0   0.0   0.0   7.5    8.7
------------------------------------------------------------------------------
 North: Leeds Parade
 1      0.162              0.0                              0.1    0.1
------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay


LANE DELAY PERCENTILES

------------------------------------------------------------
        Deg.                  Percentile Delay
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
------------------------------------------------------------
 South: Leeds Parade
 1      NA - Continuous Movement
 2     0.060    9.1    9.3    9.6    9.8   10.0   10.1   10.2
------------------------------------------------------------
 East: University
 1     0.025    8.7    9.0    9.3    9.5    9.7    9.9   10.0
------------------------------------------------------------
 North: Leeds Parade
 1      NA - Continuous Movement
------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queues
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE QUEUES (VEHICLES)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.     Back of Queue (veh)      Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   ------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade
 2     0.060  1.000    0.0     0.1    0.0    0.1    0.3   0.01    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 East: University
 1     0.025  1.000    0.0     0.0    0.0    0.0    0.1   0.00    0.0  100.0    0.0     0.0
-------------------------------------------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------------------------------------------



LANE QUEUES (DISTANCE)

-------------------------------------------------------------------------------------------------
        Deg.  Prog.   Ovrfl.     Back of Queue (m)        Queue  Prob.  P'ile   Cyc-Av. Queue
 Lane   Satn  Factor  Queue   ------------------------  Stor.  Block  Block   -------------
 No.      x           No      Nb1    Nb2    Nb     95%  Ratio     %      %      Nc      95%
-------------------------------------------------------------------------------------------------
 South: Leeds Parade
 2     0.060  1.000    0.0     0.8    0.0    0.8    1.9   0.01    0.0  100.0    0.2     0.3
-------------------------------------------------------------------------------------------------
 East: University
 1     0.025  1.000    0.0     0.3    0.0    0.3    0.7   0.00    0.0  100.0    0.1     0.1
-------------------------------------------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queue Percentiles
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE QUEUE PERCENTILES (VEHICLES)

-------------------------------------------------------------
        Deg.           Percentile Back of Queue (veh)
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
-------------------------------------------------------------
 South: Leeds Parade
 2     0.060    0.1    0.1    0.2    0.2    0.3    0.3    0.3
-------------------------------------------------------------
 East: University
 1     0.025    0.0    0.0    0.1    0.1    0.1    0.1    0.1
-------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------



LANE QUEUE PERCENTILES (DISTANCE)

-------------------------------------------------------------
        Deg.           Percentile Back of Queue (metres)
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
-------------------------------------------------------------
 South: Leeds Parade
 2     0.060    0.8    1.0    1.4    1.6    1.9    2.1    2.3
-------------------------------------------------------------
 East: University
 1     0.025    0.3    0.4    0.5    0.6    0.7    0.8    0.8
-------------------------------------------------------------
 North: Leeds Parade
-------------------------------------------------------------
```

Go to Table Links (Top)

Lane Stops
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

-------------------------------------------------------------------------------
                                                  Queue   Total
       Deg.  Prog.   -- Effective Stop Rate --   Total  Move-up  Queue   Prop.
 Lane   Satn  Factor              Geom. Overall  Stops   Rate  Move-ups Queued
 No.      x            he1   he2   hig     h       H      hqm     Hqm     pq
-------------------------------------------------------------------------------
 South: Leeds Parade
 1     0.053  1.000               0.00   0.00      0.0
 2     0.060  1.000   0.25  0.00  0.41   0.66     51.7    0.00     0.0   0.40
-------------------------------------------------------------------------------
 East: University
 1     0.025  1.000   0.23  0.00  0.40   0.63     17.6    0.00     0.0   0.38
-------------------------------------------------------------------------------
 North: Leeds Parade
 1     0.162  1.000               0.02   0.02      5.6
-------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


TOTAL FLOW RATES (ALL MOVEMENT CLASSES)

------------------------------------------------
 From SOUTH To:                N       E
 Turn:                         T1      R2     TOT
 Flow Rate                  101.0    78.0   179.0
 %HV (all designations)       5.0     5.0     5.0
------------------------------------------------
 From EAST To:                 S       N
 Turn:                         L2      R2     TOT
 Flow Rate                  26.0     2.0    28.0
 %HV (all designations)       5.0     5.0     5.0
------------------------------------------------
 From NORTH To:                E       S
 Turn:                         L2      T1     TOT
 Flow Rate                   5.0   301.0   306.0
 %HV (all designations)       5.0     5.0     5.0
------------------------------------------------
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


FLOW RATES FOR Light Vehicles

-----------------------------------------
 From SOUTH To:          N       E
 Turn:                   T1      R2     TOT
-----------------------------------------
 Flow Rate - Veh      95.9    74.1   170.0
 Mov Class %          95.0    95.0    95.0
 Flow Scale - Fixed   1.00    1.00
 Flow Scale - Var     1.00    1.00
 Peak Flow Factor     1.00    1.00
-----------------------------------------
 From EAST To:           S       N
 Turn:                   L2      R2     TOT
-----------------------------------------
 Flow Rate - Veh      24.7     1.9    26.6
 Mov Class %          95.0    95.0    95.0
 Flow Scale - Fixed   1.00    1.00
 Flow Scale - Var     1.00    1.00
 Peak Flow Factor     1.00    1.00
-----------------------------------------
```

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Flow Rate - Veh	4.8	286.0	290.7
Mov Class %	95.0	95.0	95.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

FLOW RATES FOR Heavy Vehicles

From SOUTH To:	N	E	
Turn:	T1	R2	TOT
Flow Rate - Veh	5.1	3.9	9.0
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

From EAST To:	S	N	
Turn:	L2	R2	TOT
Flow Rate - Veh	1.3	0.1	1.4
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Flow Rate - Veh	0.2	15.1	15.3
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

Go to Table Links (Top)

Lane Flow Rates
Site:Uni post AM

Intersection ID: 1
Give-Way Sign Controlled Intersection

LANE FLOW RATES AT STOP LINE

From SOUTH To:	N	E	
Turn:	T1	R2	TOT
Lane 1			
LV	95.9	*	95.9
HV	5.1	*	5.1
Total	101.0	*	101.0
Lane 2			
LV	*	74.1	74.1
HV	*	3.9	3.9
Total	*	78.0	78.0
Approach	101.0	78.0	179.0

From EAST To:	S	N	
Turn:	L2	R2	TOT
Lane 1			
LV	24.7	1.9	26.6
HV	1.3	0.1	1.4
Total	26.0	2.0	28.0
Approach	26.0	2.0	28.0

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Lane 1			
LV	4.8	286.0	290.7
HV	0.2	15.1	15.3
Total	5.0	301.0	306.0
Approach	5.0	301.0	306.0

* Movement not allocated to the lane

```
EXIT LANE FLOW RATES

---------------------------------
Movement Class:       LV      HV
---------------------------------
 Exit: SOUTH
Lane:  1           310.7    16.4
Total              310.7    16.4
---------------------------------
 Exit: EAST
Lane:  1            78.8     4.2
Total               78.8     4.2
---------------------------------
 Exit: NORTH
Lane:  1            97.8     5.2
Total               97.8     5.2
---------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

---------------------------------
Movement Class:       LV      HV
---------------------------------
 Exit: SOUTH
Lane:  1           310.7    16.4
Total              310.7    16.4
---------------------------------
 Exit: EAST
Lane:  1            78.8     4.2
Total               78.8     4.2
---------------------------------
 Exit: NORTH
Lane:  1            97.8     5.2
Total               97.8     5.2
---------------------------------
  *  Movement not allocated to the lane

Unit Time for Volumes =  60 minutes
Peak Flow Period =  30 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

Go to Table Links (Top)

Other

Model Settings Summary
Site:Uni post AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

* Basic Parameters:
  Intersection Type: Unsignalised - Give Way
  Driving on the left-hand side of the road
  Input data specified in Metric units
  Model Defaults: New South Wales
  Peak Flow Period (for performance): 30 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  SIDRA Standard Queue model used
  Level of Service based on: Delay (RTA NSW)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site:Uni post AM

Go to Table Links (Top)

DETAILED OUTPUT
Site: Uni existing AM

New Site
Giveway / Yield (Two-Way)

OUTPUT TABLE LINKS

Movements

Intersection Negotiation Data
Site:Uni existing AM

Intersection ID: 1
Give-Way Sign Controlled Intersection

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius m	Negn Speed km/h	Negn Dist. m	Appr. Dist. m	Downstream m	Distance User Spec?
South: Leeds Parade								
	North	T1	S	50.0	10.0	500	157	No
	East	R2	6.6	17.2	10.4	500	105	No
East: University								
	South	L2	10.0	20.2	15.7	500	108	No
	North	R2	6.6	17.2	10.4	500	102	No
North: Leeds Parade								
	East	L2	10.0	20.2	15.7	500	95	No
	South	T1	S	50.0	10.0	500	181	No

Downstream distance is distance travelled from the stopline until exit cruise speed is reached (includes negotiation distance). Acceleration distance is weighted for light and heavy vehicles. The same distance applies for both stopped and unstopped vehicles.

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise	App. Speeds Negn	Exit Speeds Negn	Exit Speeds Cruise	Queue Move-up 1st Grn	Queue Move-up 2nd Grn	Av. Section Spd Running	Av. Section Spd Overall	Geom Delay sec
South: Leeds Parade										
2	T1	50.0	50.0	50.0	50.0			50.0	50.0	0.0
3	R2	50.0	17.2	17.2	50.0	17.2		42.7	42.7	8.0
East: University										
4	L2	50.0	20.2	20.2	50.0	20.1		43.1	43.1	7.5
6	R2	50.0	17.2	17.2	50.0	20.1		43.1	43.1	8.0
North: Leeds Parade										

```
  7  L2      50.0  20.2   20.2  50.0                    46.3    46.3     7.5
  8  T1      50.0  50.0   50.0  50.0                    46.3    46.3     0.0
--------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.
```

Go to Table Links (Top)

Gap Acceptance Parameters
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

--------------------------------------------------------------------------------
                        Critical Gap                        Intra
                  Opng  ------------   Foll-up   Entry    Bunch   Propn
  Opd     Dest    Flow  Hdwy    Dist   Headway    HV      Hdwy    Bnchd
  Lane            pcu/h  sec     m       sec     Equiv     sec
--------------------------------------------------------------------------------
 South: Leeds Parade
      2      E       2    4.10     0.0     2.05     1.03   1.80    0.000
--------------------------------------------------------------------------------
 East: University
      1      S       1+   4.10     0.0     2.25     1.02   1.80    0.000
      1      N      87+   5.43     0.0     3.07     1.02   1.57    0.012
--------------------------------------------------------------------------------
 North: Leeds Parade

  No opposed movements on this approach.
--------------------------------------------------------------------------------

  Values in this table are adjusted for heavy vehicles in the entry stream.
  Use the Pedestrians and Priorities input dialogs to specify opposing pedestrian movements.
  +  Percentage of exiting flow included in opposing vehicle flow
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


MOVEMENT CAPACITY PARAMETERS

----------------------------------------------------------------
 Mov Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID       Cl.  Arv           Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
----------------------------------------------------------------
South: Leeds Parade
  2  T1   #       1      0      0    1889   0.98   ****  0.001
  3  R2   #      82      0      0    1753   0.98   1995  0.047*
----------------------------------------------------------------
East: University
  4  L2   #      27      0      0    1511   0.80   4377  0.018
  6  R2   #       1      0      0      56   0.80   4377  0.018
----------------------------------------------------------------
North: Leeds Parade
  7  L2   #       1      0      0     920   0.98   ****  0.001
  8  T1   #       1      0      0     920   0.98   ****  0.001
----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

--------------------------------------------------------------------------------
 Mov Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID       Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-km/h)(veh-h/h) (km/h)
--------------------------------------------------------------------------------
South: Leeds Parade
  2  T1    0.00    0.00     0.0   0.00     0.0  0.01      0.6     0.0     50.0
  3  R2    0.01    0.01     8.0   0.67    54.9  1.44     47.6     1.1     42.7
--------------------------------------------------------------------------------
East: University
  4  L2    0.00    0.00     7.5   0.63    17.1  0.52     15.8     0.4     43.1
  6  R2    0.00    0.00     7.5   0.63     0.6  0.07      0.6     0.0     43.1
--------------------------------------------------------------------------------
North: Leeds Parade
  7  L2    0.00    0.00     3.7   0.40     0.4  0.02      0.6     0.0     46.3
  8  T1    0.00    0.00     3.7   0.40     0.4  0.01      0.6     0.0     46.3
--------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Total   Total   Total   Total   Total   Total
                 $/h       L/h   kg/h    kg/h    kg/h    kg/h
-------------------------------------------------------------
South: Leeds Parade
  2  T1            0.41    0.0     0.1    0.00   0.000   0.000
  3  R2           39.01    3.1     7.4    0.02   0.003   0.018
               ----------------------------------------------
               39.42    3.2     7.5    0.02   0.003   0.018
-------------------------------------------------------------
East: University
  4  L2           12.78    1.0     2.4    0.01   0.001   0.006
  6  R2            0.47    0.0     0.1    0.00   0.000   0.000
               ----------------------------------------------
               13.25    1.1     2.5    0.01   0.001   0.006
-------------------------------------------------------------
North: Leeds Parade
  7  L2            0.44    0.0     0.1    0.00   0.000   0.000
  8  T1            0.44    0.0     0.1    0.00   0.000   0.000
               ----------------------------------------------
               0.88    0.1     0.2    0.00   0.000   0.000
-------------------------------------------------------------
 INTERSECTION:   53.55    4.3    10.2    0.03   0.004   0.025
-------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-------------------------------------------------------------
 Mov  Turn       Cost    Fuel     CO2     CO      HC      NOX
 ID              Rate    Rate    Rate    Rate    Rate    Rate
                 $/km   L/100km  g/km    g/km    g/km    g/km
-------------------------------------------------------------
South: Leeds Parade
  2  T1            0.70    6.1   144.0    0.43   0.051   0.352
  3  R2            0.82    6.6   156.5    0.48   0.061   0.381
               ----------------------------------------------
               0.82    6.6   156.3    0.48   0.061   0.380
-------------------------------------------------------------
East: University
  4  L2            0.81    6.6   155.1    0.48   0.060   0.375
  6  R2            0.81    6.6   155.1    0.48   0.060   0.375
               ----------------------------------------------
               0.81    6.6   155.1    0.48   0.060   0.375
-------------------------------------------------------------
North: Leeds Parade
  7  L2            0.76    6.3   149.5    0.46   0.056   0.364
  8  T1            0.76    6.3   149.5    0.46   0.056   0.364
               ----------------------------------------------
               0.76    6.3   149.5    0.46   0.056   0.364
-------------------------------------------------------------
 INTERSECTION:   0.68    5.5   129.9    0.40   0.050   0.316
-------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE PERFORMANCE

-------------------------------------------------------------
                                        Q u e u e
          Flow   Cap  Deg.  Aver.  Eff.    95% Back      Lane
 Lane                 Satn  Delay  Stop  -----------   Length
 No.      veh/h veh/h   x    sec   Rate    veh     m       m
-------------------------------------------------------------
 South: Leeds Parade
 1           1  1889 0.001    0.0  0.00                  500.0
 2          82  1753 0.047    8.0  0.67    0.2    1.6     60.0T
```

```
------------------------------------------------------------
 East: University
 1          28  1567 0.018    7.5  0.63    0.1    0.5    140.0
------------------------------------------------------------
 North: Leeds Parade
 1           2  1840 0.001    3.7  0.40                   500.0
------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
        (veh/h)  veh/h veh/h    x     %
----------------------------------------
 South: Leeds Parade
 1          1       1  1889  0.001  100
 2         82       6  1753  0.047  100
----------------------------------------
 East: University
 1         28       6  1567  0.018  100
----------------------------------------
 North: Leeds Parade
 1          2       2  1840  0.001  100
----------------------------------------

  The capacity value for priority and continuous movements is obtained by
  adjusting the basic saturation flow for heavy vehicle and turning vehicle
  effects.  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane Delays
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


LANE DELAYS

------------------------------------------------------------------------------
                      ----------------  Delay (seconds/veh)  ----------------
        Deg.  Prog.    Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  Factor   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x            d1    d2   dSL   dn    dq   dqm    di    dig   dic
------------------------------------------------------------------------------
 South: Leeds Parade
 1      0.001              0.0                            0.0    0.0
 2      0.047  1.000    0.0   0.0   0.0   0.1   0.0   0.0   0.0   8.0    8.0
------------------------------------------------------------------------------
 East: University
 1      0.018  1.000    0.0   0.0   0.0   0.0   0.0   0.0   0.0   7.5    7.5
------------------------------------------------------------------------------
 North: Leeds Parade
 1      0.001              0.0                            3.7    3.7
------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay


LANE DELAY PERCENTILES

------------------------------------------------------------
        Deg.                  Percentile Delay
 Lane   Satn  ------------------------------------------------
 No.      x     50%    70%    85%    90%    95%    98%   100%
------------------------------------------------------------
 South: Leeds Parade
 1      NA - Continuous Movement
 2     0.047    8.0    8.0    8.0    8.0    8.0    8.0    8.0
------------------------------------------------------------
 East: University
 1     0.018    7.5    7.5    7.5    7.5    7.5    7.6    7.6
------------------------------------------------------------
 North: Leeds Parade
 1      NA - Continuous Movement
------------------------------------------------------------
```

Go to Table Links (Top)

Lane Queues
Site:Uni existing AM

Intersection ID: 1
Give-Way Sign Controlled Intersection

LANE QUEUES (VEHICLES)

Lane No.	Deg. Satn x	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	95%	Queue Stor. Ratio	Prob. Block %	P'ile Block %	Cyc-Av. Queue Nc	95%
South: Leeds Parade												
2	0.047	1.000	0.0	0.1	0.0	0.1	0.2	0.01	0.0	100.0	0.0	0.0
East: University												
1	0.018	1.000	0.0	0.0	0.0	0.0	0.1	0.00	0.0	100.0	0.0	0.0
North: Leeds Parade												

LANE QUEUES (DISTANCE)

Lane No.	Deg. Satn x	Prog. Factor	Ovrfl. Queue No	Back of Queue (m) Nb1	Nb2	Nb	95%	Queue Stor. Ratio	Prob. Block %	P'ile Block %	Cyc-Av. Queue Nc	95%
South: Leeds Parade												
2	0.047	1.000	0.0	0.6	0.0	0.6	1.6	0.01	0.0	100.0	0.0	0.0
East: University												
1	0.018	1.000	0.0	0.2	0.0	0.2	0.5	0.00	0.0	100.0	0.0	0.0
North: Leeds Parade												

Go to Table Links (Top)

Lane Queue Percentiles
Site:Uni existing AM

Intersection ID: 1
Give-Way Sign Controlled Intersection

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
South: Leeds Parade								
2	0.047	0.1	0.1	0.2	0.2	0.2	0.2	0.3
East: University								
1	0.018	0.0	0.0	0.1	0.1	0.1	0.1	0.1
North: Leeds Parade								

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (metres) 50%	70%	85%	90%	95%	98%	100%
South: Leeds Parade								
2	0.047	0.6	0.8	1.2	1.4	1.6	1.8	1.9
East: University								
1	0.018	0.2	0.3	0.4	0.4	0.5	0.6	0.6
North: Leeds Parade								

Go to Table Links (Top)

Lane Stops
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

-------------------------------------------------------------------------------
                                                  Queue   Total
       Deg.  Prog.   -- Effective Stop Rate --   Total  Move-up  Queue   Prop.
 Lane   Satn  Factor              Geom. Overall  Stops   Rate  Move-ups Queued
 No.      x            he1   he2   hig     h       H      hqm     Hqm     pq
-------------------------------------------------------------------------------
 South: Leeds Parade
 1     0.001  1.000               0.00   0.00      0.0
 2     0.047  1.000   0.00  0.00  0.67   0.67     54.9    0.00     0.0   0.02
-------------------------------------------------------------------------------
 East: University
 1     0.018  1.000   0.00  0.00  0.63   0.63     17.8    0.00     0.0   0.01
-------------------------------------------------------------------------------
 North: Leeds Parade
 1     0.001  1.000               0.40   0.40      0.8
-------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


TOTAL FLOW RATES (ALL MOVEMENT CLASSES)

-------------------------------------------------
 From SOUTH To:                N       E
 Turn:                         T1      R2     TOT
 Flow Rate                    1.0    82.0    83.0
 %HV (all designations)       5.0     5.0     5.0
-------------------------------------------------
 From EAST To:                 S       N
 Turn:                         L2      R2     TOT
 Flow Rate                   27.0     1.0    28.0
 %HV (all designations)       5.0     5.0     5.0
-------------------------------------------------
 From NORTH To:                E       S
 Turn:                         L2      T1     TOT
 Flow Rate                    1.0     1.0     2.0
 %HV (all designations)       5.0     5.0     5.0
-------------------------------------------------
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection


FLOW RATES FOR Light Vehicles

-----------------------------------------
 From SOUTH To:          N       E
 Turn:                   T1      R2     TOT
-----------------------------------------
 Flow Rate - Veh        0.9    77.9    78.8
 Mov Class %           95.0    95.0    95.0
 Flow Scale - Fixed    1.00    1.00
 Flow Scale - Var      1.00    1.00
 Peak Flow Factor      1.00    1.00
-----------------------------------------
 From EAST To:           S       N
 Turn:                   L2      R2     TOT
-----------------------------------------
 Flow Rate - Veh       25.6     0.9    26.6
 Mov Class %           95.0    95.0    95.0
 Flow Scale - Fixed    1.00    1.00
 Flow Scale - Var      1.00    1.00
 Peak Flow Factor      1.00    1.00
-----------------------------------------
```

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Flow Rate - Veh	0.9	0.9	1.9
Mov Class %	95.0	95.0	95.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

FLOW RATES FOR Heavy Vehicles

From SOUTH To:	N	E	
Turn:	T1	R2	TOT
Flow Rate - Veh	0.1	4.1	4.2
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

From EAST To:	S	N	
Turn:	L2	R2	TOT
Flow Rate - Veh	1.4	0.1	1.4
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Flow Rate - Veh	0.1	0.1	0.1
Mov Class %	5.0	5.0	5.0
Flow Scale - Fixed	1.00	1.00	
Flow Scale - Var	1.00	1.00	
Peak Flow Factor	1.00	1.00	

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Lane Flow Rates
Site:Uni existing AM

Intersection ID: 1
Give-Way Sign Controlled Intersection

LANE FLOW RATES AT STOP LINE

From SOUTH To:	N	E	
Turn:	T1	R2	TOT
Lane 1			
LV	0.9	*	0.9
HV	0.1	*	0.1
Total	1.0	*	1.0
Lane 2			
LV	*	77.9	77.9
HV	*	4.1	4.1
Total	*	82.0	82.0
Approach	1.0	82.0	83.0

From EAST To:	S	N	
Turn:	L2	R2	TOT
Lane 1			
LV	25.6	0.9	26.6
HV	1.4	0.1	1.4
Total	27.0	1.0	28.0
Approach	27.0	1.0	28.0

From NORTH To:	E	S	
Turn:	L2	T1	TOT
Lane 1			
LV	0.9	0.9	1.9
HV	0.1	0.1	0.1
Total	1.0	1.0	2.0
Approach	1.0	1.0	2.0

* Movement not allocated to the lane

```
EXIT LANE FLOW RATES

--------------------------------
Movement Class:       LV      HV
--------------------------------
 Exit: SOUTH
Lane:  1            26.6     1.4
Total               26.6     1.4
--------------------------------
 Exit: EAST
Lane:  1            78.8     4.2
Total               78.8     4.2
--------------------------------
 Exit: NORTH
Lane:  1             1.9     0.1
Total                1.9     0.1
--------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

--------------------------------
Movement Class:       LV      HV
--------------------------------
 Exit: SOUTH
Lane:  1            26.6     1.4
Total               26.6     1.4
--------------------------------
 Exit: EAST
Lane:  1            78.8     4.2
Total               78.8     4.2
--------------------------------
 Exit: NORTH
Lane:  1             1.9     0.1
Total                1.9     0.1
--------------------------------
  *  Movement not allocated to the lane

Unit Time for Volumes =  60 minutes
Peak Flow Period =  30 minutes
Flow Rates include effects of Flow Scale and Peak Flow Factor
```

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Other

Model Settings Summary
Site:Uni existing AM

```
Intersection ID: 1
Give-Way Sign Controlled Intersection

* Basic Parameters:
  Intersection Type: Unsignalised - Give Way
  Driving on the left-hand side of the road
  Input data specified in Metric units
  Model Defaults: New South Wales
  Peak Flow Period (for performance): 30 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  SIDRA Standard Queue model used
  Level of Service based on: Delay (RTA NSW)
  Queue percentile: 95%
```

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Diagnostics
Site:Uni existing AM

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