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By: Jennifer Davison

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PLANS AND DOCUMENTS referred to in the PDA DEVELOPMENT APPROVAL

Approval no: DEV2020/1099

Date: 9 December 2020

Queensland Government

Traffic Engineering Report

Oxley Priority Development Area

At 53 Seventeen Mile Rocks Road, Oxley QLD

On behalf of Economic Development Queensland

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1 Introduction

1.1 Background

TTM Consulting has been engaged by Economic Development Queensland (EDQ) to undertake a traffic engineering assessment of the proposed redevelopment of the former Oxley Secondary College site. It is understood that this report is to accompany a reconfiguring a lot and material change of use development application to the Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP).

This report is a revision of the previous report, dated 20th February 2020, and has been prepared in response to the Further Issues letters, dated 23rd April and 23rd June 2020, issued by DSDMIP.

Specific responses to the traffic engineering related items of the Further Issues letters are provided in Section 10 of this report.

1.2 Scope

This report investigates the transport aspects associated with the proposed development. The scope of the transport aspects investigated includes:

- Access configuration to provide efficient and safe traffic movement between the site and the public road network
- Identification of likely traffic volumes and traffic distribution from the existing site and the future development
- Identification of likely traffic impact of the development on the public road network and required external road works
- Adequacy of the internal road layout
- Adequacy of access and internal facilities to provide for pedestrians and cyclists
- Access to public transport facilities

To assess the proposed transport arrangements, the development plans have been assessed against the following guidelines and planning documents:

- EDQ's Oxley Priority Development Area Development Scheme (August 2019)
- EDQ's PDA Guideline No. 6 Street and Movement Network (February 2019)
- Brisbane City Council Planning Scheme (City Plan 2014), specifically:
  - Local Government Infrastructure Plan
  - Transport, Access, Parking and Servicing Code

- Transport, Access, Parking and Servicing Planning Scheme Policy
- Infrastructure Design Planning Scheme Policy
- Subdivision Code

- Austroads Guide to Road Design series

1.3 Site Location & Current Use

The site is located to the north of Seventeen Mile Rocks Road, as shown in Figure 1.1. The site, and its surroundings, are shown Figure 1.1.

The property description is Lot 600 on SP236626 and Lot 551 on SP142916.

The site has road frontages to Seventeen Mile Rocks Road along the southern boundary, Cliveden Avenue along the northern boundary, and Blackheath Street along the eastern boundary.

It is currently occupied by C & K Yuingi Community Childcare Centre, which is located on Lot 501 in the north-eastern portion of the site. The remainder of the site contains the former secondary college that ceased operating in 2000 and has since been temporarily used as government offices during the fire ant eradication program which has also ceased to operate on the site.

Two vehicular accesses exist for the site, including:

- A primary access located at the eastern end of the Seventeen Mile Rocks Road service road. This access is effectively unused at present as it provides access to on-site car parking areas associated with the former secondary college; and
- A secondary access located on Cliveden Avenue. This access is used by staff and visitors associated with the existing childcare centre.

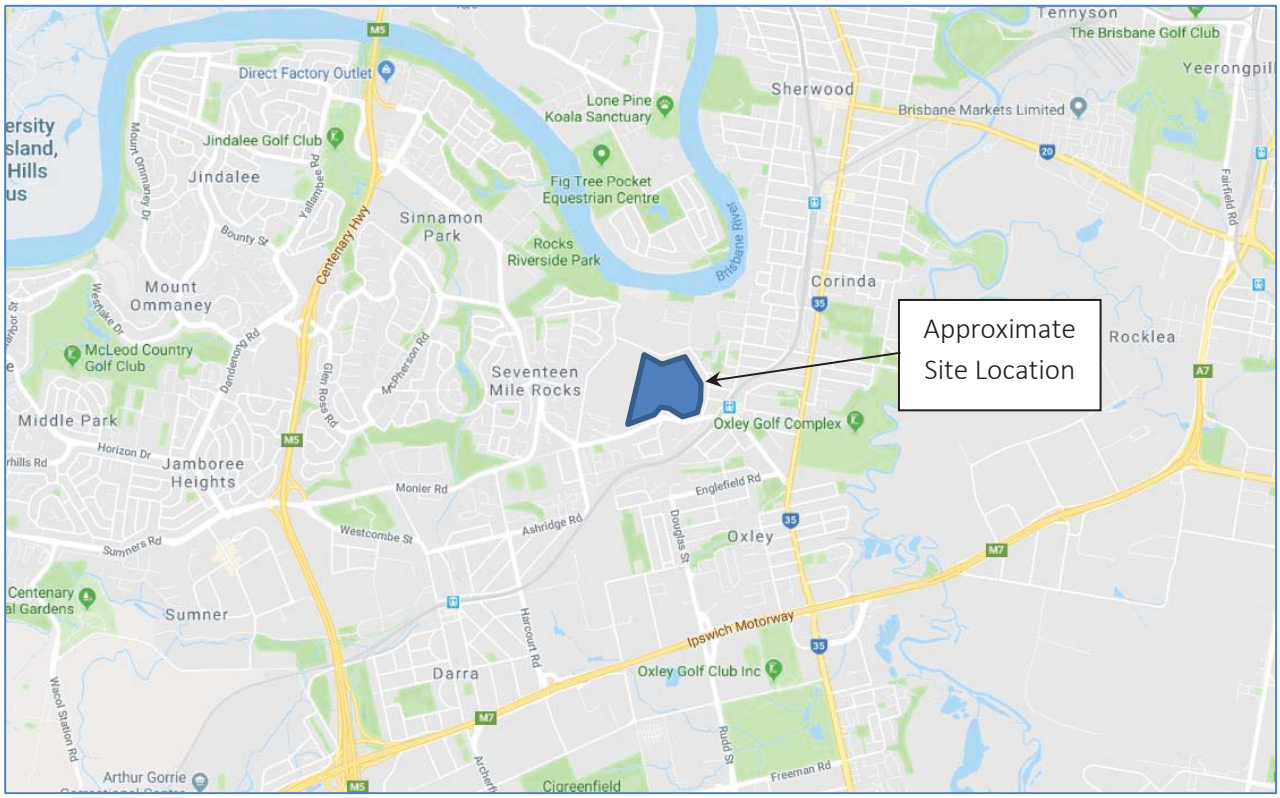


Figure 1.1: Site location

Figure 1.2: Site area

1.4 Proposed Development Description

The proposed master plan of development (copy included in ***Appendix A***) involves subdivision of the site to include a residential subdivision, a retirement living precinct and child care site (which will replace the existing child care centre). Table 1.1 summarises the anticipated ultimate master plan land use yield.

Table 1.1: Proposed Master Plan Development Yield

Land Use	Yield
Residential Dwellings	80 dwellings (approx.)
Retirement Living Dwelling Units	150 dwellings (approx.)
Child Care Centre	70 children (approx.)

The subject development application includes Stage 1 of the master plan development. It involves reconfiguration of a lot to establish 39 residential dwelling allotments, a child care centre allotment, a retirement living precinct allotment and a public recreation park allotment. It is noted that both the child care centre and retirement living developments are not included in the application and will be subject to future development applications.

Copies of the proposed *Reconfiguration of a Lot Stage 1* plan and *Plan of Development Stage 1A* are included in ***Appendix A***.

2 Existing Transport Infrastructure

2.1 The Road Network

All roads in the immediate vicinity of the site are administered by Brisbane City Council. The hierarchy and characteristics of higher order roads in the immediate vicinity of the site are shown below in Table 2.1. All other roads in the local area are classified as 'Neighbourhood Roads'.

Table 2.1: Local Road Hierarchy

Road	Speed Limit	Lanes	Classification
Seventeen Mile Rocks Road	60kph	2 (undivided, plus parking)	Suburban Road
Oxley Station Road	60kph	2 (undivided, plus parking)	District Road
Cook Street	60kph	2 (undivided, plus parking)	District Road

All road intersections in the local area are priority-controlled (either roundabout or T-junction) except for the intersection of Seventeen Mile Rocks Road / Duporth Road / Ormond Road which is signal-controlled. All intersections typically have no restrictions to turn movements except for the Seventeen Mile Rocks Road / Ardoyne Road intersection where right turns out of Ardoyne Road are prohibited from 7-9am and 4-7pm Monday to Friday.

2.2 Public and Active Transport Facilities

Train

Oxley train station, on the Ipswich line, is located approximately 250m east of the site. Services typically operate every 12 to 15 minutes between 5am and 12:30am (approx.).

Buses

The nearest on-street bus stop to the site is located on Seventeen Mile Rocks Road, approximately 80m east of the Service Road / Kingsgate Street roundabout intersection. It services bus routes 106, 467 and 468 which provide connection to Oxley train station, Indooroopilly Interchange and Brisbane City with services typically operating every 30 minutes, and 15 minutes during peak times.

Pedestrians

Formal pedestrian footpaths are located on both sides of Seventeen Mile Rocks Road and the western side of Blackheath Street. The nearest formal pedestrian crossing of Seventeen Mile Rocks Road is located at the roundabout intersection with the Service Road / Kingsgate Street.

Cyclists

Dedicated on-road cycle lanes are located on Seventeen Mile Rocks Road on approach to, and west of, the roundabout intersection with the Service Road / Kingsgate Street.

3 Existing Road Network Performance

3.1 Existing Traffic Volumes

3.1.1 Peak Hour

TTM Data conducted an intersection traffic movement surveys at the following intersections, from 6-9am and 2-6pm on Tuesday 17th April 2018:

- Seventeen Mile Rocks Road / Carlyle Street / Highland Drive roundabout
- Seventeen Mile Rocks Road / Fort Road / Pannard Street / Monier Road roundabout
- Seventeen Mile Rocks Road / Kingsgate Street roundabout
- Seventeen Mile Rocks Road / Oxley Station Road / Cook Street roundabout
- Ardoyne Road / Howard Street 'T' junction

The locations of the above-mentioned intersections are shown in Figure 3.1.

The peak hours were typically 7:30 to 8:30am and 4:45 to 5:45pm. Copies of the survey data are included in *Appendix B*.

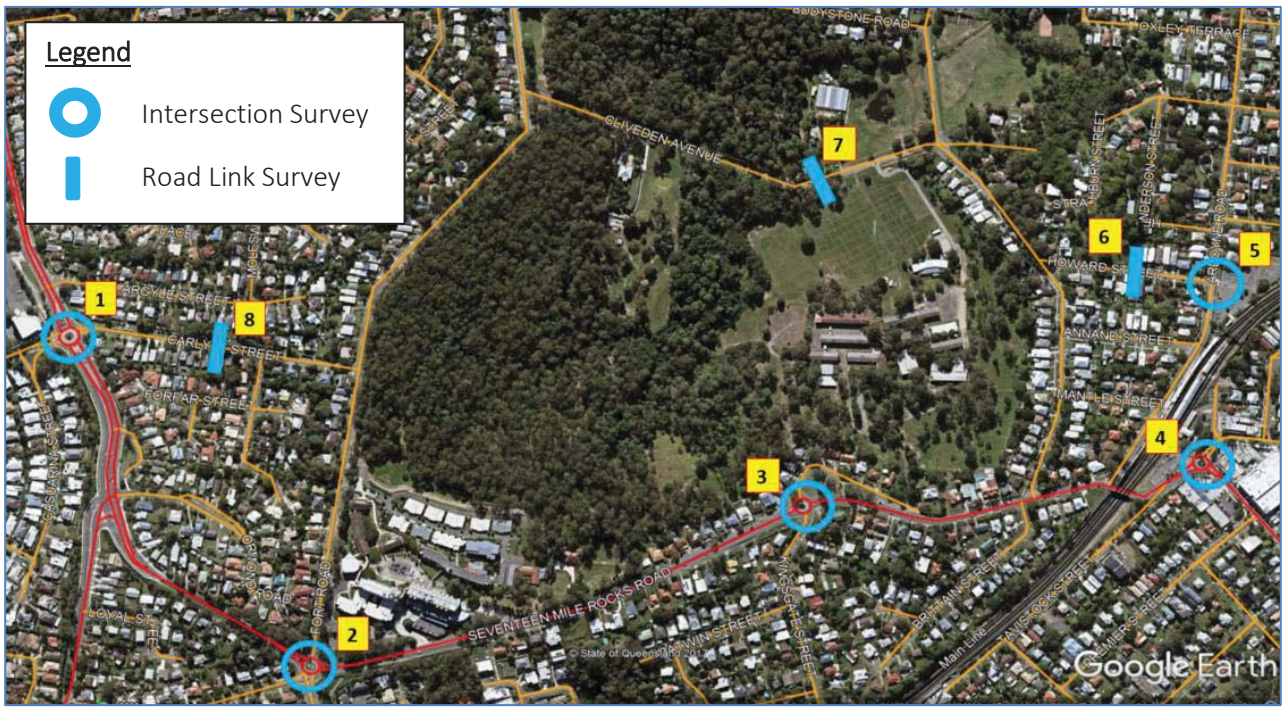


Figure 3.1: Traffic Movement Survey Locations

3.1.2 Daily Traffic

TTM Data conducted an automatic traffic movement surveys at the following locations, from Friday 13th April to Monday 23rd April 2018:

- Carlyle Street, approximately 115m east of Seventeen Mile Rocks Road
- Cliveden Avenue, approximately 150m west of Blackheath Road
- Howard Street, approximately 95m west of Ardoyne Road

Copies of the survey data are included in ***Appendix B***.

3.2 Intersections Assessment

The key intersections that were surveyed have been analysed using SIDRA 8.0 analysis software to determine the existing performance. Detailed analysis outputs for each intersection are contained in ***Appendices D to G***. Summaries of the existing performances are included in Section 7.2.

3.3 Road Link Assessment

Figure 3.2 and Table 3.1 below summarise the existing daily traffic volumes on the local road network. The identified volumes are a combination of actual surveyed daily volumes and estimates based on the peak hour and daily traffic movement surveys.

As indicated, all nominated roads are currently carrying daily traffic volumes that are within Council's guidelines (nominal thresholds).

Figure 3.2: Daily Traffic Movement Volume Locations

Table 3.1: Existing Daily Traffic Volumes

Road No.	Road Name	Segment	Daily Volume	Council Nominal Guideline [1]
1	Seventeen Mile Rocks Road	North of Carlyle Street	16,300	15,000-30,000
2	Seventeen Mile Rocks Road	West of Fort Road	14,175	15,000-30,000
3	Seventeen Mile Rocks Road	West of Kingsgate Street	16,455	15,000-30,000
4	Seventeen Mile Rocks Road	East of Kingsgate Street	16,685	15,000-30,000
5	Seventeen Mile Rocks Road	West of Oxley Station Road	14,010	15,000-30,000
6	Oxley Station Road	South of Seventeen Mile Rocks Road	10,840	6,000-15,000
7	Cook Street	East of Oxley Station Road	9,025	6,000-15,000
8	Ardoyne Road	South of Howard Street	4,209	1,000-6,000
9	Ardoyne Road	North of Howard Street	5,546	1,000-6,000
10	Howard Street	Full length of road	1,662	1,000-6,000
11	Cliveden Avenue	Full length of road	1,724	1,000-6,000
12	Carlyle Street	Full length of road	1,343	1,000-6,000
13	Service Road	North of Seventeen Mile Rocks Road	43	1,000-6,000

[1] Guideline traffic volumes as per Council's *Infrastructure Design Planning Scheme Policy* for classification of roads.

4 Road Network Planning

Review of Council's *Local Government Infrastructure Plan* indicates that there is only one road planning project in the local area which includes:

- Road Intersection Project (OXY-RI-004) at the intersection of Seventeen Mile Rocks Road / Duporth Road / Ormond Road with an estimated year of completion of 2016-2021. It is apparent that this upgrade has already been undertaken with the intersection being signal-controlled.

5 Site Access Opportunities & Constraints

The subject site has road frontage to three existing roads being Seventeen Mile Rocks Road, Cliveden Avenue and Blackheath Road. The potential for vehicular access to be provided to each road frontage is discussed in the following sections.

5.1 Blackheath Road

As shown in Figure 1.2 there is potential for an access to be established to Blackheath Road adjacent to the Howard Street intersection. The sites road frontage is approximately 20m.

Provision of a public road intersection at this location would result in a separation from the Howard Street intersection of approximately 30m. Such separation could be acceptable in terms of separation of traffic movements at both intersections, however, it is noted that Council's desirable minimum intersection spacing in this instance is 60m.

Additionally, there are several reasons why a new public road intersection should not be provided at this location, including:

- Due to the vertical alignment of Blackheath Road (crest to the south) adequate intersection sight distance would not be achieved. Based on a design speed of 50kph the minimum safe intersection sight distance requirement is 90m, whereas on-site observations indicate that only 45m approximately would be achieved.
- Blackheath Road has a kerb-to-kerb width of approximately 6m north of the Howard Street intersection. There are existing 'no stopping' restrictions along both sides of the road in this area. A new intersection at this location would require these zones to be extended further which would impact on the provision of on-street car parking opportunities for local residents.
- The topography of the site west of Blackheath Road is very steep, in the order of 1 in 7, which would require significant earthworks within the site to enable a suitable road grade to be established (i.e. 1 in 10, and less on approach to the intersection). Such works would extensively affect the proposed open space area within the site.

5.2 Cliveden Avenue

The site has a 340m frontage to this road which presents several opportunities for a public road intersection to be established. However, it is noted that within 140m of the Blackheath Road intersection is located within the 'Brisbane River flood planning area 2a sub-category' which is understood to affect the potential provision of a new public road intersection in this area.

Additionally, it is noted that Open Space Reserve is proposed over the north-western portion of the site in which provision of a new public road intersection would not be appropriate.

5.3 Seventeen Mile Rocks Road

The subject site is currently accessed via a driveway located at the eastern end of the service road that connects to Seventeen Mile Rocks Road at the Kingsgate Street roundabout intersection. The available site road frontage at this location is approximately 34m. Given the limitations and restrictions associated with gaining access via Cliveden Avenue and Blackheath Road, this is the most logical location for site access.

The potential for providing direct access between the site and Seventeen Mile Rocks Road, instead of to the service road, has been assessed. Two forms of intersection have been considered including priority-controlled (i.e. give-way conditions) and signal controlled. Both forms of intersection at this location are inappropriate for the following reasons:

- A priority-controlled intersection would require an absolute minimum *safe intersection sight distance* (SISD) of 114m. Due to the horizontal alignment of Seventeen Mile Rocks Road east of this potential intersection location, an SISD of up to 75m is achievable. Additionally, the *minimum gap sight distance* (MGSD), for right turns into Seventeen Mile Rocks Road would be 83m (maximum of 75m achievable). As such, appropriate sight distance cannot be achieved at this location.
- A signalised intersection would require provision of two through lanes in each direction and dedicated right turn lane on Seventeen Mile Rocks Road. Such a carriageway cross-section cannot be provided within the existing road reserve widths both east and west of this potential intersection location.
- A cul-de-sac turning head, or similar turning head arrangement, would need to be provided where the existing service road would be terminated. There is insufficient area for such an arrangement to be provided.

Based on the constraints identified above the only feasible access arrangement is for the existing service road to be continued into the subject site.

6 Proposed Site Access Arrangements

Due to the existing constraints along the Cliveden Avenue and Blackheath Road site frontages primary vehicular site access is proposed to be via the existing Seventeen Mile Rocks Road service road. A secondary emergency access is proposed as part of the master plan development via Cliveden Avenue. The proposed accesses are shown diagrammatically in Figure 6.1 below.

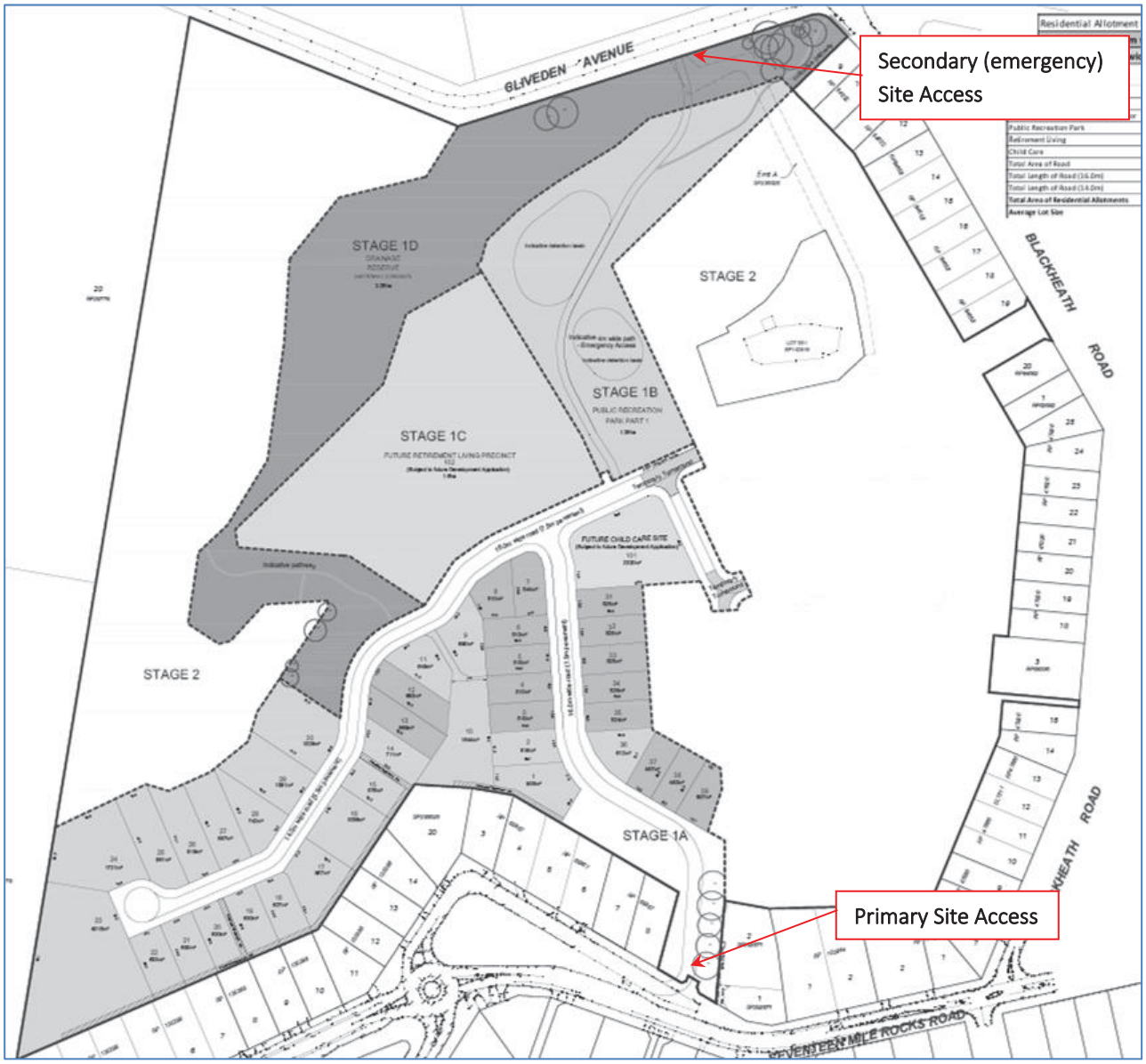


Figure 6.1: Proposed Site Accesses

6.1 Primary Access (Seventeen Mile Rocks Road)

The existing service road is proposed to be extended by providing a new public road that extends into the subject site. The preliminary concept design of this road extension, and the required upgrade to the Seventeen Mile Rocks Rd / Kingsgate St / Service Road intersection, is shown in TTM drawing numbers 18BRT0087-01D and 18BRT0087-02C (***Appendix H***).

The proposed new public road is designed in accordance with Council's 'Neighbourhood Road' design standard having a 16m wide road reserve containing a 7.5m carriageway with 4.25m verges. 1.5m wide concrete footpaths are proposed on both sides of the access road.

6.2 Secondary (Emergency) Access

Due to the scale of the master plan development it is necessary to provide a secondary point of vehicular access that can be used during an emergency.

The proposed access includes a 3m wide path that links the proposed internal road network to Cliveden Avenue. The proposed access crossover to Cliveden Avenue is located approximately 80m west of the Cliveden Avenue / Blackheath Road intersection in accordance with Council requirements.

Access to the emergency driveway should be physically restricted by way of removable bollards at both ends of the driveway. Such bollards should be installed at 1.5m centres to physically prevent access by a typical car. Regulatory traffic signage should also be installed to clearly identify the driveway as an emergency access only.

7 Internal Road Layout

7.1 Road Hierarchy

The development plan proposes a public road network throughout the southern half of the site connected to the existing Seventeen Mile Rocks Road service road. Figure 7.1 presents the proposed road hierarchy.

Figure 7.1: Proposed Road Hierarchy

7.2 Road Cross-Sections

The proposed Neighbourhood Roads are designed with a 16m road reserve containing a 7.5m carriageway and 4.25m verges in accordance with Council standards.

All proposed Local Streets are typically designed with a 14m road reserve containing a 5.5m carriageway and 4.25m verges in accordance with Council standards.

The proposed Laneway is designed with a 12m road reserve containing a 4.0m driveway in accordance with Council standards.

7.3 Intersections

Three internal intersections are proposed all of which are designed as priority-controlled T intersections. The minimum intersection spacing proposed is 70m which exceeds the minimum requirement of 60m.

7.4 Cul-de-sacs

Council's Infrastructure Design Planning Scheme Policy stipulates the length of a cul-de-sac road is to be a maximum of 180m.

Two cul-de-sac roads are proposed including one in the western portion of the site, having a length of 250m, and one in the eastern portion having a length of 90m.

The length of the western cul-de-sac road is an exceptional circumstance whereby its length is a direct result of terrain, and other site, constraints and the need to achieve acceptable vertical alignment of the road. The proposed length is considered to be an acceptable outcome in this instance.

Both cul-de-sac heads are designed with an 18m diameter in accordance with Council standards.

7.5 On-street Car Parking Availability

The proposed internal road cross-sections are designed in accordance with Council requirements which are typically adequate in terms of on-street car parking availability. The Plan of Development demonstrates that the EDQ minimum requirement of 0.75 spaces per dwelling is exceeded.

7.6 Temporary Turnaround Areas

Two temporary turnaround area are proposed in the eastern extents of Stage 1. As demonstrated in TTM drawing number 18BRT0087-03B (***Appendix H***) both turnaround areas are adequate to accommodate the manoeuvring requirements of Brisbane City Council's standard side-loading refuse collection vehicle.

8 Estimated Future Traffic Demands

The potential traffic impacts of both the overall master plan development and the proposed Stage 1 development have been assessed.

To identify the potential traffic impacts of the proposal, future traffic demands have been estimated in accordance with standard impact assessment methodology i.e. identification of likely traffic demands at both anticipated opening year of the development, assumed to be 2021, and a 10-year design horizon (2031).

Future traffic demands have been estimated based on two scenarios; BASE case scenario which assumes no development over the site, and PROJECT case scenario which includes additional of traffic demands associated with the proposed development.

8.1 Estimated Development Traffic Generation

8.1.1 Existing Development Traffic Volumes

Traffic currently generated by the site is that associated with the existing child care centre which is assumed to cater for up to 70 children. The existing traffic generation is estimated as follows:

- Daily traffic = 7.5 vehicle movements per day per child = 525 vpd
- AM Peak Hour traffic = 0.8 vehicle movements per hour per child = 56 vph
- PM Peak Hour traffic = 0.7 vehicle movements per hour per child = 49 vph

The above-mentioned traffic demands have been distributed on the surrounding road network based on the existing child care site access arrangements (i.e. access via Cliveden Avenue). Traffic volumes are shown in *Appendix C*.

8.1.2 Proposed Development Traffic Volumes

The proposed master plan land uses for this development are summarised in Table 8.1. The Stage 1 development includes only 39 residential allotments i.e. no child care or retirement living.

Table 8.1: Proposed land uses

Use	Quantity
Residential Lots	80 dwellings (approx.)
Retirement Living	150 dwellings (approx.)
Child Care Centre	70 children (approx.)

Tables 6.2, 6.3 and 6.4 summarise the estimated Daily and Peak Hour traffic demands associated with the proposed development, respectively, which have been based on typical traffic generation rates applicable to the various land uses proposed.

Table 8.2: Proposed Development Daily Traffic Generation

Land Use	Quantity	Generation Rate	VPD[1]	IN		OUT	
				%	VPD	%	VPD
Residential Lots	80 dwellings	9 vpd/dwelling	720	50%	360	50%	360
Retirement Living	150 dwellings	2.5 vpd/dwelling	375	50%	188	50%	188
Sub-total			*1,095*		*548*		*548*
Child Care Centre	70 children	7.5 vpd/child	525	50%	263	50%	263
Total			**1,620**		**810**		**810**

[1] VPD = vehicle movements per day

Table 8.3: Proposed Development AM Peak Hour Traffic Generation

Land Use	Quantity	Generation Rate	VPH[1]	IN		OUT	
				%	VPH	%	VPH
Residential Lots	80 dwellings	0.85 vph/dwelling	68	20%	14	80%	54
Retirement Living	150 dwellings	0.3 vph/dwelling	45	30%	14	70%	32
Sub-total			*113*		*28*		*86*
Child Care Centre	70 children	0.8 vph/child	56	55%	31	45%	25
Total			**169**		**59**		**111**

[1] VPH = vehicle movements per hour

Table 8.4: Proposed Development PM Peak Hour Traffic Generation

Land Use	Quantity	Generation Rate	VPH[1]	IN		OUT	
				%	VPH	%	VPH
Residential Lots	80 dwellings	0.85 vph/dwelling	68	70%	48	30%	20
Retirement Living	150 dwellings	0.2 vph/dwelling	30	70%	21	30%	9
Sub-total			*98*		*69*		*29*
Child Care Centre	70 children	0.7 vph/child	49	45%	22	55%	27
Total			**147**		**91**		**56**

[1] VPH = vehicle movements per hour

The existing child care centre is proposed to be replaced by the proposed child care centre. Traffic demands associated with the proposed child care centre are assumed to be the same as generated by the existing child care centre. However, its traffic demands would be redistributed on the local road network because all such traffic would access the site via Seventeen Mile Rocks Road, instead of via Cliveden Avenue.

As indicated in the tables above the proposed redevelopment of the site would result in a net increase of 1,095 vehicle movements per day, 113 vehicle movement per hour during the AM peak hour and 98 vehicle movements per hour during the PM peak hour.

8.2 Estimated Development Traffic Distribution

The distribution of development generation traffic is based on the existing traffic distributions exhibited in the traffic movement survey data. Figure 6.1 summarises the assumed development traffic distribution. Effectively, 75% of traffic is assumed to travel to and from the east along Seventeen Mile Rocks Road and 25% to the west.

Detailed traffic volume diagrams demonstrating the proposed developments peak hour traffic demands on the local road network are shown in ***Appendix C***.

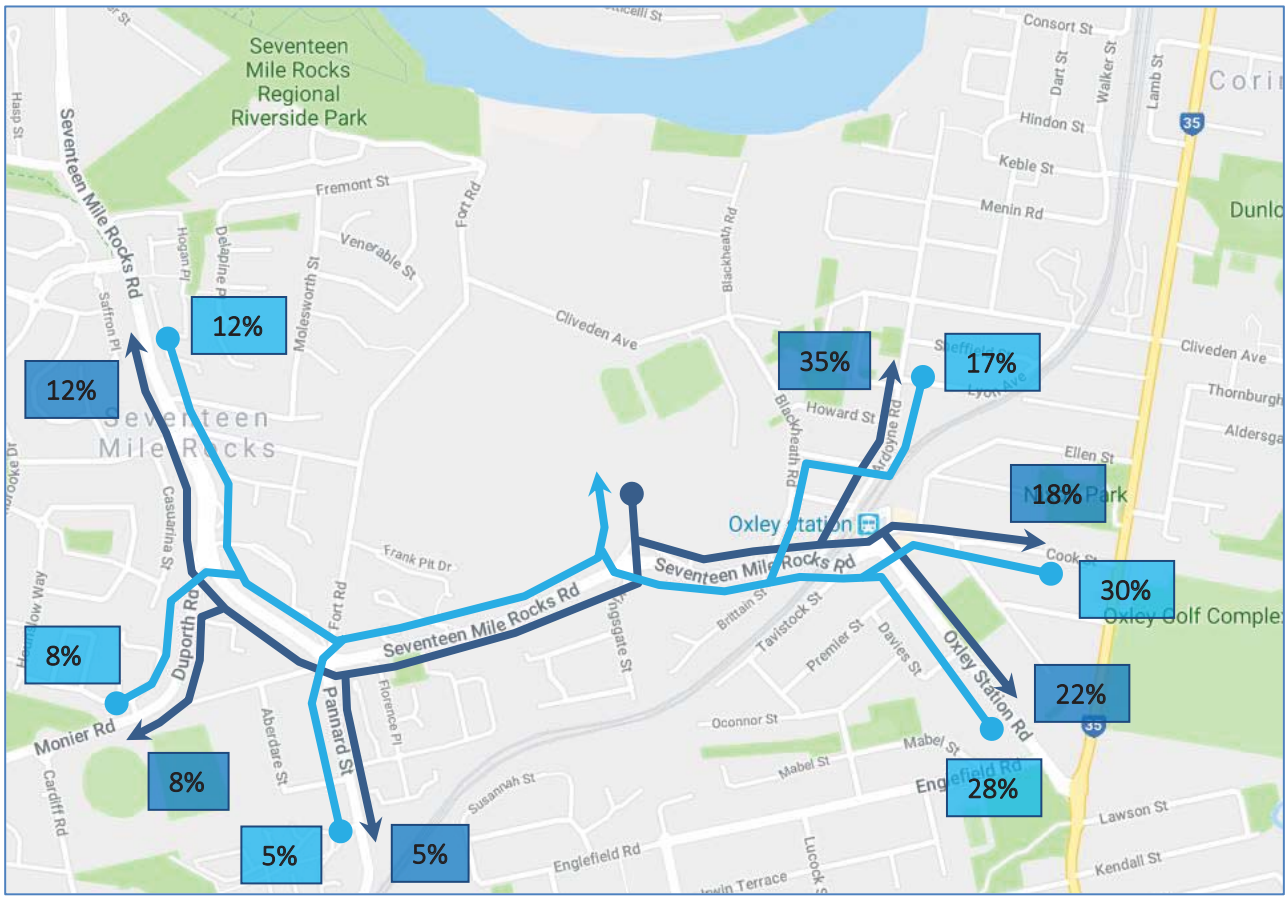


Figure 8.1: Estimated Development Traffic Distribution

8.3 Future Base Traffic Demands

Traffic demands, without the proposed development, have been estimated based on an application of an annual growth rate of 1.5% to the surveyed traffic volumes. This growth rate is consistent with population growth estimates determined by Council for the local area up to 2031.

8.4 Future Project Traffic Demands

Traffic demands, with the proposed development, have been estimated based on addition of the development traffic volumes to the BASE traffic demands. Detailed traffic volume diagrams are shown in *Appendix C*.

9 Road Network Performance

The performance of the road network, and the potential impacts of the proposed development, are considered in relation to daily traffic demands (road link performance) and peak hour demands (intersection performance).

9.1 Road Link Performance

Figure 9.1 and Table 9.1 below summarise the existing daily traffic volumes on key roads on the local network, the additional traffic demands associated with the proposed development, and the nominal thresholds of each road.

As indicated, all nominated roads would carry daily traffic volumes that are within Council's guidelines (nominal thresholds). This indicates that the existing road network is adequate to accommodate the proposed development without need to upgrade any road links (i.e. between intersections).

It is noted that, with regard to neighbourhood roads surrounding the site, the proposed development would result in a maximum increase of approximately 300 vehicle movements per day (Ardoyne Road) and would see a decrease in traffic on most roads such as Cliveden Avenue, Fort Road, Carlyle Street and Blackheath Road.

The development would generate the largest increase in traffic demand on the Seventeen Mile Rocks Road service road (proposed site access) with an additional 1,620 vehicle movements per day. Whilst this is a significant increase in traffic demand it is well within the nominal threshold of this road (1,000 to 6,000 vehicle movements per day).

Figure 9.1: Daily Traffic Movement Volume Locations

Table 9.1: Estimated Daily Traffic Volumes

Road No.	Road Name	Existing Daily Volume	Proposed Development Traffic Volume	Total Traffic With Proposed Development	Council Nominal Guideline [1]
1	Seventeen Mile Rocks Road	16,300	140	16,440	15,000-30,000
2	Seventeen Mile Rocks Road	14,175	233	14,408	15,000-30,000
3	Seventeen Mile Rocks Road	16,455	291	16,746	15,000-30,000
4	Seventeen Mile Rocks Road	16,685	875	17,560	15,000-30,000
5	Seventeen Mile Rocks Road	14,010	572	14,582	15,000-30,000
6	Oxley Station Road	10,840	292	11,132	6,000-15,000
7	Cook Street	9,025	280	9,305	6,000-15,000
8	Ardoyne Road	4,209	204	4,413	1,000-6,000
9	Ardoyne Road	5,546	303	5,849	1,000-6,000
10	Howard Street	1,662	29	1,691	1,000-6,000
11	Cliveden Avenue	1,724	-225	1,499	1,000-6,000
12	Carlyle Street	1,343	-115	1,228	1,000-6,000
13	Service Road	43	1,620	1,663	1,000-6,000

[1] Guideline traffic volumes as per Council's *Infrastructure Design Planning Scheme Policy* for classification of roads.

9.2 Intersections Performance

The performance of the identified key intersections has been assessed utilising SIDRA analysis software (version 8). Each intersection has been analysed for the existing year (2018), opening year (2021) and 10-year design horizon (2031) under both BASE and PROJECT conditions. Detailed analysis outputs, including intersection configuration layouts, are included in ***Appendices D, E, F and G***. The following sections summarise the results of the analyses.

9.2.1 Seventeen Mile Rocks Rd / Pannard St / Fort Rd

Table 9.2 summarises the analysis outputs for the various traffic cases applied to the intersection. The analysis indicates that the AM Peak Hour is the critical peak period, with the PM Peak Hour having acceptable performance up to and including 2031 demands without and with the master plan development.

For the AM Peak Hour, the existing intersection would operate at acceptable levels of performance in the opening year of development. By the 10-year design horizon (2031) excessive delays would be experienced on the Seventeen Mile Rocks Road western approach to the intersection. However, it is noted that the proposed developments additional traffic demands are relatively insignificant in terms of performance worsening indicating that mitigating upgrades are not required as a result of the development.

Table 9.2: Summary of Sidra Outputs (Seventeen Mile Rocks Rd and Pannard St Intersection)

Case	Degree of Saturation	Average Delay (sec)	Level of Service	95th Percentile Critical Queue (m)			
				South	East	North	West
AM Current Case 2018	91.4%	12.2	B	23	29	7	149
AM Base Case 2021	97.1%	17.2	B	26	32	8	228
AM Project Case 2021	98.6%	19.6	B	27	35	8	261
AM Base Case 2031	119.4%	93.4	F	42	41	8	987
AM Project Case 2031	121.0%	99.6	F	45	44	8	1053
PM Current Case 2018	69.5%	6.2	A	12	61	2	19
PM Base Case 2021	72.7%	6.3	A	14	68	3	20
PM Project Case 2021	73.4%	6.4	A	14	70	3	22
PM Base Case 2031	84.3%	7.2	A	25	113	3	27
PM Project Case 2031	84.9%	7.3	A	27	119	3	29

9.2.2 Seventeen Mile Rocks Rd / Kingsgate St / Service Road

Table 9.2 summarises the analysis outputs for the various traffic cases applied to the intersection. The analysis indicates that the existing intersection would operate at acceptable levels of performance in the opening year of development. By the 10-year design horizon unacceptable delay and queuing would be experienced on the service road (northern) approach to the intersection caused by the additional traffic demand associated with the development. This indicates that upgrade of the existing intersection should be undertaken as part of the proposed development.

TTM has prepared a preliminary concept of the required intersection upgrade, as shown in TTM drawing number 18BRT0087-02B (***Appendix H***). It includes provision of two eastbound lanes on Seventeen Mile Rocks Road on approach and departure to the intersection. Analysis of the proposed upgrade (refer Table 9.3) indicates that performance of the intersection would be significantly improved, and acceptable performance of all traffic movements would result.

The timing of the recommended upgrade is subject to the timing and scale of particular staging of the development. Analysis indicates that Stage 1 development, incorporating 39 residential allotments, could be accommodated at the existing intersection without need for the identified upgrade (refer Table 9.3 for performance results). As such, the identified upgrade should be undertaken prior to any additional development beyond the 39 residential allotments within Stage 1A.

Table 9.3: Summary of Sidra Outputs (Seventeen Mile Rocks Rd and Kingsgate St Intersection)

Case	Degree of Saturation	Average Delay (sec)	Level of Service	95th Percentile Critical Queue (m)			
				South	East	North	West
AM Current Case 2018	78.1%	5.1	A	1	25	1	93
AM Base Case 2021	81.4%	5.1	A	1	28	1	112
AM Project Case 2021	88.7%	7.4	A	2	38	30	141
AM Base Case 2031	93.8%	5.6	A	2	40	2	287
AM Project Case 2031 (Stage 1 only)	94.9%	6.2	A	2	39	14	305
AM Project Case 2031	101.7%	26.7	C	2	49	80	579
AM Project Case 2031 (Upgrade)	72.3%	5.8	A	2	47	11	64
PM Current Case 2018	61.5%	4.7	A	1	44	1	19
PM Base Case 2021	64.2%	4.7	A	1	49	1	20
PM Project Case 2021	71.9%	5.3	A	1	74	3	25
PM Base Case 2031	74.1%	4.7	A	1	76	1	25
PM Project Case 2031 (Stage 1 only)	76.0%	4.9	A	1	87	1	25
PM Project Case 2031	82.1%	5.4	A	1	126	3	32
PM Project Case 2031 (Upgrade)	82.0%	5.3	A	1	121	2	18

9.2.3 Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St

Table 9.2 summarises the analysis outputs for the various traffic cases applied to the intersection. The analysis indicates that the existing intersection would operate at acceptable levels of performance in all traffic cases and the impact of the proposed development is relatively minor and insignificant. No mitigating upgrade works are required to the intersection as a result of the development.

Table 9.4: Summary of Sidra Outputs (Seventeen Mile Rocks Rd and Oxley Station Rd Intersection)

Case	Degree of Saturation	Average Delay (sec)	Level of Service	95th Percentile Critical Queue (m)			
				South	East	North	West
AM Current Case 2018	72.7%	10.2	B	64	26	-	61
AM Base Case 2021	76.7%	11.2	B	75	29	-	73
AM Project Case 2021	80.3%	11.9	B	81	32	-	85
AM Base Case 2031	92.4%	20.0	C	168	47	-	159
AM Project Case 2031	96.1%	22.4	C	156	53	-	209
PM Current Case 2018	69.4%	9.6	A	58	49	-	26
PM Base Case 2021	74.2%	10.6	B	69	57	-	28
PM Project Case 2021	78.8%	11.5	B	82	63	-	29
PM Base Case 2031	95.5%	20.8	C	187	108	-	37
PM Project Case 2031	100.9%	28.8	C	271	123	-	38

9.2.4 Ardoyne Rd / Howard St

Table 9.2 summarises the analysis outputs for the various traffic cases applied to the intersection. The analysis indicates that existing intersection would operate adequately in all traffic cases. No mitigating upgrade works are required to the intersection as a result of the development.

Table 9.5: Summary of Sidra Outputs (Ardoyne Rd and Howard St Intersection)

Case	Degree of Saturation	Average Delay (sec)	Level of Service	95th Percentile Critical Queue (m)			
				South	East	North	West
AM Current Case 2018	31.4%	3.2	B	2	1	6	8
AM Base Case 2021	32.7%	3.2	B	2	1	6	8
AM Project Case 2021	34.6%	3.3	B	2	1	7	8
AM Base Case 2031	37.7%	3.4	B	2	1	7	10
AM Project Case 2031	39.6%	3.5	C	2	1	8	10
PM Current Case 2018	19.6%	3.1	A	1	2	6	1
PM Base Case 2021	20.1%	3.0	A	1	2	7	1
PM Project Case 2021	21.1%	3.0	A	1	2	7	1
PM Base Case 2031	22.1%	2.9	A	1	2	7	1
PM Project Case 2031	23.0%	2.9	A	1	2	8	1

10 Response to DSDMIP Further Issues

The following responses are provided in relation to the traffic engineering related items of the Further Issues letter dated 23rd April 2020 (Items 3, 4, 5, 6, 8, 9 and 10). Responses to all items of the Further Issues letter dated 23rd June 2020 are provided by others.

Item 3 – Road Hierarchy

Response:

Figure 7.1 of this report has been updated to identify the full extent of the proposed Neighbourhood Road.

Item 4 – Temporary Turnaround Swept Paths

Response:

Please refer to Section 7.6 of this report and TTM drawing number 18BRT0087-03B (Appendix H) which demonstrates the proposed temporary turnaround areas adequately accommodate Council's side loading refuse collection vehicle.

Item 5 – On-street Car Parking Opportunities

Response:

As demonstrated in the Plan of Development, the proposed internal roads, in conjunction with the proposed lot frontages and lot access crossovers, enables on-street parking opportunities that exceed the minimum EDQ requirement of 0.75 cars per dwelling.

Item 6 – Site Access Road Pedestrian Paths

Response:

Development plans have been updated to include 1.5m wide concrete footpaths on both sides of the site access road.

Item 8 – Stage 1 External Road Works

Response:

Please refer to TTM drawing 18BRT0087-01D (***Appendix H***) which depicts the required external road works, including pedestrian path modifications, required for Stage 1A of the development. These works are adequate to accommodate the 39 residential dwellings within Stage 1A. Further external upgrade works are necessary for any further development of the site beyond the initial 39 residential dwellings. The additional upgrades required as depicted in TTM drawing number 18BRT0087-02C (***Appendix H***).

Item 9 – Ultimate External Road Works Bicycle Exit Ramp

Response:

Please refer to TTM drawing 18BRT0087-02C (***Appendix H***) which depicts the required ultimate external road works. As indicated, the eastbound bicycle exit ramp is located to allow cyclists to leave the road and use the upgraded footpath to access the new development access road.

Item 10 – Ultimate External Road Works Bicycle Lane Widths

Response:

Please refer to TTM drawing 18BRT0087-02C (***Appendix H***) which depicts the required ultimate external road works and cycle lane widths. The cycle lane widths on the Seventeen Mile Rocks Road western leg of the roundabout intersection are consistent with the existing 1.3m wide cycle lanes that currently extend for approximately 280m to the west. It is important to note that the potential traffic lane and cycle lane widths on this section of road is constrained by on-street car parking on the northern side of the road and significant grade issues (including retaining structure) on the south side of the road. Retention of the existing 1.3m cycle lane widths as part of the proposed design exceeds the minimum 1.2m width specified in Austroads Guide to Road Design and is an acceptable and appropriate outcome.

The proposed cycle lane width for on the northern side of the road east of the roundabout is 1.5m. This width satisfies Council's standard drawings and exceeds the minimum Austroads requirement and is therefore considered to be an acceptable and appropriate outcome noting that similar carriageway constraints also exist on Seventeen Mile Rocks Road east of the roundabout.

11 Summary and Conclusions

11.1 Site Access

The subject site has road frontage to Seventeen Mile Rocks Road, Cliveden Avenue and Blackheath Road. Review of the constraints and opportunities associated with each road frontage indicates that the only feasible vehicular site access arrangement is to Seventeen Mile Rocks Road.

Several potential access intersection configurations have been investigated for connection to Seventeen Mile Rocks Road. It is concluded that provision of a new intersection (priority-controlled or signal-controlled) would not be appropriate with regard to safety and operations requirements. As such, the only feasible option is for connection to the eastern end of the existing service road.

The Stage 1 development includes a single vehicular site access to be provided by extension of the existing Seventeen Mile Rocks Road service road into the site. The required upgrade road works for the Stage 1 development is shown in TTM drawing number 18BRT0087-01D (***Appendix H***).

An additional emergency access is proposed to be established to Cliveden Avenue as part of the Stage 1B of the development.

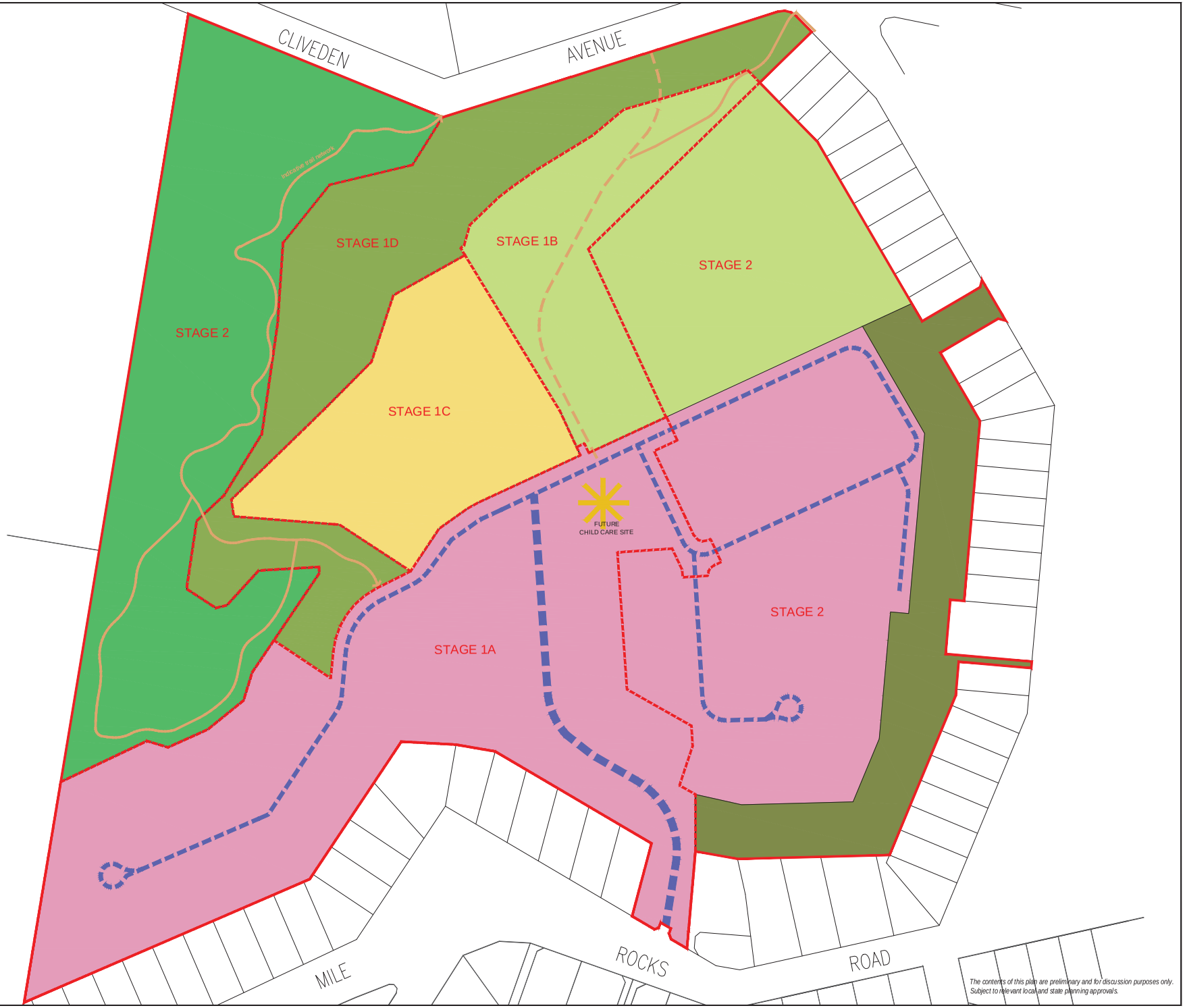
11.2 Impact on Surrounding Road Network

Assessment of the proposed development indicates that the development will not have a significant impact on the existing road network, with the exception of at the Seventeen Mile Rocks Rd / Kingsgate St / service road intersection. Mitigating upgrade works are considered necessary at this intersection and generally include the provision of two eastbound lanes on Seventeen Mile Rocks Road through the intersection. TTM drawing number 18BRT0087-02C (***Appendix H***) presents the conceptual design of the necessary upgrade works. It is recommended that such upgrade works are undertaken prior to any development beyond the 39 residential dwellings proposed within Stage 1A.

11.3 Internal Road Layout

The proposed internal road layout generally satisfies Council design standards and is considered to be acceptable.

Appendix A Proposed Development Plans



The contents of this plan are preliminary and for discussion purposes only. Subject to relevant local and state planning approvals.

place design group.

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PROJECT

Oxley Priority Development Area

CLIENT

EDQ

KEY PLAN / NOTES

- SUBJECT SITE
- STAGING BOUNDARIES
- PRECINCT 1 : ENVIRONMENTAL PROTECTION
- PRECINCT 2a : DRAINAGE RESERVE (WATERWAY CORRIDOR)
- PRECINCT 2b : PUBLIC RECREATION PARK
- PRECINCT 3a : NEIGHBOURHOOD
- PRECINCT 3b : LIFESTYLE AND CARE
- HILLSIDE REMEDIATION
- PRIVATE WATERWAY TREATMENT
- INDICATIVE ROAD NETWORK
- INDICATIVE TRAIL NETWORK
- INDICATIVE EMERGENCY / MAINTENANCE ACCESS PATHWAY

NOT FOR CONSTRUCTION

ISSUE	CODE	ISSUE DESCRIPTION	BY	CHK	DATE

PRE - Preliminary | CA - Council Approval | T - Tender | CON - Construction

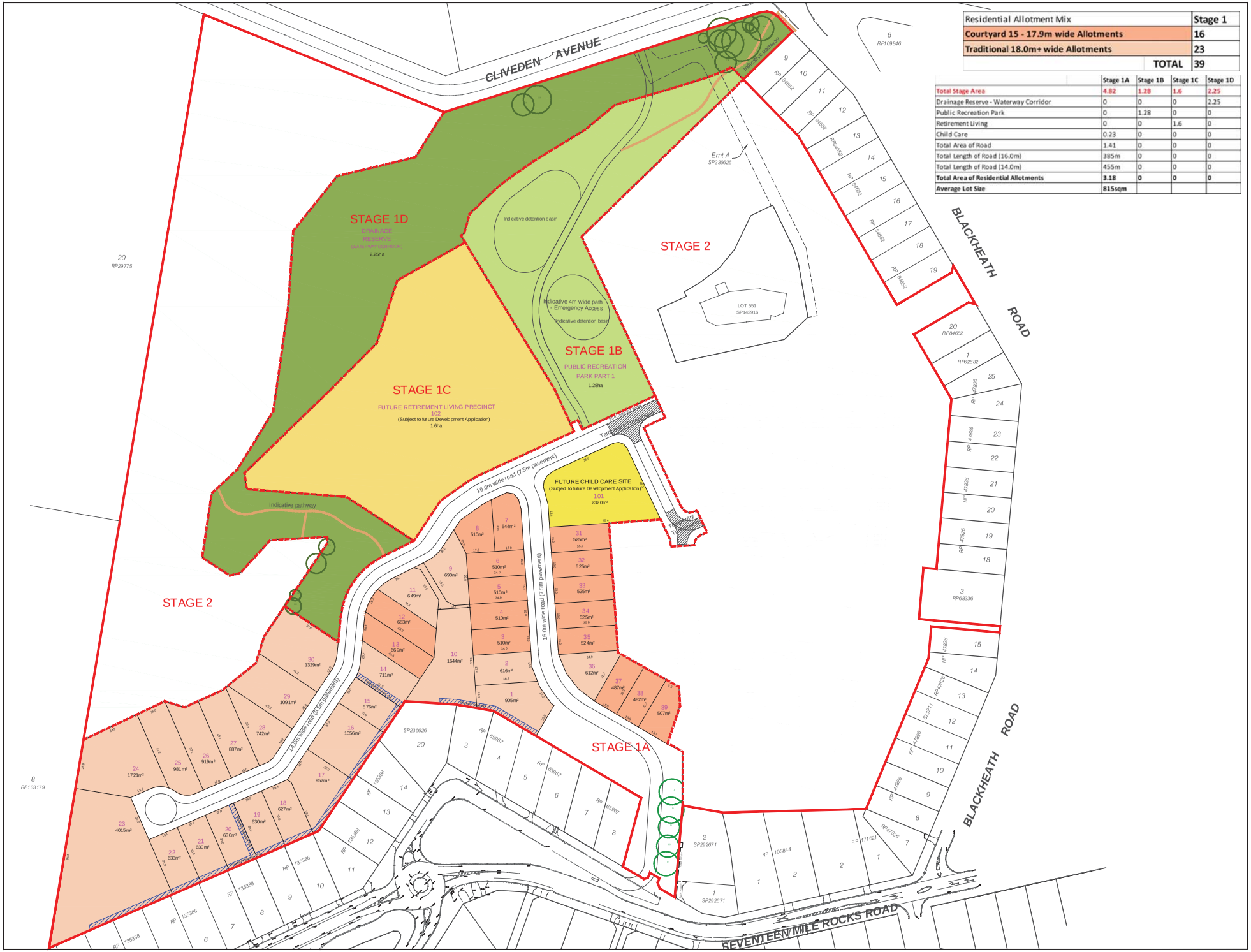
DRAWING TITLE

OVERALL MASTER PLAN

DESIGN	:	CK
DOCUMENT	:	JB
PROJECT	:	1018015
SCALE	:	1:1000@A1
DATE	:	17.08.2020

NORTH

SHEET NUMBER	REVISION
1018015_25	Rev F



Residential Allotment Mix	Stage 1
Courtyard 15 - 17.9m wide Allotments	16
Traditional 18.0m+ wide Allotments	23
TOTAL	39

	Stage 1A	Stage 1B	Stage 1C	Stage 1D
Total Stage Area	4.82	1.28	1.6	2.25
Drainage Reserve - Waterway Corridor	0	0	0	2.25
Public Recreation Park	0	1.28	0	0
Retirement Living	0	0	1.6	0
Child Care	0.23	0	0	0
Total Area of Road	1.41	0	0	0
Total Length of Road (16.0m)	385m	0	0	0
Total Length of Road (14.0m)	455m	0	0	0
Total Area of Residential Allotments	**3.18**	**0**	**0**	**0**
Average Lot Size	**815sqm**			

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PROJECT

Oxley Priority Development Area

CLIENT

EDQ

KEY PLAN / NOTES

- SUBJECT SITE
- STAGING BOUNDARIES
- FUTURE RETIREMENT LIVING SITE
- FUTURE CHILD CARE SITE
- STORMWATER & ACCESS EASEMENT
- PUBLIC RECREATION PARK
- DRAINAGE RESERVE (WATERWAY CORRIDOR)
- INDICATIVE PATHWAY
- EXISTING VEGETATION TO BE RETAINED WITHIN ROAD RESERVE (SUBJECT TO ENGINEERING DESIGN)
- EXISTING VEGETATION TO BE RETAINED WITHIN OPEN SPACE

NOT FOR CONSTRUCTION

DRAWING TITLE

RECONFIGURATION OF A LOT
STAGE ONE

DESIGN	:	CK
DOCUMENT	:	JB
PROJECT	:	1018015
SCALE	:	1:1000@A1
DATE	:	17.08.2020

NORTH

SHEET NUMBER
1018015_34

REVISION
Rev C

Plan of Development Design Requirements Residential Allotments 1 - 39

General:

1. All development is to be undertaken in accordance with the Development Approval, and Queensland Development Code (QDC), except as varied below.
2. The maximum height of buildings shall not exceed 2 storeys or 9.5m above ground level (refer to note 6 definition), whichever is lesser.
3. Maximum building location envelopes are subject to future proposed easements, building exclusion zones, protected vegetation and covenants and/or other underground services registered on title.
4. Residential structures cannot be located within the Bushfire Protection Zone.
5. Setbacks for a building or structure, means the shortest distance measured horizontally between the outermost projection of the building or structure to the vertical projection of the boundary of the lot where the building or structure is.
6. Ground level means -
   (a) the level of the natural ground; or
   (b) if the level of the natural ground has changed, the level lawfully changed (the prescribed level).

Streetscape and Articulation:

7. Dwellings must address the primary frontage with clear and well-lit access to the front door(s).
8. Dwellings must address each street and park frontage with 3 or more of:
   - Verandah or balcony;
   - Porches;
   - Awnings and shade structures;
   - Variation of roof and building line;
   - Inclusion of window openings;
   - Variation of building materials.
9. External drainpipes must be integrated into the dwelling design where visible from the street.
10. Clotheslines, condenser units, hot water systems and all other ancillary items, excluding solar panels, must not be visible from the street.
11. Lot 1, Lot 7 and Lot 8 must address all street boundaries as their primary frontage.

Built Form:

12. All allotments within the Bushfire Protection Zone must comply with requirements set out in Sections 6.1 and 6.2 of the approved (DEV2020/1099) Bushfire Management Plan from Land and Environmental Consultants for the Oxley Priority Development Area.
13. The area nominated as the Bushfire Protection Zone for Lots 23-30 is indicative only. House designs are subject to private certifier building approval and assessment against the Queensland state planning policy bushfire prone area map and compliance with AS3959-2018.
14. Good design and energy efficiency is fundamental in building a sustainable home that uses as little energy and water as possible and provides a comfortable internal environment for occupants. The following are mandatory built form and inclusions to be incorporated into the design:
   - Eaves at 600mm;
   - Dwellings must be designed for natural cross ventilation with well-considered placement of windows to draw breezes through the house;
   - Installation of Solar and Battery configuration by EDQ nominated preferred supplier; all dwellings to have a three-phase power connection which allow for:
     (a) Mandatory requirement for all garages to have a dedicated electrical circuit for future Electronic Vehicle charging;
     (b) Heat pump hot water systems;
     (c) Energy efficient air conditioning; and
     (d) A minimum 6kw solar and minimum 13.5kw battery with inverter maximum of 4kW export.
15. Dwellings to be designed to ensure passive street surveillance with habitable rooms overlooking the street. Bedrooms (excluding master bedrooms) and designated home theatre rooms do not generally provide opportunities for passive surveillance supporting CPTED principles requirements.

Setbacks and Site Cover:

16. Setbacks listed in the Plan of Development table are the minimum distance required unless otherwise specified on plan. Where distances are specified on the plan, they take precedence over the Plan of Development table.
17. Front verandah and covered areas such as porches to the front façade are permitted to extend into the front setback on the condition that the roofed area is not enclosed. For front setbacks, this roofed area can extend to no closer than 3.0 metres from the front boundary. For secondary frontage on corner lots the roofed area can extend to no closer than 1.5m from the secondary frontage boundary.

Steep Residential Lots :

18. Building designs for down slope, up slope and cross slope allotments must adhere to the good hillside construction practices and principals referred to in the Australian Geoguide LR8 (Construction Practice).
19. On down slope allotments (Lots 37-39, 24-30) cut and fill is only permitted to facilitate the establishment of a suitable garage building pad and any associated entry features (porch, entrance hall, street frontage landscaping and driveway).
    The garage pad level must be located within 0.5m of the adjacent verge level
20. On up slope allotments (Lots 1-4,10, 13-23) cut and fill permitted for the establishment of a suitable garage building pad, rooms adjoining the garage on the same building slab and associated entry features (porch, street frontage landscaping and driveway). The area excavated must only extend as far back as the rear wall of the garage.
21. On cross slope allotments (Lots 9, 11, 12 & 36) cut and fill is only permitted for the establishment of a suitable garage building pad and any associated entry features (porch, entrance hall, street frontage landscaping and driveway). The garage pad level must be located within 0.5m of the adjacent verge level.
22. All other elements of the home must be constructed to ensure no cut and/or fill is required, and must respond to the natural topography of the site.
23. Residential structures situated on southern hillside lots (1,10-23) where additional building loads and slope modification works are to occur, must require additional stability analysis approved by a RPEQ Geotechnical engineer (qualified person) prior to works commencing demonstrating that the building loads and slope modification works proposed do not adversely affect slope stability. The residential building plans must detail the earthworks and drainage proposed, building location situated on the block, detail building load (internal/external) as well as any maintenance access loading.

Retaining Walls :

24. Inter-allotment retaining walls are permitted, however they must not exceed 1.0m in height. Design of retaining walls must ensure there are no adverse impacts (functional, financial or construction limitations) on adjoining allotments.
25. Retaining walls for landscaping purposes are permitted, and must not exceed 1.0m in height.
26. Terraced retaining wall structures are permitted, but must:
   - Have a minimum separation of 1.0m between the face of each wall; and
   - Each wall must be a maximum height of 1.0m.
27. If a retaining wall is located within a Bushfire Protection Zone then the retaining wall should be constructed of a fire resistant material.
28. Retaining walls are engineer designed to withstand the lateral earth pressures and surcharges expected and include drains to prevent water pressures developing in the backfill. Construction of retaining walls must adhere to the Australian Geoguide LR6 (Retaining Walls).

Driveways, Off-Street Carparking and Garages:

29. Driveways must avoid infrastructure / services within the road reserve such as dedicated on-street parking bays, drainage pits and service pillars.
30. Driveways must be constructed at the grade of the adjacent verge area. No grade changes to the verge for the driveway are permitted.
31. Driveways must integrate with and match the level of the footpath and should not be cut through the footpath.
32. Driveways must be completed prior to occupation of the dwelling.
33. Minimum off-street car parking requirements are 2 spaces per dwelling, one of which must be covered and enclosed in the form of a garage or carport.
34. Single, double or tandem garage configurations are permitted in accordance with the setbacks provided.
35. Must have a sectional, tilt or roller door to the garage.
36. Garages are permitted forward of the building wall, and must adhere to the following:
   - Must comply with garage setbacks as per the Plan of Development Table;
   - Must have a sectional, tilt or roller door to the garage; and
   - Must not obstruct ground floor windows of the dwelling.
37. Open carports are permitted and must adhere to the following:
   - Be built forward of the 6.0m garage setback;
   - Be complimentary to the dwelling through its design, materials and colours;
   - Must be incorporated into front fence design and may include a gate across the carport entry to a height consistent with the front fence design; and
   - Be open at the front, but when on steep lots include battering or safety railing detail to the sides and rear of the structure where above ground level and be complimentary to the dwelling through its design, materials and colours.

Private Open Space and Privacy:

38. Private uncovered (no roof) outdoor space in the front yard, must measure a minimum of 30sqm with a minimum dimension of 3.0m in any dimension, excluding the driveway area.
39. Each dwelling must include a covered outdoor living area that must:
   - Be accessed from an internal living area;
   - Measure a minimum of 10sqm with a minimum dimension of 2.4m.
40. All first floor windows adjacent to a neighbouring lots private open space must be obscured to ensure occupants privacy where sill height is less than 1.7m.
41. Dwelling designs on Lots 24-30 must ensure passive surveillance is provided to park frontage and primary street frontage. This is to be achieved through living spaces at both the front and rear of the home. Verandahs facing the street are encouraged to ensure surveillance of the public street is maintained.

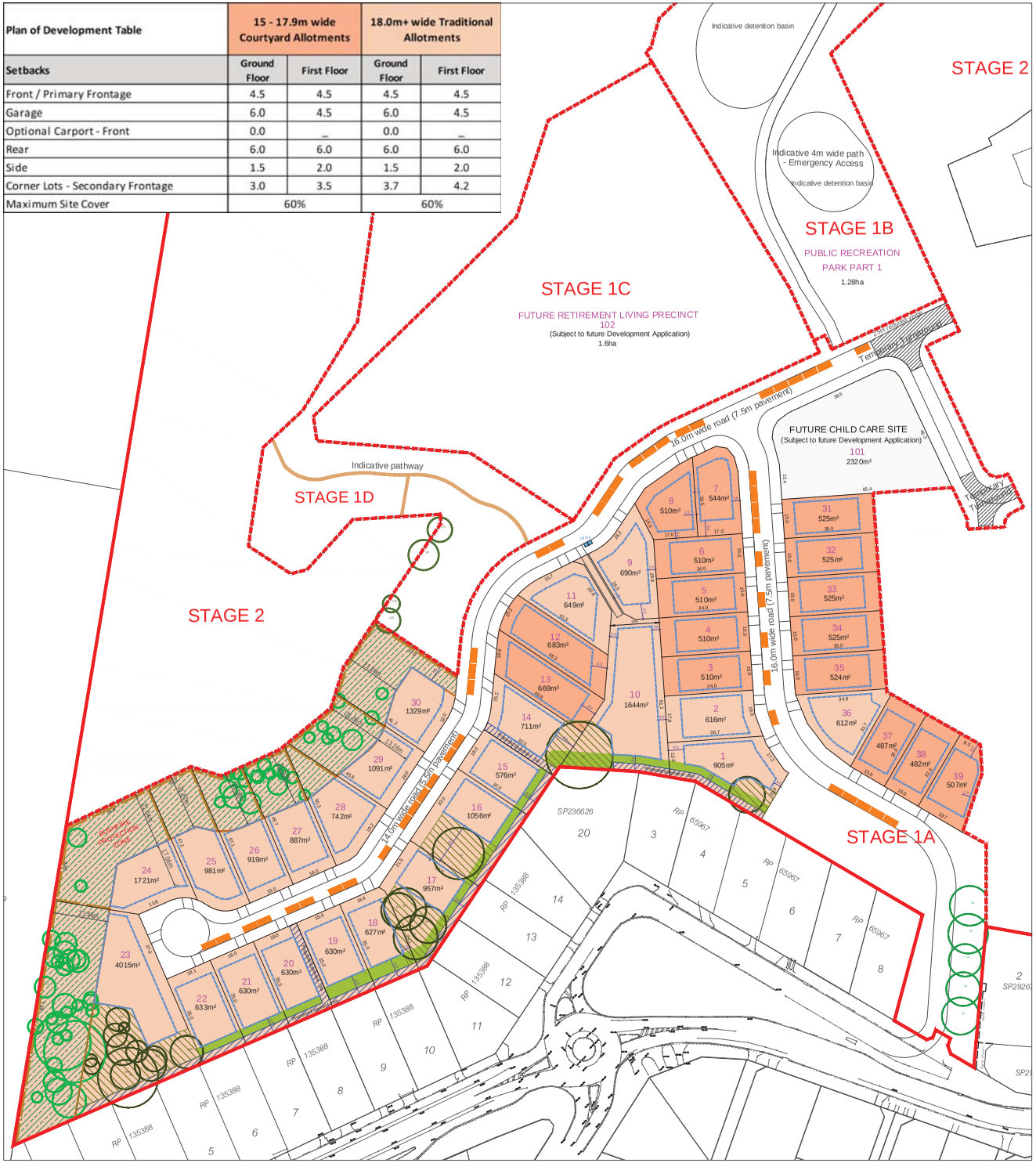
Fencing:

42. Fencing along boundaries of Lots within the area shown as Bushfire Protection Zone are to be 1.5m high, black powder-coated aluminium tubular pool style fencing. The fencing is to be constructed to allow safe passage for native fauna.
43. Fencing installed by the developer must not be altered, modified or removed without prior written approval from the statutory authority.
44. Fencing on all park, street and corner frontages must be a maximum of 1.5m high.

Landscaping & Tree Retention:

45. Landscaping requirements in the Bushfire Protection Zone must adhere to Landscaping for Bushfire - Garden design and plant selection (CFA 2011) Guideline and Section 6.2 of the approved (DEV2020/1099) Bushfire Management Plan from Land and Environmental Consultants for the Oxley Priority Development Area.
46. Trees shown in the Building Exclusion Zone and Tree Planting Zone are to be retained.

Plan of Development Table	15 - 17.9m wide Courtyard Allotments		18.0m+ wide Traditional Allotments	
Setbacks	Ground Floor	First Floor	Ground Floor	First Floor
Front / Primary Frontage	4.5	4.5	4.5	4.5
Garage	6.0	4.5	6.0	4.5
Optional Carport - Front	0.0	_	0.0	_
Rear	6.0	6.0	6.0	6.0
Side	1.5	2.0	1.5	2.0
Corner Lots - Secondary Frontage	3.0	3.5	3.7	4.2
Maximum Site Cover	60%		60%	



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PROJECT

Oxley Priority Development Area

CLIENT

EDQ

KEY PLAN / NOTES

- SUBJECT SITE
- STAGING BOUNDARIES
- BUSHFIRE PROTECTION ZONE
- STORMWATER & ACCESS EASEMENT
- BUILDING EXCLUSION ZONE
- INDICATIVE BIN COLLECTION PAD
- MAXIMUM BUILDING LOCATION ENVELOPE
- EXISTING VEGETATION TO BE RETAINED WITHIN BUILDING EXCLUSION ZONE
- NATIVE TREE TO BE RETAINED WITHIN BUSHFIRE PROTECTION ZONE
- EXISTING VEGETATION TO BE RETAINED WITHIN ROAD RESERVE (SUBJECT TO ENGINEERING DESIGN)
- EXISTING VEGETATION TO BE RETAINED WITHIN OPEN SPACE
- INDICATIVE DRIVEWAY LOCATION SUBJECT TO DETAIL DESIGN
- NOMINAL ON-STREET CAR SPACE
- 1.5M HIGH ALUMINIUM TUBULAR "POOL" FENCE. NON-FLAMMABLE MATERIALS IN BUSHFIRE PROTECTION ZONE
- INDICATIVE PATHWAY
- TREE PLANTING ZONE (Minimum 20 trees total to be planted that can reach a maturity height of 20m+ by the developer and maintained by individual lot owners as per Note 46)

NOT FOR CONSTRUCTION

DRAWING TITLE

PLAN OF DEVELOPMENT
STAGE 1A

DESIGN	:	CK
DOCUMENT	:	JB
PROJECT	:	1018015
SCALE	:	1:1000@A1
DATE	:	17.08.2020

NORTH

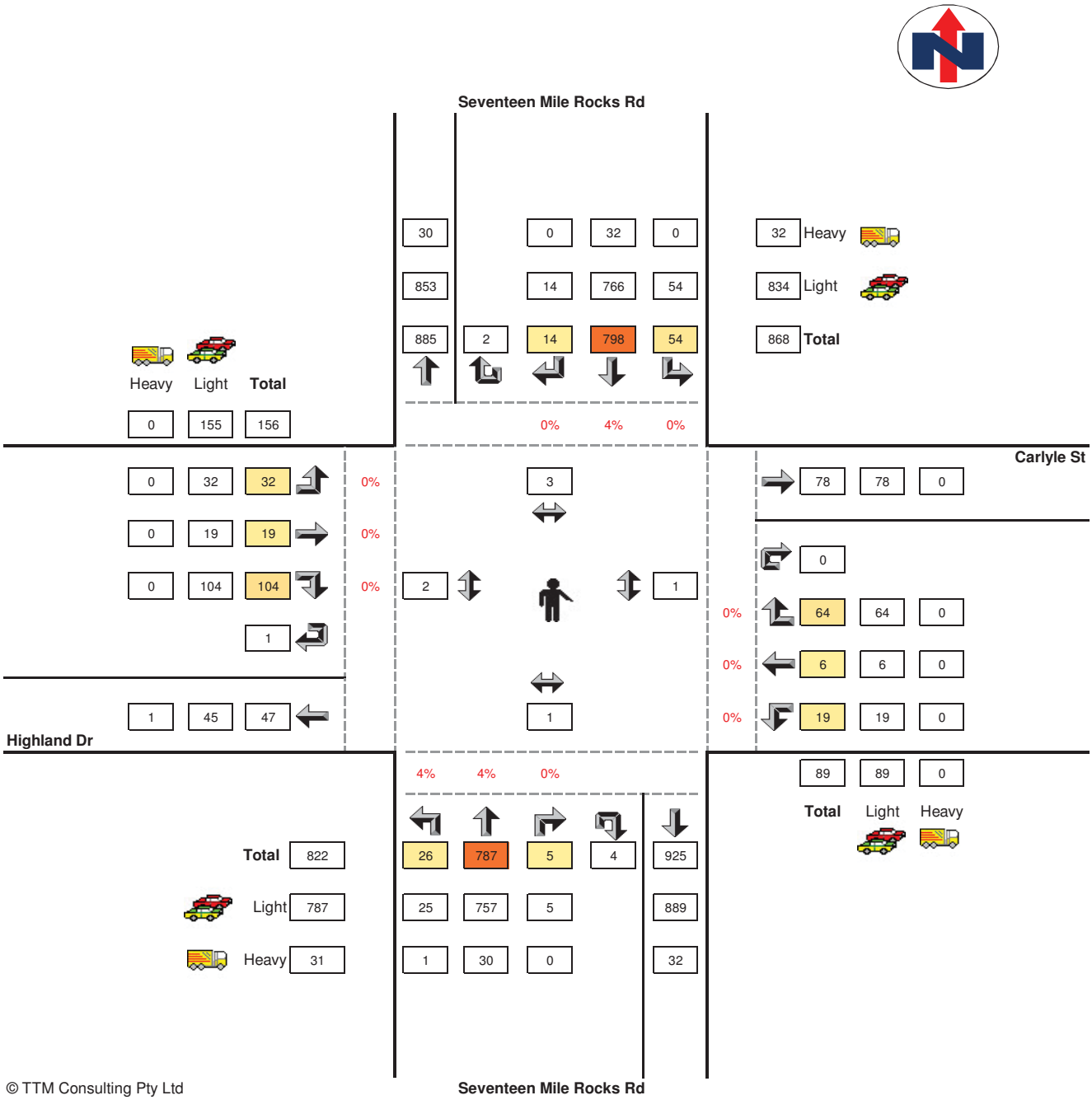
SHEET NUMBER	REVISION
1018015_35	Rev C

Appendix B Traffic Movement Survey Data

TTM Reference:	18BRT0087
Location:	Seventeen Mile Rocks Rd / Carlyle Street
Suburb:	Oxley
Date:	Tuesday 17/04/2018
AM Peak	0730-0830
Weather:	Fine

www.ttmgroup.com.au

00% indicates the heavy vehicle percentage



TTM Reference:	18BRT0087
Location:	Seventeen Mile Rocks Rd / Carlyle Street
Suburb:	Oxley
Date:	Tuesday 17/04/2018
PM Peak	1645-1745
Weather:	Fine

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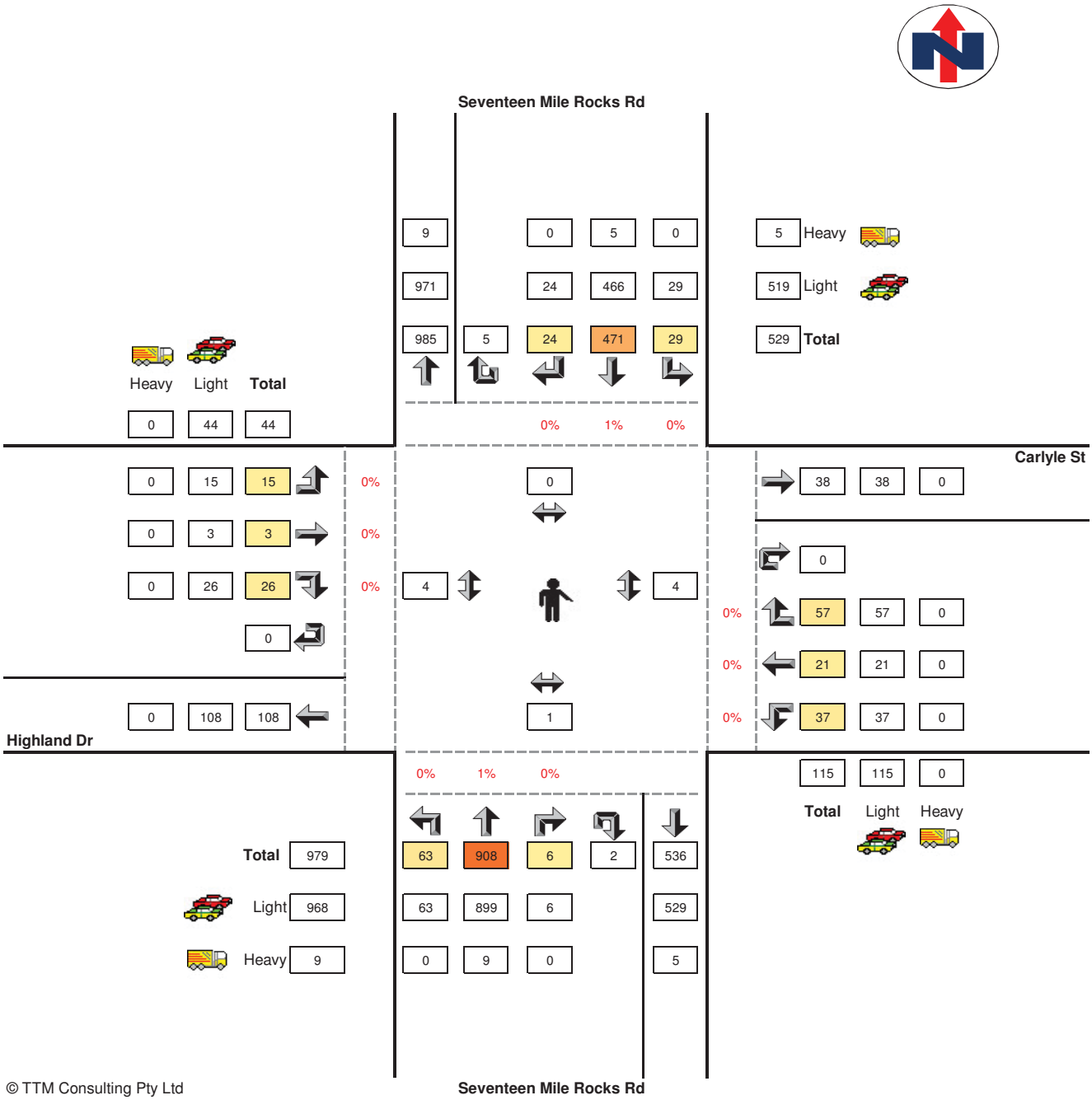
00% indicates the heavy vehicle percentage



Survey Period: 0730-0830

1 - Fort Rd Northern Approach

0	0	0	0	0	Heavy
16	4	0	16	17	37 Light
16	4	0	16	17	37 Total

0 5

Heavy	Light	Total
21	870	891

0	1	1	
21	845	866	
0	24	24	
0	0	0	
17	582	599	

0 0 0

4 - Monier Rd South West Approach

0 0

3 - Pannard St Southern Approach

	1170	1143	27
	7	7	0
	533	518	15
	2	2	0
	108	104	4
	650 Total	631 Light	19 Heavy

2 0

Total	11	3	0	7	1	5
Light	11	3	0	7	1	5
Heavy	0	0	0	0	0	0

5 - Seventeen Mile Rocks Rd Western Approach

1 0

Total	350	3	59	8	280	149
Light	342	3	57	8	274	145
Heavy	8	0	2	0	6	4

2 - Seventeen Mile Rocks Eastern Approach

Survey Period: 1645-1745

1 - Fort Rd Northern Approach

0	0	0	1	0	1 Heavy
24	19	0	15	8	42 Light
24	**19**	**0**	**16**	**8**	**43** Total

0 | 7

0 | 2

3 - Pannard St Southern Approach

	535	532	3
	15	15	0
	807	801	6
	0	0	0
	129	129	0
	951 Total	945 Light	6 Heavy

4 - Monier Rd South West Approach

Heavy	Light	Total		
3	472	**475**		
0	1	**1**		
3	437	**440**		4
0	34	**34**		
0	0	**0**		
				0
6	873	**879**		

9 | 0

5 - Seventeen Mile Rocks Rd Western Approach

Total	**7**	**6**	**0**	**1**	**0**	**3**
Light	7	6	0	1	0	3
Heavy	0	0	0	0	0	0

3 | 0

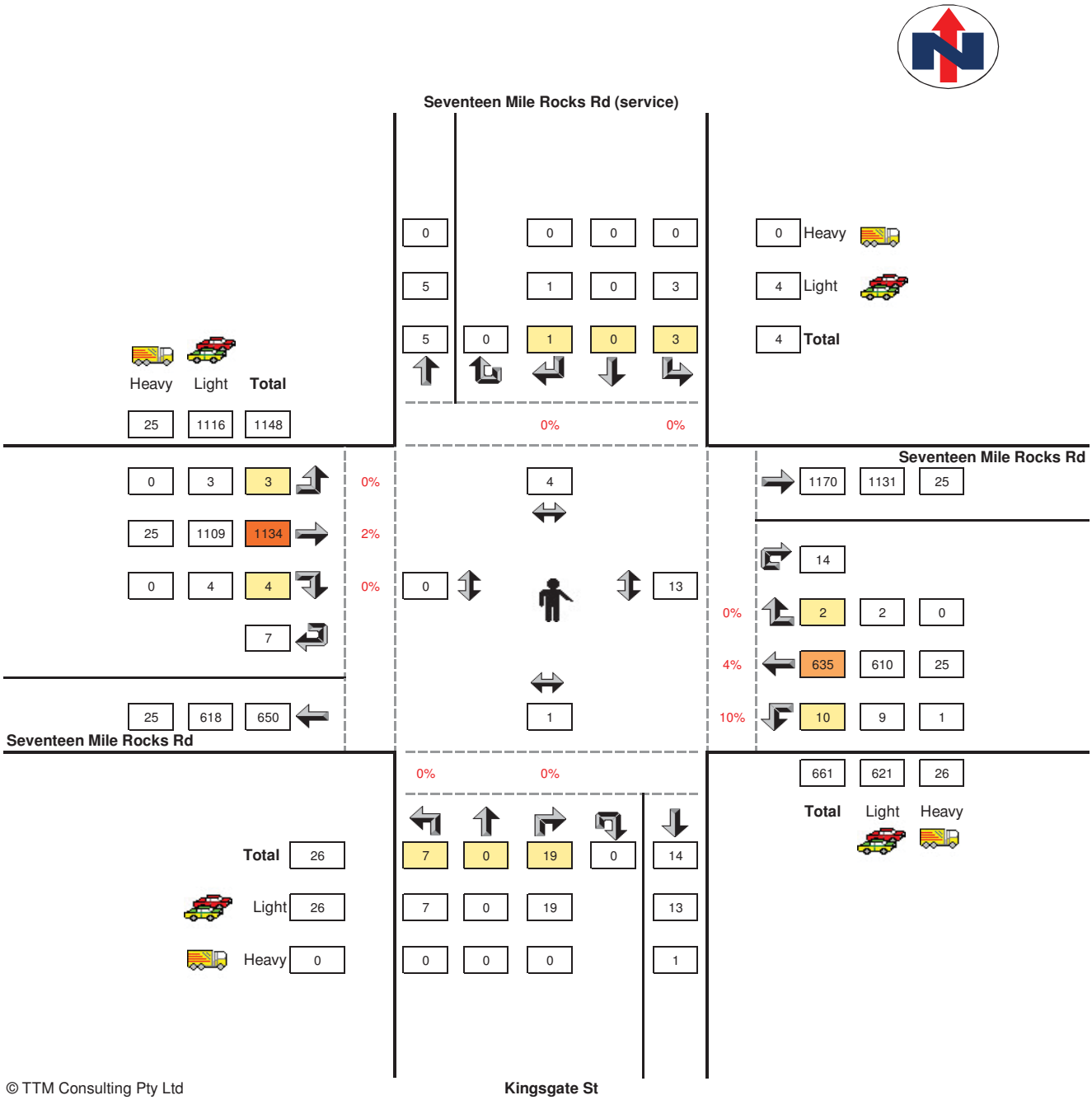
2 - Seventeen Mile Rocks Eastern Approach

Total	**144**	**3**	**47**	**8**	**86**	**179**
Light	144	3	47	8	86	178
Heavy	0	0	0	0	0	1

TTM Reference:	18BRT0087
Location:	Seventeen Mile Rocks Rd / Kingsgate St
Suburb:	Oxley
Date:	Tuesday 17/04/2018
AM Peak	0730-0830
Weather:	Fine

www.ttmgroup.com.au

00% indicates the heavy vehicle percentage



TTM Reference:	18BRT0087
Location:	Seventeen Mile Rocks Rd / Kingsgate St
Suburb:	Oxley
Date:	Tuesday 17/04/2018
PM Peak	1645-1745
Weather:	Fine

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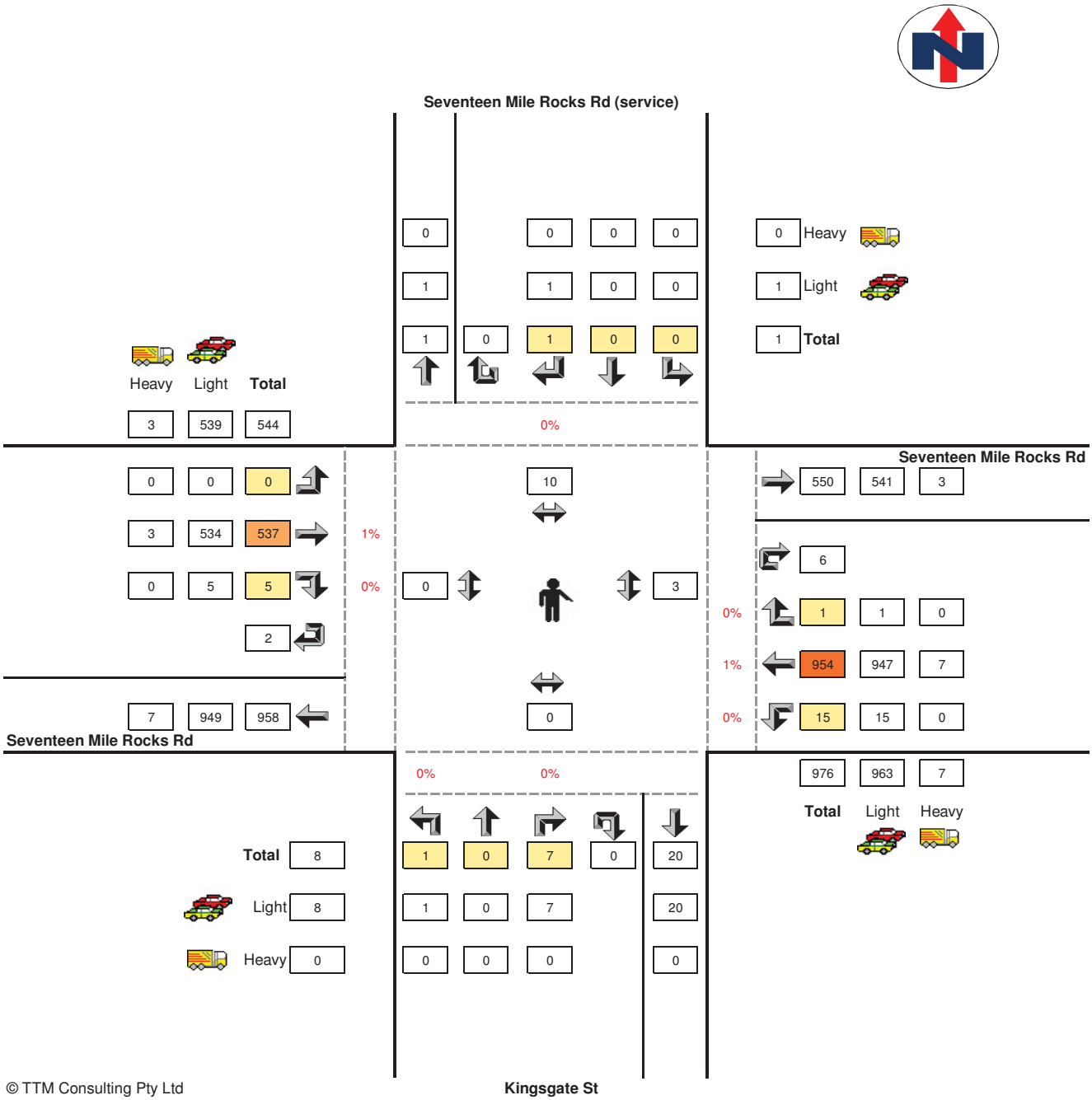
00% indicates the heavy vehicle percentage



TTM Reference:	18BRT0087
Location:	Seventeen Mile Rocks Rd / Oxley Station Rd
Suburb:	Oxley
Date:	Tuesday 17/04/2018
AM Peak	0745-0845
Weather:	Fine

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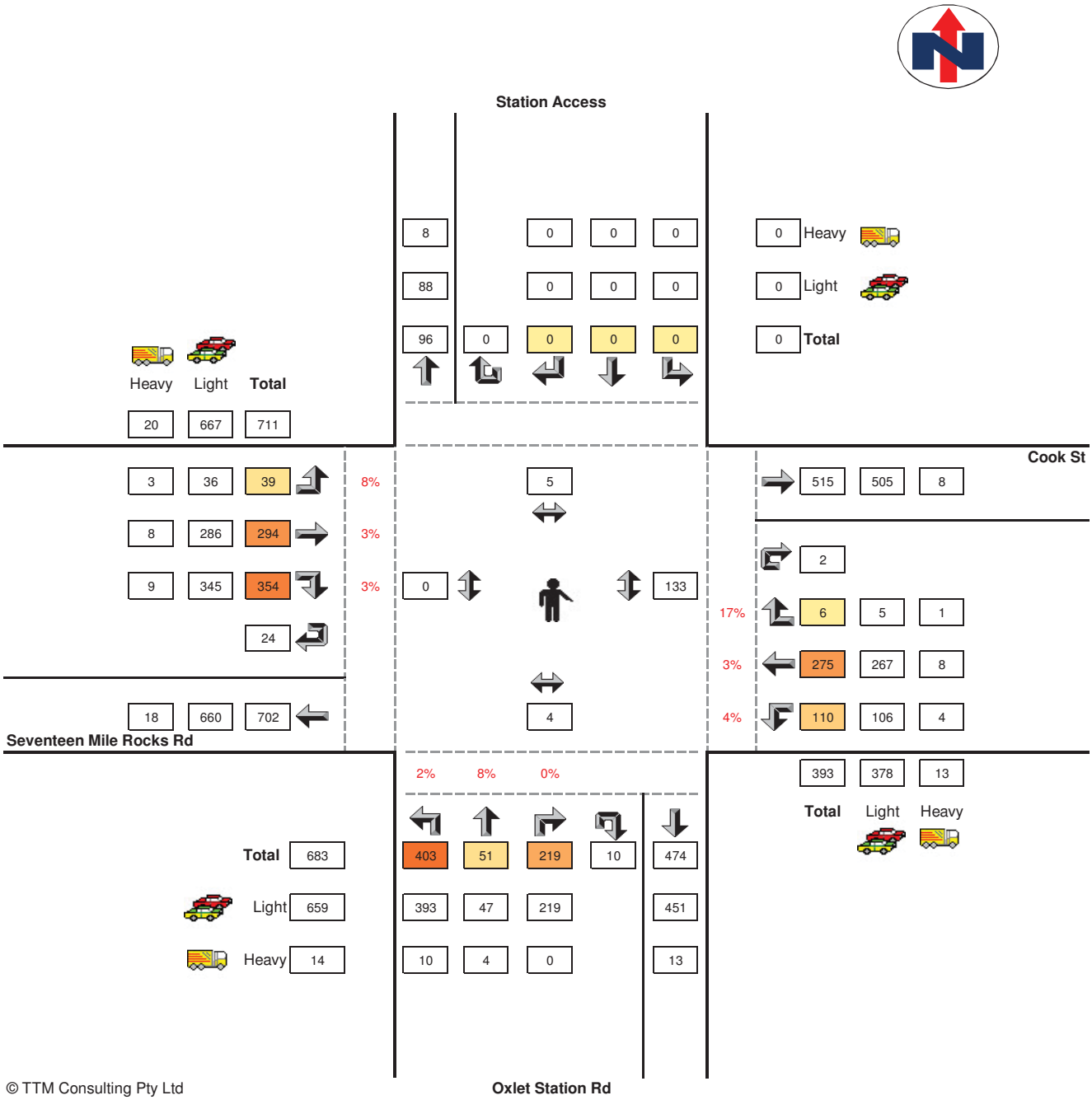
00% indicates the heavy vehicle percentage



TTM Reference:	18BRT0087
Location:	Seventeen Mile Rocks Rd / Oxley Station Rd
Suburb:	Oxley
Date:	Tuesday 17/04/2018
PM Peak	1645-1745
Weather:	Fine

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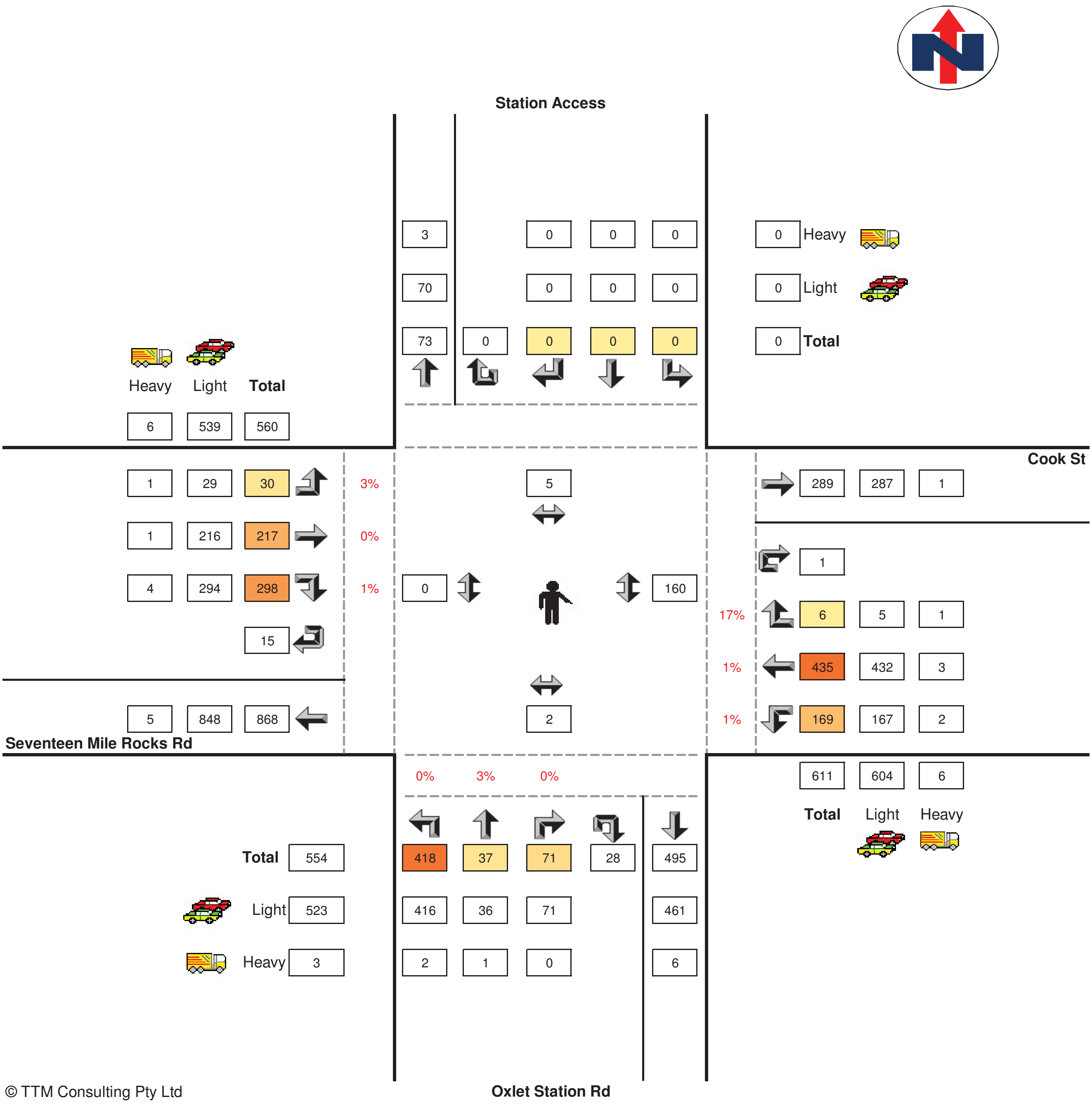
00% indicates the heavy vehicle percentage



TTM Reference:	18BRT0087
Location:	Ardyne Rd / Howard St
Suburb:	Oxley
Date:	Tuesday 17/04/2018
AM Peak	0730-0830
Weather:	Fine

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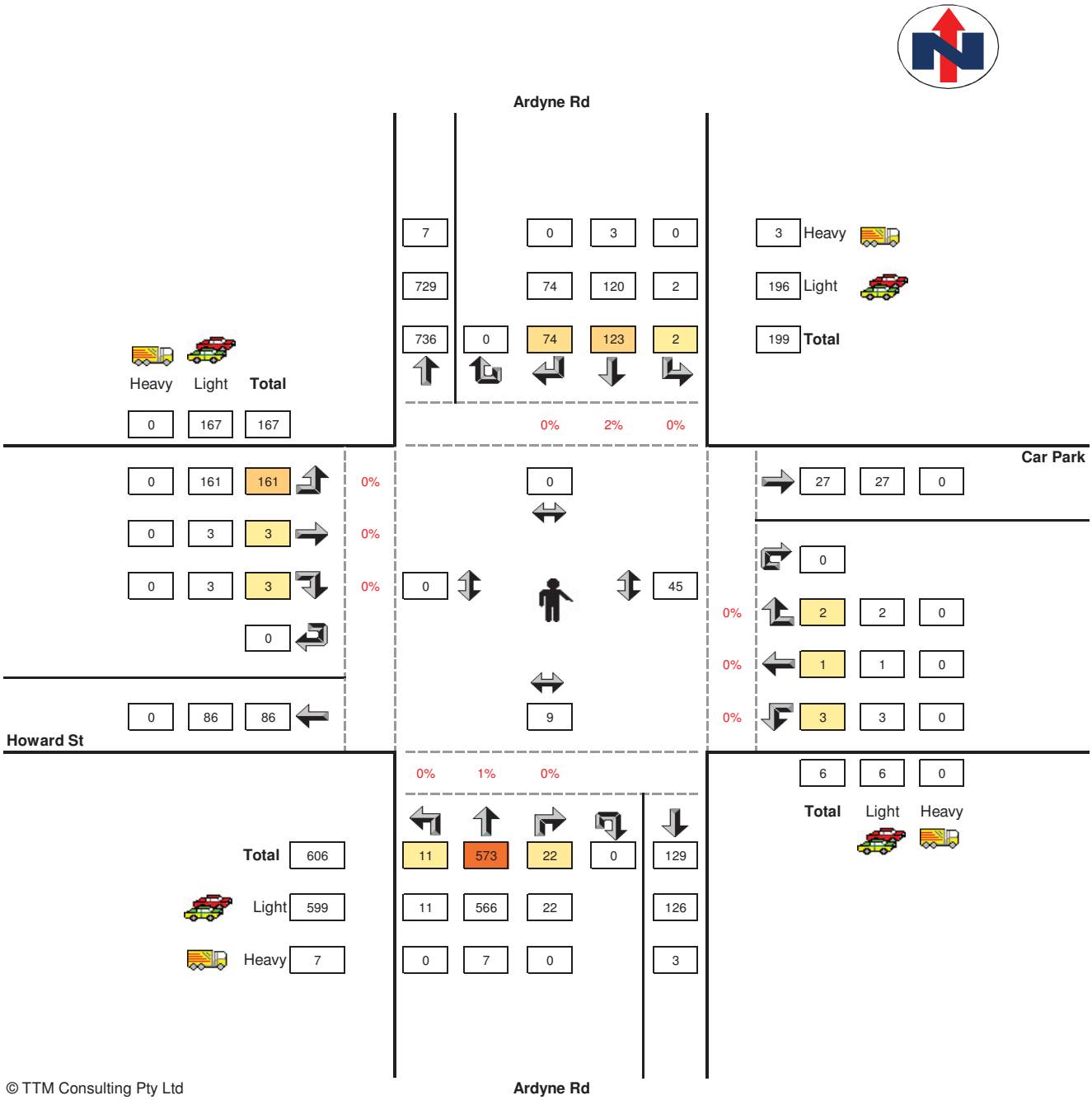
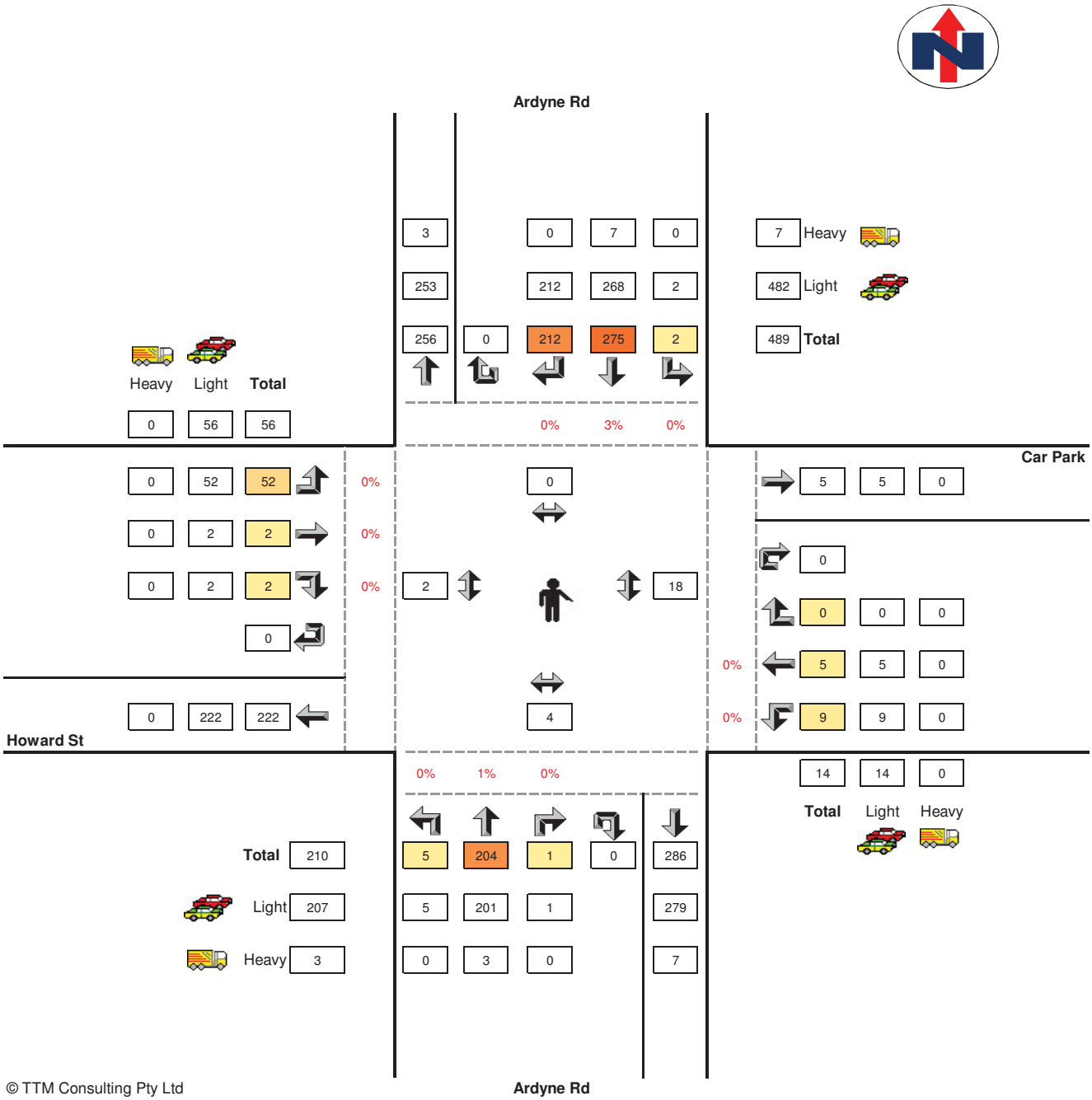
00% indicates the heavy vehicle percentage



TTM Reference:	18BRT0087
Location:	Ardyne Rd / Howard St
Suburb:	Oxley
Date:	Tuesday 17/04/2018
PM Peak	1445-1545
Weather:	Fine

www.ttmgroup.com.au

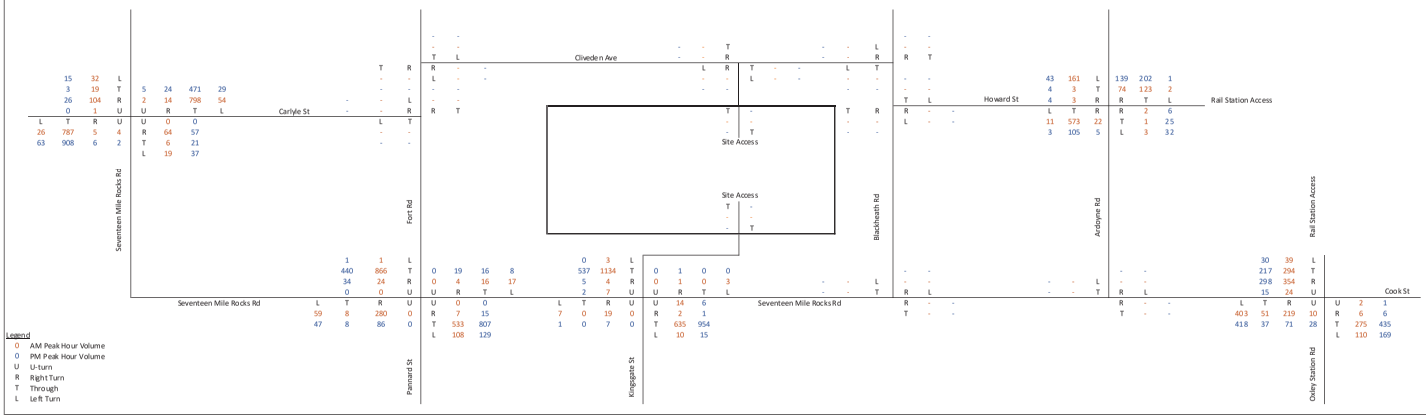
00% indicates the heavy vehicle percentage



Appendix C Traffic Volume Diagrams

Surveyed 2018 Peak Hour Traffic Volumes

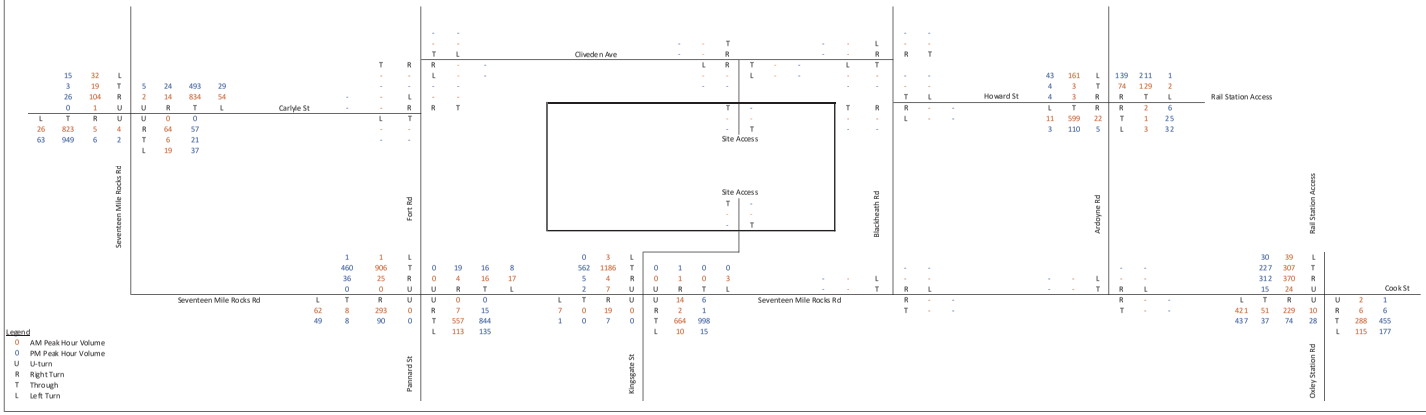
AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



Legend
- 0 AM Peak Hour Volume
- 0 PM Peak Hour Volume
- U U-turn
- R Right Turn
- T Through
- L Left Turn

Estimated 2021 BASE Peak Hour Traffic Volumes (WITHOUT Proposed Development)

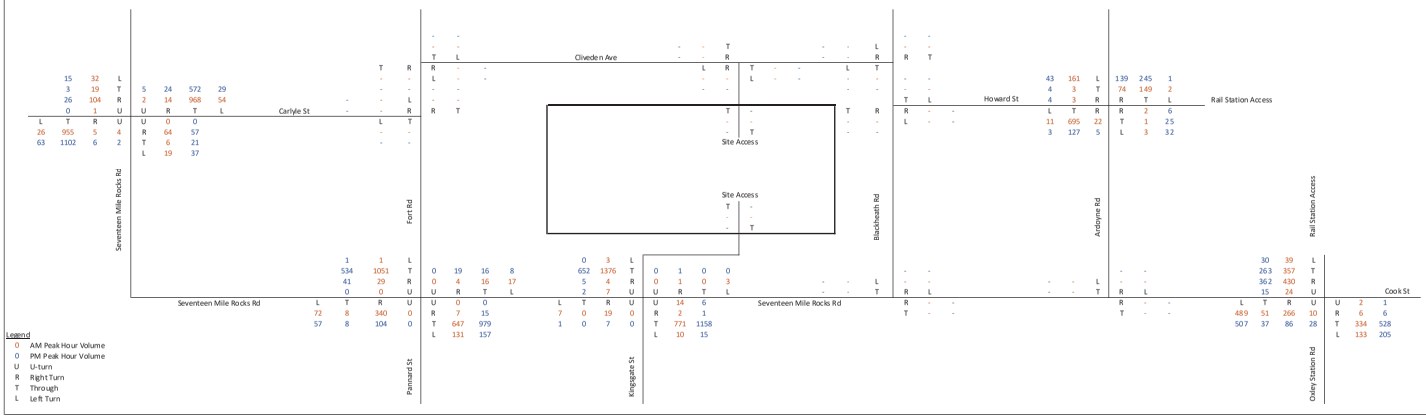
AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



Legend
- 0 AM Peak Hour Volume
- 0 PM Peak Hour Volume
- U U-turn
- R Right Turn
- T Through
- L Left Turn

Estimated 2031 BASE Peak Hour Traffic Volumes (WITHOUT Proposed Development)

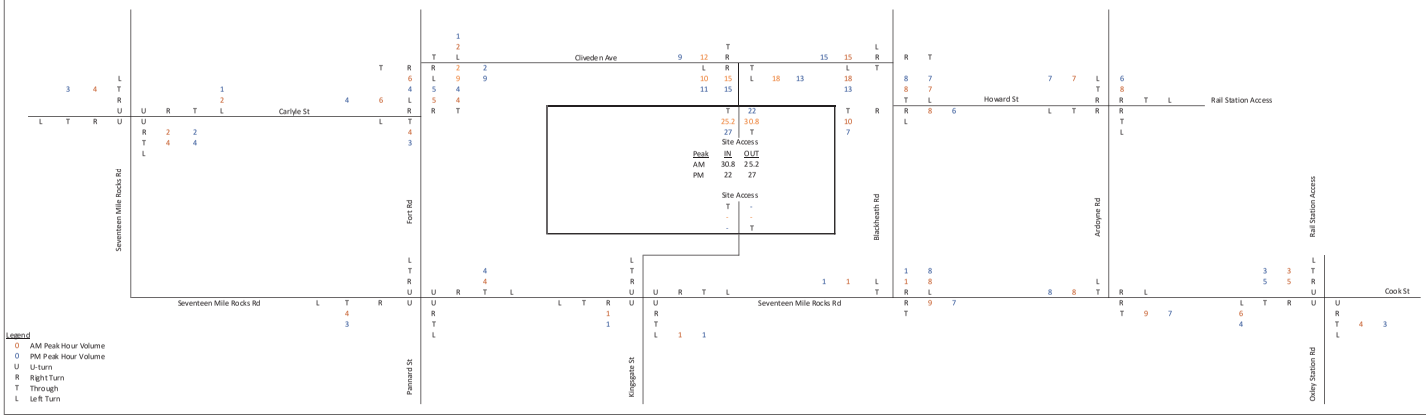
AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



Legend
- 0 AM Peak Hour Volume
- 0 PM Peak Hour Volume
- U U-turn
- R Right Turn
- T Through
- L Left Turn

Estimated Existing Child Care Centre Peak Hour Traffic Volumes

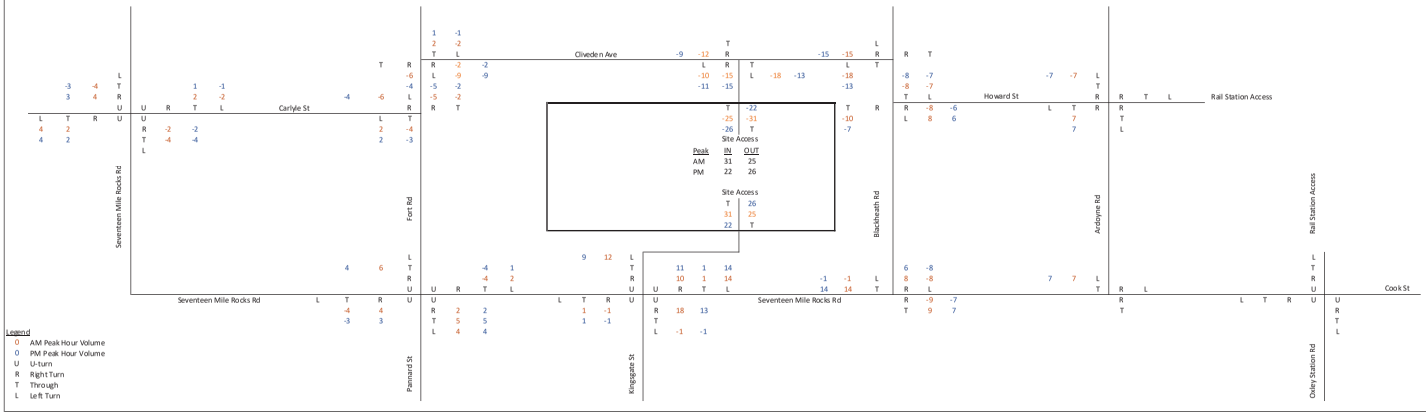
AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



Legend
0 AM Peak Hour Volume
0 PM Peak Hour Volume
U U-turn
R Right Turn
T Through
L Left Turn

Estimated Change in Child Care Centre Peak Hour Traffic Volumes

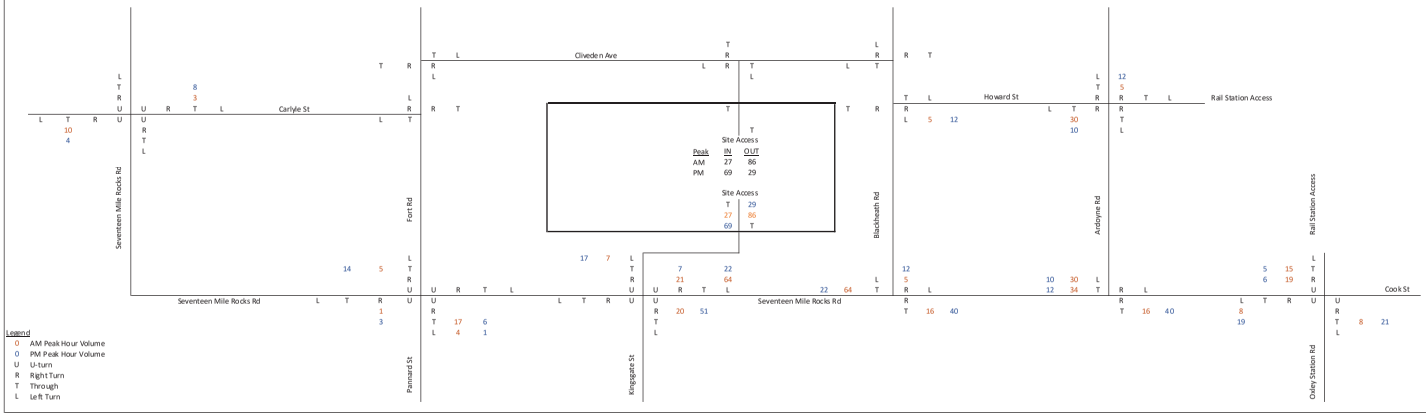
AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



Legend
0 AM Peak Hour Volume
0 PM Peak Hour Volume
U U-turn
R Right Turn
T Through
L Left Turn

Estimated Residential (Detached Dwelling & Retirement Living) Peak Hour Traffic Volumes

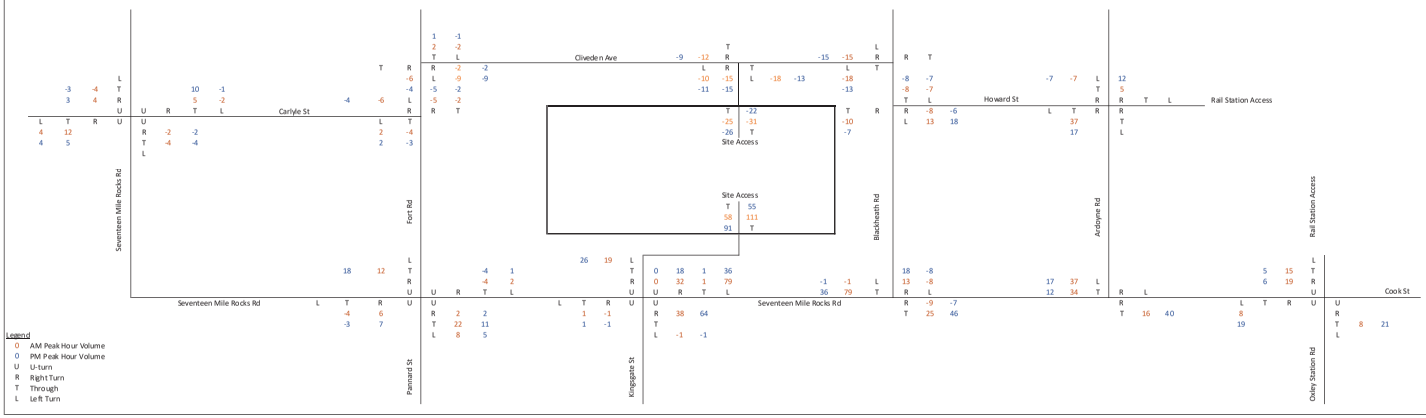
AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



Legend
0 AM Peak Hour Volume
0 PM Peak Hour Volume
U U-turn
R Right Turn
T Through
L Left Turn

Estimated Proposed Development Peak Hour Traffic Volumes

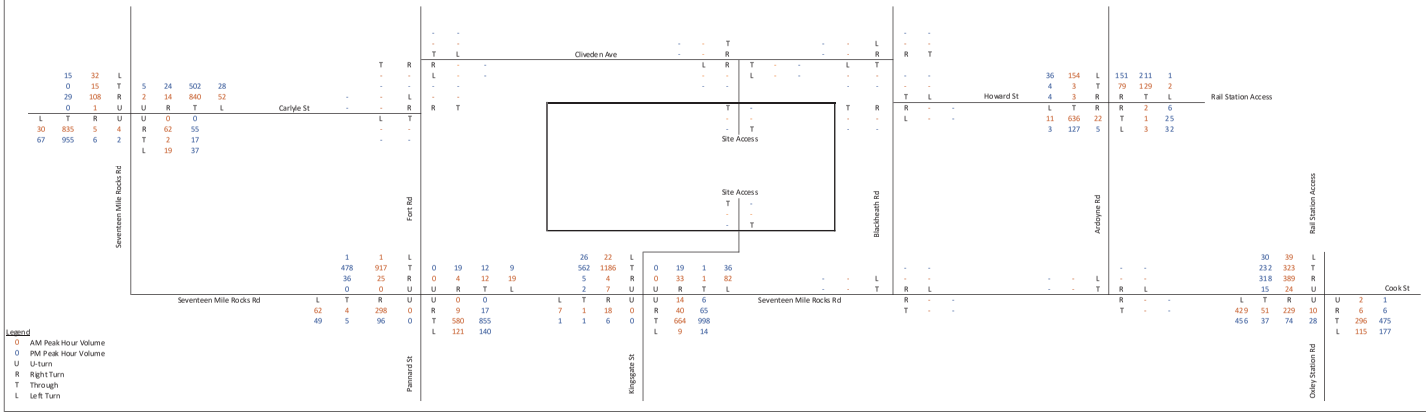
AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



Legend
- 0 AM Peak Hour Volume
- 0 PM Peak Hour Volume
- U U-turn
- R Right Turn
- T Through
- L Left Turn

Estimated 2021 PROJECT Peak Hour Traffic Volumes (WITH Proposed Development)

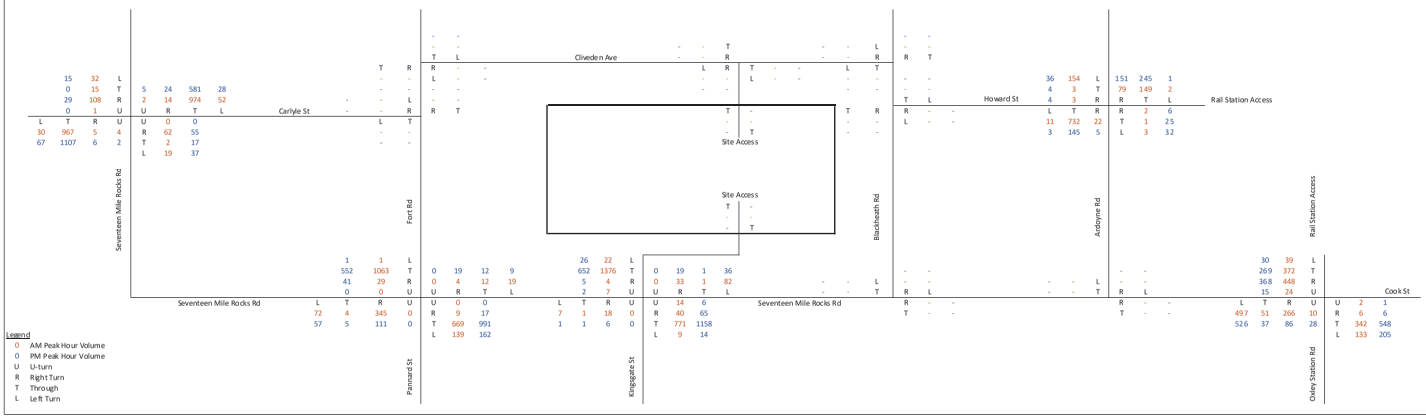
AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



Legend
- 0 AM Peak Hour Volume
- 0 PM Peak Hour Volume
- U U-turn
- R Right Turn
- T Through
- L Left Turn

Estimated 2031 PROJECT Peak Hour Traffic Volumes (WITH Proposed Development)

AM Peak Hour = 0730-0830
PM Peak Hour = 1645-1745



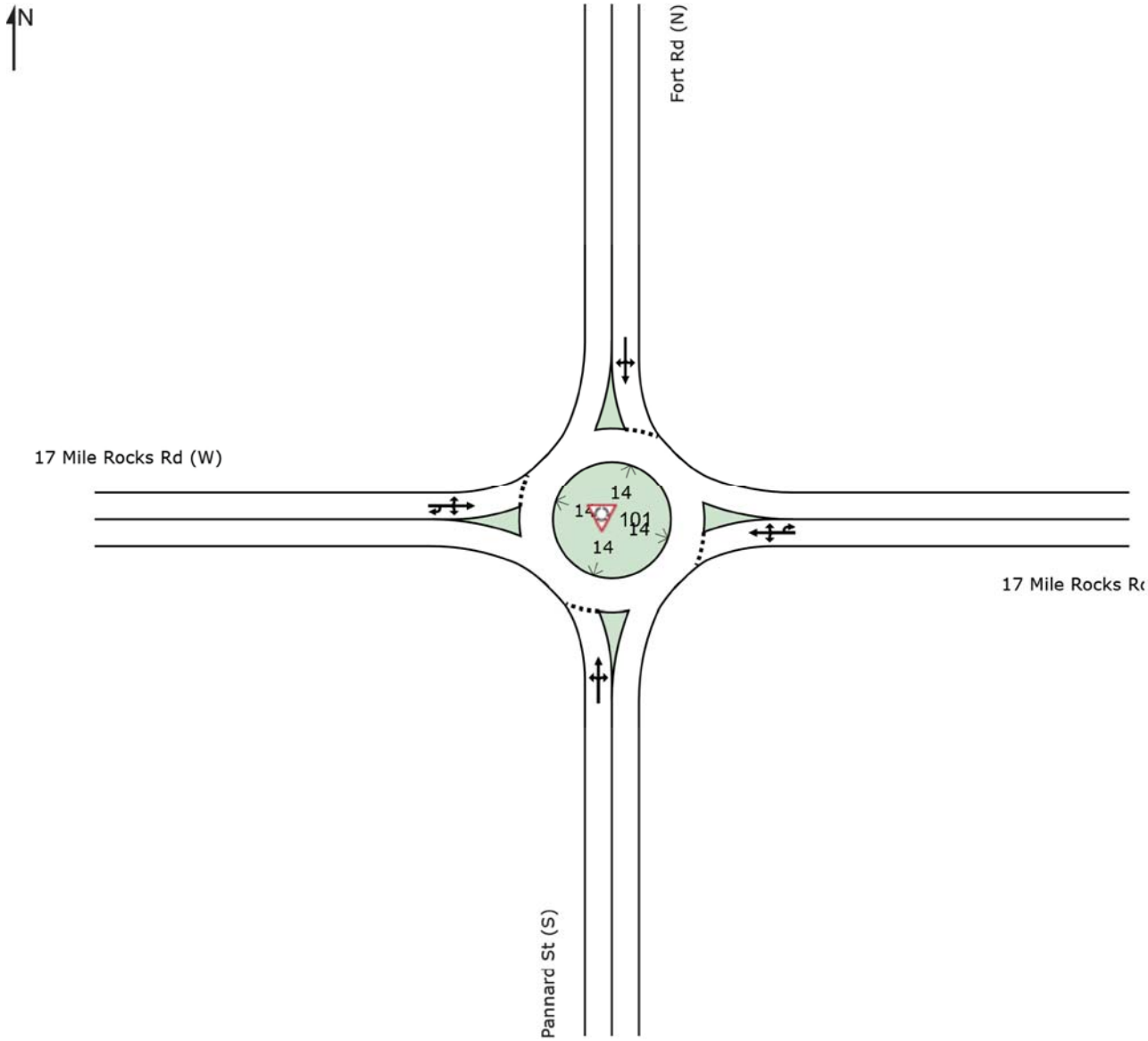
Legend
- 0 AM Peak Hour Volume
- 0 PM Peak Hour Volume
- U U-turn
- R Right Turn
- T Through
- L Left Turn

Appendix D SIDRA Analysis Outputs – Seventeen Mile Rocks Rd / Fort Rd / Pannard St

SITE LAYOUT

Site: 101 [2018 AM BASE]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2018 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout



LANE SUMMARY

Site: 101 [2018 AM BASE]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2018 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	365	1.6	815	0.448	100	12.3	LOS B	3.2	22.5	Full	500	0.0	0.0
Approach	365	1.6		0.448		12.3	LOS B	3.2	22.5				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	683	3.1	1459	0.468	100	4.8	LOS A	4.1	29.2	Full	500	0.0	0.0
Approach	683	3.1		0.468		4.8	LOS A	4.1	29.2				
North: Fort Rd (N)													
Lane 1[d]	39	0.0	301	0.129	100	19.3	LOS B	1.0	6.8	Full	500	0.0	0.0
Approach	39	0.0		0.129		19.3	LOS B	1.0	6.8				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	939	1.9	1028	0.914	100	17.1	LOS B	20.9	148.9	Full	500	0.0	0.0
Approach	939	1.9		0.914		17.1	LOS B	20.9	148.9				
Intersection	2026	2.2		0.914		12.2	LOS B	20.9	148.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2018 PM BASE]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2018 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	148	0.0	579	0.256	100	13.6	LOS B	1.7	12.0	Full	500	0.0	0.0
Approach	148	0.0		0.256		13.6	LOS B	1.7	12.0				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1002	0.8	1442	0.695	100	5.3	LOS A	8.6	60.6	Full	500	0.0	0.0
Approach	1002	0.8		0.695		5.3	LOS A	8.6	60.6				
North: Fort Rd (N)													
Lane 1[d]	45	0.0	836	0.054	100	9.6	LOS A	0.3	2.4	Full	500	0.0	0.0
Approach	45	0.0		0.054		9.6	LOS A	0.3	2.4				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	501	0.9	1277	0.392	100	5.5	LOS A	2.7	18.9	Full	500	0.0	0.0
Approach	501	0.9		0.392		5.5	LOS A	2.7	18.9				
Intersection	1697	0.8		0.695		6.2	LOS A	8.6	60.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 AM BASE]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2021 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	382	1.6	795	0.481	100	13.1	LOS B	3.6	25.9	Full	500	0.0	0.0
Approach	382	1.6		0.481		13.1	LOS B	3.6	25.9				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	714	3.1	1458	0.489	100	4.8	LOS A	4.4	31.7	Full	500	0.0	0.0
Approach	714	3.1		0.489		4.8	LOS A	4.4	31.7				
North: Fort Rd (N)													
Lane 1[d]	39	0.0	258	0.151	100	21.3	LOS C	1.1	7.8	Full	500	0.0	0.0
Approach	39	0.0		0.151		21.3	LOS C	1.1	7.8				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	982	1.9	1012	0.971	100	27.7	LOS C	32.1	228.3	Full	500	0.0	0.0
Approach	982	1.9		0.971		27.7	LOS C	32.1	228.3				
Intersection	2117	2.2		0.971		17.2	LOS B	32.1	228.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 PM BASE]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2021 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	155	0.0	544	0.284	100	14.3	LOS B	2.0	13.7	Full	500	0.0	0.0
Approach	155	0.0		0.284		14.3	LOS B	2.0	13.7				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1047	0.8	1440	0.727	100	5.4	LOS A	9.7	68.2	Full	500	0.0	0.0
Approach	1047	0.8		0.727		5.4	LOS A	9.7	68.2				
North: Fort Rd (N)													
Lane 1[d]	45	0.0	815	0.056	100	9.8	LOS A	0.4	2.5	Full	500	0.0	0.0
Approach	45	0.0		0.056		9.8	LOS A	0.4	2.5				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	524	0.9	1271	0.412	100	5.6	LOS A	2.9	20.4	Full	500	0.0	0.0
Approach	524	0.9		0.412		5.6	LOS A	2.9	20.4				
Intersection	1772	0.8		0.727		6.3	LOS A	9.7	68.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 AM BASE]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2031 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	442	1.6	725	0.610	100	17.0	LOS B	6.0	42.3	Full	500	0.0	0.0
Approach	442	1.6		0.610		17.0	LOS B	6.0	42.3				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	827	3.1	1473	0.562	100	4.9	LOS A	5.7	40.9	Full	500	0.0	0.0
Approach	827	3.1		0.562		4.9	LOS A	5.7	40.9				
North: Fort Rd (N)													
Lane 1[d]	39	0.0	249	0.156	100	22.4	LOS C	1.1	8.0	Full	500	0.0	0.0
Approach	39	0.0		0.156		22.4	LOS C	1.1	8.0				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	1139	1.9	954	1.194	100	189.7	LOS F	138.6	986.7	Full	500	0.0	31.6
Approach	1139	1.9		1.194		189.7	LOS F	138.6	986.7				
Intersection	2447	2.3		1.194		93.4	LOS F	138.6	986.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 PM BASE]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2031 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	178	0.0	402	0.442	100	19.9	LOS B	3.6	25.4	Full	500	0.0	0.0
Approach	178	0.0		0.442		19.9	LOS B	3.6	25.4				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1213	0.8	1439	0.843	100	5.9	LOS A	16.0	113.0	Full	500	0.0	0.0
Approach	1213	0.8		0.843		5.9	LOS A	16.0	113.0				
North: Fort Rd (N)													
Lane 1[d]	45	0.0	736	0.062	100	10.8	LOS B	0.4	2.9	Full	500	0.0	0.0
Approach	45	0.0		0.062		10.8	LOS B	0.4	2.9				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	607	0.9	1249	0.486	100	5.7	LOS A	3.8	27.0	Full	500	0.0	0.0
Approach	607	0.9		0.486		5.7	LOS A	3.8	27.0				
Intersection	2043	0.8		0.843		7.2	LOS A	16.0	113.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 AM PROJECT]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2021 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	383	1.6	777	0.493	100	13.7	LOS B	3.8	27.3	Full	500	0.0	0.0
Approach	383	1.6		0.493		13.7	LOS B	3.8	27.3				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	748	3.1	1475	0.507	100	4.8	LOS A	4.8	34.5	Full	500	0.0	0.0
Approach	748	3.1		0.507		4.8	LOS A	4.8	34.5				
North: Fort Rd (N)													
Lane 1[d]	37	0.0	250	0.148	100	22.1	LOS C	1.1	7.7	Full	500	0.0	0.0
Approach	37	0.0		0.148		22.1	LOS C	1.1	7.7				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	994	1.9	1008	0.986	100	33.0	LOS C	36.7	261.2	Full	500	0.0	0.0
Approach	994	1.9		0.986		33.0	LOS C	36.7	261.2				
Intersection	2162	2.3		0.986		19.6	LOS B	36.7	261.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 PM PROJECT]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2021 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	158	0.0	536	0.294	100	14.7	LOS B	2.0	14.2	Full	500	0.0	0.0
Approach	158	0.0		0.294		14.7	LOS B	2.0	14.2				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1066	0.8	1452	0.734	100	5.4	LOS A	10.0	70.3	Full	500	0.0	0.0
Approach	1066	0.8		0.734		5.4	LOS A	10.0	70.3				
North: Fort Rd (N)													
Lane 1[d]	42	0.0	795	0.053	100	10.2	LOS B	0.3	2.4	Full	500	0.0	0.0
Approach	42	0.0		0.053		10.2	LOS B	0.3	2.4				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	543	0.9	1264	0.430	100	5.6	LOS A	3.1	21.7	Full	500	0.0	0.0
Approach	543	0.9		0.430		5.6	LOS A	3.1	21.7				
Intersection	1809	0.8		0.734		6.4	LOS A	10.0	70.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 AM PROJECT]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2031 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	442	1.6	708	0.624	100	17.9	LOS B	6.3	44.5	Full	500	0.0	0.0
Approach	442	1.6		0.624		17.9	LOS B	6.3	44.5				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	861	3.1	1490	0.578	100	4.9	LOS A	6.1	44.2	Full	500	0.0	0.0
Approach	861	3.1		0.578		4.9	LOS A	6.1	44.2				
North: Fort Rd (N)													
Lane 1[d]	37	0.0	249	0.148	100	22.5	LOS C	1.1	7.6	Full	500	0.0	0.0
Approach	37	0.0		0.148		22.5	LOS C	1.1	7.6				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	1152	1.9	952	1.210	100	204.3	LOS F	148.0	1053.0	Full	500	0.0	35.6
Approach	1152	1.9		1.210		204.3	LOS F	148.0	1053.0				
Intersection	2492	2.3		1.210		99.6	LOS F	148.0	1053.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 PM PROJECT]

Seventeen Mile Rocks Rd / Fort Rd / Pannard St
Existing Roundabout Intersection
2031 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Pannard St (S)													
Lane 1[d]	182	0.0	393	0.463	100	21.2	LOS C	3.9	27.2	Full	500	0.0	0.0
Approach	182	0.0		0.463		21.2	LOS C	3.9	27.2				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1233	0.8	1451	0.849	100	5.9	LOS A	16.9	118.9	Full	500	0.0	0.0
Approach	1233	0.8		0.849		5.9	LOS A	16.9	118.9				
North: Fort Rd (N)													
Lane 1[d]	42	0.0	715	0.059	100	11.2	LOS B	0.4	2.8	Full	500	0.0	0.0
Approach	42	0.0		0.059		11.2	LOS B	0.4	2.8				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	626	0.9	1240	0.505	100	5.8	LOS A	4.1	28.6	Full	500	0.0	0.0
Approach	626	0.9		0.505		5.8	LOS A	4.1	28.6				
Intersection	2083	0.8		0.849		7.3	LOS A	16.9	118.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

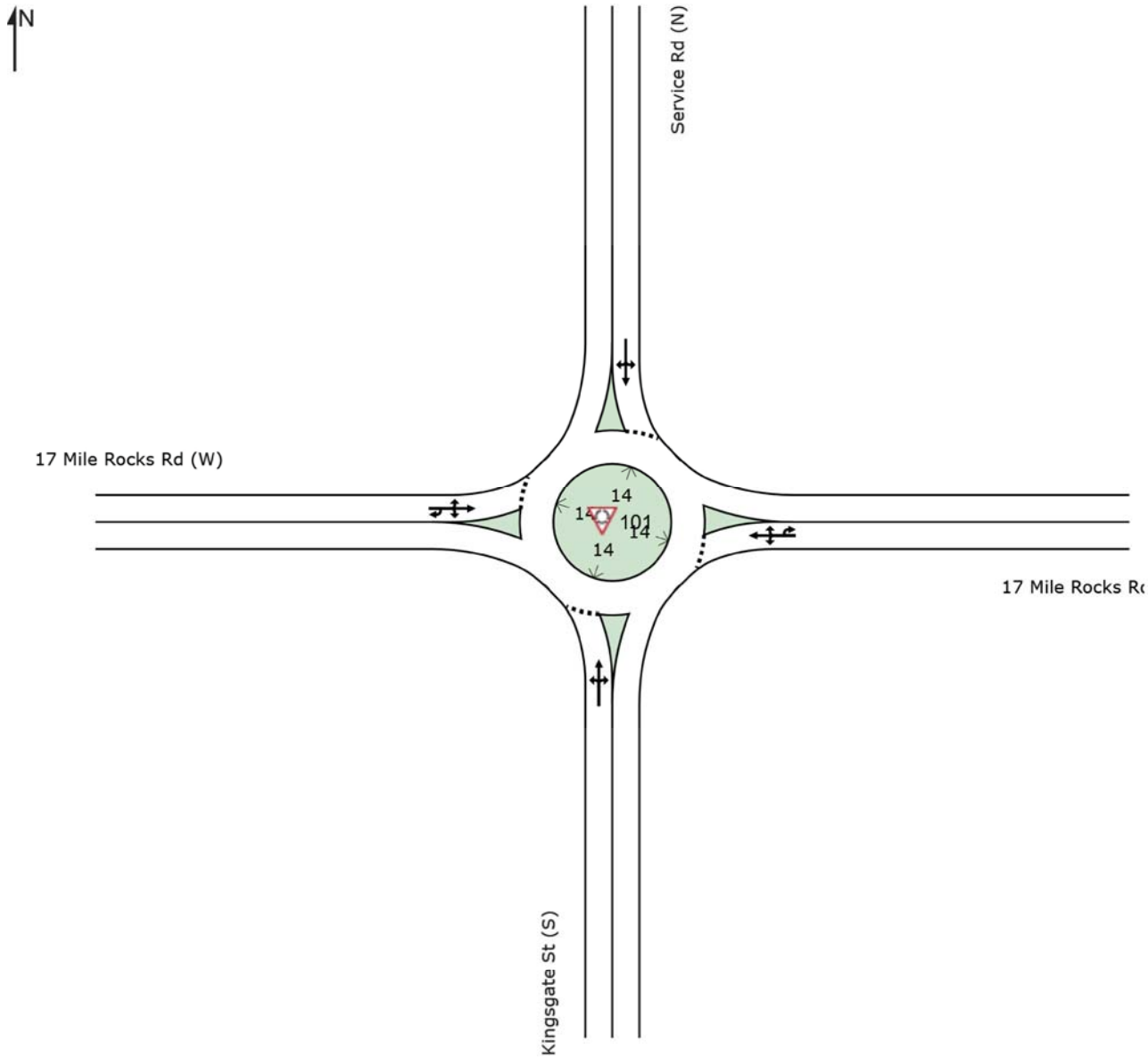
d Dominant lane on roundabout approach

Appendix E SIDRA Analysis Outputs – Seventeen Mile Rocks Rd / Kingsgate St

SITE LAYOUT

Site: 101 [2018 AM BASE]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2018 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout



LANE SUMMARY

Site: 101 [2018 AM BASE]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2018 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	28	0.0	767	0.037	100	11.2	LOS B	0.2	1.4	Full	500	0.0	0.0
Approach	28	0.0		0.037		11.2	LOS B	0.2	1.4				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	696	3.8	1602	0.434	100	4.7	LOS A	3.5	25.3	Full	500	0.0	0.0
Approach	696	3.8		0.434		4.7	LOS A	3.5	25.3				
North: Service Rd (N)													
Lane 1[d]	5	0.0	362	0.015	100	18.6	LOS B	0.1	0.7	Full	500	0.0	0.0
Approach	5	0.0		0.015		18.6	LOS B	0.1	0.7				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	1208	2.0	1548	0.781	100	5.1	LOS A	13.0	92.8	Full	500	0.0	0.0
Approach	1208	2.0		0.781		5.1	LOS A	13.0	92.8				
Intersection	1938	2.6		0.781		5.1	LOS A	13.0	92.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2018 PM BASE]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2018 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	9	0.0	574	0.017	100	15.2	LOS B	0.1	0.7	Full	500	0.0	0.0
Approach	9	0.0		0.017		15.2	LOS B	0.1	0.7				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1027	1.0	1670	0.615	100	4.6	LOS A	6.2	44.0	Full	500	0.0	0.0
Approach	1027	1.0		0.615		4.6	LOS A	6.2	44.0				
North: Service Rd (N)													
Lane 1[d]	3	0.0	844	0.004	100	8.6	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	3	0.0		0.004		8.6	LOS A	0.0	0.1				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	574	1.0	1598	0.359	100	4.6	LOS A	2.7	18.8	Full	500	0.0	0.0
Approach	574	1.0		0.359		4.6	LOS A	2.7	18.8				
Intersection	1614	1.0		0.615		4.7	LOS A	6.2	44.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 AM BASE]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2021 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	28	0.0	747	0.038	100	11.5	LOS B	0.2	1.4	Full	500	0.0	0.0
Approach	28	0.0		0.038		11.5	LOS B	0.2	1.4				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	726	3.8	1604	0.453	100	4.7	LOS A	3.8	27.5	Full	500	0.0	0.0
Approach	726	3.8		0.453		4.7	LOS A	3.8	27.5				
North: Service Rd (N)													
Lane 1[d]	5	0.0	318	0.017	100	20.8	LOS C	0.1	0.8	Full	500	0.0	0.0
Approach	5	0.0		0.017		20.8	LOS C	0.1	0.8				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	1263	2.0	1551	0.814	100	5.1	LOS A	15.7	111.7	Full	500	0.0	0.0
Approach	1263	2.0		0.814		5.1	LOS A	15.7	111.7				
Intersection	2023	2.6		0.814		5.1	LOS A	15.7	111.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 AM PROJECT]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2021 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	27	0.0	664	0.041	100	12.2	LOS B	0.2	1.7	Full	500	0.0	0.0
Approach	27	0.0		0.041		12.2	LOS B	0.2	1.7				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	765	3.7	1459	0.524	100	5.2	LOS A	5.3	38.1	Full	500	0.0	0.0
Approach	765	3.7		0.524		5.2	LOS A	5.3	38.1				
North: Service Rd (N)													
Lane 1[d]	122	0.0	251	0.486	100	32.4	LOS C	4.2	29.5	Full	500	0.0	0.0
Approach	122	0.0		0.486		32.4	LOS C	4.2	29.5				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	1283	1.9	1447	0.887	100	6.2	LOS A	19.8	140.6	Full	500	0.0	0.0
Approach	1283	1.9		0.887		6.2	LOS A	19.8	140.6				
Intersection	2198	2.4		0.887		7.4	LOS A	19.8	140.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 PM BASE]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2021 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	9	0.0	543	0.017	100	16.1	LOS B	0.1	0.7	Full	500	0.0	0.0
Approach	9	0.0		0.017		16.1	LOS B	0.1	0.7				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1074	1.0	1672	0.642	100	4.6	LOS A	6.9	48.7	Full	500	0.0	0.0
Approach	1074	1.0		0.642		4.6	LOS A	6.9	48.7				
North: Service Rd (N)													
Lane 1[d]	3	0.0	827	0.004	100	8.8	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	3	0.0		0.004		8.8	LOS A	0.0	0.1				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	600	1.0	1601	0.375	100	4.6	LOS A	2.9	20.1	Full	500	0.0	0.0
Approach	600	1.0		0.375		4.6	LOS A	2.9	20.1				
Intersection	1686	1.0		0.642		4.7	LOS A	6.9	48.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 PM PROJECT]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2021 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	8	0.0	445	0.019	100	17.9	LOS B	0.1	0.9	Full	500	0.0	0.0
Approach	8	0.0		0.019		17.9	LOS B	0.1	0.9				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1140	0.9	1585	0.719	100	5.1	LOS A	10.3	72.9	Full	500	0.0	0.0
Approach	1140	0.9		0.719		5.1	LOS A	10.3	72.9				
North: Service Rd (N)													
Lane 1[d]	59	0.0	795	0.074	100	9.1	LOS A	0.4	2.9	Full	500	0.0	0.0
Approach	59	0.0		0.074		9.1	LOS A	0.4	2.9				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	626	0.9	1381	0.453	100	5.1	LOS A	3.5	24.6	Full	500	0.0	0.0
Approach	626	0.9		0.453		5.1	LOS A	3.5	24.6				
Intersection	1834	0.9		0.719		5.3	LOS A	10.3	72.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 AM BASE]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2031 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	28	0.0	667	0.043	100	12.7	LOS B	0.2	1.7	Full	500	0.0	0.0
Approach	28	0.0		0.043		12.7	LOS B	0.2	1.7				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	839	3.9	1609	0.521	100	4.7	LOS A	5.5	39.8	Full	500	0.0	0.0
Approach	839	3.9		0.521		4.7	LOS A	5.5	39.8				
North: Service Rd (N)													
Lane 1[d]	5	0.0	134	0.039	100	32.5	LOS C	0.3	1.8	Full	500	0.0	0.0
Approach	5	0.0		0.039		32.5	LOS C	0.3	1.8				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	1463	2.0	1560	0.938	100	5.9	LOS A	40.3	287.1	Full	500	0.0	0.0
Approach	1463	2.0		0.938		5.9	LOS A	40.3	287.1				
Intersection	2336	2.6		0.938		5.6	LOS A	40.3	287.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 AM PROJECT]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2031 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	27	0.0	581	0.047	100	13.6	LOS B	0.3	2.0	Full	500	0.0	0.0
Approach	27	0.0		0.047		13.6	LOS B	0.3	2.0				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	878	3.7	1471	0.597	100	5.2	LOS A	6.8	49.2	Full	500	0.0	0.0
Approach	878	3.7		0.597		5.2	LOS A	6.8	49.2				
North: Service Rd (N)													
Lane 1[d]	122	0.0	134	0.915	100	158.6	LOS F	11.5	80.2	Full	500	0.0	0.0
Approach	122	0.0		0.915		158.6	LOS F	11.5	80.2				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	1483	2.0	1458	1.017	100	28.8	LOS C	81.4	579.3	Full	500	0.0	9.5
Approach	1483	2.0		1.017		28.8	LOS C	81.4	579.3				
Intersection	2511	2.4		1.017		26.7	LOS C	81.4	579.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 PM BASE]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2031 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	9	0.0	426	0.022	100	20.5	LOS C	0.1	1.0	Full	500	0.0	0.0
Approach	9	0.0		0.022		20.5	LOS C	0.1	1.0				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1242	1.0	1677	0.741	100	4.6	LOS A	10.8	76.0	Full	500	0.0	0.0
Approach	1242	1.0		0.741		4.6	LOS A	10.8	76.0				
North: Service Rd (N)													
Lane 1[d]	3	0.0	765	0.004	100	9.5	LOS A	0.0	0.2	Full	500	0.0	0.0
Approach	3	0.0		0.004		9.5	LOS A	0.0	0.2				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	695	1.0	1611	0.431	100	4.6	LOS A	3.6	25.4	Full	500	0.0	0.0
Approach	695	1.0		0.431		4.6	LOS A	3.6	25.4				
Intersection	1949	1.0		0.741		4.7	LOS A	10.8	76.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 PM PROJECT]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Existing Roundabout Intersection
2031 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	8	0.0	316	0.027	100	23.9	LOS C	0.2	1.3	Full	500	0.0	0.0
Approach	8	0.0		0.027		23.9	LOS C	0.2	1.3				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1308	0.9	1593	0.821	100	5.2	LOS A	17.8	125.6	Full	500	0.0	0.0
Approach	1308	0.9		0.821		5.2	LOS A	17.8	125.6				
North: Service Rd (N)													
Lane 1[d]	59	0.0	722	0.082	100	9.9	LOS A	0.5	3.3	Full	500	0.0	0.0
Approach	59	0.0		0.082		9.9	LOS A	0.5	3.3				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	721	1.0	1389	0.519	100	5.1	LOS A	4.5	31.9	Full	500	0.0	0.0
Approach	721	1.0		0.519		5.1	LOS A	4.5	31.9				
Intersection	2097	0.9		0.821		5.4	LOS A	17.8	125.6				

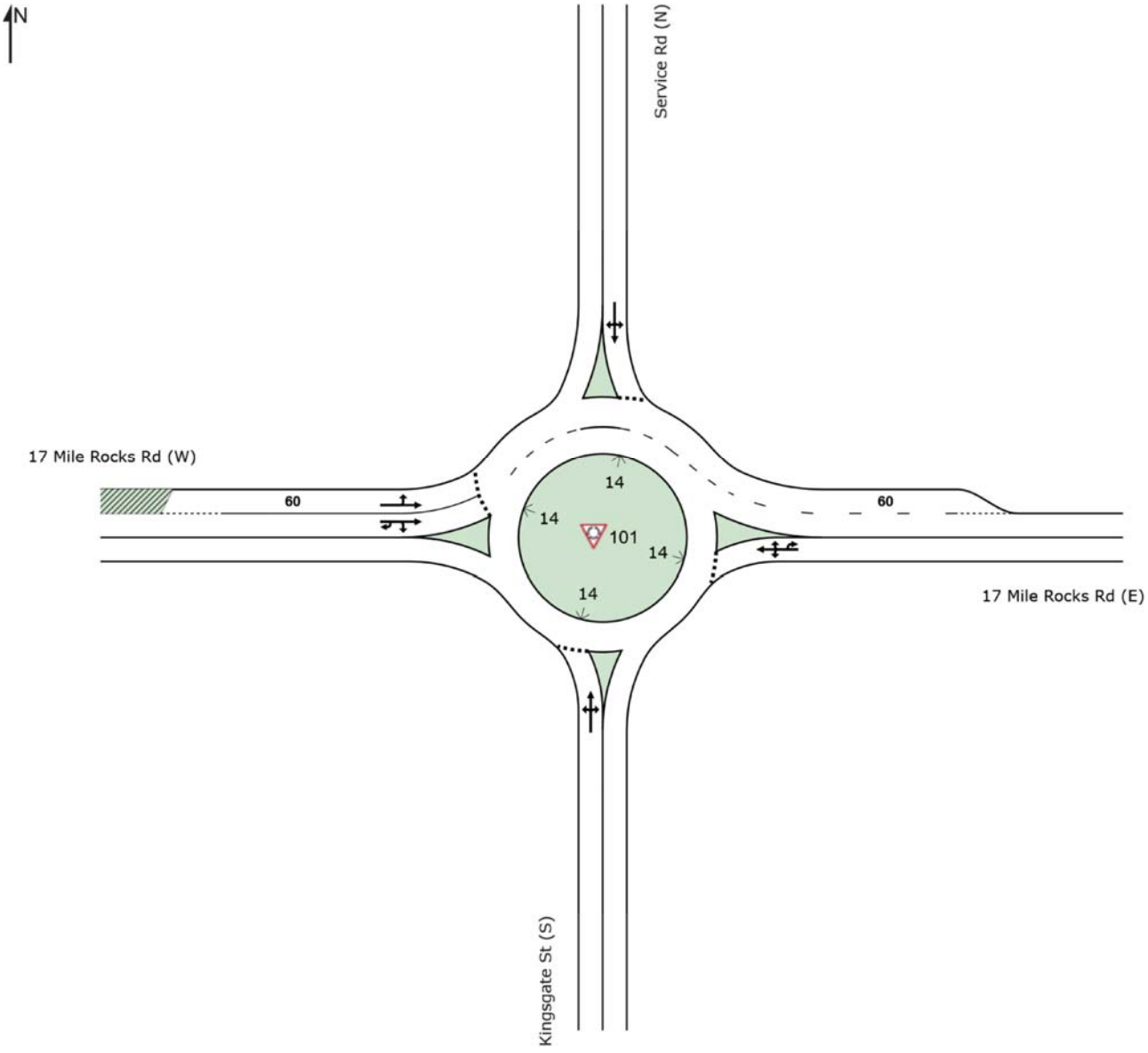
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SITE LAYOUT

Site: 101 [2031 AM PROJECT - Upgrade]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Upgraded Roundabout Intersection
2031 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Roundabout



LANE SUMMARY

Site: 101 [2031 AM PROJECT - Upgrade]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Upgraded Roundabout Intersection
2031 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	27	0.0	598	0.046	100	13.5	LOS B	0.3	2.0	Full	500	0.0	0.0
Approach	27	0.0		0.046		13.5	LOS B	0.3	2.0				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	878	3.7	1473	0.596	100	5.1	LOS A	6.5	47.3	Full	500	0.0	0.0
Approach	878	3.7		0.596		5.1	LOS A	6.5	47.3				
North: Service Rd (N)													
Lane 1[d]	122	0.0	419	0.291	100	14.5	LOS B	1.5	10.5	Full	500	0.0	0.0
Approach	122	0.0		0.291		14.5	LOS B	1.5	10.5				
West: 17 Mile Rocks Rd (W)													
Lane 1	329	1.9	1088	0.303	42[6]	5.3	LOS A	1.9	13.5	Short (P)	60	0.0	NA
Lane 2[d]	1154	2.0	1597	0.723	100	5.4	LOS A	8.9	63.7	Full	500	0.0	0.0
Approach	1483	2.0		0.723		5.4	LOS A	8.9	63.7				
Intersection	2511	2.4		0.723		5.8	LOS A	8.9	63.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 PM PROJECT - Upgrade]

Seventeen Mile Rocks Rd / Service Rd / Kingsgate St
Upgraded Roundabout Intersection
2031 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Kingsgate St (S)													
Lane 1[d]	8	0.0	327	0.026	100	23.6	LOS C	0.2	1.3	Full	500	0.0	0.0
Approach	8	0.0		0.026		23.6	LOS C	0.2	1.3				
East: 17 Mile Rocks Rd (E)													
Lane 1[d]	1308	0.9	1595	0.820	100	5.1	LOS A	17.1	120.9	Full	500	0.0	0.0
Approach	1308	0.9		0.820		5.1	LOS A	17.1	120.9				
North: Service Rd (N)													
Lane 1[d]	59	0.0	749	0.079	100	8.6	LOS A	0.3	2.2	Full	500	0.0	0.0
Approach	59	0.0		0.079		8.6	LOS A	0.3	2.2				
West: 17 Mile Rocks Rd (W)													
Lane 1	159	0.8	1048	0.152	42[6]	5.2	LOS A	0.8	5.9	Short (P)	60	0.0	NA
Lane 2[d]	562	1.0	1549	0.363	100	5.1	LOS A	2.6	18.3	Full	500	0.0	0.0
Approach	721	1.0		0.363		5.1	LOS A	2.6	18.3				
Intersection	2097	0.9		0.820		5.3	LOS A	17.1	120.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

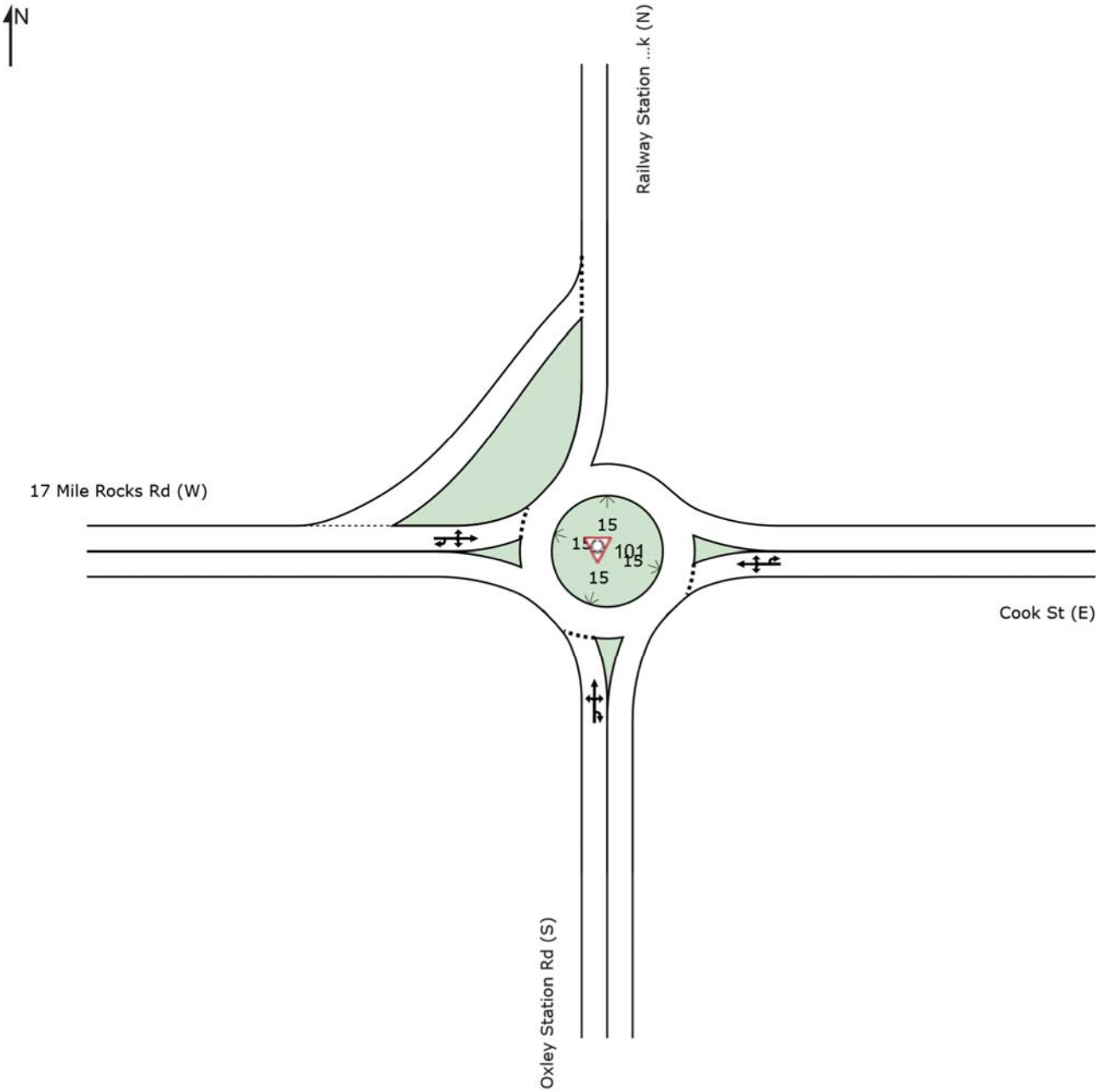
6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Appendix F SIDRA Analysis Outputs – Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St

SITE LAYOUT

Site: 101 [2018 AM BASE]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2018 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout



LANE SUMMARY

Site: 101 [2018 AM BASE]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2018 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	719	1.8	1007	0.714	100	10.8	LOS B	9.0	63.6	Full	500	0.0	0.0
Approach	719	1.8		0.714		10.8	LOS B	9.0	63.6				
East: Cook St (E)													
Lane 1[d]	414	3.5	900	0.459	100	7.6	LOS A	3.6	25.7	Full	500	0.0	0.0
Approach	414	3.5		0.459		7.6	LOS A	3.6	25.7				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	748	3.2	1030	0.727	100	11.1	LOS B	8.5	61.3	Full	500	0.0	0.0
Approach	748	3.2		0.727		11.1	LOS B	8.5	61.3				
Intersection	1881	2.7		0.727		10.2	LOS B	9.0	63.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2018 PM BASE]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2018 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	583	0.2	840	0.694	100	12.5	LOS B	8.3	58.1	Full	500	0.0	0.0
Approach	583	0.2		0.694		12.5	LOS B	8.3	58.1				
East: Cook St (E)													
Lane 1[d]	643	1.2	1011	0.636	100	8.8	LOS A	6.9	48.6	Full	500	0.0	0.0
Approach	643	1.2		0.636		8.8	LOS A	6.9	48.6				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	589	0.7	1232	0.478	100	7.7	LOS A	3.7	26.1	Full	500	0.0	0.0
Approach	589	0.7		0.478		7.7	LOS A	3.7	26.1				
Intersection	1816	0.7		0.694		9.6	LOS A	8.3	58.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 AM BASE]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2021 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	748	1.8	992	0.755	100	12.0	LOS B	10.6	75.1	Full	500	0.0	0.0
Approach	748	1.8		0.755		12.0	LOS B	10.6	75.1				
East: Cook St (E)													
Lane 1[d]	433	3.5	881	0.491	100	8.0	LOS A	4.0	28.7	Full	500	0.0	0.0
Approach	433	3.5		0.491		8.0	LOS A	4.0	28.7				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	779	3.2	1016	0.767	100	12.1	LOS B	10.1	72.6	Full	500	0.0	0.0
Approach	779	3.2		0.767		12.1	LOS B	10.1	72.6				
Intersection	1960	2.7		0.767		11.2	LOS B	10.6	75.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 AM PROJECT]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2021 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	757	1.8	981	0.772	100	12.7	LOS B	11.3	80.6	Full	500	0.0	0.0
Approach	757	1.8		0.772		12.7	LOS B	11.3	80.6				
East: Cook St (E)													
Lane 1[d]	441	3.5	860	0.513	100	8.5	LOS A	4.4	31.7	Full	500	0.0	0.0
Approach	441	3.5		0.513		8.5	LOS A	4.4	31.7				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	816	3.2	1016	0.803	100	13.0	LOS B	11.8	85.0	Full	500	0.0	0.0
Approach	816	3.2		0.803		13.0	LOS B	11.8	85.0				
Intersection	2014	2.7		0.803		11.9	LOS B	11.8	85.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 PM BASE]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2021 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	606	0.2	817	0.742	100	14.3	LOS B	9.9	69.1	Full	500	0.0	0.0
Approach	606	0.2		0.742		14.3	LOS B	9.9	69.1				
East: Cook St (E)													
Lane 1[d]	673	1.1	998	0.674	100	9.8	LOS A	8.1	57.2	Full	500	0.0	0.0
Approach	673	1.1		0.674		9.8	LOS A	8.1	57.2				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	615	0.7	1227	0.501	100	7.8	LOS A	4.0	28.4	Full	500	0.0	0.0
Approach	615	0.7		0.501		7.8	LOS A	4.0	28.4				
Intersection	1894	0.7		0.742		10.6	LOS B	9.9	69.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2021 PM PROJECT]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2021 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	626	0.2	795	0.788	100	16.5	LOS B	11.7	81.9	Full	500	0.0	0.0
Approach	626	0.2		0.788		16.5	LOS B	11.7	81.9				
East: Cook St (E)													
Lane 1[d]	694	1.1	993	0.699	100	10.4	LOS B	9.0	63.4	Full	500	0.0	0.0
Approach	694	1.1		0.699		10.4	LOS B	9.0	63.4				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	626	0.7	1227	0.510	100	7.8	LOS A	4.2	29.4	Full	500	0.0	0.0
Approach	626	0.7		0.510		7.8	LOS A	4.2	29.4				
Intersection	1946	0.7		0.788		11.5	LOS B	11.7	81.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 AM BASE]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2031 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	859	1.7	932	0.921	100	23.8	LOS C	23.7	168.2	Full	500	0.0	0.0
Approach	859	1.7		0.921		23.8	LOS C	23.7	168.2				
East: Cook St (E)													
Lane 1[d]	500	3.4	800	0.625	100	10.8	LOS B	6.6	47.4	Full	500	0.0	0.0
Approach	500	3.4		0.625		10.8	LOS B	6.6	47.4				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	895	3.1	968	0.924	100	21.5	LOS C	22.1	158.7	Full	500	0.0	0.0
Approach	895	3.1		0.924		21.5	LOS C	22.1	158.7				
Intersection	2254	2.7		0.924		20.0	LOS C	23.7	168.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 AM PROJECT]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2031 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	836	1.7	919	0.910	100	22.6	LOS C	21.9	155.5	Full	500	0.0	0.0
Approach	836	1.7		0.910		22.6	LOS C	21.9	155.5				
East: Cook St (E)													
Lane 1[d]	508	3.4	774	0.657	100	11.8	LOS B	7.3	52.5	Full	500	0.0	0.0
Approach	508	3.4		0.657		11.8	LOS B	7.3	52.5				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	932	3.1	970	0.961	100	28.0	LOS C	29.0	208.6	Full	500	0.0	0.0
Approach	932	3.1		0.961		28.0	LOS C	29.0	208.6				
Intersection	2276	2.7		0.961		22.4	LOS C	29.0	208.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 PM BASE]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2031 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	693	0.2	725	0.955	100	39.3	LOS D	26.7	187.2	Full	500	0.0	0.0
Approach	693	0.2		0.955		39.3	LOS D	26.7	187.2				
East: Cook St (E)													
Lane 1[d]	779	1.1	947	0.822	100	15.9	LOS B	15.3	107.9	Full	500	0.0	0.0
Approach	779	1.1		0.822		15.9	LOS B	15.3	107.9				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	705	0.7	1212	0.582	100	8.0	LOS A	5.2	36.8	Full	500	0.0	0.0
Approach	705	0.7		0.582		8.0	LOS A	5.2	36.8				
Intersection	2177	0.7		0.955		20.8	LOS C	26.7	187.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: 101 [2031 PM PROJECT]

Seventeen Mile Rocks Rd / Oxley Station Rd / Cook St
Existing Roundabout Intersection
2031 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Roundabout

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Oxley Station Rd (S)													
Lane 1[d]	713	0.2	706	1.009	100	62.1	LOS E	38.6	270.7	Full	500	0.0	0.0
Approach	713	0.2		1.009		62.1	LOS E	38.6	270.7				
East: Cook St (E)													
Lane 1[d]	800	1.1	942	0.849	100	17.7	LOS B	17.4	123.1	Full	500	0.0	0.0
Approach	800	1.1		0.849		17.7	LOS B	17.4	123.1				
West: 17 Mile Rocks Rd (W)													
Lane 1[d]	718	0.7	1213	0.592	100	8.0	LOS A	5.4	38.1	Full	500	0.0	0.0
Approach	718	0.7		0.592		8.0	LOS A	5.4	38.1				
Intersection	2231	0.7		1.009		28.8	LOS C	38.6	270.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

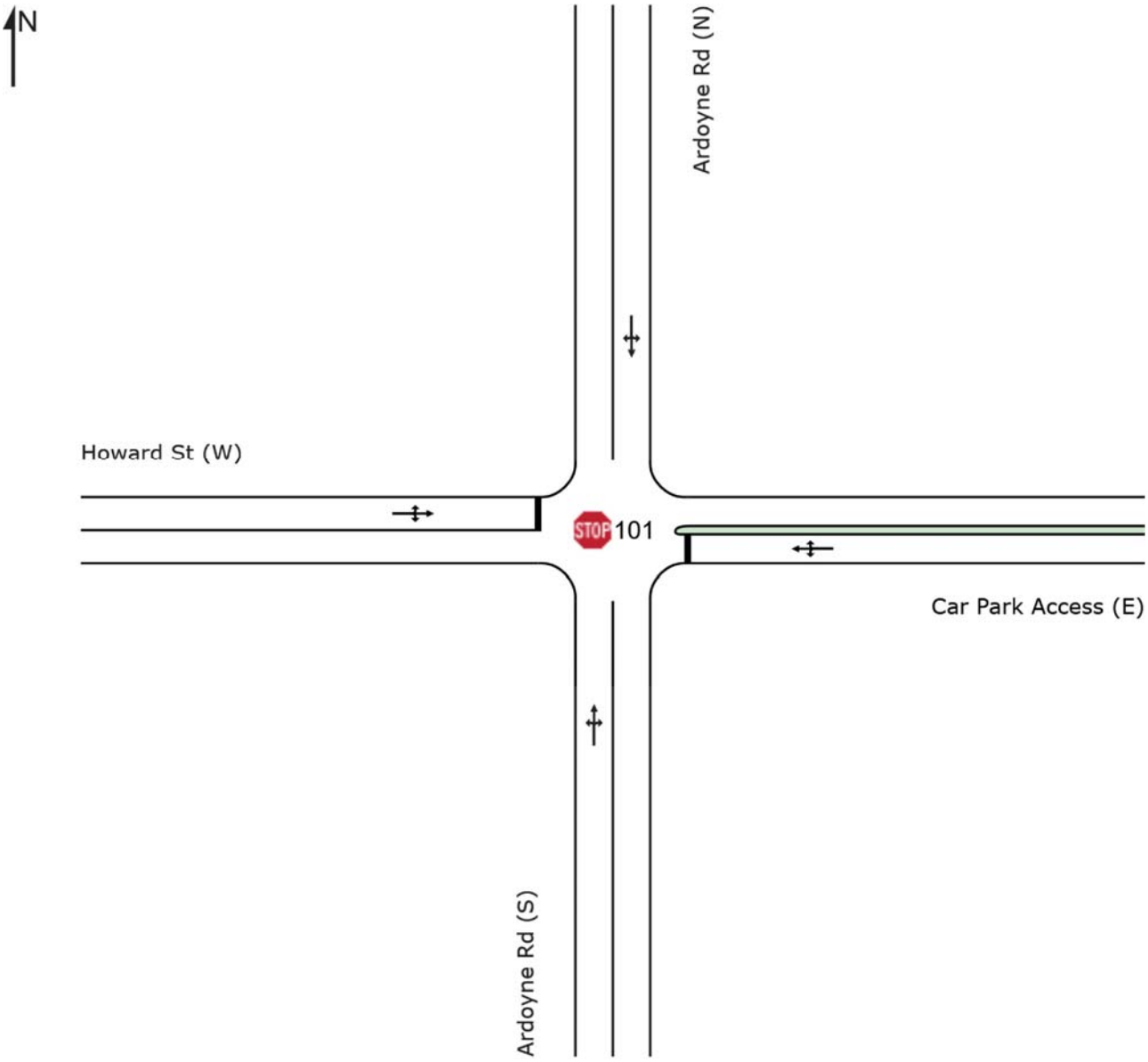
d Dominant lane on roundabout approach

Appendix G SIDRA Analysis Outputs – Ardoyne Rd / Howard St

SITE LAYOUT

Site: 101 [2018 AM Base]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2018 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Stop (Two-Way)



LANE SUMMARY

Site: 101 [2018 AM Base]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2018 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	638	0.9	2033	0.314	100	0.4	LOS A	0.2	1.7	Full	500	0.0	0.0
Approach	638	0.9		0.314		0.4	NA	0.2	1.7				
East: Car Park Access (E)													
Lane 1	6	0.0	464	0.014	100	9.5	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	6	0.0		0.014		9.5	LOS A	0.0	0.3				
North: Ardoyne Rd (N)													
Lane 1	209	1.2	1402	0.149	100	4.5	LOS A	0.8	5.5	Full	500	0.0	0.0
Approach	209	1.2		0.149		4.5	NA	0.8	5.5				
West: Howard St (W)													
Lane 1	176	0.0	679	0.259	100	11.8	LOS B	1.1	7.5	Full	500	0.0	0.0
Approach	176	0.0		0.259		11.8	LOS B	1.1	7.5				
Intersection	1029	0.8		0.314		3.2	NA	1.1	7.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2018 PM Base]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2018 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	119	0.9	2017	0.059	100	0.5	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	119	0.9		0.059		0.5	NA	0.0	0.3				
East: Car Park Access (E)													
Lane 1	66	0.0	842	0.079	100	6.1	LOS A	0.3	2.0	Full	500	0.0	0.0
Approach	66	0.0		0.079		6.1	LOS A	0.3	2.0				
North: Ardoyne Rd (N)													
Lane 1	360	1.8	1835	0.196	100	2.6	LOS A	0.9	6.4	Full	500	0.0	0.0
Approach	360	1.8		0.196		2.6	NA	0.9	6.4				
West: Howard St (W)													
Lane 1	54	0.0	1097	0.049	100	8.3	LOS A	0.2	1.3	Full	500	0.0	0.0
Approach	54	0.0		0.049		8.3	LOS A	0.2	1.3				
Intersection	599	1.2		0.196		3.1	NA	0.9	6.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2021 AM Base]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2021 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	665	0.9	2033	0.327	100	0.3	LOS A	0.2	1.7	Full	500	0.0	0.0
Approach	665	0.9		0.327		0.3	NA	0.2	1.7				
East: Car Park Access (E)													
Lane 1	6	0.0	439	0.014	100	9.9	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	6	0.0		0.014		9.9	LOS A	0.0	0.3				
North: Ardoyne Rd (N)													
Lane 1	216	1.3	1384	0.156	100	4.6	LOS A	0.8	5.8	Full	500	0.0	0.0
Approach	216	1.3		0.156		4.6	NA	0.8	5.8				
West: Howard St (W)													
Lane 1	176	0.0	649	0.271	100	12.3	LOS B	1.1	7.9	Full	500	0.0	0.0
Approach	176	0.0		0.271		12.3	LOS B	1.1	7.9				
Intersection	1063	0.8		0.327		3.2	NA	1.1	7.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2031 AM Base]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2031 AM Peak Hour (0730-0830) - Without Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	766	1.0	2035	0.377	100	0.3	LOS A	0.3	1.8	Full	500	0.0	0.0
Approach	766	1.0		0.377		0.3	NA	0.3	1.8				
East: Car Park Access (E)													
Lane 1	6	0.0	355	0.018	100	11.9	LOS B	0.1	0.4	Full	500	0.0	0.0
Approach	6	0.0		0.018		11.9	LOS B	0.1	0.4				
North: Ardoyne Rd (N)													
Lane 1	237	1.3	1310	0.181	100	5.2	LOS A	1.0	7.1	Full	500	0.0	0.0
Approach	237	1.3		0.181		5.2	NA	1.0	7.1				
West: Howard St (W)													
Lane 1	176	0.0	544	0.323	100	14.2	LOS B	1.4	9.7	Full	500	0.0	0.0
Approach	176	0.0		0.323		14.2	LOS B	1.4	9.7				
Intersection	1185	0.9		0.377		3.4	NA	1.4	9.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2021 AM Project]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2021 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	704	1.0	2035	0.346	100	0.3	LOS A	0.2	1.7	Full	500	0.0	0.0
Approach	704	1.0		0.346		0.3	NA	0.2	1.7				
East: Car Park Access (E)													
Lane 1	6	0.0	411	0.015	100	10.5	LOS B	0.0	0.3	Full	500	0.0	0.0
Approach	6	0.0		0.015		10.5	LOS B	0.0	0.3				
North: Ardoyne Rd (N)													
Lane 1	221	1.2	1321	0.167	100	5.1	LOS A	0.9	6.5	Full	500	0.0	0.0
Approach	221	1.2		0.167		5.1	NA	0.9	6.5				
West: Howard St (W)													
Lane 1	168	0.0	607	0.277	100	12.9	LOS B	1.2	8.1	Full	500	0.0	0.0
Approach	168	0.0		0.277		12.9	LOS B	1.2	8.1				
Intersection	1100	0.9		0.346		3.3	NA	1.2	8.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2021 PM Base]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2021 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	124	0.9	2018	0.062	100	0.5	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	124	0.9		0.062		0.5	NA	0.0	0.3				
East: Car Park Access (E)													
Lane 1	66	0.0	828	0.080	100	6.2	LOS A	0.3	2.0	Full	500	0.0	0.0
Approach	66	0.0		0.080		6.2	LOS A	0.3	2.0				
North: Ardoyne Rd (N)													
Lane 1	369	1.8	1835	0.201	100	2.5	LOS A	0.9	6.5	Full	500	0.0	0.0
Approach	369	1.8		0.201		2.5	NA	0.9	6.5				
West: Howard St (W)													
Lane 1	54	0.0	1086	0.049	100	8.3	LOS A	0.2	1.3	Full	500	0.0	0.0
Approach	54	0.0		0.049		8.3	LOS A	0.2	1.3				
Intersection	614	1.3		0.201		3.0	NA	0.9	6.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2031 PM Base]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2031 PM Peak Hour (1645-1745) - Without Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	142	0.9	2019	0.070	100	0.4	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	142	0.9		0.070		0.4	NA	0.0	0.3				
East: Car Park Access (E)													
Lane 1	66	0.0	777	0.085	100	6.6	LOS A	0.3	2.2	Full	500	0.0	0.0
Approach	66	0.0		0.085		6.6	LOS A	0.3	2.2				
North: Ardoyne Rd (N)													
Lane 1	405	1.9	1838	0.221	100	2.4	LOS A	1.0	6.9	Full	500	0.0	0.0
Approach	405	1.9		0.221		2.4	NA	1.0	6.9				
West: Howard St (W)													
Lane 1	54	0.0	1048	0.051	100	8.5	LOS A	0.2	1.4	Full	500	0.0	0.0
Approach	54	0.0		0.051		8.5	LOS A	0.2	1.4				
Intersection	667	1.4		0.221		2.9	NA	1.0	6.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2021 PM Project]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2021 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	142	0.9	2023	0.070	100	0.4	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	142	0.9		0.070		0.4	NA	0.0	0.3				
East: Car Park Access (E)													
Lane 1	66	0.0	807	0.082	100	6.3	LOS A	0.3	2.1	Full	500	0.0	0.0
Approach	66	0.0		0.082		6.3	LOS A	0.3	2.1				
North: Ardoyne Rd (N)													
Lane 1	382	1.7	1813	0.211	100	2.7	LOS A	1.0	7.1	Full	500	0.0	0.0
Approach	382	1.7		0.211		2.7	NA	1.0	7.1				
West: Howard St (W)													
Lane 1	46	0.0	1033	0.045	100	8.5	LOS A	0.2	1.2	Full	500	0.0	0.0
Approach	46	0.0		0.045		8.5	LOS A	0.2	1.2				
Intersection	637	1.3		0.211		3.0	NA	1.0	7.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2031 AM Project]

Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2031 AM Peak Hour (0730-0830) - With Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	805	1.0	2036	0.396	100	0.3	LOS A	0.3	1.9	Full	500	0.0	0.0
Approach	805	1.0		0.396		0.3	NA	0.3	1.9				
East: Car Park Access (E)													
Lane 1	6	0.0	329	0.019	100	12.7	LOS B	0.1	0.4	Full	500	0.0	0.0
Approach	6	0.0		0.019		12.7	LOS B	0.1	0.4				
North: Ardoyne Rd (N)													
Lane 1	242	1.3	1241	0.195	100	5.8	LOS A	1.1	8.0	Full	500	0.0	0.0
Approach	242	1.3		0.195		5.8	NA	1.1	8.0				
West: Howard St (W)													
Lane 1	168	0.0	505	0.334	100	15.0	LOS B	1.4	10.0	Full	500	0.0	0.0
Approach	168	0.0		0.334		15.0	LOS B	1.4	10.0				
Intersection	1222	0.9		0.396		3.5	NA	1.4	10.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 101 [2031 PM Project]

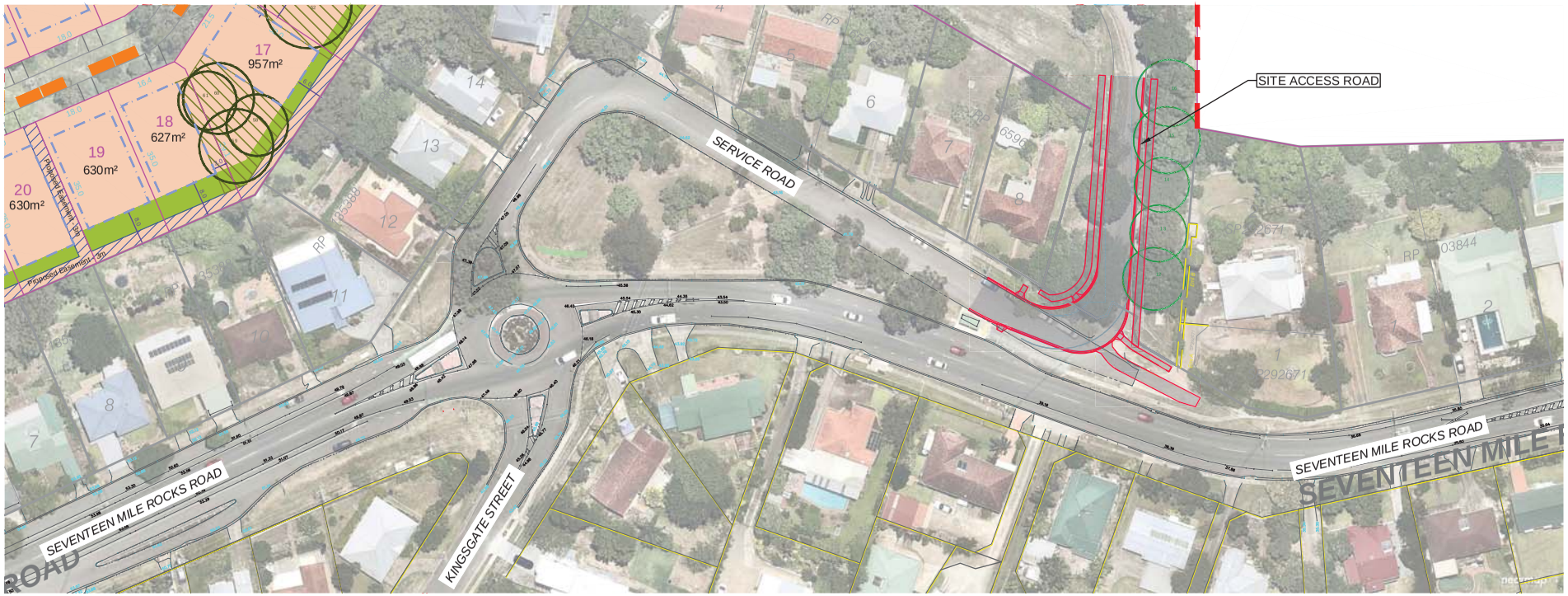
Ardoyne Rd / Howard St / Rail Station Access
Existing Intersection
2031 PM Peak Hour (1645-1745) - With Development
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Ardoyne Rd (S)													
Lane 1	161	0.9	2024	0.080	100	0.4	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	161	0.9		0.080		0.4	NA	0.0	0.3				
East: Car Park Access (E)													
Lane 1	66	0.0	757	0.088	100	6.7	LOS A	0.3	2.2	Full	500	0.0	0.0
Approach	66	0.0		0.088		6.7	LOS A	0.3	2.2				
North: Ardoyne Rd (N)													
Lane 1	418	1.9	1815	0.230	100	2.6	LOS A	1.1	7.5	Full	500	0.0	0.0
Approach	418	1.9		0.230		2.6	NA	1.1	7.5				
West: Howard St (W)													
Lane 1	46	0.0	992	0.047	100	8.7	LOS A	0.2	1.2	Full	500	0.0	0.0
Approach	46	0.0		0.047		8.7	LOS A	0.2	1.2				
Intersection	692	1.3		0.230		2.9	NA	1.1	7.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix H Seventeen Mile Rocks Rd / Kingsgate St / Service Rd Intersection Upgrade Concept Plan



REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	20-08-20	FURTHER ISSUES (BASE PLAN UPDATE)	DG	DG	DG
C	06-06-20	RFI ISSUE (BASE PLAN UPDATE)	DG	DG	DG
B	03-06-20	RFI ISSUE	DG	DG	DG
A	31-05-18	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 10 20 30 40 50m
SCALE 1:1000 AT ORIGINAL SIZE

NORTH

CLIENT
ECONOMIC DEVELOPMENT QUEENSLAND

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ABN 65 010 868 621
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PROJECT
FORMER OXLEY SECONDARY COLLEGE REDEVELOPMENT

DRAWING TITLE
EXTERNAL ROAD WORKS - SEVENTEEN MILE ROCKS ROAD
WORKS PRIOR TO STAGE 1A RESIDENTIAL DWELLINGS (39 LOTS)
PRELIMINARY CONCEPT DESIGN - SITE PLAN

PROJECT NUMBER	ORIGINAL SIZE
18BRT00087	A3
DRAWING NUMBER	REVISION
18BRT0087-01	D
DATE	SHEET
20 Aug 2020	1 OF 2

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REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	20-08-20	FURTHER ISSUES (BASE PLAN UPDATE)	DG	DG	DG
C	06-06-20	RFI ISSUE (BASE PLAN UPDATE)	DG	DG	DG
B	03-06-20	RFI ISSUE	DG	DG	DG
A	31-05-18	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

NORTH

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PROJECT
FORMER OXLEY SECONDARY COLLEGE REDEVELOPMENT

DRAWING TITLE
EXTERNAL ROAD WORKS - SEVENTEEN MILE ROCKS ROAD
WORKS FOR STAGE 1A RESIDENTIAL DWELLINGS (39 LOTS)
PRELIMINARY CONCEPT DESIGN - DETAIL PLAN

PROJECT NUMBER	ORIGINAL SIZE
18BRT00087	A3
DRAWING NUMBER	REVISION
18BRT0087-01	D
DATE	SHEET
20 Aug 2020	2 OF 2

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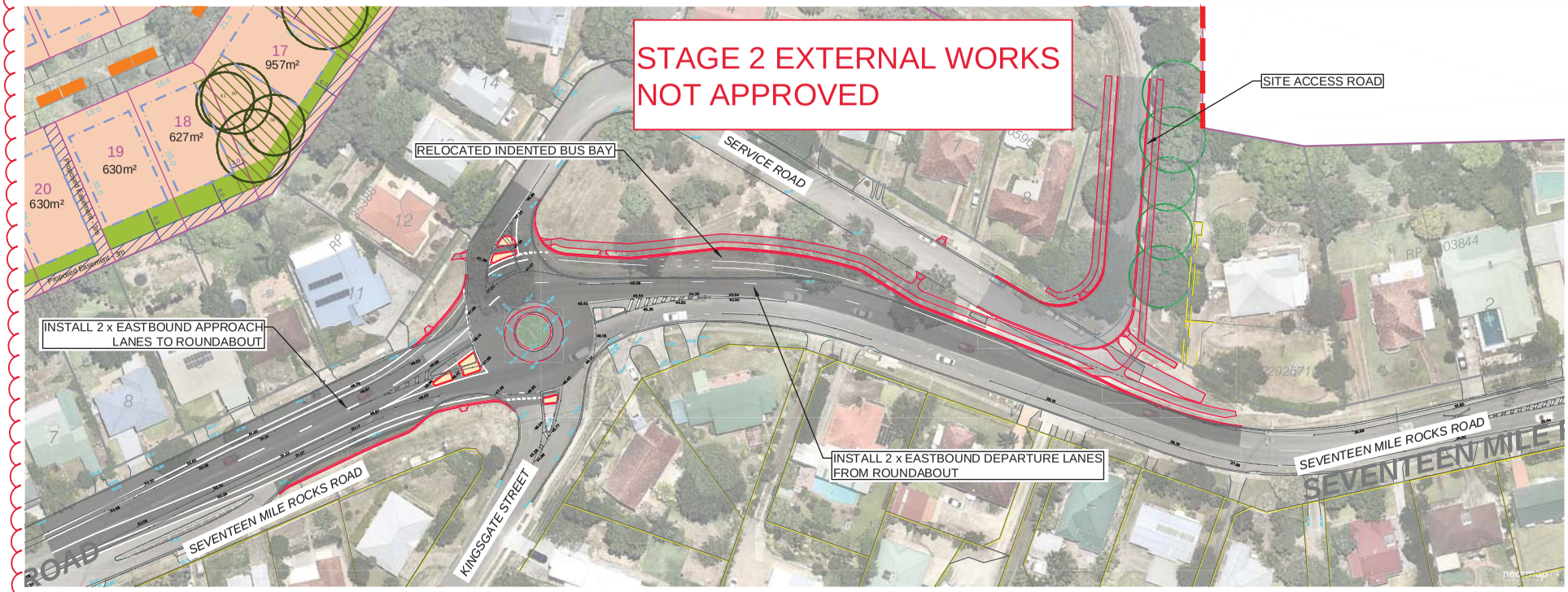

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
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B	06-06-20	RFI ISSUE	DG	DG	DG
A	03-06-20	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 10 20 30 40 50m
SCALE 1:1000 AT ORIGINAL SIZE

NORTH

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PROJECT
FORMER OXLEY SECONDARY COLLEGE REDEVELOPMENT

DRAWING TITLE
EXTERNAL ROAD WORKS - SEVENTEEN MILE ROCKS ROAD
WORKS POST STAGE 1A RESIDENTIAL DWELLINGS (39 LOTS)
PRELIMINARY CONCEPT DESIGN - SITE PLAN

PROJECT NUMBER	ORIGINAL SIZE
18BRT00087	A3
DRAWING NUMBER	REVISION
18BRT0087-02	C
DATE	SHEET
20 Aug 2020	1 OF 4

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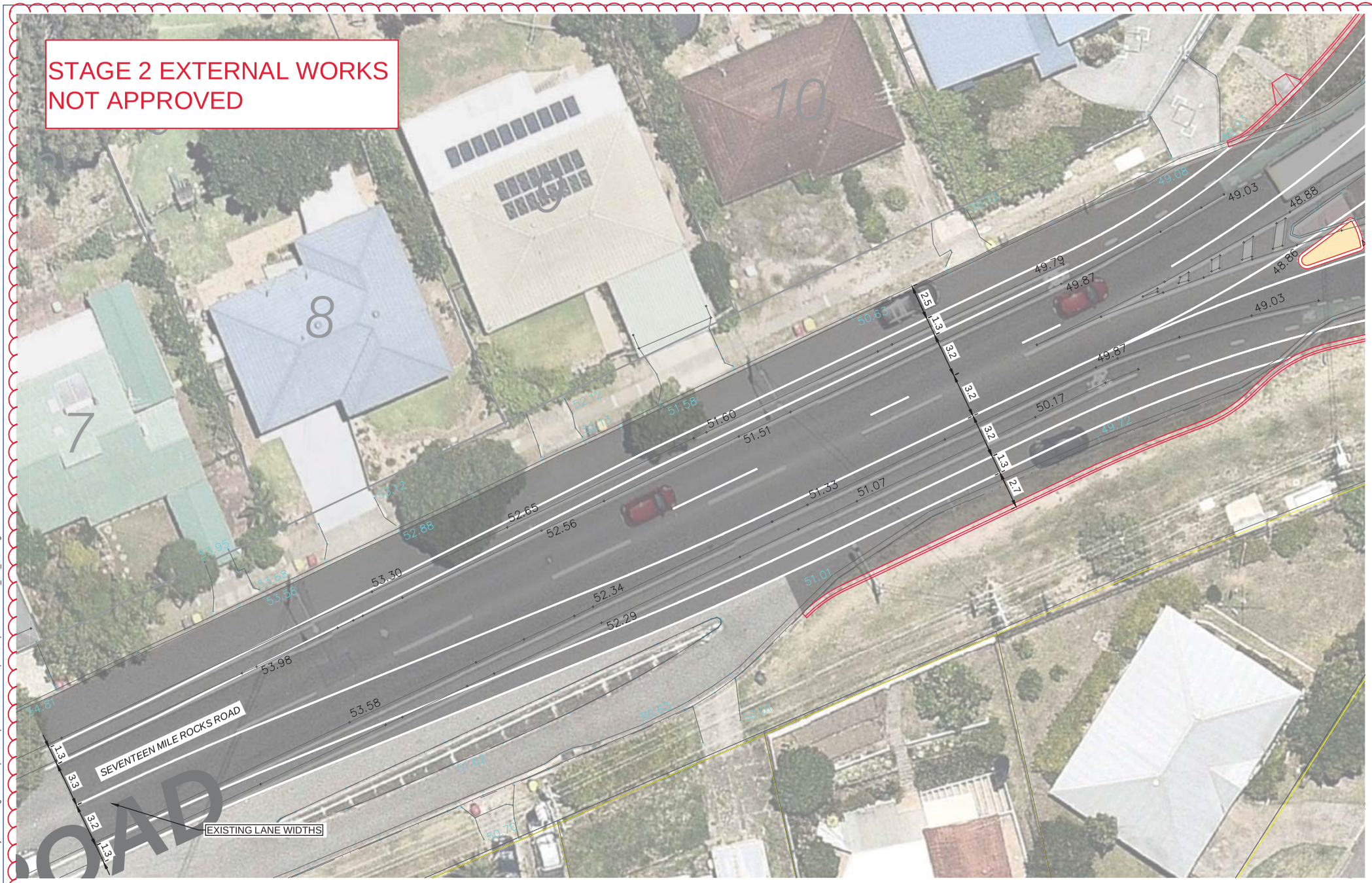
STAGE 2 EXTERNAL WORKS
NOT APPROVED



REFER SHEET 3 FOR CONTINUATION

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
C	20-08-20	FURTHER ISSUES (BASE PLAN UPDATE)	DG	DG	DG
B	06-06-20	RFI ISSUE	DG	DG	DG
A	03-06-20	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

NORTH

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PROJECT
FORMER OXLEY SECONDARY COLLEGE REDEVELOPMENT

DRAWING TITLE
EXTERNAL ROAD WORKS - SEVENTEEN MILE ROCKS ROAD
WORKS POST STAGE 1A RESIDENTIAL DWELLINGS (39 LOTS)
PRELIMINARY CONCEPT DESIGN - DETAIL PLAN

PROJECT NUMBER	ORIGINAL SIZE
18BRT00087	A3
DRAWING NUMBER	REVISION
18BRT0087-02	C
DATE	SHEET
20 Aug 2020	2 OF 4

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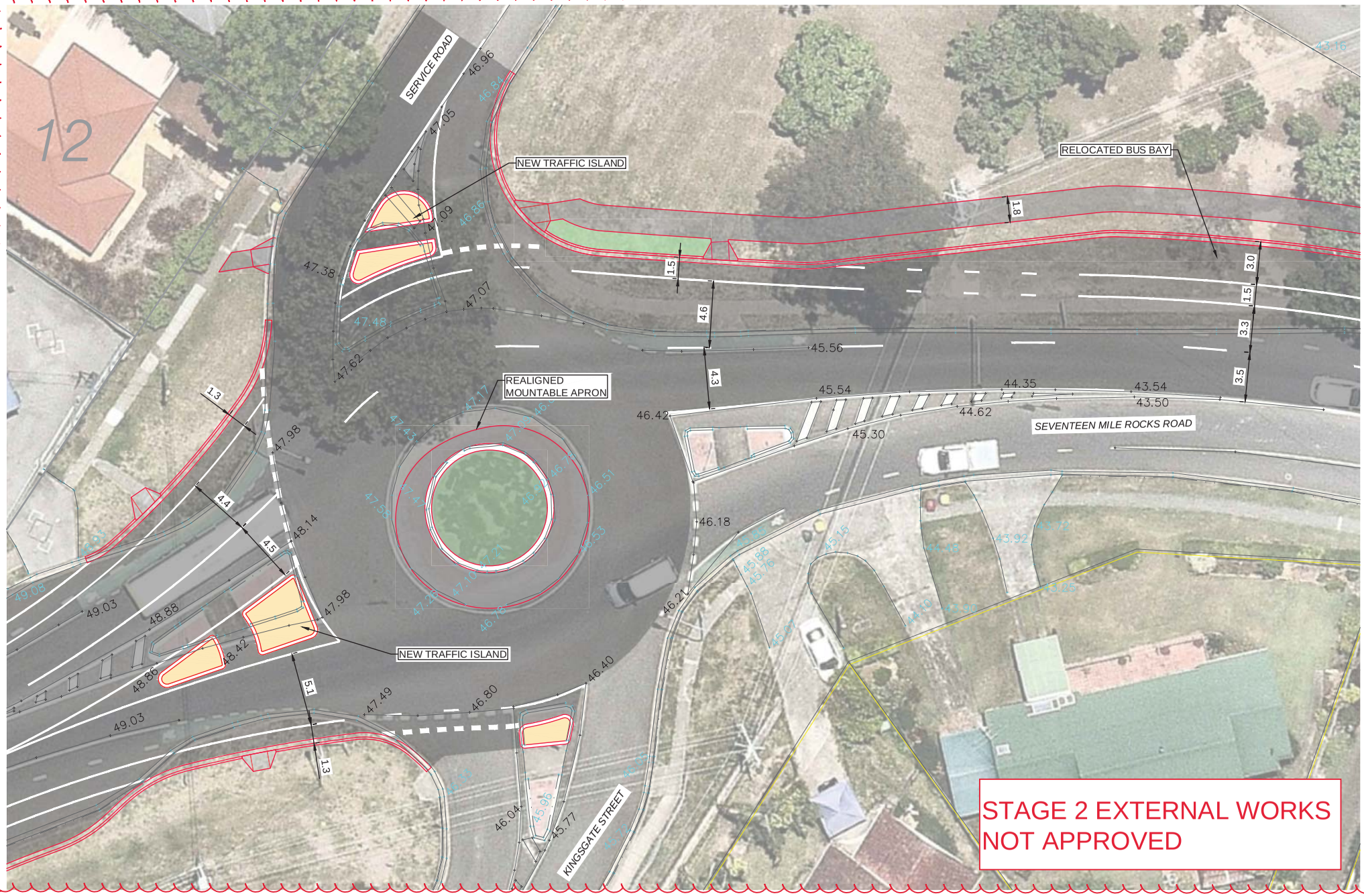

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
C	20-08-20	FURTHER ISSUES (BASE PLAN UPDATE)	DG	DG	DG
B	06-06-20	RFI ISSUE	DG	DG	DG
A	03-06-20	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

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PROJECT
FORMER OXLEY SECONDARY COLLEGE REDEVELOPMENT

DRAWING TITLE
EXTERNAL ROAD WORKS - SEVENTEEN MILE ROCKS ROAD
WORKS POST STAGE 1A RESIDENTIAL DWELLINGS (39 LOTS)
PRELIMINARY CONCEPT DESIGN - DETAIL PLAN

PROJECT NUMBER	ORIGINAL SIZE
18BRT00087	A3
DRAWING NUMBER	REVISION
18BRT0087-02	C
DATE	SHEET
20 Aug 2020	3 OF 4

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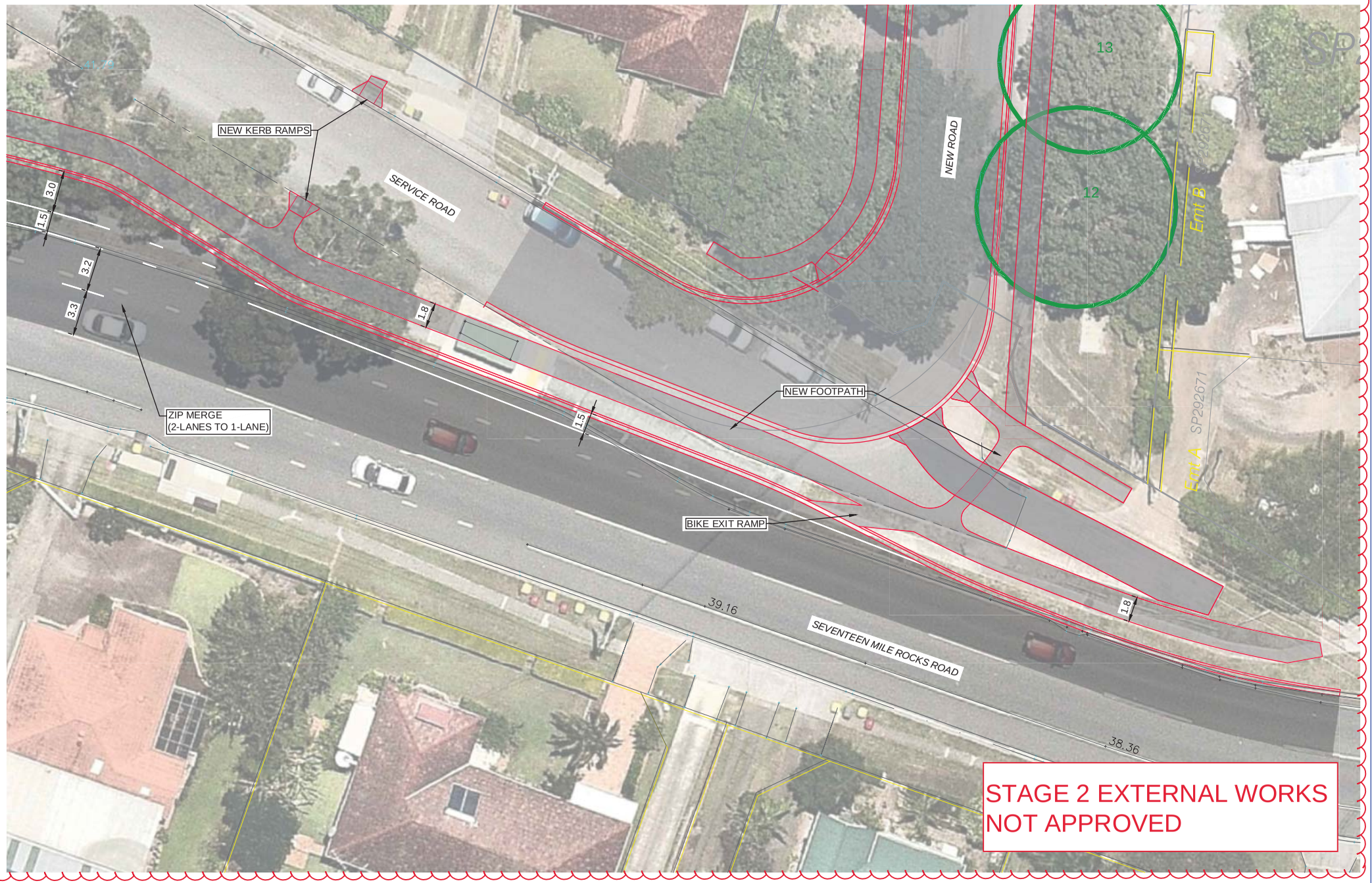

STAGE 2 EXTERNAL WORKS NOT APPROVED

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
C	20-08-20	FURTHER ISSUES (BASE PLAN UPDATE)	DG	DG	DG
B	06-06-20	RFI ISSUE	DG	DG	DG
A	03-06-20	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

NORTH

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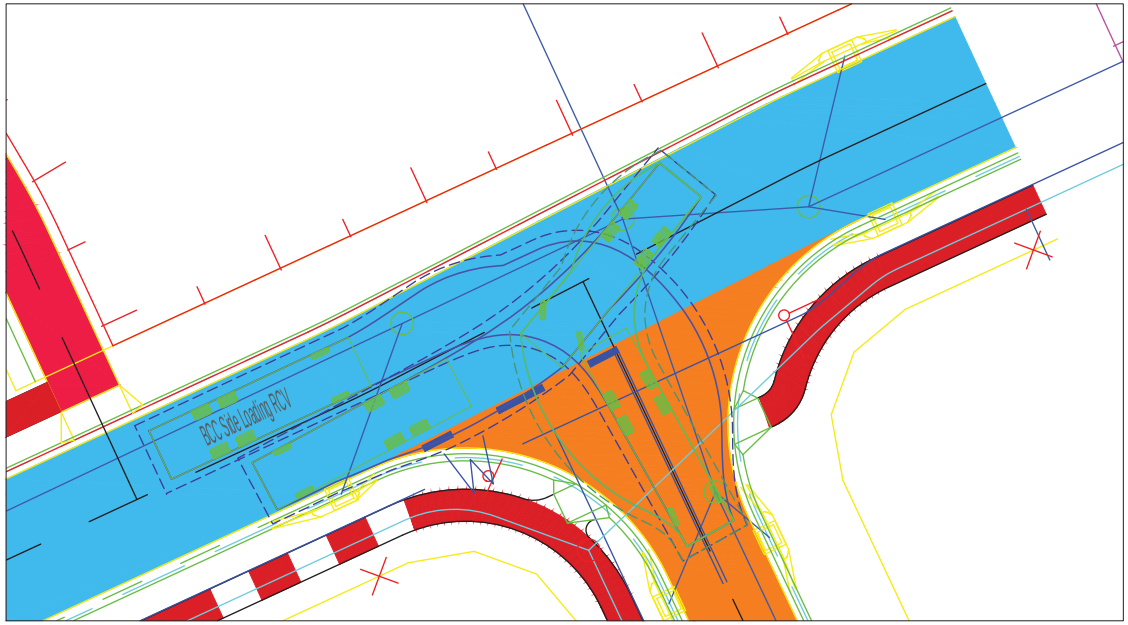
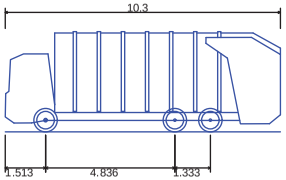
PROJECT
FORMER OXLEY SECONDARY COLLEGE REDEVELOPMENT

DRAWING TITLE
EXTERNAL ROAD WORKS - SEVENTEEN MILE ROCKS ROAD
WORKS POST STAGE 1A RESIDENTIAL DWELLINGS (39 LOTS)
PRELIMINARY CONCEPT DESIGN - DETAIL PLAN

PROJECT NUMBER	ORIGINAL SIZE
18BRT00087	A3
DRAWING NUMBER	REVISION
18BRT0087-02	C
DATE	SHEET
20 Aug 2020	4 OF 4





BCC Side Loading RCV

Overall Length	10.300m
Overall Width	2.500m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	9.000m

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	20-08-20	FURTHER ISSUES (BASE PLAN UPDATE)	DG	DG	DG
A	03-06-20	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

NORTH

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PROJECT
FORMER OXLEY SECONDARY COLLEGE REDEVELOPMENT

DRAWING TITLE
VEHICLE SWEPT PATH ANALYSIS
TEMPORARY TURNAROUND AREAS
BCC SIDE-LOADING REFUSE COLLECTION VEHICLE

PROJECT NUMBER	18BRT00087
ORIGINAL SIZE	A3
DRAWING NUMBER	18BRT0087-03
REVISION	B
DATE	20 Aug 2020
SHEET	1 OF 1