Transport Impact Assessment

Free Reformed School, Oakford TIA

CW1200712/300304677 Rev C

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Prepared for:

Free Reformed School Association

Prepared by:

Stantec Australia

TRANSPORT IMPACT ASSESSMENT – FREE REFORMED SCHOOL, OAKFORD

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TRANSPORT IMPACT ASSESSMENT – FREE REFORMED SCHOOL, OAKFORD

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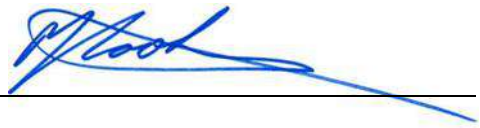

Approved by _____
Ray Cook

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1.0 INTRODUCTION

1.1 BACKGROUND

Stantec has been commissioned by Free Reformed School Association to prepare a Transport Impact Assessment (TIA) for the proposed primary/secondary private school campus (K-12) located in Oakford within the Shire of Serpentine Jarrahdale.

This report aims to focus on traffic access, circulation, and safety of the proposed school. Discussion regarding pedestrian, cycle and public transport considerations has also been included.

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016)* and the checklist is included in **Appendix A**.

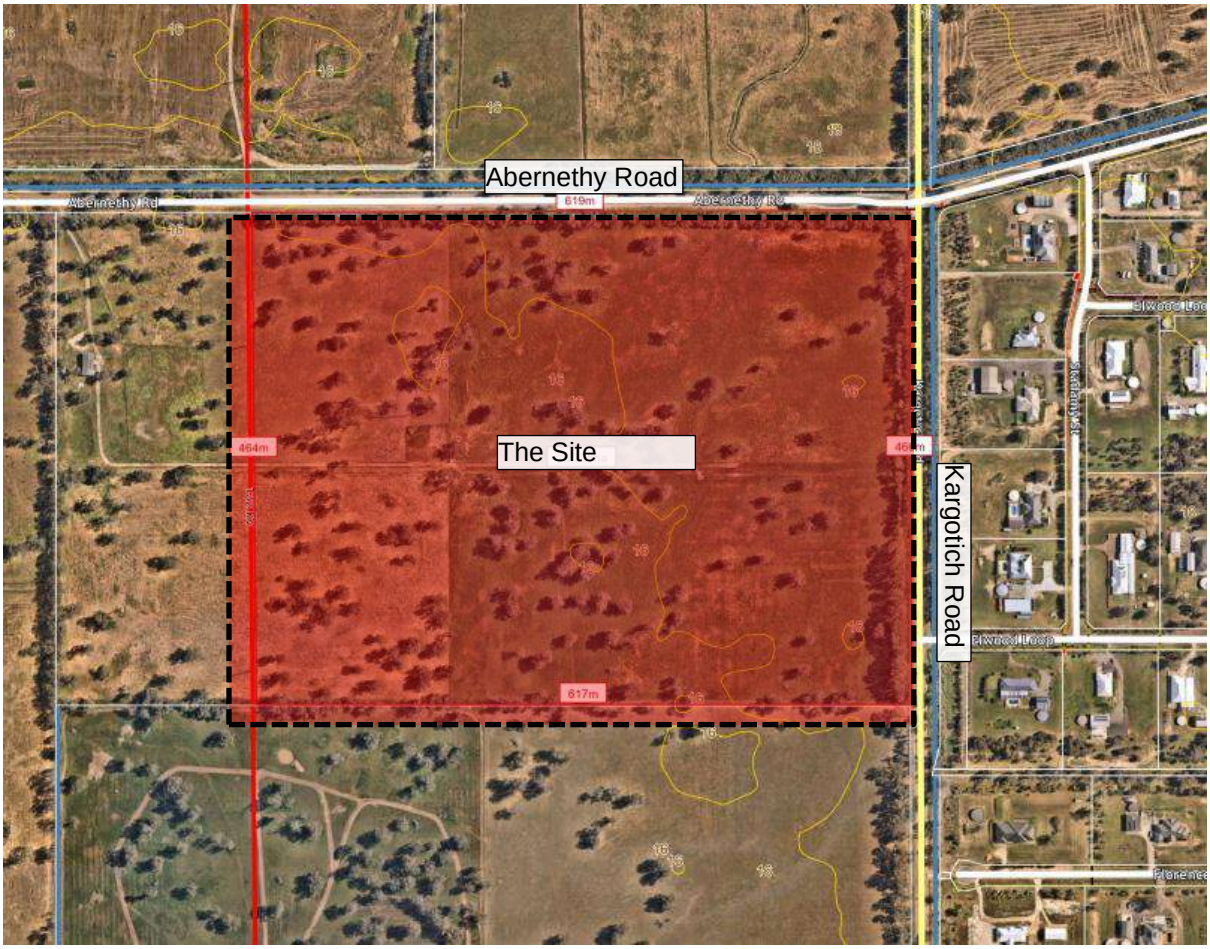
2.0 EXISTING SITUATION

2.1 SITE LOCATION AND CONTEXT

The site comprises a total area of approximately 28.73 hectares and is zoned as 'Rural' under the Shire of Serpentine-Jarrahdale TPS.No-2. The site is located approximately 30km south of the Perth Central Business District (CBD) and is within the jurisdiction of the Shire of Serpentine-Jarrahdale.

The subject site is located at 575 Abernethy Road, Oakford in the vicinity of the intersection of Abernethy Road and Kargotich Road. The site has a site frontage of 619m on Abernethy Road and 466m on Kargotich Road. **Figure 2-1** shows the site location.

Figure 2-1 Aerial Image of Site

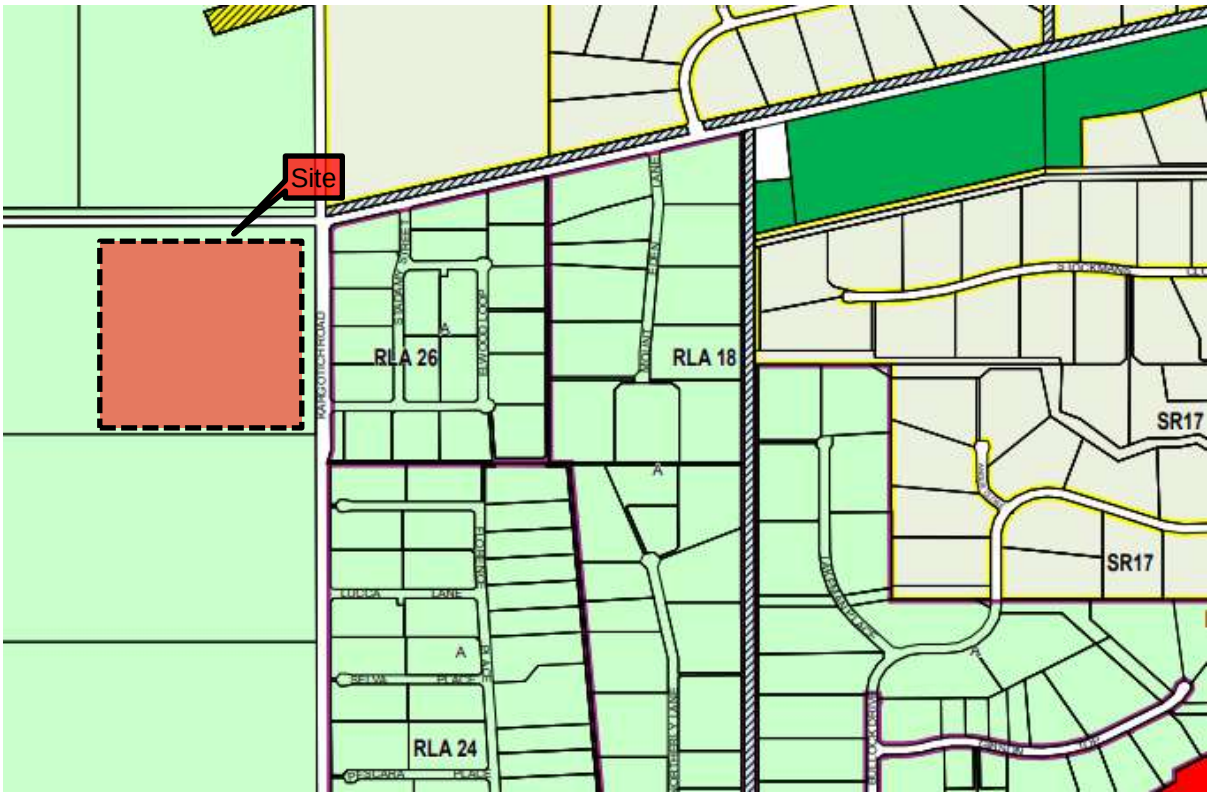


Source: MetroMap (2023)

2.2 SURROUNDING LAND USES

The subject site is zoned 'Rural' according to the Shire of Serpentine Jarrahdale TPS. No-2. Most of the surrounding sites to the east of Kargotich Road are zoned 'Rural' while to the west the lots are zoned Rural living. **Figure 2-2** shows the Zoning map.

Figure 2-2 Anketell South Structure Plan



LOCAL SCHEME ZONES

	Commercial		Special Use
	Conservation	SU	Special Use : Concrete Casting Operations
F	Farmlet	CL	Special Use : Conservation Living
	Residential	EHR/LF	Special Use : Extraction of Hard Rock/Landfill
	Rural	ESC	Special Use : Extraction/Storage Shale and Clay
	Rural Groundwater Protection	ESC/LF	Special Use : Extraction/Storage Shale and Clay/Landfill
A	Rural Living A	HP	Special Use : Historic Precinct
B	Rural Living B	LP	Special Use : Landscape Protection
	Showroom/Warehouse	TM	Special Use : Timber Mill
	Special Residential		Urban Development
	Special Rural		

Source: Shire of Serpentine Jarrahdale TPS No.2

2.3 EXISTING DEVELOPMENT

The subject site and adjacent lots are currently vacant land.

2.4 EXISTING ROAD NETWORK

Road Classifications are defined in the Main Roads Functional Hierarchy as follows:

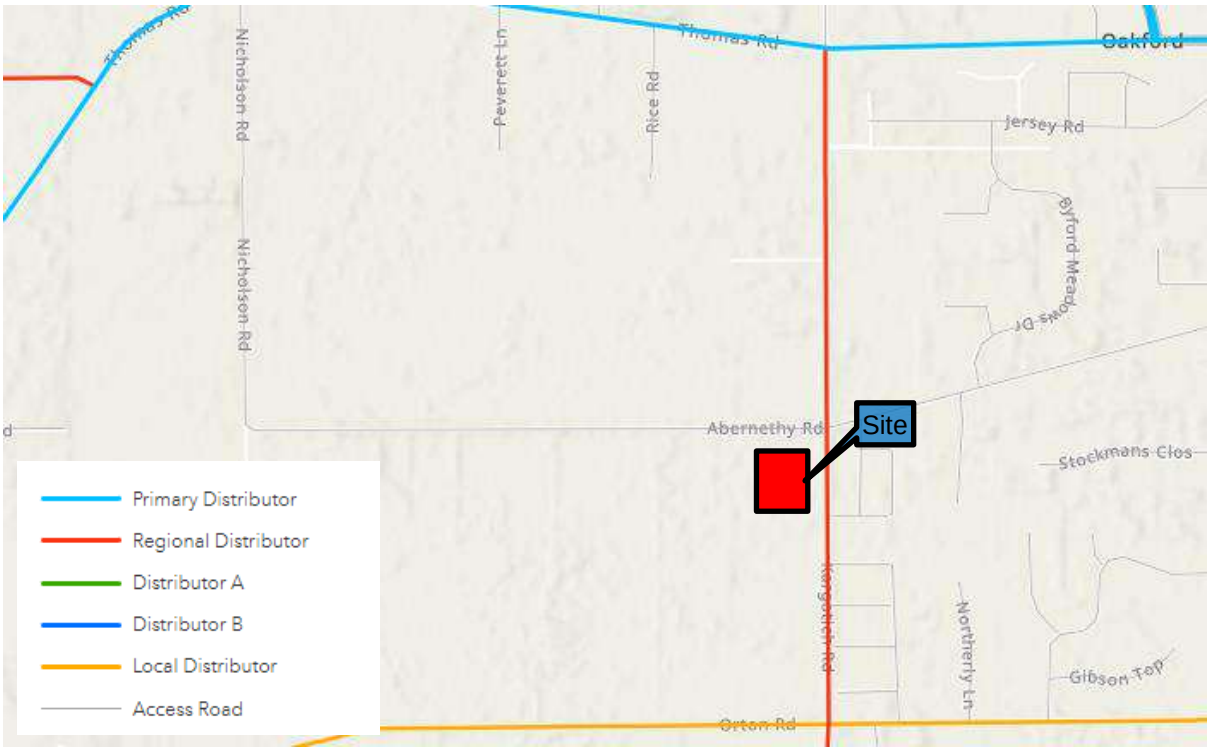
- **Primary Distributors (light blue):** Form the regional and inter-regional grid of Main Roads WA traffic routes and carry large volumes of fast-moving traffic. Some are strategic freight routes and all are National or State roads. They are managed by Main Roads.
- **Regional Distributors (red):** Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by Local Government.
- **District Distributor A (green):** These carry traffic between industrial, commercial and residential areas and connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by Local Government.
- **District Distributor B (dark blue):** Perform a similar function to District Distributor A but with reduced capacity due to flow restrictions from access to and roadside parking alongside the adjoining property. These are often older roads with traffic demand in excess of what was originally intended. District Distributor A and B roads run between land-use cells and not through them, forming a grid that would ideally be around 1.5 kilometres apart. They are managed by Local Government.
- **Local Distributors (orange):** Carry traffic within a cell and link District Distributors at the boundary to access roads. The route of the Local Distributor discourages through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. They are managed by Local government.
- **Access Roads (grey):** Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian-friendly. They are managed by Local government.

The surrounding road network characteristics is further described in **Table 2-1** and **Figure 2-3** shows the hierarchy as per the Main Roads WA Road Information Mapping System.

Table 2-1 Road Hierarchy and Characteristics

Road Name	Hierarchy	Jurisdiction	No. of Lanes	No. of Footpaths	Width (m)	Speed Limit (km/h)
Abernethy Road	Access Road	Local Government	2	0	6.7m	80 (east of Kargotich Road) 50 (in front of site)
Kargotich Road	Regional Distributor.	Regional Distributor.	2	0	7.2m	90

Figure 2-3 Road Hierarchy around the Site



Source: MRWA Information Mapping (2023)

2.5 EXISTING KEY INTERSECTIONS

2.5.1 Abernethy Road / Kargotich Road Intersection

Abernethy Road / Kargotich Road intersection is a four-legged priority-controlled intersection located north east of the Site as illustrated in **Figure 2-4.**

Figure 2-4 Abernethy Road / Kargotich Road Intersection

Source: Metromap

2.6 EXISTING TRAFFIC VOLUMES

Existing traffic volumes were sourced from Main Road WA Traffic Map which is summarised in **Table 2-2.**

Table 2-2 Traffic Volumes

Road Name	Date	Source	Average Daily Traffic Volume	AM Peak Hour	PM Peak Hour	HV %
Kargotich Road South of Orton Road	2022/23	Main Roads Traffic Map	4,833	461 (7:00AM)	521 (4:00PM)	11.8%
Kargotich Road South of Thomas Road	2020	Main Roads Traffic Map	4,248	376 (7:00AM)	476 (4:00PM)	6%

2.7 CRASH ASSESSMENT

A crash assessment for the surrounding road network of the Site has been completed using the Main Roads WA Reporting Centre. The assessment covers all the recorded accidents between 1 January 2018 and 31 December 2022 and the results are summarised in **Table 2-3** to **Table 2-5. Figure 2-5** illustrates the crash severity and locations along Thomas Road.

Table 2-3 Total Crashes

Type of Crash (RUM Code)	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Right Angle	-	3	-	-	-	**3**
Hit Animal	-	1	-	-	-	**1**
Hit Object	-	-	-	2	-	**2**
Non Collision	-	-	-	-	-	-
Total	**-**	**4**	**-**	**2**	**-**	**6**

Table 2-4 Abernethy Rd / Katgotich Rd Intersection

Type of Crash (RUM Code)	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Right Angle	-	3	-	-	-	**3**
Total	**-**	**3**	**-**	**-**	**-**	**3**

Table 2-5 Midblock Crashes

Type of Crash (RUM Code)	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Hit Animal	-	**1**	-	-	-	**1**
Right Angle	-	-	-	-	-	-
Non-Collision	-	-	-	-	-	-
Hit Object	-	-	-	2	-	**2**
Total	-	**1**	-	**2**	-	**3**

Figure 2-5 Crash Locations

Source: Maps.co

TRANSPORT IMPACT ASSESSMENT – FREE REFORMED SCHOOL, OAKFORD

The crashes recorded are summarised below:

- A total of 6 crashes were recorded in close proximity to the Site.
- 4 crashes recorded required hospitalisation and 2 crashes recorded involved Major Property Damage.
- No fatal crash was recorded near the Site.

It is very unlikely that this development would have any material impact on road safety in the area.

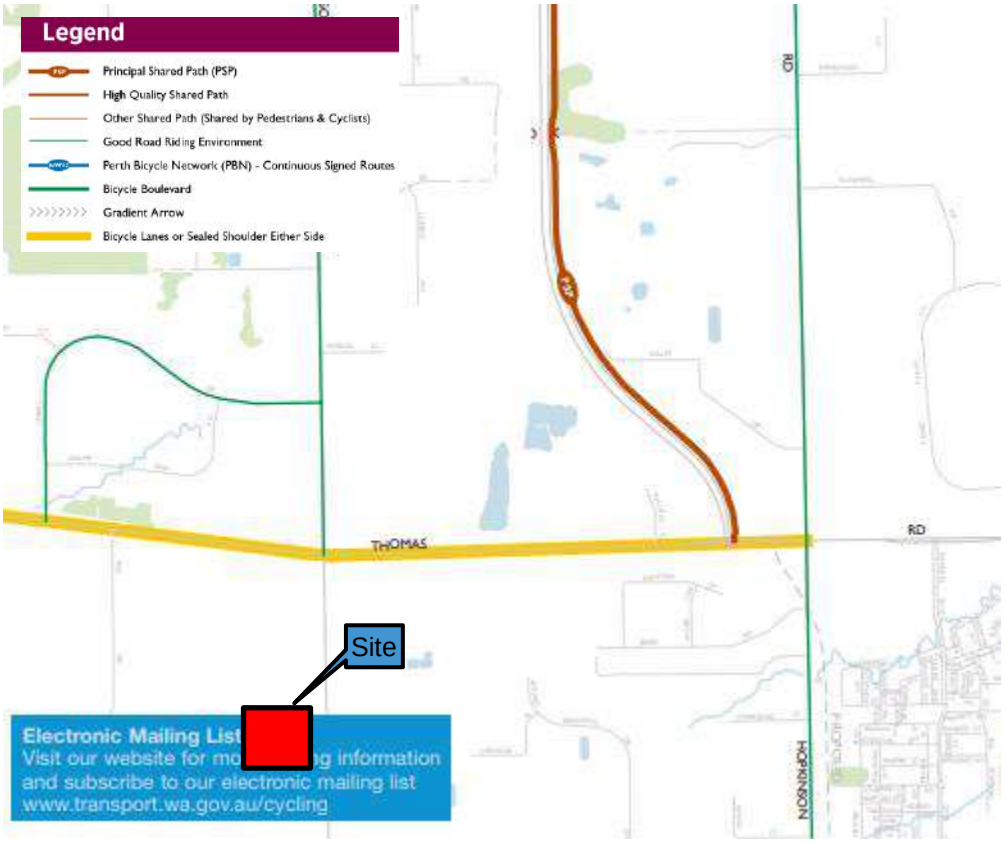
2.8 EXISTING PUBLIC TRANSPORT FACILITIES

There is currently no public transport servicing the Site. Residential and other land uses in the locality is too sparse to generate necessary demand for such services. Overall access to the site via public transport services is currently considered inadequate.

2.9 EXISTING PEDESTRIAN/CYCLE NETWORKS

There are no pedestrian facilities near the Site as shown in **Figure 2-6**. There are sealed shoulders on Thomas Road, however it is narrow and discontinuous and is not particularly suitable as a cycling facility. Overall, access to the site via pedestrian/cycle networks is currently considered inadequate.

Figure 2-6 Pedestrian & Cycling Network



Source: Department of Transport

3.0 PROPOSED DEVELOPMENT

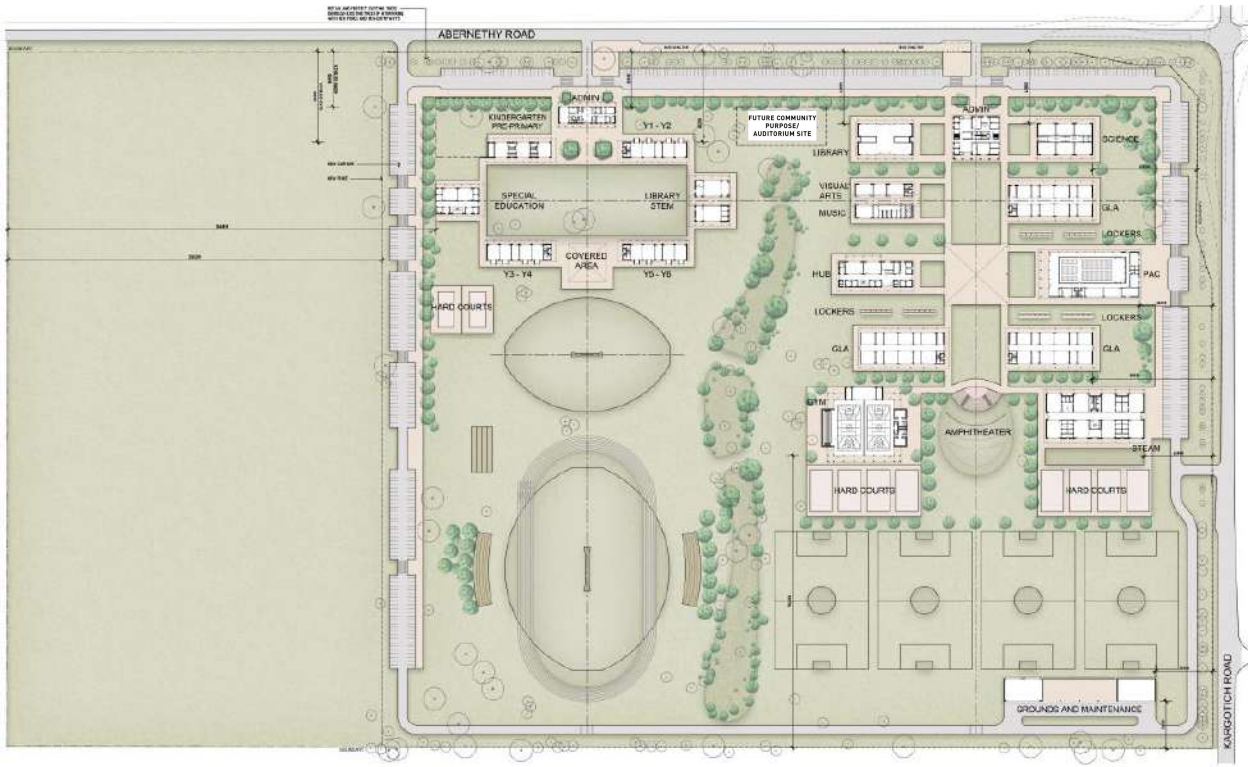
3.1 PROPOSED LAND USE

The proposed development consists of a private school for primary and secondary students which is anticipated to accommodate approximately 1,200 students and to be constructed in two stages.

- Stage 1: Proposed Secondary Opening Year (2028)– 768 Secondary Students
- Stage 2: Proposed Primary Opening Year (2033) – 432 Primary Students

The layout of the proposed Master Plan and Concept Design for the subject Site is shown in **Figure 3-1**. Detailed development plans are provided in **Appendix B**.

Figure 3-1 Master Plan and Concept Design



Source: Parry and Rosenthal Architects

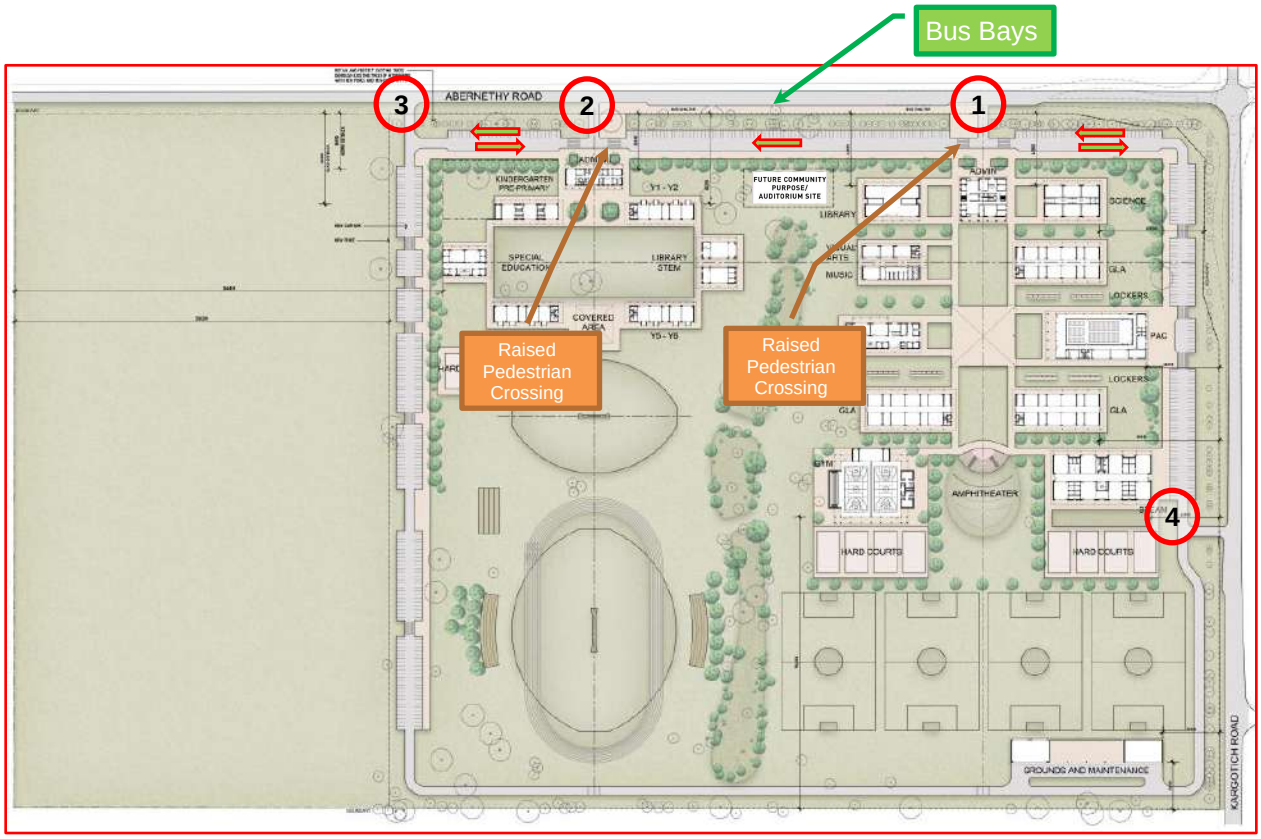
The development is proposed to be implemented in two stages wherein in the first stage will comprise the enrolment of 768 secondary students. In the second stage, additional buildings will be constructed to accommodate another 432 primary students.

3.2 ACCESS ARRANGEMENTS

The Site is proposed to be accessed through the new crossovers located on the northern frontage along Abernethy Road as shown in **Figure 3-2**. Three crossovers are proposed along Abernethy Road. It is proposed that unrestricted turning movements to and from Abernethy Road would be permitted. A secondary left-in-left-out access is proposed on Kargotich Road as shown in **Figure 3-2**. The location of the proposed access in relation to the proposed roundabout is shown in **Figure 3-3**.

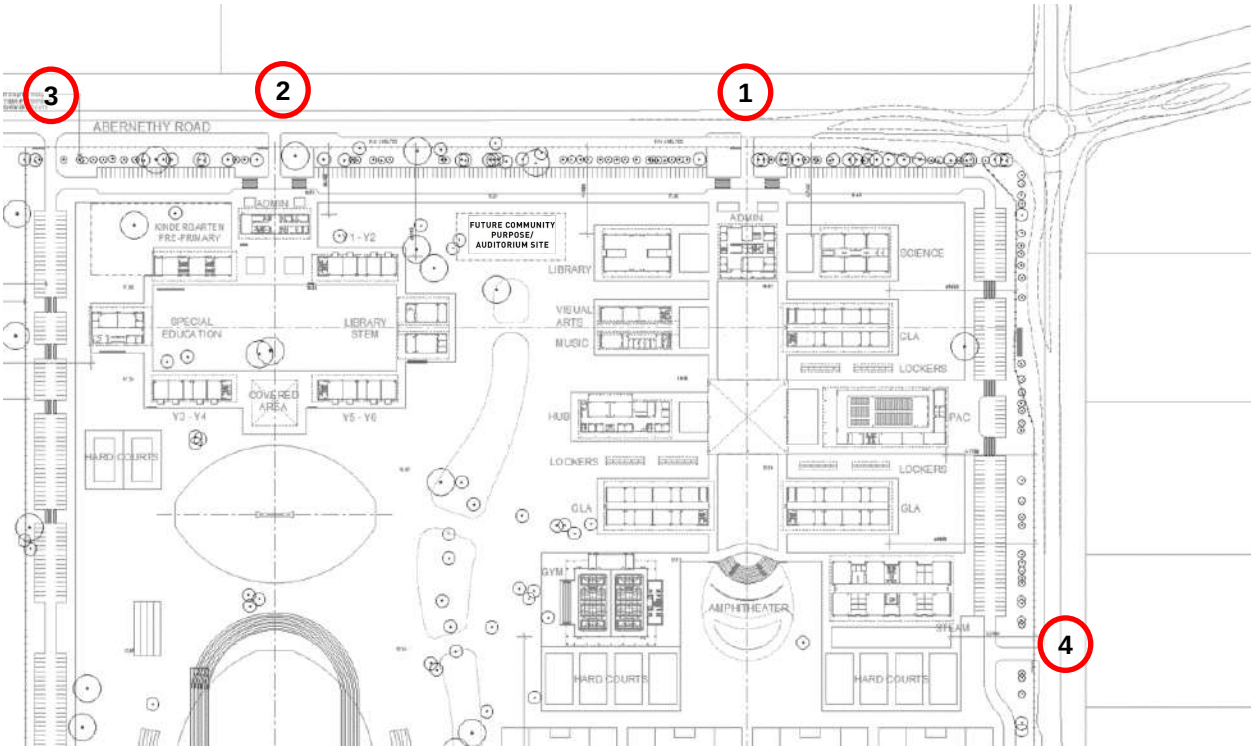
- Access 1: Full Movement access
- Access 2: Full Movement access
- Access 3: Full Movement access
- Access 4: Left-in-left out Access

Figure 3-2 Access Arrangement



Source: *Parry and Rosenthal Architects*

Figure 3-3 Access Arrangement (with the proposed Roundabout)



Source: Parry and Rosenthal Architects

Pick up and drop off bays are proposed on-site along the northern frontage which can be accessed via all three crossovers on Abernethy Road. It is also proposed that one-way traffic circulation is implemented between Access 1 & 2. On-street bus bays are also proposed on Abernethy Road.

Raised pedestrian crossings connecting to the main building areas are proposed around the car park areas as shown in **Figure 3-2**.

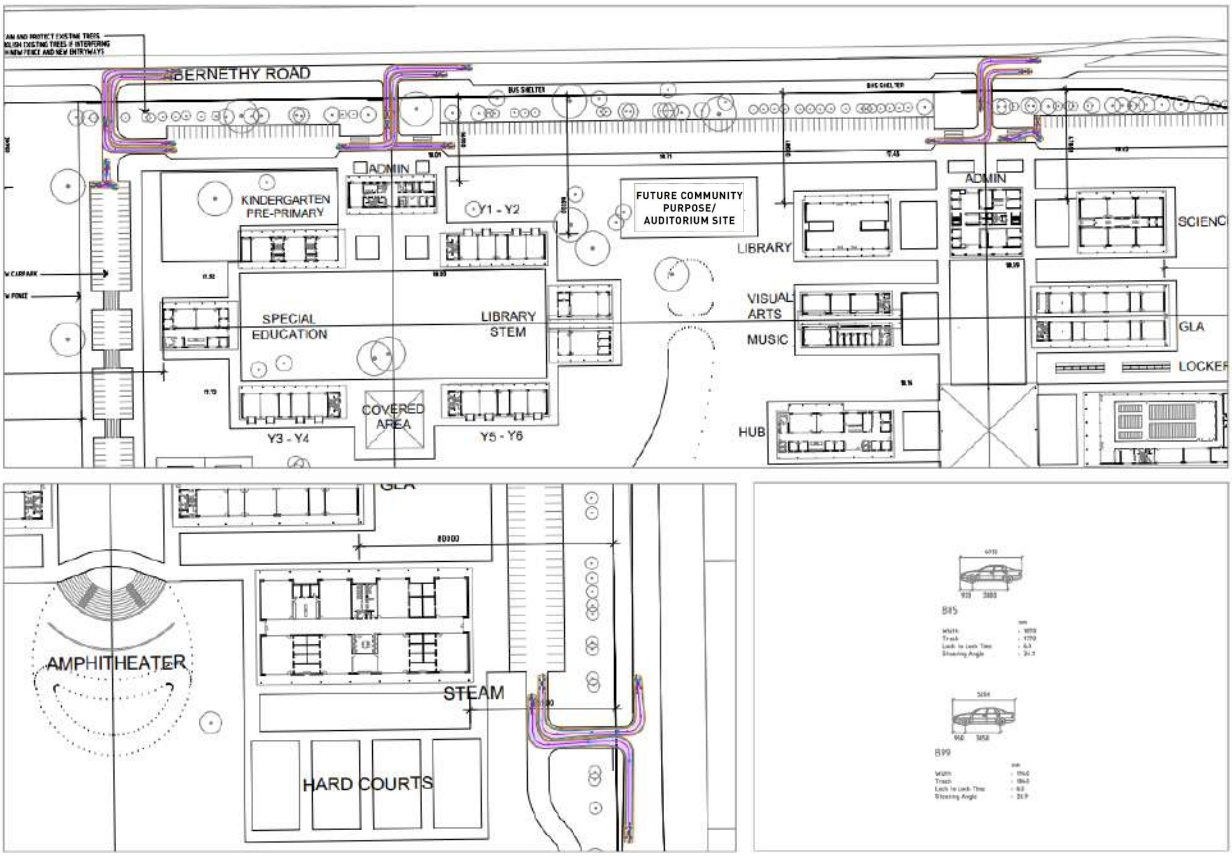
Parking spaces and manoeuvring areas shall be designed in accordance with the applicable codes and standards.

3.3 SWEPT PATHS

3.3.1 B85 & B99 Swept Paths

A swept path analysis was undertaken for B85/B99 passenger vehicles and illustrated in **Figure 3-4**. The swept path diagrams demonstrate that these design vehicles can adequately circulate the parking areas, enter and exit the proposed parking bays without any encroachments.

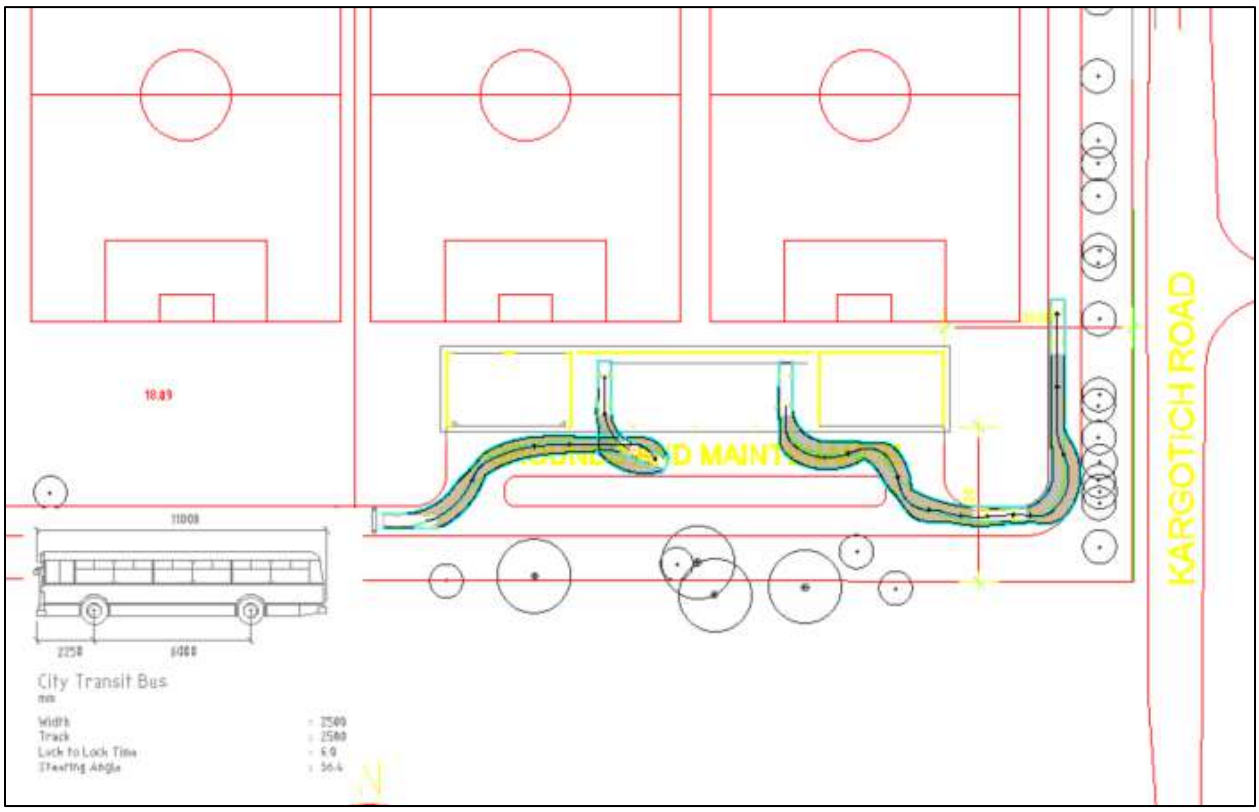
Figure 3-4 B85 & B99 Swept Paths



3.3.2 Coach Bus (11m in length)

A swept path analysis was undertaken at the site for a 11.0m long bus. The analysis indicates that the design vehicle can circulate around the site and adequately park at the grounds and maintenance area, as illustrated in **Figure 3-5**. A detailed illustration of the swept path around the site is included in **Appendix C**.

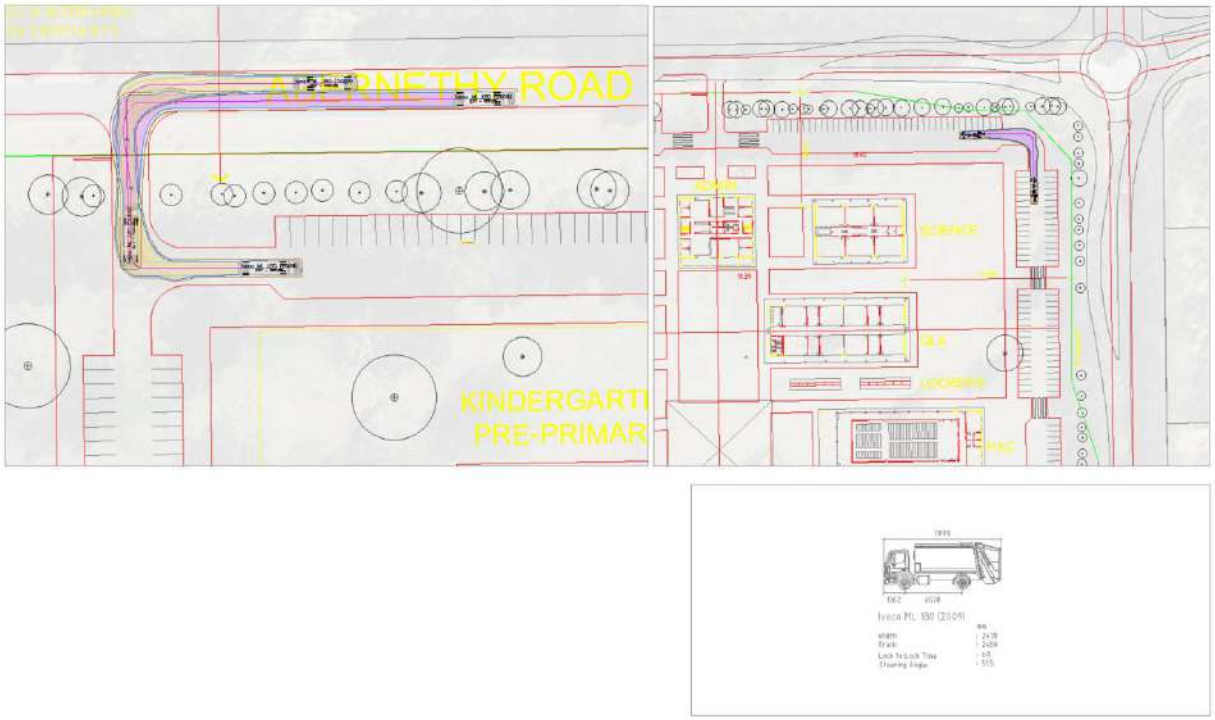
Figure 3-5 Coach Bus Swept Paths



3.3.3 WASTE AND RECYCLING COLLECTION SERVICES

A swept path analysis for a 11 m waste vehicle was undertaken as illustrated in **Figure 3-6**. The analysis indicates that a waste vehicle can adequately enter the site, manoeuvre, and exit in a forward direction. Waste collection will be undertaken on-site by a private waste contractor and to be arranged to occur during off peak hours or after normal school hours to minimise disruption to traffic operations as well as minimise any impacts to staff and students.

Figure 3-6 Waste Truck Swept Path



3.4 CAR PARKING REQUIREMENTS

The car parking requirements for the development are prescribed in the *Shire of Serpentine-Jarrahdale Scheme No.2*. **Table 3-1** summarise the car parking requirements and the on-site provision.

Table 3-1 Car Parking Requirements

Proposed Land Use	Parking Standard	Yield	Parking Requirement	Parking Provided
Primary School	1.25 spaces per classroom	15 classrooms	19	546
Secondary School	2 spaces per classroom	32 classrooms	64	
Total			**83 bays**	**546 bays**

Table 3-1 indicates that the overall parking provision meets the requirements of LPS. No.2.

The parking calculation based on the primary and secondary school brief of the Department of Education were also considered. **Table 3-2** indicates the parking requirements based on the primary and secondary school brief.

Table 3-2 Car Parking Requirements – School Brief

Proposed Land Use	Parking Standard	Yield	Parking Requirement
Primary School	Visitors: 14 bays for every 100 students.	432	61
	Staff: 10 for every 100 primary students		43
Secondary School	Staff: 10 for every 100 primary students	768	77
Total			**181 bays**

Based on the tables provided above, the number of parking bays provided meets the requirements of both the Shire of Serpentine-Jarrahdale and the Primary and Secondary School Brief. It is anticipated that there will be a significant surplus of parking spaces available to compensate for the lack of public transport services and limited cycling facilities.

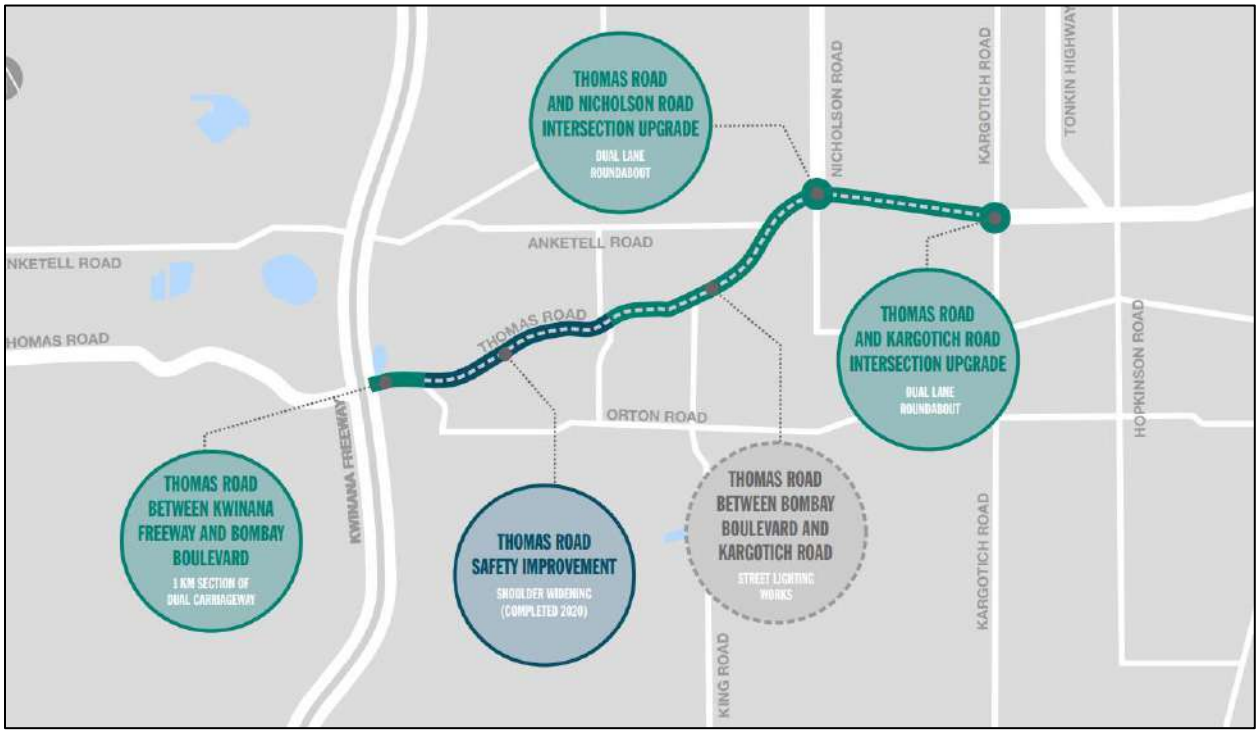
4.0 CHANGES TO SURROUNDING NETWORK

4.1 EXTERNAL ROAD NETWORK

4.1.1 Thomas Road Improvements

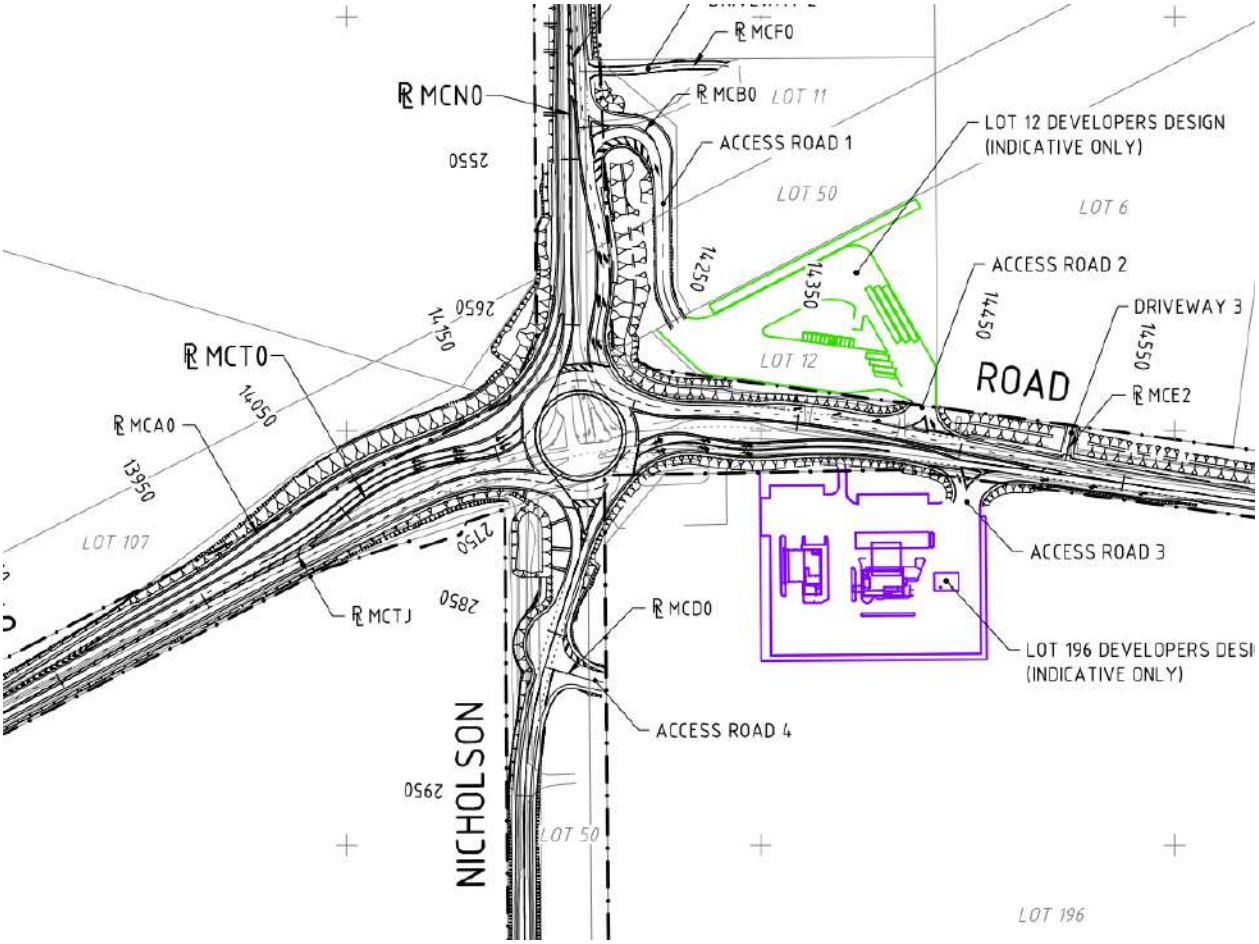
Main Roads WA have plans to upgrade Thomas Road, which includes additional lanes to improve traffic flow and safety, between Kwinana Freeway and South Western Highway as shown in **Figure 4-1**. As part of these upgrades, Thomas Road / Kargotich Road intersection and Thomas Road / Nicholson Road Intersection is planned to be upgraded to a dual-lane roundabout. The Concept layout of Thomas Road / Nicholson Road intersection upgrade is shown in **Figure 4-2**. Construction is anticipated to start in early 2023 subject to approvals. The improvements will enhance safety and ease congestion. Upgrades of these intersections will attract traffic north of Thomas Road towards Abernethy Road.

Figure 4-1 Thomas Road Future Planning Concept



Source: Main Roads WA

Figure 4-2 Proposed Upgrades – Thomas Road / Nicholson Road



Source: Main Roads

4.2 WESTPORT FREIGHT ROUTE – ANKETELL-THOMAS ROAD FREIGHT CORRIDOR

In August 2020, the State Government endorsed the recommendation of Westport Taskforce to build a container port in the Kwinana Industrial Area. The future port would be connected to Tonkin Highway via upgraded Anketell Road and Thomas Road as shown in the concept plan in **Figure 4-3.**

Details of the design have not yet been made available, however, information from the *Westport – Future Port Recommendations Stage 2 Report* and Main Roads WA indicates that Anketell Road and Thomas Road (east of Nicholson Road) will be connected as a continuous east-west freight route to and from Tonkin Highway. This would result in the removal or reconfiguration of the Thomas Road and Kargotich Road intersection and the grade separation of Thomas Road / Kargotich Road intersection to allow uninterrupted flow of freight vehicles.

Figure 4-3 Proposed Anketell Road Corridor

Source: Westport – Stage 2 Report

4.3 TONKIN HIGHWAY EXTENSION

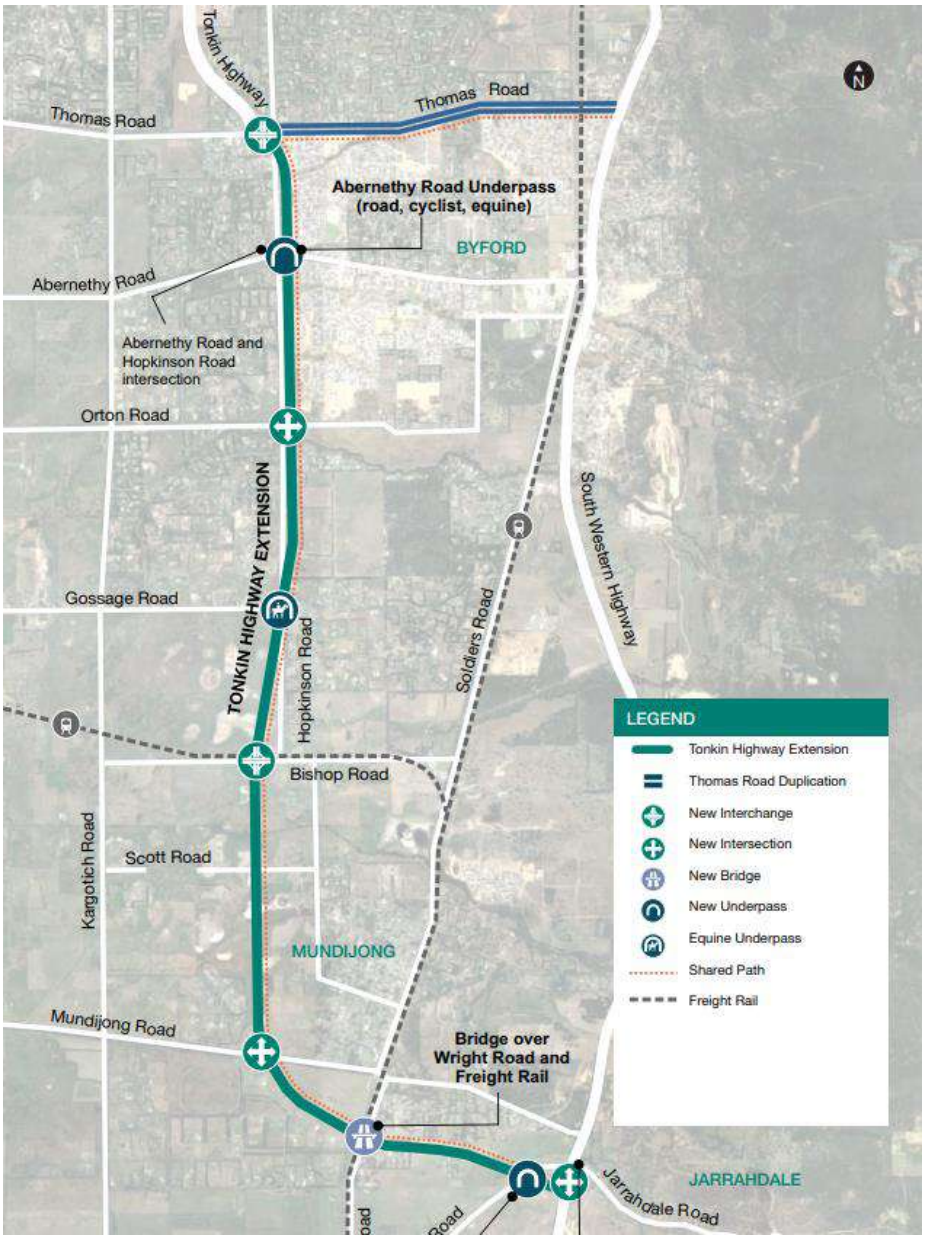
The Tonkin Highway is a 44-kilometre north-south highway and partial freeway in Perth, Western Australia, linking Perth Airport with the city's north-eastern and south-eastern suburbs. The Tonkin Highway Extension proposal involves a 14km four lane dual carriageway extension of the Tonkin Highway from Thomas Road, Oakford to the South Western Highway and to the south east of Mundjiong.

It is expected to continue from its current terminus at Thomas Road generally along the Hopkinson Road alignment through to South Western Highway near Jarrahdale Road. **Figure 4-4** shows the proposed Tonkin Highway Upgrade which includes the following.

- New intersections are proposed at Orton Road, Mundijong Road and South Western Highway.
- An equestrian and pedestrian / cyclist underpass is proposed under Tonkin Highway at Abernethy Road; and
- a shared use path is proposed along the eastern side of the Tonkin Highway corridor, connecting to local path networks.

The proposed Tonkin Highway extension indicates there will be no direct connection to Abernethy Road and the first intersection on Tonkin Hwy south of Thomas Road will be Orton Road which would distribute traffic from the north and south of Tonkin Highway to Kargotich Road.

Figure 4-4 Tonkin Highway Extension



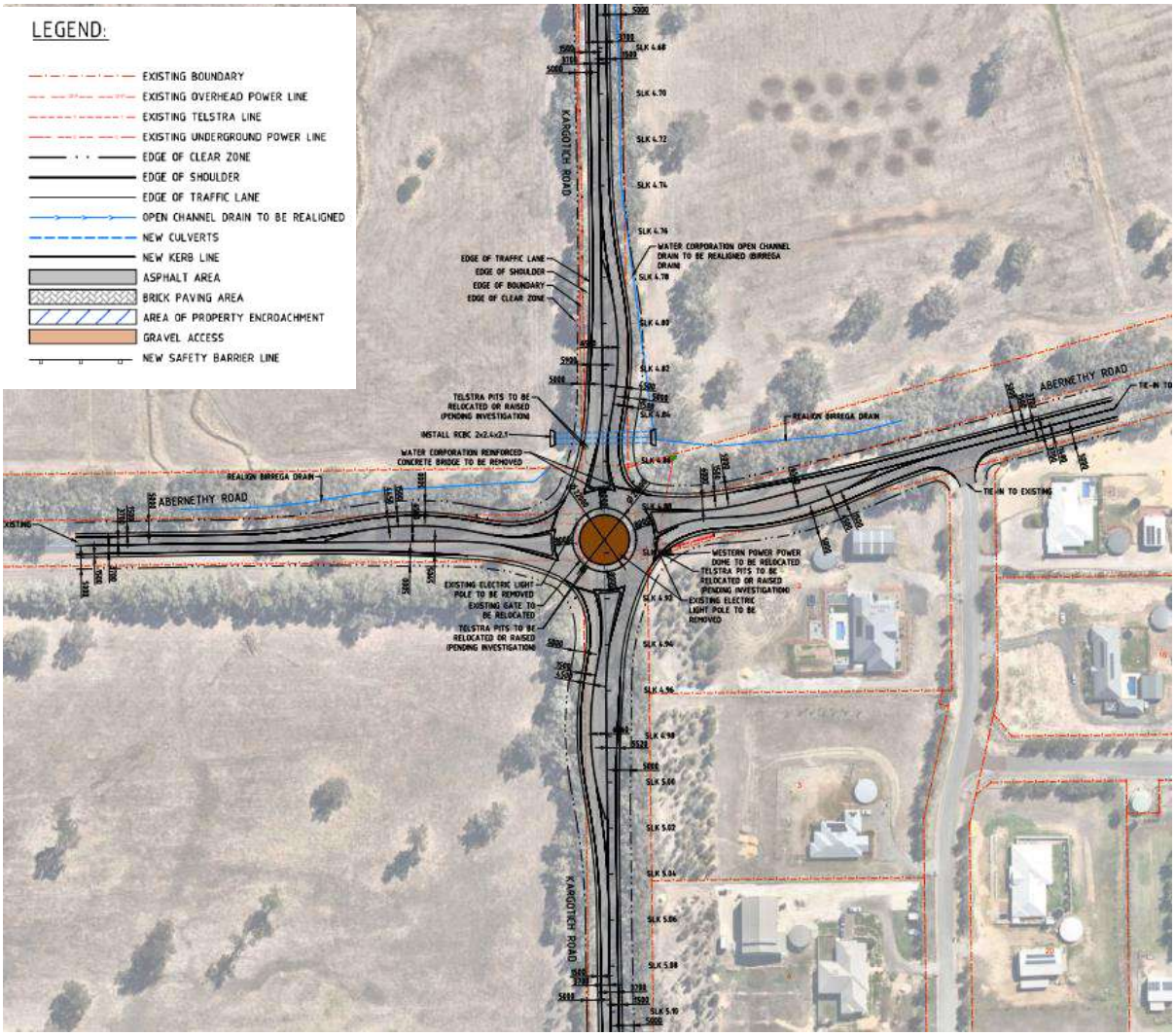
Source: Main Roads

4.4 KARGOTICH ROAD UPGRADES

Stantec contacted Main Roads WA and were advised that the whole section of Kargotich Road, south of Thomas Road, will be upgraded as part of the Thomas Road Duplication and West Mundijong Industrial Area project.

A roundabout is proposed as part of the upgrade at Kargotich Road / Abernethy Road intersection as shown in **Figure 4-5**. The proposed road upgrade is to be funded by the Shire and anticipated to be completed before 2028.

Figure 4-5 Proposed Kargotich Road / Abernethy Road Roundabout Plan



Source: Shire of Serpentine- Jarrahdale

4.5 WEST MUNDIJONG INDUSTRIAL AREA

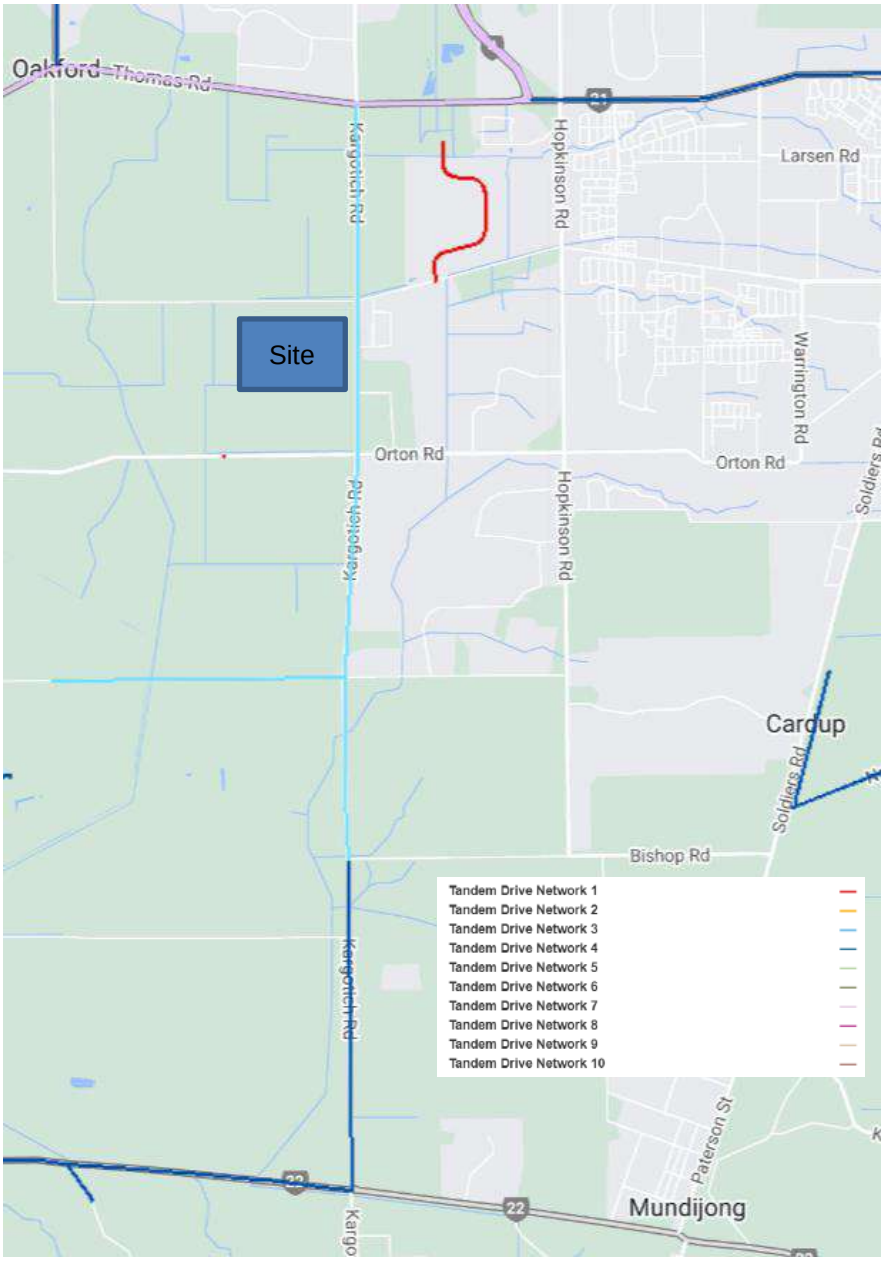
The structure plan area is located within the locality of Mundijong within the Shire of Serpentine Jarrahdale as shown in **Figure 4-6.** The area is located directly 20 kilometres east of the Kwinana industrial area via Mundijong Road. Mundijong Road will provide direct linkage to Kwinana and associated infrastructure, including complementary industries and services. This includes the proposed Westport Outer Harbour development that has recently been approved by government.

Figure 4-6 West Mundijong District Structure Plan

Source: West Mundijong Industrial Area SP

As part of the LSP, the RAV network has been upgraded on Kargotich Road between Mundijong / Kargotich Road and Bishop Road / Kargotich Road intersections to RAV 4 category as shown in **Figure 4-7.**

Figure 4-7 RAV Network



Source: HVS Network

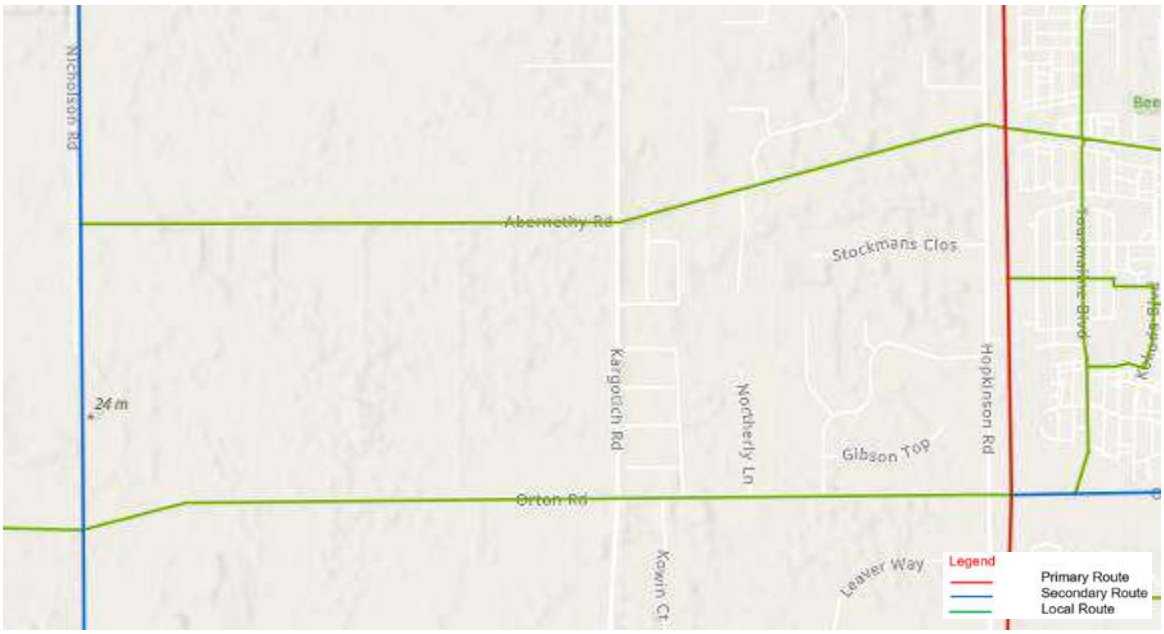
4.6 PUBLIC TRANSPORT FACILITIES

Stantec contacted the relevant authorities and was advised that there will be no changes to the public transport services within the vicinity of the Site in the short term.

4.7 PEDESTRIAN / CYCLING NETWORKS

The Long-Term Cycling Network (LTCN) is an aspirational blueprint to provide a continuous cycling network throughout Perth and identifies the function of a route – primary, secondary, or local. The LTCN shows Abernethy Road as a Local route connecting to Nicholson Road secondary route and Tonkin Highway Primary route. **Figure 4-8** shows the Long-Term Cycle Network on the surrounding network to the site.

Figure 4-8 LTCN Network



Source: LTCN

5.0 INTEGRATION WITH SURROUNDING AREA

5.1 SURROUNDING ATTRACTORS / GENERATORS

The Site primarily functions as an education institution, primarily serving the residential developments surrounding it. Anticipated major attractors/generators in the vicinity of the site include the residential developments located within the Oakford radius.

6.0 ANALYSIS OF TRANSPORT NETWORK

6.1 ASSESSMENT YEARS AND TIME PERIOD

The analysis of the transport network surrounding the Site has been undertaken using SIDRA analysis software for the below intersection.

- Kargotich Road / Abernethy Road Intersection

The assessment scenarios used in the analysis are as follows:

- Scenario 1: 2023- Existing Year
- Scenario 2: 2028- Opening Year Background + Stage 1 Proposed Development Traffic
- Scenario 3: 2038 Future Year background + Stage 2 development Traffic

Traffic count survey was undertaken by an external service provider on 09 May 2023 during the AM and PM peak periods at the Kargotich Road / Abernethy Road intersection and the following peak hours were identified:

- Weekday AM Peak: 7:45 to 8:45 am
- Weekday PM Peak: 3:00 to 4:00 pm

The traffic count survey data in included in **Appendix E.**

6.2 ANALYSIS ASSUMPTIONS

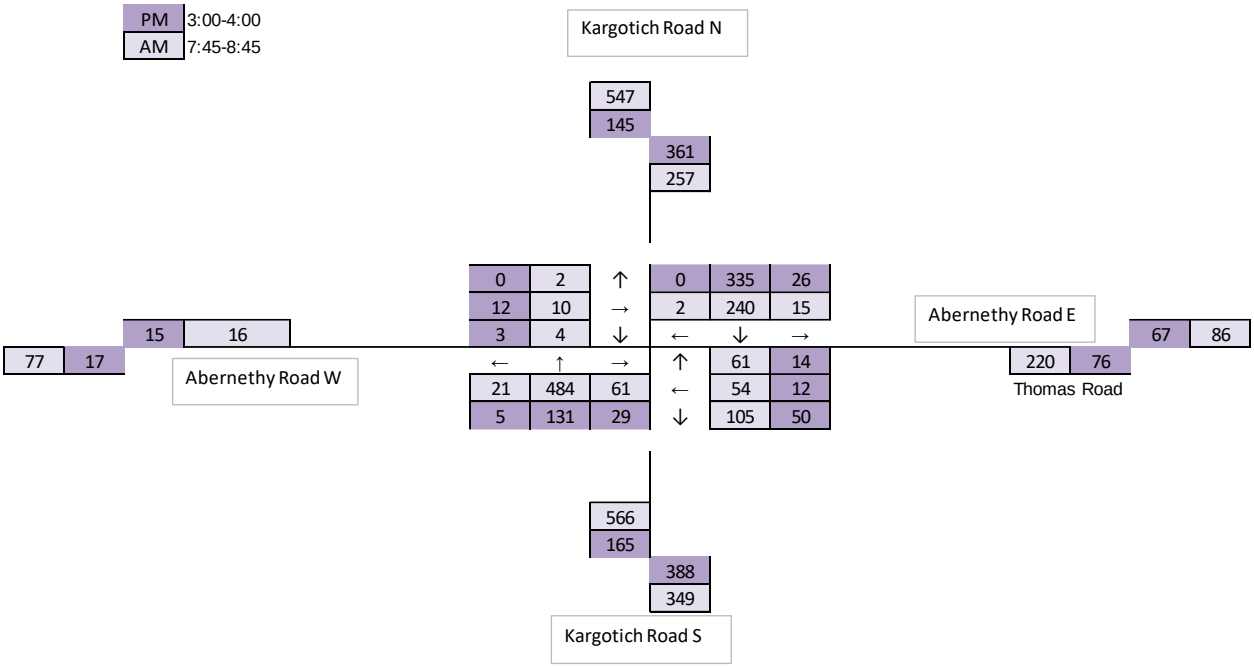
The following provides a list of assumptions used in this assessment.

- Background traffic data was obtained from the traffic count survey undertaken on 9th May 2023:
- Opening year has been assumed to be 2028 for the opening of the secondary school.
- The proportion of heavy vehicles was based on the traffic count data.
- The city has provided the ROM data for Kargotich Road / Abernethy Road Intersection for future 2036 design year 2036 for the “with” and “without” Tonkin Highway extension constructed. The ROM data is included in **Appendix F**.
- The 2028 background traffic has been obtained by interpolating traffic data from existing traffic counts and the ROM data for the “without” Tonkin Highway extension. It is also assumed that the Tonkin Highway Extension would not be operational by 2028 as a worst case scenario.
- To determine the 2038 traffic flows, a growth rate of 3% per annum of linear growth has been adopted as a worst-case scenario.
- The intersection assessment was modelled as a network model using SIDRA 9 software analysis tool in accordance with Main Roads WA Operational Modelling Guidelines.
- The approach and exit speeds were based on speed limits from Main Roads WA Road Information Mapping System.

6.2.1 Background Traffic

Figure 6-1 shows the existing traffic volumes for the intersections of Kargotich Road / Abernethy Road intersection.

Figure 6-1 Existing Trips



6.3 DEVELOPMENT TRIP GENERATION

The trip generation has been calculated for the proposed development utilising trip generation rates from the *Institute of Transportation Engineers (ITE) "Trip Generation" 10th Ed*. The following tables details the directional distribution and total trip generation of the development.

Table 6-1 and **Table 6-2** provides the trip generation rate and distribution for the AM and PM peak hours and **Table 6-3** summarises the total estimated trips to be generated by the proposed development.

The Free Reformed School Association (FRSA) has expressed its intentions to expand its school bus services. Presently, they intend to provide two bus services for the secondary school, serving approximately 100 students. FRSA have also indicated that they intend increasing the number of bus services for the secondary school to four which will accommodate around 200 students. Furthermore, no bus service is proposed for the primary school students, and it is anticipated that many of these students would rely on private vehicle.

As part of the assessment, it was assumed that approximately 200 of the totals of 768 secondary students would opt to utilize the bus transport mode.

Table 6-1 Trip Generation Rate – Peak Hour generator

Land Use	ITE Code/Source	AM Peak	PM Peak
School	WAPC	IN: 0.5 trip per student OUT: 0.5 trip per student	IN: 0.5 trip per student OUT: 0.5 trip per student

Table 6-2 Trip Distribution

Land Use	AM Peak		PM Peak	
	In	**Out**	**In**	**Out**
School	53%	47%	47%	53%

Table 6-3 Estimated Total Trip Generation

	AM Peak		PM Peak	
	In	**Out**	**In**	**Out**
Stage 1: School Opening Year* (568 Secondary Students)	284	284	284	284
Stage 2: School Full Development Buildout (432 Primary Students)	216	216	216	216
Total	**500**	**500**	**500**	**500**

*(*it is assumed that 200 of the total secondary students will travel by school bus)*

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For the full development buildout, it is estimated that a total of approximately 1000 vehicles during the AM peak hour and 1000 vehicles during the PM peak hour would be generated.

6.4 TRIP DISTRIBUTION AND ASSIGNMENT

The majority of the development traffic is anticipated to enter via Abernethy Road. Most of the school traffic will likely arrive/depart to the east and north of Abernethy Road as the majority of residential dwellings are concentrated in these areas. **Figure 6-2** and **Figure 6-3** indicates the development traffic distribution within the surrounding network.

Figure 6-2 Inbound Trip Distribution

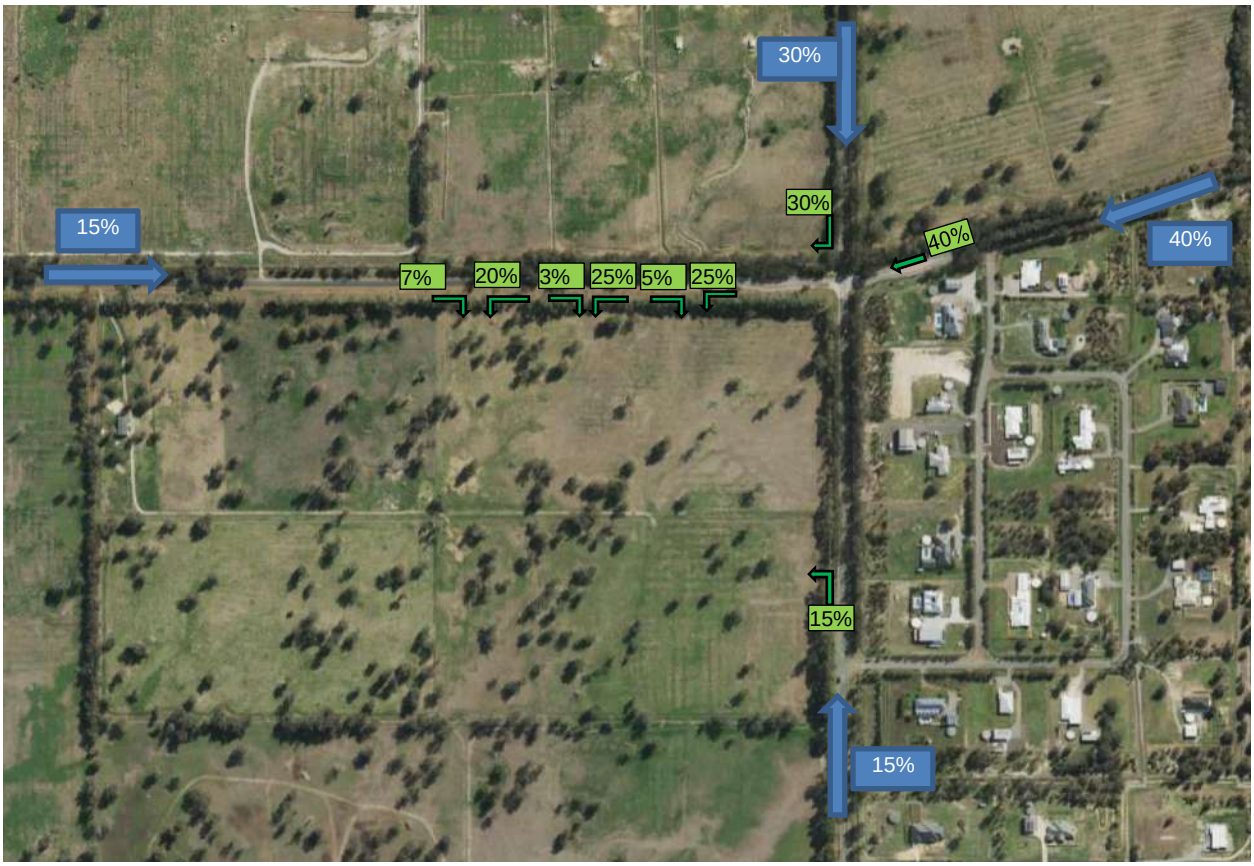

Figure 6-3 Outbound Trip Distribution

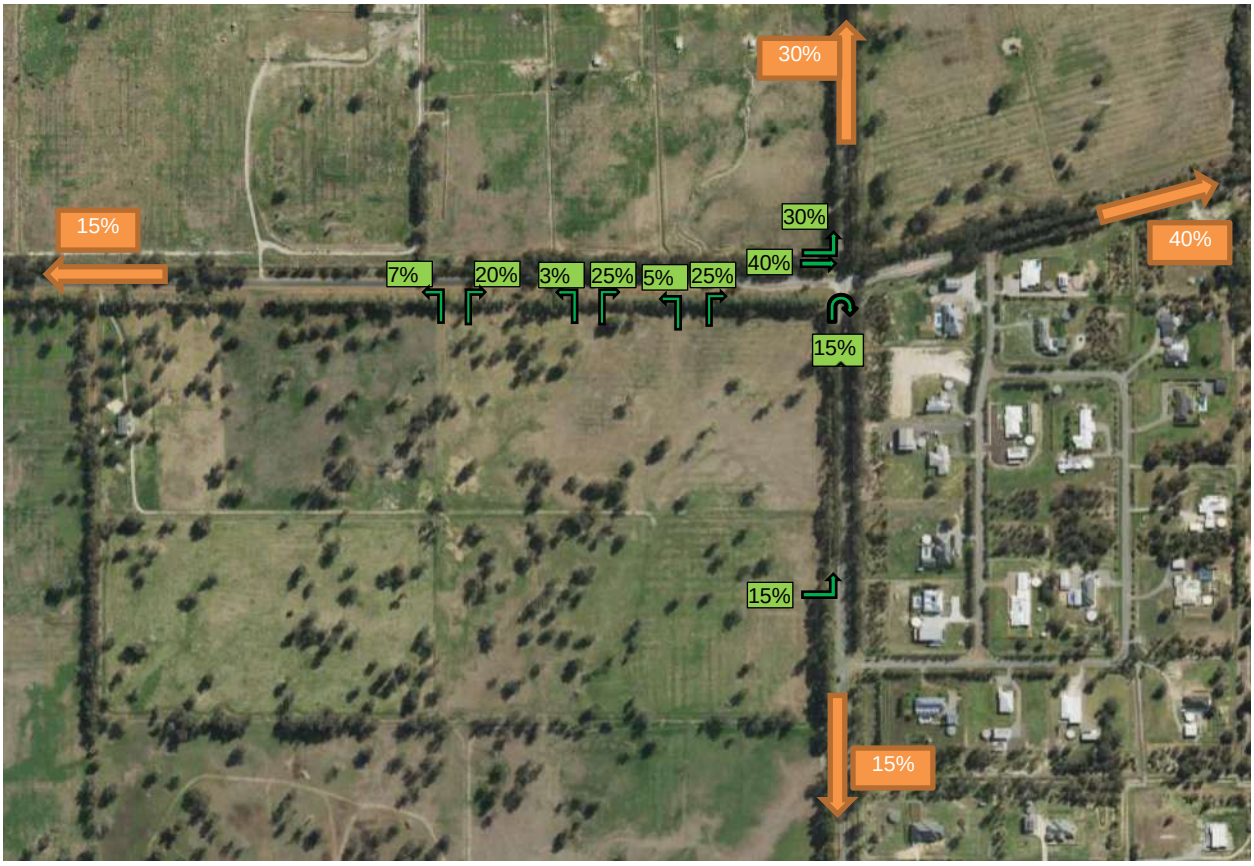

Figure 6-4 shows the trips generated for the Stage 1 development and **Figure 6-5** details the trips to be generated for the Stage 1 and Stage 2 development. **Figure 6-6** shows the 2028 opening year background and Stage 1 development trips, while **Figure 6-7** illustrates the 2038 horizon year background and combined Stage 1 and Stage 2 development trips.

Figure 6-4 Stage 1 Development Trip Distribution

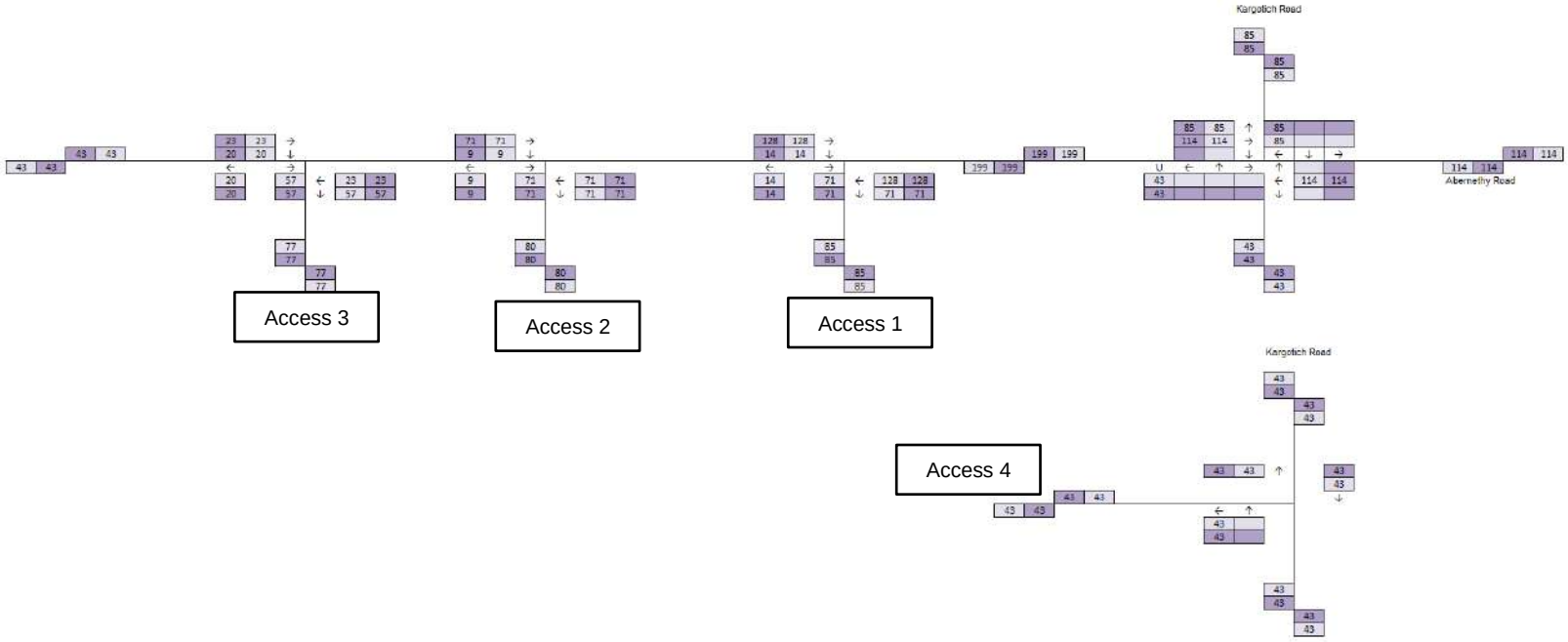

Figure 6-5 Stage 1 + Stage 2 Development Trips

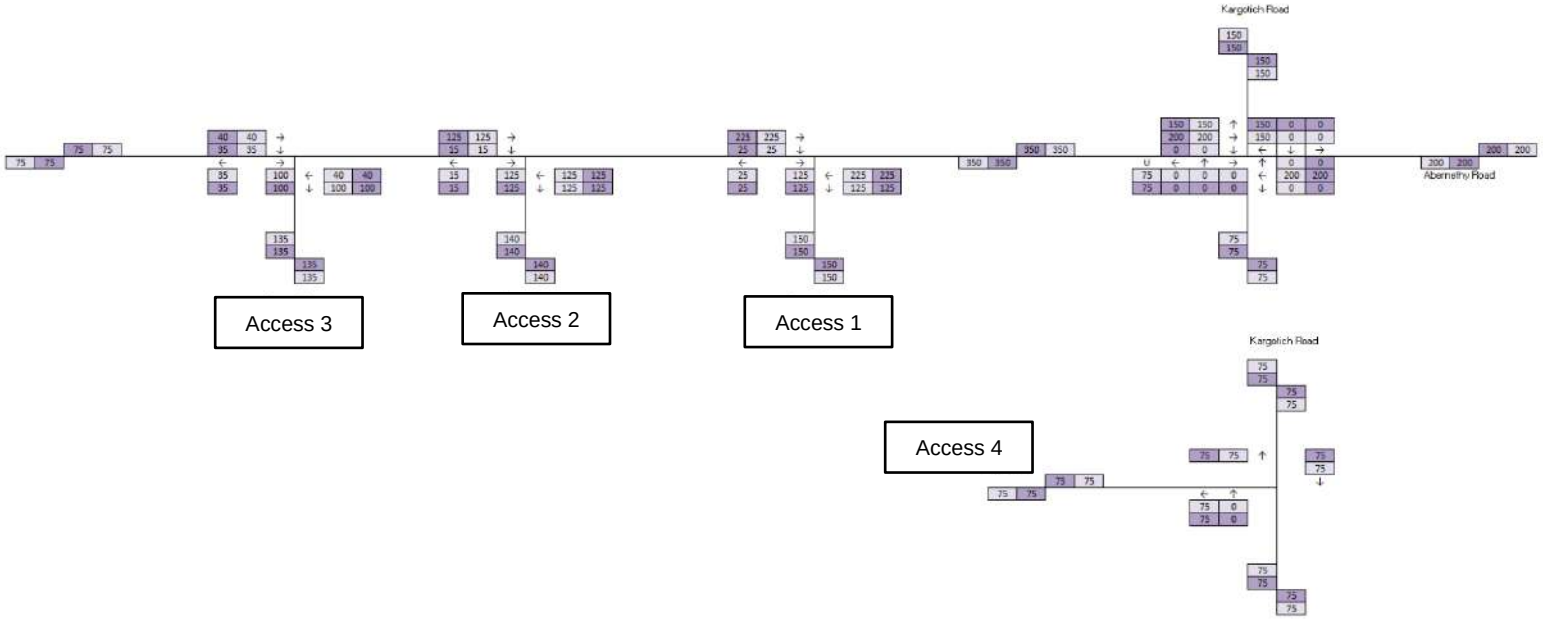

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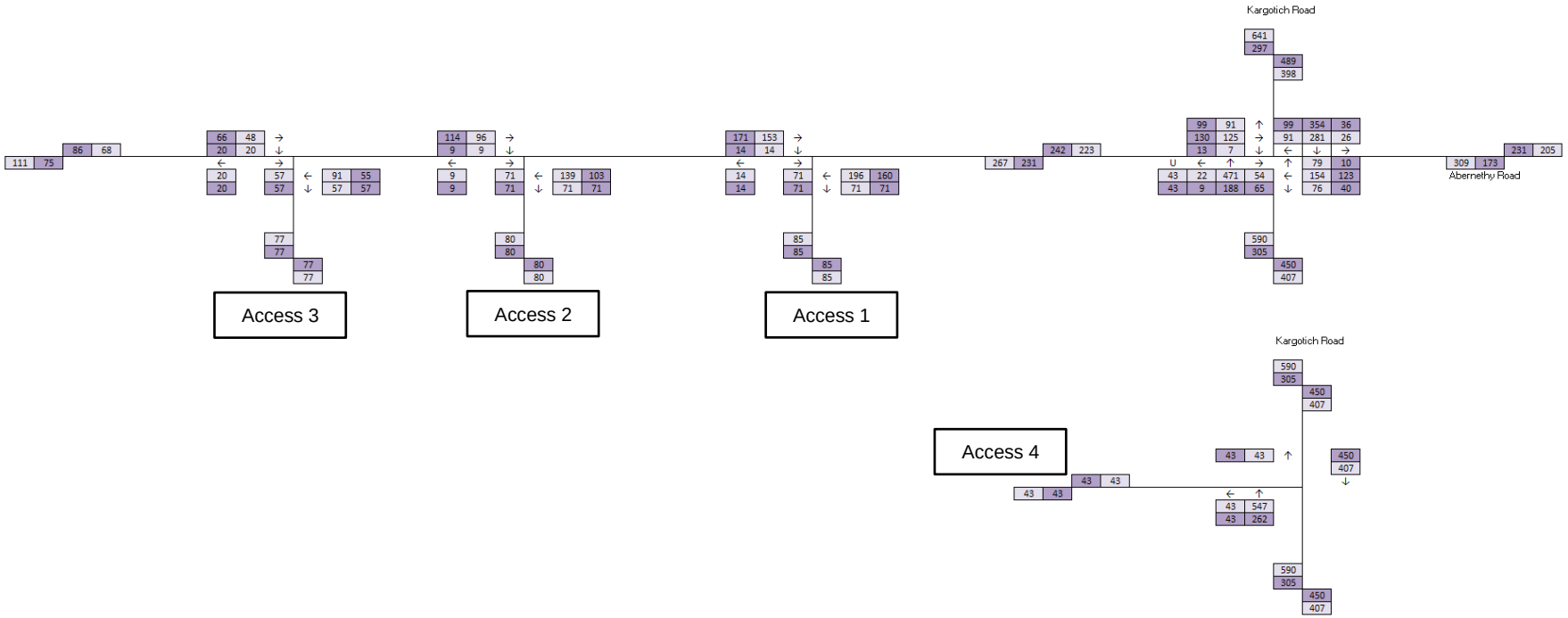
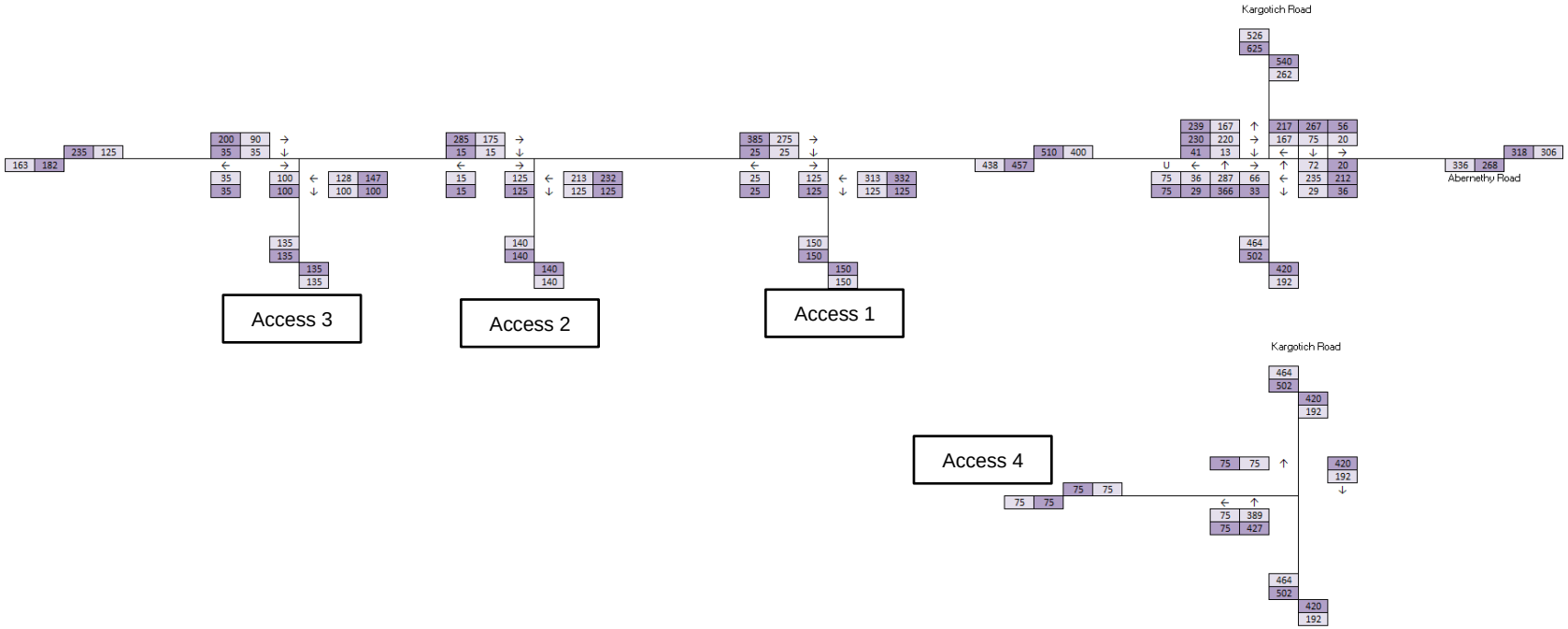
Figure 6-6 2028 + Development Traffic



TRANSPORT IMPACT ASSESSMENT – FREE REFORMED SCHOOL, OAKFORD

Figure 6-7 2038 + Development Traffic



6.5 INTERSECTION PERFORMANCE

6.5.1 Parameters

SIDRA intersection analysis was undertaken for the subject intersection. SIDRA calculates the performance of intersections based on input parameters, including geometry and traffic volumes. As an output SIDRA provides values for the Degree of Saturation (DOS), queue lengths, delays, level of service, and 95th Percentile Queue. These parameters are defined as follows:

- Degree of Saturation (DOS): is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The theoretical intersection capacity is exceeded from an un-signalized intersection where DOS > 80.
- 95% Queue: is the statistical estimate of the queue length up to or below which 95% of all observed queues would be expected.
- Average Delay: is the average of all travel delays for vehicles through the intersection. An unsigned intersection can be operating at capacity where the average delay exceeds 40 seconds for any movement; and
- Level of Service (LOS): is the qualitative measure describing operational conditions within a traffic system and the perception by motorists and/or passengers.

The different levels of service can generally be described as shown in Table 6-4. A LOS exceeding these values indicates that the road section is exceeding its practical capacity. Above these values, users of the intersections are likely to experience unsatisfactory queueing and delays during the peak hour periods.

Table 6-4 Level of Service (LoS) Specifications

LOS	Description	Signalized Intersection	Unsignalized Intersection
A	Free flow conditions (best condition)	≤ 10 sec	≤ 10 sec
B	Reasonable free flow operations	10 – 20 sec	10 – 15 sec
C	At or near free flow operations	20 – 35 sec	15 – 25 sec
D	Decreasing free flow levels	35 - 55 sec	25 - 35 sec
E	Operations at capacity	55 – 80 sec	35 – 50 sec
F	A breakdown in vehicular flow (worst condition)	≤ 80 sec	≤ 50 sec

6.6 SIDRA ANALYSIS RESULTS

Analysis has been undertaken using the SIDRA traffic analysis software. The layout of the intersections considered in the analysis is illustrated in **Figure 6-8**. Details of the results are presented in **Appendix B**. Results for each intersection are detailed in the following sub-sections.

6.6.1 Existing Year

The SIDRA layout for the Kargotich Road / Abernethy Road intersection is illustrated in **Figure 6-8**. The results of the analysis are summarised in **Table 6-5**.

Figure 6-8 SIDRA Network Layout

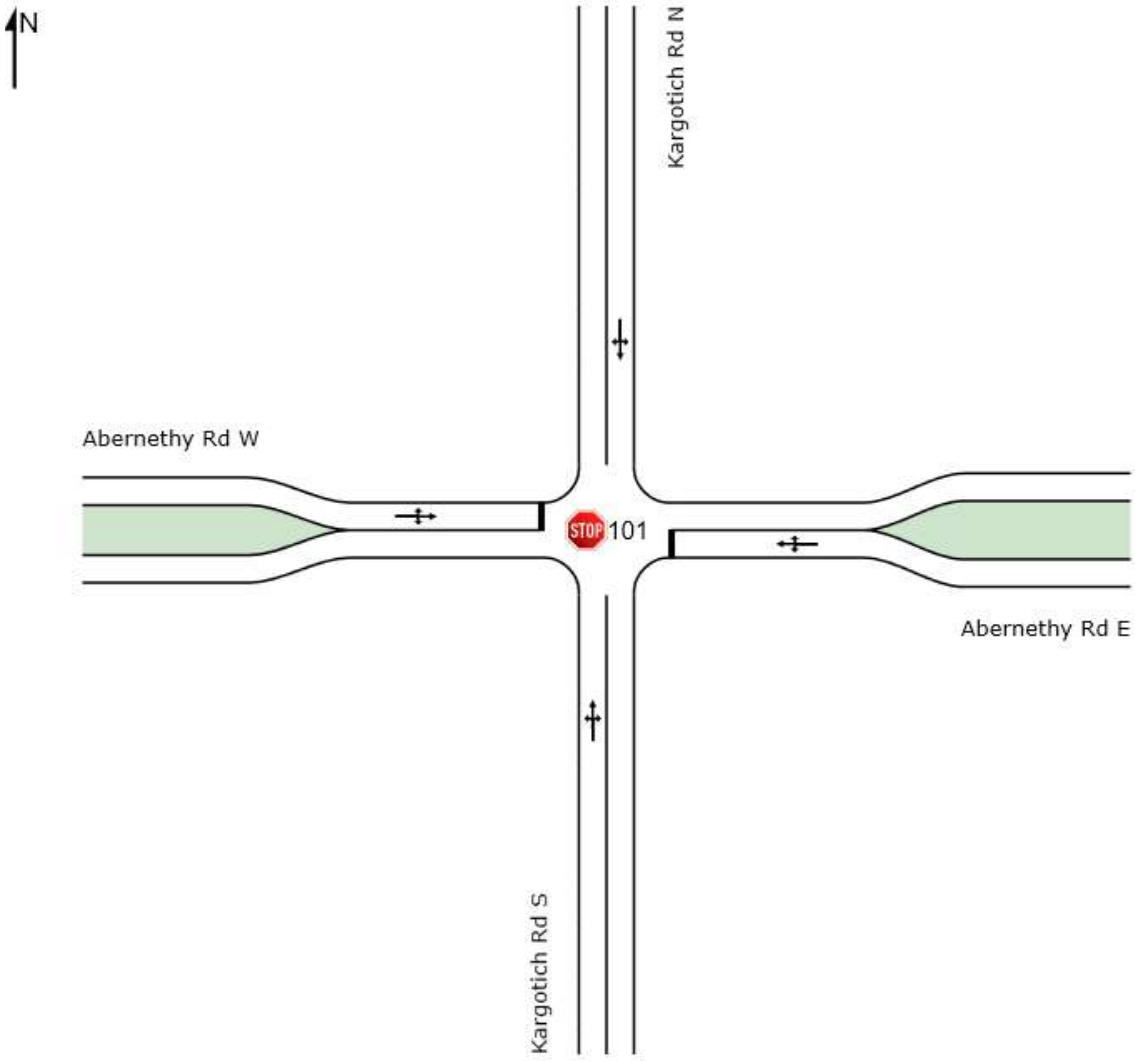


Table 6-5 SIDRA Results: Existing Scenario

Intersection Approach		AM peak				PM Peak			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
South: Kargotich Rd S	L	0.338	8.8	A	5.9	0.109	9.4	A	2.4
	T	0.338	0.3	A	5.9	0.109	0.5	A	2.4
	R	0.338	8.9	A	5.9	0.109	9.0	A	2.4
East: Abernethy Rd E	L	0.471	12.9	B	18.7	0.110	11.5	B	3.2
	T	0.471	21.1	C	18.7	0.110	12.3	B	3.2
	R	0.471	23.0	C	18.7	0.110	14.2	B	3.2
North: Kargotich Rd N	L	0.164	8.0	A	0.3	0.211	7.5	A	0.1
	T	0.164	0.6	A	0.3	0.211	0.3	A	0.1
	R	0.164	10.0	B	0.3	0.211	7.6	A	0.1
West: Abernethy Rd W	L	0.050	15.5	C	1.2	0.028	10.8	B	0.7
	T	0.050	20.5	C	1.2	0.028	11.8	B	0.7
	R	0.050	16.1	C	1.2	0.028	10.8	B	0.7
All vehicles		0.471	5.0	A	18.7	0.211	2.8	A	3.2

The existing scenario shows that the intersection is currently operating at a good capacity with a level of service of ‘A’ for both the AM and PM peak hour periods.

6.6.2 Opening Year and Horizon Year

6.6.2.1 Kargotich Road / Abernethy Road intersection

A roundabout is proposed as part of the upgrade at Kargotich Road / Abernethy Road intersection as shown in **Figure 4-5.** The SIDRA layout of Kargotich Road / Abernethy Road intersection as per the proposed upgrade is illustrated in **Figure 6-9**.

A network SIDRA analysis was undertaken on the proposed accesses and intersection as shown in **Figure 6-10**. **Table 6-6** and **Table 6-7** summarises the SIDRA analysis results.

Figure 6-9 SIDRA Layout: Kargotich Road / Abernethy Rd Intersection

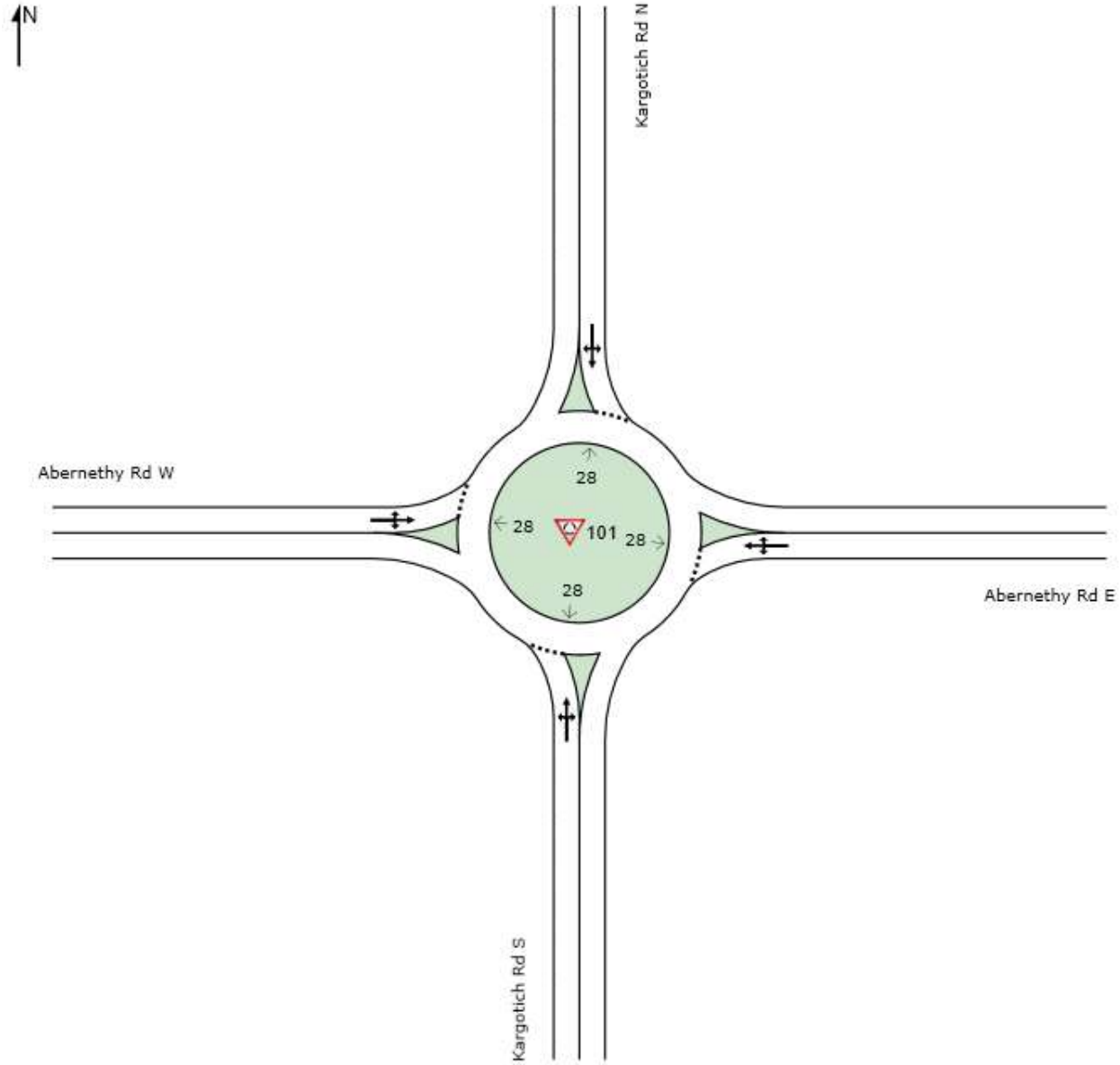


Figure 6-10 SIDRA Layout: Network Model

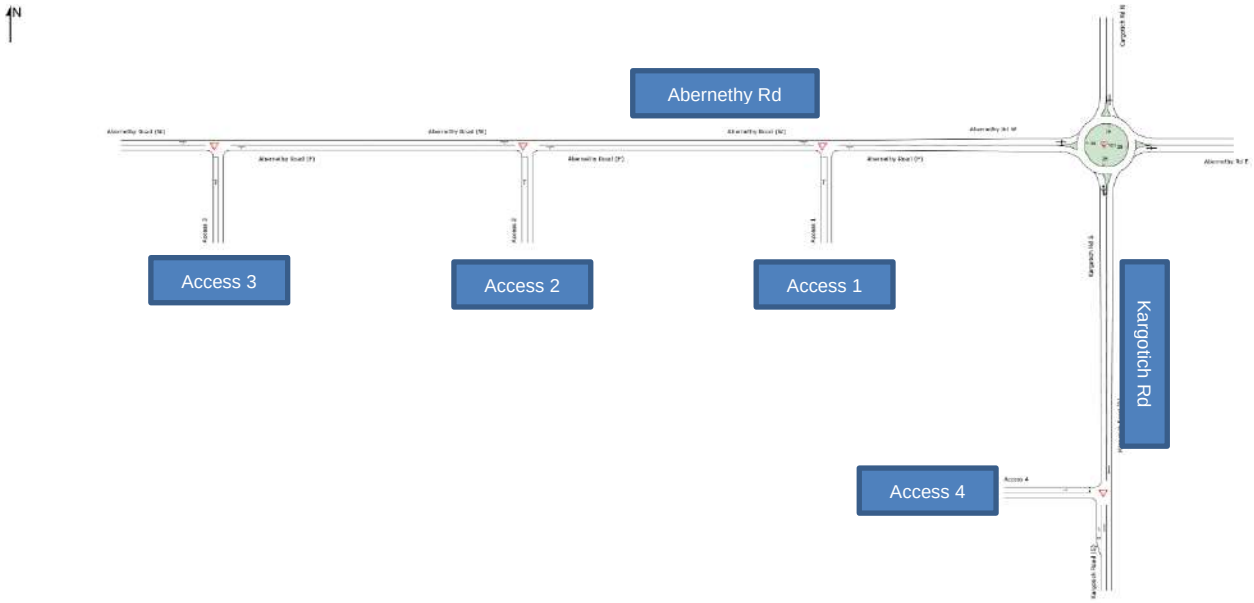


Table 6-6 Background Traffic + Stage 1 Opening Year: 2028

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Kargotich Rd S	L	0.566	8.9	A	37.7	0.280	8.0	A	14.0
	T	0.566	9.8	A	37.7	0.280	8.4	A	14.0
	R	0.566	15.4	B	37.7	0.280	13.9	B	14.0
	U	0.566	17.9	B	37.7	0.280	16.5	B	14.0
East: Abernethy Rd E	L	0.327	8.1	A	16.4	0.200	8.6	A	9.6
	T	0.327	8.6	A	16.4	0.200	8.9	A	9.6
	R	0.327	14.2	B	16.4	0.200	14.8	B	9.6
North: Kargotich Rd N	L	0.366	7.7	A	20.4	0.451	8.0	A	26.5
	T	0.366	8.7	A	20.4	0.451	9.0	A	26.5
	R	0.366	13.7	B	20.4	0.451	14.0	B	26.5
West: Abernethy Rd W	L	0.297	6.5	A	15.6	0.228	4.0	A	10.3
	T	0.297	6.3	A	15.6	0.228	3.8	A	10.3
	R	0.297	11.6	B	15.6	0.228	9.1	A	10.3
All vehicles		0.566	9.8	A	37.7	0.451	8.9	A	26.5

Table 6-7 Background Traffic + Stage 1 & 2 Trips: 2038

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Kargotich Rd S	L	0.506	10.0	A	31.2	0.560	11.4	B	40.2
	T	0.506	10.9	B	31.2	0.560	11.6	B	40.2
	R	0.506	16.5	B	31.2	0.560	17.0	B	40.2
	U	0.506	19.0	B	31.2	0.560	19.5	B	40.2
East: Abernethy Rd E	L	0.324	7.4	A	16.0	0.345	9.7	A	18.7
	T	0.324	7.9	A	16.0	0.345	9.9	A	18.7
	R	0.324	13.6	B	16.0	0.345	15.8	B	18.7
North: Kargotich Rd N	L	0.267	8.5	A	13.1	0.569	9.9	A	41.2
	T	0.267	9.5	A	13.1	0.569	10.9	B	41.2
	R	0.267	14.4	B	13.1	0.569	15.8	B	41.2
West: Abernethy Rd W	L	0.455	5.8	A	25.9	0.596	7.8	A	44.4
	T	0.455	5.6	A	25.9	0.596	7.6	A	44.4
	R	0.455	10.9	B	25.9	0.596	12.9	B	44.4
All vehicles		0.506	10.1	B	31.2	0.596	11.2	B	44.4

The analysis undertaken shows that the intersection is anticipated to operate at a good capacity during the opening year of the secondary school as well as the 2038 design year.

6.6.2.2 Access Intersections

There are 4 proposed access to the Site. A network SIDRA analysis was undertaken on the proposed accesses shown in **Figure 6-10**. The result of the analysis is summarised in **Table 6-8** to **Table 6-15.**

Table 6-8 Background Traffic + Stage 1 Opening Year: 2028 (Access 1)

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Access 1	L	0.096	5.2	A	2.4	0.094	5.1	A	2.3
	R	0.096	6.3	A	2.4	0.094	6.2	A	2.3
East: Abernethy Road (E)	L	0.146	5.5	A	0.0	0.127	5.5	A	0.0
	T	0.146	0.0	A	0.0	0.127	0.0	A	0.0
West: Abernethy Road (W)	L	0.094	0.1	A	0.9	0.103	0.1	A	0.8
	R	0.094	5.6	A	0.9	0.103	5.4	A	0.8
All vehicles		0.146	2.0	A	2.4	0.127	2.0	A	2.3

Table 6-9 Background Traffic + Stage 1 Opening Year: 2028 (Access 2)

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Access 2	L	0.082	5.0	A	2.0	0.083	5.0	A	2.1
	R	0.082	5.7	A	2.0	0.083	5.8	A	2.1
East: Abernethy Road (E)	L	0.115	5.6	A	0.0	0.115	5.6	A	0.0
	T	0.115	0.0	A	0.0	0.115	0.0	A	0.0
West: Abernethy Road (W)	L	0.058	0.1	A	0.5	0.068	0.1	A	0.5
	R	0.058	5.3	A	0.5	0.068	5.3	A	0.5
All vehicles		0.115	2.3	A	2.0	0.115	2.2	A	2.1

Table 6-10 Background Traffic + Stage 1 Opening Year: 2028 (Access 3)

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Access 3	L	0.069	4.8	A	1.8	0.068	4.7	A	1.7
	R	0.069	5.3	A	1.8	0.068	5.2	A	1.7
East: Abernethy Road (E)	L	0.081	5.5	A	0.0	0.062	5.5	A	0.0
	T	0.081	0.0	A	0.0	0.062	0.0	A	0.0
West: Abernethy Road (W)	L	0.040	0.2	A	0.9	0.049	0.1	A	0.9
	R	0.040	5.0	A	0.9	0.049	4.9	A	0.9
All vehicles		0.081	2.8	A	1.8	0.068	3.0	A	1.7

Table 6-11 Background Traffic + Stage 1 Opening Year: 2028 (Access 4)

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Kargotich Road (S)	L	0.025	5.5	A	0.0	0.025	5.5	A	0.0
	T	0.295	0.1	A	0.0	0.141	0.0	A	0.0
North: Kargotich Road (N)	T	0.220	0.0	A	0.0	0.243	0.0	A	0.0
West: Access 4	L	0.050	6.9	A	1.3	0.035	5.4	A	1.0
All vehicles		0.295	0.6	A	1.3	0.243	0.6	A	1.0

Table 6-12 Background Traffic + Stage 1 & 2 Trips: 2038 (Access 1)

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Access 1	L	0.229	5.9	A	6.0	0.266	6.2	A	7.3
	R	0.229	8.7	A	6.0	0.266	10.3	B	7.3
East: Abernethy Road (E)	L	0.240	5.5	A	0.0	0.250	5.5	A	0.0
	T	0.240	0.0	A	0.0	0.250	0.0	A	0.0
West: Abernethy Road (W)	L	0.172	0.3	A	2.1	0.232	0.3	A	2.3
	R	0.172	6.7	A	2.1	0.232	7.0	A	2.3
All vehicles		0.240	2.5	A	6.0	0.266	2.4	A	7.3

Table 6-13 Background Traffic + Stage 1 & 2 Trips: 2038 (Access 2)

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Access 2	L	0.173	5.3	A	4.5	0.199	5.4	A	5.1
	R	0.173	6.9	A	4.5	0.199	7.8	A	5.1
East: Abernethy Road (E)	L	0.186	5.6	A	0.0	0.196	5.6	A	0.0
	T	0.186	0.0	A	0.0	0.196	0.0	A	0.0
West: Abernethy Road (W)	L	0.107	0.2	A	1.0	0.167	0.1	A	1.1
	R	0.107	5.9	A	1.0	0.167	6.1	A	1.1
All vehicles		0.186	2.6	A	4.5	0.199	2.4	A	5.1

Table 6-14 Background Traffic + Stage 1 & 2 Trips: 2038 (Access 3)

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Access 3	L	0.134	5.0	A	3.5	0.150	5.1	A	3.9
	R	0.134	5.9	A	3.5	0.150	6.6	A	3.9
East: Abernethy Road (E)	L	0.126	5.5	A	0.0	0.136	5.5	A	0.0
	T	0.126	0.0	A	0.0	0.136	0.0	A	0.0
West: Abernethy Road (W)	L	0.075	0.3	A	1.8	0.135	0.2	A	2.1
	R	0.075	5.4	A	1.8	0.135	5.5	A	2.1
All vehicles		0.134	3.2	A	3.5	0.150	2.6	A	3.9

Table 6-15 Background Traffic + Stage 1 & 2 Trips: 2038 (Access 4)

Intersection Approach		Weekday AM Peak				Weekday PM Peak			
		DOS	Delay (s)	LOS	95% Back of Queue (m)	DOS	Delay (s)	LOS	95% Back of Queue (m)
South: Kargotich Road (S)	L	0.043	5.6	A	0.0	0.043	5.6	A	0.0
	T	0.210	0.1	A	0.0	0.230	0.1	A	0.0
North: Kargotich Road (N)	T	0.104	0.0	A	0.0	0.227	0.0	A	0.0
West: Access 4	L	0.071	6.1	A	2.0	0.075	6.3	A	2.1
All vehicles		0.210	1.2	A	2.0	0.230	0.9	A	2.1

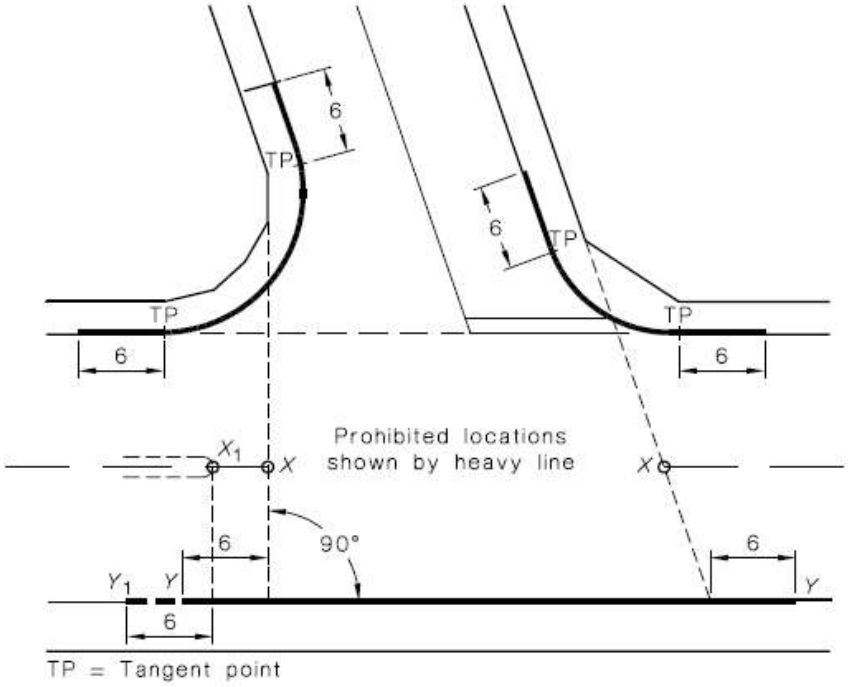
The analysis undertaken shows that the proposed accesses are anticipated to operate at a good capacity and acceptable level of service during the opening year of the secondary school, as well as the 2038 design year.

7.0 SITE SPECIFIC ISSUES

7.1.1 Location of Access 4

An assessment on the proposed ***Access Driveway 4*** was undertaken in accordance with *AS2890.1*: 2004 Parking Facilities: Off-street car parking as illustrated on **Figure 7-1**. The assessment shows that no non-compliance was identified with the location of the access driveway. The proposed access is located approximately 117m from the Kargotich Rd/Elwood Loop intersection as illustrated in **Figure 7-2** and is not anticipated to have any impact on the traffic operations at this intersection.

Figure 7-1 Prohibited Locations of Access Driveways



NOTES:

1 Accesses to domestic driveways are excluded from the prohibition in respect of the kerb section marked *Y-Y* (see Clause 3.2.3(a)).

2 The points marked X_1 and X are respectively at the median end on a divided road and at the intersection of the main road centre-line and the extensions of the side road property lines shown as dotted lines, on an undivided road. On a divided road, dimension *Y-Y* extends to Point Y_1.

DIMENSIONS IN METRES

FIGURE 3.1 PROHIBITED LOCATIONS OF ACCESS DRIVEWAYS

Source: AS2890.1: 2004 Parking Facilities: Off-street car parking

Figure 7-2 Access 4

7.1.2 Provision of an Acceleration Lane

The provision of acceleration lanes cannot be justified solely based on numerical values. However, if vehicles are unable to safely and efficiently merge with the flow of through traffic by finding a suitable gap, an additional lane can be added on the departure side of a left-turn or right-turn lane.

The inclusion of acceleration lanes at major intersections depends on traffic analysis. Nevertheless, they are typically implemented under the following circumstances:

- Insufficient gaps exist for vehicles to enter the traffic stream.
- Turning volumes are high, ranging from 300 to 500 vehicles per hour.
- The observation angle falls below the minimum requirement for the gap sight distance model, such as inside horizontal curves.
- Heavy vehicles merging into the traffic stream would cause significant deceleration of vehicles on the main road.

Acceleration lanes should only be used in situations where turning drivers do not need to rapidly cross the carriageway over a short distance once they leave the acceleration lane.

Source: Austroads: Guide to Traffic Management: Part 6: Intersections and Crossings Management

7.1.3 Provision of a Short Lane Left Turn Lane

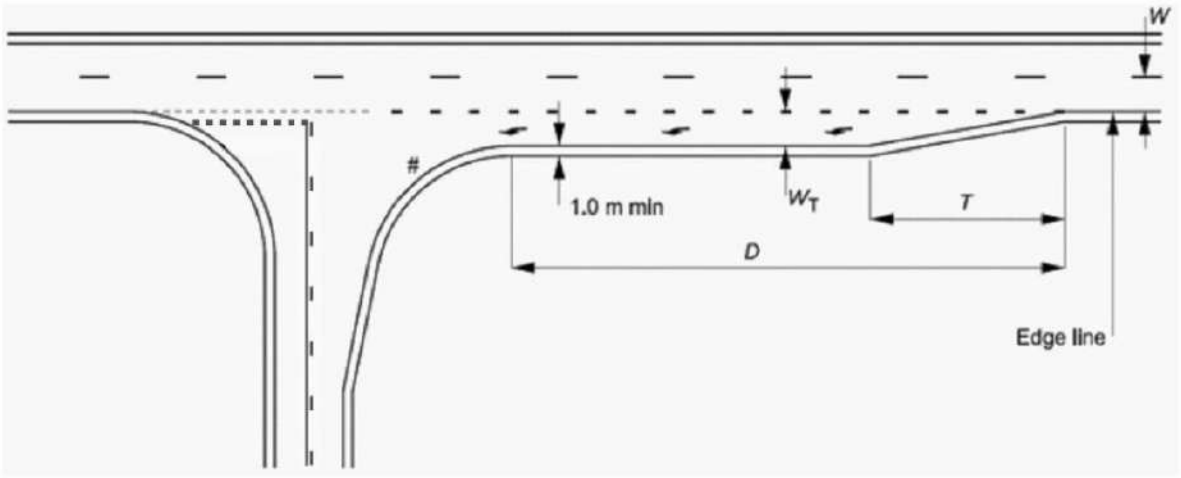
The different types of left-turn treatments and their selection criteria based on volume warrants and safety are discussed in *Austroads' Guide to Road Design*. When choosing an appropriate left-turn treatment, several factors come into play. These factors include the volume and type of traffic that will be making the left turn, as well as the volume, speed, and type of traffic with which the turning traffic will merge. Other considerations include the estimated entry speed, desired speeds during the turn and when exiting, and any local restrictions such as turn angles, property boundaries, and the presence of service utilities or structures.

As part of the development proposal for the site, Access 4 is limited to left-in/left-out movements only. To accommodate this, a proposed design for the access intersection includes a short left-turn lane on the south approach. This dedicated lane allows vehicles to make left turns at the intersection without obstructing the flow of through traffic. The design for the access intersection, including the left turn lane, is currently in the conceptual design phase, with detailed design plans expected to be provided in the future. The following design considerations have been extracted from *Austroads: Guide to Road Design Part 4A: Unsignalized and Signalised Intersections:*

Figure 7-3 illustrates an AUL(S) turn treatment, which is suitable for areas with moderate through and turning traffic volumes. The required length for the treatment can be found in **Table 7-1**.

It's important to avoid using the AUL(S) layout in areas where visibility to the turn treatment is limited. It is crucial for drivers turning left on the main road to be able to identify the deceleration lane and the side road in advance, allowing them to reduce their speed appropriately while staying in the through lane before diverting.

Figure 7-3 Rural AUL(S) treatment with a short left-turn lane



The dimensions of the treatment are defined as follows. Values of D and T are provided in Table

W = Nominal through lane width (m) (including widening for curves). For a new intersection on an existing road, the width is to be in accordance with the current link strategy.

W_T = Nominal width of the turn lane (m), including widening for curves based on the design turning vehicle = 3.0 m minimum.

T = Physical taper length (m) given by Equation 5 being: $T = \frac{0.33VW_T}{3.6}$

V = Design speed of major road approach (km/h).

Source: Austroads: Guide to Road Design Part 4A: Unsignalized and Signalised Intersections

Table 7-1 Dimensions for AUL(S) treatment on major leg

Design speed of major road approach (km/h)	Diverge/deceleration length *D* (m)[1]	Taper length *T* (m)[2]
50	15	15
60	25	15
70	35	20
80	45	20
90	55	25
100	70	30
110	85	30
120	100	35

Source: Austroads: Guide to Road Design Part 4A: Unsignalized and Signalised Intersections

Based on the information summarised above, the following conclusions can be drawn:

- The location of Access 4 is deemed suitable and meets the requirements of AS2890.1.
- Based on the criteria outlined by Austroads for requiring an acceleration lane, it is not envisaged that an acceleration lane is required at Access 4 since it is not anticipated that heavy vehicles would be exiting from this access.
- The required length for the left turn lane is 70m, including a taper length of 30m. This design is suitable for a design speed (posted speed 90km/hr) limit of 100km/hr.

8.0 SUMMARY

This Transport Impact Assessment outlines the transport aspects of the proposed development focusing on traffic operations, access and provision of car parking. Included are discussions regarding pedestrian, cycle, and public transport considerations.

This assessment has been prepared in accordance with the *WAPC Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments (2016).*

- The proposed development consists of a private school for primary and secondary students which is anticipated to accommodate approximately 1200 students and to be constructed in two stages.
  - Stage 1: Proposed Secondary Opening Year (2028)– 768 Secondary Students
  - Stage 2: Proposed Primary Opening Year (2033) – 432 Primary Students
- The proposed number of parking bays exceeds the requirements of the Shire of Serpentine-Jarrahdale Scheme as well as the Primary and Secondary School brief.
- The B85/B99 swept path analysis illustrate that the design vehicles would appear to be able to adequately manoeuvre through the proposed car park and enter and exit the parking bays.
- The proposed development is expected to generate approximately 1000 trips during the AM Peak hour, and 1000 trips during the PM peak.
- The analysis undertaken shows that all the intersections are expected to operate at a good capacity and acceptable level of service during the opening year of the secondary school, as well as the 2038 design year.
- Overall, the proposed development is expected to have minimal impact on traffic operations and safety on the surrounding road network.

APPENDICES

Appendix A WAPC CHECKLIST

Item	Provided	Comments/Proposals
Summary		
Introduction/Background		
name of applicant and consultant	Section 1	
development location and context	Section 2	
brief description of development proposal	Section 2	
key issues	Section 2	
Background information	Section 2	
Existing situation		
existing site uses (if any)	Section 2	
existing parking and demand (if appropriate)	Section 2	
existing access arrangements	Section 2	
existing site traffic	Section 2	
surrounding land uses	Section 2	
surrounding road network	Section 2	
traffic management on frontage roads	NA	
traffic flows on surrounding roads (usually am and pm peak hours)	Section 2	
traffic flows at major intersections (usually am and pm peak hours)	Section 2	
operation of surrounding intersections	Section 6	
existing pedestrian/cycle networks	Section 2	
existing public transport services surrounding the development	Section 2	
Crash data	Section 2	
Development proposal		
proposed land uses	Section 3	
table of land uses and quantities	Section 3	
access arrangements	Section 3	

parking provision	Section 4	
end of trip facilities	NA	
any specific issues	Section 2	
road network	Section 2	
intersection layouts and controls	Section 2	
pedestrian/cycle networks and crossing facilities	Section 2	
public transport services	Section 2	
Integration with surrounding area	Section 6	
surrounding major attractors/generators	Section 6	
committed developments and transport proposals	N/A	
proposed changes to land uses within 1200 metres	N/A	
travel desire lines from development to these attractors/generators	N/A	
adequacy of existing transport networks	Section 2	
deficiencies in existing transport networks	N/A	
remedial measures to address deficiencies	N/A	
Analysis of transport networks		
assessment years	Section 6	
time periods	Section 6	
development generated traffic	Section 6	
distribution of generated traffic	Section 6	
parking supply & demand	Section 6	
base and "with development" traffic flows	Section 6	
analysis of development accesses	Section 6	
impact on surrounding roads	Section 6	
impact on intersections	Section 6	
impact on neighbouring areas	Section 6	
traffic noise and vibration	N/A	
road safety	N/A	
public transport access	Section 2	

pedestrian access / amenity	Section 2	
cycle access / amenity	Section 2	
analysis of pedestrian / cycle networks	Section 2	
safe walk/cycle to school (for residential and school site developments only)	N/A	
Traffic management plan (where appropriate)	N/A	

Appendix B SITE PLANS

RETAIN AND PROTECT EXISTING TREES
DEMOLISH EXISTING TREES IF INTERFERING WITH NEW FENCE AND NEW ENTRYWAYS

ABERNETHY ROAD

BUS SHELTER

BUS SHELTER

BOUNDARY

60300 GLAS SETBACK

34900 ADMIN SETBACK

NEW CARPARK

NEW FENCE

286000

250200

ADMIN

KINDERGARTEN
PRE-PRIMARY

Y1 - Y2

FUTURE
COMMUNITY
PURPOSE/
AUDITORIUM SITE

SPECIAL
EDUCATION

LIBRARY
STEM

COVERED
AREA

Y3 - Y4

Y5 - Y6

HARD COURTS

LIBRARY

ADMIN

SCIENCE

VISUAL
ARTS

MUSIC

GLA

LOCKERS

HUB

PAC

LOCKERS

LOCKERS

GLA

GLA

GYM

AMPHITHEATER

STEAM

HARD COURTS

HARD COURTS

GROUNDS AND MAINTENANCE

BOUNDARY

KARGOTICH ROAD

LEGEND

- EXISTING TREE TO BE RETAINED & PROTECTED
- NEW PLANTED TREE ON SOFT LANDSCAPE
- SITE BOUNDARY
- NEW GARRISON FENCE - 2400m HIGH

SITE PLAN
Free Reformed School Association
Oakford Site - Masterplan and Concept Design issued for DA

Scale 1:1000@A1 1:2000 @A3 - June 2023 - Project No 2022048

Parry and Rosenthal Architects

Appendix C SWEPT PATH

RETAIN AND PROTECT EXISTING TREES
DEMOLISH EXISTING TREES IF INTERFERING WITH NEW FENCE AND NEW ENTRYWAYS

ABERNETHY ROAD

BUS SHELTER

BUS SHELTER

ADMIN

KINDERGARTEN
PRE-PRIMARY

Y1 - Y2

FUTURE CHAPEL

ADMIN

SCIENCE

LIBRARY

VISUAL
ARTS

MUSIC

GLA

LOCKERS

SPECIAL
EDUCATION

LIBRARY
STEM

COVERED
AREA

Y3 - Y4

Y5 - Y6

HUB

PAC

LOCKERS

LOCKERS

GLA

GLA

HARD COURTS

GYM

AMPHITHEATER

STEAM

HARD COURTS

HARD COURTS

GROUNDS AND MAINTENANCE

KARGOTICH ROAD

BOUNDARY

NEW CARPARK

NEW FENCE

69300
GLASS SETBACK

35000
ADMIN SETBACK

286000

250200

70000 6000

11000

2250 6000

City Transit Bus
mm

Width	2500
Track	2500
Lock to Lock Time	6.0
Steering Angle	36.4

AIN AND PROTECT EXISTING TREES
MOLISH EXISTING TREES IF INTERFERING
H NEW FENCE AND NEW ENTRYWAYS

ABERNETHY ROAD

BUS SHELTER

BUS SHELTER

36900

18.09

36900

18.31

48000

17.45

47880

18.62

ADMIN

KINDERGARTEN
PRE-PRIMARY

Y1 - Y2

60200

FUTURE COMMUNITY
PURPOSE/
AUDITORIUM SITE

LIBRARY

ADMIN

SCIENC

W CARPARK

W FENCE

17.92

18.00

18.39

SPECIAL
EDUCATION

LIBRARY
STEM

VISUAL
ARTS

MUSIC

GLA

LOCKER

17.72

18.16

COVERED
AREA

Y3 - Y4

Y5 - Y6

HUB

TENT

GLA

80000

AMPHITHEATER

STEAM

35000

HARD COURTS

4910

920 2800

B85

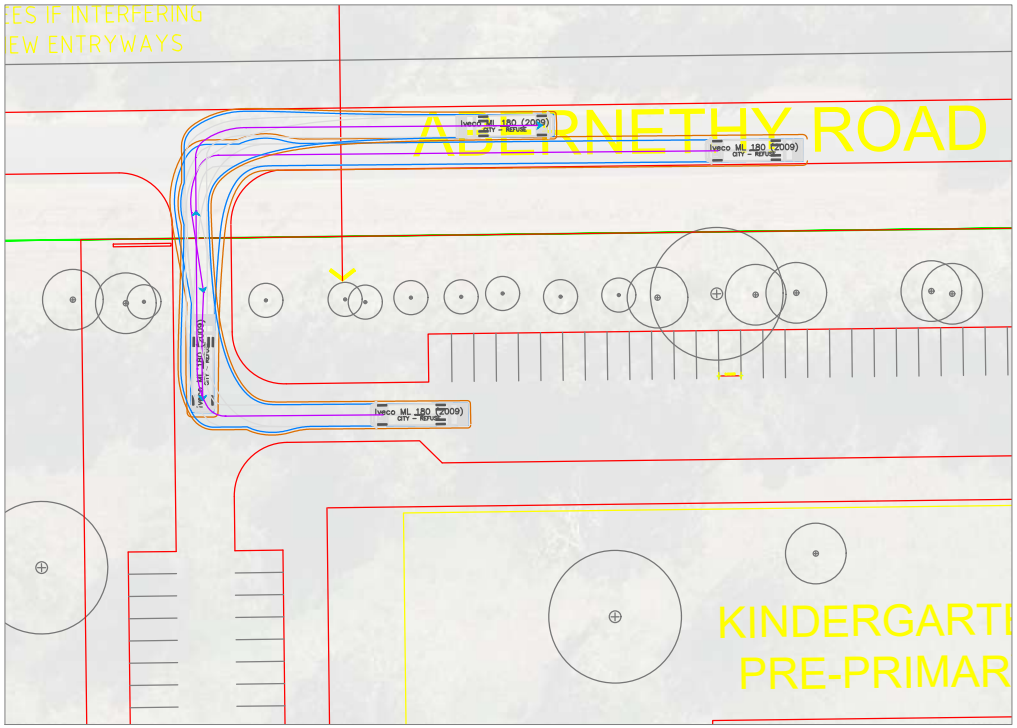
	mm
Width	: 1870
Track	: 1770
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

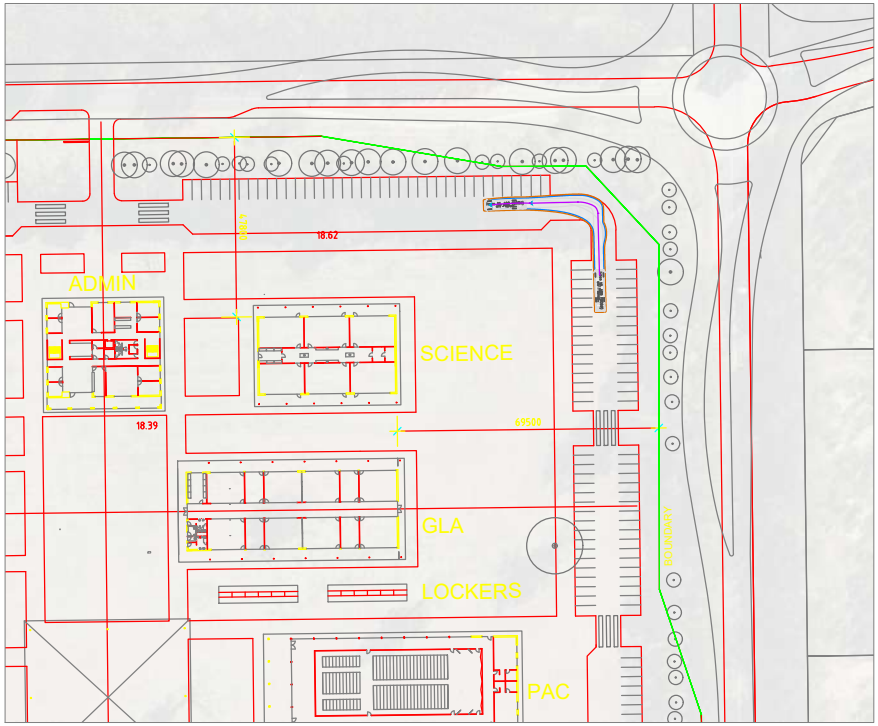
5200

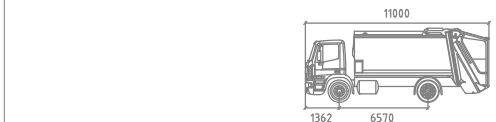
950 3050

B99

	mm
Width	: 1940
Track	: 1840
Lock to Lock Time	: 6.0
Steering Angle	: 33.9







Iveco ML 180 (2009)

	mm
Width	: 2470
Track	: 2450
Lock to Lock Time	: 6.0
Steering Angle	: 51.5

Appendix D SIDRA RESULTS

MOVEMENT SUMMARY

Site: [Kargotich Rd/ Access 4 (Site Folder: 2038 WD - PM)]

Network: N101 [2038 with DEV - PM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Road (S)														
4	L2	79	0.0	79	0.0	0.043	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	449	0.0	449	0.0	0.230	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		528	0.0	528	0.0	0.230	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.1
North: Kargotich Road (N)														
11	T1	442	0.0	442	0.0	0.227	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		442	0.0	442	0.0	0.227	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Access 4														
1	L2	79	0.0	79	0.0	0.075	6.3	LOS A	0.3	2.1	0.45	0.64	0.45	42.6
Approach		79	0.0	79	0.0	0.075	6.3	LOS A	0.3	2.1	0.45	0.64	0.45	42.6
All Vehicles		1049	0.0	1049	0.0	0.230	0.9	NA	0.3	2.1	0.03	0.09	0.03	52.7

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:54 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 1 (Site Folder: 2038 WD - PM)]

Network: N101 [2038 with DEV - PM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 1														
1	L2	26	0.0	26	0.0	0.266	6.2	LOS A	1.0	7.3	0.59	0.82	0.67	39.7
3	R2	132	0.0	132	0.0	0.266	10.3	LOS B	1.0	7.3	0.59	0.82	0.67	39.7
Approach		158	0.0	158	0.0	0.266	9.6	LOS A	1.0	7.3	0.59	0.82	0.67	39.7
East: Abernethy Road (E)														
4	L2	132	0.0	132	0.0	0.250	5.5	LOS A	0.0	0.0	0.00	0.16	0.00	55.3
5	T1	349	0.0	349	0.0	0.250	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	50.8
Approach		481	0.0	481	0.0	0.250	1.5	NA	0.0	0.0	0.00	0.16	0.00	53.5
West: Abernethy Road (W)														
11	T1	405	0.0	405	0.0	0.232	0.3	LOS A	0.3	2.3	0.09	0.04	0.09	48.3
12	R2	26	0.0	26	0.0	0.232	7.0	LOS A	0.3	2.3	0.09	0.04	0.09	48.1
Approach		432	0.0	432	0.0	0.232	0.7	NA	0.3	2.3	0.09	0.04	0.09	48.3
All Vehicles		1071	0.0	1071	0.0	0.266	2.4	NA	1.0	7.3	0.12	0.21	0.14	47.7

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:54 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 1 (Site Folder: 2028 WD - AM)]

Network: N101 [2028 with DEV - AM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 1														
1	L2	15	0.0	15	0.0	0.096	5.2	LOS A	0.3	2.4	0.38	0.64	0.38	42.8
3	R2	75	0.0	75	0.0	0.096	6.3	LOS A	0.3	2.4	0.38	0.64	0.38	42.8
Approach		89	0.0	89	0.0	0.096	6.2	LOS A	0.3	2.4	0.38	0.64	0.38	42.8
East: Abernethy Road (E)														
4	L2	75	0.0	75	0.0	0.146	5.5	LOS A	0.0	0.0	0.00	0.16	0.00	55.4
5	T1	206	0.0	206	0.0	0.146	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	51.1
Approach		281	0.0	281	0.0	0.146	1.5	NA	0.0	0.0	0.00	0.16	0.00	53.7
West: Abernethy Road (W)														
11	T1	161	0.0	161	0.0	0.094	0.1	LOS A	0.1	0.9	0.08	0.05	0.08	48.2
12	R2	15	0.0	15	0.0	0.094	5.6	LOS A	0.1	0.9	0.08	0.05	0.08	48.1
Approach		176	0.0	176	0.0	0.094	0.6	NA	0.1	0.9	0.08	0.05	0.08	48.2
All Vehicles		546	0.0	546	0.0	0.146	2.0	NA	0.3	2.4	0.09	0.20	0.09	48.8

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:38 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 1 (Site Folder: 2028 WD - PM)]

Network: N101 [2028 with DEV - PM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 1														
1	L2	15	0.0	15	0.0	0.094	5.1	LOS A	0.3	2.3	0.35	0.62	0.35	43.0
3	R2	75	0.0	75	0.0	0.094	6.2	LOS A	0.3	2.3	0.35	0.62	0.35	43.0
Approach		89	0.0	89	0.0	0.094	6.0	LOS A	0.3	2.3	0.35	0.62	0.35	43.0
East: Abernethy Road (E)														
4	L2	75	0.0	75	0.0	0.127	5.5	LOS A	0.0	0.0	0.00	0.18	0.00	55.1
5	T1	168	0.0	168	0.0	0.127	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	50.0
Approach		243	0.0	243	0.0	0.127	1.7	NA	0.0	0.0	0.00	0.18	0.00	53.3
West: Abernethy Road (W)														
11	T1	180	0.0	180	0.0	0.103	0.1	LOS A	0.1	0.8	0.06	0.04	0.06	48.4
12	R2	15	0.0	15	0.0	0.103	5.4	LOS A	0.1	0.8	0.06	0.04	0.06	48.2
Approach		195	0.0	195	0.0	0.103	0.5	NA	0.1	0.8	0.06	0.04	0.06	48.4
All Vehicles		527	0.0	527	0.0	0.127	2.0	NA	0.3	2.3	0.08	0.21	0.08	48.6

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:42 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 1 (Site Folder: 2038 WD - AM)]

Network: N101 [2038 with DEV - AM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 1														
1	L2	26	0.0	26	0.0	0.229	5.9	LOS A	0.8	6.0	0.53	0.77	0.54	40.9
3	R2	132	0.0	132	0.0	0.229	8.7	LOS A	0.8	6.0	0.53	0.77	0.54	40.9
Approach		158	0.0	158	0.0	0.229	8.2	LOS A	0.8	6.0	0.53	0.77	0.54	40.9
East: Abernethy Road (E)														
4	L2	132	0.0	132	0.0	0.240	5.5	LOS A	0.0	0.0	0.00	0.17	0.00	55.2
5	T1	329	0.0	329	0.0	0.240	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	50.5
Approach		461	0.0	461	0.0	0.240	1.6	NA	0.0	0.0	0.00	0.17	0.00	53.4
West: Abernethy Road (W)														
11	T1	289	0.0	289	0.0	0.172	0.3	LOS A	0.3	2.1	0.11	0.05	0.11	47.8
12	R2	26	0.0	26	0.0	0.172	6.7	LOS A	0.3	2.1	0.11	0.05	0.11	48.0
Approach		316	0.0	316	0.0	0.172	0.8	NA	0.3	2.1	0.11	0.05	0.11	47.9
All Vehicles		935	0.0	935	0.0	0.240	2.5	NA	0.8	6.0	0.13	0.23	0.13	47.8

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:48 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 2 (Site Folder: 2028 WD - PM)]

Network: N101 [2028 with DEV - PM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 2														
1	L2	9	0.0	9	0.0	0.083	5.0	LOS A	0.3	2.1	0.32	0.60	0.32	43.3
3	R2	75	0.0	75	0.0	0.083	5.8	LOS A	0.3	2.1	0.32	0.60	0.32	43.3
Approach		84	0.0	84	0.0	0.083	5.7	LOS A	0.3	2.1	0.32	0.60	0.32	43.3
East: Abernethy Road (E)														
4	L2	75	0.0	75	0.0	0.115	5.6	LOS A	0.0	0.0	0.00	0.20	0.00	55.6
5	T1	146	0.0	146	0.0	0.115	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	53.6
Approach		221	0.0	221	0.0	0.115	1.9	NA	0.0	0.0	0.00	0.20	0.00	54.8
West: Abernethy Road (W)														
11	T1	120	0.0	120	0.0	0.068	0.1	LOS A	0.1	0.5	0.06	0.04	0.06	47.0
12	R2	9	0.0	9	0.0	0.068	5.3	LOS A	0.1	0.5	0.06	0.04	0.06	47.9
Approach		129	0.0	129	0.0	0.068	0.5	NA	0.1	0.5	0.06	0.04	0.06	47.3
All Vehicles		435	0.0	435	0.0	0.115	2.2	NA	0.3	2.1	0.08	0.23	0.08	50.2

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:42 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 2 (Site Folder: 2038 WD - AM)]

Network: N101 [2038 with DEV - AM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 2														
1	L2	16	0.0	16	0.0	0.173	5.3	LOS A	0.6	4.5	0.44	0.70	0.44	42.3
3	R2	132	0.0	132	0.0	0.173	6.9	LOS A	0.6	4.5	0.44	0.70	0.44	42.3
Approach		147	0.0	147	0.0	0.173	6.7	LOS A	0.6	4.5	0.44	0.70	0.44	42.3
East: Abernethy Road (E)														
4	L2	132	0.0	132	0.0	0.186	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	55.4
5	T1	224	0.0	224	0.0	0.186	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	53.1
Approach		356	0.0	356	0.0	0.186	2.1	NA	0.0	0.0	0.00	0.22	0.00	54.5
West: Abernethy Road (W)														
11	T1	184	0.0	184	0.0	0.107	0.2	LOS A	0.1	1.0	0.09	0.05	0.09	46.3
12	R2	16	0.0	16	0.0	0.107	5.9	LOS A	0.1	1.0	0.09	0.05	0.09	47.7
Approach		200	0.0	200	0.0	0.107	0.6	NA	0.1	1.0	0.09	0.05	0.09	46.7
All Vehicles		703	0.0	703	0.0	0.186	2.6	NA	0.6	4.5	0.12	0.27	0.12	49.5

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:48 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 2 (Site Folder: 2028 WD - AM)]

Network: N101 [2028 with DEV - AM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 2														
1	L2	9	0.0	9	0.0	0.082	5.0	LOS A	0.3	2.0	0.31	0.59	0.31	43.3
3	R2	75	0.0	75	0.0	0.082	5.7	LOS A	0.3	2.0	0.31	0.59	0.31	43.3
Approach		84	0.0	84	0.0	0.082	5.6	LOS A	0.3	2.0	0.31	0.59	0.31	43.3
East: Abernethy Road (E)														
4	L2	75	0.0	75	0.0	0.115	5.6	LOS A	0.0	0.0	0.00	0.20	0.00	55.6
5	T1	146	0.0	146	0.0	0.115	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	53.6
Approach		221	0.0	221	0.0	0.115	1.9	NA	0.0	0.0	0.00	0.20	0.00	54.8
West: Abernethy Road (W)														
11	T1	101	0.0	101	0.0	0.058	0.1	LOS A	0.1	0.5	0.07	0.05	0.07	46.6
12	R2	9	0.0	9	0.0	0.058	5.3	LOS A	0.1	0.5	0.07	0.05	0.07	47.8
Approach		111	0.0	111	0.0	0.058	0.5	NA	0.1	0.5	0.07	0.05	0.07	47.0
All Vehicles		416	0.0	416	0.0	0.115	2.3	NA	0.3	2.0	0.08	0.24	0.08	50.2

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:38 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 2 (Site Folder: 2038 WD - PM)]

Network: N101 [2038 with DEV - PM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 2														
1	L2	16	0.0	16	0.0	0.199	5.4	LOS A	0.7	5.1	0.49	0.76	0.49	41.5
3	R2	132	0.0	132	0.0	0.199	7.8	LOS A	0.7	5.1	0.49	0.76	0.49	41.5
Approach		147	0.0	147	0.0	0.199	7.6	LOS A	0.7	5.1	0.49	0.76	0.49	41.5
East: Abernethy Road (E)														
4	L2	132	0.0	132	0.0	0.196	5.6	LOS A	0.0	0.0	0.00	0.21	0.00	55.5
5	T1	244	0.0	244	0.0	0.196	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	53.4
Approach		376	0.0	376	0.0	0.196	2.0	NA	0.0	0.0	0.00	0.21	0.00	54.7
West: Abernethy Road (W)														
11	T1	300	0.0	300	0.0	0.167	0.1	LOS A	0.2	1.1	0.06	0.03	0.06	47.5
12	R2	16	0.0	16	0.0	0.167	6.1	LOS A	0.2	1.1	0.06	0.03	0.06	47.9
Approach		316	0.0	316	0.0	0.167	0.4	NA	0.2	1.1	0.06	0.03	0.06	47.6
All Vehicles		839	0.0	839	0.0	0.199	2.4	NA	0.7	5.1	0.11	0.24	0.11	49.4

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:54 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 3 (Site Folder: 2038 WD - AM)]

Network: N101 [2038 with DEV - AM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 3														
1	L2	37	0.0	37	0.0	0.134	5.0	LOS A	0.5	3.5	0.30	0.59	0.30	45.9
3	R2	105	0.0	105	0.0	0.134	5.9	LOS A	0.5	3.5	0.30	0.59	0.30	43.3
Approach		142	0.0	142	0.0	0.134	5.7	LOS A	0.5	3.5	0.30	0.59	0.30	44.3
East: Abernethy Road (E)														
4	L2	105	0.0	105	0.0	0.126	5.5	LOS A	0.0	0.0	0.00	0.26	0.00	54.0
5	T1	135	0.0	135	0.0	0.126	0.0	LOS A	0.0	0.0	0.00	0.26	0.00	56.3
Approach		240	0.0	240	0.0	0.126	2.4	NA	0.0	0.0	0.00	0.26	0.00	55.3
West: Abernethy Road (W)														
11	T1	95	0.0	95	0.0	0.075	0.3	LOS A	0.2	1.8	0.21	0.16	0.21	47.3
12	R2	37	0.0	37	0.0	0.075	5.4	LOS A	0.2	1.8	0.21	0.16	0.21	47.7
Approach		132	0.0	132	0.0	0.075	1.8	NA	0.2	1.8	0.21	0.16	0.21	47.5
All Vehicles		514	0.0	514	0.0	0.134	3.2	NA	0.5	3.5	0.14	0.33	0.14	49.7

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:48 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 3 (Site Folder: 2028 WD - PM)]

Network: N101 [2028 with DEV - PM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 3														
1	L2	21	0.0	21	0.0	0.068	4.7	LOS A	0.2	1.7	0.18	0.54	0.18	46.2
3	R2	60	0.0	60	0.0	0.068	5.2	LOS A	0.2	1.7	0.18	0.54	0.18	43.8
Approach		81	0.0	81	0.0	0.068	5.1	LOS A	0.2	1.7	0.18	0.54	0.18	44.7
East: Abernethy Road (E)														
4	L2	60	0.0	60	0.0	0.062	5.5	LOS A	0.0	0.0	0.00	0.30	0.00	53.6
5	T1	58	0.0	58	0.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	55.8
Approach		118	0.0	118	0.0	0.062	2.8	NA	0.0	0.0	0.00	0.30	0.00	54.6
West: Abernethy Road (W)														
11	T1	69	0.0	69	0.0	0.049	0.1	LOS A	0.1	0.9	0.11	0.13	0.11	48.0
12	R2	21	0.0	21	0.0	0.049	4.9	LOS A	0.1	0.9	0.11	0.13	0.11	48.0
Approach		91	0.0	91	0.0	0.049	1.2	NA	0.1	0.9	0.11	0.13	0.11	48.0
All Vehicles		289	0.0	289	0.0	0.068	3.0	NA	0.2	1.7	0.09	0.31	0.09	49.4

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:42 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 3 (Site Folder: 2038 WD - PM)]

Network: N101 [2038 with DEV - PM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 3														
1	L2	37	0.0	37	0.0	0.150	5.1	LOS A	0.5	3.9	0.35	0.63	0.35	45.6
3	R2	105	0.0	105	0.0	0.150	6.6	LOS A	0.5	3.9	0.35	0.63	0.35	42.8
Approach		142	0.0	142	0.0	0.150	6.2	LOS A	0.5	3.9	0.35	0.63	0.35	43.9
East: Abernethy Road (E)														
4	L2	105	0.0	105	0.0	0.136	5.5	LOS A	0.0	0.0	0.00	0.24	0.00	54.3
5	T1	155	0.0	155	0.0	0.136	0.0	LOS A	0.0	0.0	0.00	0.24	0.00	56.6
Approach		260	0.0	260	0.0	0.136	2.2	NA	0.0	0.0	0.00	0.24	0.00	55.6
West: Abernethy Road (W)														
11	T1	211	0.0	211	0.0	0.135	0.2	LOS A	0.3	2.1	0.13	0.09	0.13	48.4
12	R2	37	0.0	37	0.0	0.135	5.5	LOS A	0.3	2.1	0.13	0.09	0.13	48.2
Approach		247	0.0	247	0.0	0.135	1.0	NA	0.3	2.1	0.13	0.09	0.13	48.4
All Vehicles		649	0.0	649	0.0	0.150	2.6	NA	0.5	3.9	0.13	0.27	0.13	49.9

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:54 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Abernethy Rd/ Access 3 (Site Folder: 2028 WD - AM)]

Network: N101 [2028 with DEV - AM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Access 3														
1	L2	21	0.0	21	0.0	0.069	4.8	LOS A	0.2	1.8	0.23	0.55	0.23	46.1
3	R2	60	0.0	60	0.0	0.069	5.3	LOS A	0.2	1.8	0.23	0.55	0.23	43.6
Approach		81	0.0	81	0.0	0.069	5.2	LOS A	0.2	1.8	0.23	0.55	0.23	44.6
East: Abernethy Road (E)														
4	L2	60	0.0	60	0.0	0.081	5.5	LOS A	0.0	0.0	0.00	0.23	0.00	54.4
5	T1	96	0.0	96	0.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	56.8
Approach		156	0.0	156	0.0	0.081	2.1	NA	0.0	0.0	0.00	0.23	0.00	55.8
West: Abernethy Road (W)														
11	T1	51	0.0	51	0.0	0.040	0.2	LOS A	0.1	0.9	0.16	0.16	0.16	47.4
12	R2	21	0.0	21	0.0	0.040	5.0	LOS A	0.1	0.9	0.16	0.16	0.16	47.7
Approach		72	0.0	72	0.0	0.040	1.6	NA	0.1	0.9	0.16	0.16	0.16	47.6
All Vehicles		308	0.0	308	0.0	0.081	2.8	NA	0.2	1.8	0.10	0.30	0.10	50.4

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:38 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: 101 [Kargotich Rd- Abernethy Rd - AM (Site Folder: 2038 WD - AM)]

Network: N101 [2038 with DEV - AM (Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Rd S														
1	L2	38	0.0	38	0.0	0.506	10.0	LOS A	4.1	31.2	0.76	0.83	0.81	43.3
2	T1	302	5.0	302	5.0	0.506	10.9	LOS B	4.1	31.2	0.76	0.83	0.81	60.5
3	R2	69	8.0	69	8.0	0.506	16.5	LOS B	4.1	31.2	0.76	0.83	0.81	57.1
3u	U	79	0.0	79	0.0	0.506	19.0	LOS B	4.1	31.2	0.76	0.83	0.81	43.3
Approach		488	4.2	488	4.2	0.506	13.0	LOS B	4.1	31.2	0.76	0.83	0.81	57.5
East: Abernethy Rd E														
4	L2	31	2.0	31	2.0	0.324	7.4	LOS A	2.1	16.0	0.58	0.67	0.58	56.2
5	T1	247	2.0	247	2.0	0.324	7.9	LOS A	2.1	16.0	0.58	0.67	0.58	56.2
6	R2	76	2.0	76	2.0	0.324	13.6	LOS B	2.1	16.0	0.58	0.67	0.58	66.0
Approach		354	2.0	354	2.0	0.324	9.1	LOS A	2.1	16.0	0.58	0.67	0.58	59.2
North: Kargotich Rd N														
7	L2	21	7.0	21	7.0	0.267	8.5	LOS A	1.7	13.1	0.60	0.73	0.60	61.7
8	T1	79	15.0	79	15.0	0.267	9.5	LOS A	1.7	13.1	0.60	0.73	0.60	56.6
9	R2	176	0.0	176	0.0	0.267	14.4	LOS B	1.7	13.1	0.60	0.73	0.60	56.6
Approach		276	4.8	276	4.8	0.267	12.5	LOS B	1.7	13.1	0.60	0.73	0.60	57.2
West: Abernethy Rd W														
10	L2	176	0.0	176	0.0	0.455	5.8	LOS A	3.5	25.9	0.79	0.70	0.80	57.7
11	T1	232	0.0	232	0.0	0.455	5.6	LOS A	3.5	25.9	0.79	0.70	0.80	57.7
12	R2	14	0.0	14	0.0	0.455	10.9	LOS B	3.5	25.9	0.79	0.70	0.80	31.6
Approach		421	0.0	421	0.0	0.455	5.9	LOS A	3.5	25.9	0.79	0.70	0.80	57.3
All Vehicles		1539	2.7	1539	2.7	0.506	10.1	LOS B	4.1	31.2	0.70	0.74	0.72	57.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:48 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: 101 [Kargotich Rd- Abernethy Rd - AM (Site Folder: 2028 WD - AM)]

Network: N101 [2028 with DEV - AM (Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Rd S														
1	L2	23	0.0	23	0.0	0.566	8.9	LOS A	4.9	37.7	0.72	0.74	0.74	45.2
2	T1	496	5.0	496	5.0	0.566	9.8	LOS A	4.9	37.7	0.72	0.74	0.74	62.0
3	R2	57	8.0	57	8.0	0.566	15.4	LOS B	4.9	37.7	0.72	0.74	0.74	58.4
3u	U	45	0.0	45	0.0	0.566	17.9	LOS B	4.9	37.7	0.72	0.74	0.74	45.2
Approach		621	4.7	621	4.7	0.566	10.8	LOS B	4.9	37.7	0.72	0.74	0.74	60.6
East: Abernethy Rd E														
4	L2	80	2.0	80	2.0	0.327	8.1	LOS A	2.2	16.4	0.66	0.73	0.66	55.5
5	T1	162	2.0	162	2.0	0.327	8.6	LOS A	2.2	16.4	0.66	0.73	0.66	55.5
6	R2	83	2.0	83	2.0	0.327	14.2	LOS B	2.2	16.4	0.66	0.73	0.66	65.5
Approach		325	2.0	325	2.0	0.327	9.9	LOS A	2.2	16.4	0.66	0.73	0.66	59.1
North: Kargotich Rd N														
7	L2	27	7.0	27	7.0	0.366	7.7	LOS A	2.5	20.4	0.52	0.64	0.52	63.7
8	T1	296	15.0	296	15.0	0.366	8.7	LOS A	2.5	20.4	0.52	0.64	0.52	59.7
9	R2	96	0.0	96	0.0	0.366	13.7	LOS B	2.5	20.4	0.52	0.64	0.52	59.7
Approach		419	11.0	419	11.0	0.366	9.8	LOS A	2.5	20.4	0.52	0.64	0.52	60.2
West: Abernethy Rd W														
10	L2	96	0.0	96	0.0	0.297	6.5	LOS A	2.1	15.6	0.81	0.75	0.81	57.2
11	T1	132	0.0	132	0.0	0.297	6.3	LOS A	2.1	15.6	0.81	0.75	0.81	57.2
12	R2	7	0.0	7	0.0	0.297	11.6	LOS B	2.1	15.6	0.81	0.75	0.81	31.1
Approach		235	0.0	235	0.0	0.297	6.6	LOS A	2.1	15.6	0.81	0.75	0.81	56.8
All Vehicles		1600	5.1	1600	5.1	0.566	9.8	LOS A	4.9	37.7	0.67	0.71	0.68	59.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:38 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: 101 [Kargotich Rd- Abernethy Rd - AM (Site Folder: Existing)]

Kargotich Rd- Abernethy Rd - Existing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Rd S														
1	L2	21	0.0	22	0.0	0.338	8.8	LOS A	0.8	5.9	0.15	0.09	0.15	61.8
2	T1	484	5.0	509	5.0	0.338	0.3	LOS A	0.8	5.9	0.15	0.09	0.15	86.3
3	R2	61	8.0	64	8.0	0.338	8.9	LOS A	0.8	5.9	0.15	0.09	0.15	70.1
Approach		566	5.1	596	5.1	0.338	1.5	NA	0.8	5.9	0.15	0.09	0.15	83.0
East: Abernethy Rd E														
4	L2	105	4.0	111	4.0	0.471	12.9	LOS B	2.5	18.7	0.59	1.04	0.90	56.6
5	T1	54	0.0	57	0.0	0.471	21.1	LOS C	2.5	18.7	0.59	1.04	0.90	47.7
6	R2	61	0.0	64	0.0	0.471	23.0	LOS C	2.5	18.7	0.59	1.04	0.90	57.5
Approach		220	1.9	232	1.9	0.471	17.7	LOS C	2.5	18.7	0.59	1.04	0.90	54.3
North: Kargotich Rd N														
7	L2	15	4.0	16	4.0	0.164	8.0	LOS A	0.0	0.3	0.02	0.13	0.02	75.4
8	T1	240	13.0	253	13.0	0.164	0.6	LOS A	0.0	0.3	0.02	0.13	0.02	85.9
9	R2	2	4.0	2	4.0	0.164	10.0	LOS B	0.0	0.3	0.02	0.13	0.02	60.4
Approach		257	12.4	271	12.4	0.164	1.1	NA	0.0	0.3	0.02	0.13	0.02	84.9
West: Abernethy Rd W														
10	L2	2	2.0	2	2.0	0.050	10.3	LOS B	0.2	1.2	0.71	1.01	0.71	48.5
11	T1	10	2.0	11	2.0	0.050	15.5	LOS C	0.2	1.2	0.71	1.01	0.71	47.0
12	R2	4	2.0	4	2.0	0.050	20.5	LOS C	0.2	1.2	0.71	1.01	0.71	48.2
Approach		16	2.0	17	2.0	0.050	16.1	LOS C	0.2	1.2	0.71	1.01	0.71	47.5
All Vehicles		1059	6.2	1115	6.2	0.471	5.0	NA	2.5	18.7	0.22	0.31	0.28	74.4

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

MOVEMENT SUMMARY

Site: 101 [Kargotich Rd- Abernethy Rd - PM (Site Folder: Existing)]

Kargotich Rd- Abernethy Rd - Existing
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Rd S														
1	L2	5	15.0	5	15.0	0.109	9.4	LOS A	0.3	2.4	0.21	0.14	0.21	59.9
2	T1	131	8.0	138	8.0	0.109	0.5	LOS A	0.3	2.4	0.21	0.14	0.21	84.8
3	R2	29	7.0	31	7.0	0.109	9.0	LOS A	0.3	2.4	0.21	0.14	0.21	69.7
Approach		165	8.0	174	8.0	0.109	2.3	NA	0.3	2.4	0.21	0.14	0.21	80.7
East: Abernethy Rd E														
4	L2	50	8.0	53	8.0	0.110	11.5	LOS B	0.4	3.2	0.48	0.95	0.48	60.8
5	T1	12	0.0	13	0.0	0.110	12.3	LOS B	0.4	3.2	0.48	0.95	0.48	51.7
6	R2	14	7.0	15	7.0	0.110	14.2	LOS B	0.4	3.2	0.48	0.95	0.48	60.7
Approach		76	6.6	80	6.6	0.110	12.1	LOS B	0.4	3.2	0.48	0.95	0.48	59.1
North: Kargotich Rd N														
7	L2	26	0.0	27	0.0	0.211	7.5	LOS A	0.0	0.1	0.00	0.09	0.00	77.8
8	T1	335	6.0	353	6.0	0.211	0.3	LOS A	0.0	0.1	0.00	0.09	0.00	87.4
9	R2	1	0.0	1	0.0	0.211	7.6	LOS A	0.0	0.1	0.00	0.09	0.00	62.2
Approach		362	5.6	381	5.6	0.211	0.8	NA	0.0	0.1	0.00	0.09	0.00	86.5
West: Abernethy Rd W														
10	L2	1	0.0	1	0.0	0.028	8.0	LOS A	0.1	0.7	0.49	0.95	0.49	51.8
11	T1	12	0.0	13	0.0	0.028	10.8	LOS B	0.1	0.7	0.49	0.95	0.49	50.2
12	R2	3	0.0	3	0.0	0.028	11.8	LOS B	0.1	0.7	0.49	0.95	0.49	51.5
Approach		16	0.0	17	0.0	0.028	10.8	LOS B	0.1	0.7	0.49	0.95	0.49	50.5
All Vehicles		619	6.2	652	6.2	0.211	2.8	NA	0.4	3.2	0.13	0.23	0.13	79.1

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

MOVEMENT SUMMARY

Site: 101 [Kargotich Rd- Abernethy Rd - PM (Site Folder: 2028 WD - PM)]

Network: N101 [2028 with DEV - PM (Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Rd S														
1	L2	9	20.0	9	20.0	0.280	8.0	LOS A	1.7	14.0	0.48	0.65	0.48	46.7
2	T1	198	8.0	198	8.0	0.280	8.4	LOS A	1.7	14.0	0.48	0.65	0.48	61.9
3	R2	68	7.0	68	7.0	0.280	13.9	LOS B	1.7	14.0	0.48	0.65	0.48	59.4
3u	U	45	0.0	45	0.0	0.280	16.5	LOS B	1.7	14.0	0.48	0.65	0.48	46.7
Approach		321	7.0	321	7.0	0.280	10.7	LOS B	1.7	14.0	0.48	0.65	0.48	59.8
East: Abernethy Rd E														
4	L2	42	8.0	42	8.0	0.200	8.6	LOS A	1.3	9.6	0.68	0.71	0.68	56.4
5	T1	129	0.0	129	0.0	0.200	8.9	LOS A	1.3	9.6	0.68	0.71	0.68	56.4
6	R2	11	7.0	11	7.0	0.200	14.8	LOS B	1.3	9.6	0.68	0.71	0.68	64.8
Approach		182	2.3	182	2.3	0.200	9.2	LOS A	1.3	9.6	0.68	0.71	0.68	57.2
North: Kargotich Rd N														
7	L2	38	7.0	38	7.0	0.451	8.0	LOS A	3.2	26.5	0.57	0.66	0.57	63.5
8	T1	373	15.0	373	15.0	0.451	9.0	LOS A	3.2	26.5	0.57	0.66	0.57	59.4
9	R2	104	0.0	104	0.0	0.451	14.0	LOS B	3.2	26.5	0.57	0.66	0.57	59.4
Approach		515	11.4	515	11.4	0.451	9.9	LOS A	3.2	26.5	0.57	0.66	0.57	59.9
West: Abernethy Rd W														
10	L2	104	0.0	104	0.0	0.228	4.0	LOS A	1.4	10.3	0.53	0.50	0.53	59.6
11	T1	137	0.0	137	0.0	0.228	3.8	LOS A	1.4	10.3	0.53	0.50	0.53	59.6
12	R2	14	0.0	14	0.0	0.228	9.1	LOS A	1.4	10.3	0.53	0.50	0.53	34.2
Approach		255	0.0	255	0.0	0.228	4.2	LOS A	1.4	10.3	0.53	0.50	0.53	59.0
All Vehicles		1273	6.7	1273	6.7	0.451	8.9	LOS A	3.2	26.5	0.56	0.63	0.56	59.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:42 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: 101 [Kargotich Rd- Abernethy Rd - PM (Site Folder: 2038 WD - PM)]

Network: N101 [2038 with DEV - PM (Network Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Rd S														
1	L2	31	20.0	31	20.0	0.560	11.4	LOS B	5.0	40.2	0.79	0.85	0.88	43.3
2	T1	385	8.0	385	8.0	0.560	11.6	LOS B	5.0	40.2	0.79	0.85	0.88	59.6
3	R2	35	7.0	35	7.0	0.560	17.0	LOS B	5.0	40.2	0.79	0.85	0.88	57.3
3u	U	79	0.0	79	0.0	0.560	19.5	LOS B	5.0	40.2	0.79	0.85	0.88	43.3
Approach		529	7.4	529	7.4	0.560	13.1	LOS B	5.0	40.2	0.79	0.85	0.88	57.4
East: Abernethy Rd E														
4	L2	38	8.0	38	8.0	0.345	9.7	LOS A	2.5	18.7	0.80	0.81	0.80	54.8
5	T1	223	0.0	223	0.0	0.345	9.9	LOS A	2.5	18.7	0.80	0.81	0.80	54.8
6	R2	21	7.0	21	7.0	0.345	15.8	LOS B	2.5	18.7	0.80	0.81	0.80	63.7
Approach		282	1.6	282	1.6	0.345	10.3	LOS B	2.5	18.7	0.80	0.81	0.80	55.8
North: Kargotich Rd N														
7	L2	59	7.0	59	7.0	0.569	9.9	LOS A	5.2	41.2	0.78	0.81	0.84	61.3
8	T1	281	15.0	281	15.0	0.569	10.9	LOS B	5.2	41.2	0.78	0.81	0.84	55.8
9	R2	228	0.0	228	0.0	0.569	15.8	LOS B	5.2	41.2	0.78	0.81	0.84	55.8
Approach		568	8.1	568	8.1	0.569	12.8	LOS B	5.2	41.2	0.78	0.81	0.84	56.8
West: Abernethy Rd W														
10	L2	252	0.0	252	0.0	0.596	7.8	LOS A	6.0	44.4	0.88	0.90	1.03	55.8
11	T1	242	0.0	242	0.0	0.596	7.6	LOS A	6.0	44.4	0.88	0.90	1.03	55.8
12	R2	43	0.0	43	0.0	0.596	12.9	LOS B	6.0	44.4	0.88	0.90	1.03	29.4
Approach		537	0.0	537	0.0	0.596	8.1	LOS A	6.0	44.4	0.88	0.90	1.03	54.7
All Vehicles		1917	4.7	1917	4.7	0.596	11.2	LOS B	6.0	44.4	0.81	0.85	0.90	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:54 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Kargotich Rd/ Access 4 (Site Folder: 2028 WD - AM)]

Network: N101 [2028 with DEV - AM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Road (S)														
4	L2	45	0.0	45	0.0	0.025	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	576	0.0	576	0.0	0.295	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		621	0.0	621	0.0	0.295	0.5	NA	0.0	0.0	0.00	0.04	0.00	58.9
North: Kargotich Road (N)														
11	T1	428	0.0	428	0.0	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		428	0.0	428	0.0	0.220	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Access 4														
1	L2	45	0.0	45	0.0	0.050	6.9	LOS A	0.2	1.3	0.51	0.68	0.51	42.1
Approach		45	0.0	45	0.0	0.050	6.9	LOS A	0.2	1.3	0.51	0.68	0.51	42.1
All Vehicles		1095	0.0	1095	0.0	0.295	0.6	NA	0.2	1.3	0.02	0.05	0.02	53.6

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:38 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Kargotich Rd/ Access 4 (Site Folder: 2028 WD - PM)]

Network: N101 [2028 with DEV - PM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Road (S)														
4	L2	45	0.0	45	0.0	0.025	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	276	0.0	276	0.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		321	0.0	321	0.0	0.141	0.8	NA	0.0	0.0	0.00	0.08	0.00	58.2
North: Kargotich Road (N)														
11	T1	474	0.0	474	0.0	0.243	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		474	0.0	474	0.0	0.243	0.0	NA	0.0	0.0	0.00	0.00	0.00	49.9
West: Access 4														
1	L2	45	0.0	45	0.0	0.035	5.4	LOS A	0.1	1.0	0.34	0.55	0.34	43.1
Approach		45	0.0	45	0.0	0.035	5.4	LOS A	0.1	1.0	0.34	0.55	0.34	43.1
All Vehicles		840	0.0	840	0.0	0.243	0.6	NA	0.1	1.0	0.02	0.06	0.02	52.0

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

Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:42 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

MOVEMENT SUMMARY

Site: [Kargotich Rd/ Access 4 (Site Folder: 2038 WD - AM)]

Network: N101 [2038 with DEV - AM (Network Folder: General)]

Site Category: (None)
Give-Way (Two-Way)

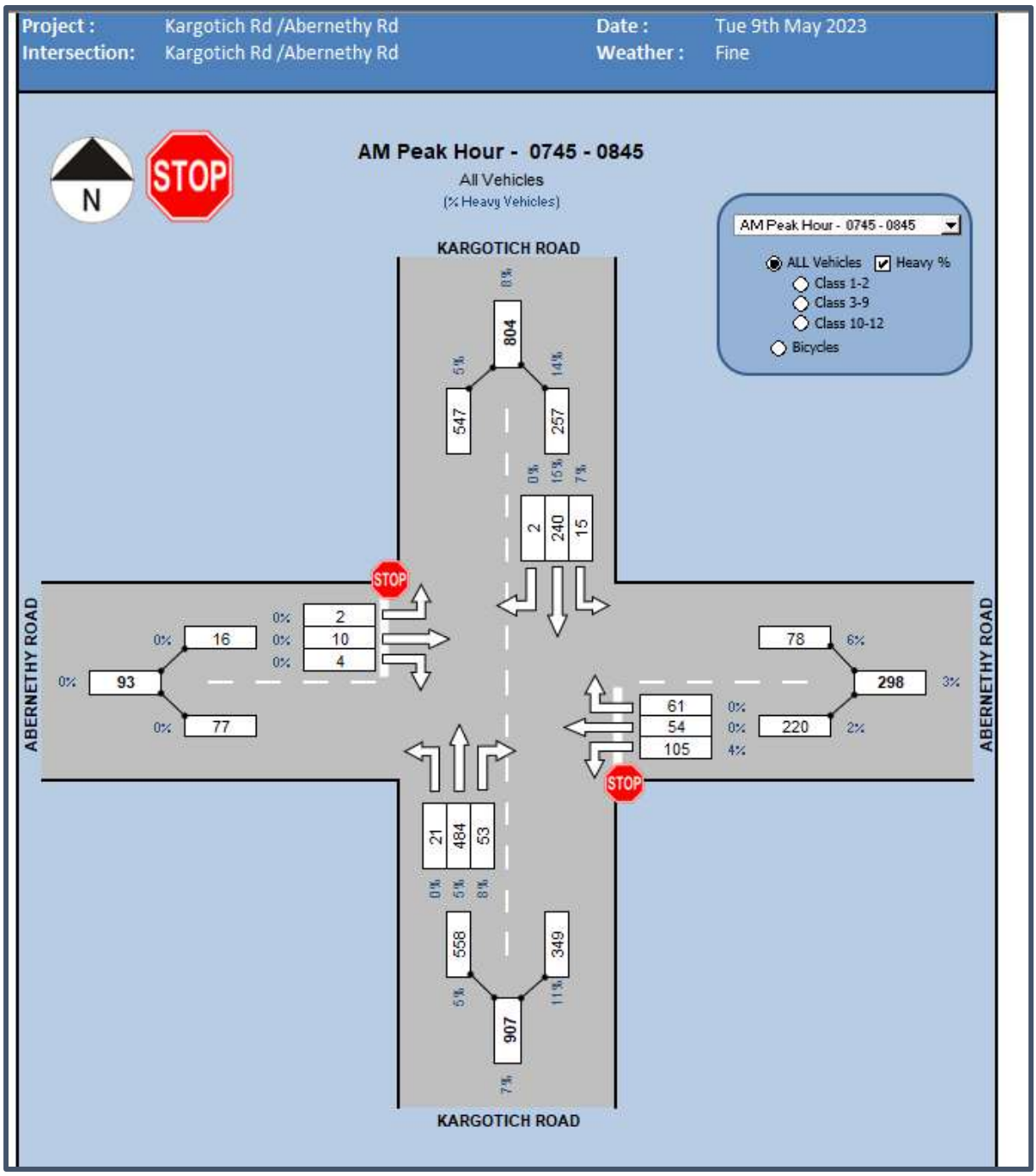
Vehicle Movement Performance

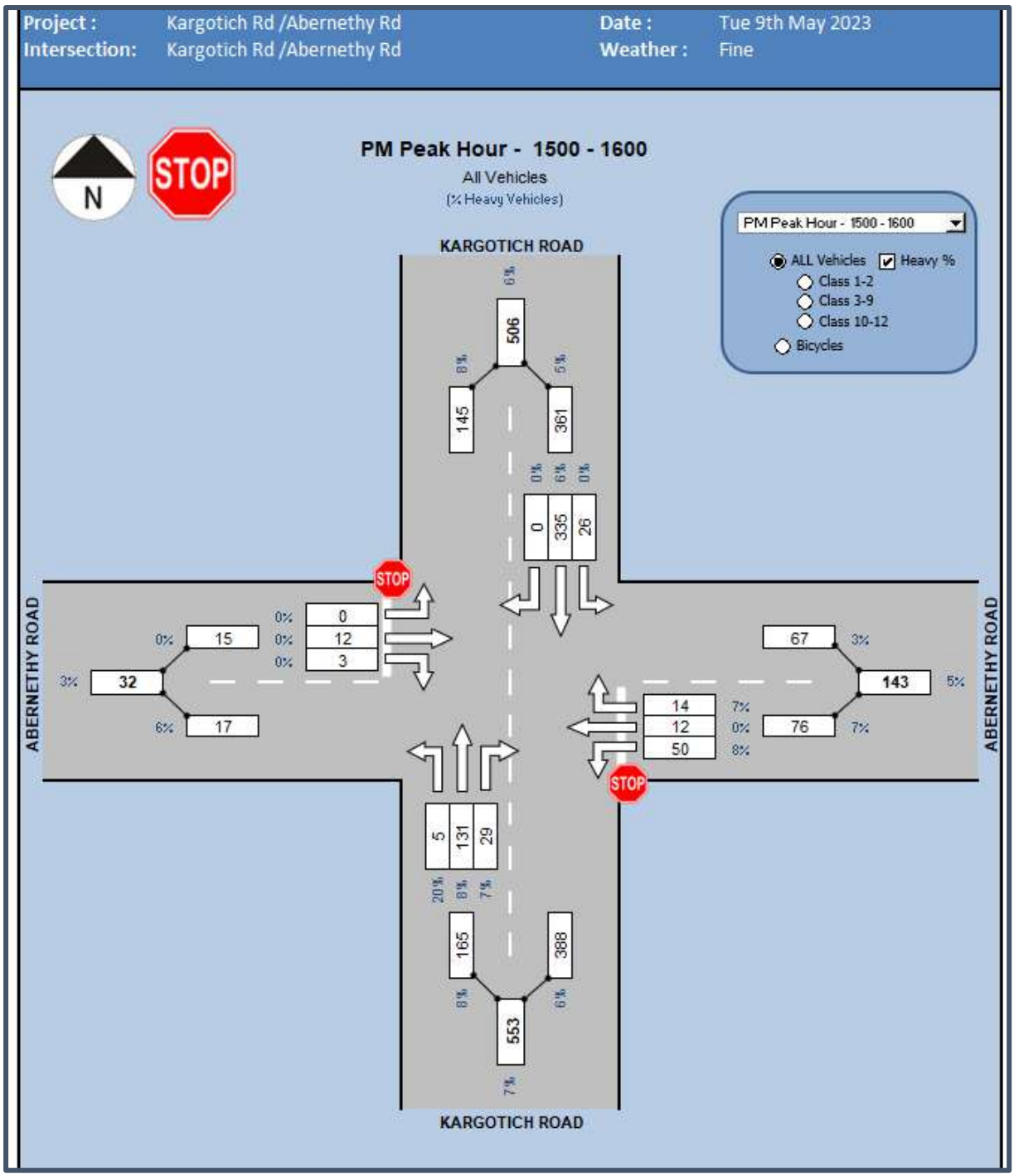
Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kargotich Road (S)														
4	L2	79	0.0	79	0.0	0.043	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	409	0.0	409	0.0	0.210	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		488	0.0	488	0.0	0.210	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.0
North: Kargotich Road (N)														
11	T1	202	0.0	202	0.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		202	0.0	202	0.0	0.104	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Access 4														
1	L2	79	0.0	79	0.0	0.071	6.1	LOS A	0.3	2.0	0.43	0.62	0.43	42.7
Approach		79	0.0	79	0.0	0.071	6.1	LOS A	0.3	2.0	0.43	0.62	0.43	42.7
All Vehicles		769	0.0	769	0.0	0.210	1.2	NA	0.3	2.0	0.04	0.12	0.04	53.6

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

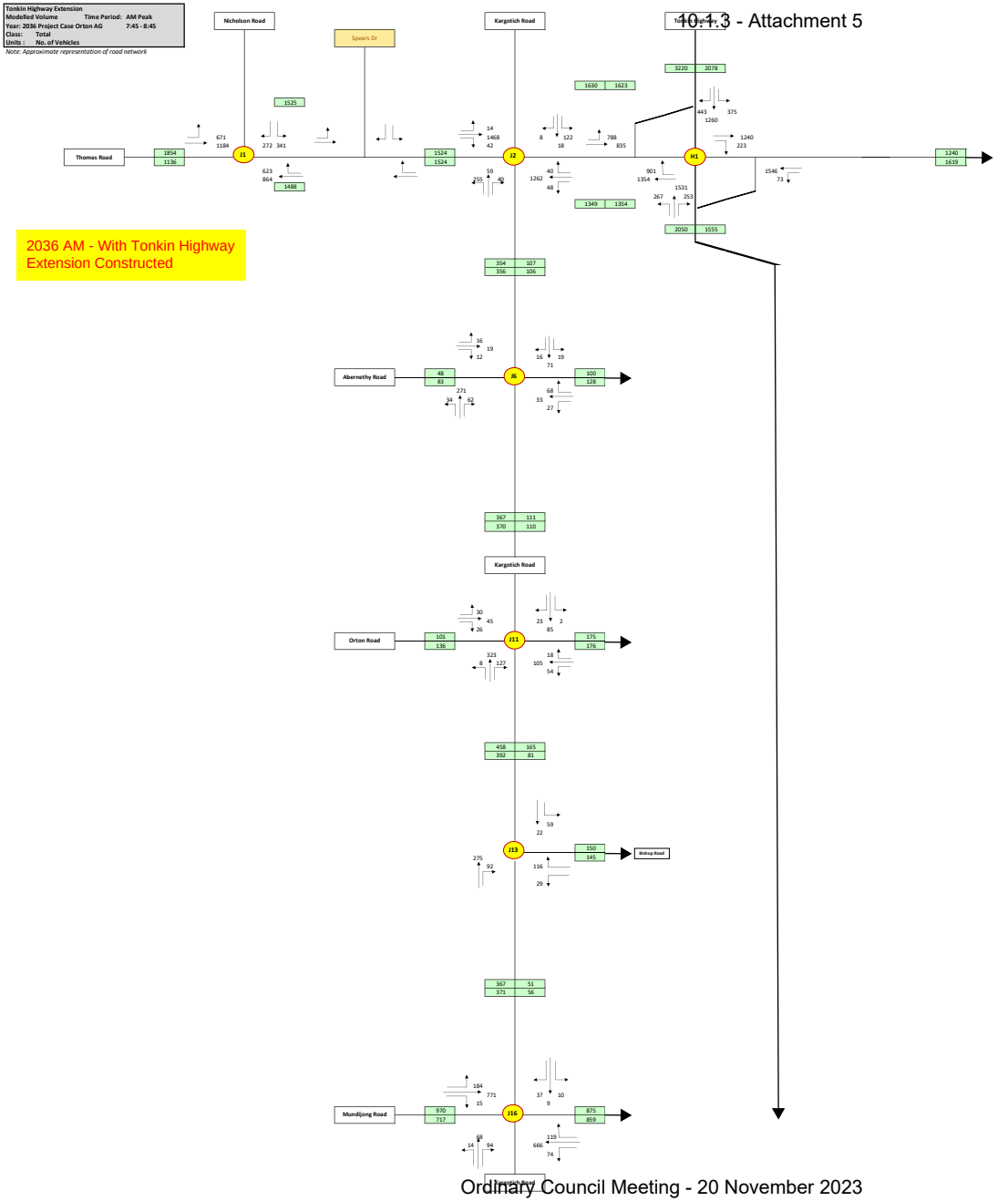
Organisation: CARDNO PTY LTD | Licence: NETWORK / Enterprise | Processed: Thursday, 13 July 2023 9:17:48 AM
Project: K:\Projects\CW1200712_300304677_Free Reformed School_575 Abernethy Rd_Oakford - TIA & WMP\5_Technical\Traffic\Modelling\SIDRA V2.sip9

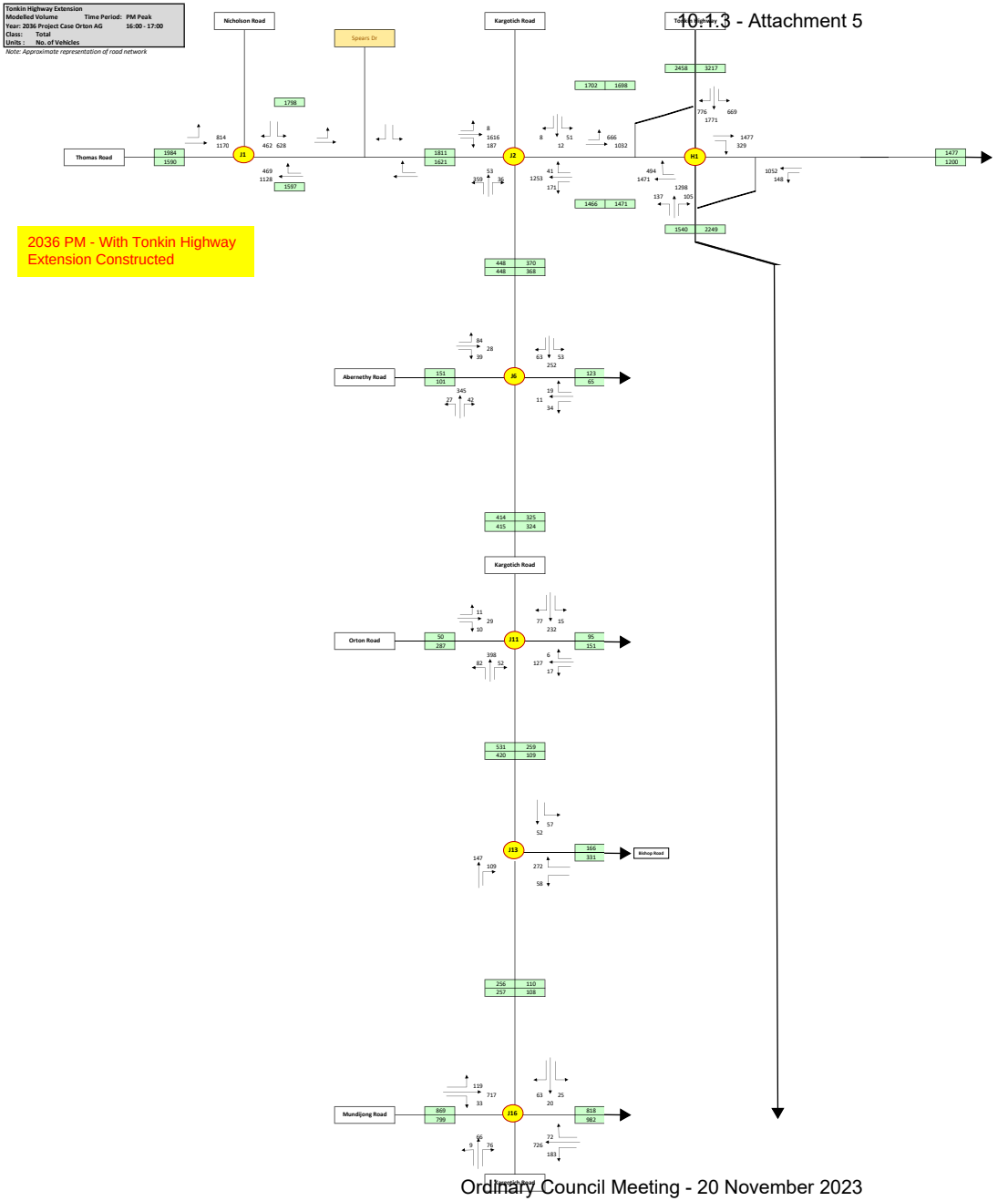
Appendix E TRAFFIC COUNT SURVEY DATA


Project : Kargotich Rd /Abernethy Rd
Intersection: Kargotich Rd /Abernethy Rd
Date : Tue 9th May 2023
Weather : Fine
N
STOP
AM Peak Hour - 0745 - 0845
All Vehicles
(% Heavy Vehicles)
AM Peak Hour - 0745 - 0845
ALL Vehicles
Heavy %
Class 1-2
Class 3-9
Class 10-12
Bicycles
KARGOTICH ROAD
ABERNETHY ROAD
ABERNETHY ROAD
KARGOTICH ROAD
804
547
257
2
240
15
2
10
4
16
93
77
78
298
220
61
54
105
21
484
53
558
907
349


Project : Kargotich Rd /Abernethy Rd
Intersection: Kargotich Rd /Abernethy Rd
Date : Tue 9th May 2023
Weather : Fine
N
STOP
PM Peak Hour - 1500 - 1600
All Vehicles
(% Heavy Vehicles)
PM Peak Hour - 1500 - 1600
ALL Vehicles
Heavy %
Class 1-2
Class 3-9
Class 10-12
Bicycles
KARGOTICH ROAD
ABERNETHY ROAD
ABERNETHY ROAD
KARGOTICH ROAD
STOP
STOP
6%
506
8%
145
5%
361
0%
0
6%
335
0%
26
0%
0
0%
12
0%
3
0%
15
3%
32
6%
17
67
3%
143
5%
14
7%
12
0%
50
8%
76
7%
5
20%
131
8%
29
7%
165
8%
388
6%
553
7%

Appendix F ROM DATA


Tonkin Highway Extension
Modelled Volume Time Period: AM Peak
Year: 2036 Project Case Orton AG 7:45 - 8:45
Class: Total
Units : No. of Vehicles
Note: Approximate representation of road network
Nicholson Road
Spears Dr
Kargotich Road
Thomas Road
J1
J2
H1
J5
Abernethy Road
J11
Orton Road
J13
Bishop Road
J16
Mundijong Road
2036 AM - With Tonkin Highway Extension Constructed


Tonkin Highway Extension
Modelled Volume Time Period: PM Peak
Year: 2036 Project Case Orton AG 16:00 - 17:00
Class: Total
Units : No. of Vehicles
Note: Approximate representation of road network
2036 PM - With Tonkin Highway Extension Constructed
Nicholson Road
Spears Dr
Kargotich Road
Thomas Road
Abernethy Road
Orton Road
Bishop Road
Mundijong Road
J1
J2
H1
J5
J11
J13
J16