



## **Transport Impact Assessment**

Fabric Street Temporary Workforce  
Accommodation – Lot 67 (45) Bates  
Drive, Somerville

CW1200837/300306985 Rev D

24 August 2023

Prepared for:

Planning Solutions (Aust) Pty Ltd

Prepared by:

Stantec Australia Pty Ltd



**Fabric Street Temporary Workforce Accommodation – Lot 67 (45) Bates Drive, Somerville**

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## Fabric Street Temporary Workforce Accommodation – Lot 67 (45) Bates Drive, Somerville

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## 1.0 INTRODUCTION

### 1.1 BACKGROUND

Stantec has been commissioned by Planning Solutions (Aust) Pty Ltd ('the Client') to undertake a Transport Impact Assessment for the proposed Fabric Street Temporary Workforce Accommodation development located at Lot 67 (45) Bates Drive, Somerville (the 'Site').

This report aims to assess the impact of the development on the adjacent road network. The report will focus on access, public transport, pedestrian and cycle networks, circulation, and car parking requirements.

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

### 1.2 SITE LOCATION

The proposed development is located on Bates Drive, Somerville within the City of Kalgoorlie-Boulder, as shown in **Figure 1-1**. The Site is located approximately 591 kilometres east of Perth CBD. The racing club is located to the northeast and Centennial Park to the north of the Site.



Figure 1-1     Aerial Overview of the Site



Source: Metromap (base map)



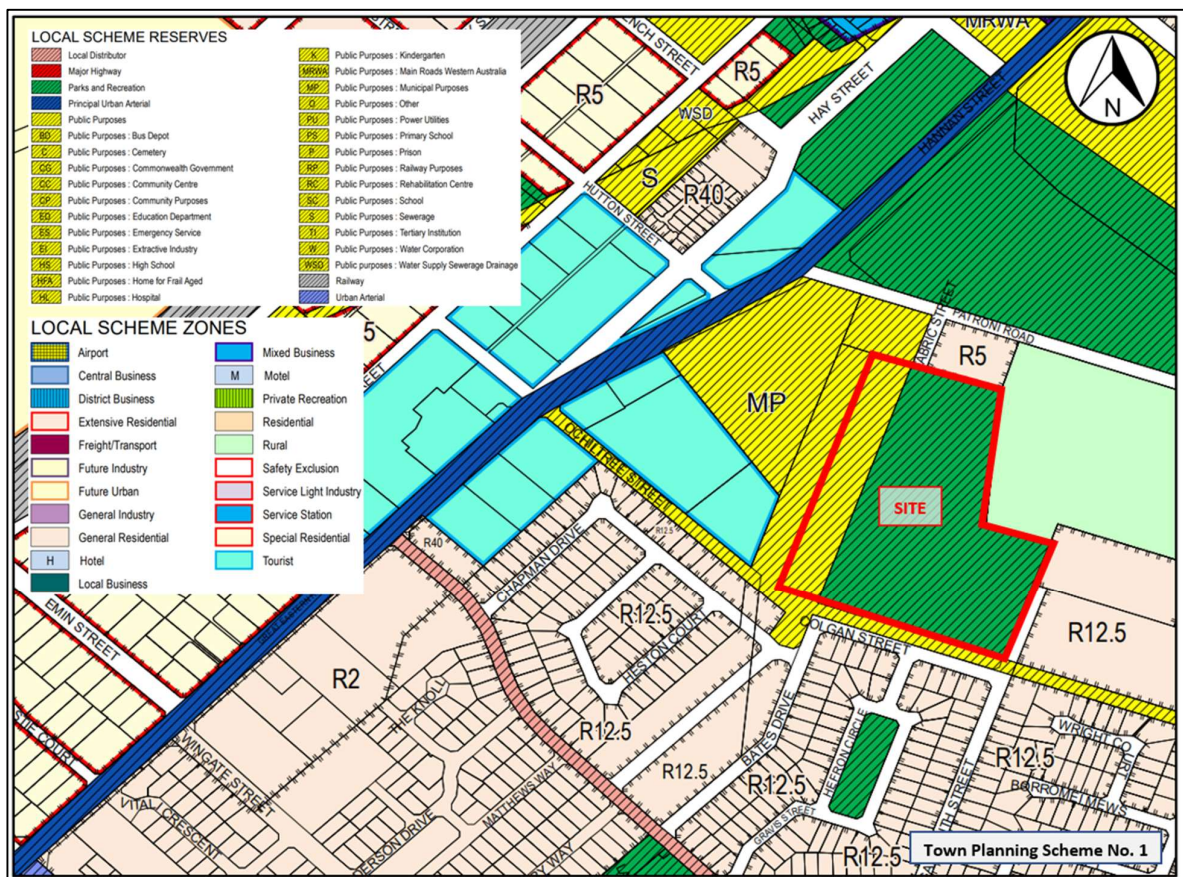


## 2.0 EXISTING SITUATION

### 2.1 EXISTING LAND USES

Currently, the Site is undeveloped. According to the *City of Kalgoorlie-Boulder's Town Planning Scheme No. 1*, the subject Site is zoned as a 'Local Reserve for Parks and Recreation' and a portion as a 'Local Reserve for Municipal Purposes' as shown in **Figure 2-1**. Land use for this type of zoning is aimed at providing a range of essential physical and community infrastructure. The majority of the land surrounding the subject Site is zoned as residential R2, R5, R10, R12.5, R20, and R40 areas. In addition, there is an existing 24-hour rest stop facility in Centennial Park located to the northeast of the site.

**Figure 2-1 Site Zoning Map**



Source: City of Kalgoorlie-Boulder's Town Planning Scheme No. 1



## 2.2 EXISTING ROAD NETWORK

Road Classifications defined in the Main Roads Functional Hierarchy are 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 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 more than 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 the 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 the Local government.

The Site is primarily accessible via Great Eastern Highway (Hannan Street) and Patroni Road (north of the Site). The surrounding road network characteristics is summarised in **Table 2-1**, while **Figure 2-2** shows the road hierarchy as per Main Roads WA Road Information Mapping System.



**Table 2-1 Road Hierarchy and Characteristics**

Road Name (Road ID)	Road Hierarchy		Road Characteristics			
	Road Hierarchy	Road Jurisdiction	No. of Lanes	No. of Footpaths	Road Width (m)	Posted Speed (km/h)
<b>Great Eastern Highway (Hannan Street (H005))</b>	Primary Distributor	MRWA	4 <i>(two-way divided)</i>	2	26.0 (incl. 2x 1m shoulders and 9m Median)	60 (north of Hutton Street) 70 (south of Hutton Street)
<b>Patroni Road (6056016)</b>	Access Road	Local Government	2 <i>(two-way undivided)</i>	0	7.0 to 8.2	50
<b>Colgan Street (6052072)</b>	Access Road	Local Government	2 <i>(two-way undivided)</i>	1	7.0 to 7.3	50
<b>Bates Drive (6052071)</b>	Access Road	Local Government	2 <i>(two-way undivided)</i>	1	7.40	50
<b>Straw Street (6052068)</b>	Access Road	Local Government	2 <i>(two-way undivided)</i>	1	7.40	50
<b>Galbraith Street (6052073)</b>	Access Road	Local Government	2 <i>(two-way undivided)</i>	1	7.40	50

Source: MRWA Road Information Mapping System





## 2.3 EXISTING TRAFFIC VOLUMES

Existing traffic data were sourced from MRWA's Traffic Map and are summarised below in **Table 2-2**.

**Table 2-2 Traffic Volumes**

Site No.	Road Name	Source	Year	Average Weekday Daily Traffic (% of Heavy Vehicles)
1	Great Eastern Highway <i>East of Atbara St (SLK 587.92)</i> Site 16193	MRWA Traffic Map	2022/2023	10,539 (11.1%)
2	(Ochiltree Street)	CoKB	2021	1,122 (36.4%)
3	Speculation Road	CoKB	2021	2,073 (46%)
4	Meldrum Ave	CoKB	2021	3,628 (4%)
5	O'Connor Street	CoKB	2021	3,985 (29.6%)
6	Gatacre Dr	CoKB	2021	8,226 (10.2%)

Source: MRWA Traffic Map, City of Kalgoorlie-Boulder

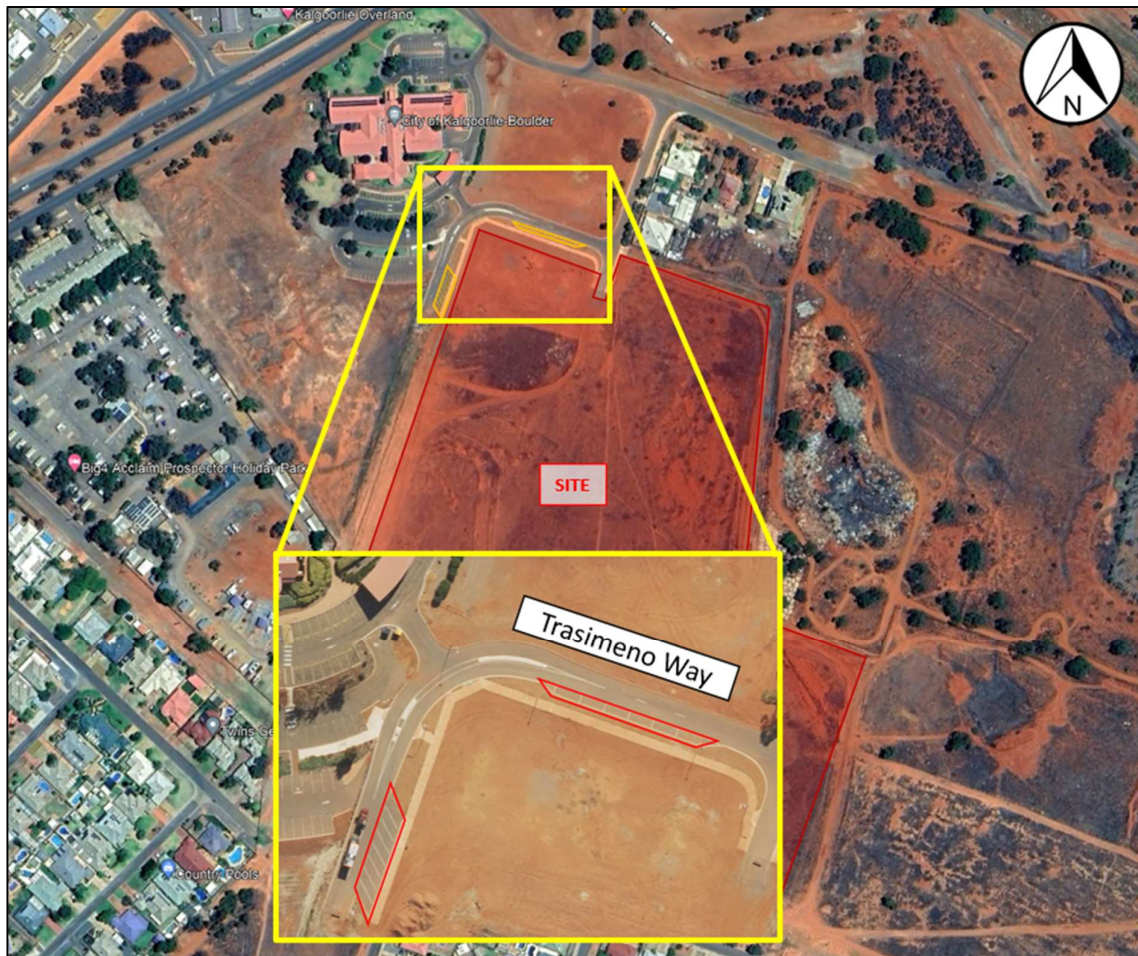




## 2.4 EXISTING PARKING FACILITIES

Existing on-street parking facilities are located to the north of the Site on Trasimeno Way as shown in Figure 2-3.

**Figure 2-3 Existing Parking Facilities**



Source: Google Earth (base map)

## 2.5 EXISTING PUBLIC TRANSPORT FACILITIES

The Site has access to bus stops in the vicinity of the Site. **Figure 2-4** shows the location of these bus stops relative to the Site. The nearby bus stops are serviced by a single bus route (route 863) that runs a CircleRoute via Somerville and Boulder bus stations as shown in **Figure 2-5**. The bus stop nearest to the Site is at the Caltex Roadhouse located on Hannan Street. Buses route 863 operates at this bus stop during the weekdays at 7:10 AM, 7:50 AM, 8:27 AM and then every hour thereafter. The last bus is available at 5:46 PM. Bus trips are limited every Saturday and no service operates on Sundays and Public Holidays as summarised in **Figure 2-6**.

Overall, public transport within the Site's surrounding area is inadequate given the limited number of operational routes near the Site. It should be noted that trips to and from the Site are anticipated to be primarily serviced by shuttle buses provided by the operator of this site.

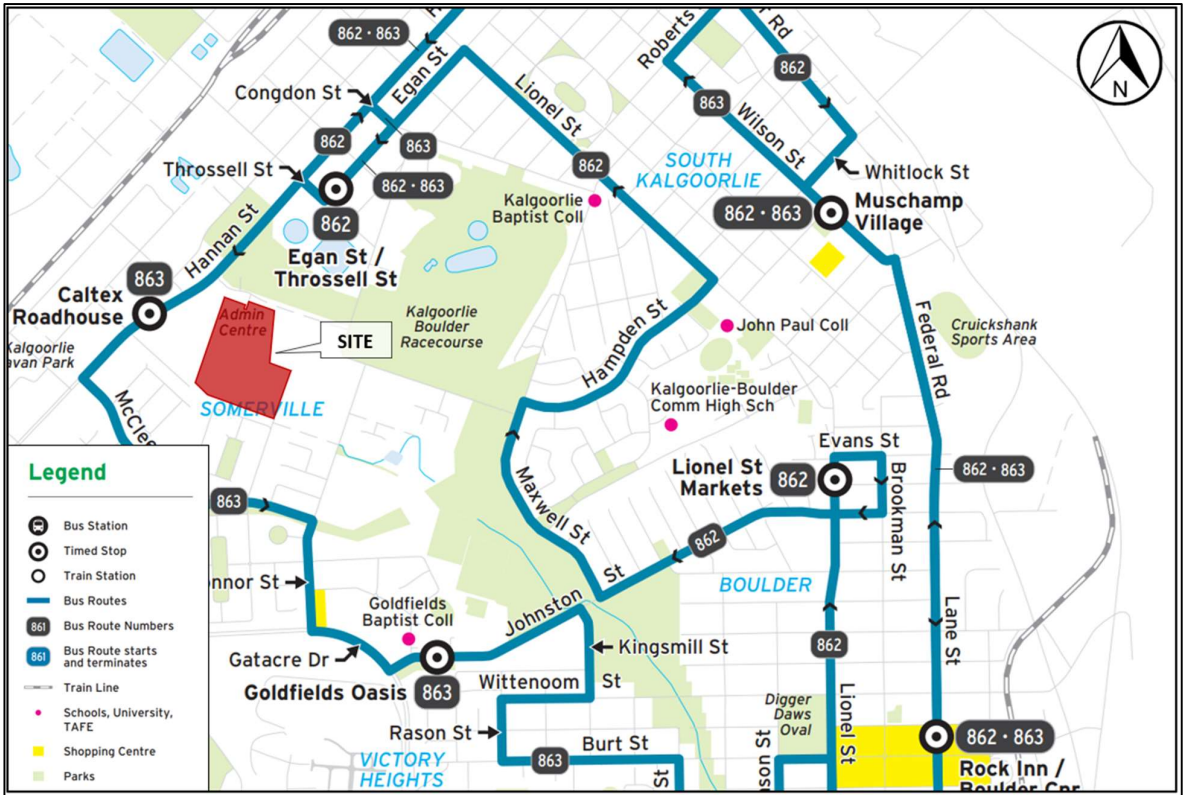
**Figure 2-4 Location of Nearest Bus Stop**



Source: Google Maps (base map)



Figure 2-5 TransRegional Bus Service Map



Source: Public Transport Authority (TransRegional)



**Figure 2-6 TransRegional Bus Service Schedule**

Route 863 - CircleRoute via Somerville and Boulder						
Timed Stops	71468	71486	71611	71453	71629	71468
Stop No.	Palace Chambers	Caltex Roadhouse	Goldfields Oasis	Boulder Cnr Burt / Lane Streets	Muschamp Village	Palace Chambers
Route No.						
Monday to Friday						
am 863	7:03	7:10	7:15	7:26	7:30	7:38
863	7:43	7:50	7:55	8:06	8:10	8:18
863	8:20	8:27	8:33	8:45	8:49	8:57
863	9:20	9:27	9:33	9:44	9:48	9:56
863	10:20	10:27	10:33	10:44	10:48	10:56
863	11:20	11:27	11:33	11:44	11:48	11:56
pm 863	12:20	12:27	12:33	12:44	12:48	12:56
863	1:20	1:27	1:33	1:44	1:48	1:56
863	2:20	2:27	2:33	2:44	2:48	2:56
863	3:20	3:27	3:33	3:44	3:48	3:56
863	4:20	4:27	4:33	4:44	4:48	4:56
863	5:40	5:46	5:51	6:01	6:04	6:12
Saturday						
am 863	8:20	8:26	8:31	8:43	8:47	8:55
863	10:20	10:26	10:31	10:43	10:47	10:55
pm 863	12:20	12:26	12:31	12:43	12:47	12:55
No Sunday & Public Holiday service						

Source: Public Transport Authority (TransRegional)

## 2.6 EXISTING PEDESTRIAN AND CYCLE FACILITIES

Somerville currently has several high-quality Off Road and On Road Cycleways as shown in the bike path network for the City of Kalgoorlie-Boulder in **Figure 2-7**. The On Road Cycleways along Great Eastern Highway (Hannan Street) and Off-Road Cycleways within Centennial Park provides a comprehensive cycling route that may be utilised by bicycle users from adjacent areas to access the Site.

Overall, the existing pedestrian and cycling facilities surrounding the Site are considered adequate. It should be noted that trips to and from the Site are anticipated to be primarily serviced by shuttle buses to be provided by the operator of this site.



Figure 2-7 Existing Bike Map for Kalgoorlie-Boulder



Source: WA Department of Transport

2.7 CRASH ASSESSMENT

Recorded crashes along the Great Eastern Highway (Hannan Street) from SLK 589.60 to SLK 590.00 were extracted from the MRWA database between January 2018 and December 2022. **Figure 2-8** illustrates the location and severity of the crash that was recorded in the vicinity of the Site and summarised in **Table 2-3** and **Table 2-4**.





**Figure 2-8 Crash Location and Severity Map**



Source: MRWA Crash Reporting Centre

**Table 2-3 Total Crashes**

Type of Crash (RUM Code)	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Right Angle	-	-	-	1	-	1
<b>Total</b>	-	-	-	1	-	1

**Table 2-4 Intersection Crashes**

Intersection Name	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total Crashes
Great Eastern Hwy – Hutton St	-	-	-	1	-	1
<b>Total</b>	-	-	-	1	-	1

Based on the above, only one (1) incident was recorded at the Great Eastern Highway/Hutton Street intersection. Other observations are summarised below:

- > The recorded crash resulted in major property damage with no fatalities or hospitalisation or medical attention required.

Overall, the number of crashes that occurred within the surrounding area is relatively low and it is anticipate that the proposed development will have a minimal impact on the overall safety of the surrounding road network.



## 3.0 PROPOSED DEVELOPMENT

### 3.1 PROPOSED LAND USE

The proposal is for Fabric Street Temporary Workforce Accommodation project comprising the following site-specific design components:

- 1152 temporary accommodation;
- 127 car parking bays (including 4 ACROD bays);
- 21 bus bays;
- Gym;
- Tavern; and
- Kitchen Diner.

The proposed accommodation will house the construction workers for the Kalgoorlie Smelter Renewal Project. The layout of the proposed development and the Site is shown in **Figure 3-1**. A larger scaled drawing is included in **Appendix B**).



Figure 3-1 Proposed Site Plan



Source: Planning Solutions (Aust) Pty Ltd



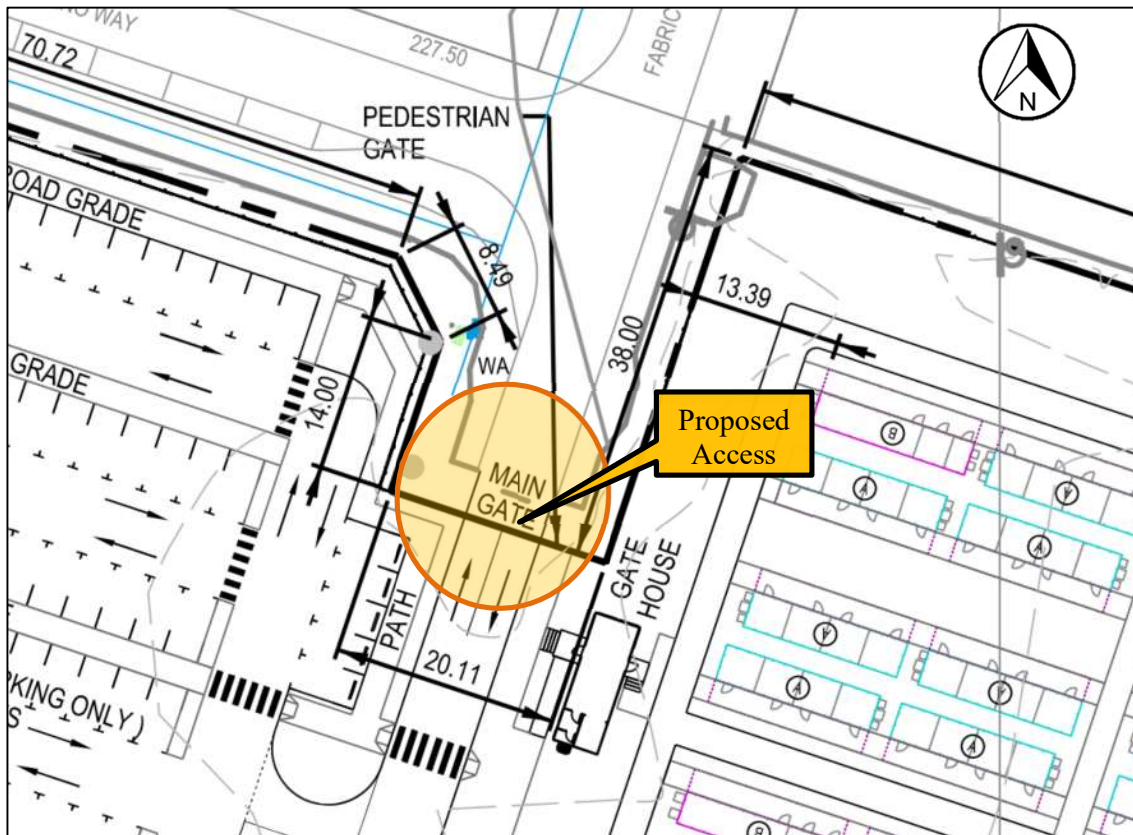


### 3.2 ACCESS ARRANGEMENTS

The sole access to the Site is proposed via Fabric Street to the north of the Site as shown in

Figure 3-2.

**Figure 3-2 Access Arrangement**



Source: Planning Solutions (Aust) Pty Ltd

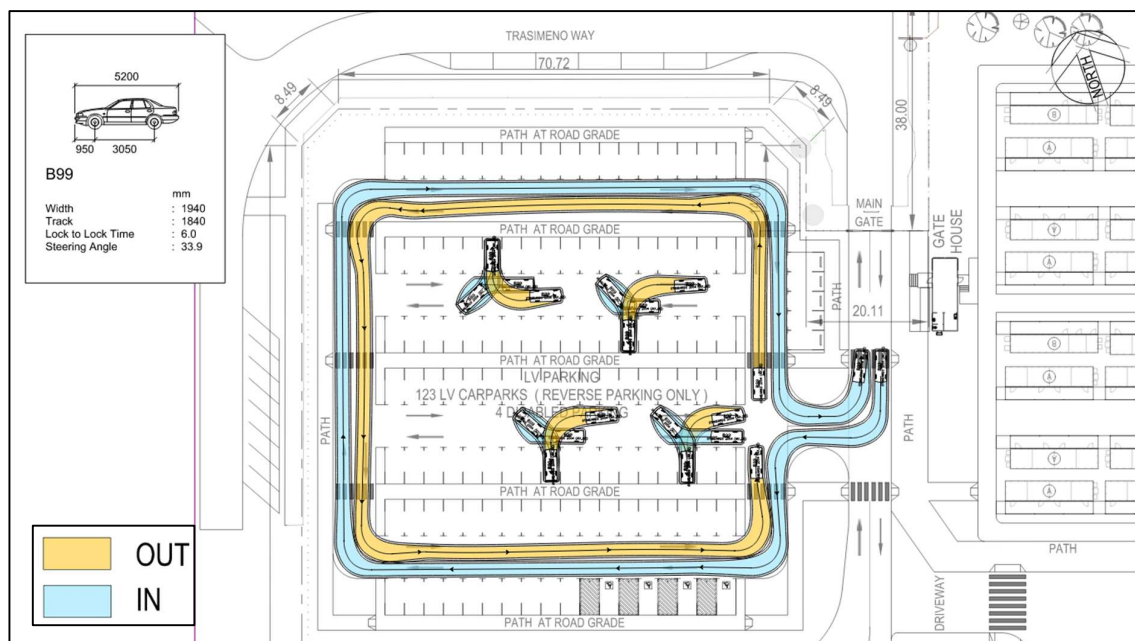
### 3.3 SWEPT PATH ANALYSIS

The swept paths for the different vehicles anticipated to enter and exit the proposed development site are discussed in the following subsections.

#### 3.3.1 B85 and B99 Design Cars

A swept path analysis was undertaken for a B99 design vehicle which is indicated that this design vehicle can adequately enter and exit the parking bays and manoeuvre around corners as illustrated in **Figure 3-3**. Larger scaled swept path diagrams are included in **Appendix D**.

**Figure 3-3 B99 Swept Paths**



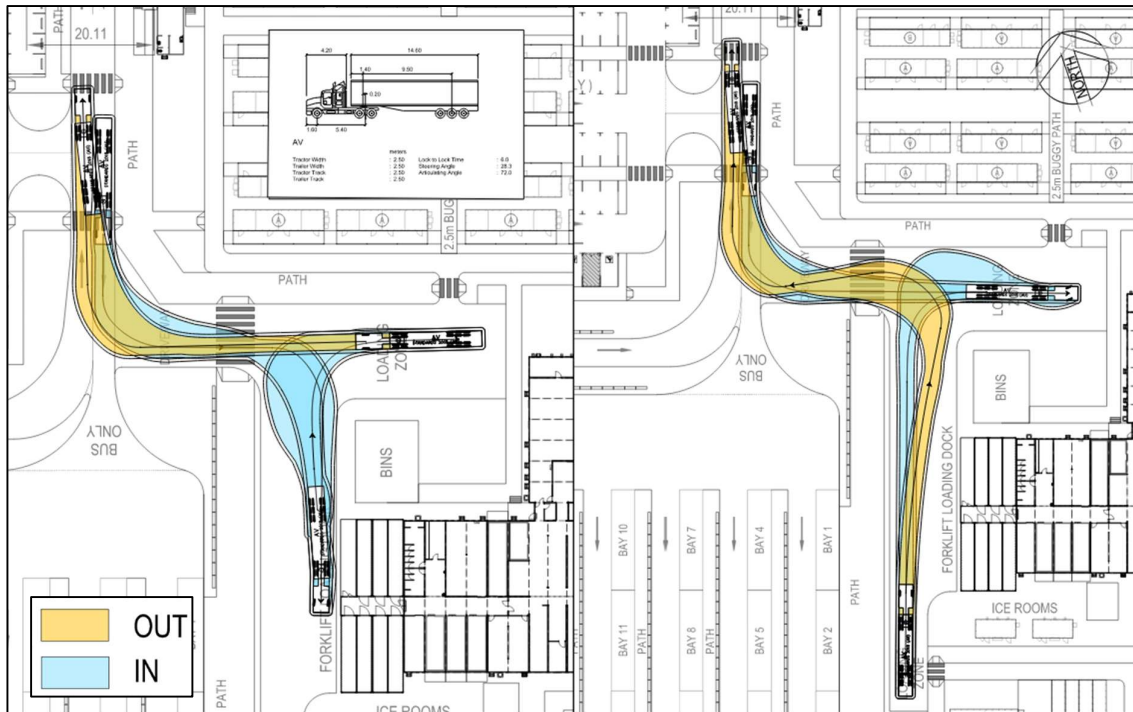
Source: Planning Solutions

No issues are anticipated within the proposed car park.

#### 3.3.2 19m Articulated Vehicle (AV)

Deliveries are anticipated to be undertaken by a 19.0m articulated vehicle. **Figure 3-4** shows the swept paths of this design vehicle. Larger scaled swept path diagrams are also included in **Appendix D**.

### Figure 3-4 19m AV Swept Paths



Source: Planning Solutions

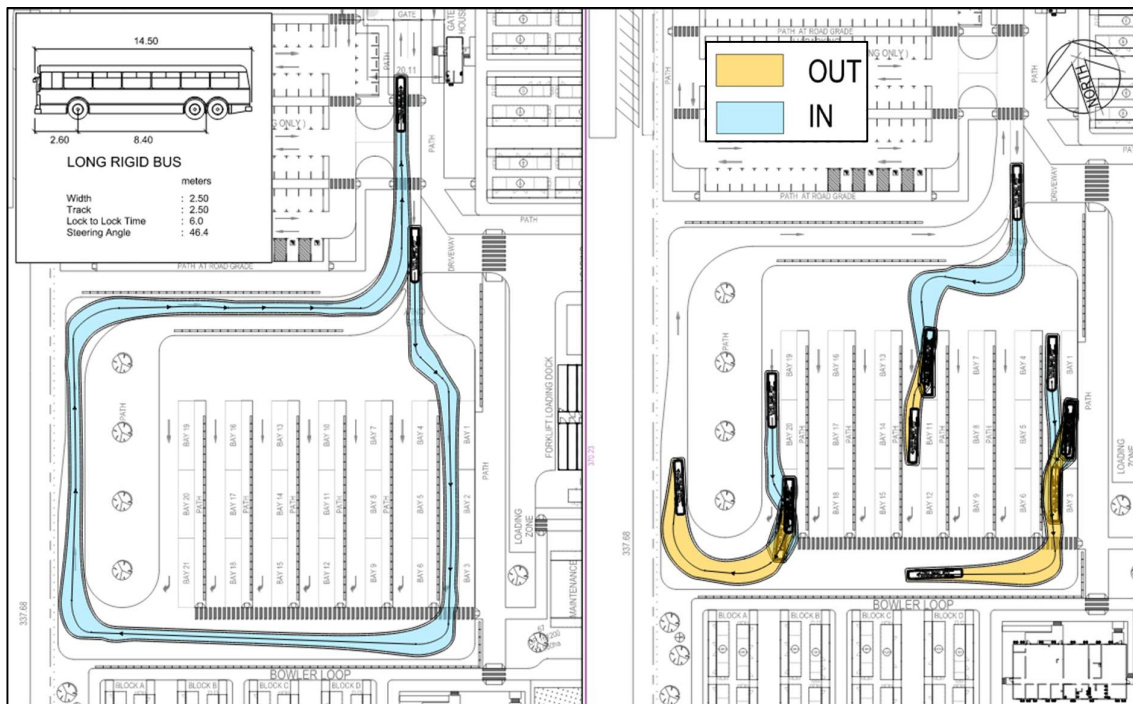
The swept paths show that encroachment of the opposing lanes is anticipated when a 19m AV enters and exits the access road leading to the proposed loading/delivery areas. This is considered to be acceptable and the volume of 19m AV frequenting the site is expected to be low. Other vehicles are anticipated to give way to the 19m AV within the development site.

### 3.3.3 Bus Swept Paths

A 14.5m long rigid bus is proposed to be used within the Site. The swept paths of the bus are shown in **Figure 3-5**.



### Figure 3-5 14.5m Bus Swept Paths



Source: Planning Solutions

The swept paths indicates that buses are anticipated to enter/exit the bus bays with no issues of concerns. A bus turning to exit the bus pickup/drop area may partially encroach the opposing lane. It is recommended that consideration be given to providing signage and/or line markings to clearly indicate which vehicles would have priority.



## **3.4 CAR PARKING PROVISION**

### **3.4.1 Number of Parking Bays**

The City of Kalgoorlie-Boulder Local Planning Scheme No. 1 does not provide guidelines for the required parking bays for workforce accommodation. Thus, the parking provision assessment of this proposed development has been conducted based on the expected demand for car parking bays.

The estimation of the potential number of car parking bays required in the development is detailed below:

- 5% (58) of the total workforce (1152) will be on-site workers (admin, kitchen, management staff & etc.). These staff are likely to reside on-site and be shuttled or pick-up/drop-off between the Site and the airport.
- The other 95% (1095) of the workforce will be shift workers. 90% of the shift workers (985) will travel to the Site via the shuttle bus service to be provided by the operator of this development. The shuttle buses have a capacity of 56 persons, thus, the total number of bus bays required is 18 (for a single run). There are 21 proposed bus bays within the development, providing a surplus of 3 bus bays.
- 10% (109) of the shift workers will travel via car. Assuming a vehicle occupancy of two persons per car, the total number of car bays required is 55. There are 127 proposed car bays within the development, providing a surplus of 72 bays.

Based on the above, the proposed development is expected to provide adequate number of parking bays for both cars and buses.



### 3.4.2 Australian Standards Review

#### 3.4.2.1 AS2890.1 and AS2890.6

**Table 3-1** shows the assessment of parking compliance based on the requirements of AS2890.1 and AS2890.6.

**Table 3-1 AS2890 Compliance**

Parameter	Subcategory	Required	Provided	Remarks
<b>Regular bay Width, m</b>	User class 1A	2.4	3.2	No non-compliance identified
<b>Regular bay Length, m</b>	User class 1A, Regular Bay	5.4	6	No non-compliance identified
<b>Aisle width, m</b>	User class 1A	5.8	7.0	No non-compliance identified
<b>ACROD bay width, m</b>		2.4	3.2	No non-compliance identified
<b>ACROD bay length, m</b>		5.4	6	No non-compliance identified
<b>Shared area width, m</b>		2.4	3.2	No non-compliance identified
<b>Shared area length, m</b>		5.4	6	No non-compliance identified
<b>Bollard distance from aisle, mm</b>		800±50	500	Non compliance identified
<b>Circulation roadway width, m</b>	Straight, two-way	5.5	7.0	No non-compliance identified
<b>Wheelstop distance, m</b>	front into low kerb	0.62	0.68	No non-compliance identified
<b>Access width, m</b>	Category 2	6.0 to 9.0 (Combined)	7.0	No non-compliance identified

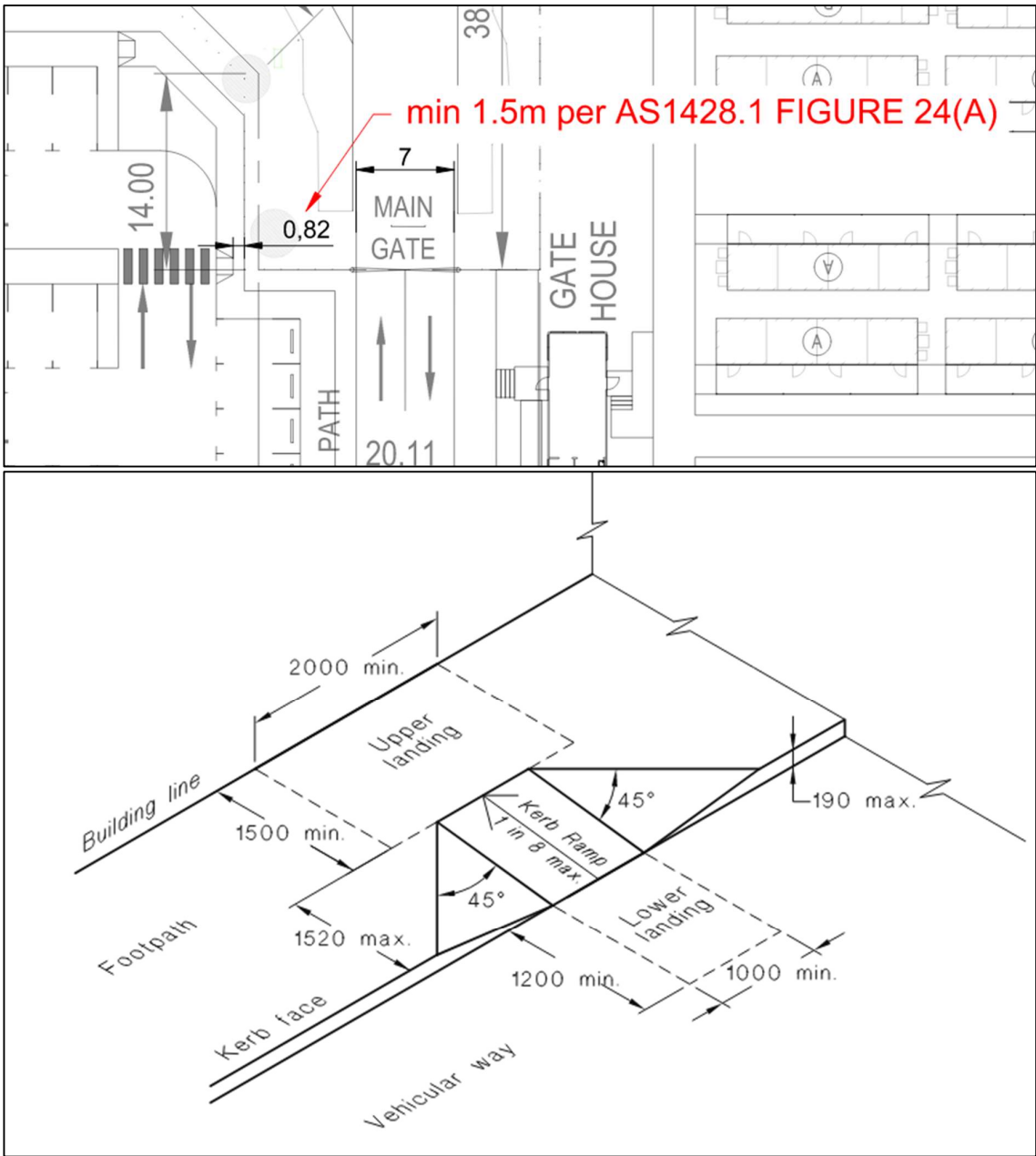
A minor non-compliance has been identified with regard to the location of the bollard in the shared area adjacent to an ACROD bays. This non-compliance is anticipated to be addressed in the future planning stages.

#### 3.4.2.2 AS1428.1

The footpath located on the northern side of the car park only measures 0.82 m which is less than the required 1.5m as per Figure 24(A) of AS 1428.1. **Figure 3-6** shows the proposed path width and the minimum path width required. This non-compliance is anticipated to be addressed in the future planning stages.



Figure 3-6 Inadequate Path Width



Source: AS1428.1



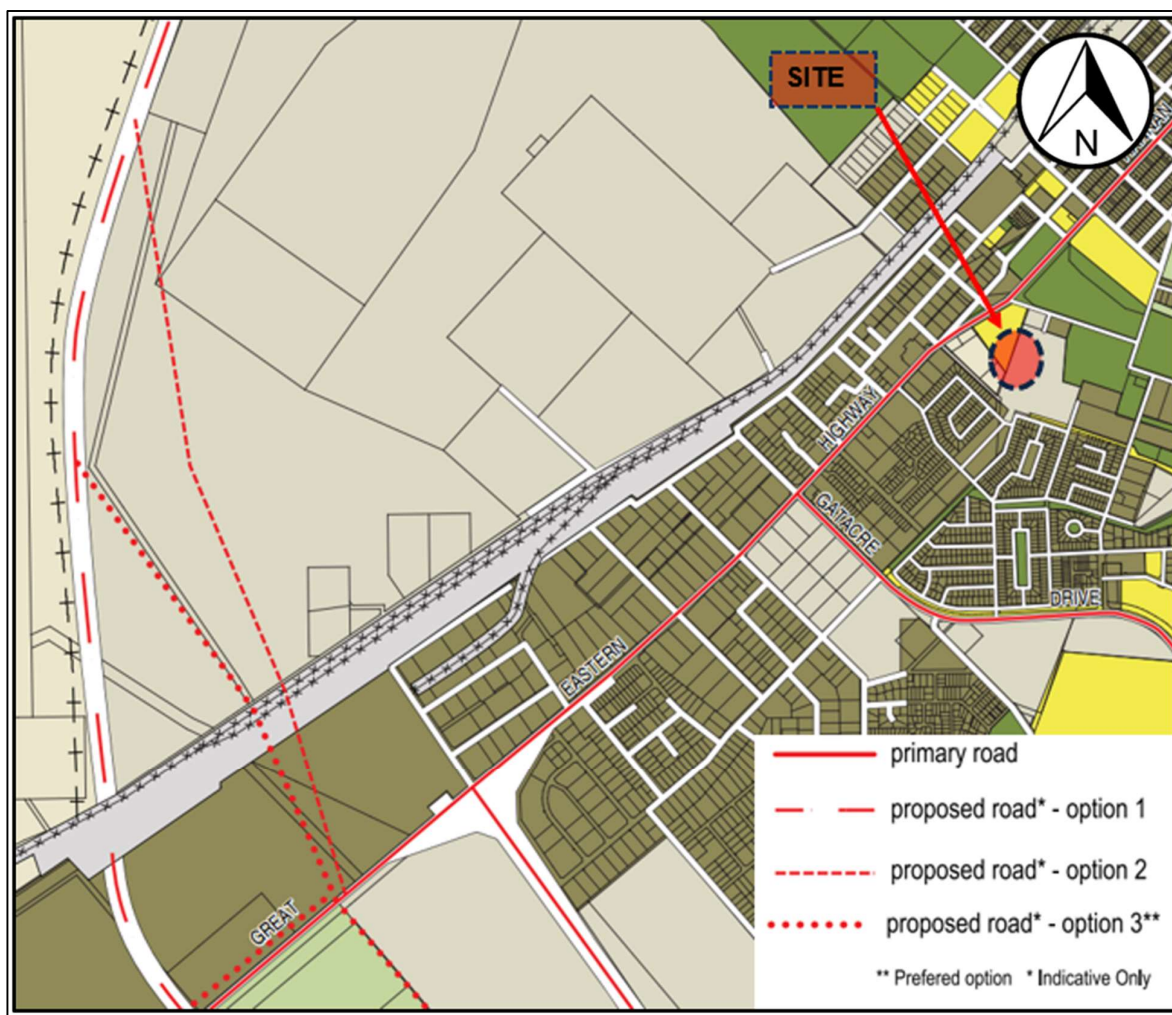


## 4.0 CHANGES TO SURROUNDING TRANSPORT NETWORK

### 4.1 ROAD NETWORK

Stantec contacted the City of Kalgoorlie-Boulder and was advised that Kalgoorlie-Boulder has efficient heavy haulage routes to the east and southwest that largely avoid the urban area. There is currently no such route around the north-western side of the urban area. In order to reduce the travel time and improve the overall safety of the road network, a bypass around the western edge of the city has been proposed by Main Roads WA, in liaison with the City and other key stakeholders. Three options have been identified as shown in **Figure 4-1**. However, this is under the strategic planning stage and is a high-priority project for the Department of Main Roads as indicated in the City of Kalgoorlie Boulder in *Local Planning Strategy 2013-2033*.

**Figure 4-1 Future Road Network**



Source: City of Kalgoorlie-Boulder Local Planning Strategy Shaping our Future (2013-2033)





## **4.2 PUBLIC TRANSPORT NETWORK**

Stantec contacted the Public Transport Authority and was advised that there are no proposed changes to the network within the short term. TransGoldfields services will be reviewed at the end of 2023 with the view to rationalise and improve existing services throughout the Karlgoolie-Boulder public transport network.

## **4.3 PEDESTRIAN/CYCLE NETWORK**

Stantec contacted the City of Karlgoolie-Boulder and was advised that no changes to the existing pedestrian and cycle networks are anticipated.

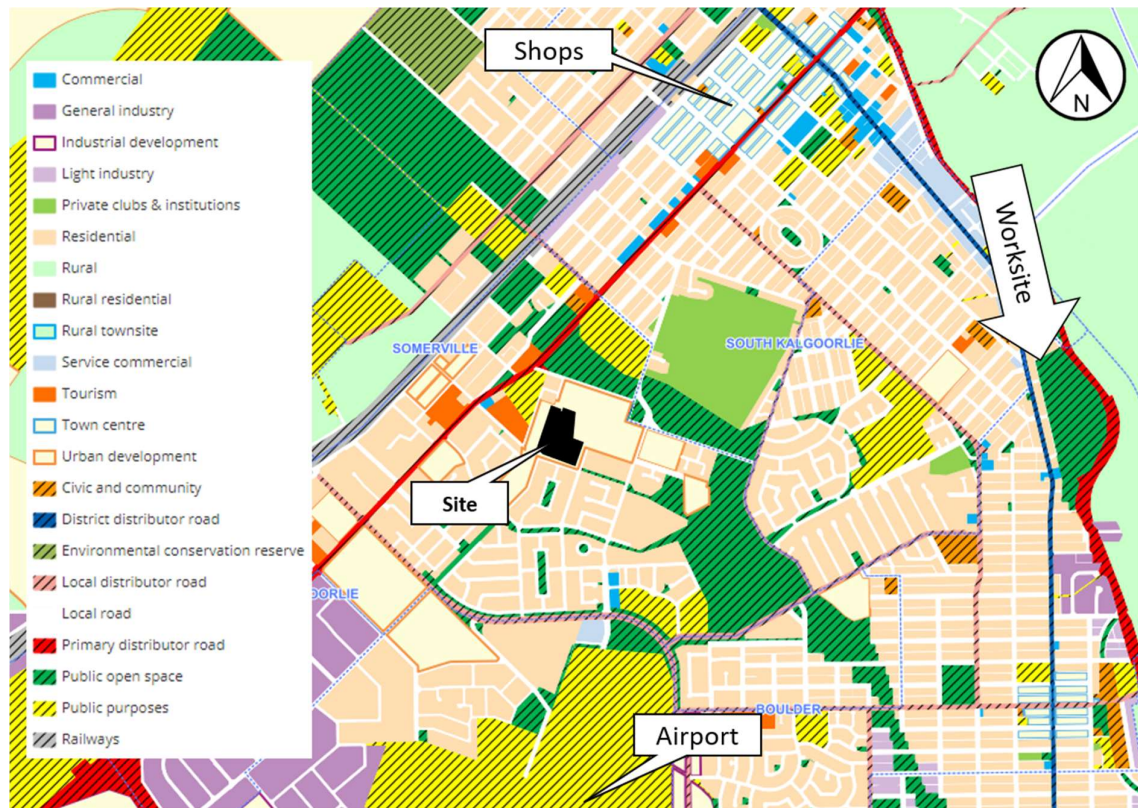


## 5.0 INTEGRATION WITH SURROUNDING AREA

### 5.1 SURROUNDING ATTRACTORS/GENERATORS

Trips generated and attracted by the Site are anticipated to be mostly trips to the worksite located to the northeast as shown in **Figure 5-1**. Some of the trips will also be arriving from the airport to transport workers to and from the Site. The Site is also anticipated to generate trips to the shops located to the south.

**Figure 5-1 Surrounding Attractors/Generators**

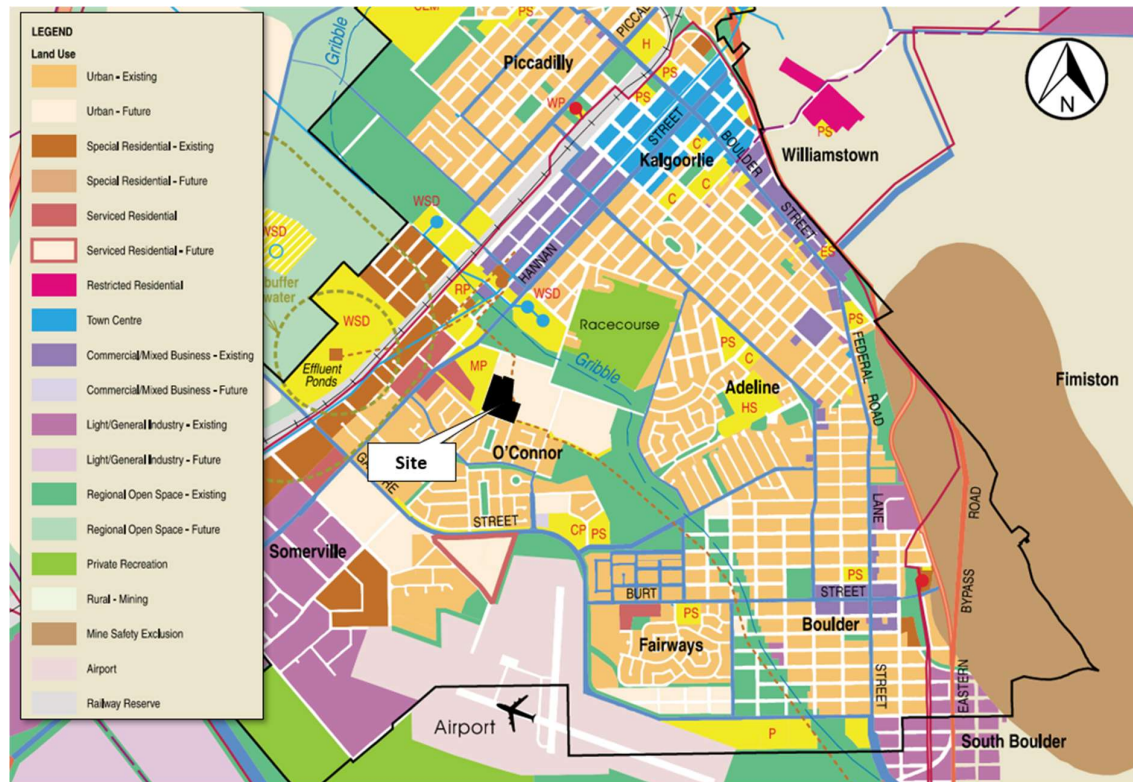


Source: City of Kalgoorlie-Boulder IntraMaps

## 5.2 PROPOSED CHANGES TO SURROUNDING LAND USES

The City of Kalgoorlie-Boulder sets out the long-term planning objectives for the townsite, establishing the recommended actions to address residential, environmental, recreation and industrial issues associated with an expanding community. The strategic direction for the City is focused on the diversification of industry and playing a significant role as the principal service hub for commercial, industrial, agricultural, and mining activities. The City aims to maintain its standing as a dynamic regional centre with a proud history and a high quality of life, striving to be the most successful city in regional Western Australia, whilst at the same time complimenting the success of neighbouring regional towns. **Figure 5-2** shows the structure plan within the City of Kalgoorlie-Boulder indicating the future land use zoning within the surrounding area in accordance with the *Local Planning Strategy, Shaping Our Future 2013-2033* plan.

**Figure 5-2 City of Kalgoorlie-Boulder Future Land Use Plan**



Source: City of Kalgoorlie-Boulder Strategic Plan

The City of Kalgoorlie-Boulder is currently in the process of preparing the Local Planning Scheme No. 2 which has the following goals:

- More residential zoned land for housing.
- New industrial areas to support local business.
- Development incentives to encourage investment in the CBD and suburbs.
- Introduction of a mixed use zone.
- Larger lot sizes in rural lifestyle zones.

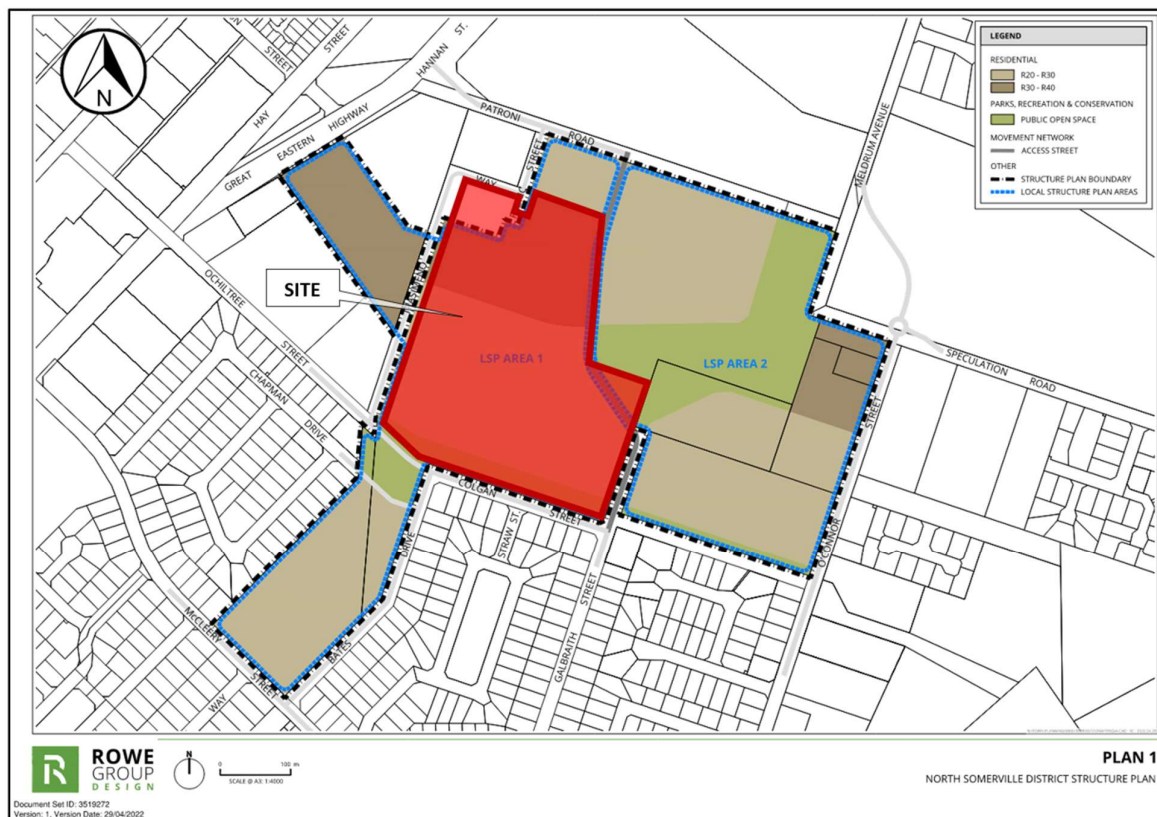
## Fabric Street Temporary Workforce Accommodation – Lot 67 (45) Bates Drive, Somerville

- New subdivision opportunities for existing residential land.
- Supporting our rural town sites with increased development options.
- Supporting the mining sector.

The new scheme is pending final approval and it is anticipated it will be gazetted in the near future. The proposed site was included in the *North Somerville District Structure Plan* shown in **Figure 5-3** (comprising a total area of 35.49 hectares) and was advertised for comment in 2022.

The LSP area 2 TIA advertised with the DSP is estimated to generate 448 trips in the AM peak and 599 trips in the PM peak.

**Figure 5-3 Northern Somerville District Structure Plan**



Source: Northern Somerville District Structure Plan - 2022





## 6.0 ANALYSIS OF TRANSPORT NETWORK

### 6.1 ANALYSIS OVERVIEW

To identify the impact of the proposed development on the surrounding road network, the intersection of Hannan Street (Great Eastern Highway) / Patroni Road has been analysed using the SIDRA analysis software.

### 6.2 ANALYSIS SCENARIOS

The following three scenarios were identified for assessment purposes:

- Scenario 1: 2023 Base Scenario;
- Scenario 2: 2025 future traffic with development; and
- Scenario 3: 2035 future traffic with development.

The analysis was undertaken for the identified intersection for the weekday AM and PM peak hour periods for each of the above scenarios. The peak hour periods were derived from the Main Roads WA SCATS data at the intersections of Great Eastern Highway/Gatacre Drive and Great Eastern Highway/Throssell Street:

- AM Peak: 07:45-08:45 AM
- PM Peak: 4:30-5:30 PM

### 6.3 KEY ASSUMPTIONS

The following assumptions are applied to estimate the trips generated by the development:

- Base scenario traffic volumes are based on SCATS data for the intersections of Great Eastern Highway/Throssell Street and Great Eastern Highway/Gatacre Road
- Heavy vehicle percentages were sourced from Main Roads WA Traffic Map. The combined proportion of Austroads Class 10, 11, and 12 trucks are less than 1%. This is considered negligible and was integrated into the Class 6-9 category for simplicity.
- The proportion of turning traffic at the intersection of Great Eastern Highway/Patroni Road is based on the existing proportions of northbound and southbound traffic on Great Eastern Highway as per the Main Roads WA SCATS data.

The traffic growth rate used for projecting the traffic volumes for future years is based on the Great Eastern Highway east of Atbara Street historical traffic counts which was sourced from the Main Roads WA Traffic Map.



## 6.4 TRIP GENERATION

### 6.4.1 Proposed Development

The following assumptions were applied to estimate the potential number of trips generated by the proposed development:

- The light and heavy vehicle trips to and from the Site were provided by the client and are presented in **Table 6-1**
  - 5% of the 1152 workforce are site based and will not generate vehicle trips.
  - 90% of the shift workers will travel via bus, equivalent to 18 bus trips. For a robust assessment, 20 bus trips were assumed in the analysis.
  - Heavy vehicles entering the Site for goods deliveries and services are anticipated to arrive/depart the Site outside the peak hours
  - Based on the busiest day of the week for air charter services:  
Of the three flights, one flight is assumed to coincide with the network AM peak, one flight is assumed to coincide with the network PM peak, and one flight is assumed to be outside the peak periods
- The trips to and from the worksite are anticipated to be outside the network's peak hours. **For a robust assessment, it is assumed that the worksite trips will coincide with the network peak hours.**

**Table 6-1 Development Daily Trip Generation**

Trip Description	Daily Total Trips		Assumptions
	IN	OUT	
<b><u>Heavy vehicle trips</u></b>			
Village (Site) to and from the worksite - Bus	20	20	90% of the shift workers (985) will travel via bus
Village (Site) to and from the airport - Bus	6	6	Three flights of a 100-seat aircraft
Village operation (deliveries and services) - Truck	4	4	estimated number
<b>Total</b>	<b>30</b>	<b>30</b>	
<b>Grand Total</b>	<b>60</b>		
<b><u>Car Trips</u></b>	IN	OUT	Assumptions
Village (Site) to and from the worksite	55	55	10% of the shift workers (109) will travel by car, with occupancy of 2 persons per car
Village (Site) to and from the airport	15	15	estimated number
Village operation (deliveries and services)	15	15	estimated number
<b>Total</b>	<b>85</b>	<b>85</b>	
<b>Grand Total</b>	<b>170</b>		
<b>Combined light and heavy vehicle daily trips</b>	<b>230</b>		

The proposed development is anticipated to generate a combined light and heavy vehicle daily traffic of **230 trips**. **Table 6-2** shows the trips generated by the development during the peak periods.



**Table 6-2 Development Peak Hour Trip Generation**

Trip Description	Vehicle Type	Weekday AM Peak (7:45-8:45 AM)		Weekday PM Peak (4:30-5:30 PM)	
		In	Out	In	Out
<b>Work Trips</b>	Light vehicle	0	55	55	0
	Heavy vehicle	0	20	20	0
Airport Trips	Light vehicle	5	5	5	5
	Heavy vehicle	2	2	2	2
<i>Total</i>	Light vehicle	5	60	60	5
	Heavy vehicle	2	22	22	2
	All vehicles	7	82	82	7
<b>Grand Total</b>		<b>89</b>		<b>89</b>	

The proposed development is anticipated to generate 89 trips in both the AM and PM peak periods. According to the Western Australia Planning Commission (WAPC) TIA Guidelines, a development that generates between 10 and 100 trips during the peak period is considered a 'moderate-impact' development and is not anticipated to significantly affect the performance of the surrounding road network.

#### 6.4.2 Existing Trips on Patroni Road

To estimate the volume of existing trips on Patroni Road, the trip generation of existing developments accessed via Patroni Road was calculated. The existing developments include the City of Kalgoorlie-Boulder building, four residential dwellings, and a City Park with 24-hr rest stop area. The following methodology and assumptions were applied:

- ITE trip generation rates were used to estimate the volumes generated by the council building and the residential dwellings, with the trip generation rates detailed in **Table 6-3**.
- The 24-hr rest stop area traffic was estimated using the information provided by the City of Kalgoorlie-Boulder. The provided information and assumptions include:
  - 4,800 vans entered the 24-hr rest stop area from October 2022 to July 2023 (9 months). This is equivalent to 18 vans entering per day
  - A 15% peak hour factor was assumed to estimate the peak hour trips, equal to 3 trips per peak per direction
  - The vans were assumed to enter the rest stop during the PM peak and leave during the AM peak



**Table 6-3 Trip Generation Rates and Directional Distribution**

Land Use	Yield	Unit	Reference	Trip Rates		Directional Distribution			
				Weekday AM	Weekday PM	Weekday AM		Weekday PM	
						In	Out	In	Out
<b>Council building</b>	3900	sq.m	ITE 710	1.68 per 100 sq.m	1.60 per 100 sq.m	88%	12%	17%	83%
Residential dwellings	4	dwellings	ITE 210	0.76 per dwelling	1.00 per dwelling	26%	74%	64%	36%

The estimated number of trips currently using Patroni Road is summarised in **Table 6-4**.

**Table 6-4 Existing Peak Hour Vehicle Trips on Patroni Road**

Existing Trip Generators	Weekday AM Peak (7:45-8:45 AM)		Weekday PM Peak (4:30-5:30 PM)r	
	In	Out	In	Out
<b>Council building</b>	58	8	11	52
Residential developments	1	2	3	1
City Park	0	3	3	0
<b>Sub-Total</b>	<b>59</b>	<b>13</b>	<b>17</b>	<b>53</b>
<b>Total</b>	<b>72</b>		<b>70</b>	

It is estimated that approximately 72 and 70 trips are on Patroni Road during the AM and PM peak hour periods respectively.

## 6.5 TRIP DISTRIBUTION

The following was assumed in establishing the trip distribution for the existing trips on Patroni Road and the trips generated by the proposed development:

- The proportion of turning traffic from Patroni Road at its intersection with Great Eastern Highway is based on the proportion of traffic on the northbound and southbound directions of Great Eastern Highway. This equates to approximately 30% of the trips heading to or arriving from the south and the remaining 70% heading to or arriving from the north.
- The distribution of the trips generated by the proposed development is based on the relative locations of the destinations from the Site. Trips to the airport and to the worksite are anticipated to head southwards.





6.6 TRAFFIC VOLUMES

Using the assumptions discussed in **Sections 6.3, 6.4, and 6.5**, the traffic volumes for the analysed scenarios were calculated and are shown in **Figure 6-1, Figure 6-2, and Figure 6-3**.

Figure 6-1 2023 Base Year

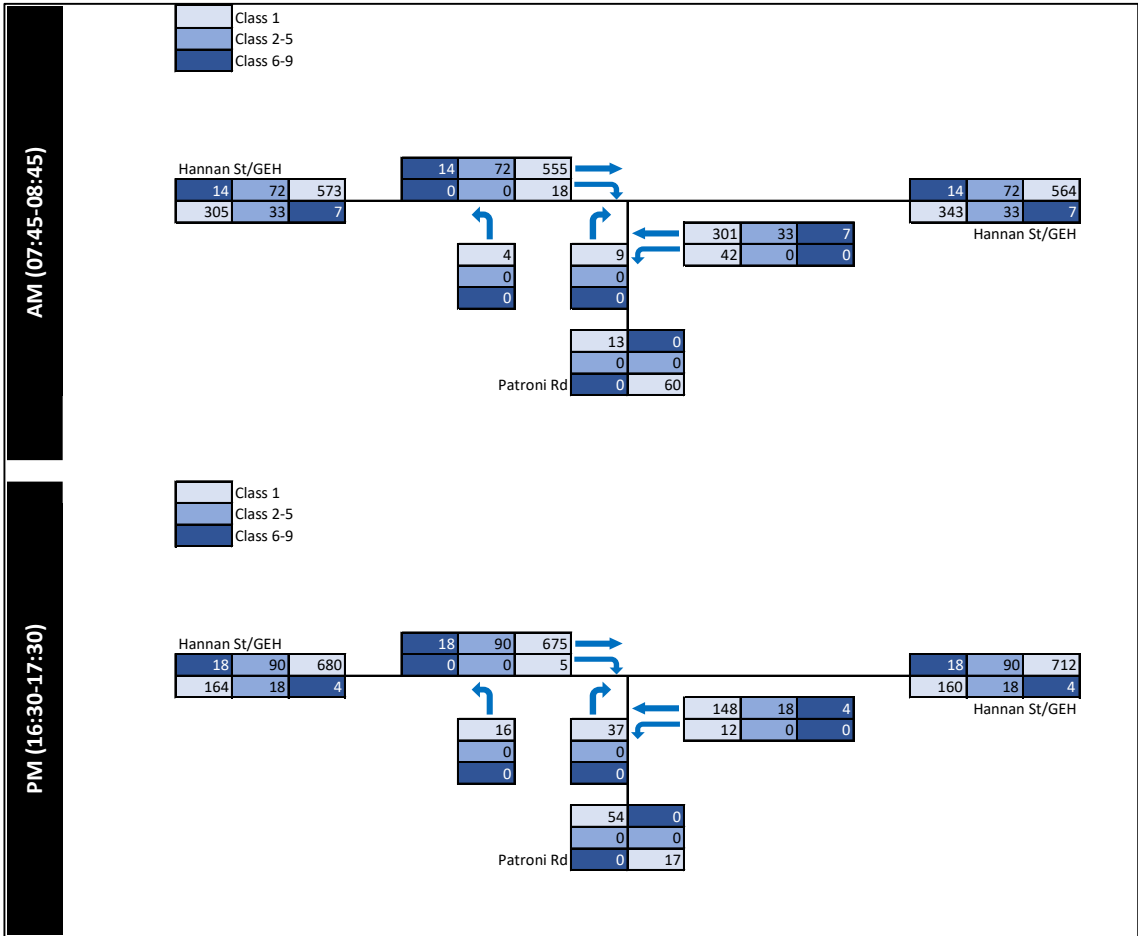


Figure 6-2 2025 Opening Year with Development Traffic

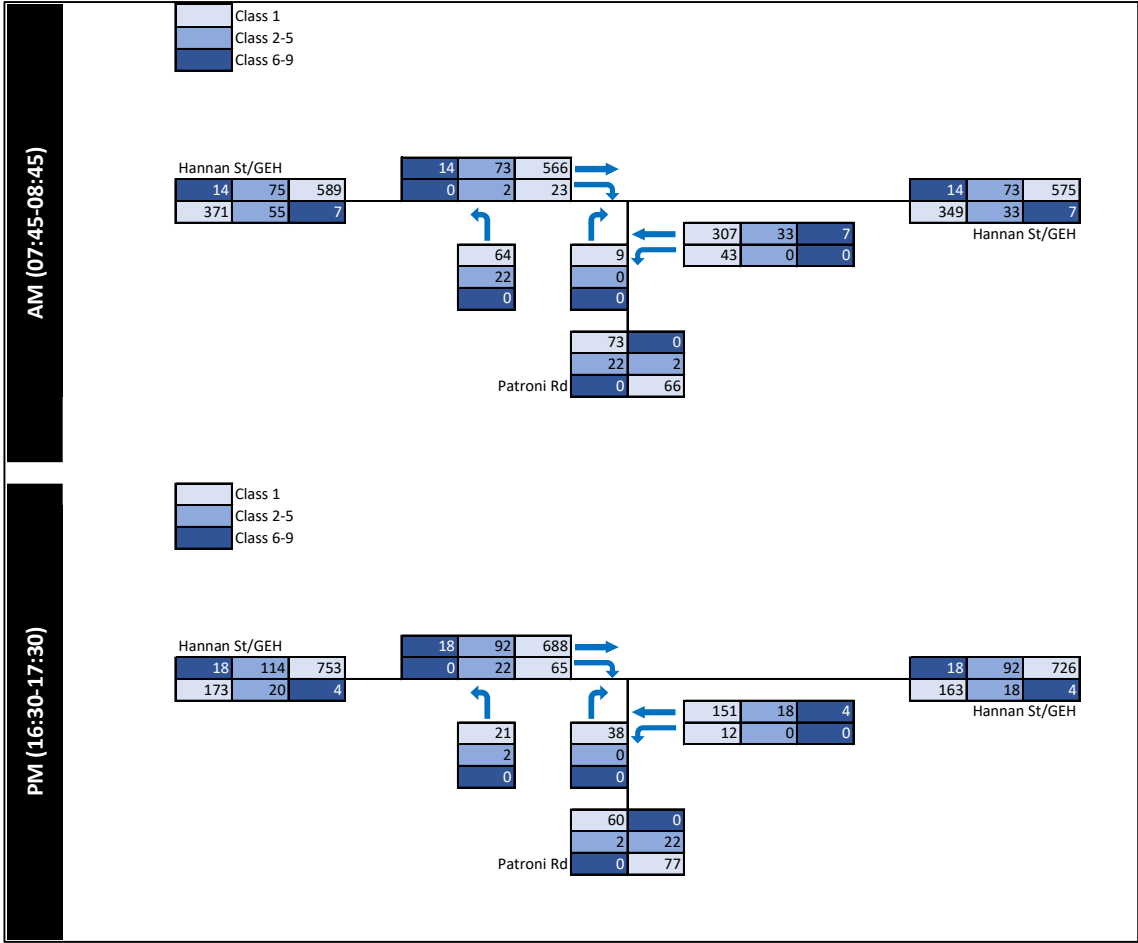
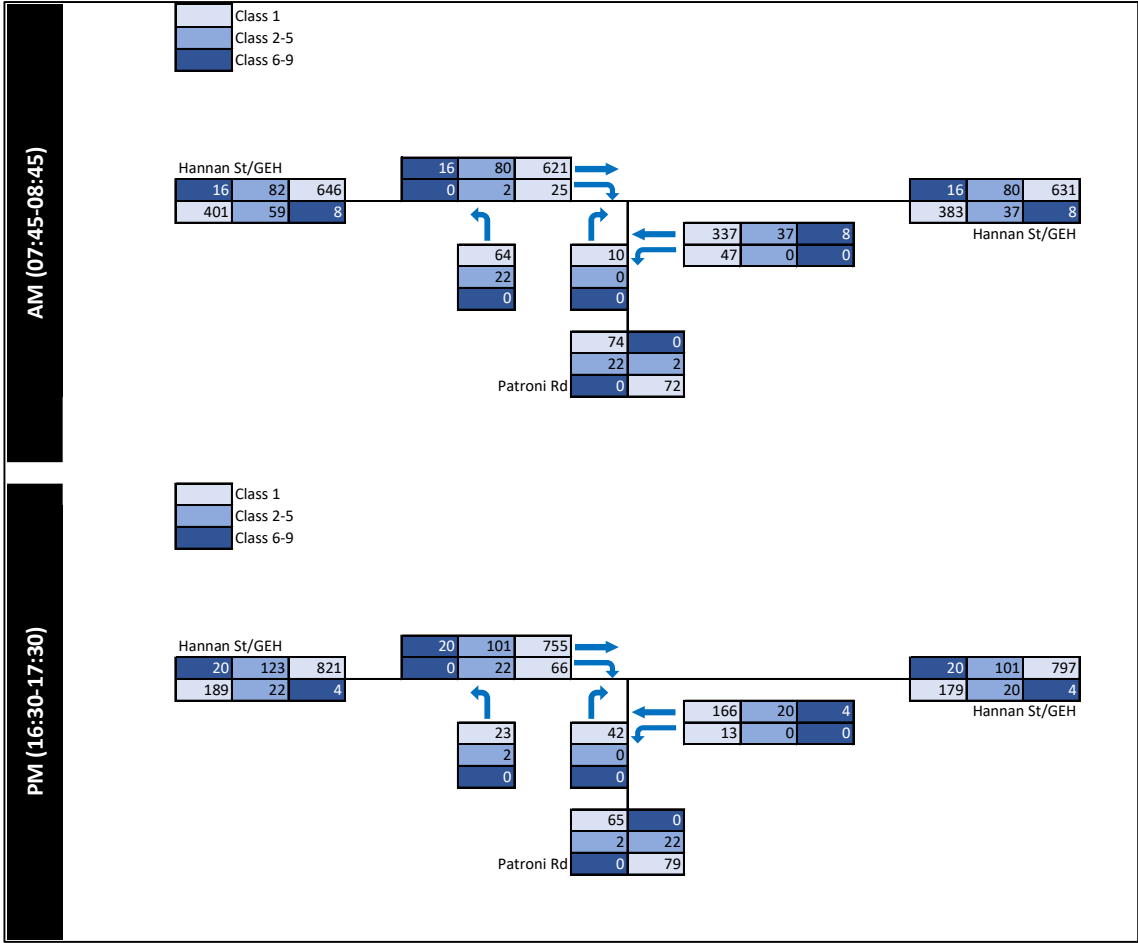


Figure 6-3 2035 Future Year with Development Traffic



## 6.7 INTERSECTION PERFORMANCE

The identified intersections have been analysed using the SIDRA analysis program. This program calculates the performance of intersections based on input parameters, including geometry and traffic volumes. SIDRA results for each approach are presented below in the form of Degree of Saturation (DOS), Average Delay, Level of Service (LOS) 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 for an un-signalized intersection where  $DOS > 0.80$ ;
- 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 6-5**.

**Table 6-5 Level of Service (LOS) Performance Criteria**

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

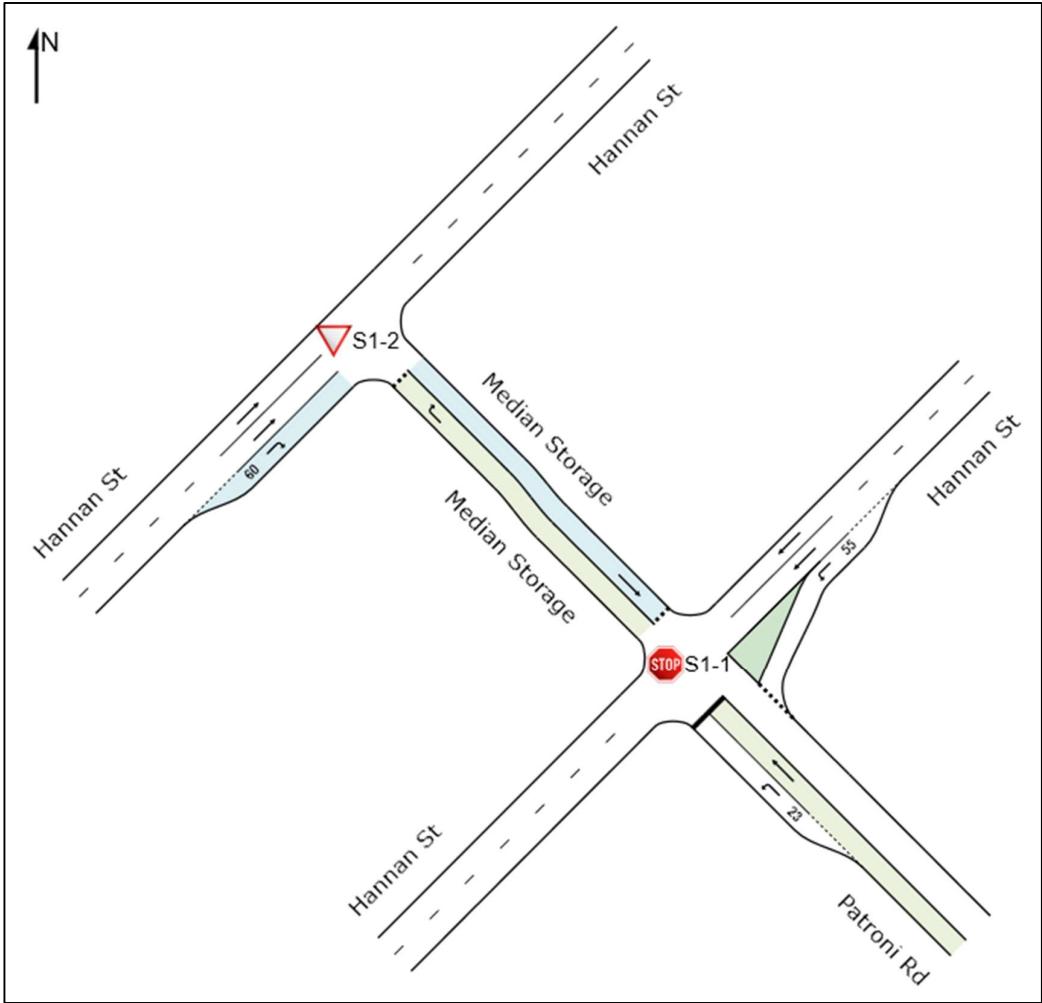
A LOS exceeding these values indicates that the road section is exceeding its practical capacity. Above these values, users of the intersections are likely to experience unsatisfactory queueing and delays during peak hour periods.



### 6.8 TRAFFIC ANALYSIS

The SIDRA layout of the intersection of Great Eastern Highway (Hannan Street) and Patroni Road is shown in **Figure 6-4**. It should be noted that this intersection has been modelled as a staged crossing as per the MRWA Operational Modelling Guidelines due to the presence of a median storage on Great Eastern Highway.

**Figure 6-4** SIDRA Network Layout – Great Eastern Hwy and Patroni Rd



The results of the analysis are presented in **Table 6-6**, **Table 6-7**, and **Table 6-8**.



# Fabric Street Temporary Workforce Accommodation – Lot 67 (45) Bates Drive, Somerville

**Table 6-6 SIDRA Results – 2023 Base Year**

Intersection Approach		AM				PM			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
NorthEast: Hannan St	L	0.031	5.7	A	0.9	0.009	5.6	A	0.3
	T	0.104	0	A	0	0.052	0	A	0
SouthWest: Hannan St	T	0.195	0.1	A	0	0.240	0.1	A	0
	R	0.010	6	A	0.2	0.003	5.8	A	0
SouthEast: Patroni Rd	L	0.004	8.1	A	0.1	0.013	7.8	A	0.4
	R	0.015	12.4	B	0.6	0.045	11	B	2.2
All Vehicles		0.195	1.1	A	0.9	0.240	2.3	A	2.2

**Table 6-7 SIDRA Results – 2025 Opening Year + Development**

Intersection Approach		AM				PM			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
NorthEast: Hannan St	L	0.032	5.7	A	0.9	0.010	6	A	0.3
	T	0.105	0	A	0	0.053	0	A	0
SouthWest: Hannan St	T	0.199	0.1	A	0	0.244	0.1	A	0
	R	0.015	6.1	A	0.3	0.062	6.3	A	1.2
SouthEast: Patroni Rd	L	0.088	10.4	B	3.3	0.019	8.5	A	0.6
	R	0.015	12.5	B	0.6	0.046	11.5	B	2.3
All Vehicles		0.199	2.8	A	3.3	0.244	2.6	A	2.3

**Table 6-8 SIDRA Results – 2035 Future Year + Development**

Intersection Approach		AM				PM			
		DOS	Delay (s)	LOS	95% Queue (m)	DOS	Delay (s)	LOS	95% Queue (m)
NorthEast: Hannan St	L	0.035	5.7	A	1	0.010	6	A	0.3
	T	0.116	0	A	0	0.058	0	A	0
SouthWest: Hannan St	T	0.219	0.1	A	0	0.268	0.1	A	0
	R	0.016	6.1	A	0.3	0.063	6.3	A	1.2
SouthEast: Patroni Rd	L	0.090	10.5	B	3.4	0.021	8.5	A	0.7
	R	0.017	13.1	B	0.7	0.052	11.9	B	2.7
All Vehicles		0.219	2.7	A	3.4	0.268	2.6	A	2.7





## **Fabric Street Temporary Workforce Accommodation – Lot 67 (45) Bates Drive, Somerville**

The results of the analysis showed that the intersection of Great Eastern Highway and Patroni Road is anticipated to perform at an excellent level of service with low average delays and queues for all three analysed scenarios. The worst movement at the intersection is the right turn from Patroni Road into Great Eastern Highway with an average delay of 13.1 seconds in the 2035+development scenario. This is still considered satisfactory with a level of service B.

The additional volumes generated by the proposed development are anticipated to also have negligible impact on intersections farther away from the Great Eastern Highway/Patroni Road intersection.

Overall, the proposed development is not anticipated to significantly affect the traffic operations and safety of the surrounding road network.



## 7.0 SUMMARY

This Transport Impact Assessment outlines the transport aspects of the proposed development focusing on traffic operations, access, and parking provisions.

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

The following conclusions are made for the proposed development:

- > The Site is adequately accessible to pedestrians and cyclists via cycleways on Great Eastern Highway;
- > The number of recorded crash incidents within the subject area is low and is unlikely to have a significant impact on the overall road safety in the area;
- > Adequate car and bus parking bays are provided within the Site;
- > The swept path analysis has indicated that the B99 design vehicle, 19m articulated vehicles, and 14.5m buses are able to adequately manoeuvre through the relevant parking areas within the Site;
- > The proposed redevelopment is expected to generate 89 trips during the AM and PM peak hour periods;
- > The SIDRA analysis showed that the impact of the estimated trips to be generated by the proposed development at the intersection of Great Eastern Highway and Patroni Road is negligible.

Overall, the proposed Fabric Street temporary workforce accommodation is unlikely to cause a significant impact on overall safety and traffic operations on the surrounding road network.



# **APPENDICES**

## APPENDIX A WAPC CHECKLIST

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



## Fabric Street Temporary Workforce Accommodation – Lot 67 (45) Bates Drive, Somerville

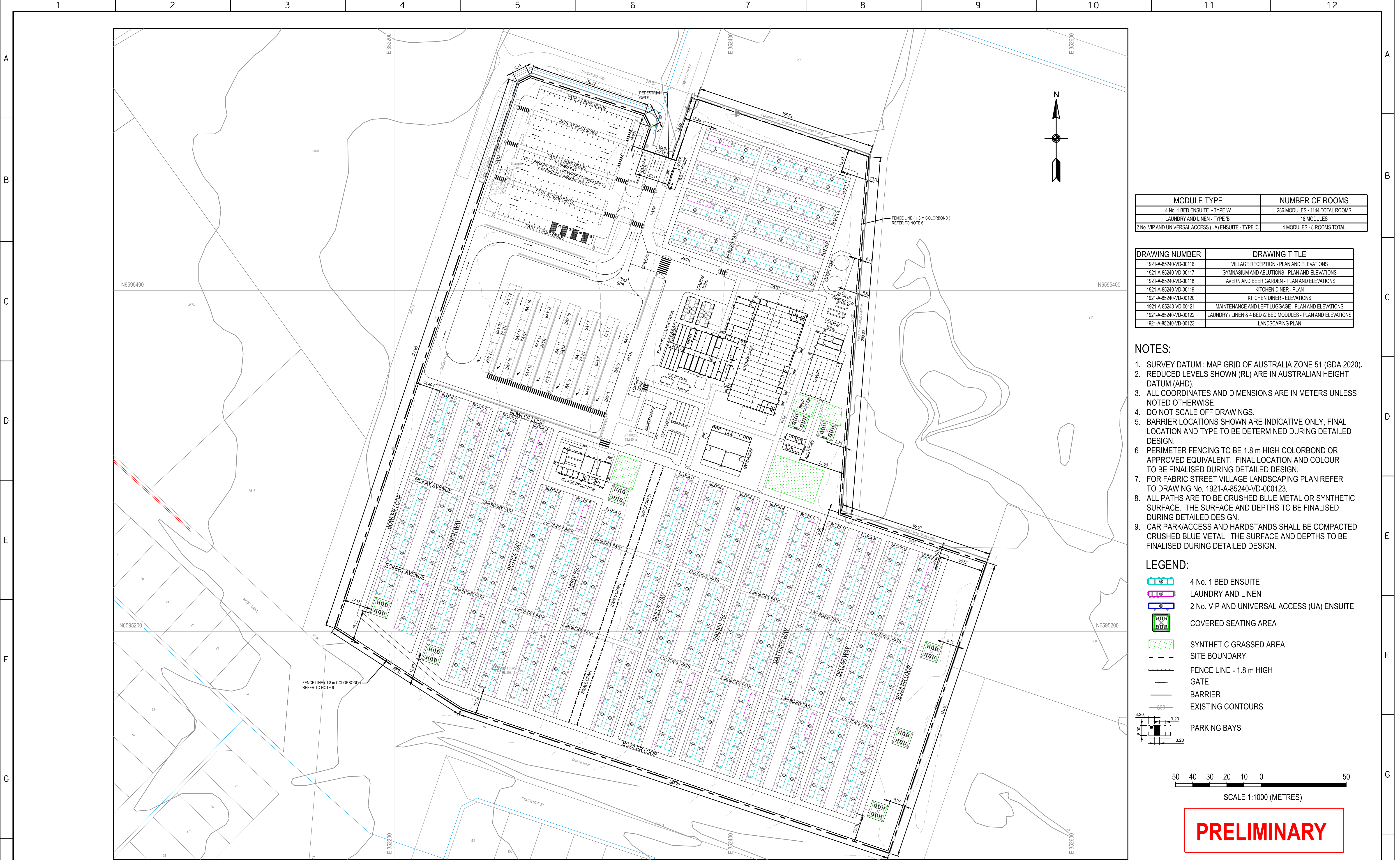
road network	Section 3	
intersection layouts and controls	Section 3	
pedestrian/cycle networks and crossing facilities	Section 3	
public transport services	N/A	
Integration with surrounding area	Section 5	
surrounding major attractors/generators	Section 5	
committed developments and transport proposals	N/A	
proposed changes to land uses within 1200 metres	Section 5	
travel desire lines from development to these attractors/generators	N/A	
adequacy of existing transport networks	Section 2	
deficiencies in existing transport networks	Section 2	
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





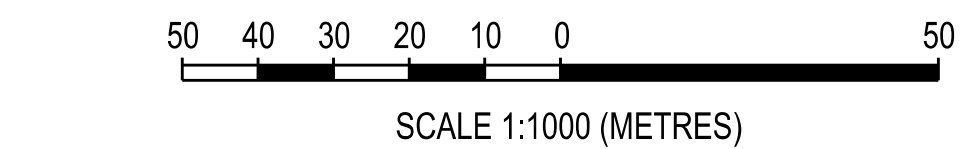


MODULE TYPE	NUMBER OF ROOMS
4 No. 1 BED ENSUITE - TYPE 'A'	286 MODULES - 1144 TOTAL ROOMS
LAUNDRY AND LINEN - TYPE 'B'	18 MODULES
2 No. VIP AND UNIVERSAL ACCESS (UA) ENSUITE - TYPE 'C'	4 MODULES - 8 ROOMS TOTAL

DRAWING NUMBER	DRAWING TITLE
1921-A-85240-VD-00116	VILLAGE RECEPTION - PLAN AND ELEVATIONS
1921-A-85240-VD-00117	GYMNASIUM AND ABLUTIONS - PLAN AND ELEVATIONS
1921-A-85240-VD-00118	TAVERN AND BEER GARDEN - PLAN AND ELEVATIONS
1921-A-85240-VD-00119	KITCHEN DINER - PLAN
1921-A-85240-VD-00120	KITCHEN DINER - ELEVATIONS
1921-A-85240-VD-00121	MAINTENANCE AND LEFT LUGGAGE - PLAN AND ELEVATIONS
1921-A-85240-VD-00122	LAUNDRY / LINEN & 4 BED / 2 BED MODULES - PLAN AND ELEVATIONS
1921-A-85240-VD-00123	LANDSCAPING PLAN

- NOTES:
- SURVEY DATUM : MAP GRID OF AUSTRALIA ZONE 51 (GDA 2020).
  - REDUCED LEVELS SHOWN (RL) ARE IN AUSTRALIAN HEIGHT DATUM (AHD).
  - ALL COORDINATES AND DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
  - DO NOT SCALE OFF DRAWINGS.
  - BARRIER LOCATIONS SHOWN ARE INDICATIVE ONLY, FINAL LOCATION AND TYPE TO BE DETERMINED DURING DETAILED DESIGN.
  - PERIMETER FENCING TO BE 1.8 m HIGH COLORBOND OR APPROVED EQUIVALENT, FINAL LOCATION AND COLOUR TO BE FINALISED DURING DETAILED DESIGN.
  - FOR FABRIC STREET VILLAGE LANDSCAPING PLAN REFER TO DRAWING No. 1921-A-85240-VD-000123.
  - ALL PATHS ARE TO BE CRUSHED BLUE METAL OR SYNTHETIC SURFACE. THE SURFACE AND DEPTHS TO BE FINALISED DURING DETAILED DESIGN.
  - CAR PARK/ACCESS AND HARDSTANDS SHALL BE COMPACTED CRUSHED BLUE METAL. THE SURFACE AND DEPTHS TO BE FINALISED DURING DETAILED DESIGN.

- LEGEND:
- 4 No. 1 BED ENSUITE
  - LAUNDRY AND LINEN
  - 2 No. VIP AND UNIVERSAL ACCESS (UA) ENSUITE
  - COVERED SEATING AREA
  - SYNTHETIC GRASSED AREA
  - SITE BOUNDARY
  - FENCE LINE - 1.8 m HIGH
  - GATE
  - BARRIER
  - EXISTING CONTOURS
  - PARKING BAYS



**PRELIMINARY**

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## APPENDIX C SIDRA ANALYSIS RESULTS



# MOVEMENT SUMMARY

 **Site: S1-1 [Hannan St/Patroni Rd AM S1 (Site Folder: 2023 Base)]**

 **Network: SCTI-B [Hannan St/Patroni Rd AM (Network Folder: 2023 Base)]**

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist m				
SouthEast: Patroni Rd														
1	L2	4	0.0	4	0.0	0.004	8.1	LOS A	0.0	0.1	0.29	0.83	0.29	47.5
2	T1	9	0.0	9	0.0	0.015	10.4	LOS B	0.1	0.4	0.50	0.84	0.50	36.8
Approach		14	0.0	14	0.0	0.015	9.7	LOS A	0.1	0.4	0.43	0.84	0.43	41.7
NorthEast: Hannan St														
3	L2	44	0.0	44	0.0	0.031	5.7	LOS A	0.1	0.9	0.07	0.52	0.07	50.4
4	T1	359	11.7	359	11.7	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		403	10.4	403	10.4	0.104	0.6	LOS A	0.1	0.9	0.01	0.06	0.01	58.9
NorthWest: Median Storage														
5	T1	19	0.0	19	0.0	0.009	0.3	LOS A	0.0	0.2	0.22	0.08	0.22	43.7
Approach		19	0.0	19	0.0	0.009	0.3	LOS A	0.0	0.2	0.22	0.08	0.22	43.7
All Vehicles		436	9.7	436	9.7	0.104	0.9	NA	0.1	0.9	0.03	0.08	0.03	58.1

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.

# MOVEMENT SUMMARY

Site: S1-2 [Hannan St/Patroni Rd AM S2 (Site Folder: 2023 Base)]

Network: SCTI-B [Hannan St/Patroni Rd AM (Network Folder: 2023 Base)]

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
SouthEast: Median Storage														
1	R2	9	0.0	9	0.0	0.007	2.0	LOS A	0.0	0.2	0.44	0.40	0.44	49.5
Approach		9	0.0	9	0.0	0.007	2.0	LOS A	0.0	0.2	0.44	0.40	0.44	49.5
SouthWest: Hannan St														
2	T1	675	13.4	675	13.4	0.195	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	19	0.0	19	0.0	0.010	5.7	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		694	13.1	694	13.1	0.195	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		703	12.9	703	12.9	0.195	0.2	NA	0.0	0.2	0.01	0.02	0.01	59.6

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.

# MOVEMENT SUMMARY

 **Site: S1-1 [Hannan St/Patroni Rd PM S1 (Site Folder: 2023 Base)]**

 **Network: SCTI-B [Hannan St/Patroni Rd PM (Network Folder: 2023 Base)]**

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Patroni Rd														
1	L2	17	0.0	17	0.0	0.013	7.8	LOS A	0.0	0.4	0.19	0.88	0.19	47.6
2	T1	39	0.0	39	0.0	0.045	8.6	LOS A	0.2	1.4	0.36	0.85	0.36	38.4
Approach		56	0.0	56	0.0	0.045	8.4	LOS A	0.2	1.4	0.31	0.86	0.31	42.6
NorthEast: Hannan St														
3	L2	13	0.0	13	0.0	0.009	5.6	LOS A	0.0	0.3	0.03	0.53	0.03	50.6
4	T1	179	12.9	179	12.9	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		192	12.1	192	12.1	0.052	0.4	LOS A	0.0	0.3	0.00	0.04	0.00	59.3
NorthWest: Median Storage														
5	T1	5	0.0	5	0.0	0.002	0.1	LOS A	0.0	0.0	0.15	0.04	0.15	44.0
Approach		5	0.0	5	0.0	0.002	0.1	LOS A	0.0	0.0	0.15	0.04	0.15	44.0
All Vehicles		253	9.2	253	9.2	0.052	2.1	NA	0.2	1.4	0.07	0.22	0.07	56.3

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.

## MOVEMENT SUMMARY

▼ Site: S1-2 [Hannan St/Patroni Rd PM S2 (Site Folder: 2023 Base)]

■ Network: SCTI-B [Hannan St/Patroni Rd PM (Network Folder: 2023 Base)]

Staged Crossing at T Intersection Type B

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Median Storage														
1	R2	39	0.0	39	0.0	0.033	2.4	LOS A	0.1	0.8	0.49	0.51	0.49	48.9
Approach		39	0.0	39	0.0	0.033	2.4	LOS A	0.1	0.8	0.49	0.51	0.49	48.9
SouthWest: Hannan St														
2	T1	824	13.8	824	13.8	0.240	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	5	0.0	5	0.0	0.003	5.7	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		829	13.7	829	13.7	0.240	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		868	13.1	868	13.1	0.240	0.2	NA	0.1	0.8	0.02	0.03	0.02	59.5

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.

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# MOVEMENT SUMMARY

 **Site: S1-1 [Hannan St/Patroni Rd AM S1 (Site Folder: 2025 +Development)]**

 **Network: SCTI-B [Hannan St/Patroni Rd AM (Network Folder: 2025+Development)]**

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Patroni Rd														
1	L2	91	25.6	91	25.6	0.088	10.4	LOS B	0.4	3.3	0.33	0.97	0.33	40.9
2	T1	9	0.0	9	0.0	0.015	10.5	LOS B	0.1	0.4	0.50	0.85	0.50	36.8
Approach		100	23.2	100	23.2	0.088	10.4	LOS B	0.4	3.3	0.35	0.96	0.35	40.7
NorthEast: Hannan St														
3	L2	45	0.0	45	0.0	0.032	5.7	LOS A	0.1	0.9	0.09	0.52	0.09	50.4
4	T1	365	11.5	365	11.5	0.105	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		411	10.3	411	10.3	0.105	0.7	LOS A	0.1	0.9	0.01	0.06	0.01	58.9
NorthWest: Median Storage														
5	T1	26	8.0	26	8.0	0.012	0.3	LOS A	0.0	0.3	0.23	0.09	0.23	42.7
Approach		26	8.0	26	8.0	0.012	0.3	LOS A	0.0	0.3	0.23	0.09	0.23	42.7
All Vehicles		537	12.5	537	12.5	0.105	2.5	NA	0.4	3.3	0.08	0.23	0.08	54.5

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.

# MOVEMENT SUMMARY

Site: S1-2 [Hannan St/Patroni Rd AM S2 (Site Folder: 2025 +Development)]

Network: SCTI-B [Hannan St/Patroni Rd AM (Network Folder: 2025+Development)]

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Median Storage														
1	R2	9	0.0	9	0.0	0.007	2.0	LOS A	0.0	0.2	0.45	0.41	0.45	49.4
Approach		9	0.0	9	0.0	0.007	2.0	LOS A	0.0	0.2	0.45	0.41	0.45	49.4
SouthWest: Hannan St														
2	T1	687	13.3	687	13.3	0.199	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	26	8.0	26	8.0	0.015	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		714	13.1	714	13.1	0.199	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		723	13.0	723	13.0	0.199	0.3	NA	0.0	0.2	0.01	0.03	0.01	59.6

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.

# MOVEMENT SUMMARY

 **Site: S1-1 [Hannan St/Patroni Rd PM S1 (Site Folder: 2025 +Development)]**

 **Network: SCTI-B [Hannan St/Patroni Rd PM (Network Folder: 2025+Development)]**

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Patroni Rd														
1	L2	24	8.7	24	8.7	0.019	8.5	LOS A	0.1	0.6	0.20	0.92	0.20	45.2
2	T1	40	0.0	40	0.0	0.046	8.7	LOS A	0.2	1.4	0.36	0.86	0.36	38.4
Approach		64	3.3	64	3.3	0.046	8.6	LOS A	0.2	1.4	0.30	0.88	0.30	42.1
NorthEast: Hannan St														
3	L2	13	0.0	13	0.0	0.010	6.0	LOS A	0.0	0.3	0.20	0.51	0.20	50.0
4	T1	182	12.7	182	12.7	0.053	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		195	11.9	195	11.9	0.053	0.4	LOS A	0.0	0.3	0.01	0.03	0.01	59.3
NorthWest: Median Storage														
5	T1	92	25.3	92	25.3	0.044	0.2	LOS A	0.1	1.2	0.17	0.05	0.17	41.2
Approach		92	25.3	92	25.3	0.044	0.2	LOS A	0.1	1.2	0.17	0.05	0.17	41.2
All Vehicles		351	13.8	351	13.8	0.053	1.8	NA	0.2	1.4	0.11	0.19	0.11	53.4

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.

# MOVEMENT SUMMARY

Site: S1-2 [Hannan St/Patroni Rd PM S2 (Site Folder: 2025 +Development)]

Network: SCTI-B [Hannan St/Patroni Rd PM (Network Folder: 2025+Development)]

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
SouthEast: Median Storage														
1	R2	40	0.0	40	0.0	0.037	2.8	LOS A	0.1	0.9	0.52	0.54	0.52	48.5
Approach		40	0.0	40	0.0	0.037	2.8	LOS A	0.1	0.9	0.52	0.54	0.52	48.5
SouthWest: Hannan St														
2	T1	840	13.8	840	13.8	0.244	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	92	25.3	92	25.3	0.062	6.1	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		932	14.9	932	14.9	0.244	0.7	NA	0.0	0.0	0.00	0.06	0.00	59.3
All Vehicles		972	14.3	972	14.3	0.244	0.8	NA	0.1	0.9	0.02	0.08	0.02	59.0

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.

# MOVEMENT SUMMARY

Site: S1-2 [Hannan St/Patroni Rd PM S2 (Site Folder: 2035 +Development)]

Network: SCTI-B [Hannan St/Patroni Rd PM (Network Folder: 2035+Development)]

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Median Storage														
1	R2	44	0.0	44	0.0	0.044	3.1	LOS A	0.1	1.1	0.54	0.58	0.54	48.1
Approach		44	0.0	44	0.0	0.044	3.1	LOS A	0.1	1.1	0.54	0.58	0.54	48.1
SouthWest: Hannan St														
2	T1	922	13.8	922	13.8	0.268	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	93	25.0	93	25.0	0.063	6.1	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		1015	14.8	1015	14.8	0.268	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.3
All Vehicles		1059	14.2	1059	14.2	0.268	0.7	NA	0.1	1.1	0.02	0.08	0.02	59.0

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.

# MOVEMENT SUMMARY

 **Site: S1-1 [Hannan St/Patroni Rd AM S1 (Site Folder: 2035 +Development)]**

 **Network: SCTI-B [Hannan St/Patroni Rd AM (Network Folder: 2035+Development)]**

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Patroni Rd														
1	L2	91	25.6	91	25.6	0.090	10.5	LOS B	0.4	3.4	0.35	0.97	0.35	40.9
2	T1	11	0.0	11	0.0	0.017	10.9	LOS B	0.1	0.5	0.53	0.86	0.53	36.3
Approach		101	22.9	101	22.9	0.090	10.6	LOS B	0.4	3.4	0.37	0.96	0.37	40.7
NorthEast: Hannan St														
3	L2	49	0.0	49	0.0	0.035	5.7	LOS A	0.1	1.0	0.10	0.52	0.10	50.4
4	T1	402	11.8	402	11.8	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		452	10.5	452	10.5	0.116	0.7	LOS A	0.1	1.0	0.01	0.06	0.01	58.9
NorthWest: Median Storage														
5	T1	28	7.4	28	7.4	0.014	0.3	LOS A	0.0	0.3	0.25	0.10	0.25	42.7
Approach		28	7.4	28	7.4	0.014	0.3	LOS A	0.0	0.3	0.25	0.10	0.25	42.7
All Vehicles		581	12.5	581	12.5	0.116	2.4	NA	0.4	3.4	0.08	0.22	0.08	54.8

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.



# MOVEMENT SUMMARY

Site: S1-2 [Hannan St/Patroni Rd AM S2 (Site Folder: 2035 +Development)]

Network: SCTI-B [Hannan St/Patroni Rd AM (Network Folder: 2035+Development)]

Staged Crossing at T Intersection Type B  
Site Category: (None)  
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
SouthEast: Median Storage														
1	R2	11	0.0	11	0.0	0.009	2.2	LOS A	0.0	0.2	0.47	0.44	0.47	49.2
Approach		11	0.0	11	0.0	0.009	2.2	LOS A	0.0	0.2	0.47	0.44	0.47	49.2
SouthWest: Hannan St														
2	T1	755	13.4	755	13.4	0.219	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	28	7.4	28	7.4	0.016	5.8	LOS A	0.0	0.0	0.00	0.63	0.00	50.6
Approach		783	13.2	783	13.2	0.219	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		794	13.0	794	13.0	0.219	0.3	NA	0.0	0.2	0.01	0.03	0.01	59.6

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.

# MOVEMENT SUMMARY

 **Site: S1-1 [Hannan St/Patroni Rd PM S1 (Site Folder: 2035 +Development)]**

 **Network: SCTI-B [Hannan St/Patroni Rd PM (Network Folder: 2035+Development)]**

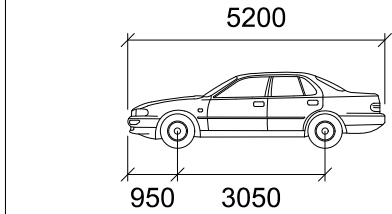
Staged Crossing at T Intersection Type B  
Site Category: (None)  
Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
SouthEast: Patroni Rd														
1	L2	26	8.0	26	8.0	0.021	8.5	LOS A	0.1	0.7	0.21	0.91	0.21	45.4
2	T1	44	0.0	44	0.0	0.052	8.8	LOS A	0.2	1.6	0.38	0.86	0.38	38.3
Approach		71	3.0	71	3.0	0.052	8.7	LOS A	0.2	1.6	0.32	0.88	0.32	42.1
NorthEast: Hannan St														
3	L2	14	0.0	14	0.0	0.010	6.0	LOS A	0.0	0.3	0.20	0.51	0.20	50.0
4	T1	200	12.6	200	12.6	0.058	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		214	11.8	214	11.8	0.058	0.4	LOS A	0.0	0.3	0.01	0.03	0.01	59.3
NorthWest: Median Storage														
5	T1	93	25.0	93	25.0	0.044	0.2	LOS A	0.1	1.2	0.17	0.06	0.17	41.2
Approach		93	25.0	93	25.0	0.044	0.2	LOS A	0.1	1.2	0.17	0.06	0.17	41.2
All Vehicles		377	13.4	377	13.4	0.058	1.9	NA	0.2	1.6	0.11	0.20	0.11	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.

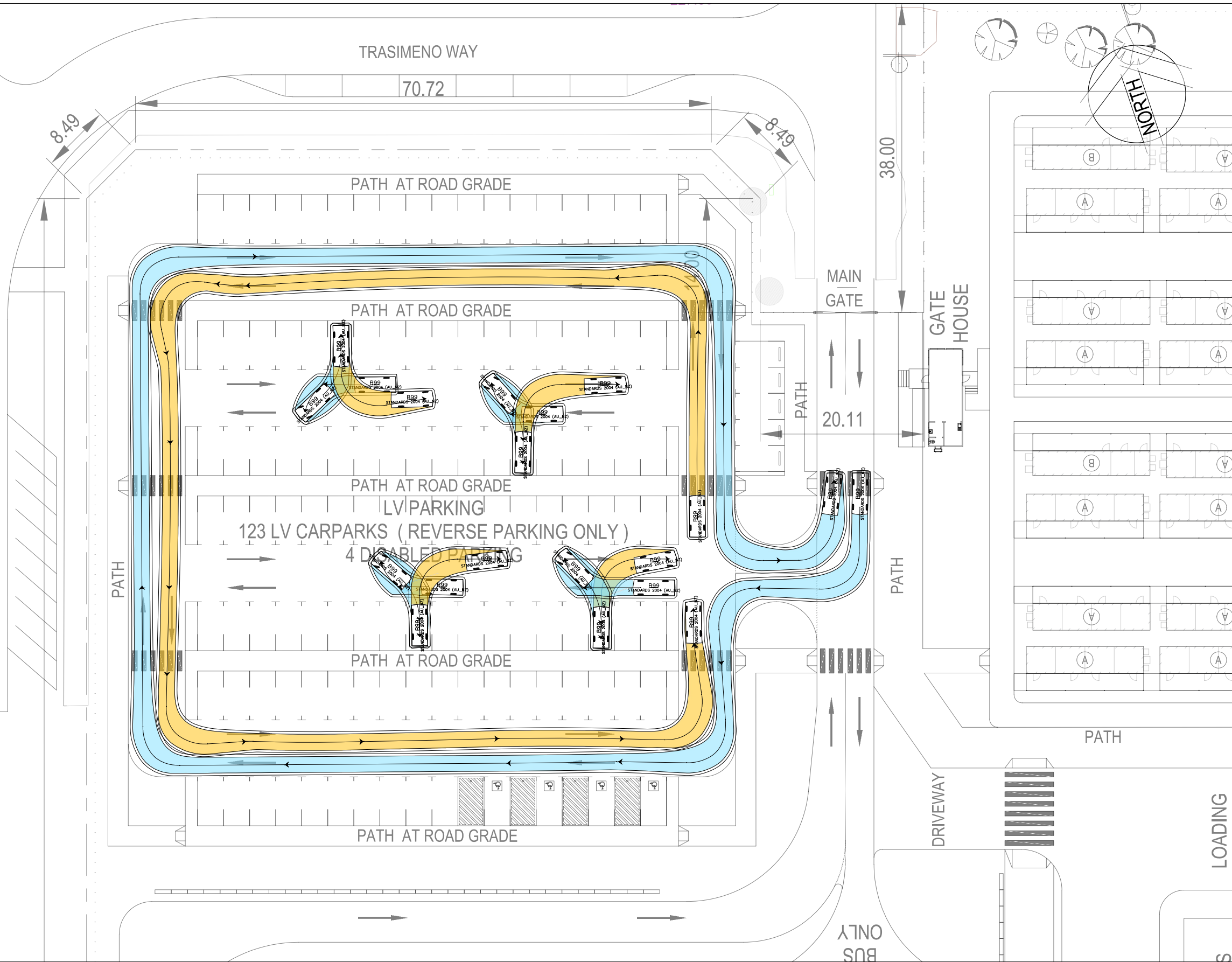
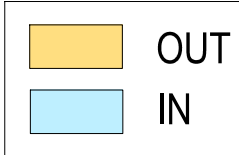
## APPENDIX D SWEPT PATHS





**B99**

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Track	: 1840
Lock to Lock Time	: 6.0
Steering Angle	: 33.9



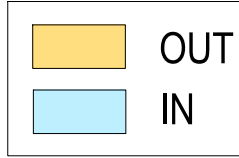
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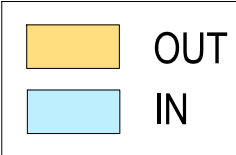
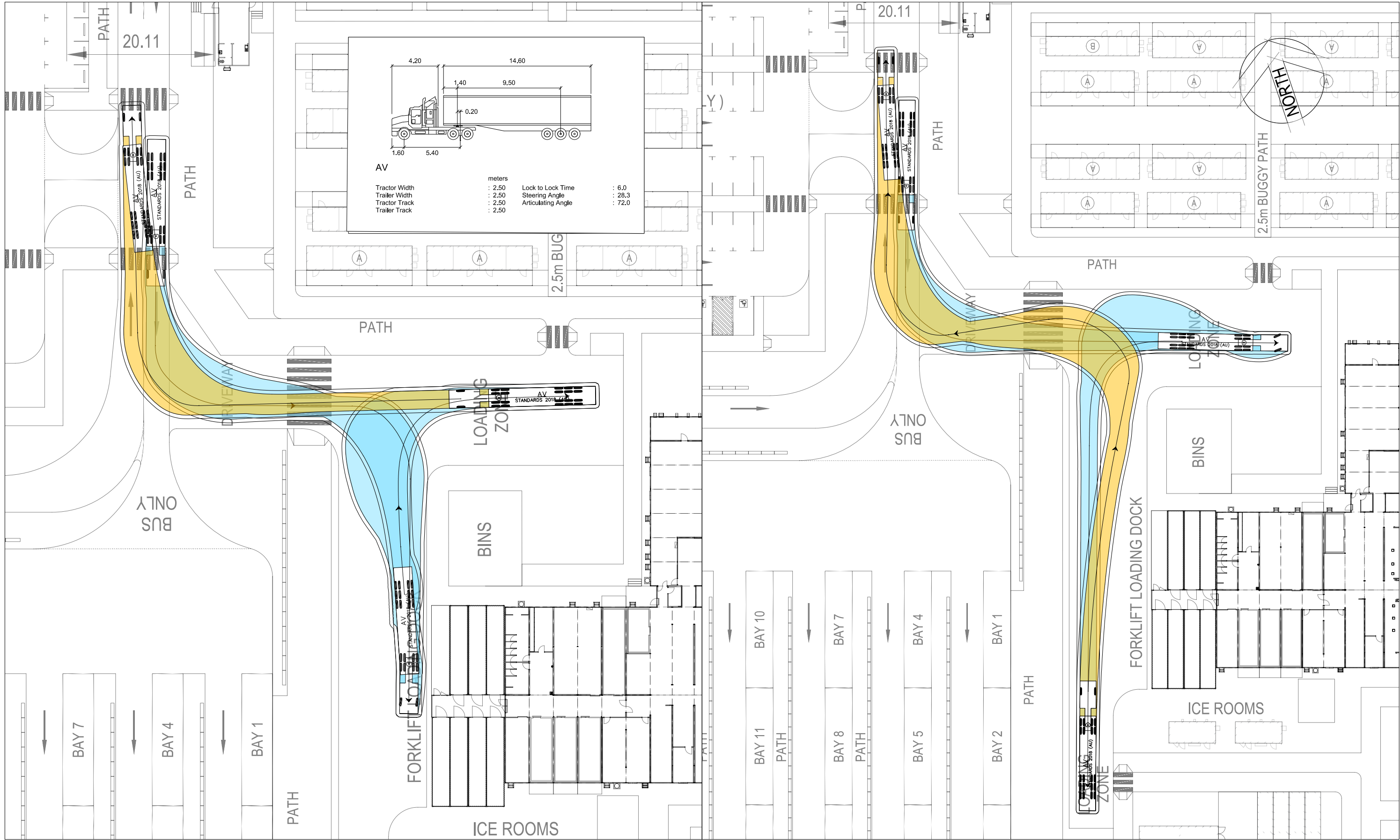
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Planning Solutions				
Temporary Construction Accommodation				
Lot 67 Bates Drive Somerville				
Car Swept Path				
Datum	Date	Scale	Size	Revision
	2023 08 03	1:500	A3	
Drawing Number				
300306985-SK002				3



<h1>Planning Solutions</h1> <p>Temporary Construction Accommodation</p> <p>Lot 67 Bates Drive Somerville</p> <p>Bus Swept Path</p>			
Datum	Date	Scale	Size
	2023 08 03		A3
Drawing Number <b>300306985-SK003</b>			Revision <b>3</b>



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Planning Solutions			
Temporary Construction Accommodation			
Lot 67 Bates Drive Somerville			
Truck Sweep Path			
Datum	Date	Scale	Size
	2023 08 03		A3
Drawing Number	Revision		
300306985-SK004	3		