

SPF Diana Australia Pty Ltd Facility  
91 Gardiner Street, Rutherford

**Traffic and Parking Assessment Report**

Prepared for: SPF Diana Australia Pty Ltd (Diana Pet Foods)

March 2022

Report No: PT21101r01\_V2

# TABLE OF CONTENTS

<b>1. Introduction .....</b>	<b>3</b>
<b>2. Existing Development / Conditions .....</b>	<b>4</b>
2.1 Site Location .....	4
2.2 Classification Criteria .....	5
2.3 Existing Road Network .....	6
2.4 Existing Site Traffic Generation .....	6
2.5 Existing Traffic Flows .....	6
2.6 2015 Intersection Operation Conditions .....	8
2.7 2022 Intersection Operation Conditions .....	10
<b>3. The Proposed Development.....</b>	<b>11</b>
<b>4. Potential Traffic Impacts .....</b>	<b>12</b>
4.1 Comparison of Traffic Generation Rates .....	12
4.1.1 RTA Technical Direction TDT 2013-04a .....	12
4.1.2 Survey of Existing Diana Pet Foods Development .....	12
4.1.3 First Principles Forecast Site Traffic Generation .....	13
4.2 Future Intersection Operating Conditions .....	14
<b>5. Parking, Access and Design Compliance Assessment .....</b>	<b>16</b>
5.1 General Parking Provision .....	16
5.2 Car Park Design.....	16
5.3 Service Vehicle Access Assessment.....	16
<b>6. Conclusions .....</b>	<b>18</b>
<b>7. Appendix A – Plans of Proposed Development.....</b>	<b>19</b>
<b>8. Appendix B – Diana Pet Foods Beresfield Staff / Service Vehicle Surveys.....</b>	<b>20</b>
<b>9. Appendix C – SIDRA Modelling Outputs .....</b>	<b>21</b>
<b>10. Appendix D – Service Vehicle Turning Path Assessments .....</b>	<b>22</b>

## List of Figures

Figure 1 - Site Location

Figure 2 - Site Location in Context of Proposed Industrial

Figure 3 – Hunter Expressway Annual Average Traffic Demands (Two Way) – 2015 to 2022

Figure 4 – Transpacific Development Site / 91 Gardiner Street Rutherford Site

Figure 5 – Rutherford Industrial Precinct 2015 vs 2021

## List of Tables

Table 1 – Level of Service Criteria

Table 2 – 2022 Estimated Weekday Intersection Operating Conditions

Table 3 – 2022 + Development Estimated Weekday Intersection Operating Conditions

Table 4 – 2032 + Development Estimated Weekday Intersection Operating Conditions



## 1. Introduction

This report has been prepared on behalf of SPF Diana Australia Pty Ltd to present findings of a traffic and parking assessment of the proposed pet food production facility at the site known as 91 Gardiner Street, Rutherford.

The study has assessed existing traffic conditions, parking demands, access arrangements, future traffic conditions, service vehicle provision and design compliance.

The remainder of the report is set out as follows:

- Section 2 describes the existing traffic and parking conditions;
- Section 3 summarises the proposed development;
- Section 4 reviews the potential traffic impacts of the proposal;
- Section 5 provides a compliance assessment of the proposed car park areas and access arrangements; and
- Section 6 presents the conclusions



## 2. Existing Development / Conditions

The following presents a summary of existing site and traffic conditions.

### 2.1 Site Location

The proposed development site is located near the southern boundary of the Rutherford Industrial Estate which has been established for a significant period of time comprising of industries that service the heavy manufacturing, steel and mining sectors. At the time of preparing this report, the development would form part of a Stage 2 subdivision of lands surrounding and including the site.

The site location is shown in **Figure 1**.

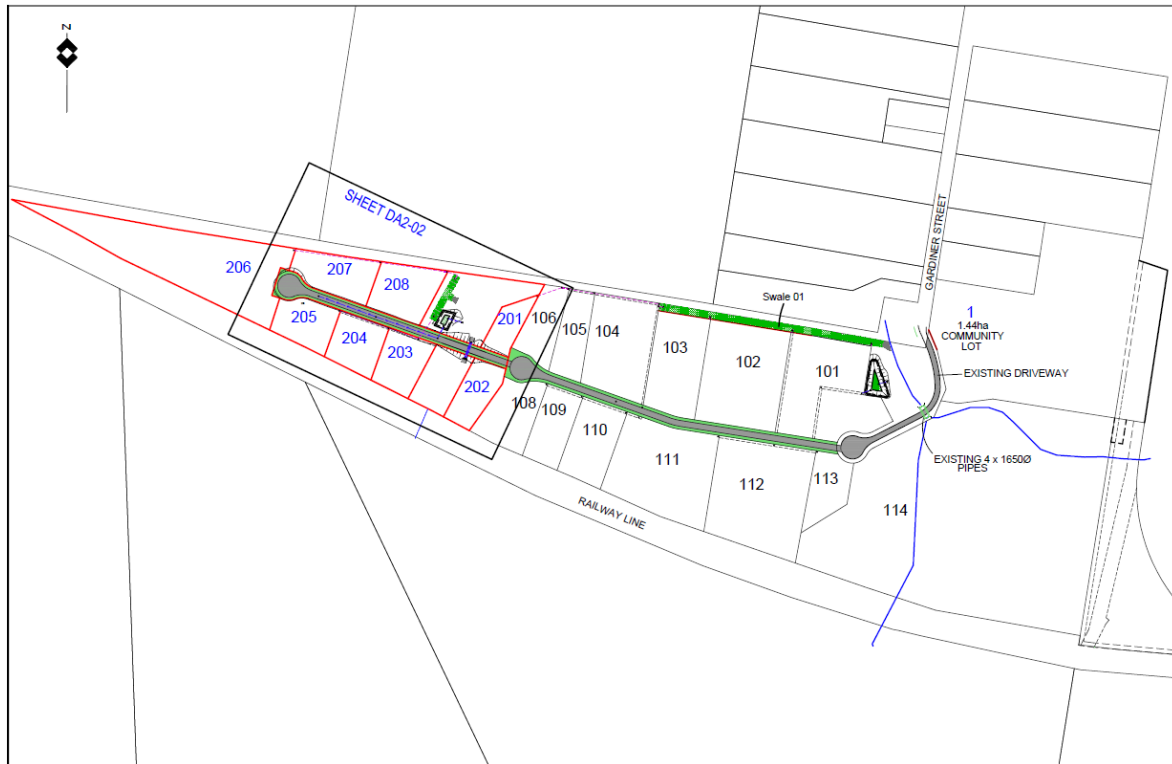
**Figure 1 - Site Location**



Source: Nearmap

The location of the development site (Lot 206) in relation to the proposed subdivision which includes the site is shown below in **Figure 2**.

Figure 2 - Site Location in Context of Proposed Industrial Subdivision



The proposed subdivision includes an extension of the existing driveway providing a connection to Gardiner Street. Further, the new internal access road and existing driveway would be sufficient in width to comply with the industrial road requirements of Maitland Council.

## 2.2 Classification Criteria

It is usual to classify roads according to a road hierarchy in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry. The RTA has set down the following guidelines for the functional classification of roads.

- Arterial Road – typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour)
- Sub-arterial Road – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour)
- Collector Road – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.
- Local Road – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

### 2.3 Existing Road Network

Gardiner Street – is a local industrial road which includes a wide (13.0m) carriageway and provides access to adjacent industrial developments which includes large service vehicles (19.0m semi-trailers and B Double trucks). The street includes a single travel lane in each direction, unrestricted parallel parking on both sides of the street and a posted speed limit of 50km/hr. The intersection of Gardiner Street / Kyle Street is a priority-controlled intersection.

Kyle Street – is a local east-west street Kyle Street is a local road providing access to the different land uses within the Rutherford Industrial Estate and which provides a direct link to the New England Highway via a roundabout controlled intersection. It is a two-lane undivided road with a sign posted speed limit of 60 km/h.

New England Highway – in the vicinity of Kyle Street generally includes a two-lane undivided road and is a key corridor through the area providing connectivity to the surrounding strategic road network, linking to the Hunter Expressway to the west and Cessnock Road to the east. It has a posted 80 km/h speed limit east and west side of the New England Highway / Kyle Street / Mirage Road intersection.

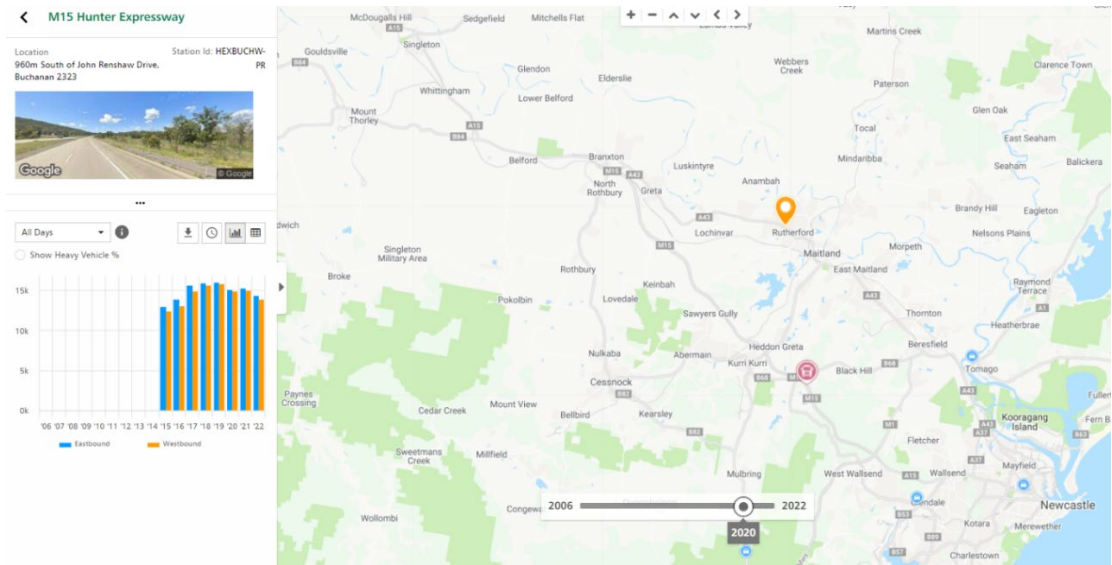
### 2.4 Existing Site Traffic Generation

The existing site is a greenfield site and is not considered a traffic generator in its own right.

### 2.5 Existing Traffic Flows

At the time of preparing this report, travel restrictions and government requests for work from home arrangements to be put in place did not allow appropriate counts to be undertaken which might reflect potential traffic conditions post the current Covid 19 pandemic. As an example, a review of the permanent counter station within the Hunter Expressway (Station ID HEXBUCHW-PR) revealed traffic demands remain somewhat below the peak of 2019. Further, traffic demands between 2016 – 2019 were fairly constant.

Figure 3 – Hunter Expressway Annual Average Traffic Demands (Two Way) – 2015 to 2022



Therefore, historical traffic counts were obtained from published traffic reports undertaken within the precinct. A traffic impact assessment report<sup>1</sup> undertaken for a major development application for the Transpacific industrial site in Kyle Street, a short distance to the north of the subject site at No.91 Gardiner Street, included 2016 intersection counts for the dual lane roundabout of the New England Highway / Kyle Street / Mirage Drive. This intersection would provide the main intersection connection access between the New England Highway and the proposed development at No.91 Gardiner Street. The location of the two sites is shown below in **Figure 4**.

**Figure 4 – Transpacific Development Site / 91 Gardiner Street Rutherford Site**



To gauge further potential generators of increased traffic in and around the precinct since 2016, a comparison of the development changes which have occurred in and around the Rutherford Industrial Precinct is shown below.

<sup>1</sup> Transpacific Diversification Project 05\_0037 Mod 5 TIA Report – AECOM 2016



**Figure 5 – Rutherford Industrial Precinct 2015 vs 2021**

From **Figure 5** it is noted that there has been little to no material increase in development within the Rutherford Industrial Precinct on the southern side of the New England Highway and surrounding the development site at No.91 Gardiner Street. However, some new development has occurred on the northern side of the New England Highway adjacent to the airport.

## 2.6 2015 Intersection Operation Conditions

The 2016 AECOM report included an assessment of 'existing' intersection operating conditions for the intersection of New England Highway / Kyle Street / Mirage Drive.

The intersection was analysed using the Sidra Intersection analysis program. Sidra Intersection determines the average delay that vehicles encounter, the degree of saturation of the intersection, and the level of service. The degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Sidra Intersection provides analysis of the operating conditions which can be compared to the performance criteria set out in **Table 1**.

Table 1 – Level of Service Criteria

Level of Service	Average Delay per Vehicle (secs/veh)	Signals & Roundabouts	Give Way & Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & Spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Extra capacity required	Extreme delay, traffic signals or other major treatment required

Adapted from RTA Guide to Traffic Generating Developments, 2002.

For roundabouts and priority intersections, the reported average delay is for the individual movement with the highest average delay per vehicle. At signalised intersections, the reported average delay is over all movements. The two intersections surveyed have been modelled as a network given their close proximity to each other.

The 2016 AM and PM weekday peak hour intersection operating conditions from the report<sup>2</sup> are presented below.

Approach	Volume (veh/h)	Level of Service	Degree of Saturation	Average Delay (s)	95% back of queue (m)
<b>2015 AM Peak</b>					
Kyle Street (S Leg)	43	A	0.028	8.6	1
New England Hwy (E Leg)	577	A	0.187	6.6	8
Mirage Road (N Leg)	32	A	0.022	7.9	1
New England Hwy (W Leg)	672	A	0.216	6.7	9
<b>Total</b>	<b>1,324</b>	<b>A</b>	<b>0.216</b>	<b>6.7</b>	<b>9</b>
<b>2015 PM Peak</b>					
Kyle Street (S Leg)	119	A	0.066	7.1	2
New England Hwy (E Leg)	586	A	0.184	6.3	8
Mirage Road (N Leg)	47	A	0.030	7.2	1
New England Hwy (W Leg)	634	A	0.201	6.4	9
<b>Total</b>	<b>1,387</b>	<b>A</b>	<b>0.201</b>	<b>6.4</b>	<b>9</b>

It is noted that in 2016 the intersection of New England Highway / Kyle Street / Mirage Drive operated at a satisfactory level of service with spare capacity in 2016.

<sup>2</sup> Transpacific Diversification Project 05\_0037 Mod 5 TIA Report – AECOM 2016

## 2.7 2022 Intersection Operation Conditions

To gauge potential 2022 traffic demands (post covid pandemic) at the intersection which would provide the main access to the development site at No.91 Gardiner Road, Rutherford, the average annual growth from the Hunter Expressway permanent station was considered for the years 2016 – 2019.

An annual growth rate of **3% per annum** was then applied to the 2016 recorded traffic flows from the AECOM report<sup>3</sup> for the New England Highway traffic flows and the traffic flows recorded for Mirage Drive. This resulted in the following 2022 intersection operating conditions.

**Table 2 – 2022 Estimated Weekday Intersection Operating Conditions**

Intersection	Control	Morning Peak		Evening Peak	
		Av Delay	LOS	Av Delay	LOS
New England Hwy / Kyle St / Mirage Dr	Roundabout	11.4	A	11.3	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 2** it is forecast that on the basis that a 3% growth in traffic volumes per annum occurred (compound increase) since 2016 at the intersection, the dual lane roundabout at the intersection of New England Highway / Kyle Street / Mirage Drive would continue to operate at a satisfactory level service with spare capacity.

The 2022 intersection operating conditions detailed above form the basis of the future year traffic assessment of this report.

<sup>3</sup> Transpacific Diversification Project 05\_0037 Mod 5 TIA Report – AECOM 2016

### 3. The Proposed Development

The key components of the proposed development and associated public works are described below.

- Construction of an industrial use building to house the production of Pet Feed Ingredients. The main building would include a total Gross Floor Area (GFA) of **6,407m<sup>2</sup>**.
- The majority of the new development would include warehousing of product (5,091m<sup>2</sup>) with the remainder (1,316m<sup>2</sup>) considered 'factory / production' operation areas.
- On-site parking of **45 spaces** for staff / visitors access via a single entry / exit driveway.
- Total peak staff demand of up to **40 staff**.
- Separate entry only and exit only service vehicle driveways which can accommodate access from expected main service vehicle of a 19.0m semi-trailer with occasional service by B Double trucks.
- Provision of six (6) loading docks which can accommodate each up to a B Double truck if required.
- Potential production tonnage of 25,000 tonnes per annum (2,085 tonnes per month).

Plans of the proposed development can be found in [Appendix A](#) of this report.

#### 4. Potential Traffic Impacts

The following presents an assessment of the potential traffic impacts of the proposed development.

##### 4.1 Comparison of Traffic Generation Rates

###### 4.1.1 RTA Technical Direction TDT 2013-04a

The RTA (now known as Transport for NSW) recommends the following traffic generation rates for a business parks / industrial estates development:

###### Business parks and industrial estates

In 2012 eleven of these two types of sites were surveyed, four within the Sydney urban area, four within the Lower Hunter, one in the Illawarra and one in Dubbo. Summary vehicle trip generation rates were as follows:

Weekday Rates	Sydney Average	Sydney Range	Regional Average	Regional Range
AM peak (1 hour) vehicle trips per 100 m <sup>2</sup> of GFA.	0.52	0.15-1.31	0.70	0.32-1.20
PM peak (1 hour) vehicle trips per 100 m <sup>2</sup> of GFA.	0.56	0.16-1.50	0.78	0.39-1.30
Daily total vehicle trips	4.60	1.89-10.47	7.83	3.78-11.99

Therefore, applying the regional average rate to the proposed development, it is estimated based on RTA rates that the site would generate **45 trips** in the AM weekday peak and **50 trips** in the PM weekday peak two way. However, the above average general rate is not considered reflective of the potential traffic impacts of the proposed development. Thus, surveys of a mirror smaller scale site were undertaken to inform this assessment.

###### 4.1.2 Survey of Existing Diana Pet Foods Development

To gauge the travel / traffic generation characteristics of the specific type of development proposed, traffic / parking surveys of the existing Diana Pet Foods development at Hawthorne Street, Beresfield were undertaken.

The surveys included recording *all* deliveries (by vehicle type) to and from the site for the month of October 2021 and weekly production tonnages for the months of September 2021 to November 2021. A copy of the service vehicle records are provided in [Appendix B](#) of this report.

In summary, the existing mirror development at the Beresfield site includes the following characteristics:

- Total of **31 staff** with the following attendance:

Shift Name	Shift Timing	Number of Staff
<b>Production 1</b>	4:00 AM till 12:00 PM	4
<b>Production 2</b>	12:00 PM till 8:00 PM	4
<b>Production 3</b>	8:00 PM till 4:00 AM	4
<b>Warehouse</b>	7:00 AM till 3:00 PM	2
<b>Maintenance</b>	6:30 AM till 2:30 PM	1
<b>Office</b>	8:00 AM till 5:00 PM	16

It is noted from the above that the majority of staff travel to / from the site outside of typical road network peak periods of 7:00am – 9:00am and 4:00pm – 6:00pm. Only the office staff of 16 would travel to / from the site during these periods.

- Average monthly tonnage production of 1,095 tonnes
- Average weekly tonnage production of 252 tonnes

Over the period of October 2021, each and every service vehicle which entered / exited the site was recorded including both the size of each vehicle and the length of stay. The existing site generated the following average service vehicle movements by type per day:

- **1.67** rigid trucks per day with an average length of stay of approximately 60 minutes.
- **2.72** semi-trailers per day with an average length of stay of approximately 60 minutes.
- Maximum number of rigid trucks recorded in one day was **4**
- Maximum number of semi trailer trucks recorded in one day (different day to the maximum of 4 rigid trucks recorded) was **5**
- The earliest arrival of service vehicles occurred between 4:00am – 5:00am.
- Generally service vehicles avoided the road peak periods of 7:00am – 9:00am and 4:00pm – 6:00pm.
- No traffic was generated by the site on a weekend.

The above service vehicle demands were generated by an average annual tonnage of production of **12,500 tonnes** of material.

#### **4.1.3 First Principles Forecast Site Traffic Generation**

The general / service vehicle surveys of the existing food production site in Beresfield provides an accurate basis to forecast the potential road network peak hour traffic generation of the proposed development. That is, the proposed development anticipates a production of 25,000 tonnes per annum of product.

Further, the majority of the facility would include machinery / warehouse areas for the production of products with a total staff population of 35-40 persons required compared to the existing site at Beresfield of 31 persons. In addition, the split of the 35-40 staff would mirror that of the existing site in terms of shift / office attendance with the additional 4 staff (compared with the existing site) undertaking warehouse / production (non-office) duties to facilitate larger production volumes.

With a doubling of production compared to the Beresfield site, it is estimated on average the site would generate the following during road network peak periods:

- 20 staff inbound trips in the AM peak
- 20 staff outbound trips in the PM peak

In terms of service vehicle generation, the site is forecast to generate **3 rigid trucks** and **5 semi-trailers** each weekday. Again, the majority of these service vehicles would travel to / from the site avoiding road network peak periods.

On the basis that the *maximum* number of rigid and semi-trailer trucks recorded during the survey period of the existing premises travelled to / from the new site on one particular day, this would equate to a forecast **8 rigid trucks** and **10 semi-trailer trucks** over the course of a weekday.

Overall, the potential traffic generation of the proposed development during road network peak periods would be minimal and would not impact on the function of the surrounding road system.

#### 4.2 Future Intersection Operating Conditions

To provide a conservative estimate of future intersection operating conditions, *all* service vehicles generated over a typical weekday by the development have assumed to arrive during the AM peak and leave during the PM peak. Further, *all* staff (20 vehicle trips) would do the same.

The additional traffic generated by the development has been added to the 2022 forecast traffic demands at the intersection of New England Highway / Gardiner Street / Mirage Drive resulting in the following intersection operating conditions. The distribution of trips of the development have assumed to mirror the east-west distribution of traffic volumes recorded in the New England Highway.

**Table 3 – 2022 + Development Estimated Weekday Intersection Operating Conditions**

Intersection	Control	Morning Peak		Evening Peak	
		Avg Delay	LOS	Avg Delay	LOS
New England Hwy / Kyle St / Mirage Dr	Roundabout	11.4	A	11.6	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 3** it is noted that the potential peak hour traffic generation of the proposed development would have a minimal impact on the future intersection operating conditions of the main intersection access to the site, namely the intersection of the New England Highway / Kyle Street / Mirage Drive.

A future year (+10 years) assessment of intersection operating conditions with a 2% growth rate on *all* movements would result in the following intersection operating conditions.

**Table 4 – 2032 + Development Estimated Weekday Intersection Operating Conditions**

Intersection	Control	Morning Peak		Evening Peak	
		Avg Delay	LOS	Avg Delay	LOS
New England Hwy / Kyle St / Mirage Dr	Roundabout	11.7	A	12.0	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 4** it is noted that in the year 2032 with a 2% growth per annum on all movements, the intersection of the New England Highway / Kyle Street / Mirage Drive would continue to operate at a satisfactory level of service with spare capacity.

Overall, the potential traffic impacts of the proposal are considered satisfactory.

Copies of all SIDRA outputs are provided in **Appendix C** of this report.





## 5. Parking, Access and Design Compliance Assessment

### 5.1 General Parking Provision

The Maitland Development Control Plan - Part C Design Guidelines requires the following parking provision applicable to the development components proposed:

Warehouse or Distribution Centre

- 1 space per 300m<sup>2</sup> GFA

Industry

- 1 space per 75m<sup>2</sup> GFA or 1 space per 2 employees (whichever is greater)

The industry rate detailed above has been conservatively applied to the production floorspace area of the development to acknowledge this component as the production of materials. Applying the above rates to each main component of the development would require a total of **35 parking spaces**.

Alternatively, with a peak demand of 35-40 staff, applying the staff parking rate would equate to a parking provision of **18 -20 spaces**.

Therefore, as the development includes a total parking provision of **45 spaces**, the proposed parking provision complies with the minimum requirements of the DCP and thus is considered satisfactory.

### 5.2 Car Park Design

For the type of development proposed, the Australian Standard for Off Street Car Parking Facilities AS2890.1 recommends a Class 1 parking arrangement which includes 2.4m wide spaces with 6.2m wide aisles. The design of the car park was noted to include 2.4m wide spaces with 6.6m wide aisles.

All elements of the proposed car parking areas design have been reviewed for compliance with AS2890.1 and were found to be satisfactory. All parking space widths, lengths and aisle widths and comply with AS2890.1.

Overall, the design of the parking areas and access arrangements comply with the relevant Australian Standards and is considered satisfactory.

### 5.3 Service Vehicle Access Assessment

As confirmed in the surveys of service vehicle access for the existing Diana Foods site at Beresfield, all servicing of the site occurs through the use of either Heavy Rigid Vehicles or 19.0m semi-trailers. It is expected these vehicle types will continue to provide the main vehicle types for the servicing of the site on a daily basis.

A turning path assessment of a 19.0m semi-trailer entering, accessing each loading dock and exiting the site is provided in **Appendix D** of this report. This turning path assessment confirms the proposed access, loading dock arrangements and manoeuvring areas would adequately cater for the expected operational largest vehicle to access the site.

It is also understood that on occasion access to / from the site may occur via a B Double vehicle. AS2890.2 defines an 'occasional service' vehicle as a design vehicle which would access the site less than once per day.

A further turning path assessment of a B Double truck entering, accessing each loading dock and exiting the site is also provided in **Appendix D** of this report. This assessment confirms the proposed arrangements for this occasional service vehicle are adequate to ensure it would enter and leave the site in a forward direction without issue.

Overall, the provision for service vehicles in the design comply with the requirements of AS2890.2 and are considered satisfactory.



## 6. Conclusions

This report has reviewed the potential traffic impacts of the proposed pet foods facility at the site known as No.91 Gardiner Street, Rutherford. The findings of this review are presented below:

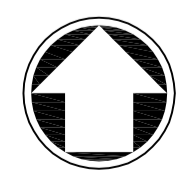
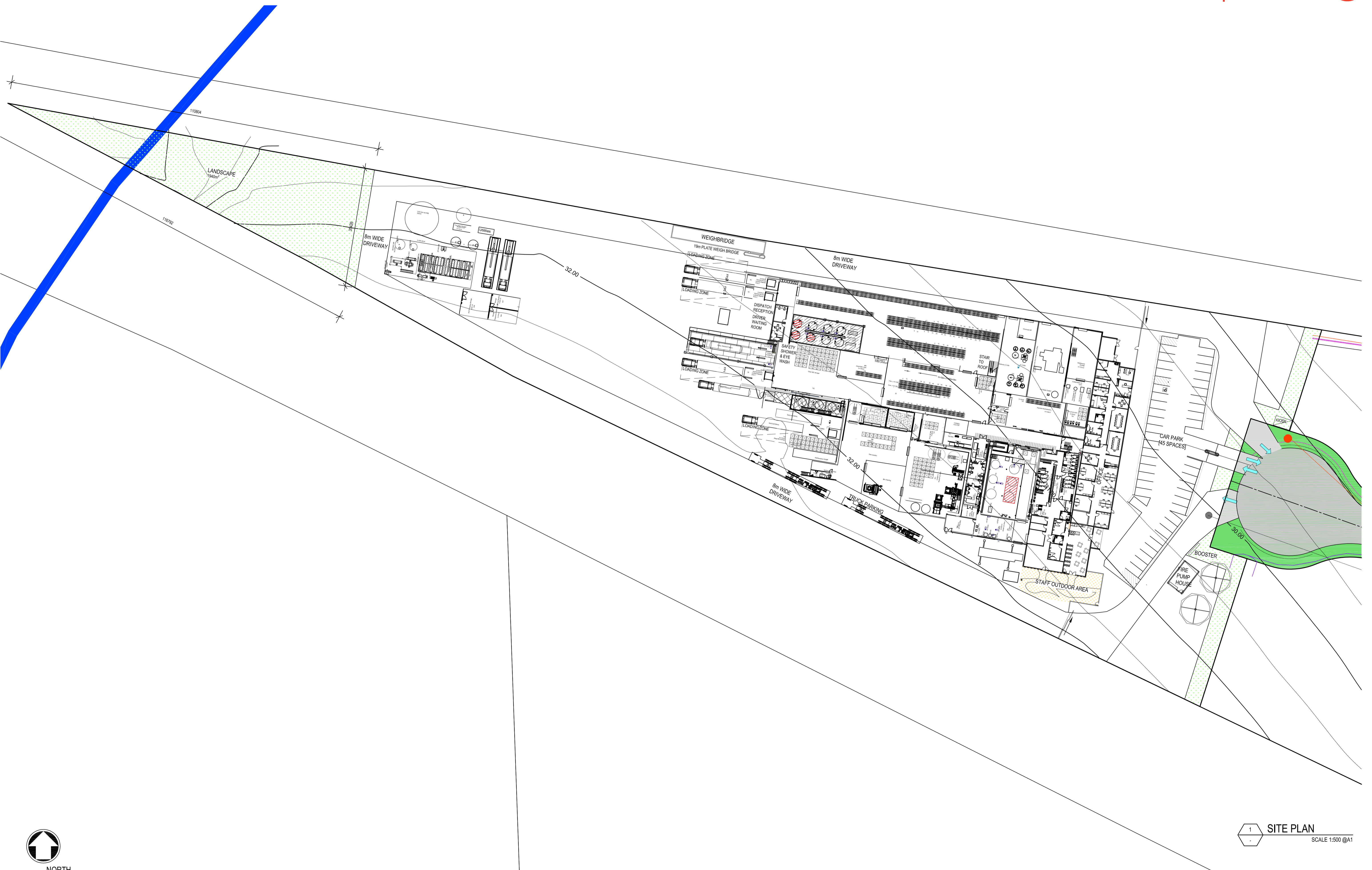
1. The potential traffic impacts of the proposal would not result in poor road or intersection operating conditions in the vicinity of the site and thus are considered acceptable.
2. Intersections surrounding the development would continue to operate at levels of service to that which currently occurs.
3. The proposed parking provision would more than cater for the requirements of both staff and visitors of the site.
4. The design of the car parking areas and access arrangements complies with AS2890.1 / AS2890.6 and are considered satisfactory.
5. The provision for operational and occasional service vehicles in the design adequately caters for their access and ensures all service vehicles would enter and leave the site in a forward direction.
6. The arrangements for service vehicles fully comply with the requirements of AS2890.2 and are considered satisfactory.

Overall, the traffic impacts of the proposal are considered acceptable.



**7. Appendix A – Plans of Proposed Development**

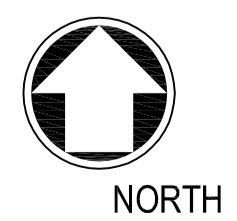




NORTH



1 LAYOUT PLAN, PART  
SCALE 1:200 @A1



**8. Appendix B – Diana Pet Foods Beresfield Staff / Service Vehicle Surveys**



	Shift Name	Shift Timing	Number of Staff
1	Production 1	4:00 AM till 12:00 PM	4
2	Production 2	12:00 PM till 8:00 PM	4
3	Production 3	8:00 PM till 4:00 AM	4
4	Warehouse	7:00 AM till 3:00 PM	2
5	Maintenance	6:30 AM till 2:30 PM	1
6	Office	8:00 AM till 5:00 PM	16

Weekly Production in Metric Tonnes					
	Week 1	Week 2	Week 3	Week 4	Week 5
Sep-21	267	257	218	268	284
Oct-21	256	271	278	252	
Nov-21	224	216	244	246	



Week		October Week # 1			
Date		4/10/2021	5/10/2021	6/10/2021	7/10/2021
Raw Material Delivery 1	Raw Material		Frozen	Frozen	Fresh
	Time IN		4:00 AM	4:00 AM	3:30 PM
	Time Out		5:00 AM	5:00 AM	4:30 PM
	Vehicle Type		Rigid Truck	Semi Trailer	Rigid Truck
	Unloading Method		FL Unloading from Back	FL Unloading from Back	FL Unloading from Back
Raw Material Delivery 2	Raw Material		Fresh	Frozen	
	Time IN		3:30 PM	4:00 AM	
	Time Out		4:00 PM	5:30 AM	
	Vehicle Type		Rigid Truck	Rigid Truck	
	Unloading Method		FL Unloading from Back	FL Unloading from Back	
Raw Material Delivery 3	Raw Material			Fresh	
	Time IN			2:30 PM	
	Time Out			2:45 PM	
	Vehicle Type			Rigid Truck	
	Unloading Method			FL Unloading from Back	

Finished Product Despatch 1	Despatched To				
	Time IN		4:00 PM	1:00 PM	5:00 AM
	Time Out		5:30 PM	1:30 PM	6:30 AM
	Vehicle Type		Semi Trailer Tanker 24 MT	Semi Trailer	Semi Trailer Tanker 24 MT
	Loading Method		Pump In	FL from Side	Pump In

Finished Product Despatch 2	Despatched To				
	Time IN			1:00 PM	1:00 PM
	Time Out			2:00 PM	2:00 PM
	Vehicle Type			Semi Trailer	Semi Trailer
	Loading Method			FL Loading from Side	FL Loading from Side

Finished Product Despatch 3	Despatched To				
	Time IN				10:00 AM
	Time Out				10:45 AM
	Vehicle Type				Side Loader 20 ft Container
	Loading Method				FL loading from Back

Finished Product Despatch 4					
	Time IN				
	Time Out				
	Vehicle Type				
	Loading Method				

			October W		
8/10/2021	9/10/2021	10/10/2021	11/10/2021	12/10/2021	13/10/2021
Fresh			Frozen	Frozen	Fresh
3:30 PM			4:00 AM	4:00 AM	6:00 PM
4:00 PM			5:00 AM	4:30 AM	7:00 PM
Rigid Truck			Semi Trailer	Rigid Truck	Semi Trailer
FL Unloading from Back			FL Unloading from Back	FL Unloading from Back	FL Unloading from Back
			Fresh	Frozen	
			3:30 PM	4:30 AM	
			4:30 PM	5:00 AM	
			Rigid Truck	Rigid Truck	
			FL Unloading from Back	FL Unloading from Back	
				Fresh	
				3:30 PM	
				3:45 PM	
				Rigid Truck	
				FL Unloading from Back	

1:00 PM			5:00 AM	5:00 AM	5:00 AM
1:30 PM			6:30 AM	6:30 AM	6:30 AM
Rigid Truck			Semi Trailer Tanker 24 MT	Semi Trailer Tanker 24 MT	Semi Trailer Tanker 24 MT
FL from Side			Pump In	Pump In	Pump In

3:00 PM			8:00 AM	1:00 PM	1:00 PM
3:30 PM			9:00 AM	1:30 PM	1:30 PM
Rigid Truck			Semi Trailer Tanker 24 MT	Rigid Truck	Semi Trailer
FL from Side			Pump In	FL from Side	FL from Side

			12:00 PM	12:00 PM	
			12:15 PM	12:30 PM	
			Rigid Truck	Semi Trailer	
			FL from Side	FL from Side	

				1:00 PM	
				2:00 PM	
				Semi Trailer	
				FL Loading from Side	

Week # 2				Oct		
14/10/2021	15/10/2021	16/10/2021	17/10/2021	18/10/2021	19/10/2021	20/10/2021
Frozen				Frozen	Frozen	Frozen
4:00 AM				4:00 AM	4:00 AM	4:00 AM
5:00 AM				5:00 AM	5:00 AM	5:00 AM
Rigid Truck				Semi Trailer	Semi Trailer	Rigid Truck
FL Unloading from Back				FL Unloading from Back	FL Unloading from Back	FL Unloading from Back
Fresh				Fresh	Frozen	Fresh
3:30 PM				3:30 PM	4:00 AM	3:30 PM
4:30 PM				4:30 PM	5:30 AM	4:30 PM
Semi Trailer				Semi Trailer	Rigid Truck	Rigid Truck
FL Unloading from Back				FL Unloading from Back	FL Unloading from Back	FL Unloading from Back
					Fresh	
					2:30 PM	
					3:30 PM	
					Semi Trailer	
					FL Unloading from Back	

2:00 PM				12:00 PM	5:00 AM	10:00 AM
2:30 PM				12:30 PM	6:30 AM	10:45 AM
Semi Trailer				Semi Trailer	Semi Trailer Tanker 24 MT	Side Loader 20 ft Container
FL from Side				FL from Side	Pump In	FL loading from Back

				12:00 PM	1:00 PM	
				1:00 PM	1:30 PM	
				Semi Trailer	Semi Trailer	
				FL from Side	FL from Side	

				1:00 PM	10:00 AM	
				1:30 PM	10:45 AM	
				Rigid Truck	Side Loader 20 ft Container	
				FL from Side	FL loading from Back	

				1:00 PM		
				2:00 PM		
				Semi Trailer		
				FL Loading from Side		

October Week # 3					
21/10/2021	22/10/2021	23/10/2021	24/10/2021	25/10/2021	26/10/2021
Fresh	Fresh			Frozen	Fresh
6:00 PM	3:30 PM			4:00 AM	3:00 PM
7:00 PM	4:30 PM			5:00 AM	4:00 PM
Semi Trailer	Rigid Truck			Semi Trailer	Semi Trailer
FL Unloading from Back	FL Unloading from Back			FL Unloading from Back	FL Unloading from Back
				Fresh	
				3:30 PM	
				4:30 PM	
				Semi Trailer	
				FL Unloading from Back	

5:00 PM	12:00 PM			5:00 AM	5:00 AM
6:30 PM	12:30 PM			6:30 AM	6:30 AM
Semi Trailer Tanker 24 MT	Rigid Truck			Semi Trailer Tanker 24 MT	Semi Trailer Tanker 24 MT
Pump In	FL from Side			Pump In	Pump In

1:00 PM	1:00 PM			12:00 PM	12:00 PM
1:45 PM	1:30 PM			12:15 PM	12:15 PM
Semi Trailer	Semi Trailer			Rigid Truck	Rigid Truck
FL from Side	FL from Side			FL from Side	FL from Side

	2:00 PM			1:00 PM	10:00 AM
	2:30 PM			1:30 PM	10:45 AM
	Rigid Truck			Semi Trailer	Side Loader 20 ft Container
	FL from Side			FL from Side	FL loading from Back

	10:00 AM			1:00 PM	11:00 AM
	10:45 AM			1:30 PM	11:45 AM
	Side Loader 20 ft Container			Semi Trailer	Side Loader 20 ft Container
	FL loading from Back			FL from Side	FL loading from Back



Ingredients							
S.No	Item	Vehicle Type	Unloading Method	Unloading Time	Usual Receiving Time	Order Qty	Frequency
1	Phosphoric Acid	Semi-Trailer Tanker 20KL	Pump out	1.5 hours	10 to 11 am	20,000 Liters	Once 4 to 6 weeks
2	Caustic Acid	Semi-trailer / Rigid	FL from side	15 minutes	7am till 11 am	5 x IBC's	Once a week
3	B080	Semi-Trailer	FL from side	15 to 20 minutes	7am till 11 am	20 Pallets	Once in 2 months
4	B093	Semi-trailer / Rigid	FL from side	15 to 20 minutes	11 am to 3 pm	04 Pallets	Once in fortnight
5	B110	Semi-trailer / Rigid	FL from side	15 to 20 minutes	11 am to 3 pm	10 Pallets	Once in month
6	B123	Semi-trailer / Rigid	FL from side	15 to 20 minutes	7am till 3 pm	04 Pallets	Once a week
Packing Material							
7	New Empty IBC	Semi-Trailer / B-Double	FL from side	45 minutes	6am	80 IBC's	Once a month , May vary as per demand
8	New Paper IBC	Semi Trailer	FL from side	10 minutes	11 am onwards		Once every 03 weeks
9	Chep Boxes	Rigid	FL from side	10 minutes	10 am onwards		Once a week
10	Other Packing Stuff						
Collections and Replacements							
11	Skin Bin Collection VEOLIA Organic	Rigid Truck		5 minutes	12:00 noon		03 times a week
12	Skin Bin Collection VEOLIA Packing	Rigid Truck		5 minutes	12:00 noon		03 times a week
13	Chep pallets / mega bins	Semi Trailer	FL from side	45 mintes	daytime anytime		Once every fortnight

**9. Appendix C – SIDRA Modelling Outputs**



# MOVEMENT SUMMARY

Site: 101 [New England\_Kyle\_PM 2032 + Dev (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout  
 Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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 ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Kyle St														
1	L2	100	7	128	7.0	0.126	7.2	LOS A	0.5	3.7	0.53	0.67	0.53	54.2
2	T1	6	0	8	0.0	0.106	6.0	LOS A	0.4	3.0	0.54	0.79	0.54	52.3
3	R2	59	6	76	10.2	0.106	12.0	LOS A	0.4	3.0	0.54	0.79	0.54	52.3
Approach		165	13	212	7.9	0.126	8.9	LOS A	0.5	3.7	0.53	0.72	0.53	53.4
East: New England Hwy														
4	L2	13	2	17	15.4	0.288	3.9	LOS A	1.7	12.0	0.18	0.35	0.18	55.3
5	T1	655	8	840	1.2	0.288	4.5	LOS A	1.7	12.0	0.18	0.36	0.18	57.5
6	R2	6	0	8	0.0	0.288	9.4	LOS A	1.7	11.8	0.19	0.36	0.19	57.8
Approach		674	10	865	1.5	0.288	4.6	LOS A	1.7	12.0	0.18	0.36	0.18	57.4
North: Mirage Rd														
7	L2	19	2	24	10.5	0.034	8.2	LOS A	0.1	1.0	0.56	0.67	0.56	53.8
8	T1	3	2	4	66.7	0.046	7.1	LOS A	0.2	1.3	0.54	0.73	0.54	51.3
9	R2	31	1	40	3.2	0.046	11.2	LOS A	0.2	1.3	0.54	0.73	0.54	52.5
Approach		53	5	68	9.4	0.046	9.9	LOS A	0.2	1.3	0.55	0.71	0.55	52.9
West: New England Hwy														
10	L2	20	3	26	15.0	0.322	4.1	LOS A	1.9	13.8	0.27	0.39	0.27	54.8
11	T1	686	15	880	2.2	0.322	4.8	LOS A	1.9	13.8	0.27	0.39	0.27	56.9
12	R2	2	0	3	0.0	0.322	9.6	LOS A	1.9	13.5	0.28	0.39	0.28	57.3
Approach		708	18	908	2.5	0.322	4.8	LOS A	1.9	13.8	0.27	0.39	0.27	56.9
All Vehicles		1600	46	2053	2.9	0.322	5.3	LOS A	1.9	13.8	0.27	0.42	0.27	56.6

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



# INTERSECTION SUMMARY

 Site: 101 [New England\_Kyle\_AM 2016 (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	56.8 km/h	56.8 km/h
Travel Distance (Total)	1448.9 veh-km/h	1738.7 pers-km/h
Travel Time (Total)	25.5 veh-h/h	30.6 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.95	
Travel Time Index	9.41	
Congestion Coefficient	1.06	
Demand Flows (Total)	1383 veh/h	1660 pers/h
Percent Heavy Vehicles (Demand)	7.4 %	
Degree of Saturation	0.245	
Practical Spare Capacity	246.4 %	
Effective Intersection Capacity	5637 veh/h	
Control Delay (Total)	1.80 veh-h/h	2.16 pers-h/h
Control Delay (Average)	4.7 sec	4.7 sec
Control Delay (Worst Lane)	10.1 sec	
Control Delay (Worst Movement)	11.2 sec	11.2 sec
Geometric Delay (Average)	4.0 sec	
Stop-Line Delay (Average)	0.6 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.2 veh	
95% Back of Queue - Distance (Worst Lane)	9.0 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	549 veh/h	658 pers/h
Effective Stop Rate	0.40	0.40
Proportion Queued	0.20	0.20
Performance Index	34.7	34.7
Cost (Total)	1173.51 \$/h	1173.51 \$/h
Fuel Consumption (Total)	146.3 L/h	
Carbon Dioxide (Total)	350.5 kg/h	
Hydrocarbons (Total)	0.027 kg/h	
Carbon Monoxide (Total)	0.362 kg/h	
NOx (Total)	0.953 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.0 %

Number of Iterations: 4 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 92.5% 1.3% 0.8%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	663,916 veh/y	796,699 pers/y
Delay	865 veh-h/y	1,038 pers-h/y
Effective Stops	263,319 veh/y	315,983 pers/y
Travel Distance	695,490 veh-km/y	834,588 pers-km/y
Travel Time	12,236 veh-h/y	14,683 pers-h/y
Cost	563,284 \$/y	563,284 \$/y
Fuel Consumption	70,233 L/y	
Carbon Dioxide	168,241 kg/y	
Hydrocarbons	13 kg/y	
Carbon Monoxide	174 kg/y	
NOx	458 kg/y	

# MOVEMENT SUMMARY

 Site: 101 [New England\_Kyle\_AM 2016 (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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				
South: Kyle St														
1	L2	17	7	18	41.2	0.024	6.9	LOS A	0.1	0.8	0.48	0.60	0.48	53.4
2	T1	5	2	5	40.0	0.028	5.5	LOS A	0.1	0.9	0.45	0.66	0.45	52.6
3	R2	20	7	21	35.0	0.028	11.2	LOS A	0.1	0.9	0.45	0.66	0.45	52.4
Approach		42	16	44	38.1	0.028	8.8	LOS A	0.1	0.9	0.46	0.63	0.46	52.8
East: New England Hwy														
4	L2	24	3	25	12.5	0.212	4.0	LOS A	1.0	7.3	0.19	0.37	0.19	55.3
5	T1	519	28	546	5.4	0.212	4.1	LOS A	1.0	7.3	0.19	0.38	0.19	57.2
6	R2	29	1	31	3.4	0.212	9.5	LOS A	1.0	7.2	0.19	0.40	0.19	57.2
Approach		572	32	602	5.6	0.212	4.4	LOS A	1.0	7.3	0.19	0.38	0.19	57.1
North: Mirage Rd														
7	L2	11	1	12	9.1	0.014	6.5	LOS A	0.0	0.4	0.49	0.58	0.49	54.3
8	T1	8	2	8	25.0	0.022	5.4	LOS A	0.1	0.7	0.47	0.63	0.47	53.5
9	R2	12	3	13	25.0	0.022	11.2	LOS A	0.1	0.7	0.47	0.63	0.47	53.4
Approach		31	6	33	19.4	0.022	8.0	LOS A	0.1	0.7	0.48	0.62	0.48	53.7
West: New England Hwy														
10	L2	31	2	33	6.5	0.245	3.9	LOS A	1.2	9.0	0.18	0.36	0.18	55.5
11	T1	594	34	625	5.7	0.245	4.2	LOS A	1.2	9.0	0.18	0.38	0.18	57.2
12	R2	44	7	46	15.9	0.245	9.6	LOS A	1.2	9.0	0.19	0.41	0.19	56.7
Approach		669	43	704	6.4	0.245	4.5	LOS A	1.2	9.0	0.18	0.38	0.18	57.1
All Vehicles		1314	97	1383	7.4	0.245	4.7	LOS A	1.2	9.0	0.20	0.40	0.20	56.8

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

# INTERSECTION SUMMARY

 Site: 101 [New England\_Kyle\_AM 2022 (Site Folder: General)]

New Site

Site Category: (None)

Roundabout

Design Life Analysis (Final Year): Results for 5 years

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	56.7 km/h	56.7 km/h
Travel Distance (Total)	1599.7 veh-km/h	1919.7 pers-km/h
Travel Time (Total)	28.2 veh-h/h	33.8 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.95	
Travel Time Index	9.40	
Congestion Coefficient	1.06	
Demand Flows (Total)	1527 veh/h	1833 pers/h
Percent Heavy Vehicles (Demand)	7.4 %	
Degree of Saturation	0.272	
Practical Spare Capacity	212.2 %	
Effective Intersection Capacity	5609 veh/h	
Control Delay (Total)	2.03 veh-h/h	2.43 pers-h/h
Control Delay (Average)	4.8 sec	4.8 sec
Control Delay (Worst Lane)	10.2 sec	
Control Delay (Worst Movement)	11.4 sec	11.4 sec
Geometric Delay (Average)	4.0 sec	
Stop-Line Delay (Average)	0.7 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.4 veh	
95% Back of Queue - Distance (Worst Lane)	10.4 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	614 veh/h	737 pers/h
Effective Stop Rate	0.40	0.40
Proportion Queued	0.22	0.22
Performance Index	38.7	38.7
Cost (Total)	1297.98 \$/h	1297.98 \$/h
Fuel Consumption (Total)	161.9 L/h	
Carbon Dioxide (Total)	387.9 kg/h	
Hydrocarbons (Total)	0.030 kg/h	
Carbon Monoxide (Total)	0.401 kg/h	
NOx (Total)	1.056 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.3 %

Number of Iterations: 4 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 92.8% 1.6% 1.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	733,017 veh/y	879,620 pers/y
Delay	973 veh-h/y	1,168 pers-h/y
Effective Stops	294,707 veh/y	353,649 pers/y
Travel Distance	767,877 veh-km/y	921,452 pers-km/y
Travel Time	13,531 veh-h/y	16,237 pers-h/y
Cost	623,030 \$/y	623,030 \$/y
Fuel Consumption	77,727 L/y	
Carbon Dioxide	186,188 kg/y	
Hydrocarbons	14 kg/y	
Carbon Monoxide	192 kg/y	

# MOVEMENT SUMMARY

**Site: 101 [New England\_Kyle\_AM 2022 (Site Folder: General)]**

New Site

Site Category: (None)

Roundabout

Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[ Total veh/h	[ HV ] veh/h	[ Total veh/h	[ HV ] %				[ Veh. veh	[ Dist ] m				
South: Kyle St														
1	L2	17	7	20	41.2	0.028	7.2	LOS A	0.1	0.9	0.50	0.62	0.50	53.3
2	T1	5	2	6	40.0	0.032	5.7	LOS A	0.1	1.1	0.47	0.67	0.47	52.5
3	R2	20	7	23	35.0	0.032	11.4	LOS A	0.1	1.1	0.47	0.67	0.47	52.3
Approach		42	16	49	38.1	0.032	9.0	LOS A	0.1	1.1	0.48	0.65	0.48	52.7
East: New England Hwy														
4	L2	24	3	28	12.5	0.236	4.0	LOS A	1.1	8.3	0.20	0.37	0.20	55.2
5	T1	519	28	603	5.4	0.236	4.2	LOS A	1.1	8.3	0.21	0.39	0.21	57.1
6	R2	29	1	34	3.4	0.236	9.5	LOS A	1.1	8.3	0.21	0.41	0.21	57.2
Approach		572	32	665	5.6	0.236	4.5	LOS A	1.1	8.3	0.21	0.39	0.21	57.0
North: Mirage Rd														
7	L2	11	1	13	9.1	0.016	6.8	LOS A	0.1	0.4	0.51	0.60	0.51	54.2
8	T1	8	2	9	25.0	0.025	5.6	LOS A	0.1	0.8	0.49	0.65	0.49	53.4
9	R2	12	3	14	25.0	0.025	11.3	LOS A	0.1	0.8	0.49	0.65	0.49	53.3
Approach		31	6	36	19.4	0.025	8.3	LOS A	0.1	0.8	0.50	0.63	0.50	53.6
West: New England Hwy														
10	L2	31	2	36	6.5	0.272	3.9	LOS A	1.4	10.3	0.19	0.37	0.19	55.4
11	T1	594	34	690	5.7	0.272	4.3	LOS A	1.4	10.3	0.20	0.39	0.20	57.1
12	R2	44	7	51	15.9	0.272	9.7	LOS A	1.4	10.4	0.21	0.41	0.21	56.6
Approach		669	43	778	6.4	0.272	4.6	LOS A	1.4	10.4	0.20	0.39	0.20	57.0
All Vehicles		1314	97	1527	7.4	0.272	4.8	LOS A	1.4	10.4	0.22	0.40	0.22	56.7

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

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).

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.

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**

Organisation: POSITIVE TRAFFIC PTY LTD | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 9:11:56 AM

Project: Z:\2021 Projects\PT21101 - 91 Gardiner Street, Rutherford Industrial\SIDRA\PT21101.sip9

# INTERSECTION SUMMARY

Site: 101 [New England\_Kyle\_AM 2022 Base (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	56.7 km/h	56.7 km/h
Travel Distance (Total)	1683.8 veh-km/h	2020.6 pers-km/h
Travel Time (Total)	29.7 veh-h/h	35.6 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.95	
Travel Time Index	9.40	
Congestion Coefficient	1.06	
Demand Flows (Total)	1607 veh/h	1929 pers/h
Percent Heavy Vehicles (Demand)	6.4 %	
Degree of Saturation	0.286	
Practical Spare Capacity	197.1 %	
Effective Intersection Capacity	5618 veh/h	
Control Delay (Total)	2.15 veh-h/h	2.58 pers-h/h
Control Delay (Average)	4.8 sec	4.8 sec
Control Delay (Worst Lane)	10.1 sec	
Control Delay (Worst Movement)	11.3 sec	11.3 sec
Geometric Delay (Average)	4.0 sec	
Stop-Line Delay (Average)	0.8 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.5 veh	
95% Back of Queue - Distance (Worst Lane)	10.9 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	650 veh/h	780 pers/h
Effective Stop Rate	0.40	0.40
Proportion Queued	0.23	0.23
Performance Index	40.8	40.8
Cost (Total)	1352.31 \$/h	1352.31 \$/h
Fuel Consumption (Total)	164.2 L/h	
Carbon Dioxide (Total)	392.3 kg/h	
Hydrocarbons (Total)	0.030 kg/h	
Carbon Monoxide (Total)	0.412 kg/h	
NOx (Total)	0.969 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.1 %

Number of Iterations: 5 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 1.8% 1.1% 0.5%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	771,537 veh/y	925,844 pers/y
Delay	1,032 veh-h/y	1,238 pers-h/y
Effective Stops	312,119 veh/y	374,542 pers/y
Travel Distance	808,224 veh-km/y	969,868 pers-km/y
Travel Time	14,245 veh-h/y	17,094 pers-h/y
Cost	649,107 \$/y	649,107 \$/y
Fuel Consumption	78,800 L/y	
Carbon Dioxide	188,309 kg/y	
Hydrocarbons	15 kg/y	
Carbon Monoxide	198 kg/y	

# MOVEMENT SUMMARY

Site: 101 [New England\_Kyle\_AM 2022 Base (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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 ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Kyle St														
1	L2	20	7	21	35.0	0.029	7.2	LOS A	0.1	0.9	0.50	0.62	0.50	53.5
2	T1	6	2	6	33.3	0.033	5.6	LOS A	0.1	1.1	0.48	0.67	0.48	52.6
3	R2	23	7	24	30.4	0.033	11.3	LOS A	0.1	1.1	0.48	0.67	0.48	52.5
Approach		49	16	52	32.7	0.033	8.9	LOS A	0.1	1.1	0.49	0.65	0.49	52.9
East: New England Hwy														
4	L2	28	3	29	10.7	0.248	4.0	LOS A	1.2	8.8	0.21	0.37	0.21	55.2
5	T1	603	28	635	4.6	0.248	4.3	LOS A	1.2	8.8	0.21	0.39	0.21	57.1
6	R2	34	1	36	2.9	0.248	9.6	LOS A	1.2	8.7	0.22	0.41	0.22	57.1
Approach		665	32	700	4.8	0.248	4.5	LOS A	1.2	8.8	0.21	0.39	0.21	57.0
North: Mirage Rd														
7	L2	13	1	14	7.7	0.017	6.9	LOS A	0.1	0.5	0.51	0.61	0.51	54.3
8	T1	9	2	9	22.2	0.026	5.6	LOS A	0.1	0.8	0.50	0.65	0.50	53.4
9	R2	14	3	15	21.4	0.026	11.3	LOS A	0.1	0.8	0.50	0.65	0.50	53.3
Approach		36	6	38	16.7	0.026	8.3	LOS A	0.1	0.8	0.50	0.64	0.50	53.7
West: New England Hwy														
10	L2	36	2	38	5.6	0.286	3.9	LOS A	1.5	10.9	0.20	0.37	0.20	55.4
11	T1	690	34	726	4.9	0.286	4.3	LOS A	1.5	10.9	0.21	0.39	0.21	57.0
12	R2	51	7	54	13.7	0.286	9.7	LOS A	1.5	10.9	0.21	0.41	0.21	56.7
Approach		777	43	818	5.5	0.286	4.6	LOS A	1.5	10.9	0.21	0.39	0.21	56.9
All Vehicles		1527	97	1607	6.4	0.286	4.8	LOS A	1.5	10.9	0.23	0.40	0.23	56.7

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

# INTERSECTION SUMMARY

Site: 101 [New England\_Kyle\_AM 2022 + Dev (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	56.6 km/h	56.6 km/h
Travel Distance (Total)	1714.7 veh-km/h	2057.6 pers-km/h
Travel Time (Total)	30.3 veh-h/h	36.3 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.94	
Travel Time Index	9.37	
Congestion Coefficient	1.06	
Demand Flows (Total)	1637 veh/h	1964 pers/h
Percent Heavy Vehicles (Demand)	6.8 %	
Degree of Saturation	0.292	
Practical Spare Capacity	191.3 %	
Effective Intersection Capacity	5610 veh/h	
Control Delay (Total)	2.22 veh-h/h	2.67 pers-h/h
Control Delay (Average)	4.9 sec	4.9 sec
Control Delay (Worst Lane)	10.1 sec	
Control Delay (Worst Movement)	11.3 sec	11.3 sec
Geometric Delay (Average)	4.1 sec	
Stop-Line Delay (Average)	0.8 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.5 veh	
95% Back of Queue - Distance (Worst Lane)	11.3 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	674 veh/h	809 pers/h
Effective Stop Rate	0.41	0.41
Proportion Queued	0.24	0.24
Performance Index	41.8	41.8
Cost (Total)	1386.09 \$/h	1386.09 \$/h
Fuel Consumption (Total)	170.3 L/h	
Carbon Dioxide (Total)	407.2 kg/h	
Hydrocarbons (Total)	0.031 kg/h	
Carbon Monoxide (Total)	0.425 kg/h	
NOx (Total)	1.049 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.2 %

Number of Iterations: 5 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 1.8% 1.1% 0.6%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	785,684 veh/y	942,821 pers/y
Delay	1,066 veh-h/y	1,280 pers-h/y
Effective Stops	323,564 veh/y	388,277 pers/y
Travel Distance	823,040 veh-km/y	987,648 pers-km/y
Travel Time	14,535 veh-h/y	17,442 pers-h/y
Cost	665,321 \$/y	665,321 \$/y
Fuel Consumption	81,738 L/y	
Carbon Dioxide	195,474 kg/y	
Hydrocarbons	15 kg/y	
Carbon Monoxide	204 kg/y	

# MOVEMENT SUMMARY

Site: 101 [New England\_Kyle\_AM 2022 + Dev (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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 ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Kyle St														
1	L2	20	7	21	35.0	0.029	7.2	LOS A	0.1	0.9	0.51	0.63	0.51	53.5
2	T1	6	2	6	33.3	0.033	5.6	LOS A	0.1	1.1	0.48	0.67	0.48	52.6
3	R2	23	7	24	30.4	0.033	11.3	LOS A	0.1	1.1	0.48	0.67	0.48	52.5
Approach		49	16	52	32.7	0.033	8.9	LOS A	0.1	1.1	0.49	0.65	0.49	52.9
East: New England Hwy														
4	L2	42	7	44	16.7	0.258	4.2	LOS A	1.3	9.4	0.23	0.39	0.23	54.9
5	T1	603	28	635	4.6	0.258	4.3	LOS A	1.3	9.4	0.24	0.40	0.24	56.9
6	R2	34	1	36	2.9	0.258	9.6	LOS A	1.3	9.2	0.24	0.42	0.24	57.0
Approach		679	36	715	5.3	0.258	4.6	LOS A	1.3	9.4	0.24	0.40	0.24	56.8
North: Mirage Rd														
7	L2	13	1	14	7.7	0.017	7.0	LOS A	0.1	0.5	0.52	0.61	0.52	54.2
8	T1	9	2	9	22.2	0.026	5.6	LOS A	0.1	0.8	0.50	0.66	0.50	53.4
9	R2	14	3	15	21.4	0.026	11.3	LOS A	0.1	0.8	0.50	0.66	0.50	53.3
Approach		36	6	38	16.7	0.026	8.3	LOS A	0.1	0.8	0.51	0.64	0.51	53.7
West: New England Hwy														
10	L2	36	2	38	5.6	0.292	3.9	LOS A	1.5	11.2	0.20	0.37	0.20	55.4
11	T1	690	34	726	4.9	0.292	4.3	LOS A	1.5	11.2	0.21	0.39	0.21	57.0
12	R2	65	11	68	16.9	0.292	9.7	LOS A	1.5	11.3	0.21	0.42	0.21	56.4
Approach		791	47	833	5.9	0.292	4.7	LOS A	1.5	11.3	0.21	0.39	0.21	56.9
All Vehicles		1555	105	1637	6.8	0.292	4.9	LOS A	1.5	11.3	0.24	0.41	0.24	56.6

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



# INTERSECTION SUMMARY

 Site: 101 [New England\_Kyle\_AM 2032 + Dev (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout  
 Design Life Analysis (Final Year): Results for 10 years

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	56.4 km/h	56.4 km/h
Travel Distance (Total)	2090.2 veh-km/h	2508.2 pers-km/h
Travel Time (Total)	37.1 veh-h/h	44.5 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.94	
Travel Time Index	9.33	
Congestion Coefficient	1.06	
Demand Flows (Total)	1995 veh/h	2394 pers/h
Percent Heavy Vehicles (Demand)	6.8 %	
Degree of Saturation	0.360	
Practical Spare Capacity	136.1 %	
Effective Intersection Capacity	5543 veh/h	
Control Delay (Total)	2.88 veh-h/h	3.46 pers-h/h
Control Delay (Average)	5.2 sec	5.2 sec
Control Delay (Worst Lane)	10.5 sec	
Control Delay (Worst Movement)	11.7 sec	11.7 sec
Geometric Delay (Average)	4.1 sec	
Stop-Line Delay (Average)	1.1 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	2.1 veh	
95% Back of Queue - Distance (Worst Lane)	15.2 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	853 veh/h	1024 pers/h
Effective Stop Rate	0.43	0.43
Proportion Queued	0.28	0.28
Performance Index	52.2	52.2
Cost (Total)	1697.94 \$/h	1697.94 \$/h
Fuel Consumption (Total)	208.9 L/h	
Carbon Dioxide (Total)	499.6 kg/h	
Hydrocarbons (Total)	0.039 kg/h	
Carbon Monoxide (Total)	0.521 kg/h	
NOx (Total)	1.290 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.8 %

Number of Iterations: 5 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.8% 1.7% 0.9%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	957,745 veh/y	1,149,294 pers/y
Delay	1,382 veh-h/y	1,659 pers-h/y
Effective Stops	409,518 veh/y	491,421 pers/y
Travel Distance	1,003,281 veh-km/y	1,203,938 pers-km/y
Travel Time	17,795 veh-h/y	21,354 pers-h/y
Cost	815,011 \$/y	815,011 \$/y
Fuel Consumption	100,280 L/y	
Carbon Dioxide	239,805 kg/y	
Hydrocarbons	19 kg/y	

# MOVEMENT SUMMARY

Site: 101 [New England\_Kyle\_AM 2032 + Dev (Site Folder: General)]

New Site

Site Category: (None)

Roundabout

Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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 ] veh/h	[ Total veh/h ]	[ HV ] %				[ Veh. veh ]	[ Dist ] m				
South: Kyle St														
1	L2	20	7	26	35.0	0.039	8.0	LOS A	0.1	1.3	0.55	0.68	0.55	53.1
2	T1	6	2	8	33.3	0.043	5.9	LOS A	0.2	1.4	0.53	0.71	0.53	52.5
3	R2	23	7	30	30.4	0.043	11.7	LOS A	0.2	1.4	0.53	0.71	0.53	52.3
Approach		49	16	63	32.7	0.043	9.5	LOS A	0.2	1.4	0.54	0.70	0.54	52.6
East: New England Hwy														
4	L2	42	7	54	16.7	0.320	4.3	LOS A	1.7	12.5	0.28	0.40	0.28	54.7
5	T1	603	28	774	4.6	0.320	4.6	LOS A	1.7	12.5	0.28	0.42	0.28	56.7
6	R2	34	1	44	2.9	0.320	9.8	LOS A	1.7	12.3	0.29	0.43	0.29	56.8
Approach		679	36	871	5.3	0.320	4.8	LOS A	1.7	12.5	0.28	0.42	0.28	56.5
North: Mirage Rd														
7	L2	13	1	17	7.7	0.023	7.9	LOS A	0.1	0.6	0.56	0.66	0.56	53.9
8	T1	9	2	12	22.2	0.034	6.0	LOS A	0.1	1.1	0.55	0.69	0.55	53.1
9	R2	14	3	18	21.4	0.034	11.7	LOS A	0.1	1.1	0.55	0.69	0.55	53.1
Approach		36	6	46	16.7	0.034	8.9	LOS A	0.1	1.1	0.56	0.68	0.56	53.4
West: New England Hwy														
10	L2	36	2	46	5.6	0.360	4.0	LOS A	2.1	15.1	0.25	0.38	0.25	55.2
11	T1	690	34	885	4.9	0.360	4.7	LOS A	2.1	15.1	0.25	0.41	0.25	56.8
12	R2	65	11	83	16.9	0.360	9.8	LOS A	2.0	15.2	0.26	0.44	0.26	56.2
Approach		791	47	1015	5.9	0.360	5.1	LOS A	2.1	15.2	0.25	0.41	0.25	56.6
All Vehicles		1555	105	1995	6.8	0.360	5.2	LOS A	2.1	15.2	0.28	0.43	0.28	56.4

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

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).

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.

SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: POSITIVE TRAFFIC PTY LTD | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 9:11:57 AM

Project: Z:\2021 Projects\PT21101 - 91 Gardiner Street, Rutherford Industrial\SIDRA\PT21101.sip9

# INTERSECTION SUMMARY

 Site: 101 [New England\_Kyle\_PM 2016 (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	57.1 km/h	57.1 km/h
Travel Distance (Total)	1490.2 veh-km/h	1788.2 pers-km/h
Travel Time (Total)	26.1 veh-h/h	31.3 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.95	
Travel Time Index	9.46	
Congestion Coefficient	1.05	
Demand Flows (Total)	1424 veh/h	1709 pers/h
Percent Heavy Vehicles (Demand)	2.8 %	
Degree of Saturation	0.218	
Practical Spare Capacity	289.8 %	
Effective Intersection Capacity	6532 veh/h	
Control Delay (Total)	1.81 veh-h/h	2.17 pers-h/h
Control Delay (Average)	4.6 sec	4.6 sec
Control Delay (Worst Lane)	10.5 sec	
Control Delay (Worst Movement)	11.1 sec	11.1 sec
Geometric Delay (Average)	3.9 sec	
Stop-Line Delay (Average)	0.7 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.1 veh	
95% Back of Queue - Distance (Worst Lane)	8.2 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	551 veh/h	661 pers/h
Effective Stop Rate	0.39	0.39
Proportion Queued	0.19	0.19
Performance Index	34.7	34.7
Cost (Total)	1145.54 \$/h	1145.54 \$/h
Fuel Consumption (Total)	124.8 L/h	
Carbon Dioxide (Total)	295.5 kg/h	
Hydrocarbons (Total)	0.023 kg/h	
Carbon Monoxide (Total)	0.331 kg/h	
NOx (Total)	0.415 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.9 %

Number of Iterations: 4 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 91.8% 1.0% 0.7%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	683,621 veh/y	820,345 pers/y
Delay	868 veh-h/y	1,041 pers-h/y
Effective Stops	264,330 veh/y	317,196 pers/y
Travel Distance	715,294 veh-km/y	858,352 pers-km/y
Travel Time	12,533 veh-h/y	15,040 pers-h/y
Cost	549,860 \$/y	549,860 \$/y
Fuel Consumption	59,892 L/y	
Carbon Dioxide	141,860 kg/y	
Hydrocarbons	11 kg/y	
Carbon Monoxide	159 kg/y	
NOx	199 kg/y	

# MOVEMENT SUMMARY

Site: 101 [New England\_Kyle\_PM 2016 (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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				
South: Kyle St														
1	L2	74	3	78	4.1	0.069	5.8	LOS A	0.3	1.8	0.44	0.59	0.44	54.6
2	T1	5	0	5	0.0	0.052	5.3	LOS A	0.2	1.3	0.46	0.71	0.46	52.8
3	R2	39	2	41	5.1	0.052	11.1	LOS A	0.2	1.3	0.46	0.71	0.46	53.0
Approach		118	5	124	4.2	0.069	7.5	LOS A	0.3	1.8	0.45	0.63	0.45	54.0
East: New England Hwy														
4	L2	11	2	12	18.2	0.201	3.9	LOS A	1.0	7.4	0.13	0.35	0.13	55.4
5	T1	564	8	594	1.4	0.201	4.0	LOS A	1.0	7.4	0.13	0.35	0.13	57.7
6	R2	5	0	5	0.0	0.201	9.3	LOS A	1.0	7.3	0.14	0.35	0.14	58.1
Approach		580	10	611	1.7	0.201	4.1	LOS A	1.0	7.4	0.13	0.35	0.13	57.7
North: Mirage Rd														
7	L2	16	2	17	12.5	0.021	6.6	LOS A	0.1	0.6	0.48	0.59	0.48	54.3
8	T1	3	2	3	66.7	0.030	6.3	LOS A	0.1	0.8	0.45	0.68	0.45	51.6
9	R2	27	1	28	3.7	0.030	10.6	LOS A	0.1	0.8	0.45	0.68	0.45	52.8
Approach		46	5	48	10.9	0.030	9.0	LOS A	0.1	0.8	0.46	0.65	0.46	53.2
West: New England Hwy														
10	L2	17	3	18	17.6	0.218	4.0	LOS A	1.1	8.2	0.17	0.35	0.17	55.2
11	T1	590	15	621	2.5	0.218	4.1	LOS A	1.1	8.2	0.17	0.36	0.17	57.5
12	R2	2	0	2	0.0	0.218	9.4	LOS A	1.1	8.1	0.18	0.36	0.18	57.9
Approach		609	18	641	3.0	0.218	4.1	LOS A	1.1	8.2	0.17	0.36	0.17	57.4
All Vehicles		1353	38	1424	2.8	0.218	4.6	LOS A	1.1	8.2	0.19	0.39	0.19	57.1

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

# INTERSECTION SUMMARY

 Site: 101 [New England\_Kyle\_PM 2022 (Site Folder: General)]

New Site

Site Category: (None)

Roundabout

Design Life Analysis (Final Year): Results for 5 years

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	57.0 km/h	57.0 km/h
Travel Distance (Total)	1645.3 veh-km/h	1974.4 pers-km/h
Travel Time (Total)	28.9 veh-h/h	34.6 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.95	
Travel Time Index	9.44	
Congestion Coefficient	1.05	
Demand Flows (Total)	1572 veh/h	1887 pers/h
Percent Heavy Vehicles (Demand)	2.8 %	
Degree of Saturation	0.242	
Practical Spare Capacity	251.5 %	
Effective Intersection Capacity	6503 veh/h	
Control Delay (Total)	2.04 veh-h/h	2.45 pers-h/h
Control Delay (Average)	4.7 sec	4.7 sec
Control Delay (Worst Lane)	10.7 sec	
Control Delay (Worst Movement)	11.3 sec	11.3 sec
Geometric Delay (Average)	3.9 sec	
Stop-Line Delay (Average)	0.8 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.3 veh	
95% Back of Queue - Distance (Worst Lane)	9.4 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	615 veh/h	739 pers/h
Effective Stop Rate	0.39	0.39
Proportion Queued	0.20	0.20
Performance Index	38.6	38.6
Cost (Total)	1266.73 \$/h	1266.73 \$/h
Fuel Consumption (Total)	138.1 L/h	
Carbon Dioxide (Total)	327.0 kg/h	
Hydrocarbons (Total)	0.026 kg/h	
Carbon Monoxide (Total)	0.366 kg/h	
NOx (Total)	0.460 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.1 %

Number of Iterations: 4 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 92.0% 1.3% 0.9%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	754,773 veh/y	905,727 pers/y
Delay	978 veh-h/y	1,174 pers-h/y
Effective Stops	295,428 veh/y	354,513 pers/y
Travel Distance	789,742 veh-km/y	947,690 pers-km/y
Travel Time	13,857 veh-h/y	16,628 pers-h/y
Cost	608,030 \$/y	608,030 \$/y
Fuel Consumption	66,264 L/y	
Carbon Dioxide	156,953 kg/y	
Hydrocarbons	12 kg/y	
Carbon Monoxide	176 kg/y	

# MOVEMENT SUMMARY

 Site: 101 [New England\_Kyle\_PM 2022 (Site Folder: General)]

New Site

Site Category: (None)

Roundabout

Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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 ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Kyle St														
1	L2	74	3	86	4.1	0.078	6.0	LOS A	0.3	2.1	0.46	0.61	0.46	54.5
2	T1	5	0	6	0.0	0.059	5.5	LOS A	0.2	1.5	0.48	0.73	0.48	52.8
3	R2	39	2	45	5.1	0.059	11.3	LOS A	0.2	1.5	0.48	0.73	0.48	52.9
Approach		118	5	137	4.2	0.078	7.7	LOS A	0.3	2.1	0.47	0.65	0.47	53.9
East: New England Hwy														
4	L2	11	2	13	18.2	0.223	3.9	LOS A	1.2	8.5	0.14	0.35	0.14	55.4
5	T1	564	8	655	1.4	0.223	4.1	LOS A	1.2	8.5	0.15	0.35	0.15	57.7
6	R2	5	0	6	0.0	0.223	9.3	LOS A	1.2	8.3	0.15	0.35	0.15	58.0
Approach		580	10	674	1.7	0.223	4.1	LOS A	1.2	8.5	0.15	0.35	0.15	57.6
North: Mirage Rd														
7	L2	16	2	19	12.5	0.024	7.0	LOS A	0.1	0.6	0.50	0.61	0.50	54.2
8	T1	3	2	3	66.7	0.034	6.5	LOS A	0.1	0.9	0.47	0.69	0.47	51.6
9	R2	27	1	31	3.7	0.034	10.7	LOS A	0.1	0.9	0.47	0.69	0.47	52.7
Approach		46	5	53	10.9	0.034	9.1	LOS A	0.1	0.9	0.48	0.66	0.48	53.1
West: New England Hwy														
10	L2	17	3	20	17.6	0.242	4.0	LOS A	1.3	9.4	0.18	0.36	0.18	55.2
11	T1	590	15	686	2.5	0.242	4.2	LOS A	1.3	9.4	0.19	0.36	0.19	57.4
12	R2	2	0	2	0.0	0.242	9.4	LOS A	1.3	9.2	0.19	0.36	0.19	57.8
Approach		609	18	708	3.0	0.242	4.2	LOS A	1.3	9.4	0.19	0.36	0.19	57.4
All Vehicles		1353	38	1572	2.8	0.242	4.7	LOS A	1.3	9.4	0.20	0.39	0.20	57.0

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

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).

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.

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**

Organisation: POSITIVE TRAFFIC PTY LTD | Licence: PLUS / 1PC | Processed: Thursday, 17 March 2022 9:11:58 AM

Project: Z:\2021 Projects\PT21101 - 91 Gardiner Street, Rutherford Industrial\SIDRA\PT21101.sip9

# INTERSECTION SUMMARY

Site: 101 [New England\_Kyle\_PM 2022 Base (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	57.0 km/h	57.0 km/h
Travel Distance (Total)	1731.3 veh-km/h	2077.6 pers-km/h
Travel Time (Total)	30.4 veh-h/h	36.5 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.95	
Travel Time Index	9.44	
Congestion Coefficient	1.05	
Demand Flows (Total)	1655 veh/h	1986 pers/h
Percent Heavy Vehicles (Demand)	2.4 %	
Degree of Saturation	0.255	
Practical Spare Capacity	233.8 %	
Effective Intersection Capacity	6498 veh/h	
Control Delay (Total)	2.17 veh-h/h	2.60 pers-h/h
Control Delay (Average)	4.7 sec	4.7 sec
Control Delay (Worst Lane)	10.7 sec	
Control Delay (Worst Movement)	11.4 sec	11.4 sec
Geometric Delay (Average)	3.9 sec	
Stop-Line Delay (Average)	0.9 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.4 veh	
95% Back of Queue - Distance (Worst Lane)	10.0 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	651 veh/h	781 pers/h
Effective Stop Rate	0.39	0.39
Proportion Queued	0.21	0.21
Performance Index	40.8	40.8
Cost (Total)	1328.03 \$/h	1328.03 \$/h
Fuel Consumption (Total)	142.9 L/h	
Carbon Dioxide (Total)	338.1 kg/h	
Hydrocarbons (Total)	0.027 kg/h	
Carbon Monoxide (Total)	0.381 kg/h	
NOx (Total)	0.429 kg/h	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.2 %

Number of Iterations: 4 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 91.9% 1.4% 1.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	794,274 veh/y	953,129 pers/y
Delay	1,039 veh-h/y	1,247 pers-h/y
Effective Stops	312,553 veh/y	375,064 pers/y
Travel Distance	831,035 veh-km/y	997,242 pers-km/y
Travel Time	14,587 veh-h/y	17,504 pers-h/y
Cost	637,452 \$/y	637,452 \$/y
Fuel Consumption	68,590 L/y	
Carbon Dioxide	162,296 kg/y	
Hydrocarbons	13 kg/y	
Carbon Monoxide	183 kg/y	

# MOVEMENT SUMMARY

Site: 101 [New England\_Kyle\_PM 2022 Base (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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 ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Kyle St														
1	L2	86	3	91	3.5	0.082	6.1	LOS A	0.3	2.2	0.47	0.62	0.47	54.5
2	T1	6	0	6	0.0	0.062	5.6	LOS A	0.2	1.6	0.49	0.73	0.49	52.8
3	R2	45	2	47	4.4	0.062	11.4	LOS A	0.2	1.6	0.49	0.73	0.49	52.9
Approach		137	5	144	3.6	0.082	7.8	LOS A	0.3	2.2	0.48	0.66	0.48	53.9
East: New England Hwy														
4	L2	13	2	14	15.4	0.234	3.9	LOS A	1.3	9.0	0.15	0.35	0.15	55.4
5	T1	655	8	689	1.2	0.234	4.1	LOS A	1.3	9.0	0.15	0.35	0.15	57.6
6	R2	6	0	6	0.0	0.234	9.3	LOS A	1.3	8.9	0.15	0.35	0.15	58.0
Approach		674	10	709	1.5	0.234	4.2	LOS A	1.3	9.0	0.15	0.35	0.15	57.6
North: Mirage Rd														
7	L2	19	2	20	10.5	0.025	7.0	LOS A	0.1	0.7	0.51	0.62	0.51	54.2
8	T1	3	2	3	66.7	0.035	6.6	LOS A	0.1	1.0	0.48	0.70	0.48	51.5
9	R2	31	1	33	3.2	0.035	10.8	LOS A	0.1	1.0	0.48	0.70	0.48	52.7
Approach		53	5	56	9.4	0.035	9.2	LOS A	0.1	1.0	0.49	0.67	0.49	53.1
West: New England Hwy														
10	L2	20	3	21	15.0	0.255	4.0	LOS A	1.4	10.0	0.19	0.36	0.19	55.2
11	T1	686	15	722	2.2	0.255	4.3	LOS A	1.4	10.0	0.20	0.36	0.20	57.4
12	R2	2	0	2	0.0	0.255	9.4	LOS A	1.4	9.8	0.20	0.36	0.20	57.8
Approach		708	18	745	2.5	0.255	4.3	LOS A	1.4	10.0	0.20	0.36	0.20	57.3
All Vehicles		1572	38	1655	2.4	0.255	4.7	LOS A	1.4	10.0	0.21	0.39	0.21	57.0

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



# INTERSECTION SUMMARY

Site: 101 [New England\_Kyle\_PM 2022 + Dev (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	56.8 km/h	56.8 km/h
Travel Distance (Total)	1762.2 veh-km/h	2114.6 pers-km/h
Travel Time (Total)	31.0 veh-h/h	37.2 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.95	
Travel Time Index	9.41	
Congestion Coefficient	1.06	
Demand Flows (Total)	1684 veh/h	2021 pers/h
Percent Heavy Vehicles (Demand)	2.9 %	
Degree of Saturation	0.261	
Practical Spare Capacity	226.3 %	
Effective Intersection Capacity	6465 veh/h	
Control Delay (Total)	2.26 veh-h/h	2.72 pers-h/h
Control Delay (Average)	4.8 sec	4.8 sec
Control Delay (Worst Lane)	11.0 sec	
Control Delay (Worst Movement)	11.6 sec	11.6 sec
Geometric Delay (Average)	3.9 sec	
Stop-Line Delay (Average)	0.9 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.4 veh	
95% Back of Queue - Distance (Worst Lane)	10.3 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	682 veh/h	818 pers/h
Effective Stop Rate	0.40	0.40
Proportion Queued	0.23	0.23
Performance Index	41.8	41.8
Cost (Total)	1363.32 \$/h	1363.32 \$/h
Fuel Consumption (Total)	149.3 L/h	
Carbon Dioxide (Total)	353.7 kg/h	
Hydrocarbons (Total)	0.028 kg/h	
Carbon Monoxide (Total)	0.395 kg/h	
NOx (Total)	0.513 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.1 %

Number of Iterations: 5 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 1.7% 1.2% 0.6%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	808,421 veh/y	970,105 pers/y
Delay	1,087 veh-h/y	1,305 pers-h/y
Effective Stops	327,164 veh/y	392,596 pers/y
Travel Distance	845,842 veh-km/y	1,015,010 pers-km/y
Travel Time	14,890 veh-h/y	17,868 pers-h/y
Cost	654,394 \$/y	654,394 \$/y
Fuel Consumption	71,667 L/y	
Carbon Dioxide	169,796 kg/y	
Hydrocarbons	14 kg/y	
Carbon Monoxide	190 kg/y	

# MOVEMENT SUMMARY

Site: 101 [New England\_Kyle\_PM 2022 + Dev (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND 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 ] veh/h	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] m				
South: Kyle St														
1	L2	100	7	105	7.0	0.098	6.2	LOS A	0.4	2.8	0.48	0.63	0.48	54.4
2	T1	6	0	6	0.0	0.081	5.6	LOS A	0.3	2.2	0.50	0.75	0.50	52.6
3	R2	59	6	62	10.2	0.081	11.6	LOS A	0.3	2.2	0.50	0.75	0.50	52.6
Approach		165	13	174	7.9	0.098	8.1	LOS A	0.4	2.8	0.49	0.68	0.49	53.7
East: New England Hwy														
4	L2	13	2	14	15.4	0.235	3.9	LOS A	1.3	9.1	0.15	0.35	0.15	55.4
5	T1	655	8	689	1.2	0.235	4.1	LOS A	1.3	9.1	0.15	0.35	0.15	57.6
6	R2	6	0	6	0.0	0.235	9.3	LOS A	1.3	8.9	0.15	0.35	0.15	58.0
Approach		674	10	709	1.5	0.235	4.2	LOS A	1.3	9.1	0.15	0.35	0.15	57.6
North: Mirage Rd														
7	L2	19	2	20	10.5	0.026	7.2	LOS A	0.1	0.7	0.51	0.62	0.51	54.2
8	T1	3	2	3	66.7	0.035	6.6	LOS A	0.1	1.0	0.49	0.70	0.49	51.5
9	R2	31	1	33	3.2	0.035	10.8	LOS A	0.1	1.0	0.49	0.70	0.49	52.7
Approach		53	5	56	9.4	0.035	9.3	LOS A	0.1	1.0	0.50	0.67	0.50	53.1
West: New England Hwy														
10	L2	20	3	21	15.0	0.261	4.0	LOS A	1.4	10.3	0.22	0.37	0.22	55.0
11	T1	686	15	722	2.2	0.261	4.4	LOS A	1.4	10.3	0.23	0.37	0.23	57.2
12	R2	2	0	2	0.0	0.261	9.5	LOS A	1.4	10.1	0.23	0.37	0.23	57.6
Approach		708	18	745	2.5	0.261	4.4	LOS A	1.4	10.3	0.23	0.37	0.23	57.1
All Vehicles		1600	46	1684	2.9	0.261	4.8	LOS A	1.4	10.3	0.23	0.40	0.23	56.8

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

# INTERSECTION SUMMARY

 Site: 101 [New England\_Kyle\_PM 2032 + Dev (Site Folder: General)]

New Site  
 Site Category: (None)  
 Roundabout  
 Design Life Analysis (Final Year): Results for 10 years

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	56.6 km/h	56.6 km/h
Travel Distance (Total)	2148.1 veh-km/h	2577.7 pers-km/h
Travel Time (Total)	38.0 veh-h/h	45.6 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.94	
Travel Time Index	9.37	
Congestion Coefficient	1.06	
Demand Flows (Total)	2053 veh/h	2464 pers/h
Percent Heavy Vehicles (Demand)	2.9 %	
Degree of Saturation	0.322	
Practical Spare Capacity	163.9 %	
Effective Intersection Capacity	6375 veh/h	
Control Delay (Total)	3.00 veh-h/h	3.61 pers-h/h
Control Delay (Average)	5.3 sec	5.3 sec
Control Delay (Worst Lane)	11.5 sec	
Control Delay (Worst Movement)	12.0 sec	12.0 sec
Geometric Delay (Average)	3.9 sec	
Stop-Line Delay (Average)	1.4 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	1.9 veh	
95% Back of Queue - Distance (Worst Lane)	13.8 m	
Ave. Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	862 veh/h	1034 pers/h
Effective Stop Rate	0.42	0.42
Proportion Queued	0.27	0.27
Performance Index	52.1	52.1
Cost (Total)	1669.12 \$/h	1669.12 \$/h
Fuel Consumption (Total)	183.0 L/h	
Carbon Dioxide (Total)	433.7 kg/h	
Hydrocarbons (Total)	0.035 kg/h	
Carbon Monoxide (Total)	0.484 kg/h	
NOx (Total)	0.630 kg/h	

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

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 1.8 %

Number of Iterations: 5 (Maximum: 10)

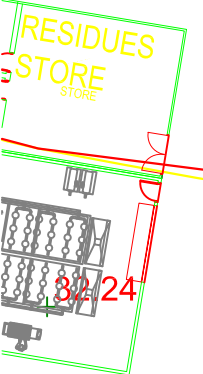
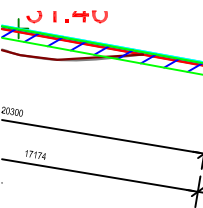
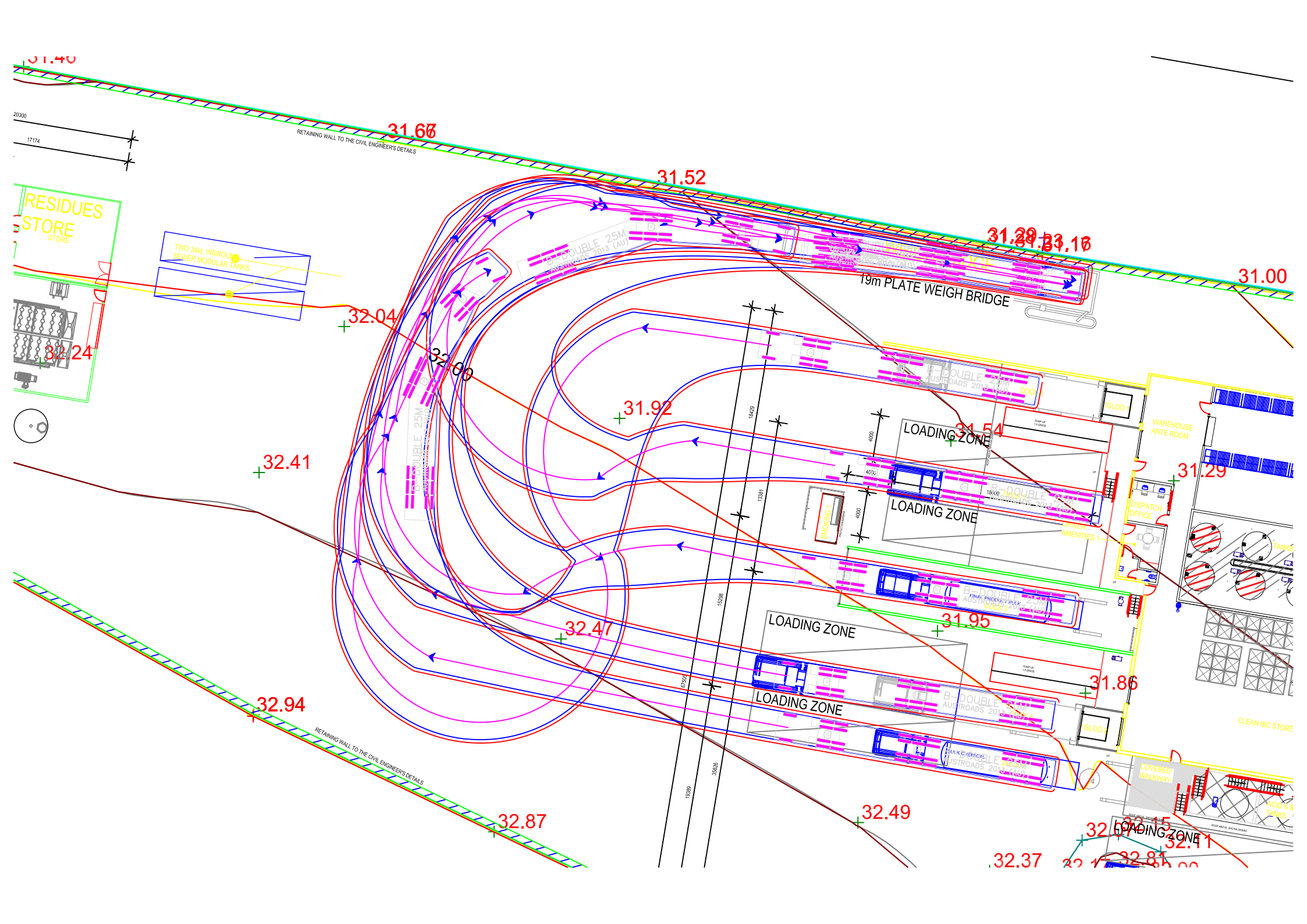
Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 2.6% 1.8% 0.9%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	985,461 veh/y	1,182,553 pers/y
Delay	1,442 veh-h/y	1,731 pers-h/y
Effective Stops	413,716 veh/y	496,460 pers/y
Travel Distance	1,031,076 veh-km/y	1,237,292 pers-km/y
Travel Time	18,221 veh-h/y	21,865 pers-h/y
Cost	801,175 \$/y	801,175 \$/y
Fuel Consumption	87,862 L/y	
Carbon Dioxide	208,162 kg/y	
Hydrocarbons	17 kg/y	

**10. Appendix D – Service Vehicle Turning Path Assessments**







RETAINING WALL TO THE CIVIL ENGINEERS DETAILS

31.68

31.52

31.28 31.16

31.00

19m PLATE WEIGH BRIDGE

32.04

32.00

31.92

32.41

LOADING ZONE

31.29

32.47

LOADING ZONE

31.95

32.94

LOADING ZONE

31.86

32.87

32.49

32.37

32.45

32.81

32.00

RETAINING WALL TO THE CIVIL ENGINEERS DETAILS

COVERED WALKWAY

ACID & S TANKS

CLEAN IBC STORE

DISPATCH OFFICE

WAREHOUSE ANTE ROOM

SMOKING 1

DRIVER AMENITIES 1

IGLOO 1

IGLOO 2

DOUBLE 25M AUSTRROADS 2013 (AU)

DOUBLE 25M AUSTRROADS 2013 (AU)

DOUBLE 25M AUSTRROADS 2013 (AU)

DOUBLE 25M AUSTRROADS 2013 (AU)

DOUBLE 25M AUSTRROADS 2013 (AU)

DOUBLE 25M AUSTRROADS 2013 (AU)

DOUBLE 25M AUSTRROADS 2013 (AU)

DOUBLE 25M AUSTRROADS 2013 (AU)

DOUBLE 25M AUSTRROADS 2013 (AU)



